

**APPENDIX E.**  
**RESEARCH PAPER: TRANSPORTATION PROVIDER  
SERVICE COVERAGE IN DISADVANTAGED AREAS IN  
COLORADO**

# Transportation Provider Service Coverage in Disadvantaged Areas in Colorado

*Prepared for*  
Colorado Department of Transportation



*Prepared by:*



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# 1. INTRODUCTION

This study was completed on behalf of the CDOT Social Impact and Equity subcommittee, one of six committees participating in the CDOT Emerging Mobility Impact Study. The purpose of this study is to identify coverage and gaps in the service area of the statewide transportation providers covered under Senate Bill 19-239. These transportation providers are encompassed in six categories, including TNCs, taxis, peer car share, non-peer car share, car rental, and residential delivery. This gap analysis reveals whether disadvantaged populations in Colorado are adequately served by the transportation providers. The disadvantaged populations are defined as the census tracts within the Colorado counties that have high transit need and propensity as outlined in the Colorado Statewide Transit Plan<sup>1</sup>. The analysis was completed using geospatial analysis and the results lead to conclusions about transportation providers' coverage among disadvantaged populations statewide.

## 2. METHODOLOGY

This study included two main steps, a statewide demographic analysis to determine transit propensity and a statewide transportation provider coverage analysis to determine service area.

### A. Demographic Analysis

The demographic analysis was completed to determine the census tracts in Colorado with disadvantaged populations and transit need and propensity. US Census data was obtained for each census tract in Colorado for the following seven demographic characteristics: people with disabilities, people with limited English proficiency, minority populations, low-income populations, households without vehicles, veterans, and population over the age of 65. These factors were selected because they were used to determine transit propensity in the Colorado Statewide Transit Plan, 2015. This analysis was completed using GIS software and Figure 1a and Figure 1b display the results of this analysis.

The statewide rate for each characteristic was calculated and used as the baseline to determine if each census tract was above or below the statewide rate. The census tracts were sorted into two categories for each statistic, greater than statewide rate and less than statewide rate. The census tracts were assigned a point value of 1 for each characteristic greater than the statewide rate. The census tracts were then ranked on the following scale:

- 5-7 Characteristics Above Statewide Rate = Highest Transit Needs
- 2-4 Characteristics Above Statewide Rate = Higher Transit Needs
- 0-1 Characteristics Above Statewide Rate = Moderate Transit Need

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<sup>1</sup> "Statewide Transit Plan," Statewide Transit Plan § (2015), <https://www.codot.gov/programs/transitandrail/plans-studies-reports/statewidetransitplan/statewide-transit-plan>.

Figure 1a. Compilation of the Transit Need and Propensity Indicators by Census Tract

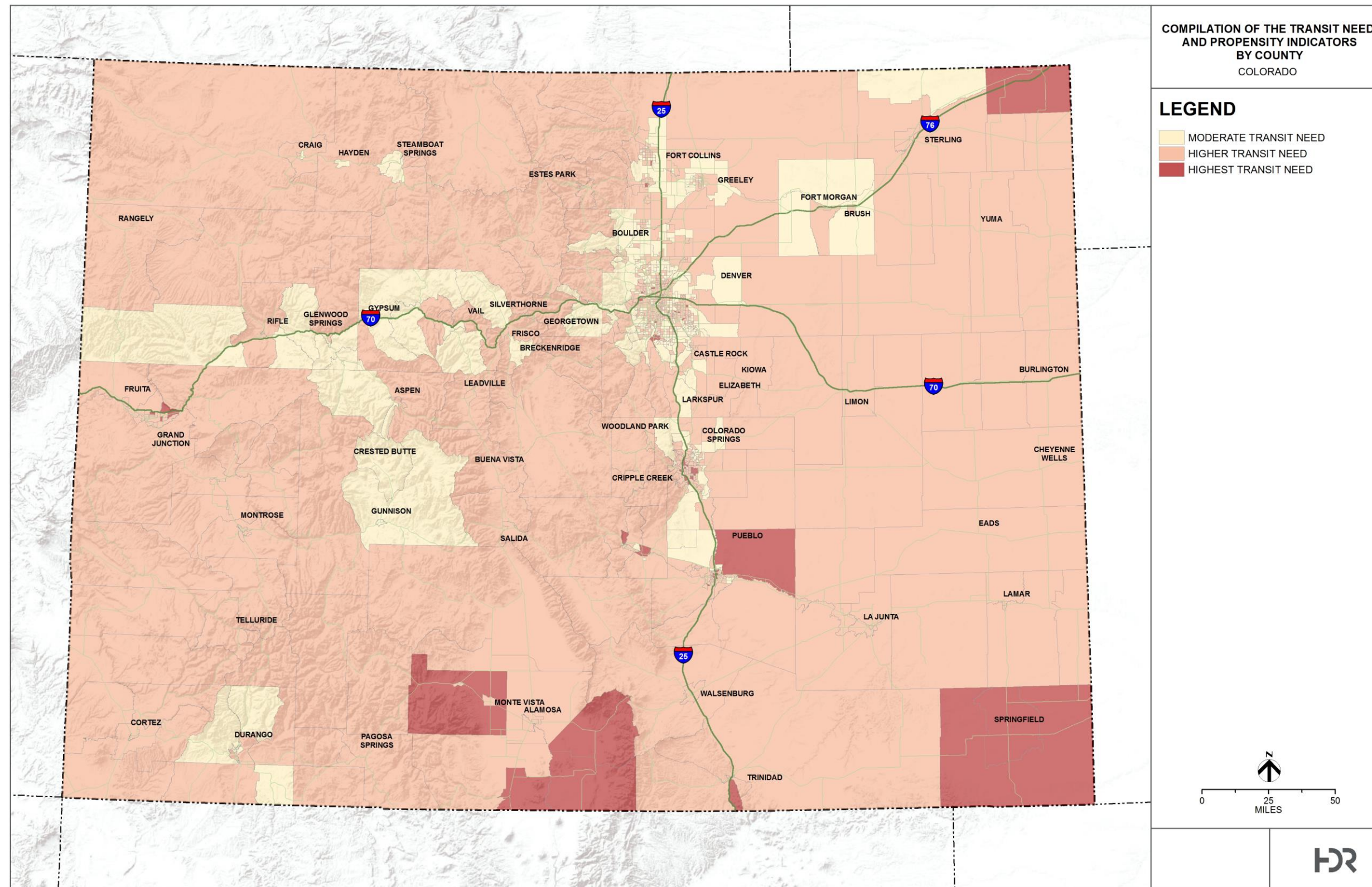
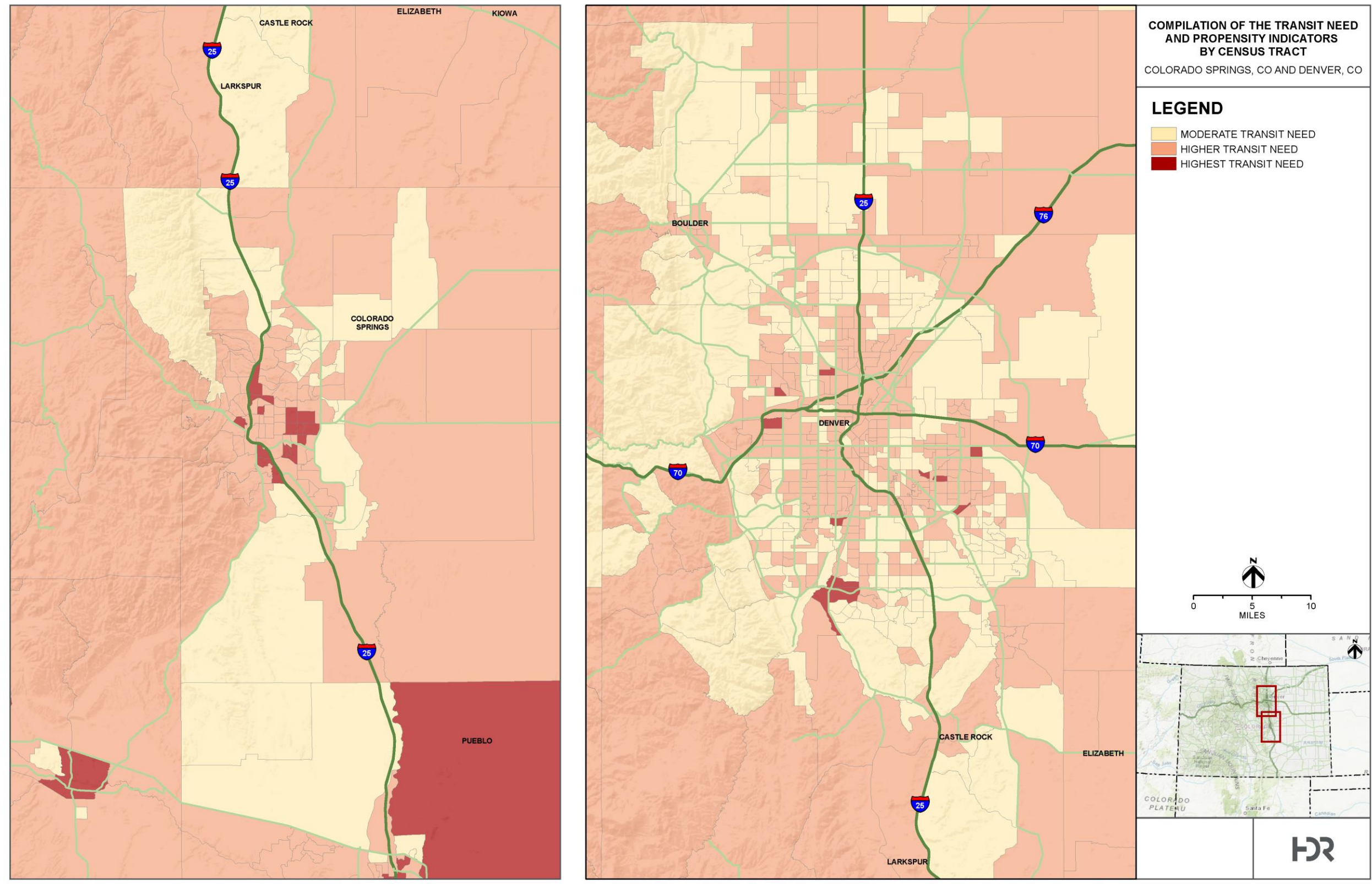


Figure 1b. Compilation of the Transit Need and Propensity Indicators by Census Tract



## B. Transportation Provider Coverage Analysis

The service area of the six categories of transportation providers was determined by researching maps or lists of municipalities included in the service areas on providers' websites, see Appendix A for the source of information. The six transportation providers and examples of the companies are as follows: (Note that additional analysis to include transit service providers will be provided in subsequent drafts of this memo.)

Emerging Commercial Transportation Providers Covered Under Senate Bill 19-239	
TRANSPORTATION NETWORK COMPANY	<ul style="list-style-type: none"><li>• A motor vehicle that is used to provide passenger transportation services purchased through a transportation network company, as defined in section 40-10.1-602 (3)</li><li>• Examples: Uber, Lyft, Hop Skip Drive</li></ul>
PEER CAR SHARE	<ul style="list-style-type: none"><li>• A peer-to-peer car sharing company</li><li>• Examples: Turo, Getaround, Maven, Drift</li></ul>
CAR CLUBS: NON-PEER CAR SHARE	<ul style="list-style-type: none"><li>• A car sharing company that does not use a peer-to-peer business model</li><li>• Examples: Streetcar, ZipCar, Car2Go, eGo, UHaul Car Share, We-Cart by Enterprise Rental Car, Connect by Hertz</li></ul>
TAXI	<ul style="list-style-type: none"><li>• A company that provides taxicab service as defined in Section 40-10.1-101 (19)</li><li>• Examples: Freedom Cabs, Super Shuttle, Curb, Metro Taxi, I am Yellow Cab, Green Taxi Cooperative</li></ul>
CAR RENTAL	<ul style="list-style-type: none"><li>• A motor vehicle that is rented out by a rental car company</li><li>• Examples: Enterprise, Avis, Hertz, Budget, and others</li></ul>
RESIDENTIAL DELIVERY	<ul style="list-style-type: none"><li>• A motor vehicle that is used for residential delivery of goods (under 14,000 lbs. weight vehicle)</li><li>• Examples: Uber Eats, Door Dash, UPS, Fed Ex, restaurant food delivery, package delivery, grocery home deliveries</li></ul>

Some transportation providers listed municipalities included in their service areas while others provided a map on their website. These service areas were coded in GIS, either using the boundary shown on the providers' website with a two-mile buffer or municipal boundaries when a service area map was not available. It should be noted that these service areas are widely varied and unpredictable.<sup>2</sup> A geospatial analysis was completed using GIS software to determine which census tracts in Colorado are served by the transportation providers. Note that some datasets may be incomplete; the data represented herein is the most current available data.

## 3. RESULTS

The analysis revealed that the majority of Colorado census tracts are covered by one or more transportation providers, but coverage is lower for higher transit need and propensity tracts and lowest for the highest transit need and propensity tracts. Service providers that partially covered a census tract were included in the number of transportation providers per census tract, as displayed in Figure 2a and Figure 2b. The results from the geospatial analysis are as follows:

- 10.42% of highest propensity tracts have zero transportation providers (5/48)
- 6.3% of higher propensity tracts have zero transportation providers (67/807)
- 1.02% of moderate propensity tracts have zero transportation providers (4/394)

<sup>2</sup> The Social Impact and Equity Analysis Subcommittee recommended that the service areas be refined as more information comes available.

Figure 2a. Compiled Transportation Provider Locations overlaid on Transit Need

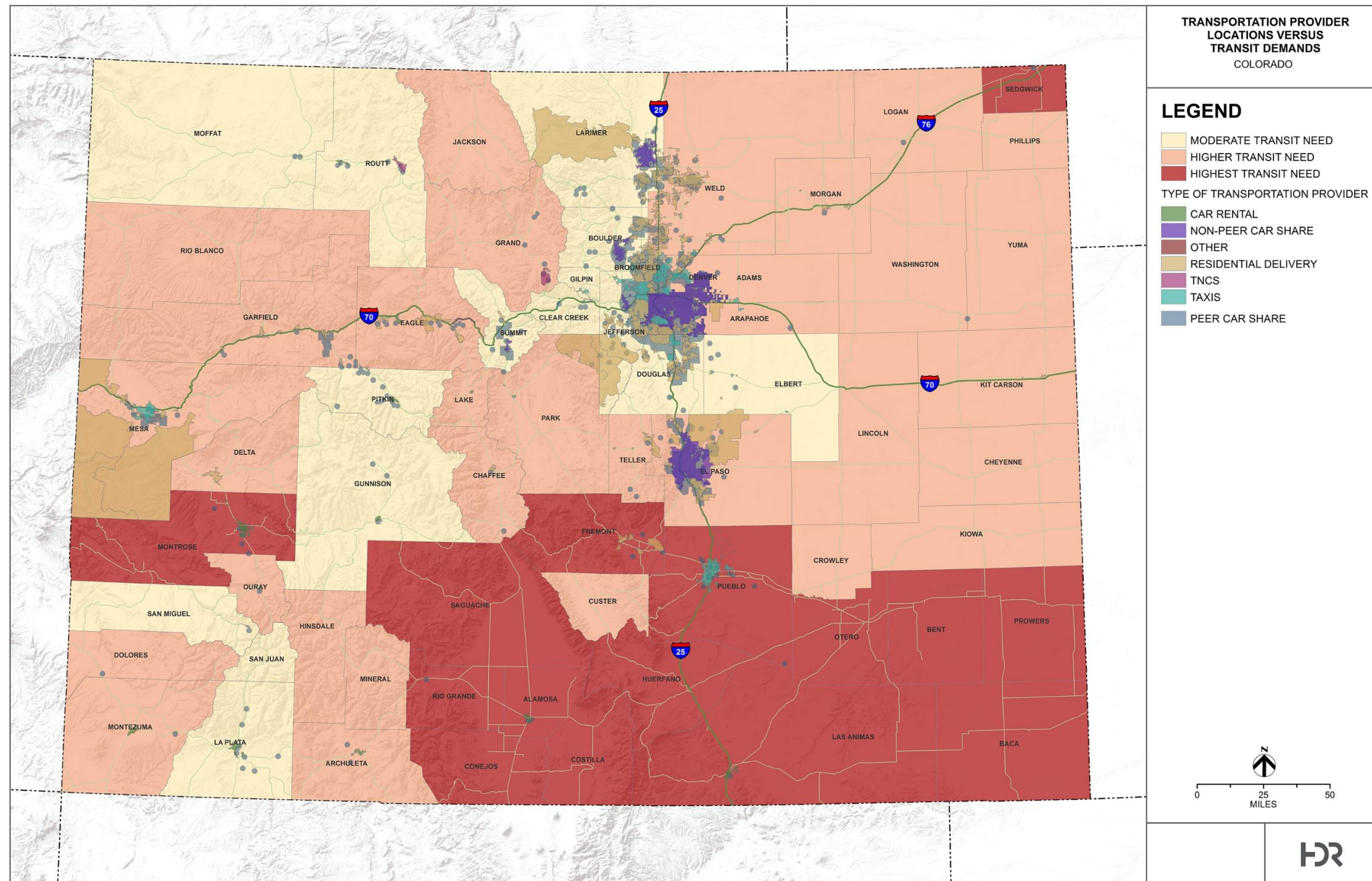
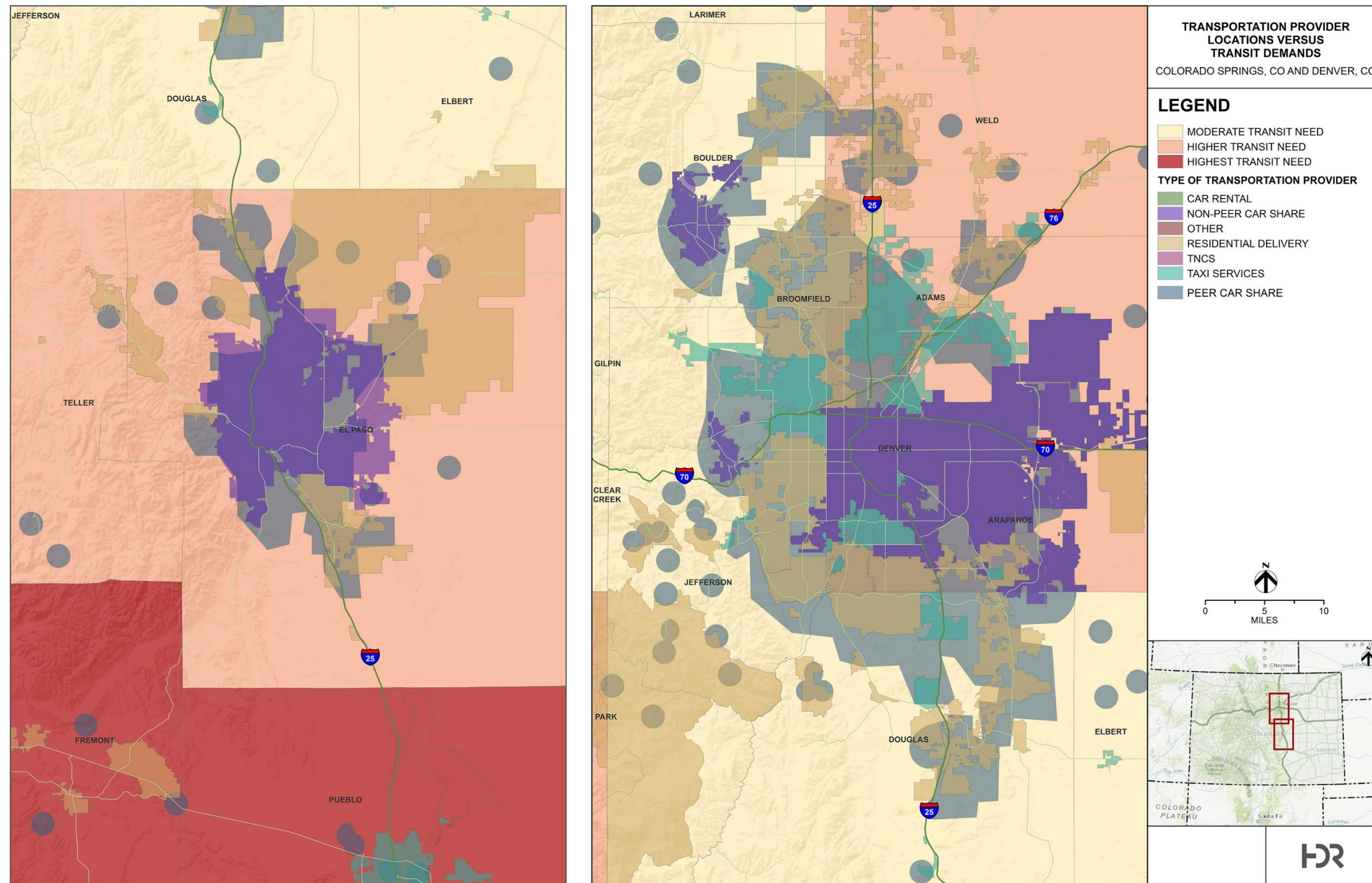




Figure 2b. Compiled Transportation Provider Locations overlaid on Transit Need



The service area coverage varied by transportation provider type. Figure 3 through Figure 8 display the service area coverage by transportation provider type overlaid on census tracts displayed by transit need. Figure 9 through Figure 14 display the service area coverage by transportation provider type overlaid on Transportation Planning Regions (TPR) and Metropolitan Planning Organization (MPO) boundaries.

While the overall service area coverage rate is high, there are some gaps in the service areas. The bulk of the transportation providers' service areas are located along the I-25 corridor, with the highest density seen from Fort Collins/Denver to Colorado Springs. Most notably, these gaps can be seen in the eastern plains and in the northwest quadrant of the state. Transportation providers become increasingly sparse the further from major highways. Areas to the east of I-25 - especially to the east of Peyton, Falcon, Brush and La Junta - have very few transportation provider service areas (approximately five total).

Several outliers were identified that did not follow this pattern of higher concentration of service area coverage in urban as compared to rural areas. The residential delivery services were found in many rural areas throughout the state. There is also a higher concentration of transportation providers, including transportation network companies, in rural areas that can be characterized by tourist attractions or ski resorts. Car rental service areas are concentrated around airports across the state. Peer car share spans more rural census tracts than non-peer car share.

Figure 3a. Car Rental Providers overlaid on Transit Need

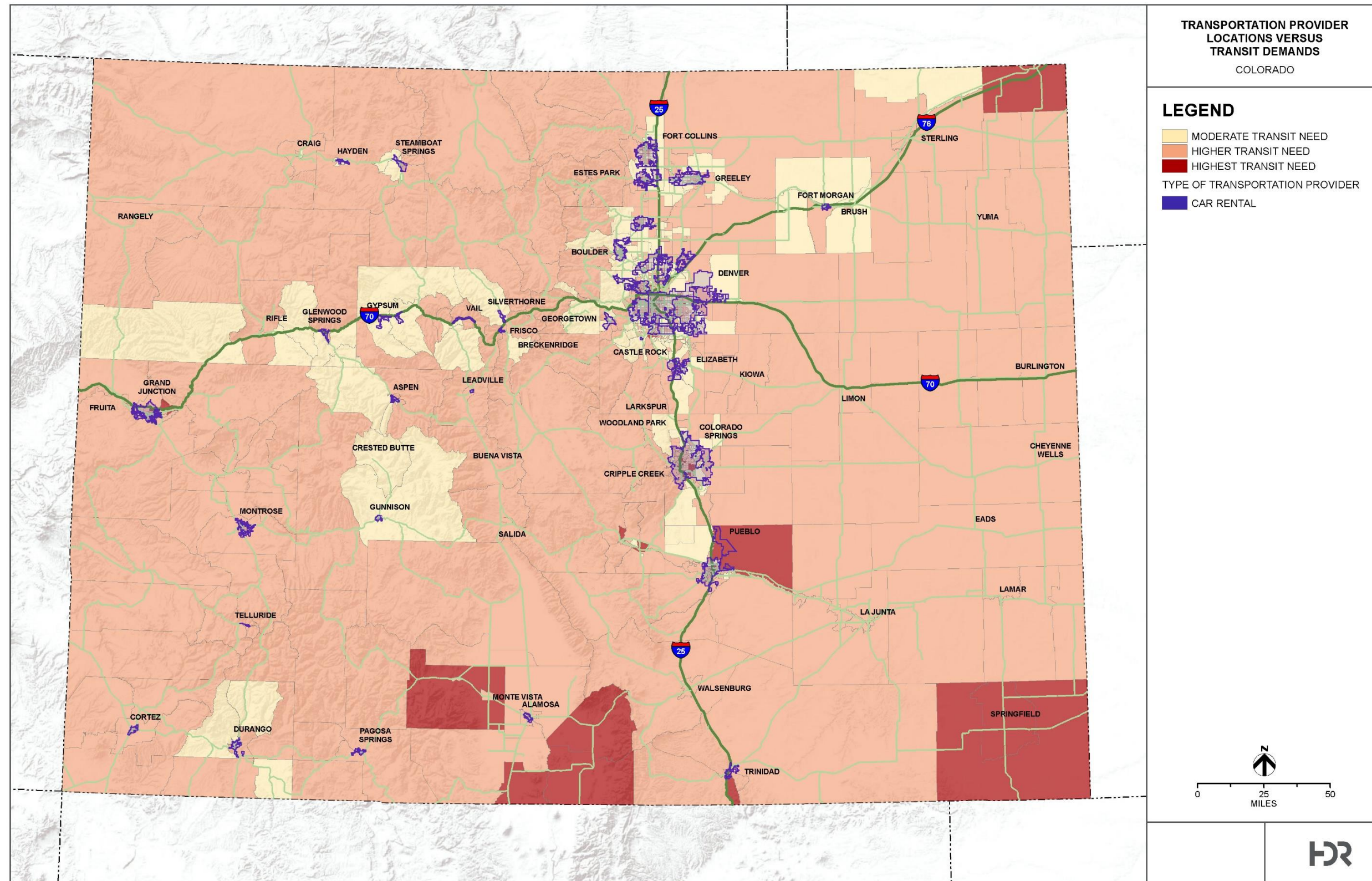


Figure 3b. Car Rental Providers overlaid on Transit Need

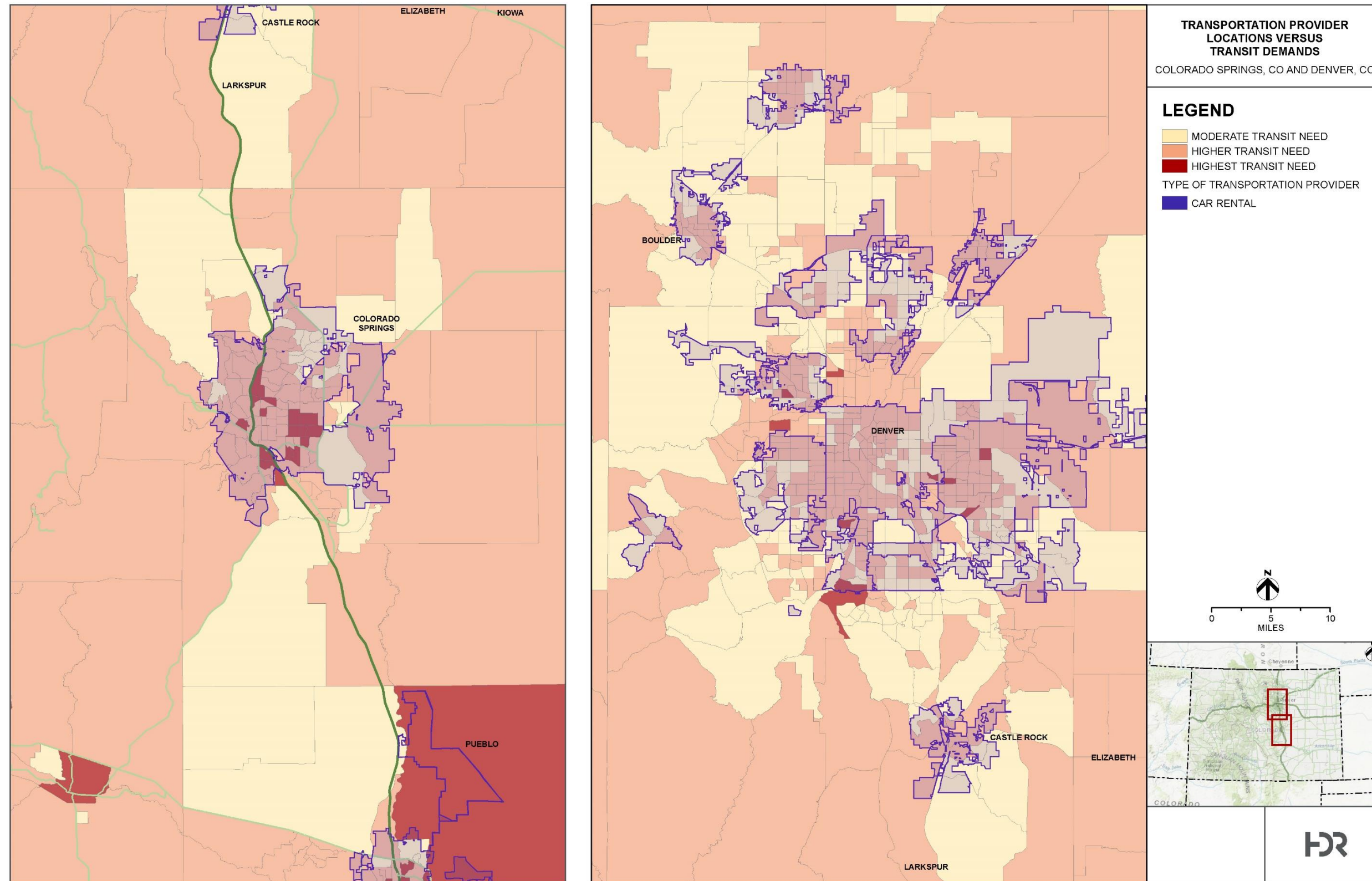


Figure 4a. Non-Peer Car Share Providers overlaid on Transit Need

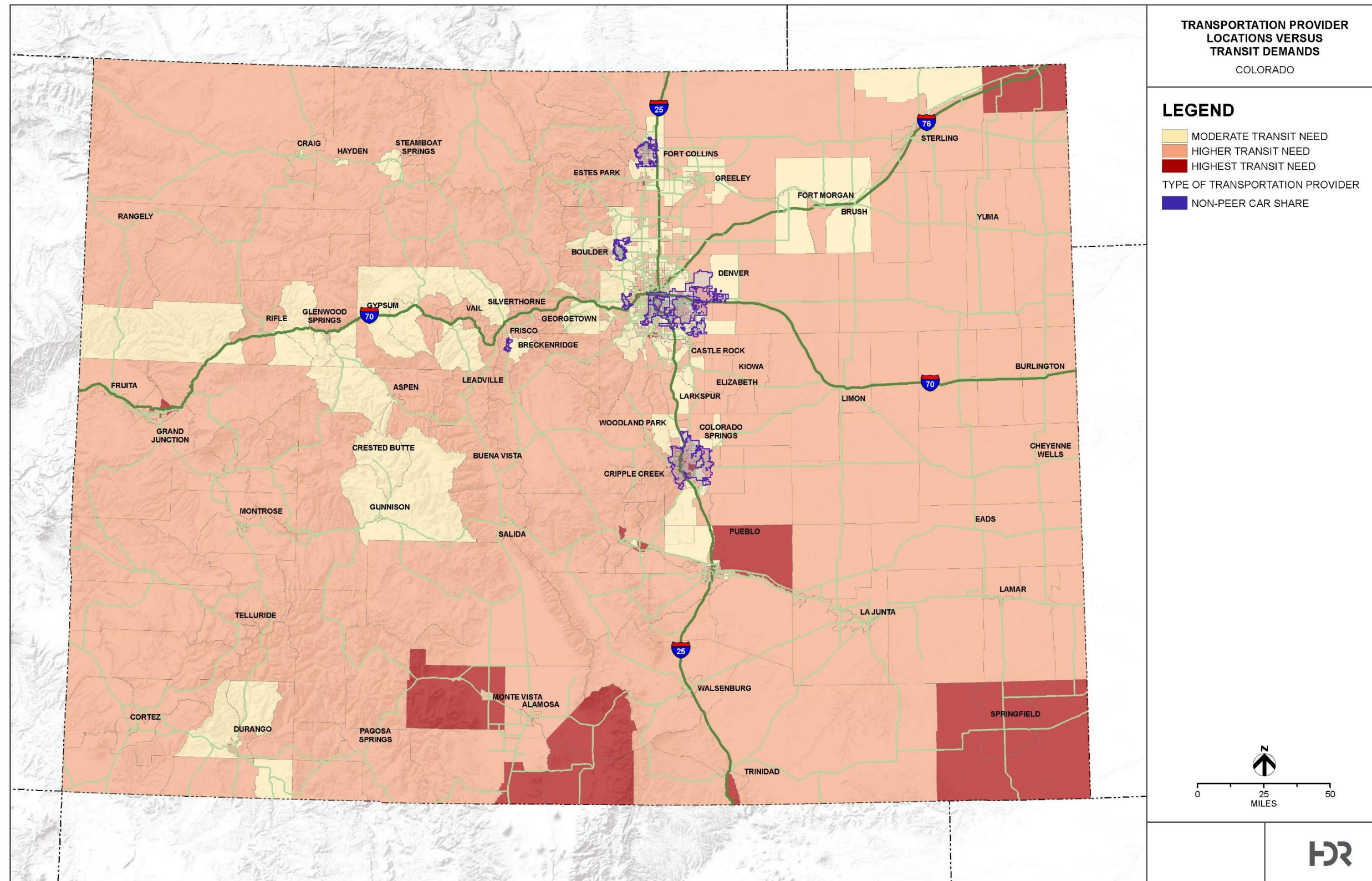


Figure 4b. Non-Peer Car Share Providers overlaid on Transit Need

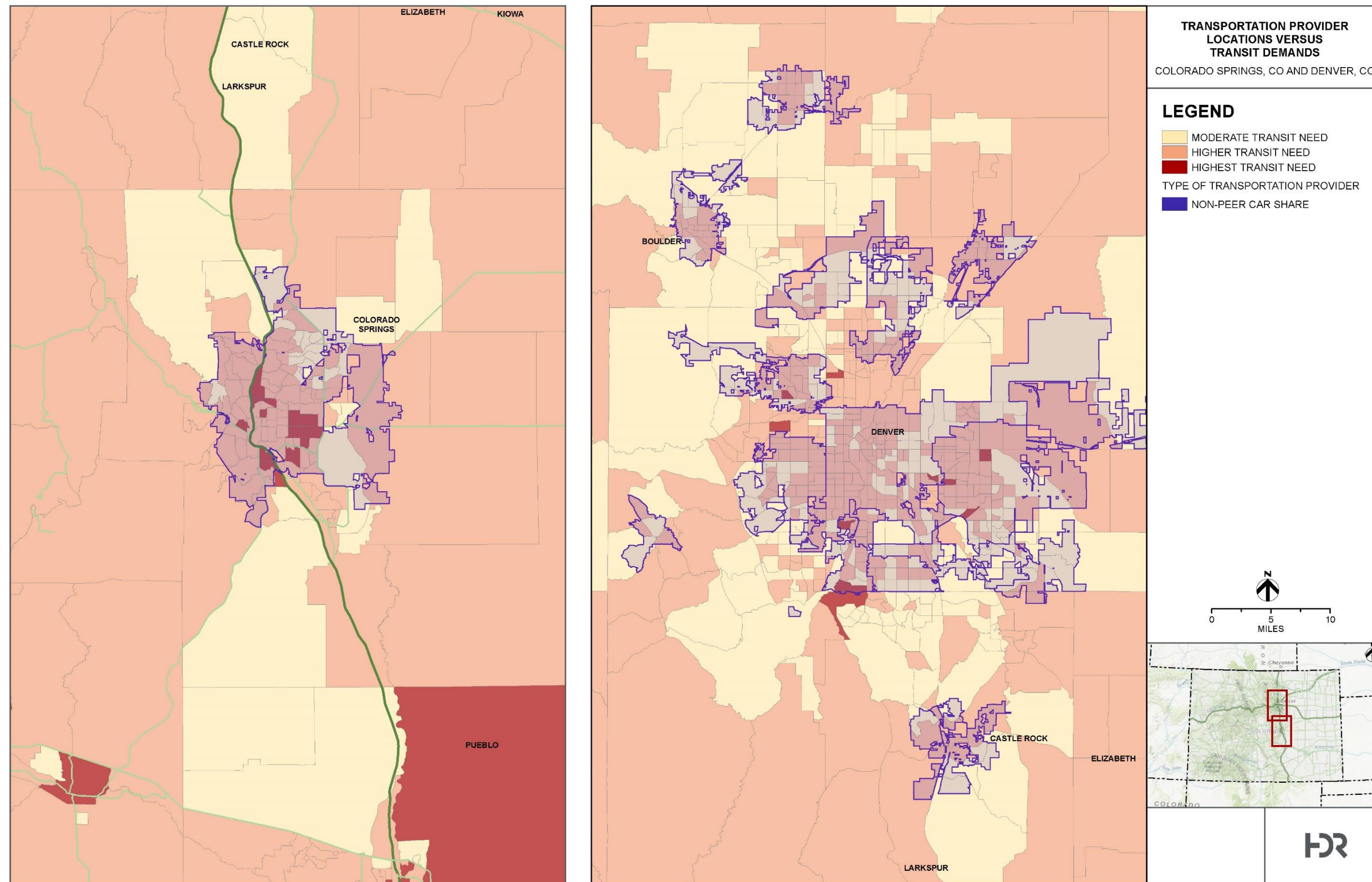


Figure 5a. Peer Car Share Providers overlaid on Transit Need

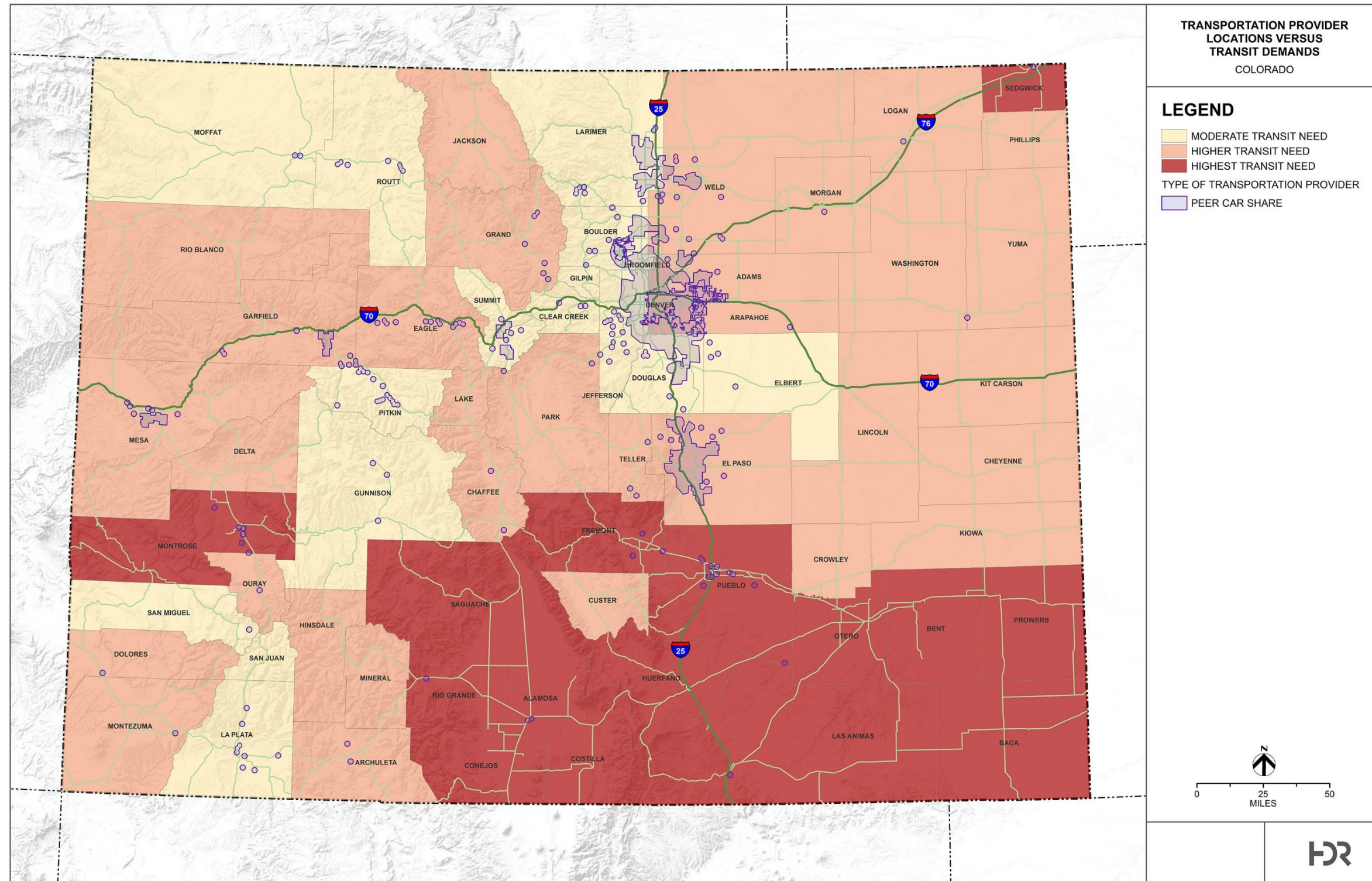


Figure 5b. Peer Car Share Providers overlaid on Transit Need

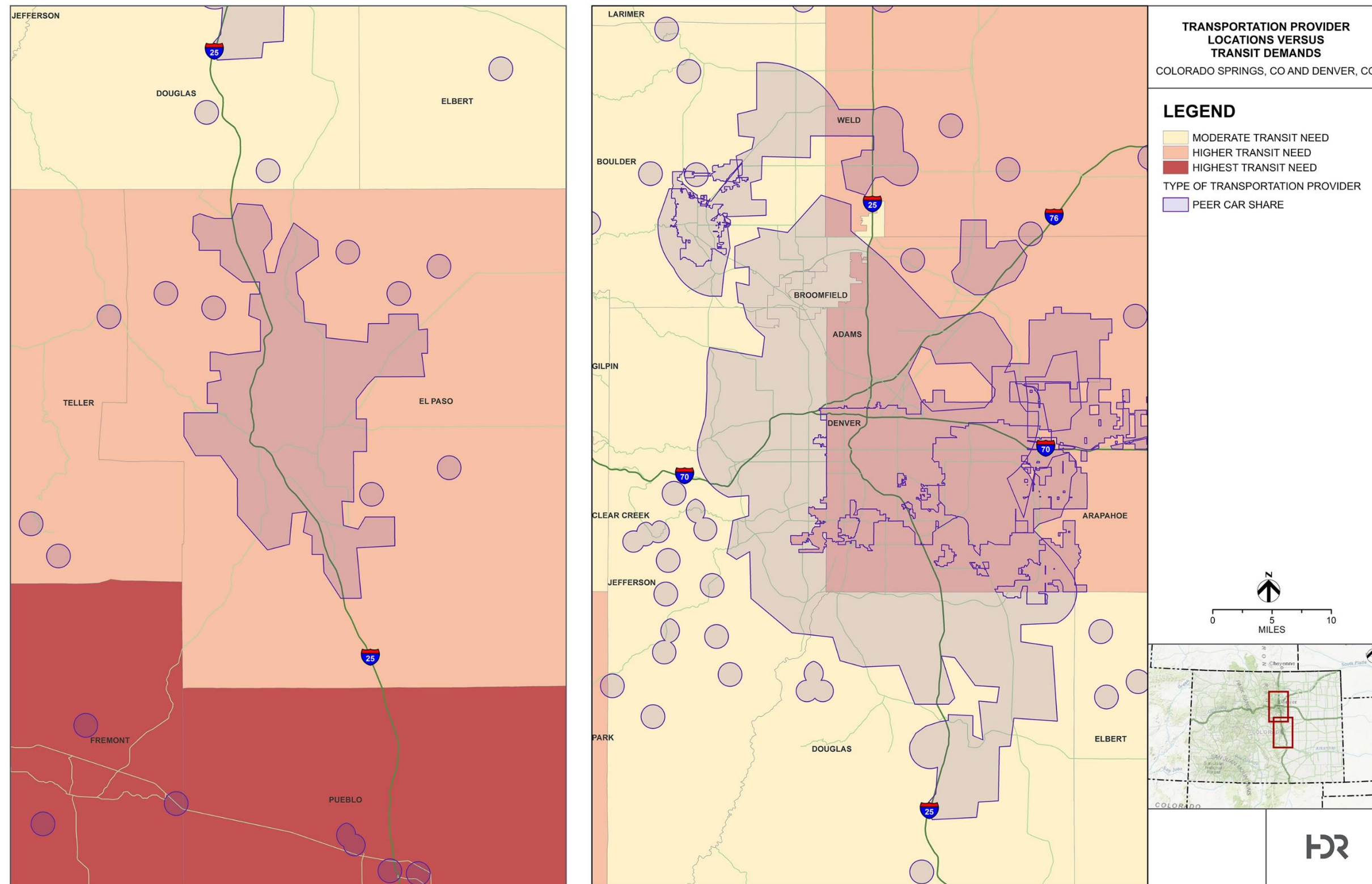




Figure 6a. Residential Delivery Providers overlaid on Transit Need

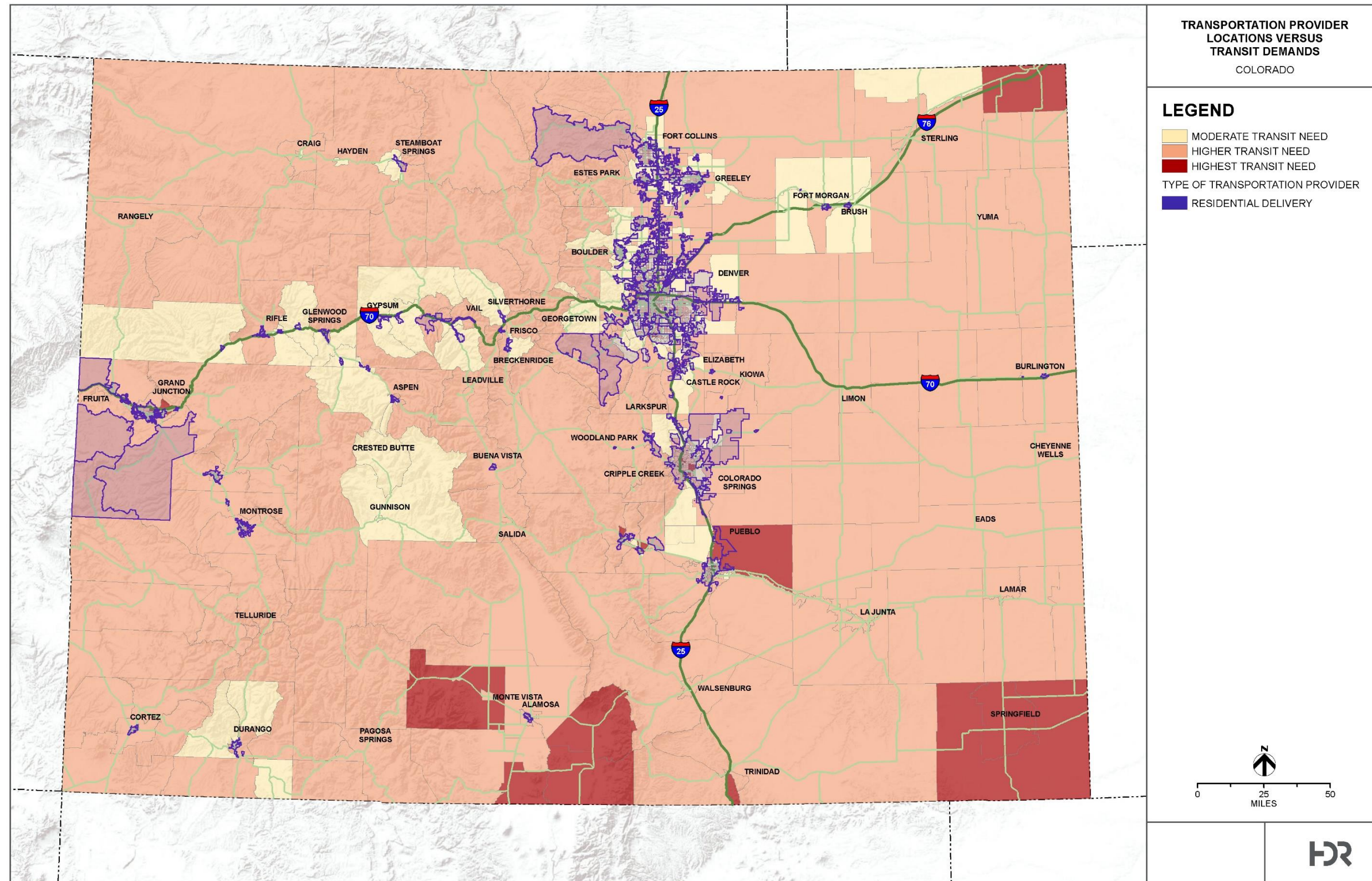


Figure 6b. Residential Delivery Providers overlaid on Transit Need

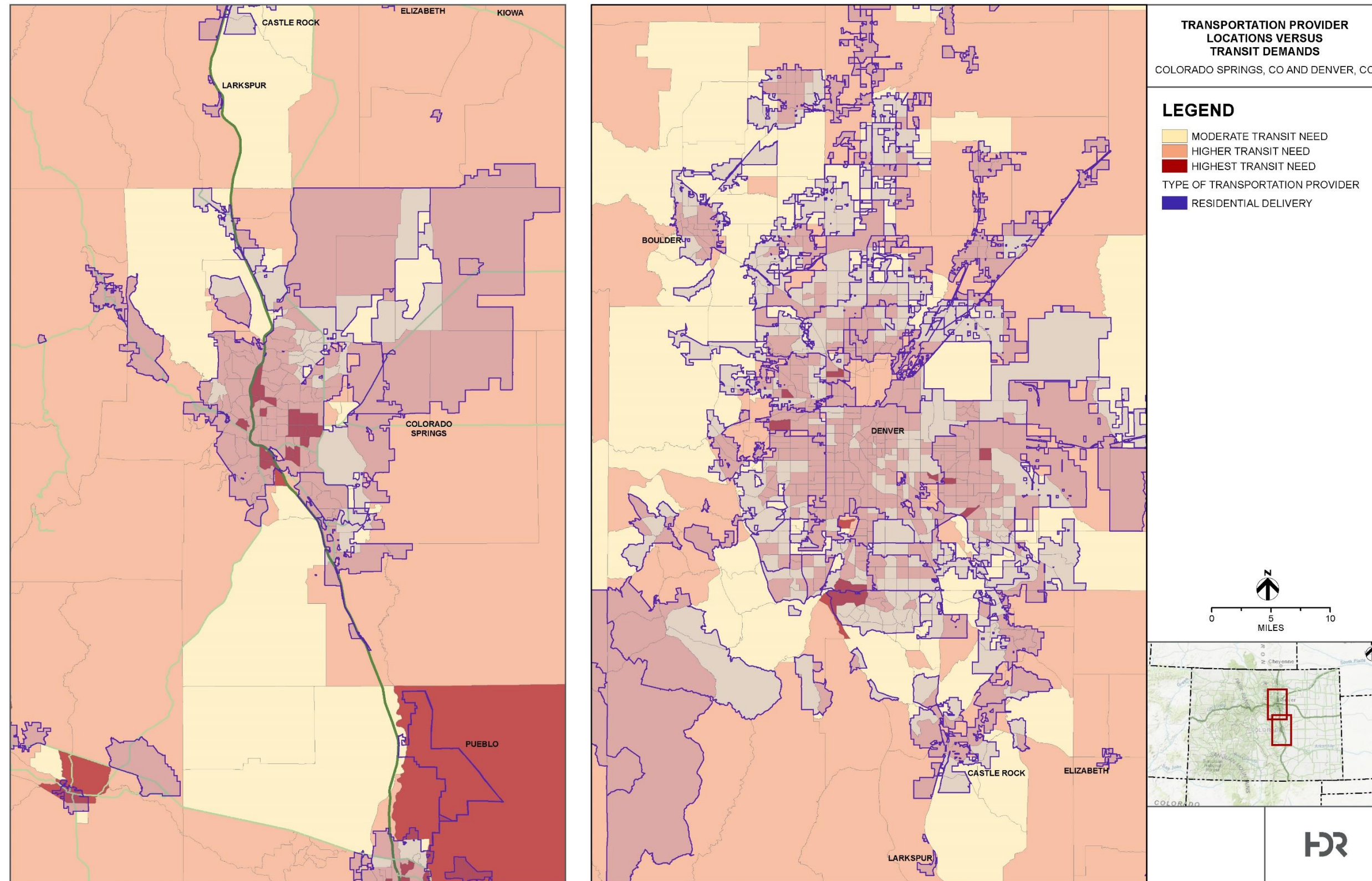


Figure 7a. Taxi Service Providers overlaid on Transit Need

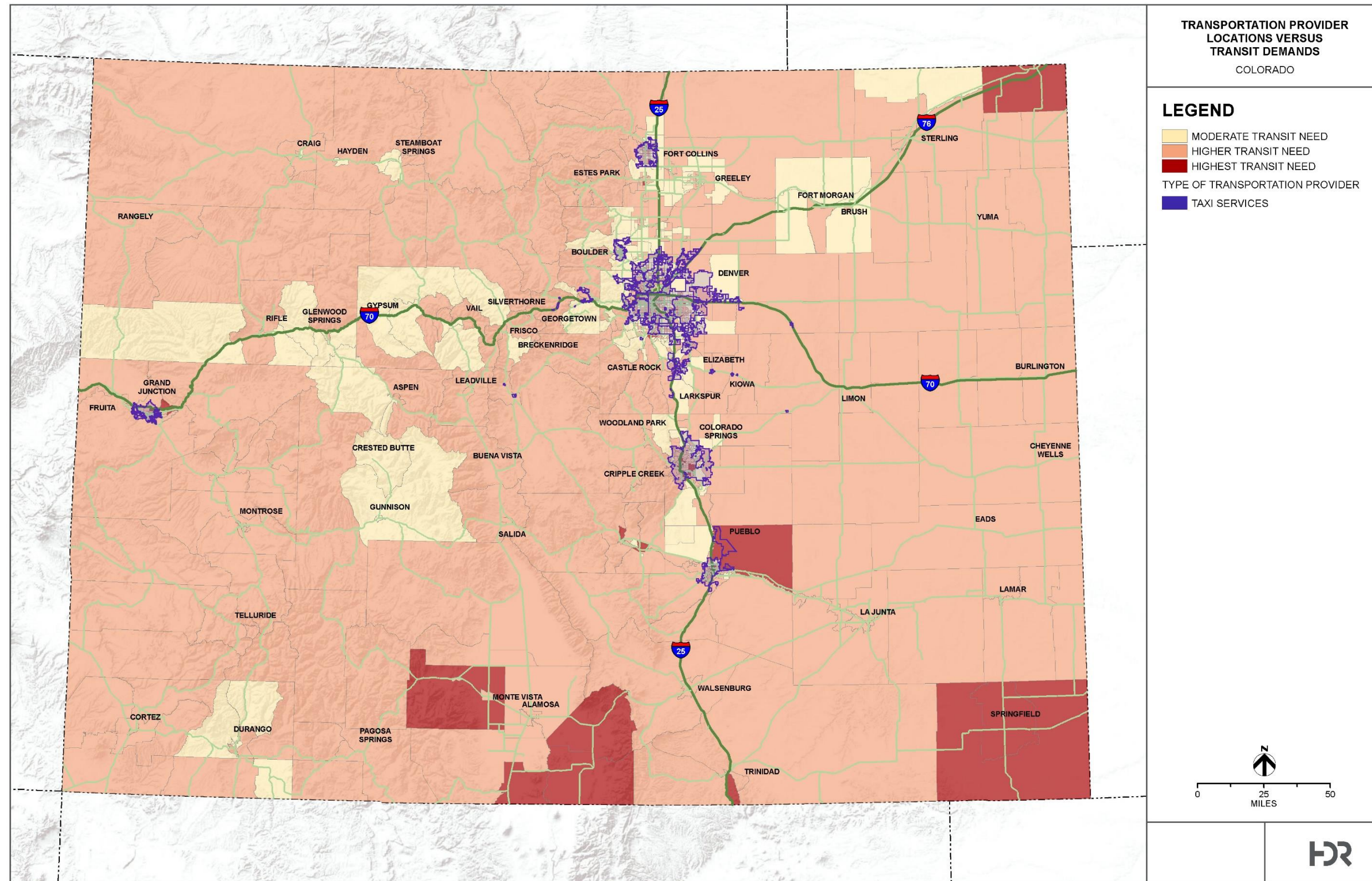


Figure 7b. Taxi Service Providers overlaid on Transit Need

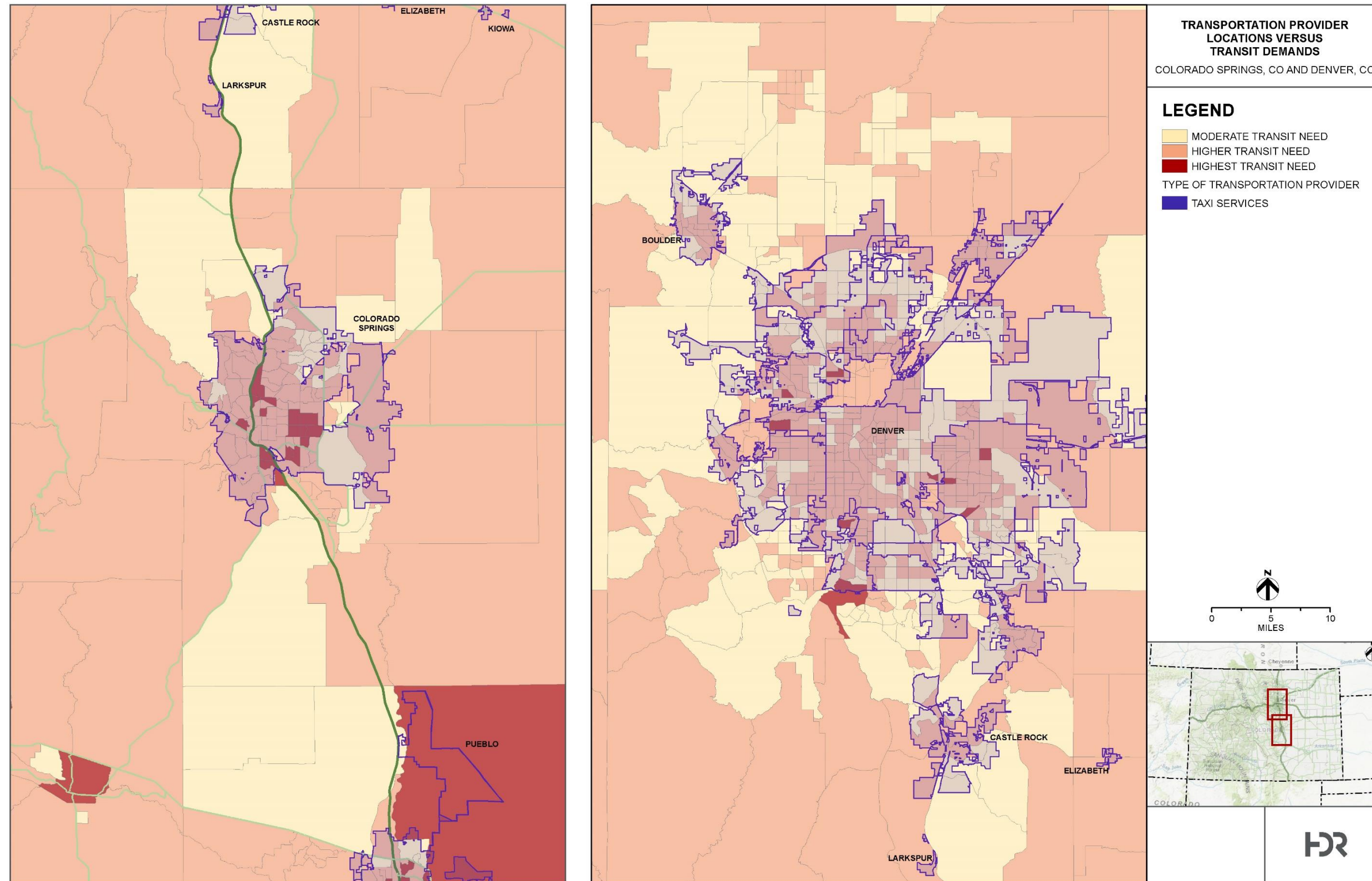


Figure 8a. Transportation Network Companies overlaid on Transit Need

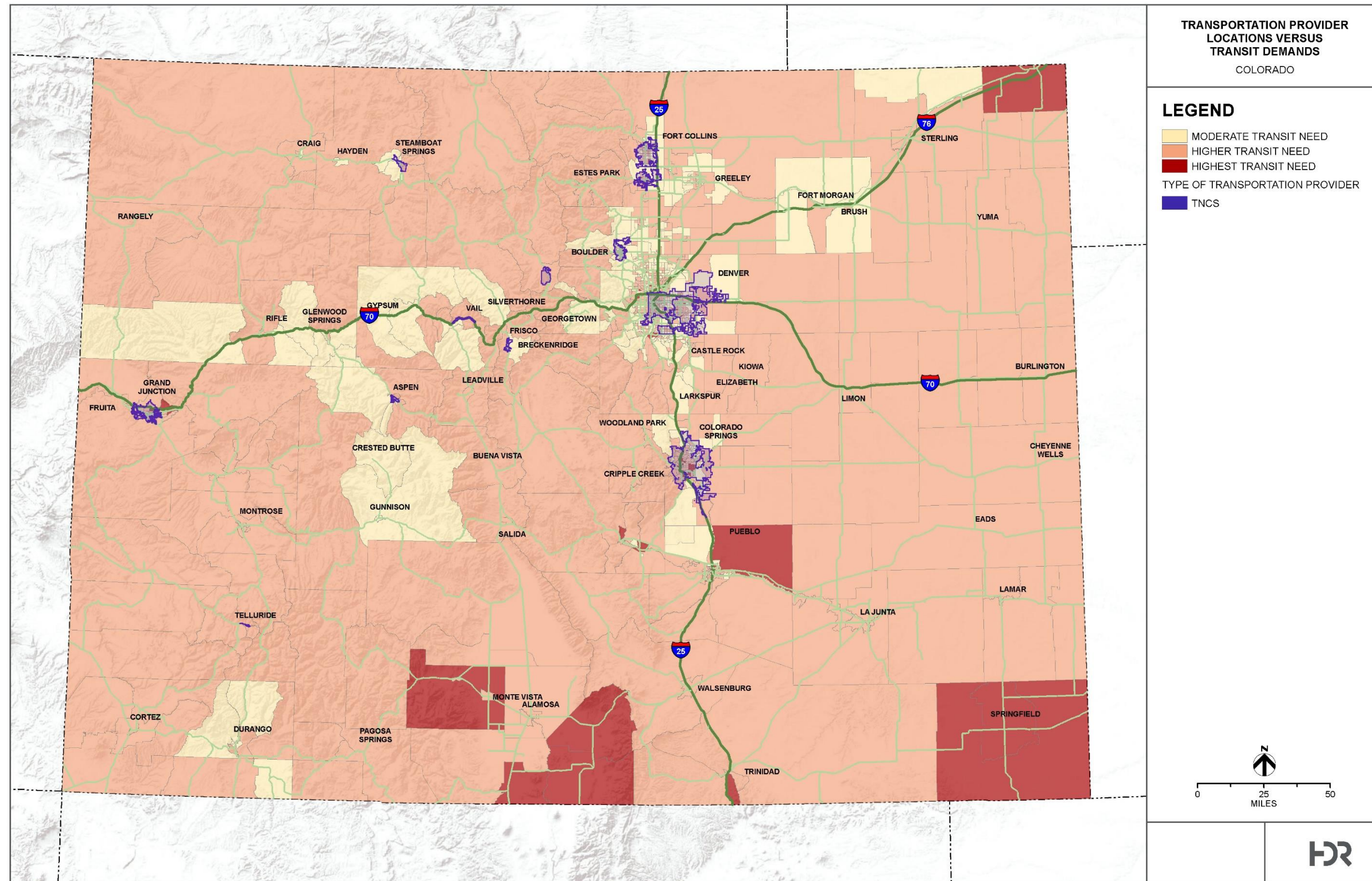


Figure 8b. Transportation Network Companies overlaid on Transit Need

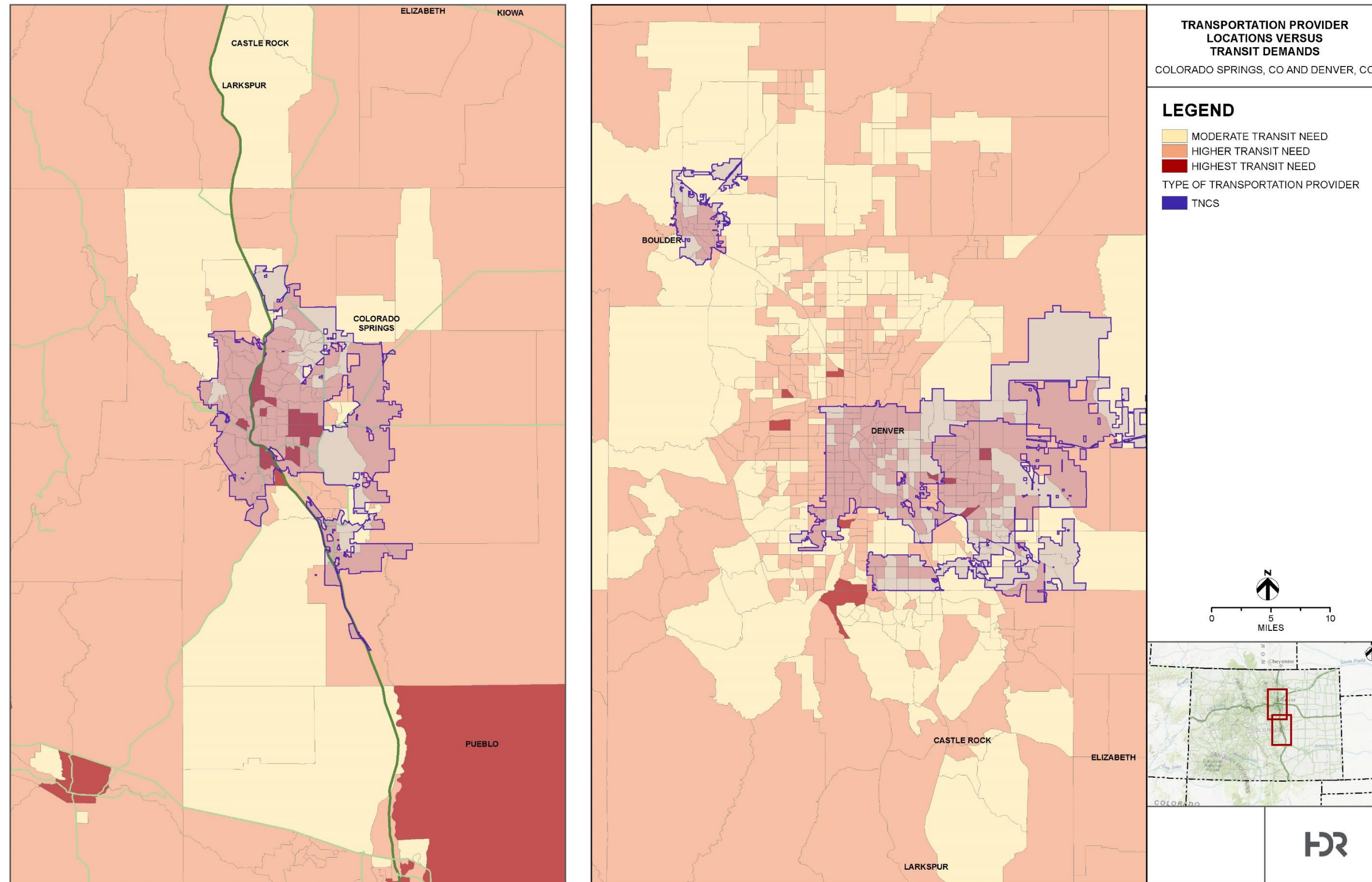


Figure 9. Car Rental Providers overlaid on TPR/MPO Boundaries

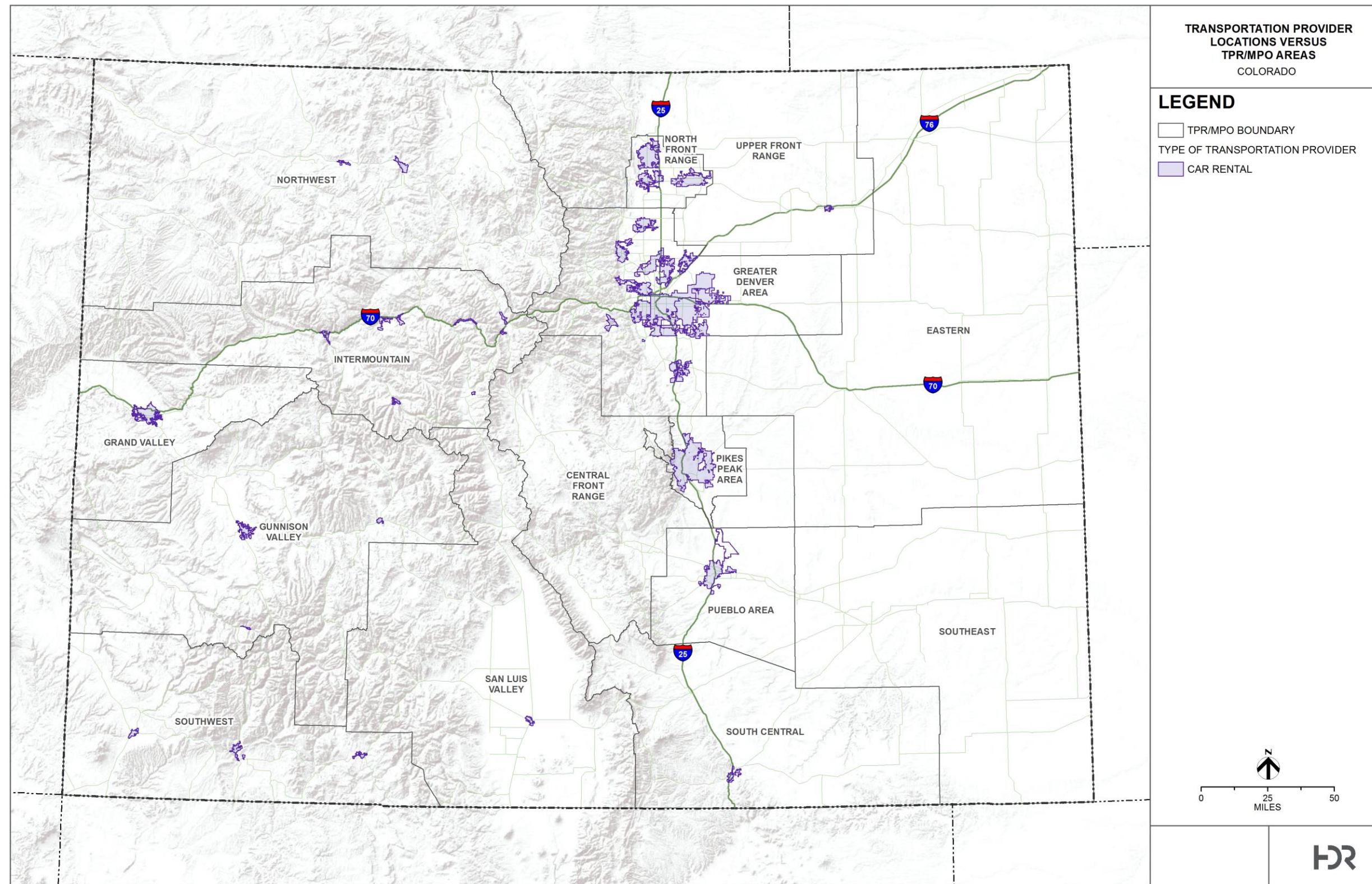


Figure 10. Non-Peer Car Share Providers overlaid on TPR/MPO Boundaries

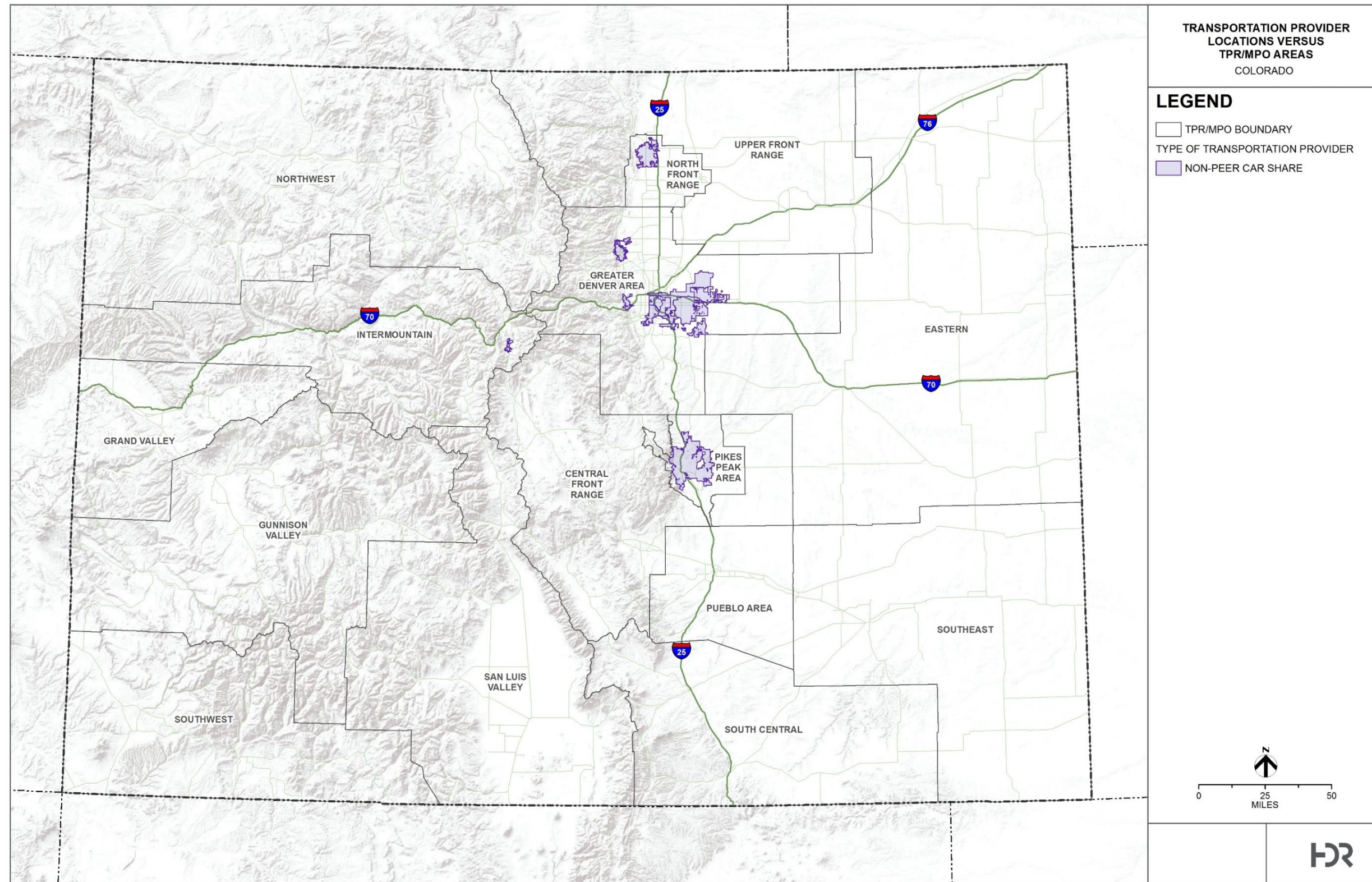




Figure 11. Peer Car Share Providers overlaid on TPR/MPO Boundaries

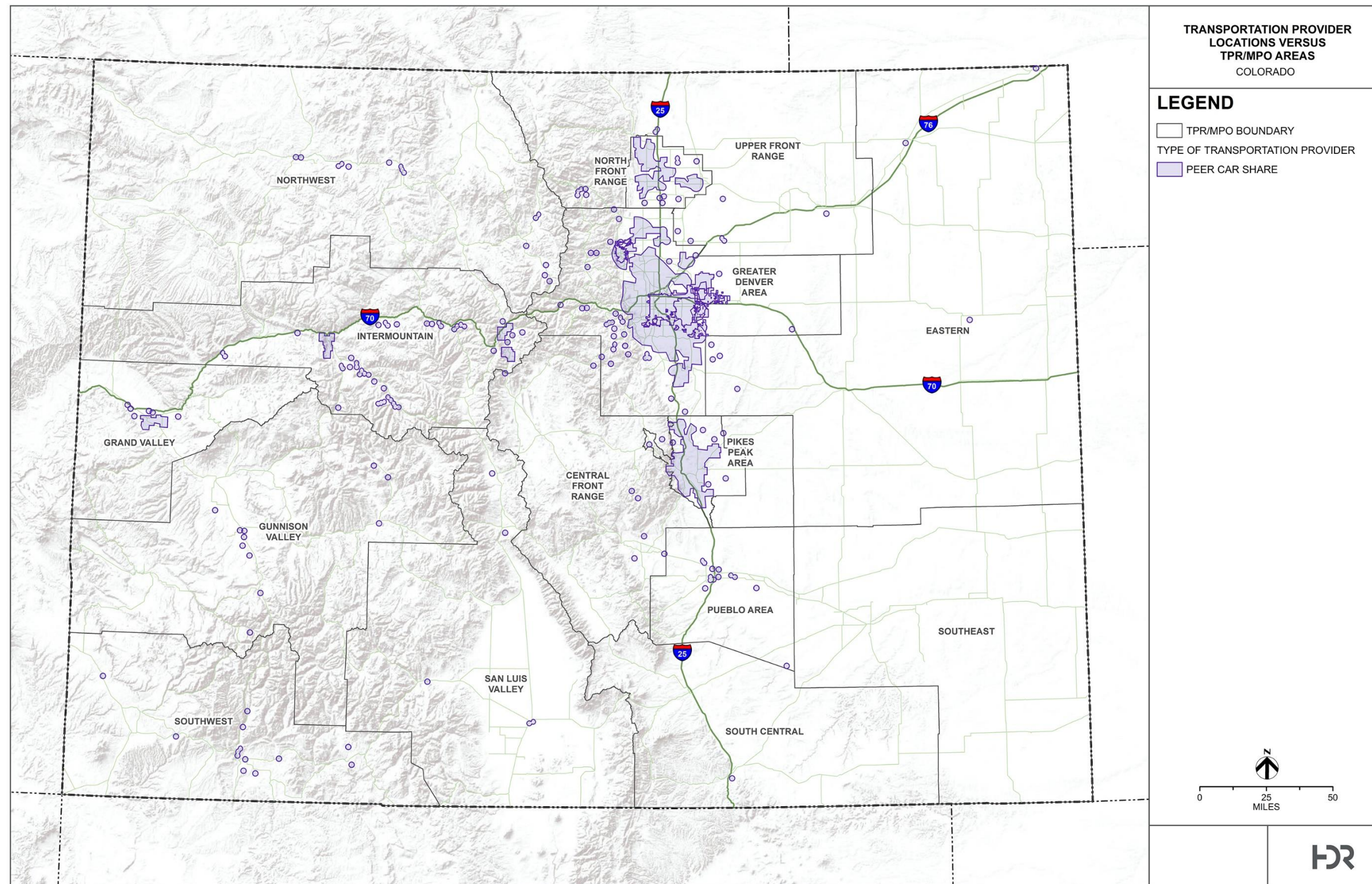


Figure 12. Residential Delivery Providers overlaid on TPR/MPO Boundaries

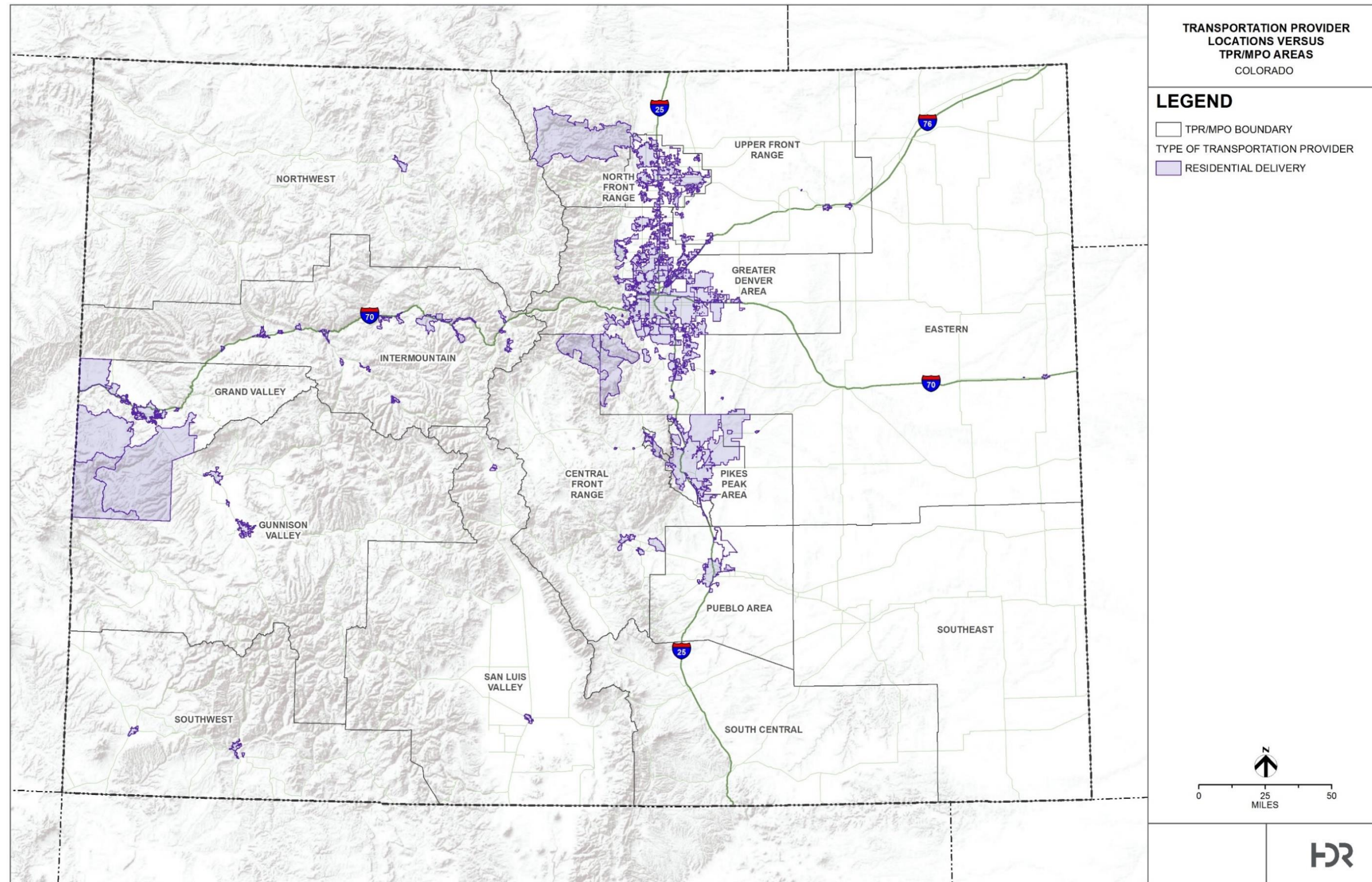


Figure 13. Taxi Service Providers overlaid on TPR/MPO Boundaries

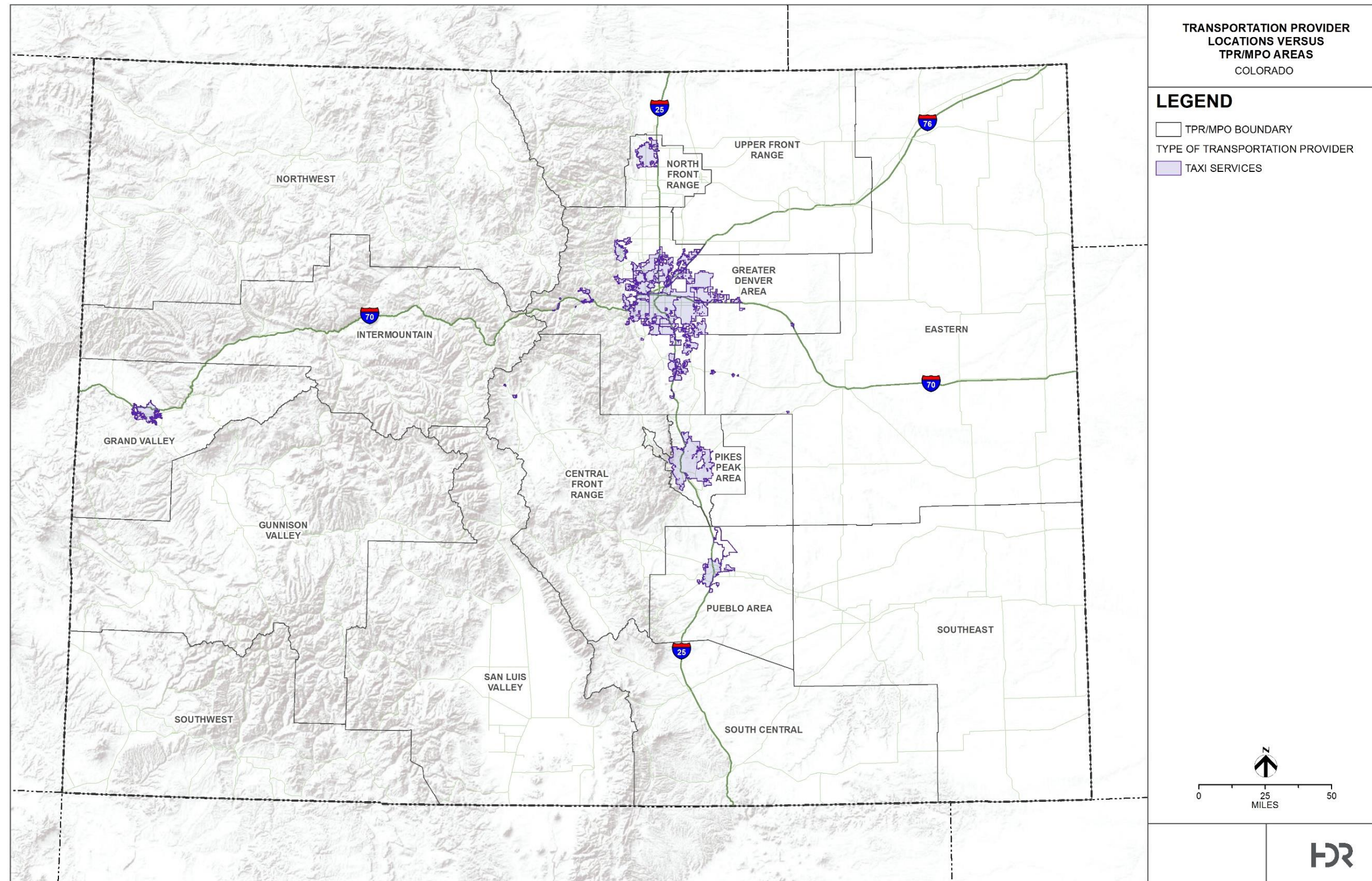
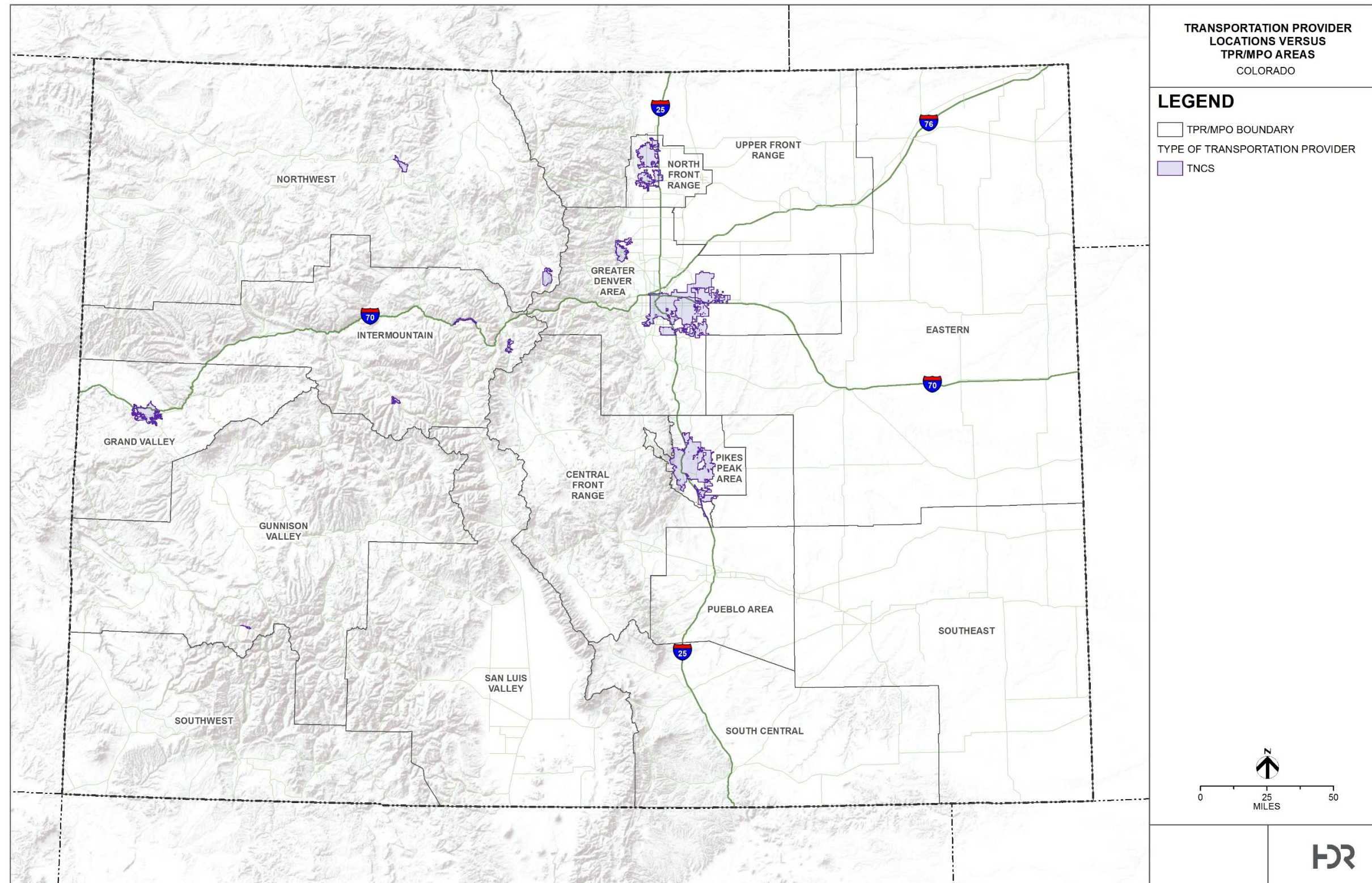


Figure 14. Transportation Network Companies overlaid on TPR/MPO Boundaries



## 4. CONCLUSION

The service areas for the six transportation providers analyzed were not distributed equitably across the state. Disadvantaged communities with higher populations of people with disabilities, people with limited English proficiency, minority populations, low-income populations, households without vehicles, and people over the age of 65 have less access to transportation providers. In addition, rural areas have less access to transportation providers than urban areas. The majority of transportation providers that do provide access in rural areas may be catering to tourists, rather than residents in those areas. This study provides the CDOT Social Impact and Equity subcommittee data and conclusions about coverage and gaps in the service area of the transportation providers covered under CDOT Senate Bill 19-239.

Given the assumptions made in this analysis, it is recommended that the State of Colorado gather additional data sets on number of providers and location of service areas from the different emerging mobility providers. This data could be compared before and after a potential fee structure is implemented to assess the impacts on the vulnerable populations in the State of Colorado.

**ATTACHMENT 1.**  
**TRANSPORTATION PROVIDER COVERAGE**

## Transportation Provider Coverage

#	Provider Name	City or Service Areas	Use Municipality Borders or Service Area?	Source
<b>TNCs</b>				
1	Uber	Fort Collins, Denver, Colorado Springs	Municipality Borders	Company Website
2	Lyft	COLORADO: Aspen, Aurora, Boulder, Breckenridge, Centennial, Colorado Springs, Denver, Fort Collins, Fountain, Grand Junction, Loveland, Steamboat Springs, Telluride, Vail, Winter Park	Municipality Borders	Company Website
3	Hop Skip Drive	Denver, Boulder, Colorado Springs	Municipality Borders	<a href="https://www.hopskipdrive.com/families">https://www.hopskipdrive.com/families</a>
<b>Taxis</b>				
4	Taxi Companies	Alma, Bennett, Bow Mar, Castle Rock, Columbine Valley, Deer Trail, Elizabeth, Empire, Fairplay, Foxfield, Georgetown, Kiowa, Lakeside, Larkspur, Lochbuie, Morrison, Mountain View, Parker, Silver Plume, Simla, Superior, Arvada, Aurora, Black Hawk, Brighton, Broomfield, Castle Pines, Centennial, Central City, Cherry Hills Village, Commerce City, Denver, Edgewater, Englewood, Federal Heights, Glendale, Golden, Greenwood Village, Idaho Springs, Lakewood, Littleton, Lone Tree, Northglenn, Sheridan, Thornton, Westminster, Wheat Ridge, Denver, Aurora, Lakewood, Broomfield, Colorado Springs, Boulder, Fort Collins, Pueblo, Grand Junction,	Municipality Borders	PUC/Google Maps
<b>Peer Car Share</b>				
5	Getaround	Denver, Boulder	Service Area	<a href="https://www.getaround.com/search?start_time=2019-08-29T21:00:00.000Z&amp;end_time=2019-08-30T05:00:00.000Z&amp;use=CARSHARE&amp;viewport=36.133191,-110.167846,43.608018,-93.139037">https://www.getaround.com/search?start_time=2019-08-29T21:00:00.000Z&amp;end_time=2019-08-30T05:00:00.000Z&amp;use=CARSHARE&amp;viewport=36.133191,-110.167846,43.608018,-93.139037</a>

## Transportation Provider Coverage

#	Provider Name	City or Service Areas	Use Municipality Borders or Service Area?	Source
6	Turo	Various	Service Area and City Border	Turo provided a map
7	Scoop	N/A Anyone can use app from any location, not mappable		N/A
<b>Non-Peer Car Share</b>				
8	Car2Go/Sharenow	Denver	Service Area	<a href="https://www.car2go.com/US/en/denver/where/">https://www.car2go.com/US/en/denver/where/</a>
9	ZipCar	Aurora, Boulder, Breckenridge, Colorado Springs, Denver, Fort Collins, Golden, Greenwood Village	City Borders	Company Website
10	ZimRide	N/A Anyone can use app from any location, not mappable		N/A
11	Silvercar	Denver	City Borders	Company Website
12	eGo CarShare	Denver, Boulder	Service Area	<a href="https://carshare.org/vehicles-locations/">https://carshare.org/vehicles-locations/</a>
<b>Car Rental</b>				
13	Enterprise	Denver, Colorado Springs, Pueblo, Pagosa Springs, Durango, Cortez, Montrose, Grand Junction, Aspen, Glenwood Springs, Vail, Silverthorne, Evergreen, Boulder, Longmont, Broomfield, Thornton, Brighton, Loveland, Greeley, Fort Collins, Fort Morgan, Littleton, Aurora, Arvada, Englewood, Sheridan, Greenwood Village, Centennial, Steamboat Springs	City Borders	Google Maps
14	Hertz	Denver, Boulder, Brighton, Longmont, Loveland, Greeley, Fort Collins, Fort Morgan, Trinidad, Pueblo, Colorado Springs, Castle Rock, Alamosa, Gunnison, Durango, Cortez, Telluride, Montrose, Grand Junction, Aspen, Eagle, Frisco, Leadville, Hayden	City Borders	Google Maps



## Transportation Provider Coverage

#	Provider Name	City or Service Areas	Use Municipality Borders or Service Area?	Source
15	Avis	Fort Collins, Denver, Boulder, Thornton, Castle Rock, Colorado Springs, Pueblo, Durango, Gunnison, Montrose, Grand Junction, Aspen, Hayden, Eagle	City Borders	Google Maps
16	Alamo	Denver, Colorado Springs, Aspen, Montrose, Grand Junction, Durango, Eagle	City Borders	Google Maps
17	Budget	Aspen, Eagle, Denver, Boulder, Longmont, Broomfield, Aurora, Centennial, Littleton, Fort Collins, Colorado Springs, Pueblo, Cortez, Pagosa Springs, Telluride, Grand Junction	City Borders	Google Maps
18	Dollar	Gypsum, Denver, Colorado Springs, Montrose, Grand Junction	City Borders	Google Maps
19	National	Montrose, Grand Junction, Durango, Colorado Springs, Denver, Aspen, Loveland	City Borders	Google Maps
20	Thrifty	Eagle, Denver, Lakewood, Montrose	City Borders	Google Maps
<b>Residential Delivery</b>				
21	Amazon Prime Now	Denver, Boulder, Fort Collins, Colorado Springs	City Borders	Company Website
22	Uber Eats	Denver	City Borders	Company Website
23	Door Dash	Arvada, Aspen, Aurora, Berthoud, Boulder, Broomfield, Casper, Castle Rock, Centennial, Cheyenne, Colorado, Springs, Denver, Durango, Edgewater, Englewood, Erie, Ft. Collins, Gillette, Golden, Grand Junction, Greeley, Greenwood Village, Highlands Ranch, Johnstown, Ken Caryl, Lafayette, Lakewood, Laramie, Littleton, Lone Tree, Longmont, Louisville, Loveland, Manitou Springs, Niwot, Parker, Pueblo, <del>CO</del> , Silverthorne, Superior, Westminster, Wheat Ridge	City Borders	Company Website
24	GrubHub	Arvada, Aurora, Bellvue, Bennett, Berthoud, Boulder, Brighton, Broomfield, Calhan, Cascade, Castle Rock,	City Borders	Company Website

### Transportation Provider Coverage

#	Provider Name	City or Service Areas	Use Municipality Borders or Service Area?	Source
		Clifton, Colorado Springs, Commerce City, Conifer, Dacono, Denver, Eaton, Elbert, Elizabeth, Englewood, Erie, Evans, Evergreen, Florissant, Fort Collins, Fort Lupton, Fountain, Franktown, Frederick, Fruita, Gateway, Glade Park, Golden, Grand Junction, Greeley, Henderson, Johnstown, La Salle, Lafayette, Laporte, Larkspur, Littleton, Loma, Lone Tree, Longmont, Louisville, Loveland, Mack, Manitou Springs, Mead, Milliken, Monument, Morrison, Palisade, Palmer Lake, Parker, Penrose, Peyton, Pike NTL Forest, Platteville, Pueblo, Sedalia, Thornton, U-S-A-F Academy, Watkins, Westminster, Wheat Ridge, Whitewater, Windsor, Woodland Park		
25	PostMates	Colorado Springs, Denver, Fort Collins, Greeley	City Borders	Company Website
26	Dominoes Pizza	Cortez, Durango, Alamosa, Montrose, Delta, Grand Junction, Parachute, Rifle, Glenwood Springs, Carbondale, Gympsum, Avon, Silverthone, Buena Vista, Colorado Springs, Canon City, Woodland Park, Arvada, Lakewood, Cherry Hills Village, Boulder, Lafayette, Superior, Thornton, Aurora, Littleton, Centennial, Commerce City, Evergreen, Englewood	City Borders	Company Website
27	Walmart Grocery	Aurora Brighton Broomfield Castle Rock Centennial Colorado Springs Denver Fort Collins Fountain Greeley Highlands Ranch Lakewood Littleton Longmont Loveland Monument Parker Westminster	City Borders	Company Website
28	Jimmy Johns	Denver, Lakewood, Englewood, Centennial, Aurora, Littleton, Commerce City, Westminster, Northglenn, Boulder, Longmont, Greeley, Windsor, Loveland, Fort Collins, Glenwood Springs, Frisco, Grand Junction, Montrose, Durango, Pueblo, Colorado Springs, Canon City, Fountain, Woodland Park, Falcon, Gleneagle, Monument		Company Website

### Transportation Provider Coverage

#	Provider Name	City or Service Areas	Use Municipality Borders or Service Area?	Source
29	Instacart	Broomfield, Brush, Burlington, Canon City, Carbondale, Cascade, Castle Rock, Clifton, Colorado Springs, Commerce City, Conifer, Dacono, Denver, Dillon, Divide, Dupont, Durango, Eagle, Eastlake, Eaton, Edwards, Elbert, Eldorado Springs, Englewood, Erie, Evans, Evergreen, Firestone, Florence, Fort Collins, Fort Lupton, Fort Morgan, Fountain, Franktown, Frederick, Frisco, Fruita, Gilcrest, Glenwood Springs, Golden, Grand Junction, Greeley, Green Mountain Falls, Gypsum, Henderson, Hudson, Idledale, Indian Hills, Johnstown, Kittredge, La Salle, Lafayette, Laporte, Littleton, Lochbuie, Loma, Lone Tree, Longmont, Louisville, Louviers, Loveland, Manitou Springs, Mead, Milliken, Minturn, Montrose, Monument, Morrison, New Castle, Niwot, Olathe, Palisade, Palmer Lake, Parker, Penrose, Peyton, Pine, Platteville, Pueblo, Rifle, Sedalia, Severance, Silt, Silverthorne, Snowmass, Steamboat Springs, Thornton, Timnath, U-S-A-F Academy, Vail, Weldona, Westminster, Wheat Ridge, Windsor, Woodland Park	City Borders	Company Website
30	Shipt	Denver, Colorado Springs, Aurora, Ft Collins, Lakewood, Thornton, Arvada, Westminster, Centennial, Boulder, Greeley, Highlands Ranch, Longmont, Broomfield, Castle Rock, Commerce City, Parker, Littleton, Brighton, Northglenn, Security-Widefield, Englewood, Dakota Ridge, Ken Caryl, Wheat Ridge, Windsor, Lafayette, Erie, Columbine, Golden, Evans, Louisville, Greenwood Village, Firestone, Lone Tree, Black Forest, Frederick, Superior, Federal Heights, Cherry Creek, Berkley, the Pinery, Castle Pines, Roxborough Park, Stonegate, Cherry Hills Village	City Borders	Company Website
<b>Other</b>				
31	Drift	Denver	City Borders	

### Transportation Provider Coverage

#	Provider Name	City or Service Areas	Use Municipality Borders or Service Area?	Source
32	Hytch	N/A employer based app, not mappable		
33	Gondola	N/A Carpool app, not mappable		