State of Colorado

Public Safety
Radio System-Wide Needs
Assessment Report

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Executive Summary

The state of Colorado (State) recognizes that it is critical for state, local, tribal, and federal public safety personnel across Colorado to have radio communications systems that meet their needs for daily and emergency operations. The current landscape of public safety radio communications includes the statewide Digital Trunked Radio System (DTRS) as well as numerous other radio systems that serve regional or local areas. The State selected Federal Engineering (***FE***) to assess these radio systems, with a focus on DTRS, and to make recommendations as to the best approach to improving their ability to meet stakeholders' current and future radio communications needs.

In support of the statewide effort to maintain and improve public safety radio communications, ***FE*** presents this *Public Safety Radio System-Wide Needs Assessment Report (Needs Assessment).* The report assesses the public safety communications needs in Colorado and describes the impact of those needs on various systems (DTRS and other systems).

The companion to this report, the *Public Safety Radio System-Wide Business Plan Report*, *(Business Plan)* identifies the recommended business goals and objectives, cost projections, financial activities, governance models, and administrative items related to statewide public safety communications and interoperability. Due to the background information contained in this report, ***FE*** suggests reading this report prior to reading the *Business Plan*.

DTRS Overview

DTRS is the statewide, public safety, voice radio system that enables direct communications between public safety agencies across jurisdictional and regional boundaries. DTRS encompasses 215 radio tower sites distributed across the state. These sites connect to one of five distributed cores via approximately 300 backhaul links (microwave or other telecommunications circuits). The system uses frequencies in the 700 MHz and 800 MHz bands and employs Association of Public Safety Communications Officials (APCO) Project 25 (P25) standards, which define a common set of signaling interfaces and user features.

More than 1,000 local, regional, tribal, state and federal agencies use DTRS and the system supports over 75,000 subscriber radios. Approximately 18% of these users are from state government. The remaining 82% are local, regional, tribal and federal government agency users. The ownership of the DTRS is diverse. The state of Colorado

Governor's Office of Information Technology (OIT) owns a significant portion of the equipment used in the network, as do numerous municipalities and regional partnerships.

DTRS Issues and Needs

The term "operability" describes the ability of a radio system to meet the operational needs of those who use it on a daily basis. Based on the results of the user surveys, DTRS currently meets most of the needs for operability of its users including those for capacity, features, and reliability.

State and local radio users raised concerns about the mobile radio coverage DTRS provides including significant gaps along Colorado highways. ***FE***'s analysis found estimated current mobile radio highway coverage to be 79% across the entire state (with approximately 73% coverage in the western portion of the state and 84% in the eastern portion.[1]) Users from across the state substantiated this critical need for additional coverage through a series of coverage workshops conducted by ***FE*** as part of the development of this report.

The following list describes other critical needs identified through the user survey and interview process:

- Replace soon-to-be unsupported radio repeater stations (which operate at sites and provide radio coverage to users) and dispatcher console equipment (which allows 9-1-1 centers to communicate with field users) over the next 3 to 5 years
- Keep the system's overall platform up to date through the application of the new system software releases within the next 1 to 4 years
- Replace the aging and unreliable microwave backhaul system that provides links between DTRS sites and zone controllers

[1] For the purposes of this analysis, the "western portion of the state" includes the following Counties; Alamosa, Archuleta, Delta, Dolores, Eagle, Garfield, Grand, Gunnison, Hinsdale, Jackson, La Plata, Mesa, Mineral, Moffat, Montezuma, Montrose, Ouray, Pitkin, Rio Blanco, Rio Grande, Routt, Saguache, San Juan, San Miguel, and Summit. The "eastern portion of the state" includes all other Counties.

DTRS Recommendations and Cost Estimates

In order to address each of the critical needs identified by the users: coverage, equipment lifecycle, system platform upgrade, and microwave backhaul replacement, ***FE*** developed a set of recommendations for the State's consideration.

Enhancing DTRS coverage is the most critical user need based on feedback from the user surveys and coverage workshops. Coverage in the western portion of the state requires the most improvement. Due to the radio engineering challenges posed by the Rocky Mountains, enhancing the mobile radio coverage in the gaps identified by users (through surveys and coverage workshops) requires the addition of approximately 109 new radio sites with the majority of them being located in the western portion of the state. These additional sites raise the predicted statewide mobile radio coverage on state highways from the estimated 79% to approximately 90% (with predicted increases from 73% to 87% in the western portion of the state and from 84% to 93% in the eastern portion).

The estimated cost to add these 109 new radio sites is $115,976,000. The cost estimate is conservative in that it includes the development new radio sites, which require items such as access roads, communications equipment shelters, towers, and main and backup power. If the State identifies and uses existing sites, a reduction in the overall cost is possible. The funding to add these sites has not been requested or appropriated at either the state or local levels.

Table ES-1 describes the recommendations and estimated costs to address the remaining critical improvements to DTRS: equipment lifecycle, system platform upgrade, and microwave backhaul.

Table ES1 – Critical Improvements - Recommendations and cost summary

Recommendation	Action Plan	Estimated Cost and Funding Status
Topic: Equipment Lifecycle		
Continue replacement of legacy DTRS equipment	Replace existing Gold Elite consoles and Quantar® repeaters before the end of lifecycle in 2018 and 2020, respectively.	Approximately $12,504,000 to replace state-owned equipment. House Bill 14-1203 will address this funding.

Recommendation	Action Plan	Estimated Cost and Funding Status
		Approximately $17,527,000 to replace locally owned and funded equipment.
Topic: System Platform Upgrade		
Keep the DTRS platform up to date in order to continue to receive vendor support	State and local stakeholders collaboratively develop a plan for statewide "system release" upgrade to be performed within the next 1 to 5 years	A plan and related costs have yet to be determined. However, funding will be available for state-owned assets starting in 2017 via House Bill 14-1203.
Topic: Microwave Backhaul		
Replace the aging and unreliable microwave backhaul system	Implement a new microwave system using MPLS technology in a fault-tolerant topology (a design of five interconnected rings)	According to OIT, the total project cost estimate is between $44.5M and $55.9M. Budget requests have been made by OIT

Section 6 of this report further details ***FE***'s recommendations on addressing the high and medium priority needs.

Overview of Systems other than DTRS

There are numerous public safety radio systems in Colorado other than DTRS. These include large regional radio systems such as those that serve the cities Denver, Lakewood, Arvada, Westminster, and Aurora. These cities deployed systems to meet the specific operational needs of their users. There are also smaller, localized systems across Colorado's remote and rural areas.

These systems use different frequency bands and technologies. The concerns regarding these systems are similar to those for DTRS and include improving outdoor and in-building radio coverage and replacing aging and unsupported equipment.

Section 4 of this report describes these and other concerns, along with plans to address them as established by the system operators.

Interoperability Overview

The term "interoperability" refers to the ability to provide communications between disparate systems when needed and when authorized. This allows users of those systems to communicate with each other during emergencies or planned major events. There are various ways to achieve interoperability, such as simply sharing radios or by using technology and/or operational procedures to interconnect different systems.

Within Colorado, there are many methods used to provide interoperability. These include the provision of shared Mutual Aid talkgroups (the equivalent of a dedicated radio channel in a trunked radio system) within DTRS as well as various interconnections between systems. Interoperability has been implemented at the local level to support local interoperability needs. Users expressed that these methods met a majority of their interoperability needs but room for improvement exists.

Interoperability Issues and Recommendations

In order to enhance interoperability, it is essential to improve operability. Therefore, it is critical to address system issues such as coverage and equipment replacement.

FE recommends that the State address its interoperability issues at the local agency level and work with planning groups such as the State Homeland Security and All-Hazards Senior Advisory Committee (HSAC) Communications Committees to establish effective governance structures and provide the funding support they require[2].

The needs for interoperability at the regional and statewide levels continue to grow due to the higher degree of cross-discipline and cross-jurisdiction cooperation for public safety services. Implementations of new radio systems in Colorado that are not part of DTRS have created new requirements for improved interoperability. In addition, collaborative public safety interactions across state borders have increased the need for interstate interoperability.

The technical method most likely to address these regional, statewide, and interstate needs for interoperability is a new capability called the Inter-RF-Subsystem Interface

[2] Issues related to funding and governance are addressed in the *Business Plan* report, which is described later as a companion to this Needs Assessment report.

(ISSI). The deployment of ISSI is just beginning in Colorado and neighboring states. This deployment should continue but it should do so:

- Only to meet specifically-identified operational needs
- Without negative consequences to the capacity or other aspects of individual systems that will be interconnected
- In a design/topology that meets needs while minimizing deployment and on-going costs
- Within the collaborative planning and governance purview of the Public Safety Communications Subcommittee (PSCS)[3]

Emerging Technologies Overview

The deployment of a Nationwide Public Safety Broadband Network (NPSBN), more commonly referred to as FirstNet®, is currently in the planning stages. This network is envisioned to be based on fourth-generation Long Term Evolution (4G LTE) technology.

The planning and communications regarding the NPSBN in Colorado are also in the early stages and are being conducted by FirstNet Colorado, a department within OIT. Support given to FirstNet Colorado for these efforts should be maintained but should not hinder, nor be at the expense of, continuing the improvements to DTRS or other statewide public safety communications systems.

[3] The PSCS is a subcommittee to the Homeland Security and All-Hazards Senior Advisory Committee (HSAC) and has the legislative charter to, among other tasks, promote interoperable communications among public safety organizations throughout the state

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1. Scope of Report

This *Public Safety Radio System-Wide Needs Assessment Report* describes the current and future public safety radio communications needs in Colorado and determines how they may affect the statewide Digital Trunked Radio System (DTRS) and the various local systems as well as interoperability between them.

FE developed this report according to the scope of work of a contract executed by ***FE*** and the state of Colorado, Department of Public Safety, Division of Homeland Security and Emergency Management. That scope of work directed ***FE*** to address the following topics in this Needs Assessment Report:

- Digital Trunked Radio System (DTRS) coverage across Colorado
- Upgrade/replacement of existing DTRS network infrastructure
- Expansion, enhancement, and maintenance of interoperability in Colorado including systems other than the statewide DTRS
- Land lease costs for DTRS transmitter / repeater sites (see Note below)
- DTRS capacity and reliability
- Ownership by local governments of DRTS infrastructure
- Satisfaction (via a survey) of DTRS and non-DTRS agencies
- Maintenance and support capabilities of locally owned DTRS assets
- Any other recommendations to expand, improve, modernize, and sustain statewide radio communications

Note: With agreement from the Division of Homeland Security and Emergency Management, we present our research and findings on site lease costs in the *Business Plan*, a companion to this report.

FE drew upon multiple sources of information and insight including surveys, interviews, site visits, documentation, workshops, and coordination with other communications initiatives. ***FE*** then analyzed this information and used it to identify needs, develop recommendations and implementation costs and plans.

The following list defines the organization of the balance of this report:

- Section 2 describes our methodology for gathering and analyzing the data included in this report.
- Section 3 details our assessment of the key performance attributes of DTRS.
- Section 4 summarizes the capabilities and needs of over 20 non-DTRS systems from across Colorado.
- Section 5 includes a description of the three main methods of interoperability between DTRS and other systems in the state.
- Section 6 discusses recommendations, implementation plans, and costs to address the needs of DTRS as identified in Section 3.
- Section 7 provides recommendations to address statewide interoperability.
- Section 8 summarizes the status of the National Public Safety Broadband Network as prepared by FirstNet Colorado.
- In Appendices A through N, we provide supporting details for this report including coverage prediction maps and prediction assumptions, tabulated data from user surveys, assumptions used for cost estimates, and other information.

2. Methodology

The methodology used to develop this report follows the processes that ***FE*** has used successfully in hundreds of similar projects across more than 32 years of experience.

Project initiation

On January 6, 2015, ***FE*** conducted a Project Initiation meeting with stakeholders from the Division of Homeland Security and Emergency Management (DHSEM). The purpose of the meeting was to confirm a common understanding of the project goals, objectives, and vision; items best understood through a close working relationship between the respective management teams and staffs.

Regular project status reports

FE provided stakeholders from the Division of Homeland Security and Emergency Management with a biweekly project status report that described the progress and issues related to our data gathering and data analysis efforts. We shared these reports with members of Public Safety Communications Subcommittee (PSCS)[4] and other stakeholders.

Existing system analysis and data collection

FE took four distinct data collection approaches: requests for information, web-based surveys, stakeholder interviews, and physical site surveys.

FE sent Requests for Information (RFI's) to member agencies for the express purpose of gathering information about DTRS from the Governor's Office of Information Technology (OIT), identifying the ownership of DTRS assets, and gathering information on the technical and operational details of systems other than DTRS.

Web-based surveys were available for DTRS and non-DTRS users, dispatchers, technicians, and managers to complete between January 26, 2015, and February 10, 2015. We received 214 responses; however, 48 were incomplete and only partially usable.

[4] The PSCS is a subcommittee to the Homeland Security and All-Hazards Senior Advisory Committee (HSAC) and it has the legislative charter to, among other tasks, promote interoperable communications among public safety organizations throughout the state

FE personnel conducted stakeholder interviews during February and March 2015, with a number of entities, including the regional all hazards subcommittees, the PSCS, the Consolidated Communications Network of Colorado (CCNC), OIT, DHSEM, and various local entities such as Eagle, Pueblo, and Boulder counties.

Appendix O lists the agencies, departments, and other organizations that participated in the interviews, surveys, and requests-for-information (RFI's). It lists both the agencies that received requests to participate as well as those that did participate.

The ***FE*** team conducted physical site surveys at 20 representative radio sites over the course of two weeks in February 2015. The sites visited were a mix of locally, and state-owned sites and included sites in DTRS as well as other systems. These site visits enabled us to identify any issues present at those specific sites and to use that information as representative of all sites in the corresponding system.

Needs analysis and requirements definition

FE analyzed the data collected, determined high-level stakeholder requirements, and discussed these with the State and local entities to validate the identified requirements. This allowed us to gain consensus, acceptance, and a mutual understanding of user-defined requirements before developing recommendations to fulfill those requirements.

Coverage assessment and workshop

Through our detailed coverage analysis and execution of our onsite interactive and collaborative coverage workshop, ***FE*** assessed existing coverage performance and identified gaps in coverage. We then developed recommendations for alleviating those coverage gaps to meet State and local needs.

Recommendations for upgrade of existing DTRS

Based on the conclusions derived in the preceding steps, we developed our recommendations for upgrade of the existing DTRS network. We undertook a number of steps to develop the recommended changes and improvements including:

- Identifying potential solutions based on activities in the previous task
- Distilling client-driven needs which were then used to determine the recommended changes and improvements

- Identifying potential risks and effects to the existing system

FE's recommended changes and improvements address a wide range of needs expressed by users.

Consideration of the SCIP and PSCS Annual Report

FE took efforts to make certain that this report and its companion *Business Plan* considered the intent of two other important documents, the Colorado Statewide Communications Interoperability Plan (SCIP) and the PSCS 2014 Annual Report. We reviewed the current versions of these documents and attended the SCIP workshop held in April 2015.

Estimated costs for equipment, installation and optimization

Using our in-house cost analysis tool, ***FE*** prepared high-level cost estimates for the recommended changes and improvements outlined in this report including equipment, installation, and optimization costs. These estimates reflect previous activities in this project and publicly available industry information.

The dynamics of the wireless communications technology market are such that the eventual prices provided by vendors can vary significantly due to a number of factors. Therefore, ***FE***'s budgetary estimates are conservative in nature to allow for flexibility within the budget.

Coordination with FirstNet Colorado

Part of the scope of this report was to investigate and report on the development of the Nationwide Public Safety Broadband Network (NPSBN) and its potential impact to the existing public safety radio systems in place in Colorado. The NPSBN is more commonly referred to as FirstNet and is based on fourth-generation Long Term Evolution (4G LTE) cellular phone technology. FirstNet Colorado, a department within the Governor's Office of Information Technology (OIT), is responsible for the planning and communications regarding the broadband network in Colorado. ***FE*** agreed that FirstNet Colorado, with approval from the Division of Homeland Security and Emergency Management, would provide the content for Section 8 of the report.

Summary of Methodology

Figure 1 provides a summary of the project phases:

- Project management and preparation (blue)
- Needs identification (purple)
- Needs analysis (green) tasks involved in the development of this report
- Business Plan report (red)

FE completed the execution of this methodology between January 2015 and June 2015.

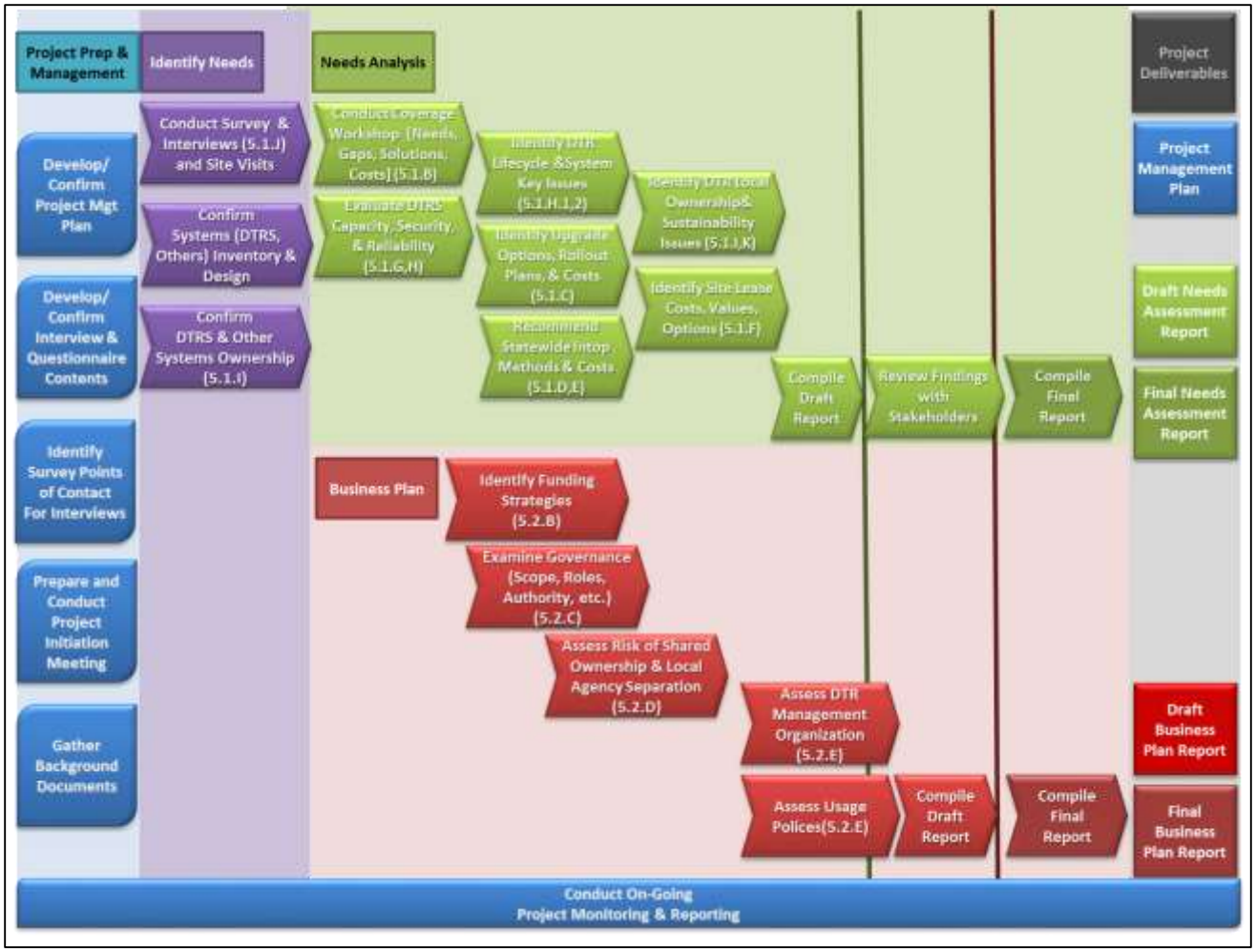


Figure 1 – Summary of Methodology

3. DTRS Assessment and Needs

This section describes ***FE***'s assessment of the DTRS. We discuss the system's ownership, condition, and performance (including coverage, capacity, reliability and other attributes). This section also describes needs of users of DTRS including needs currently unmet by the system. The basis of this assessment is information provided from interviews, user surveys, site visits, and documentation provided by various owners of DTRS assets.

3.1 DTRS Overview

3.1.1 DTRS Purpose

The DTRS is the statewide, public safety, voice radio system that enables direct communications between first responder / public safety agencies across jurisdictional and regional boundaries.

DTRS is available to all public safety agencies, some of whom choose to use DTRS as their primary radio system for daily operations. It is also available to agencies that may choose to utilize the resources of the DTRS for interoperable communications only. In these two capacities, it serves state, local, federal, and tribal public safety agencies across the state of Colorado.

3.1.2 DTRS Description

The infrastructure of DTRS includes:

1. Radio sites spread out across the state that house radio repeater equipment
2. Master sites (also known as "zones") which control the operations of the radio sites
3. Dispatch centers that interface to allow 9-1-1 dispatch positions to directly connect to the network
4. Backhaul links (also known as transport links) that interconnect the sites to each other and to the master sites and dispatch centers.

DTRS consists of 215 radio tower sites, 5 zone controllers, over 70 dispatch sites and approximately 300 backhaul links comprised of microwave radio, optical fiber, and leased circuit technologies. The radio system utilizes frequencies in both the 700 MHz and 800 MHz bands.

The vendor for a majority of the DTRS infrastructure is Motorola Solutions, Inc. ("Motorola") and their product name for the DTRS system is an APCO Project 25-compliant ASTRO25® radio system[5]. Motorola is the provider of the radio repeaters in the radio sites, the master sites, and the dispatch positions in the dispatch centers that are part of DTRS. Other vendors including Alcatel, Harris, and Western-Multiplex provided the equipment for microwave-based transport links, while other vendors provided the fiber-based or leased-line-based transport links.

More than 1,000 local, regional, tribal, state and federal agencies use DTRS and the system supports over 75,000 subscriber radios. Approximately 18% of these users are from state government. The remaining 82% are local, regional, tribal and federal government agency users.

Subscriber radios from multiple vendors operate on DTRS. These include Motorola, Harris Corp., EF Johnson, and others. Subscriber equipment must comply with certain minimum specifications to operate on DTRS, but user agencies are at their own discretion as to which compliant subscribers they purchase and use.

3.1.3 DTRS Ownership

The ownership of DTRS is diverse: OIT owns a significant amount of the equipment used in the network, as do numerous municipalities and regional partnerships. These local owners range from metropolitan-area counties, regional partnerships, and numerous smaller municipalities and county governments. For the most part, regardless of ownership, usage of the network is ubiquitously open to all authorized users, and statewide access is available to all user agencies independent of their jurisdiction[6].

This report includes a listing of the ownership of the DTRS infrastructure assets in the following categories: radio repeaters (located at radio sites spread out across the state),

[5] APCO is the Association of Public Safety Communications Officials, International. This organization created a set of specifications referred to as "Project 25" to define standards for digital public safety radio products and interfaces. ASTRO25® is Motorola's line of products, systems, and interfaces that adhere to the APCO Project 25 (P25) standards.

[6] Exceptions to this statement do exist wherein, by explicit agreement, certain owners allow visiting, out-of-jurisdiction users to access selected statewide mutual aid channels and talkgroups instead of those users' home talkgroup.

master sites (also known as “zones”), dispatch centers, and backhaul links. Identifying ownership of these infrastructure assets was important for various reasons.

Prior to this report, there had been no compiled and agreed upon listing of the ownership of DTRS assets. In our investigations, most owners of DTRS assets were aware of what they owned; however, for numerous DTRS assets, no one claimed ownership. This led to instances in which those ‘unclaimed’ assets required repair or upkeep and there was no agreement as to who was financially responsible for such actions. In those cases, someone ultimately provided the necessary repair or upkeep in order to sustain public safety communications. However, because ownership of that asset was not firmly established, that entity may have absorbed a cost that was the responsibility of another party.

At some DTRS sites, different parties own the land, the shelter, the tower, the radio repeater equipment, and the backhaul. This high degree of mixed ownership complicates the task of identifying responsibility for upkeep and maintenance of assets.

Ownership also carries a responsibility to appropriately budget for future costs such as maintenance, repairs, and upgrades. Failure to secure the necessary budget for upkeep of a DTRS asset can result in that asset’s failure.

The agencies that manage statewide systems in states other than Colorado base their decisions on funding and governance on ownership. Some states that charge participating agencies a fee for the use of the system provide a discount to those agencies that own infrastructure connected to the statewide system (and some provide higher levels of discount to those that own more interconnected infrastructure).

Establishing ownership is a critical component toward building foundations for system-wide funding, which can further promote system sustainability.

Appendix A includes a listing of the DTRS infrastructure assets of repeaters, master site controllers (“zones”), dispatch centers, and transport links. At a summary level, this list shows:

- There are 1,564 repeaters at the 215 radio sites in DTRS:
    - Of those repeaters, the state of Colorado owns 744 (or 48%)
- There are 5 master sites (“zones”) in DTRS with the following ownership:
    - The state of Colorado owns 3 master sites

  - The Pikes Peak Regional Communications Network (serving agencies in El Paso County) owns 1 master site
  - Pueblo County owns 1 master site

- There are 71 dispatch centers with a total of 382 dispatch console positions in DTRS (note that the number of dispatch positions per dispatch center varies widely - some centers have as many as 22 dispatch console positions and others have as few as 1).
  - The state of Colorado owns 37 dispatch consoles across 9 dispatch centers
- There are 298 transport links in DTRS; 10 use optical fiber, 26 use leased circuits ("T1's"), and 262 use privately-licensed microwave paths
  - Of those transport links, the state of Colorado owns or leases 177 (or 60%)

It is important to note that this list is current as of the date of this report but that ownership of DTRS assets may change as the system expands and as ownership transfers through the establishment or terminations of agreements. ***FE*** recommends that the state of Colorado Division of Homeland Security and Emergency Management establish a process to review and revise this ownership list to ensure it is current, complete, and accurate on an annual basis.

3.1.4 Summary of DTRS Description/Ownership Status and Need

Table 1 briefly describes the status and needs of system ownership:

Table 1 – System Attribute: Ownership

System Attribute: Ownership	
Current Status	*Need*
DTRS is currently a radio system of 215 radio tower sites, 5 zone controllers, over 70 dispatch sites and approximately 300 backhaul links. The primary vendor for the radio infrastructure is Motorola and the primary vendor for microwave backhaul is Alcatel. Ownership of DTRS infrastructure assets is diverse and this report presents the first compiled list of their ownership.	As DTRS evolves and expands, there should be a process for updating and maintaining a detailed list of the ownership of infrastructure assets on an annual basis.

3.2 DTRS Equipment and System Lifecycle

In a public safety communications system, keeping all components current with the radio systems vendor's product line is crucial. Doing so ensures that the vendor can support the system's hardware and software with troubleshooting support, hardware repair services, spare parts, and software updates. Using components in a public safety communications system that are not kept current with the vendor's product line can result in a reduced level of support. This, in turn, can significantly extend a service outage caused by a failure or incompatibility in a non-current product. The following information focuses on vendor support and product lifecycle of the current DTRS equipment.

Motorola provides services and support on the equipment used in DTRS at both the product and platform levels. This means they have a support lifecycle that defines key dates for the beginning and end of production (shipment) and support (which includes spare parts and repair service) for the individual products (such as repeaters and servers used for master sites as well as other components) in the system and the combination of those products that together constitute a platform.

The term "platform" refers to the system-wide set of hardware and software operating together and certified by Motorola to provide a specific set of features and functionality. DTRS currently operates on ASTRO25® platform Version 7.14. This platform version, in turn, supports the mix of different types of Motorola radio repeaters, master sites, and dispatch center positions used in DTRS. As Motorola discontinues support of these

individual products by ending their production and, later, the availability of repair, spares, and troubleshooting support for them, Motorola will also discontinue support of these products as components of the ASTRO25® platform.

This section provides information about Motorola's lifecycle of support for the individual products followed by information about support for the overall ASTRO25® platform. ***FE*** developed all lifecycle figures based on information provided by Motorola.

3.2.1 Master Site Servers

As noted, DTRS currently operates with five master sites (Zones 1, 2, 3, 4, and 6 (there is no Zone 5)). These master sites operate on hardware servers made by companies other than Motorola; however, Motorola integrates specially developed software into that hardware to provide the control and management functionality of ASTRO25® systems such as DTRS. Because Motorola is the integrator of the software and hardware for the master sites, they ultimately set the roadmap for them.

Motorola's support for the Sun® Netra™ 240 server as the hardware platform for Master Sites ended in December 2010, and their support for Master Sites that use the Sun® Netra™ T5220 Server ended in December 2014. Motorola still supports the CAS Server DL 380 G6 for the Master Sites with no set end-of-life. Figure 2 summarizes the master site servers' lifecycle.

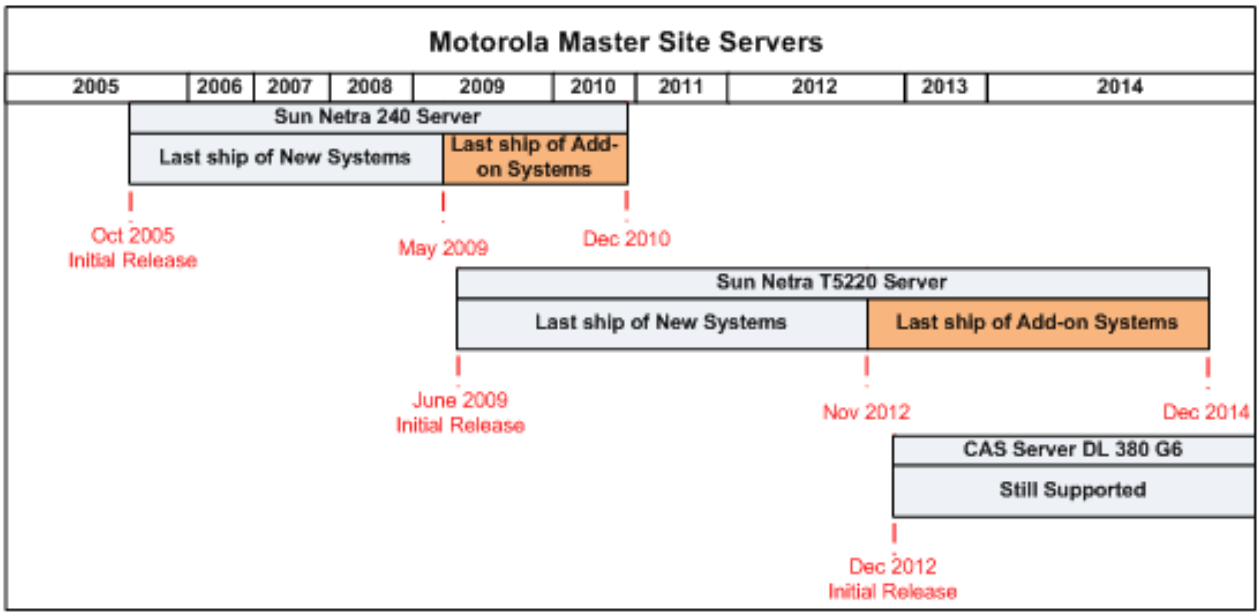


Figure 2 – Motorola Master Site servers' lifecycle

According to records from the OIT, all of the DTRS master sites utilize the CSA DL380p Gen8 Servers, which currently have support from Motorola.

3.2.2 Motorola Networking Equipment

The connections from one master site to the others as well as from master sites to radio sites rely on networking equipment. Although not mentioned in the description of infrastructure assets listed above, this networking equipment includes devices and switches, which interface the master sites and radio sites to the transport links. To a large degree, Motorola uses commercial-off-the-shelf networking equipment for these devices and switches; however, it integrates into them specialized software, developed by Motorola, that supports the features and functionality of ASTRO25®.

Motorola announced that support for the S2500 network device will end in June 2020, and support for the S6000 will end in December 2024. The end-of-life date for the GGM8000 is currently undetermined. Figure 3 summarizes the lifecycle of the Motorola networking equipment.

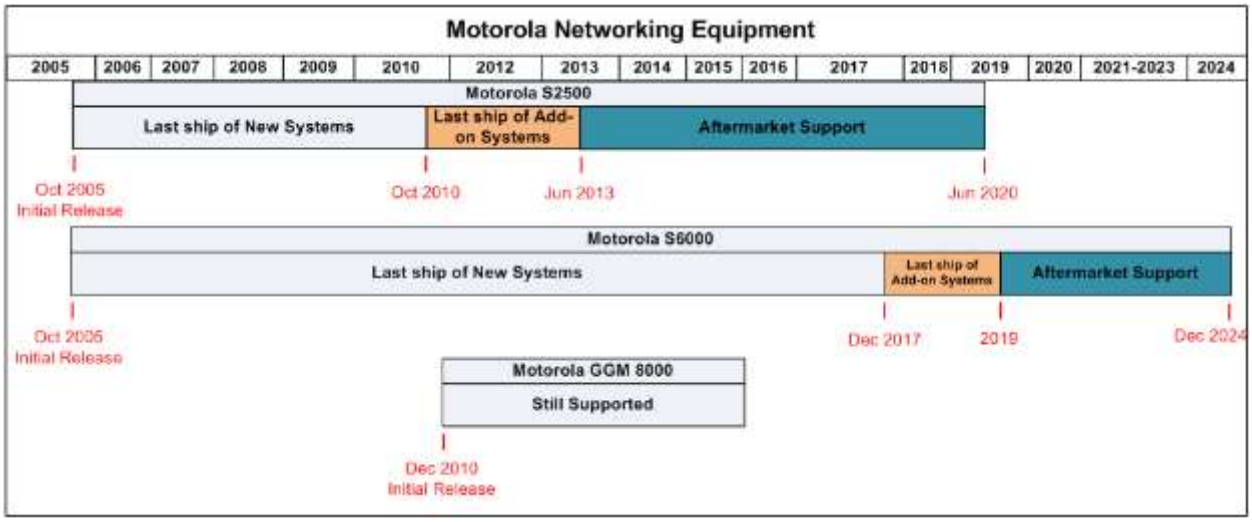


Figure 3 – Motorola networking equipment lifecycle

Aftermarket support for the HP 2610-24, HP 2610-48, and HP 3500-48 will end in December 2015. The end-of-life dates for the HP 2620-24, HP 2620-48, and HP 3800-48 are still undetermined. Figure 4 summarizes the WAN/LAN switching equipment lifecycles.

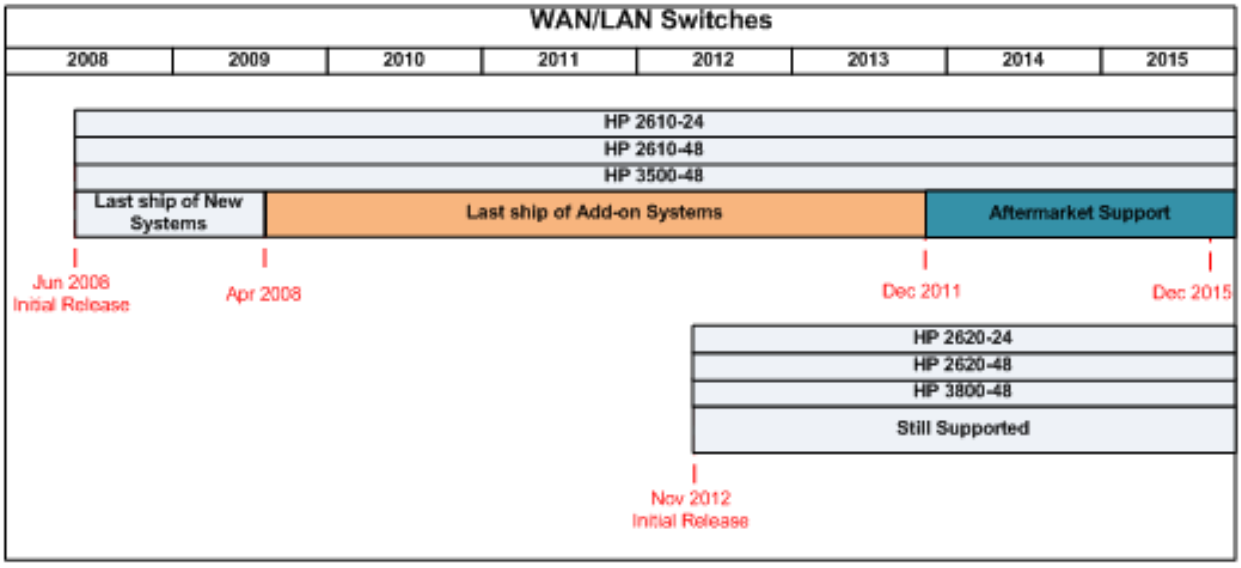


Figure 4 – WAN/LAN switching equipment lifecycle

According to records from OIT, DTRS uses a mix of networking devices including S2500, S6000, and GGM8000 devices. Additionally, OIT reports the existence of a mix of

2610-24, 2620-24, and 3800-48 switches in DTRS, the latter used only at master sites. Motorola currently supports all of these devices.

3.2.3 Radio Site Repeaters

The repeaters located at the radio sites receive and transmit radio signals to-and-from the subscriber radios used by field personnel. Motorola announced various end-of-life dates for the Radio Frequency (RF) site equipment located at the 215 Colorado DTRS RF locations. Aftermarket services currently support many of these devices, but these services are nearing the end of the lifecycle. Figure 5 summarizes the lifecycle of the RF site equipment.

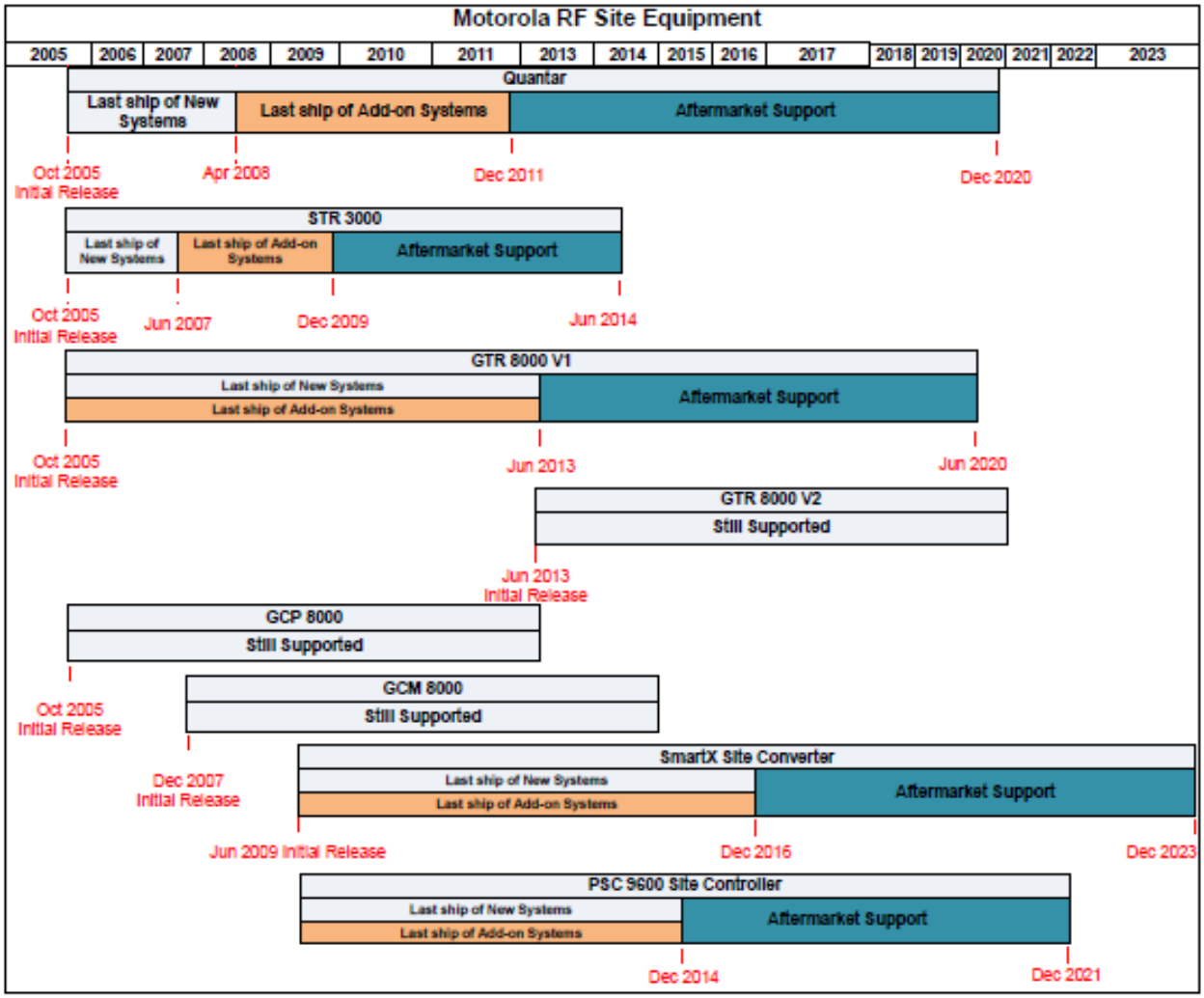


Figure 5 – Motorola repeater (RF site equipment) lifecycle

According to records from OIT, 666 of the 1,564 repeaters at the 215 radio sites in DTRS are Quantar® and STR3000 repeaters; however, OIT provided no information regarding their ownership. The remaining DTRS repeaters are GTR 8000 repeaters. The state of Colorado has already purchased 56 GTR 8000 repeaters to replace some of the Quantars®.

3.2.4 Dispatch Console Equipment

The equipment located at 9-1-1 public safety answering points (PSAP, also known as dispatch centers) which allows a human dispatcher to communicate through the radio system to the subscriber radios used by field personnel are the dispatch consoles.

Motorola announced the end of aftermarket support for the CENTRACOM™ Gold Elite console as December 2018, and the end of aftermarket support for the MCC 7500 (General Purpose Input / Output Module (GPIOM)) in June 2018. Motorola continues support of the MCC 7500 (Voice Processor Module (VPM)) with the end-of-life date yet undetermined. Figure 6 summarizes the lifecycle of the dispatch center equipment.

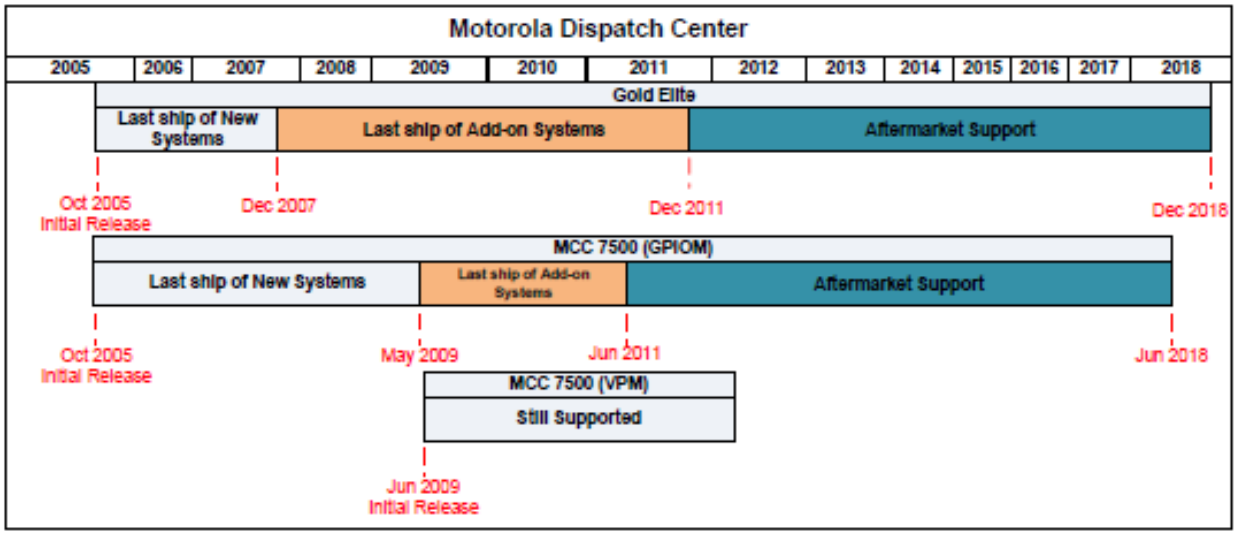


Figure 6 – Motorola dispatch center equipment lifecycle

According to records from OIT, fewer than 100 of 382 dispatch consoles at the 71 dispatch centers in DTRS are Gold Elite consoles. However, no information was available regarding their ownership. Currently, 21 of these dispatch consoles are being replaced with MCC 7500 consoles. According to OIT, all state consoles are or will be MCC 7500

by June 30, 2015. The remaining Gold Elite consoles belong to county or local municipalities.

3.2.5 Workstations

Workstations, or special-purpose desktop computers, are in use throughout DTRS for various purposes including network management and dispatch operator positions. Like the previously described products, Motorola provides and supports these workstations, mainly manufactured by Hewlett Packard (HP). Motorola integrates them with software specific to operations on public safety radio systems like DTRS.

The XW440, XW4600, and Z400 HP Workstations are already at end-of-life and the end of aftermarket support. Motorola still supports the Z420, which it initially released in 2012, and has set no end-of-life date. Figure 7 summarizes Motorola's lifecycles for HP workstations.

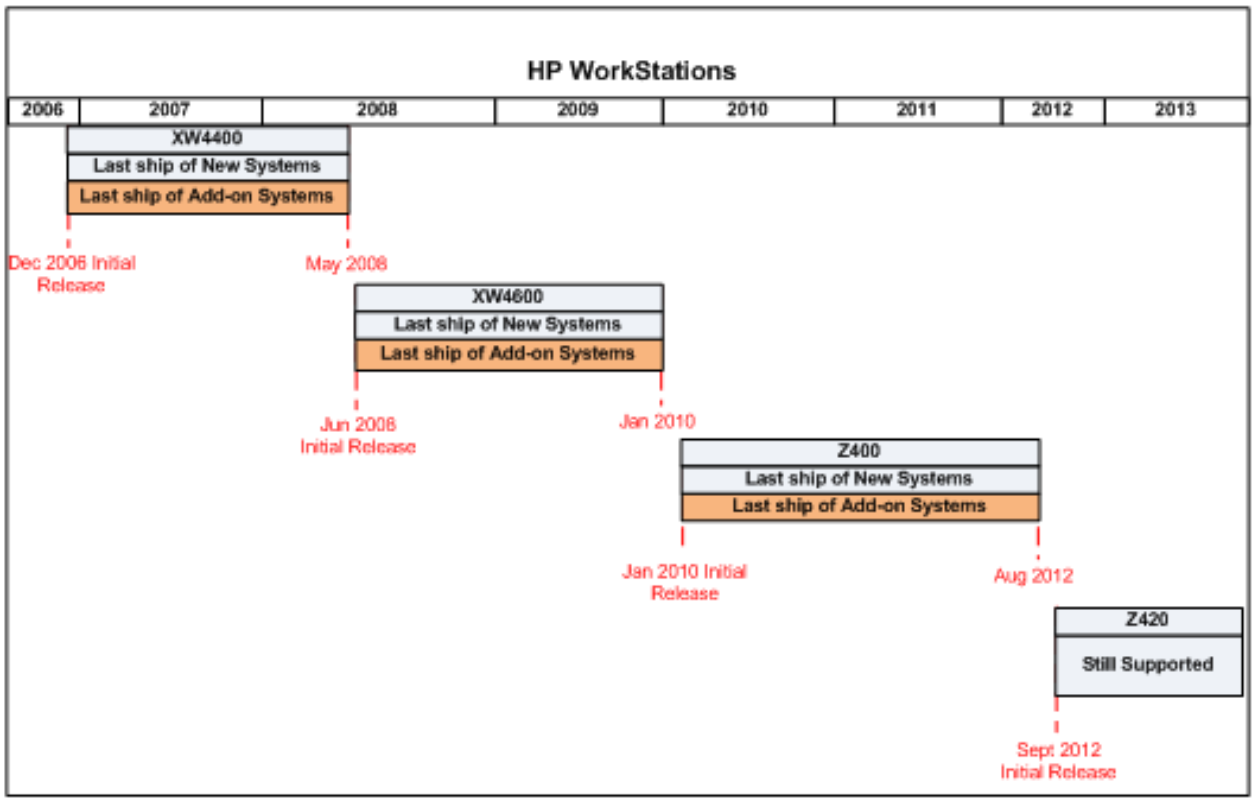


Figure 7 – HP workstation lifecycles

Due to a lack of information provided by non-state agencies, lifecycle information for non-state owned communications systems was unknown at the writing of this report.

3.2.6 System Platform ("System Release")

As noted, Motorola designs, tests, and supports combinations of all of the hardware and software used in an ASTRO25® radio system. Together, these components comprise a "platform" and Motorola notates its ASTRO25® platforms with a "system release" number. The format of the "system release" number is "7.xx" in which the "xx" are typically the last two digits of the calendar year in which the platform was developed and made available for release to customers. For example, the current system release of Motorola's ASTRO25® platform is 7.15.

Motorola recommends that owners of ASTRO25® systems perform an upgrade to a new platform (or system release) every 2 years and Motorola discontinues its support of platforms more than 5 years old. Lack of platform-level support from Motorola can have many effects including:

- Lack of compatibility between the individual hardware and software components within the system
- Inability to provide support for software including the inability to deliver "bug fixes", patches, and security updates such as anti-virus updates
- Limitations on the ability of the system to support new features or to be expanded to support growth in the number of sites or users on the system

Currently, DTRS is operating on system release version 7.14. The upgrade to 7.14 occurred in late 2014 and early 2015. Prior to the system-wide upgrade to 7.14, DTRS operated at the same system release version since mid-2009. That previous gap of over 5 years between system upgrades caused significant issues in DTRS including the effects listed above.

OIT recently announced that it is investigating upgrading DTRS to system release 7.16 at some time in the second half of 2017. This system release continues to support the Quantar® repeaters. (According to Motorola, 7.16 is the last system release that supports Quantar® repeaters. but it does not support the CENTRACOM™ Gold Elite consoles.) This means that all remaining Gold Elite consoles (approximately 100 of them) require

replacement before, or as part of that upgrade to system release 7.16 in the second half of 2017.

3.2.7 Summary of Lifecycle Status and Need

Table 2 – System Attribute: Equipment and System Lifecycle

System Attribute: Equipment and System Lifecycle	
Current Status	*Need*
DTRS currently operates at the latest releases of master site servers but it includes a mix of repeaters, dispatch console, and networking equipment. The current DTRS platform is Motorola's ASTRO25® system release 7.14.	DTRS should keep up-to-date with Motorola's equipment and system-release lifecycle plan. This involves replacing existing Gold Elite consoles by 2018, Quantar® repeaters as possible (before end -of-support in 2020), and completing a further platform upgrade within the next 1 to 4 years.

3.3 DTRS Coverage

FE analyzed system coverage of the DTRS network via two methods. The first is through a survey of system user groups. Section 3.3.1 describes the results. The second method of analysis was through an iterative process of predicting and refining system coverage and Section 3.3.2 describes those results.

According to OIT, DTRS delivers the following level of coverage: "Mobile (in vehicle) radio coverage provided to approximately 93%-95% of state roadways.[7]" Additionally, the Standard Operating Procedures (SOP) for DTRS as developed by the Consolidated Communications Network of Colorado (CCNC) states, "DTR is designed to provide mobile radio communication coverage on major State highways to the Participant. However, the system is provided as is and neither CCNC nor the state of Colorado makes any guarantee, either express or implied, as to a specific level of coverage.[8]" Furthermore, the CCNC SOP states "Additional, or coverage required beyond the mobile radio

[7] As stated in the Colorado Governor's Office of Information Technology's "*2013 – Public Safety Communications Network – 2014"* Report and on PSCN's website at http://www.oit.state.co.us/cto/dtrs
[8] DIGITAL TRUNKED RADIO (DTR) SYSTEM PARTICIPANT AGREEMENT", as contained within the CCNC's Standard Operating Procedures (Revision 6, date 3/11/2009)

communication coverage on major State highways is the responsibility of the requesting [local agency].”Local municipalities have added sites and repeaters to DTRS to enhance the coverage provided in their local areas, sometimes to the extent of providing coverage to portable radios in buildings or below ground elevation.

In addition, when reviewing DTRS coverage, it is important to keep in mind the history of the build-out of sites across the state. As conceived in the late 1990s, the State planned to build the DTRS in seven phases, with the timing and approximate coverage areas as depicted on Figure 8, provided by OIT.

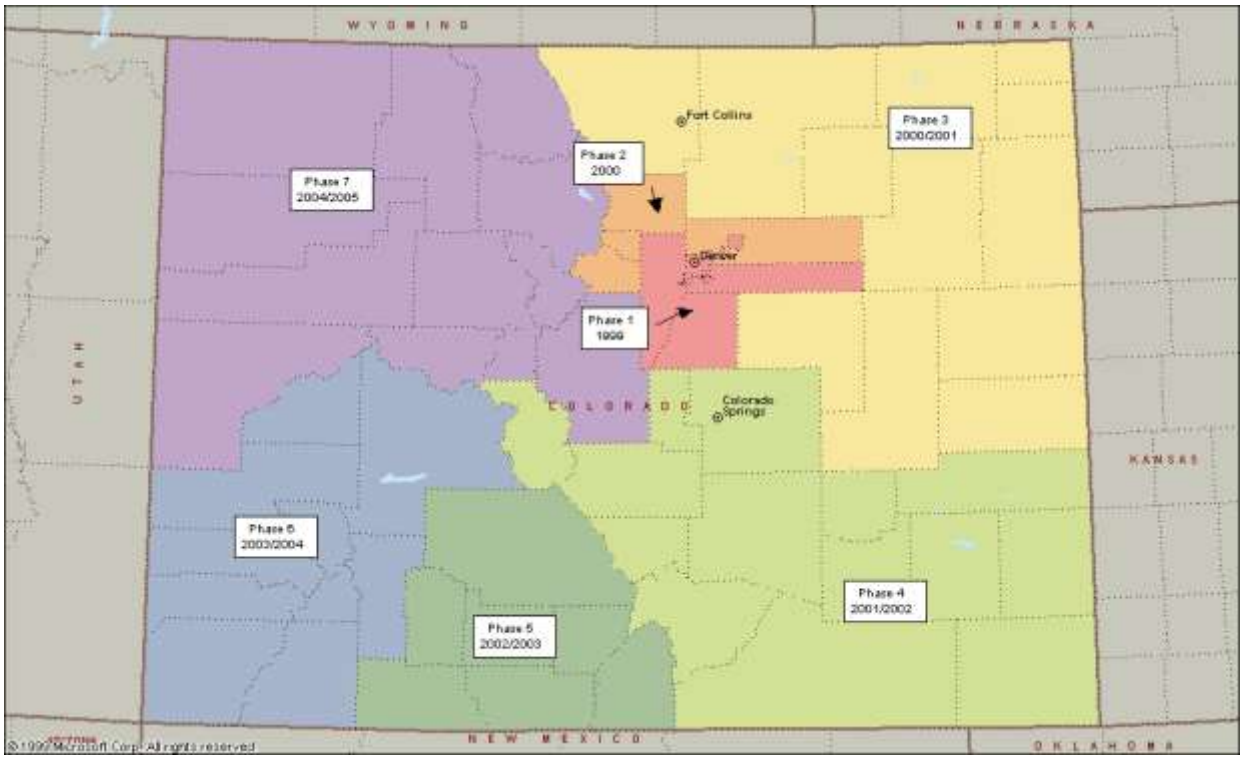


Figure 8 – Original DTRS implementation plan

According to OIT, funding of approximately $10 million per phase was provided to build state-owned radio sites for Phase 1 through Phase 4 but in the early 2000s, due to redirection of funds related to homeland security and the overall economic situation, funding was halted for the construction of sites in Phases 5 through 7. Later, in the mid-2000s, an initiative known as Colorado Wireless Interoperable Network (CWIN) provided approximately $43 million in funding to local municipalities so that they could build radio sites to meet their local coverage requirements.

Approximately 70 sites were built and added to DTRS through the CWIN project; however, these sites were located throughout the State (not just in the region of Phase 5 through Phase 7) and, in many areas, the CWIN-funded sites are not enhancements to the state-owned sites but, instead, they are the only sites providing coverage to users. Therefore, our survey and our coverage predictions (and refinements) showed that users in the western half of the State (in the areas of Phases 5 and 6) accounted for a majority of coverage concerns.

3.3.1 System Coverage – User Survey

FE provides the following analysis of online survey results regarding DTRS coverage as collected from field users, dispatchers, technical support, and management. We asked these four groups of survey participants to rate DTRS coverage on a scale with five choices ranging from excellent (no issues or problems) to poor (does not meet daily needs). In addition to providing the ratings, we asked participants to identify known areas where below average or inadequate coverage exists.

Field users provided ratings on system coverage for a radio mounted in a vehicle and operated on an open street, a handheld radio operated outdoors, and a handheld radio operated indoors or underground. Figure 9 illustrates the field user ratings on DTRS coverage.

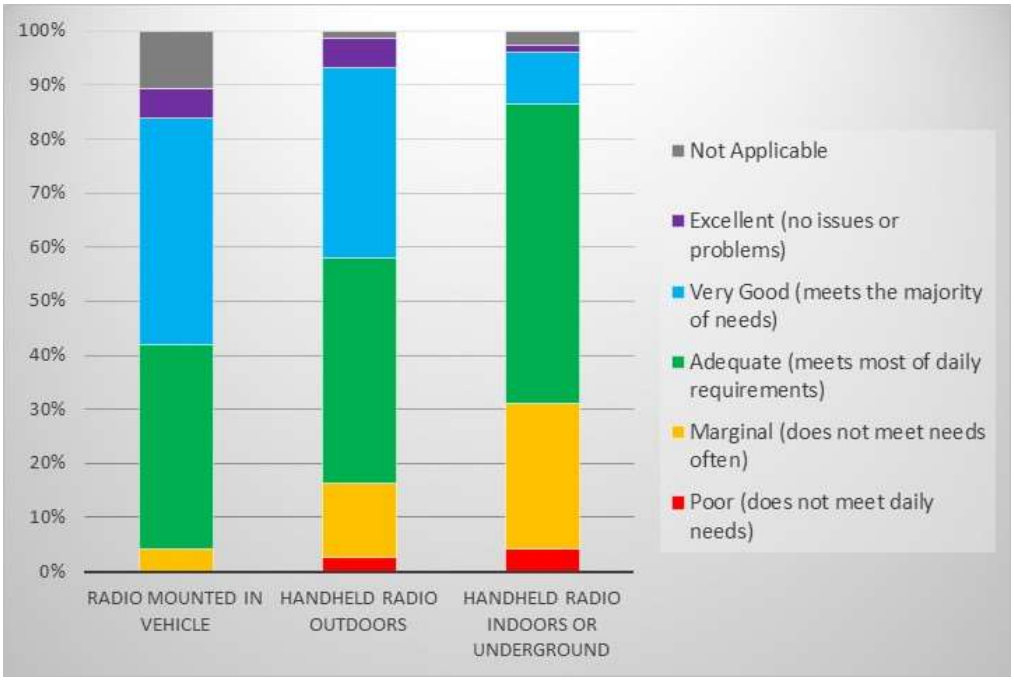


Figure 9 – Field user ratings on DTRS coverage

Almost 50% of field users rated system coverage for radios mounted in vehicles as very good to excellent. For handheld radios operating outdoors, the ratings of very good to excellent decreased while ratings of adequate, marginal and poor system coverage increased. Survey results further emphasize that trend for handheld radios operating indoors or underground.

The majority (70%) of field users reported that they do not operate their radios off network (i.e., they do not conduct unit-to-unit communications as opposed to transmitting through a DTRS repeater) and they do not anticipate expanding their needs for coverage in the future.

Survey participants that identified themselves as technical support rated the quality of coverage that they believe the DTRS provides for field users. The technical support ratings mirror very closely those of field users for radios mounted in a vehicle, handheld radio used outdoors, and handheld radios used indoors or underground.

The survey asked dispatchers to provide their ratings on overall DTRS coverage. Figure 10 summarizes their response.

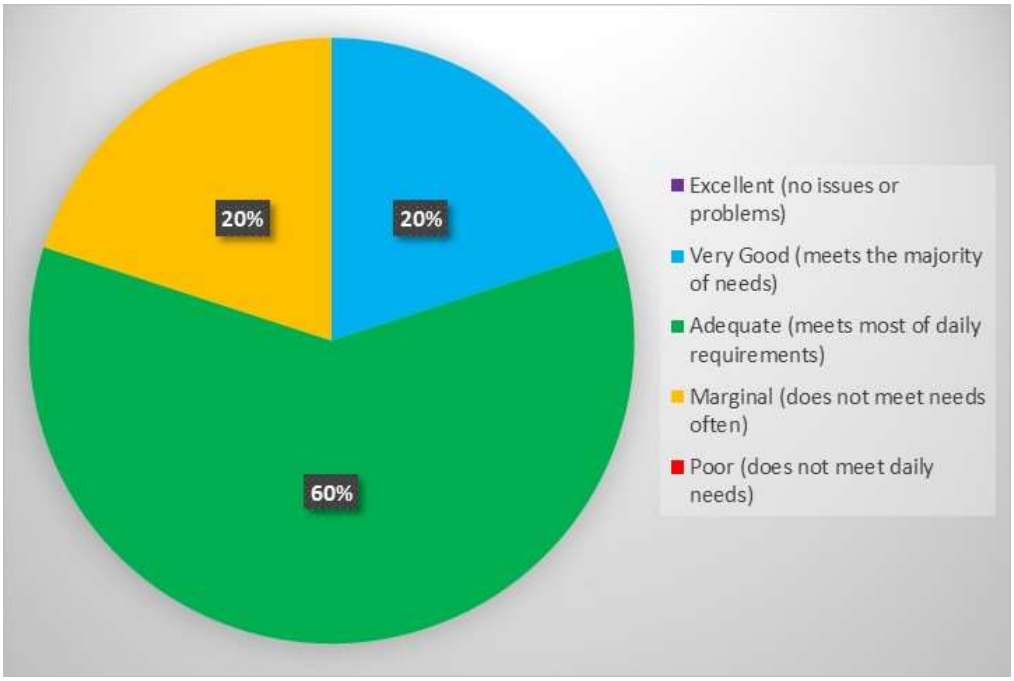


Figure 10 – Dispatcher ratings on DTRS coverage

The majority (60%) of dispatchers reported that system coverage is adequate, meeting most of their daily requirements. However, the remaining 40% of dispatchers' ratings were divided evenly between a rating of very good (meets the majority of needs) and marginal (does not meet needs often).

Figure 11 illustrates management's ratings of DTRS coverage.

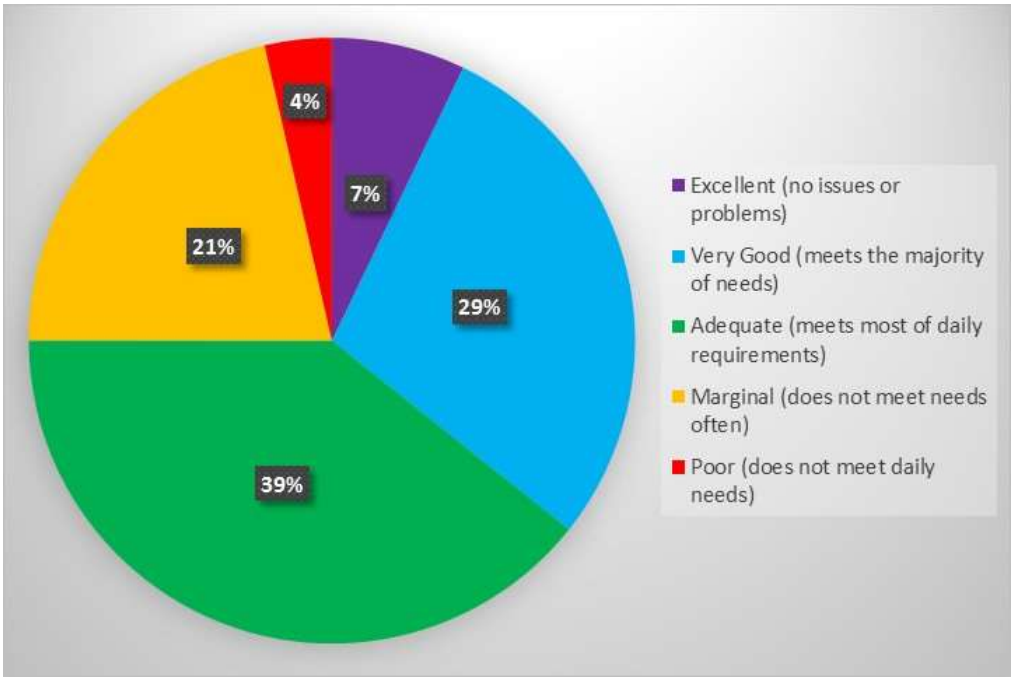


Figure 11 – Management ratings on DTRS coverage

Based on comments from the survey, the differences in ratings are due in most part to the geographical location (e.g., region, county or city) and mode of operation (in vehicle, on street or in building) of the different user groups.

To provide further insight into the participant ratings, Appendix B provides a number of comments from field users, dispatchers, technical support, and management regarding DTRS coverage, organized in the following manner:

- Field user comments on known areas of below average or inadequate coverage
- Dispatcher comments on known areas of below average or inadequate coverage
- Technical support comments on known areas of below average or inadequate coverage
- Management comments on the need for improvements to the current coverage
- Technical support comments regarding any planned coverage improvements

FE staff reviewed these comments regarding coverage and translated their narrative into maps that depict areas having “spotty coverage” (areas that frequently produce dropped calls) and no coverage (areas in which calls are simply not possible).

Figures 12 and 13 depict these two types of areas. These maps also depict highways (including interstate, U.S., and state highways) in blue. In addition, the “no coverage” areas shown in Figure 13 include the locations of dropped calls as reported by Colorado State Patrol (CSP). For those locations, we applied a 100-meter radius around the location of the dropped call, and the resultant circle is included as an area of “no coverage”.

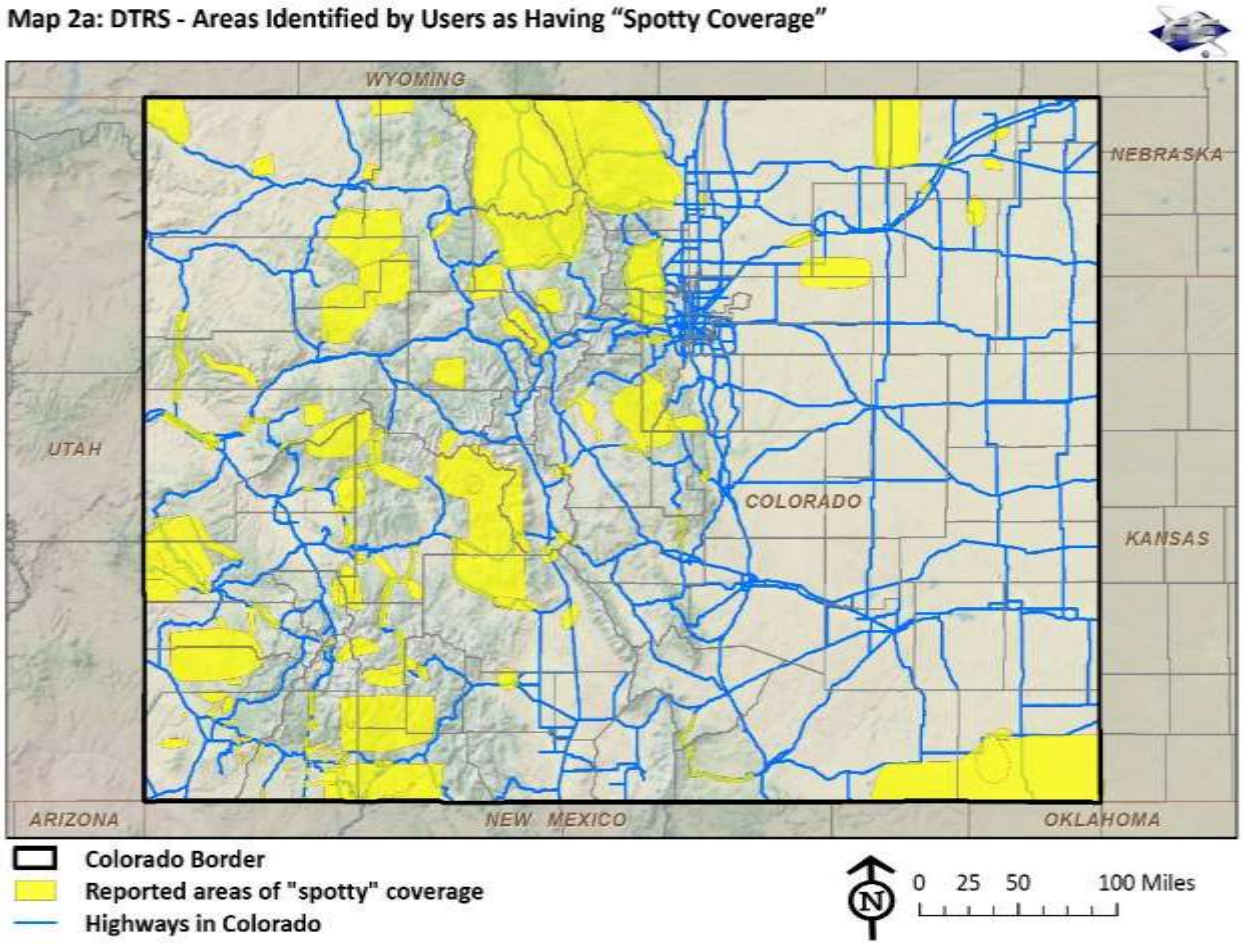


Figure 12 – Known areas of “spotty coverage”

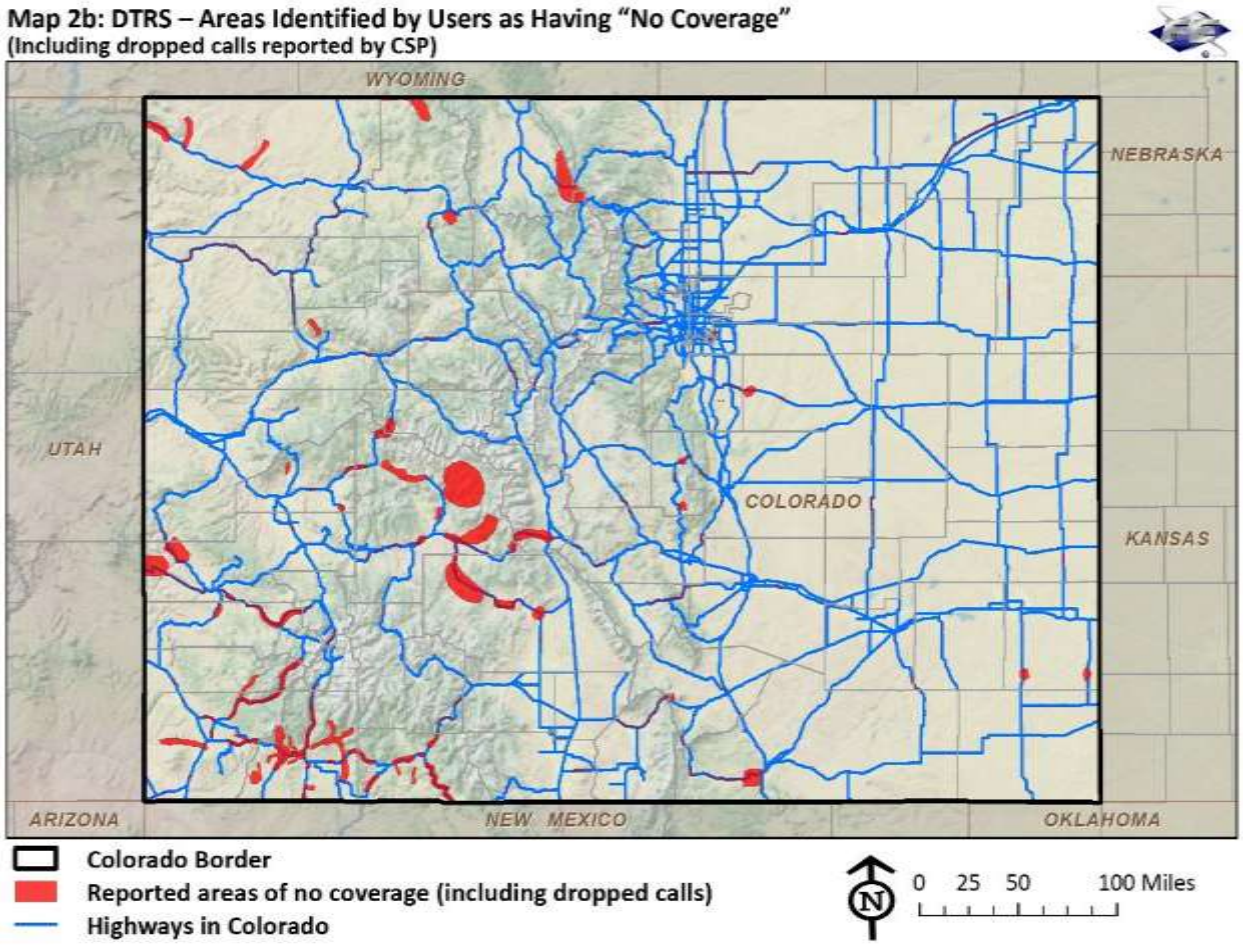


Figure 13 – Known areas of inadequate or "No Coverage", including dropped calls as reported by CSP

3.3.2 System Coverage - Prediction and Workshop Analysis

To analyze the coverage performance of DTRS further, ***FE*** performed a coverage analysis that included the two steps of modeling coverage of the system using computerized prediction tools, and reviewing and modifying the predicted models with users through an iterative and interactive "workshop" process.

The purpose of this two-step analysis was to supplement the information provided by survey participants regarding coverage needs so that our staff could determine the areas that require additional sites to provide additional coverage. Through the course of the analysis, ***FE*** gauged the level of coverage of the following:

- Wide-area, geographic coverage over the entire State
- Highway coverage throughout the State
- Coverage along roadways[9] in areas reported as having “spotty coverage”
- Coverage along roadways in areas reported as having “no coverage”, including areas of dropped calls

This section provides details regarding the methodology and results of the coverage prediction analysis.

FE uses industry standards and best practices to predict radio coverage as accurately as possible. This includes using all available system data as input to a sophisticated computer-modeling tool. Throughout this process, ***FE*** uses methods and parameters consistent with TIA TSB-88[10].

FE performed coverage prediction studies for the existing DTRS using technical information from the following sources:

- State-supplied information – ***FE*** obtained a set of existing radio site and technical parameters for establishing a baseline of the existing DTRS coverage. This information contained parameters such as geographic coordinates, structure heights, and elevations.
- Vendor-supplied information – ***FE*** obtained a set of existing radio site and technical parameters from Motorola, the DTRS vendor. This information supplemented the technical parameters provided by the State.
- Publicly available information – For technical information not supplied by the State or the system vendor, ***FE*** consulted Antenna Structure Registration database (ASR). The ASR database, operated by the Federal Communications Commission (FCC), maintains data of all antenna structures that meet a

[9] The term “roadways” is used in this report to designate state highways (as defined above) plus a limited set of county highways that were deemed as important by users of DTRS (including those from State and local agencies).
[10] TIA TSB-88 Wireless Communications Systems Performance in Noise and Interference-Limited Situations

particular height threshold or proximity to airports. Where possible, ***FE*** mined this database when verifying or making assumptions on DTRS radio sites.

Figure 14 shows the 215 radio sites used in the coverage prediction analysis of DTRS. Site icon coloring is according to their "Zone", of which there are five: Zones 1, 2, 3, 4, and 6. (There is no Zone 5.) Appendix C contains a detailed list of all site technical parameters used in modeling the existing DTRS coverage.

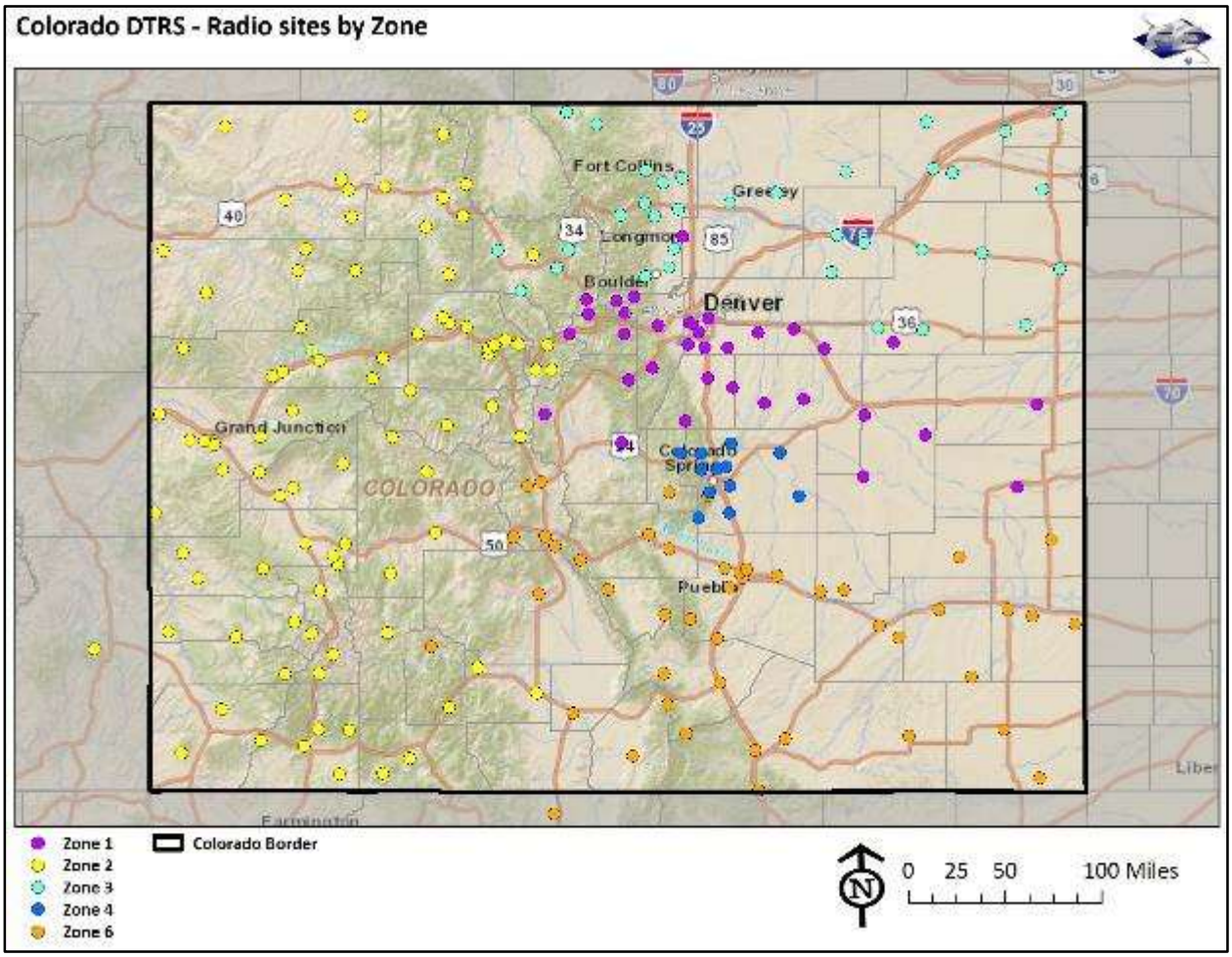


Figure 14 – 215 radio sites in the Colorado DTRS

FE used the following system-wide technical parameters and characteristics when modeling coverage for the existing DTRS:

- System Technology: Digital, Project 25 (P25) Phase 1

- Frequency Band: 700 MHz and 800 MHz (site dependent)
- Minimum Delivered Audio Quality (DAQ): DAQ 3.4
    - A DAQ level of 3.4 is the minimum recommended audio quality for public safety systems. A DAQ of 3.4 translates to “Speech understandable without repetition. Some noise or distortion present.”
    - All coverage shown in the coverage maps represents areas where our study showed a DAQ of 3.4 or higher predicted to exist.
- Tile Reliability Margin (measure of confidence in reliability of signals in covered areas): 95% - per recommendations from TSB-88-D for public safety radio systems
- Propagation Model: International Telecommunications Union Recommendation Model ITU-525
- Talk-paths modeled:
    - Talk-out (of the system radio sites) to a mobile radio
    - Talk-in from a mobile radio (to the radio system sites)
    - Talk-out to a portable radio, on-street
    - Talk-in from a portable radio, on-street

Appendix D provides additional detailed technical parameters for all radio sites pertinent to the coverage prediction analysis, including general site information, transmit path information, receive path information, and subscriber unit parameters.

FE based this analysis on a comparison between existing coverage and the gaps identified by users who participated in the survey and the coverage workshops. ***FE*** performed the coverage prediction analysis over four areas of consideration:

1. Statewide geographic coverage
2. Highway coverage
3. Roadways in areas where coverage was reported as below average (i.e., “spotty coverage”)

4. Roadways in areas where coverage was reported as inadequate, (i.e., areas of “no coverage”)

Figure 15 shows a reference map of all highways (inclusive of interstate highways, U.S. highways, and state highways) in the state of Colorado.

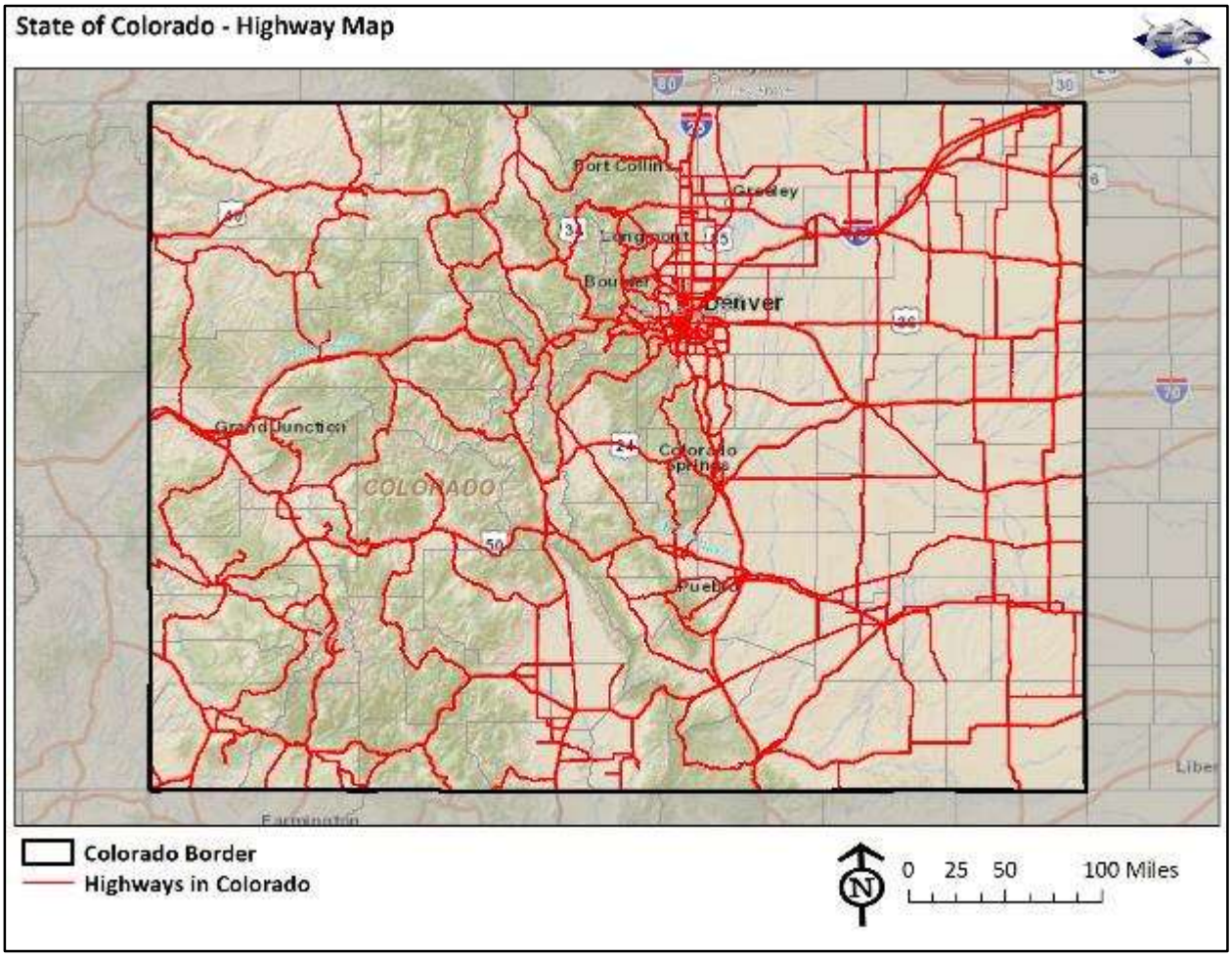


Figure 15 – Map of highways in Colorado

For areas of consideration #3 and #4 (roadways of spotty coverage and no coverage, respectively), ***FE*** considered the highways (including interstate, U.S., state, and county highways) that were within the “spotty-coverage” and no-coverage areas, as reported by State and local DTRS users (shown in Figures 13 and 14). Figures 16 and 17 show the roadways considered for this part of the analysis.

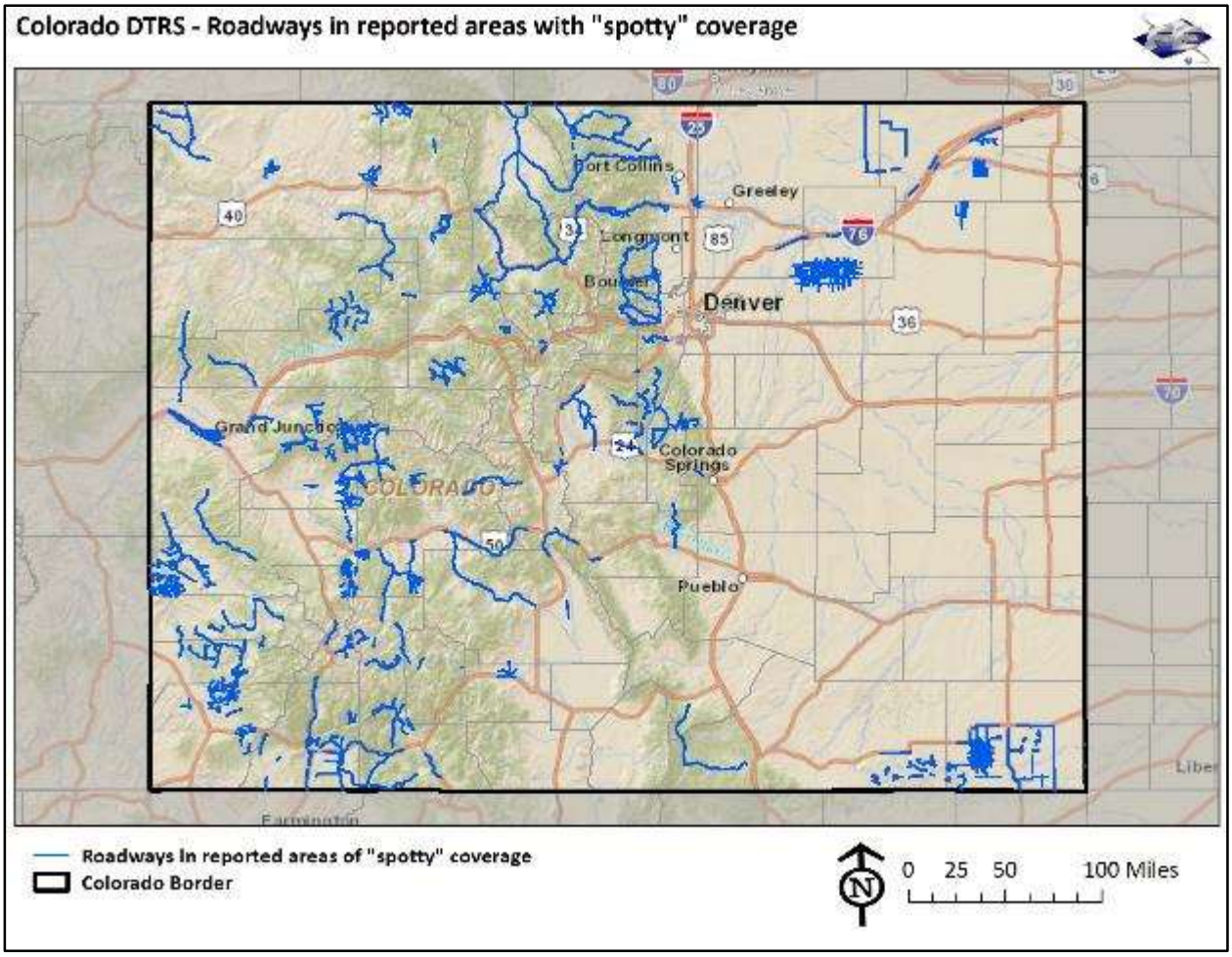


Figure 16 – Roadways in known areas of "spotty coverage"

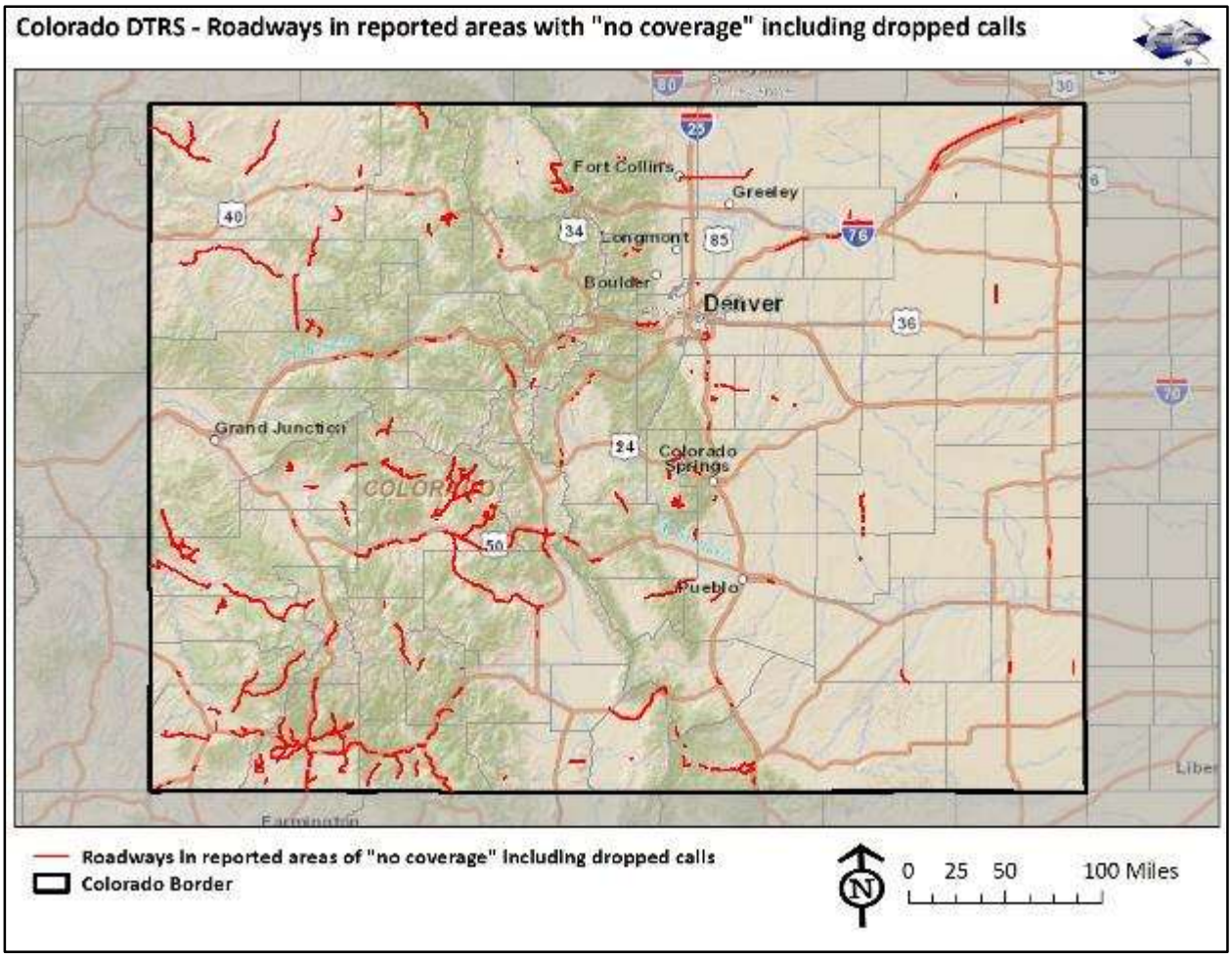


Figure 17 – Roadways in known areas of inadequate or "no coverage", including dropped calls as reported by CSP

FE's development of coverage prediction maps was a two-step process and the use of the data and procedures described above led to the completion of the initial step of modeling coverage of the system using computerized prediction tools. The second step involved reviewing the initial coverage predictions with a set of actual DTRS users and using their input and knowledge to adjust our prediction data to represent the system's actual coverage performance more accurately.

We began this process by showing our initial maps to a diverse set of DTRS users and requesting their input. Their response was that our models predicted slightly too much coverage in the western areas of the state and slightly too little coverage in eastern areas. Based on this input, we adjusted our model slightly (and within the guidelines of accepted

coverage standards) and presented the modified maps to a subset of the users (again including representatives from both state and local agencies) who agreed that our adjustments produced maps with recognizably accurate coverage.

All coverage maps included in this report (both in the narrative of this section and in Appendix E) are the product of the coverage workshop process involving feedback from DTRS users.

Below, ***FE*** provides coverage maps that demonstrate the graphical results of the coverage prediction studies for DTRS. These maps are a subset of the full set of coverage prediction maps located in Appendix E.

The coverage maps in this section show the "limiting path" for both mobile and portable radios. The limiting path represents only the transmission path (i.e., talk-out or talk-in) that provides the least amount of total coverage, which therefore demonstrates a "worst-case" scenario. For example, talk-in from a portable will likely provide a limiting path because the unit has a lower power output than a repeater or a mobile radio mounted in a vehicle. The coverage footprint of the limiting path shows the areas where the users can both transmit and receive high-quality audio (according to the evaluation criteria for DAQ 3.4).

Many system designers attempt to balance the talk-out and talk-in paths, so that there are few areas where inbound and outbound communications cannot occur at the same level of quality. However, it is difficult to design a completely balanced large-scale radio system for both portable and mobile radios, because of the large differences in transmission power between these types of subscriber equipment and system design factors such as body loss for portables. For ***FE***'s DTRS coverage prediction analysis, the following talk-paths were determined to be the limiting paths:

- Talk-out to a Mobile radio
- Talk-in from a Portable radio

For this analysis, ***FE*** modeled the use of tower-top amplifiers (TTAs), which boost inbound, or talk-in, signals. System operators frequently use TTAs in 700/800 MHz radio systems. ***FE*** used an industry-accepted value of 6 dB of net system gain at all sites when modeling these TTAs. The actual amount of realized gain from the use of TTAs can vary depending on a number of factors (e.g., RF noise at the radio site). The datasets from the state of Colorado and the system vendor did not include details on TTA gain. It is possible

a different amount of TTA gain exists at the DTRS sites; however, ***FE*** proceeded with the value of 6dB based on prior experience with numerous similar systems.

For the four areas of consideration described above, Figures 18, 19, 20, and 21 show the predicted statewide coverage for mobile talk-out. On the three maps depicting roadway coverage, the roadways where coverage predictions meet or exceed DAQ 3.4 appear in green. Roadways that do not meet DAQ 3.4 appear in yellow (a highway or roadway in an area of “spotty coverage”), red (a highway or roadway in an area of no coverage) or blue (a highway or roadway in an area this is neither “spotty” nor “no coverage”).

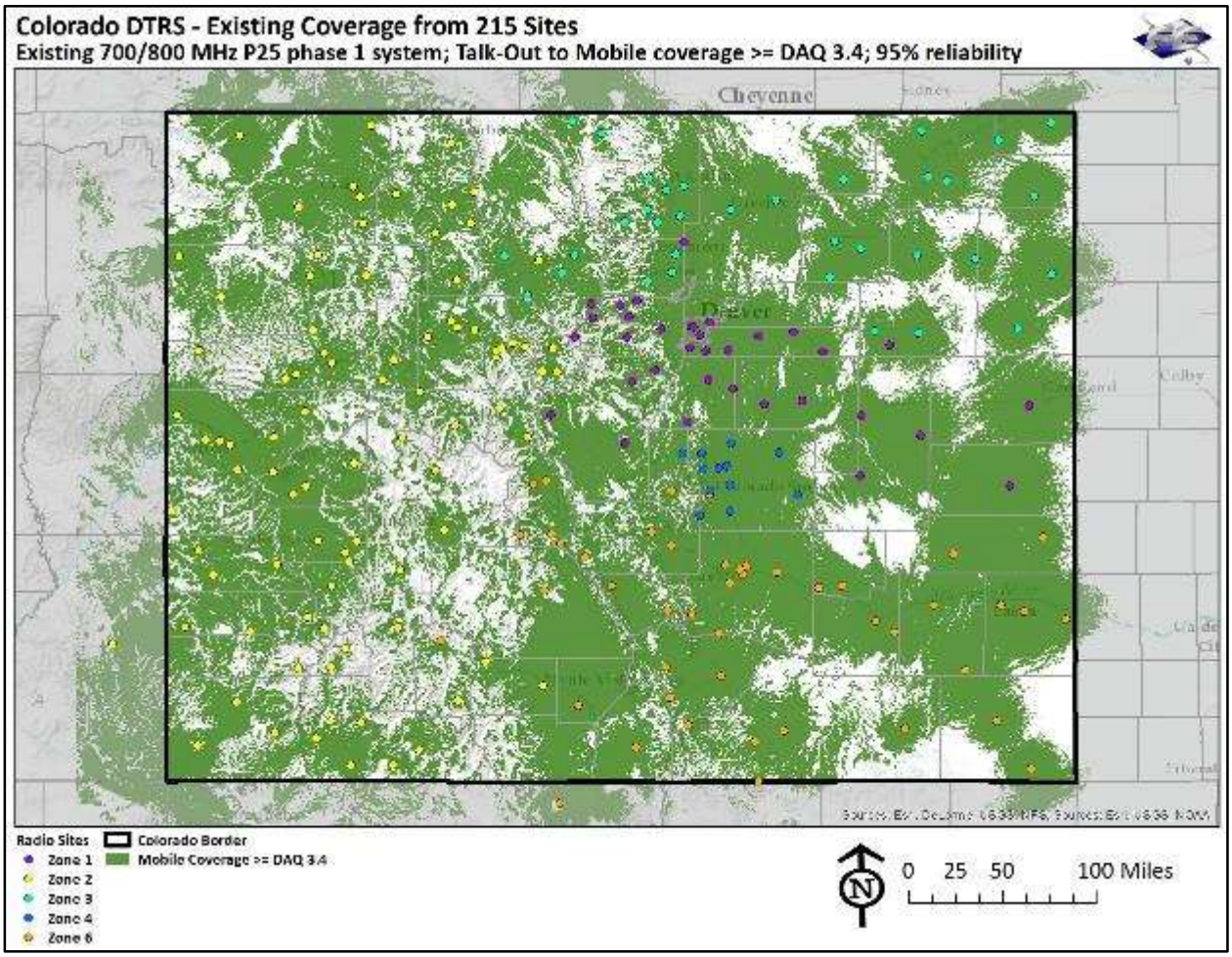


Figure 18 – Statewide coverage of DTRS, talk-out to mobile radio

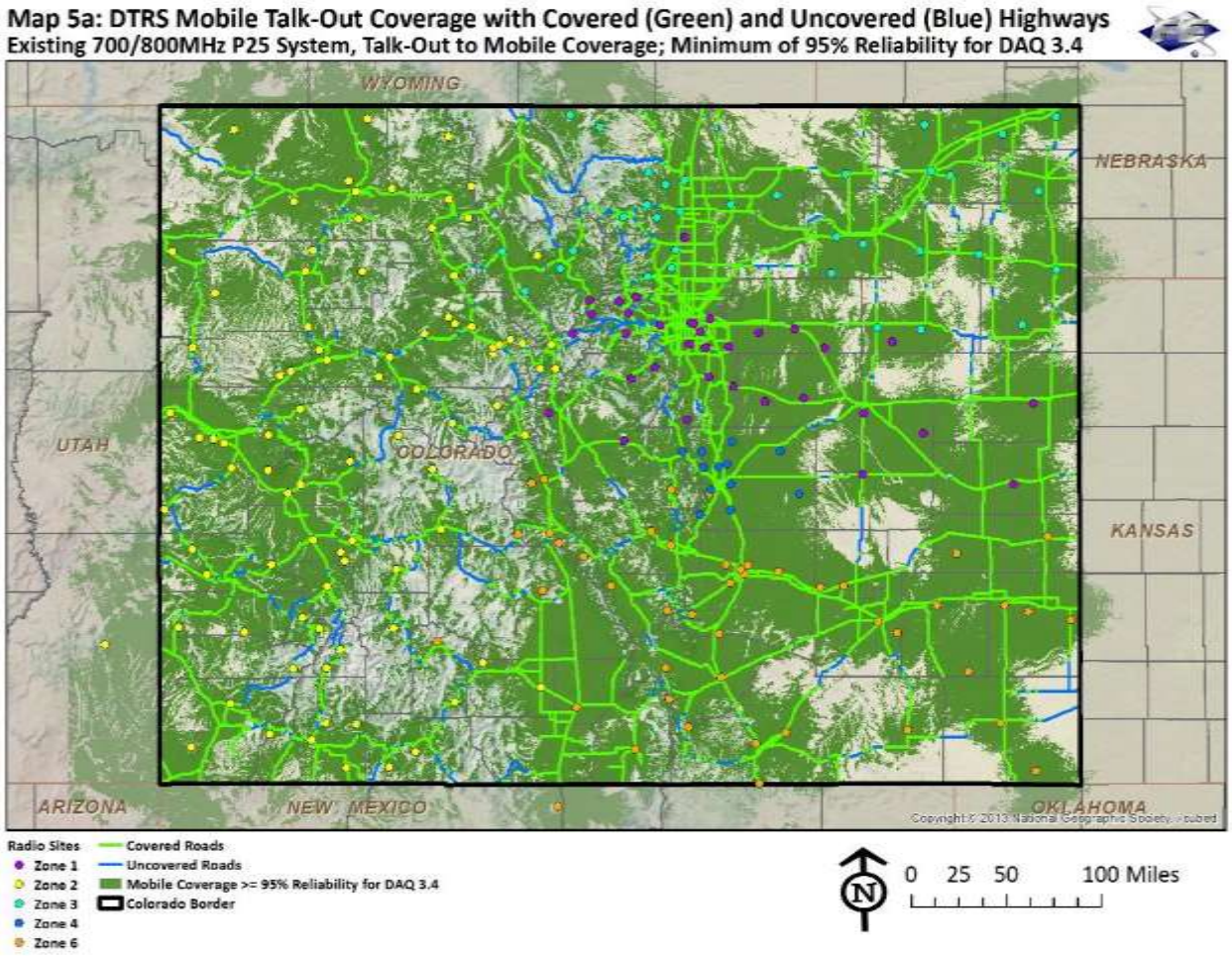


Figure 19 – Statewide coverage of DTRS, talk-out to mobile radio, with coverage of State/U.S. highways shown

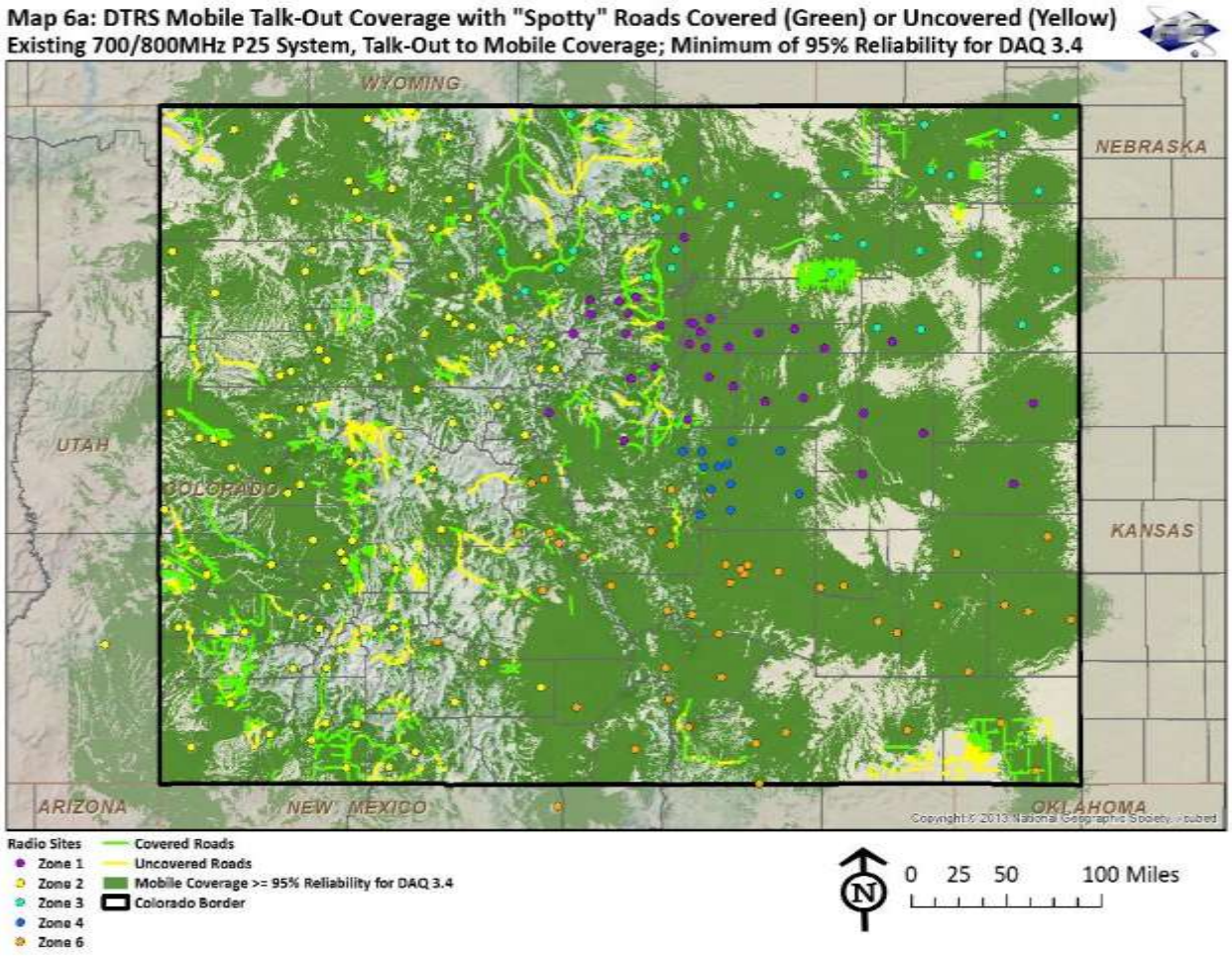


Figure 20 – Statewide coverage of DTRS, talk-out to mobile radio, with coverage of roadways with reported "spotty coverage" shown

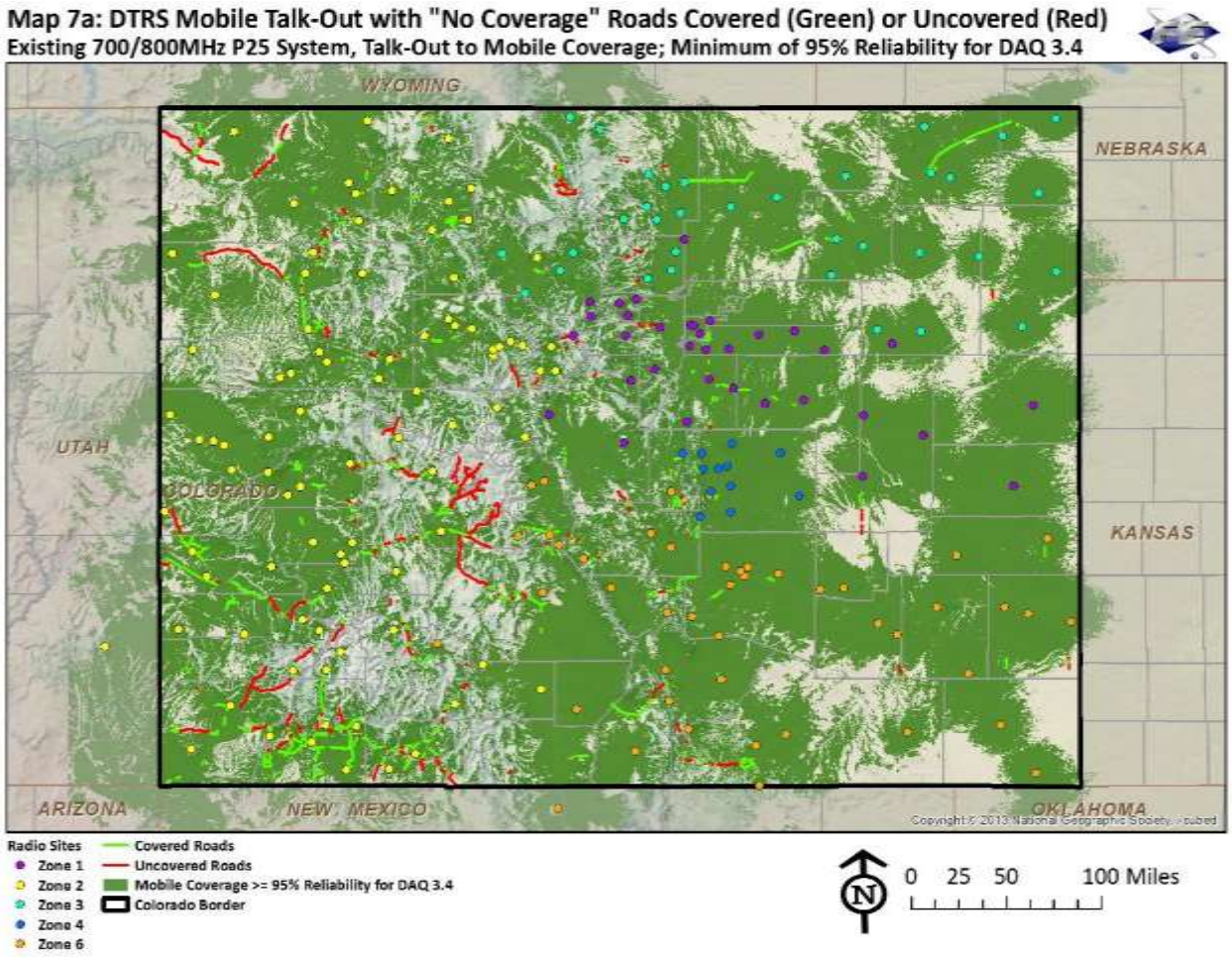


Figure 21 – Statewide coverage of DTRS, talk-out to mobile radio, with coverage of roadways with reported "no coverage" shown

Figures 22, 23, 24, and 25 show the predicted statewide portable talk-in coverage, on the street, of DTRS over the four areas of consideration previously described. While the intent for DTRS was to provide mobile radio coverage, state and local public safety personnel use portable radios on DTRS, therefore evaluating portable radio coverage is an important part of assessing the system's performance. The following maps show talk-in coverage from a portable radio operating outside, at street level.

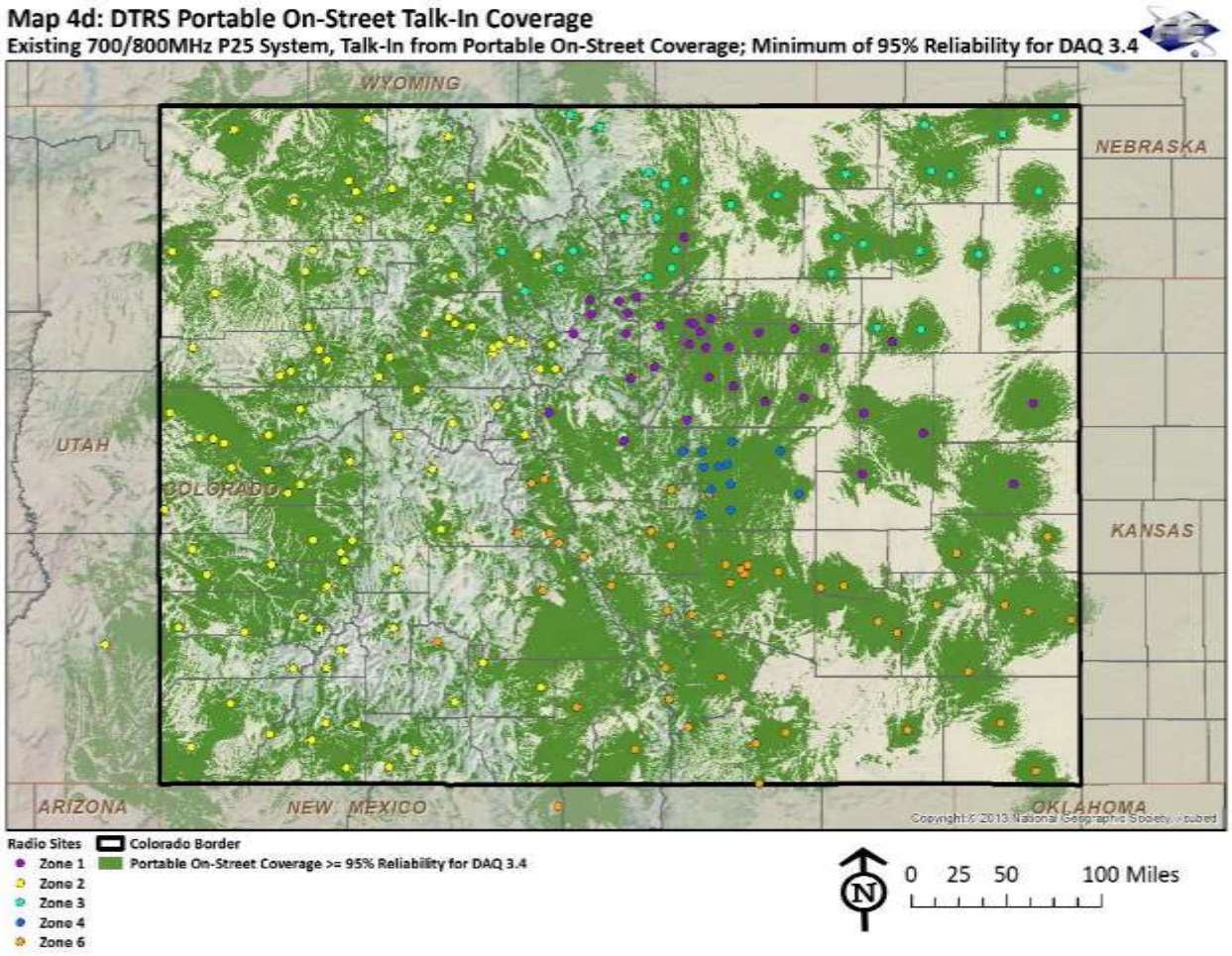


Figure 22 – Statewide coverage of DTRS, talk-in from portable radio

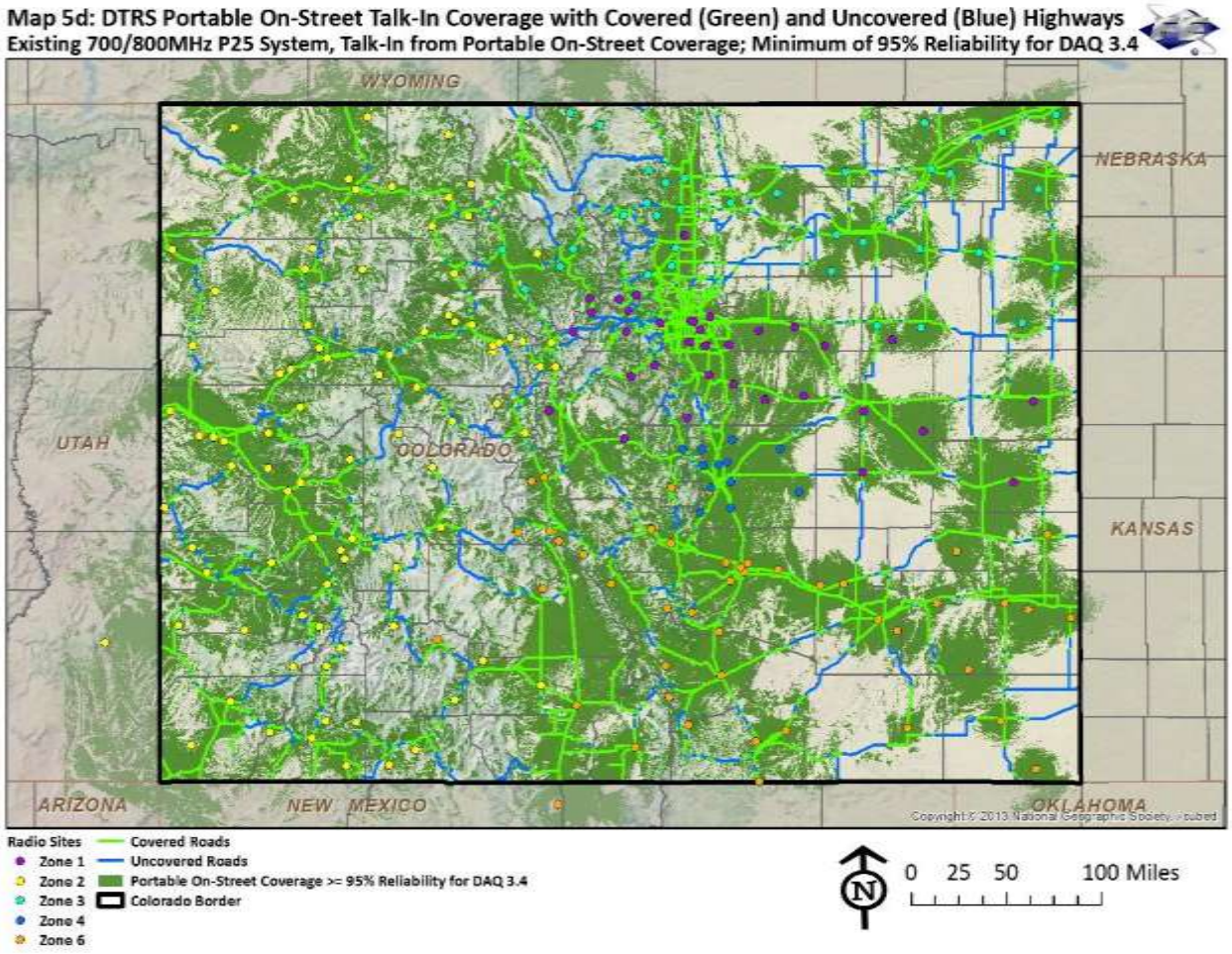


Figure 23 – Statewide coverage of DTRS, talk-in from portable radio, with coverage of State/U.S. highways shown

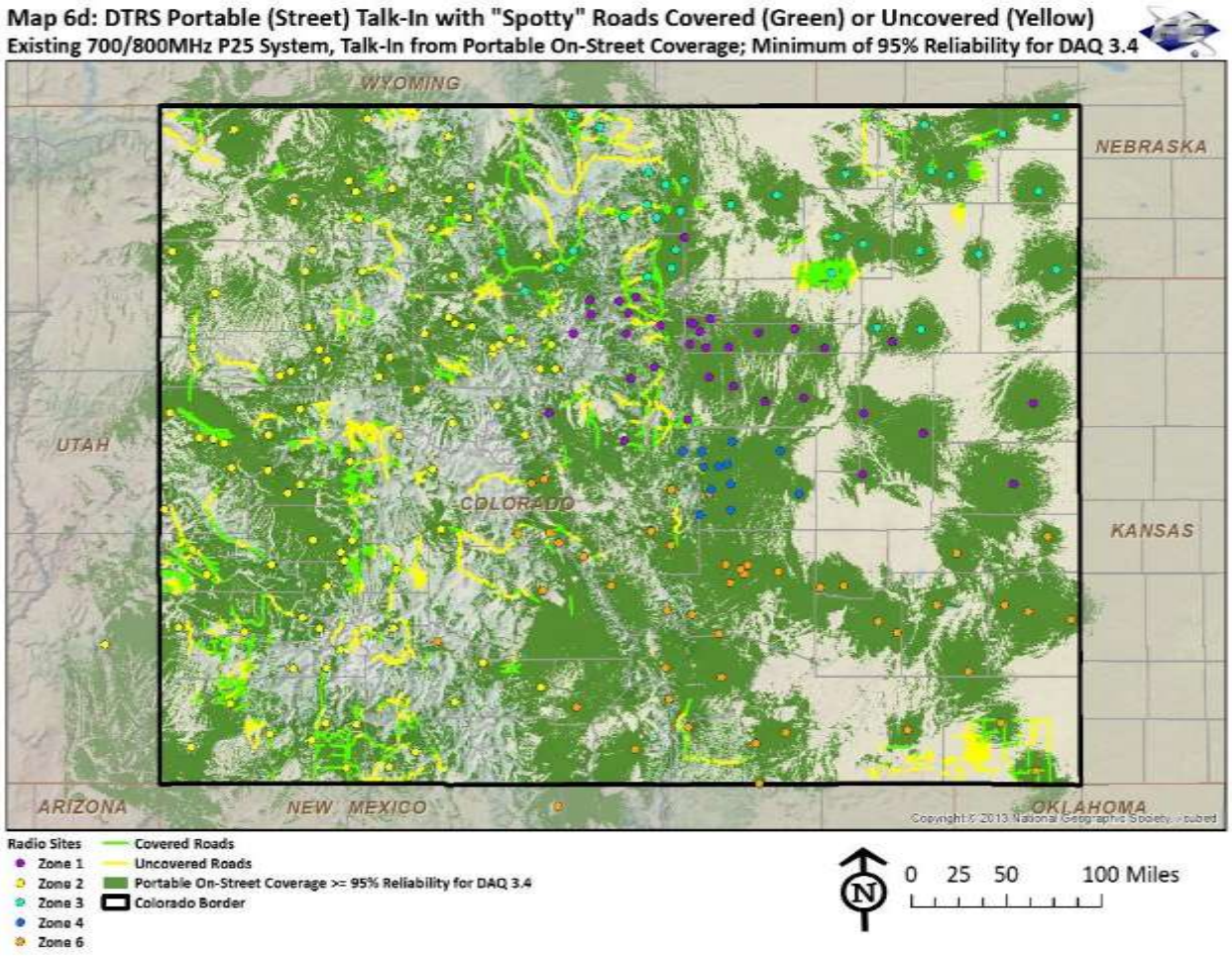


Figure 24 – Statewide coverage of DTRS, talk-In from portable radio, with coverage of roadways with reported "spotty coverage" shown

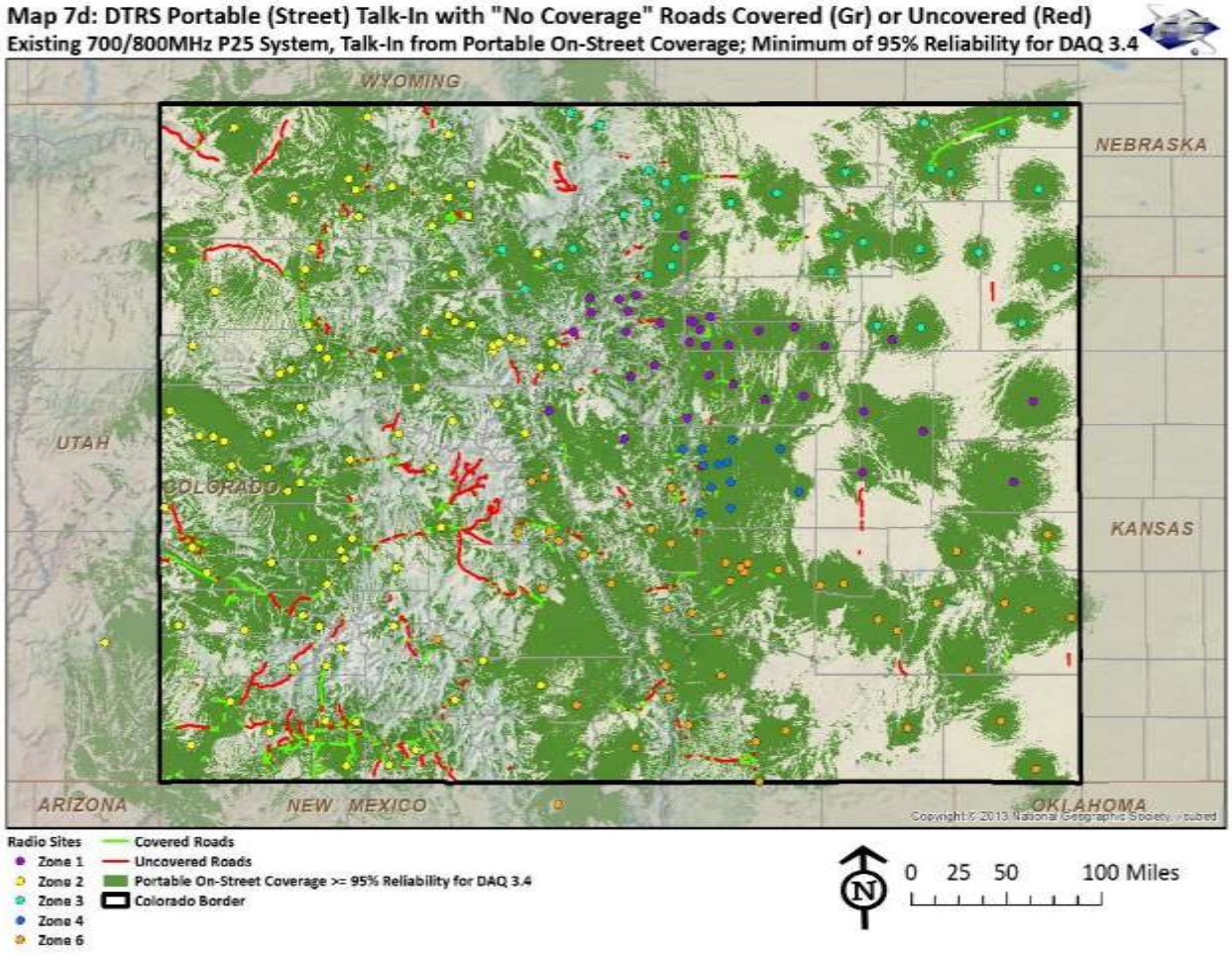


Figure 25 – Statewide coverage of DTRS, talk-in from portable radio, with coverage of roadways with reported "no coverage" shown

The coverage depicted in the maps presents areas where ***FE***'s propagation software predicted coverage should meet or exceed DAQ 3.4 and 95% reliability. It is important to note that this does not necessarily mean no coverage exists in the non-covered areas. It may be that users can communicate outside of the covered areas, albeit at a lower predicted level of DAQ and/or reliability.

Appendix E contains all coverage maps created as part of DTRS coverage prediction analysis. This includes higher-resolution versions of the maps presented in this section, as well as coverage maps for all four talk-paths. In addition, Appendix E provides maps that show coverage unique to each of the five zones in DTRS.

3.3.3 Coverage Percentages

Table 3 shows a statistical breakdown of the coverage provided by DTRS for each of the four areas of consideration.

Table 3 – DTRS coverage percentages

% Coverage over Area of Consideration *												
Talk-path	Geographic Coverage			Highway Coverage			Reported Areas of Spotty Coverage			Reported Areas of No Coverage		
	State-wide	Western CO	Eastern CO	State-wide	Western CO	Eastern CO	State-wide	Western CO	Eastern CO	State-wide	Western CO	Eastern CO
Mobile Talk-Out	70	63	75	79	73	84	57	51	60	44	38	64
Mobile Talk-In	80	72	86	87	81	92	67	60	72	54	49	76
Portable Talk-Out	55	53	57	66	64	68	44	41	46	34	29	51
Portable Talk-In	51	50	52	62	62	64	41	38	43	32	28	47

* For the purposes of this analysis, the “western portion of the state” includes the following Counties; Alamosa, Archuleta, Delta, Dolores, Eagle, Garfield, Grand, Gunnison, Hinsdale, Jackson, La Plata, Mesa, Mineral, Moffat, Montezuma, Montrose, Ouray, Pitkin, Rio Blanco, Rio Grande, Routt, Saguache, San Juan, San Miguel, and Summit. The “eastern portion of the state” includes all other Counties.

3.3.4 Summary of Coverage Status and Need

Table 4 briefly describes the status and needs of system coverage:

Table 4 – System Attribute: Coverage

System Attribute: Coverage	
Current Status	*Need*
DTRS currently operates with 215 sites and provides the levels of coverage shown in our included coverage prediction maps and summarized in the table in	DTRS users from all levels of government should assist in defining the system’s coverage requirement. The coverage gaps identified by users need to be

Section 3.3.3. According to users, significant gaps exist using mobile radios on highways, especially in the western portion of the state. Our predictions show that at the statewide level 79% of state highways are covered at a reliability level of 95% (with approximately 73% coverage in the western portion of the state and 84% in the eastern portion).	addressed to enhance public safety radio communications.

3.4 DTRS Interoperability

This section describes the interoperability capabilities and requirements of users of DTRS as expressed by agencies that primarily use DTRS. Section 4 of this report provides information about the interoperability capabilities and requirements of users of systems other than DTRS while Section 5 provides more details on the three major methods of interoperability within the state of Colorado including:

- NetworkFirst®: a set of interconnections between DTRS and, primarily, the trunked radio systems that operate in the Denver metro area
- ISSI: a specialized type of gateway used to interconnect different Project25-compliant trunked systems
- DTRS MAC Channels: talkgroups within DTRS specifically reserved for the purposes of interoperability and mutual aid

3.4.1 Interoperability Survey

To understand the extent to which DTRS users can communicate with other agencies (including those that use systems other than DTRS), ***FE*** surveyed DTRS field users, dispatchers, technical support, and management staff. Interoperability, as ***FE*** defined in the survey, meant the ability to talk to people outside of one's daily operational group, when needed and when authorized. The survey asked field users to identify other agencies with whom they functionally interact and intercommunicate, both on a daily and special (emergency/event) basis. For each "other agency", each survey participant identified, we asked them to provide the following details:

- How often do you interact/intercommunicate with the agency (daily, weekly, monthly, or yearly)?

- Do you have interoperability capabilities with the agency (Yes or No)?

    - If “Yes”, what communications method do you use? (shared channels, dispatch console, gateway equipment, swap radios, cell phone or other)

    - If “Yes”, how well does the communications method work? (Poor, Marginal, Adequate, Very Good, or Excellent)

We define the methods of interoperability listed above in the following manner:

- Shared Channels – The channels (or talkgroups) used by one agency are programmed into the radios used by another agency so that, when needed and authorized, the second agency can simply tune to the first agency’s channels (or talkgroups) for direct communications. This method is efficient in that only the channel (or talkgroup) of the first agency is used for the agency-to-agency communications. In this method, both audio and signaling (such as the identification of the user radio’s identifiers) are carried between the users of the shared channels (or talkgroups). (Note: From a dispatcher’s perspective, this method of interoperability requires “No Dispatch Intervention” because field users can directly select the external agency with whom they wish to communicate.)

- Dispatch Console – A dispatch console operator creates a “patch” between the channels (or talkgroups) used by different agencies so that any conversation that occurs on the channels (or talkgroups) of one agency are automatically carried to the channels (or talkgroups) of the other(s). Dispatchers typically create console patches for short durations and for specific events. This method is inefficient in that the channels (or talkgroups) of all involved agencies are used for the agency-to-agency communications. This method carries audio but not signaling between the users of the shared channels (or talkgroups).

- Gateway – A specific piece of equipment called a gateway (which is different from a dispatcher’s console) interconnects channels and/or patches in a method similar to the “console patch” as described above; however, the location of this interconnection is not limited to the dispatch center. In addition, use of gateway interconnections is typically for longer durations (or even permanently) for on-going interoperability requirements. This method is also inefficient in that it uses the

channels (or talkgroups) of all involved agencies for the agency-to-agency communications. This method carries audio but not signaling between the users of the shared channels (or talkgroups).

  - NOTE: There is a specific type of gateway, called an Inter-RF-SubSystem Interface gateway (or ISSI gateway), that can interconnect systems that support the APCO Project 25 standard. ISSI gateways can carry both audio and a limited set of signaling between the users of the shared talkgroups that it interconnects. The use of ISSI is, however, limited to interconnection of Project-25-compliant systems.

- Swap Radios – Users from one agency borrow radios that belong to another agency so that the two of them can communicate with each other. Like shared channels, this is efficient and supports both audio and signaling, but it requires one agency to become familiar with the configuration and operation of the other agency's radios.

- Verbal Repeat – A dispatcher that has access to multiple systems repeats the conversation of a user agency that occurs on one system to a user agency operating on a different system.

- Cell Phones (and other non-public-safety-radio methods) – Users of different agencies simply abandon use of public safety radio systems and communicate with each other via alternate methods.

3.4.2 Interoperability Capabilities and Requirements

Appendix F contains a matrix of the current interoperability capabilities and requirements of field users that primarily use DTRS.

Figure 26 shows how often DTRS field users communicate with other agencies.

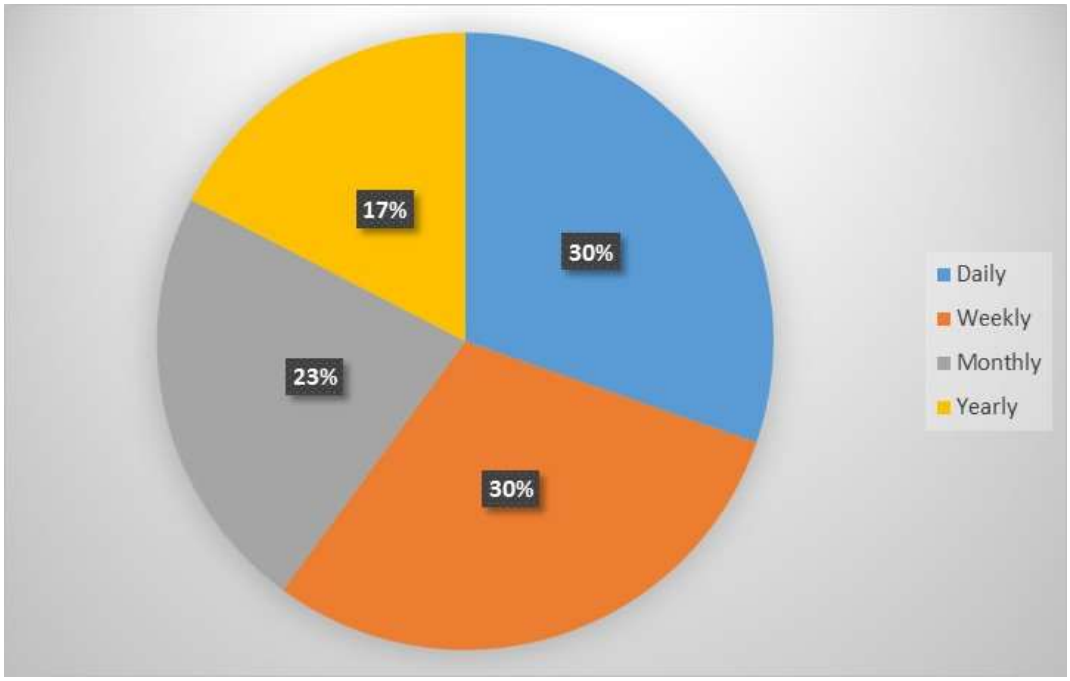


Figure 26 – Frequency of DTRS field user interoperability

The survey results show that 60% of field users that require interoperability communicate with other agencies on a daily or weekly basis, while the balance communicate with other agencies on a monthly or yearly basis. Additionally, 96% of field users report that they have some kind of interoperability capabilities with the other agencies. Of those field users who have interoperability capabilities with the other agencies, 83% report that they employ shared channels. A small percentage of field users achieve interoperability via dispatch console, gateway equipment, swapping radios, cell phone, or other communications method. Figure 27 illustrates the ratings on the effectiveness of the interoperable communications method that DTRS field users have with other agencies.

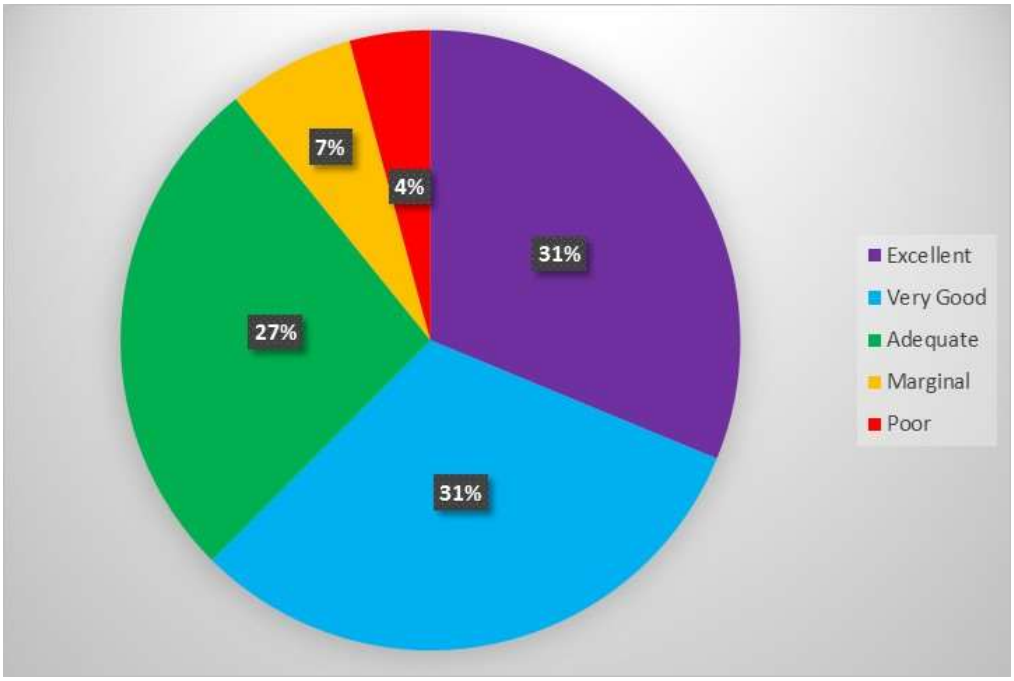


Figure 27 – Ratings on effectiveness of DTRS interoperability

Overall, the majority (62%) of field users rate the effectiveness of each communications method as very good or excellent. It is important to note that a small percentage (11%) of field users rate the effectiveness of each communications method as marginal or poor.

There are times when agencies need to travel outside of their jurisdiction. Survey results show that 86% of field users currently have the ability to talk back to their home users when they travel. However, a slightly lower percentage (73%) express that they will need the ability to talk back to their home users when they travel in the future.

The online survey asked dispatchers to identify the divisions, departments, agencies, or organizations for which they facilitate interoperability. For each division, department, agency, or organization listed, we asked the dispatchers to provide the following details:

- How often do you facilitate interoperability? (Daily, Weekly, Monthly, or Less Often than Monthly)
- How do you currently facilitate interoperability? (Verbally/manually repeat, Console patch, Gateway interconnection (not through console), No Dispatch Involvement, or Other).

- How would you rate ease of use (operability) of the communications method? (Poor, Marginal, Adequate, Very Good, Excellent)?

Appendix F also contains a matrix of the current interoperability capabilities and requirements of dispatchers that primarily use DTRS.[11] Figure 28 illustrates how often DTRS dispatchers facilitate interoperability for other divisions, departments, agencies, or organizations.

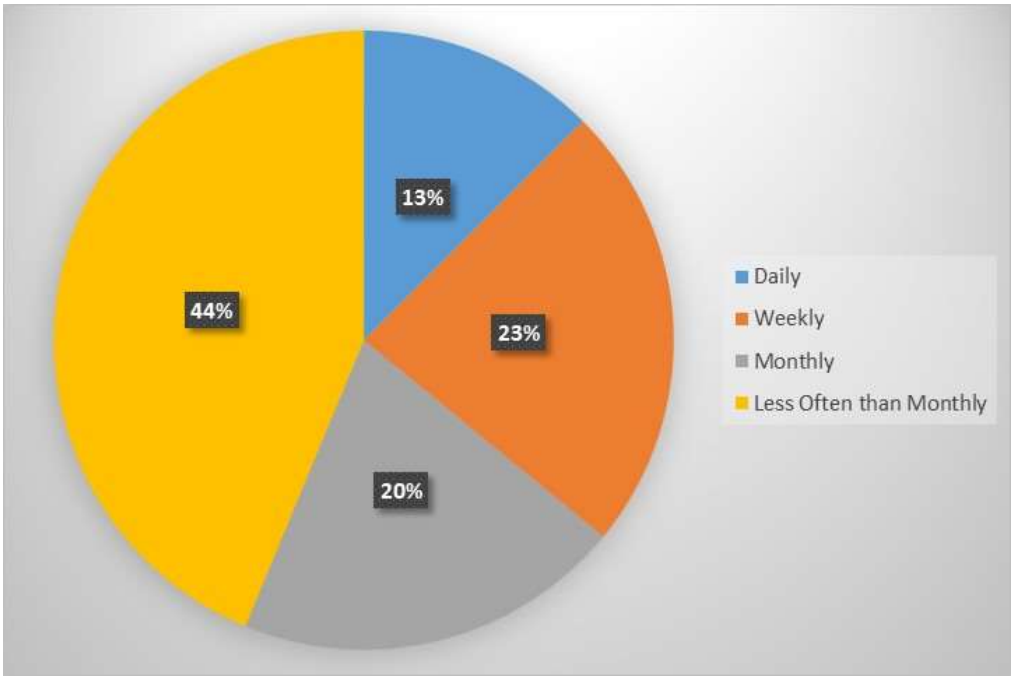


Figure 28 – Frequency of DTRS dispatcher-facilitated interoperability

Less than half of the dispatchers reported that they facilitate interoperability on a daily or weekly basis. The majority (64%) of the dispatchers indicated that they facilitate interoperability on a monthly basis or less often than monthly. The majority (67%) of the dispatchers reported that they facilitate interoperability via verbal/manual repeat or by console patch. The remaining dispatchers indicate that facilitating interoperability consists of gateway interconnection (not through a console), no dispatch involvement, or other communications method. Figure 29 shows the ratings on ease of use (operability) of the communications method used, as reported by DTRS dispatchers.

[11] The following section of this report provides a similar analysis of the interoperability capabilities and requirement of agencies that primarily use systems other than DTRS.

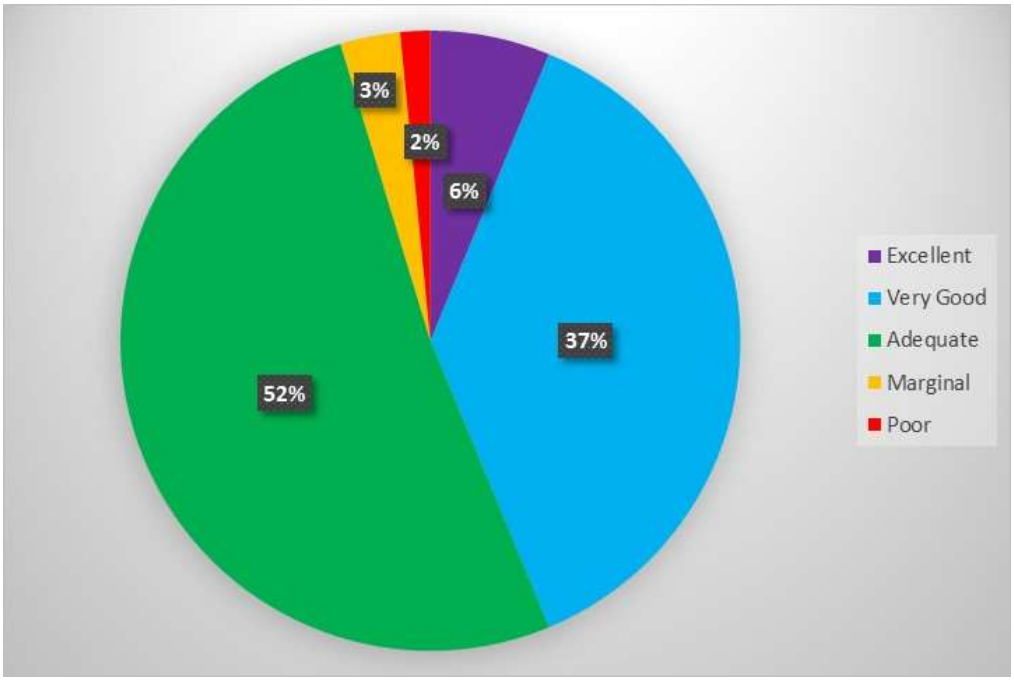


Figure 29 – Ratings on ease of use of the communications method

Although the majority (52%) of dispatchers rates the communications method's ease of use as adequate, 43% of dispatchers rate it as very good to excellent. A small percentage (5%) of dispatchers indicates marginal or poor ease of use for the communications method they utilize.

FE asked those in a technical support capacity what methods of interoperability DTRS users primarily use. Survey results show that console patches, selection of mode radio, and gateways are the primary methods of interoperability. Technical support staff also indicate moderate use of ISSI connections, caches/swapping radios, and other communications method.

The survey asked those in a technical support role a series of questions relating to interoperability sets that work well, need minor adjustments, need major changes, or do not exist but need to be established. ***FE*** defined an "interoperability set" as the combination of two separate departments/agencies (the two organizations that need to talk to each other) and the method used to interconnect them. Appendix F provides details on those different categories of interoperability sets.

The survey asked technical support staff how well the current fleetmap suits the needs of the users on DTRS. Figure 30 shows technical support's ratings on how well the current fleetmap suits DTRS user needs.

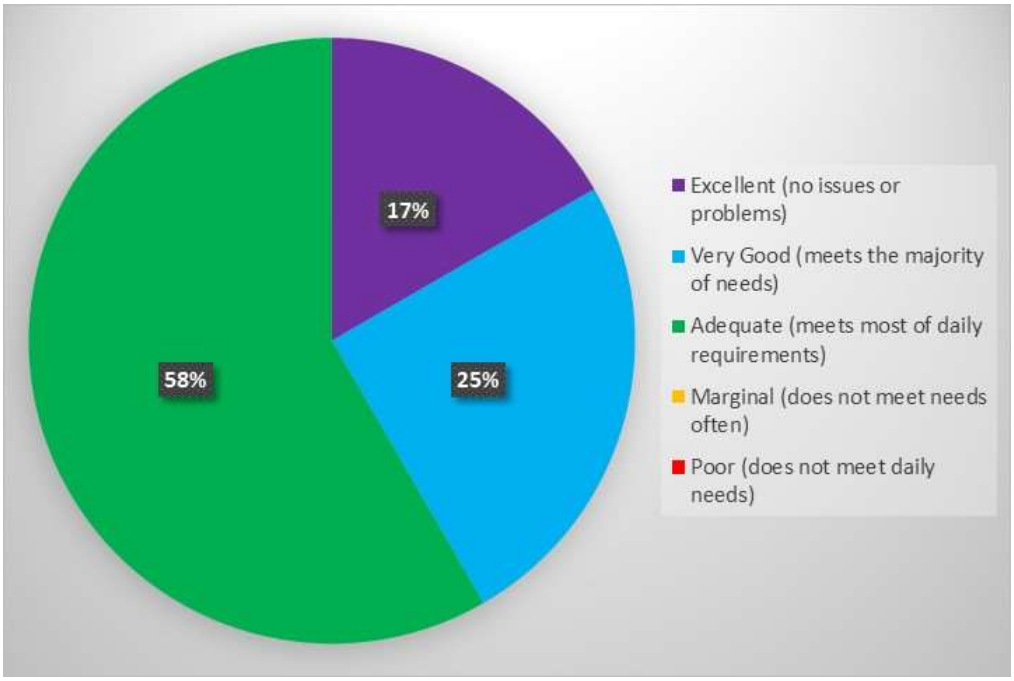


Figure 30 – Technical support ratings on current DTRS fleetmap

While the majority (58%) of technical support believes the current fleetmap adequately suits DTRS user needs, the remaining 42% provided very good or excellent ratings. Although no survey participants rated current fleetmapping marginal or poor, they provided the following comments on the changes they would like to see on the fleetmap:

- "We have some County MAC channels that are rarely used. May rename and reassign them operations roles in the future. Some may agree we have too many TG options, gets confusing and needs to be simplified. Currently working on that."

- "The fleetmap for DTRS seems adequate but underfunded and changes are not sent though the system well."

- "More strict guidelines for programmers. Aliases for talkgroups tend to deviate from programmer to programmer at times. Re-visit of aliases from original setup due to lack of understanding of local area naming. (Example: San Luis Valley Regional Medical Center - fleetmap is SLV MED, local naming is SLVRMC)"

- "I would prefer to receive the entire state fleetmap but understand the reason for keeping it restricted."

Figure 31 illustrates the management ratings on DTRS interoperability.

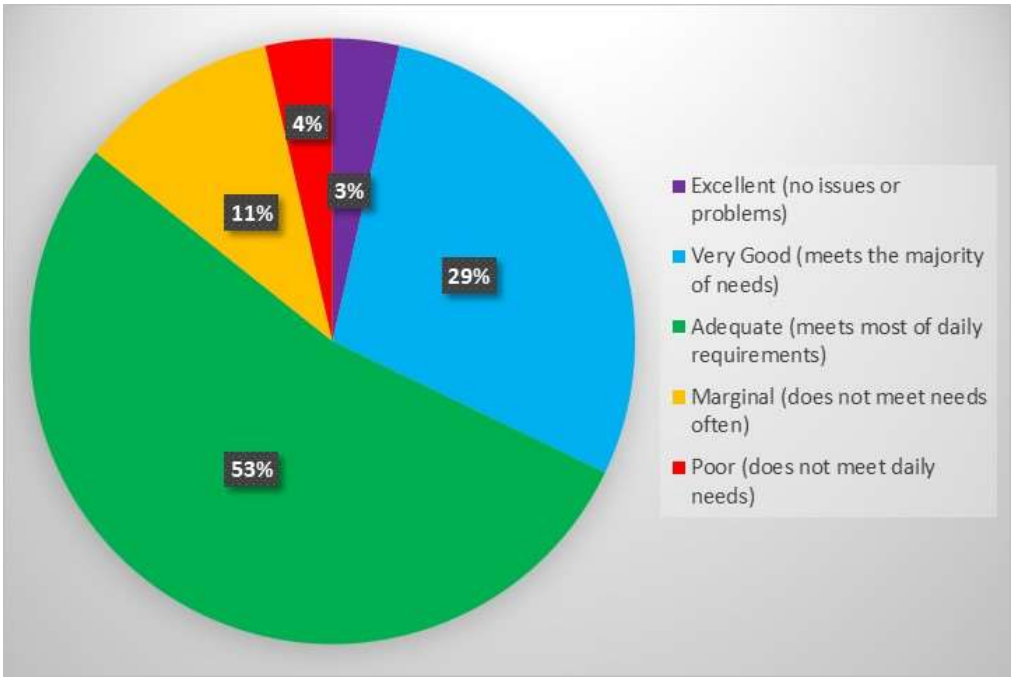


Figure 31 – Management ratings on DTRS interoperability

Fifty three percent of managers reported adequate DTRS interoperability and another 32% of managers rated it as very good or excellent. A small percentage reported that DTRS interoperability is marginal or poor.

Appendix G contains the comments from field user, dispatcher, technical support, and management on DTRS interoperability, organized in the following manner:

- DTRS field user interoperability capabilities
- DTRS dispatcher interoperability capabilities
- Field user comments on specific issues with system interoperability
- Dispatcher and technical support comments on specific issues with interoperability
- Interoperability sets that work very well or adequately

- Interoperability sets that work poorly or do not exist
- Management comments on system interoperability needs

3.4.3 Summary of Interoperability Status and Need

Table 5 briefly describes the status and needs of system interoperability:

Table 5 – System Attribute: Interoperability

System Attribute: Interoperability	
Current Status	*Need*
DTRS currently provides a high-level of interoperability between the field users and dispatchers of agencies that primarily use it for daily and special-purpose communications. As described in subsequent sections of this report, methods to provide interoperability between users of DTRS and other systems exist and are in development.	DTRS should continue to provide the same high level of interoperability between users that primarily use it for daily communications. As described in subsequent sections of this report, the State should continue with their current efforts using ISSI and other means to provide interoperability between DTRS and other systems to meet specified operational needs through supportive governance and funding as needed.

3.5 DTRS Features

3.5.1 Features Capabilities and Requirements

To assess the overall experience with DTRS features, it was necessary to gauge satisfaction levels with current system features, determine the features that are critical today, and identify the features needed in the future. This was completed via the online survey in which participants were asked to rate their overall satisfaction with the current system features on a scale with five choices ranging from being extremely satisfied to extremely dissatisfied. Figure 32 illustrates the overall levels of satisfaction with DTRS features, as reported by field users, dispatchers, technical support, and management.

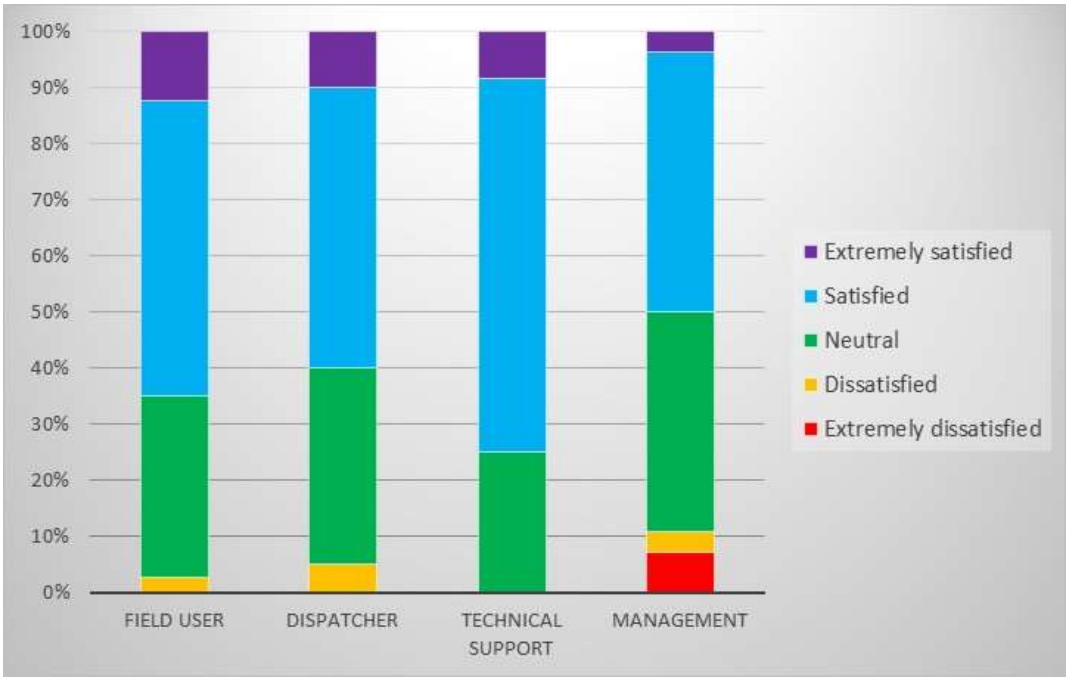


Figure 32 – Satisfaction levels with DTRS features

Survey results show that at least 60% of field users, dispatchers and technical support, and 50% of managers are satisfied or extremely satisfied with current DTRS features. However, Figure 33 shows the degree to which field users and dispatchers feel that they know all of the system features available.

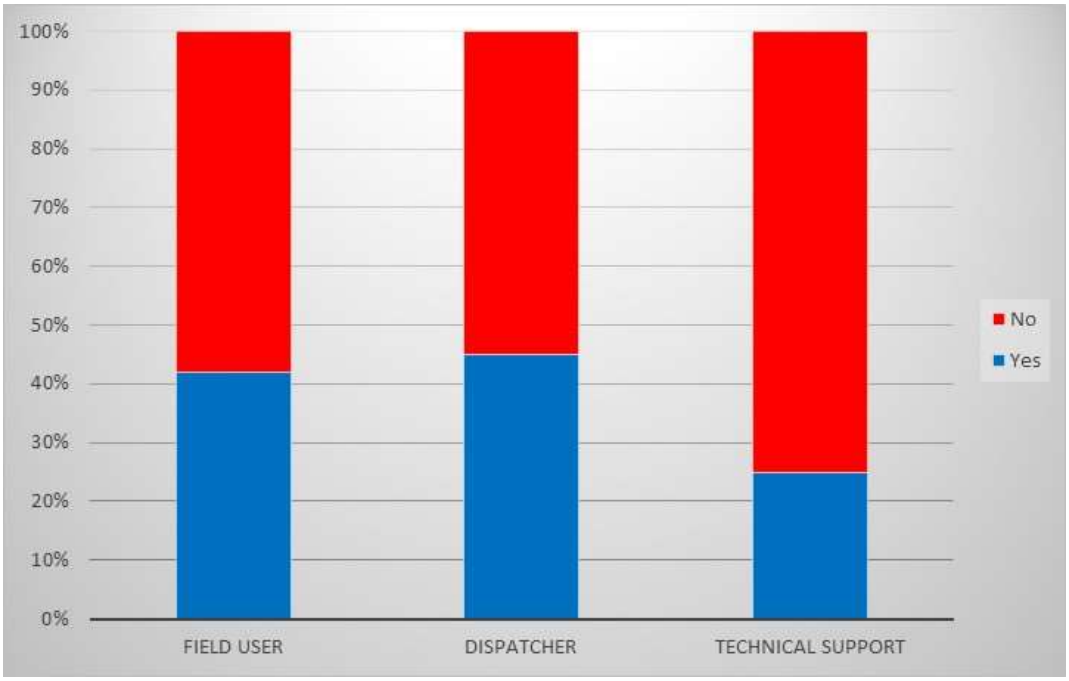


Figure 33 – Knowledge of DTRS features available

Only about 40% of field users and 45% of dispatchers feel that they know how to operate all of the system features available. About 25% of those in a technical support role feel that users of the DTRS know how to operate all of the system features available.

The survey asked field users to identify which system features, categorized into calling features and management/security, are critical in their current radio system and in a future radio system. Table 6 lists current system features ranked by level of importance, with the three most critical ones in each category highlighting in red.

Table 6 – Critical features in current radio system

Importance	Calling Features	Management/Security Features
1	Emergency Calls	Global Positioning System (GPS)
2	Emergency Alarm	User Authentication
3	Call Alert	Voice Encryption
4	Group Calls	Status Query
5	Announcement Group Calls	Over-the-air Programming (OTAP)
6	Private Calls	Short Messaging Service (SMS)

Importance	Calling Features	Management/Security Features
7		Radio Inhibit / Uninhibit
8		Over-the-air Rekeying (OTAR)
9		Dynamic Regrouping

Technical support also reported emergency calls, emergency alarm, and call alert as the top three calling features. However, technical support believes that the radio inhibit/uninhibit feature, rather than GPS, is the most critical management/security feature.

The results for field-user requirements for critical calling and management/security features for a future radio system were nearly identical to those for the current system (the only difference being a swap in position of the calling features of Announcement Group Calls and Group Calls). Technical support requirements for the features of a future system were also nearly identical to those for the current system.

All of the calling features required by field users are part of the Project 25 standard for features and signaling and all but Private Call are part of the DTRS Subscriber Acceptance Test Plan used by CCNC to approve the operation of a particular brand and model of radio on the system. This is also true of the management/security feature of inhibit/uninhibit. Therefore, all of these features, with the possible exception of Private Calls, should be available to field users allowed to operate on DTRS. ***FE*** believes that the classification of these features as “required” (both in the existing and in any future system) means they are the foundational features of the system and that they must remain despite any other changes made to the system.

Our survey did not reveal an overwhelming mandate to incorporate the top three management/security features into the system. Fifty one percent of survey participants listed GPS as a requirement, while 43% cited authentication as a requirement and 41% cited encryption as required.

The features of GPS and authentication are part of the Project 25 standard for features and signaling but they are not universally available in all subscriber radio models. Additionally, their incorporation typically requires the addition of software and/or hardware within the system’s infrastructure and in each subscriber radio. These additions of software and hardware can be costly, depending on the manufacturer and exact model of the radio as well as on the exact functionality required. Because the call for these

features was not at a “mandate” level and because of their additional cost, ***FE*** recommends that users’ operational needs be further studied before taking action on procuring these features.

The DTRS infrastructure is, by its definition as a Project 25 compliant system, capable of providing the feature of encryption. However, activating that feature includes the installation of additional software and/or hardware in subscriber radios and dispatch consoles. The decision to install the hardware and/or software to provide this feature can and should be left to the individual agency that requires the encryption feature; however, implementing it in talkgroups used by multiple agencies requires coordination to ensure that encryption is available (with the same key) to all that could use that talkgroup.

Regarding features needed or desired in a future radio system, users provided the following comments:

- “Emergency calls/alarms able to be heard across multiple channels, and the ability to access certain channels in times of emergencies are extremely important.”
- “The ability to lower the minimum speaker volume so it does not alert the suspect.”
- “Over-the-air programming would be extremely helpful; GPS would provide an enhanced level of crew safety.”
- “I would like to see encryption for law enforcement radios.”
- “OTAP would be necessary to ensure timely updates or programming of radio channels as needed without the presence of a vendor or timely shop programming times.”
- “Scan improvements, SMS texting, personnel locations, and data transfer (pictures etc.)”

The survey provided dispatchers with a list of dispatch console features and asked them to identify whether they have and do use, have and do not use, or do not have but would use each of the features. Table 7 provides a list of top ten console features that dispatchers have and do use, as well as the top ten features that dispatchers do not have but would use.

Table 7 – DTRS dispatch console features

Importance	Have and Do Use	Do not Have But Would Use
1	Alert Tone(s)	Intercom
2	Call Playback	Radio Unit Status Messages
3	Unit ID Display	All-Call (System Wide)
4	Call History	Announcement Groups
5	Patches	Radio Unit Monitoring
6	Simulselect	More than one "unselect" speaker
7	Display Loss of Network Connectivity	Channel Marker Messages
8	One "unselect" speaker	Dispatch Priority
9	Emergency Call	RF (Control-Station) Backup
10	Emergency Alarm	Individual Calls

The only concern with currently used features is that emergency signals could be marked more clearly to recognize immediately the individual deputy who hit their alarm.

3.5.2 Summary of Features Status and Need

Table 8 briefly describes the status and needs of the system features:

Table 8 – System Attribute: Features

System Attribute: Features	
Current Status	*Need*
DTRS currently provides a set of user and dispatcher features that is highly compliant with the Project 25 standards for feature interoperability and that meets a significant portion of users' calling and security/management needs.	Users of DTRS, including field users and dispatchers, need more awareness of the features of DTRS. DTRS can accomplish this through a combination of training, exercise, and usage. Additionally, the specific features of GPS, authentication, and encryption require special consideration to determine the potential value of expanding the DTRS in order to provide them at a local or statewide level.

3.6 DTRS Capacity

3.6.1 Capacity Capabilities and Requirements

Capacity is the ability of the system to support the number of simultaneous conversations requested by users. In a statewide system like DTRS that uses multiple, interconnected sites; sites with greater numbers of radio channels will be able to provide greater capacity to the area they serve. The number of channels supported at each DTRS site varies. Remote areas typically have the capacity to support four to five simultaneous conversations while some urban areas can support over 20 simultaneous conversations. The intent of the capacity is to support routine, peak, and emergency traffic on the system.

The capacity of a system is often measured as the percentage of call attempts that receive a busy indication (i.e., no available channels at the sites able to accept additional users/conversations) relative to all call attempts for a given time period. (Note that in systems such as DTRS that comply with the Project 25 standards for features and signaling, a call that receives a busy indicator will receive an automatic callback once a channel becomes available.) The industry term for this is the Grade of Service (GoS). The targeted GoS for a public safety radio system is typically 1% during the period of peak traffic.

The State's Office of Information Technology provided system traffic summary reports for each month in 2014. Table 9 summarizes the information provided in those reports.

Table 9 – DTRS traffic report summary

Month	Number of Busy Calls	Number of Total Calls	% Busy	Avg. Busy Duration (seconds)
January	19,960	8,775,702	0.23%	1.7
February	12,181	7,590,239	0.16%	1.9
March	4,295	7,824,751	0.05%	1.7
April	2,574	7,432,056	0.03%	1.3
May	3,524	8,344,663	0.04%	1.2
June	3,034	8,035,755	0.04%	1.4
July	6,272	8,662,189	0.07%	1.8
August	5,318	8,475,456	0.06%	1.3
September	3,855	7,929,447	0.05%	1.2
October	3,073	8,046,870	0.04%	1.3
November	6,001	7,422,148	0.08%	1.0
December	4,746	7,760,518	0.06%	2.3
Monthly Average	**6,236**	**8,024,983**	**0.08%**	**1.5**

The monthly average percentage of busy calls for the 2014 calendar year was under 0.1%. This means that, on average, less than one call attempt per month of out each one thousand calls received a busy indication.

To assess user experience with the current system capacity, it was critical to determine whether user groups experience an unacceptable number of system busies or if there are sufficient channels to conduct normal and emergency operations. Survey participants were asked to rate DTRS capacity on a scale with five choices ranging from excellent (never busy) to poor (frequently busy). In addition to the ratings, the user groups commented on specific issues with channel capacity (busies, congested channels, etc.).

Figure 34 illustrates the field user, dispatcher, technical support, and management ratings on DTRS capacity.

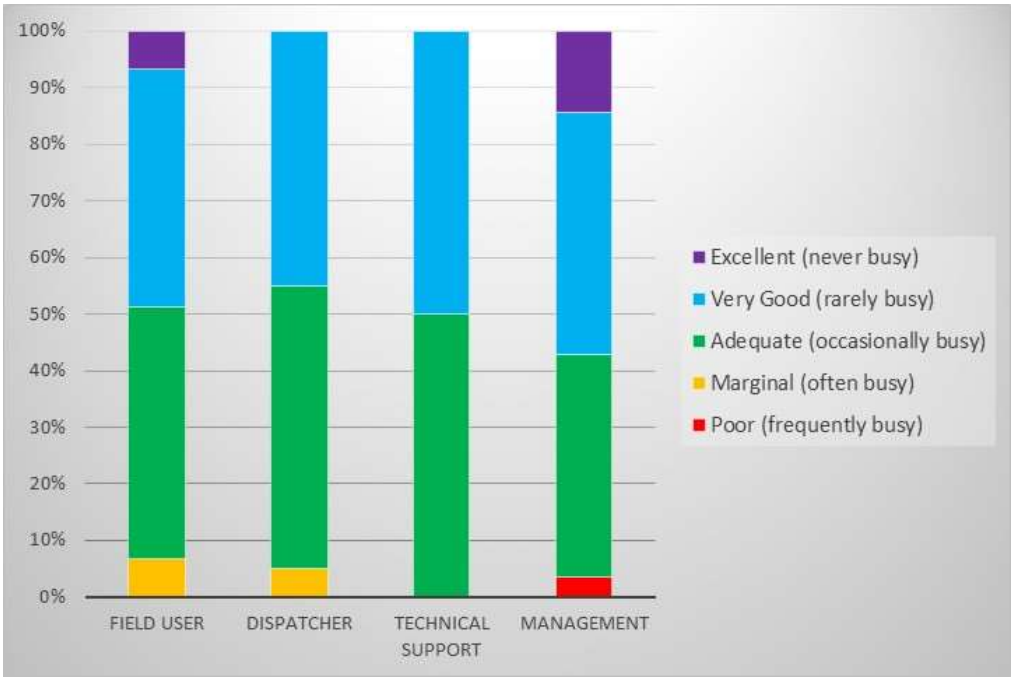


Figure 34 – Overall ratings on DTRS Capacity

Across the board, about half of the participants rated system capacity as very good, with a few excellent ratings. A considerable number of users (average of 45%) reported adequate system capacity, experiencing busy system channels only on occasion.

Three-fourths of the field users report that they do not anticipate expanding their use of the system. However, the remaining field users communicated that they do anticipate expanding their use of the system by either expanding the number of users or increasing the degree to which radios are used. The field users expressing the need for increased capacity represent a variety of disciplines and regions, including state and local law enforcement agencies, fire protection districts, airport and rescue authorities, and health and paramedic services.

Appendix H provides field user, dispatcher, technical support, and management comments regarding DTRS capacity organized in the following manner:

- Field user comments on specific issues with channel capacity
- Dispatcher and management comments on specific issues with channel capacity
- Management and technical support comments on DTRS capacity needs

Those survey respondents who identified themselves as management believe that the system works well for day-to-day operations, but it does not have the additional capacity to handle major multi-agency events and heavy loading conditions such as a snowstorm, tornado, flood or wildfire. Participants from technical support roles stated that they continue to work with their current vendor to add capacity as needed to address the number of busies reported. These participants also stated that counties upgrade and expand simulcast cells in their region to meet their system capacity needs.

3.6.2 Summary of Capacity Status and Need

Table 10 briefly describes the status and needs of the system capacity:

Table 10 – System Attribute: Capacity

System Attribute: Capacity	
Current Status	*Need*
DTRS is currently equipped with a varying number of channels per radio site with some metropolitan area sites having as many as 20 channels while most remote or rural sites have 5 to 6 channels. When measured at the month level, the capacity of DTRS is well within typical design criteria and users had overall positive comments about capacity performance.	Monitoring of DTRS capacity performance should continue, including the continuation of the current process for predicting effects of the anticipated traffic from new user agencies. Addition of channels or migration to P25 Phase 2 operation, which effectively doubles existing capacity, should occur when such predictions show the need for expanded capacity in the affected areas.

3.7 DTRS Reliability

3.7.1 Capacity Capabilities and Requirements

FE sought to analyze the reliability of DTRS through two methods. The first method was an analysis of reports regarding infrastructure equipment failures and other empirical data about the causes and durations of system outages. ***FE*** requested this information from OIT; however, OIT advised us that the format of their information is not compatible with this analysis. While there are software packages for system management applications that track outages and that can provide reports on system reliability, no such package is

currently in use by OIT. This does not mean that OIT is unable to monitor and react to outages; it simply means that they do not currently have the capabilities to record and produce reports on such information.

We successfully analyzed system reliability via the second method through our completion of an online survey that covered several topics related to DTRS reliability. Field users, dispatchers, technical support and management rated overall system reliability on a scale with five choices ranging from excellent (never has issues) to poor (frequently has issues). Field users and dispatchers also rated their experience with the notification process for system outages. Those in a technical support role provided ratings on site power source(s), backhaul equipment, and their ability to monitor system performance.

Figure 35 shows the ratings on overall DTRS reliability, as reported by field users, dispatchers, technical support, and management.

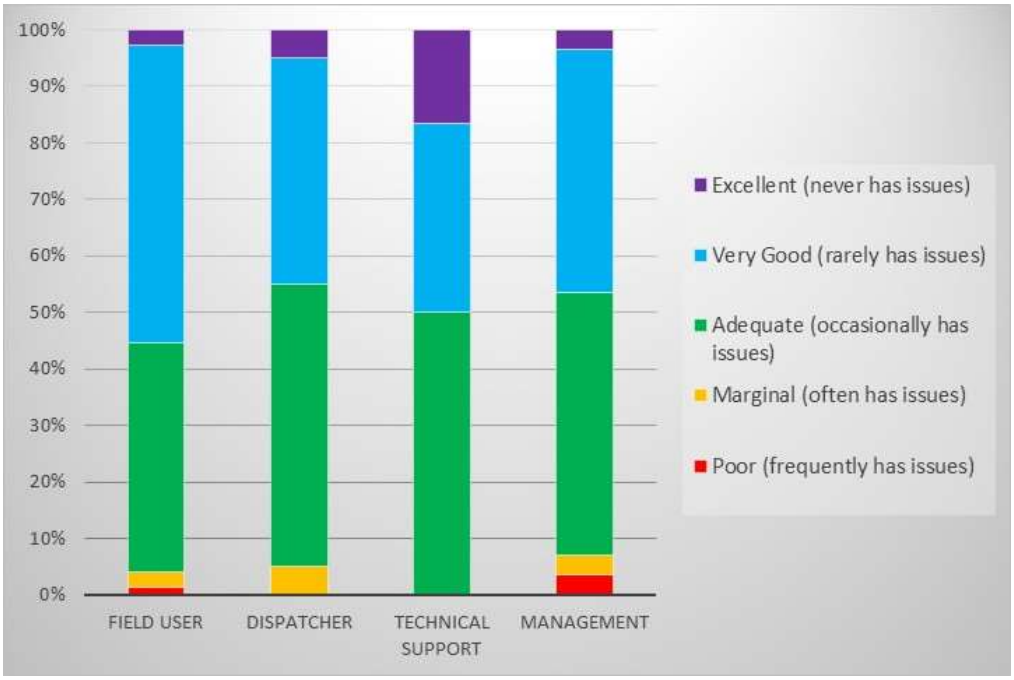


Figure 35 – Overall ratings on DTRS reliability

On average, about 50% of the survey participants rated system reliability as very good to excellent. A significant number of participants reported adequate reliability as the system occasionally has issues. Only a few field users, dispatchers, and managers provided marginal or poor ratings for system reliability.

When asked the manner by which technical support staff notify users of system outages, survey participants listed several communication methods including direct notification, dispatch, emails, radio, pages, or phone calls. Survey participants were asked to rate the notification process for system outages (planned and/or unplanned outages). Figure 36 illustrates the ratings on the notification process for system outages, as reported by field users and dispatchers.

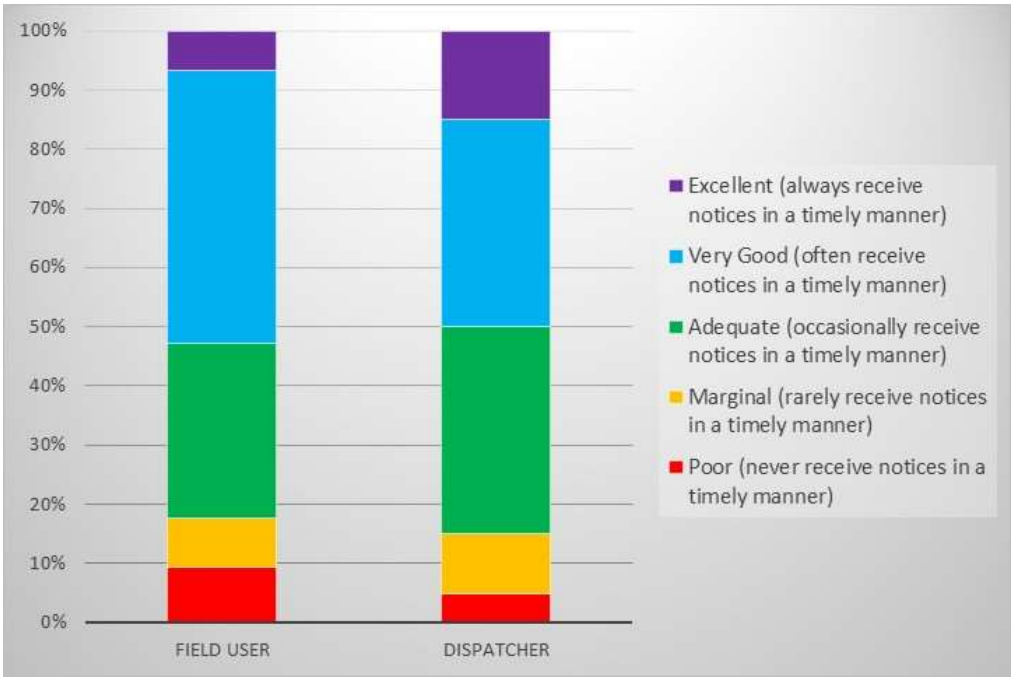


Figure 36 – Satisfaction with notification process for DTRS outages

At least half of the field users and dispatchers rated the notification process for DTRS outages as very good to excellent. Another 30% of participants rated the notification process as adequate, occasionally receiving notices in a timely manner. However, some field users and dispatchers report that they rarely, or in some cases, never receive notices in a timely manner.

Survey participants in a technical-support role provided comments on improvements they feel are necessary in notifying users of system outages and their comments include:

- The contact list of those requiring notification of system outages needs constant updating.

- Some technical support staff would like to find a way to have system and device alarms set via pages or text instead of just emails. This requires identifying all of the alarms that users really need to see for each device.

- Currently, users statewide receive outage notifications. When users receive frequent notifications that do not pertain to their region, they begin to ignore the notifications in general. Participants believe that only users in the affected region should receive outage notifications.

The survey asked participants in a technical support role to rate the site power resources of the DTRS and backhaul equipment (i.e., the equipment that supports site-to-site links that use microwave, fiber, or leased T-1 circuits). Technical support also rated their ability to monitor the performance (including outages) of equipment, sites, backhaul, and other items throughout the system. Figure 37 illustrates the technical support ratings on DTRS infrastructure reliability and performance monitoring ability.

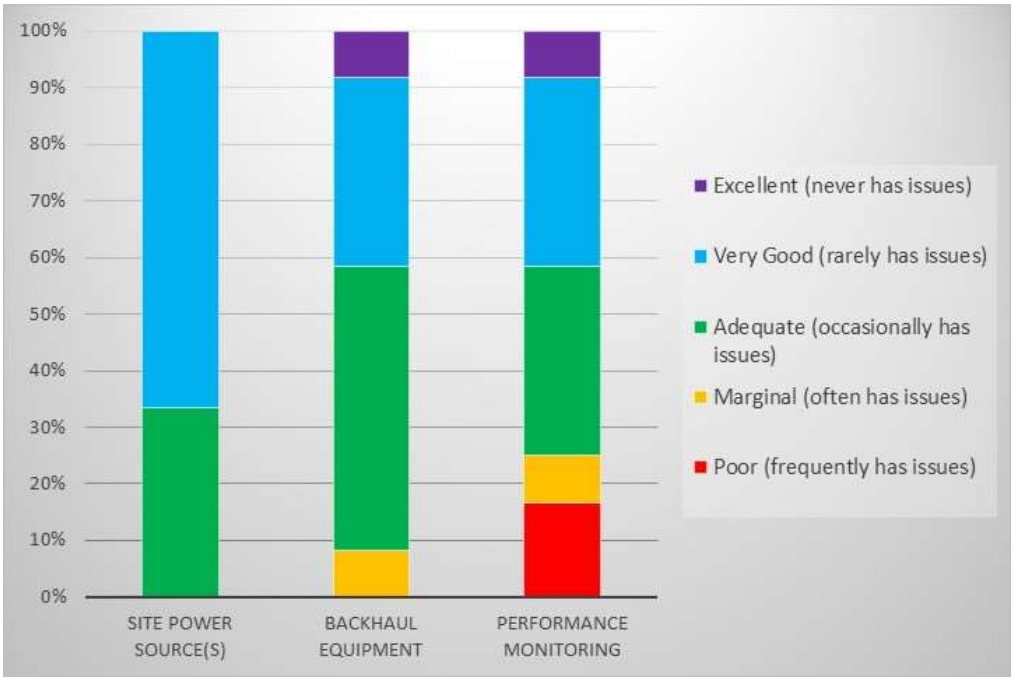


Figure 37 – Technical Support ratings on DTRS reliability and monitoring

Survey results show that two-thirds of technical support rate site power sources as very good, with the remaining third reporting that site power sources occasionally have issues. While 42% of technical support rated backhaul equipment reliability as very good or excellent, 50% of them reported that backhaul equipment occasionally has issues.

Regarding the ability to monitor the performance of equipment, sites, backhaul, and other items throughout DTRS, 42% of technical support provided very good to excellent ratings. However, it is important to note that a small percentage of technical support rated backhaul equipment reliability and their ability to monitor system performance as marginal or poor. Some items that technical support staff does not have the ability to monitor but which they feel are necessary to monitor include county-owned routers and switches, waveguide pressures, generator failures, microwave equipment, and site status and alarms.

Appendix I contains the following field user, dispatcher, technical support, and management comments that provide further insight into DTRS reliability ratings:

- Field user comments on specific issues with system reliability
- Dispatcher and management comments on specific issues with system reliability
- Field user comments on notification process for system outages
- Dispatcher comments on notification process for system outages
- Technical support comments on site power sources, backhaul equipment, and overall system reliability
- Management comments on improvements needed for current system reliability

3.7.2 Summary of Reliability Status and Need

Table 11 briefly describes the status and needs of the system reliability:

Table 11 – System Attribute: Reliability

System Attribute: Reliability	
Current Status	*Need*
A majority of DTRS users views the system as reliable; however, there were individual and specific concerns over backhaul. Additionally, no empirical data about outages at the component, site, or system level was available for analysis.	DTRS should be equipped with a software package that records and is capable of producing reports on system reliability.

3.8 DTRS Backhaul

The backhaul interconnects the sites in the radio system to each other. This section provides a summary of ***FE***'s *2014 State of Colorado Microwave System Requirements, Analysis and Recommendations Repor*t. For further details on this topic, refer to that report. It is important to note that state-owned microwave dominates the topic of backhaul for the following reasons:

- Of the 298 total backhaul links, 262 (or 90%) use microwave while the remainder of the links use optical fiber or leased T1 circuits.
- Of the 262 microwave links, the state of Colorado owns 169 (or 65%).
- Of the state-owned microwave links, a majority of the equipment has aged beyond the manufacturer's support lifecycle; whereas, the majority of locally owned microwave equipment is of a more recent technological evolution.

3.8.1 Backhaul Capabilities and Requirements

The State's microwave system consists of approximately 262 microwave links, which include links to remote mountaintop locations, state facilities, and dispatch center locations. This microwave system provides connection of critical communication circuits to state agencies such as Colorado Department of Corrections, Colorado Department of Transportation, Colorado State Patrol, Colorado Department of Natural Resources, and other state agencies. The existing microwave system also interconnects into microwave systems owned by local governments to allow communications among jurisdictions.

The primary use of the microwave system is to connect sites serving DTRS. It also serves other systems that require remote radio sites. The microwave system uses Time Division Multiplex (TDM) technology in the 2 Gigahertz (GHz), 6 GHz, 10 GHz, 11 GHz, 18 GHz, and 23 GHz frequency bands. The images in Figures 38-44 below are diagrams of the State's existing microwave system provided to ***FE*** by the State's OIT. For image clarity purposes, ***FE*** divided the state into the following seven areas: North West (Figure 38); West Central (Figure 39); South West (Figure 40); North East (Figure 41); East Central (Figure 42); South East (Figure 43) and Denver Metro (Figure 44).

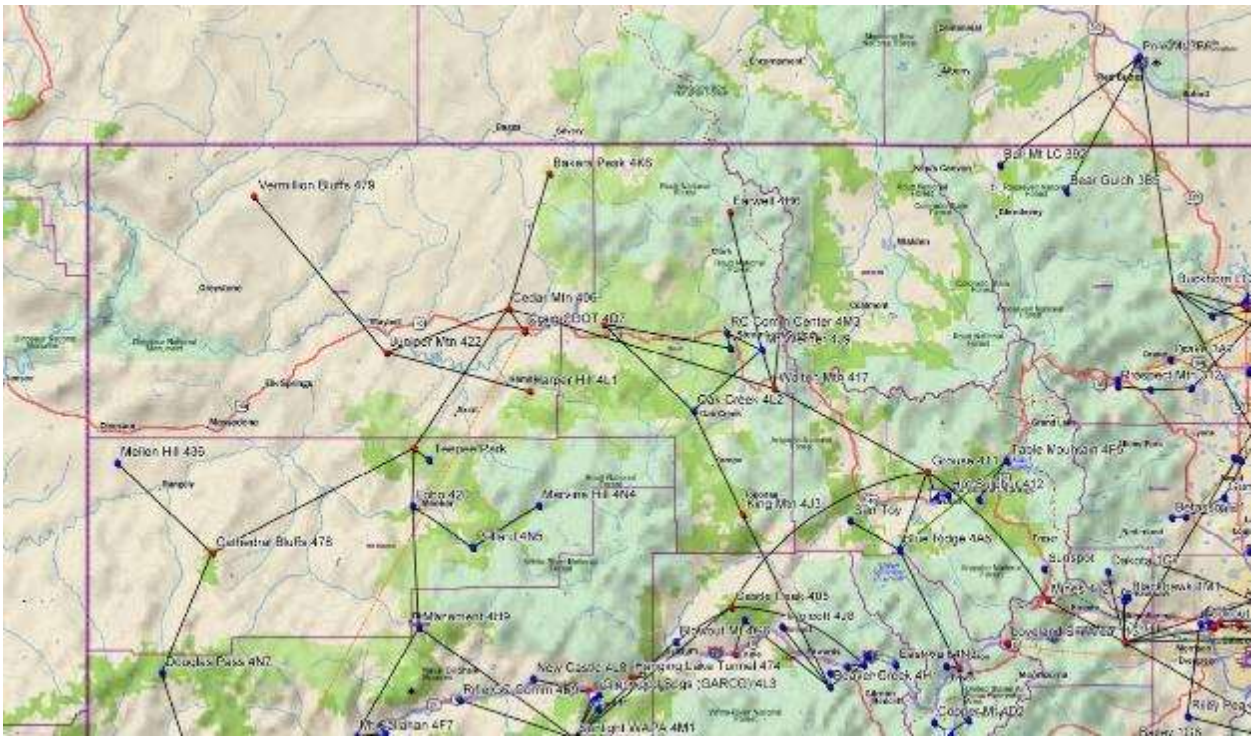


Figure 38 – Current microwave network, North West portion of State

Figure 39 – Current microwave network, West Central portion of State

Figure 40 – Current microwave network, South West portion of State

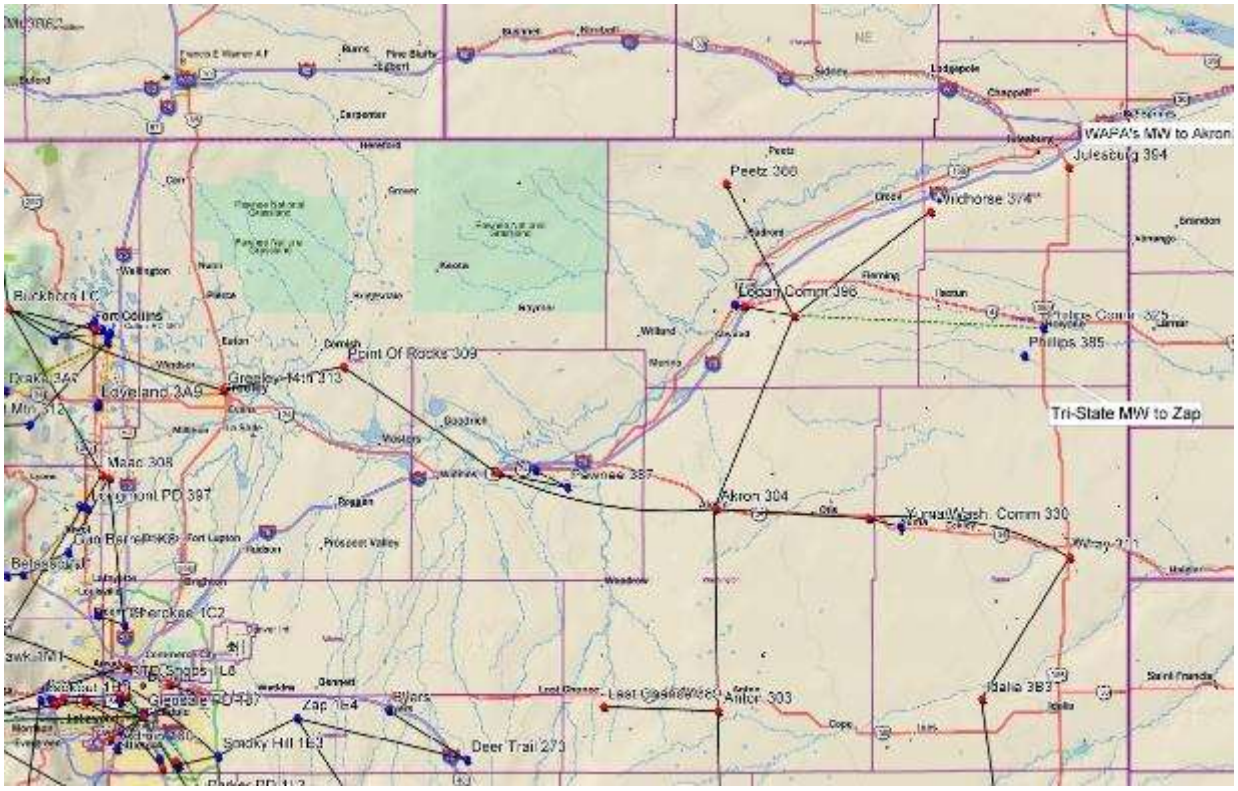


Figure 41 – Current microwave network, North East portion of State

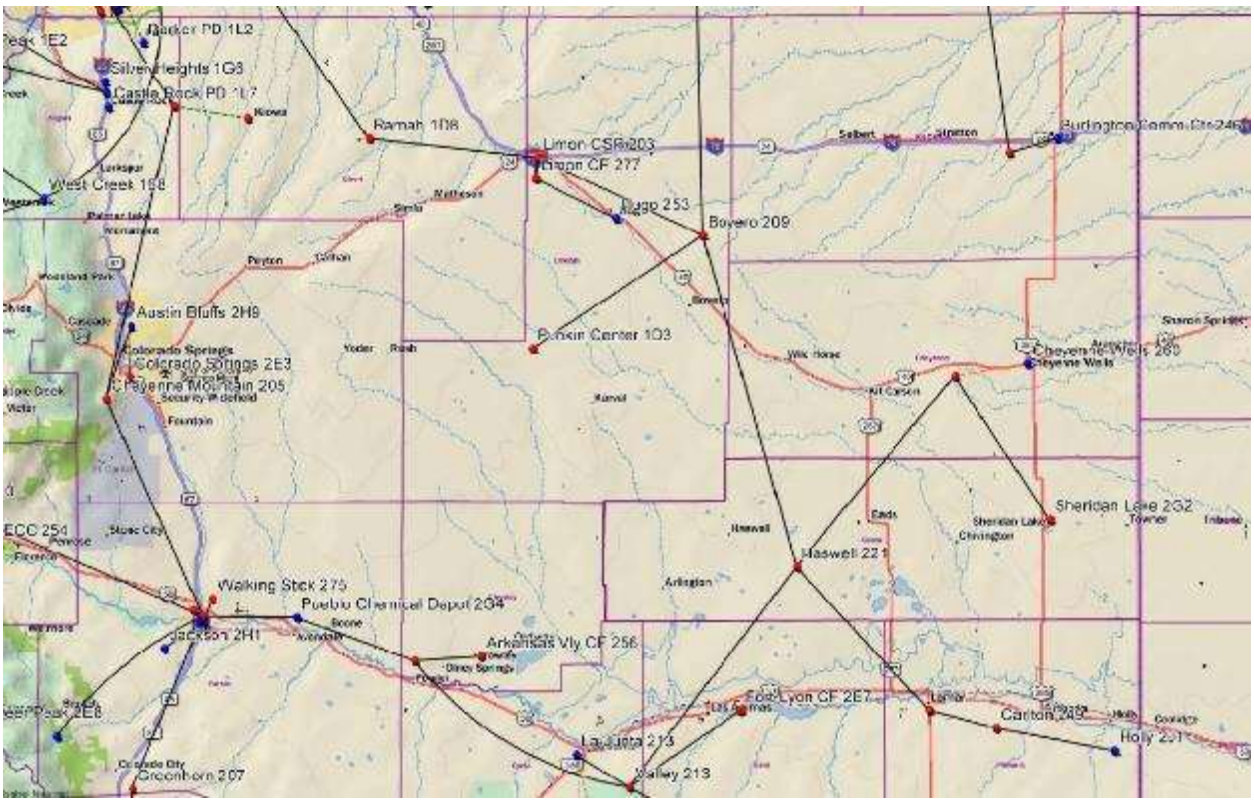


Figure 42 – Current microwave network, East Central portion of State

Figure 43 – Current microwave network, South East portion of State

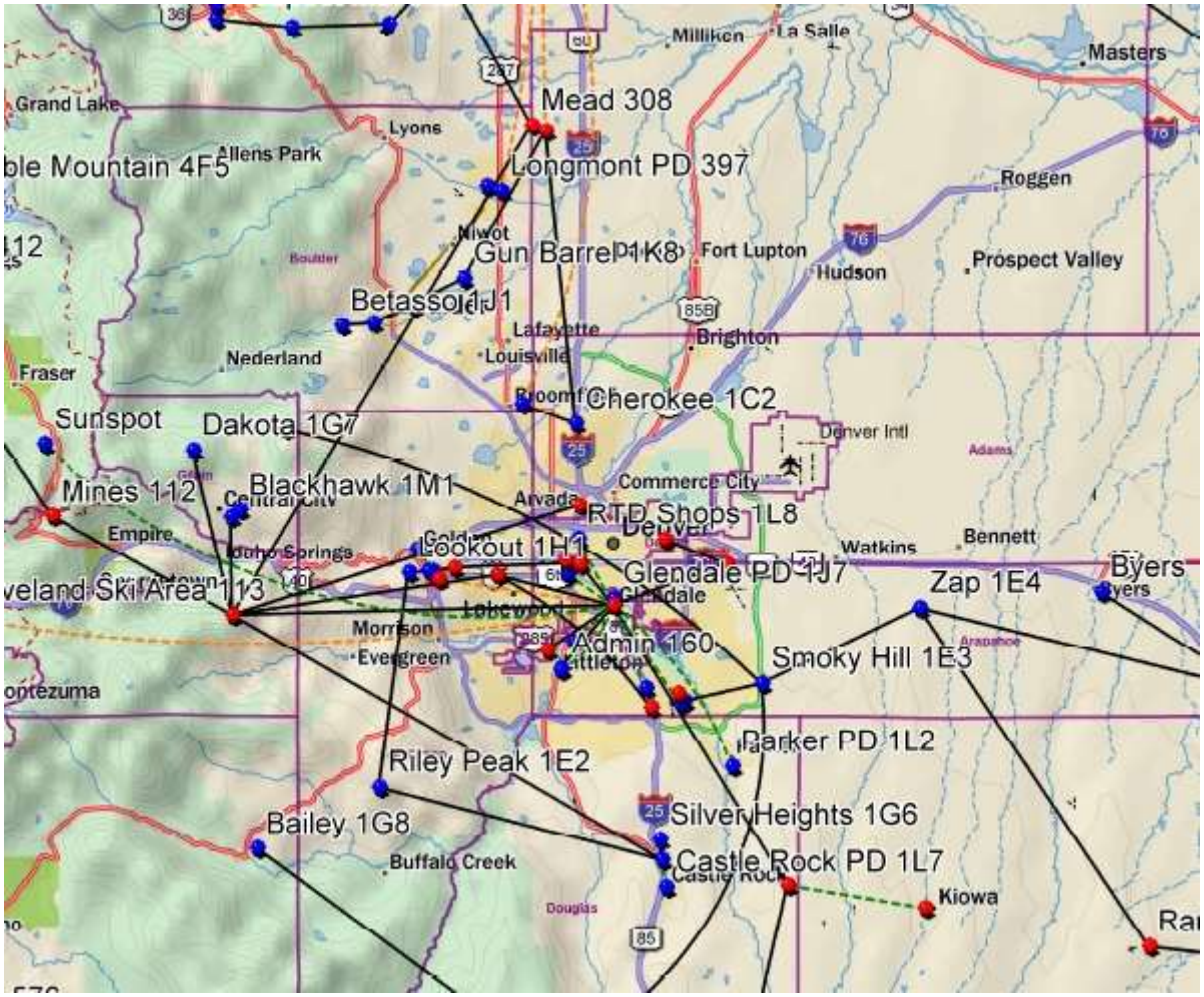


Figure 44 – Current microwave network, Denver Metro Area

The current microwave system comprises two main architectures. Ring architecture provides connectivity to all sites when one site-to-site connection is lost. A spur is a single hop that provides connectivity to a single site or multiple sites in a linear fashion. Rings provide a level of redundancy that spurs do not provide since there are two communication routes into each site in the ring architecture. The State's current microwave system comprises many spurs and very few rings.

The majority of the microwave stations and their ancillary equipment are obsolete. Manufacturers have discontinued support of these products in favor of newer products. Our analysis determined that 59% of the microwave stations used in the microwave system is at a point in their lifecycle where the manufacturer no longer supplies parts and service, making the system difficult to support.

Based on the OIT provided data covering a period of 1,310 days between May 17, 2010, and December 17, 2013, ***FE*** calculated the State's current typical mean time between failures (MTBF) of a microwave system component to be 349 hours or 14.5 days. This falls well short of the common performance criterion of "five nines" or 99.999% reliability and further substantiates the need to replace the aging equipment that in the majority of cases is out of support from the manufacturer.

3.8.2 Summary of Backhaul Status and Need

Table 12 briefly describes the status and needs of the system backhaul:

Table 12 – System Attribute: Backhaul

System Attribute: Backhaul	
Current Status	*Need*
Varying technologies and equipment currently serve the site-to-site links in DTRS; however, the majority of the backhaul network is State-owned microwave that uses equipment beyond its manufacturer's support lifecycle and that incurs outages beyond an acceptable level. Additionally, the backhaul network relies on a topology of spurs, which leave sites that are at the end of a series of microwave hops susceptible to isolation (and outage).	Improvements to the backhaul network of DTRS are essential. These include the replacement of the current topology, technology, and equipment with highly reliable modern technology that incorporates ring architecture (not spurs), and has the bandwidth necessary to meet anticipated growth.

3.9 DTRS Maintenance

3.9.1 System and Subscriber Maintenance Capabilities and Requirements

To assess the current maintenance practices of DTRS infrastructure and user equipment, ***FE*** provides the following analysis of online survey results on maintenance from field users, dispatchers, technical support, and management. The online survey asked field users and dispatchers to identify the agencies maintenance organizations (or individuals), as well as the frequency of maintenance activities, and their overall satisfaction level with

equipment maintenance. We asked those in a technical support or management role to report the frequency and satisfaction with DTRS maintenance activities, as well as any improvements required to the maintenance capabilities of the current system.

Table 13 provides a list of the individuals/organizations identified by field users through the on-line survey that perform DTRS user-radio ("subscriber radio") maintenance.

Table 13 – Individuals/organizations that perform DTRS user-radio maintenance

Individuals/Organizations that Perform DTRS User-Radio Maintenance Per Survey Responses
Arapahoe County Sheriff's Office
Barry Mitchell, a local radio technician
Chris Truby
City of Colorado Springs
Commercial radio shops, OEM dealers
Dale Wise
DigitCom Electronics
Douglas County Sheriff's Office radio shop
Grand Junction Radio Tech
KCI and Wireless Technologies Mike McCarty
Mobile Radio Durango
Park County Communications Center
QDS Communications
Spectracom
Various un-named in-house radio technicians from multiple survey participants
Walter Zorn
WDSL, PUEBLO
Wireless Advanced Communications

A subset of the individuals/organizations that perform user-radio maintenance also perform the dispatch console maintenance. Figure 45 illustrates the frequency of DTRS user equipment (subscriber radio and dispatch consoles) maintenance, as reported by field users and dispatchers.

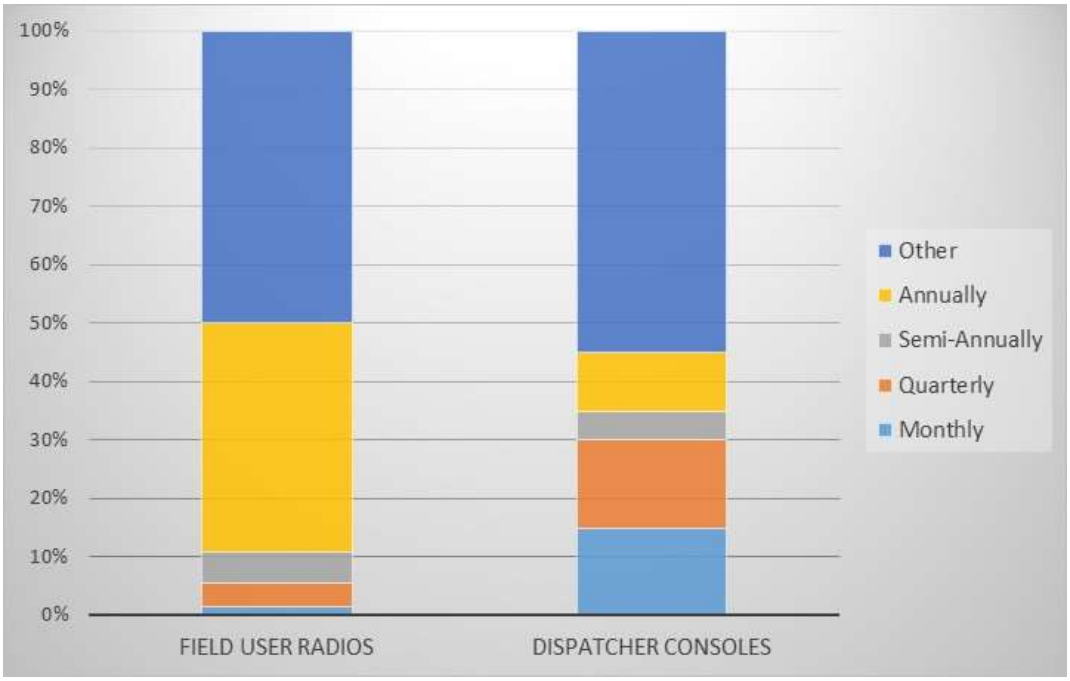


Figure 45 – Frequency of DTRS user equipment maintenance

Survey results indicate that 40% of field users are aware of annual equipment maintenance, and 10% of field users report quarterly or monthly maintenance. More dispatchers report quarterly or monthly maintenance on their equipment. Field users and dispatchers who indicated “Other” commented that frequency of equipment maintenance was unknown, occurs on an as-needed basis (when problems arise), or when equipment is reassigned. Figure 46 highlights the satisfaction with DTRS user equipment maintenance, as reported by field users and dispatchers.

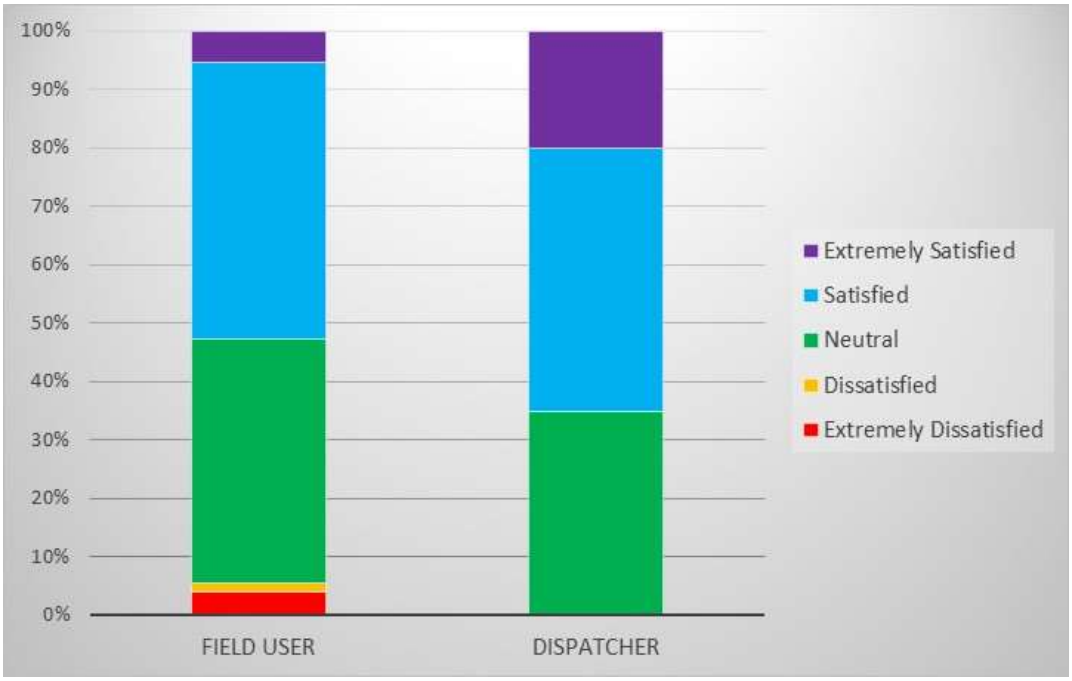


Figure 46 – Satisfaction with DTRS user equipment maintenance

More than 50% of field users and dispatchers indicate that they are satisfied or extremely satisfied with DTRS user equipment maintenance. Only a small percentage of field users indicate they are dissatisfied or extremely dissatisfied with DTRS user equipment maintenance. One change that some dispatchers would like to see regarding console maintenance is notifications on planned (or scheduled) outages, so they know in advance when technicians are working on the system.

On the system infrastructure side, we asked technical support staff to identify who was responsible for maintenance/service of DTRS components. For the purposes of this topic, the term “DTRS components” includes system controllers, radio repeaters, system networking, backhaul network, antenna systems, site power sources, and site facilities and towers.

The majority (54%) of survey participants indicated that a local radio shop is responsible for maintenance/service of the aforementioned system components. A significant number (35%) of participants also reported that another state or municipal radio shop is responsible for maintenance/service of their system components. The remaining participants (11%) noted a contracted/private radio shop or that they do not know who is responsible for maintenance/service on their portions of the radio system.

Figure 47 shows the frequency of DTRS maintenance/service, as reported by technical support staff.

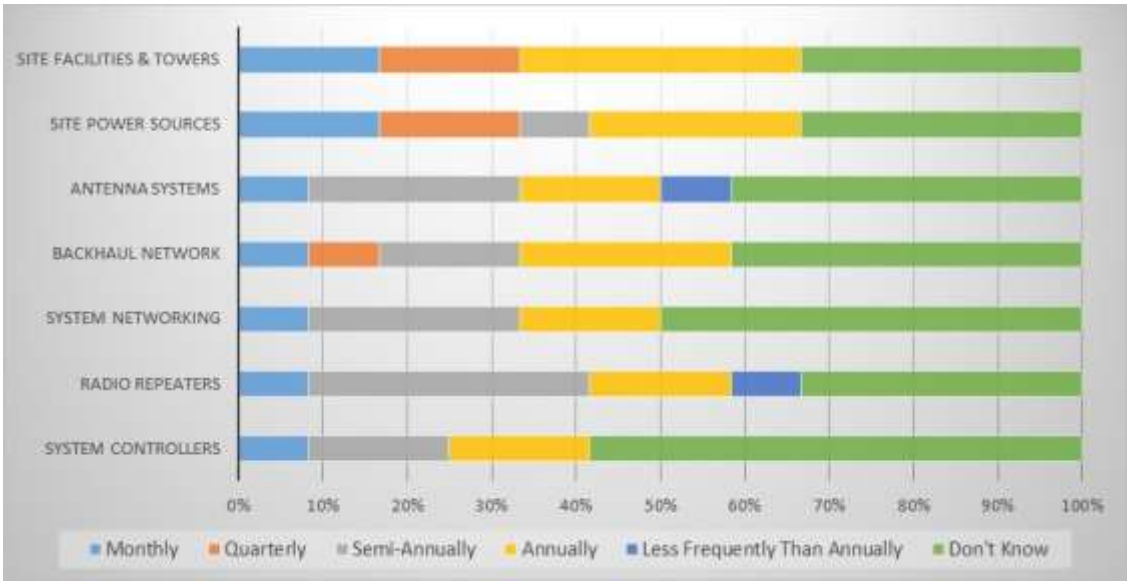


Figure 47 – Frequency of maintenance/service on DTRS

On average, only about 35% of technical support staff report maintenance is performed at semiannual or more frequent (i.e., quarterly or monthly) intervals. Perhaps more revealing is that an average 42% of participants in a technical support role indicated they do not know the frequency of maintenance/service on the DTRS. Some participants believe that the State is underfunded and that more personnel, vehicles and calibrated test equipment are necessary. Another concern is that wild fires, such as those experienced in Colorado in 2012 and 2013, are unpredictable and can reduce the amount of time spent doing site maintenance in the summer. Other participants emphasize the importance of other agencies' responsibilities for maintaining portions of the DTRS those agencies own.

Despite these challenges, Figure 48 illustrates the levels of satisfaction from technical support on DTRS maintenance and service.

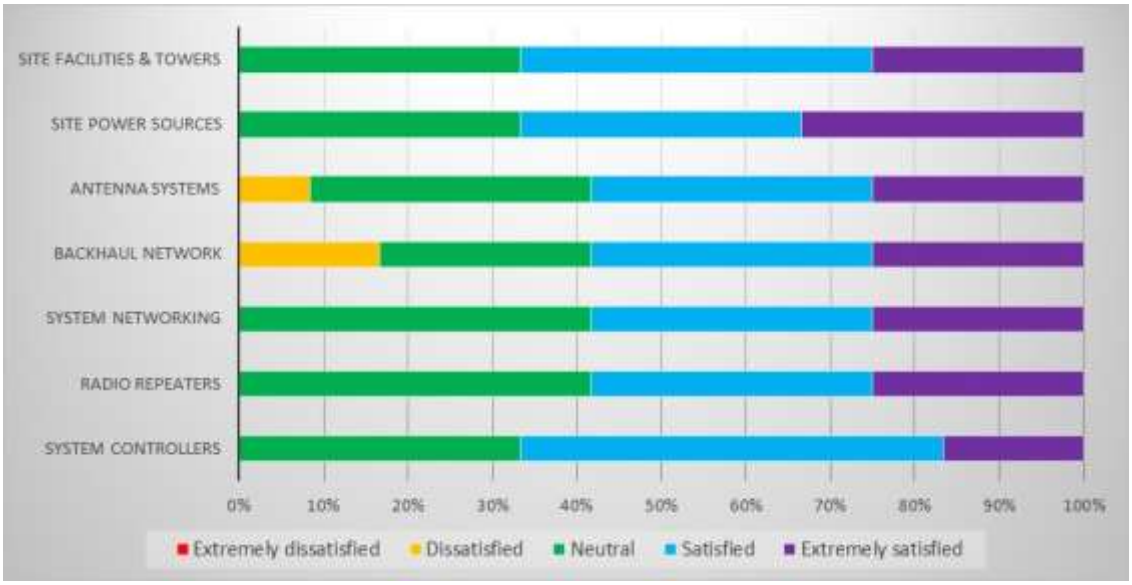


Figure 48 – Satisfaction with maintenance/service on DTRS

On average, the majority (62%) of the technical support staff is satisfied or extremely satisfied with maintenance/service on each of the DTRS components. Only a few participants reported dissatisfaction with antenna systems and backhaul network.

Based on responses from management, the organization that managers actually contact for service requests differs from the organization they think should be responsible for providing service. Figure 49 shows management ratings on DTRS maintenance policies and procedures.

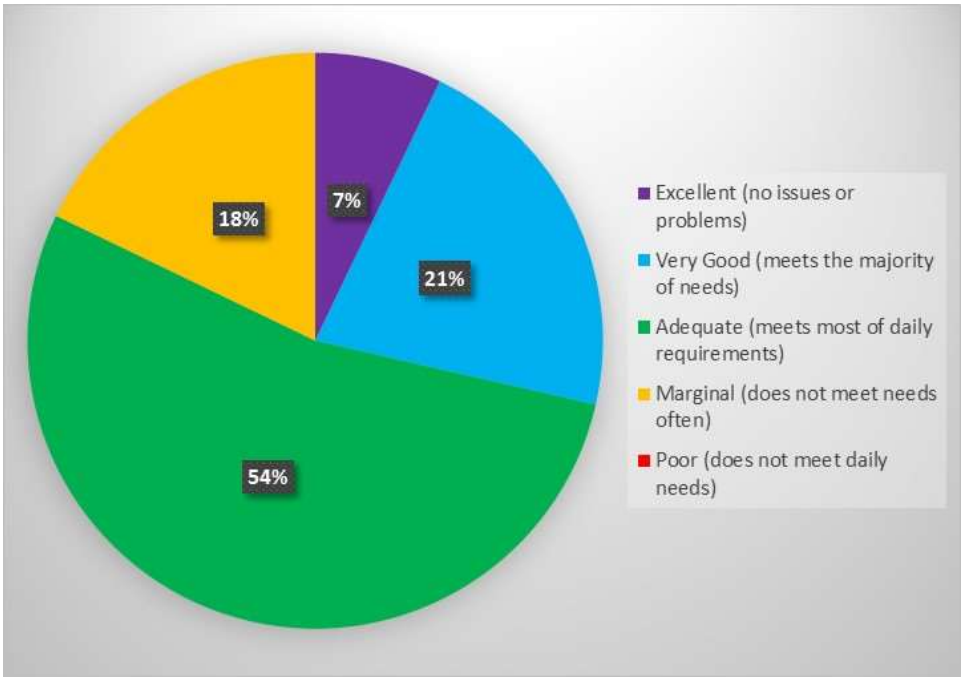


Figure 49 – Ratings on DTRS maintenance policies and procedures

The majority (54%) of participants in a management role report that current DTRS maintenance policies and procedures are adequate. Although a number of managers rated those policies and procedures as very good or excellent, a small percentage stated that they do not meet needs often. However, managers did not list any specific improvements needed for the maintenance capabilities of their current system, including the quantity or quality of preventative maintenance or the time required to complete a repair.

Appendix J provides field user and management comments on DTRS maintenance and service, organized in the following manner:

- Changes that field users would like regarding user-radio maintenance
- Organizations contacted for service on the system or users' radios

FE also investigated the maintenance-related topic of advanced system keys, which are physical devices owned and controlled by the owner of a radio system and required in order to program user/subscriber radios to operate on that radio system. For DTRS, the state of Colorado's OIT holds and distributes advanced system keys to those that program radios for operation on DTRS but such distribution requires execution of a system key agreement. Technical support staff identified the needs for the exchange of

advanced system keys between DTRS and other systems including Front Range Communications Consortium (FRCC), Lakewood, and (at some future point) the Utah Communications Agency Network (UCAN). Participants also identified the following changes that they would like to see regarding the exchanges of advanced system keys:

- "FRCC to be willing to issue system keys for non-FRCC member agencies."
- "Great progress has been made but [need] more open sharing. Perhaps have keys made for specific agencies that they simply make available to their programming agencies as needed. For example, Littleton Fire has a Lakewood key that only allows the programming of the talkgroups they are authorized for which they are the custodian. They simply give to the programmer as needed."
- "We have been using a limited ASK in the field for a couple years now. Works well for small changes and saves on travel expenses and technical resources. Others should consider them."
- "Advanced System Keys are only, as far as I know, applicable to Motorola radios. Other radios are on the system and do not require Advanced System Keys. Most State Specialists only have partial system keys. It causes work delays with little additional security."
- "Tighter guidelines - required training course and passing of test required before issuance of system keys."
- "Reciprocal agreements need to be in place. Work has been done at the local level, but the State holds up all progress to move forward. OIT wants control of everything and plays well when it benefits them."

3.9.2 System Site Conditions

As a specific topic related to system maintenance, ***FE*** performed the following analysis of sites used in DTRS and other radio systems. The intent of this effort was to identify the degree to which site maintenance is an issue that could have a negative effect on DTRS performance.

Our analysis included visiting a representative sample of sites from DTRS and other systems to perform detailed site surveys. The site surveys included recording and analyzing the current conditions of the following attributes of each site:

- Access (road or other methods to travel to site)
- General physical conditions (construction of shelter, status of fence, surrounding land space)
- Tower conditions (height, type, signs of weakness or wear)
- Antennas and cables (age, condition, quantity and placement on tower, status of tower lighting)
- Power and grounding (type and quantity of main power, availability of backup power, grounding and lightning suppression)

Over the course of two weeks in February 2015, ***FE*** visited and documented the conditions of 20 representative radio sites. The sites visited were a mix of locally owned and State-owned sites grouped into the following three categories.

- State owned DTRS facilities
- Locally owned (Non-State) DTRS facilities
- Non-DTRS facilities (Conventional, analog radio systems, trunked)

We produced detailed reports (each approximately 25 pages in length) for each site visited by ***FE*** and provided them to the site owners. This report provides a summary of our findings.

FE visited State-owned DTRS locations at Zone 3 Ft. Collins, Buckhorn, Franktown, DTB/Zone 1 Denver, and Sunset Mesa. These sites varied geographically from the urban core facility at Denver to the remote mountaintop location of Bucktown in the North.

We found each site to be well constructed, using best practices, and generally following the industry standards of EIA-222 and R56 with no significant site issues identified. All sites had backup power in the event of a loss of utility power.

The following are specific comments for each of the State-owned DTRS sites visited:

- Zone 3, Ft. Collins - This is a very well engineered installation supporting the regional ASTRO 25 core serving Zone 3. There was good security, room available for additional equipment, and all related reference materials available, with recovery and operating system compact disks.

- Buckhorn, Larimer County – This is an older, mountain top site where the installation methods were a bit dated but were consistent with best practices.

- Franktown - This site was well planned and constructed.

- DTB/Zone 1, Denver - This site is equipped with the ASTRO 25 controller for the metro region. The physical plant at this location is a bit dated, but we noted no issues with system design or installation.

- Sunset Mesa - This site is located in one of the larger townships in western Colorado, on a commanding mesa. Being located near a State Police maintenance facility gives it a logistical maintenance advantage. The site is equipped with a light duty monopole tower.

FE understands that OIT has initiated and is seeking to continue a project to replace approximately 25 radio towers over a period of 8 years with funding secured within each fiscal year. To date, funding is available to replace approximately 10 towers (groups A and B) and OIT is seeking funding for each year through fiscal year 2019 to replace another approximately 15 towers.

FE visited locally owned DTRS sites at Gun Barrel, Horsetooth, Austin Bluffs, Cedar Heights, Calhan, Zone 6-Pueblo, Vail, East Vail, Wolcott, Black Ridge, and the Grand Junction Water Plant. These sites varied geographically from the urban core facility at Pueblo to the multiple mountaintop locations in Eagle County (Vail, Wolcott) and Horsetooth in Larimer County. We found each site to be well constructed using best practices, and generally following the industry standards of EIA-222 and R56 with no significant site issues identified. All sites had backup power present in the event of a loss of utility power.

The following are specific comments for each of the locally owned DTRS sites visited:

- Gun Barrel, Boulder County - This site is well constructed and has good security.

- Horsetooth, Larimer County - This is an older site but we identified no substantial issues during the site survey.

- Austin Bluffs, Pikes Peak Regional Communications Network (PPRCN) - This is a modern well-constructed site. The equipment appears well maintained. Overall site installation quality and engineering were excellent.

- Cedar Heights and Calhan, PPRCN - These sites primarily serve the Colorado Springs metro area, but are located on the outskirts of the City core. We observed that both are well built and maintained. The Cedar Heights system is especially robust with critical equipment powered by very high capacity DC battery banks, with generator back up.

- Zone 6, Pueblo County - This core is integrated into the PSAP / EOC. The installation and maintenance is consistent with best industry practices. The site has superior connectivity and excellent security.

- Wolcott and East Vail, Eagle County - Best practices were employed for the installation of these sites in the Eagle County / Vail area.

- Vail “Telco”, Eagle County - This is a very well secured and engineered site.

- Grand Junction “Black Ridge” and Water Plant, Grand Junction Regional Communications Network - Black Ridge is on a ridgeline overlooking the great majority of the county and city. It is a well-maintained and engineered site. The Water Plant site is very close to the city core, and the I-70 corridor. We noted no installation or engineering issues at either location.

Finally***, FE*** visited sites from systems other than DTRS including those at locations in the Lakewood, Arvada, and Denver systems. These sites provided sampling from the urban core facilities at Arvada and the Denver System (Station #2 Station #26) to the foothills location for Lakewood on Green Mountain. Each of the sites from systems other than DTRS were well constructed using best practices, and the industry standards of EIA-222 and R56 were generally followed. All sites had backup power present in the event of a loss of utility power.

The following are specific comments for each of the non-DTRS sites visited:

- Green Mountain, Lakewood - This site is collocated with a broadcast company and sits atop a high ridgeline. We identified no significant site issues.

- Denver Fire Stations #2 and #26, Denver - These sites are equipped with Harris EDACS analog, equipment. We identified no significant site issues.

- Arvada City, Arvada – This site is a well-constructed concrete block that appears to have undergone numerous recent improvements.

3.9.3 Summary of Maintenance Status and Need

Table 14 briefly describes the status and needs of the system maintenance:

Table 14 – System Attribute: Maintenance

System Attribute: Maintenance	
Current Status	*Need*
DTRS is generally well maintained and users, dispatchers, and management expressed general satisfaction on the topic. However, these same individuals reported uncertainty on the schedule and process for requesting and receiving maintenance on both infrastructure and subscriber equipment. In addition, ***FE*** found the representative sites surveyed to be well maintained.	Existing standards for infrastructure and subscriber maintenance need periodic review to ensure that they completely and accurately describe the requirements for the type and frequency of maintenance performed for the various components. Where no standards exist, new maintenance standards are essential. Radio sites require continuing maintenance and funding for the replacement of towers as requested by OIT.

3.10 DTRS Training and Exercises

3.10.1 System Training Capabilities and Requirements

As part of this report, ***FE*** provides the following analysis of field users, dispatchers, technical support survey results on DTRS training and exercises. This section addresses training while the subsequent section covers the topic of exercises.

In 2010, the Consolidated Communications Network of Colorado developed a training program covering the technical background and operational use of DTRS. This program focused on improving user understanding of the basic operations of DTRS as well as the methods of interoperability provided by the system. The training material was available to all users of the system and currently resides on the state of Colorado's Learning Management System website (www.co.train.org). The material is essentially unchanged since its launch in 2011.

Local Agencies have offered and continue to offer additional training of users.

Figure 50 illustrates the percentage of field users, dispatchers, and technical staff who feel their training on DTRS and its equipment is adequate.

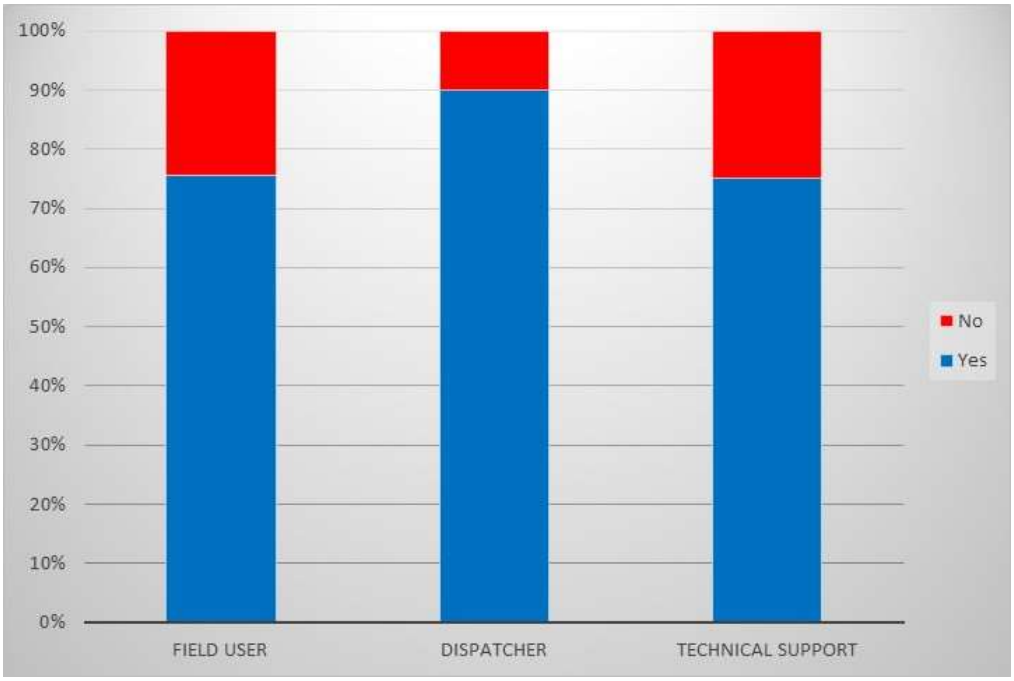


Figure 50 – Ratings on DTRS and equipment training

Survey results show that at least 75% of survey participants in a field user, dispatcher, or technical support role feel their training on DTRS and its related equipment[12] is adequate. Appendix K lists specific areas of system and/or radio operation training that field users described as necessary. Dispatchers' specific areas of system and/or console operation training include a comprehensive overview of the DTRS, backroom electronics, modules available, and interoperability between systems (for example, Denver and FRCC) and the impact on operational decisions.

[12] This figure may seem to conflict with the statement regarding features that "only about half of field users and 70% of dispatchers feel that they know how to operate all of the system features available." ***FE*** has, however, encountered similar survey results which have been further explored and found to mean that users feel well trained in the features that are critical to their daily operations but feel they do not know the full capabilities (beyond those required for completion of daily tasks) of their subscriber radio equipment or the system.

Those in a technical support role provided the following remarks on specific areas of system operations or maintenance where they feel they need training:

- “I just would like a better understanding of Motorola’s software.”
- “New simulcast equipment that will be part of our project but not for several months.”
- “Interzone troubleshooting.”
- “Factory Training on Microwave, fiber, all current radios and test equipment. We are hired with what training we have and don't get more, other than being self-taught.”
- “Better-qualified technicians and/or better training provided by State for maintenance personnel. Working relationship between state of Colorado and private maintenance companies.”

Figure 51 highlights the preferred method to receive training, as reported by field users, dispatchers, and technical support.

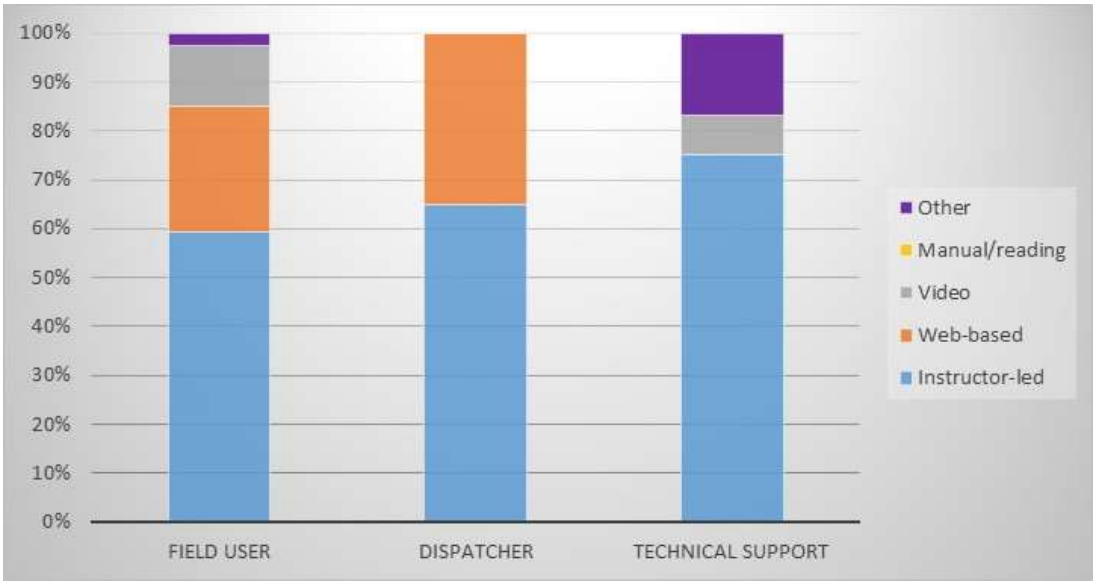


Figure 51 – Preferred method to receive training

At least 60% of field users, dispatchers, and technical support prefer instructor-led training. Because of different learning styles, some survey participants showed preference to web-based or video training.

3.10.2 System Exercise Capabilities and Requirements

The survey asked field users if they feel there are sufficient exercises that incorporate radio communications. Survey results show an even split among field users (50/50) on whether there are sufficient exercises that incorporate radio communications, as shown in Figure 52.

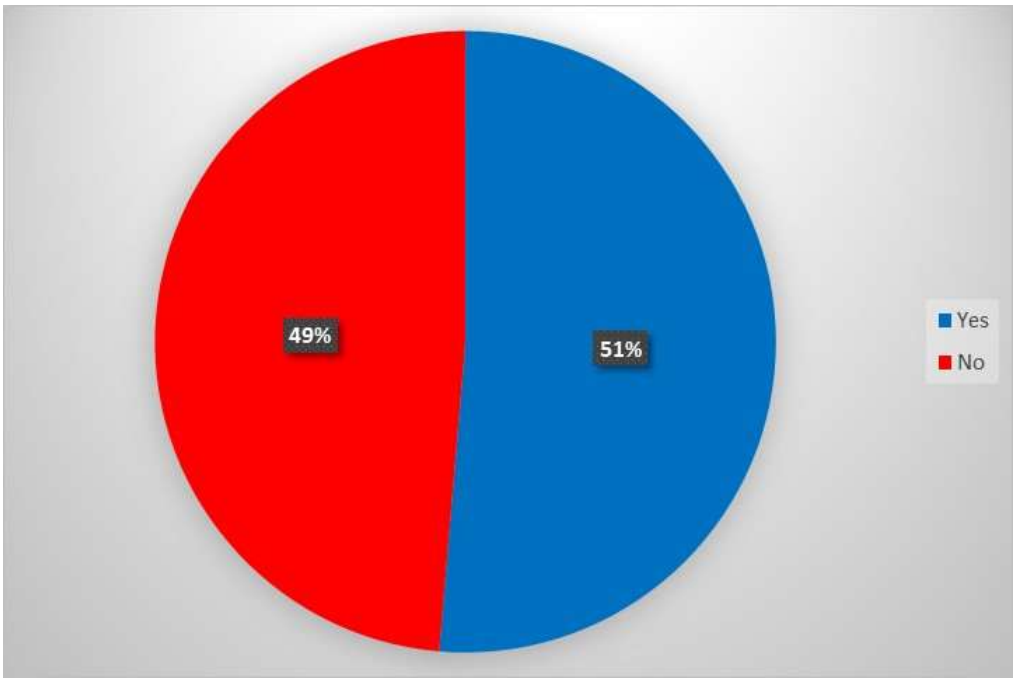


Figure 52 – Field user response on radio communications exercises

The majority of field users believe that other exercises should include radio communications. Appendix K provides field users' comments on how to improve exercises to enhance their ability to use the radio system and/or radios and to enhance their ability to communicate with others outside of their normal work group.

The survey asked dispatchers and technical support if they currently participate in exercises that include radio communications. Figure 53 illustrates the dispatcher and technical support participation in radio communications exercises.

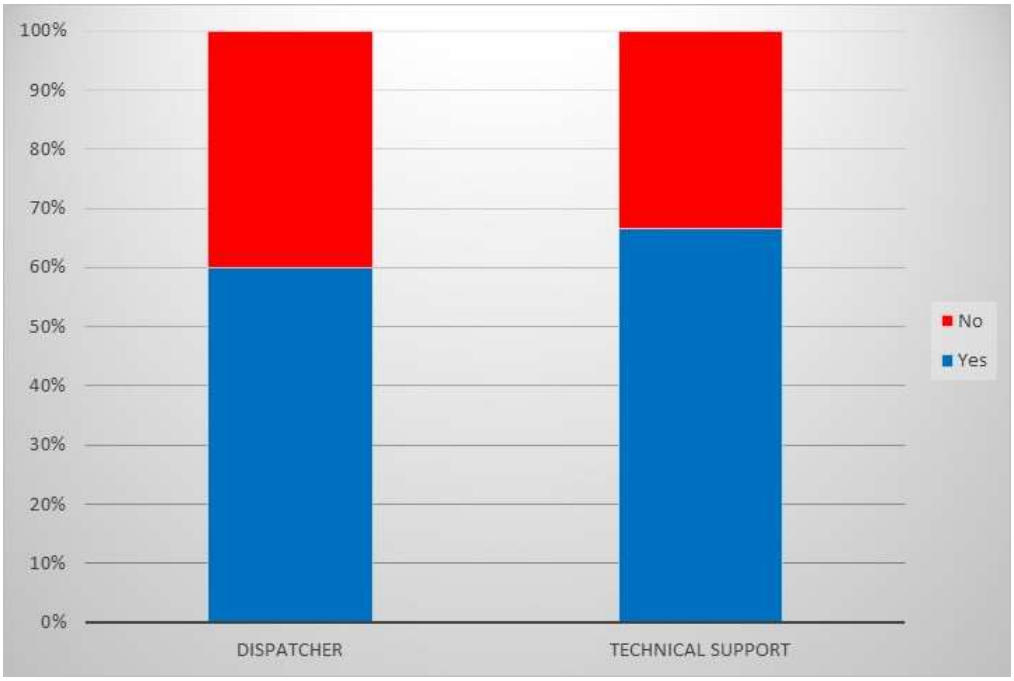


Figure 53 – Dispatcher and technical support participation in radio communications exercises

Survey results show that 60% of dispatchers and 67% of technical support staff participate in radio communications exercises.

Dispatchers expressed the need for “real world” exercises more often. They stated that not releasing exercise information to the participants before the exercise would force them to think about solutions and what they would really do and not what their operational leads and managers tell them would work in a perfect world.

Dispatchers also expressed the need for large-scale exercises such as HAZMAT, which usually have compressed timelines to facilitate getting the exercise done in a few hours. According to survey participants, proper communications by participating agencies are usually pushed aside to save time. They feel that, for the most part, communications are viewed as the least important part of exercises or are ignored due to agencies’ difficulty using DTRS in an interoperable situation. Dispatchers noted that this results in simply talking to each other face-to-face because it is easier. During incidents this results in disorganized communications because the agencies cannot or will not properly use the radios. They continued that training must stress proper communications as being as important as any other task during an exercise.

Those in a technical support capacity indicated that having more live training exercises, more often, would help to improve the ability to use the system and radios. Technical support staff also provided the following comments on ways to improve exercises, thereby improving the ability to use the system and radios:

- "Force people to actually use all of the resources at their disposal and not just say what they might do. Make each person do a radio check on the proper resource. Make each person properly demonstrate following proper procedures for emergency communications. Introduce system failures so they have to use their backup communications."

- "There needs to be more user instructions on radio usage, but you need to find the users that care."

- "More physical exercises using actual system assets. Too many assumptions are made on tabletops to be effective; most I have seen will fail in real life situations. I personally get more out of live training, I always learn something new about an incident and its true needs this way."

- "All state specialists should have IC-100 to IC-400 and CUL training and participate in local and statewide drills and support any Incident Command teams (other than local) where radios are used across complex interfaces. Training should be cross-organizational and the use of 'experts' outside of the 'team' should be sought out and deployed."

- "Currently we [Longmont Department of Public Safety] train regularly with our local hospital and school district. It would be nice to increase the number of agencies attending these trainings even if it was restricted to tabletop only."

The dispatchers and technical support staff that do not currently participate in the exercises expressed that it would be valuable to participate in exercises that include radio communications.

3.10.3 Summary of Training and Exercise Status and Need

Table 15 briefly describes the status and needs regarding Training and Exercises:

Table 15 – System Attribute: Training and Exercises

System Attribute: Training and Exercises	
Current Status	*Need*
A majority of users reported satisfaction regarding the level of training received through statewide and local programs. Most users, dispatchers, and technical support personnel reported that they desire more regularly scheduled exercises. They also requested that exercises include a focus on communications.	DTRS training should continue at its current levels and a statewide governance organization (such as PSCS or CCNC) should consider revising the online training material to reflect recent system developments. Exercises require expansion to include communications (for both field users and dispatchers) and at shorter intervals.

4. Existing Other Systems Assessment

This section provides a summary assessment of public safety radio systems other than DTRS that exist in Colorado. The systems described in this section include:

- Amateur Radio Emergency Services (ARES)
- Boulder County
- Chaffee County
- Cherry Creek Schools
- City of Arvada
- City of Aurora
- City of Boulder
- City of Cortez
- City and County of Denver
- City of Lakewood
- City of Westminster
- Clear Creek, Evergreen Fire, and Gilpin County
- Elk Creek Fire Protection District
- Front Range Communications Consortium (FRCC)
- Gunnison/Hinsdale
- Park County
- Pikes Peak Regional Communication Network (PPRCN)
- State of Colorado Fire
- Teller County
- Ute Pass Regional Emergency Medical Services

These are systems deployed at the municipal, countywide, or multi-countywide levels for the purposes of providing local communications operability. Many of these have also developed methods of interoperability with each other and with DTRS.

FE obtained the information in this section by requests made directly to representatives of these systems as well as from publically available sources such as FCC databases. When available, we also included in our descriptions of these systems, information gathered from the on-line survey as provided by users, dispatchers, technical support, and managers. In addition to the following overviews of the individual systems, Appendix L contains a matrix of the current interoperability capabilities and requirements of field users and dispatchers that primarily use systems other than DTRS.

FE provides this information to report on these non-DTRS systems as they are and with the changes as reported by the representatives. We included no summaries of requirements for future expansions of these systems.

4.1 Amateur Radio Emergency Services (ARES)

ARES is a VHF amateur radio system divided into 9 regions and 29 districts across the state of Colorado that supports volunteer groups that assist in emergency preparedness and communications. Based on survey information collected by ***FE***, the overall coverage and capacity of the system is adequate but the system needs infrastructure updates.

4.2 Boulder County

Boulder County implemented a VHF conventional and 700/800 MHz Motorola (version 7.14) trunked, 20-site radio system to provide critical communications to public safety agencies within the County. The Boulder Sheriff's Office, City of Boulder, City of Longmont and University of Colorado (CU) dispatch centers currently use a 10-channel 700/800 MHz system and 25 VHF frequencies to provide critical communications to the following agencies:

- Lafayette
- Louisville
- Erie
- Nederland
- Ward Marshalls
- All County Fire with the exception of Boulder and Longmont

The 20-site radio system uses a mix of leased phone lines and a microwave backhaul network for connectivity between the communication sites. The system supports approximately 2,500 radio units.

Boulder County currently connects to the DTRS for interoperability. The County is planning enhancements to the current infrastructure to expand the number of agencies served by the system, improve system features and reliability, and increase system capacity and coverage. Boulder County has plans to enhance current system coverage by adding two or more communication sites.

Based on survey information collected by ***FE***, mobile coverage is very good and portable outdoor coverage is adequate and meets most of their operational needs. In-building coverage is marginal and does not meet operational needs. The Boulder system has sufficient 700/800 MHz channel capacity and the City is seeking more VHF frequencies to increase capacity.

The reliability of the system infrastructure is very good. The backhaul reliability is adequate. The ability for the City's personnel to monitor the performance of the system is poor which decreases the overall reliability of the system.

To achieve interoperability, the City of Boulder uses a variety of radio modes, cached radios, interoperability gateways, and console patches. Console patches are the preferred method of interoperability based on information collected from the survey. Implementing an ISSI Gateway would improve interoperability between the DTRS and other local systems.

4.3 Chaffee County

Chaffee County implemented a three-site, five-channel Motorola VHF analog radio system in 1995. Three dispatch consoles are a part of the system. The system provides critical communication capabilities to the Chaffee County Sheriff's office and the Chaffee County Road and Bridge agency. A microwave backhaul network provides connectivity between the three sites. The system supports approximately 50+ subscribers units.

Chaffee County uses console patches for interoperability purposes. At present, Chaffee County has no plans to enhance the infrastructure, coverage, or interoperability of the existing system.

Based on survey information collected by ***FE***, mobile and portable radio users experience adequate coverage throughout the coverage area. Portable radio users cannot communicate with the dispatch center using the VHF system or DTRS in certain areas of the county. In these areas, a command system is set up to allow dispatch to communicate with field users. VHF base stations provide very good in-building coverage in specific buildings in Chaffee County. The system has sufficient capacity.

The reliability of the overall system infrastructure is excellent. To achieve interoperability, agencies in Chaffee County use shared channels on the current system. A Chaffee County DTRS travel channel is also available to provide talkback capabilities to the dispatch center when roaming outside the service area but the County rarely uses this channel.

4.4 Cherry Creek Schools

Cherry Creek County Schools currently use a UHF MOTOTRBO™ with a connection to DTRS to provide additional coverage to the North Central Region and to buses traveling in the Denver Metropolitan area. Based on information collected from research, the Cherry Creek School District is equipped with approximately 15 repeated stations to provide mobile coverage to 2,000 licensed devices.

Based on survey information collected by ***FE***, mobile coverage is very good throughout the school district. In-building coverage is very good with the exception of some basement locations. BDA systems are under consideration as a method to assist in improving in-building coverage. System capacity is adequate with occasional busies during severe weather conditions.

The reliability of the overall system infrastructure is very good. The backhaul reliability is very good but to mitigate concern regarding the loss of backhaul, the survey responder mentioned the need for redundant network paths.

To achieve interoperability, the Cherry Creek School District uses a variety of radio mode selections, a gateway, and console patches. Their most useful method of interoperability is a bridge for the MOTOTRBO™ channel to contact the MAC channel. An interoperability concern is gateway bridging adding communication delays.

4.5 City of Arvada

The City of Arvada implemented a single site, eight-channel 800 MHz Harris P25 Phase 2 (version SR10A) trunked radio system in 2013. Two dispatch centers located at the Arvada Police Department and Arvada Fire Protection District are part of the system. This system provides critical communication capabilities to approximately 550 subscribers from the following agencies:

- Arvada Police
- Arvada Public Works
- Arvada Fire Protection District

The City of Arvada shares the SR10A core equipment with the City of Lakewood and the City and County of Denver. An ISSI gateway provides connectivity between the City and the DTRS providing interoperability between the systems. The control points for the SR10A core are locations at 950 Josephine, Denver, and West Metro Fire in Lakewood.

The City of Arvada will consider the possibility of upgrading their current system to enhance features, improve coverage, and enhance current system reliability. The City also has plans to participate in the future Jefferson County Regional Dispatch Center.

Based on survey information collected by ***FE***, mobile and portable outdoor coverage is very good and meets the majority of the City's operational needs. In-building coverage is adequate and meets most of their operational needs. The City is planning to add a second site in the next 2 years to increase the overall system coverage. The City of Arvada has no capacity issues on the current system and rates capacity as excellent.

The reliability of the system's site power sources is excellent and the radio equipment and backhaul is very good according to the survey response. The ability to monitor the performance of the system, including backhaul and other equipment is adequate.

To achieve interoperability, the City uses a variety of radio mode selections, ISSI interconnections, interoperability gateways, and console patches. The NetworkFirst® platform is a method of interoperability that is working very well for the City. The City reported a need to adjust to a smoother process for sharing P25 programming and site access between DTRS users and private systems as a method of improving interoperability. As agencies continue to own different vendor user equipment, interoperability with all platforms and current systems becomes even more critical.

4.6 City of Aurora

The City of Aurora is in the process of implementing a new radio system to serve its fire, EMS, law enforcement, public works, and other local-government agencies. The new system will be a 20-channel, Project 25 800 MHz trunked radio system provided by Motorola. Because of this new system implementation, we did not assess user satisfaction with the current system.

4.7 City of Boulder

The City of Boulder utilizes a multiple site, VHF conventional analog voting system to provide critical communications for police, fire, and EMS personnel. Based on survey information collected by ***FE***, mobile coverage is excellent and portable outdoor and in-building coverage is very good. Since narrowbanding the system, there has been a coverage reduction. The City is in the process of moving repeater equipment to different locations in an attempt to regain the lost coverage. Channel capacity of the existing system is very good and users rarely experience any busies. The City is currently upgrading equipment that will result in a digital-ready infrastructure for future systems.

To achieve interoperability with local agencies; the City of Boulder uses shared VHF channels with the Boulder County Sheriff's Office, the University of Colorado Public Safety Department, and the public safety agencies in Louisville, Lafayette, and Erie on a daily basis. The City plans to implement permanent patches between the City's VHF channels and selected DTRS, allowing interoperability with neighboring DTRS users.

4.8 City of Cortez

The City of Cortez is equipped with a dual band communication system that provides critical communications to law enforcement, fire, and EMS agencies located in the City. Law enforcement agencies use the 800 MHz DTRS. The City's fire and EMS agencies utilize a five-repeater VHF system.

Mobile and portable outdoor coverage is marginal and does not meet all operational needs. The area between mile marker 14.5 and 45 on Highway 145 has little to no coverage on either communications system. An area east of Highway 160 on County Road G also has no coverage for approximately 15 miles. In-door coverage is marginal with stores such as Walmart, City Market, and the hospital being the buildings of primary concern. Channel capacity is adequate with the system having occasional busies.

Specific channel capacity problems occur when the pivot-point RF site experiences performance issues.

Reliability of the system is marginal and often has issues. Users experience trouble with the Ute Mountain site going down, causing major issues with coverage.

City agencies currently achieve interoperability via repeating transmissions verbally/manually. A concern about the current interoperability method is convincing agencies to leave their own channel and communicate with agencies directly on other channels.

4.9 City and County of Denver

The City and County of Denver implemented an 800 MHz Harris EDACS® (version SR10) 20-channel trunked, seven-site simulcast radio system in 2008. The Denver County facility, the Denver 911 Communications Center, and the Recovery Operations Center (ROC) are the three dispatch centers that provide critical communication capabilities to the City and County of Denver along with numerous other agencies. Controlling the 800 MHz Harris EDACS® system are high-availability, geographically redundant control points located at the Denver 911 facility and in the City of Lakewood, Colorado. The system consists of Harris MASTR® III stations at each of the seven sites and a microwave backhaul network used for connectivity between the simulcast sites. The system supports approximately 3,500 radio units.

The City and County of Denver share the SR10A core equipment with the City of Arvada, and the City of Lakewood providing interoperability between the cities. In addition, an ISSI gateway provides connectivity between the SR10A core and the DTRS, providing interoperability among the systems.

The City and County of Denver are planning a move to a new Public Safety Answering Point (PSAP) in mid to late 2016 and upgrading the existing system to a Project 25 system in 2018. They are considering implementing P25 Phase 2 for additional system capacity. With the planned upgrade in 2018, the City and County will evaluate changes in coverage and consider additional sites to their seven-site infrastructure to improve system coverage.

Based on survey information collected by ***FE***, mobile and portable outdoor coverage is satisfactory. New building developments around the Denver area may affect the existing overall coverage experienced by the system users. In-building coverage is adequate and

meets most of the operational needs. The survey did note that current building code requires the use of Distributed Antenna Systems (DAS) for new and remodeled buildings above a specific size to ensure RF coverage within the building. The City and County of Denver have no issues with channel capacity on the current system.

The reliability of the system infrastructure is very good according to the survey response but some issues are beginning to develop due to the age of the existing equipment. The City and County of Denver are evaluating the system to determine methods to correct reliability issues related to aging equipment. The survey responder also has concerns about the system's reliability due to the access issues related to remote locations for maintenance and leased site maintenance versus City/County owned site maintenance.

To achieve interoperability, the City and County use a variety of radio modes, cached radios, ISSI Interconnections, interoperability gateways, and console patches. Console patches and the interoperability gateways are the preferred method of interoperability based on information collected from the survey while the overall ISSI design and implementation is an area of concern.

4.10 City of Lakewood

The City of Lakewood implemented a two-site, 21-channel 800 MHz Harris P25 (version SR10) radio system in 2011. Three dispatch centers are part of the system. The system provides critical communication capabilities to the following agencies:

- City of Lakewood
- West Metro Fire
- Wheat Ridge
- National Renewable Energy Labs
- Federal Protective Service (FPS)
- Red Rocks Community College
- Wheat Ridge Fire
- Rural Metro Ambulance
- Several Police Department task forces

The system consists of Harris MASTR® V stations at both sites and a microwave backhaul network for connectivity between the sites.

The City of Lakewood shares the SR10A core equipment with the City of Arvada and the City and County of Denver providing interoperability between the cities. An ISSI gateway provides connectivity between the SR10A core and the DTRS, providing interoperability between the systems.

The City of Lakewood has plans to upgrade the existing infrastructure to P25 Phase 2 to expand capacity and to upgrade to Next Generation dispatch consoles to enhance the current system infrastructure. Along with these upgrades, the City has plans to add one additional multicast site to the existing two-site system to enhance coverage. Discussions are also underway for the City's police and fire departments to join the future Jefferson County Regional Dispatch Center.

Based on survey information collected by ***FE***, mobile and portable outdoor coverage is very good. Jefferson County Jail and Rooney Road are areas where mobile coverage is inadequate. In-building coverage is very good with the exception of large commercial buildings and some schools. Bi-Directional Amplifiers (BDA) are planned to improve in-building coverage. The current system capacity is very good and users rarely experience system busies. Occasional interference causes the reduction of channel availability. Adding a new site at North Table Mountain will increase channel capacity for users in that area.

The reliability of the overall system infrastructure is very good. Wild fires in the area and long-term sustainability of the system are areas of concern.

To achieve interoperability, Lakewood uses a variety of radio modes, interoperability gateways, and console patches. NetworkFirst® interconnection and cross-programmed radios are the preferred methods of interoperability. ISSI interconnection testing between Lakewood and other communication systems will enhance current interoperability when completed.

4.11 City of Westminster

The City of Westminster recently implemented an 800 MHz P25 Phase 2 Airbus DS Communications, 10-channel, three-site simulcast communication system with Avtech dispatch consoles to provide critical communications to approximately 800 mobile and portable users. Coverage is adequate and meets most of the operational needs.

Coverage during the transport of prisoners to Adams County jail in Brighton is a concern. An ISSI connection to the Front Range Communication Consortium (FRCC) system partially resolved this coverage issue by interconnecting the two systems in such a way that they act as coverage extensions of each other. In-building coverage is adequate but hospitals and larger facilities have poor in-building coverage.

To achieve interoperability with other entities, Westminster uses a gateway interconnection and verbally/manual repeats transmissions. NetworkFirst® channels are available for interoperability purposes but dispatchers and users have issues with volume control.

4.12 Clear Creek County, Gilpin County, and Evergreen Fire

Clear Creek County, Gilpin County, and Evergreen Fire share a VHF multi-site voting communications system to provide critical communications to multiple county and city agencies. Mobile and portable coverage is adequate and meets most of the operational needs. Users in areas of mountainous terrain and within canyons experience poor coverage. The following list identifies areas of poor coverage based on survey information:

- Pinecliffe Area
- Areas west of Rollinsville to the East Portal
- Lower areas of Boulder County Road 68, near Gross Reservoir
- Siton Road
- Witter Gulch
- Interstate 70 in Floyd Hill
- Highway 74 in Kittredge

In-building coverage is adequate with the exception of large commercial facilities and schools. Channel capacity is adequate and users only experience occasional busies during normal operation. However, when there is a major emergency, users may experience a number of busies on the system.

The reliability of the system infrastructure is very good and there are rarely issues. Occasional power outages and lightning strikes cause temporary outages but there is a maintenance contract with a radio repair shop that includes 24/7 emergency response.

To achieve interoperability, the three entities use console patches and shared system channels. Agencies in nearby Jefferson County utilize DTRS user radios. Command staff carries multiband radios to assist when responding to mutual aid incidents. Currently Gilpin and Boulder County dispatch centers bridge VHF channels and selected DTRS talkgroups for enhanced interoperability.

4.13 Elk Creek Fire Protection District

The Elk Creek Fire Protection District operates a four-site VHF system with approximately 100 mobile and portable users. According to survey information collected by ***FE***, mobile and outdoor coverage is excellent. Indoor coverage is excellent and users have coverage inside all buildings within the district. Channel capacity is excellent and the current system is never busy. Elk Creek FPD is exploring an expansion with agencies in western Jefferson County to create a single VHF dispatch channel to provide enhanced coverage north of I-70 into Douglas County.

4.14 Front Range Communications Consortium (FRCC)

FRCC is a 700/800 MHz, Project 25 joint communications radio system developed to support user agencies in Adams, Weld, and Broomfield counties. The system configuration comprises these 10 subsystems:

- Adams County Simulcast – 4-sites, 12-channels, 700 MHz
- Weld County Simulcast – 3-sites, 12-channels, 800 MHz
- Raymer – 1-site, 3-channels, 800 MHz
- Grover – 1-site, 4-channels, 800 MHz
- Nunn – 1-site, 5-channels, 800 MHz
- Broomfield – 1-site, 5-channels, 700 MHz
- Bennett – 1-site, 5-channels, 700 MHz
- Hoyt – 5-sites, 5-channels, 700 MHz
- Fort Lupton – 1-site, 9-channels, 700 MHz
- Keensburg – 1-site, 6-channels, 700 MHz

Based on survey information collected by ***FE***, mobile and portable outdoor coverage is adequate and meets most of the operational needs. In-building coverage is adequate and there are plans to convert additional eastern sites to simulcast to improve the overall coverage of the system. Channel capacity is very good and users of the FRCC network rarely experience system busies.

The reliability of the system infrastructure, power, and backhaul network is very good according to the survey response.

To achieve interoperability, the FRCC system uses a variety of radio modes, ISSI interconnections, interoperability gateways, and console patches. The ISSI connection between FRCC and the City works well. Future ISSI interconnections between the FRCC and DTRS, as well as between the FRCC and Denver Metro Harris Systems, are under consideration. These would allow for interoperability capabilities between the systems.

4.15 Gunnison/Hinsdale

Hinsdale County currently uses a three-site VHF communications system to provide RF coverage to approximately 125 mobile and portable users throughout the County. Based on survey information collected by ***FE***, mobile coverage is adequate with Taylor Park and Monarch Pass as areas known to have coverage problems. Outdoor portable coverage is marginal. Users experience inadequate portable outdoor coverage when traveling more than two miles outside of the City of Gunnison. In-building coverage is poor and does not meet the operational needs of public safety users. Capacity of the system is adequate and users experience occasional busies on the system.

Overall reliability of the system is very good. Dispatch console patches and shared channels are current methods of interoperability. Shared channels provide an adequate method of interoperability and are the preferred method of interoperability. Console patches are the less preferred method.

4.16 Park County

Park County operates a four-site VHF communication system to provide critical communications to its public safety agencies. Based on survey information collected by ***FE***, mobile coverage and outdoor portable coverage is adequate. In-building coverage is adequate and meets most of their operational needs. Channel capacity is adequate on

the current system. Dispatcher skill sets vary and can cause delays, user confusion, and occasional busy channels on the system.

System reliability is adequate with occasional outages. The County achieves interoperability by using shared channels and radio swaps. Shared channels are the preferred method of interoperability in Park County.

4.17 Pikes Peak Regional Communication Network (PPRCN)

FE bases the information for this section on the *2013 Functional and Lifecycle Audit Report* provided by the PPRCN.

The PPRCN operates a Project 25 800 MHz Motorola ASTRO25® system that supports 5,500 users across 70+ agencies throughout the El Paso County region. The 13-site system covers the 2,100 square mile region. The system comprises equipment with varying lifespans and delivers the capacity required for a public safety grade of service. The number of channels at each site range from 6 to 13 channels. Redundancy is a part of the fault tolerant design to ensure high reliability.

A direct connection between the PPRCN master site controller (known on DTRS as "Zone 4") and the other master site controllers in DTRS integrates the PPRCN into the larger DTRS network. An agreement between PPRCN and CCNC made this connection possible. Under the agreement, PPRCN has the ability to break the connection at its discretion and users that are not native to PPRCN (i.e., those DTRS users that travel into El Paso County) are limited to using only selected mutual-aid talkgroups.

The strategic direction recommended in the *2013 Functional and Lifecycle Audit Report* involves the implementation of additional base station sites, repeaters, and simulcast technology. Simulcast technology is very effective for improving radio system coverage within the PPRCN coverage area. The channel efficiency provided with a simulcast architecture would free up radio channels for use at the new sites required to improve the service in various parts of El Paso County. A phased system implementation would allow distribution of capital investments over a period of 3 to 5 years. ***FE*** understands that PPRCN is still investigating the feasibility of implementing these recommendations.

PPRNC recently participated in the upgrade of DTRS to Motorola's platform release 7.14 (completed early in 2015), however, PPRCN paid for its portion of the upgrade without financial assistance from the state of Colorado.

Mobile and portable outdoor coverage is very good and meets the majority of the daily operational needs. In-door coverage is adequate and meets most of the daily operational requirements. Channel capacity is very good and users rarely experience busies.

Reliability of the system is adequate and there are only occasional interruptions of service. Dispatch console patches are the method used to achieve interoperability with Northeast Teller County Fire and Ute Pass Ambulance service.

4.18 State of Colorado VHF Fire and Mutual Aid

The state of Colorado Fire and Mutual Aid system is a 218-site, VHF communication system that provides critical communication to public safety agencies across the state of Colorado. The VHF frequencies used in this system are a mix of repeaters, fixed bases, and mobile-to-mobile channels deployed and licensed to support regional fire efforts as well as selected national, non-federal mutual aide channels such as VFIRE21, VMED28, and VLAW31. Appendix M provides an illustration of the locations of the repeaters and bases in the system, along with their corresponding frequencies.

According to user survey data, mobile and portable coverage is marginal and does not meet many of the operational needs. The majority of the operational area consists of rural and wilderness environments that may require vehicular repeaters to provide additional coverage. In-building coverage is marginal and many metal buildings and basements prevent users from communicating with their portable radios. Channel capacity is adequate and system users experience only occasional busies on the system.

Reliability and interoperability of the overall system are adequate and meet most of the operational needs of users of these channels. Users of this system achieve interoperability through shared radios, shared channels, and dispatch console patching.

4.19 Teller County

In 2006, Teller County implemented a VHF/UHF communications system with four primary sites and two backup sites. The system uses a mixture of Daniels, Kenwood, and Motorola base stations. The Teller County Sheriff Office (TSCO) dispatch center is part of the system. The system provides critical communication capabilities to approximately 50 TCSO users and 50 Teller County Public Works (TCPW) users. Teller County currently utilizes a conventional analog simulcast system to support TSCO users and a

conventional analog system to support TCPW users. A microwave network interconnects these sites.

Teller County has system interconnections with all fire, EMS, and law enforcement agencies within Teller County. The County also has a system interconnection with the DTRS allowing for interoperability between the two systems.

Teller County has no plans to upgrade their current infrastructure.

Based on survey information collected by ***FE***, mobile coverage is adequate and outdoor portable coverage is marginal. Survey responses identified the following locations as having marginal coverage:

- North Western portion of Florissant Fire District
- Pike National Forest
- Longwater and Metberry Gulch
- Colorado Mountain Estates
- Western area of Mueller State Park
- Dome Rock State Wildlife Area
- State Highway 67 between Divide and Cripple Creek

In-building coverage is marginal and does not meet operational needs. Survey responses specifically mentioned multiple structures along Highway 24 corridor and casinos in Cripple Creek where in-building coverage is poor. One survey participant reported that radio frequency interference is elevated in the casinos due to the emissions of the gaming machines and this causes in-building communication issues. Channel capacity is adequate but the system does occasionally have congestion issues during larger incidents or multiple concurrent incidents in Teller County.

The overall reliability of the system infrastructure is adequate. Based on survey information, high winds and lightning strikes are the main issues that affect system reliability. Difficulty accessing sites powered only by solar chargers is also an issue.

To achieve interoperability, Teller County uses a variety of radio modes, cache radios, interoperability gateways, and console patches. Interoperability with Woodland Park Police Department is an issue because Woodland Park PD uses DTRS and the rest of the County uses the VHF system.

4.20 Ute Pass Regional Emergency Medical Services

The Ute Pass Regional EMS system is a five-site, VHF MOTOTRBO™ communication system that provides critical communications to approximately 250 EMS users. Based on survey information collected by ***FE***, mobile coverage is very good and meets the majority of user needs. Outdoor and in-building portable coverage is adequate and meets most of their operational needs.

The Ute Pass EMS system uses shared channels for interoperability with multiple local agencies.

4.21 Walsh Ambulance Service

Walsh Ambulance Service uses an 800 MHz conventional and UHF Digital Mobile Radio (DMR) communications system that provides critical communications to approximately 91 users. Mobile radio coverage is adequate and meets most of their operational needs. Portable radio coverage is marginal and does not meet their operational needs. Portable radios that receive pages and calls have inadequate coverage in vehicles and on the street. The area of Eastern Baca County has poor mobile and portable radio coverage. System capacity is adequate and the users experience only occasional busies on the system with the exception being large events.

The County of Baca owns the system, which Walsh Fire and EMS also share. System reliability is poor and the system frequently has issues. This system has no backup power system, which results in a system outage when the site experiences commercial power disruptions.

Shared channels provide interoperability between Walsh Ambulance Service and multiple agencies in and around the local area. Currently there is a need to interoperate with Stanton County and Morton County hospitals and EMS.

4.22 Other Systems with No Information Provided

FE received no survey participation or responses to Requests for Information (RFI) for the systems listed below:

- Elbert County Detention Center
- Evraz Pueblo Plant

- San Miguel County
- State of Colorado Eleven Mile State Park
- Upper Pine River Fire Prevention Department

4.23 Interoperability in Other Systems

As noted above, Appendix L contains a matrix of the interoperability capabilities and requirements of field users and dispatchers who primarily use systems other than DTRS.

5. Existing Interoperability Initiatives

This section describes the three main interoperability initiatives in use in the state of Colorado. They are:

- DTRS “MAC Channels”
- NetworkFirst®
- Inter-RF-SubSystem Interface (ISSI)

While the DTRS MAC Channels are limited to being a method of interoperability only within DTRS, there are discussions about expanding their implementation (through various technological means) beyond DTRS. NetworkFirst® and ISSI inherently extend interoperability between DTRS and other systems.

It is important to note, that other local or regional interoperability initiatives facilitate interoperability between shared systems. These initiatives involve console patches, gateways, swapped radios, and even manual dispatcher repeat of conversations between systems. Section 3.4.1 describes these methods and Appendices F and L provide matrix formats of these methods with details of their implementation.

5.1 Mutual Aid Channel (MAC) Talkgroups

Mutual Aid Channel (MAC) talkgroups are DTRS talkgroups that are regionally available for use to agencies operating in designated geographic areas. These talkgroups enable interoperable communications between disparate users. Four mutual aid talkgroups assigned to each of CCNC’s five geographic areas throughout Colorado facilitate multi-agency coordination. Table 16 defines the regions, participating counties, talkgroups, and their operational use.

Table 16 – MAC talkgroups

Region	Participating Counties	Talkgroups	Operational Use
Metro	Adams Arapahoe Boulder Broomfield Clear Creek Denver Douglas Elbert Gilpin Jefferson	MAC 1 MET	For inter-regional mutual aid communications and designated contact channel for roaming user
		MAC 2 MET	Used by fire agencies for mutual aid coordination and communications
		MAC 3 MET	Used by law enforcement agencies for mutual aid coordination and communications
		MAC 4 MET	Used by EMS agencies for mutual aid coordination and communications
Northeast	Cheyenne Kit Carson Larimer Lincoln Logan Morgan Phillips Sedgwick Washington Weld Yuma	MAC 5 NE	For inter-regional mutual aid communications and designated contact channel for roaming user
		MAC 6 NE	Used by fire agencies for mutual aid coordination and communications
		MAC 7 NE	Used by law enforcement agencies for mutual aid coordination and communications
		MAC 8 NE	Used by EMS agencies for mutual aid coordination and communications
Southeast	Baca Bent Chaffee Crowley Custer El Paso Fremont Huerfano Kiowa Lake	MAC 9 SE	For inter-regional mutual aid communications and designated contact channel for roaming user
		MAC 10 SE	Used by fire agencies for mutual aid coordination and communications
		MAC 11 SE	Used by law enforcement agencies for mutual aid coordination and communications

Region	Participating Counties	Talkgroups	Operational Use
	Las Animas Otero Park Powers Pueblo Teller	MAC 12 SE	Used by EMS agencies for mutual aid coordination and communications
Southwest	Alamosa Archuleta Conejos Costilla Delores Delta Gunnison Hinsdale La Plata Mineral Montezuma Montrose Ouray Rio Grande Saguache San Juan San Miguel	MAC 13 SW	For inter-regional mutual aid communications and designated contact channel for roaming user
		MAC 14 SW	Used by fire agencies for mutual aid coordination and communications
		MAC 15 SW	Used by law enforcement agencies for mutual aid coordination and communications
		MAC 16 SW	Used by EMS agencies for mutual aid coordination and communications
Northwest	Eagle Garfield Grand Jackson Mesa Moffat Pitkin Rio Blanco Routt Summit	MAC 17 NW	For inter-regional mutual aid communications and designated contact channel for roaming user
		MAC 18 NW	Used by fire agencies for mutual aid coordination and communications
		MAC 19 NW	Used by law enforcement agencies for mutual aid coordination and communications
		MAC 20 NW	Used by EMS agencies for mutual aid coordination and communications

Region	Participating Counties	Talkgroups	Operational Use
Statewide	All counties	MAC 21	Used for intra-state mutual aid coordination and communications and available for use when no other Mutual Aid Talkgroups are available

There are also specific MAC talkgroups available on a regional basis for emergency medical and trauma purposes (the “EMS MACs”) as well as for county health department usage (the “CHD MACs”).

The CCNC’s Standard Operational Procedure contains general purposes and rules of use for all MAC talkgroups.

5.2 NetworkFirst®

NetworkFirst® is an interoperability initiative implemented by the North Central Region’s (NCR) All Hazards Committee’s Communications Subcommittee. The North Central Region’s participants and the users of the NetworkFirst® talkgroups include:

- Aurora/Glendale
- Adams County
- Arapahoe County
- Boulder County
- Broomfield County
- City and County of Denver
- Douglas County
- Elbert County
- Jefferson County
- And state agencies

NetworkFirst®, implemented in 2005, received funding from a combination of Federal Urban Area Security Initiative (UASI) and other grants. Funding from Federal Public Safety Interoperable Communications (PSIC) grants made an upgrade possible in 2008.

Harris Corporation manufactures the NetworkFirst® gateways that contain distributed Universal Audio Cards (UACs). The UACs collect audio from various radio systems and bring them into the gateways. The gateways bridge them together then route them back to the UACs for rebroadcast to the various radio systems.

The interconnected systems currently include those from the City and County of Denver, DTRS, Lakewood, Arvada, Aurora, Denver International Airport (DIA), Boulder County (VHF), and the Federal "IO" system (a collection of VHF channels). Discussions are in progress to expand NetworkFirst® and interconnect the system used by Clear Creek, Gilpin, and Evergreen Fire.

The interconnections bridge a number of discipline-specific talkgroups and, in the case of conventional systems, channels across four regions. The intersections of I-70 and I-25 define the four regions: Northwest (NW); Northeast (NE); Southwest (SW); and Southeast (SE). Table 17 lists the NetworkFirst® talkgroups.

Table 17 – NetworkFirst® talkgroups

Talkgroup Name and Number	NetworkFirst® Use
Gold (2 - spanning all regions)	Command/Control
Blue (4 - one for each region)	Police (NW, NE, SW, SE)
Red (4 - one for each region)	Fire (NW, NE, SW, SE)
Silver (1 - spanning all regions)	State-Local Interoperability (Aurora/Glendale/CSP)
Gray (1 - spanning all regions)	Federal-Local Interoperability (US Marshall/FBI)
Green (2 - spanning all regions)	EMS
MetroNet (1 – spanning all regions)	Dispatch Center to Dispatch Center

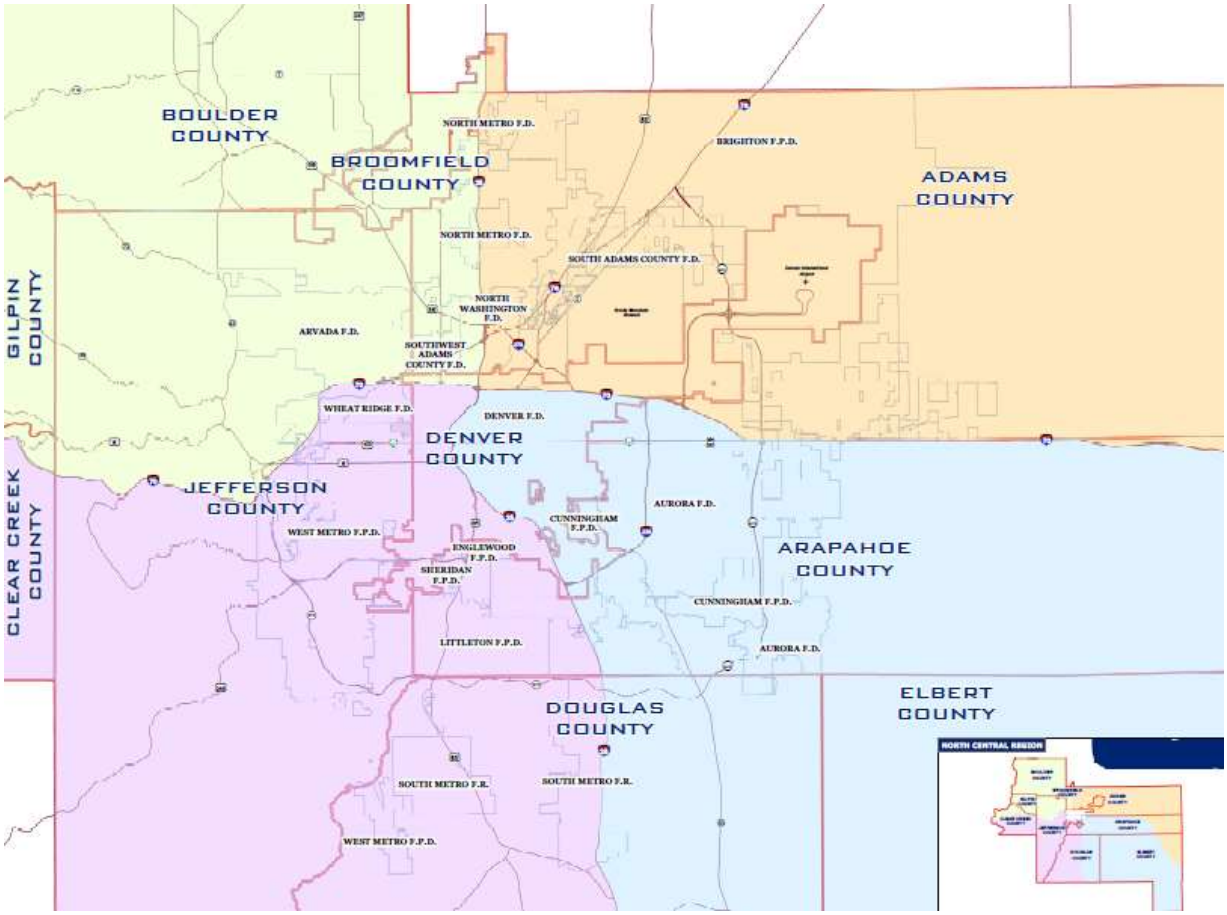
Because these talkgroup interconnections are "always on", there is no set-up or knockdown process. They are generally first-come-first-serve but they can be reserved for special, pre-planned incidents. Users can reserve the talkgroups by contacting the City and County of Denver and/or the State's OIT.

As an example, transmissions of a user on Blue NW talkgroup on the Denver system go out on the Blue NW talkgroups on the DTRS, Lakewood, Arvada, Aurora, DIA, trunked

systems as well as on dedicated VHF conventional channels on the Boulder County (VHF) and the Federal “IO” systems.

Other than the MetroNet talkgroup, dispatch centers do not routinely monitor the NetworkFirst® talkgroups and dispatch centers cannot patch these talkgroups to other talkgroups on their “home” system.

Figure 54 shows the NetworkFirst® interoperability paths.



Map Symbology

- NORTH CENTRAL REGION BOUNDARIES
- URBAN AREA SECURITY INITIATIVE BOUNDARIES
- UASI FIRE DISTRICTS
- BLUE NE, RED NE , METRO NET, GOLD1, GOLD 2, GRAY
- BLUE NW, RED NW, METRO NET, GOLD1, GOLD 2, GRAY
- BLUE SE, RED SE, METRO NET, GOLD1, GOLD 2, GRAY
- BLUE SW, RED SW, METRO NET, GOLD1, GOLD 2, GRAY

Figure 54 – NetworkFirst® interoperability paths

The migration from NetworkFirst® gateways to ISSI gateways has begun. An initial migration of four talkgroups (MetroNet, Gold 1, Gold 2, and Green 2) occurred in early 2015. The ISSI gateways used for this interconnection were an initiative of the North Central Region funded by Homeland Security and UASI grants.

A Harris StarGate™ bridge interconnects the systems of Denver, Lakewood, Arvada, Aurora, and DIA. The StarGate™ bridge also connects to a Harris ISSI gateway that connects to a Motorola ISSI gateway allowing access to DTRS. There are UACs that interconnect the StarGate™ bridge to the VHF conventional channels on the Boulder County (VHF), Clear Creek and Gilpin, and the Federal "IO" systems.

There have been discussions to add the DTRS Mutual Aid Channel (MAC) talkgroups to NetworkFirst®, either through the NetworkFirst® gateways or through ISSI. As described, the DTRS MAC talkgroups are special-purpose, Mutual Aid talkgroups used regionally on DTRS. They are primarily discipline specific and they are available for use by all DTRS users. To date, adding these talkgroups to NetworkFirst® has not been viewed as functionally viable because all Denver PD and many Denver FD radios are capable of operating directly on DTRS' MAC talkgroups and creating MAC talkgroups on the Denver, Lakewood, Arvada, Aurora, and DIA systems would require reprogramming of all of their radios

5.3 Inter-RF Subsystem Interface (ISSI)

5.3.1 ISSI Technical Background

An Inter-RF-Subsystem Interface (ISSI) gateway is a special type of gateway that can interconnect systems that support the APCO Project 25 standard. ISSI gateways can carry both audio and a limited set of signaling between the users of the shared talkgroups that it interconnects. ISSI can only interconnect Project-25-compliant systems.

Interconnecting two systems requires two ISSI gateways. The manufacturer of the radio system provides the ISSI gateway for that system. The signaling exchanged between the ISSI gateways that interconnect the systems is capable of supporting the following features:

- Caller ID
- Group calls (confirmed and unconfirmed)
- Encrypted calls
- Emergency call
- Roaming with automatic unit registration/deregistration
- Roaming with automatic group registration/deregistration

- Performance monitoring
- Real-time and historical call activity logs

Note that the signaling specification for ISSI allows the gateways of various manufacturers to support these features; however, manufacturers of radio systems may choose to implement some or all of the features from this previous list. ISSI gateways are "sized to provide interconnections to varying number of other systems. When two or more ISSI gateways are interconnected, each is assigned as a "home gateway" to some portion of the talkgroups and the user radio IDs that will be allowed to communicate between the two interconnected systems.

The implementation of home gateway assignment does not allow interconnection of more than two ISSI gateways in a "chain" or "ring" fashion. This creates two possible interconnection topologies for interconnections of three or more systems via ISSI gateways. The first is a "mesh" in which each ISSI gateway is connected to all of the other ISSI gateways for the interconnected system. The obvious disadvantage to interconnecting three or more systems in this way is the large number of interconnections required; however, the advantage is that each system retains control over the IDs and talkgroups that are home-assigned to it (i.e., retention of system administration autonomy).

The second alternative for interconnecting three or more systems via ISSI gateways is a hub-and-spoke method in which one (and only one) ISSI gateway holds full home-assignment authority for all IDs and talkgroups that will communicate between the various systems. The obvious advantage to interconnecting three or more systems in this way is the minimal number of interconnections required. However, the disadvantage is that one system has home-assignment control of all the IDs and talkgroups that will roam between the interconnected systems.

5.3.2 ISSI in Colorado

As noted, there are five systems in the state of Colorado equipped with ISSI gateways. They are:

- DTRS whose ISSI gateway (provided by Motorola) is currently equipped with two possible interconnections, one of which is connected to the Denver system; the other is unused

- Denver whose ISSI gateway (provided by Harris) is currently equipped with one interconnection to DTRS

- FRCC whose ISSI gateway (provided by Motorola) is currently equipped with three possible interconnections, one of which is connected to the Westminster system

- Westminster whose ISSI (provided by Airbus DS) gateway is currently equipped with one interconnection to FRCC

- Aurora whose ISSI gateway (provided by Motorola) is currently equipped with one interconnection which is currently not connected to any other system

NOTE: The number of interconnections supported by an ISSI gateway can typically be expanded beyond the number initially provided by the vendor.

The ISSI interconnection between DTRS and Denver primarily supports the interconnection of the NetworkFirst® talkgroups previously described. The interconnection between the ISSI gateways of these two systems is via a leased T1 circuit. In this configuration, units to do not roam between DTRS and the Denver radio systems but, instead, the ISSI interconnection supports direct conversations between those units (on their native system) via shared NetworkFirst® talkgroups.

As noted, selected conventional channels from the Boulder County system and the Clear Creek and Gilpin systems are also interconnected to the NetworkFirst® talkgroups. This is accomplished by a gateway that interfaces these systems to the StarGate™ bridge shared by Denver, Lakewood, and Arvada, then further interfaced to the NetworkFirst® talkgroups that are shared using ISSI. At the time of this report, the Federal “IO” system is being implemented into this same StarGate™ bridge and there remain available interfaces to support additional interfaces to other conventional (non-Project-25) systems such as local VHF channels.

The ISSI interconnection between FRCC and Westminster primarily supports the roaming of units from one system to the other. The interconnection between the ISSI gateways of these two systems is also via a leased T1 circuit. This addresses operational situations such as the transport of prisoners from Weld County to Westminster in which Weld County personnel leave the coverage of FRCC and enter the coverage of the Westminster system but retain the ability to converse with dispatchers and users that remain on FRCC.

There have been initial discussions about establishing an ISSI interconnection between DTRS and FRCC. This interconnection is pending the FRCC's completion of prerequisite interconnection agreements to allow it to establish the necessary connection to DTRS.

Figure 55 is a graphical summary of the current implementation of ISSI in Colorado:

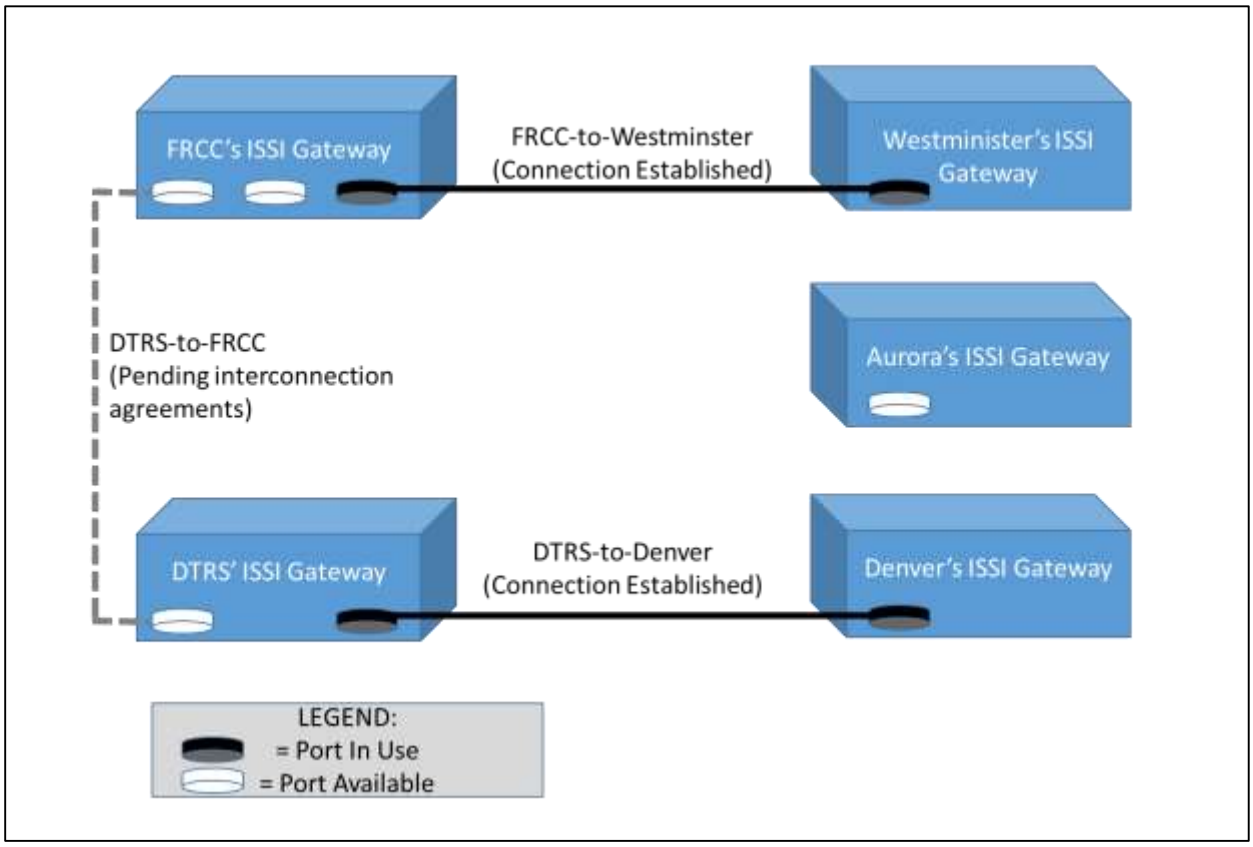


Figure 55 – Current ISSI implementation in Colorado

There are also ISSI gateways that are part of the statewide public safety radio systems in neighboring Wyoming, Kansas, and Utah. There have been some initial discussions between representatives of Colorado and those states to determine the operational need and technical viability of interconnecting the statewide systems via ISSI.

6. DTRS Upgrade Recommendations

This section provides recommendations and costs to address the requirements for DTRS as identified in Section 3. Table 18 lists those requirements, as summarized in each subsection of Section 3, and groups them in categories of critical, high, and medium importance:

Table 18 – Summary of DTRS requirements

DTRS Requirements	
DTRS Attribute	**Identified Need**
Critical Priority	
Coverage	DTRS' coverage requirement should be developed and the system should be expanded with additional sites to address the user-identified coverage gaps, mainly in the western part of the state.
Backhaul	Improvements to the backhaul network of DTRS are essential. These include the replacement of the current topology, technology, and equipment with highly reliable modern technology that incorporates ring architecture (not spurs), and has the bandwidth necessary to meet anticipated growth.
Equipment and System Lifecycle	DTRS should be kept up-to-date with Motorola's equipment and system-release lifecycle plan. This involves replacing existing Gold Elite consoles by 2018, Quantar® repeaters as possible (before end – of-support in 2020), and completing a further platform upgrade within the next 1 to 4 years.
High Priority	
Interoperability	DTRS should continue to provide the same high-level of interoperability available to users for daily communications. The methods to provide interoperability between DTRS and other systems (mainly ISSI) should be further developed to meet specified operational needs through supportive governance and, as needed, funding.
Ownership	As DTRS is changed and expanded, the detailed listing of the ownership of infrastructure assets should be updated on an annual basis.

DTRS Requirements	
Features	Users of DTRS, including field users and dispatchers, should be made more aware of the features of DTRS. This can be accomplished through a combination of training, exercise, and usage. Additionally, the specific features of GPS, authentication, and encryption should be explored to determine if DTRS should be enhanced in order to provide them at a local or statewide level.
Reliability	DTRS should be equipped with a software package that records, and is capable of producing reports on, system reliability. Additionally, the specific concerns about backhaul reliability should be addressed.
Medium Priority	
Capacity	DTRS should continue to be monitored for its traffic loading including the continuation of the current process for predicting effects of the anticipated traffic from new user agencies. Channels should be added at sites or the system should be migrated to P25 Phase 2, which effectively doubles the capacity and should be employed when such predictions show the need for increased capacity.
Maintenance	Existing standards for infrastructure and subscriber maintenance should be reviewed to ensure that they completely and accurately describe the requirements for the type and frequency of maintenance to be performed for the various components. If none is found to exist, new maintenance standards should be developed. Radio sites should continue to be maintained and funding for the replacement of towers as requested by OIT should be provided.
Training and Exercises	DTRS training should continue at its current levels and a statewide governance organization (such as PSCS or CCNC) should consider revising the online training material to reflect recent system developments. Exercises should be expanded to include communications (both field users and dispatchers) and exercises should be held more frequently.

In this section, ***FE*** presents details on the scope, implementation plan, and costs for our recommended changes and improvements for the critical needs of coverage, backhaul, and equipment and system lifecycle.

Summaries of recommendations are provided for the high and medium priority needs of ownership, features, reliability, capacity, maintenance, and training and exercises.

6.1 Recommendation: DTRS Coverage

6.1.1 Scope of DTRS Coverage Improvement

The most critical need among those identified above is coverage. Responses from surveys and input from interviews resoundingly stressed the need for improved coverage. As described, the initial phases of the build-out of DTRS (Phases 1 - 4) were in the eastern part of the state and fully funded. The later phases (Phases 5 - 7) in the western parts of the state were not funded to the same level as the earlier phases; therefore, coverage in those areas does not meet user requirements.

Section 8 of the *Business Plan* report provides an assessment of the current coverage policies regarding DTRS as well as a comparison of polices of other statewide systems. A recommendation of the *Business Plan*'s assessment of coverage policies is that users of DTRS, collaboratively and through the Public Safety Communications Subcommittee (PSCS), develop a coverage requirement.

FE conducted a thorough analysis of the existing DTRS coverage gaps from our coverage workshops, which included feedback from the user community. The majority of the analysis focused on enhancing coverage on major roadways on which public safety radio users often travel. ***FE*** conducted a high-level coverage analysis to identify the approximate location of additional sites required to address the coverage gaps.

Our effort involved placing virtual sites in locations that could best serve the needs of improving coverage. This effort did not involve identifying precise site locations nor did we confirm the viability of sites to house all necessary components of a radio site including an access road, a shelter, a tower, and main and backup power as that was not part of our scope. The feasibility of confirming or securing sites in the areas we identified as candidate areas is not a required component of this study and remains a subsequent step in the process of developing a design for DTRS coverage improvement.

Based on this analysis, ***FE*** estimates that enhancing the mobile radio coverage in the gaps identified by users (through surveys and coverage workshops) requires the addition of approximately 109 new radio sites with the majority of them being located in the western portion of the state. These additional sites raise the predicted statewide mobile radio coverage on state highways from the estimated 79% to approximately 90% (with

predicted increases from 73% to 87% in the western portion of the state and from 84% to 93% in the eastern portion).

A total of 89 (or approximately 81%) of the 109 additional sites required to enhance coverage would be located in the western half of the state. Using the boundaries of the existing site-to-zone-controller associations, we also estimated the assignment of these 109 additional sites to specific zone controllers as shown in Table 19.

Table 19 – Assignment of additional sites to DTRS zone controllers

Zone	# of Additional Sites
Zone 1	21
Zone 2	45
Zone 3	31
Zone 5	1
Zone 6	11

6.1.2 DTRS Coverage Improvement Implementation Approach

Unless personnel or financial considerations dictate the need for a phased approach, ***FE*** recommends avoiding a phased approach if possible. The longer it takes to develop and install the additional sites, the longer the system coverage remains a concern for public safety radio users.

If the State determines that, due to financial constraints, it is necessary to proceed with a phased implementation, the plan should allow for completion of the additional sites for one or more zones in their entirety for each phase. Due to a variety of factors, it is not possible to predict the actual timeframe associated with implementation of the additional sites. However, given the number of additional sites needed, this will be a multi-year project.

6.1.3 Coverage Improvement Risks and Effects on System

FE categorized the project risks of upgrading and enhancing the coverage of DTRS into two categories. These represent lessons learned in other states implementing public safety radio communications systems. ***FE*** identifies the following anticipated risks and their associated mitigation strategies discussed in Sections 6.1.3.1 and 6.1.3.2:

- Coordination and management risks
- Technical risks

Each risk is independent of the other and not listed in degrees of magnitude. It is prudent to identify risks and their associated mitigation strategy to the best extent possible.

6.1.3.1 Coordination and Management Risks

A significant risk factor in projects of similar size, complexity, and cost is the coordination and management of the design, procurement, implementation, and testing. Table 20 outlines the potential coordination, organization, and management risks, as well as the potential mitigation strategies to address them.

Table 20 – Coordination and management risks and mitigation

Coordination and Management Risks	Mitigation Strategies
Overly optimistic timeline planned for rollout	Use risk assessment techniques to obtain more realistic estimates that can result in a more attainable plan
Inadequate project management support and vendor oversight	Adopt and implement formal project management, quality management, change management, risk management, and systems development lifecycle methodologies
Inefficiencies in the procurement process	Retain qualified project management personnel with demonstrated successful experience in vendor oversight and procurement
Inadequate testing processes	Develop acceptance test plan during the design phase and revise it with changes approved
Limited access due to winter weather conditions and wildfires	Plan for sites that require special consideration during the installation and testing phase of the project due to site access issues
Building constraints in specific jurisdictions	Keep external changes to a minimum and follow a “like kind replacement” strategy

Coordination and Management Risks	Mitigation Strategies
Assessment of lease restrictions, which vary, on a site-by-site basis	Shelter and tower space must be coordinated and property owners must be aware of changes during the planning process and during the transition
Failure to meet tower loading requirements under latest guidelines	Identify sites where a new dish or waveguide could cause the tower to fail load requirements

6.1.3.2 Technical Risks

Overly complex technical requirements and a lack of a formal change control process pose significant risks to projects. Additionally, there may be new technologies available in the future that function equally well or better than the technologies available today at a similar cost. As with any technology, there is always a risk that emerging solutions could overtake the system design and cause early obsolescence of equipment or functionally shorten the useful life of the system. Table 21 identifies potential technical risks, as well as the potential mitigation strategies to address them.

Table 21 – Technical risks and mitigation

Technical Risks	Mitigation Strategies
Overly-complex requirements and lack of change control	Retain competent and experienced external engineering firm(s) for the duration of the project to provide both project management and quality and design control
Changes in the availability of technology	Include technical performance requirements in vendor contracts and agree upon the support requirements during the negotiation phase
Failure of equipment purchased to meet industry standards	Follow established technology standards to help extend the lifecycle of the system

6.1.4 Estimated Costs for DTRS Coverage Improvement

FE prepared high-level cost estimates for system expansion, equipment upgrades, and implementation services based on the recommendation of adding 109 sites to DTRS to address the coverage gaps as identified by users. These estimates reflect previous activities in this project, historical information from our experience designing radio systems comparable to DTRS, and publicly available industry information. The dynamics of the wireless communications technology market are such that the actual bid prices can vary significantly due to a number of factors. Therefore, ***FE***'s capital cost estimates for equipment, installation and optimization are conservative in nature. In the *Business Plan*, ***FE*** recommends that DTRS users, working with and through the PSCS, develop a requirement for coverage.

6.1.4.1 DTRS Coverage Improvement Cost Assumptions

To develop the capital cost estimates, ***FE*** generated a list of system and service related assumptions. The assumptions reflect system zone configurations, existing legacy equipment, greenfield site development, new backhaul equipment, FCC licensing and coordination, and vendor implementation services. Table 22 provides the key assumptions used in the development of the system expansion cost estimates. Note that we assumed that all sites would be "greenfield" sites meaning that they are currently

undeveloped in any way and in need of all necessary components of a radio site (access road, a shelter, a tower, main and backup power, etc.). If existing sites are identified the cost can be reduced.

Table 22 – DTRS coverage improvement cost assumptions

Assumptions	QTY	Notes
Coverage Improvements – Additional Costs		
Total Number of New Sites Required	109	Quantity used to determine cost of additional site licenses needed for the P25 system core – 89 of these 109 will be in western half of the state while the balance will be in the east
Number of RF Channels per Site	6	Trunked multicast 800 MHz P25 Phase 1 channels
FCC Licensing and Coordination		
New LMR FCC Licenses per Site	6	Fees on per frequency per site basis
New LMR Frequency Coordination	6	Fees on per frequency per site basis
New LMR Engineering Services	6	Fees on per frequency per site basis
New Microwave Frequency Coordination	2	Fees on per loop hop basis
New Microwave Licenses	2	Fees on per frequency per site basis
Implementation Services		
PM / Engineering / Installation for Flat/Plains Site (Type I Site)	30%	Based on **FE** historical / industry data
PM / Engineering / Installation for Mountaintop Site (Type II Site)	35%	Based on **FE** historical / industry data

The new system equipment includes a standard 1-year manufacturer's warranty. It is important to note that the cost estimates do not include extended warranty or any state or local sales tax. The following cost estimates also reflect list pricing and do not include any discount structures that vendors may provide through a competitive procurement process.

6.1.4.2 DTRS Coverage Improvement Costs

To calculate the system expansion costs, ***FE*** developed models for two types of greenfield sites. A Type I greenfield site is a flat/plains site (located in Colorado's eastern plains) with a 300-foot guyed tower structure. A Type II greenfield site is a mountaintop site (located in the western areas - Front Range, central Rockies, or western slope of the state) with a 100-foot self-supported tower structure. Both site types include the following equipment and services:

- 6-channel P25 Phase 1 system
- 700/800 MHz antenna system
- Networking and alarm equipment
- 180 Mbps IP/MPLS microwave system
- FCC licensing and coordination
- 12'x24' shelter with generator and fuel system
- Tower structure (guyed or self-supported)
- Project management, engineering and installation

Appendix N provides the detailed costs for each type of greenfield site.

Based on the results from the coverage analysis, the recommended improvement requires 109 new greenfield sites. As noted, we identified that 89 of these sites will be Type II / mountaintop sites while 20 will be Type I / plains sites. The recommendation also includes the licenses for the 109 additional sites to be interconnected to the Zone Controllers 1, 2, 3, 4, and 6 as listed in Table 9 above.

The total estimated cost for DTRS coverage improvements is $115,976,000 as summarized in Table 23.

Table 23 – System expansion cost summary

700/800 MHz P25 System Expansion Summary			
System Infrastructure	*Quantity*	*Unit Cost*	*Extended Cost*
Core Capacity Licenses	109	$17,000	$1,853,000
Plains Sites (Type I)	20	$869,000	$17,380,000
Mountaintop Sites (Type II)	89	$1,087,000	$96,743,000
Total System Expansion Cost Estimate			**$115,976,000**

Appendix N provides a breakdown of system equipment, site development, and implementation services on a site type basis.

6.2 Recommendation: DTRS Equipment and System Lifecycle

6.2.1 Scope of DTRS Equipment Lifecycle Replacements

FE identified the need to replace DTRS infrastructure equipment that is at or nearing its end of life. This includes replacing the following system components:

- Replacement of legacy Quantar® or STR3000 repeaters with new 700/800 MHz repeaters licensed to operate in P25 Phase 1 trunking mode
- Replacement of legacy CENTRACOM™ Gold Elite consoles with new P25 IP-based dispatch consoles capable of operating on the P25 system

Based on information from our analysis of existing DTRS infrastructure ownership, ***FE*** determined a breakdown of 47% State-owned repeaters and 53% locally owned repeaters. According to OIT, there are 666 Quantars® or STR3000s in the system today. The State has already purchased 56 new repeaters to replace some of these Quantars®. Therefore, 287 State-owned repeaters require replacement and 323 locally owned repeaters require replacement.

Information provided by OIT indicates that 21 State-owned consoles require replacement and 79 locally owned consoles require replacement.

6.2.2 DTRS Equipment Lifecycle Replacement Implementation Approach

Motorola's equipment lifecycle information states that Motorola will end support of the CENTRACOM™ Gold Elite consoles as of December of 2018 and that Quantar® repeaters will likewise be unsupported by December of 2020, and STR3000 repeaters are already at the end of support. ***FE*** therefore recommends placing priority on replacing STR3000 repeaters and CENTRACOM™ Gold Elite consoles before replacing Quantar® repeaters. We base this recommendation on the fact that Motorola's system release roadmap includes support for Quantar® repeaters through the 7.17 release (available in early 2017) but includes support for Gold Elites only through the 7.16 release (available in early 2016).

6.2.3 Estimated Costs for DTRS Equipment Lifecycle Replacements

To develop the capital cost estimates, ***FE*** generated a list of system and service related assumptions. We base these assumptions on the quantities that pertain to DTRS infrastructure. Table 24 provides the key assumptions used in the development of the system expansion and equipment upgrades cost estimates.

Table 24 – Cost assumptions

Assumptions	QTY	Notes
System Upgrades		
Number of existing State-owned base radios requiring replacement	286	Based on State provided information, 47% of 610 base radios requiring replacement
Number of existing locally owned base radios requiring replacement	324	Based on State provided information, 53% of 610 base radios requiring replacement
Number of existing State-owned dispatch consoles requiring replacement	21	Based on State provided information, CENTRACOM™ Gold Elite to MCC 7500
Number of existing locally owned dispatch consoles requiring replacement	79	Based on State provided information, CENTRACOM™ Gold Elite to MCC 7500

Assumptions	QTY	Notes
Implementation Services		
PM / engineering / installation for repeater of dispatch center equipment	30%	Based on ***FE*** historical / industry data

The estimated cost for the State-owned DTRS equipment upgrades is $12,504,000 as shown in Table 25.

Table 25 – State-owned equipment upgrade cost

State Owned System Equipment Upgrades			
System Equipment	*Quantity*	*Unit Cost*	*Extended Cost*
P25 Phase 1 Repeater	287	$30,000	$8,610,000
P25 Dispatch Console	21	$48,000	$1,008,000
Subtotal			**$9,618,000**
Implementation Services	*Quantity*	*Unit Cost*	*Extended Cost*
PM / Engineering / Installation	30%		$2,886,000
Subtotal			**$2,886,000**
Total State Upgrades Cost Estimate			**$12,504,000**

The estimated cost for the local-owned DTRS equipment upgrades is $17,527,000 as shown in Table 26.

Table 26 – Local-owned equipment upgrade cost

Locally Owned System Equipment Upgrades			
System Equipment	*Quantity*	*Unit Cost*	*Extended Cost*
P25 Phase 1 Repeater	323	$30,000	$9,690,000
P25 Dispatch Console	79	$48,000	$3,792,000
Subtotal			**$13,482,000**
Implementation Services	*Quantity*	*Unit Cost*	*Extended Cost*
PM / Engineering / Installation	30%		$4,045,000
Subtotal			**$4,045,000**
Total Local Upgrades Cost Estimate			**$17,527,000**

6.2.4 Status of a DTRS System Platform ("System Release") Upgrade

As noted, the State updated the DTRS to system release 7.14 in late 2014 and early 2015. As part of this upgrade, the state of Colorado offered to pay for the upgrade in its entirety, including upgrades to locally owned equipment. In doing so, the state of Colorado offered local owners of DTRS equipment two options (selected by a local owner through the completion of one of two corresponding Memoranda of Understanding). The first was for the State to pay for the local owner's upgrade costs if the local owner agreed to continue to interconnect their upgraded assets to DTRS for at least 5 years. The second was for the local owner to pay for their own upgrade costs with no connection requirements.

As also noted, Motorola recommends the implementation of a platform (or "system release") upgrade every 2 years and Motorola stops supporting a platform version 5 years after its release. For this reason, and for the implications to individual product (repeater and dispatch console equipment) lifecycles, ***FE***'s recommendation is to complete a further platform upgrade to the DTRS within the next 1 to 4 years.

The state of Colorado's OIT recently announced that it is investigating upgrading DTRS to system release 7.16 at some time in the second half of 2017. This is consistent with the provisions of Colorado House Bill 14-1203 which provides OIT with funding for platform upgrades starting in 2017, with funds available in the second half of the calendar year at an amount of $3.7M per year for a total of 7 years.

According to discussions between OIT and ***FE***, the State has just begun investigating these options with Motorola and there is not yet any information on the total price for such an upgrade to 7.16 in the second half of 2017. Negotiations on the scope, schedule, and costs for the upgrade are expected to continue through at least the summer of 2015 and details will be provided by OIT to other owners of DTRS as they become available. ***FE*** recommends that OIT continue their negotiations and other planning discussions with Motorola with as much collaboration as possible with other owners and users of DTRS. The negotiations should represent concerns and issues of local owners of DTRS assets through measures such as direct participation by PSCS and/or CCNC or by regular check-in sessions between OIT and these groups.

In addition, depending on the outcome of negotiations, the state of Colorado may or may not be able to offer local owners the same options for purchase as available for the 7.14 upgrade. ***FE*** recommends that OIT and local owners address the topic of the total funding amount as well as a plan to allow local owners to provide for their own costs, including sufficient time for budgeting, either directly or through representative organizations such as PSCS and/or CCNC.

6.3 Recommendation: DTRS Backhaul

6.3.1 Scope of DTRS Backhaul Improvement

This section provides a summary of *FE*'s *2014 State of Colorado Microwave System Requirements, Analysis and Recommendations Repor*t. For further details on this topic, refer to that report.

In our 2014 report, ***FE*** recommended the use of a microwave system based on Internet Protocol (IP) with Multiprotocol Label Switching (MPLS) devices. This microwave system provides the required capacity and allows the State the flexibility to add various interfaces at each site to transport traffic for the DTRS as well as federal, state, and local agencies. The IP microwave system will provide compatibility with existing locally owned TDM hops where funding might not be available for upgrade. A hop is a microwave connection between two sites.

FE envisioned the new microwave system to have five synchronous rings providing connection to multiple sites throughout the state. The conceptual system architecture consists of a Western ring, a Southeast ring, a Northeast ring, a Southwest ring and a Metro ring. Sites not connected within the five rings will connect to it using Monitored Hot

Standby (MHSB) spurs for redundancy. This configuration will address each of the primary goals of improved capability, increased capacity, and reliability through full redundancy.

6.3.2 DTRS Backhaul Improvement Implementation Approach

Given the criticality of the system and lack of manufacturer product support, ***FE*** recommended the State proceed immediately with the procurement and implementation of an upgraded or replacement system using a directed procurement strategy. We believe this strategy provides the greatest value to the State by using a structured procurement method while leveraging re-use of their existing microwave radio assets to the greatest degree possible.

Unless personnel or financial constraints dictate otherwise, ***FE*** recommended avoiding a phased approach that could take an extended time to implement. The longer it takes to implement an upgraded or new system, the greater the likelihood of manufacturer obsolescence with the existing reusable equipment, some of which is now 5 years old, and the current equipment offered by the existing vendor. If the State decides to proceed with a phased approach, the plan should allow for completion of as many rings as possible for each phase.

6.3.3 Estimated Costs for DTRS Backhaul Improvement

The following are estimated costs from ***FE***'s 2014 report for the recommended changes and improvements to the existing system:

Western ring:	$14,685,700
Southeast ring:	$5,832,900
Northeast ring:	$7,276,400
Southwest ring:	$11,963,300
Metro ring:	$4,800,800
Estimated Total:	**$44,559,100**

The portion of the estimated capital cost attributable to replace/upgrade the local government owned equipment is $4.1M of this total.

For more details on the topic of backhaul improvements, including analysis of the current system, alternatives for a replacement system, and basis for cost estimates, please refer

to ***FE***'s *2014 State of Colorado Microwave System Requirements, Analysis and Recommendations Report*.

6.4 Recommendations for High and Medium Priority Needs

Because of their lower priority, effect, and (generally) cost, ***FE*** provides a summary of recommendations for the needs of ownership, features, reliability, capacity, maintenance, and training and exercises in Table 27. Section 7 addresses the topic of interoperability.

Table 27 – Summary of scope, plan, and costs for other needs

Need	Scope	Plan	Cost Estimate
Ownership	Execute ownership and interconnection agreements as prepared by CCSA. Also, maintain currency of DTRS ownership list on an annual basis.	At the direction of governance organizations such as PSCS and CCNC, the identified owners of DTRS infrastructure assets should complete the agreements to establish the responsibilities and obligations of ownership. In addition, with the guidance and support of such organizations, the ownership list should be reviewed and updated on an annual basis, at a minimum, to ensure it reflects expansions and any changes in ownership.	Costs are limited to costs of staff required to complete the tasks listed in the plan.
Features	Educate users and dispatchers on the capabilities of DTRS and user equipment. Consider statewide or local implementation of GPS and authentication.	Revise and re-launch the DTRS training developed in 2011 (as commissioned by CCNC) with a focus on expanding understanding of features that are either new or not commonly used. This PSCS Outreach and Education Subcommittee could direct this effort. Also, investigate the operational requirements and benefits for GPS and authentication, and compare those benefits to the costs listed here.	Costs for training are limited to costs of staff required to develop and re-launch the training materials. Estimated costs for implementing GPS are: $410,000 for a GPS application server $450 for each portable subscriber radio $720 for each mobile subscriber radio. Estimated costs for implementing authentication are: $1,000,000 for an authentication server

Need	Scope	Plan	Cost Estimate
			$100 for each portable or mobile subscriber radio.
Reliability	Continue to operate DTRS at a high level of reliability while establishing a method for developing and maintaining reports on system reliability. Improve backhaul reliability.	Investigate the system management capabilities of DTRS following the improvements as part of the 7.14 platform upgrade. This will likely lead to the identification of a method to develop and maintain reliability reports. In addition, continue efforts to secure funding for and begin implementation of the backhaul improvement effort described above.	Costs for reliability reporting should be limited to costs of staff required to investigate and implement new reporting capabilities. Earlier sections of this report list costs for microwave system improvements.
Capacity	Maintain capacity through monitoring and planning.	Monitor capacity and expand sites with additional repeaters as necessary.	Costs for capacity monitoring and planning are limited to costs of staff. Costs for expanding capacity are approximately $30,000 per repeater.
Maintenance	Ensure user-agency familiarity with maintenance policies and develop new documents if needed.	Review the existing set of maintenance policies to determine if all DTRS infrastructure and subscriber components are covered. Distribute these policies to user agencies and develop new maintenance policies under the direction/guidance of governance organizations such as PSCS or CCNC. In addition, continue to pursue funding for and implementation of DTRS tower replacements.	Costs for maintenance policy review, development, and outreach are limited to costs of staff. OIT presented costs for ongoing tower replacement to the State's Joint Budget Committee.
Training and Exercises	Expand exercises and incorporate communications more often. Revise and re-launch DTRS training.	Review planned exercises to ensure they include components to evaluate communications, including for dispatchers	Costs for training and exercise improvements are limited to costs of staff.

Need	Scope	Plan	Cost Estimate
		and field users. Ensure that after-action-reports for both exercises and real events address communications. In addition, revise and re-launch the DTRS training developed in 2011 (as commissioned by CCNC) with a focus on expanding understanding of features that are either new or not commonly used. The PSCS Outreach and Education Subcommittee could direct this effort.	

7. Interoperability Enhancement Recommendations

FE developed three recommendations to enhance interoperability among public safety communication systems across Colorado. ***FE*** recommends pursuing all three of these recommendations simultaneously with equally high importance.

7.1 Interoperability Enhancements to DTRS

By enhancing the existing DTRS through the coverage and other improvements described in this report, more agencies, especially those in remote locations of the state, will have access to DTRS. Allowing them access through the enhanced coverage also provides them with the capability to interoperate with other agencies on DTRS. Therefore, enhancing coverage will lead to improved interoperability within the state.

Maintaining the DTRS with the most current equipment and platform upgrades and replacing the microwave backbone will enhance overall system reliability. This will promote its “uptime” and its ability to deliver interoperability among those who use it and those who interconnect to it.

7.2 Support Regional Communications Subcommittees

The Homeland Security and All-Hazards Senior Advisory Committee (HSAC) operate Regional Communications Subcommittees. These Communications Subcommittees have the ongoing responsibility to address regional issues including local interoperability gaps as identified in the DTRS and non-DTRS interoperability matrices included in Appendices F and L. These subcommittees also support regional interoperability through locally relevant, non-technological solutions such as the development of operational procedures and the conduct of training and policies.

Increased support for these subcommittees from the State and from governance organizations like PSCS and CCNC will help to enhance interoperability. Please refer to the *Business Plan* (a companion report to this document) for more information on the Regional Communications Subcommittees and their role in statewide communications governance.

7.3 Use of ISSI to Interconnect Large Systems

As described in Section 5.3.2, several large radio systems within the state of Colorado have begun initial deployments of ISSI to provide interoperability interconnections to serve their users. These systems include DTRS, FRCC, Denver, Westminster, and Aurora. The implementations of ISSI among these systems included the creation of linked/shared talkgroups (the NetworkFirst® talkgroups that exist between DTRS, Denver, and other metro-area systems) and the support of roaming between different systems (the coverage-extensions provided between FRCC and Westminster).

As a technical tool, ISSI is an excellent option for interconnecting different Project 25-compliant systems. It supports the exchange of voice audio and signaling, the latter supporting cross-system functionality that cannot be supported by other means such as gateways or console patches. The deployment of ISSI among the various systems in Colorado should occur in a controlled manner and only after consideration of the following alternatives:

1. Operational use cases – ISSI has many capabilities but it cannot solve all interoperability problems. Creation of a detailed list of the operational requirements of the users of all systems that will be interconnected should precede the deployment of ISSI. ISSI should not be deployed if its technical capabilities cannot address those operational needs. For example, interconnecting two systems of different radio frequency bands (such as 800 MHz and VHF) will not be a viable solution to extend coverage of the systems unless all users are equipped with dual-band radios.
2. Capacity – The interconnection of multiple systems can enhance interoperability by allowing users of one system to participate in conversations on another system. This can cause capacity problems as those shared conversations can consume channel resources on a system by loading it with radio traffic that was never included in the capacity design process. Development of operational use cases should ensure that the new interoperability capability does not have a harmful effect on the capacity of each system. Likewise, system operators should ensure that they design and maintain their systems to account for the increase in radio traffic from ISSI interconnections.
3. Topology – As described in Section 5.3 of this report, ISSI interconnections between three or more systems can occur with either a hub-and-spoke or fully-connected mesh topology. Selection of an ISSI topology requires consideration

of the benefits and detriments of each. Cost is one factor and knowing the number and layout of the inter-system interconnections planned may help drive the decision between the two topologies. The hub-and-spoke topology requires one central ISSI gateway, which could be a distinct/neutral gateway that does not 'belong' to any of the individual systems. It also alleviates the requirements for the numerous interconnections associated with a fully interconnected mesh.

4. Governance – Regardless of the use cases and topology chosen, a governance body is necessary to plan and manage the deployment of ISSI in the state of Colorado. Implementing ISSI without such coordination may result in missing user requirements and/or duplication of costs. PSCS is the statewide governance organization which has the legislative charter to, among other tasks, promote interoperable communications among public safety organizations throughout the state and it has established a working group on ISSI. This working group should define interoperability needs at a statewide level and determine the best way to meet those needs via ISSI. Furthermore, PSCS should plan and coordinate the governance of the implemented ISSI solution.

Discussions between Colorado and other states such as Wyoming, Kansas, and Utah to plan the interconnection of DTRS to those statewide radio systems should consider these same issues.

8. National Public Safety Broadband Network

The state of Colorado – Governor's Office of Information Technology, FirstNet Colorado team prepared this section of this report using funds under award 08-10-S13008 from the National Telecommunications and Information Administration (NTIA), U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the state of Colorado – Governor's Office of Information Technology.

The planning for the eventual implementation of the National Public Safety Broadband Network (NPSBN) is currently taking place at both a federal and state level. The NPSBN will be the first high-speed interoperable wireless, broadband data and cellular voice network dedicated to public safety, which will facilitate communication for first responders and other public safety entities daily and in the event of emergencies. This network will provide a resilient network with public safety-grade quality of service, and local control of prioritization and preemption, enabling access to applications and system coverage where public safety needs it most. From the federal perspective, planning and deployment efforts are being led by the First Responder Network Authority, or FirstNet, an independent authority within the U.S. Department of Commerce, National Telecommunications and Information Administration (NTIA).

In Colorado, planning and outreach efforts for FirstNet began in earnest in December 2013. Using approximately $3 Million in funds from the State and Local Implementation Grant Program (SLIGP) and matching funds, staff at the Governor's Office of Information Technology (OIT), under the direction of the FirstNet Colorado Governing Body (FNCGB), developed a strategic approach to managing the program in Colorado. The FNCGB comprises members representing:

- County Sheriffs of Colorado (CSOC)
- Colorado Association of Chiefs of Police (CACP)
- Colorado State Fire Chiefs (CSFC)
- Colorado Municipal League (CML)
- Colorado Counties Inc. (CCI)
- First Responder Organized Labor
- Emergency Medical Services Association of Colorado (EMSAC)
- Adams County Communications Center (ADCOM911)

- Rural Colorado
- Ute Mountain Ute Tribe
- Southern Ute Tribe
- Colorado Department of Public Safety (CDPS)
- Colorado Department of Public Health and Environment (CDPHE)
- OIT

The FNCGB's mandate is to strategically guide the implementation of the NPSBN within the state to ensure it will meet the needs of all Colorado's first responders, local, tribal and state governments.

Colorado is uniquely poised to be a leader in the NPSBN planning and implementation efforts. First, ADCOM911 is home to one of only five pilots of the PSBN in the entire nation; their network became operational in June 2014. The ADCOM911 network currently provides dedicated Long Term Evolution (LTE) capabilities to public safety entities in Adams County, using an Evolved Packet Core (EPC), Radio Access Network (RAN), and User Equipment (UE) funded through the NTIA Broadband Technology Opportunities Program (BTOP). The ADCOM EPC will also function as a remote core for the state of New Mexico's pilot PSBN, connecting to their RAN. Additionally, the Public Safety Communications Research (PSCR) labs and the FirstNet technical headquarters are located in Boulder, CO.

As the PSCS is tasked with long-term strategic planning for public safety communications, integrating the FNCGB's efforts to create access to mission critical data capabilities and the development of Colorado's implementation of the NPSBN should be considered a high priority. LTE and other broadband technologies are playing an increasing role in public safety response and recovery to emergent and non-emergent incidents, natural and manmade. The following items should be of note:

- Today, Land Mobile Radio is the only mission critical voice capability for public safety; funding for and investment in LMR must continue. However, based on recent trials, Push-To-Talk communications (PTT) over a broadband network will become services that public safety will demand with the initial implementation of the NPSBN.

- Participation in all planning efforts is critical to ensure deployment of the PSBN within Colorado is a success. Colorado is required to participate in the NPSBN

planning process in order to ensure its responders have access to this future nationwide network. The FirstNet Colorado (FNC) planning efforts are inclusive of public safety entities within all 64 counties, the two tribal governments, all state agencies, federal partners and many other quasi-government and non-governmental organizations (NGOs).

- While state and local governments continue to invest funds in infrastructure, they must also consider the PSBN when looking at the network architectures. There are significant infrastructure investments and synergies to be gained with existing LMR and Next Generation 911 (NG911) systems/networks. The PSBN will require integration with these technologies as well as have the possibility of sharing resources, like backhaul and redundant power. For example, major backhaul routes should be planned to support a minimum of approximately 500 MB of throughput capabilities.

Appendix A - Ownership of DTRS Infrastructure Assets

Please see attached document Appendix A - DTRS Ownership.pdf

Appendix B - Survey Comments Regarding DTRS Coverage

Please see attached document Appendix B - Survey Comments re Coverage.pdf

Appendix C - Site Parameters for DTRS Coverage Predictions

Please see attached document Appendix C - Site Parameters.pdf

Appendix D - System Parameters for DTRS Coverage Predictions

Please see attached document Appendix D - System Parameters.pdf

Appendix E - DTRS Coverage Maps

Please see attached document Appendix E - Coverage Predictions.pdf

Appendix F - Interoperability Matrix for DTRS Users and Dispatchers

Please see attached document Appendix F - DTRS Interop Matrix.pdf

Appendix G - Survey Comments Regarding DTRS Interoperability

Please see attached document Appendix G - Survey Comments re Interop.pdf

Appendix H - Survey Comments Regarding DTRS Capacity

Please see attached document Appendix H - Survey Comments re Capacity.pdf

Appendix I - Survey Comments Regarding DTRS Reliability

Please see attached document Appendix I - Survey Comments re Reliability.pdf

Appendix J - Survey Comments Regarding DTRS Maintenance

Please see attached document Appendix J - Survey Comments re Maintenance.pdf

Appendix K - Survey Comments Regarding DTRS Training and Exercises

Please see attached document Appendix K - Survey Comments re Training & Exercises.pdf

Appendix L - Interoperability Matrix for Non-DTRS Users and Dispatchers

Please see attached document Appendix L - Non-DTRS Interop Matrix.pdf

Appendix M - Sites and Frequencies of State of Colorado Fire System

Please see attached document Appendix M - CO Fire & MA System.pdf

Appendix N - Detailed Cost Estimates

Please see attached document Appendix N - Detailed Cost Estimates.pdf

Appendix O - Participation in Interviews, Requests for Information, and Surveys

Please see attached document Appendix O - Participation in Interviews, RFIs, and Surveys.pdf

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
Pueblo County	Radio Site Repeater	12 Mile	60			6	12_Mile.Repeater.1
Pueblo County	Radio Site Repeater	12 Mile	60			6	12_Mile.Repeater.2
Pueblo County	Radio Site Repeater	12 Mile	60			6	12_Mile.Repeater.3
Pueblo County	Radio Site Repeater	12 Mile	60			6	12_Mile.Repeater.4
Pueblo County	Radio Site Repeater	12 Mile	60			6	12_Mile.Repeater.5
Pueblo County	Radio Site Repeater	12 Mile	60			6	12_Mile.Repeater.6
Pueblo County	Radio Site Repeater	12 Mile	60			6	12_Mile.Repeater.7
Pueblo County	Radio Site Repeater	12 Mile	60			6	12_Mile.Repeater.8
State of Colorado	Radio Site Repeater	Abajo Peak	2			2	Abajo_Peak.Repeater.1
State of Colorado	Radio Site Repeater	Abajo Peak	2			2	Abajo_Peak.Repeater.2
State of Colorado	Radio Site Repeater	Abajo Peak	2			2	Abajo_Peak.Repeater.3
State of Colorado	Radio Site Repeater	Abajo Peak	2			2	Abajo_Peak.Repeater.4
State of Colorado	Radio Site Repeater	Abajo Peak	2			2	Abajo_Peak.Repeater.5
RTD	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.1
RTD	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.2
RTD	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.3
RTD	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.4
RTD	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.5
RTD	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.6
State of Colorado	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.7
State of Colorado	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.8
State of Colorado	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.9
Arapahoe County	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.10
Arapahoe County	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.11
Arapahoe County	Radio Site Repeater	Admin (Arapahoe)	1			1	Admin.Repeater.12
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.1
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.2
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.3
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.4
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.5
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.6
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.7
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.8
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.9
PPRCN	Radio Site Repeater	Airport	17			4	Airport.Repeater.10
Pitkin County	Radio Site Repeater	Ajax	66			2	Ajax.Repeater.1
Pitkin County	Radio Site Repeater	Ajax	66			2	Ajax.Repeater.2
Pitkin County	Radio Site Repeater	Ajax	66			2	Ajax.Repeater.3
Pitkin County	Radio Site Repeater	Ajax	66			2	Ajax.Repeater.4
Pitkin County	Radio Site Repeater	Ajax	66			2	Ajax.Repeater.5
Holy Cross	Radio Site Repeater	Ajax	66			2	Ajax.Repeater.6
State of Colorado	Radio Site Repeater	Akron	17			3	Akron.Repeater.1
State of Colorado	Radio Site Repeater	Akron	17			3	Akron.Repeater.2
State of Colorado	Radio Site Repeater	Akron	17			3	Akron.Repeater.3
State of Colorado	Radio Site Repeater	Akron	17			3	Akron.Repeater.4
State of Colorado	Radio Site Repeater	Akron	17			3	Akron.Repeater.5
State of Colorado	Radio Site Repeater	Alamosa	52			6	Alamosa.Repeater.1
State of Colorado	Radio Site Repeater	Alamosa	52			6	Alamosa.Repeater.2
State of Colorado	Radio Site Repeater	Alamosa	52			6	Alamosa.Repeater.3
State of Colorado	Radio Site Repeater	Alamosa	52			6	Alamosa.Repeater.4
State of Colorado	Radio Site Repeater	Alamosa	52			6	Alamosa.Repeater.5
State of Colorado	Radio Site Repeater	Alamosa	52			6	Alamosa.Repeater.6
State of Colorado	Radio Site Repeater	Anton	19			3	Anton.Repeater.1
State of Colorado	Radio Site Repeater	Anton	19			3	Anton.Repeater.2
State of Colorado	Radio Site Repeater	Anton	19			3	Anton.Repeater.3
State of Colorado	Radio Site Repeater	Anton	19			3	Anton.Repeater.4
State of Colorado	Radio Site Repeater	Anton	19			3	Anton.Repeater.5
State of Colorado	Radio Site Repeater	Arkansas Valley CF	69			6	Arkansas_Valley_CF.Repeater.1
State of Colorado	Radio Site Repeater	Arkansas Valley CF	69			6	Arkansas_Valley_CF.Repeater.2
State of Colorado	Radio Site Repeater	Arkansas Valley CF	69			6	Arkansas_Valley_CF.Repeater.3
State of Colorado	Radio Site Repeater	Arkansas Valley CF	69			6	Arkansas_Valley_CF.Repeater.4
State of Colorado	Radio Site Repeater	Arkansas Valley CF	69			6	Arkansas_Valley_CF.Repeater.5
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.1
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.2
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.3
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.4
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.5
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.6
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.7
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.8
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.9
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.10
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.11
State of Colorado	Radio Site Repeater	Auraria	70			1	Auraria.Repeater.12
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.1
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.2
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.3
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.4
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.5
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.6
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.7

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.8
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.9
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.10
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.11
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.12
PPRCN	Radio Site Repeater	Austin Bluffs	16			4	Austin_Bluffs.Repeater.13
PPRCN	Radio Site Repeater	Badger	20			4	Badger.Repeater.6
PPRCN	Radio Site Repeater	Badger	20			4	Badger.Repeater.7
PPRCN	Radio Site Repeater	Badger	20			4	Badger.Repeater.8
PPRCN	Radio Site Repeater	Badger	20			4	Badger.Repeater.9
PPRCN	Radio Site Repeater	Badger	20			4	Badger.Repeater.10
State of Colorado	Radio Site Repeater	Badger	45			1	Badger.Repeater.1
State of Colorado	Radio Site Repeater	Badger	45			1	Badger.Repeater.2
State of Colorado	Radio Site Repeater	Badger	45			1	Badger.Repeater.3
State of Colorado	Radio Site Repeater	Badger	45			1	Badger.Repeater.4
Park County	Radio Site Repeater	Badger	45			1	Badger.Repeater.5
State of Colorado	Radio Site Repeater	Bailey	54			1	Bailey.Repeater.1
State of Colorado	Radio Site Repeater	Bailey	54			1	Bailey.Repeater.2
State of Colorado	Radio Site Repeater	Bailey	54			1	Bailey.Repeater.3
State of Colorado	Radio Site Repeater	Bailey	54			1	Bailey.Repeater.4
Park County	Radio Site Repeater	Bailey	54			1	Bailey.Repeater.5
State of Colorado	Radio Site Repeater	Bakers Peak	41			2	Bakers_Peak.Repeater.1
State of Colorado	Radio Site Repeater	Bakers Peak	41			2	Bakers_Peak.Repeater.2
State of Colorado	Radio Site Repeater	Bakers Peak	41			2	Bakers_Peak.Repeater.3
State of Colorado	Radio Site Repeater	Bakers Peak	41			2	Bakers_Peak.Repeater.4
State of Colorado	Radio Site Repeater	Bakers Peak	41			2	Bakers_Peak.Repeater.5
NCRCN	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.1
NCRCN	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.2
NCRCN	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.3
NCRCN	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.4
NCRCN	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.5
Larimer County	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.6
Larimer County	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.7
Larimer County	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.8
Longmont, City of	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.9
Dept of Energy	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.10
State of Colorado	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.11
State of Colorado	Radio Site Repeater	Bald North	61			3	Bald_North.Repeater.12
State of Colorado	Radio Site Repeater	Bald South	15			6	Bald_South.Repeater.1
State of Colorado	Radio Site Repeater	Bald South	15			6	Bald_South.Repeater.2
State of Colorado	Radio Site Repeater	Bald South	15			6	Bald_South.Repeater.3
State of Colorado	Radio Site Repeater	Bald South	15			6	Bald_South.Repeater.4
State of Colorado	Radio Site Repeater	Bald South	15			6	Bald_South.Repeater.5
State of Colorado	Radio Site Repeater	Bald South	15			6	Bald_South.Repeater.6
Holy Cross	Radio Site Repeater	Beacon Hill	96			2	Beacon_Hill.Repeater.1
Holy Cross	Radio Site Repeater	Beacon Hill	96			2	Beacon_Hill.Repeater.2
Holy Cross	Radio Site Repeater	Beacon Hill	96			2	Beacon_Hill.Repeater.3
Holy Cross	Radio Site Repeater	Beacon Hill	96			2	Beacon_Hill.Repeater.4
Holy Cross	Radio Site Repeater	Beacon Hill	96			2	Beacon_Hill.Repeater.5
Holy Cross	Radio Site Repeater	Beacon Hill	96			2	Beacon_Hill.Repeater.6
Holy Cross	Radio Site Repeater	Beacon Hill	96			2	Beacon_Hill.Repeater.7
Holy Cross	Radio Site Repeater	Beacon Hill	96			2	Beacon_Hill.Repeater.8
Larimer County	Radio Site Repeater	Bear Gulch	33			3	Bear_Gulch.Repeater.1
Larimer County	Radio Site Repeater	Bear Gulch	33			3	Bear_Gulch.Repeater.2
Larimer County	Radio Site Repeater	Bear Gulch	33			3	Bear_Gulch.Repeater.3
Larimer County	Radio Site Repeater	Bear Gulch	33			3	Bear_Gulch.Repeater.4
Larimer County	Radio Site Repeater	Bear Gulch	33			3	Bear_Gulch.Repeater.5
Eagle County	Radio Site Repeater	Beaver Creek	35			2	Beaver_Creek.Repeater.1
Eagle County	Radio Site Repeater	Beaver Creek	35			2	Beaver_Creek.Repeater.2
Eagle County	Radio Site Repeater	Beaver Creek	35			2	Beaver_Creek.Repeater.3
Eagle County	Radio Site Repeater	Beaver Creek	35			2	Beaver_Creek.Repeater.4
Eagle County	Radio Site Repeater	Beaver Creek	35			2	Beaver_Creek.Repeater.5
Eagle County	Radio Site Repeater	Beaver Creek	35			2	Beaver_Creek.Repeater.6
Holy Cross	Radio Site Repeater	Beaver Creek	35			2	Beaver_Creek.Repeater.7
State of Colorado	Radio Site Repeater	Betasso	32			3	Betasso.Repeater.1
State of Colorado	Radio Site Repeater	Betasso	32			3	Betasso.Repeater.2
State of Colorado	Radio Site Repeater	Betasso	32			3	Betasso.Repeater.3
State of Colorado	Radio Site Repeater	Betasso	32			3	Betasso.Repeater.4
State of Colorado	Radio Site Repeater	Betasso	32			3	Betasso.Repeater.5
State of Colorado	Radio Site Repeater	Bethune	30			1	Bethune.Repeater.1
State of Colorado	Radio Site Repeater	Bethune	30			1	Bethune.Repeater.2
State of Colorado	Radio Site Repeater	Bethune	30			1	Bethune.Repeater.3
State of Colorado	Radio Site Repeater	Bethune	30			1	Bethune.Repeater.4
State of Colorado	Radio Site Repeater	Bethune	30			1	Bethune.Repeater.5
PPRCN	Radio Site Repeater	Black Forest	21			4	Black_Forest.Repeater.1
PPRCN	Radio Site Repeater	Black Forest	21			4	Black_Forest.Repeater.2
PPRCN	Radio Site Repeater	Black Forest	21			4	Black_Forest.Repeater.3
PPRCN	Radio Site Repeater	Black Forest	21			4	Black_Forest.Repeater.4
PPRCN	Radio Site Repeater	Black Forest	21			4	Black_Forest.Repeater.5
PPRCN	Radio Site Repeater	Black Forest	21			4	Black_Forest.Repeater.6
PPRCN	Radio Site Repeater	Black Forest	21			4	Black_Forest.Repeater.7

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Radio Site Repeater	Black Hawk	19			1	Black_Hawk.Repeater.1
State of Colorado	Radio Site Repeater	Black Hawk	19			1	Black_Hawk.Repeater.2
State of Colorado	Radio Site Repeater	Black Hawk	19			1	Black_Hawk.Repeater.3
State of Colorado	Radio Site Repeater	Black Hawk	19			1	Black_Hawk.Repeater.4
State of Colorado	Radio Site Repeater	Black Hawk	19			1	Black_Hawk.Repeater.5
GJRCC	Radio Site Repeater	Black Ridge	22			2	Black_Ridge.Repeater.1
GJRCC	Radio Site Repeater	Black Ridge	22			2	Black_Ridge.Repeater.2
GJRCC	Radio Site Repeater	Black Ridge	22			2	Black_Ridge.Repeater.3
GJRCC	Radio Site Repeater	Black Ridge	22			2	Black_Ridge.Repeater.4
GJRCC	Radio Site Repeater	Black Ridge	22			2	Black_Ridge.Repeater.5
GJRCC	Radio Site Repeater	Black Ridge	22			2	Black_Ridge.Repeater.6
GJRCC	Radio Site Repeater	Black Ridge	22			2	Black_Ridge.Repeater.7
Eagle County	Radio Site Repeater	Blowout	59			2	Blowout.Repeater.1
Eagle County	Radio Site Repeater	Blowout	59			2	Blowout.Repeater.2
Eagle County	Radio Site Repeater	Blowout	59			2	Blowout.Repeater.3
Eagle County	Radio Site Repeater	Blowout	59			2	Blowout.Repeater.4
Eagle County	Radio Site Repeater	Blowout	59			2	Blowout.Repeater.5
Eagle County	Radio Site Repeater	Blowout	59			2	Blowout.Repeater.6
State of Colorado	Radio Site Repeater	Blue Ridge	48			3	Blue_Ridge.Repeater.1
State of Colorado	Radio Site Repeater	Blue Ridge	48			3	Blue_Ridge.Repeater.2
State of Colorado	Radio Site Repeater	Blue Ridge	48			3	Blue_Ridge.Repeater.3
State of Colorado	Radio Site Repeater	Blue Ridge	48			3	Blue_Ridge.Repeater.4
State of Colorado	Radio Site Repeater	Blue Ridge	48			3	Blue_Ridge.Repeater.5
State of Colorado	Radio Site Repeater	Bowen Marker	31			6	Bowen_Marker.Repeater.1
State of Colorado	Radio Site Repeater	Bowen Marker	31			6	Bowen_Marker.Repeater.2
State of Colorado	Radio Site Repeater	Bowen Marker	31			6	Bowen_Marker.Repeater.3
State of Colorado	Radio Site Repeater	Bowen Marker	31			6	Bowen_Marker.Repeater.4
State of Colorado	Radio Site Repeater	Bowen Marker	31			6	Bowen_Marker.Repeater.5
State of Colorado	Radio Site Repeater	Bowen Marker	31			6	Bowen_Marker.Repeater.6
State of Colorado	Radio Site Repeater	Boyero	22			1	Boyero.Repeater.1
State of Colorado	Radio Site Repeater	Boyero	22			1	Boyero.Repeater.2
State of Colorado	Radio Site Repeater	Boyero	22			1	Boyero.Repeater.3
State of Colorado	Radio Site Repeater	Boyero	22			1	Boyero.Repeater.4
State of Colorado	Radio Site Repeater	Boyero	22			1	Boyero.Repeater.5
State of Colorado	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.1
State of Colorado	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.2
State of Colorado	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.3
State of Colorado	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.4
State of Colorado	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.5
State of Colorado	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.6
State of Colorado	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.7
NCRCN	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.8
NCRCN	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.9
NCRCN	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.10
Larimer County	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.11
Larimer County	Radio Site Repeater	Buckhorn	13			3	Buckhorn.Repeater.12
State of Colorado	Radio Site Repeater	Buena Vista CF	4			6	Buena_Vista_CF.Repeater.1
State of Colorado	Radio Site Repeater	Buena Vista CF	4			6	Buena_Vista_CF.Repeater.2
State of Colorado	Radio Site Repeater	Buena Vista CF	4			6	Buena_Vista_CF.Repeater.3
State of Colorado	Radio Site Repeater	Buena Vista CF	4			6	Buena_Vista_CF.Repeater.4
State of Colorado	Radio Site Repeater	Buena Vista CF	4			6	Buena_Vista_CF.Repeater.5
State of Colorado	Radio Site Repeater	Buffalo Pass	3			2	Bufffalo_Pass.Repeater.1
State of Colorado	Radio Site Repeater	Buffalo Pass	3			2	Bufffalo_Pass.Repeater.2
State of Colorado	Radio Site Repeater	Buffalo Pass	3			2	Bufffalo_Pass.Repeater.3
State of Colorado	Radio Site Repeater	Buffalo Pass	3			2	Bufffalo_Pass.Repeater.4
State of Colorado	Radio Site Repeater	Buffalo Pass	3			2	Bufffalo_Pass.Repeater.5
Larimer County	Radio Site Repeater	Bull Mountain	23			3	Bull_Mountain.Repeater.1
Larimer County	Radio Site Repeater	Bull Mountain	23			3	Bull_Mountain.Repeater.2
Larimer County	Radio Site Repeater	Bull Mountain	23			3	Bull_Mountain.Repeater.3
Larimer County	Radio Site Repeater	Bull Mountain	23			3	Bull_Mountain.Repeater.4
Larimer County	Radio Site Repeater	Bull Mountain	23			3	Bull_Mountain.Repeater.5
Arapahoe County	Radio Site Repeater	Byers	73			1	Byers.Repeater.1
Arapahoe County	Radio Site Repeater	Byers	73			1	Byers.Repeater.2
Arapahoe County	Radio Site Repeater	Byers	73			1	Byers.Repeater.3
Arapahoe County	Radio Site Repeater	Byers	73			1	Byers.Repeater.4
Arapahoe County	Radio Site Repeater	Byers	73			1	Byers.Repeater.5
Arapahoe County	Radio Site Repeater	Byers	73			1	Byers.Repeater.6
PPRCN	Radio Site Repeater	Calhan	14			4	Calhan.Repeater.1
PPRCN	Radio Site Repeater	Calhan	14			4	Calhan.Repeater.2
PPRCN	Radio Site Repeater	Calhan	14			4	Calhan.Repeater.3
PPRCN	Radio Site Repeater	Calhan	14			4	Calhan.Repeater.4
PPRCN	Radio Site Repeater	Calhan	14			4	Calhan.Repeater.5
PPRCN	Radio Site Repeater	Calhan	14			4	Calhan.Repeater.6
State of Colorado	Radio Site Repeater	Carlton	29			6	Carlton.Repeater.1
State of Colorado	Radio Site Repeater	Carlton	29			6	Carlton.Repeater.2
State of Colorado	Radio Site Repeater	Carlton	29			6	Carlton.Repeater.3
State of Colorado	Radio Site Repeater	Carlton	29			6	Carlton.Repeater.4
State of Colorado	Radio Site Repeater	Carlton	29			6	Carlton.Repeater.5
Eagle County	Radio Site Repeater	Castle	47			2	Castle.Repeater.1
Eagle County	Radio Site Repeater	Castle	47			2	Castle.Repeater.2
Eagle County	Radio Site Repeater	Castle	47			2	Castle.Repeater.3

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
Eagle County	Radio Site Repeater	Castle	47			2	Castle.Repeater.4
Eagle County	Radio Site Repeater	Castle	47			2	Castle.Repeater.5
Eagle County	Radio Site Repeater	Castle	47			2	Castle.Repeater.6
State of Colorado	Radio Site Repeater	Cathedral Bluffs	6			2	Cathedral_Bluffs.Repeater.1
State of Colorado	Radio Site Repeater	Cathedral Bluffs	6			2	Cathedral_Bluffs.Repeater.2
State of Colorado	Radio Site Repeater	Cathedral Bluffs	6			2	Cathedral_Bluffs.Repeater.3
State of Colorado	Radio Site Repeater	Cathedral Bluffs	6			2	Cathedral_Bluffs.Repeater.4
State of Colorado	Radio Site Repeater	Cathedral Bluffs	6			2	Cathedral_Bluffs.Repeater.5
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.1
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.2
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.3
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.4
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.5
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.6
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.7
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.8
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.9
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.10
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.11
PPRCN	Radio Site Repeater	Cedar Heights	24			4	Cedar_Heights.Repeater.12
State of Colorado	Radio Site Repeater	Cedar Mtn	21			2	Cedar_Mtn.Repeater.1
State of Colorado	Radio Site Repeater	Cedar Mtn	21			2	Cedar_Mtn.Repeater.2
State of Colorado	Radio Site Repeater	Cedar Mtn	21			2	Cedar_Mtn.Repeater.3
State of Colorado	Radio Site Repeater	Cedar Mtn	21			2	Cedar_Mtn.Repeater.4
State of Colorado	Radio Site Repeater	Cedar Mtn	21			2	Cedar_Mtn.Repeater.5
State of Colorado	Radio Site Repeater	Cedar Mtn	21			2	Cedar_Mtn.Repeater.6
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.1
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.2
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.3
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.4
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.5
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.6
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.7
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.8
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.9
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.10
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.11
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.12
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.13
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.14
Arapahoe County	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.15
RTD	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.16
RTD	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.17
RTD	Radio Site Repeater	Chevron	64			1	Chevron.Repeater.18
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.1
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.2
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.3
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.4
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.5
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.6
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.7
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.8
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.9
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.10
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.11
State of Colorado	Radio Site Repeater	Cheyenne Mtn	48			6	Cheyenne_Mtn.Repeater.12
State of Colorado	Radio Site Repeater	Coal Bank	28			2	Coal_Bank.Repeater.1
State of Colorado	Radio Site Repeater	Coal Bank	28			2	Coal_Bank.Repeater.2
State of Colorado	Radio Site Repeater	Coal Bank	28			2	Coal_Bank.Repeater.3
State of Colorado	Radio Site Repeater	Coal Bank	28			2	Coal_Bank.Repeater.4
State of Colorado	Radio Site Repeater	Coal Bank	28			2	Coal_Bank.Repeater.5
State of Colorado	Radio Site Repeater	Coaldale	64			6	Coaldale.Repeater.1
State of Colorado	Radio Site Repeater	Coaldale	64			6	Coaldale.Repeater.2
State of Colorado	Radio Site Repeater	Coaldale	64			6	Coaldale.Repeater.3
State of Colorado	Radio Site Repeater	Coaldale	64			6	Coaldale.Repeater.4
State of Colorado	Radio Site Repeater	Coaldale	64			6	Coaldale.Repeater.5
GJRCC	Radio Site Repeater	Collbran	98			2	Collbran.Repeater.1
GJRCC	Radio Site Repeater	Collbran	98			2	Collbran.Repeater.2
GJRCC	Radio Site Repeater	Collbran	98			2	Collbran.Repeater.3
GJRCC	Radio Site Repeater	Collbran	98			2	Collbran.Repeater.4
GJRCC	Radio Site Repeater	Collbran	98			2	Collbran.Repeater.5
GJRCC	Radio Site Repeater	Collbran	98			2	Collbran.Repeater.6
State of Colorado	Radio Site Repeater	Coonskin	72			2	Coonskin.Repeater.1
State of Colorado	Radio Site Repeater	Coonskin	72			2	Coonskin.Repeater.2
State of Colorado	Radio Site Repeater	Coonskin	72			2	Coonskin.Repeater.3
State of Colorado	Radio Site Repeater	Coonskin	72			2	Coonskin.Repeater.4
State of Colorado	Radio Site Repeater	Coonskin	72			2	Coonskin.Repeater.5
Summit County	Radio Site Repeater	Copper Mtn	7			2	Copper_Mtn.Repeater.1
Summit County	Radio Site Repeater	Copper Mtn	7			2	Copper_Mtn.Repeater.2
Summit County	Radio Site Repeater	Copper Mtn	7			2	Copper_Mtn.Repeater.3
Summit County	Radio Site Repeater	Copper Mtn	7			2	Copper_Mtn.Repeater.4

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
Summit County	Radio Site Repeater	Copper Mtn	7			2	Copper_Mtn.Repeater.5
State of Colorado	Radio Site Repeater	Cordova Pass	59			6	Cordova_Pass.Repeater.1
State of Colorado	Radio Site Repeater	Cordova Pass	59			6	Cordova_Pass.Repeater.2
State of Colorado	Radio Site Repeater	Cordova Pass	59			6	Cordova_Pass.Repeater.3
State of Colorado	Radio Site Repeater	Cordova Pass	59			6	Cordova_Pass.Repeater.4
State of Colorado	Radio Site Repeater	Cordova Pass	59			6	Cordova_Pass.Repeater.5
State of Colorado	Radio Site Repeater	Craig	91			2	Craig.Repeater.1
State of Colorado	Radio Site Repeater	Craig	91			2	Craig.Repeater.2
State of Colorado	Radio Site Repeater	Craig	91			2	Craig.Repeater.3
State of Colorado	Radio Site Repeater	Craig	91			2	Craig.Repeater.4
State of Colorado	Radio Site Repeater	Craig	91			2	Craig.Repeater.5
State of Colorado	Radio Site Repeater	Craig	91			2	Craig.Repeater.6
State of Colorado	Radio Site Repeater	Creede	67			6	Creede.Repeater.1
State of Colorado	Radio Site Repeater	Creede	67			6	Creede.Repeater.2
State of Colorado	Radio Site Repeater	Creede	67			6	Creede.Repeater.3
State of Colorado	Radio Site Repeater	Creede	67			6	Creede.Repeater.4
State of Colorado	Radio Site Repeater	Creede	67			6	Creede.Repeater.5
State of Colorado	Radio Site Repeater	Crested Butte	65			2	Crested_Butte.Repeater.1
State of Colorado	Radio Site Repeater	Crested Butte	65			2	Crested_Butte.Repeater.2
State of Colorado	Radio Site Repeater	Crested Butte	65			2	Crested_Butte.Repeater.3
State of Colorado	Radio Site Repeater	Crested Butte	65			2	Crested_Butte.Repeater.4
State of Colorado	Radio Site Repeater	Crested Butte	65			2	Crested_Butte.Repeater.5
Pitkin County	Radio Site Repeater	Crown Mountain	86			2	Crown_Mountain.Repeater.1
Pitkin County	Radio Site Repeater	Crown Mountain	86			2	Crown_Mountain.Repeater.2
Pitkin County	Radio Site Repeater	Crown Mountain	86			2	Crown_Mountain.Repeater.3
Pitkin County	Radio Site Repeater	Crown Mountain	86			2	Crown_Mountain.Repeater.4
Pitkin County	Radio Site Repeater	Crown Mountain	86			2	Crown_Mountain.Repeater.5
State of Colorado	Radio Site Repeater	Dakota	24			1	Dakota_Mountain.Repeater.1
State of Colorado	Radio Site Repeater	Dakota	24			1	Dakota_Mountain.Repeater.2
State of Colorado	Radio Site Repeater	Dakota	24			1	Dakota_Mountain.Repeater.3
State of Colorado	Radio Site Repeater	Dakota	24			1	Dakota_Mountain.Repeater.4
State of Colorado	Radio Site Repeater	Dakota	24			1	Dakota_Mountain.Repeater.5
State of Colorado	Radio Site Repeater	Dakota	24			1	Dakota_Mountain.Repeater.6
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.1
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.2
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.3
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.4
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.5
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.6
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.7
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.8
State of Colorado	Radio Site Repeater	Deer Peak	51			6	Deer_Peak.Repeater.9
Arapahoe County	Radio Site Repeater	Deer Trail	37			1	Deer_Trail.Repeater.1
Arapahoe County	Radio Site Repeater	Deer Trail	37			1	Deer_Trail.Repeater.2
Arapahoe County	Radio Site Repeater	Deer Trail	37			1	Deer_Trail.Repeater.3
Arapahoe County	Radio Site Repeater	Deer Trail	37			1	Deer_Trail.Repeater.4
Arapahoe County	Radio Site Repeater	Deer Trail	37			1	Deer_Trail.Repeater.5
State of Colorado	Radio Site Repeater	Deer Trail	37			1	Deer_Trail.Repeater.6
State of Colorado	Radio Site Repeater	Delta	51			2	Delta.Repeater.1
State of Colorado	Radio Site Repeater	Delta	51			2	Delta.Repeater.2
State of Colorado	Radio Site Repeater	Delta	51			2	Delta.Repeater.3
State of Colorado	Radio Site Repeater	Delta	51			2	Delta.Repeater.4
State of Colorado	Radio Site Repeater	Delta	51			2	Delta.Repeater.5
State of Colorado	Radio Site Repeater	Dolores	8			2	Dolores.Repeater.1
State of Colorado	Radio Site Repeater	Dolores	8			2	Dolores.Repeater.2
State of Colorado	Radio Site Repeater	Dolores	8			2	Dolores.Repeater.3
State of Colorado	Radio Site Repeater	Dolores	8			2	Dolores.Repeater.4
SW Region	Radio Site Repeater	Dolores	8			2	Dolores.Repeater.5
SW Region	Radio Site Repeater	Dolores	8			2	Dolores.Repeater.6
Rio Blanco County	Radio Site Repeater	Douglas Pass	64			2	Douglas_Pass.Repeater.1
Rio Blanco County	Radio Site Repeater	Douglas Pass	64			2	Douglas_Pass.Repeater.2
Rio Blanco County	Radio Site Repeater	Douglas Pass	64			2	Douglas_Pass.Repeater.3
Rio Blanco County	Radio Site Repeater	Douglas Pass	64			2	Douglas_Pass.Repeater.4
Rio Blanco County	Radio Site Repeater	Douglas Pass	64			2	Douglas_Pass.Repeater.5
Rio Blanco County	Radio Site Repeater	Douglas Pass	64			2	Douglas_Pass.Repeater.6
NCRCN	Radio Site Repeater	Drake	59			3	Drake.Repeater.1
NCRCN	Radio Site Repeater	Drake	59			3	Drake.Repeater.2
NCRCN	Radio Site Repeater	Drake	59			3	Drake.Repeater.3
Larimer County	Radio Site Repeater	Drake	59			3	Drake.Repeater.4
Larimer County	Radio Site Repeater	Drake	59			3	Drake.Repeater.5
State of Colorado	Radio Site Repeater	DRDC CF	9			1	DRDC_CF.Repeater.1
State of Colorado	Radio Site Repeater	DRDC CF	9			1	DRDC_CF.Repeater.2
State of Colorado	Radio Site Repeater	DRDC CF	9			1	DRDC_CF.Repeater.3
State of Colorado	Radio Site Repeater	DRDC CF	9			1	DRDC_CF.Repeater.4
State of Colorado	Radio Site Repeater	DRDC CF	9			1	DRDC_CF.Repeater.5
State of Colorado	Radio Site Repeater	DRDC CF	9			1	DRDC_CF.Repeater.6
State of Colorado	Radio Site Repeater	DRDC CF	9			1	DRDC_CF.Repeater.7
Glendale, City of	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.1
Glendale, City of	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.2
Glendale, City of	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.3
RTD	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.4

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
RTD	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.5
RTD	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.6
Arapahoe County	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.7
Arapahoe County	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.8
Arapahoe County	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.9
Arapahoe County	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.10
Arapahoe County	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.11
Arapahoe County	Radio Site Repeater	Denver TX	20			1	Denver TX.Repeater.12
State of Colorado	Radio Site Repeater	DTB Test	67			1	DTB_Test.Repeater.1
State of Colorado	Radio Site Repeater	DTB Test	67			1	DTB_Test.Repeater.2
State of Colorado	Radio Site Repeater	DTB Test	67			1	DTB_Test.Repeater.3
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.1
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.2
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.3
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.4
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.5
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.6
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.7
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.8
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.9
State of Colorado	Radio Site Repeater	East Canon Complex (ECC)	58			6	ECC.Repeater.10
Eagle County	Radio Site Repeater	East Vail	78			2	East_Vail.Repeater.1
Eagle County	Radio Site Repeater	East Vail	78			2	East_Vail.Repeater.2
Eagle County	Radio Site Repeater	East Vail	78			2	East_Vail.Repeater.3
Eagle County	Radio Site Repeater	East Vail	78			2	East_Vail.Repeater.4
Eagle County	Radio Site Repeater	East Vail	78			2	East_Vail.Repeater.5
State of Colorado	Radio Site Repeater	Egnar	79			2	Egnar.Repeater.1
State of Colorado	Radio Site Repeater	Egnar	79			2	Egnar.Repeater.2
State of Colorado	Radio Site Repeater	Egnar	79			2	Egnar.Repeater.3
State of Colorado	Radio Site Repeater	Egnar	79			2	Egnar.Repeater.4
State of Colorado	Radio Site Repeater	Egnar	79			2	Egnar.Repeater.5
Steamboat Springs, City of	Radio Site Repeater	Emerald Mtn	81			2	Emerald_Mtn.Repeater.1
Steamboat Springs, City of	Radio Site Repeater	Emerald Mtn	81			2	Emerald_Mtn.Repeater.2
Steamboat Springs, City of	Radio Site Repeater	Emerald Mtn	81			2	Emerald_Mtn.Repeater.3
Steamboat Springs, City of	Radio Site Repeater	Emerald Mtn	81			2	Emerald_Mtn.Repeater.4
Steamboat Springs, City of	Radio Site Repeater	Emerald Mtn	81			2	Emerald_Mtn.Repeater.5
State of Colorado	Radio Site Repeater	Farwell	73			2	Farwell.Repeater.1
State of Colorado	Radio Site Repeater	Farwell	73			2	Farwell.Repeater.2
State of Colorado	Radio Site Repeater	Farwell	73			2	Farwell.Repeater.3
State of Colorado	Radio Site Repeater	Farwell	73			2	Farwell.Repeater.4
State of Colorado	Radio Site Repeater	Farwell	73			2	Farwell.Repeater.5
State of Colorado	Radio Site Repeater	Firstview	33			1	Firstview.Repeater.1
State of Colorado	Radio Site Repeater	Firstview	33			1	Firstview.Repeater.2
State of Colorado	Radio Site Repeater	Firstview	33			1	Firstview.Repeater.3
State of Colorado	Radio Site Repeater	Firstview	33			1	Firstview.Repeater.4
State of Colorado	Radio Site Repeater	Firstview	33			1	Firstview.Repeater.5
NCRCN	Radio Site Repeater	Fort Collins PVH	60			3	Fort_Collins_PVH.Repeater.1
NCRCN	Radio Site Repeater	Fort Collins PVH	60			3	Fort_Collins_PVH.Repeater.2
NCRCN	Radio Site Repeater	Fort Collins PVH	60			3	Fort_Collins_PVH.Repeater.3
NCRCN	Radio Site Repeater	Fort Collins PVH	60			3	Fort_Collins_PVH.Repeater.4
NCRCN	Radio Site Repeater	Fort Collins PVH	60			3	Fort_Collins_PVH.Repeater.5
NCRCN	Radio Site Repeater	Fort Collins PVH	60			3	Fort_Collins_PVH.Repeater.6
NCRCN	Radio Site Repeater	Fort Collins PVH	60			3	Fort_Collins_PVH.Repeater.7
State of Colorado	Radio Site Repeater	Fort Lyon CF	55			6	Fort_Lyon_CF.Repeater.1
State of Colorado	Radio Site Repeater	Fort Lyon CF	55			6	Fort_Lyon_CF.Repeater.2
State of Colorado	Radio Site Repeater	Fort Lyon CF	55			6	Fort_Lyon_CF.Repeater.3
State of Colorado	Radio Site Repeater	Fort Lyon CF	55			6	Fort_Lyon_CF.Repeater.4
State of Colorado	Radio Site Repeater	Fort Lyon CF	55			6	Fort_Lyon_CF.Repeater.5
Otero County	Radio Site Repeater	Fort Lyon CF	55			6	Fort_Lyon_CF.Repeater.6
State of Colorado	Radio Site Repeater	Fort Morgan	16			3	Fort_Morgan.Repeater.1
State of Colorado	Radio Site Repeater	Fort Morgan	16			3	Fort_Morgan.Repeater.2
State of Colorado	Radio Site Repeater	Fort Morgan	16			3	Fort_Morgan.Repeater.3
State of Colorado	Radio Site Repeater	Fort Morgan	16			3	Fort_Morgan.Repeater.4
State of Colorado	Radio Site Repeater	Fort Morgan	16			3	Fort_Morgan.Repeater.5
State of Colorado	Radio Site Repeater	Fort Morgan	16			3	Fort_Morgan.Repeater.6
PPRCN	Radio Site Repeater	Fountain Valley	11			4	Fountain_Valley.Repeater.1
PPRCN	Radio Site Repeater	Fountain Valley	11			4	Fountain_Valley.Repeater.2
PPRCN	Radio Site Repeater	Fountain Valley	11			4	Fountain_Valley.Repeater.3
PPRCN	Radio Site Repeater	Fountain Valley	11			4	Fountain_Valley.Repeater.4
PPRCN	Radio Site Repeater	Fountain Valley	11			4	Fountain_Valley.Repeater.5
PPRCN	Radio Site Repeater	Fountain Valley	11			4	Fountain_Valley.Repeater.6
PPRCN	Radio Site Repeater	Fountain Valley	11			4	Fountain_Valley.Repeater.7
PPRCN	Radio Site Repeater	Fountain Valley	11			4	Fountain_Valley.Repeater.8
State of Colorado	Radio Site Repeater	Fowler	34			6	Fowler.Repeater.1
State of Colorado	Radio Site Repeater	Fowler	34			6	Fowler.Repeater.2
State of Colorado	Radio Site Repeater	Fowler	34			6	Fowler.Repeater.3
State of Colorado	Radio Site Repeater	Fowler	34			6	Fowler.Repeater.4
State of Colorado	Radio Site Repeater	Fowler	34			6	Fowler.Repeater.5
State of Colorado	Radio Site Repeater	Fowler	34			6	Fowler.Repeater.6
State of Colorado	Radio Site Repeater	Franktown	10			1	Franktown.Repeater.1
State of Colorado	Radio Site Repeater	Franktown	10			1	Franktown.Repeater.2

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Radio Site Repeater	Franktown	10			1	Franktown.Repeater.3
State of Colorado	Radio Site Repeater	Franktown	10			1	Franktown.Repeater.4
State of Colorado	Radio Site Repeater	Franktown	10			1	Franktown.Repeater.5
State of Colorado	Radio Site Repeater	Franktown	10			1	Franktown.Repeater.6
Huerfano County	Radio Site Repeater	Gardner	53			6	Gardner.Repeater.1
Huerfano County	Radio Site Repeater	Gardner	53			6	Gardner.Repeater.2
Huerfano County	Radio Site Repeater	Gardner	53			6	Gardner.Repeater.3
Huerfano County	Radio Site Repeater	Gardner	53			6	Gardner.Repeater.4
Huerfano County	Radio Site Repeater	Gardner	53			6	Gardner.Repeater.5
Garfield County	Radio Site Repeater	Glenwood	26			2	Glenwood.Repeater.1
Garfield County	Radio Site Repeater	Glenwood	26			2	Glenwood.Repeater.2
Garfield County	Radio Site Repeater	Glenwood	26			2	Glenwood.Repeater.3
Garfield County	Radio Site Repeater	Glenwood	26			2	Glenwood.Repeater.4
Garfield County	Radio Site Repeater	Glenwood	26			2	Glenwood.Repeater.5
Roaring Fork Transportation Authority	Radio Site Repeater	Glenwood	26			2	Glenwood.Repeater.6
Roaring Fork Transportation Authority	Radio Site Repeater	Glenwood	26			2	Glenwood.Repeater.7
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.1
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.2
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.3
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.4
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.5
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.6
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.7
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.8
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.9
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.10
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.11
Pueblo, City of	Radio Site Repeater	Goat Hill	1-2			6	Goat_Hill.Repeater.12
Montrose County	Radio Site Repeater	Gobblers Knob	46			2	Gobblers_Knob.Repeater.1
Montrose County	Radio Site Repeater	Gobblers Knob	46			2	Gobblers_Knob.Repeater.2
Montrose County	Radio Site Repeater	Gobblers Knob	46			2	Gobblers_Knob.Repeater.3
Montrose County	Radio Site Repeater	Gobblers Knob	46			2	Gobblers_Knob.Repeater.4
GJRCC	Radio Site Repeater	Grand Junction	89			2	Grand_Junction.Repeater.1
GJRCC	Radio Site Repeater	Grand Junction	89			2	Grand_Junction.Repeater.2
GJRCC	Radio Site Repeater	Grand Junction	89			2	Grand_Junction.Repeater.3
GJRCC	Radio Site Repeater	Grand Junction	89			2	Grand_Junction.Repeater.4
GJRCC	Radio Site Repeater	Grand Junction	89			2	Grand_Junction.Repeater.5
GJRCC	Radio Site Repeater	Grand Junction	89			2	Grand_Junction.Repeater.6
GJRCC	Radio Site Repeater	Grand Junction	89			2	Grand_Junction.Repeater.7
State of Colorado	Radio Site Repeater	Grand Mesa	1			2	Grand_Mesa.Repeater.1
State of Colorado	Radio Site Repeater	Grand Mesa	1			2	Grand_Mesa.Repeater.2
State of Colorado	Radio Site Repeater	Grand Mesa	1			2	Grand_Mesa.Repeater.3
State of Colorado	Radio Site Repeater	Grand Mesa	1			2	Grand_Mesa.Repeater.4
GJRCC	Radio Site Repeater	Grand Mesa	1			2	Grand_Mesa.Repeater.5
GJRCC	Radio Site Repeater	Grand Mesa	1			2	Grand_Mesa.Repeater.6
GJRCC	Radio Site Repeater	Grand Mesa	1			2	Grand_Mesa.Repeater.7
GJRCC	Radio Site Repeater	Grand Mesa	1			2	Grand_Mesa.Repeater.8
US Bureau of Reclamation	Radio Site Repeater	Granite	33			2	Granite.Repeater.1
US Bureau of Reclamation	Radio Site Repeater	Granite	33			2	Granite.Repeater.2
US Bureau of Reclamation	Radio Site Repeater	Granite	33			2	Granite.Repeater.3
US Bureau of Reclamation	Radio Site Repeater	Granite	33			2	Granite.Repeater.4
US Bureau of Reclamation	Radio Site Repeater	Granite	33			2	Granite.Repeater.5
Lake County	Radio Site Repeater	Granite	33			2	Granite.Repeater.6
State of Colorado	Radio Site Repeater	Grassy	71			2	Grassy.Repeater.1
State of Colorado	Radio Site Repeater	Grassy	71			2	Grassy.Repeater.2
State of Colorado	Radio Site Repeater	Grassy	71			2	Grassy.Repeater.3
State of Colorado	Radio Site Repeater	Grassy	71			2	Grassy.Repeater.4
State of Colorado	Radio Site Repeater	Grassy	71			2	Grassy.Repeater.5
State of Colorado	Radio Site Repeater	Grassy	71			2	Grassy.Repeater.6
State of Colorado	Radio Site Repeater	Greeley - State	14			3	Greeley.Repeater.1
State of Colorado	Radio Site Repeater	Greeley - State	14			3	Greeley.Repeater.2
State of Colorado	Radio Site Repeater	Greeley - State	14			3	Greeley.Repeater.3
State of Colorado	Radio Site Repeater	Greeley - State	14			3	Greeley.Repeater.4
State of Colorado	Radio Site Repeater	Greeley - State	14			3	Greeley.Repeater.5
State of Colorado	Radio Site Repeater	Greeley - State	14			3	Greeley.Repeater.6
State of Colorado	Radio Site Repeater	Greenhorn	35			6	Greenhorn.Repeater.1
State of Colorado	Radio Site Repeater	Greenhorn	35			6	Greenhorn.Repeater.2
State of Colorado	Radio Site Repeater	Greenhorn	35			6	Greenhorn.Repeater.3
State of Colorado	Radio Site Repeater	Greenhorn	35			6	Greenhorn.Repeater.4
State of Colorado	Radio Site Repeater	Greenhorn	35			6	Greenhorn.Repeater.5
State of Colorado	Radio Site Repeater	Greenhorn	35			6	Greenhorn.Repeater.6
State of Colorado	Radio Site Repeater	Grouse	30			2	Grouse.Repeater.1
State of Colorado	Radio Site Repeater	Grouse	30			2	Grouse.Repeater.2
State of Colorado	Radio Site Repeater	Grouse	30			2	Grouse.Repeater.3
State of Colorado	Radio Site Repeater	Grouse	30			2	Grouse.Repeater.4
State of Colorado	Radio Site Repeater	Grouse	30			2	Grouse.Repeater.5
State of Colorado	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.1
State of Colorado	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.2
State of Colorado	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.3
State of Colorado	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.4
State of Colorado	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.5

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
Longmont, City of	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.6
RTD	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.7
RTD	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.8
RTD	Radio Site Repeater	Gunbarrel	54			3	Gunbarrel.Repeater.9
US Bureau of Reclamation	Radio Site Repeater	Hagerman Pass	32			2	Hagerman_Pass.Repeater.1
US Bureau of Reclamation	Radio Site Repeater	Hagerman Pass	32			2	Hagerman_Pass.Repeater.2
US Bureau of Reclamation	Radio Site Repeater	Hagerman Pass	32			2	Hagerman_Pass.Repeater.3
US Bureau of Reclamation	Radio Site Repeater	Hagerman Pass	32			2	Hagerman_Pass.Repeater.4
US Bureau of Reclamation	Radio Site Repeater	Hagerman Pass	32			2	Hagerman_Pass.Repeater.5
Lake County	Radio Site Repeater	Hagerman Pass	32			2	Hagerman_Pass.Repeater.6
State of Colorado	Radio Site Repeater	Harper Hill	39			2	Harper_Hill.Repeater.1
State of Colorado	Radio Site Repeater	Harper Hill	39			2	Harper_Hill.Repeater.2
State of Colorado	Radio Site Repeater	Harper Hill	39			2	Harper_Hill.Repeater.3
State of Colorado	Radio Site Repeater	Harper Hill	39			2	Harper_Hill.Repeater.4
State of Colorado	Radio Site Repeater	Harper Hill	39			2	Harper_Hill.Repeater.5
State of Colorado	Radio Site Repeater	Haswell	36			6	Haswell.Repeater.1
State of Colorado	Radio Site Repeater	Haswell	36			6	Haswell.Repeater.2
State of Colorado	Radio Site Repeater	Haswell	36			6	Haswell.Repeater.3
State of Colorado	Radio Site Repeater	Haswell	36			6	Haswell.Repeater.4
State of Colorado	Radio Site Repeater	Haswell	36			6	Haswell.Repeater.5
State of Colorado	Radio Site Repeater	Hayden	67			2	Hayden.Repeater.1
State of Colorado	Radio Site Repeater	Hayden	67			2	Hayden.Repeater.2
State of Colorado	Radio Site Repeater	Hayden	67			2	Hayden.Repeater.3
State of Colorado	Radio Site Repeater	Hayden	67			2	Hayden.Repeater.4
State of Colorado	Radio Site Repeater	Hayden	67			2	Hayden.Repeater.5
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.1
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.2
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.3
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.4
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.5
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.6
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.7
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.8
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.9
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.10
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.11
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.12
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.13
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.14
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.15
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.16
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.17
Douglas County	Radio Site Repeater	Hess	14-x			1	Hess.Repeater.18
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.1
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.2
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.3
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.4
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.5
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.6
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.7
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.8
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.9
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.10
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.11
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.12
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.13
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.14
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.15
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.16
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.17
Douglas County	Radio Site Repeater	Hidden Mesa	14-x			1	Hidden.Mesa.Repeater.18
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.1
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.2
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.3
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.4
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.5
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.6
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.7
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.8
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.9
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.10
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.11
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.12
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.13
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.14
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.15
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.16
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.17
Douglas County	Radio Site Repeater	Highlands Ranch	14-x			1	Highlands.Ranch.Repeater.18
State of Colorado	Radio Site Repeater	Hill 71	80			2	Hill_71.Repeater.1
State of Colorado	Radio Site Repeater	Hill 71	80			2	Hill_71.Repeater.2

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Radio Site Repeater	Hill 71	80			2	Hill_71.Repeater.3
State of Colorado	Radio Site Repeater	Hill 71	80			2	Hill_71.Repeater.4
State of Colorado	Radio Site Repeater	Hill 71	80			2	Hill_71.Repeater.5
State of Colorado	Radio Site Repeater	Holly	44			6	Holly.Repeater.1
State of Colorado	Radio Site Repeater	Holly	44			6	Holly.Repeater.2
State of Colorado	Radio Site Repeater	Holly	44			6	Holly.Repeater.3
State of Colorado	Radio Site Repeater	Holly	44			6	Holly.Repeater.4
State of Colorado	Radio Site Repeater	Holly	44			6	Holly.Repeater.5
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.1
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.2
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.3
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.4
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.5
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.6
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.7
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.8
NCRCN	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.9
Larimer County	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.10
Larimer County	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.11
Larimer County	Radio Site Repeater	Horsetooth	62			3	Horsetooth.Repeater.12
State of Colorado	Radio Site Repeater	Hugo	63			1	Hugo.Repeater.1
State of Colorado	Radio Site Repeater	Hugo	63			1	Hugo.Repeater.2
State of Colorado	Radio Site Repeater	Hugo	63			1	Hugo.Repeater.3
State of Colorado	Radio Site Repeater	Hugo	63			1	Hugo.Repeater.4
State of Colorado	Radio Site Repeater	Hugo	63			1	Hugo.Repeater.5
State of Colorado	Radio Site Repeater	Idalia	31			3	Idalia.Repeater.1
State of Colorado	Radio Site Repeater	Idalia	31			3	Idalia.Repeater.2
State of Colorado	Radio Site Repeater	Idalia	31			3	Idalia.Repeater.3
State of Colorado	Radio Site Repeater	Idalia	31			3	Idalia.Repeater.4
State of Colorado	Radio Site Repeater	Idalia	31			3	Idalia.Repeater.5
Southern Ute	Radio Site Repeater	Ignacio	90			2	Ignacio.Repeater.1
Southern Ute	Radio Site Repeater	Ignacio	90			2	Ignacio.Repeater.2
Southern Ute	Radio Site Repeater	Ignacio	90			2	Ignacio.Repeater.3
Southern Ute	Radio Site Repeater	Ignacio	90			2	Ignacio.Repeater.4
Southern Ute	Radio Site Repeater	Ignacio	90			2	Ignacio.Repeater.5
Southern Ute	Radio Site Repeater	Ignacio	90			2	Ignacio.Repeater.6
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.1
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.2
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.3
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.4
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.5
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.6
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.7
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.8
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.9
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.10
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.11
Pueblo, City of	Radio Site Repeater	Jackson Hill	1-3			6	Jackson_Hill.Repeater.12
State of Colorado	Radio Site Repeater	Julesburg	35			3	Julesburg.Repeater.1
State of Colorado	Radio Site Repeater	Julesburg	35			3	Julesburg.Repeater.2
State of Colorado	Radio Site Repeater	Julesburg	35			3	Julesburg.Repeater.3
State of Colorado	Radio Site Repeater	Julesburg	35			3	Julesburg.Repeater.4
State of Colorado	Radio Site Repeater	Julesburg	35			3	Julesburg.Repeater.5
State of Colorado	Radio Site Repeater	Juniper Mtn	25			2	Juniper_Mtn.Repeater.1
State of Colorado	Radio Site Repeater	Juniper Mtn	25			2	Juniper_Mtn.Repeater.2
State of Colorado	Radio Site Repeater	Juniper Mtn	25			2	Juniper_Mtn.Repeater.3
State of Colorado	Radio Site Repeater	Juniper Mtn	25			2	Juniper_Mtn.Repeater.4
State of Colorado	Radio Site Repeater	Juniper Mtn	25			2	Juniper_Mtn.Repeater.5
State of Colorado	Radio Site Repeater	Kim	25			6	Kim.Repeater.1
State of Colorado	Radio Site Repeater	Kim	25			6	Kim.Repeater.2
State of Colorado	Radio Site Repeater	Kim	25			6	Kim.Repeater.3
State of Colorado	Radio Site Repeater	Kim	25			6	Kim.Repeater.4
State of Colorado	Radio Site Repeater	Kim	25			6	Kim.Repeater.5
State of Colorado	Radio Site Repeater	King Mountain	31			2	King_Mountain.Repeater.1
State of Colorado	Radio Site Repeater	King Mountain	31			2	King_Mountain.Repeater.2
State of Colorado	Radio Site Repeater	King Mountain	31			2	King_Mountain.Repeater.3
State of Colorado	Radio Site Repeater	King Mountain	31			2	King_Mountain.Repeater.4
State of Colorado	Radio Site Repeater	King Mountain	31			2	King_Mountain.Repeater.5
State of Colorado	Radio Site Repeater	Kiowa	72			1	Kiowa.Repeater.1
State of Colorado	Radio Site Repeater	Kiowa	72			1	Kiowa.Repeater.2
State of Colorado	Radio Site Repeater	Kiowa	72			1	Kiowa.Repeater.3
State of Colorado	Radio Site Repeater	Kiowa	72			1	Kiowa.Repeater.4
State of Colorado	Radio Site Repeater	Kiowa	72			1	Kiowa.Repeater.5
State of Colorado	Radio Site Repeater	Kiowa	72			1	Kiowa.Repeater.6
La Junta, City of	Radio Site Repeater	La Junta	68			6	La_Junta.Repeater.1
La Junta, City of	Radio Site Repeater	La Junta	68			6	La_Junta.Repeater.2
La Junta, City of	Radio Site Repeater	La Junta	68			6	La_Junta.Repeater.3
La Junta, City of	Radio Site Repeater	La Junta	68			6	La_Junta.Repeater.4
La Junta, City of	Radio Site Repeater	La Junta	68			6	La_Junta.Repeater.5
La Junta, City of	Radio Site Repeater	La Junta	68			6	La_Junta.Repeater.6
State of Colorado	Radio Site Repeater	La Monte Peak	9			2	La_Monte_Peak.Repeater.1

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Radio Site Repeater	La Monte Peak	9			2	La_Monte_Peak.Repeater.2
State of Colorado	Radio Site Repeater	La Monte Peak	9			2	La_Monte_Peak.Repeater.3
State of Colorado	Radio Site Repeater	La Monte Peak	9			2	La_Monte_Peak.Repeater.4
SW Region	Radio Site Repeater	La Monte Peak	9			2	La_Monte_Peak.Repeater.5
SW Region	Radio Site Repeater	La Monte Peak	9			2	La_Monte_Peak.Repeater.6
State of Colorado	Radio Site Repeater	La Veta	32			6	La_Veta.Repeater.1
State of Colorado	Radio Site Repeater	La Veta	32			6	La_Veta.Repeater.2
State of Colorado	Radio Site Repeater	La Veta	32			6	La_Veta.Repeater.3
State of Colorado	Radio Site Repeater	La Veta	32			6	La_Veta.Repeater.4
State of Colorado	Radio Site Repeater	La Veta	32			6	La_Veta.Repeater.5
State of Colorado	Radio Site Repeater	La Veta	32			6	La_Veta.Repeater.6
State of Colorado	Radio Site Repeater	Lake Hill	57			2	Lake_Hill.Repeater.1
State of Colorado	Radio Site Repeater	Lake Hill	57			2	Lake_Hill.Repeater.2
State of Colorado	Radio Site Repeater	Lake Hill	57			2	Lake_Hill.Repeater.3
State of Colorado	Radio Site Repeater	Lake Hill	57			2	Lake_Hill.Repeater.4
State of Colorado	Radio Site Repeater	Lake Hill	57			2	Lake_Hill.Repeater.5
State of Colorado	Radio Site Repeater	Lamar	18			6	Lamar.Repeater.1
State of Colorado	Radio Site Repeater	Lamar	18			6	Lamar.Repeater.2
State of Colorado	Radio Site Repeater	Lamar	18			6	Lamar.Repeater.3
State of Colorado	Radio Site Repeater	Lamar	18			6	Lamar.Repeater.4
State of Colorado	Radio Site Repeater	Lamar	18			6	Lamar.Repeater.5
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.1
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.2
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.3
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.4
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.5
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.6
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.7
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.8
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.9
Douglas County	Radio Site Repeater	Larkspur	52-x			1	Larkspur.Repeater.10
State of Colorado	Radio Site Repeater	Last Chance	39			3	Last_Chance.Repeater.1
State of Colorado	Radio Site Repeater	Last Chance	39			3	Last_Chance.Repeater.2
State of Colorado	Radio Site Repeater	Last Chance	39			3	Last_Chance.Repeater.3
State of Colorado	Radio Site Repeater	Last Chance	39			3	Last_Chance.Repeater.4
State of Colorado	Radio Site Repeater	Last Chance	39			3	Last_Chance.Repeater.5
State of Colorado	Radio Site Repeater	Last Dollar	24			2	Last_Dollar.Repeater.1
State of Colorado	Radio Site Repeater	Last Dollar	24			2	Last_Dollar.Repeater.2
State of Colorado	Radio Site Repeater	Last Dollar	24			2	Last_Dollar.Repeater.3
State of Colorado	Radio Site Repeater	Last Dollar	24			2	Last_Dollar.Repeater.4
State of Colorado	Radio Site Repeater	Last Dollar	24			2	Last_Dollar.Repeater.5
GJRCC	Radio Site Repeater	Lee's Point	43			2	Lee's_Point.Repeater.1
GJRCC	Radio Site Repeater	Lee's Point	43			2	Lee's_Point.Repeater.2
GJRCC	Radio Site Repeater	Lee's Point	43			2	Lee's_Point.Repeater.3
GJRCC	Radio Site Repeater	Lee's Point	43			2	Lee's_Point.Repeater.4
GJRCC	Radio Site Repeater	Lee's Point	43			2	Lee's_Point.Repeater.5
State of Colorado	Radio Site Repeater	Limon CF	38			1	Limon_CF.Repeater.1
State of Colorado	Radio Site Repeater	Limon CF	38			1	Limon_CF.Repeater.2
State of Colorado	Radio Site Repeater	Limon CF	38			1	Limon_CF.Repeater.3
State of Colorado	Radio Site Repeater	Limon CF	38			1	Limon_CF.Repeater.4
State of Colorado	Radio Site Repeater	Limon CF	38			1	Limon_CF.Repeater.5
Rio Blanco County	Radio Site Repeater	Lobo	82			2	Lobo.Repeater.1
Rio Blanco County	Radio Site Repeater	Lobo	82			2	Lobo.Repeater.2
Rio Blanco County	Radio Site Repeater	Lobo	82			2	Lobo.Repeater.3
Rio Blanco County	Radio Site Repeater	Lobo	82			2	Lobo.Repeater.4
Rio Blanco County	Radio Site Repeater	Lobo	82			2	Lobo.Repeater.5
Rio Blanco County	Radio Site Repeater	Lobo	82			2	Lobo.Repeater.6
State of Colorado	Radio Site Repeater	Log Hill	38			2	Log_Hill.Repeater.1
State of Colorado	Radio Site Repeater	Log Hill	38			2	Log_Hill.Repeater.2
State of Colorado	Radio Site Repeater	Log Hill	38			2	Log_Hill.Repeater.3
State of Colorado	Radio Site Repeater	Log Hill	38			2	Log_Hill.Repeater.4
State of Colorado	Radio Site Repeater	Log Hill	38			2	Log_Hill.Repeater.5
Longmont, City of	Radio Site Repeater	Longmont	56			3	Longmont.Repeater.1
Longmont, City of	Radio Site Repeater	Longmont	56			3	Longmont.Repeater.2
Longmont, City of	Radio Site Repeater	Longmont	56			3	Longmont.Repeater.3
Longmont, City of	Radio Site Repeater	Longmont	56			3	Longmont.Repeater.4
Longmont, City of	Radio Site Repeater	Longmont	56			3	Longmont.Repeater.5
Longmont, City of	Radio Site Repeater	Longmont	56			3	Longmont.Repeater.6
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.1
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.2
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.3
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.4
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.5
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.6
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.7
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.8
Jefferson County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.9
Arapahoe County	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.10
State of Colorado	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.11
State of Colorado	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.12
State of Colorado	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.13

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.14
State of Colorado	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.15
State of Colorado	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.16
ADCOM	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.17
ADCOM	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.18
ADCOM	Radio Site Repeater	Lookout	8			1	Lookout.Repeater.19
NCRCN	Radio Site Repeater	Loveland	63			3	Loveland.Repeater.1
NCRCN	Radio Site Repeater	Loveland	63			3	Loveland.Repeater.1
NCRCN	Radio Site Repeater	Loveland	63			3	Loveland.Repeater.1
NCRCN	Radio Site Repeater	Loveland	63			3	Loveland.Repeater.1
NCRCN	Radio Site Repeater	Loveland	63			3	Loveland.Repeater.1
NCRCN	Radio Site Repeater	Loveland	63			3	Loveland.Repeater.1
State of Colorado	Radio Site Repeater	Loveland Ski	21			1	Loveland_Ski.Repeater.1
State of Colorado	Radio Site Repeater	Loveland Ski	21			1	Loveland_Ski.Repeater.2
State of Colorado	Radio Site Repeater	Loveland Ski	21			1	Loveland_Ski.Repeater.3
State of Colorado	Radio Site Repeater	Loveland Ski	21			1	Loveland_Ski.Repeater.4
State of Colorado	Radio Site Repeater	Loveland Ski	21			1	Loveland_Ski.Repeater.5
Eagle County	Radio Site Repeater	Lower Beaver Creek	95			2	Lower_Beaver_Creek.Repeater.1
Eagle County	Radio Site Repeater	Lower Beaver Creek	95			2	Lower_Beaver_Creek.Repeater.2
Eagle County	Radio Site Repeater	Lower Beaver Creek	95			2	Lower_Beaver_Creek.Repeater.3
Eagle County	Radio Site Repeater	Lower Beaver Creek	95			2	Lower_Beaver_Creek.Repeater.4
Eagle County	Radio Site Repeater	Lower Beaver Creek	95			2	Lower_Beaver_Creek.Repeater.5
Eagle County	Radio Site Repeater	Lower Dowd	50			2	Lower_Dowd.Repeater.1
Eagle County	Radio Site Repeater	Lower Dowd	50			2	Lower_Dowd.Repeater.2
Eagle County	Radio Site Repeater	Lower Dowd	50			2	Lower_Dowd.Repeater.3
Eagle County	Radio Site Repeater	Lower Dowd	50			2	Lower_Dowd.Repeater.4
Eagle County	Radio Site Repeater	Lower Dowd	50			2	Lower_Dowd.Repeater.5
Eagle County	Radio Site Repeater	Lower Dowd	50			2	Lower_Dowd.Repeater.6
Eagle County	Radio Site Repeater	Lower Dowd	50			2	Lower_Dowd.Repeater.7
State of Colorado	Radio Site Repeater	Lower Dowd	50			2	Lower_Dowd.Repeater.8
Holy Cross	Radio Site Repeater	Marble	97			2	Marble.Repeater.1
Holy Cross	Radio Site Repeater	Marble	97			2	Marble.Repeater.2
Holy Cross	Radio Site Repeater	Marble	97			2	Marble.Repeater.3
Holy Cross	Radio Site Repeater	Marble	97			2	Marble.Repeater.4
Rio Blanco County	Radio Site Repeater	Marvine Hill	88			2	Marvine_Hill.Repeater.1
Rio Blanco County	Radio Site Repeater	Marvine Hill	88			2	Marvine_Hill.Repeater.2
Rio Blanco County	Radio Site Repeater	Marvine Hill	88			2	Marvine_Hill.Repeater.3
Rio Blanco County	Radio Site Repeater	Marvine Hill	88			2	Marvine_Hill.Repeater.4
Rio Blanco County	Radio Site Repeater	Marvine Hill	88			2	Marvine_Hill.Repeater.5
Rio Blanco County	Radio Site Repeater	Marvine Hill	88			2	Marvine_Hill.Repeater.6
Broomfield, City of	Radio Site Repeater	Mead	12			1	Mead.Repeater.1
State of Colorado	Radio Site Repeater	Mead	12			1	Mead.Repeater.2
State of Colorado	Radio Site Repeater	Mead	12			1	Mead.Repeater.3
State of Colorado	Radio Site Repeater	Mead	12			1	Mead.Repeater.4
State of Colorado	Radio Site Repeater	Mead	12			1	Mead.Repeater.5
State of Colorado	Radio Site Repeater	Mead	12			1	Mead.Repeater.6
State of Colorado	Radio Site Repeater	Mead	12			1	Mead.Repeater.7
Weld County	Radio Site Repeater	Mead	12			1	Mead.Repeater.8
Longmont, City of	Radio Site Repeater	Mead	12			1	Mead.Repeater.9
Longmont, City of	Radio Site Repeater	Mead	12			1	Mead.Repeater.10
Longmont, City of	Radio Site Repeater	Mead	12			1	Mead.Repeater.11
Longmont, City of	Radio Site Repeater	Mead	12			1	Mead.Repeater.12
Rio Blanco County	Radio Site Repeater	Mellen Hill	87			2	Mellen_Hill.Repeater.1
Rio Blanco County	Radio Site Repeater	Mellen Hill	87			2	Mellen_Hill.Repeater.2
Rio Blanco County	Radio Site Repeater	Mellen Hill	87			2	Mellen_Hill.Repeater.3
Rio Blanco County	Radio Site Repeater	Mellen Hill	87			2	Mellen_Hill.Repeater.4
Rio Blanco County	Radio Site Repeater	Mellen Hill	87			2	Mellen_Hill.Repeater.5
Rio Blanco County	Radio Site Repeater	Mellen Hill	87			2	Mellen_Hill.Repeater.6
GJRCC	Radio Site Repeater	Mesa Point	60			2	Mesa_Point.Repeater.1
GJRCC	Radio Site Repeater	Mesa Point	60			2	Mesa_Point.Repeater.2
GJRCC	Radio Site Repeater	Mesa Point	60			2	Mesa_Point.Repeater.3
GJRCC	Radio Site Repeater	Mesa Point	60			2	Mesa_Point.Repeater.4
GJRCC	Radio Site Repeater	Mesa Point	60			2	Mesa_Point.Repeater.5
GJRCC	Radio Site Repeater	Mesa Point	60			2	Mesa_Point.Repeater.6
Mesa County	Radio Site Repeater	Mesa Point	60			2	Mesa_Point.Repeater.7
State of Colorado	Radio Site Repeater	Methodist	50			6	Methodist.Repeater.1
State of Colorado	Radio Site Repeater	Methodist	50			6	Methodist.Repeater.2
State of Colorado	Radio Site Repeater	Methodist	50			6	Methodist.Repeater.3
State of Colorado	Radio Site Repeater	Methodist	50			6	Methodist.Repeater.4
State of Colorado	Radio Site Repeater	Methodist	50			6	Methodist.Repeater.5
State of Colorado	Radio Site Repeater	Methodist	50			6	Methodist.Repeater.6
State of Colorado	Radio Site Repeater	Mines	11			1	Mines.Repeater.1
State of Colorado	Radio Site Repeater	Mines	11			1	Mines.Repeater.2
State of Colorado	Radio Site Repeater	Mines	11			1	Mines.Repeater.3
State of Colorado	Radio Site Repeater	Mines	11			1	Mines.Repeater.4
State of Colorado	Radio Site Repeater	Mines	11			1	Mines.Repeater.5
State of Colorado	Radio Site Repeater	Missionary Ridge	14			2	Missionary_Ridge.Repeater.1
State of Colorado	Radio Site Repeater	Missionary Ridge	14			2	Missionary_Ridge.Repeater.2
State of Colorado	Radio Site Repeater	Missionary Ridge	14			2	Missionary_Ridge.Repeater.3
State of Colorado	Radio Site Repeater	Missionary Ridge	14			2	Missionary_Ridge.Repeater.4
SW Region	Radio Site Repeater	Missionary Ridge	14			2	Missionary_Ridge.Repeater.5

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
SW Region	Radio Site Repeater	Missionary Ridge	14			2	Missionary_Ridge.Repeater.6
State of Colorado	Radio Site Repeater	Monarch	20			6	Monarch.Repeater.1
State of Colorado	Radio Site Repeater	Monarch	20			6	Monarch.Repeater.2
State of Colorado	Radio Site Repeater	Monarch	20			6	Monarch.Repeater.3
State of Colorado	Radio Site Repeater	Monarch	20			6	Monarch.Repeater.4
State of Colorado	Radio Site Repeater	Monarch	20			6	Monarch.Repeater.5
State of Colorado	Radio Site Repeater	Monte Vista	61			2	Monte_Vista.Repeater.1
State of Colorado	Radio Site Repeater	Monte Vista	61			2	Monte_Vista.Repeater.2
State of Colorado	Radio Site Repeater	Monte Vista	61			2	Monte_Vista.Repeater.3
State of Colorado	Radio Site Repeater	Monte Vista	61			2	Monte_Vista.Repeater.4
State of Colorado	Radio Site Repeater	Monte Vista	61			2	Monte_Vista.Repeater.5
Garfield County	Radio Site Repeater	Monument	36			2	Monument.Repeater.1
Garfield County	Radio Site Repeater	Monument	36			2	Monument.Repeater.2
Garfield County	Radio Site Repeater	Monument	36			2	Monument.Repeater.3
Garfield County	Radio Site Repeater	Monument	36			2	Monument.Repeater.4
Garfield County	Radio Site Repeater	Monument	36			2	Monument.Repeater.5
Garfield County	Radio Site Repeater	Mt Callahan	17			2	Mt_Callahan.Repeater.1
Garfield County	Radio Site Repeater	Mt Callahan	17			2	Mt_Callahan.Repeater.2
Garfield County	Radio Site Repeater	Mt Callahan	17			2	Mt_Callahan.Repeater.3
Garfield County	Radio Site Repeater	Mt Callahan	17			2	Mt_Callahan.Repeater.4
Garfield County	Radio Site Repeater	Mt Callahan	17			2	Mt_Callahan.Repeater.5
Mesa County	Radio Site Repeater	Mt Callahan	17			2	Mt_Callahan.Repeater.6
State of Colorado	Radio Site Repeater	Mt Carmel	27			6	Mt_Carmel.Repeater.1
State of Colorado	Radio Site Repeater	Mt Carmel	27			6	Mt_Carmel.Repeater.2
State of Colorado	Radio Site Repeater	Mt Carmel	27			6	Mt_Carmel.Repeater.3
State of Colorado	Radio Site Repeater	Mt Carmel	27			6	Mt_Carmel.Repeater.4
State of Colorado	Radio Site Repeater	Mt Carmel	27			6	Mt_Carmel.Repeater.5
Garfield County	Radio Site Repeater	New Castle	84			2	New_Castle.Repeater.1
Garfield County	Radio Site Repeater	New Castle	84			2	New_Castle.Repeater.2
Garfield County	Radio Site Repeater	New Castle	84			2	New_Castle.Repeater.3
Garfield County	Radio Site Repeater	New Castle	84			2	New_Castle.Repeater.4
Garfield County	Radio Site Repeater	New Castle	84			2	New_Castle.Repeater.5
State of Colorado	Radio Site Repeater	New Raymer-State	25			3	New_Raymer.Repeater.1
State of Colorado	Radio Site Repeater	New Raymer-State	25			3	New_Raymer.Repeater.2
State of Colorado	Radio Site Repeater	New Raymer-State	25			3	New_Raymer.Repeater.3
State of Colorado	Radio Site Repeater	New Raymer-State	25			3	New_Raymer.Repeater.4
State of Colorado	Radio Site Repeater	New Raymer-State	25			3	New_Raymer.Repeater.5
Grand County	Radio Site Repeater	North Cottonwood	40			3	North Cottonwood.Repeater.1
Grand County	Radio Site Repeater	North Cottonwood	40			3	North Cottonwood.Repeater.2
Grand County	Radio Site Repeater	North Cottonwood	40			3	North Cottonwood.Repeater.3
Grand County	Radio Site Repeater	North Cottonwood	40			3	North Cottonwood.Repeater.4
Grand County	Radio Site Repeater	North Cottonwood	40			3	North Cottonwood.Repeater.5
Grand County	Radio Site Repeater	North Cottonwood	40			3	North Cottonwood.Repeater.6
State of Colorado	Radio Site Repeater	North Mtn	18			2	North_Mtn.Repeater.1
State of Colorado	Radio Site Repeater	North Mtn	18			2	North_Mtn.Repeater.2
State of Colorado	Radio Site Repeater	North Mtn	18			2	North_Mtn.Repeater.3
State of Colorado	Radio Site Repeater	North Mtn	18			2	North_Mtn.Repeater.4
State of Colorado	Radio Site Repeater	North Mtn	18			2	North_Mtn.Repeater.5
State of Colorado	Radio Site Repeater	Oak Brush Hill	19			2	Oak_Brush_Hill.Repeater.1
State of Colorado	Radio Site Repeater	Oak Brush Hill	19			2	Oak_Brush_Hill.Repeater.2
State of Colorado	Radio Site Repeater	Oak Brush Hill	19			2	Oak_Brush_Hill.Repeater.3
State of Colorado	Radio Site Repeater	Oak Brush Hill	19			2	Oak_Brush_Hill.Repeater.4
SW Region	Radio Site Repeater	Oak Brush Hill	19			2	Oak_Brush_Hill.Repeater.5
SW Region	Radio Site Repeater	Oak Brush Hill	19			2	Oak_Brush_Hill.Repeater.6
Routt County	Radio Site Repeater	Oak Creek	92			2	Oak_Creek.Repeater.1
Routt County	Radio Site Repeater	Oak Creek	92			2	Oak_Creek.Repeater.2
Routt County	Radio Site Repeater	Oak Creek	92			2	Oak_Creek.Repeater.3
Routt County	Radio Site Repeater	Oak Creek	92			2	Oak_Creek.Repeater.4
Routt County	Radio Site Repeater	Oak Creek	92			2	Oak_Creek.Repeater.5
Routt County	Radio Site Repeater	Oak Creek	92			2	Oak_Creek.Repeater.6
Garfield County	Radio Site Repeater	Parachute	13			2	Parachute.Repeater.1
Garfield County	Radio Site Repeater	Parachute	13			2	Parachute.Repeater.2
Garfield County	Radio Site Repeater	Parachute	13			2	Parachute.Repeater.3
Garfield County	Radio Site Repeater	Parachute	13			2	Parachute.Repeater.4
Garfield County	Radio Site Repeater	Parachute	13			2	Parachute.Repeater.5
Morgan County	Radio Site Repeater	Pawnee	29			3	Pawnee.Repeater.1
Morgan County	Radio Site Repeater	Pawnee	29			3	Pawnee.Repeater.2
Morgan County	Radio Site Repeater	Pawnee	29			3	Pawnee.Repeater.3
Morgan County	Radio Site Repeater	Pawnee	29			3	Pawnee.Repeater.4
Morgan County	Radio Site Repeater	Pawnee	29			3	Pawnee.Repeater.5
Morgan County	Radio Site Repeater	Pawnee	29			3	Pawnee.Repeater.6
State of Colorado	Radio Site Repeater	Peetz	28			3	Peetz.Repeater.1
State of Colorado	Radio Site Repeater	Peetz	28			3	Peetz.Repeater.2
State of Colorado	Radio Site Repeater	Peetz	28			3	Peetz.Repeater.3
State of Colorado	Radio Site Repeater	Peetz	28			3	Peetz.Repeater.4
State of Colorado	Radio Site Repeater	Peetz	28			3	Peetz.Repeater.5
State of Colorado	Radio Site Repeater	Phillips	53			3	Phillips.Repeater.1
State of Colorado	Radio Site Repeater	Phillips	53			3	Phillips.Repeater.2
State of Colorado	Radio Site Repeater	Phillips	53			3	Phillips.Repeater.3
State of Colorado	Radio Site Repeater	Phillips	53			3	Phillips.Repeater.4
State of Colorado	Radio Site Repeater	Phillips	53			3	Phillips.Repeater.5

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
PPRCN	Radio Site Repeater	Pittsburg	18			4	Phittsburg.Repeater.1
PPRCN	Radio Site Repeater	Pittsburg	18			4	Phittsburg.Repeater.2
PPRCN	Radio Site Repeater	Pittsburg	18			4	Phittsburg.Repeater.3
PPRCN	Radio Site Repeater	Pittsburg	18			4	Phittsburg.Repeater.4
PPRCN	Radio Site Repeater	Pittsburg	18			4	Phittsburg.Repeater.5
PPRCN	Radio Site Repeater	Pittsburg	18			4	Phittsburg.Repeater.6
PPRCN	Radio Site Repeater	Pittsburg	18			4	Phittsburg.Repeater.7
State of Colorado	Radio Site Repeater	Point of Rocks	15			3	Point_of_Rocks.Repeater.1
State of Colorado	Radio Site Repeater	Point of Rocks	15			3	Point_of_Rocks.Repeater.2
State of Colorado	Radio Site Repeater	Point of Rocks	15			3	Point_of_Rocks.Repeater.3
State of Colorado	Radio Site Repeater	Point of Rocks	15			3	Point_of_Rocks.Repeater.4
State of Colorado	Radio Site Repeater	Point of Rocks	15			3	Point_of_Rocks.Repeater.5
State of Colorado	Radio Site Repeater	Point of Rocks	15			3	Point_of_Rocks.Repeater.6
Weld County	Radio Site Repeater	Point of Rocks	15			3	Point_of_Rocks.Repeater.7
State of Colorado	Radio Site Repeater	Poncha Springs	70			6	Poncha_Springs.Repeater.1
State of Colorado	Radio Site Repeater	Poncha Springs	70			6	Poncha_Springs.Repeater.2
State of Colorado	Radio Site Repeater	Poncha Springs	70			6	Poncha_Springs.Repeater.3
State of Colorado	Radio Site Repeater	Poncha Springs	70			6	Poncha_Springs.Repeater.4
State of Colorado	Radio Site Repeater	Poncha Springs	70			6	Poncha_Springs.Repeater.5
State of Colorado	Radio Site Repeater	Pooltable	42			2	Pooltable.Repeater.1
State of Colorado	Radio Site Repeater	Pooltable	42			2	Pooltable.Repeater.2
State of Colorado	Radio Site Repeater	Pooltable	42			2	Pooltable.Repeater.3
State of Colorado	Radio Site Repeater	Pooltable	42			2	Pooltable.Repeater.4
State of Colorado	Radio Site Repeater	Pooltable	42			2	Pooltable.Repeater.5
State of Colorado	Radio Site Repeater	Pooltable	42			2	Pooltable.Repeater.6
State of Colorado	Radio Site Repeater	Prospect	52			3	Prospect.Repeater.1
State of Colorado	Radio Site Repeater	Prospect	52			3	Prospect.Repeater.2
State of Colorado	Radio Site Repeater	Prospect	52			3	Prospect.Repeater.3
State of Colorado	Radio Site Repeater	Prospect	52			3	Prospect.Repeater.4
State of Colorado	Radio Site Repeater	Prospect	52			3	Prospect.Repeater.5
Larimer County	Radio Site Repeater	Prospect	52			3	Prospect.Repeater.6
Pueblo County	Radio Site Repeater	Pueblo Chem Depot	62			6	Pueblo_Chem.Repeater.1
Pueblo County	Radio Site Repeater	Pueblo Chem Depot	62			6	Pueblo_Chem.Repeater.2
Pueblo County	Radio Site Repeater	Pueblo Chem Depot	62			6	Pueblo_Chem.Repeater.3
Pueblo County	Radio Site Repeater	Pueblo Chem Depot	62			6	Pueblo_Chem.Repeater.4
Pueblo County	Radio Site Repeater	Pueblo Chem Depot	62			6	Pueblo_Chem.Repeater.5
Pueblo County	Radio Site Repeater	Pueblo Chem Depot	62			6	Pueblo_Chem.Repeater.6
Pueblo County	Radio Site Repeater	Pueblo Chem Depot	62			6	Pueblo_Chem.Repeater.7
Pueblo County	Radio Site Repeater	Pueblo Chem Depot	62			6	Pueblo_Chem.Repeater.8
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.1
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.2
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.3
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.4
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.5
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.6
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.7
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.8
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.9
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.10
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.11
Pueblo County	Radio Site Repeater	Pueblo West	1-5			6	Pueblo_West.Repeater.12
State of Colorado	Radio Site Repeater	Punkin Center	40			1	Punkin_Center.Repeater.1
State of Colorado	Radio Site Repeater	Punkin Center	40			1	Punkin_Center.Repeater.2
State of Colorado	Radio Site Repeater	Punkin Center	40			1	Punkin_Center.Repeater.3
State of Colorado	Radio Site Repeater	Punkin Center	40			1	Punkin_Center.Repeater.4
State of Colorado	Radio Site Repeater	Punkin Center	40			1	Punkin_Center.Repeater.5
GJRCC	Radio Site Repeater	Rabbit Valley	94			2	Rabbit_Valley.Repeater.1
GJRCC	Radio Site Repeater	Rabbit Valley	94			2	Rabbit_Valley.Repeater.2
GJRCC	Radio Site Repeater	Rabbit Valley	94			2	Rabbit_Valley.Repeater.3
GJRCC	Radio Site Repeater	Rabbit Valley	94			2	Rabbit_Valley.Repeater.4
GJRCC	Radio Site Repeater	Rabbit Valley	94			2	Rabbit_Valley.Repeater.5
GJRCC	Radio Site Repeater	Rabbit Valley	94			2	Rabbit_Valley.Repeater.6
State of Colorado	Radio Site Repeater	Ramah	23			1	Ramah.Repeater.1
State of Colorado	Radio Site Repeater	Ramah	23			1	Ramah.Repeater.2
State of Colorado	Radio Site Repeater	Ramah	23			1	Ramah.Repeater.3
State of Colorado	Radio Site Repeater	Ramah	23			1	Ramah.Repeater.4
State of Colorado	Radio Site Repeater	Ramah	23			1	Ramah.Repeater.5
Montrose County	Radio Site Repeater	Raspberry Ridge	29			2	Raspberry_Ridge.Repeater.1
Montrose County	Radio Site Repeater	Raspberry Ridge	29			2	Raspberry_Ridge.Repeater.2
Montrose County	Radio Site Repeater	Raspberry Ridge	29			2	Raspberry_Ridge.Repeater.3
Montrose County	Radio Site Repeater	Raspberry Ridge	29			2	Raspberry_Ridge.Repeater.4
Montrose County	Radio Site Repeater	Raspberry Ridge	29			2	Raspberry_Ridge.Repeater.5
Montrose County	Radio Site Repeater	Raspberry Ridge	29			2	Raspberry_Ridge.Repeater.6
State of Colorado	Radio Site Repeater	Raton Pass	57			6	Raton_Pass.Repeater.1
State of Colorado	Radio Site Repeater	Raton Pass	57			6	Raton_Pass.Repeater.2
State of Colorado	Radio Site Repeater	Raton Pass	57			6	Raton_Pass.Repeater.3
State of Colorado	Radio Site Repeater	Raton Pass	57			6	Raton_Pass.Repeater.4
State of Colorado	Radio Site Repeater	Raton Pass	57			6	Raton_Pass.Repeater.5
GJRCC	Radio Site Repeater	Redlands	56			2	Redlands.Repeater.1
GJRCC	Radio Site Repeater	Redlands	56			2	Redlands.Repeater.2
GJRCC	Radio Site Repeater	Redlands	56			2	Redlands.Repeater.3

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GJRCC	Radio Site Repeater	Redlands	56			2	Redlands.Repeater.4
GJRCC	Radio Site Repeater	Redlands	56			2	Redlands.Repeater.5
GJRCC	Radio Site Repeater	Redlands	56			2	Redlands.Repeater.6
GJRCC	Radio Site Repeater	Redlands	56			2	Redlands.Repeater.7
State of Colorado	Radio Site Repeater	Reiradon	18			3	Reiradon.Repeater.1
State of Colorado	Radio Site Repeater	Reiradon	18			3	Reiradon.Repeater.2
State of Colorado	Radio Site Repeater	Reiradon	18			3	Reiradon.Repeater.3
State of Colorado	Radio Site Repeater	Reiradon	18			3	Reiradon.Repeater.4
State of Colorado	Radio Site Repeater	Reiradon	18			3	Reiradon.Repeater.5
State of Colorado	Radio Site Repeater	Reiradon	18			3	Reiradon.Repeater.6
State of Colorado	Radio Site Repeater	Reiradon	18			3	Reiradon.Repeater.7
State of Colorado	Radio Site Repeater	Reiradon	18			3	Reiradon.Repeater.8
State of Colorado	Radio Site Repeater	Rico	48			2	Rico.Repeater.1
State of Colorado	Radio Site Repeater	Rico	48			2	Rico.Repeater.2
State of Colorado	Radio Site Repeater	Rico	48			2	Rico.Repeater.3
State of Colorado	Radio Site Repeater	Rico	48			2	Rico.Repeater.4
State of Colorado	Radio Site Repeater	Rico	48			2	Rico.Repeater.5
Garfield County	Radio Site Repeater	Rifle	83			2	Rifle.Repeater.1
Garfield County	Radio Site Repeater	Rifle	83			2	Rifle.Repeater.2
Garfield County	Radio Site Repeater	Rifle	83			2	Rifle.Repeater.3
Garfield County	Radio Site Repeater	Rifle	83			2	Rifle.Repeater.4
Garfield County	Radio Site Repeater	Rifle	83			2	Rifle.Repeater.5
Roaring Fork Transportation Authority	Radio Site Repeater	Rifle	83			2	Rifle.Repeater.6
Douglas County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.1
Douglas County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.2
Douglas County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.3
Douglas County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.4
Douglas County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.5
Jefferson County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.6
Jefferson County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.7
Jefferson County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.8
Jefferson County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.9
Jefferson County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.10
Arapahoe County	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.11
State of Colorado	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.12
State of Colorado	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.13
State of Colorado	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.14
State of Colorado	Radio Site Repeater	Riley Peak	2			1	Riley_Peak.Repeater.15
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.1
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.2
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.3
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.4
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.5
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.6
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.7
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.8
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.9
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.10
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.11
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.12
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.13
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.14
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.15
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.16
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.17
Douglas County	Radio Site Repeater	Rocky Point	14-x			1	Rocky.Point.Repeater.18
State of Colorado	Radio Site Repeater	Rose Ridge	63			2	Rose_Ridge.Repeater.1
State of Colorado	Radio Site Repeater	Rose Ridge	63			2	Rose_Ridge.Repeater.2
State of Colorado	Radio Site Repeater	Rose Ridge	63			2	Rose_Ridge.Repeater.3
State of Colorado	Radio Site Repeater	Rose Ridge	63			2	Rose_Ridge.Repeater.4
State of Colorado	Radio Site Repeater	Rose Ridge	63			2	Rose_Ridge.Repeater.5
State of Colorado	Radio Site Repeater	Sacramento	46			1	Sacramento.Repeater.1
State of Colorado	Radio Site Repeater	Sacramento	46			1	Sacramento.Repeater.2
State of Colorado	Radio Site Repeater	Sacramento	46			1	Sacramento.Repeater.3
State of Colorado	Radio Site Repeater	Sacramento	46			1	Sacramento.Repeater.4
Park County	Radio Site Repeater	Sacramento	46			1	Sacramento.Repeater.5
State of Colorado	Radio Site Repeater	Saguache Peak	54			6	Saguache_Peak.Repeater.1
State of Colorado	Radio Site Repeater	Saguache Peak	54			6	Saguache_Peak.Repeater.2
State of Colorado	Radio Site Repeater	Saguache Peak	54			6	Saguache_Peak.Repeater.3
State of Colorado	Radio Site Repeater	Saguache Peak	54			6	Saguache_Peak.Repeater.4
State of Colorado	Radio Site Repeater	Saguache Peak	54			6	Saguache_Peak.Repeater.5
State of Colorado	Radio Site Repeater	Saguache Peak	54			6	Saguache_Peak.Repeater.6
State of Colorado	Radio Site Repeater	San Antonio Pk, NM	45			6	San_Antonio_Pk.Repeater.1
State of Colorado	Radio Site Repeater	San Antonio Pk, NM	45			6	San_Antonio_Pk.Repeater.2
State of Colorado	Radio Site Repeater	San Antonio Pk, NM	45			6	San_Antonio_Pk.Repeater.3
State of Colorado	Radio Site Repeater	San Antonio Pk, NM	45			6	San_Antonio_Pk.Repeater.4
State of Colorado	Radio Site Repeater	San Antonio Pk, NM	45			6	San_Antonio_Pk.Repeater.5
State of Colorado	Radio Site Repeater	San Antonio Pk, NM	45			6	San_Antonio_Pk.Repeater.6
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.1
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.2
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.3

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State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.4
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.5
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.6
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.7
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.8
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.9
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.10
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.11
State of Colorado	Radio Site Repeater	San Carlos CF	1-1			6	San_Carlos.Repeater.12
State of Colorado	Radio Site Repeater	San Luis	40			6	San_Luis.Repeater.1
State of Colorado	Radio Site Repeater	San Luis	40			6	San_Luis.Repeater.2
State of Colorado	Radio Site Repeater	San Luis	40			6	San_Luis.Repeater.3
State of Colorado	Radio Site Repeater	San Luis	40			6	San_Luis.Repeater.4
State of Colorado	Radio Site Repeater	San Luis	40			6	San_Luis.Repeater.5
State of Colorado	Radio Site Repeater	Sandoval	62			2	Sandaval.Repeater.1
State of Colorado	Radio Site Repeater	Sandoval	62			2	Sandaval.Repeater.2
State of Colorado	Radio Site Repeater	Sandoval	62			2	Sandaval.Repeater.3
State of Colorado	Radio Site Repeater	Sandoval	62			2	Sandaval.Repeater.4
State of Colorado	Radio Site Repeater	Sandoval	62			2	Sandaval.Repeater.5
SW Region	Radio Site Repeater	Sandoval	62			2	Sandaval.Repeater.6
Grand County	Radio Site Repeater	Santoy	42			3	Santoy.Repeater.1
Grand County	Radio Site Repeater	Santoy	42			3	Santoy.Repeater.2
Grand County	Radio Site Repeater	Santoy	42			3	Santoy.Repeater.3
Grand County	Radio Site Repeater	Santoy	42			3	Santoy.Repeater.4
Grand County	Radio Site Repeater	Santoy	42			3	Santoy.Repeater.5
Grand County	Radio Site Repeater	Santoy	42			3	Santoy.Repeater.6
State of Colorado	Radio Site Repeater	Sheeps Knob	58			2	Sheeps_Knob.Repeater.1
State of Colorado	Radio Site Repeater	Sheeps Knob	58			2	Sheeps_Knob.Repeater.2
State of Colorado	Radio Site Repeater	Sheeps Knob	58			2	Sheeps_Knob.Repeater.3
State of Colorado	Radio Site Repeater	Sheeps Knob	58			2	Sheeps_Knob.Repeater.4
State of Colorado	Radio Site Repeater	Sheeps Knob	58			2	Sheeps_Knob.Repeater.5
State of Colorado	Radio Site Repeater	Sheridan Lake	26			6	Sheridan_Lake.Repeater.1
State of Colorado	Radio Site Repeater	Sheridan Lake	26			6	Sheridan_Lake.Repeater.2
State of Colorado	Radio Site Repeater	Sheridan Lake	26			6	Sheridan_Lake.Repeater.3
State of Colorado	Radio Site Repeater	Sheridan Lake	26			6	Sheridan_Lake.Repeater.4
State of Colorado	Radio Site Repeater	Sheridan Lake	26			6	Sheridan_Lake.Repeater.5
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.1
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.2
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.3
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.4
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.5
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.6
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.7
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.8
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.9
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.10
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.11
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.12
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.13
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.14
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.15
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.16
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.17
Douglas County	Radio Site Repeater	Silver Heights	14-x			1	Silver_Heights.Repeater.18
State of Colorado	Radio Site Repeater	Silverton	70			2	Silverton.Repeater.1
State of Colorado	Radio Site Repeater	Silverton	70			2	Silverton.Repeater.2
State of Colorado	Radio Site Repeater	Silverton	70			2	Silverton.Repeater.3
State of Colorado	Radio Site Repeater	Silverton	70			2	Silverton.Repeater.4
State of Colorado	Radio Site Repeater	Silverton	70			2	Silverton.Repeater.5
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #1	99			n/a	SOW.1.Repeater.1
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #1	99			n/a	SOW.1.Repeater.2
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #1	99			n/a	SOW.1.Repeater.3
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #1	99			n/a	SOW.1.Repeater.4
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #1	99			n/a	SOW.1.Repeater.5
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #1	99			n/a	SOW.1.Repeater.6
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #2	99			n/a	SOW.2.Repeater.1
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #2	99			n/a	SOW.2.Repeater.2
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #2	99			n/a	SOW.2.Repeater.3
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #2	99			n/a	SOW.2.Repeater.4
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #2	99			n/a	SOW.2.Repeater.5
State of Colorado	Radio Site Repeater	Site On Wheels (SOW) #2	99			n/a	SOW.2.Repeater.6
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.1
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.2
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.3
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.4
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.5
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.6
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.7
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.8
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.9
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.10

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.11
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.12
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.13
PPRCN	Radio Site Repeater	Ski Summit	13			4	Ski_Summit.Repeater.14
State of Colorado	Radio Site Repeater	Smelter Mtn	23			2	Smelter_Mtn.Repeater.1
State of Colorado	Radio Site Repeater	Smelter Mtn	23			2	Smelter_Mtn.Repeater.2
State of Colorado	Radio Site Repeater	Smelter Mtn	23			2	Smelter_Mtn.Repeater.3
State of Colorado	Radio Site Repeater	Smelter Mtn	23			2	Smelter_Mtn.Repeater.4
State of Colorado	Radio Site Repeater	Smelter Mtn	23			2	Smelter_Mtn.Repeater.5
SW Region	Radio Site Repeater	Smelter Mtn	23			2	Smelter_Mtn.Repeater.6
Jefferson County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.1
Jefferson County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.2
Jefferson County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.3
Jefferson County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.4
Jefferson County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.5
Arapahoe County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.6
Arapahoe County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.7
Arapahoe County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.8
Arapahoe County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.9
Arapahoe County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.10
Arapahoe County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.11
Arapahoe County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.12
Arapahoe County	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.13
State of Colorado	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.14
State of Colorado	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.15
State of Colorado	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.16
State of Colorado	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.17
State of Colorado	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.18
State of Colorado	Radio Site Repeater	Smoky Hill	7			1	Smoky_Hill.Repeater.19
Morgan County	Radio Site Repeater	South Morgan	51			3	South Morgan.Repeater.1
Morgan County	Radio Site Repeater	South Morgan	51			3	South Morgan.Repeater.2
Morgan County	Radio Site Repeater	South Morgan	51			3	South Morgan.Repeater.3
Morgan County	Radio Site Repeater	South Morgan	51			3	South Morgan.Repeater.4
Morgan County	Radio Site Repeater	South Morgan	51			3	South Morgan.Repeater.5
Morgan County	Radio Site Repeater	South Morgan	51			3	South Morgan.Repeater.6
State of Colorado	Radio Site Repeater	Springfield	41			6	Springfield.Repeater.1
State of Colorado	Radio Site Repeater	Springfield	41			6	Springfield.Repeater.2
State of Colorado	Radio Site Repeater	Springfield	41			6	Springfield.Repeater.3
State of Colorado	Radio Site Repeater	Springfield	41			6	Springfield.Repeater.4
State of Colorado	Radio Site Repeater	Springfield	41			6	Springfield.Repeater.5
Jefferson County	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.1
Jefferson County	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.2
Jefferson County	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.3
Jefferson County	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.4
Jefferson County	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.5
Jefferson County	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.6
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.7
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.8
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.9
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.10
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.11
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.12
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.13
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.14
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.15
State of Colorado	Radio Site Repeater	Squaw	6			1	Squaw.Repeater.16
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.1
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.2
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.3
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.4
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.5
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.6
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.7
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.8
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.9
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.10
PPRCN	Radio Site Repeater	Stanley Canyon	12			4	Stanley_Canyon.Repeater.11
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.1
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.2
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.3
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.4
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.5
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.6
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.7
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.8
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.9
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.10
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.11
RTD	Radio Site Repeater	State Capitol	71			1	State_Capitol.Repeater.12
State of Colorado	Radio Site Repeater	Sterling CF	57			3	Sterling_CF.Repeater.1
State of Colorado	Radio Site Repeater	Sterling CF	57			3	Sterling_CF.Repeater.2

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Radio Site Repeater	Sterling CF	57			3	Sterling_CF.Repeater.3
State of Colorado	Radio Site Repeater	Sterling CF	57			3	Sterling_CF.Repeater.4
State of Colorado	Radio Site Repeater	Sterling CF	57			3	Sterling_CF.Repeater.5
State of Colorado	Radio Site Repeater	Sterling CF	57			3	Sterling_CF.Repeater.6
State of Colorado	Radio Site Repeater	Sterling CF	57			3	Sterling_CF.Repeater.7
State of Colorado	Radio Site Repeater	Sterling CF	57			3	Sterling_CF.Repeater.8
State of Colorado	Radio Site Repeater	Storm King	10			2	Storm_King.Repeater.1
State of Colorado	Radio Site Repeater	Storm King	10			2	Storm_King.Repeater.2
State of Colorado	Radio Site Repeater	Storm King	10			2	Storm_King.Repeater.3
State of Colorado	Radio Site Repeater	Storm King	10			2	Storm_King.Repeater.4
State of Colorado	Radio Site Repeater	Storm King	10			2	Storm_King.Repeater.5
State of Colorado	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.1
State of Colorado	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.2
State of Colorado	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.3
State of Colorado	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.4
State of Colorado	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.5
Garfield County	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.6
Eagle County	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.7
Holy Cross	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.8
Roaring Fork Transportation Authority	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.9
Roaring Fork Transportation Authority	Radio Site Repeater	Sunlight	11			2	Sunlight.Repeater.10
State of Colorado	Radio Site Repeater	Sunset Mesa	5			2	Sunset_Mesa.Repeater.1
State of Colorado	Radio Site Repeater	Sunset Mesa	5			2	Sunset_Mesa.Repeater.2
State of Colorado	Radio Site Repeater	Sunset Mesa	5			2	Sunset_Mesa.Repeater.3
State of Colorado	Radio Site Repeater	Sunset Mesa	5			2	Sunset_Mesa.Repeater.4
State of Colorado	Radio Site Repeater	Sunset Mesa	5			2	Sunset_Mesa.Repeater.5
GJRCC	Radio Site Repeater	Sunset Mesa	5			2	Sunset_Mesa.Repeater.6
Grand County	Radio Site Repeater	Sunspot	15			1	Sunspot.Repeater.1
Grand County	Radio Site Repeater	Sunspot	15			1	Sunspot.Repeater.2
Grand County	Radio Site Repeater	Sunspot	15			1	Sunspot.Repeater.3
Grand County	Radio Site Repeater	Sunspot	15			1	Sunspot.Repeater.4
Grand County	Radio Site Repeater	Sunspot	15			1	Sunspot.Repeater.5
Grand County	Radio Site Repeater	Sunspot	15			1	Sunspot.Repeater.6
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.1
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.2
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.3
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.4
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.5
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.6
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.7
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.8
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.9
Douglas County	Radio Site Repeater	Swank Ranch	52-x			1	Swank.Ranch.Repeater.10
State of Colorado	Switch	Switch #1 (DTB)	n/a			1	Switch.1
State of Colorado	Switch	Switch #2 (Grand Junction)	n/a			2	Switch.2
State of Colorado	Switch	Switch #3 (PRPA)	n/a			3	Switch.3
PPRCN	Switch	Switch #4 (PPRCN)	n/a			4	Switch.4
Pueblo County	Simulcast Prime Site	Pueblo County Simulcast Prime Site (Site 1, Zone 6)	1			6	Pueblo.County.Simulcast.Prime.Site
Pueblo County	Switch	Switch #6 (Pueblo)	n/a			6	Switch.6
NCRCN	Radio Site Repeater	Table Mountain	43			3	Table_Mountain.Repeater.1
NCRCN	Radio Site Repeater	Table Mountain	43			3	Table_Mountain.Repeater.2
NCRCN	Radio Site Repeater	Table Mountain	43			3	Table_Mountain.Repeater.3
NW Region	Radio Site Repeater	Table Mountain	43			3	Table_Mountain.Repeater.4
NW Region	Radio Site Repeater	Table Mountain	43			3	Table_Mountain.Repeater.5
Delta County	Radio Site Repeater	Tank Hill	93			2	Tank_Hill.Repeater.1
Delta County	Radio Site Repeater	Tank Hill	93			2	Tank_Hill.Repeater.2
Delta County	Radio Site Repeater	Tank Hill	93			2	Tank_Hill.Repeater.3
Delta County	Radio Site Repeater	Tank Hill	93			2	Tank_Hill.Repeater.4
Delta County	Radio Site Repeater	Tank Hill	93			2	Tank_Hill.Repeater.5
PPRCN	Radio Site Repeater	Templeton Gap	22			4	Templeton_Gap.Repeater.1
PPRCN	Radio Site Repeater	Templeton Gap	22			4	Templeton_Gap.Repeater.2
PPRCN	Radio Site Repeater	Templeton Gap	22			4	Templeton_Gap.Repeater.3
PPRCN	Radio Site Repeater	Templeton Gap	22			4	Templeton_Gap.Repeater.4
PPRCN	Radio Site Repeater	Templeton Gap	22			4	Templeton_Gap.Repeater.5
PPRCN	Radio Site Repeater	Templeton Gap	22			4	Templeton_Gap.Repeater.6
PPRCN	Radio Site Repeater	Templeton Gap	22			4	Templeton_Gap.Repeater.7
PPRCN	Radio Site Repeater	Templeton Gap	22			4	Templeton_Gap.Repeater.8
State of Colorado	Radio Site Repeater	Tenderfoot II	17			6	Tenderfoot_II.Repeater.1
State of Colorado	Radio Site Repeater	Tenderfoot II	17			6	Tenderfoot_II.Repeater.2
State of Colorado	Radio Site Repeater	Tenderfoot II	17			6	Tenderfoot_II.Repeater.3
State of Colorado	Radio Site Repeater	Tenderfoot II	17			6	Tenderfoot_II.Repeater.4
State of Colorado	Radio Site Repeater	Tenderfoot II	17			6	Tenderfoot_II.Repeater.5
Jefferson County	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.1
Jefferson County	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.2
Jefferson County	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.3
ADCOM	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.4
ADCOM	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.5
ADCOM	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.6
ADCOM	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.7
ADCOM	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.8
State of Colorado	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.9

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.10
State of Colorado	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.11
State of Colorado	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.12
State of Colorado	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.13
State of Colorado	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.14
State of Colorado	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.15
State of Colorado	Radio Site Repeater	Thorodin	5			1	Thorodin.Repeater.16
State of Colorado	Radio Site Repeater	Toonerville	28			6	Toonerville.Repeater.1
State of Colorado	Radio Site Repeater	Toonerville	28			6	Toonerville.Repeater.2
State of Colorado	Radio Site Repeater	Toonerville	28			6	Toonerville.Repeater.3
State of Colorado	Radio Site Repeater	Toonerville	28			6	Toonerville.Repeater.4
State of Colorado	Radio Site Repeater	Toonerville	28			6	Toonerville.Repeater.5
State of Colorado	Radio Site Repeater	Trinidad CF	56			6	Trinidad_CF.Repeater.1
State of Colorado	Radio Site Repeater	Trinidad CF	56			6	Trinidad_CF.Repeater.2
State of Colorado	Radio Site Repeater	Trinidad CF	56			6	Trinidad_CF.Repeater.3
State of Colorado	Radio Site Repeater	Trinidad CF	56			6	Trinidad_CF.Repeater.4
State of Colorado	Radio Site Repeater	Trinidad CF	56			6	Trinidad_CF.Repeater.5
PPRCN	Radio Site Repeater	Truckton	19			4	Truckton.Repeater.1
PPRCN	Radio Site Repeater	Truckton	19			4	Truckton.Repeater.2
PPRCN	Radio Site Repeater	Truckton	19			4	Truckton.Repeater.3
PPRCN	Radio Site Repeater	Truckton	19			4	Truckton.Repeater.4
PPRCN	Radio Site Repeater	Truckton	19			4	Truckton.Repeater.5
PPRCN	Radio Site Repeater	Truckton	19			4	Truckton.Repeater.6
State of Colorado	Radio Site Repeater	TV Hill	34			2	TV_Hill.Repeater.1
State of Colorado	Radio Site Repeater	TV Hill	34			2	TV_Hill.Repeater.2
State of Colorado	Radio Site Repeater	TV Hill	34			2	TV_Hill.Repeater.3
State of Colorado	Radio Site Repeater	TV Hill	34			2	TV_Hill.Repeater.4
State of Colorado	Radio Site Repeater	TV Hill	34			2	TV_Hill.Repeater.5
State of Colorado	Radio Site Repeater	Teepee Park	49			2	Teepee Park.Repeater.1
State of Colorado	Radio Site Repeater	Teepee Park	49			2	Teepee Park.Repeater.1
State of Colorado	Radio Site Repeater	Teepee Park	49			2	Teepee Park.Repeater.1
State of Colorado	Radio Site Repeater	Teepee Park	49			2	Teepee Park.Repeater.1
State of Colorado	Radio Site Repeater	Teepee Park	49			2	Teepee Park.Repeater.1
State of Colorado	Radio Site Repeater	Twin	49			6	Twin.Repeater.1
State of Colorado	Radio Site Repeater	Twin	49			6	Twin.Repeater.2
State of Colorado	Radio Site Repeater	Twin	49			6	Twin.Repeater.3
State of Colorado	Radio Site Repeater	Twin	49			6	Twin.Repeater.4
State of Colorado	Radio Site Repeater	Twin	49			6	Twin.Repeater.5
State of Colorado	Radio Site Repeater	Twin	49			6	Twin.Repeater.6
Canon City, City of	Radio Site Repeater	Twin	49			6	Twin.Repeater.7
Canon City, City of	Radio Site Repeater	Twin	49			6	Twin.Repeater.8
State of Colorado	Radio Site Repeater	Twin	49			6	Twin.Repeater.9
State of Colorado	Radio Site Repeater	Twin	49			6	Twin.Repeater.10
Summit County	Radio Site Repeater	Tyrolean	77			2	Tyrolean.Repeater.1
Summit County	Radio Site Repeater	Tyrolean	77			2	Tyrolean.Repeater.2
Summit County	Radio Site Repeater	Tyrolean	77			2	Tyrolean.Repeater.3
Summit County	Radio Site Repeater	Tyrolean	77			2	Tyrolean.Repeater.4
Summit County	Radio Site Repeater	Tyrolean	77			2	Tyrolean.Repeater.5
Montrose County	Radio Site Repeater	Uravan	85			2	Uravan.Repeater.1
Montrose County	Radio Site Repeater	Uravan	85			2	Uravan.Repeater.2
Montrose County	Radio Site Repeater	Uravan	85			2	Uravan.Repeater.3
Montrose County	Radio Site Repeater	Uravan	85			2	Uravan.Repeater.4
Montrose County	Radio Site Repeater	Uravan	85			2	Uravan.Repeater.5
State of Colorado	Radio Site Repeater	Ute	74			2	Ute.Repeater.1
State of Colorado	Radio Site Repeater	Ute	74			2	Ute.Repeater.2
State of Colorado	Radio Site Repeater	Ute	74			2	Ute.Repeater.3
State of Colorado	Radio Site Repeater	Ute	74			2	Ute.Repeater.4
State of Colorado	Radio Site Repeater	Ute	74			2	Ute.Repeater.5
State of Colorado	Radio Site Repeater	Vail	76			2	Vail.Repeater.1
State of Colorado	Radio Site Repeater	Vail	76			2	Vail.Repeater.2
State of Colorado	Radio Site Repeater	Vail	76			2	Vail.Repeater.3
State of Colorado	Radio Site Repeater	Vail	76			2	Vail.Repeater.4
Eagle County	Radio Site Repeater	Vail	76			2	Vail.Repeater.5
Eagle County	Radio Site Repeater	Vail	76			2	Vail.Repeater.6
State of Colorado	Radio Site Repeater	Valley	42			6	Valley.Repeater.1
State of Colorado	Radio Site Repeater	Valley	42			6	Valley.Repeater.2
State of Colorado	Radio Site Repeater	Valley	42			6	Valley.Repeater.3
State of Colorado	Radio Site Repeater	Valley	42			6	Valley.Repeater.4
State of Colorado	Radio Site Repeater	Valley	42			6	Valley.Repeater.5
La Junta, City of	Radio Site Repeater	Valley	42			6	Valley.Repeater.6
State of Colorado	Radio Site Repeater	Verdemont	16			6	Verdemont.Repeater.1
State of Colorado	Radio Site Repeater	Verdemont	16			6	Verdemont.Repeater.2
State of Colorado	Radio Site Repeater	Verdemont	16			6	Verdemont.Repeater.3
State of Colorado	Radio Site Repeater	Verdemont	16			6	Verdemont.Repeater.4
State of Colorado	Radio Site Repeater	Verdemont	16			6	Verdemont.Repeater.5
State of Colorado	Radio Site Repeater	Vermillion Bluffs	16			2	Vermillion_Bluffs.Repeater.1
State of Colorado	Radio Site Repeater	Vermillion Bluffs	16			2	Vermillion_Bluffs.Repeater.2
State of Colorado	Radio Site Repeater	Vermillion Bluffs	16			2	Vermillion_Bluffs.Repeater.3
State of Colorado	Radio Site Repeater	Vermillion Bluffs	16			2	Vermillion_Bluffs.Repeater.4
State of Colorado	Radio Site Repeater	Vermillion Bluffs	16			2	Vermillion_Bluffs.Repeater.5
State of Colorado	Radio Site Repeater	W Mountain	44			2	W_Mountain.Repeater.1

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Radio Site Repeater	W Mountain	44			2	W_Mountain.Repeater.2
State of Colorado	Radio Site Repeater	W Mountain	44			2	W_Mountain.Repeater.3
State of Colorado	Radio Site Repeater	W Mountain	44			2	W_Mountain.Repeater.4
State of Colorado	Radio Site Repeater	W Mountain	44			2	W_Mountain.Repeater.5
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.1
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.2
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.3
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.4
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.5
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.6
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.7
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.8
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.9
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.10
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.11
Pueblo, City of	Radio Site Repeater	Walking Stick	1-4			6	Walking_Stick.Repeater.12
State of Colorado	Radio Site Repeater	Walsenburg	43			6	Walsenburg.Repeater.1
State of Colorado	Radio Site Repeater	Walsenburg	43			6	Walsenburg.Repeater.2
State of Colorado	Radio Site Repeater	Walsenburg	43			6	Walsenburg.Repeater.3
State of Colorado	Radio Site Repeater	Walsenburg	43			6	Walsenburg.Repeater.4
Huerfano County	Radio Site Repeater	Walsenburg	43			6	Walsenburg.Repeater.5
Huerfano County	Radio Site Repeater	Walsenburg	43			6	Walsenburg.Repeater.6
State of Colorado	Radio Site Repeater	Walton Mtn	43			2	Walton_Mtn.Repeater.1
State of Colorado	Radio Site Repeater	Walton Mtn	43			2	Walton_Mtn.Repeater.2
State of Colorado	Radio Site Repeater	Walton Mtn	43			2	Walton_Mtn.Repeater.3
State of Colorado	Radio Site Repeater	Walton Mtn	43			2	Walton_Mtn.Repeater.4
State of Colorado	Radio Site Repeater	Walton Mtn	43			2	Walton_Mtn.Repeater.5
State of Colorado	Radio Site Repeater	Waterdog	75			2	Waterdog.Repeater.1
State of Colorado	Radio Site Repeater	Waterdog	75			2	Waterdog.Repeater.2
State of Colorado	Radio Site Repeater	Waterdog	75			2	Waterdog.Repeater.3
State of Colorado	Radio Site Repeater	Waterdog	75			2	Waterdog.Repeater.4
State of Colorado	Radio Site Repeater	Waterdog	75			2	Waterdog.Repeater.5
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.1
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.2
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.3
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.4
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.5
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.6
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.7
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.8
Douglas County	Radio Site Repeater	West Creek	52-x			1	West Creek.Repeater.9
Douglas County	Radio Site Repeater	West Creek	52-x			1	West.Creek.Repeater.10
State of Colorado	Radio Site Repeater	Whitewater	12			2	Whitewater.Repeater.1
State of Colorado	Radio Site Repeater	Whitewater	12			2	Whitewater.Repeater.2
State of Colorado	Radio Site Repeater	Whitewater	12			2	Whitewater.Repeater.3
State of Colorado	Radio Site Repeater	Whitewater	12			2	Whitewater.Repeater.4
GJRCC	Radio Site Repeater	Whitewater	12			2	Whitewater.Repeater.5
GJRCC	Radio Site Repeater	Whitewater	12			2	Whitewater.Repeater.6
State of Colorado	Radio Site Repeater	Wildhorse	21			3	Wildhorse.Repeater.1
State of Colorado	Radio Site Repeater	Wildhorse	21			3	Wildhorse.Repeater.2
State of Colorado	Radio Site Repeater	Wildhorse	21			3	Wildhorse.Repeater.3
State of Colorado	Radio Site Repeater	Wildhorse	21			3	Wildhorse.Repeater.4
State of Colorado	Radio Site Repeater	Wildhorse	21			3	Wildhorse.Repeater.5
Eagle County	Radio Site Repeater	Wolcott	55			2	Wolcott.Repeater.1
Eagle County	Radio Site Repeater	Wolcott	55			2	Wolcott.Repeater.2
Eagle County	Radio Site Repeater	Wolcott	55			2	Wolcott.Repeater.3
Eagle County	Radio Site Repeater	Wolcott	55			2	Wolcott.Repeater.4
Eagle County	Radio Site Repeater	Wolcott	55			2	Wolcott.Repeater.5
State of Colorado	Radio Site Repeater	Wolf Creek Pass	27			2	Wolf_Creek_Pass.Repeater.1
State of Colorado	Radio Site Repeater	Wolf Creek Pass	27			2	Wolf_Creek_Pass.Repeater.2
State of Colorado	Radio Site Repeater	Wolf Creek Pass	27			2	Wolf_Creek_Pass.Repeater.3
State of Colorado	Radio Site Repeater	Wolf Creek Pass	27			2	Wolf_Creek_Pass.Repeater.4
State of Colorado	Radio Site Repeater	Wolf Creek Pass	27			2	Wolf_Creek_Pass.Repeater.5
PPRCN	Radio Site Repeater	Woodland Park	15			4	Woodland_Park.Repeater.1
PPRCN	Radio Site Repeater	Woodland Park	15			4	Woodland_Park.Repeater.2
PPRCN	Radio Site Repeater	Woodland Park	15			4	Woodland_Park.Repeater.3
PPRCN	Radio Site Repeater	Woodland Park	15			4	Woodland_Park.Repeater.4
PPRCN	Radio Site Repeater	Woodland Park	15			4	Woodland_Park.Repeater.5
PPRCN	Radio Site Repeater	Woodland Park	15			4	Woodland_Park.Repeater.6
State of Colorado	Radio Site Repeater	Wray	44			3	Wray.Repeater.1
State of Colorado	Radio Site Repeater	Wray	44			3	Wray.Repeater.2
State of Colorado	Radio Site Repeater	Wray	44			3	Wray.Repeater.3
State of Colorado	Radio Site Repeater	Wray	44			3	Wray.Repeater.4
State of Colorado	Radio Site Repeater	Wray	44			3	Wray.Repeater.5
State of Colorado	Radio Site Repeater	Yuma	34			3	Yuma.Repeater.1
State of Colorado	Radio Site Repeater	Yuma	34			3	Yuma.Repeater.2
State of Colorado	Radio Site Repeater	Yuma	34			3	Yuma.Repeater.3
State of Colorado	Radio Site Repeater	Yuma	34			3	Yuma.Repeater.4
State of Colorado	Radio Site Repeater	Yuma	34			3	Yuma.Repeater.5
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.1
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.2

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.3
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.4
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.5
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.6
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.7
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.8
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.9
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.10
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.11
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.12
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.13
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.14
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.15
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.16
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.17
Douglas County	Radio Site Repeater	Xcel 470	14-x			1	Xcel.470.Repeater.18
Arapahoe County	Radio Site Repeater	Zap	47			1	Zap.Repeater.1
Arapahoe County	Radio Site Repeater	Zap	47			1	Zap.Repeater.2
Arapahoe County	Radio Site Repeater	Zap	47			1	Zap.Repeater.3
Arapahoe County	Radio Site Repeater	Zap	47			1	Zap.Repeater.4
Arapahoe County	Radio Site Repeater	Zap	47			1	Zap.Repeater.5
Arapahoe County	Radio Site Repeater	Zap	47			1	Zap.Repeater.6
State of Colorado	Radio Site Repeater	Zap	47			1	Zap.Repeater.7
ADCOM	Radio Site Repeater	Zap	47			1	Zap.Repeater.8
ADCOM	Radio Site Repeater	Zap	47			1	Zap.Repeater.9
Castle Rock, City of	Dispatch Center	Castle Rock PD Dispatch (4 Positions)	SZ0D1C1D03	4		1	Castle.Rock.PD.Dispatch.Center
State of Colorado	Dispatch Center	SOC Pueblo Dispatch (7 Positions)	SZ0D1C6D26	7		6	SOC.Pueblo.Dispatch.Center
State of Colorado	Dispatch Center	SOC Denver - Kipling Dispatch (8 Positions)	SZ0D1C1D08	8		n/a	SOC.Denver.Kipling.Dispatch.Center
State of Colorado	Dispatch Center	SOC Denver - CGW Dispatch (1 Position)	SZ0D1C1D09	1		n/a	SOC.Denver.CGW.Dispatch.Center
State of Colorado	Dispatch Center	SOC Denver - OEM Dispatch (1 Position)	SZ0D1C1D10	1		n/a	SOC.Denver.OEM.Dispatch.Center
South Metro Fire	Dispatch Center	S_Metro Fire Dispatch (6 Positions)	SZ0D1C1D10	6		1	S.Metro.Fire.Dispatch.Center
Park County	Dispatch Center	Park County Dispatch (5 Positions)	SZ0D1C1D11	5		1	Park.County.Dispatch.Center
Arapahoe County	Dispatch Center	Arapahoe County Dispatch (7 Positions)	SZ0D1C1D13	7		1	Arapahoe.County.Dispatch.Center
State of Colorado	Dispatch Center	SOC Denver - ESU Dispatch (1 Position)	SZ0D1C1D14	1		n/a	SOC.Denver.ESU.Dispatch.Center
Littleton, City of Police Department	Dispatch Center	Littleton, City of PD Dispatch (4 Positions)	SZ0D1C1D15	4		1	Littleton.City.of.PD.Dispatch.Center
Littleton, City of Fire Department	Dispatch Center	Littleton, City of FD Dispatch (4 Positions)	SZ0D1C1D15	4		1	Littleton.City.of.FD.Dispatch.Center
Englewood, City of	Dispatch Center	Englewood, City Of Dispatch (3 Positions)	SZ0D1C1D16	3		1	Englewood.City.Of.Dispatch.Center
Glendale, City of	Dispatch Center	Glendale, City of Dispatch (3 Positions)	SZ0D1C1D17	3		1	Glendale.City.of.Dispatch.Center
Parker, City of	Dispatch Center	Parker, City of PD Dispatch (6 Positions)	SZ0D1C1D18	6		1	Parker.City.of.PD.Dispatch.Center
CDOT	Dispatch Center	CDOT TOC Dispatch (1 Position)	SZ0D1C1D19	1		1	CDOT.TOC.Dispatch.Center
CDOT	Dispatch Center	CDOT Eisenhower Dispatch (2 Positions)	SZ0D1C1D20	2		1	CDOT.Eisenhower.Dispatch.Center
Cheyenne County	Dispatch Center	Cheyenne County Dispatch (1 Position)	SZ0D1C1D21	1		1	Cheyenne.County.Dispatch.Center
Kit Carson County	Dispatch Center	Kit Carson County Dispatch (2 Positions)	SZ0D1C1D22	2		1	Kit.Carson.County.Dispatch.Center
Pueblo County	Dispatch Center	Pueblo County Dispatch (11 Positions)	SZ0D1C1D37	11		1	Pueblo.County.Dispatch.Center
Pueblo, City of	Dispatch Center	Pueblo, City of Dispatch (9 Positions)	SZ0D1C1D38	9		1	Pueblo.City.of.Dispatch.Center
Golden, City of	Dispatch Center	Golden, City of Dispatch (3 Positions)	SZ0D1C1D39	3		1	Golden.City.of.Dispatch.Center
Douglas County	Dispatch Center	Douglass County Dispatch (19 Positions)	SZ0D1C1D40	19		1	Douglass.County.Dispatch.Center
Jefferson County	Dispatch Center	Jefferson County Dispatch (5 Positions)	SZ0D1C1D41	5		1	Jefferson.County.Dispatch.Center
RTD	Dispatch Center	RTD District Shops Dispatch (14 Positions)	SZ0D1C1D42	14		1	RTD.District.Shops.Dispatch.Center
RTD	Dispatch Center	RTD Mariposa Dispatch (6 Positions)	SZ0D1C1D43	6		1	RTD.Mariposa.DispatchCenter
State of Colorado	Dispatch Center	Zone 1 Master Site (1 Position)	SZ0D1C1	1		n/a	Zone.1.Master.Site.Center
State of Colorado	Dispatch Center	SOC Montrose Dispatch (6 Positions)	SZ0D1C2D01	6		n/a	SOC.Montrose.Dispatch.Center
Garfield County	Dispatch Center	Garfield County Dispatch (7 Positions)	SZ0D1C2D05	7		2	Garfield.County.Dispatch.Center
Montrose, City of	Dispatch Center	Montrose, City of Dispatch (5 Positions)	SZ0D1C2D06	5		2	Montrose.City.Dispatch.Center
Routt County	Dispatch Center	Routt County Dispatch (4 Positions)	SZ0D1C2D08	4		2	Routt.County.Dispatch.Center
Chaffee County	Dispatch Center	Chaffee County Dispatch (2 Positions)	SZ0D1C2D10	2		2	Chaffee.County.Dispatch.Center
Grand County	Dispatch Center	Grand County Dispatch (2 Positions)	SZ0D1C2D11	2		2	Grand.County.Dispatch.Center
City of Durango, La Plata County	Dispatch Center	Durango, City of / La Plata County Dispatch (5 Positions)	SZ0D1C2D12	5		2	Durango.City.Dispatch.Center
Grand Junction Regional	Dispatch Center	Grand Junction Regional Dispatch (22 Positions)	SZ0D1C2D22	22		2	Grand.Junction.Dispatch.Center
State of Colorado	Dispatch Center	SOC Alamosa Dispatch (6 Positions)	SZ0D1C2D25	6		n/a	SOC.Alamosa.Dispatch.Center
CDOT	Dispatch Center	CDOT Hanging Lake Tunnel Dispatch (5 Positions)	SZ0D1C2D26	5		2	CDOT.Hanging.Dispatch.Center
Vail, City of	Dispatch Center	Vail, City of Dispatch (6 Positions)	SZ0D1C2D27	6		2	Vail.City.Dispatch.Center
Rio Blanco County	Dispatch Center	Rio Blanco County Dispatch (3 Positions)	SZ0D1C2D29	3		2	Rio.Blanco.Dispatch.Center
State of Colorado	Dispatch Center	SOC Craig Dispatch (6 Positions)	SZ0D1C2D30	6		n/a	SOC.Craig.Dispatch.Center
Ft. Collins, City of	Dispatch Center	Ft. Collins, City of Dispatch (9 Positions)	SZ0D1C3D02	9		3	Ft.Collins.City.of.Dispatch.Center
UNC	Dispatch Center	UNC Dispatch (1 Position)	SZ0D1C3D04	1		3	UNC.Dispatch.Center
Longmont, City of PD	Dispatch Center	Longmont, City of PD Dispatch (8 Positions)	SZ0D1C3D05	8		3	Longmont.City.of.Dispatch.Center
ADCOM	Dispatch Center	ADCOM Dispatch (10 Positions)	SZ0D1C3D06	10		3	ADCOM.Dispatch Center
Broomfield, City of	Dispatch Center	Broomfield, City of Dispatch (6 Positions)	SZ0D1C3D07	6		3	Broomfield.City.of.Dispatch.Center
Washington/Yuma Counties	Dispatch Center	Washington/Yuma Counties Dispatch (4 Positions)	SZ0D1C3D08	4		3	Washington.Yuma.Counties.Dispatch.Center
Morgan County	Dispatch Center	Morgan County Dispatch (4 Positions)	SZ0D1C3D09	4		3	Morgan.County.Dispatch.Center
Larimer County	Dispatch Center	Larimer County Dispatch (7 Positions)	SZ0D1C3D10	7		3	Larimer.County.Dispatch.Center
Boulder County	Dispatch Center	Boulder County Dispatch (10 Positions)	SZ0D1C3D11	10		3	Boulder.County.Dispatch.Center
Phillips County	Dispatch Center	Phillips County Dispatch (1 Position)	SZ0D1C3D13	1		3	Phillips.County.Dispatch.Center
Estes Park, City of PD	Dispatch Center	Estes Park, City of PD Dispatch (3 Positions)	SZ0D1C3D14	3		3	Estes.Park.City.of.PD.Dispatch.Center
UNC	Dispatch Center	UNC Dispatch (1 Position)	SZ0D1C3D24	1		3	UNC.Dispatch.Center
Thornton, City of	Dispatch Center	Thornton, City of Dispatch (8 Positions)	SZ0D1C3D25	8		3	Thornton.City.of.Dispatch.Center
Weld County	Dispatch Center	Weld County Dispatch (14 Positions)	SZ0D1C3D26	14		3	Weld.County.County.Dispatch.Center
Logan County	Dispatch Center	Sterling Emergency Dispatch (4 Positions)	SZ0D1C3D27	4		3	Sterling.Emergency.Emergency.Dispatch.Center
Loveland, City of	Dispatch Center	Loveland, City of Dispatch (10 Positions)	SZ0D1C3D28	10		3	Loveland.City.of.Dispatch.Center
Colorado Springs, City of	Dispatch Center	Colorado Springs, City of Police Fire Dispatch (16 Positions)	SZ0D1C4D1	16		4	Colorado.Springs.City.of.Police.Fire.Dispatch.Center

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
Springs Utilities	Dispatch Center	Springs Utilities ESC Dispatch (14 Positions)	SZ0D1C4D3	14		4	Springs.Utilities.ESC.Dispatch.Center
Springs Utilities	Dispatch Center	Springs Utilities Leon Young Dispatch (2 Positions)	SZ0D1C4D3	2		4	Springs.Utilities.Young.Dispatch.Center
Springs Utilities	Dispatch Center	Springs Utilities SECC Dispatch (7 Positions)	SZ0D1C4D4	7		4	Springs.Utilities.SECC.Dispatch.Center
El Paso County	Dispatch Center	El Paso County Sheriff Dispatch (8 Positions)	SZ0D1C4D29	8		4	El.Paso.Sheriff.Dispatch.Center
Colorado Springs, City of	Dispatch Center	Colorado Springs, City of Airport Dispatch (2 Positions)		2		4	Colorado.Springs.City.of.Airport.Dispatch.Center
Colorado Springs, City of	Dispatch Center	Colorado Springs, City of OEM Dispatch (2 Positions)		2		4	Colorado.S+I1548prings.City.of.OEM.Dispatch.Center
Colorado Springs, City of	Dispatch Center	Colorado Springs, City of Radio Test Dispatch (1 Position)		1		4	Colorado.Springs.City.of.Radio.Test.Dispatch.Center
Colorado Springs, City of	Dispatch Center	Colorado Springs, City of Streets Dispatch (3 Positions)		3		4	Colorado.Springs.City.of.Streets.Dispatch.Center
Colorado Springs, City of	Dispatch Center	Colorado Springs, City of Traffic Dispatch (1 Position)		1		4	Colorado.Springs.City.of.Traffic.Dispatch.Center
Colorado Springs, City of	Dispatch Center	Colorado Springs, City of Transit Dispatch (2 Positions)		2		4	Colorado.Springs.City.of.Transit.Dispatch.Center
Fountain Springs, City	Dispatch Center	Fountain Springs, City of Dispatch (2 Positions)		2		4	Fountain.Springs.City.of.Dispatch.Center
Memorial Hospital	Dispatch Center	Memorial Hospital Main Dispatch (2 Positions)		2		4	Memorial.Hospital.Main.Dispatch.Center
Memorial Hospital	Dispatch Center	Memorial Hospital North Dispatch (1 Position)		1		4	Memorial.Hospital.North.Dispatch.Center
Woodland Park, City of	Dispatch Center	Woodland Park, City of PD Dispatch (1 Position)		1		4	Woodland.Park.City.of.PD.Dispatch.Center
El Paso County	Dispatch Center	El Paso County Teller Dispatch (6 Positions)		6		4	El.Paso.Teller.Dispatch.Center
State of Colorado	Transport - uW	DTB (Denver Transfer Building)	103	Littleton	160	AA	DTB.Denver.Transfer.Building.to.Littleton.Transport.Link
State of Colorado	Transport - uW	ADCOM	1C2	Broomfield, City of	1J5	CW	ADCOM.to.Broomfield.City.of.Transport.Link
IGC	Transport - Fiber	Broomfield, City of	1J5	PRPA (Ft. Collins)	3B2	CWf	Broomfield.City of.to.PRPA.Ft.Collins.Transport.Link
State of Colorado	Transport - uW	ADCOM	1C2	Long Peak	386	CN	ADCOM.to.Long.Peak.Transport.Link
IGC	Transport - Fiber	Long Peak	386	PRPA (Ft. Collins)	3B2	CNf	Long Peak.to.PRPA.Ft.Collins.Transport.Link
State of Colorado	Transport - uW	ADCOM	1C2	Thronton, City of	1J6	CC	ADCOM.to.Thronton.City.of.Transport.Link
State of Colorado	Transport - uW	Thronton, City of	1J6	Commerce, City of	161	CC	Thronton.City of.to.Commerce.City.of.Transport.Link
State of Colorado	Transport - uW	Commerce, City of	161	ADCOM	1C2	CC	Commerce.City.of.to.ADCOM.Transport.Link
State of Colorado	Transport - uW	ADCOM	1C2	Lady Bird Hill	198	CE	ADCOM.to.Lady.Bird.Hill.Transport.Link
State of Colorado	Transport - uW	Lady Bird Hill	198	Hoyt	3B4	CE	Lady.Bird.Hill.to.Hoyt.Transport.Link
State of Colorado	Transport - uW	Hoyt	3B4	Ft. Morgan	315	CE	Hoyt.to.Ft.Morgan.Transport.Link
State of Colorado	Transport - uW	Long Peak	386	Gunbarrel Hill	1K8	CNB	Long.Peak.to.Gunbarrel.Hill.Transport.Link
Boulder County	Transport - uW	Gunbarrel Hill	1K8	Boulder, City of PD	1K7	CNB	Gunbarrel.Hill.to.Boulder.City.of.Transport.Link
State of Colorado	Transport - uW	Boulder, City of PD	1K7	Betasso	1J1	CNB	Boulder.City.of.PD.to.Betasso.Transport.Link
State of Colorado	Transport - uW	DTB (Denver Transfer Building)	103	Hwy-E. Colfax	146	DD	DTB.Denver.Transfer.Building.to.Hwy.Colfax.Transport.Link
State of Colorado	Transport - uW	Hwy-E. Colfax	146	DRDC	187	DD	Hwy.E.Colfax.to.DRDC.Transport.Link
State of Colorado	Transport - uW	Limon	203	Limon Correction	277	DEH	Limon.to.Limon.Correction.Transport.Link
State of Colorado	Transport - uW	Limon Correction	277	Hugo	253	DEH	Limon.to.Hugh.Transport.Link
State of Colorado	Transport - uW	Boyero	209	Punkin Center	1D3	DEP	Boyero.to.Punkin.Center.Transport.Link
State of Colorado	Transport - uW	Smoky Hill	1E3	Zap	1E4	DEA	Smoky.Hill.to.Zap.Transport.Link
Arapahoe County	Transport - uW	Smoky Hill	1E3	Arapahoe County Justice Center	1E9	DEM	Smoky.Hill.to.Arapahoe.County.Justice.Center.Transport.Link.
State of Colorado	Transport - uW	Arapahoe County Justice Center	1E9	Military Affairs	1E8	DEM	Arapahoe.County.Justice.Center.to.Military.Affairs.Transport.Link
State of Colorado	Transport - uW	DTB (Denver Transfer Building)	103	Smoky Hill	1E3	DE	DTB.Denver.Transfer.Building.to.Smoky.Hill.Transport.Link
State of Colorado	Transport - uW	Zap	1E4	Ramah	1D8	DE	Zap.to.Ramah.Transport.Link
State of Colorado	Transport - uW	Ramah	1D8	Limon	203	DE	Ramah.to.Limon.Transport.Link
State of Colorado	Transport - uW	Limon	203	Boyero	209	DE	Limon.to.Boyero.Transport.Link
State of Colorado	Transport - uW	DTB (Denver Transfer Building)	103	690 Kipling	147	DK	DTB.Denver.Transfer.Building.to.690 Kipling.Kipling.Transport.Link
State of Colorado	Transport - uW	South Metro Fire	1H8	690 Kipling	147	SL	South.Metro.Fire.to.690 Kipling.Kipling.Transport.Link
State of Colorado	Transport - uW	DTB (Denver Transfer Building)	103	Ft Logan MH	139	DL	DTB.Denver.Transfer.Building.to.Ft Logan MH.Transport.Link
State of Colorado	Transport - uW	DTB (Denver Transfer Building)	103	SSB (State Service Building)	102	DM	DTB.Denver.Transfer.Building.to.SSB.State Service Building.Transport.Link
State of Colorado	Transport - uW	SSB (State Service Building)	102	Camp George West	148	DMA	SSB.State.Service.Building.to.Camp George West.Transport.Link
State of Colorado	Transport - uW	Auraria-King Center	1H9	Centennial Building	191	MK	Auraria.King.Center.to.Centennial.Building.Transport.Link
Jefferson County	Transport - uW	Camp George West	148	Jefferson County Shop	1C6	DMJ	Camp George West.to.Jefferson.County.Shop.Transport.Link
State of Colorado	Transport - uW	Buckhorn	305	Ft. Collins	306	NF	Buckhorn.to.Ft.Collins.Transport.Link
State of Colorado	Transport - uW	Squaw Mt.	111	Mead	308	DN	Squaw.Mt.to.Mead.Transport.Link
State of Colorado	Transport - uW	Mead	308	Buckhorn	305	DN	Mead.to.Buckhorn.Transport.Link
State of Colorado	Transport - uW	Buckhorn	305	Greeley	313	DN	Buckhorn.to.Greeley.Transport.Link
State of Colorado	Transport - uW	DTB (Denver Transfer Building)	103	Franktown	109	DS	DTB.Denver.Transfer.Building.to.Franktown.Transport.Link
State of Colorado	Transport - uW	Franktown	109	Cheyenne Mt.	205	DS	Franktown.to.Cheyenne.Mt.Transport.Link
State of Colorado	Transport - uW	Cheyenne Mt.	205	Pueblo	204	DS	Cheyenne.Mt.to.Pueblo.Transport.Link
State of Colorado	Transport - uW	Cheyenne Mt.	205	Austin Bluffs	2H9	SC	Cheyenne.Mt.to.Austin.Bluffs.Transport.Link
PPRCN	Transport - uW	Austin Bluffs	2H9	Colorado Springs	215	SC	Austin.Bluffs.to.Colorado.Springs.Transport.Link
State of Colorado	Transport - uW	DTB (Denver Transfer Building)	103	Squaw Mt.	111	DW	DTB.Denver.Transfer.Building.to.Squaw.Mt.Transport.Link
State of Colorado	Transport - uW	Squaw Mt.	111	Mines Peak	112	DW	Squaw.Mt.to.Mines.Peak.Transport.Link
State of Colorado	Transport - uW	Mines Peak	112	Grouse Mt.	411	DW	Mines.Peak.to.Grouse.Mt.Transport.Link
State of Colorado	Transport - uW	Grouse Mt.	411	Castle Peak	405	DW	Grouse.Mt.to.Castle.Peak.Transport.Link
State of Colorado	Transport - uW	Castle Peak	405	Sunlight Peak	416	DW	Castle.Peak.to.Sunlight.Peak.Transport.Link
State of Colorado	Transport - uW	Sunlight Peak	416	Grand Mesa	410	DW	Sunlight.Peak.to.Grand.Mesa.Transport.Link
State of Colorado	Transport - uW	Grand Mesa	410	Grand Junction	400	DW	Grand.Mesa.to.Grand.Junction.Transport.Link
Grand County	Transport - uW	Hot Sulphur Springs	412	Grouse Mt.	411	WH	Hot.Sulphur.Springs.to.Grouse.Mt.Transport.Link
State of Colorado	Transport - uW	Eagle	424	Castle Mt.	405	WE	Eagle.to.Castle.Mt.Transport.Link
State of Colorado	Transport - Fiber	Glenwood Springs	4A5	Cinnamon Creek	474	GHf	Glenwood.Springs.to.Cinnamon.Creek.Transport.Link
State of Colorado	Transport - uW	Cinnamon Creek	474	Sunlight Peak	416	WC	Cinnamon.Creek.to.Sunlight.Peak.Transport.Link
State of Colorado	Transport - uW	Grand Mesa	410	Grand Mesa Radar	4C2	WR	Grand.Mesa.to.Grand.Mesa.Radar.Transport.Link
State of Colorado	Transport - uW	Squaw Mt.	111	Castle Rock	1F9	WS	Squaw.Mt.to.Castle.Rock.Transport.Link
State of Colorado	Transport - Fiber	Grand Junction	400	Craig Justice Center	4D7	GCf	Grand.Junction.to.Craig.Justice.Center.Transport.Link
State of Colorado	Transport - uW	Akron	304	Reirdon	310	GS	Akron.to.Reirdon.Transport.Link
State of Colorado	Transport - uW	Reiradon	310	Sterling	314	GS	Reiradon.to.Sterling.Transport.Link
State of Colorado	Transport - uW	Sterling	314	Sterling CF	370	GSC	Sterling.to.Sterling.CF.Transport.Link
State of Colorado	Transport - uW	Akron	304	Yuma	3A5	GW	Akron.to.Yuma.Transport.Link
State of Colorado	Transport - uW	Yuma	3A5	Wray	311	GW	Yuma.to.Wray.Transport.Link
State of Colorado	Transport - uW	Wray	311	Idalia	3B3	GW	Wray.to.Idalia.Transport.Link
State of Colorado	Transport - uW	Idalia	3B3	Bethune	272	GW	Idalia.to.Bethune.Transport.Link
State of Colorado	Transport - uW	Bethune	272	Burlington	247	GW	Bethune.to.Burlington.Transport.Link
State of Colorado	Transport - uW	Greeley	313	Point of Rocks	309	GE	Greeley.to.Point.of.Rocks.Transport.Link
State of Colorado	Transport - uW	Point of Rocks	309	Ft. Morgan	315	GE	Point.of.Rocks.to.Ft.Morgan.Transport.Link

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Transport - uW	Ft. Morgan	315	Akron	304	GE	Ft.Morgan.to.Akron.Transport.Link
State of Colorado	Transport - uW	Akron	304	Anton	303	GE	Akron.to.Anton.Transport.Link
State of Colorado	Transport - uW	Anton	303	Boyero	209	GE	Anton.to.Boyero.Transport.Link
State of Colorado	Transport - uW	Reiradon	310	Wildhorse	374	RW	Reiradon.to.Wildhorse.Transport.Link
State of Colorado	Transport - uW	Ft. Morgan	315	Pawnee	387	FF	Ft.Morgan.to.Pawnee.Transport.Link
State of Colorado	Transport - uW	Pawnee	387	Ft. Morgan	315	FF	Pawnee.to.Ft.Morgan.Transport.Link
IGC	Transport - Fiber	Greeley	313	PRPA (Ft. Collins)	3B2	GPf	Greeley.to.PRPA.Ft.Collins.Transport.Link
State of Colorado	Transport - uW	Reiradon	310	Peetz	388	RP	Reiradon.to.Peetz.Transport.Link
State of Colorado	Transport - uW	Anton	303	Last Chance	389	GL	Anton.to.Last.Chance.Transport.Link
Yuma County	Transport - uW	Yuma	3A5	Yuma	330	YY	Yuma.to.Yuma.Transport.Link
State of Colorado	Transport - uW	Grand Junction	400	Grand Junction	409	JM	Grand.Junction.to.Grand.Junction.Transport.Link
GJRCC	Transport - uW	Grand Junction	400	Grand Junction Water Plant	4K3	WP	Grand Junction.to.Grand Junction Water Plant.Transport.Link
GJRCC	Transport - uW	Grand Junction	400	Whitewater	418	JS	Grand Junction.to.Whitewater.Transport.Link
State of Colorado	Transport - uW	Whitewater	418	Montrose	425	JS	Whitewater.to.Montrose.Transport.Link
State of Colorado	Transport - uW	Montrose	425	Storm King	415	JS	Montrose.to.Storm.King.Transport.Link
State of Colorado	Transport - uW	Storm King	415	North Mt.	413	JS	Storm.King.to.North.Mt.Transport.Link
State of Colorado	Transport - uW	North Mt.	413	Lamonte	506	JS	North Mt.to.Lamonte.Transport.Link
State of Colorado	Transport - uW	Lamonte	506	Missionary	510	JS	Lamonte.to.Missionary.Transport.Link
State of Colorado	Transport - uW	Missionary	510	Durango	509	JS	Missionary.to.Durango.Transport.Link
Garfield County	Transport - uW	Whitewater	418	Mt. Callahan	4F7	JX	Whitewater.to.Mt.Callahan.Transport.Link
Garfield County	Transport - uW	Mt. Callahan	4F7	Monument	4H9	JX	Mt. Callahan.to.Monument.Transport.Link
Garfield County	Transport - uW	Monument	4H9	Sunlight - Graco	4J5	JX	Monument.to.Sunlight.Sunlight.Graco.Transport.Link
Garfield County	Transport - uW	Sunlight - Graco	4J5	Glenwood Springs (Lookout)	4K5	JX	Sunlight.Graco.to.Glenwood.Springs.Lookout.Transport.Link
Garfield County	Transport - uW	Glenwood Springs (Lookout)	4K5	New Castle	4L8	JX	Glenwood.Springs.Lookout.to.New.Castle.Transport.Link
Pitkin County	Transport - uW	Crown Mt.	4M9	Ajax Mt.	4K4	JXA	Crown.Mt.to.Ajax.Mt.Transport.Link
GJRCC	Transport - uW	Sunlight - Graco	4J5	Rifle - Garco Comm Center	4E9	JXB	Sunlight.Graco.to.Rifle.Garco Comm Center.Transport.Link
Bureau of Reclamation	Transport - uW	Sunlight - Graco	4J5	Sunlight - WAPA	4M1	JXG	Sunlight.Graco.to.Sunlight.WAPA.Transport.Link
Bureau of Reclamation	Transport - uW	Sunlight - WAPA	4M1	Hangerman Pass	2G7	JXG	Sunlight.WAPA.to.Hangerman.Pass.Transport.Link
Bureau of Reclamation	Transport - uW	Hangerman Pass	2G7	Granite	5A6	JXG	Hangerman Pass.to.Granite.Transport.Link
State of Colorado	Transport - uW	North Mt.	413	Dolores	530	JSC	North.Mt.to.Dolores.Transport.Link
State of Colorado	Transport - uW	Dolores	530	Cortez	533	JSC	Dolores.to.Cortez.Transport.Link
State of Colorado	Transport - uW	Whitewater	418	Delta	430	JD	Whitewater.to.Delta.Transport.Link
GJRCC	Transport - uW	Lee's Point	4H7	Uncompahgre Butte	4K8	JL	Lee's.Point.to.Uncompahgre.Butte.Transport.Link
GJRCC	Transport - uW	Uncompahgre Butte	4K8	Mesa Point	4H8	JL	Uncompahgre.Butte.to.Mesa.Point.Transport.Link
GJRCC	Transport - uW	Mesa Point	4H8	Grand Junction Water Plant	4K3	JL	Mesa Point.to.Grand.Junction.Water.Plant.Transport.Link
GJRCC	Transport - uW	Grand Junction Water Plant	4K3	Grand Junction Regional Communications	4E1	JL	Grand.Junction.Water.Plant.to.Grand.Junction.Regional.Communications.Transport.Link
GJRCC	Transport - uW	Grand Junction Regional Communications	4E1	Grand Junction	400	JL	Grand.Junction.Regional.Communications.to.Grand.Junction.Transport.Link
GJRCC	Transport - uW	Grand Junction Water Plant	4K3	Blackridge	4H5	JL	Grand.Junction.Water.Plant.to.Blackridge.Transport.Link
GJRCC	Transport - uW	Black Ridge	4H5	Rabbit Valley	4MB	JL	Blackridge.to.Rabbit.Valley.Transport.Link
Montrose County	Transport - uW	NUCLA	421	Gobbler's Knob	4G3	JN	NUCLA.to.Gobbler's.Knob.Transport.Link
Montrose County	Transport - uW	Gobbler's Knob	4G3	Last Dollar	4G5	JN	Gobbler's.Knob.to.Last.Dollar.Transport.Link
State of Colorado	Transport - uW	Last Dollar	4G5	Raspberry	4G8	JN	Last.Dollar.to.Raspberry.Transport.Link
Montrose County	Transport - uW	Raspberry	4G8	Montrose	4H3	JN	Raspberry.to.Montrose.Transport.Link
State of Colorado	Transport - uW	Montrose	4H3	Montrose	425	JN	Montrose.to.Montrose.Transport.Link
State of Colorado	Transport - uW	Last Dollar	4G5	Grayhead Mt.	4A1	JN	Last.Dollar.to.Grayhead.Mt.Transport.Link
State of Colorado	Transport - uW	Grayhead Mt.	4A1	Coonskin	4K9	JN	Grayhead.Mt.to.Coonskin.Transport.Link
State of Colorado	Transport - uW	Gobbler's Knob	4G3	Uravan	4M5	JN	Gobbler's.Knob.to.Uravan.Transport.Link
GJRCC	Transport - uW	Grand Junction	400	Mesa Point	4H8	JR	Grand.Junction.to.Mesa.Point.Transport.Link
State of Colorado	Transport - uW	Mesa Point	4H8	Raspberry	4G8	JR	Mesa Point.to.Raspberry.Transport.Link
State of Colorado	Transport - uW	Raspberry	4G8	North Mt.	413	JR	Raspberry.to.North.Mt.Transport.Link
State of Colorado	Transport - uW	Raspberry	4G8	Egner Mt.	5C4	JR	Raspberry.to.Egner.Mt.Transport.Link
State of Utah	Transport - uW	North Mt.	413	Abajo Peak	5A9	JU	North.Mt.to.Abajo.Peak.Transport.Link
State of Colorado	Transport - uW	Montrose	4H3	Water Dog	4H4	MS	Montrose.to.Water.Dog.Transport.Link
State of Colorado	Transport - uW	Waterdog	4H4	Sheep's Knob	4G4	MS	Water.Dog.to.Sheep's.Knob.Transport.Link
State of Colorado	Transport - uW	Waterdog	4H4	Log Hill	4G2	MS	Water.Dog.to.Log.Hill.Transport.Link
State of Colorado	Transport - uW	Missionary	510	Smelter Mt.	581	JSD	Missionary.to.Smelter.Mt.Transport.Link
City of Durango	Transport - uW	Smelter Mt.	581	Durango Dispatch	5B7	JSD	Smelter.Mt.to.Durango.Dispatch.Transport.Link
State of Colorado	Transport - uW	Smelter Mt.	581	Durango Shop	503	JSD	Smelter.Mt.to.Durango.Shop.Transport.Link
State of Colorado	Transport - uW	Grassy	5C6	Missionary	506	JSG	Grassy.to.Missionary.Transport.Link
State of Colorado	Transport - uW	Missionary	506	Rico	582	JSR	Missionary.to.Rico.Transport.Link
State of Colorado	Transport - uW	Ute Mt.	5C5	Lamonte	506	JSU	Ute.Mt.to.Lamonte.Transport.Link
Southern Ute	Transport - uW	Igancio	5D3	Smelter Mt.	581	JSS	Igancio.to.Smelter.Mt.Transport.Link
State of Colorado	Transport - uW	Montrose	415	Sunset Mesa	4F4	JST	Montrose.to.Sunset.Mesa.Transport.Link
Delta County	Transport - uW	Sunset Mesa	4F4	Tank Hill	4M4	JST	Sunset.Mesa.to.Tank.Hill.Transport.Link
Garfield County	Transport - uW	Monument	4H9	Sunlight	4J5	JX	Monument.to.Sunlight.Transport.Link
Garfield County	Transport - uW	Sunlight	4K5	Glenwood Springs	4K5	JX	Sunlight.to.Glenwood.Springs.Transport.Link
State of Colorado	Transport - uW	Sunlight	4J5	Crown Mt.	4M9	JXA	Sunlight.to.Crown.Mt.Transport.Link
Bureau of Reclamation	Transport - uW	Hangerman Pass	2G7	Granite	5A6	JXG	Hangerman.Pass.to.Granite.Transport.Link
State of Colorado	Transport - T1	Grand Junction	400	Grand Junction NWS	4E7	JWq	Grand.Junction.to.Grand.Junction.NWS.Transport.Link
State of Colorado	Transport - uW	Lakewood	147	Squaw Mt.	111	LW	Lakewood.to.Squaw.Mt.Transport.Link
State of Colorado	Transport - uW	Squaw Mt.	111	Wildlife	152	LW	Squaw.Mt.to.Wildlife.Transport.Link
State of Colorado	Transport - uW	Pueblo	204	Greenhorn	207	PA	Pueblo.to.Greenhorn.Transport.Link
State of Colorado	Transport - uW	Greenhorn	207	Walsenburg	214	PA	Greenhorn.to.Walsenburg.Transport.Link
State of Colorado	Transport - uW	Walsenburg	214	Laveta	507	PA	Walsenburg.to.Laveta.Transport.Link
State of Colorado	Transport - uW	Laveta	507	Alamosa	519	PA	Laveta.to.Alamosa.Transport.Link
State of Colorado	Transport - uW	Walsenburg	214	Bowen Marker	267	PAT	Walsenburg.to.Bowen.Marker.Transport.Link
State of Colorado	Transport - uW	Bowen Marker	267	Trinidad CF	E3A	PAT	Bowen.Marker.to.Trinidad.CF.Transport.Link
State of Colorado	Transport - uW	Laveta	507	Cordova Pass	2F5	PAR	Laveta.to.Cordova.Pass.Transport.Link
State of Colorado	Transport - uW	Cordova Pass	2F5	Raton Pass	2G6	PAR	Cordova.Pass.to.Raton.Pass.Transport.Link
State of Colorado	Transport - uW	Alamosa	519	Saguache	543	PAN	Alamosa.to.Saguache.Transport.Link
State of Colorado	Transport - uW	Monte Vista	583	Pool Table	513	PAM	Monte.Vista.to.Pool.Table.Transport.Link

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
State of Colorado	Transport - uW	Alamosa	519	San Antonio Peak	5A1	PAS	Alamosa.to.San.Antonio.Peak.Transport.Link
State of Colorado	Transport - uW	San Antonio Peak	5A1	San Luis	578	PAS	San.Antonio.Peak.to.San.Luis.Transport.Link
State of Colorado	Transport - uW	Alamosa	519	Alamosa CSP	587	PA	Alamosa.to.Alamosa.CSP.Transport.Link
State of Colorado	Transport - uW	Alamosa CSP	587	Pool Table	513	PA	Alamosa.CSP.to.Pool.Table.Transport.Link
State of Colorado	Transport - uW	Pool Table	513	Wolf Creek	5B9	PA	Pool.Table.to.Wolf.Creek.Transport.Link
State of Colorado	Transport - uW	Wolf Creek	5B9	Oak Brush	545	PA	Wolf.Creek.to.Oak.Brush.Transport.Link
State of Colorado	Transport - uW	Oak Brush	545	Missionary	510	PA	Oak.Brush.to.Missionary.Transport.Link
State of Colorado	Transport - uW	Sandoval	5C2	Wolf Creek	5B9	PAV	Sandoval.to.Wolf.Creek.Transport.Link
Pueblo County	Transport - uW	Pueblo	204	Pueblo Chem Depot	2G4	PE	Pueblo.to.Pueblo.Chem.Depot.Transport.Link
State of Colorado	Transport - uW	Pueblo Chem Depot	2G4	Fowler	206	PE	Pueblo.Chem.Depot.to.Fowler.Transport.Link
State of Colorado	Transport - uW	Fowler	206	Valley	213	PE	Fowler.to.Valley.Transport.Link
State of Colorado	Transport - uW	Valley	213	Haswell	221	PE	Valley.to.Haswell.Transport.Link
State of Colorado	Transport - uW	Haswell	221	Boyero	209	PE	Haswell.to.Boyero.Transport.Link
State of Colorado	Transport - uW	Valley	213	Toonervillle	211	ES	Valley.to.Toonervillle.Transport.Link
State of Colorado	Transport - uW	Toonervillle	211	Springfield	218	ES	Toonervillle.to.Springfield.Transport.Link
Baca Sheriff's Office	Transport - uW	Springfield	218	Springfield Extension	2F7	ES	Springfield.to.Springfield.Transport.Link
State of Colorado	Transport - uW	Springfield	27F	Mt. Carmel	2F6	ES	Springfield.to.Mt.Carmel.Transport.Link
State of Colorado	Transport - uW	Fowler	206	Ordway	256	EO	Fowler.to.Ordway.Transport.Link
State of Colorado	Transport - uW	Haswell	221	Lamar	208	EL	Haswell.to.Lamar.Transport.Link
State of Colorado	Transport - uW	Lamar	208	Carlton	249	EL	Lamar.to.Carlton.Transport.Link
State of Colorado	Transport - uW	Carlton	249	Holly	2J1	EL	Carlton.to.Holly.Transport.Link
State of Colorado	Transport - uW	Valley	213	Ft. Lyon	2E7	EF	Valley.to.Ft.Lyon.Transport.Link
State of Colorado	Transport - uW	Haswell	221	First View	250	HS	Haswell.to.First.View.Transport.Link
State of Colorado	Transport - uW	First View	250	Sheridan Lake	2G2	HS	First.View.to.Sheridan.Lake.Transport.Link
State of Colorado	Transport - uW	Pueblo	204	Pueblo State Hospital	226	PIA	Pueblo.to.Pueblo.State.Hospital.Transport.Link
State of Colorado	Transport - Fiber	Pueblo State Hospital	226	Pueblo San Carlos	2B8	PIAf	Pueblo.State.Hospital.to.Pueblo.San.Carlos.Transport.Link
Park County	Transport - uW	Fairplay	534	Sacramento	576	PK	Fairplay.to.Sacramento.Transport.Link
State of Colorado & Park County	Transport - uW	Sacramento	576	Badger	544	PK	Sacramento.to.Badger.Transport.Link
State of Colorado	Transport - uW	Badger	544	West Creek	168	PK	Badger.to.West.Creek.Transport.Link
State of Colorado	Transport - uW	West Creek	168	Bailey	1G8	PK	West.Creek.to.Bailey.Transport.Link
State of Colorado	Transport - uW	Pueblo	204	Mt. Pittsburg		PN	Pueblo.to.Mt.Pittsburg.Transport.Link
PPRCN	Transport - uW	Pittsburg		Fountain Valley		PN	Mt.Pittsburg.to.Fountain.Valley.Transport.Link
State of Colorado	Transport - uW	Fountain Valley		Ski Summit		PN	Fountain.Valley.to.Ski.Summit.Transport.Link
PPRCN	Transport - uW	Ski Summit		Colorado Springs POC	2H8	PN	Ski.Summit.to.Colorado.Springs.POC.Transport.Link
State of Colorado	Transport - uW	Pueblo	204	Twin Mt.	210	PW	Pueblo.to.Twin.Mt.Transport.Link
State of Colorado	Transport - uW	Twin Mt.	210	Coaldale	505	PW	Twin.Mt.to.Coaldale.Transport.Link
State of Colorado	Transport - uW	Coaldale	505	Bald Mt.	504	PW	Coaldale.to.Bald.Mt.Transport.Link
State of Colorado	Transport - uW	Bald Mt.	504	Salida	514	PW	Bald.Mt.to.Salida.Transport.Link
State of Colorado	Transport - uW	Salida	514	Monarch Pass	511	PW	Salida.to.Monarch.Pass.Transport.Link
State of Colorado	Transport - uW	Monarch Pass	511	Cupola Hill	407	PW	Monarch.Pass.to.Cupola.Hill.Transport.Link
State of Colorado	Transport - uW	Cupola Hill	407	Storm King	415	PW	Cupola.Hill.to.Storm.King.Transport.Link
State of Colorado	Transport - uW	Twin Mt.	210	East Canon	254	PCA	Twin.Mt.to.East.Canon.Transport.Link
State of Colorado	Transport - uW	East Canon	254	Canon City	216	PCB	East.Canon.to.Canon.City.Transport.Link
State of Colorado	Transport - uW	Bald Mt.	504	Buena Vista	508	PB	Bald.Mt.to.Buena.Vista.Transport.Link
WAPA	Transport - uW	Twin Mt.	210	Deer Peak	2E8	PV	Twin.Mt.to.Deer.Peak.Transport.Link
State of Colorado	Transport - uW	Deer Peak	2E8	Verdemont	2G3	PV	Deer.Peak.to.Verdemont.Transport.Link
State of Colorado	Transport - uW	Salida	514	Poncha Springs	5C1	PWP	Salida.to.Poncha.Springs.Transport.Link
State of Colorado	Transport - uW	Twin Mt.	210	Tenderfoot II	2C6	PWT	Twin.Mt.to.Tenderfoot.II.Transport.Link
State of Colorado	Transport - uW	Cupola Hill	407	Comstock	4J6	PWC	Cupola.Hill.to.Comstock.Transport.Link
State of Colorado	Transport - uW	Comstock	4J6	Crested Butte	4J5	PWC	Comstock.to.Crested.Butte.Transport.Link
State of Colorado	Transport - uW	Cupola Hill	407	Tenderfoot	476	PWR	Cupola.Hill.to.Tenderfoot.Transport.Link
State of Colorado	Transport - uW	Walton Mtn	476	Rose Ridge	4K7	PWR	Walton.Mtn.to.Rose.Ridge.Transport.Link
State of Colorado	Transport - uW	Rose Ridge	4K7	Hill 71	556	PWR	Rose.Ridge.to.Hill.Hill 71.Transport.Link
State of Colorado	Transport - uW	Grouse Mt.	411	Walton Mt.	417	WA	Grouse.Mt.to.Walton.Mt.Transport.Link
State of Colorado	Transport - uW	Walton Mtn	417	Cedar Mt.	406	WA	Walton.Mt.to.Cedar.Mt.Transport.Link
State of Colorado	Transport - uW	Cedar Mt.	406	Craig Justice Center	4D7	WA	Cedar.Mt.to.Craig.Justice.Center.Transport.Link
State of Colorado	Transport - uW	Craig Justice Center	4D7	Craig	402	WAC	Craig.Justice.Center.to.Craig.Transport.Link
State of Colorado	Transport - uW	Cedar Mt.	406	Wilson Creek	419	WC	Cedar.Mt.to.Wilson.Creek.Transport.Link
State of Colorado	Transport - uW	Wilson Creek	419	Cathedral Bluffs	478	WC	Wilson.Creek.to.Cathedral.Bluffs.Transport.Link
Rio Blanco County	Transport - uW	Cathedral Bluffs	478	Douglas Pass	4N7	WC	Cathedral.Bluffs.to.Douglas.Pass.Transport.Link
Rio Blanco County	Transport - uW	Douglas Pass	4N7	Grand Junction Water Plant	4K3	WC	Douglas.Pass.to.Grand.Junction.Water.Plant.Transport.Link
Rio Blanco County	Transport - uW	Cathedral Bluffs	478	Mellen Hill	436	WCM	Cathedral.Bluffs.to.Mellen.Hill.Transport.Link
State of Colorado	Transport - uW	Cedar Mt.	406	Juniper Mt.	422	WAB	Cedar.Mt.to.Juniper.Mt.Transport.Link
State of Colorado	Transport - uW	Juniper Mt.	422	Vermillion Bluffs	479	WAB	Juniper.Mt.to.Vermillion.Bluffs.Transport.Link
State of Colorado	Transport - uW	Juniper Mt.	422	Harper Hill	4J1	WAB	Juniper.Mt.to.Harper.Hill.Transport.Link
State of Colorado	Transport - uW	Cedar Mt.	406	Bakers Peak	4K6	WAD	Cedar.Mt.to.Bakers.Peak.Transport.Link
State of Colorado	Transport - uW	Walton Mtn	417	Mt. Werner	4J9	WAF	Walton.to.Mt.Werner.Transport.Link
Rio Blanco County	Transport - uW	Mt. Werner	4J9	Farwell	4H6	WAF	Mt. Werner.to.Farwell.Transport.Link
Routt County	Transport - uW	Wilson Creek	419	Lobo	420	WM	Wilson Creek.to.Lobo.Transport.Link
Rio Blanco County	Transport - uW	Lobo	420	Monument	478	WM	Lobo.to.Monument.Transport.Link
Rio Blanco County	Transport - uW	Lobo	420	Pollard	4N5	WM	Lobo.to.Pollard.Transport.Link
Rio Blanco County	Transport - uW	Pollard	4N5	Marvine Hill	4N4	WM	Pollard.to.Marvine.Hill.Transport.Link
State of Colorado	Transport - uW	Grouse Mt.	411	Blue Ridge	4A6	WL	Grouse.Mt.to.Blue.Ridge.Transport.Link
State of Colorado	Transport - uW	Blue Ridge	4A6	Lake Hill	459	WL	Blue.Ridge.to.Lake.Hill.Transport.Link
Summit County	Transport - uW	Lake Hill	459	Tyrolean	4L4	WL	Lake.Hill.to.Tyrolean.Transport.Link
Summit County	Transport - uW	Tyrolean	4L4	Peak Ten	4L6	WL	Tyrolean.to.Peak.Ten.Transport.Link
Summit County	Transport - uW	Peak Ten	4L6	Copper Mt.	4D2	WL	Peak.Ten.to.Copper.Mt.Transport.Link
Summit County	Transport - uW	Lake Hill	459	Wilderness	4L5	WL	Lake Hill.to.Wilderness.Transport.Link
Jefferson County	Transport - T1	West Creek	168	Castle Rock	1F9	WS03	West.Creek.to.Castle.Rock.WS03.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	Castle Rock	1F9	DEA13	Smoky.Hill.to.Castle.Rock.DEA13.Transport.Link
Jefferson County	Transport - T1	Riley Peak	1E2	Smoky Hill	1E3	DEA01	Riley.Peak.to.Smoky.Hill.DEA01.Transport.Link

Owner Organization	Assset Type	Primary Site Name	Primary Site #	Only for Transport Links 2nd Site Name	2nd Site #	Switch Assn or Link Segment	Database Name
Jefferson County	Transport - T1	Smoky Hill	1E3	West Creek	168	DEA04	Smoky.Hill.to.West.Creek.DEA04.Transport.Link
Jefferson County	Transport - T1	Lookout	1H1	Smoky Hill	1E3	DEA09	Lookout.to.Smoky.Hill.DEA09.Transport.Link
Jefferson County	Transport - T1	Lookout	1H1	Smoky Hill	1E3	DEA15	Lookout.to.Smoky.Hill.DEA.15.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	Castle Rock	1F9	DEA21	Smoky.Hill.to.Castle.Rock.DEA21.Transport.Link
Jefferson County	Transport - T1	Lookout	1H1	Smoky Hill	1E3	DEA05	Lookout.to.Smoky.Hill.DEA05.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	Castle Rock	1F9	DEA26	Smoky.Hill.to.Castle.Rock.DEA26.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	West Creek	168	DEA14	Smoky.Hill.to.West.Creek.DEA14.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	West Creek	168	DEA18	Smoky.Hill.to.West.Creek.DEA18.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	West Creek	168	DEA25	Smoky.Hill.to.West.Creek.DEA25.Transport.Link
Jefferson County	Transport - T1	Lookout	1H1	Smoky Hill	1E3	DEA17	Lookout.to.Smoky.Hill.DEA17.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	Castle Rock	1F9	DEB07	Smoky.Hill.to.Castle.Rock.DEB07.Transport.Link
Jefferson County	Transport - T1	Lookout	1H1	Smoky Hill	1E3	DEA19	Lookout.to.Smoky.Hill.DEA19.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	West Creek	168	DEA22	Smoky.Hill.to.West.Creek.DEA22.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	West Creek	168	DEA02	Smoky.Hill.to.West.Creek.DEA02.Transport.Link
Jefferson County	Transport - T1	Smoky Hill	1E3	West Creek	168	DEA24	Smoky.Hill.to.West.Creek.DEA24.Transport.Link
WAPA	Transport - uW	Deer Peak	2E8	Methodist	5B5		Deer.Peak.to.Methodist.Transport.Link
WAPA	Transport - uW	Twin Mt.	210	Verdemont	2G3		Twin.Mt.to.Verdemont.Transport.Link
State of Colorado	Transport - T1	Kiowa	1K9	Castle Rock PD			Kiowa.to.Castle.Rock.PD.Transport.Link
Grand County	Transport - uW	Santoy		Blue Ridge	4A6		Santoy.to.Blue.Ridge.Transport.Link
Grand County	Transport - uW	North Cottonwood		Table Mountain	4A6		North.Cottonwood.to.Table.Mountain.Transport.Link
PPRCN	Transport - uW	Austin Bluffs		Black Forest			Autsin.Bluffs.to.Black.Forest.Transport.Link
PPRCN	Transport - uW	Austin Bluffs		Stanley Canyon			Autsin.Bluffs.to.Stanley.Canyon.Transport.Link
PPRCN	Transport - uW	Stanley Canyon		Badger			Stanley.Canyon.to.Badger.Transport.Link
PPRCN	Transport - uW	Badger		Woodland Park			Badger.to.Woodland.Park.Transport.Link
PPRCN	Transport - uW	Colorado Springs POC		Cedar Heights			Colorado.POC.to.Cedar.Heights.Transport.Link
PPRCN	Transport - uW	Cedar Heights		Calhan			Cedar.Heights.to.Calhan.Transport.Link
PPRCN	Transport - uW	Calhan		Truckton			Calhan.to.Truckton.Transport.Link
PPRCN	Transport - uW	Truckton		Pittsburg			Trukcton.to.Pittsburg.Transport.Link
PPRCN	Transport - uW	Fountain Valley		Aiport			Fountain.Valley.to.Airport.Transport.Link
PPRCN	Transport - uW	Airport		Ski Summit			Airport.to.Ski.Summit.Transport.Link
State of Colorado	Transport - uW	Wilson Creek	419	TeePee Park	4N8		Wilson Creek.to.TeePee.Park.Transport.Link
Tri State	Transport - uW	Storm King Tri State		TV Hill	4G1		Stromking.Tri.state.to.TV.Hill.Transport.Link
State of Colorado	Transport - uW	Storm King Tri State		Storm King	415		Storm.King.Tri.State.to.Storm.King.Transport.Link
GJRCC	Transport - uW	Grand Junction Regional Communications	4E1	Grand Mesa Mesa County	4E2		GJRCC.to.Grand.Mesa.Co.Transport.Link
GJRCC	Transport - uW	Grand Mesa Mesa County	4E2	Collbran	4P8		Grand.Mesa.Co.to.Collbran.Transport.Link
GJRCC	Transport - uW	Grand Junction Water Plant	4K3	Redlands	4P7		Grand.Junction.Water.Plant.to.Redlands.Transport.Link
State of Colorado	Transport - uW	Walton	417	Buffalo Pass	458		Walton.to.Buffalo.Pass.Transport.Link
Eagle County	Transport - uW	Sunlight - Graco	4J5	Blowout	4G6		Sunlight.Garco.to.Blowout.Transport.Link
Eagle County	Transport - uW	Blowout	4G6	Castle Peak	4K2		Blowout.to.Castle.Peak.Transport.Link
Eagle County	Transport - uW	Castle Peak	4K2	Vail Jct	4N2		Castle.Peak.to.Vail.Jct.Transport.Link
Eagle County	Transport - uW	Vail Jct	4N2	Lower Dowd	4G7		Vail.Jct.to.Lower.Dowd.Transport.Link
Eagle County	Transport - uW	Vail Jct	4N2	Beaver Creek	4H1		Vail.Jct.to.Beaver.Creek.Transport.Link
Eagle County	Transport - uW	Beaver Creek	4H1	Wolcott	4J8		Beaver.Creek.to.Wolcott.Transport.Link
Leased Copper from Vail Assoc.	Transport - T1	Beaver Creek	4H1	Lower Beaver Creek	4P6		Beaver.Creek.to.Lower.Beaver.Creek.Transport.Link
Eagle County	Transport - uW	Beaver Creek	4H1	King	4J3		Beaver.Creek.to.King.Transport.Link
Leased T1 from Century Link	Transport - T1	Vail PD	440	East Vail	4N3		Vail.PD.to.East.Vail.Transport.Link
Leased T1 from Century Link	Transport - T1	Vail PD	440	Vail	4N6		Vail.PD.to.Vail.Transport.Link
Eagle County	Transport - uW	Vail PD	440	Vail Jct	4N2		Vail.PD.to.Vail.Jct.Transport.Link
Grand County	Transport - uW	Blue Ridge	4A6	Santoy	4P5		Blueridge.to.Santoy.Transport.Link
Grand County	Transport - uW	North Cottonwood	4P4	Table Mtn	4F5		North.Cottonwood.to.Table.Mtn.Transport.Link
WAPA	Transport - uW	Blue Ridge	4A5	Table Mtn	4F5		Blue.Ridge.to.Table.Mtn.Transport.Link
Routt County	Transport - uW	Routt County Dispatch	4M3	Emerald Mtn	4L9		Routt.County.Dispatch.to.Emerald.Mtn.Transport.Link
Routt County	Transport - uW	Emerald Mtn	4L9	Hayden	4J2		Emerald.Mtn.to.Hayden.Transport.Link
Routt County	Transport - uW	Hayden	4J2	Oak Creek	4L2		Hayden.to.Oak.Creek.Transport.Link
Routt County	Transport - uW	Oak Creek	4L2	Mt Werner	4J9		Oak.Creek.to.Mt.Werner.Transport.Link
Routt County	Transport - uW	Mt Werner	4J9	Routt County Dispatch	4M3		Mt.Werner.to Routt.County.Dispatch.Transport.Link
Routt County	Transport - uW	Oak Creek	4L2	King	4J3		Oak.Creek.to.King.Transport.Link
State of Colorado	Transport - uW	Missionary Ridge	510	Coalbank	5C3		Missionary.Ridge.to.Coalbank.Transport.Link
State of Colorado	Transport - uW	Coalbank	5C3	Silverton	5C7		Coalbank.to.Silverton.Transport.Link
Garfield County	Transport - uW	Parachute	4N1	Mt. Callahan	4F7		Parachute.to.Mt.Callahan.Transport.Link
Holy Cross	Transport - uW	Sunlight holy Cross	4N9	Ajax Mt.	492		Sunlight.Holy.Cross.to.Ajax.Mt.Transport Link
State of Colorado and Garfield County	Transport - Fiber	Sunlight - Graco	4J5	Sunlight Peak	416		Sunlight.Garco.to.Sunlight.Peak.Transport.Link
State of Colorado and Pitkin County	Transport - Fiber	Sunligh+C1610t Peak	416	Sunlight Holy Cross	4N9		Sunlight.Peak.to Sunlight.Holy.Cross.Transport.Link
Holy Cross	Transport - Fiber	Ajax - Holy Cross		Ajax Mt.	492		Ajax.Holy.Cross.to.Ajax.Mt.Transport.Link
State of Colorado / CDOT	Transport - T1	Glenwood Springs	468	Glenwood Springs	4A5		Glenwood.Springs.to.Glenwood.Springs.Transport.Link
Holy Cross	Transport - uW	Beacon Hill	4K1	Sunlight Holy Cross	4N9		Beacon.Hill.to.Sunlight.Holy.Cross.Transport.Link
Leased T1 from Century Link	Transport - T1	Marble	4P2	Glenwood Spr Holy Cross	4P1		Marble.to.Glenwood.Springs.Holy.Cross.Transport.Link
Holy Cross	Transport - uW	Glenwood Spr Holy Cross	4P1	Sunlight Holy Cross	4N9		Glenwood.Springs.Holy.Cross.to.Sunlight.Holy.Cross.Transport.Link
Century Link T1	Transport - T1	Meeker Dispatch	4P3	White River Electric			Meeker.Dispatch.to.White.River.Electric.Transport.Link
White River Electric	Transport - Fiber	White River Electric		Lobo	420		White.River.Electric.to.Lobo.Transport.Link
Dougas County	Simulcast Prime Site	Douglas County North Simulcast Prime Site (Site 14, Zone 1)	14			1	Douglas.County.North.Simulcast.Prime.Site
Dougas County	Simulcast Prime Site	Douglas County South Simulcast Prime Site (Site 52, Zone 1)	52			1	Douglas.County.South.Simulcast.Prime.Site

Appendix B: Survey Comments Regarding DTRS Coverage

Table B.1 – Field User Comments on DTRS Coverage Problems

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Anything on the South Platte River basin	Anything on the South Platter River basin and the southwest corner of Morgan County in the Hoyt area.	Still have issues in the [Grand Junction] Police Department, St. Mary's hospital
Ute Pass, Hwy 24 between Manitou Springs and Cascade, on Pikes Peak	Ute Pass, Hwy 24 between Manitou Springs and Cascade, on Pikes Peak	Certain areas within the city [Westminster] still do not receive adequate radio coverage, as radio transmissions are dropped, and only the dispatcher's time stamps are heard. These areas have been identified by multiple users, but still continue to have issues. Also, radios receive a "busy" tone when attempting to key up and transmit traffic, even though there is no current radio traffic being transmitted.
Certain areas within the city [Westminster] still do not receive adequate radio coverage, as radio transmissions are dropped, and only the dispatcher's time stamps are heard. These areas have been identified by multiple users, but still continue to have issues. Also, radios receive a "busy" tone when attempting to key up and transmit traffic, even though there is no current radio traffic being transmitted.	[City of Westminster] Areas of below average/inadequate coverage include the same areas as the vehicle mounted radios. Additional issues pertain to partial radio transmissions being dropped/unheard, background wind/noise, and dispatchers relaying "unreadable" transmissions.	Inside Walmart, the jail, the hospital and most buildings in the Salida Downtown area.

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Under High-Voltage Power Lines, Remote Areas, Canyons	Works most of the time unless if the user is laying down	Handheld Radio service is very POOR at the Heart of the Rockies Regional Medical Center Emergency Room and at Walmart were we spend a significant amount of time regularly.
Some areas [City of Sterling] have less than ideal coverage	Some areas [City of Sterling] have less than ideal coverage	Sterling Regional MedCenter, Cooperating Ministries, Human Services
800MHZ coverage is spotty within the southern portion of Douglas county	800MHZ coverage is spotty within the southern portion of Douglas county	800MHZ coverage is spotty within the southern portion of Douglas county
Parts of Monarch Pass, Trout Creek Pass, Cottonwood Creek and Chalk Creek Drainages.	Parts of Monarch Pass, Trout Creek Pass, Cottonwood Creek and Chalk Creek Drainages.	[City of Littleton and surrounding areas] Inside large buildings, especially office buildings
South portion of the city of Littleton	In buildings and the south area of the city of Littleton	A few of the older building in the county [Prowers] have poor reception.
We do have a few area [Prowers County] that we do not have coverage, but they are small and do not usually cause any problems.	Again there are some area in the county [Prowers] they do not have coverage. Mainly inside certain building and a few low spots in the county.	Unless the area [North Central Colorado] is protected by BDA, the system coverage is problematic. The more fire resistive, the less radio signal coverage. tough areas usually requires simplex operations
In the low lying areas of unincorporated Arapahoe County around Iliff/Parker Road. The radios are programmed to low sites, this causes problems in several locations as they tend to only want to connect to Smoky Hill site. The most problematic area right now is the low area of Syracuse Way and E Yale Ave.	In the low lying areas of unincorporated Arapahoe County around Iliff/Parker Road. The radios are programmed to low sites, this causes problems in several locations as they tend to only want to connect to Smoky Hill site. The most problematic area right now is the low area of Syracuse Way and E Yale Ave.	[Front Range Region] Indoors is very good but underground is not very reliable.

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Big Thompson Canyon, Waltonia, areas around Centerra Parkway in Loveland	Cumbres La Manga Pass, Colo 17. Inter mountain areas in Rio Grande County- La Jara reservoir, Plutoro, Inter mountain areas in Mineral and Saguache Counties. In Saguache, Saguache Park, Colorado Highway 114.	In building coverage in the LaJara, Sanford and Manassa areas is spotty, or not existent.
Areas around the towns of Crook (south of), and Fleming (south of).	Big Thompson Canyon, Waltonia, areas around Centerra Parkway in Loveland	Large commercial buildings such as Medical Center of the Rockies and Woodward Governor. Mostly impacted on the east side of our district.
Various areas [Northeastern corner of Colorado] exist due to terrain, when line of sight drops below the horizon - mostly on rural highways.	we [Vernon Volunteer Fire] use vhf for paging and have very poor coverage within our area [Yuma County]	Inside all [Logan County] schools - radio gives busy tone and/or is digital when broadcasting
Hwy 55. Merino.	Various areas [Northeastern corner of Colorado] exist due to terrain, when line of sight drops below the horizon - mostly on rural highways.	almost no coverage within our area [Yuma County]
Portions of Morgan County and Weld County along I-76 from MM45-70	Peetz	Concrete/block buildings in particular [Northeastern corner of Colorado]
Town of Elizabeth	Spotty coverage on Highway 61 between Sterling and Otis.	[Logan County] Hospital and metal buildings
Colorado Hwy 114 is extremely poor from mile post 1 to mile post 56, including non-existent in the canyon	Portions of Morgan County and Weld County along I-76 from MM45-70	Many [Arapahoe County] buildings are digital dead zones, I've personally been involved in adding BDAs to improve dead-zones in frequented buildings.
some dead spots up Medano Creek drainage	Multiple spotty or dead spots through out the county [Elbert]	Does not work reliably inside of large commercial structures [City of Englewood].

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Colorado 160 on La Veta Pass from milepost 263 to milepost 275 is very unreliable. Colorado 114 on the west side of Cochetopa Pass in the Canyon from milepost 4 to 17.	4th & Front Street [Town of Fairplay]	[Alamosa and Saguache Counties] works well near a window, but not deep in a building or underground
Taylor Park, portions of the upper North Fork/Gunnison River including McClure Pass, Kebler Pass, Somerset area, Cochetopa Canyon (Hwy 114), Dome Lakes (norther Saguache county)	Mosca Creek, Sand Creek, and Medano Creek drainages. These are mountainous back-country areas.	We have no service in our [Bent County] schools and some public buildings.
Northwest, western, southwest, and northeast areas of Baca County all have spotty inadequate coverage	Colorado 160 on La Veta Pass from milepost 263 to milepost 275 is very unreliable. Colorado 114 on the west side of Cochetopa Pass in the Canyon from milepost 4 to 17.	In the town of Pritchett it's a 60 40 chance if you will hear the radio in a house
We have poor to no coverage when we are towards the canyons in SW Baca County	Taylor Park, portions of the upper North Fork/Gunnison River including McClure Pass, Kebler Pass, Somerset area, Cochetopa Canyon (Hwy 114), Dome Lakes (northern Saguache county)	[City of Durango] depending on the building we are in and its location
A few holes [City of Durango] we cant get out on the mobiles	Northwest, western, southwest, and northeast, and two buttes lake areas of Baca County all have spotty inadequate coverage.	Inside the Family Dollar store handheld radios are almost completely unusable. The store is located very close to the communications tower in town [Fairplay].

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Kenosha Pass and Indy Pass	In Prowers County, 287 MM 55 area of Gobblers Knob, US HWY 89 southern end of county. A majority of southeastern Prowers County on wild land fires we will move over to our VHF system or VTAC.. During mutual aid situations in Bent County, coverage is poor to non on their CR HH east of John Martin Dam.	Doesn't work very well in the [Elbert County] schools
> 10 miles east of Gunnison on Highway 50 and very sporadically the rest of the area to the county line on Monarch Pass. > a few areas of approximately stretches along Highway 135 north of Gunnison. (mp 8-9 and mp 11-13) > 20 miles west of Gunnison between mileposts 125 and 128	A few locations in the southern part of Bent County do not have service.	Depends on structure composition [All of Gunnison County, northern Hinsdale County, eastern Montrose County, northern Saquatche County]. In Wal-Mart it works fine (corrugated tin roof, insulated brick building) versus the county jail with reinforced concrete.
There are areas in our jurisdiction [Elbert County] that we do not have coverage but because of the rural nature of these areas and our low cal volume it is difficult to identify them with specificity. Typically, when we do not have coverage on the DTRS we do have coverage with our VHF system and can move operations there temporarily.	We have poor to no coverage when we are towards the canyons in SW Baca County, we have stretches on HWY 160 where our handheld radios do not work	We occasionally have coverage issues indoors [Elbert County], but nothing that is not to be expected with any radio system.

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Western Douglas county in the Pike National Forest, southern Douglas County south of Castle Rock, pockets within the "shadows" in Castle Rock where signal is weak.	A few holes [City of Durango] we cannot get out on the [portables].	Any significant size building [in Douglas, Arapahoe, Elbert, and El Paso Counties], i.e. jail, justice center, events center, etc. Even with BDAs, some of these are still a challenge.
Areas in Eastern Adams County near E-470/56th Ave, and South in Arapahoe County along E-470 sometimes experience poor signal quality.	Hwy 50 from Salida to Canon City, Kenosha Pass, Trout Creek Pass, Monarch Pass, Indy Pass.	In-Building radio coverage for [Bennett] fire department functions is often in adequate. The state system was primarily designed around in-street coverage not in-building coverage. The largest issues pertain to fire service or other functions with require emergency responders to use their radios inside a building. A greater focus needs to be placed on the performance of the system in building with portable radio coverage.
Coverage is below average when operating in and along the mountain ranges [City of Del Norte/Rio Grande County]	In the schools in our area [Elbert County] are below average	Radios seem more likely to tone out in and around buildings [City of Del Norte/Rio Grande County]
System has numerous "gone digital" moments. Mountain corridors need to be addressed - coverage is minimal in many areas [Denver metro area]	Much worse than listed above for vehicle mounted platforms [All of Gunnison County, northern Hinsdale County, eastern Montrose County, northern Saquatche County].	Multiple "errors" include - no bars, unprogrammed, busy [Tri-County Health Department]

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Highway 50 East of Salida to Chaffee County Line.	Same coverage issues as above [mobile], but with increased frequency. [There are areas in our jurisdiction [Elbert County] that we do not have coverage…]	I would say that the radios function as they should most of the time, they have some difficulties communicating do to the type of construction or how deep you within the structure that we are in [front range area, from Wyoming to southern Colorado].
Highway 50 east of Salida in the Bighorn Sheep Canyon.	Western Douglas county in the Pike National Forest, southern Douglas County south of Castle Rock, pockets within the "shadows" in Castle Rock where signal is weak.	Problems inside certain buildings; for example, inside the building at the Sanford School in Conejos County.
mountainous terrain and valleys [Chaffee County]	Eastern Arapahoe County on the Former Lowry Bombing range typically experiences problems.	In Denver numerous 'holes" in coverage.
Ivy Creek area in Mineral County Spring Creek Pass in Hinsdale County Highway 149 @ MM 7 in Mineral County Rio Grande Reservoir in Hinsdale County	Radio coverage is not consistent through out our coverage area [City of Del Norte/Rio Grande County].	Inside [City Limits of Salida and surrounding area] fortified buildings, police department, hospital and Walmart Store.
Canyon Areas statewide, many locations away from State and federal highways especially in the Far southeastern and western portions of the state.	During our coverage in the mountains communities, we have experienced some spotty areas. I think this is to be expected do to the terrain that we encounter [front range area, from Wyoming to southern Colorado; coverage in the Summit County, Salida, and Steamboat area].	[Chaffee County] Local hospital.
Hamilton Canyon	Mountainous areas in Mineral and Conejos counties	[San Luis Valley] Schools and/or buildings with metal roads

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Colo 114 over Cochatopa Pass	Same issue with "going digital". The other issue is the need for multiple hand held units due to different systems with the Metro area Mountain corridor has numerous issue with coverage areas	It's hit or miss depending on the type of structure you are in [City, County of Alamosa, 5B, Southwest].
Southwest corner of the county [Baca] has little to no radio coverage. The county has a old 800 analog system that sometimes works in this area but it is down more than it works. Areas in north east part of county are hit and miss at times	Alleyways between larger downtown buildings [Salida].	Indoors in Walsh depends on building. Will work from most homes but due to construction materials schools nursing homes and many businesses they do not work in. Springfield is really the only town where we have good indoor radio use with handhelds in the county
Mountainous areas mostly when in valley areas [Rio Grande County]	Highway 50 east of Salida in the Bighorn Sheep Canyon.	Have some very large concrete structures that are difficult to talk out and sometimes in in their sub grade areas [Grand County and surrounding region/counties]. Various tunnels-railroad and water. Bank vaults?
Very few. US 40 between Granby and Hot Sulphur -a few intermittent spots. East end of Grand Lake. Portions of Hot Sulphur Springs Portions of CO 125 to Walden	Mountainous terrain and valleys [Chaffee County]	
Some areas in deep drainages [Delta County].	Ivy Creek area in Mineral County Spring Creek Pass in Hinsdale County Highway 149 @ MM 7 in Mineral County Rio Grande Reservoir in Hinsdale County	

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
	Some areas near power lines tend to be problematic	
	See vehicle radio list and expand due to reduced power of the radios.	
	Hamilton Area	
	Colo 114 over Cochatopa Pass	
	Southwest corner of the county they won't work. Handheld radio works some when in the twobuttes wildlife area north central part of the county. Handhelds don't work in north east part of county.	
	Mountainous areas mostly in valleys	
	Reverse hillsides away from repeater sites, very intermittent.	
	Areas where steep terrain shields the radio from the tower.	

Table B.2 – Dispatcher Comments on DTRS Coverage Problems

Specific Outdoor Areas	Indoor Areas (Specific Buildings)
[Grand Junction] rural area coverage is limited. Canyons, mountains, etc. interfere with coverage.	We have several "dead spot" in certain areas of the county [Arapahoe] where deputies come across unreadable, indoors as well as outdoors.
We have several "dead spot" in certain areas of the county [Arapahoe] where deputies come across unreadable.	Littleton Hospital
the south end of the City of Littleton limits, and multi-floor buildings	Poor Quality on tones on VHF radio side, reported from fire units houses
Some rural areas [Sterling]	Sterling Reginal Medical Center
Cochetopa Pass, La Veta Pass, spotty coverage in various spots throughout the valley.	There are some coverage issues in parts of Arapahoe county, Highlands Ranch and the City of Parker that have low RSSIs
There are some coverage issues in parts of northern Arapahoe county and the City of Parker that have low RSSIs	Many [Baca] buildings, including ambulance barn.
Because of where we live [Mineral County] we there are places in our Mts that DTR will not work or VHF at times	800 does not work well in some buildings [Park County]
The repeater is very poor, and the whole area is under served by the vhf system.	DTR coverage is nonexistent in large buildings in the Heart of the Rockies Regional Medical Center in Salida and metal buildings such as Walmart.
Most rural areas in the hills [Park County]	ALAMOSA SHERIFFS DEPT
[Statewide] rural areas and mountain passes have spotty coverage	Most new school [statewide] have the metal roofing which has caused the signal to be almost non existent
Mountainous areas such as St. Elmo /Winfield area have poor/no coverage and units needs to use VHF instead (which is also poor in those areas). All areas of the county have issues with the signal going "digital" making units repeat their transmissions to dispatch.	Inside hospitals [statewide] I'll have poor reception.

Specific Outdoor Areas	Indoor Areas (Specific Buildings)
Mainly on valley passes, there is poor radio coverage and they will go 'digital'. Definitely an officer safety issue.	RIO GRANDE COUNTY COURTHOUSE
SAGUACHE/CREEDE/WOLF CREEK	[Chaffee County] Hospital, they put in bi-directional antennae but still have some areas that are hard to reach
The Towns of La Jara and Manassa within the San Luis Valley. The signal does not blanket the town, more so shoots over officers on North sides of buildings do not have adequate coverage. Cumbres La Manga pass, Poncha pass, La Veta pass Wolf Creek pass all within the San Luis Valley	Building penetration is poor along 470 and Lucent [Littleton].
I have worked in the Alamosa troop prior to castle rock, and there are extremely poor areas of coverage in San Luis Colorado. I often had no reception, and the radio would say site trunking. Also areas in la Veta pass would have poor signal.	larger buildings brick and metal [Sterling]
MOST OF THE MOUNTAIN REGIONS WITHIN OUR COUNTY [Rio Grande]	
When we get onto some of our county [Chaffee] roads off the state highway, we have to use VHF, we also have some stretches on state highways where DTR is static or unreadable	
Littleton at Mineral and Santa Fe is poor as well as the Western portion of Highlands Ranch (which is being fixed).	
Peetz, NW corner of [Logan] County	

Table B.3 – Technical Support Comments on DTRS Coverage Problems

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
Needs more towers	Needs more towers	Needs towers
Hwy 70 Debeque Canyon Hwy 141 to Gateway and south to Montrose County border North of the town of Debeque Palisade, Colorado downtown	The North East part of Mesa County. Not populated but lots of recreational areas with frequent search and rescues and other types of accidents.	Palisade Police dept.
Mountainous northwestern Larimer County. Colorado Highway 14 from MM118 to Cameron Pass. Communities of Red Feather Lakes, Crystal Lakes, Glacier View Meadows, Beaver Meadows.	Same as [mobile] plus many other areas of mountainous terrain.	Mostly the same as the areas listed for on-street for typical homes and smaller businesses. Pretty much everywhere for most of if not all of larger, hardened buildings without BDAs.
Primarily along highway 67 along Platte River down to Deckers area and parts of the Pike National Forest. All other areas currently being addressed by the Douglas County simulcast cells being built.	Most of the Pike National Forest areas / Highway 67. Most of Western Highlands Ranch, several areas in Parker, Larkspur, and the Franktown area. Being addressed by the Douglas County simulcast cells being built.	It would be excellent except for the reason that has been stated above.
Pueblo Blvd and Highway 50. Could be a radio firmware issue accessing simulcast system. radios will not affiliate to simulcast system.	Still tied to firmware issue. Radios will not affiliate to simulcast system.	- Downtown Salida - Kenosha Pass Area - Guffy and surrounding Area - Chalk Creek Drainage - Cottonwood Pass - Taylor Park - Parts of Independence Pass
Debeque Canyon, Unaweep Canyon, north of Debeque	Debeque Canyon, Unaweep Canyon, north of Debeque	The towns mentioned above, the in-building coverage is nearly non existent.

Radio Mounted in Vehicle	Handheld Radio Outdoors	Handheld Radio Indoors or Underground
- Kenosha Pass Area - Guffy and surrounding Area - Chalk Creek Drainage - Cottonwood Pass - Taylor Park - Parts of Independence Pass	Downtown Salida as well as areas in: - Kenosha Pass Area - Guffy and surrounding Area - Chalk Creek Drainage - Cottonwood Pass - Taylor Park - Parts of Independence Pass	Usually, it is in high-rise offices, or in parking garages. Signal tries searching for best site, and may just bounce around.
Hand offs from one tower to another within good coverage areas, mountain canyons, back country for sheriff personnel and wildlife law enforcement. Town of Creede service is continually in and out of site trunking. Hwy 160 - La Veta Pass.	Many towns have trouble with law enforcement officers when they are out of their cars when making traffic stops. These towns are Del Norte, La Jara, Manassa, Sanford, Center, Blanca, Ft. Garland.	after moving to DTRS, we have nearly no issues within buildings
Primarily parking structures and underground areas.	Low lying areas, urban canyons.	

Table B.4 – Management Comments on Needed DTRS Coverage Improvements

Needed Coverage Improvements	Needed Coverage Improvements
We definitely need more towers in the rural areas. many areas on the mountain passes do not have coverage and seem to be an areas where public safety agencies are consistently sent	We need better coverage in the Dolores and Mancos areas. Some of Cortez is problematic as well.
More towers to improve coverage	All rural Counties have areas of poor or no coverage due to the vast land areas they consist of small populations with larger gaps between towns.
Yes-- In the inter mountain areas and in Conejos County, in the towns of LaJara, Sanford, Mannassa.	Statewide coverage based upon probability of use and criticality of use
Better coverage is needed in the canyons, rural areas, mountains in Mesa County	Mountain areas
MULTIPLE AREAS IN THE DISTRICT ARE NOT COVERED BY STATE DTR.	On the rural fringes for low frequency / high risk hazards.
In building coverage could be better throughout the county.	We have and continue to identify areas of limited coverage and have shared the information with State OIT.
As described above. NE of the town of Kiowa. SE of the town of Elbert. In and around the town of Simla SE of Simla to the county borders.	Coverage on the Northern half of Colo Hwy 69. Colo Hwy 12
If needs were expanded, the current system would probably not be adequate.	Covers the areas needed by our agency

Needed Coverage Improvements	Needed Coverage Improvements
We cannot communicate between vehicles or portable radios that are not completely DTRS-FRCC-Harris-VHF compatible meaning that we cannot communicate WITHIN the team. We cannot communicate with other teams from Denver or Aurora unless they are supported by additional Denver radio assets. Most users do not know or understand this issue. We are unable to communicate in remote areas. Team members generally default to using cellular phones for communications which is not a realistic answer during a large actual incident.	Need to work on the eastern portion of Grand Lake-has a shadowed area-fairly small. The Town of Hot Sulphur has coverage from several sites depending on location- once again a fairly small area-there is one BDA covering the Courthouse. An area on US 40 for a few miles that sees several sites. Portions of CO HWY 125 north of US HWY 40 that has intermittent poor talk out both south (in Grand County) and north (in Jackson County) of summit of Willow Creek Pass.
Coverage within Highlands Ranch and along the platte river/ Santa Fe north through the West Mineral depression.	HWY91 and 82
I-25 south Of Lincoln to castle Rock HWY 85 from Chatfield to Castle Rock	In our deep canyons and areas out of range of the repeaters. Probably cannot be helped.

Table B.5 – Technical Support Comments on DTRS Coverage Improvement Plans

Planned Coverage Improvements	Planned Coverage Improvements
3-4 DTR towers in the future.	BDAs in large new construction.
Construction of a new site in 2015 to address poor coverage areas in [Mountainous northwestern Larimer County; Colorado Highway 14 from MM118 to Cameron Pass; Communities of Red Feather Lakes, Crystal Lakes, Glacier View Meadows, Beaver Meadows].	Debeque Colorado area. as soon as a site is located. new location on Grand Mesa to improve coverage
Douglas County is in the process of building two simulcast cells to vastly improve coverage throughout the county. Additional BDAs for schools and other government buildings are a near future (2-3 years out) project after the need is determined based on improvements by the simulcast cells.	Sine this is a state owned system in this area, and it primarily affects the local law agencies, the State of Colorado does not see it as their responsibility to address it. Though the La Veta Pass area has been on the table for years and no action has been taken and this is a Colorado State Patrol area of concern.

Appendix C - Site Parameters for DTRS Coverage Predictions

This appendix contains the technical parameters for all radio sites modeled during the coverage prediction studies of the State of Colorado DTR system.

Appendix C - Site Parameters for DTRS Coverage Predictions

DTRS – Site Parameters, General Information

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
12 mile	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.016769	-104.997519
abajo peak_ ut	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.839417	-109.462333
airport	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.797500	-104.701111
ajax	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.153083	-106.820861
akron	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.163583	-103.264389
alamosa	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.459444	-105.876667
anton	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.705	-103.2538889
Arapahoe admin	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.61944444	-105.0135833
arkansas vly cf	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.19	-103.8416111
auraria	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.74361111	-105.0063889
austin bluffs	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.89666667	-104.7969444
badger = PPRCN	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.049167	-105.512778
badger = State of CO	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.05027778	-105.5138889
bailey	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.415278	-105.460278
baker peak	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.92427778	-107.4693889
bald north	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.35580556	-105.2636111
bald south	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.79916667	-106.2186389
beacon hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.73972222	-106.8014167
bear gulch	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.87691667	-105.6960278

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
beaver creek	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.56441667	-106.5089167
betasso	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.01166667	-105.335
bethune	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.27219444	-102.3987778
black forest	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.04611111	-104.6944444
black hawk	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.8015	-105.4844722
black ridge	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.06555556	-108.7471111
blowout mnt	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.68230556	-107.0365
blue ridge	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.92805556	-106.2700278
bowen marker	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.23975	-104.5108056
boyero	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.09583333	-103.2377778
buckhorn	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.61666667	-105.3277778
buena vista cf	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.82361111	-106.1200278
buffalo pass	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.53747222	-106.6764444
bull mtn	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.94730556	-105.9254167
byers	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.70638889	-104.2188889
calhan	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.98972222	-104.3230556
carlton	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.03472222	-102.4366667
castle peak	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.77555556	-106.8528056
cathedral bluffs	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.91861111	-108.6241667

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
cedar heights	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.89333333	-104.9133333
cedar mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.56608333	-107.6100556
chevron	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.59972222	-104.8896944
cheyenne mtn	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.74247222	-104.8652778
coal bank	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.69791667	-107.7788889
coaldale	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.36388889	-105.8202778
Colibrane	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.236583	-107.978361
coonskin	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.93380556	-107.8349167
copper mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.475	-106.1530833
cordova pass	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.34055556	-105.0244444
craig	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.50580556	-107.5578333
creede	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.85552778	-106.9380833
crested butte	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.88444444	-106.9736111
crown mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.35275	-107.0930833
dakota	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.86972222	-105.5505556
deer peak	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.04138889	-105.1852778
deer trail	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.59469444	-103.9899722
delta	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.73997222	-108.072
denver tx	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.69194444	-104.9363611

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
dolores	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.48277778	-108.5109167
douglas pass	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.59916667	-108.7961111
drake	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.43052778	-105.34025
drdc	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.76722222	-104.8608056
east vail	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.62138889	-106.2838889
ECC CF	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.43108333	-105.1574722
egnar	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.94166667	-108.909
emerald mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.46194444	-106.8491667
farwell	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.82369444	-106.8513611
firstview	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.79166667	-102.5491667
fort lyon cf	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.0725	-103.1329722
fort morgan	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.24444444	-103.8977778
fountain valley	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.64080556	-104.7038889
fowler	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.18027778	-104.0225
franktown	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.37	-104.6794167
gardner	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.69666667	-105.1963889
glenwood_lookout	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.54277778	-107.3
gobbler knob	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.25527778	-108.6886111
grand junction	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.03777778	-108.5613889

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Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
grand mesa	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.08386111	-108.2202778
granite	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.08583333	-106.2683333
grassy	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.35872222	-107.55325
Greeley	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.431389	-104.702778
greenhorn	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.90333333	-104.7935833
grouse	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.13497222	-106.1740833
gun barrel	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.06511111	-105.1555278
hagerman pass	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.25888889	-106.4822778
harper hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.35130556	-107.5339444
haswell	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.38166667	-102.98075
hayden	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.52427778	-107.2821111
hill 71	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.9375	-107.2683333
holly	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.98577778	-102.1133611
horsetooth	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.54691667	-105.1983056
hugo	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.63191667	-103.4738333
idalia	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.73055556	-102.4827778
ignacio	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.096	-107.6256389
julesburg	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.93694444	-102.2286111
juniper mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.44941667	-108.0300833

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Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
kim	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.32358333	-103.3574722
king mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.02044444	-106.8068056
kiowa	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.2815	-104.4424167
la junta	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.97672222	-103.5811667
la monte peak	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.29834722	-108.2135278
la veta	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.51194444	-105.1711111
lake hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.61388889	-106.0675278
lamar	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.07305556	-102.6188056
last chance	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.71422222	-103.5893611
last dollar	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.99916667	-107.9622222
lees point	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.64469444	-109.0098333
limon cf	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.21108333	-103.6916111
lobo	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.04236667	-107.9380833
log hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.18638889	-107.7756111
longmont	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.17083333	-105.1216667
lookout	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.72916667	-105.2372222
loveland	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.39541667	-105.0888611
loveland ski	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.68	-105.90075
lower beaver creek	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.59802778	-106.5094722

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
lower dowd	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.61611111	-106.4663056
Marble	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.081389	-107.230056
marvine hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.04472222	-107.5058333
mead	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.23997222	-105.0558056
mellen hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.15813889	-108.9496944
mesa point	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.87777778	-108.225
methodist	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.44666667	-106.0108333
mines	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.79444444	-105.7636111
missionary ridge	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.36388889	-107.7831111
monarch	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.49722222	-106.3203056
monte vista	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.58113889	-106.1493333
monument	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.71944444	-107.9162778
mt callahan	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.4325	-108.1305
mt carmel	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.07489722	-102.3795833
new castle	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.58561111	-107.8349167
new raymer_dtr	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.60747222	-103.8313889
North Cottonwood	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.06005556	-105.9989444
north mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.91083333	-108.4031389
oak brush hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.19222222	-107.1036667

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
oak creek	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.29483333	-106.9756389
parachute	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.45928889	-108.0500306
pawnee	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.20386111	-103.6966111
peetz	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.89186111	-103.2297222
phillips	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.51027778	-102.3597222
pittsburg	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.61277778	-104.9352778
point of rock	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.48555556	-104.3497222
poncha springs	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.50555556	-106.0824167
pooltable	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.72972222	-106.5889167
Prospect	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.36083333	-105.5208333
Pueblo Chem	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.27273056	-104.3442194
Pueblo Simulcast Goat Hill	6	TX/RX	P25 Phase 1	700/800 MHz	Simulcast	38.26115	-104.6003111
Pueblo Simulcast Jackson Hill	6	TX/RX	P25 Phase 1	700/800 MHz	Simulcast	38.20675	-104.7062694
Pueblo Simulcast Pueblo West	6	TX/RX	P25 Phase 1	700/800 MHz	Simulcast	38.31561944	-104.7403389
Pueblo Simulcast San Carlos	6	TX/RX	P25 Phase 1	700/800 MHz	Simulcast	38.28888889	-104.6280278
Pueblo Simulcast Walking Stick	6	TX/RX	P25 Phase 1	700/800 MHz	Simulcast	38.31174444	-104.57505
punkin center	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.85111111	-103.7018889
PVH (Fort Collins)	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.57163889	-105.0563611
rabbit valley	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.21627778	-108.9716389

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
ramah	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.30277778	-104.1475
raspberry ridge	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.31444444	-108.19675
raton pass	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.00094444	-104.4829722
redlands	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.06199167	-108.6391444
reiradon	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.60083333	-103.0325
rico	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.69330556	-108.03325
rifle	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.52738889	-107.7766111
riley peak	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.48472222	-105.2811111
rose ridge	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.28658333	-107.2469444
sacramento	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.21638889	-106.0869722
saguache peak	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.16333333	-106.1325
san antonio peak_ nm	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	36.85947222	-106.0183611
san luis	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.20458333	-105.428
sandoval	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.10026111	-107.3016417
santoy	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.15861111	-106.4408333
sheep knob	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.45916667	-107.5830556
sheridan lake	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.48369444	-102.2905556
silver heights	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.42527778	-104.8683056
silverton	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.80636111	-107.6739444

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
ski summit	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.76055556	-104.8527778
smelter mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.2625	-107.8913333
smoky hill	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.60277778	-104.7180556
south morgan	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.03367	-103.93858
springfield	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.36363889	-102.6485278
squaw	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.68111111	-105.4961111
stanley	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.98722222	-104.9202778
state capital	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.74052778	-104.98525
sterling cf	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.62416667	-103.178
storm king	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.33805556	-107.6389444
sunlight	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.42552778	-107.3797778
sunset mesa	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.46294444	-107.8823056
sunspot	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.87616667	-105.7744167
table mtn	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.16330556	-105.9044722
tank hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.79	-107.975
teepee park	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.16538889	-107.88175
tenderfoot ii	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.761	-105.1552222
Tgap	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.91083333	-104.7283889
thorodin	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.89333333	-105.4188889

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
toonerville	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.67527778	-102.8919444
trinidad cf	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.30677778	-104.2843333
truckton	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.73897222	-104.1819167
tv hill	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.92777778	-107.6013889
twin mtn	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.51555556	-105.3077778
tyrolean	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.47441667	-106.0342778
uravan	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.40583333	-108.8005556
ute	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.22022222	-108.8073056
vail	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.64616667	-106.381
valley	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.9075	-103.4371389
verdemont	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.19108333	-105.6108611
vermillion bluffs	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.86352778	-108.4832778
w mountain	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.52430556	-106.9067222
walsenburg	6	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.64138889	-104.7736111
walton mtn	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.35441667	-106.6992222
waterdog	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.3875	-107.6744444
west creek	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.17444444	-105.0338611
whitewater	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.89163889	-108.5006389
wildhorse	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.83777778	-102.6330556

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Site Name	GENERAL INFORMATION						
	DTR Zone	Site Type	System Tech	Frequency Band	Simulcast / Multicast	Latitude (Decimal)	Longitude (Decimal)
wolcott	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.72183333	-106.6724444
wolf creek pass	2	TX/RX	P25 Phase 1	700/800 MHz	Multicast	37.493	-106.8012222
woodland	4	TX/RX	P25 Phase 1	700/800 MHz	Multicast	38.98666667	-105.0688889
wray	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.05416667	-102.2261111
yuma	3	TX/RX	P25 Phase 1	700/800 MHz	Multicast	40.14302778	-102.8146667
zap	1	TX/RX	P25 Phase 1	700/800 MHz	Multicast	39.68886111	-104.4891389

Appendix C - Site Parameters for DTRS Coverage Predictions

DTR System – Site Parameters, Transmit Information, Part 1

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
12 mile	6	Sinclair SC476-HF1LDF	6	122	0	0	125.9	51
abajo peak_ ut	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
airport	4	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
ajax	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
akron	3	Celwave 800-900_pd1110_1110-2	9.3	130	0	0	79.4	49
alamosa	6	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
anton	3	Celwave 800-900_pd1110_1110-2	9.3	224	0	0	79.4	49
Arapahoe admin	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
arkansas vly cf	6	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
auraria	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
austin bluffs	4	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
badger = PPRCN	4	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
badger = State of CO	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
bailey	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
baker peak	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
bald north	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
bald south	6	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
beacon hill	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
bear gulch	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
beaver creek	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
betasso	3	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
bethune	1	Celwave 800-900_pd1110_1110-2	9.3	380	0	0	79.4	49
black forest	4	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
black hawk	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
black ridge	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
blowout mnt	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
blue ridge	3	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
bowen marker	6	Celwave 800-900_pd1110_1110-2	9.3	160	0	0	79.4	49
boyero	1	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49
buckhorn	3	Celwave 800-900_pd1110_1110-2	9.3	80	0	0	79.4	49
buena vista cf	6	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
buffalo pass	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
bull mtn	3	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
byers	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
calhan	4	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
carlton	6	Celwave 800-900_pd1110_1110-2	9.3	380	0	0	79.4	49
castle peak	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
cathedral bluffs	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
cedar heights	4	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
cedar mtn	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
chevron	1	Celwave 800-900_pd1110_1110-2	9.3	307	0	0	79.4	49
cheyenne mtn	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
coal bank	2	Sinclair 49001	9	280	0	0	79.4	49
coaldale	6	Celwave 800-900_pd1110_1110-2	9.3	20	0	0	79.4	49
Colibrane	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
coonskin	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
copper mtn	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
cordova pass	6	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
craig	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
creede	6	Celwave 800-900_pd1110_1110-2	9.3	40	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
crested butte	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
crown mtn	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
dakota	1	Celwave 800-900_pd1110_1110-2	9.3	40	0	0	79.4	49
deer peak	6	Celwave 800-900_pd1110_1110-2	9.3	80	0	0	79.4	49
deer trail	1	Celwave 800-900_pd1110_1110-2	9.3	180	0	0	79.4	49
delta	2	Celwave 800-900_pd1110_1110-2	9.3	130	0	0	79.4	49
denver tx	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
dolores	2	Sinclair 49001	9	125	0	0	125.9	51
douglas pass	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
drake	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
drdc	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
east vail	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
ECC CF	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
egnar	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
emerald mtn	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
farwell	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
firstview	1	Celwave 800-900_pd1110_1110-2	9.3	330	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
fort lyon cf	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
fort morgan	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
fountain valley	4	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
fowler	6	Celwave 800-900_pd1110_1110-2	9.3	180	0	0	79.4	49
franktown	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
gardner	6	Celwave 800-900_pd1110_1110-2	9.3	130	0	0	79.4	49
glenwood_lookout	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
gobbler knob	2	Celwave 800-900_pd1110_1110-2	9.3	80	0	0	79.4	49
grand junction	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
grand mesa	2	Celwave 800-900_pd1110_1110-2	9.3	140	0	0	79.4	49
granite	2	Celwave 800-900_pd1110_1110-2	9.3	40	0	0	79.4	49
grassy	2	Sinclair 49001	9	100	0	0	79.4	49
Greeley	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
greenhorn	6	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
grouse	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
gun barrel	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
hagerman pass	2	Celwave 800-900_pd1110_1110-2	9.3	40	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
harper hill	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
haswell	6	Celwave 800-900_pd1110_1110-2	9.3	145	0	0	79.4	49
hayden	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
hill 71	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
holly	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
horsetooth	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
hugo	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
idalia	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
ignacio	2	Sinclair 49001	9	100	0	0	79.4	49
julesburg	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
juniper mtn	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
kim	6	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
king mtn	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
kiowa	1	Celwave 800-900_pd1110_1110-2	9.3	130	0	0	79.4	49
la junta	6	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49
la monte peak	2	Sinclair 49001	9	125	0	0	125.9	51
la veta	6	Celwave 800-900_pd1110_1110-2	9.3	80	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
lake hill	2	Celwave 800-900_pd1110_1110-2	9.3	40	0	0	79.4	49
lamar	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
last chance	3	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
last dollar	2	Celwave 800-900_pd1110_1110-2	9.3	140	0	0	79.4	49
lees point	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
limon cf	1	Celwave 800-900_pd1110_1110-2	9.3	120	0	0	79.4	49
lobo	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
log hill	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
longmont	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
lookout	1	Celwave 800-900_pd1110_1110-2	9.3	235	0	0	79.4	49
loveland	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
loveland ski	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
lower beaver creek	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
lower dowd	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
Marble	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
marvine hill	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
mead	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
mellen hill	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
mesa point	2	Celwave 800-900_pd1110_1110-2	9.3	55	0	0	79.4	49
methodist	6	Celwave 800-900_pd1110_1110-2	9.3	30	0	0	79.4	49
mines	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
missionary ridge	2	Sinclair 49001	9	125	0	0	79.4	49
monarch	6	Celwave 800-900_pd1110_1110-2	9.3	20	0	0	79.4	49
monte vista	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
monument	2	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49
mt callahan	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
mt carmel	6	Celwave 800-900_pd1110_1110-2	9.3	130	0	0	79.4	49
new castle	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
new raymer_dtr	3	Celwave 800-900_pd1110_1110-2	9.3	120	0	0	79.4	49
North Cottonwood	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
north mtn	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
oak brush hill	2	Sinclair 49001	9	125	0	0	79.4	49
oak creek	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
parachute	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
pawnee	3	Celwave 800-900_pd1110_1110-2	9.3	130	0	0	79.4	49
peetz	3	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
phillips	3	Celwave 800-900_pd1110_1110-2	9.3	120	0	0	79.4	49
pittsburg	4	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
point of rock	3	Celwave 800-900_pd1110_1110-2	9.3	110	0	0	79.4	49
poncha springs	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
pooltable	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
Prospect	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
Pueblo Chem	6	Sinclair SC476-HF1LDF	6	125	0	0	158.5	52
Pueblo Simulcast Goat Hill	6	Sinclair SC476-HF1LDF	6	150	0	0	125.9	51
Pueblo Simulcast Jackson Hill	6	Sinclair SC476-HF1LDF	6	150	0	0	125.9	51
Pueblo Simulcast Pueblo West	6	Sinclair SC476-HF1LDF	6	145	0	0	125.9	51
Pueblo Simulcast San Carlos	6	Sinclair SC476-HF1LDF	6	98	0	0	158.5	52
Pueblo Simulcast Walking Stick	6	Sinclair SC476-HF1LDF	6	105	0	0	158.5	52
punkin center	1	Celwave 800-900_pd1110_1110-2	9.3	120	0	0	79.4	49
PVH (Fort Collins)	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
rabbit valley	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
ramah	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
raspberry ridge	2	Celwave 800-900_pd1110_1110-2	9.3	206	0	0	79.4	49
raton pass	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
redlands	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
reiradon	3	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49
rico	2	Sinclair 49001	9	100	0	0	79.4	49
rifle	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
riley peak	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
rose ridge	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
sacramento	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
saguache peak	6	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
san antonio peak_ nm	6	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
san luis	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
sandoval	2	Sinclair 49001	9	100	0	0	79.4	49
santoy	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
sheep knob	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
sheridan lake	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
silver heights	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
silverton	2	Sinclair 49001	9	100	0	0	79.4	49
ski summit	4	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
smelter mtn	2	Sinclair 49001	9	125	0	0	79.4	49
smoky hill	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
south morgan	3	Celwave 800-900_pd1110_1110-2	9.3	80	0	0	79.4	49
springfield	6	Celwave 800-900_pd1110_1110-2	9.3	80	0	0	79.4	49
squaw	1	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
stanley	4	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
state capital	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
sterling cf	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
storm king	2	Celwave 800-900_pd1110_1110-2	9.3	140	0	0	79.4	49
sunlight	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
sunset mesa	2	Celwave 800-900_pd1110_1110-2	9.3	15	0	0	79.4	49
sunspot	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
table mtn	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
tank hill	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
teepee park	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
tenderfoot ii	6	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
Tgap	4	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
thorodin	1	RFI CC806-06	4.8	100	0	0	79.4	49
toonerville	6	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49
trinidad cf	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
truckton	4	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
tv hill	2	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49
twin mtn	6	Celwave 800-900_pd1110_1110-2	9.3	145	0	0	79.4	49
tyrolean	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
uravan	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
ute	2	Sinclair 49001	9	40	0	0	79.4	49
vail	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
valley	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
verdemont	6	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
vermillion bluffs	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
w mountain	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 1							
	DTR Zone	TX Antenna Model	TX Antenna Gain (dBd)	TX Antenna Height (ft)	TX Antenna Azimuth (degrees)	TX Antenna Tilt (degrees)	TX Power Out (W)	TX Power Out (dBm)
walsenburg	6	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49
walton mtn	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
waterdog	2	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
west creek	1	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
whitewater	2	Celwave 800-900_pd1110_1110-2	9.3	80	0	0	79.4	49
wildhorse	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
wolcott	2	Celwave 800-900_pd1110_1110-2	9.3	60	0	0	79.4	49
wolf creek pass	2	Celwave 800-900_pd1110_1110-2	9.3	125	0	0	79.4	49
woodland	4	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
wray	3	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49
yuma	3	Celwave 800-900_pd1110_1110-2	9.3	100	0	0	79.4	49
zap	1	Celwave 800-900_pd1110_1110-2	9.3	280	0	0	79.4	49

Appendix C - Site Parameters for DTRS Coverage Predictions

DTRS – Site Parameters, Transmit Information, Part 2

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
12 mile	6	2.8	2.9	1.2	6.9	50.10	102.33
abajo peak_ ut	2	3	4	0.8	7.8	50.50	112.20
airport	4	3	4	0.8	7.8	50.50	112.20
ajax	2	3	0	0.8	3.8	54.50	281.84
akron	3	3	2	0.8	5.8	52.50	177.83
alamosa	6	3	1.1	0.8	4.9	53.40	218.78
anton	3	3	3.2	0.8	7	51.30	134.90
Arapahoe admin	1	3	1.5	0.8	5.3	53.00	199.53
arkansas vly cf	6	3	4	0.8	7.8	50.50	112.20
auraria	1	3	4	0.8	7.8	50.50	112.20
austin bluffs	4	3	1.5	0.8	5.3	53.00	199.53
badger = PPRCN	4	3	1.5	0.8	5.3	53.00	199.53
badger = State of CO	1	3	1.5	0.8	5.3	53.00	199.53
bailey	1	3	1.5	0.8	5.3	53.00	199.53
baker peak	2	3	1.5	0.8	5.3	53.00	199.53
bald north	3	3	1.5	0.8	5.3	53.00	199.53
bald south	6	3	1.1	0.8	4.9	53.40	218.78
beacon hill	2	3	1.5	0.8	5.3	53.00	199.53
bear gulch	3	3	1.5	0.8	5.3	53.00	199.53

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
beaver creek	2	3	1.5	0.8	5.3	53.00	199.53
betasso	3	3	4	0.8	7.8	50.50	112.20
bethune	1	3	1.5	0.8	5.3	53.00	199.53
black forest	4	3	4	0.8	7.8	50.50	112.20
black hawk	1	3	1.5	0.8	5.3	53.00	199.53
black ridge	2	3	4	0.8	7.8	50.50	112.20
blowout mnt	2	3	1.5	0.8	5.3	53.00	199.53
blue ridge	3	3	4	0.8	7.8	50.50	112.20
bowen marker	6	3	1.5	0.8	5.3	53.00	199.53
boyero	1	3	4	0.8	7.8	50.50	112.20
buckhorn	3	3	1.1	0.8	4.9	53.40	218.78
buena vista cf	6	3	4	0.8	7.8	50.50	112.20
buffalo pass	2	3	4	0.8	7.8	50.50	112.20
bull mtn	3	3	4	0.8	7.8	50.50	112.20
byers	1	3	4	0.8	7.8	50.50	112.20
calhan	4	3	1.5	0.8	5.3	53.00	199.53
carlton	6	3	1.5	0.8	5.3	53.00	199.53
castle peak	2	3	1.5	0.8	5.3	53.00	199.53

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
cathedral bluffs	2	3	4	0.8	7.8	50.50	112.20
cedar heights	4	3	1.5	0.8	5.3	53.00	199.53
cedar mtn	2	3	4	0.8	7.8	50.50	112.20
chevron	1	3	4	0.8	7.8	50.50	112.20
cheyenne mtn	6	3	1.5	0.8	5.3	53.00	199.53
coal bank	2	3	4	0.8	7.8	50.20	104.71
coaldale	6	3	1.5	0.8	5.3	53.00	199.53
Colibrane	2	3	1.5	0.8	5.3	53.00	199.53
coonskin	2	3	1.5	0.8	5.3	53.00	199.53
copper mtn	2	3	4	0.8	7.8	50.50	112.20
cordova pass	6	3	4	0.8	7.8	50.50	112.20
craig	2	3	1.5	0.8	5.3	53.00	199.53
creede	6	3	1.5	0.8	5.3	53.00	199.53
crested butte	2	3	0	0.8	3.8	54.50	281.84
crown mtn	2	3	1.5	0.8	5.3	53.00	199.53
dakota	1	3	1.5	0.8	5.3	53.00	199.53
deer peak	6	3	1.5	0.8	5.3	53.00	199.53
deer trail	1	3	2.6	0.8	6.4	51.90	154.88

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
delta	2	3	1.5	0.8	5.3	53.00	199.53
denver tx	1	3	0.5	0.8	4.3	54.00	251.19
dolores	2	3	4	0.8	7.8	52.20	165.96
douglas pass	2	3	1.5	0.8	5.3	53.00	199.53
drake	3	3	1.5	0.8	5.3	53.00	199.53
drdc	1	3	1.5	0.8	5.3	53.00	199.53
east vail	2	3	1.5	0.8	5.3	53.00	199.53
ECC CF	6	3	1.5	0.8	5.3	53.00	199.53
egnar	2	3	4	0.8	7.8	50.50	112.20
emerald mtn	2	3	1.5	0.8	5.3	53.00	199.53
farwell	2	3	1.5	0.8	5.3	53.00	199.53
firstview	1	3	1.5	0.8	5.3	53.00	199.53
fort lyon cf	6	3	1.5	0.8	5.3	53.00	199.53
fort morgan	3	3	1.5	0.8	5.3	53.00	199.53
fountain valley	4	3	4	0.8	7.8	50.50	112.20
fowler	6	3	2.6	0.8	6.4	51.90	154.88
franktown	1	3	1.6	0.8	5.4	52.90	194.98
gardner	6	3	1.5	0.8	5.3	53.00	199.53

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
glenwood_lookout	2	3	4	0.8	7.8	50.50	112.20
gobbler knob	2	3	4	0.8	7.8	50.50	112.20
grand junction	2	3	1.5	0.8	5.3	53.00	199.53
grand mesa	2	3	2.1	0.8	5.9	52.40	173.78
granite	2	3	4	0.8	7.8	50.50	112.20
grassy	2	3	1.5	0.8	5.3	52.70	186.21
Greeley	3	3	1.5	0.8	5.3	53.00	199.53
greenhorn	6	3	1.1	0.8	4.9	53.40	218.78
grouse	2	3	1.5	0.8	5.3	53.00	199.53
gun barrel	3	3	1.5	0.8	5.3	53.00	199.53
hagerman pass	2	3	4	0.8	7.8	50.50	112.20
harper hill	2	3	4	0.8	7.8	50.50	112.20
haswell	6	3	2.2	0.8	6	52.30	169.82
hayden	2	3	4	0.8	7.8	50.50	112.20
hill 71	2	3	1.5	0.8	5.3	53.00	199.53
holly	6	3	1.5	0.8	5.3	53.00	199.53
horsetooth	3	3	1.5	0.8	5.3	53.00	199.53
hugo	1	3	1.5	0.8	5.3	53.00	199.53

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
idalia	3	3	1.5	0.8	5.3	53.00	199.53
ignacio	2	3	1.5	0.8	5.3	52.70	186.21
julesburg	3	3	1.5	0.8	5.3	53.00	199.53
juniper mtn	2	3	4	0.8	7.8	50.50	112.20
kim	6	3	4	0.8	7.8	50.50	112.20
king mtn	2	3	1.1	0.8	4.9	53.40	218.78
kiowa	1	3	1.5	0.8	5.3	53.00	199.53
la junta	6	3	4	0.8	7.8	50.50	112.20
la monte peak	2	3	4	0.8	7.8	52.20	165.96
la veta	6	3	1.3	0.8	5.1	53.20	208.93
lake hill	2	3	0.5	0.8	4.3	54.00	251.19
lamar	6	3	1.5	0.8	5.3	53.00	199.53
last chance	3	3	4	0.8	7.8	50.50	112.20
last dollar	2	3	4	0.8	7.8	50.50	112.20
lees point	2	3	1.5	0.8	5.3	53.00	199.53
limon cf	1	3	1.5	0.8	5.3	53.00	199.53
lobo	2	3	1.5	0.8	5.3	53.00	199.53
log hill	2	3	1.1	0.8	4.9	53.40	218.78

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
longmont	3	3	1.5	0.8	5.3	53.00	199.53
lookout	1	3	1.5	0.8	5.3	53.00	199.53
loveland	3	3	1.5	0.8	5.3	53.00	199.53
loveland ski	1	3	1.5	0.8	5.3	53.00	199.53
lower beaver creek	2	3	1.5	0.8	5.3	53.00	199.53
lower dowd	2	3	4	0.8	7.8	50.50	112.20
Marble	2	3	1.5	0.8	5.3	53.00	199.53
marvine hill	2	3	1.5	0.8	5.3	53.00	199.53
mead	1	3	1.3	0.8	5.1	53.20	208.93
mellen hill	2	3	0	0.8	3.8	54.50	281.84
mesa point	2	3	1.5	0.8	5.3	53.00	199.53
methodist	6	3	1.5	0.8	5.3	53.00	199.53
mines	1	3	1.5	0.8	5.3	53.00	199.53
missionary ridge	2	3	4	0.8	7.8	50.20	104.71
monarch	6	3	1.5	0.8	5.3	53.00	199.53
monte vista	2	3	4	0.8	7.8	50.50	112.20
monument	2	3	4	0.8	7.8	50.50	112.20
mt callahan	2	3	1.5	0.8	5.3	53.00	199.53

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
mt carmel	6	3	1.5	0.8	5.3	53.00	199.53
new castle	2	3	1.5	0.8	5.3	53.00	199.53
new raymer_dtr	3	3	1.6	0.8	5.4	52.90	194.98
North Cottonwood	3	3	1.5	0.8	5.3	53.00	199.53
north mtn	2	3	4	0.8	7.8	50.50	112.20
oak brush hill	2	3	4	0.8	7.8	50.20	104.71
oak creek	2	3	1.5	0.8	5.3	53.00	199.53
parachute	2	3	1.5	0.8	5.3	53.00	199.53
pawnee	3	3	1.5	0.8	5.3	53.00	199.53
peetz	3	3	4	0.8	7.8	50.50	112.20
phillips	3	3	1.9	0.8	5.7	52.60	181.97
pittsburg	4	3	1.5	0.8	5.3	53.00	199.53
point of rock	3	3	1.7	0.8	5.5	52.80	190.55
poncha springs	6	3	4	0.8	7.8	50.50	112.20
pooltable	2	3	4	0.8	7.8	50.50	112.20
Prospect	3	3	1.5	0.8	5.3	53.00	199.53
Pueblo Chem	6	2.8	2.9	1.2	6.9	51.10	128.82
Pueblo Simulcast Goat Hill	6	2.8	2.9	1.2	6.9	50.10	102.33

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
Pueblo Simulcast Jackson Hill	6	2.8	2.9	1.2	6.9	50.10	102.33
Pueblo Simulcast Pueblo West	6	2.8	3.6	1.2	7.6	49.40	87.10
Pueblo Simulcast San Carlos	6	2.8	2.9	1.2	6.9	51.10	128.82
Pueblo Simulcast Walking Stick	6	2.8	2.9	1.2	6.9	51.10	128.82
punkin center	1	3	1.5	0.8	5.3	53.00	199.53
PVH (Fort Collins)	3	3	1.5	0.8	5.3	53.00	199.53
rabbit valley	2	3	1.5	0.8	5.3	53.00	199.53
ramah	1	3	1.5	0.8	5.3	53.00	199.53
raspberry ridge	2	3	1.5	0.8	5.3	53.00	199.53
raton pass	6	3	1.5	0.8	5.3	53.00	199.53
redlands	2	3	1.5	0.8	5.3	53.00	199.53
reiradon	3	3	4	0.8	7.8	50.50	112.20
rico	2	3	1.5	0.8	5.3	52.70	186.21
rifle	2	3	1.5	0.8	5.3	53.00	199.53
riley peak	1	3	1.5	0.8	5.3	53.00	199.53
rose ridge	2	3	0	0.8	3.8	54.50	281.84
sacramento	1	3	1.5	0.8	5.3	53.00	199.53
saguache peak	6	3	4	0.8	7.8	50.50	112.20

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
san antonio peak_ nm	6	3	4	0.8	7.8	50.50	112.20
san luis	6	3	1.5	0.8	5.3	53.00	199.53
sandoval	2	3	1.5	0.8	5.3	52.70	186.21
santoy	3	3	1.5	0.8	5.3	53.00	199.53
sheep knob	2	3	4	0.8	7.8	50.50	112.20
sheridan lake	6	3	1.5	0.8	5.3	53.00	199.53
silver heights	1	3	1.5	0.8	5.3	53.00	199.53
silverton	2	3	1.5	0.8	5.3	52.70	186.21
ski summit	4	3	4	0.8	7.8	50.50	112.20
smelter mtn	2	3	4	0.8	7.8	50.20	104.71
smoky hill	1	3	1.5	0.8	5.3	53.00	199.53
south morgan	3	3	1.5	0.8	5.3	53.00	199.53
springfield	6	3	1.5	0.8	5.3	53.00	199.53
squaw	1	3	1.1	0.8	4.9	53.40	218.78
stanley	4	3	1.5	0.8	5.3	53.00	199.53
state capital	1	3	0	0.8	3.8	54.50	281.84
sterling cf	3	3	1.5	0.8	5.3	53.00	199.53
storm king	2	3	2.1	0.8	5.9	52.40	173.78

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
sunlight	2	3	1.6	0.8	5.4	52.90	194.98
sunset mesa	2	3	0.5	0.8	4.3	54.00	251.19
sunspot	1	3	1.5	0.8	5.3	53.00	199.53
table mtn	3	3	1.5	0.8	5.3	53.00	199.53
tank hill	2	3	1.5	0.8	5.3	53.00	199.53
teepee park	2	3	1.5	0.8	5.3	53.00	199.53
tenderfoot ii	6	3	4	0.8	7.8	50.50	112.20
Tgap	4	3	4	0.8	7.8	50.50	112.20
thorodin	1	3	1.5	0.8	5.3	48.50	70.79
toonerville	6	3	3.7	0.8	7.5	50.80	120.23
trinidad cf	6	3	1.5	0.8	5.3	53.00	199.53
truckton	4	3	4	0.8	7.8	50.50	112.20
tv hill	2	3	4	0.8	7.8	50.50	112.20
twin mtn	6	3	2.2	0.8	6	52.30	169.82
tyrolean	2	3	4	0.8	7.8	50.50	112.20
uravan	2	3	1.5	0.8	5.3	53.00	199.53
ute	2	3	1.5	0.8	5.3	52.70	186.21
vail	2	3	1.1	0.8	4.9	53.40	218.78

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	TRANSMIT INFORMATION, PART 2						
	DTR Zone	Combiner Loss (dB)	Line Loss (dB)	Jumper / Connector Loss (dB)	Combined Site Losses (dB)	ERP (dBm)	ERP (Watts)
valley	6	3	1.3	0.8	5.1	53.20	208.93
verdemont	6	3	1.5	0.8	5.3	53.00	199.53
vermillion bluffs	2	3	4	0.8	7.8	50.50	112.20
w mountain	2	3	1.5	0.8	5.3	53.00	199.53
walsenburg	6	3	4	0.8	7.8	50.50	112.20
walton mtn	2	3	4	0.8	7.8	50.50	112.20
waterdog	2	3	1.5	0.8	5.3	53.00	199.53
west creek	1	3	1.5	0.8	5.3	53.00	199.53
whitewater	2	3	1.3	0.8	5.1	53.20	208.93
wildhorse	3	3	1.5	0.8	5.3	53.00	199.53
wolcott	2	3	4	0.8	7.8	50.50	112.20
wolf creek pass	2	3	4	0.8	7.8	50.50	112.20
woodland	4	3	1.5	0.8	5.3	53.00	199.53
wray	3	3	4	0.8	7.8	50.50	112.20
yuma	3	3	1.5	0.8	5.3	53.00	199.53
zap	1	3	4	0.8	7.8	50.50	112.20

Appendix C - Site Parameters for DTRS Coverage Predictions

DTR System – Site Parameters, Receive Information, Part 1

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
12 mile	Sinclair SC476-HF1LDF	6	100	0	0
abajo peak_ ut	Antenna Specialists s_h952b.ana	9	145	0	0
airport	Antenna Specialists s_h952b.ana	9	60	0	0
ajax	Antenna Specialists s_h952b.ana	9	100	0	0
akron	Antenna Specialists s_h952b.ana	9	150	0	0
alamosa	Antenna Specialists s_h952b.ana	9	80	0	0
anton	Antenna Specialists s_h952b.ana	9	244	0	0
Arapahoe admin	Antenna Specialists s_h952b.ana	9	100	0	0
arkansas vly cf	Antenna Specialists s_h952b.ana	9	145	0	0
auraria	Antenna Specialists s_h952b.ana	9	100	0	0
austin bluffs	Antenna Specialists s_h952b.ana	9	100	0	0
badger = PPRCN	Antenna Specialists s_h952b.ana	9	100	0	0
badger = State of CO	Antenna Specialists s_h952b.ana	9	100	0	0
bailey	Antenna Specialists s_h952b.ana	9	100	0	0
baker peak	Antenna Specialists s_h952b.ana	9	100	0	0
bald north	Antenna Specialists s_h952b.ana	9	100	0	0
bald south	Antenna Specialists s_h952b.ana	9	80	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
beacon hill	Antenna Specialists s_h952b.ana	9	100	0	0
bear gulch	Antenna Specialists s_h952b.ana	9	100	0	0
beaver creek	Antenna Specialists s_h952b.ana	9	100	0	0
betasso	Antenna Specialists s_h952b.ana	9	60	0	0
bethune	Antenna Specialists s_h952b.ana	9	400	0	0
black forest	Antenna Specialists s_h952b.ana	9	60	0	0
black hawk	Antenna Specialists s_h952b.ana	9	100	0	0
black ridge	Antenna Specialists s_h952b.ana	9	145	0	0
blowout mnt	Antenna Specialists s_h952b.ana	9	100	0	0
blue ridge	Antenna Specialists s_h952b.ana	9	145	0	0
bowen marker	Antenna Specialists s_h952b.ana	9	180	0	0
boyero	Antenna Specialists s_h952b.ana	9	300	0	0
buckhorn	Antenna Specialists s_h952b.ana	9	100	0	0
buena vista cf	Antenna Specialists s_h952b.ana	9	145	0	0
buffalo pass	Antenna Specialists s_h952b.ana	9	145	0	0
bull mtn	Antenna Specialists s_h952b.ana	9	60	0	0
byers	Antenna Specialists s_h952b.ana	9	100	0	0
calhan	Antenna Specialists s_h952b.ana	9	100	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
carlton	Antenna Specialists s_h952b.ana	9	400	0	0
castle peak	Antenna Specialists s_h952b.ana	9	120	0	0
cathedral bluffs	Antenna Specialists s_h952b.ana	9	145	0	0
cedar heights	Antenna Specialists s_h952b.ana	9	100	0	0
cedar mtn	Antenna Specialists s_h952b.ana	9	145	0	0
chevron	Antenna Specialists s_h952b.ana	9	307	0	0
cheyenne mtn	Antenna Specialists s_h952b.ana	9	120	0	0
coal bank	Sinclair 49001	9	300	0	0
coaldale	Antenna Specialists s_h952b.ana	9	25	0	0
Colibrane	Antenna Specialists s_h952b.ana	9	120	0	0
coonskin	Antenna Specialists s_h952b.ana	9	100	0	0
copper mtn	Antenna Specialists s_h952b.ana	9	145	0	0
cordova pass	Antenna Specialists s_h952b.ana	9	145	0	0
craig	Antenna Specialists s_h952b.ana	9	100	0	0
creede	Antenna Specialists s_h952b.ana	9	40	0	0
crested butte	Antenna Specialists s_h952b.ana	9	100	0	0
crown mtn	Antenna Specialists s_h952b.ana	9	100	0	0
dakota	Antenna Specialists s_h952b.ana	9	40	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
deer peak	Antenna Specialists s_h952b.ana	9	100	0	0
deer trail	Antenna Specialists s_h952b.ana	9	200	0	0
delta	Antenna Specialists s_h952b.ana	9	150	0	0
denver tx	Antenna Specialists s_h952b.ana	9	100	0	0
dolores	Sinclair 49001	9	145	0	0
douglas pass	Antenna Specialists s_h952b.ana	9	100	0	0
drake	Antenna Specialists s_h952b.ana	9	100	0	0
drdc	Antenna Specialists s_h952b.ana	9	100	0	0
east vail	Antenna Specialists s_h952b.ana	9	100	0	0
ECC CF	Antenna Specialists s_h952b.ana	9	100	0	0
egnar	Antenna Specialists s_h952b.ana	9	60	0	0
emerald mtn	Antenna Specialists s_h952b.ana	9	100	0	0
farwell	Antenna Specialists s_h952b.ana	9	100	0	0
firstview	Antenna Specialists s_h952b.ana	9	350	0	0
fort lyon cf	Antenna Specialists s_h952b.ana	9	100	0	0
fort morgan	Antenna Specialists s_h952b.ana	9	100	0	0
fountain valley	Antenna Specialists s_h952b.ana	9	60	0	0
fowler	Antenna Specialists s_h952b.ana	9	200	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
franktown	Antenna Specialists s_h952b.ana	9	120	0	0
gardner	Antenna Specialists s_h952b.ana	9	150	0	0
glenwood_lookout	Antenna Specialists s_h952b.ana	9	145	0	0
gobbler knob	Antenna Specialists s_h952b.ana	9	100	0	0
grand junction	Antenna Specialists s_h952b.ana	9	100	0	0
grand mesa	Antenna Specialists s_h952b.ana	9	160	0	0
granite	Antenna Specialists s_h952b.ana	9	60	0	0
grassy	Sinclair 49001	9	100	0	0
Greeley	Antenna Specialists s_h952b.ana	9	100	0	0
greenhorn	Antenna Specialists s_h952b.ana	9	80	0	0
grouse	Antenna Specialists s_h952b.ana	9	100	0	0
gun barrel	Antenna Specialists s_h952b.ana	9	100	0	0
hagerman pass	Antenna Specialists s_h952b.ana	9	60	0	0
harper hill	Antenna Specialists s_h952b.ana	9	60	0	0
haswell	Antenna Specialists s_h952b.ana	9	165	0	0
hayden	Antenna Specialists s_h952b.ana	9	100	0	0
hill 71	Antenna Specialists s_h952b.ana	9	100	0	0
holly	Antenna Specialists s_h952b.ana	9	100	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
horsetooth	Antenna Specialists s_h952b.ana	9	100	0	0
hugo	Antenna Specialists s_h952b.ana	9	100	0	0
idalia	Antenna Specialists s_h952b.ana	9	100	0	0
ignacio	Sinclair 49001	9	100	0	0
julesburg	Antenna Specialists s_h952b.ana	9	100	0	0
juniper mtn	Antenna Specialists s_h952b.ana	9	145	0	0
kim	Antenna Specialists s_h952b.ana	9	145	0	0
king mtn	Antenna Specialists s_h952b.ana	9	80	0	0
kiowa	Antenna Specialists s_h952b.ana	9	150	0	0
la junta	Antenna Specialists s_h952b.ana	9	300	0	0
la monte peak	Sinclair 49001	9	145	0	0
la veta	Antenna Specialists s_h952b.ana	9	100	0	0
lake hill	Antenna Specialists s_h952b.ana	9	60	0	0
lamar	Antenna Specialists s_h952b.ana	9	100	0	0
last chance	Antenna Specialists s_h952b.ana	9	60	0	0
last dollar	Antenna Specialists s_h952b.ana	9	160	0	0
lees point	Antenna Specialists s_h952b.ana	9	100	0	0
limon cf	Antenna Specialists s_h952b.ana	9	140	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
lobo	Antenna Specialists s_h952b.ana	9	100	0	0
log hill	Antenna Specialists s_h952b.ana	9	80	0	0
longmont	Antenna Specialists s_h952b.ana	9	100	0	0
lookout	Antenna Specialists s_h952b.ana	9	235	0	0
loveland	Antenna Specialists s_h952b.ana	9	100	0	0
loveland ski	Antenna Specialists s_h952b.ana	9	100	0	0
lower beaver creek	Antenna Specialists s_h952b.ana	9	100	0	0
lower dowd	Antenna Specialists s_h952b.ana	9	60	0	0
Marble	Antenna Specialists s_h952b.ana	9	100	0	0
marvine hill	Antenna Specialists s_h952b.ana	9	100	0	0
mead	Antenna Specialists s_h952b.ana	9	120	0	0
mellen hill	Antenna Specialists s_h952b.ana	9	100	0	0
mesa point	Antenna Specialists s_h952b.ana	9	75	0	0
methodist	Antenna Specialists s_h952b.ana	9	50	0	0
mines	Antenna Specialists s_h952b.ana	9	100	0	0
missionary ridge	Sinclair 49001	9	145	0	0
monarch	Antenna Specialists s_h952b.ana	9	20	0	0
monte vista	Antenna Specialists s_h952b.ana	9	60	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
monument	Antenna Specialists s_h952b.ana	9	300	0	0
mt callahan	Antenna Specialists s_h952b.ana	9	100	0	0
mt carmel	Antenna Specialists s_h952b.ana	9	150	0	0
new castle	Antenna Specialists s_h952b.ana	9	100	0	0
new raymer_dtr	Antenna Specialists s_h952b.ana	9	140	0	0
North Cottonwood	Antenna Specialists s_h952b.ana	9	100	0	0
north mtn	Antenna Specialists s_h952b.ana	9	145	0	0
oak brush hill	Sinclair 49001	9	145	0	0
oak creek	Antenna Specialists s_h952b.ana	9	100	0	0
parachute	Antenna Specialists s_h952b.ana	9	100	0	0
pawnee	Antenna Specialists s_h952b.ana	9	150	0	0
peetz	Antenna Specialists s_h952b.ana	9	60	0	0
phillips	Antenna Specialists s_h952b.ana	9	140	0	0
pittsburg	Antenna Specialists s_h952b.ana	9	100	0	0
point of rock	Antenna Specialists s_h952b.ana	9	130	0	0
poncha springs	Antenna Specialists s_h952b.ana	9	100	0	0
pooltable	Antenna Specialists s_h952b.ana	9	145	0	0
Prospect	Antenna Specialists s_h952b.ana	9	130	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
Pueblo Chem	Sinclair SC476-HF1LDF	9	100	0	0
Pueblo Simulcast Goat Hill	Sinclair SC476-HF1LDF	6	175	0	0
Pueblo Simulcast Jackson Hill	Sinclair SC476-HF1LDF	6	175	0	0
Pueblo Simulcast Pueblo West	Sinclair SC476-HF1LDF	6	165	0	0
Pueblo Simulcast San Carlos	Sinclair SC476-HF1LDF	6	119	0	0
Pueblo Simulcast Walking Stick	Sinclair SC476-HF1LDF	6	115	0	0
punkin center	Antenna Specialists s_h952b.ana	9	140	0	0
PVH (Fort Collins)	Antenna Specialists s_h952b.ana	9	130	0	0
rabbit valley	Antenna Specialists s_h952b.ana	9	100	0	0
ramah	Antenna Specialists s_h952b.ana	9	100	0	0
raspberry ridge	Antenna Specialists s_h952b.ana	9	226	0	0
raton pass	Antenna Specialists s_h952b.ana	9	100	0	0
redlands	Antenna Specialists s_h952b.ana	9	100	0	0
reiradon	Antenna Specialists s_h952b.ana	9	300	0	0
rico	Sinclair 49001	9	100	0	0
rifle	Antenna Specialists s_h952b.ana	9	100	0	0
riley peak	Antenna Specialists s_h952b.ana	9	100	0	0
rose ridge	Antenna Specialists s_h952b.ana	9	100	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
sacramento	Antenna Specialists s_h952b.ana	9	100	0	0
saguache peak	Antenna Specialists s_h952b.ana	9	145	0	0
san antonio peak_ nm	Antenna Specialists s_h952b.ana	9	145	0	0
san luis	Antenna Specialists s_h952b.ana	9	100	0	0
sandoval	Sinclair 49001	9	100	0	0
santoy	Antenna Specialists s_h952b.ana	9	100	0	0
sheep knob	Antenna Specialists s_h952b.ana	9	80	0	0
sheridan lake	Antenna Specialists s_h952b.ana	9	100	0	0
silver heights	Antenna Specialists s_h952b.ana	9	100	0	0
silverton	Sinclair 49001	9	100	0	0
ski summit	Antenna Specialists s_h952b.ana	9	60	0	0
smelter mtn	Sinclair 49001	9	145	0	0
smoky hill	Antenna Specialists s_h952b.ana	9	100	0	0
south morgan	Antenna Specialists s_h952b.ana	9	100	0	0
springfield	Antenna Specialists s_h952b.ana	9	100	0	0
squaw	Antenna Specialists s_h952b.ana	9	80	0	0
stanley	Antenna Specialists s_h952b.ana	9	100	0	0
state capital	Antenna Specialists s_h952b.ana	9	100	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
sterling cf	Antenna Specialists s_h952b.ana	9	100	0	0
storm king	Antenna Specialists s_h952b.ana	9	160	0	0
sunlight	Antenna Specialists s_h952b.ana	9	120	0	0
sunset mesa	Antenna Specialists s_h952b.ana	9	35	0	0
sunspot	Antenna Specialists s_h952b.ana	9	100	0	0
table mtn	Antenna Specialists s_h952b.ana	9	100	0	0
tank hill	Antenna Specialists s_h952b.ana	9	100	0	0
teepee park	Antenna Specialists s_h952b.ana	9	100	0	0
tenderfoot ii	Antenna Specialists s_h952b.ana	9	145	0	0
Tgap	Antenna Specialists s_h952b.ana	9	60	0	0
thorodin	RFI CC806-06	4.8	100	0	0
toonerville	Antenna Specialists s_h952b.ana	9	300	0	0
trinidad cf	Antenna Specialists s_h952b.ana	9	100	0	0
truckton	Antenna Specialists s_h952b.ana	9	60	0	0
tv hill	Antenna Specialists s_h952b.ana	9	300	0	0
twin mtn	Antenna Specialists s_h952b.ana	9	165	0	0
tyrolean	Antenna Specialists s_h952b.ana	9	100	0	0
uravan	Antenna Specialists s_h952b.ana	9	100	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 1				
	RX Antenna Model	RX Antenna Gain (dBd)	RX Antenna Height (ft)	RX Antenna Azimuth (degrees)	RX Antenna Tilt (degrees)
ute	Sinclair 49001	9	60	0	0
vail	Antenna Specialists s_h952b.ana	9	80	0	0
valley	Antenna Specialists s_h952b.ana	9	120	0	0
verdemont	Antenna Specialists s_h952b.ana	9	100	0	0
vermillion bluffs	Antenna Specialists s_h952b.ana	9	145	0	0
w mountain	Antenna Specialists s_h952b.ana	9	100	0	0
walsenburg	Antenna Specialists s_h952b.ana	9	300	0	0
walton mtn	Antenna Specialists s_h952b.ana	9	145	0	0
waterdog	Antenna Specialists s_h952b.ana	9	100	0	0
west creek	Antenna Specialists s_h952b.ana	9	100	0	0
whitewater	Antenna Specialists s_h952b.ana	9	100	0	0
wildhorse	Antenna Specialists s_h952b.ana	9	100	0	0
wolcott	Antenna Specialists s_h952b.ana	9	60	0	0
wolf creek pass	Antenna Specialists s_h952b.ana	9	145	0	0
woodland	Antenna Specialists s_h952b.ana	9	100	0	0
wray	Antenna Specialists s_h952b.ana	9	300	0	0
yuma	Antenna Specialists s_h952b.ana	9	100	0	0
zap	Antenna Specialists s_h952b.ana	9	300	0	0

Appendix C - Site Parameters for DTRS Coverage Predictions

DTR System – Site Parameters, Receive Information, Part 2

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
12 mile	3.1	1	10.1	-103	-6.0
abajo peak_ ut	1.0	1	8.0	-103	-6.0
airport	1.0	1	8.0	-103	-6.0
ajax	1.0	1	8.0	-103	-6.0
akron	1.0	1	8.0	-103	-6.0
alamosa	1.0	1	8.0	-103	-6.0
anton	1	1	8.0	-103	-6.0
Arapahoe admin	1	1	8.0	-103	-6.0
arkansas vly cf	1.00	1.00	8.0	-103	-6.0
auraria	1.00	1.00	8.0	-103	-6.0
austin bluffs	1.00	1.00	8.0	-103	-6.0
badger = PPRCN	1.00	1.00	8.0	-103	-6.0
badger = State of CO	1.00	1.00	8.0	-103	-6.0
bailey	1.00	1.00	8.0	-103	-6.0
baker peak	1.00	1.00	8.0	-103	-6.0
bald north	1.00	1.00	8.0	-103	-6.0
bald south	1.00	1.00	8.0	-103	-6.0
beacon hill	1.00	1.00	8.0	-103	-6.0
bear gulch	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
beaver creek	1.00	1.00	8.0	-103	-6.0
betasso	1.00	1.00	8.0	-103	-6.0
bethune	1.00	1.00	8.0	-103	-6.0
black forest	1.00	1.00	8.0	-103	-6.0
black hawk	1.00	1.00	8.0	-103	-6.0
black ridge	1.00	1.00	8.0	-103	-6.0
blowout mnt	1.00	1.00	8.0	-103	-6.0
blue ridge	1.00	1.00	8.0	-103	-6.0
bowen marker	1.00	1.00	8.0	-103	-6.0
boyero	1.00	1.00	8.0	-103	-6.0
buckhorn	1.00	1.00	8.0	-103	-6.0
buena vista cf	1.00	1.00	8.0	-103	-6.0
buffalo pass	1.00	1.00	8.0	-103	-6.0
bull mtn	1.00	1.00	8.0	-103	-6.0
byers	1.00	1.00	8.0	-103	-6.0
calhan	1.00	1.00	8.0	-103	-6.0
carlton	1.00	1.00	8.0	-103	-6.0
castle peak	1.00	1.00	8.0	-103	-6.0
cathedral bluffs	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
cedar heights	1.00	1.00	8.0	-103	-6.0
cedar mtn	1.00	1.00	8.0	-103	-6.0
chevron	1.00	1.00	8.0	-103	-6.0
cheyenne mtn	1.00	1.00	8.0	-103	-6.0
coal bank	1.00	1.00	8.0	-103	-6.0
coaldale	1.00	1.00	8.0	-103	-6.0
Colibrane	1.00	1.00	8.0	-103	-6.0
coonskin	1.00	1.00	8.0	-103	-6.0
copper mtn	1.00	1.00	8.0	-103	-6.0
cordova pass	1.00	1.00	8.0	-103	-6.0
craig	1.00	1.00	8.0	-103	-6.0
creede	1.00	1.00	8.0	-103	-6.0
crested butte	1.00	1.00	8.0	-103	-6.0
crown mtn	1.00	1.00	8.0	-103	-6.0
dakota	1.00	1.00	8.0	-103	-6.0
deer peak	1.00	1.00	8.0	-103	-6.0
deer trail	1.00	1.00	8.0	-103	-6.0
delta	1.00	1.00	8.0	-103	-6.0
denver tx	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
dolores	1.00	1.00	8.0	-103	-6.0
douglas pass	1.00	1.00	8.0	-103	-6.0
drake	1.00	1.00	8.0	-103	-6.0
drdc	1.00	1.00	8.0	-103	-6.0
east vail	1.00	1.00	8.0	-103	-6.0
ECC CF	1.00	1.00	8.0	-103	-6.0
egnar	1.00	1.00	8.0	-103	-6.0
emerald mtn	1.00	1.00	8.0	-103	-6.0
farwell	1.00	1.00	8.0	-103	-6.0
firstview	1.00	1.00	8.0	-103	-6.0
fort lyon cf	1.00	1.00	8.0	-103	-6.0
fort morgan	1.00	1.00	8.0	-103	-6.0
fountain valley	1.00	1.00	8.0	-103	-6.0
fowler	1.00	1.00	8.0	-103	-6.0
franktown	1.00	1.00	8.0	-103	-6.0
gardner	1.00	1.00	8.0	-103	-6.0
glenwood_lookout	1.00	1.00	8.0	-103	-6.0
gobbler knob	1.00	1.00	8.0	-103	-6.0
grand junction	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
grand mesa	1.00	1.00	8.0	-103	-6.0
granite	1.00	1.00	8.0	-103	-6.0
grassy	1.00	1.00	8.0	-103	-6.0
Greeley	1.00	1.00	8.0	-103	-6.0
greenhorn	1.00	1.00	8.0	-103	-6.0
grouse	1.00	1.00	8.0	-103	-6.0
gun barrel	1.00	1.00	8.0	-103	-6.0
hagerman pass	1.00	1.00	8.0	-103	-6.0
harper hill	1.00	1.00	8.0	-103	-6.0
haswell	1.00	1.00	8.0	-103	-6.0
hayden	1.00	1.00	8.0	-103	-6.0
hill 71	1.00	1.00	8.0	-103	-6.0
holly	1.00	1.00	8.0	-103	-6.0
horsetooth	1.00	1.00	8.0	-103	-6.0
hugo	1.00	1.00	8.0	-103	-6.0
idalia	1.00	1.00	8.0	-103	-6.0
ignacio	1.00	1.00	8.0	-103	-6.0
julesburg	1.00	1.00	8.0	-103	-6.0
juniper mtn	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
kim	1.00	1.00	8.0	-103	-6.0
king mtn	1.00	1.00	8.0	-103	-6.0
kiowa	1.00	1.00	8.0	-103	-6.0
la junta	1.00	1.00	8.0	-103	-6.0
la monte peak	1.00	1.00	8.0	-103	-6.0
la veta	1.00	1.00	8.0	-103	-6.0
lake hill	1.00	1.00	8.0	-103	-6.0
lamar	1.00	1.00	8.0	-103	-6.0
last chance	1.00	1.00	8.0	-103	-6.0
last dollar	1.00	1.00	8.0	-103	-6.0
lees point	1.00	1.00	8.0	-103	-6.0
limon cf	1.00	1.00	8.0	-103	-6.0
lobo	1.00	1.00	8.0	-103	-6.0
log hill	1.00	1.00	8.0	-103	-6.0
longmont	1.00	1.00	8.0	-103	-6.0
lookout	1.00	1.00	8.0	-103	-6.0
loveland	1.00	1.00	8.0	-103	-6.0
loveland ski	1.00	1.00	8.0	-103	-6.0
lower beaver creek	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
lower dowd	1.00	1.00	8.0	-103	-6.0
Marble	1.00	1.00	8.0	-103	-6.0
marvine hill	1.00	1.00	8.0	-103	-6.0
mead	1.00	1.00	8.0	-103	-6.0
mellen hill	1.00	1.00	8.0	-103	-6.0
mesa point	1.00	1.00	8.0	-103	-6.0
methodist	1.00	1.00	8.0	-103	-6.0
mines	1.00	1.00	8.0	-103	-6.0
missionary ridge	1.00	1.00	8.0	-103	-6.0
monarch	1.00	1.00	8.0	-103	-6.0
monte vista	1.00	1.00	8.0	-103	-6.0
monument	1.00	1.00	8.0	-103	-6.0
mt callahan	1.00	1.00	8.0	-103	-6.0
mt carmel	1.00	1.00	8.0	-103	-6.0
new castle	1.00	1.00	8.0	-103	-6.0
new raymer_dtr	0.00	1.00	7.0	-103	-6.0
North Cottonwood	1.00	1.00	8.0	-103	-6.0
north mtn	1.00	1.00	8.0	-103	-6.0
oak brush hill	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
oak creek	1.00	1.00	8.0	-103	-6.0
parachute	1.00	1.00	8.0	-103	-6.0
pawnee	1.00	1.00	8.0	-103	-6.0
peetz	1.00	1.00	8.0	-103	-6.0
phillips	1.00	1.00	8.0	-103	-6.0
pittsburg	1.00	1.00	8.0	-103	-6.0
point of rock	1.00	1.00	8.0	-103	-6.0
poncha springs	1.00	1.00	8.0	-103	-6.0
pooltable	1.00	1.00	8.0	-103	-6.0
Prospect	1.00	1.00	8.0	-103	-6.0
Pueblo Chem	3.10	1.00	10.1	-103	-6.0
Pueblo Simulcast Goat Hill	3.10	1.00	10.1	-103	-6.0
Pueblo Simulcast Jackson Hill	3.10	1.00	10.1	-103	-6.0
Pueblo Simulcast Pueblo West	3.90	1.00	10.9	-103	-6.0
Pueblo Simulcast San Carlos	3.10	1.00	10.1	-103	-6.0
Pueblo Simulcast Walking Stick	3.10	1.00	10.1	-103	-6.0
punkin center	1.00	1.00	8.0	-103	-6.0
PVH (Fort Collins)	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
rabbit valley	1.00	1.00	8.0	-103	-6.0
ramah	1.00	1.00	8.0	-103	-6.0
raspberry ridge	1.00	1.00	8.0	-103	-6.0
raton pass	1.00	1.00	8.0	-103	-6.0
redlands	1.00	1.00	8.0	-103	-6.0
reiradon	1.00	1.00	8.0	-103	-6.0
rico	1.00	1.00	8.0	-103	-6.0
rifle	1.00	1.00	8.0	-103	-6.0
riley peak	1.00	1.00	8.0	-103	-6.0
rose ridge	1.00	1.00	8.0	-103	-6.0
sacramento	1.00	1.00	8.0	-103	-6.0
saguache peak	1.00	1.00	8.0	-103	-6.0
san antonio peak_ nm	1.00	1.00	8.0	-103	-6.0
san luis	1.00	1.00	8.0	-103	-6.0
sandoval	1.00	1.00	8.0	-103	-6.0
santoy	1.00	1.00	8.0	-103	-6.0
sheep knob	1.00	1.00	8.0	-103	-6.0
sheridan lake	1.00	1.00	8.0	-103	-6.0
silver heights	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
silverton	1.00	1.00	8.0	-103	-6.0
ski summit	1.00	1.00	8.0	-103	-6.0
smelter mtn	1.00	1.00	8.0	-103	-6.0
smoky hill	1.00	1.00	8.0	-103	-6.0
south morgan	1.00	1.00	8.0	-103	-6.0
springfield	1.00	1.00	8.0	-103	-6.0
squaw	1.00	1.00	8.0	-103	-6.0
stanley	1.00	1.00	8.0	-103	-6.0
state capital	1.00	1.00	8.0	-103	-6.0
sterling cf	1.00	1.00	8.0	-103	-6.0
storm king	1.00	1.00	8.0	-103	-6.0
sunlight	1.00	1.00	8.0	-103	-6.0
sunset mesa	1.00	1.00	8.0	-103	-6.0
sunspot	1.00	1.00	8.0	-103	-6.0
table mtn	1.00	1.00	8.0	-103	-6.0
tank hill	1.00	1.00	8.0	-103	-6.0
teepee park	1.00	1.00	8.0	-103	-6.0
tenderfoot ii	1.00	1.00	8.0	-103	-6.0
Tgap	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
thorodin	1.00	1.00	8.0	-103	-6.0
toonerville	1.00	1.00	8.0	-103	-6.0
trinidad cf	1.00	1.00	8.0	-103	-6.0
truckton	1.00	1.00	8.0	-103	-6.0
tv hill	1.00	1.00	8.0	-103	-6.0
twin mtn	1.00	1.00	8.0	-103	-6.0
tyrolean	1.00	1.00	8.0	-103	-6.0
uravan	1.00	1.00	8.0	-103	-6.0
ute	1.00	1.00	8.0	-103	-6.0
vail	1.00	1.00	8.0	-103	-6.0
valley	1.00	1.00	8.0	-103	-6.0
verdemont	1.00	1.00	8.0	-103	-6.0
vermillion bluffs	1.00	1.00	8.0	-103	-6.0
w mountain	1.00	1.00	8.0	-103	-6.0
walsenburg	1.00	1.00	8.0	-103	-6.0
walton mtn	1.00	1.00	8.0	-103	-6.0
waterdog	1.00	1.00	8.0	-103	-6.0
west creek	1.00	1.00	8.0	-103	-6.0
whitewater	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

Site Name	RECEIVE INFORMATION, PART 2				
	Line Loss (dB)	Jumper / Connector Losses	Multicoupler Gain (dB)	Faded Sensitivity (dBm)	Combined Site Losses (RX Path) (dB)
wildhorse	1.00	1.00	8.0	-103	-6.0
wolcott	1.00	1.00	8.0	-103	-6.0
wolf creek pass	1.00	1.00	8.0	-103	-6.0
woodland	1.00	1.00	8.0	-103	-6.0
wray	1.00	1.00	8.0	-103	-6.0
yuma	1.00	1.00	8.0	-103	-6.0
zap	1.00	1.00	8.0	-103	-6.0

Appendix C - Site Parameters for DTRS Coverage Predictions

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Appendix D - System Parameters for DTRS Coverage Predictions

This appendix contains the technical parameters for the system-level (subscriber units) modeled during the coverage prediction studies of the State of Colorado DTR system.

Appendix D - System Parameters for DTRS Coverage Prediction

Appendix D - System Parameters for DTRS Coverage Predictions

Subscriber Type	Talk Path	Power out of Unit (w)	Antenna Height (m)	Antenna Gain (dBd)	Line/Connector Losses (dB)	Receiver Sensitivity (dBm)	Body Loss (dB)	Antenna Location
Mobile	Talk-In	35	1.52	-1	2.35	-103 (faded)	0	5' rooftop height
Mobile	Talk-Out	Site Dependent	1.52	-1	2.35	-119 (static)	0	5' rooftop height
Portable	Talk-In (On-Street)	3	0.91	0	0	-103 (faded)	10	Hip height
Portable	Talk-Out (On-Street)	Site Dependent	0.91	0	0	-119 (static)	10	Hip height

Appendix E – DTRS Coverage Prediction Maps

This appendix contains the coverage prediction maps created as part of the existing DTRS analysis for the State of Colorado. ***FE*** created the following sets of maps:

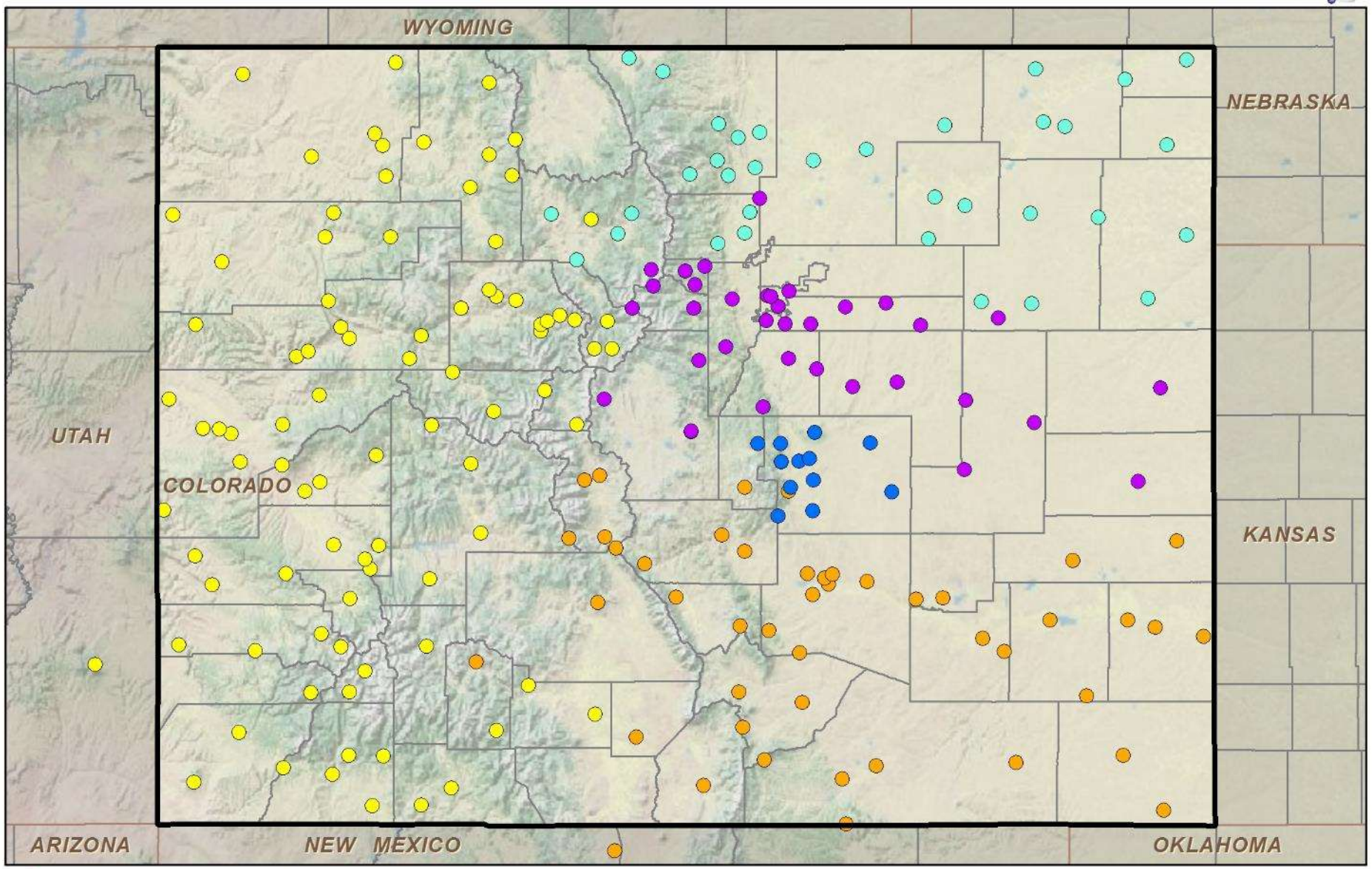
- Statewide Reference Maps
  - DTR Sites
    - Map 1: DTRS Sites by Zone
  - Areas of reported below average “spotty” coverage or “no” coverage
    - Map 2a: DTRS Areas Identified by Users as Having "Spotty Coverage"
    - Map 2a: DTRS Areas Identified by Users as Having "No Coverage"
  - Colorado highway maps
    - Map 3a: Colorado Highway Map
    - Map 3b: Colorado Highway Map with Areas Identified by Users as Having "Spotty Coverage"
    - Map 3c: Colorado Highway Map with Areas Identified by Users as Having “No Coverage”
- Coverage Maps
  - Statewide coverage (4 maps)
    - Map 4a: DTRS Mobile Talk-Out Coverage
    - Map 4b: DTRS Mobile Talk-In Coverage
    - Map 4c: DTRS Portable On-Street Talk-Out Coverage
    - Map 4d: DTRS Portable On-Street Talk-In Coverage
  - Statewide coverage over Colorado highways (4 maps)
    - Map 5a: DTRS Mobile Talk-Out Coverage with Covered and Uncovered Highways
    - Map 5b: DTRS Mobile Talk-In Coverage with Covered and Uncovered Highways
    - Map 5c: DTRS Portable On-Street Talk-Out Coverage with Covered and Uncovered Highways
    - Map 5d: DTRS Portable On-Street Talk-In Coverage with Covered and Uncovered Highways
  - Statewide coverage over reported “spotty coverage” roadways (4 maps)
    - Map 6a: DTRS Mobile Talk-Out Coverage with "Spotty" Roads Covered and Uncovered
    - Map 6b: DTRS Mobile Talk-In Coverage with "Spotty" Roads Covered and Uncovered

Appendix E – DTRS Coverage Prediction Maps

        - Map 6c: DTRS Portable (Street) Talk-Out Coverage with "Spotty" Roads Covered and Uncovered
        - Map 6d: DTRS Portable (Street) Talk-In Coverage with "Spotty" Roads Covered and Uncovered
    - Statewide coverage over reported “no coverage” roadways (4 maps)
        - Map 7a: DTRS Mobile Talk-Out Coverage with "No Coverage" Roads Covered and Uncovered
        - Map 7b: DTRS Mobile Talk-In Coverage with "No Coverage" Roads Covered and Uncovered
        - Map 7c: DTRS Portable (Street) Talk-Out Coverage with "No Coverage" Roads Covered and Uncovered
        - Map 7d: DTRS Portable (Street) Talk-In Coverage with "No Coverage" Roads Covered and Uncovered
    - Zone-wide coverage for Zones 1, 2, 3, 4, and 6 (20 maps)
        - Map 8a: DTRS Zone 1 - Mobile Talk-Out Coverage
        - Map 8b: DTRS Zone 1 - Mobile Talk-In Coverage
        - Map 8c: DTRS Zone 1 - Portable (On-Street) Talk-Out Coverage
        - Map 8d: DTRS Zone 1 - Portable (On-Street) Talk-In Coverage
        - Map 9a: DTRS Zone 2 - Mobile Talk-Out Coverage
        - Map 9b: DTRS Zone 2 - Mobile Talk-In Coverage
        - Map 9c: DTRS Zone 2 - Portable (On-Street) Talk-Out Coverage
        - Map 9d: DTRS Zone 2 - Portable (On-Street) Talk-In Coverage
        - Map 10a: DTRS Zone 3 - Mobile Talk-Out Coverage
        - Map 10b: DTRS Zone 3 - Mobile Talk-In Coverage
        - Map 10c: DTRS Zone 3 - Portable (On-Street) Talk-Out Coverage
        - Map 10d: DTRS Zone 3 - Portable (On-Street) Talk-In Coverage
        - Map 11a: DTRS Zone 4 - Mobile Talk-Out Coverage
        - Map 11b: DTRS Zone 4 - Mobile Talk-In Coverage
        - Map 11c: DTRS Zone 4 - Portable (On-Street) Talk-Out Coverage
        - Map 11d: DTRS Zone 4 - Portable (On-Street) Talk-In Coverage
        - Map 12a: DTRS Zone 6 - Mobile Talk-Out Coverage
        - Map 12b: DTRS Zone 6 - Mobile Talk-In Coverage
        - Map 12c: DTRS Zone 6 - Portable (On-Street) Talk-Out Coverage
        - Map 12d: DTRS Zone 6 - Portable (On-Street) Talk-In Coverage

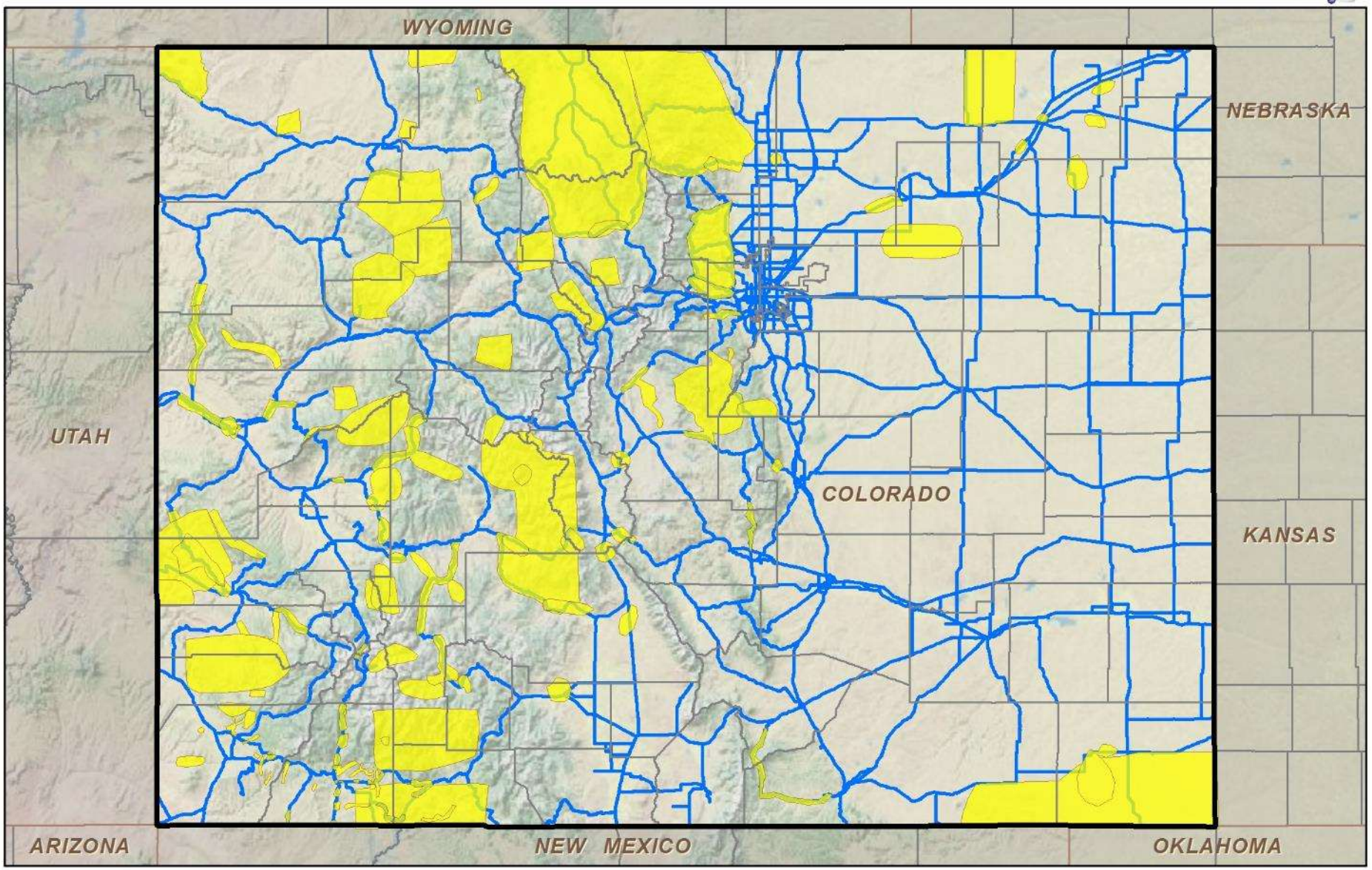
Appendix E – DTRS Coverage Prediction Maps

Map 1: DTRS Sites By Zone



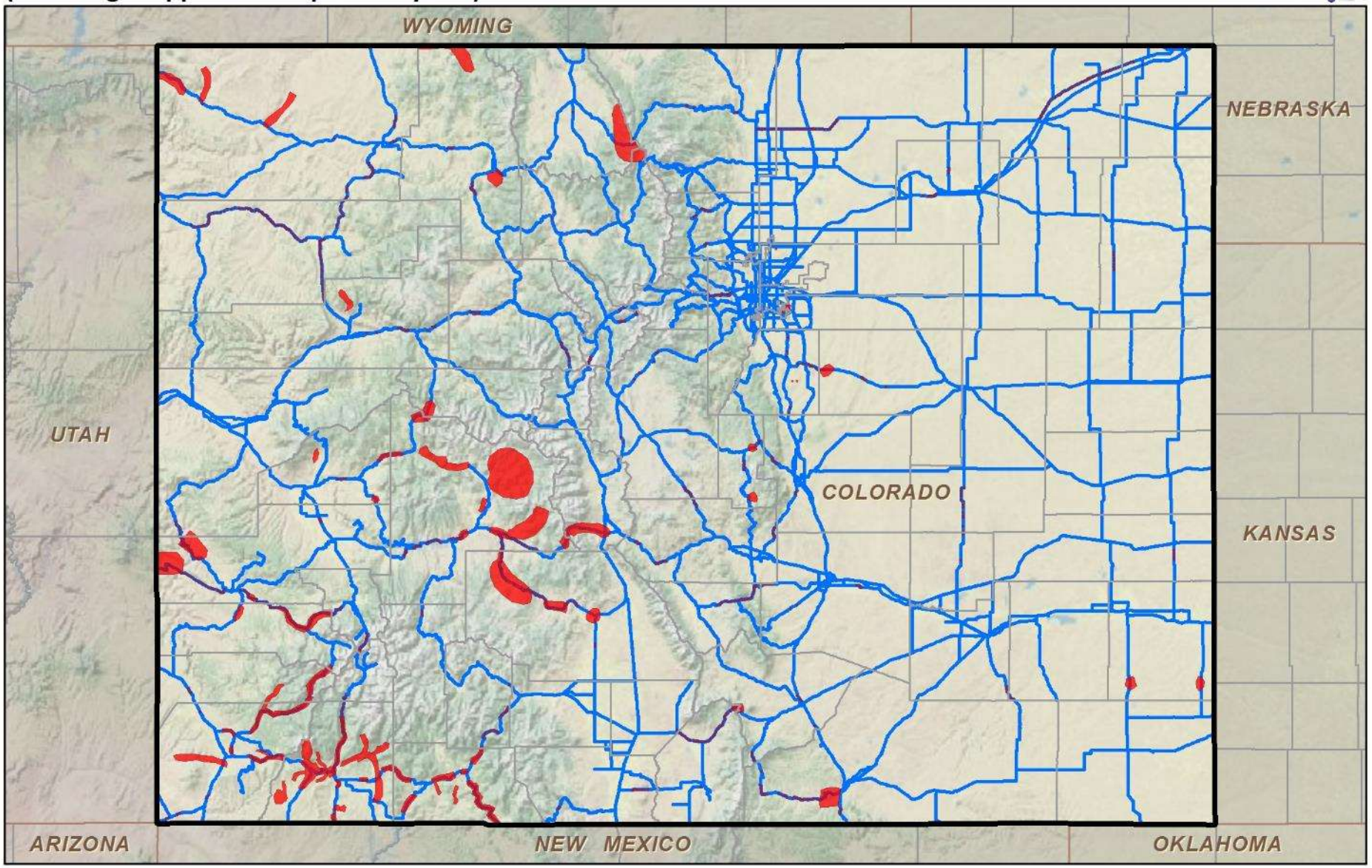
Appendix E – DTRS Coverage Prediction Maps

Map 2a: DTRS - Areas Identified by Users as Having "Spotty Coverage"



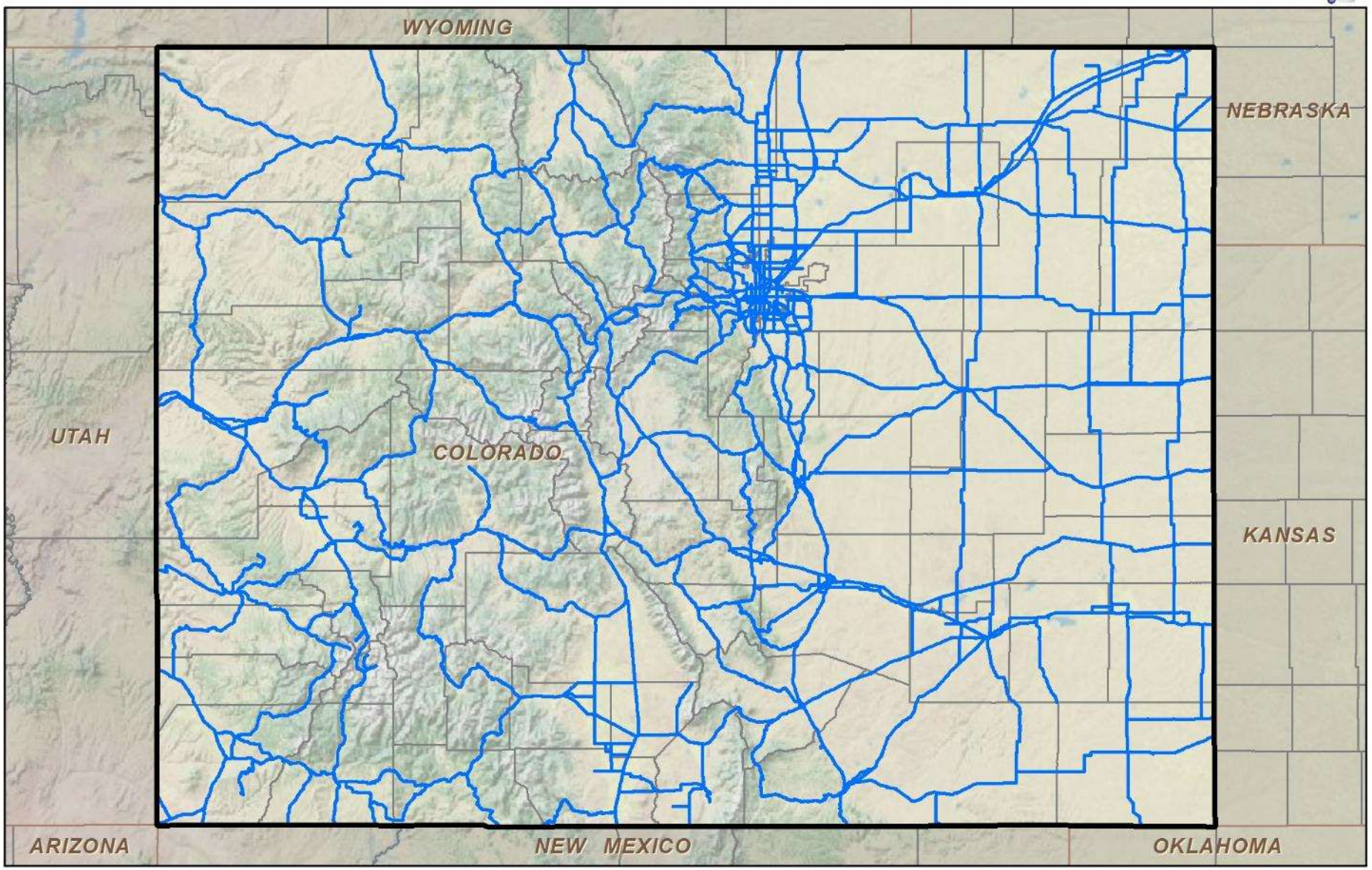
Appendix E – DTRS Coverage Prediction Maps

Map 2b: DTRS – Areas Identified by Users as Having "No Coverage"
(Including dropped calls reported by CSP)



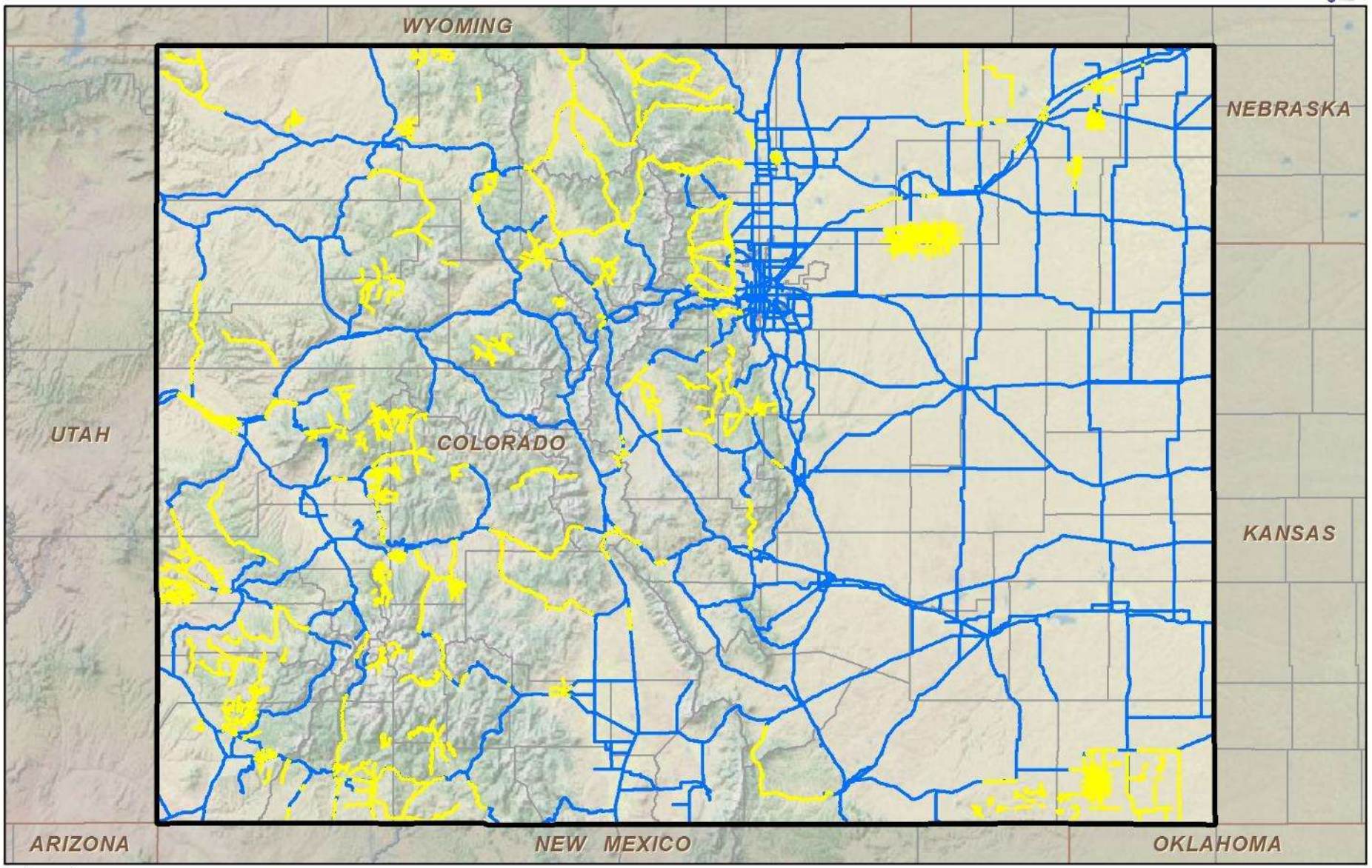
Appendix E – DTRS Coverage Prediction Maps

Map 3a: Colorado Highway Map (Interstate, US, and State Highways) – No Coverage Depicted



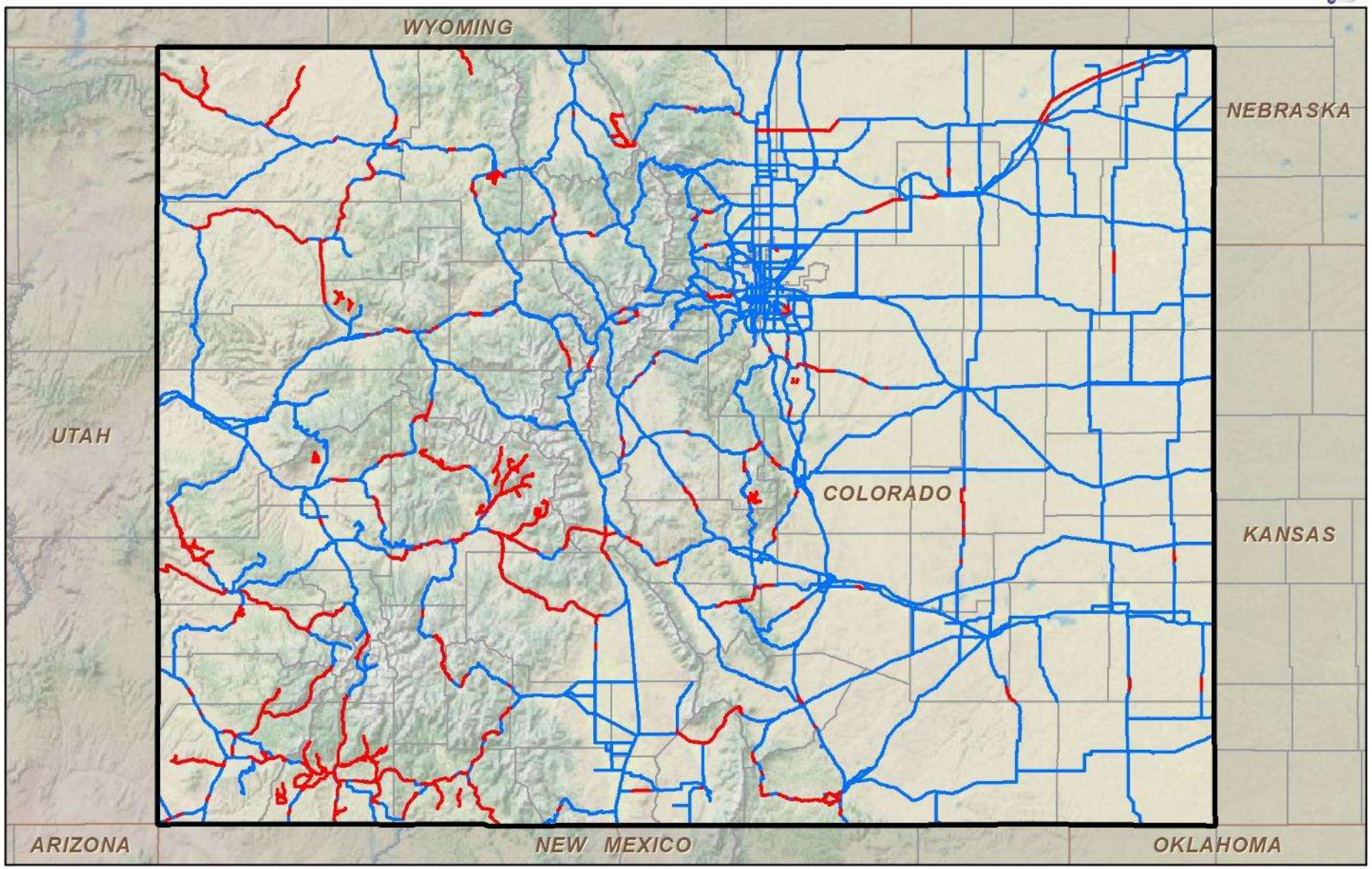
Appendix E – DTRS Coverage Prediction Maps

Map 3b: Colorado Highway Map with Areas Identified by Users as Having "Spotty Coverage"



Appendix E – DTRS Coverage Prediction Maps

Map 3c: Colorado Highway Map with Areas Identified by Users as Having "No Coverage"



Colorado Border
Roadways in reported areas of "no coverage" including dropped calls
Highways in Colorado

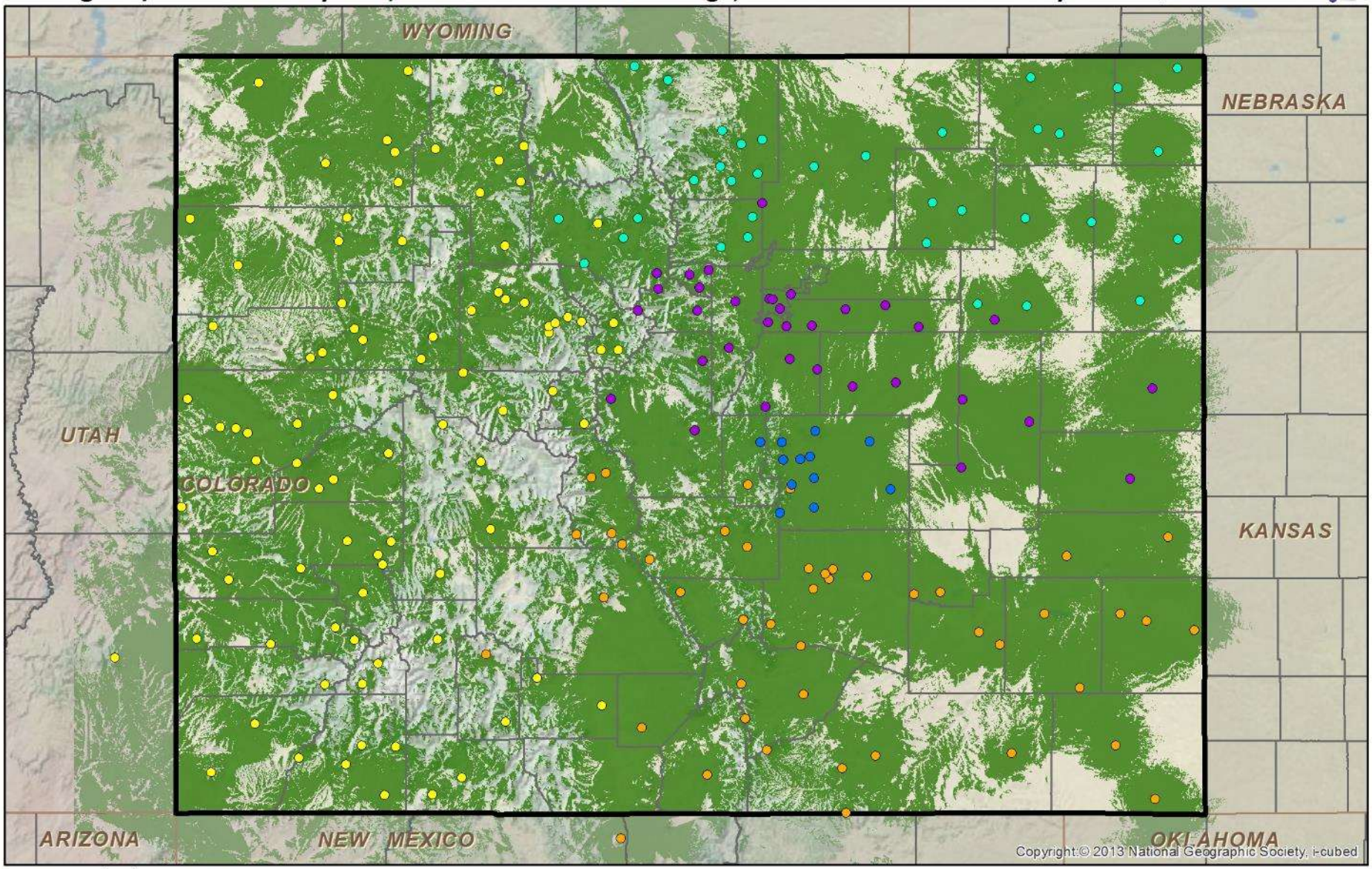
N

0 25 50 100 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 4a: DTRS Mobile Talk-Out Coverage

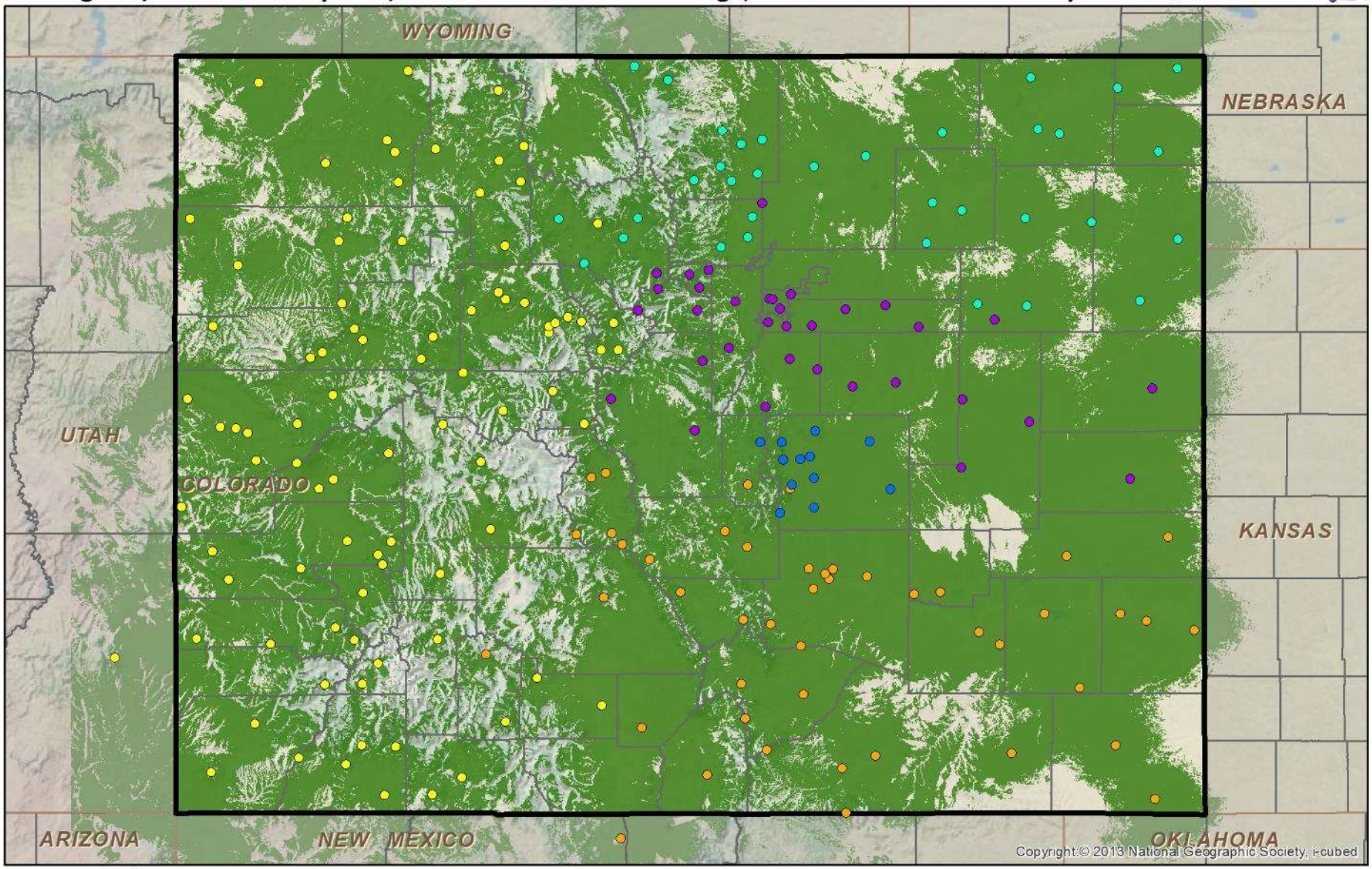
Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 4b: DTRS Mobile Talk-In Coverage

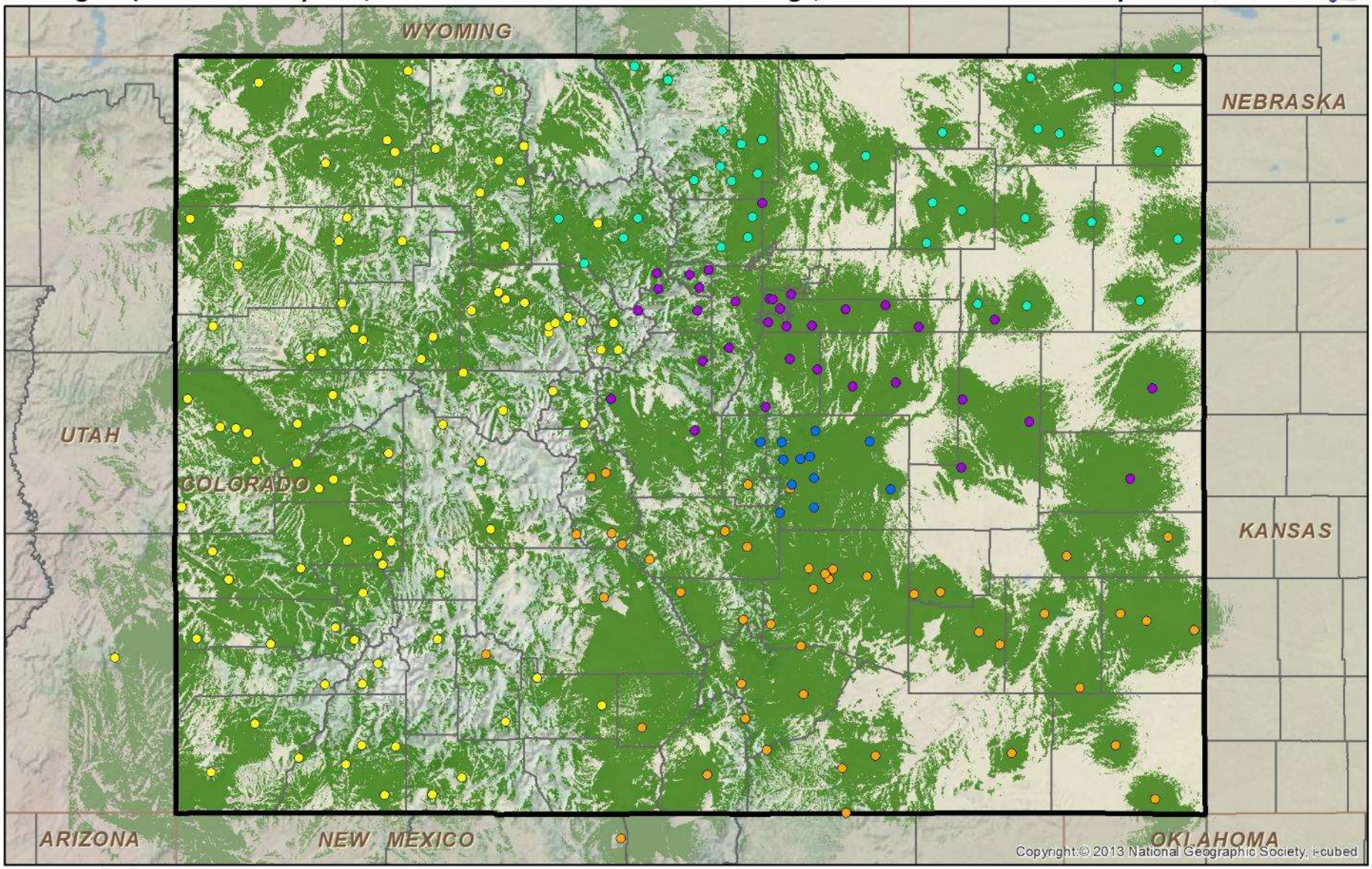
Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 4c: DTRS Portable On-Street Talk-Out Coverage

Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Portable On-Street Coverage >= 95% Reliability for DAQ 3.4

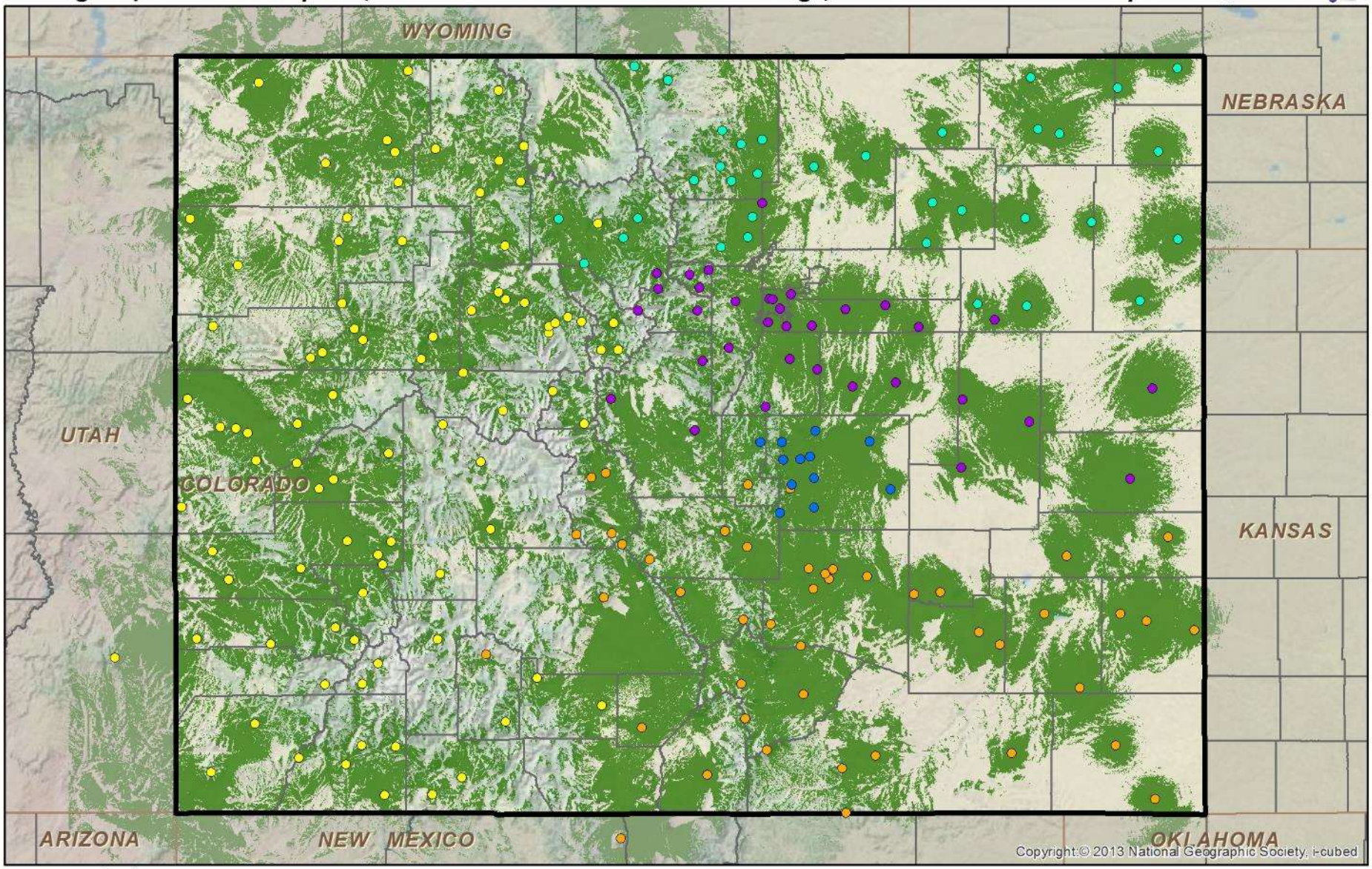
N

0 25 50 100 Miles

Appendix E – DTRS Coverage Prediction Maps

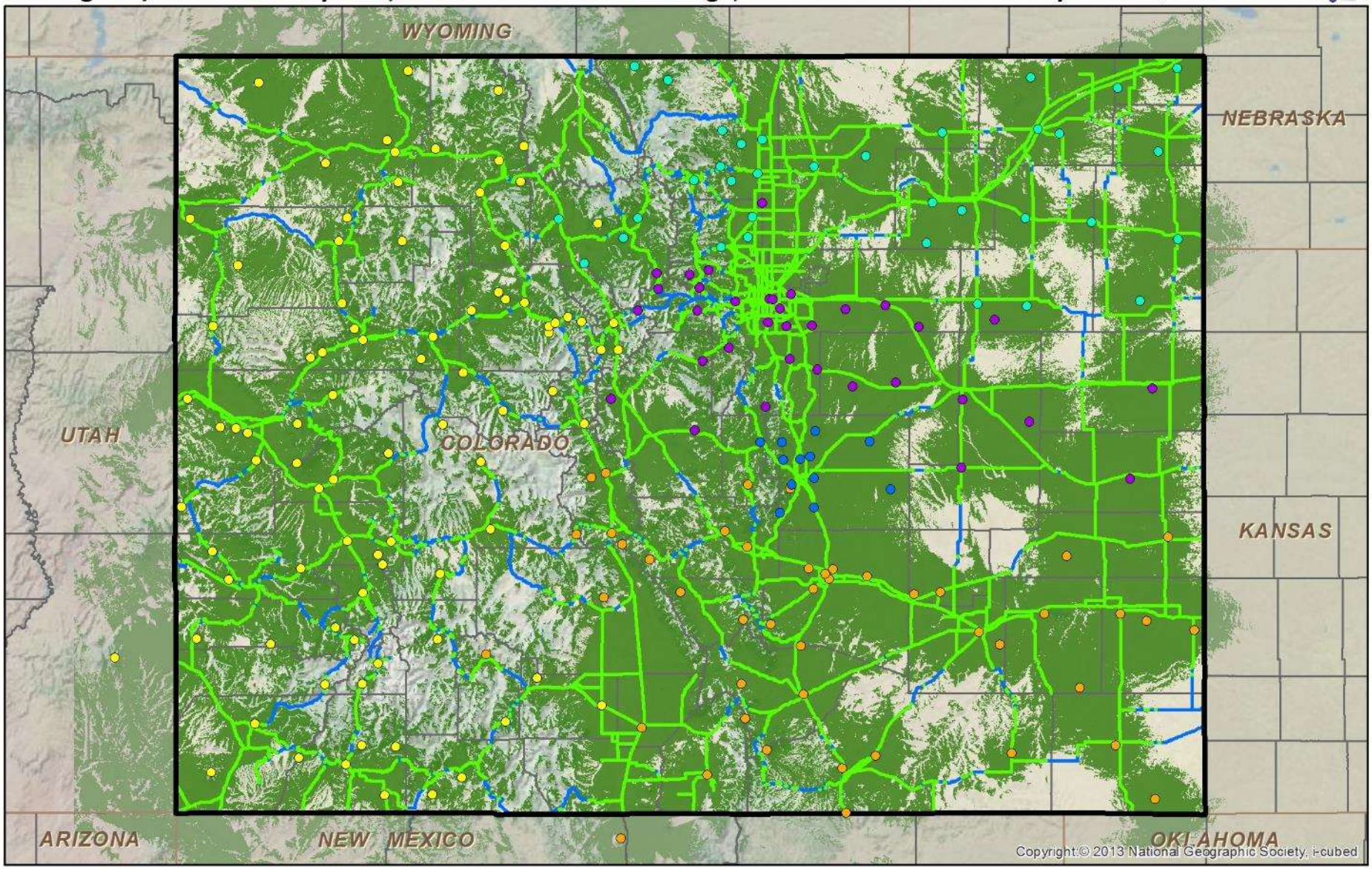
Map 4d: DTRS Portable On-Street Talk-In Coverage

Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



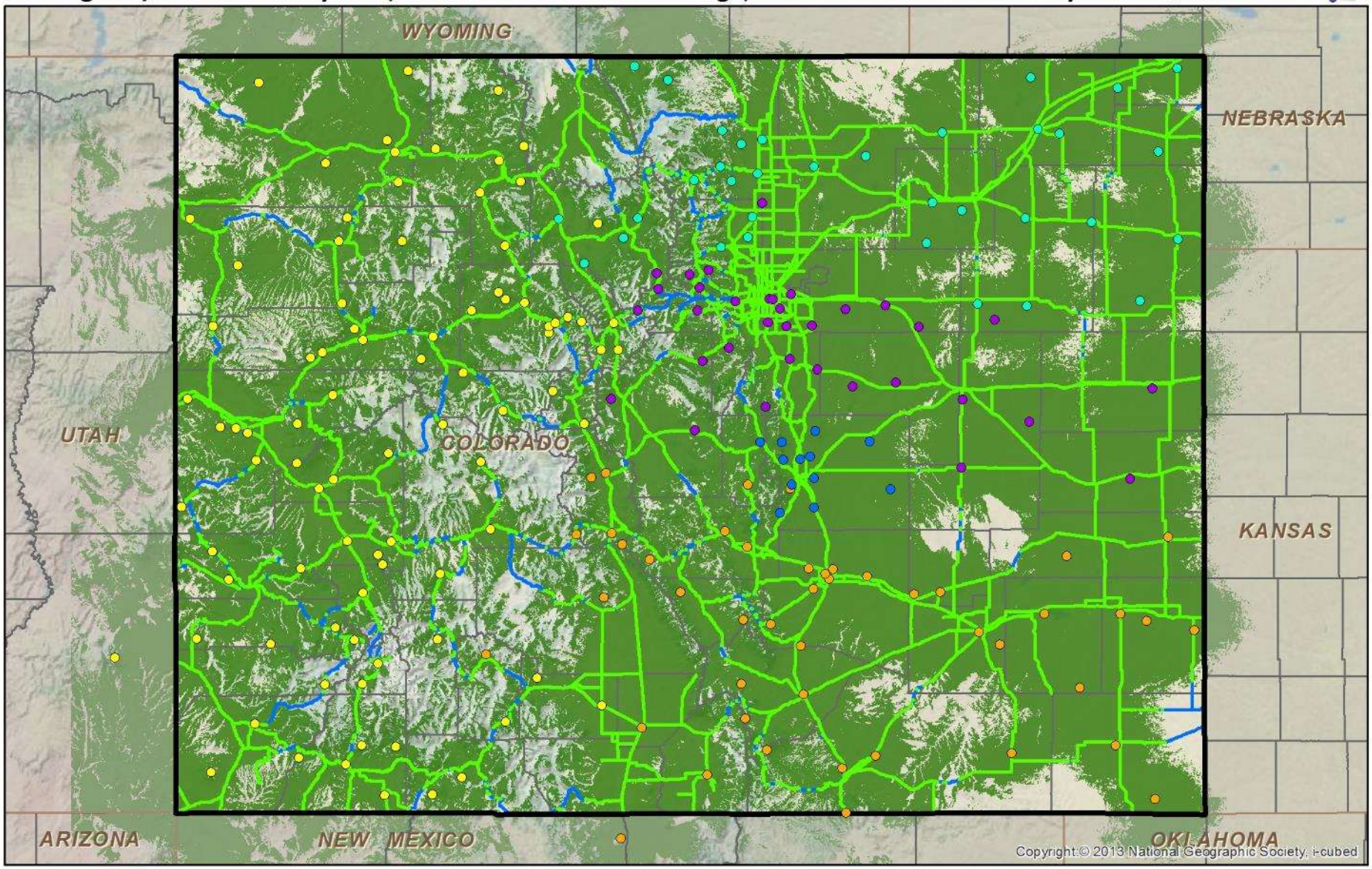
Appendix E – DTRS Coverage Prediction Maps

Map 5a: DTRS Mobile Talk-Out Coverage with Covered (Green) and Uncovered (Blue) Highways
Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



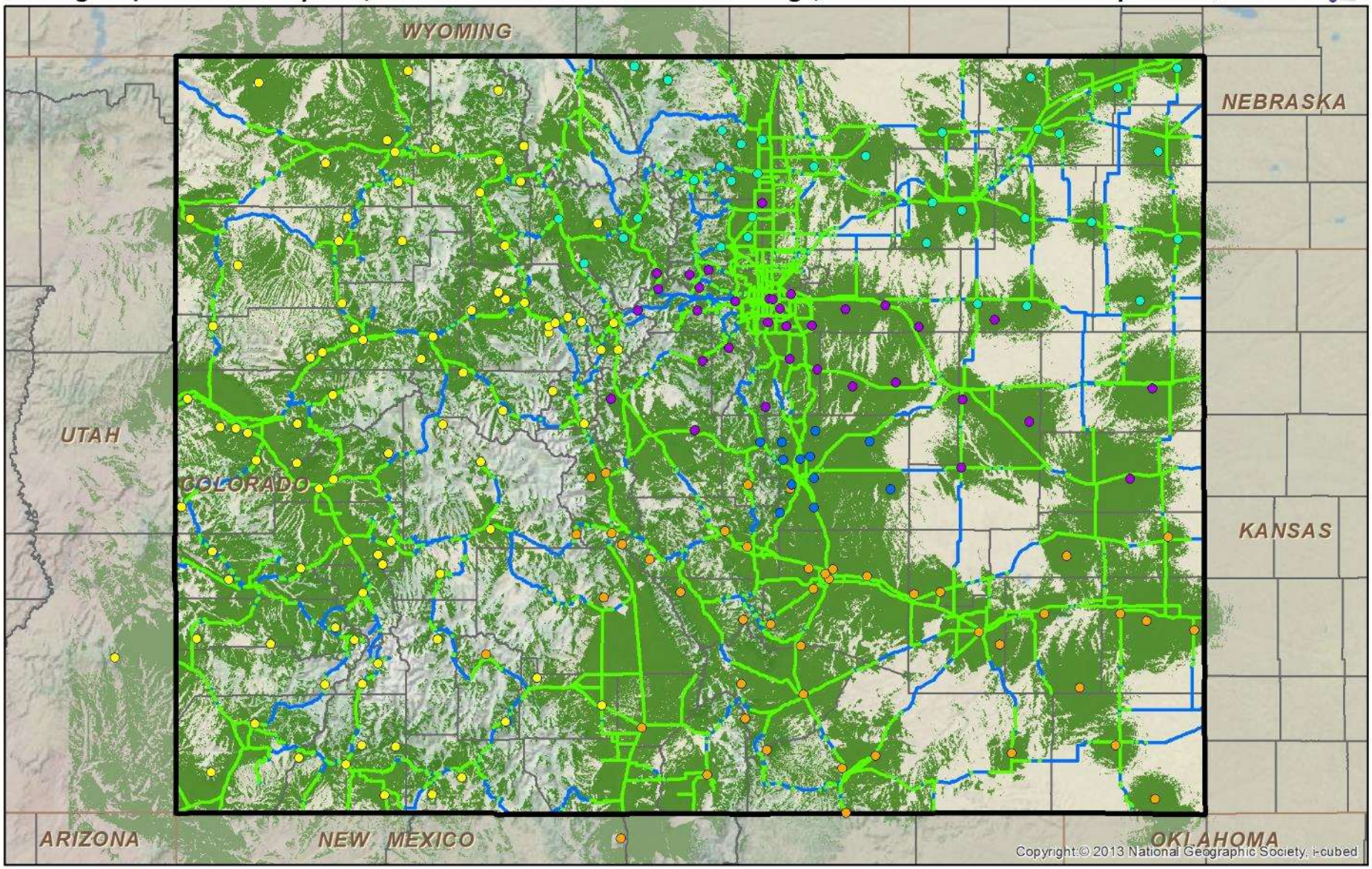
Appendix E – DTRS Coverage Prediction Maps

Map 5b: DTRS Mobile Talk-In Coverage with Covered (Green) and Uncovered (Blue) Highways
Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



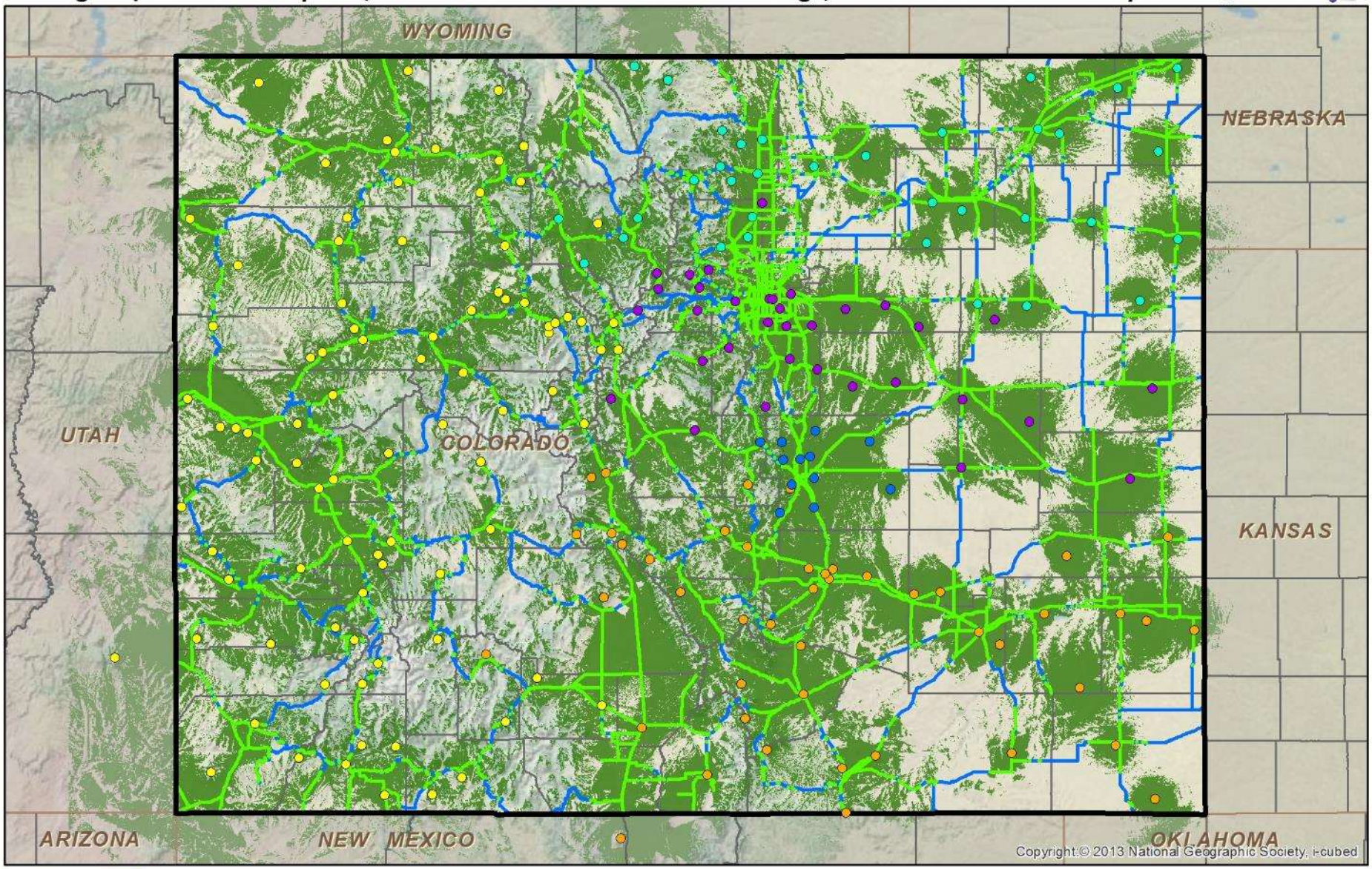
Appendix E – DTRS Coverage Prediction Maps

Map 5c: DTRS Portable On-Street Talk-Out Coverage with Covered (Green) and Uncovered (Blue) Highways
Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



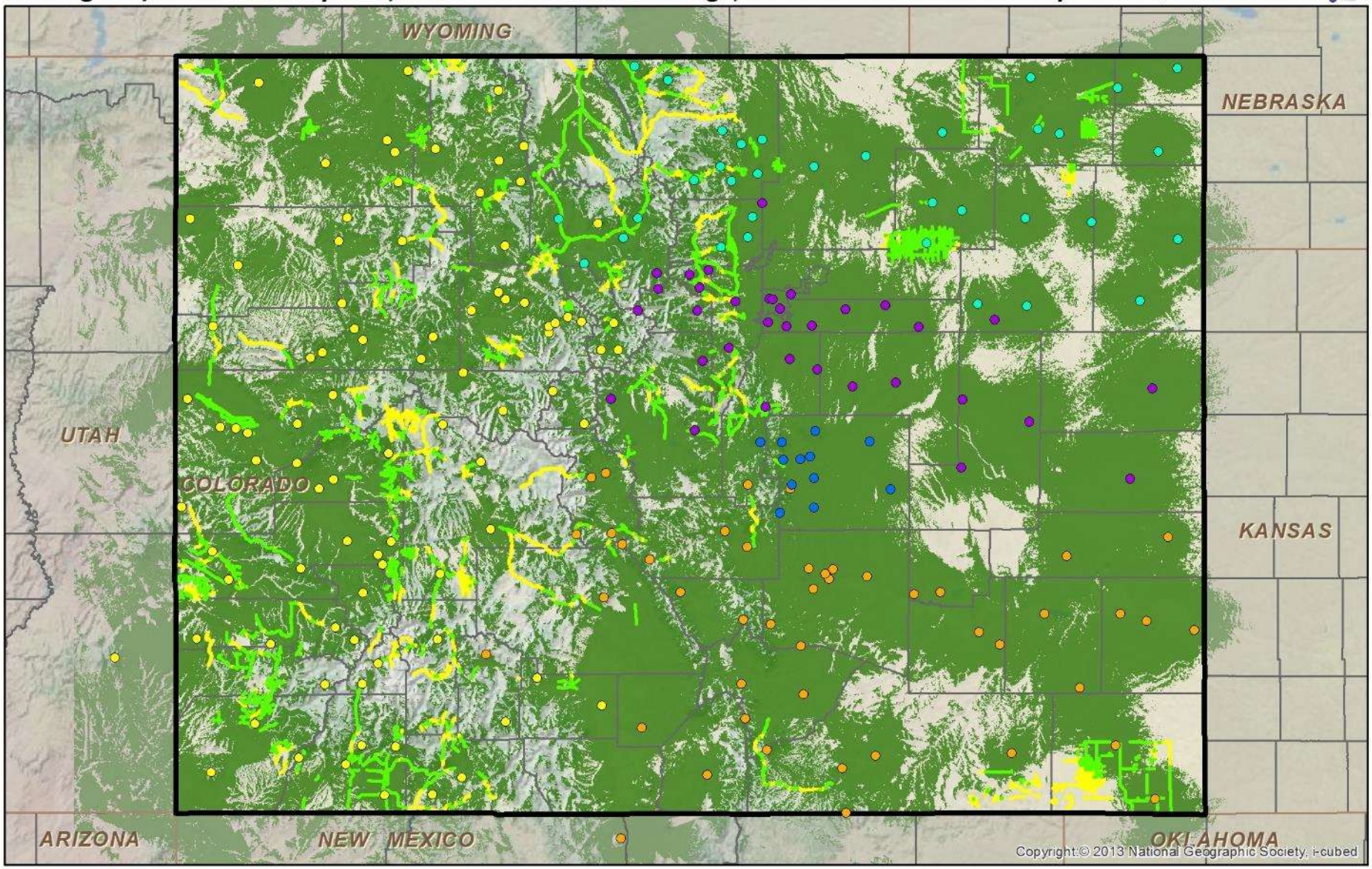
Appendix E – DTRS Coverage Prediction Maps

Map 5d: DTRS Portable On-Street Talk-In Coverage with Covered (Green) and Uncovered (Blue) Highways
Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



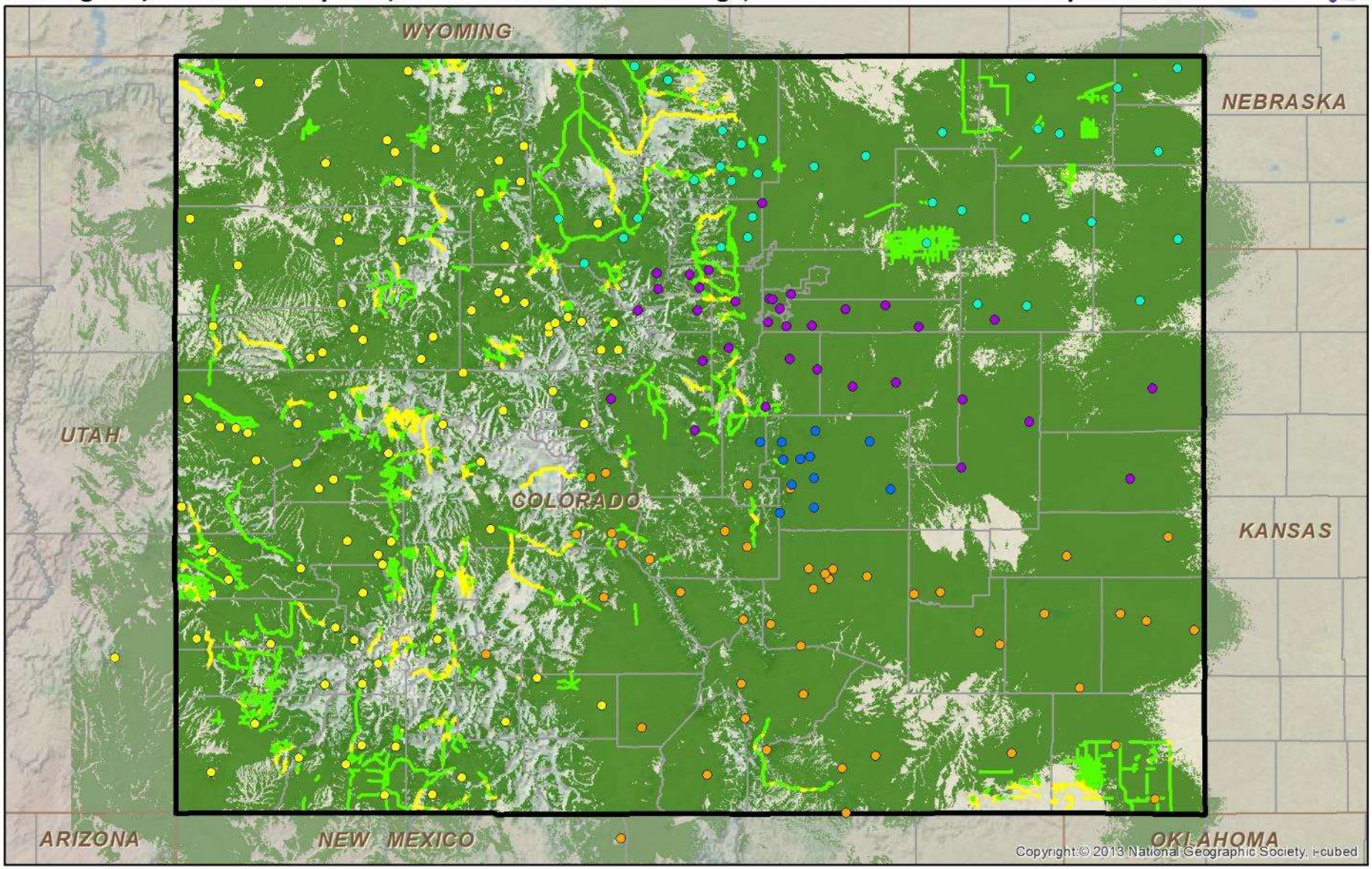
Appendix E – DTRS Coverage Prediction Maps

Map 6a: DTRS Mobile Talk-Out Coverage with "Spotty" Roads Covered (Green) or Uncovered (Yellow)
Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



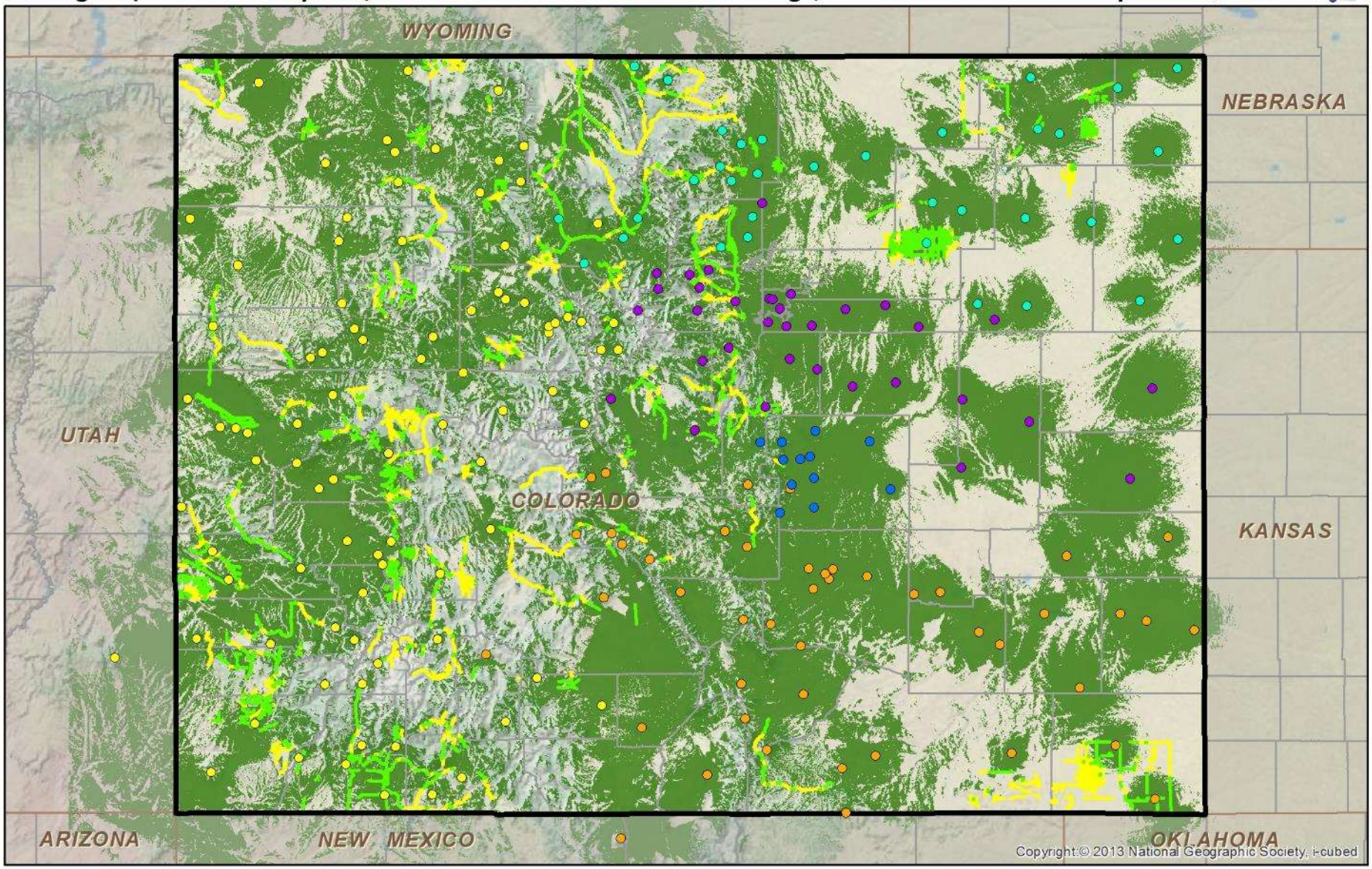
Appendix E – DTRS Coverage Prediction Maps

Map 6b: DTRS Mobile Talk-In Coverage with "Spotty" Roads Covered (Green) or Uncovered (Yellow)
Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



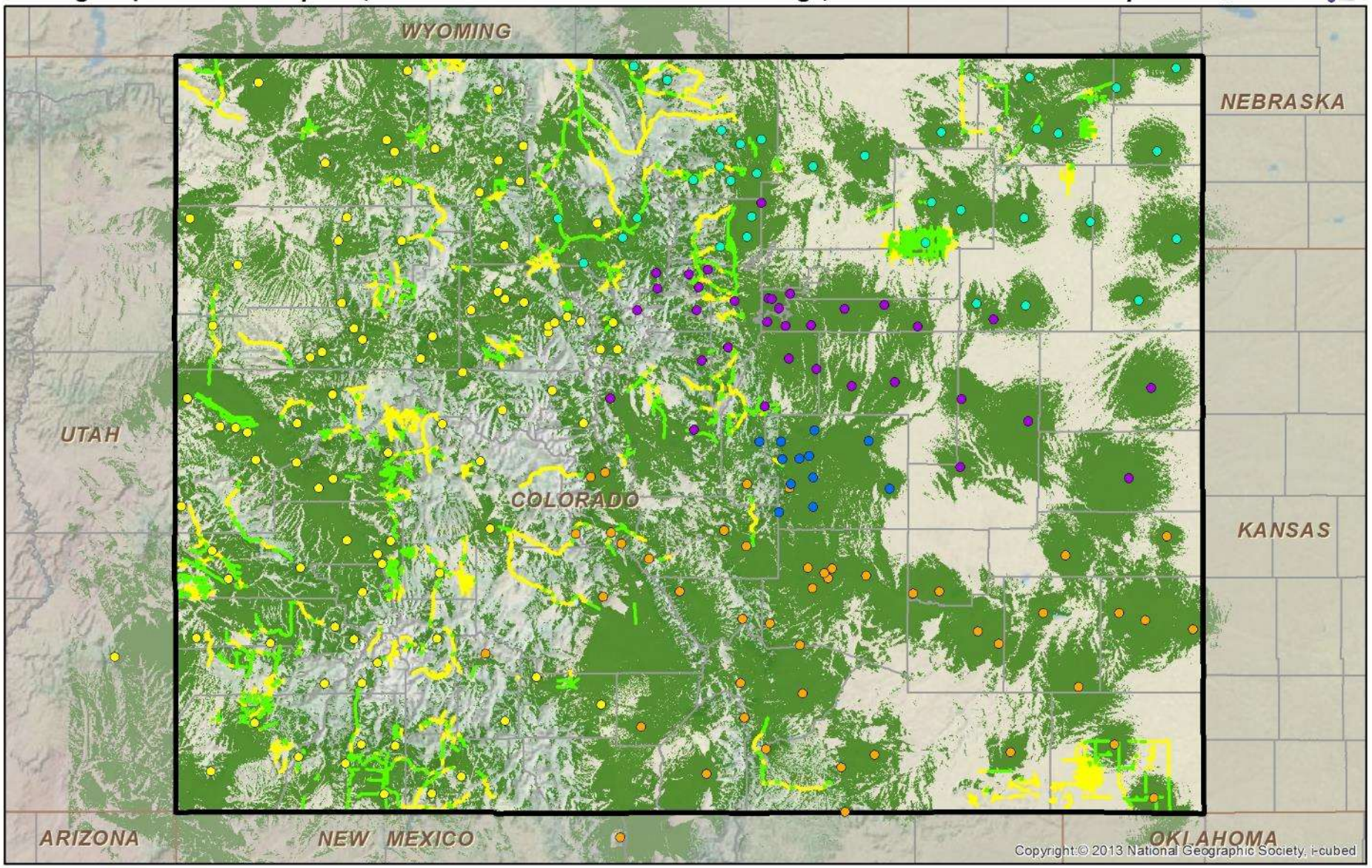
Appendix E – DTRS Coverage Prediction Maps

Map 6c: DTRS Portable (Street) Talk-Out with "Spotty" Roads Covered (Green) or Uncovered (Yellow)
Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



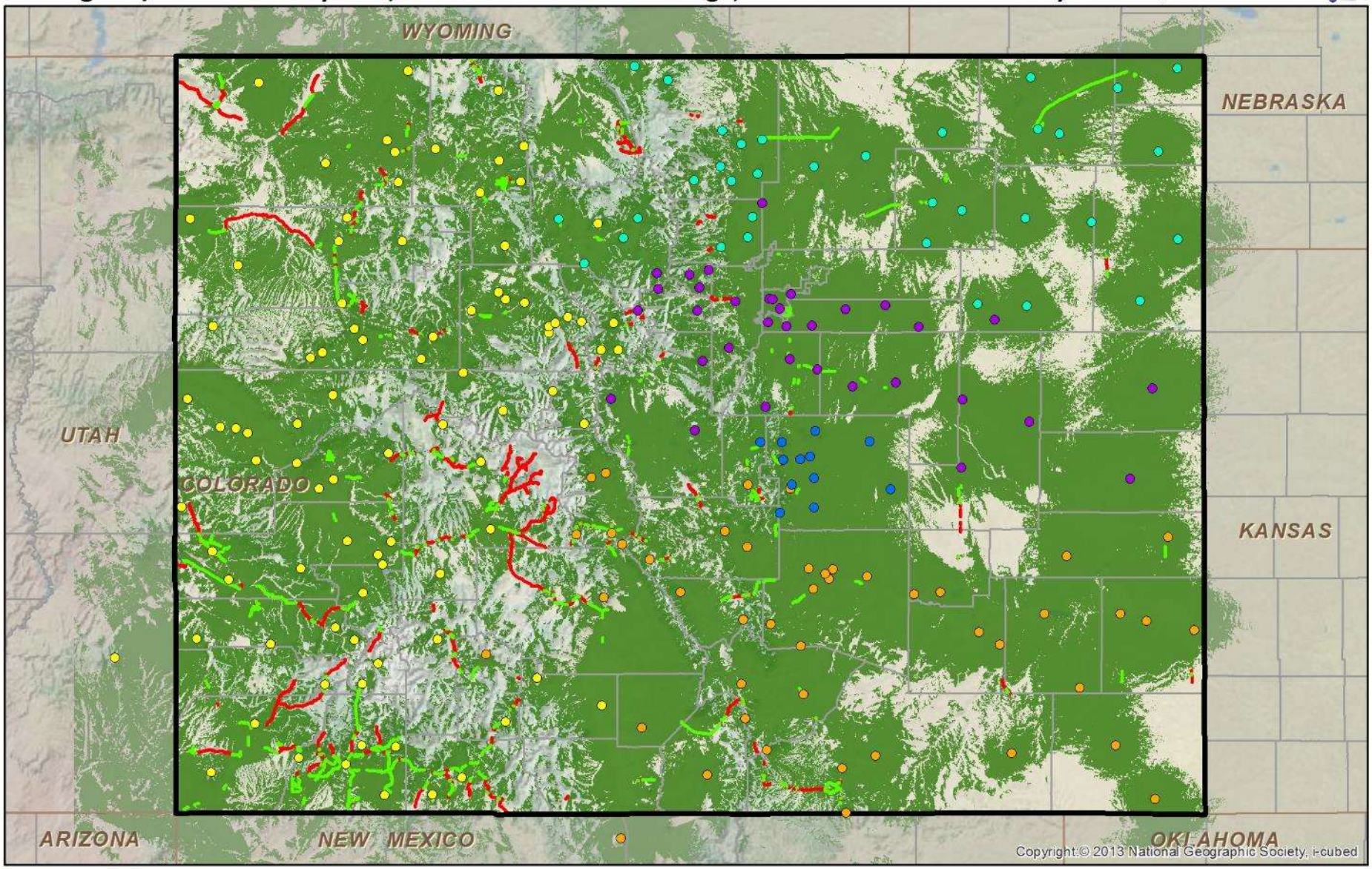
Appendix E – DTRS Coverage Prediction Maps

Map 6d: DTRS Portable (Street) Talk-In with "Spotty" Roads Covered (Green) or Uncovered (Yellow)
Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



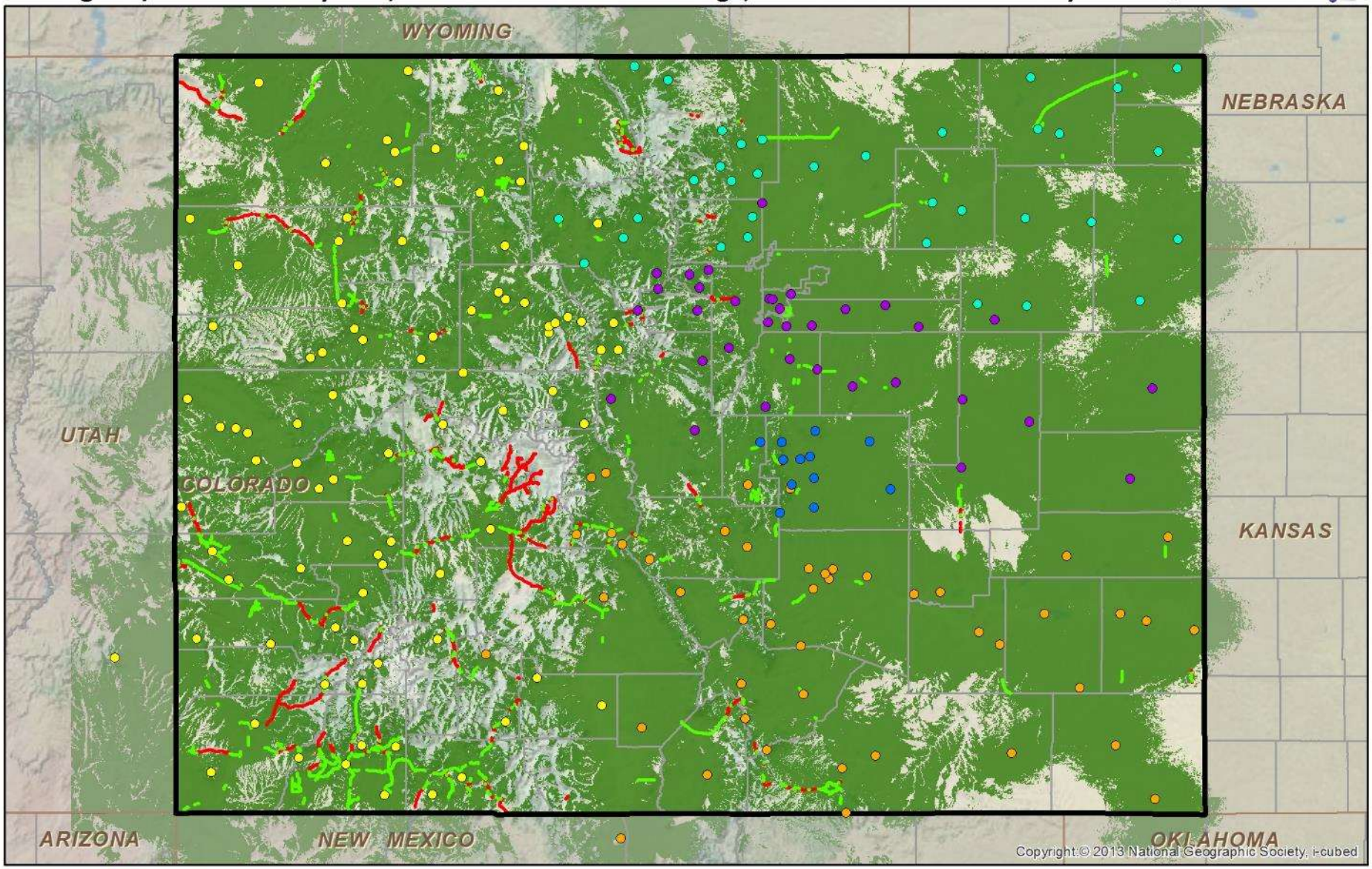
Appendix E – DTRS Coverage Prediction Maps

Map 7a: DTRS Mobile Talk-Out with "No Coverage" Roads Covered (Green) or Uncovered (Red)
Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



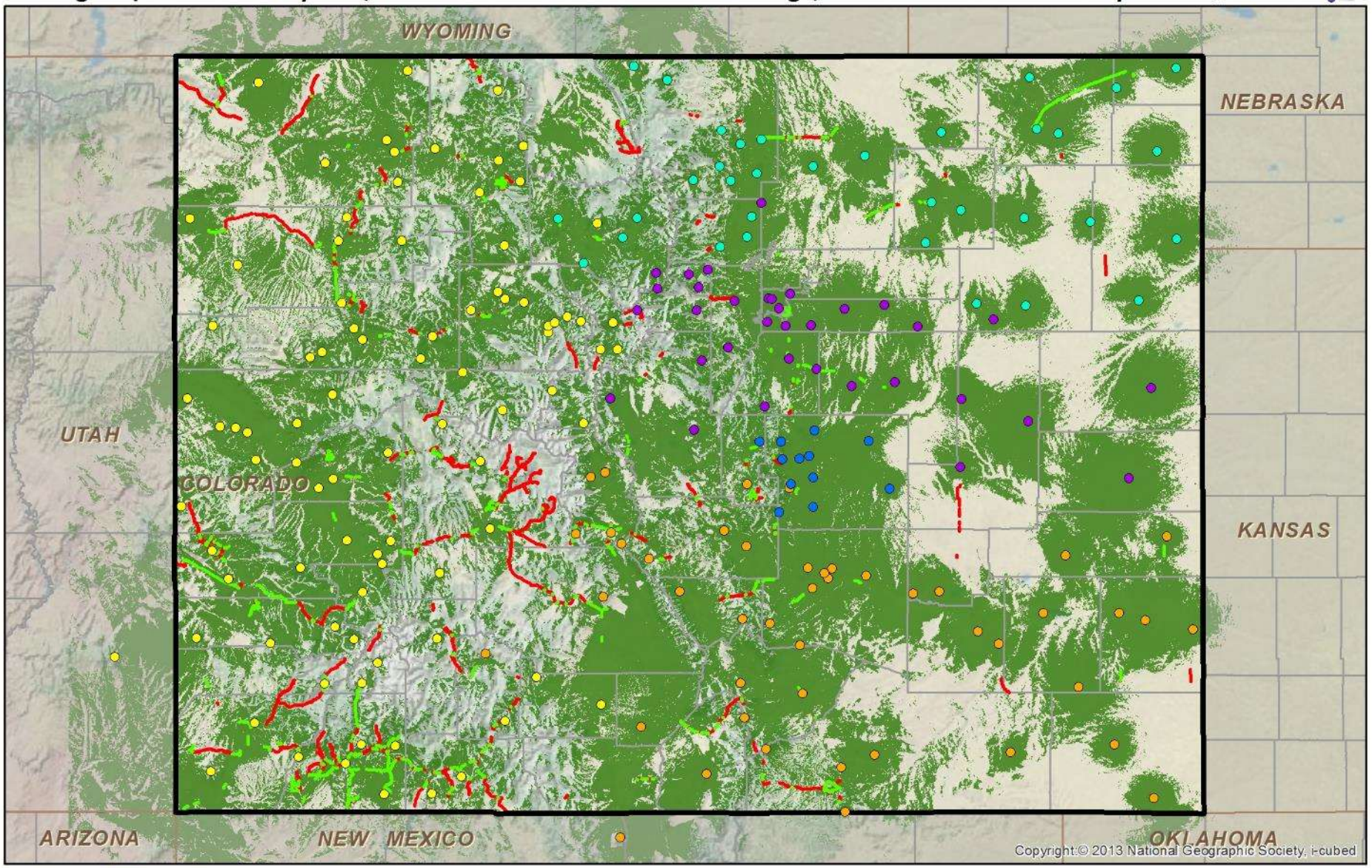
Appendix E – DTRS Coverage Prediction Maps

Map 7b: DTRS Mobile Talk-In with "No Coverage" Roads Covered (Green) or Uncovered (Red)
Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



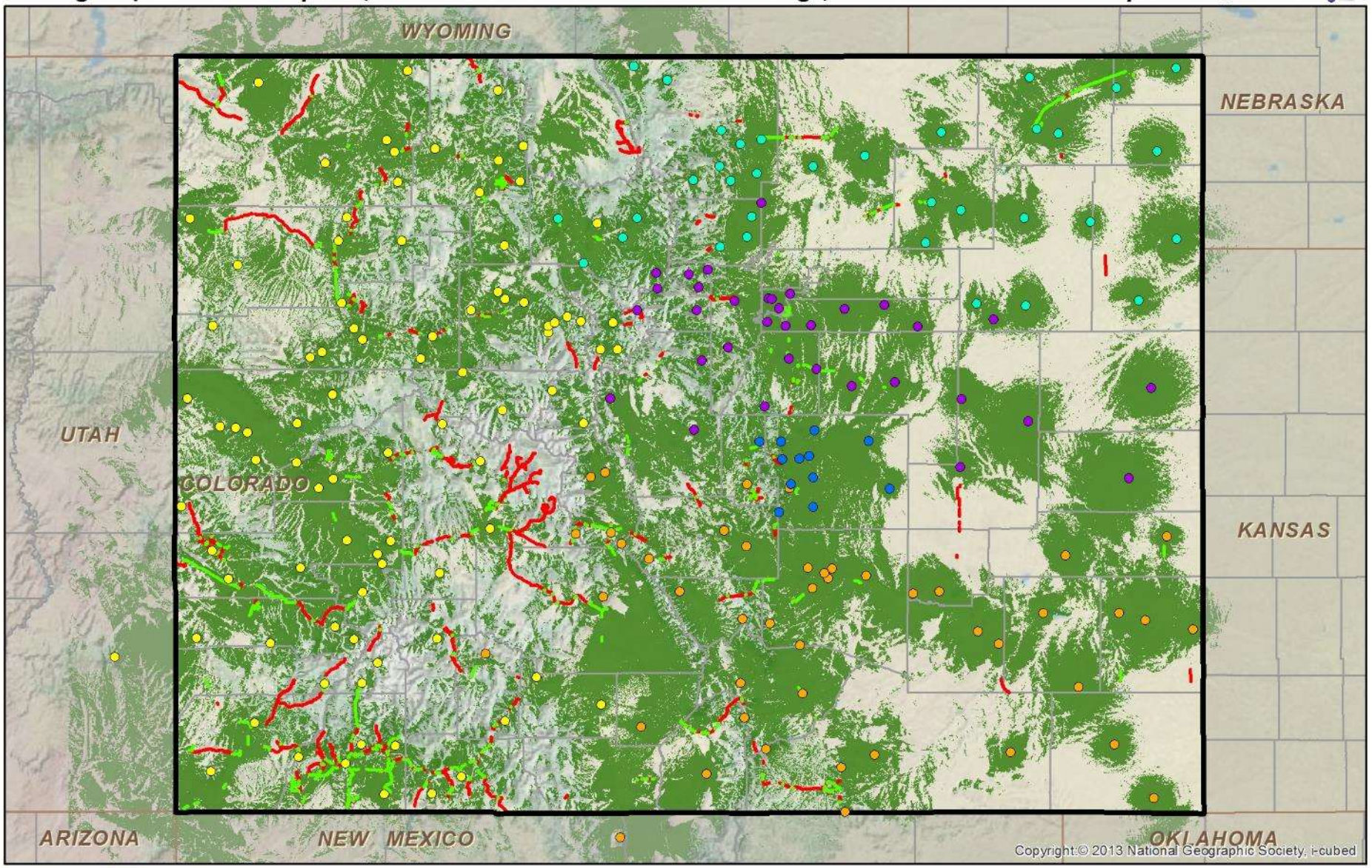
Appendix E – DTRS Coverage Prediction Maps

Map 7c: DTRS Portable (Street) Talk-Out with "No Coverage" Roads Covered (Gr) or Uncovered (Red)
Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

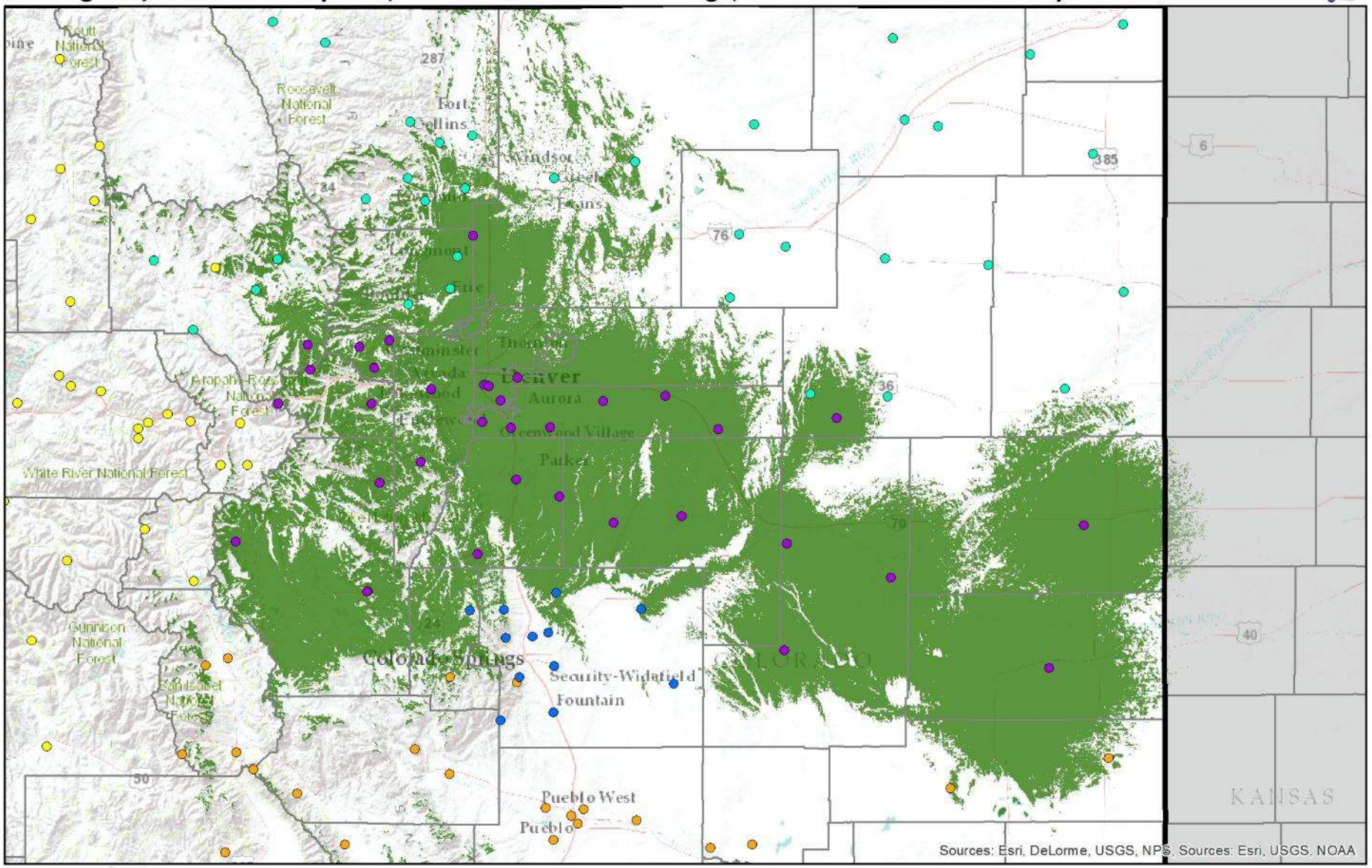
Map 7d: DTRS Portable (Street) Talk-In with "No Coverage" Roads Covered (Gr) or Uncovered (Red)
Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 8a: DTRS Zone 1 – Mobile Talk-Out Coverage from Existing 34 Zone 1 Sites

Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Mobile Coverage >= 95% Reliability for DAQ 3.4

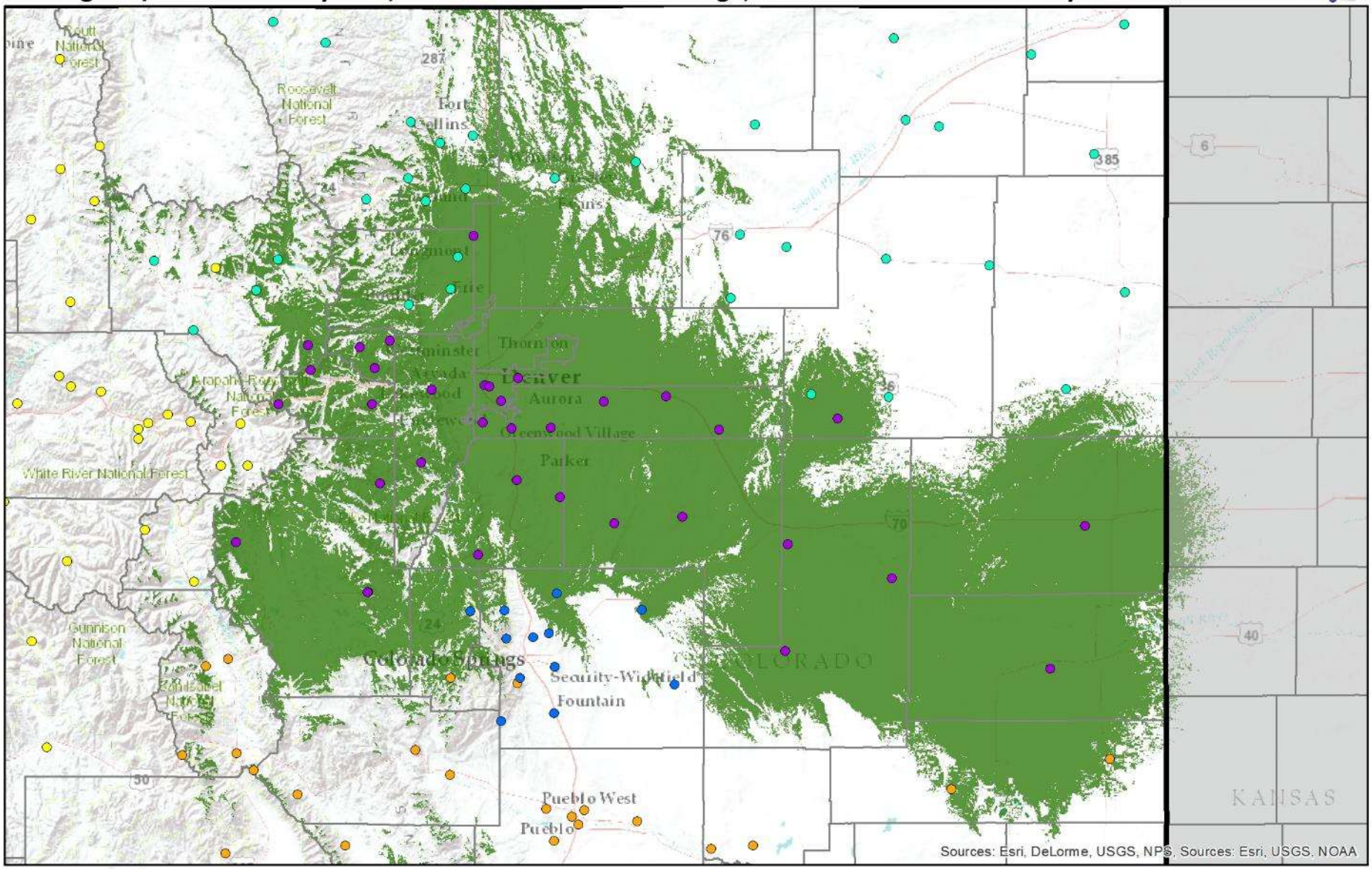
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 8b: DTRS Zone 1 – Mobile Talk-In Coverage from Existing 34 Zone 1 Sites

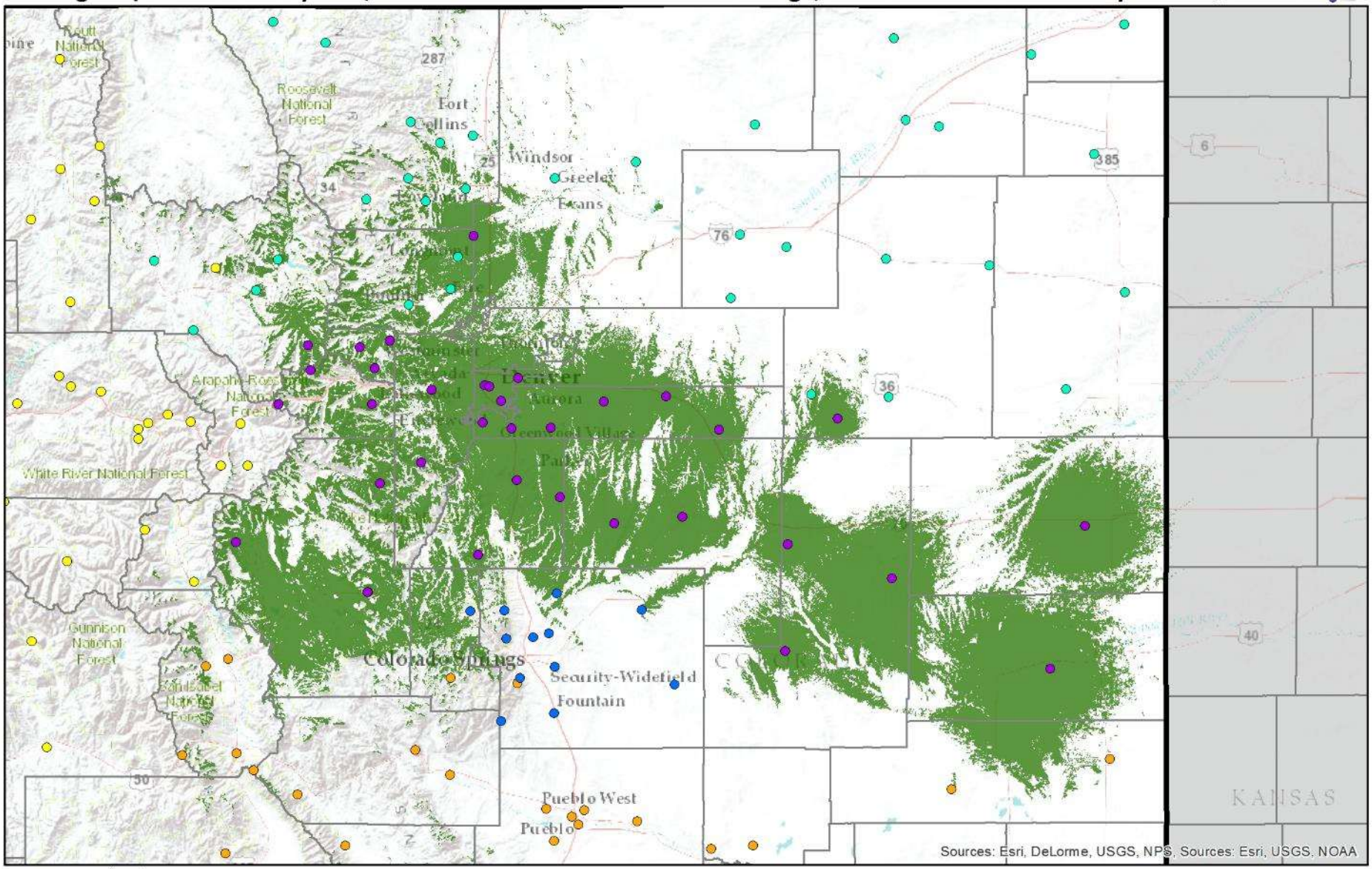
Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 8c: DTRS Zone 1 – Portable On-Street Talk-Out Coverage from Existing 34 Zone 1 Sites

Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Portable On-Street Coverage >= 95% Reliability for DAQ 3.4

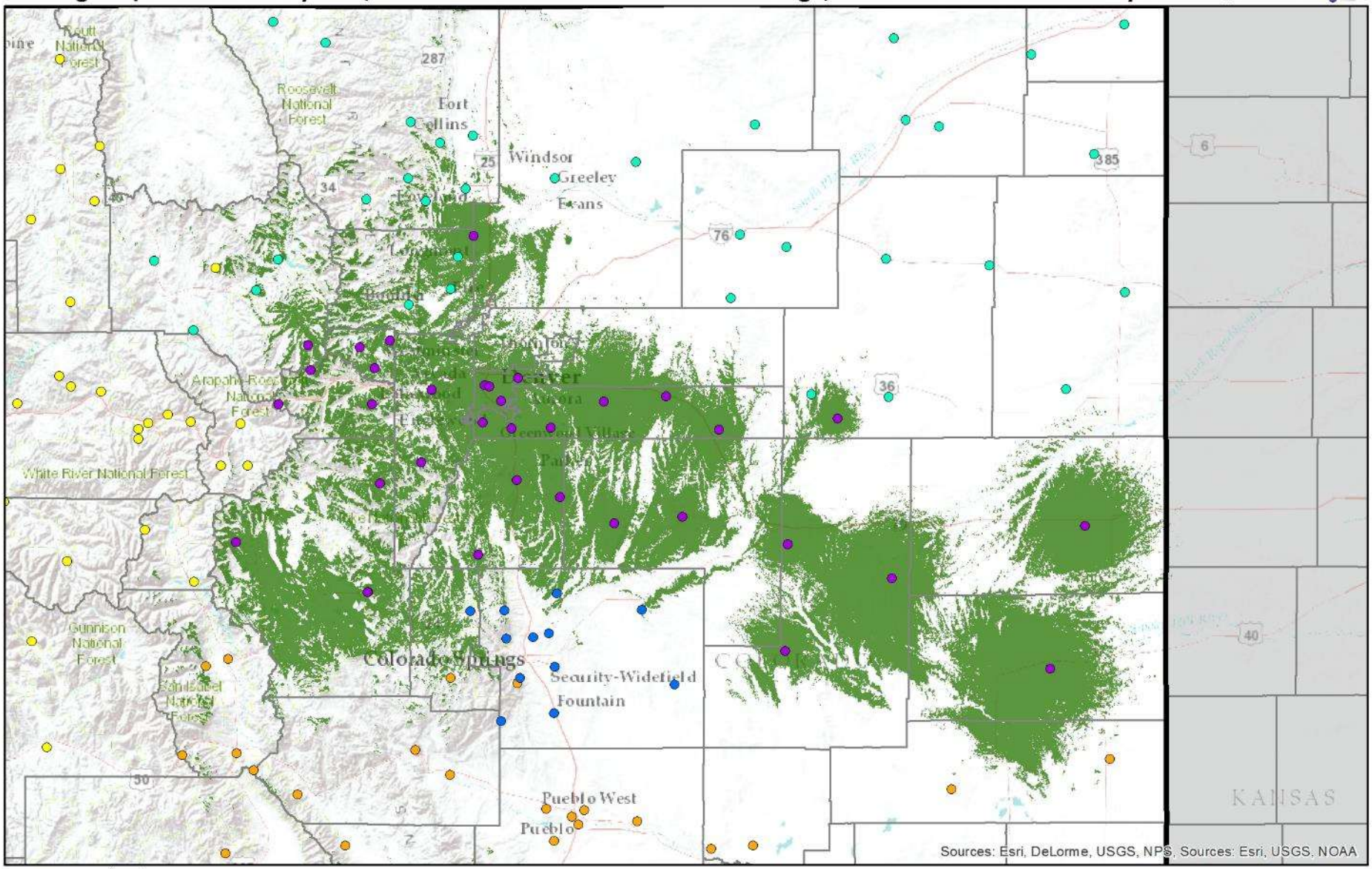
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 8d: DTRS Zone 1 – Portable On-Street Talk-In Coverage from Existing 34 Zone 1 Sites

Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Portable On-Street Coverage >= 95% Reliability for DAQ 3.4

N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 9a: DTRS Zone 2 – Mobile Talk-Out Coverage from Existing 88 Zone 2 Sites

Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4

Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 6

Colorado Border

Mobile Coverage >= 95% Reliability for DAQ 3.4

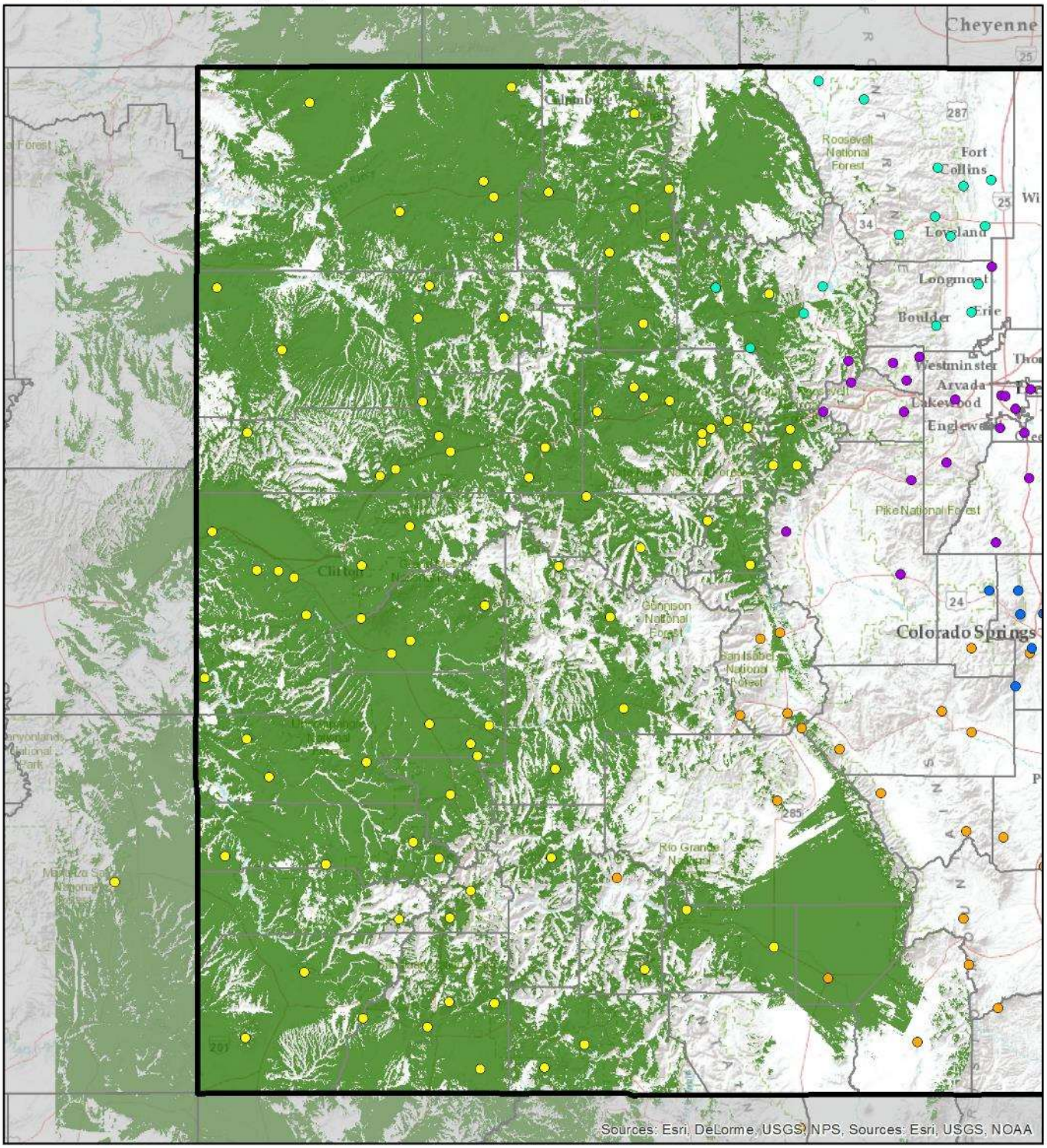
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 9b: DTRS Zone 2 – Mobile Talk-In Coverage from Existing 88 Zone 2 Sites

Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 6

Colorado Border

Mobile Coverage >= 95% Reliability for DAQ 3.4

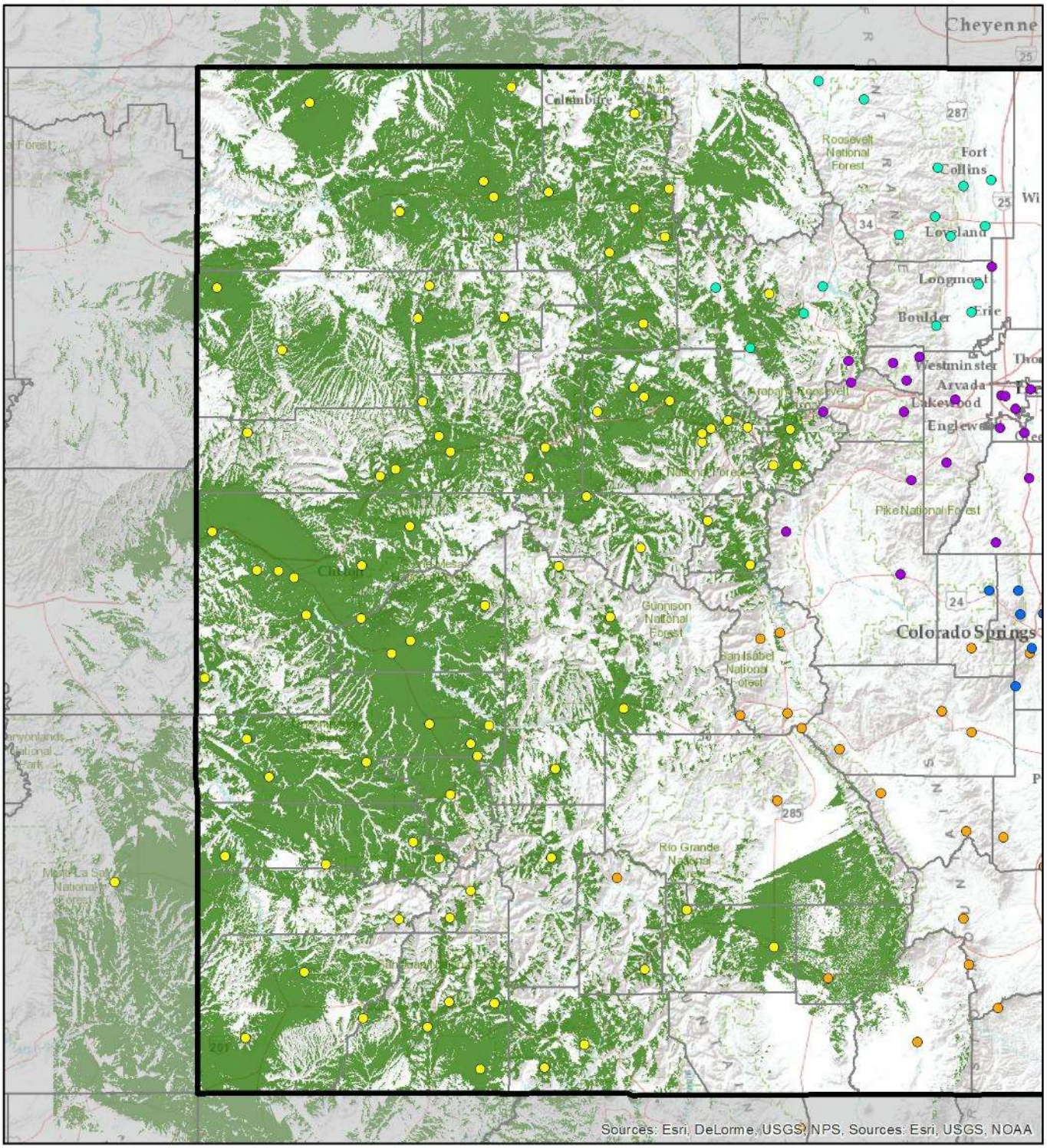
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 9c: DTRS Zone 2 – Portable On-Street Talk-Out from Existing 88 Zone 2 Sites

Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 6

Colorado Border

Portable On-Street Coverage >= 95% Reliability for DAQ 3.4

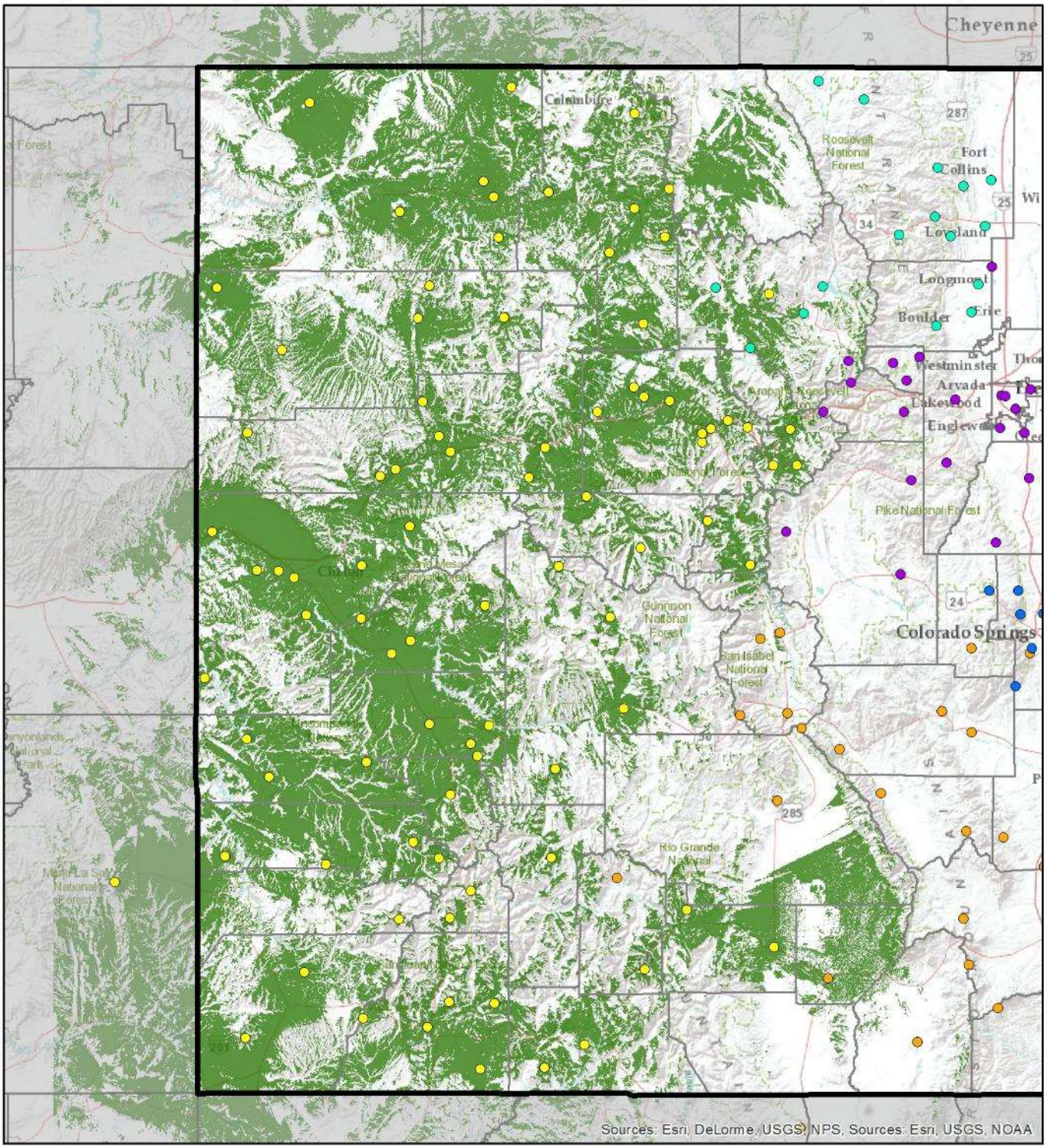
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 9d: DTRS Zone 2 – Portable On-Street Talk-In from Existing 88 Zone 2 Sites

Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 6

Colorado Border

Portable On-Street Coverage >= 95% Reliability for DAQ 3.4

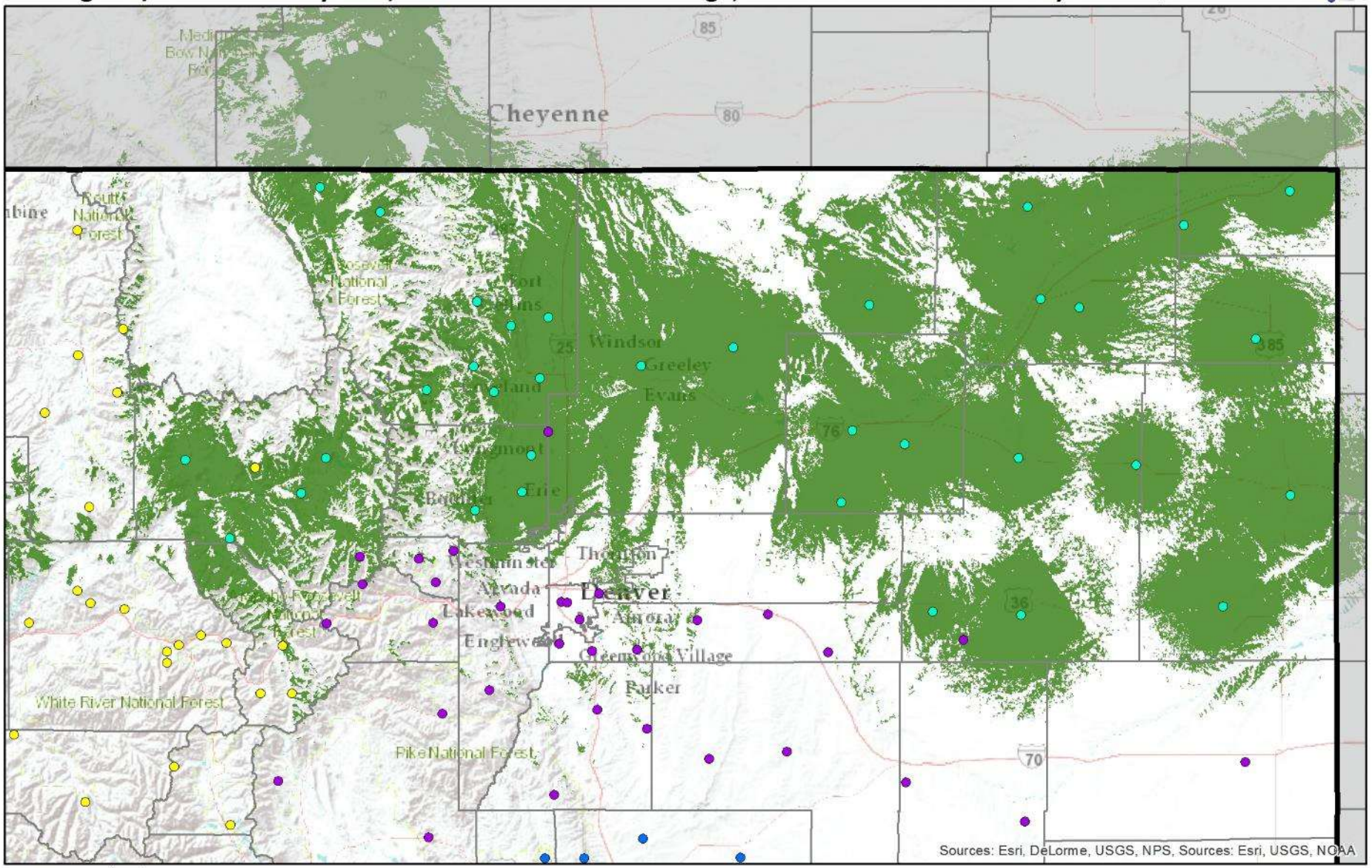
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 10a: DTRS Zone 3 – Mobile Talk-Out Coverage from Existing 34 Zone 3 Sites

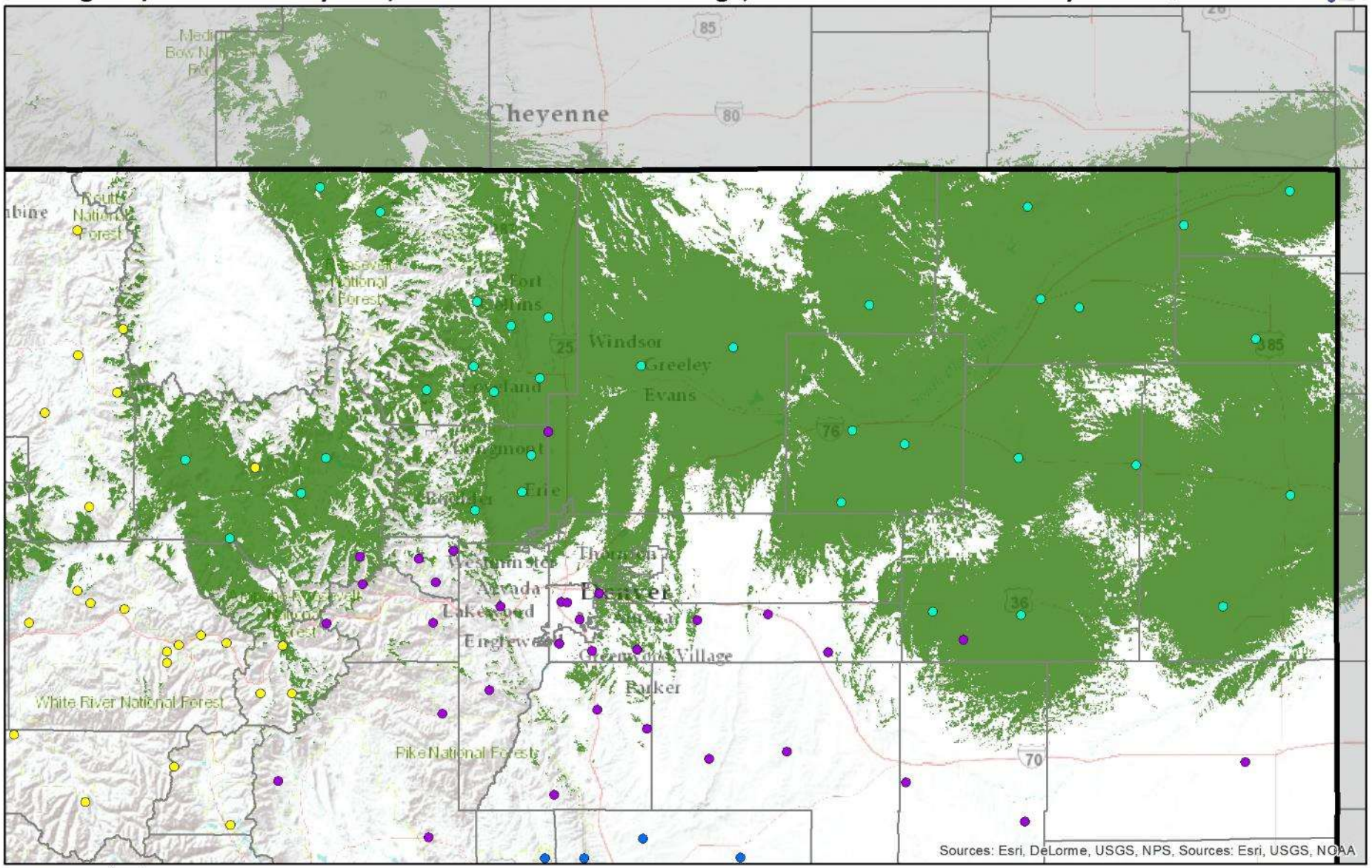
Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 10b: DTRS Zone 3 – Mobile Talk-In Coverage from Existing 34 Zone 3 Sites

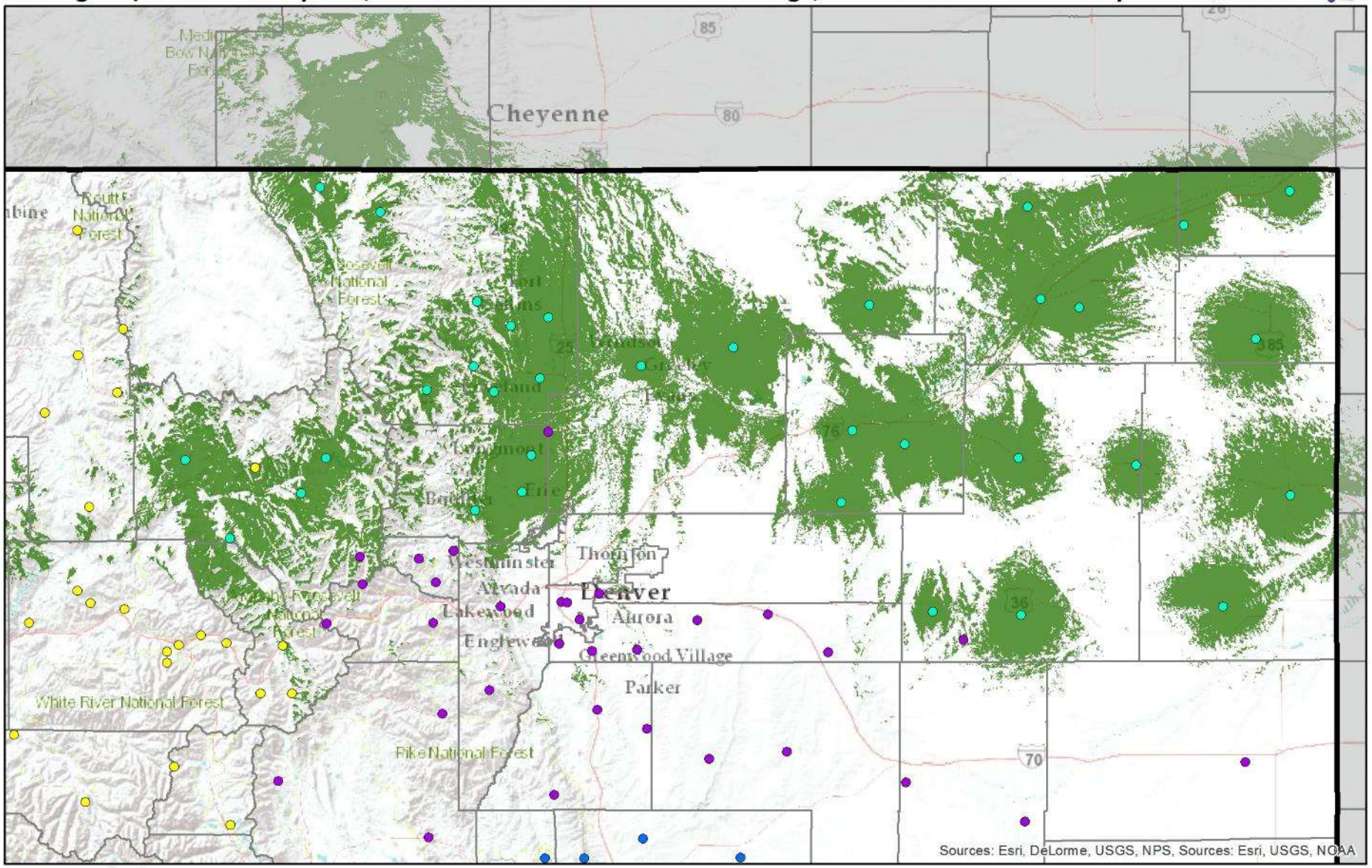
Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 10c: DTRS Zone 3 – Portable On-Street Talk-Out Coverage from Existing 34 Zone 3 Sites

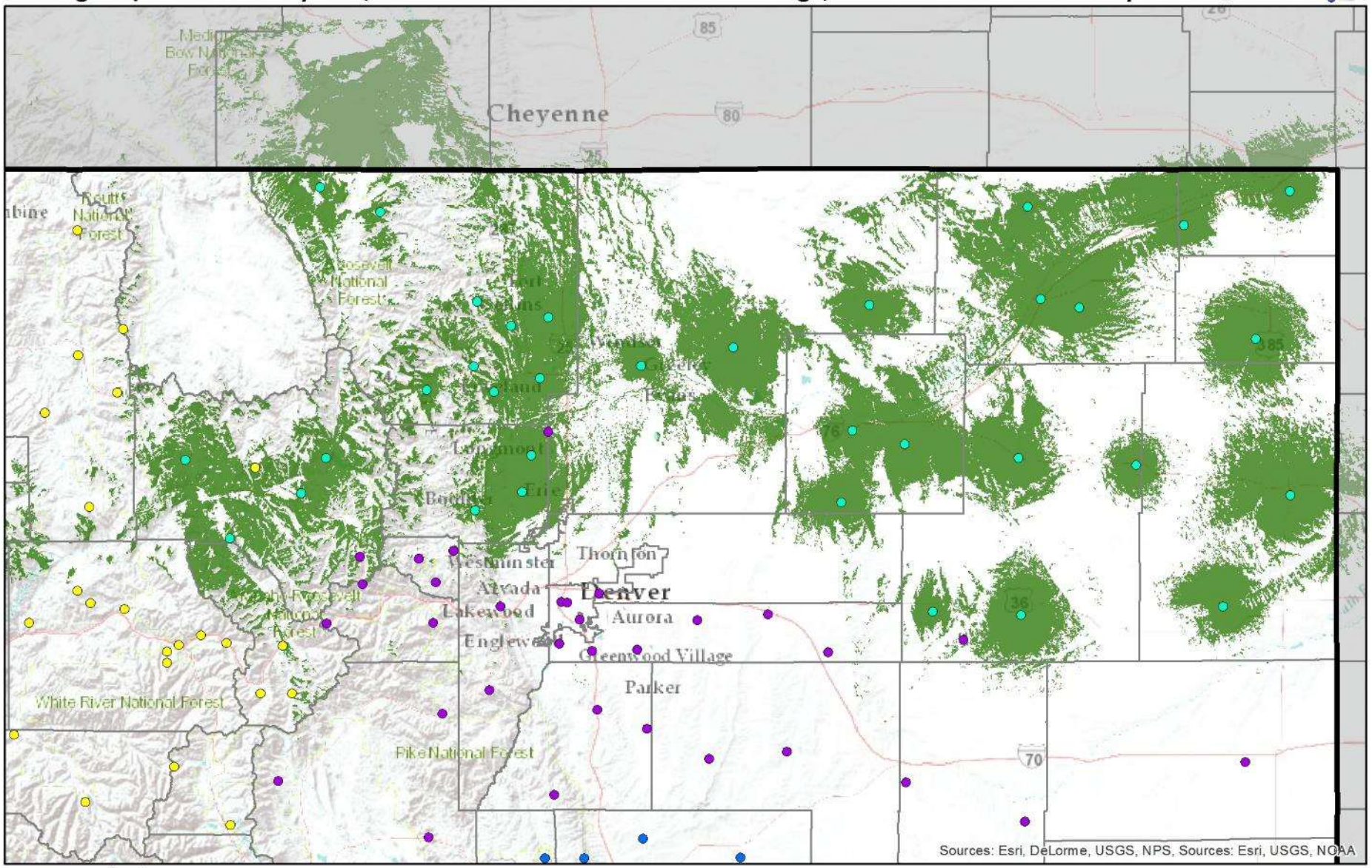
Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 10d: DTRS Zone 3 – Portable On-Street Talk-In Coverage from Existing 34 Zone 3 Sites

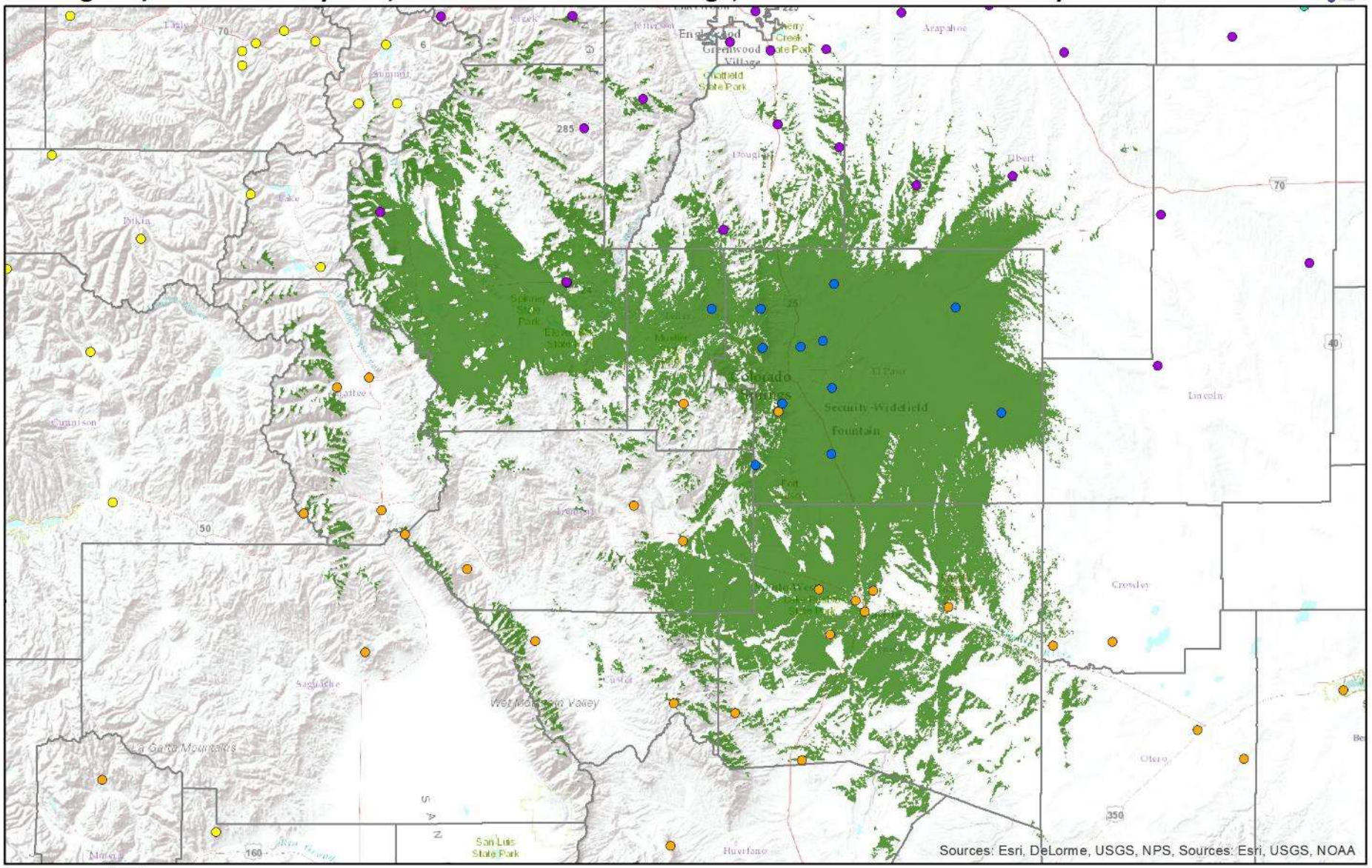
Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 11a: DTRS Zone 4 – Mobile Talk-Out Coverage from Existing 13 Zone 4 Sites

Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Mobile Coverage >= 95% Reliability for DAQ 3.4

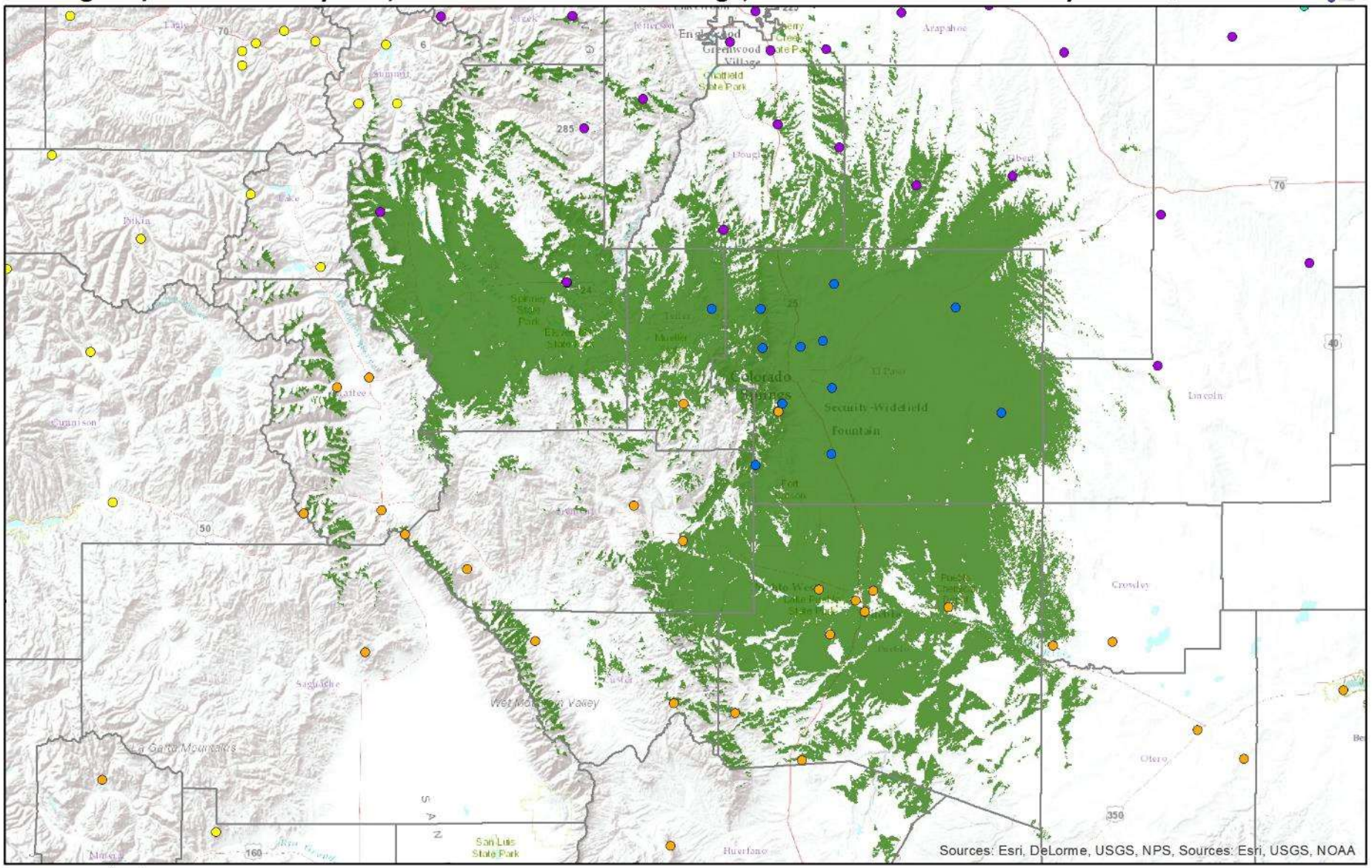
N

0 12.5 25 50 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 11b: DTRS Zone 4 – Mobile Talk-In Coverage from Existing 13 Zone 4 Sites

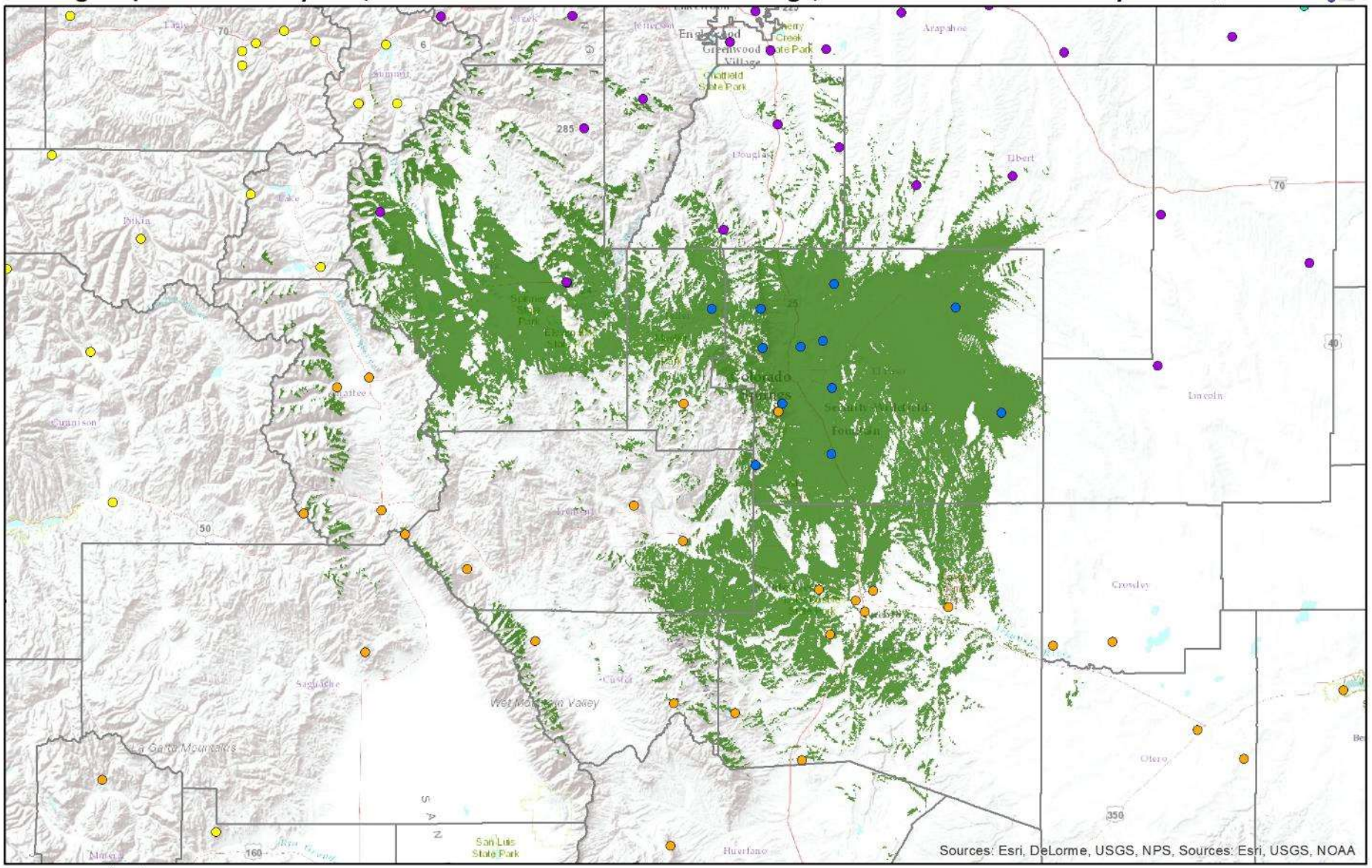
Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 11c: DTRS Zone 4 – Portable On-Street Talk-Out Coverage from Existing 13 Zone 4 Sites

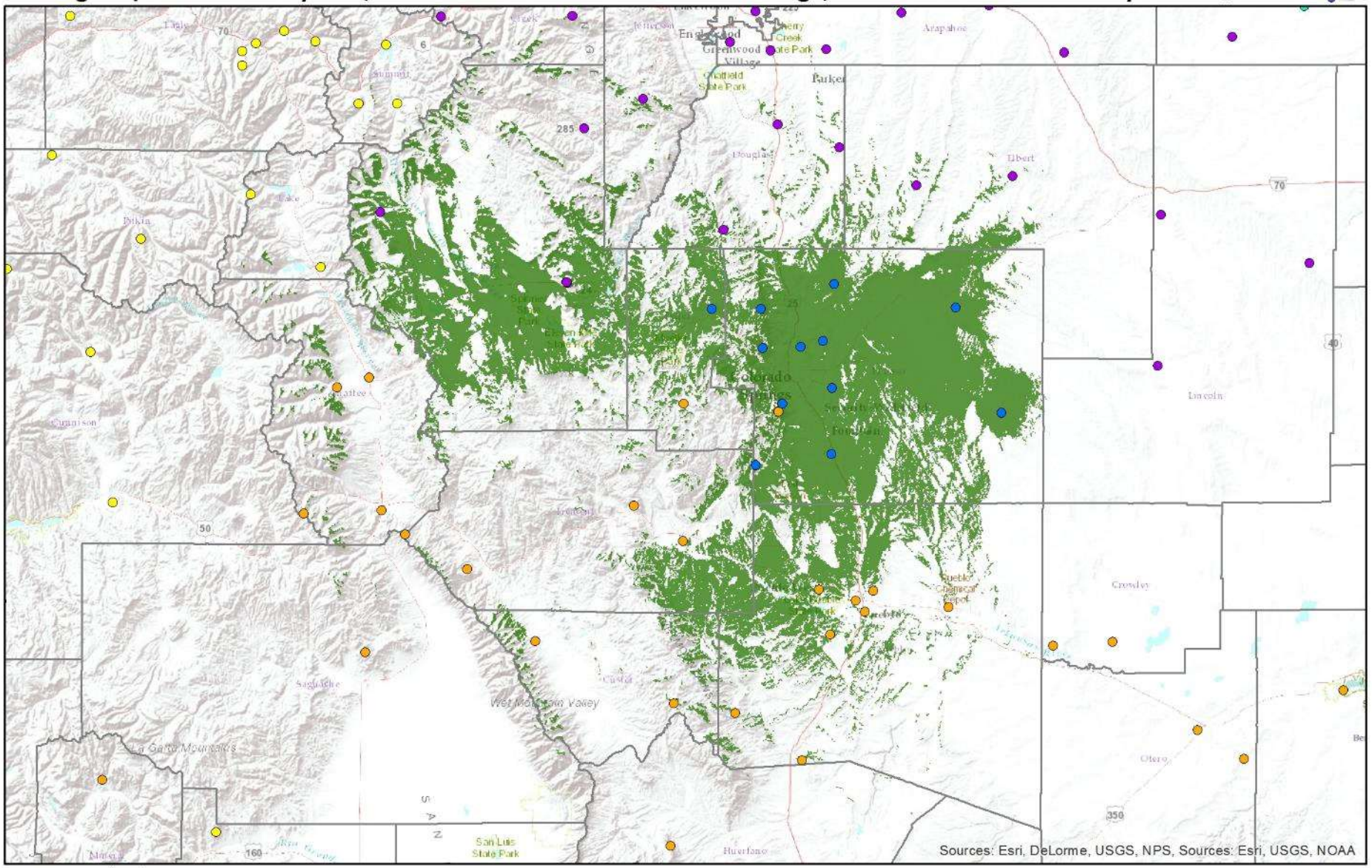
Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 11d: DTRS Zone 4 – Portable On-Street Talk-In Coverage from Existing 13 Zone 4 Sites

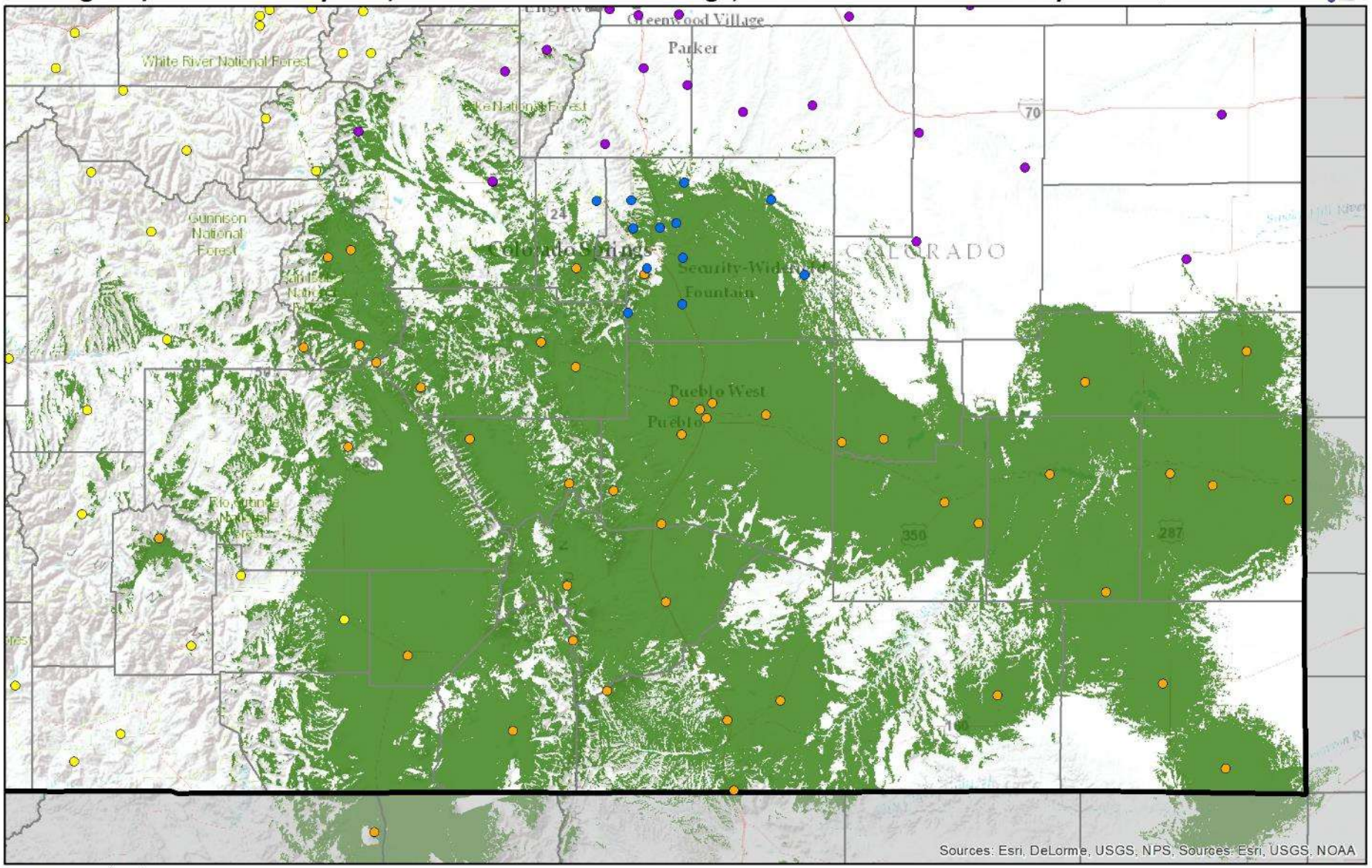
Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Appendix E – DTRS Coverage Prediction Maps

Map 12a: DTRS Zone 6 – Mobile Talk-Out Coverage from Existing 46 Zone 6 Sites

Existing 700/800MHz P25 System, Talk-Out to Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Mobile Coverage >= 95% Reliability for DAQ 3.4

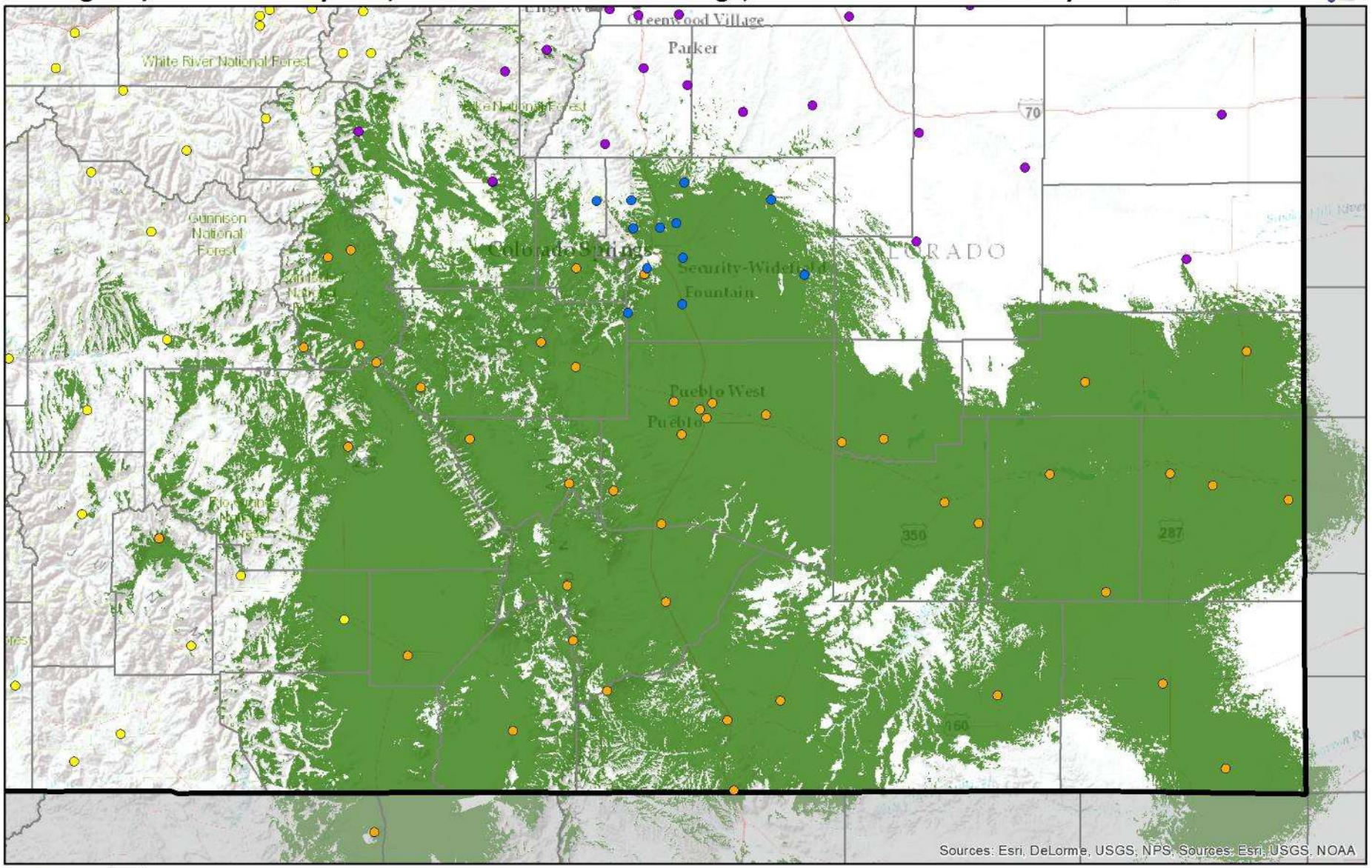
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 12b: DTRS Zone 6 – Mobile Talk-In Coverage from Existing 46 Zone 6 Sites

Existing 700/800MHz P25 System, Talk-In from Mobile Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Mobile Coverage >= 95% Reliability for DAQ 3.4

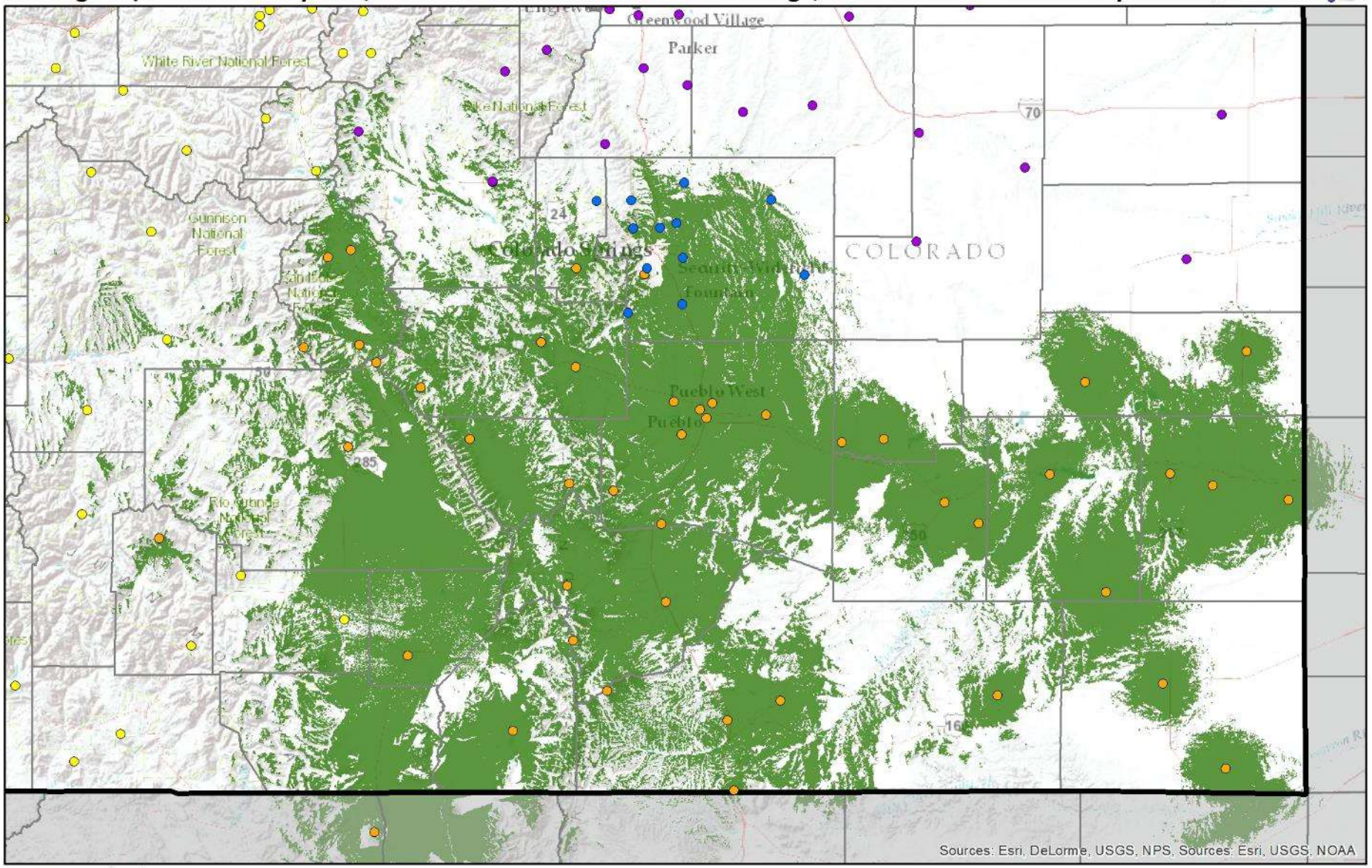
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 12c: DTRS Zone 6 – Portable On-Street Talk-Out Coverage from Existing 46 Zone 6 Sites

Existing 700/800MHz P25 System, Talk-Out to Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Portable On-Street Coverage >= 95% Reliability for DAQ 3.4

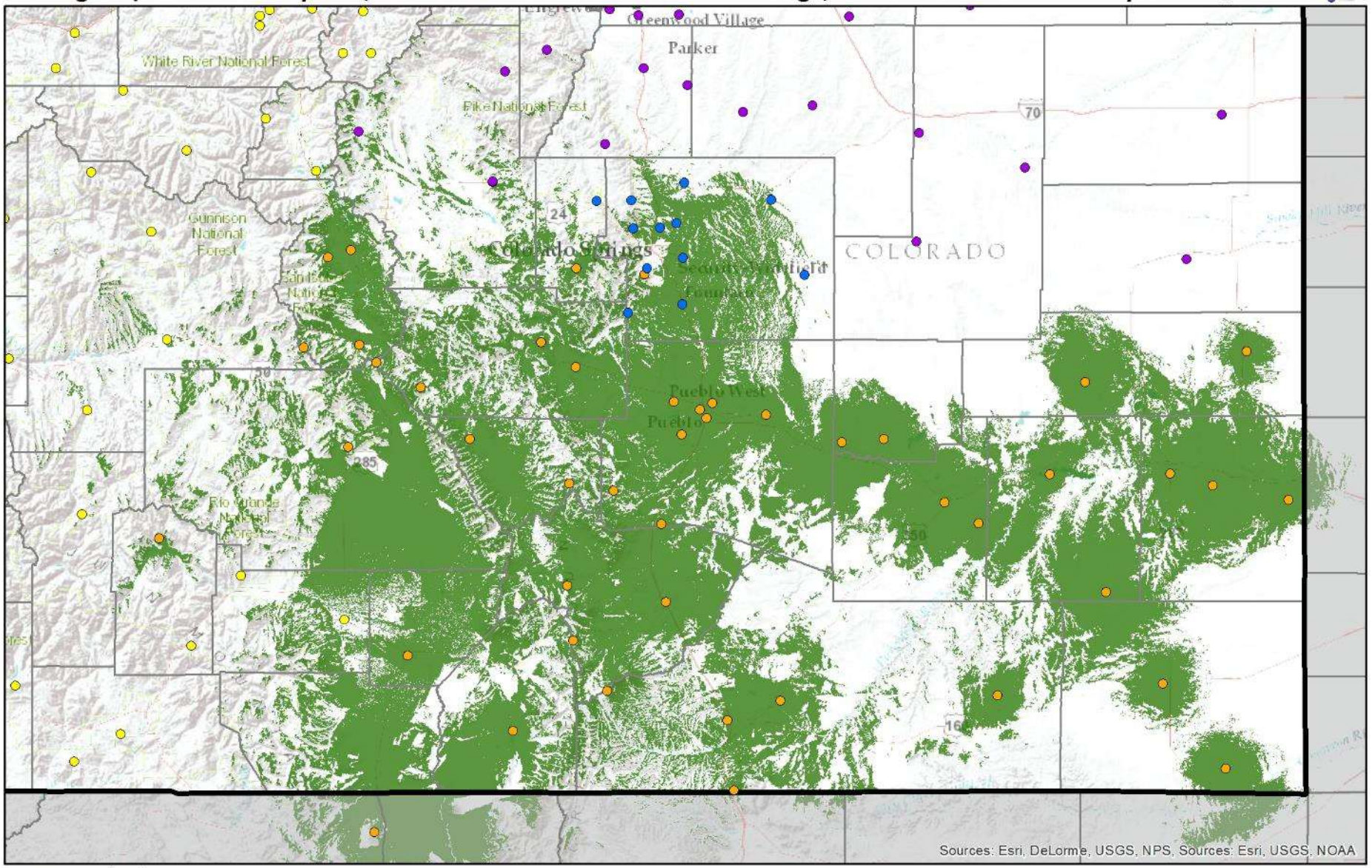
N

0 15 30 60 Miles

Appendix E – DTRS Coverage Prediction Maps

Map 12d: DTRS Zone 6 – Portable On-Street Talk-In Coverage from Existing 46 Zone 6 Sites

Existing 700/800MHz P25 System, Talk-In from Portable On-Street Coverage; Minimum of 95% Reliability for DAQ 3.4



Radio Sites
- Zone 1
- Zone 2
- Zone 3
- Zone 4

Colorado Border

Portable On-Street Coverage >= 95% Reliability for DAQ 3.4

N

0 15 30 60 Miles

Contents:

Legend for Field User Interoperability Matrix:

The character(s) before the comma designate the frequency of intreroperabilty: D=Daily, W=Weekly, M=Monthly, >M=Less than Monthly.
The character(s) after the comma designate the method: SC = Shared Channels, G = Gateway, P = Patch, SR = Swap Radios, O = Other.
The color of the box designates the satisfaction with the method: Purple=Excellent, Blue=Very Good, Green=Adequate, Orange=Marginal, Red=Poor
Blank boxes means no interoperabilty was reported by the agencies or that no interoperabilty exists between the agencies.

Legend for Dispatcher Interoperability Matrix:

The character(s) before the comma designate the frequency of intreroperabilty: D=Daily, W=Weekly, M=Monthly, >M=Less than Monthly.
The character(s) after the comma designate the method: P=Patch, VR=Verbal Repeat, NDI=No Dispatch Intervention, O=Other.
The color of the box designates the satisfaction with the method: Purple=Excellent, Blue=Very Good, Green=Adequate, Orange=Marginal, Red=Poor
Blank boxes means no interoperabilty was reported by the agencies or that no interoperabilty exists between the agencies.

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
Adams County Sheriff's Office				D, G		D, SC				
Adams State University Police Department		M, P								
Agate Fire Protection District										
Alamosa County Sheriff		D, O								
Alamosa EMS		M, P								
Alamosa Fire Department		M, P								
Alamosa Police Department										
Alamosa Regional Airport										
Alamosa Regional Communications Center										
Alma Police Department										
AMR Ambulance										
Arapahoe County Public Airport Authority										
Arapahoe County Sheriff			>W, SC			D, SC				
Arkansas Headwaters Recreation Area										M, SC
Armel Fire Department										
Aurora Communications Center										
Aurora Fire Department										
Aurora Police Department				D, G						
Baca County Fire										
Baca County Roads and Bridges										
Baca County Office of Emergency Management										
Baca County Sheriff's Office										
Bayfield Marshal										
Bennett Fire Protection District										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
Bent County OEM										
Bent County Road and Bridge							>M, SC			
Bent County Sherrif							D, SC			
Berthoud Fire Protection District										
Beulah Volunteer Fire										
Big Sandy Fire Protection District										
Blanca Police Department										
Bristol Granada Fire										
Brush Fire Protection District										
Buckley Fire Department										
Buena Vista Fire Department									D, SC	W, SC
Buena Vista Police Department										D, SC
Calhan Fire Department										
Cascade Fire Protection District										
Castle Rock Fire and Rescue Department										
Castle Rock Police Department								D, SC		
Cedaredge Fire Distrcit										
Chaffee County EMS									D, SC	D, SC
Chaffee County Fire Protection District										W, SC
Chaffee County Office of Emergency Management										
Chaffee County Sheriff's Office									D, SC	D, SC
Cherry Creek Rangers										
Cimmiron County Oklahoma					M, O					
Colorado Brand/Board Inspectors										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
Colorado Department of Parks & Wildlife										
Colorado Department of Public Safety										
Colorado Department of Transportation										
Colorado Division of HS/EM										
Colorado State Patrol		M, P				W, SC				>M, SC
Conejos County Hospital	M, SC									
Costilla County										
Craig Fire Department										
Craig Police Department										
Crawford Fire District										
Crested Butte Marshal's Office										
Cunningham Fire District				D, SC						
Custer County Sheriff's Office										
Del Norte Ambulace										
Del Norte Fire Department										
Del Norte Police Dept										
Delta County Ambulance District										
Delta County Sheriff Office										
Delta Fire District										
Denver Communications Center										
Denver Fire										
Denver Health										
Denver Police				D, G						
District 51 Schools Security										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
District 9R Schools										
Douglas County Sheriffs Office			>M, SC					W, SC		
Durango Fire Department										
Durango Police Department										
Eagle County Ambulance										
Eckley Fire Dept										
El Paso County Fire Marshall										
Elbert County Sheriff's Office										
Elbert Fire Protection District										
Elizabeth Fire Protection District										
Englewood Fire Department										
Englewood Police Department										
Fairplay Police Department										
Fort Morgan Fire										
Franktown Fire Protection District										
Fraser/Winter Park Police Department										
Fraser/Winter Park Public Works										
Front Range Fire Authority										
Fruita Police Department										
Granada Police Department										
Granby Police Department										
Granby Public Works										
Grand County Road & Bridge										
Grand County OEM										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
Grand Fire Protection District										
Grand Junction Police Department										
Grand Lake Fire Protection District										
Great Sand Dunes National Park										
Greater Brighton Fire Protection District						W, SC				
Green Mtn Falls/Chipita Park FPD										
Greenwood Village Police Department										
Gunnison County Sheriff's Office										
Gunnison Police Department										
Hasty/McClave Fire District										
Heart of the Rockies Regional Medical Center							W, P			M, SC
Hinsdale Sheriff's Office										
Holly Fire and Ambulance										
Holly Police Department										
Hotchkiss Fire District										
Huerfano County EMS										
Huerfano County Fire Department										
Huerfano County OEM										
Idalia Ambulance Service										
Idalia Fire Department										
Ignacio Police Department										
Jefferson County Sheriff										
Kiowa County Fire										
Kiowa County Sheriff										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
Kiowa Fire Protection District						M, SC				
Kiowa Police Department										
Kremmling Fire Protection District										
Kremmling Police Department										
Kremmling Public Works										
La Junta Fire										
La Plata Sheriff's Office							>M, P			
Lamar Fire and Ambulance										
Lamar Police department										
Larimer County Sheriff's Office										
Larkspur Fire Protection District										
Las Anamis County Sheriff's Office					W, SC					
Las Animas Fire and AMS							W, P			
Littleton Communications Center										
Littleton Fire Department										
Littleton Police Department										
Logan County Sheriff's Office										
Lone Tree/Parker Communciations Center										
Loveland Fire Rescue Authority										
Loveland Police Department										
Manitou Fire Department										
Maybell Ambulance										
Maybell Fire										
Medical Reserve Corps	M, SC									

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
Mesa County School District 51										
Mesa County Sheriff										
Metropolotan Area Communications Center						D, P				
Mineral County Sheriff's Office										
Moffat County Sheriff's Office										
Monte Vista Police Department										
Morgan County Ambulance Service										
Morgan County Sheriff										
Morton County Kansas					M, O					
Mt. Crested Butte Police Department										
North Central Fire Protection District										
North Fork Ambulance Association										
North West Fire										
Northeast Colorado Health Department										
Northeast Teller County FPD										
Northwest Fire District										
Northwest Regional Field Manager										
Palisade Police Department										
Palmer Lake Fire										
Paonia Fire District										
Park County Sheriff's Office										
Platte Valley Fire Protection District										
Poudre Fire Authority										
Pritchett Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
Prowers County Fire							>M, P			
Prowers County OEM										
Prowers County Rural Fire										
Prowers County Sheriff's Office					W, SC					
Pueblo County Emergency Services Bureau										
Pueblo County Road & Bridge										
Pueblo County Sheriff's Office										
Pueblo Rural Fire										
Pueblo West Fire										
Rapid Response Paramedic Services, LLC										
Rattlesnake Fire Protection District						M, SC				
Red Creek Volunteer Fire & Rescue										
Rio Grande County Sheriff's Department										
Rio Grande Hospital	M, SC									
Sable-Altura Fire Protection District						D, SC				
Salida Fire Department									D, SC	D, SC
Salida Police Department										D, SC
San Luis Valley Medical Reserve Corps										
San Luis Valley RETAC										
Sheridan Police Department										
SLV Health Regional Medical Center	M, SC									
SLV Region Emergency Managers	M, SC									
SLV Region Public Health Agencies	M, SC									
SLV Regional All Hazards Coordinator										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
SLV Regional EPR planning										
South Central Regional Field Manager										
South East Weld Fire Protection District						W, SC				
South Metro Fire Rescue Authority			W, SC	D, SC				W, SC		
South Park Ambulance District										
SouthEast Healthcare Coalition										
Southeast Regional Field Manager										
Spanish Peaks Regional Health Center										
Springfield Fire Department										
Stanton County Kansas					M, O					
Sterling Fire Department										
Sterling Police Department										
Strasburg Fire Protection District						W, SC				
Summit County Ambulance										
Thompson Valley EMS										
Tri-County Health Department										
United States Bureau of Indian Affairs										
United States Bureau of Land Management										
United States Forest Service								M, O		
United States National Park Service										
Upper Pine Fire Department										
Ute Pass EMS										
Valley Wide Health Systems	M, SC									
Vernon Volunteer Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Alamosa County Sheriff	Alamosa Police Department	Arapahoe County Public Airport Authority	Arapahoe County Sheriff	Baca County Sheriff's Office	Bennett Fire Protection District	Bent County OEM	Castle Rock Fire and Rescue Department	Chaffee County Fire Protection District	Chaffee County Office of Emergency Management
West Park Volunteer Fire										
Westminster Police Department										
Wiggins Rural Fire Protection District										
Wiley Fire Protection District										
Windsor Severance Fire Rescue Authority										
Wray Ambulance Service										
Wray Fire Department										
Yuma Fire Department										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
Adams County Sheriff's Office										
Adams State University Police Department										
Agate Fire Protection District										
Alamosa County Sheriff										
Alamosa EMS										
Alamosa Fire Department										
Alamosa Police Department										
Alamosa Regional Airport	W, SC									
Alamosa Regional Communications Center	D, SC									
Alma Police Department										W, SC
AMR Ambulance										
Arapahoe County Public Airport Authority										
Arapahoe County Sheriff				M, SC	D, SC					
Arkansas Headwaters Recreation Area										
Armel Fire Department										
Aurora Communications Center		D, O								
Aurora Fire Department					D, G					
Aurora Police Department				M, SC						
Baca County Fire										
Baca County Roads and Bridges										
Baca County Office of Emergency Management										
Baca County Sheriff's Office										
Bayfield Marshal							D, SC			
Bennett Fire Protection District					>M, SC					

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
Bent County OEM										
Bent County Road and Bridge										
Bent County Sherrif										
Berthoud Fire Protection District										
Beulah Volunteer Fire										
Big Sandy Fire Protection District										
Blanca Police Department										
Bristol Granada Fire										
Brush Fire Protection District										
Buckley Fire Department					>M, SC					
Buena Vista Fire Department										
Buena Vista Police Department				D, SC						
Calhan Fire Department										
Cascade Fire Protection District										
Castle Rock Fire and Rescue Department										
Castle Rock Police Department										
Cedaredge Fire Distrcit										
Chaffee County EMS										
Chaffee County Fire Protection District				W, SC						
Chaffee County Office of Emergency Management										
Chaffee County Sheriff's Office				D, SC						
Cherry Creek Rangers					W, SC					
Cimmiron County Oklahoma										
Colorado Brand/Board Inspectors										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
Colorado Department of Parks & Wildlife				W, SC						M, SC
Colorado Department of Public Safety										
Colorado Department of Transportation				>M, SC						
Colorado Division of HS/EM	D, SC									
Colorado State Patrol		D, SC		D, SC		W, O	D, SC			D, SC
Conejos County Hospital										
Costilla County										
Craig Fire Department										
Craig Police Department										
Crawford Fire District										
Crested Butte Marshal's Office				W, P						
Cunningham Fire District										
Custer County Sheriff's Office										
Del Norte Ambulace						W, SC				
Del Norte Fire Department										
Del Norte Police Dept						W, SC				
Delta County Ambulance District										
Delta County Sheriff Office			D, SC							
Delta Fire District										
Denver Communications Center		D, O								
Denver Fire					M, G					
Denver Health					W, G					
Denver Police										
District 51 Schools Security										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
District 9R Schools							>M, G			
Douglas County Sheriffs Office		W, SC						D, SC		
Durango Fire Department							D, SC			
Durango Police Department										
Eagle County Ambulance										
Eckley Fire Dept										
El Paso County Fire Marshall										
Elbert County Sheriff's Office										
Elbert Fire Protection District										
Elizabeth Fire Protection District										
Englewood Fire Department										
Englewood Police Department										
Fairplay Police Department										
Fort Morgan Fire										
Franktown Fire Protection District										
Fraser/Winter Park Police Department										
Fraser/Winter Park Public Works										
Front Range Fire Authority										
Fruita Police Department										
Granada Police Department										
Granby Police Department										
Granby Public Works										
Grand County Road & Bridge										
Grand County OEM										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
Grand Fire Protection District										
Grand Junction Police Department										
Grand Lake Fire Protection District										
Great Sand Dunes National Park										
Greater Brighton Fire Protection District										
Green Mtn Falls/Chipita Park FPD										
Greenwood Village Police Department										
Gunnison County Sheriff's Office			D, O	D, P						
Gunnison Police Department				D, P						
Hasty/McClave Fire District										
Heart of the Rockies Regional Medical Center										
Hinsdale Sheriff's Office			W, SC							
Holly Fire and Ambulance										
Holly Police Department										
Hotchkiss Fire District										
Huerfano County EMS										
Huerfano County Fire Department										
Huerfano County OEM										
Idalia Ambulance Service										
Idalia Fire Department										
Ignacio Police Department							W, SC			
Jefferson County Sheriff										
Kiowa County Fire										
Kiowa County Sheriff										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
Kiowa Fire Protection District										
Kiowa Police Department										
Kremmling Fire Protection District										
Kremmling Police Department										
Kremmling Public Works										
La Junta Fire										
La Plata Sheriff's Office							D, SC			
Lamar Fire and Ambulance										
Lamar Police department										
Larimer County Sheriff's Office										
Larkspur Fire Protection District										
Las Anamis County Sheriff's Office										
Las Animas Fire and AMS										
Littleton Communications Center		W, O								
Littleton Fire Department									D, SC	
Littleton Police Department										
Logan County Sheriff's Office										
Lone Tree/Parker Communciations Center		W, SC								
Loveland Fire Rescue Authority										
Loveland Police Department										
Manitou Fire Department										
Maybell Ambulance										
Maybell Fire										
Medical Reserve Corps										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
Mesa County School District 51										
Mesa County Sheriff										
Metropolotan Area Communications Center	W, O									
Mineral County Sheriff's Office	W, SC									
Moffat County Sheriff's Office										
Monte Vista Police Department				M, SC						
Morgan County Ambulance Service										
Morgan County Sheriff										
Morton County Kansas										
Mt. Crested Butte Police Department				W, P						
North Central Fire Protection District										
North Fork Ambulance Association										
North West Fire										W, O
Northeast Colorado Health Department										
Northeast Teller County FPD										
Northwest Fire District										
Northwest Regional Field Manager	W, SC									
Palisade Police Department										
Palmer Lake Fire										
Paonia Fire District										
Park County Sheriff's Office										W, SC
Platte Valley Fire Protection District										
Poudre Fire Authority										
Pritchett Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
Prowers County Fire										
Prowers County OEM										
Prowers County Rural Fire										
Prowers County Sheriff's Office										
Pueblo County Emergency Services Bureau										
Pueblo County Road & Bridge										
Pueblo County Sheriff's Office										
Pueblo Rural Fire										
Pueblo West Fire										
Rapid Response Paramedic Services, LLC										
Rattlesnake Fire Protection District					>M, SC					
Red Creek Volunteer Fire & Rescue										
Rio Grande County Sheriff's Department	W, SC			D, SC		M, SC				
Rio Grande Hospital										
Sable-Altura Fire Protection District					>M, SC					
Salida Fire Department										
Salida Police Department				D, SC						
San Luis Valley Medical Reserve Corps										
San Luis Valley RETAC	W, SC									
Sheridan Police Department										
SLV Health Regional Medical Center										
SLV Region Emergency Managers										
SLV Region Public Health Agencies										
SLV Regional All Hazards Coordinator										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
SLV Regional EPR planning										
South Central Regional Field Manager	W, SC									
South East Weld Fire Protection District										
South Metro Fire Rescue Authority	W, SC				D, SC				D, SC	
South Park Ambulance District										W, O
SouthEast Healthcare Coalition										
Southeast Regional Field Manager	W, SC									
Spanish Peaks Regional Health Center										
Springfield Fire Department										
Stanton County Kansas										
Sterling Fire Department										
Sterling Police Department										
Strasburg Fire Protection District										
Summit County Ambulance										
Thompson Valley EMS										
Tri-County Health Department										
United States Bureau of Indian Affairs				>M, SR						
United States Bureau of Land Management				W, SC						
United States Forest Service			W, SC	W, SC						
United States National Park Service				W, P						
Upper Pine Fire Department							M, G			
Ute Pass EMS										
Valley Wide Health Systems										
Vernon Volunteer Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Colorado Department of Public Safety	Colorado Department of Transportation	Colorado Parks & Wildlife	Colorado State Patrol	Cunningham Fire District	Del Norte Fire Department	Durango Police Department	Elbert County Sheriff's Office	Englewood Fire Department	Fairplay Police Department
West Park Volunteer Fire										
Westminster Police Department										
Wiggins Rural Fire Protection District										
Wiley Fire Protection District										
Windsor Severance Fire Rescue Authority										
Wray Ambulance Service										
Wray Fire Department										
Yuma Fire Department										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
Adams County Sheriff's Office										
Adams State University Police Department										
Agate Fire Protection District						>M, SC				
Alamosa County Sheriff			M, SC							
Alamosa EMS										
Alamosa Fire Department										
Alamosa Police Department										
Alamosa Regional Airport										
Alamosa Regional Communications Center										
Alma Police Department										
AMR Ambulance				M, SC						
Arapahoe County Public Airport Authority										
Arapahoe County Sheriff								W, SC		
Arkansas Headwaters Recreation Area										
Armel Fire Department										
Aurora Communications Center										
Aurora Fire Department										
Aurora Police Department										
Baca County Fire										
Baca County Roads and Bridges										
Baca County Office of Emergency Management										
Baca County Sheriff's Office										
Bayfield Marshal										
Bennett Fire Protection District										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
Bent County OEM										
Bent County Road and Bridge										
Bent County Sherrif										
Berthoud Fire Protection District										W, SC
Beulah Volunteer Fire										
Big Sandy Fire Protection District						M, SC				
Blanca Police Department										
Bristol Granada Fire										
Brush Fire Protection District										
Buckley Fire Department										
Buena Vista Fire Department										
Buena Vista Police Department										
Calhan Fire Department						>M, O				
Cascade Fire Protection District				W, SC						
Castle Rock Fire and Rescue Department										
Castle Rock Police Department										
Cedaredge Fire Distrcit					M, SC					
Chaffee County EMS										
Chaffee County Fire Protection District										
Chaffee County Office of Emergency Management										
Chaffee County Sheriff's Office										
Cherry Creek Rangers										
Cimmiron County Oklahoma										
Colorado Brand/Board Inspectors										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
Colorado Department of Parks & Wildlife										
Colorado Department of Public Safety										
Colorado Department of Transportation										
Colorado Division of HS/EM										
Colorado State Patrol			D, SC						W, O	W, P
Conejos County Hospital										
Costilla County										
Craig Fire Department										
Craig Police Department										
Crawford Fire District					W, SC					
Crested Butte Marshal's Office										
Cunningham Fire District										
Custer County Sheriff's Office										
Del Norte Ambulace										
Del Norte Fire Department										
Del Norte Police Dept										
Delta County Ambulance District					>M, SC					
Delta County Sheriff Office					D, SC					
Delta Fire District					>M, SC					
Denver Communications Center										
Denver Fire										
Denver Health										
Denver Police										
District 51 Schools Security		D, SC								

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
District 9R Schools										
Douglas County Sheriffs Office							W, SC	W, SC		
Durango Fire Department										
Durango Police Department										
Eagle County Ambulance										
Eckley Fire Dept										
El Paso County Fire Marshall				>M, SC		>M, SC				
Elbert County Sheriff's Office							M, SC			
Elbert Fire Protection District						W, SC				
Elizabeth Fire Protection District						W, SC				
Englewood Fire Department										
Englewood Police Department								W, SC		
Fairplay Police Department										
Fort Morgan Fire										
Franktown Fire Protection District						>M, SC				
Fraser/Winter Park Police Department	D, SC									
Fraser/Winter Park Public Works	W, SC									
Front Range Fire Authority										W, SC
Fruita Police Department		D, SC								
Granada Police Department										
Granby Police Department	D, SC									
Granby Public Works	W, SC									
Grand County Road & Bridge	W, SC									
Grand County OEM	D, SC									

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
Grand Fire Protection District	D, SC									
Grand Junction Police Department										
Grand Lake Fire Protection District	D, SC									
Great Sand Dunes National Park										
Greater Brighton Fire Protection District										
Green Mtn Falls/Chipita Park FPD										
Greenwood Village Police Department								W, SC		
Gunnison County Sheriff's Office										
Gunnison Police Department										
Hasty/McClave Fire District										
Heart of the Rockies Regional Medical Center										
Hinsdale Sheriff's Office										
Holly Fire and Ambulance										
Holly Police Department										
Hotchkiss Fire District										
Huerfano County EMS										
Huerfano County Fire Department										
Huerfano County OEM										
Idalia Ambulance Service										
Idalia Fire Department										
Ignacio Police Department										
Jefferson County Sheriff								W, SC		
Kiowa County Fire										
Kiowa County Sheriff										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
Kiowa Fire Protection District										
Kiowa Police Department						>M, SC				
Kremmling Fire Protection District										
Kremmling Police Department	D, SC									
Kremmling Public Works	W, SC									
La Junta Fire										
La Plata Sheriff's Office										
Lamar Fire and Ambulance										
Lamar Police department										
Larimer County Sheriff's Office										M, SC
Larkspur Fire Protection District										
Las Anamis County Sheriff's Office										
Las Animas Fire and AMS										
Littleton Communications Center										
Littleton Fire Department										
Littleton Police Department										
Logan County Sheriff's Office										
Lone Tree/Parker Communciations Center										
Loveland Fire Rescue Authority										
Loveland Police Department										W, SC
Manitou Fire Department				>M, SC						
Maybell Ambulance										
Maybell Fire										
Medical Reserve Corps										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
Mesa County School District 51		D, SC								
Mesa County Sheriff		D, SC								
Metropolotan Area Communications Center										
Mineral County Sheriff's Office										
Moffat County Sheriff's Office										
Monte Vista Police Department										
Morgan County Ambulance Service										
Morgan County Sheriff										
Morton County Kansas										
Mt. Crested Butte Police Department										
North Central Fire Protection District						M, SC				
North Fork Ambulance Association					M, SC					
North West Fire										
Northeast Colorado Health Department										
Northeast Teller County FPD				M, SC						
Northwest Fire District										
Northwest Regional Field Manager										
Palisade Police Department		>M, SC								
Palmer Lake Fire										
Paonia Fire District					>M, SC					
Park County Sheriff's Office										
Platte Valley Fire Protection District										
Poudre Fire Authority										W, SC
Pritchett Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
Prowers County Fire										
Prowers County OEM										
Prowers County Rural Fire										
Prowers County Sheriff's Office										
Pueblo County Emergency Services Bureau										
Pueblo County Road & Bridge										
Pueblo County Sheriff's Office										
Pueblo Rural Fire										
Pueblo West Fire										
Rapid Response Paramedic Services, LLC										
Rattlesnake Fire Protection District						M, SC				
Red Creek Volunteer Fire & Rescue										
Rio Grande County Sheriff's Department										
Rio Grande Hospital										
Sable-Altura Fire Protection District										
Salida Fire Department										
Salida Police Department										
San Luis Valley Medical Reserve Corps										
San Luis Valley RETAC										
Sheridan Police Department								W, SC		
SLV Health Regional Medical Center										
SLV Region Emergency Managers										
SLV Region Public Health Agencies										
SLV Regional All Hazards Coordinator										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
SLV Regional EPR planning										
South Central Regional Field Manager										
South East Weld Fire Protection District										
South Metro Fire Rescue Authority										
South Park Ambulance District										
SouthEast Healthcare Coalition										
Southeast Regional Field Manager										
Spanish Peaks Regional Health Center										
Springfield Fire Department										
Stanton County Kansas										
Sterling Fire Department									D, P	
Sterling Police Department									D, SC	
Strasburg Fire Protection District										
Summit County Ambulance										
Thompson Valley EMS										D, SC
Tri-County Health Department										
United States Bureau of Indian Affairs										
United States Bureau of Land Management										
United States Forest Service				>M, O						
United States National Park Service										
Upper Pine Fire Department										
Ute Pass EMS				W, SC						
Valley Wide Health Systems										
Vernon Volunteer Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Grand County Sheriffs Office	Grand Junction Police Department	Great Sand Dunes National Park	Green Mtn Falls / Chipita Park FPD	Hotchkiss Fire District	Kiowa Fire Protection District	Larkspur Fire Protection District	Littleton Police Department	Logan County Sheriff's Office	Loveland Fire Rescue Authority
West Park Volunteer Fire										
Westminster Police Department										
Wiggins Rural Fire Protection District										
Wiley Fire Protection District										
Windsor Severance Fire Rescue Authority										**W, SC**
Wray Ambulance Service										
Wray Fire Department										
Yuma Fire Department										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
Adams County Sheriff's Office										
Adams State University Police Department										
Agate Fire Protection District										
Alamosa County Sheriff										
Alamosa EMS										
Alamosa Fire Department										
Alamosa Police Department										
Alamosa Regional Airport										
Alamosa Regional Communications Center										
Alma Police Department										
AMR Ambulance								M, SC		
Arapahoe County Public Airport Authority										
Arapahoe County Sheriff										
Arkansas Headwaters Recreation Area										
Armel Fire Department										
Aurora Communications Center										
Aurora Fire Department										
Aurora Police Department										
Baca County Fire					>M, SC					
Baca County Roads and Bridges										
Baca County Office of Emergency Management										
Baca County Sheriff's Office						M, O				
Bayfield Marshal										
Bennett Fire Protection District										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
Bent County OEM										
Bent County Road and Bridge										
Bent County Sherrif										
Berthoud Fire Protection District										
Beulah Volunteer Fire							W, SC		>M, SC	
Big Sandy Fire Protection District										
Blanca Police Department										
Bristol Granada Fire						D, SC				
Brush Fire Protection District										
Buckley Fire Department										
Buena Vista Fire Department										
Buena Vista Police Department										
Calhan Fire Department										
Cascade Fire Protection District										
Castle Rock Fire and Rescue Department								>M, SC		
Castle Rock Police Department										
Cedaredge Fire Distrcit										
Chaffee County EMS										
Chaffee County Fire Protection District										
Chaffee County Office of Emergency Management										
Chaffee County Sheriff's Office										
Cherry Creek Rangers										
Cimmiron County Oklahoma										
Colorado Brand/Board Inspectors							M, SC			

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
Colorado Department of Parks & Wildlife							W, SC			
Colorado Department of Public Safety										
Colorado Department of Transportation										
Colorado Division of HS/EM			M, SC							
Colorado State Patrol	W, SC					D, SC	W, SC	M, SC		
Conejos County Hospital										
Costilla County										
Craig Fire Department		M, SC								
Craig Police Department		>M, SC								
Crawford Fire District										
Crested Butte Marshal's Office										
Cunningham Fire District										
Custer County Sheriff's Office							M, SC			
Del Norte Ambulace										
Del Norte Fire Department										
Del Norte Police Dept										
Delta County Ambulance District										
Delta County Sheriff Office										
Delta Fire District										
Denver Communications Center										
Denver Fire										
Denver Health										
Denver Police										
District 51 Schools Security										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
District 9R Schools										
Douglas County Sheriffs Office										
Durango Fire Department										
Durango Police Department										
Eagle County Ambulance								>M, SC		
Eckley Fire Dept										
El Paso County Fire Marshall										
Elbert County Sheriff's Office										
Elbert Fire Protection District										
Elizabeth Fire Protection District										
Englewood Fire Department										
Englewood Police Department										
Fairplay Police Department										
Fort Morgan Fire										
Franktown Fire Protection District								>M, SC		
Fraser/Winter Park Police Department										
Fraser/Winter Park Public Works										
Front Range Fire Authority										
Fruita Police Department										
Granada Police Department						D, SC				
Granby Police Department										
Granby Public Works										
Grand County Road & Bridge										
Grand County OEM										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
Grand Fire Protection District										
Grand Junction Police Department										
Grand Lake Fire Protection District										
Great Sand Dunes National Park										
Greater Brighton Fire Protection District										
Green Mtn Falls/Chipita Park FPD										
Greenwood Village Police Department										
Gunnison County Sheriff's Office										
Gunnison Police Department										
Hasty/McClave Fire District					>M, SC					
Heart of the Rockies Regional Medical Center										
Hinsdale Sheriff's Office										
Holly Fire and Ambulance					>M, SC	D, SC				
Holly Police Department										
Hotchkiss Fire District										
Huerfano County EMS										
Huerfano County Fire Department										
Huerfano County OEM										
Idalia Ambulance Service										
Idalia Fire Department										
Ignacio Police Department										
Jefferson County Sheriff										
Kiowa County Fire					>M, SC					
Kiowa County Sheriff						W, O				

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
Kiowa Fire Protection District										
Kiowa Police Department										
Kremmling Fire Protection District										
Kremmling Police Department										
Kremmling Public Works										
La Junta Fire										
La Plata Sheriff's Office										
Lamar Fire and Ambulance					W, SC	D, SC				
Lamar Police department						D, SC				
Larimer County Sheriff's Office										
Larkspur Fire Protection District								>M, SC		
Las Anamis County Sheriff's Office				>M, SC						
Las Animas Fire and AMS										
Littleton Communications Center										
Littleton Fire Department										
Littleton Police Department										
Logan County Sheriff's Office										
Lone Tree/Parker Communciations Center										
Loveland Fire Rescue Authority										
Loveland Police Department										
Manitou Fire Department										
Maybell Ambulance		>M, SC								
Maybell Fire		>M, SC								
Medical Reserve Corps										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
Mesa County School District 51										
Mesa County Sheriff										
Metropolotan Area Communications Center										
Mineral County Sheriff's Office										
Moffat County Sheriff's Office										
Monte Vista Police Department										
Morgan County Ambulance Service										
Morgan County Sheriff										
Morton County Kansas										
Mt. Crested Butte Police Department										
North Central Fire Protection District										
North Fork Ambulance Association										
North West Fire										
Northeast Colorado Health Department										
Northeast Teller County FPD										
Northwest Fire District										
Northwest Regional Field Manager										
Palisade Police Department										
Palmer Lake Fire								>M, SC		
Paonia Fire District										
Park County Sheriff's Office										
Platte Valley Fire Protection District										
Poudre Fire Authority										
Pritchett Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
Prowers County Fire						D, SC				
Prowers County OEM										
Prowers County Rural Fire										
Prowers County Sheriff's Office				>M, SC	M, SC				W, SC	
Pueblo County Emergency Services Bureau									>M, SC	
Pueblo County Road & Bridge							W, SC			
Pueblo County Sheriff's Office										
Pueblo Rural Fire							W, SC			
Pueblo West Fire							W, SC			
Rapid Response Paramedic Services, LLC										
Rattlesnake Fire Protection District										
Red Creek Volunteer Fire & Rescue										
Rio Grande County Sheriff's Department										
Rio Grande Hospital										
Sable-Altura Fire Protection District										
Salida Fire Department										
Salida Police Department										
San Luis Valley Medical Reserve Corps										
San Luis Valley RETAC										
Sheridan Police Department										
SLV Health Regional Medical Center										
SLV Region Emergency Managers										
SLV Region Public Health Agencies										
SLV Regional All Hazards Coordinator										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
SLV Regional EPR planning										
South Central Regional Field Manager										
South East Weld Fire Protection District										
South Metro Fire Rescue Authority								>M, SC		M, O
South Park Ambulance District										
SouthEast Healthcare Coalition										
Southeast Regional Field Manager										
Spanish Peaks Regional Health Center										
Springfield Fire Department										
Stanton County Kansas				>M, O						
Sterling Fire Department										
Sterling Police Department										
Strasburg Fire Protection District										
Summit County Ambulance								>M, SC		
Thompson Valley EMS										
Tri-County Health Department										
United States Bureau of Indian Affairs										
United States Bureau of Land Management										
United States Forest Service	M, SC						>M, SC			
United States National Park Service										
Upper Pine Fire Department										
Ute Pass EMS										
Valley Wide Health Systems										
Vernon Volunteer Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Mesa County Sheriff	Moffat County Sheriff's Office	Northeast Colorado Health Department	Pritchett Fire	Prowers County OEM	Prowers County Sheriff's Office	Pueblo County Sheriff's Office	Rapid Response Paramedic Services, LLC	Red Creek Volunteer Fire & Rescue	Rio Grande County Sheriff's Department
West Park Volunteer Fire									>M, SC	
Westminster Police Department										
Wiggins Rural Fire Protection District										
Wiley Fire Protection District					M, SC	D, SC				
Windsor Severance Fire Rescue Authority										
Wray Ambulance Service										
Wray Fire Department										
Yuma Fire Department										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
Adams County Sheriff's Office										D, SC
Adams State University Police Department										
Agate Fire Protection District										
Alamosa County Sheriff										
Alamosa EMS										
Alamosa Fire Department										
Alamosa Police Department										
Alamosa Regional Airport										
Alamosa Regional Communications Center										
Alma Police Department										
AMR Ambulance										
Arapahoe County Public Airport Authority										
Arapahoe County Sheriff										
Arkansas Headwaters Recreation Area										
Armel Fire Department									>M, SC	
Aurora Communications Center										
Aurora Fire Department										
Aurora Police Department										
Baca County Fire						W, SC				
Baca County Roads and Bridges						W, SC				
Baca County Office of Emergency Management						W, SC				
Baca County Sheriff's Office						W, SC				
Bayfield Marshal										
Bennett Fire Protection District										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
Bent County OEM										
Bent County Road and Bridge										
Bent County Sherrif										
Berthoud Fire Protection District										
Beulah Volunteer Fire										
Big Sandy Fire Protection District										
Blanca Police Department										
Bristol Granada Fire										
Brush Fire Protection District										
Buckley Fire Department										
Buena Vista Fire Department	D, SC									
Buena Vista Police Department	D, SC									
Calhan Fire Department										
Cascade Fire Protection District										
Castle Rock Fire and Rescue Department										
Castle Rock Police Department										
Cedaredge Fire Distrcit										
Chaffee County EMS										
Chaffee County Fire Protection District		W, SC								
Chaffee County Office of Emergency Management	D, SC									
Chaffee County Sheriff's Office		D, SC								
Cherry Creek Rangers										
Cimmiron County Oklahoma										
Colorado Brand/Board Inspectors										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
Colorado Department of Parks & Wildlife		M, SC								
Colorado Department of Public Safety										
Colorado Department of Transportation										
Colorado Division of HS/EM										
Colorado State Patrol		W, SC		M, SC		>M, P				
Conejos County Hospital										
Costilla County										
Craig Fire Department										
Craig Police Department										
Crawford Fire District										
Crested Butte Marshal's Office										
Cunningham Fire District										
Custer County Sheriff's Office										
Del Norte Ambulace										
Del Norte Fire Department										
Del Norte Police Dept										
Delta County Ambulance District										
Delta County Sheriff Office										
Delta Fire District										
Denver Communications Center										
Denver Fire										
Denver Health										
Denver Police										
District 51 Schools Security										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
District 9R Schools										
Douglas County Sheriffs Office										
Durango Fire Department										
Durango Police Department										
Eagle County Ambulance										
Eckley Fire Dept									>M, SC	
El Paso County Fire Marshall										
Elbert County Sheriff's Office										
Elbert Fire Protection District										
Elizabeth Fire Protection District										
Englewood Fire Department										
Englewood Police Department										
Fairplay Police Department										
Fort Morgan Fire										
Franktown Fire Protection District										
Fraser/Winter Park Police Department										
Fraser/Winter Park Public Works										
Front Range Fire Authority										
Fruita Police Department										
Granada Police Department										
Granby Police Department										
Granby Public Works										
Grand County Road & Bridge										
Grand County OEM										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
Grand Fire Protection District										
Grand Junction Police Department										
Grand Lake Fire Protection District										
Great Sand Dunes National Park										
Greater Brighton Fire Protection District										
Green Mtn Falls/Chipita Park FPD										
Greenwood Village Police Department										
Gunnison County Sheriff's Office										
Gunnison Police Department										
Hasty/McClave Fire District										
Heart of the Rockies Regional Medical Center										
Hinsdale Sheriff's Office										
Holly Fire and Ambulance										
Holly Police Department										
Hotchkiss Fire District										
Huerfano County EMS					D, SC					
Huerfano County Fire Department					M, SC					
Huerfano County OEM					M, SC					
Idalia Ambulance Service									>M, SC	
Idalia Fire Department									>M, SC	
Ignacio Police Department										
Jefferson County Sheriff										
Kiowa County Fire										
Kiowa County Sheriff										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
Kiowa Fire Protection District										
Kiowa Police Department										
Kremmling Fire Protection District										
Kremmling Police Department										
Kremmling Public Works										
La Junta Fire										
La Plata Sheriff's Office										
Lamar Fire and Ambulance										
Lamar Police department										
Larimer County Sheriff's Office										
Larkspur Fire Protection District										
Las Anamis County Sheriff's Office										
Las Animas Fire and AMS										
Littleton Communications Center										
Littleton Fire Department										
Littleton Police Department										
Logan County Sheriff's Office							D, SC			
Lone Tree/Parker Communciations Center										
Loveland Fire Rescue Authority										
Loveland Police Department										
Manitou Fire Department										
Maybell Ambulance										
Maybell Fire										
Medical Reserve Corps										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
Mesa County School District 51										
Mesa County Sheriff										
Metropolotan Area Communications Center										
Mineral County Sheriff's Office										
Moffat County Sheriff's Office										
Monte Vista Police Department										
Morgan County Ambulance Service										
Morgan County Sheriff										
Morton County Kansas										
Mt. Crested Butte Police Department										
North Central Fire Protection District										
North Fork Ambulance Association										
North West Fire										
Northeast Colorado Health Department										
Northeast Teller County FPD										
Northwest Fire District										
Northwest Regional Field Manager										
Palisade Police Department										
Palmer Lake Fire										
Paonia Fire District										
Park County Sheriff's Office										
Platte Valley Fire Protection District										
Poudre Fire Authority										
Pritchett Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
Prowers County Fire										
Prowers County OEM										
Prowers County Rural Fire										
Prowers County Sheriff's Office										
Pueblo County Emergency Services Bureau										
Pueblo County Road & Bridge										
Pueblo County Sheriff's Office										
Pueblo Rural Fire										
Pueblo West Fire										
Rapid Response Paramedic Services, LLC										
Rattlesnake Fire Protection District										
Red Creek Volunteer Fire & Rescue										
Rio Grande County Sheriff's Department										
Rio Grande Hospital										
Sable-Altura Fire Protection District										
Salida Fire Department		W, SC								
Salida Police Department										
San Luis Valley Medical Reserve Corps										
San Luis Valley RETAC										
Sheridan Police Department										
SLV Health Regional Medical Center										
SLV Region Emergency Managers				M, SC						
SLV Region Public Health Agencies				M, SC						
SLV Regional All Hazards Coordinator										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
SLV Regional EPR planning			M, SC					M, SC		
South Central Regional Field Manager										
South East Weld Fire Protection District										
South Metro Fire Rescue Authority			Y, SC							
South Park Ambulance District										
SouthEast Healthcare Coalition								M, SC		
Southeast Regional Field Manager										
Spanish Peaks Regional Health Center										
Springfield Fire Department										
Stanton County Kansas										
Sterling Fire Department										
Sterling Police Department										
Strasburg Fire Protection District										
Summit County Ambulance										
Thompson Valley EMS										
Tri-County Health Department										
United States Bureau of Indian Affairs										
United States Bureau of Land Management										
United States Forest Service						>M, SR				
United States National Park Service										
Upper Pine Fire Department										
Ute Pass EMS										
Valley Wide Health Systems										
Vernon Volunteer Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Salida Fire Department	Salida Police Department	San Luis Valley Medical Reserve Corps	SLV Regional All Hazards Coordinator	Spanish Peaks Regional Health Center	Springfield Fire Department	Sterling Police Department	Valley Wide Health Systems	Vernon Volunteer Fire	Westminster Police Department
West Park Volunteer Fire										
Westminster Police Department										
Wiggins Rural Fire Protection District										
Wiley Fire Protection District										
Windsor Severance Fire Rescue Authority										
Wray Ambulance Service									M, SC	
Wray Fire Department									>M, SC	
Yuma Fire Department									>M, SC	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
Adams County Sheriff's Office	
Adams State University Police Department	
Agate Fire Protection District	
Alamosa County Sheriff	
Alamosa EMS	
Alamosa Fire Department	
Alamosa Police Department	
Alamosa Regional Airport	
Alamosa Regional Communications Center	
Alma Police Department	
AMR Ambulance	
Arapahoe County Public Airport Authority	
Arapahoe County Sheriff	
Arkansas Headwaters Recreation Area	
Armel Fire Department	
Aurora Communications Center	
Aurora Fire Department	
Aurora Police Department	
Baca County Fire	
Baca County Roads and Bridges	
Baca County Office of Emergency Management	
Baca County Sheriff's Office	
Bayfield Marshal	
Bennett Fire Protection District	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
Bent County OEM	
Bent County Road and Bridge	
Bent County Sherrif	
Berthoud Fire Protection District	
Beulah Volunteer Fire	
Big Sandy Fire Protection District	
Blanca Police Department	
Bristol Granada Fire	
Brush Fire Protection District	**M, SC**
Buckley Fire Department	
Buena Vista Fire Department	
Buena Vista Police Department	
Calhan Fire Department	
Cascade Fire Protection District	
Castle Rock Fire and Rescue Department	
Castle Rock Police Department	
Cedaredge Fire Distrcit	
Chaffee County EMS	
Chaffee County Fire Protection District	
Chaffee County Office of Emergency Management	
Chaffee County Sheriff's Office	
Cherry Creek Rangers	
Cimmiron County Oklahoma	
Colorado Brand/Board Inspectors	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
Colorado Department of Parks & Wildlife	
Colorado Department of Public Safety	
Colorado Department of Transportation	
Colorado Division of HS/EM	
Colorado State Patrol	
Conejos County Hospital	
Costilla County	
Craig Fire Department	
Craig Police Department	
Crawford Fire District	
Crested Butte Marshal's Office	
Cunningham Fire District	
Custer County Sheriff's Office	
Del Norte Ambulace	
Del Norte Fire Department	
Del Norte Police Dept	
Delta County Ambulance District	
Delta County Sheriff Office	
Delta Fire District	
Denver Communications Center	
Denver Fire	
Denver Health	
Denver Police	
District 51 Schools Security	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
District 9R Schools	
Douglas County Sheriffs Office	
Durango Fire Department	
Durango Police Department	
Eagle County Ambulance	
Eckley Fire Dept	
El Paso County Fire Marshall	
Elbert County Sheriff's Office	
Elbert Fire Protection District	
Elizabeth Fire Protection District	
Englewood Fire Department	
Englewood Police Department	
Fairplay Police Department	
Fort Morgan Fire	**M, SC**
Franktown Fire Protection District	
Fraser/Winter Park Police Department	
Fraser/Winter Park Public Works	
Front Range Fire Authority	
Fruita Police Department	
Granada Police Department	
Granby Police Department	
Granby Public Works	
Grand County Road & Bridge	
Grand County OEM	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
Grand Fire Protection District	
Grand Junction Police Department	
Grand Lake Fire Protection District	
Great Sand Dunes National Park	
Greater Brighton Fire Protection District	
Green Mtn Falls/Chipita Park FPD	
Greenwood Village Police Department	
Gunnison County Sheriff's Office	
Gunnison Police Department	
Hasty/McClave Fire District	
Heart of the Rockies Regional Medical Center	
Hinsdale Sheriff's Office	
Holly Fire and Ambulance	
Holly Police Department	
Hotchkiss Fire District	
Huerfano County EMS	
Huerfano County Fire Department	
Huerfano County OEM	
Idalia Ambulance Service	
Idalia Fire Department	
Ignacio Police Department	
Jefferson County Sheriff	
Kiowa County Fire	
Kiowa County Sheriff	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
Kiowa Fire Protection District	
Kiowa Police Department	
Kremmling Fire Protection District	
Kremmling Police Department	
Kremmling Public Works	
La Junta Fire	
La Plata Sheriff's Office	
Lamar Fire and Ambulance	
Lamar Police department	
Larimer County Sheriff's Office	
Larkspur Fire Protection District	
Las Anamis County Sheriff's Office	
Las Animas Fire and AMS	
Littleton Communications Center	
Littleton Fire Department	
Littleton Police Department	
Logan County Sheriff's Office	
Lone Tree/Parker Communciations Center	
Loveland Fire Rescue Authority	
Loveland Police Department	
Manitou Fire Department	
Maybell Ambulance	
Maybell Fire	
Medical Reserve Corps	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
Mesa County School District 51	
Mesa County Sheriff	
Metropolotan Area Communications Center	
Mineral County Sheriff's Office	
Moffat County Sheriff's Office	
Monte Vista Police Department	
Morgan County Ambulance Service	W, SC
Morgan County Sheriff	W, SC
Morton County Kansas	
Mt. Crested Butte Police Department	
North Central Fire Protection District	
North Fork Ambulance Association	
North West Fire	
Northeast Colorado Health Department	
Northeast Teller County FPD	
Northwest Fire District	
Northwest Regional Field Manager	
Palisade Police Department	
Palmer Lake Fire	
Paonia Fire District	
Park County Sheriff's Office	
Platte Valley Fire Protection District	W, SC
Poudre Fire Authority	
Pritchett Fire	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
Prowers County Fire	
Prowers County OEM	
Prowers County Rural Fire	
Prowers County Sheriff's Office	
Pueblo County Emergency Services Bureau	
Pueblo County Road & Bridge	
Pueblo County Sheriff's Office	
Pueblo Rural Fire	
Pueblo West Fire	
Rapid Response Paramedic Services, LLC	
Rattlesnake Fire Protection District	
Red Creek Volunteer Fire & Rescue	
Rio Grande County Sheriff's Department	
Rio Grande Hospital	
Sable-Altura Fire Protection District	
Salida Fire Department	
Salida Police Department	
San Luis Valley Medical Reserve Corps	
San Luis Valley RETAC	
Sheridan Police Department	
SLV Health Regional Medical Center	
SLV Region Emergency Managers	
SLV Region Public Health Agencies	
SLV Regional All Hazards Coordinator	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
SLV Regional EPR planning	
South Central Regional Field Manager	
South East Weld Fire Protection District	W, SC
South Metro Fire Rescue Authority	
South Park Ambulance District	
SouthEast Healthcare Coalition	
Southeast Regional Field Manager	
Spanish Peaks Regional Health Center	
Springfield Fire Department	
Stanton County Kansas	
Sterling Fire Department	
Sterling Police Department	
Strasburg Fire Protection District	
Summit County Ambulance	
Thompson Valley EMS	
Tri-County Health Department	
United States Bureau of Indian Affairs	
United States Bureau of Land Management	
United States Forest Service	
United States National Park Service	
Upper Pine Fire Department	
Ute Pass EMS	
Valley Wide Health Systems	
Vernon Volunteer Fire	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use DTRS	Wiggins Rural Fire Protection District
West Park Volunteer Fire	
Westminster Police Department	
Wiggins Rural Fire Protection District	
Wiley Fire Protection District	
Windsor Severance Fire Rescue Authority	
Wray Ambulance Service	
Wray Fire Department	
Yuma Fire Department	

State of Colorado Interoperability Matrix Between Dispatch Centers and Agencies For Agencies that Primarily Use DTRS	Arapahoe County Sheriff's Office	Baca Crestone Ambulance / Baca Grande FireDept.	Chaffee County Sheriff's Office	Colorado State Patrol	Grand Junction Police Department	Mineral County Public Health
Agencies (Multiple, First Responder)	W, VR					
Ark River EMS (Fremont County)			W, P			
Bennett Fire			>M, O			
Buena Vista FD			>M,VR			
Buena Vista PD						
Center Police Department			>M,VR			
Chaffee County EMS			>M,VR			
Chaffee County FPD			>M,VR			
Chaffee County OEM			>M,O			
Chaffee County SAR North and South			>M,O			
Costilla County				W, NDI		
Crook Fire						
Del Norte Police Department						
Deuel CO NB						
Englewood Fire						
Fleming Fire						
Garfield County Communications					>M, VR	
Grand County, Utah					>M, VR	
Logan County SO						
MEDIVAC						
Merino fire						
Metronet	D, VR					
Mineral County OEM						M, NDI
Mineral County Sheriff						
Monte Vista Fire Department						
New Mexico State Police				>M, P		

State of Colorado Interoperability Matrix Between Dispatch Centers and Agencies For Agencies that Primarily Use DTRS	Arapahoe County Sheriff's Office	Baca Crestone Ambulance / Baca Grande FireDept.	Chaffee County Sheriff's Office	Colorado State Patrol	Grand Junction Police Department	Mineral County Public Health
Northern Saguache County Fire Protection District		W, VR				
Peetz Fire						
Philips County SO						
Sable Altura Fire						
Saguache County Sheriff						
Salida FD			>M,VR			
Salida PD			>M, O			
South Fork Police Department						
Sterling Fire Department						
Sterling PD						
Utah Highway Patrol					>M, VR	
West Douglas Fire						

State of Colorado Interoperability Matrix Between Dispatch Centers and Agencies For Agencies that Primarily Use DTRS	Rio Grande County Sheriff	Sedgwick County Comms Center	South Metro Fire	Sterling Emergency Comms Center
Agencies (Multiple, First Responder)				
Ark River EMS (Fremont County)				
Bennett Fire			W, P	
Buena Vista FD				
Buena Vista PD				
Center Police Department	M, VR			
Chaffee County EMS				
Chaffee County FPD				
Chaffee County OEM				
Chaffee County SAR North and South				
Costilla County				
Crook Fire				>M, VR
Del Norte Police Department	W, VR			
Deuel CO NB				
Englewood Fire			M, P	
Fleming Fire				>M, VR
Garfield County Communications				
Grand County, Utah				
Logan County SO		>M, P		M, VR
MEDIVAC				M, VR
Merino fire				>M, VR
Metronet				
Mineral County OEM				
Mineral County Sheriff	W, VR			
Monte Vista Fire Department	W, VR			
New Mexico State Police				

State of Colorado Interoperability Matrix Between Dispatch Centers and Agencies For Agencies that Primarily Use DTRS	Rio Grande County Sheriff	Sedgwick County Comms Center	South Metro Fire	Sterling Emergency Comms Center
Northern Saguache County Fire Protection District				
Peetz Fire				>M, VR
Philips County SO		>M, NDI		
Sable Altura Fire			W, P	
Saguache County Sheriff	W, VR			
Salida FD				
Salida PD				
South Fork Police Department	M, VR			
Sterling Fire Department				W, NDI
Sterling PD				>M, VR
Utah Highway Patrol				
West Douglas Fire			M, P	

Appendix G: Survey Comments Regarding DTRS Interoperability

Table G.1 – Field User Comments on DTRS Interoperability Problems

Field User	Field User
We have VHF in our patrol cars and can communicate sufficiently with the agencies using that radio system. When we exit our car to participate in multi-agency operations, the interoperability is poor, even when the channels are patched on a mutual aid channel via dispatch.	There needs to be more training to encourage agencies to use MAC talkgroups and Simplex channels for mutual aid incidents. This should replace the "need" to put all the home talkgroups of mutual aid agencies in a radio.
We do not have interoperability (cannot scan their main channels) with surrounding county agencies.	Just need to be able to talk to whom I need to when I need to regardless of where I am.
Seems it takes too much time to get things set up and if we are trying to communicate with bordering counties that are out of state then we do not really have the capabilities.	Programming for a shared talk group to be used by all regional hospitals and all EMS agencies and all public health (ESF 8) agencies during a major medical response event
Certain channels are available (MAC Channels), but are so spread out that too many agencies utilize them, reducing their availability as a region.	The newer pac-set portable radios appear to be more complicated. Thus, new users and/or those that do not use the radio often will be more likely not to use it.
Denver CSP dispatchers are extraordinarily loud, to the point of temporary hearing damage.	LACK OF USE OF ABILITY BY FIELD USERS WHO ARE TO DISPATCH CENTER DEPENDANT
Since we are near and mutual aid with the State of Kansas, we would like to be able to share systems with them.	DR is limited to mostly line of site. Does not work well in remote areas.
The ability to talk to other users who are currently using VHF.	Getting users to understand their radios capabilities.
Getting to the mutual aid channels without any assistance	Lack of communications exercises with agencies in other counties.
Training for the application of patching.	Lack interoperability Weld County.
Still fixing holes that are not funded.	

Table G.2 – Dispatcher and Technical Support Comments on DTRS Interoperability Problems

Dispatcher	Technical Support
Many users in the field are unfamiliar with how to access or use talk groups that are not their home or tac channels. Need more training and use of radios integrated into training..	Use of ADP encryption by most agencies limits vendor choices. Cost of AES encryption pushes users to ADP.
Lack of direct system-to-system communications on non-P25 Harris systems. Lack of direct system-to-system communications with FRCC users without having to use ISSI. We have taken a step back pertaining to radio based interoperability due to egos and politics.	Most issues are user based and not technology. Policy, legal, personality, training issues.
Some agencies are reluctant to change or do not know how to change to different talk groups when instructed by dispatch during multi agency incident. They prefer the comfort of their "home" talk group. Many users do not understand how DTR functions despite being given classes specific to their agencies.	Encryption is the main one except on the MACs.
Very concerned that agencies that have had interoperability are allowed to move outside the system causing interoperability. Any system should be required to be inter operable with existing systems at the cost of the agency deviating, not the agencies currently within the standard requirement of interoperability	Will never get the FED's on 800 so we just deal with it.
TRAINING OF USE FOR BOTH AGENCIES	User Training and lack of, or adhering to, standards. Most of this is beyond the "system" and is human interface.

Table G.3 – Interoperability Sets that are Working Very Well or Adequately

Interoperability Sets Working Very Well	Interoperability Sets Working Adequately but Need Adjustments
Mesa So and CSP use regional MAC channel	BLM and Grand Junction Fire use a gateway device to patch (VHF/800)
Mode selection (MAC channels) for use with state agencies and Larimer County, console patch for Larimer county and city agencies (PD, fire ems)	CSP - GC LE on actual channel usage. Used to be NW MAC 17, has not been clarified to GC County Sheriff.
Changing the mode on the radio with others we work with daily and on the same system. Network first gateway when both are in good coverage of their system. Would like to see ISSI implemented as soon as possible to take the place of this. Patches with agencies who have talkgroups on our consoles when needed.	Older gateways like the ACU 1000 are becoming obsolete with solutions like Network First and ISSI. Also becoming less useful as more agencies share resources across systems.
Console patching	Assure all Counties have SE Net Talk-groups
MAC 19 - GC First responders and State/Border County Interoperability (Glenwood Canyon plan)	Console patching and Gateway. ISSI is on the horizon, but not fully implemented.
Longmont patches its primary law and primary fire talk groups to VHF channels Boulder County monitors. Boulder County does the same with their VHF so Longmont can monitor on the DTRS	
State and County Dispatch Centers. Net Talk-groups. If the Dispatch Centers have Motorola Consoles.	
Selection Mode and cache radio	

Table G.4 – Interoperability Sets that are Working Poorly or Do Not Exist

Interoperability Sets Working Poorly and Need Major Changes	Interoperability Sets that Do Not Exist but Need to be Established
Cache swapping as these are often different radio types and almost always programmed differently. Patching is typically not an option when we use caches.	ISSI talkgroups for DTRS.
VHF to DTR patches (non-console) do not allow hand-off of Permit to Talk tones, etc.	State in Federal (DTR to USFS) patch or link. Any Interop Channel (VTac or 8Tac, for example) to the local dispatch center.
Mode switching - needs improved training of personnel	ISSI

Table G.5 – Management Comments on DTRS Interoperability Needs

Management	Management
The systems interoperability is very good, shared channels. It is the management/ command and control of the systems capabilities at an incident that needs to improve. That must be done by better training and a better understanding of the current systems abilities and limitations.	With the DTRS as long as agencies understand when to go to MAC's or other interop talk groups it works. VHF has numerous mutual aid channels and once everyone gets using the newer naming system it will be fine!
We need to work on interop with the State and counties bordering Colorado/Mesa County	no / problem with disperse systems in neighboring counties on separate system. realize there are some work around with ISSI that can and may come into play.
WE ARE IN THE PROCESS OF SWITCHING TO VHF DUE TO COVERAGE AND INTER-OPERABILITY ISSUES IN THE MOUNTAINS	We do pretty good in this area right now, but it could be better. Not sure where we could improve or which agencies need the most attention.
Interop with FRCC, Denver, Aurora is a challenge at times, but is being addressed. Mutual Aid.	encryption keys different among areas, counties and regions, ADP encryption is proprietary. The end user equipment is to locked down, end users should be empowered to manage their own devices rather than OEM certified programmer due to complexity
Too many agencies insist neighboring agencies have their talk groups rather than using MAC channels. The could be more MAC channels. However, this is a governance and management issue rather than a technical one.	ISSI needs to be implemented although still will not solve day to day issues caused by FRCC leaving in Weld and Adams counties.
[South Metro Fire Rescue Authority] can't talk well to Aurora	This is a training and personnel issue, not a technology issue
Federal agencies and Fire teams are used during Wildland fires and they do not use the DTR system	Needs more towers for coverage

Management	Management
Absolutely not. As a regional HazMat teams, we are encouraged to share assets and resources yet we cannot communicate AT ALL- EVER! using any single "system" including cellular phones and that is even within the Denver Metro area of the NCR. Any HazMat call that requires anything more than a single agency requires the ability to communicate. We train for, encourage, plan and equip for mutual aid yet we are limited to face-to-face communications after arriving on scene.	It does only with the Network First bridge that is in place. However this bridge relies on a user (Denver) to be able to reach their home system in order to use the bridge. We need to move more toward a system where bridges are not the answer, during emergencies, bridges can fail or not be available isolating users.

Appendix H: Survey Comments Regarding DTRS Capacity

Table H.1 – Field User Comments on DTRS Capacity Problems

Field User	Field User
[Grand Junction] PD Primary gets very busy through out the week.	We have very few busy tones in our area. There is not a great deal of users on the system in this area [Bent County].
The radio system is often busy [Salida Police Department]	During events our MAC channel [Pritchett Fire] sometimes get congested
[Westminster Police Department] Primary radio channel is usually pretty busy, and users routinely get "walked on" by dispatch. Although this is a feature used so dispatch can air relevant information, it creates issues for users to provide information themselves.	This has more to do with the number of officer's working the road and congesting the radio. Even on heavily scheduled days, I do not notice an increase in busy signals received. However, because of the remote location I regularly receive busy signals, a digital reception, or no signal bars on the radio's display.
Currently one channel is being shared among three law-enforcement agencies (Salida, Buena Vista, and Chaffee Sheriff's). The region is mostly split between the north and south side of the county. Splitting this traffic between north and south would be beneficial to officers in emergency situations to have an open channel to communicate. Please dedicate separate channels for north and south.	Since we are in a rural area our towers have less capacity than other areas. This is typically not a problem, but in the event of a large incident it could be. To help avoid these problems we train to use simplex channels as well as other systems (VHF) whenever possible to avoid exceeding system capacity. It is often a challenge to get first responders to understand the importance of this, but we do our best.
[Sterling Police Department] Sometimes have to share dispatchers with Sheriff's Office	Busies increase with significant events and weather.
Busy and congested when there is a incident that requires multiple users on the same system	Depending on call loading and users on the system, at times there are busy signals result in delayed communications

Field User	Field User
Continual changes by surrounding agencies require modifications to our own system. As channels are added or changed, we need to find easily accessible areas on our own radios, which quite often causes higher priority channels to be pushed into less accessible zones.	Our experience has been very good, but I think there are times and regions that the system seems to get overwhelmed with events. With that being said I believe the state has done a great job managing the events when it comes to building communication plans.
Too busy when Sterling PD is sharing our channel, which is almost everyday.	CDOT is upgrading systems to newer radios that do not have channel maximum capacity issues
Congested on multiple calls	3 Law Enforcement agencies on one channel at times
Because a number of departments use the same frequency, it is not uncommon to have to wait for access to the system.	Congested channels only occur when an operator overuses his/her radio
ARCC 1 can get busy sometimes	OK unless there is a multi-agency or mulit-jurisdictional response to an emergency event
Not so much busy but the inability to scan multiple channels.	On days with normal traffic it all works well. If we have one incident that has multiple county departments using it we start having problems. If we were to have a major disaster I could forsee the system being insufficient to maintain good communications
We have a lot of fire personal that operate all the time on baca Mac who congest the channel. There is a need to make them understand that they can operate on their own fire or email channels.	We use an OPS talk group system generally assigning OPS 1 to 5 for each incident. If we use up all the OPS TG we can go to other TG's such as MAC's or more typically we assign a OPS TG for an area to allow better coordination of resources in that general location.
During a larger incident busies are high.	

Table H.2 – Dispatcher and Technical Support Comments on DTRS Capacity Problems

Dispatcher	Technical Support
We do get busy signals when we see an increase in deputies on the channel. I don't know if this is unavoidable or our system is just not large enough.	Often take busies on snow days or when any major unplanned event takes place. All of the metro area / front range needs additional capacity to accommodate the additional load when snow plows are out or any major unplanned event occurs. Instances like the Arapahoe High School shooting caused significant busies for the first hour severely hindering normal communications. While the use of DFB (dynamic frequency blocking) allows for typical capacity needs without bad weather or a major incident it also cripples the capacity of the system much faster when all of the sites involved need to operate at capacity. These channels should be replaced with clean, not reused frequencies as soon as possible.
Only have issues when there is a major incident or weather event.	so far, very few busies most is caused by radios affiliated to smaller sites. Firmware issue.
We are a rural agency and share our dispatch channel with at least six other agencies.	Most busies are attributed to CDOT, CSP and County agencies NOT using regional MAC channels in certain circumstances. These are rare and geographical by nature. Training programs are helping control this problem.
The system will busy out when the call volume is high or during a major incident when multiple officers are on the same channel.	System works well most of the time. Sometimes, usually related to in incident, the capacity is not enough to serve more than 5 active talk-groups, (plus the control channel).
Except for during major events	rarely busy except during the flood, that was a bad few days

Table H.3 – Management and Technical Support Comments on DTRS Capacity Needs

Management Comments on Need for Capacity Improvements	Technical Support Comments on Planned Capacity Improvements
Wildfire or other incident will overload the system	Will add capacity as needed. Mostly determined buy the amount of busies we get.
Channel capacity is adequate at all sites, however snow days can overload Chevron, which is a very heavily used site in the Metro area.	Douglas County is upgrading all of its sites in the southern cell to 10 channels, the northern cell will have 12 channels that are not reused or dynamically blocked with other sites in the system. This is through an agreement with the state to use their clean 800MHz frequencies acquired from Nextel at our sites. We anticipate adding an additional 6 channels of 700mhz to the north cell once all radios in the county are replaced with 700 capable radios.
I cannot get on a system to know that it is busy. I am limited to the regional TIC talk-groups which have not presented a problem during exercises.	Motorola is working a solution. could be as easy as updating firmware. if traffic does increased we would need additional channels.
The system works for day to day operations, but does not have the additional capacity to handle major events. Even a snowstorm stretches the network, let alone a tornado, flood or wildfire.	
Rural agencies as a whole do not experience busies until an event surfaces. Expansions have been made where needed to take care of normal everyday traffic sufficiently.	
Would be good to have all sites become 6 channel-there are several older Quantar sites due for upgrading.	
Need alternate channel for tactical / staging / redundancy	
Site expansion is always encouraged.	
Large multi agency LE events can be a challenge based on historical events. Failure/resistance of responders to use MAC and simplex channels as appropriate.	

Appendix I: Survey Comments Regarding DTRS Reliability

Table I.1 – Field User Comments on DTRS Reliability Problems

Field User	Field User
The transition of systems in Weld and Adams counties (both of which we border) have caused many problems with reliability of communicating with mutual aid agencies.	We have to go down for maintenance and sometimes it just goes down without warning. More so than VHF ever did.
An amplifier on one tower was down for several months; radio use in southcentral and southeast part of the county [Baca] were bad during that time. We were advised they were waiting on tower crews to climb tower to make repairs. The problem was the radio would hit of the tower and then the tower could not send the signal out from the tower would be to week of a signal for dispatch to receive and understand. We had to resort to cell phones much of the time to have good communications with dispatch.	Rarely the system enters into a "trunking" mode. The older car radios were nice to have the option to switch towers to avoid the ones that were down or were providing poor service.
Sometimes the Reardon tower goes out and needs fixed	Don't have total [Del Norte] district coverage
Mineral County DTR tower goes into site trunking often due to T-1 line issues.	Minimal affects, with the exception of 'going digital'
We [Springfield Fire Department] have a lot of down time.	Mineral County DTR has had a serious problem with site trunking for an extended period.
System works well in most cases occasionally we are cut off from the State but we still have in county communications	The system is generally functional, but occasionally loses coverage based on user loading and weather.
Can have some connection problems on cloudy days	

Table I.2 – Dispatcher and Technical Support Comments on DTRS Reliability Problems

Dispatcher	Technical Support
We [Baca Crestone Ambulance/Baca Grande Fire Dept.] have DTR which works reasonably well if the traffic volume is low. The repeater is a constant source of communications shut down. And the appointee, a political appointee!, at the top has restricted our ability to get it fixed ourselves. It appears to me that the appointee has never been involved in first response.	The equipment owned by other agencies who may not receive proper funding or properly staffed to keep infrastructure properly upgraded and / or maintained to public safety reliability standards.
We [Sterling Emergency Communications Center] lose our radios completely if it gets too cold. The state tech does not communicate with use while it is down and takes literally hours to respond with no sense of urgency at all.	Most of the issue is with the connection between the console and the zone controller. We use a T-1 and it has had issues at the central office of going down and being down for hours.
At times our [Mineral County Public Health] tower will have problems and the DTR will trunk for sometimes up to a week.	Quantar Power Supplies. Backhaul (microwave) to the Zone Controllers are outdated. Most are past their planned in-service period.
Busy signals, dead spots, digital transmissions.	Past concerns of UPS problems at Zone 2, problem has been addressed.
Our [Colorado State Patrol] system rarely goes down, but when it does, it is a major issue.	We have a new simulcast system. Trying to get the kinks out of subscriber units.

Table I.3 – Field User Comments on Notification Process for DTRS Outages

Field User	Field User
[Larkspur Fire Protection District] receives emails on a occasion	[Bennett Fire Protection District] does not received outage notifications.
[Chaffee County Fire] have never been notified but our dispatch center might be notified.	[Tri-County Health Department] are not daily users. I do not know how this information is provided.
[Colorado State Patrol Supervisor] knows about the notifications they send out but rarely experience a prolonged (hours) loss of service.	[Alamosa County] do not recall receiving notifications of system outages, but I also do not recall any system outages.
[Kiowa Fire Protection District] notifications come to us through several people leaving the possibility for failure. That being said, to date our notifications have been timely.	Most issues with notifications on this have been on our end [Baca County Sheriff's Office]. We get emails sent to us and we are not always getting them checked and making reminders for ourselves of the planned outages. We can't blame anyone but ourselves for this.
[Vernon Volunteer Fire] have never had an outage	[Grand County] Wind and dead trees make for a real pain.
Other than annual billing from CCNC, NCHD never receives any notifications regarding the radio system at all.	When the system goes offline for scheduled things we [Chaffee County Office of Emergency Management] are not notified

Table I.4 – Dispatcher Comments on Notification Process for DTRS Outages

Dispatcher	Dispatcher
The State Radio Tech in our area [Chaffee County] is very good about notifying of outages, or if it is not scheduled letting us know about how long the outage will be. We also receive notifications from CCNC	Would like to see a callback notification or some other high reliability notification on outages as it pertains to a geographic area and not just emails.
We can use our DTR 800 for Local; however, the VHF works so much better in this area.	Not too many outages with the systems.

Table I.5 – Technical Support Comments on Site Power Sources, Backhaul Equipment, and Overall System Reliability

Site Power Sources	Backhaul Equipment	Overall System Reliability
We have one site that is a microwave relay that is solar powered. Very remote area. We have made significant improvements in the last year to the system.	The [solar powered] site does occasionally go down due to remoteness and inaccessibility in the winter.	Ability to upgrade when needed based on cooperative efforts and coordinated budgets by all of the infrastructure partners.
Some equipment owned by other agencies have less backup power than we would like. For instance, we have enough generator to last at least 3 days and enough battery to support at least 24 hours of normal operation at a radio site. Other owners have far less and this is often mixed at radio sites with multiple equipment owners.	Older microwave in use by other partners that desperately needs upgraded and very hard to get parts for repair if failures occur. There are often too many hops required to connect a site to a zone controller making reliability a concern and far more likely to fail.	Mixed technical support groups, in my area the amount of technical support is limited. Limited cooperation with state and local technical support due to state directors.
Back-up power, generator, on most sites. Some sites, Mt. Bailey, as no back-up power.	We have older 2' dishes that loosed feed horns, which will take a site into site trunking. Microwave dishes need to be replaced with a better-designed dish.	Lack of funding for back-up batteries, UPS, etc.
Site Generators are maintained annually by certified EM contractors.	The microwave system, for the most part, is old and outdated. Sometimes runs without redundant parts and like has no redundant path.	That one day the system will cease to function, and agencies will revert back to stovepipe systems.
Normal stuff, generators not starting.	The backhaul is owned by the State of Colorado and is antiquated. I question its reliability.	Back up routes (Fiber Preferred) to sites when possible.

Table I.6 – Management Comments on Needed DTRS Reliability Improvements

Management	Management
Overlapping coverage would be nice but we would be happy with just fixing the current holes. Additionally, I believe every DTRS site that serves our county except one has a single T1 or microwave back-haul, so there is no redundancy. Outages have put sites into site trunking and taken hours to fix.	Occasional outages. Possibly more that when VHF systems were primary. Differences would be formerly the individual agencies would build out a VHF system to have coverage on separate channel when equipment may fail on a piece of equipment. With DTR when a tower goes into site trunking, there can be no contact with the units in that area of coverage.
Have had commercial power issues from trees into lines-almost have that taken care of from right of way maintenance and that most of the dead beetle killed trees are gone. Backup generators can be very difficult to monitor or refuel on mountaintops.	We have had several circumstances where there have been site issues with DTR, resulting in radio black radio blackouts.
Connectivity between DTR sites should be improved; Some Sites should be tied to two Zone Controllers.	Power supply failures and UPS failures are the main enemies of our system's reliability.
System loading is a major concern, especially during major events.	Forced a switch to VHF to conduct missions.

Appendix J: Survey Comments Regarding DTRS Maintenance

Table J.1 – Changes that Field Users Would Like Regarding User-radio Maintenance

Changes that Field Users Would Like to See Regarding User-radio Maintenance	
If we have issues with our county owned equipment. The cost just to get techs to come to our county is $500, and it goes up fast from that point. We are a rural county with minimal funds. Many years ago over 15 prior to the DTR system the state radio tech out of Lamar was allowed to look at our radios when not working right and help us out. It is my understanding that is no longer allowed. Seems it is the tax dollar paying the state radio tech and when time allows they should be allowed to give us a hand. We have had one radio in our consolette down for several months I believe it is for the southeast region channel. We cannot afford a new radio and we believe it needs power supply. At this point, it has been a low priority to fix, as funding is tight.	They need more help to speed up the process and allow them to get the work done.
CDOT have an in-house capability. State OIT can take months to work on radios	Ability to adjust the volume or the light screen coming on during incoming communications
Not aware of necessary regular maintenance	Would like to know what maintenance needs to be done and how often.
Maintenance and programming at least quarterly	END USER INPUT ON NEEDS/UPGRADES
Annual maintenance and check.	More help from the state
Reliable service	Reduced Vendor Costs
More timely service	

Table J.2 – Organizations that Managers Contact for Service on the System or Users' Radios

Organizations that Managers Contact for Service on the System or Users' Radios	
We are currently forced to use a Motorola dealer that has a tech in the Alamosa area, however are forced to use one of the techs out of the La Junta office that adds to the cost, this is dictated out of OIT due to the tech once worked for OIT.	Each fire department and each town PD and the sheriff's office does their own thing with their user radios. For infrastructure, we use mainly Triple C Communications.
DCSO Radio shop	Motorola or state radio tech
For the system, we contact the State, OIT or CSP. For user radios, either DigitCom Electronic or SpectraCom.	Generally QDS for DTR and microwave items and various other shops for VHF items.
Arapahoe County Sheriff's Office	Southwest All Hazards
First is our own radio technician, then the State techs and then QDS	Jefferson County SO radio maintenance or outside contractor.
Service on the system is taken care of by Dispatch, we use QDS for our radio issues and needs.	System problems: OIT, users radios private vendor
Local vendors for radios, State for system	System is Arapahoe County, user radios are individual vendors.
OIT on system in house on radios	State Patrol/DOW/2-Way Radio/Dale Myers
County Sheriff's Office.	Outside vendor (Digitcom Electronics)
State / WAC	South Metro
State OIT	Motorola
Digitcom	Tait, or Motorola dealers.

Appendix K: Survey Comments Regarding DTRS Training & Exercises

Table K.1 – Field User Specific Areas of System and/or Radio Operation Training

Field User Specific Areas of System and/or Radio Operation Training	
Troubleshooting day to day issues	Tower Associations and Scan Capabilities
Being able to recognize the specific channel and location to the mutual aid channels needed in emergency situations.	integration with the new systems in Weld and Adams county
Clear-Concise Radio Communications and the utilization of the TAC channels	There needs to be more training to encourage agencies to use MAC talkgroups and Simplex channels for mutual aid incidents. This should replace the "need" to put all the home talkgroups of mutual aid agencies in a radio.
I do pretty good-getting the rest of the gang is a struggle! The DTRS is a fairly sophisticated computer put in the hands of users that really only want to mash the transmit button and call it good. And we wonder why we have issues.	COML training is not applicable for public health and hospital users. Public Health and hospitals are collaborating with NCR Communications committee to develop better training for our type of radio use
Appear to be a number of areas we are not familiar with that may be helpful in our operation	Basic over view of system, was just given a radio with no training
I am unaware of additional features beyond PTT on various channels...	Tactical channels and communicating with other local city agencies.
More practice on the channel use	All areas of use other than basic operations.
I know enough to meet my needs, but do not know if there are advanced features I could be using.	Everyone needs annual refreshers: we have users on the system that have been on it for years that still have no idea how to change talkgroups.
Total system functions, including special features	All of it. I have had to experiment to figure out the radio.
Available functionality	800 CONVENTIONAL REPEATERS
Radio Features and programming	Programming channels to scan
Available channels	Simplex channels
Private Talk	Patching

Table K.2 – Field User Comments on Improving Exercises to Enhance Ability to Use the Radio System and Radios

Field User Comments on Improving Exercises to Enhance Operability	
Incorporate them in exercises and include troubleshooting scenarios	Channel/Zone selection, proper radio transmission (goes both ways)
Training more often and more well planned exercises	Hands-on (field) experience
More real world (live) practice	Quarterly web trainings
A radio is like any other tool in the toolbox. The more familiar with features and programming, the more likely to use it.	Exercises should have a communications component and it should be evaluated. Short falls/gaps should be noted, is it training/or system problems
Radio waves 101. Need to understand the characteristics of radio waves at different frequencies in order to understand the advantages and limitation of VHF, 800 etc.	State Agencies need to do more communication exercises. Local government agencies are sufficient in meeting those deliverables
Use the MACs and get users familiar to their radio	Group exercises along with web based training.
Training events that would include radio procedures. (I.e. pursuits, shootings, critical incidents, mass-casualty incidents.)	Require user to have radios during exercise, this would also help identify gaps in the current system
Build in the comms portion specifically to test/train	Specific Components on Radio/Communications
Follow the HSEEP process start with workshops/seminars for ALL audiences. Start with frequently scheduled routine drills between agencies and work up to multiple agencies and multiple disciplines and then to regional use/multiple agency multiple discipline	Always include a comms piece to compliment the exercise; functional and full-scale exercises could do this. Tabletop exercises wouldn't use radios
More frequent incorporation of radios into other types of exercises	Need to correct errors quickly so they do not propagate!
ENCOURAGE ROUTINE USE/ABILITY OUTSIDE TRAININGS, BECOMING SECOND NATURE TO USERS OUTSIDE EMERGENCIES	Use radios with real life levels of loading so that you can decide other methods of communication for when radios do not work.

Table K.3 – Field User Comments on Improving Exercises to Enhance Interoperability

Field User Comments on Improving Exercises to Enhance Interoperability	
Mutual aid trainings	Channel/Zone selection
More practice and group exercises	More real world (live) practice
Exercises like a TIC plan exercise every radio holder in the region.	Monthly radio drills are a good tool.
Get everyone on the same page and have a Comm plan written.	Familiarization among state agency radio groups
Someone needs to just do the training.	More involvement with the various PSAP's
Channel Sharing Plans and Procedures, agreed upon MAC/RED, etc.	Build in the comms portion specifically to test/train
Start with frequently scheduled routine drills between agencies and work up to multiple agencies and multiple disciplines and then to regional use/multiple agency multiple discipline	Morgan County Emergency Management could provide opportunities for exercises.
We can pre-determine what works and what doesn't, this can save time in an actual event/response	Interagency exercises in remote areas for testing areas of questionable functionality
RADIO RODEOS SHOWING FUNCTIONS THAT END USERS MAY BE UNAWARE OF OUTSIDE 'REAL WORLD' DANGERS	Bring all agencies to the exercise. We are often left out even though we have a large number of employees with specialized skills and equipment including Boating, ATVs, 4X4 patrol vehicles.
Assistance with coordination in doing these. We tried to set up so Colorado and Kansas could access across systems it is my understanding Kansas was willing to make it happen and Colorado refused to cooperate so they could program their radios to operate off the Colorado system yet we work with them regularly.	Appoint a Communications Officer in either the Command or possibly the General Staff positions right there with the PIO, Deputy IC, Safety, Operations, Logistics, Plans, etc. No more hiding!

Contents:

Legend for Field User Interoperability Matrix:

The character(s) before the comma designate the frequency of intreroperabilty: D=Daily, W=Weekly, M=Monthly, >M=Less than Monthly.
The character(s) after the comma designate the method: SC = Shared Channels, G = Gateway, P = Patch, SR = Swap Radios, O = Other.
The color of the box designates the satisfaction with the method: Purple=Excellent, Blue=Very Good, Green=Adequate, Orange=Marginal, Red=Poor
Blank boxes means no interoperabilty was reported by the agencies or that no interoperabilty exists between the agencies.

Legend for Dispatcher Interoperability Matrix:

The character(s) before the comma designate the frequency of intreroperabilty: D=Daily, W=Weekly, M=Monthly, >M=Less than Monthly.
The character(s) after the comma designate the method: P=Patch, VR=Verbal Repeat, NDI=No Dispatch Intervention, O=Other.
The color of the box designates the satisfaction with the method: Purple=Excellent, Blue=Very Good, Green=Adequate, Orange=Marginal, Red=Poor
Blank boxes means no interoperabilty was reported by the agencies or that no interoperabilty exists between the agencies.

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Alamosa Fire Department	Black Hawk Police Department	Chaffee County Search and Rescue - North	City of Boulder	Crested Butte Marshal's Department	Elk Creek Fire District	Evergreen Fire Rescue	Fairplay Police Department	Florissant Fire Protection District	Hale Fire & Rescue Dept.
4-Mile Fire Protection District										
Adams County Fire										
Adams County Sheriff										
Alamosa Police	D, SC									
Alma Marshals Office								W, SC		
Armel Volunteer Fire Dept.										>M, SC
Arvada										
Baca County Sheriff's Office										
Black Hawk Fire Department										
Boulder County Sheriff				D, SC						
Brighton Fire										
Broomfield										
Broomfield Police Department										
Central City		W, SC								
Central City Fire Department										
Chaffee County EMS			M, SC							
Chaffee County Fire			>M, SC							
Chaffee County Search and Rescue - South			>M, SC							
Chaffee County Sheriff			M, SC							
Clear Creek Fire							M, SC			
Clear Creek Sheriff Office		>M, SC					M, SC			
Coal Creek Fire										
Colorado Division of Fire Prevention and Control	W, SC									
Colorado Division of Wildlife					M, P					

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Alamosa Fire Department	Black Hawk Police Department	Chaffee County Search and Rescue - North	City of Boulder	Crested Butte Marshal's Department	Elk Creek Fire District	Evergreen Fire Rescue	Fairplay Police Department	Florissant Fire Protection District	Hale Fire & Rescue Dept.
Colorado State Patrol	D, P				W, P			W, SC		
Colorado University (Boulder) Public Safety				D, SC						
Cripple Creek Fire/EMS										
Custer County Fire and EMS										
Dacono Police										
Denver										
Divide Fire Protection District										
Division of Gaming		W, SC								
Elk Creek Fire							M, SC			
Evergreen Fire						D, SC				
Federal Heights										
Firestone Police										
Florissant Fire Protection District										
Foothills Fire						>M, O	M, SC			
Ft Lupton Police										
Genesee Fire						>M, O	M, P			
Gilpin Ambulance		D, SC								
Gilpin County		W, SC								
Golden Gate Fire Department										
Green Mtn Falls FD										
Gunnison County Sheriff					W, SC					
Gunnison Police Department					M, SC					
Highland Rescue							M, P			
Huerfano County Fire										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Alamosa Fire Department	Black Hawk Police Department	Chaffee County Search and Rescue - North	City of Boulder	Crested Butte Marshal's Department	Elk Creek Fire District	Evergreen Fire Rescue	Fairplay Police Department	Florissant Fire Protection District	Hale Fire & Rescue Dept.
Huerfano Dispatch										
Idalia Volunteer Fire Dept.										>M, SC
Indian Hills Fire						M, SC	M, SC			
Inter Canyon fire						W, SC				
Jefferson County SO							W, P			
Kirk Volunteer Fire Dept.										>M, SC
La Veta Fire										
Lake George FPD									M, SC	
Laveta FD/EMS										
Monte Vista Ambulance										
Monte Vista Fire										
Morton County KS EMS										
Morton County KS Hospital										
Mt Crested Butte Police					D, SC					
Mtn Communities FD										
Nederland Fire										
North East Teller County FD										
North Fork Fire						M, SC	>M, SC			
Northeast Teller County Fire										
Northglenn										
Northglenn Police Deoartment										
Ouray County Emergency Managment										
Ouray County EMS										
Ouray County Sheriff										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Alamosa Fire Department	Black Hawk Police Department	Chaffee County Search and Rescue - North	City of Boulder	Crested Butte Marshal's Department	Elk Creek Fire District	Evergreen Fire Rescue	Fairplay Police Department	Florissant Fire Protection District	Hale Fire & Rescue Dept.
Park County Sheriff's Office								D, SC	>M, SC	
Platte Canyon Fire						W, SC				
Platteville Police										
SLV Area Fire Departments	M, SC									
SLV EPR Alamosa										
South Park Ambulance								M, SR		
Southeast Colorado Hosptial										
Southwest Teller County EMS										
St. Francis, KS Volunteer Fire Dept.										>M, P
Stanton County KS EMS										
Stanton County KS Hosptial										
Surgarloaf Fire										
Teller County Fire Agencies									M, SC	
Teller County SAR									>M, O	
Teller County Sheriff's Office									M, SC	
Thornton										
Thornton Fire										
Timberline Fire		M, SC								
Two Buttes Fire Department										
United States Forest Service	M, SR								>M, SC	
United States Park Service									>M, O	
Upper Huerfano Fire Protection District										
Ute Pass Ambulance										
Ute Pass Regional EMS									W, SC	

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Alamosa Fire Department	Black Hawk Police Department	Chaffee County Search and Rescue - North	City of Boulder	Crested Butte Marshal's Department	Elk Creek Fire District	Evergreen Fire Rescue	Fairplay Police Department	Florissant Fire Protection District	Hale Fire & Rescue Dept.
Vernon Volunteer Fire Dept.										>M, SC
Victor Fire Dept										
Vilas Fire Department										
Walsh Fire Department										
Walsh Police Department										
Washington-Yuma Communications Center										>M, SC
Weld County Regional Communications Center										
Weld County Sheriff										
West Metro Fire							>M, P			
Westminster Fire Department										
Yuma County Sheriff's Office										M, SC

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	North Metro Fire Rescue	Ouray County	Saguache Public Health	SLV RETAC	Southwest Teller County EMS	Timberline Fire Protection District	Town of Frederick	Upper Huerfano Fire Protection District	Ute Pass EMS	Victor Volunteer Fire Department
4-Mile Fire Protection District					W, P					>M, SC
Adams County Fire	W, SC									
Adams County Sheriff										
Alamosa Police										
Alma Marshals Office										
Armel Volunteer Fire Dept.										
Arvada										
Baca County Sheriff's Office										
Black Hawk Fire Department						W, SC				
Boulder County Sheriff										
Brighton Fire	M, SC									
Broomfield										
Broomfield Police Department	W, SC									
Central City										
Central City Fire Department						W, SC				
Chaffee County EMS										
Chaffee County Fire										
Chaffee County Search and Rescue - South										
Chaffee County Sheriff										
Clear Creek Fire						>M, SC				
Clear Creek Sheriff Office										
Coal Creek Fire						M, SC				
Colorado Division of Fire Prevention and Control										
Colorado Division of Wildlife										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	North Metro Fire Rescue	Ouray County	Saguache Public Health	SLV RETAC	Southwest Teller County EMS	Timberline Fire Protection District	Town of Frederick	Upper Huerfano Fire Protection District	Ute Pass EMS	Victor Volunteer Fire Department
Colorado State Patrol										
Colorado University (Boulder) Public Safety										
Cripple Creek Fire/EMS					D, P					M, SC
Custer County Fire and EMS								>M, SC		
Dacono Police							D, SC			
Denver										
Divide Fire Protection District					D, G				W, SC	>M, SC
Division of Gaming										
Elk Creek Fire										
Evergreen Fire										
Federal Heights										
Firestone Police							D, SC			
Florissant Fire Protection District					D, P					>M, SC
Foothills Fire										
Ft Lupton Police							W, SC			
Genesee Fire										
Gilpin Ambulance										
Gilpin County										
Golden Gate Fire Department						M, SC				
Green Mtn Falls FD									M, SC	
Gunnison County Sheriff										
Gunnison Police Department										
Highland Rescue										
Huerfano County Fire								M, SC		

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	North Metro Fire Rescue	Ouray County	Saguache Public Health	SLV RETAC	Southwest Teller County EMS	Timberline Fire Protection District	Town of Frederick	Upper Huerfano Fire Protection District	Ute Pass EMS	Victor Volunteer Fire Department
Huerfano Dispatch								D, P		
Idalia Volunteer Fire Dept.										
Indian Hills Fire										
Inter Canyon fire										
Jefferson County SO										
Kirk Volunteer Fire Dept.										
La Veta Fire								>M, SC		
Lake George FPD									M, SC	
Laveta FD/EMS										
Monte Vista Ambulance										
Monte Vista Fire										
Morton County KS EMS										
Morton County KS Hospital										
Mt Crested Butte Police										
Mtn Communities FD									M, SC	
Nederland Fire						M, SC				
North East Teller County FD										
North Fork Fire										
Northeast Teller County Fire									D, SC	
Northglenn										
Northglenn Police Deoartment										
Ouray County Emergency Managment		D, SC								
Ouray County EMS		D, SC								
Ouray County Sheriff		D, SC								

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	North Metro Fire Rescue	Ouray County	Saguache Public Health	SLV RETAC	Southwest Teller County EMS	Timberline Fire Protection District	Town of Frederick	Upper Huerfano Fire Protection District	Ute Pass EMS	Victor Volunteer Fire Department
Park County Sheriff's Office										
Platte Canyon Fire										
Platteville Police							W, SC			
SLV Area Fire Departments										
SLV EPR Alamosa			M, SC							
South Park Ambulance										
Southeast Colorado Hosptial										
Southwest Teller County EMS									M, SC	
St. Francis, KS Volunteer Fire Dept.										
Stanton County KS EMS										
Stanton County KS Hosptial										
Surgarloaf Fire						>M, SC				
Teller County Fire Agencies										
Teller County SAR										
Teller County Sheriff's Office										
Thornton										
Thornton Fire	D, SC									
Timberline Fire										
Two Buttes Fire Department										
United States Forest Service										
United States Park Service										
Upper Huerfano Fire Protection District								W, SC		
Ute Pass Ambulance					W, G					
Ute Pass Regional EMS										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	North Metro Fire Rescue	Ouray County	Saguache Public Health	SLV RETAC	Southwest Teller County EMS	Timberline Fire Protection District	Town of Frederick	Upper Huerfano Fire Protection District	Ute Pass EMS	Victor Volunteer Fire Department
Vernon Volunteer Fire Dept.										
Victor Fire Dept					W, P					
Vilas Fire Department										
Walsh Fire Department										
Walsh Police Department										
Washington-Yuma Communications Center										
Weld County Regional Communications Center							D, P			
Weld County Sheriff							D, SC			
West Metro Fire										
Westminster Fire Department	W, SC									
Yuma County Sheriff's Office										

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Walsh Ambulance Service	Westminster Police Department	Woodland Park Police Department
4-Mile Fire Protection District			
Adams County Fire		W, SC	
Adams County Sheriff			
Alamosa Police			
Alma Marshals Office			
Armel Volunteer Fire Dept.			
Arvada		W, SC	
Baca County Sheriff's Office	D, SC		
Black Hawk Fire Department			
Boulder County Sheriff			
Brighton Fire			
Broomfield		W, SC	
Broomfield Police Department			
Central City			
Central City Fire Department			
Chaffee County EMS			
Chaffee County Fire			
Chaffee County Search and Rescue - South			
Chaffee County Sheriff			
Clear Creek Fire			
Clear Creek Sheriff Office			
Coal Creek Fire			
Colorado Division of Fire Prevention and Control			
Colorado Division of Wildlife			

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Walsh Ambulance Service	Westminster Police Department	Woodland Park Police Department
Colorado State Patrol			
Colorado University (Boulder) Public Safety			
Cripple Creek Fire/EMS			
Custer County Fire and EMS			
Dacono Police			
Denver		**M, P**	
Divide Fire Protection District			
Division of Gaming			
Elk Creek Fire			
Evergreen Fire			
Federal Heights		**W, SC**	
Firestone Police			
Florissant Fire Protection District			
Foothills Fire			
Ft Lupton Police			
Genesee Fire			
Gilpin Ambulance			
Gilpin County			
Golden Gate Fire Department			
Green Mtn Falls FD			
Gunnison County Sheriff			
Gunnison Police Department			
Highland Rescue			
Huerfano County Fire			

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Walsh Ambulance Service	Westminster Police Department	Woodland Park Police Department
Huerfano Dispatch			
Idalia Volunteer Fire Dept.			
Indian Hills Fire			
Inter Canyon fire			
Jefferson County SO			
Kirk Volunteer Fire Dept.			
La Veta Fire			
Lake George FPD			
Laveta FD/EMS			
Monte Vista Ambulance			
Monte Vista Fire			
Morton County KS EMS	W, O		
Morton County KS Hospital	W, O		
Mt Crested Butte Police			
Mtn Communities FD			
Nederland Fire			
North East Teller County FD			
North Fork Fire			
Northeast Teller County Fire			D, P
Northglenn		W, SC	
Northglenn Police Deoartment			
Ouray County Emergency Managment			
Ouray County EMS			
Ouray County Sheriff			

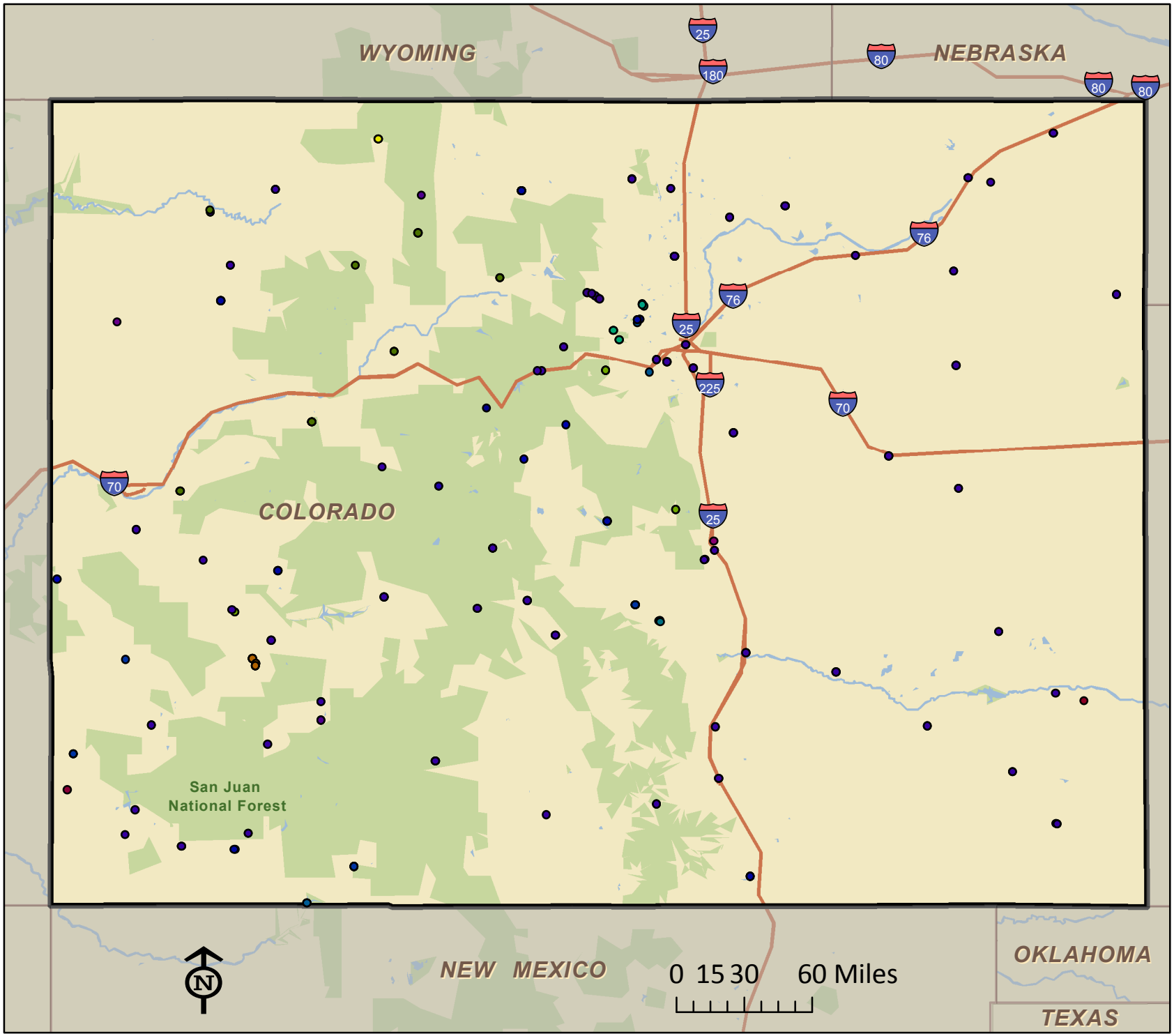
State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Walsh Ambulance Service	Westminster Police Department	Woodland Park Police Department
Park County Sheriff's Office			
Platte Canyon Fire			
Platteville Police			
SLV Area Fire Departments			
SLV EPR Alamosa			
South Park Ambulance			
Southeast Colorado Hosptial	D, SC		
Southwest Teller County EMS			
St. Francis, KS Volunteer Fire Dept.			
Stanton County KS EMS	W, O		
Stanton County KS Hosptial	W, O		
Surgarloaf Fire			
Teller County Fire Agencies			
Teller County SAR			
Teller County Sheriff's Office			
Thornton		W, SC	
Thornton Fire			
Timberline Fire			
Two Buttes Fire Department	D, SC		
United States Forest Service			
United States Park Service			
Upper Huerfano Fire Protection District			
Ute Pass Ambulance			D, P
Ute Pass Regional EMS			

State of Colorado Interoperability Matrix Between Field User Agencies For Agencies that Primarily Use Systems Other Than DTRS	Walsh Ambulance Service	Westminster Police Department	Woodland Park Police Department
Vernon Volunteer Fire Dept.			
Victor Fire Dept			
Vilas Fire Department	D, SC		
Walsh Fire Department	D, SC		
Walsh Police Department	D, SC		
Washington-Yuma Communications Center			
Weld County Regional Communications Center			
Weld County Sheriff			
West Metro Fire			
Westminster Fire Department		>M, SC	
Yuma County Sheriff's Office			

State of Colorado Interoperability Matrix Between Dispatch Centers and Agencies For Agencies that Primarily Use Systems Other Than DTRS	Black Hawk Police Department	City of Cortez	Evergreen Fire	Westminster Police / Fire Department
Adams County Fire				W, MR
ADCOM				D, GW
Arvada Fire				M, GW
Arvada Police				>M, VR
Central City	D, VR			
Clear Creek Fire	M, VR		D, O	
Colorado Division of Gaming	W, CR			
Cortez Fire Department		D, MR		
Cortez Police Department		W, MR		
Dolores Fire Department		D, MR		
Elk Creek Fire				
Foothills Fire			W, O	
Gilpin Ambulance	D, VR			
Gilpin County Sheriff	D, VR			
Intercanyon Fire			W, O	
Lewis Arriola Fire Department		D, MR		
Mancos Fire Department		W, MR		
Mancos Marshal's Office		D, MR		
Montezuma County Sheriff's Department		W, MR		

State of Colorado Interoperability Matrix Between Dispatch Centers and Agencies For Agencies that Primarily Use Systems Other Than DTRS	Black Hawk Police Department	City of Cortez	Evergreen Fire	Westminster Police / Fire Department
Network First				>M, VR
North Fork Fire			W, O	M, GW
NorthMetro Fire Protection District				
Pleasant View Fire Department		D, MR		
Rico Fire Department		>M, VR		
Southwest Memorial Ambulance		D, MR		
Timberline Fire	M, VR			
West Metro Fire			>M, O	

Appendix M, Colorado Fire and Mutual Aid - Sites by VHF Frequency



- 151.145
- 151.28
- 151.34
- 151.37
- 151.4
- 151.43
- 151.445
- 151.46
- 151.475
- 153.875
- 154.28
- 154.74
- 154.755
- 154.845
- 154.905
- 155.01
- 155.025
- 155.13
- 155.19
- 155.295
- 155.31
- 155.34
- 155.475
- 155.505
- 155.58
- 155.7
- 155.73
- 155.775
- 155.895
- 155.91
- 155.925
- 158.91
- 159.09
- 159.105
- 159.24
- 159.45
- 170.325
- 173.075

Appendix N – Detailed Cost Estimates

Table N.1 – Greenfield Site Type I: Flat/Plains

Greenfield Site Type I - Flat/Plains			
Multicast Site Equipment	*Quantity*	*Unit Cost*	*Extended Cost*
6-CH Multicast Equipment	1	$159,000	$159,000
700/800 MHz Antenna System	1	$19,000	$19,000
Site Networking Equipment	1	$13,000	$13,000
Fault Management Equipment	1	$10,000	$10,000
Subtotal			**$201,000**
Microwave Site Equipment	*Quantity*	*Unit Cost*	*Extended Cost*
150Mbps Non-Standby Radio	1	$26,000	$26,000
50Mbps Non-Standby Radio	1	$24,000	$24,000
Service Router for IP/MPLS Solution	1	$12,000	$12,000
Equipment Rack and Accessories	1	$11,000	$11,000
12-Hour, -48VDC Battery System	1	$25,000	$25,000
Dual Polarized Parabolic Antenna	2	$13,000	$26,000
EWP63-59W or EW90 Waveguide	2	$3,000	$6,000
Antenna/Waveguide Accessories	2	$2,000	$4,000
Dehydrator with Full Alarm Package	1	$4,000	$4,000
Subtotal			**$138,000**
FCC Licensing and Coordination	*Quantity*	*Unit Cost*	*Extended Cost*
LMR FCC License Fees	6	$100	$1,000
LMR Frequency Coordination Fees	6	$300	$2,000
LMR Engineering Services Fees	6	$125	$1,000
MW Frequency Coordination Fees	2	$1,000	$2,000
MW FCC License Fees	2	$1,200	$3,000
Subtotal			**$9,000**
Site Development	*Quantity*	*Unit Cost*	*Extended Cost*
12'x24' Shelter with Generator	1	$122,000	$122,000
300' Guyed Tower Structure	1	$198,000	$198,000
Subtotal			**$320,000**
Implementation Services	*Quantity*	*Unit Cost*	*Extended Cost*
PM / Engineering / Installation	30%		$201,000
Subtotal			**$201,000**
Total Infrastructure and Services Cost Estimate			**$869,000**

Table N.2 – Greenfield Site Type II: Mountaintop

Greenfield Site Type II - Mountaintop			
Multicast Site Equipment	*Quantity*	*Unit Cost*	*Extended Cost*
6-CH Multicast Equipment	1	$159,000	$159,000
700/800 MHz Antenna System	1	$19,000	$19,000
Site Networking Equipment	1	$13,000	$13,000
Fault Management Equipment	1	$10,000	$10,000
Subtotal			**$201,000**
Microwave Site Equipment	*Quantity*	*Unit Cost*	*Extended Cost*
150Mbps Non-Standby Radio	1	$26,000	$26,000
50Mbps Non-Standby Radio	1	$24,000	$24,000
Service Router for IP/MPLS Solution	1	$12,000	$12,000
Equipment Rack and Accessories	1	$11,000	$11,000
12-Hour, -48VDC Battery System	1	$25,000	$25,000
Dual Polarized Parabolic Antenna	2	$13,000	$26,000
EWP63-59W or EW90 Waveguide	2	$3,000	$6,000
Antenna/Waveguide Accessories	2	$2,000	$4,000
Dehydrator with Full Alarm Package	1	$4,000	$4,000
Subtotal			**$138,000**
FCC Licensing and Coordination	*Quantity*	*Unit Cost*	*Extended Cost*
LMR FCC License Fees	6	$100	$1,000
LMR Frequency Coordination Fees	6	$300	$2,000
LMR Engineering Services Fees	6	$125	$1,000
MW Frequency Coordination Fees	2	$1,000	$2,000
MW FCC License Fees	2	$1,200	$3,000
Subtotal			**$9,000**
Site Development	*Quantity*	*Unit Cost*	*Extended Cost*
12'x24' Shelter with Generator	1	$174,000	$174,000
100' Self-Supported Tower Structure	1	$283,000	$283,000
Subtotal			**$457,000**
Implementation Services	*Quantity*	*Unit Cost*	*Extended Cost*
PM / Engineering / Installation	35%		$282,000
Subtotal			**$282,000**
Total Infrastructure and Services Cost Estimate			**$1,087,000**

Appendix O - Participation in Interviews, Requests for Information, and Surveys

This appendix lists the agencies, departments, and other organizations that assisted the development of the *Needs Assessment* and *Business Plan* through interviews, surveys, and requests-for-information (RFI's). It lists those agencies that were requested to participate as well as those that did participate.

Interviews:

Agency / Organization Invited	Participated?
OIT/PSCN Management	Yes
OIT Financial Management	Yes
OIT Legislative Liaison	No
DHSEM Management	Yes
DHSEM Financial Management	Yes
DHSEM Legislative Liaison	No
PSCS Officers	Yes
CCNC Officers	Yes
Northwest All Hazards Region Communications Subcommittee	No
Northeast All Hazards Region Communications Subcommittee	Yes
North Central All Hazards Region Communications Subcommittee	No
South Central All Hazards Region Communications Subcommittee	Yes
West All Hazards Region Communications Subcommittee	Yes
Southwest All Hazards Region Communications Subcommittee	No
San Luis All Hazards Region Communications Subcommittee	Yes
South All Hazards Region Communications Subcommittee	Yes
Southeast All Hazards Region Communications Subcommittee	No

Additionally, all user agencies that were invited to participate in the Survey were offered the opportunity to participate in an interview to express any concerns not covered by the Survey. Representatives from the following user agencies participated in such interviews:

- Eagle County
- Pueblo County
- Boulder County
- Larimer County

Requests for Information:

Agency / Organization	Participated?
ADCOM 9-1-1 / Adams County	No

Appendix O - Participation in Interviews, Requests for Information, and Surveys

Boulder County	Yes
Chaffee County	Yes
City of Arvada	Yes
City of Boulder	Yes
City of Denver	Yes
City of Lakewood	Yes
City of Lamar	No
City of Westminster	Yes
Clear Creek County	No
Gilpin County	No
Pitkin County	No
PPRCN	Yes
Teller County	Yes

Surveys:

Invitations to participate in the on-line survey were sent to at least one point of contact within each county in Colorado, each major city in Colorado, and each State-level department that uses the DTRS. The invitation asked the points of contact to forward it to any and all users, dispatchers, technical service representatives, and managers of agencies that use public safety radio systems. The following table is a list of those agencies, including sub-department that participated in the survey. If multiple representatives from an agency responded, they are listed individually. Also listed are indications of the type of participant that took part in the survey (user, dispatcher, technical service, and management) as well as whether they use DTRS or system other than DTRS on a daily basis. Immediately following this table is a list of those departments that were invited to the survey but that did not participate in it.

Needs Assessment and Business Plan Survey Participants				
Index	**Agency Name**	**Sub-Department**	**User Type**	**System**
1	Adams and Jefferson County Hazardous Response Authority	N/A	Management	DTRS
2	Adams County	Office of Emergency Management	Management	Other
3	Adams County School District #14	Transportation	Management	Other
4	Adcom911	N/A	Technical Support	Other

Appendix O - Participation in Interviews, Requests for Information, and Surveys

Needs Assessment and Business Plan Survey Participants				
Index	**Agency Name**	**Sub-Department**	**User Type**	**System**
5	Alamosa County	San Luis Valley Emergency Preparedness and Response	Field User	DTRS
6	Alamosa County Public Health Department	N/A	Management	DTRS
7	Alamosa Police Department	Patrol Division	Field User	DTRS
8	Alamosa Police Department	N/A	Field User	DTRS
9	Alamosa Police Department	Department Head	Management	DTRS
10	Alamosa Fire Department	None	Field User	Other
11	Arapahoe County Public Airport Authority	Centennial airport	Field User	DTRS
12	Arapahoe County Sheriff's Office	Communications	Dispatcher	DTRS
13	Arapahoe County Sheriff's Office	OEM	Field User	DTRS
14	Arapahoe County Sheriff's Office	Telecom Unit	Management	DTRS
15	Baca County Sheriff's Office	Patrol	Field User	DTRS
16	Baca County Sheriff's Office	N/A	Field User	DTRS
17	Baca Crestone Ambulance/Baca Grande Fire Dept.	N/A	Dispatcher	DTRS
18	Bennett Fire Protection District	Admin	Field User	DTRS
19	Bent County OEM	N/A	Field User	DTRS
20	Black Hawk Police Department	PD	Management	Other
21	Black Hawk Police Department	N/A	Management	Other
22	Blanca Police Department	Costilla Co.	Field User	DTRS
23	Boulder County Sheriff's Office	Support Services	Technical Support	Other
24	C & C of Denver	Technology Services	Management	Other
25	Castle Rock Fire and Rescue Department	Operations Division	Field User	DTRS
26	Chaffee County Fire	N/A	Field User	DTRS
27	Chaffee County Office of Emergency Management	Emergency Management	Field User	DTRS
28	Chaffee County Search and Rescue - North	N/A	Field User	Other
29	Chaffee County Sheriff's Office	911 Communications	Dispatcher	DTRS
30	Chaffee County Sheriff's Office	Communications	Dispatcher	DTRS

Appendix O - Participation in Interviews, Requests for Information, and Surveys

Needs Assessment and Business Plan Survey Participants				
Index	**Agency Name**	**Sub-Department**	**User Type**	**System**
31	Cherry Creek School District	Telecommunications	Technical Support	Other
32	City of Arvada	Information Technology	Technical Support	Other
33	City of Boulder	Radio Shop	Technical Support	Other
34	City of Cortez	Communications Center	Dispatcher	Other
35	City of Glendale	Police Department	Technical Support	DTRS
36	City of Pueblo	IT	Technical Support	DTRS
37	Clear Creek Sheriff's Office	Radio	Technical Support	Other
38	CO Division of Fire Prevention and Control	Northeast Region	Management	Other
39	Colorado Department of Public Safety	Division of Homeland Security and Emergency Management	Field User	DTRS
40	Colorado Department of Public Safety	Division of Homeland Security and Emergency Management	Field User	DTRS
41	Colorado Department Of Transportation	TSM&O	Field User	DTRS
42	Colorado Dept of Public Safety	Colorado State Patrol	Field User	DTRS
43	Colorado DPS	CSP	Dispatcher	DTRS
44	Colorado Parks and Wildlife	Area 16	Field User	DTRS
45	Colorado Parks and Wildlife	Law Enforcement	Field User	DTRS
46	Colorado State Patrol	Alamosa Regional Communications Center	Dispatcher	DTRS
47	Colorado State Patrol	Alamosa Office	Dispatcher	DTRS
48	Colorado State Patrol	Alamosa Regional Communication Center	Dispatcher	DTRS
49	Colorado State Patrol	N/A	Field User	DTRS
50	Colorado State Patrol	Evidence Section	Field User	DTRS
51	Colorado State Patrol	Troop 2A	Field User	DTRS
52	Colorado State Patrol	MCSAP	Field User	DTRS

Appendix O - Participation in Interviews, Requests for Information, and Surveys

Needs Assessment and Business Plan Survey Participants				
Index	**Agency Name**	**Sub-Department**	**User Type**	**System**
53	Colorado State Patrol	Communications	Management	DTRS
54	Colorado State Patrol	Communication Center Alamosa	Dispatcher	DTRS
55	Colorado State Patrol	Castle Rock	Dispatcher	DTRS
56	Colorado State Patrol	Troop 5/C Gunnison	Field User	DTRS
57	Crested Butte Marshal's Department	Patrol	Field User	Other
58	Cunningham Fire District	Operations	Field User	DTRS
59	Del Norte Fire Department	Del Norte Fire Department	Field User	DTRS
60	Denver ARES	Denver CERT	Management	Other
61	DHSEM	DHSEM	Management	DTRS
62	Digitcom Electronics Inc.	San Luis Valley Regional Manager	Technical Support	DTRS
63	Douglas County Sheriff's Office	Radio Shop	Technical Support	DTRS
64	Durango Police Department	Operations	Field User	DTRS
65	Durango Police Department	Chief's Office	Field User	DTRS
66	Elbert County Communications Authority	N/A	Management	DTRS
67	Elbert County Sheriffs Office	Victim Advocates	Field User	DTRS
68	Elbert County Sheriffs Office	Detentions	Field User	DTRS
69	Elk Creek Fire District	N/A	Field User	Other
70	Englewood Fire Department	N/A	Field User	DTRS
71	Evergreen Fire	Dispatch	Dispatcher	Other
72	Evergreen Fire Rescue	Evergreen Fire Rescue	Field User	Other
73	Evergreen Fire Rescue	Administration	Field User	Other
74	Fairplay Police Department	Patrol	Field User	Other
75	Fairplay Police Department	N/A	Field User	DTRS
76	Fairplay Police Department	patrol	Field User	DTRS
77	Fairplay Police Department	N/A	Field User	DTRS
78	Florissant Fire Protection District	Florissant FPD	Field User	Other
79	Foothills Fire Protection District	Fire Department	Management	DTRS
80	Fremont County	Emergency Management	Management	DTRS

Appendix O - Participation in Interviews, Requests for Information, and Surveys

Needs Assessment and Business Plan Survey Participants				
Index	**Agency Name**	**Sub-Department**	**User Type**	**System**
81	Garfield County Emergency Communications Authority	Technical Operations and DTR System Administration	Technical Support	DTRS
82	Grand County	Grand County ETSA and East Grand Fire District	Management	DTRS
83	Grand Junction Police Department	Grand Junction Regional Communication Center	Dispatcher	DTRS
84	Grand Junction Police Department	Special Units	Field User	DTRS
85	Grand Junction Police Department	Patrol	Field User	DTRS
86	Grand Junction Police Department	Grand Junction Regional Comm. Center	Management	DTRS
87	Grand Junction Regional Communications Center	911/City of Grand junction	Technical Support	DTRS
88	Great Sand Dunes National Park	VRP	Field User	DTRS
89	Green Mtn Falls/Chipita Park FPD	N/A	Field User	DTRS
90	Gunnison County	Coroner	Field User	Other
91	Hale Fire & Rescue Dept.	Hale Fire & Rescue Dept.	Field User	Other
92	Hinsdale County Sheriff's Office	Hinsdale County Sheriff's Office	Management	DTRS
93	Hotchkiss Fire District	N/A	Management	DTRS
94	Huerfano County Communications	Huerfano Emergency Dispatch	Management	DTRS
95	Kiowa Fire Protection District	N/A	Field User	DTRS
96	KRH Consulting	Engineering	Technical Support	Other
97	Lake County Office of Emergency Management	N/A	Management	DTRS
98	Lakewood	Radio Communications Division	Technical Support	Other
99	Lakewood PD	Radio	Technical Support	Other
100	Larimer County	Technical Communications	Technical Support	DTRS
101	Larkspur Fire Protection District	Operations	Field User	DTRS
102	Littleton Fire Rescue	911 Fire Communications	Management	DTRS
103	Littleton Police	Communications/Records	Dispatcher	DTRS

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Needs Assessment and Business Plan Survey Participants				
Index	**Agency Name**	**Sub-Department**	**User Type**	**System**
104	Littleton Police Department	Support Services	Field User	DTRS
105	Logan County Sheriff's Office	Patrol	Field User	DTRS
106	Logan County Sheriff's Office	Patrol	Field User	DTRS
107	Longmont Department of Public Safety	911 Communications Center	Technical Support	DTRS
108	Loveland Fire Rescue Authority	Fire	Field User	DTRS
109	Loveland Fire Rescue Authority	Operations	Field User	DTRS
110	Mesa County Sheriff	Law Operations	Technical Support	DTRS
111	Mineral County Public Health	EMT	Dispatcher	DTRS
112	Moffat County	Emergency Management	Field User	DTRS
113	Montezuma County Public Health Department	Emergency Preparedness & Response	Management	DTRS
114	Montezuma County Sheriff's Office	Sheriff's Assistant	Management	DTRS
115	North Central All-Hazards Emergency Management Region	Homeland Security	Management	DTRS
116	North Metro Fire Rescue	Admin	Field User	Other
117	Northeast Colorado Health Department	Emergency Preparedness & Response Program	Field User	DTRS
118	OIT	PSCB	Technical Support	DTRS
119	Ouray County	Emergency Managment	Field User	Other
120	Park County OEM	N/A	Dispatcher	DTRS
121	Pritchett Fire	Pritchett Fire	Field User	DTRS
122	Prowers County OEM	Prowers County Rural Fire	Field User	DTRS
123	Prowers County Sheriff's Office	N/A	Field User	DTRS
124	Prowers County Sheriff's Office	Administration	Management	DTRS
125	Pueblo Cnty. Sheriff's Ofc.	Emergency Svc.'s; Special Operations	Field User	DTRS
126	Pueblo County Sheriffs Office	Emergency Services Bureau	Management	DTRS
127	Rapid Response Paramedic Services, LLC	Special Event	Field User	DTRS
128	Red Creek Volunteer Fire & Rescue	N/A	Field User	DTRS
129	Rio Grande County	Emergency Management	Field User	DTRS

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Needs Assessment and Business Plan Survey Participants				
Index	**Agency Name**	**Sub-Department**	**User Type**	**System**
130	Rio Grande County Sheriff	Rio Grande Search & Rescue	Dispatcher	DTRS
131	Saguache Public Health	EPR	Field User	Other
132	Salida Fire Department	N/A	Field User	DTRS
133	Salida Police Department	Patrol	Field User	DTRS
134	Salida Police Department	Patrol	Field User	DTRS
135	Salida Police Department	N/A	Field User	DTRS
136	San Luis Valley Medical Reserve Corps	N/A	Field User	DTRS
137	Sedgwick County Communication Center	Dispatch	Dispatcher	DTRS
138	SLV Regional All Hazards Coordinator	SLV EOC Chairman	Field User	DTRS
139	SLV RETAC	RETAC	Field User	Other
140	South Metro Fire	MetCom	Dispatcher	DTRS
141	South Metro Fire Rescue Authority	N/A	Management	DTRS
142	Southwest Teller County EMS	EMS	Field User	Other
143	Spanish Peaks Regional Health Center	Emergency Preparedness and Response	Field User	DTRS
144	Springfield Fire Department	Fire	Field User	DTRS
145	Sterling CO Police Department	Patrol	Field User	DTRS
146	Sterling Emergency Communications Center	N/A	Dispatcher	DTRS
147	Sterling Emergency Communications Center	Dispatch	Management	DTRS
148	Sterling Police	N/A	Management	DTRS
149	Teller County	Public Works - Fleet, TCSO - tech support	Technical Support	Other
150	Thornton	9-1-1 Emergency Communications	Management	Other
151	Timberline Fire Protection District	N/A	Field User	Other
152	Town of Fairplay	Police Department	Field User	DTRS
153	Town of Frederick	Frederick Police	Field User	Other
154	Tri-County Health Department	Emergency Preparedness and Response	Field User	DTRS
155	UHFD	N/A	Field User	Other
156	Upper Huerfano Fire Protection District	Fire fighter, EMT	Field User	Other

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Needs Assessment and Business Plan Survey Participants				
Index	**Agency Name**	**Sub-Department**	**User Type**	**System**
157	Ute Pass EMS	Emergency Medical Services 911	Field User	Other
158	Valley-Wide Health Systems, Inc.	HR	Field User	DTRS
159	Vernon Volunteer Fire	N/A	Field User	DTRS
160	Victor Volunteer Fire Department	N/A	Field User	Other
161	Walsh Ambulance Service	Administration	Field User	Other
162	West Metro Fire Rescue	Communication Center	Management	Other
163	Westminster PD	Patrol	Field User	Other
164	Westminster Police	Technical Services	Technical Support	Other
165	Westminster Police Department	Police	Field User	Other
166	Westminster Police Department	Patrol	Field User	DTRS
167	Westminster Police/Fire Department	Communications	Dispatcher	Other
168	Wiggins Rural Fire Protection District	N/A	Field User	DTRS
169	Woodland Park Police Department	Emergency Management	Field User	Other

The following agencies were invited to participate in the survey but did not respond.

- Archuleta County
- City of Aurora
- City and County of Broomfield
- City of La Junta
- City of Montrose
- City of Parker
- City of Ft. Collins
- Cheyenne County
- Colorado Department of Corrections
- Colorado Department of Local Affairs
- Colorado Department of Natural Resources
- Conejos County
- Crowley County
- Custer County
- Denver International Airport
- Dolores County
- Gilpin County
- Jackson County

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- Kit Carson County
- La Plata County
- Las Animas County
- Lincoln County
- Montrose County
- Morgan County
- Otero County
- Philips County
- Pitkin County
- Rio Blanco County
- Routt County
- San Miguel County
- Southern Ute Tribe
- Summit County
- University of Northern Colorado
- Ute Mountain Tribe
- Washington County
- Weld County