

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Traffic & Safety Section

222 South 6th Street, Room 100
Grand Junction, Colorado 81501
(970) 683-6287 Fax: 970-683-6290



Date: October 12, 2010
To: City/County Transportation Officials
From: Alisa Babler
Permit Unit Engineer
**Subject: CDOT Region 3 Intersection Analysis and Prioritization
Request for Applications**

CDOT Region 3 Traffic and Safety (CDOT) has commissioned Fehr and Peers to complete the Intersection Analysis and Prioritization Study. The intent of this study is to update the study done in 2007, develop a methodology, and prioritize intersection improvements for the use of the TPR and CDOT in a multi-year funding program. Up to three intersections per county will be analyzed in-depth and ranked, to assist in developing priorities for CDOT and the TPR. The study will analyze the intersections, identifying long and short term improvements to address deficiencies, and recommend prioritization for future funding.

At this time we are requesting intersection applications for the study. Intersections for consideration should have safety or operational issues and be located on the state highway system. We are requesting that counties submit up to three intersections for inclusion in the study. Additionally, please provide the application packet to cities within your respective county for additional submittals by the city if desired. All intersections submitted will be compiled and an initial evaluation done to establish the top three intersections in the county for an in-depth analysis and inclusion in the study. Intersections not included in the in-depth analysis will be provided as a list in the appendix for future reference.

Any supporting data and documentation available, as it relates to the intersection, will be useful in determining applicable improvements and the final priority of the intersection. The application should include as many specifics as possible regarding deficiencies of the intersection, time of day, impacts of weather, geometric constraints, right of way constraints, crash history, and any other site specific information available.

Please provide your applications no later than **December 15, 2010**. Completed applications should be sent to:

Emily Gloeckner, P.E.
Fehr & Peers Transportation Consultants
621 17th Street, Ste. 2301
Denver, CO 80293
E.Gloeckner@fehrandpeers.com

Phone: 303-296-4300
Fax: 303-296-4302

Thank you for assisting us in the development of this program. Should you have any questions, please feel free to contact the CDOT project manager, Alisa Babler at 970-683-6271 or the Fehr & Peers project manager, Emily Gloeckner, at 303-296-4300.

Region 3 Intersection Analysis and Prioritization
Intersection Application

Requesting Agency

Agency Name	Routt County
Contact Person	Heather McLaughlin
Title	Senior Engineer
Email	hmclaughlin@co.routt.co.us
Phone Number	970.879.0537
Mailing Address	136 6th Street, Box 773598 Steamboat Springs, CO 80477-3598

Intersection Location

Highway (example, US 50)	US40		
Highway Milepost	128.33		
Local Cross Street name	CR 42		
Is the Cross Street (check one)	Public ROW <input checked="" type="checkbox"/>	Private Drive <input type="checkbox"/>	Other <input type="checkbox"/>

DEPARTMENT OF TRANSPORTATION
Traffic & Safety Section

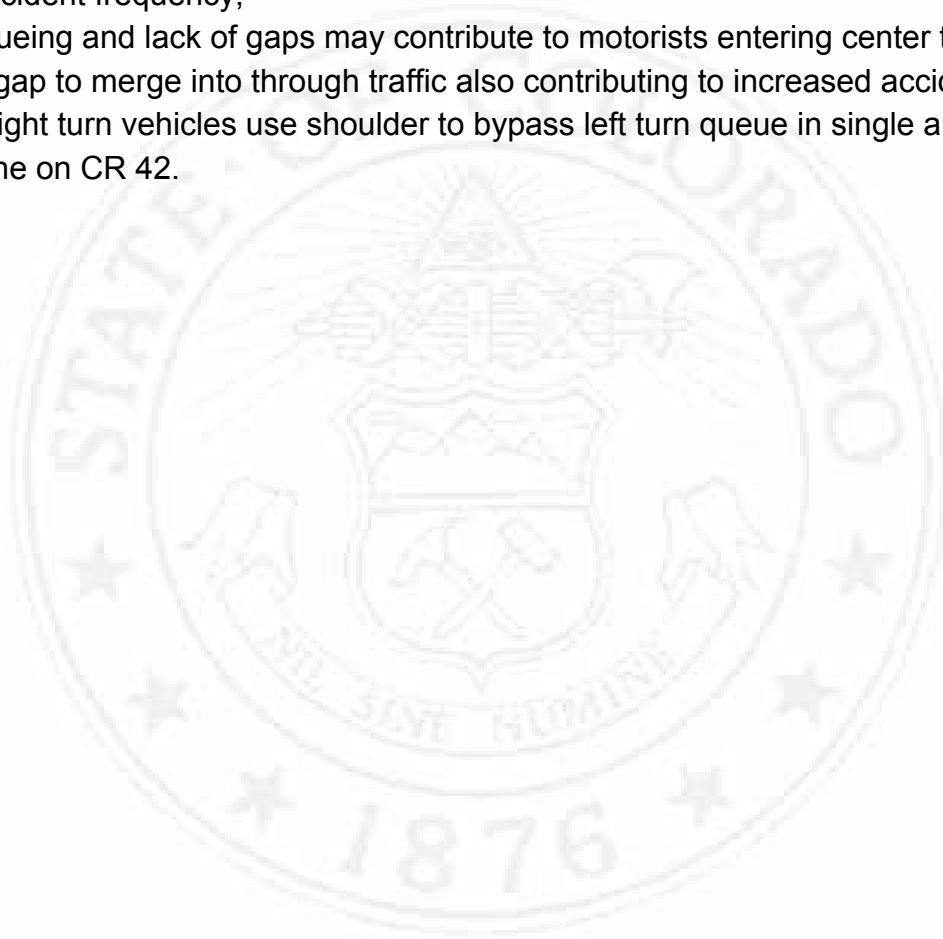
Intersection Information

Type of Intersection (check one)	Signal	Minor St Stop X	All Way Stop	Other:
Nearby Driveways	Yes: there is a private access north of US 40 Distance between intersections: 160 ft north			No
Traffic Mix (check all that apply)	Trucks x	Pedestrians x	Bicycles x	Other: x Transit
Intersection Issues	Please describe the types of safety or operational issues at the intersection.			
<p>Safety Issues:</p> <p>sight distance</p> <p>crash frequency</p>	<p>the existing embankment north of US 40 in conjunction with right turning vehicles blocks the sight of oncoming US 40 westbound vehicles for southbound CR 42 motorists turning left onto US 40 (150/47 Left turns am/pm)</p> <p>per the Needs Study, the crash frequency and severity exceeds statewide averages for similar locations</p>			
<p>Operational Issues:</p> <p>AM peak hour delays</p>	<p>with no signal, there are delays for motorists turning left in the AM peak hour that can't enter US 40 due to lack of gaps in through traffic; additionally with one outbound lane, any right turning motorists are delayed</p>			

Intersection Deficiencies

Please provide a brief description of the existing intersection deficiencies and associated safety concerns, including time of the concerns (day of the week/hour(s)/seasons/time/weekday/weekend/holiday/etc):

- sight distance restrictions impede ability for southbound motorists on CR 42 from seeing westbound thru traffic on US 40; it is believed this contributes to the increased accident frequency;
- queing and lack of gaps may contribute to motorists entering center turn lane without a gap to merge into through traffic also contributing to increased accident frequency;
- right turn vehicles use shoulder to bypass left turn queue in single approach lane on CR 42.




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Mitigation

Please provide a brief description of possible mitigations, improvements, and/or projects to mitigate the safety concerns at the intersection:

A NEPA study has been approved for US 40 including the CR 42 intersection. Refer to the NEPA study for long-term mitigation measures. In the short - term the Needs study suggests construction of an exclusive southbound left-turn lane on CR 42 and recommends an engineering study. The 2008 Safety Assessment report by CDOT recommended laying back the embankment to provide additional sight distance on US 40 east of CR 42 along with advance intersection warning signs to improve sight distance.



Are there any existing plans for improvements for this intersection? Yes/No. If yes, please explain:

Yes - the NEPA study for US 40 approved August 2010 includes this intersection.

Are any additional funding sources available for this project: Yes/No. If yes, please explain:

None identified.

Does this intersection have impacts to adjacent intersections, roadways, etc? If yes, please explain:

None identified.

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Traffic & Safety Section

Additional Information

To assist in analyzing the intersection please attach the following information if available/applicable:

- Accident data, including police reports if available -see Studies
- Traffic Volumes, such as AADT/ADT, peak hour volumes, peak hour turning movement counts-see Studies
- Traffic Studies -see below
- Pedestrian Counts - none available
- Bicycle Counts - none available
- Existing signal timing or Synchro files -can be provided
- Existing construction plans -none available
- Survey data - none available
- Aerial photos -attached
- Photographs of the intersection -can be provided
- Right of Way maps *Studies
- Any other data/documentation to assist in analyzing the intersection

-See West Steamboat Springs US Highway 40 System Needs Study
and Technical Appendix August 2008 by Stolfus Associates

-See West of Steamboat Springs US Highway 40 NEPA Study, August 2010
by Jacobs

- See US 40 Highway NEPA Study - West of Steamboat Springs Traffic
Technical Memo DRAFT, October 2009 by Jacobs

- 2008 Safety Assessment Report for West US 40 NEPA Study, October 2008
by CDOT

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Region 3 Intersection Analysis and Prioritization
Intersection Application

Requesting Agency

Agency Name	City of Steamboat Springs
Contact Person	Janet Hruby
Title	City Engineer
Email	jhruby@steamboatsprings.net
Phone Number	970.871.8245
Mailing Address	P.O. Box 775088 137 10th Street Steamboat Springs, CO 80477-5088

Intersection Location

Highway (example, US 50)	US40		
Highway Milepost	130.22		
Local Cross Street name	Downhill Drive / Riverside		
Is the Cross Street (check one)	Public ROW <input checked="" type="checkbox"/>	Private Drive <input type="checkbox"/>	Other <input type="checkbox"/>

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Traffic & Safety Section

Intersection Information

Type of Intersection (check one)	Signal	Minor St Stop <input checked="" type="checkbox"/>	All Way Stop	Other:
Nearby Driveways	Yes: driveways within 300 ft to east Distance between intersections: 200 ft to private access 300 ft to private road/ access			No
Traffic Mix (check all that apply)	Trucks <input checked="" type="checkbox"/>	Pedestrians <input checked="" type="checkbox"/>	Bicycles <input checked="" type="checkbox"/>	Other: <input checked="" type="checkbox"/> Transit
Intersection Issues	Please describe the types of safety or operational issues at the intersection.			
<p>Safety Issues:</p> <p>pedestrian access</p> <p>access onto us 40</p> <p>bicycle access</p> <p>accidents</p>	<p>peders cross from residential area north of US 40 to access bus stop with no crosswalk or traffic control</p> <p>without traffic control can be difficult to turn left to access US 40 during peak periods</p> <p>intersection of downhill drive is narrow and bikes must share travel lanes on Downhill drive</p> <p>per the Needs Study, the crash frequency exceeds the statewide average</p>			
<p>Operational Issues:</p> <p>downhill drive</p> <p>alignment</p> <p>level of service</p>	<p>downhill drive accesses industrial area; lane widths are narrow and inbound trucks cross into outbound left turn lane</p> <p>intersections are offset by approx 100 ft</p> <p>per the Needs Study the LOS is F/D (am/pm) due to the lack of a signal</p>			

Intersection Deficiencies

Please provide a brief description of the existing intersection deficiencies and associated safety concerns, including time of the concerns (day of the week/hour(s)/seasons/time/weekday/weekend/holiday/etc):

- it is difficult to make left turns from Downhill Drive to US 40 without a signal; this is problematic during the AM peak hour when the left turn volume is higher (approx 100 vph)
- there is no sidewalks or cross walks for pedestrians to access the bus stop on the south side of US 40; also no traffic control for pedestrians
- the lanes on downhill drive are narrow
- there is no auxiliary right turn lane from US 40 onto downhill drive
- there is currently no bike lane on Downhill drive (one is planned in the future)
- the bus stop is mostly out of the travel lane, but the location blocks visibility from Riverside Drive
- as a result of these items there are concerns for vehicular and pedestrian safety while entering/exiting Downhill drive

Mitigation

Please provide a brief description of possible mitigations, improvements, and/or projects to mitigate the safety concerns at the intersection:

A NEPA study has been approved for US 40 including the Downhill Drive intersection. Refer to the NEPA study for mitigation measures. In addition to the US40 NEPA improvements, bike lanes/4 ft shoulder is planned on Downhill Drive to serve bike traffic on this collector roadway between US 40 and Elk River road.



Are there any existing plans for improvements for this intersection? Yes/No. If yes, please explain:

Yes - the NEPA study for US 40 approved August 2010 includes this intersection.

Are any additional funding sources available for this project: Yes/No. If yes, please explain:

None have been identified

Does this intersection have impacts to adjacent intersections, roadways, etc? If yes, please explain:

None identified

Additional Information

To assist in analyzing the intersection please attach the following information if available/applicable:

- Accident data, including police reports if available -see Studies
- Traffic Volumes, such as AADT/ADT, peak hour volumes, peak hour turning movement counts-see Studies
- Traffic Studies -see below
- Pedestrian Counts - none available
- Bicycle Counts - none available
- Existing signal timing or Synchro files -can be provided
- Existing construction plans -none available
- Survey data - none available
- Aerial photos -attached
- Photographs of the intersection -can be provided
- Right of Way maps *Studies
- Any other data/documentation to assist in analyzing the intersection

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and Technical Appendix August 2008 by Stolfus Associates

-See West of Steamboat Springs US Highway 40 NEPA Study, August 2010
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Agency Name	City of Steamboat Springs
Contact Person	Janet Hruby
Title	City Engineer
Email	jhruby@steamboatsprings.net
Phone Number	970.871.8245
Mailing Address	P.O. Box 775088 137 10th Street Steamboat Springs, CO 80477-5088

Intersection Location

Highway (example, US 50)	US40		
Highway Milepost	130.64		
Local Cross Street name	CR 129 (Elk River Road)/ Shields Drive		
Is the Cross Street (check one)	Public ROW <input checked="" type="checkbox"/>	Private Drive <input type="checkbox"/>	Other <input type="checkbox"/>

DEPARTMENT OF TRANSPORTATION
Traffic & Safety Section

Intersection Information

Type of Intersection (check one)	Signal <input checked="" type="checkbox"/>	Minor St Stop	All Way Stop	Other:
Nearby Driveways	Yes: driveways within 200 ft to north Distance between intersections: 200 ft to private access to north 300 ft to private access to east			No
Traffic Mix (check all that apply)	Trucks <input checked="" type="checkbox"/>	Pedestrians <input checked="" type="checkbox"/>	Bicycles <input checked="" type="checkbox"/>	Other: <input checked="" type="checkbox"/> Transit
Intersection Issues	Please describe the types of safety or operational issues at the intersection.			
Safety Issues: pedestrian access bicycle crossings	pedestrians have a long distance to cross and no sidewalks on the north side; island refuges are not adequate; and timing is minimally adequate for crossing. there is no bike lane on US 40 or CR 129; there is no bike detection to trigger the signal for crossing			
Operational Issues: split phase signal queing level of service	Based on the existing geometry of the side streets; split phasing is required to safely accommodate movements during the peak hours queuing blocks accesses north of the intersection per the Needs Study the LOS was D/C but with the more recent NEPA Technical memo the LOS was F/F			

Intersection Deficiencies

Please provide a brief description of the existing intersection deficiencies and associated safety concerns, including time of the concerns (day of the week/hour(s)/seasons/time/weekday/weekend/holiday/etc):

- The split phasing is inefficient and during the AM/PM peak hours there are very long queues on CR 129 (up to 1,000 ft blocking the TIC driveway) as well as moderate queues to the east and West on US 40.
- there is no sidewalks or cross walks for pedestrians to access from the core trail south of US 40 to the businesses north of US 40; this is not a ped friendly intersection
- the lanes on Shield Drive are narrow due to the existing island configuration which can pose conflicts for vehicles turning left from US 40
- there is currently no bike lane on CR 129 (one is planned in the future) and this area serves as a connection between the core trail and businesses north of US 40 for commuters as well as a heavily traveled recreational cycling route
- bicyclists dont trigger the signal and it is impractical to push the existing ped buttons; therefore it is difficult for cyclists to cross the intersection when there is no side street traffic to trigger the signal
- as a result of these items there are significant concerns for bicycle and pedestrian safety while crossing US 40 from our major trail connector to area businesses
- in addition the queuing and inefficient intersection operations create vehicle safety concerns


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Mitigation

Please provide a brief description of possible mitigations, improvements, and/or projects to mitigate the safety concerns at the intersection:

A NEPA study has been approved for US 40 including the CR 129 intersection. Refer to the NEPA study for mitigation measures. In addition to the US40 NEPA improvements, bike lanes/4 ft shoulder is planned on CR 129 to serve bike traffic on this collector roadway between US 40 and the Airport. In addition the 2008 Intersection Safety Assessment recommended reconfiguring the intersection to allow protective/permissive phasing to reduce accidents



Are there any existing plans for improvements for this intersection? Yes/No. If yes, please explain:

Yes - the NEPA study for US 40 approved August 2010 includes this intersection.

Are any additional funding sources available for this project: Yes/No. If yes, please explain:

Yes, the City has collected \$70,000 in developer contributions toward improving this intersection.

Does this intersection have impacts to adjacent intersections, roadways, etc? If yes, please explain:

Queuing at this intersection blocks adjacent access points to Kamar plaza/ Elk River Plaza, the CDOT maintenance facility, and the TIC office access.

Additional Information

To assist in analyzing the intersection please attach the following information if available/applicable:

- Accident data, including police reports if available -see Studies
- Traffic Volumes, such as AADT/ADT, peak hour volumes, peak hour turning movement counts-see Studies
- Traffic Studies -see below
- Pedestrian Counts - none available
- Bicycle Counts - see info from new CDOT bike counter !!
- Existing signal timing or Synchro files -can be provided
- Existing construction plans -none available
- Survey data - none available
- Aerial photos -attached
- Photographs of the intersection -can be provided
- Right of Way maps *Studies
- Any other data/documentation to assist in analyzing the intersection

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by CDOT

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

HQ Safety and Traffic Engineering Branch
Safety Engineering and Analysis Group
4201 East Arkansas Avenue, 3rd Floor
Denver, Colorado 80222-3400
303.757.9654 Voice
303.757.9219 Fax

DATE: October 20, 2008

TO: Van Pilaud, Region 3 Project Manager

FROM: KC Matthews, HQ Safety and Traffic Engineering

SUBJECT: **Safety Assessment Report for West US 40 NEPA Study
Categorical Exclusion (CatEx)
SH 40 (MP 4.00 to MP 17.00)
Routt County**



Attached for your review is a copy of the draft Safety Assessment Report for the above referenced NEPA Categorical Exclusion (CatEx). The observations and recommendations in this report are based on the analysis of three years of accident history, and review of the video log. The Region is advised to verify, through field survey, the observations made in this report regarding physical features, roadside characteristics, and traffic control devices in the study area.

If you have any comments on the content or format of this report, please provide them to us by November 10, 2008. If we do not hear from you by this date, we will assume that the report has met with your approval.

Should any questions arise concerning this report, or if further assistance is needed, please do not hesitate to contact me at (303) 757-9543, or Ken Nakao at (303) 757-9436.

This report may be accessed on the web site using the following link:

["internal.dot.state.co.us/stafftraffic/safety_engineering_group/safety_assessment_reports.html"](http://internal.dot.state.co.us/stafftraffic/safety_engineering_group/safety_assessment_reports.html)

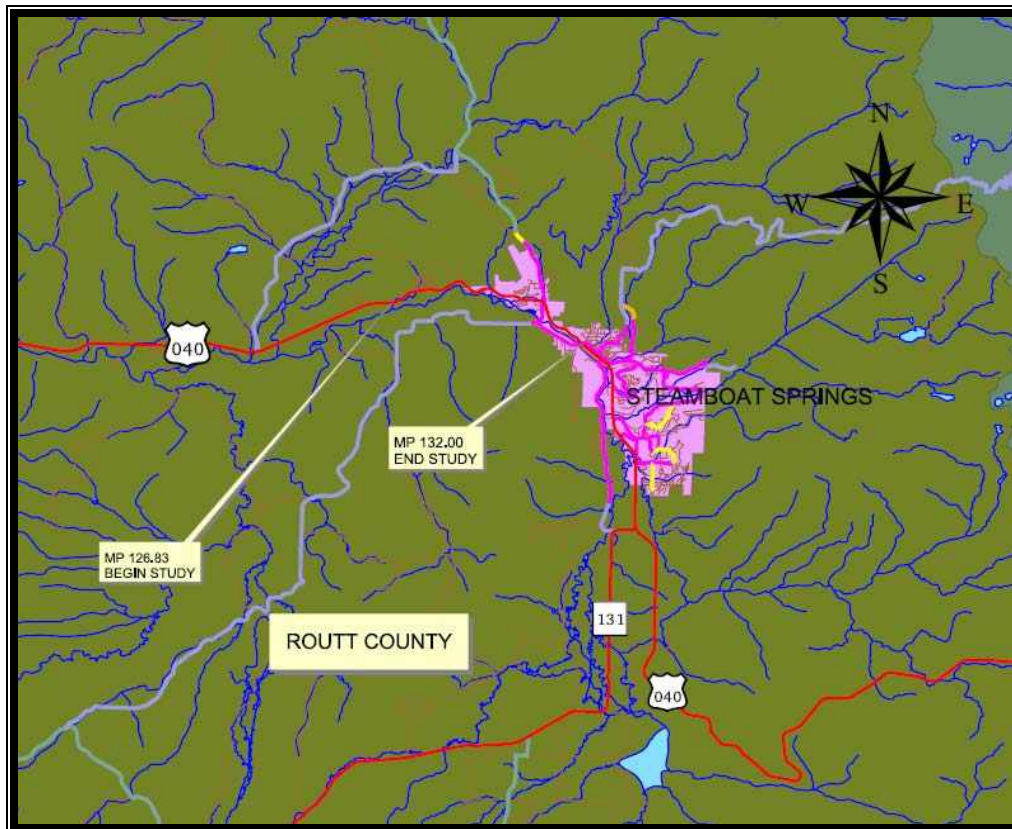
attachment

cc: Gabriela Vidal, HQ Safety and Traffic Engineering Branch Manager (memo only)
Weldon Allen, Region 3 Director (memo only)
Dave Eller, Region 3 Program Engineer (memo only)
Zane Znamenacek, Region 3 Traffic Operations Engineer
Kandace Lukow, Region 3 Maintenance Superintendent (memo only)
File



SAFETY ASSESSMENT

SH 40A: MP 126.83 – MP 132.00
Region 3
US 40 NEPA Study
Categorical Exclusion (CatEx)
October 20, 2008



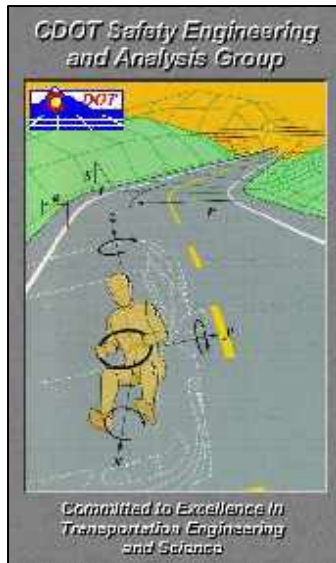
Prepared by: **The Colorado Department of Transportation**
HQ Safety and Traffic Engineering Branch
Safety Engineering and Analysis Group
4201 E. Arkansas Ave., 3rd Floor
Denver, CO 80222

*Reproduction of any Portion of this Document is Prohibited Without Expressed
Written Authority from the CDOT Safety Engineering and Analysis Group*

This report is prepared solely for the purpose of identifying, evaluating and planning safety improvements on public roads. It is subject to the provisions of 23 U.S.C.A. 409, and therefore is not subject to discovery and is excluded from evidence. Applicable provisions of 23 U.S.C.A. 409 are cited below:

Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 152 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists or data.

Any intentional or inadvertent release of this report, or any data derived from its use shall not constitute a waiver of privilege pursuant to 23 U.S.C.A. 409.



A Statement of Philosophy

The efficient and responsible investment of resources in addressing safety problems is a difficult task. Since crashes occur on all highways in use, it is inappropriate to say of any highway that it is safe. However, it is correct to say that highways can be built to be safer or less safe. Road safety is a matter of degree. When making decisions effecting road safety it is critical to understand that expenditure of limited available funds on improvements in places where it prevents few injuries and saves few lives can mean that injuries will occur and lives will be lost by not spending them in places where more accidents could have been prevented¹. It is CDOT's objective to maximize accident reduction within the limitations of available budgets by making road safety improvements at locations where it does the most good or prevents the most accidents.

INTRODUCTION

The primary intent of this report is to provide information, as related to safety, on State Highway (SH) 40A from milepost (MP) 126.83 to 132.00. In conjunction with this project, an opportunity exists for the detection of safety problems and the implementation of selected improvements at locations where it is justified by accident experience.

The scope of this report is as follows:

- Assess the magnitude and nature of the safety problem within the project limits.
- Relate accident causality to roadway geometrics, roadside features, traffic control devices, traffic operations, driver behavior, and vehicle type.
- Suggest cost effective counter measures to address identified problems.
- Provide guidance on how to maximize accident reduction within the scope of a resurfacing project.

This report is based on the comprehensive analysis of three years of accident history and a video log review. The Region is advised to verify the information included in this report regarding physical features and roadside characteristics through a field survey.

¹ Hauer, E., (1999) *Safety Review of Highway 407: Confronting Two Myths*. TRB

SITE LOCATION

This study addresses SH 40A in Routt County beginning at MP 126.83 and continuing southeast and entering into the City of Steamboat Springs. The included distance is 5.17 miles. SH 13 is classified as an Urban, Other Principal Arterial throughout the entire study section.

SITE CONDITIONS

The terrain is classified as rolling, flat and mountainous throughout the study section. The number of through lanes changes from a two-lane undivided to a four-lane undivided highway at MP 131.70. The shoulder surface is asphalt throughout the study section.

The highway terrain varies as shown in **Table 1**.

Table 1 – Corridor Description

MP	Description
126.00 – 129.32	Flat , two-lane undivided
129.87 – 130.51	Rolling, two-lane undivided
130.51 – 130.66	Rolling, four-lane undivided
130.66 – 130.91	Mountainous, four-lane undivided
130.91 – 131.72	Mountainous, two-lane undivided
131.72 – 132.00	Mountainous, four-lane undivided

The Average Daily Traffic (ADT) and the percent of trucks are summarized in **Table 2** based on 2005 CORIS.

Table 2 – Average Daily Traffic and % Trucks

MP	ADT	Percent Trucks
126.00 – 127.57	4,800	5.4
127.57 – 130.66	12,600	5.2
130.66 – 131.93	18,400	3.0
131.93 – 131.96	24,700	3.0
131.96 – 132.00	23,700	3.0

The posted speed limit ranges from 25 mph to 65 mph throughout the study section. This is summarized in **Table 3**.

Table 3 – Speed Limit

MP	Posted Speed Limit
126.00 – 126.51	65
126.51 – 127.40	55
127.40 – 130.00	50
130.00 – 131.60	40
131.60 – 132.00	25

There are 11 minor and major intersections within the study section which are shown in **Table 4**.

Table 4 – Intersection Locations

MP	Name
127.57	RD N (CO RD 204N)
128.34	RD N (CO RD 42)
130.28	RD S (EVERGREEN DRIVE)
130.29	RD N (DOWNHILL DRIVE)
130.38	RD N (COUNTY SHOP ROAD)
130.48	RD S (SHIELD DRIVE)
130.66	RD N (ELK RIVER ROAD)
131.27	RD S (STOCKBRIDGE ROAD)
131.93	RD S (13 TH STREET)
131.96	RD NE (12 TH STREET)
132.00	RD SW (12 TH STREET)

Three (3) of the 11 intersections are signalized, and they are located at Elk River Road, Stockbridge Road, and 13th Street.

ACCIDENT HISTORY AND PROBLEM ANALYSIS

The accident history for the period of January 1st, 2003 through December 31st, 2005 was examined between MP 126.83 and MP 132.00 to locate accident clusters and identify accident causes. One hundred fifty-one (151) accidents were reported in the three-year study period.

Figure 1 shows a graphical breakdown of these accidents by severity. As the figure shows, 89% (135 accidents) resulted in '**Property Damage-Only**' (PDO), 11% (16 accidents) resulted in '**Injury**', and there were no '**Fatal**' accidents during the three-year study period.

Figure 1

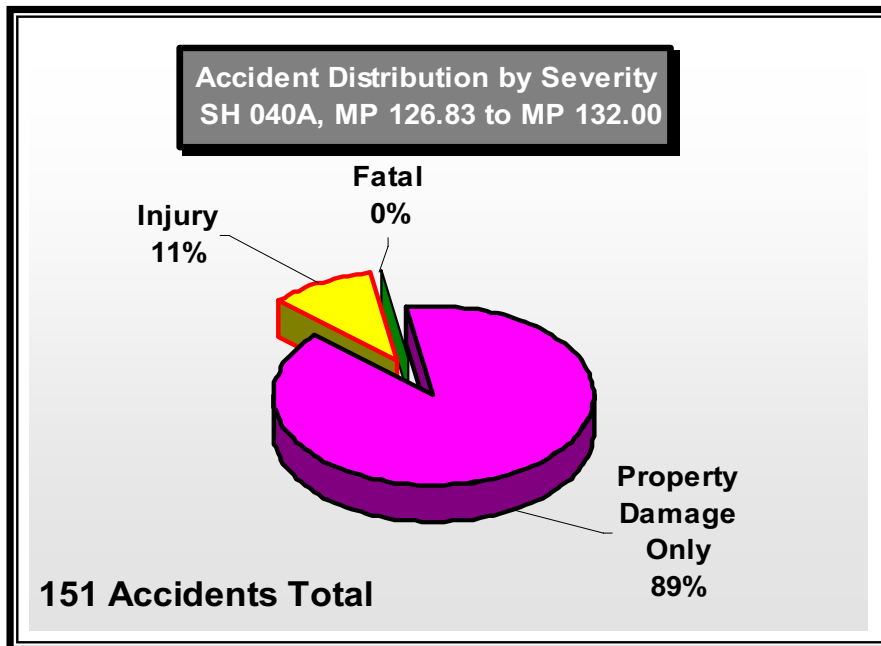


Table 5 summarizes the **Weighted Hazard Indices (WHI)** and accident rates on a yearly basis over the three-year study period and provides a comparison to the statewide averages for other Urban Other Principal Arterial highways. The table indicates that the overall accident rate and severity throughout the study section is well below average when compared to similar facilities statewide. The average WHI for the three year period is -5.28. The negative WHI indicated that, overall, this roadway is performing better than average when compared to similar facilities statewide.

Table 5 – Weighted Hazard Index for SH 40A, MP 126.83 to MP 132.00

Year	Weighted Hazard Index	Accident Rates*			
		Prop. Damage Only	Injury	Fatal (X100)**	Total
2003	-5.80	1.91	0.14	0.00	2.04
2004	-4.94	1.66	0.32	0.00	1.97
2005	-5.11	2.07	0.20	0.00	2.27
AVERAGE	-5.28	1.88	0.22	0.00	2.10
2003 Average Statewide Rate for Urban Other Principal Arterial Highways		3.49	1.25	1.41	4.75

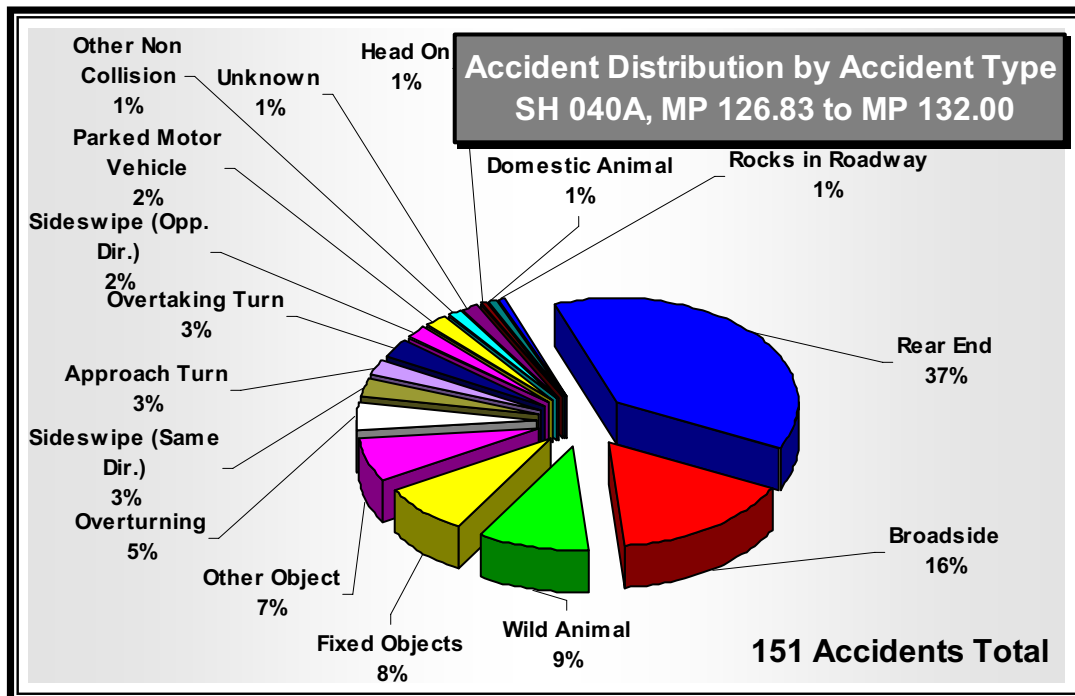
* Rates are accidents per million vehicle-miles of travel, and Fatal Rate in 100 million vehicle miles of travel

** Fatality rates are in accidents per hundred-million miles of travel

While this facility appears to be performing well, overall, in terms of safety, lets examine the accident distributions, locations and characteristics in more detail to identify possible countermeasures to reduce accidents within the study section.

Figure 2 shows a breakdown of the 151 accidents that occurred on SH 40 during the three-year study period by accident type.

Figure 2



As **Figure 2** shows, the most common type of accident was **'Rear End'** accident type, accounting for 37% (57 accidents) of the total accidents. **'Broadside'** accidents accounted for the second-most at 16% (25 accidents) followed by **'Wild Animal'** accidents at 9% (15 accidents).

Figure 3 shows all of the accidents on SH 40A happening throughout the day with no specific time period concentration.

Figure 3

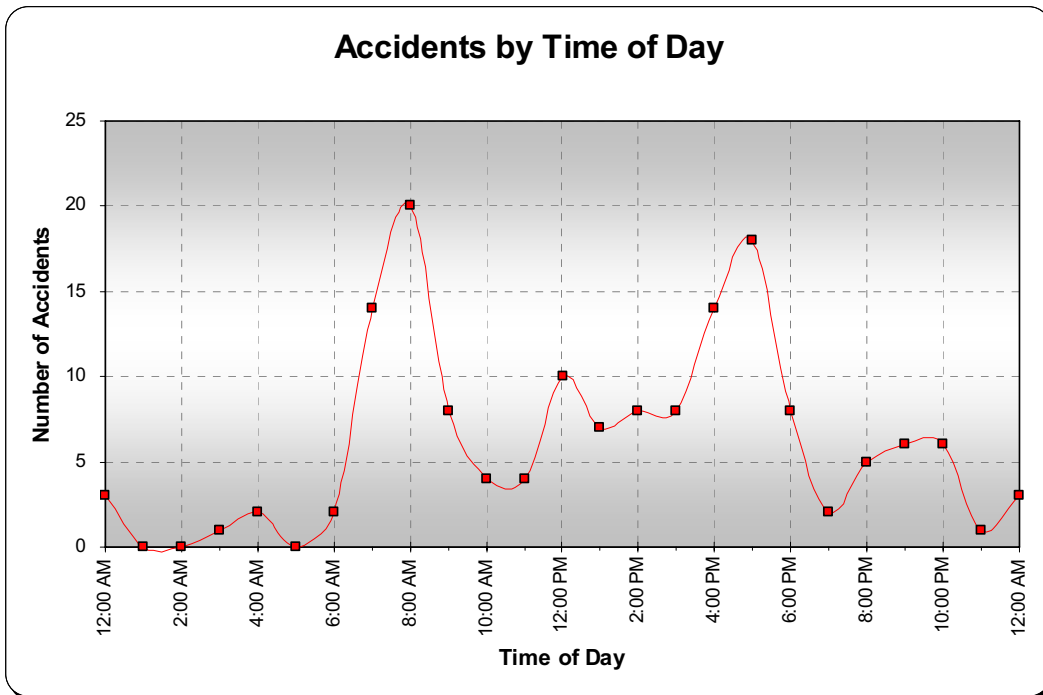
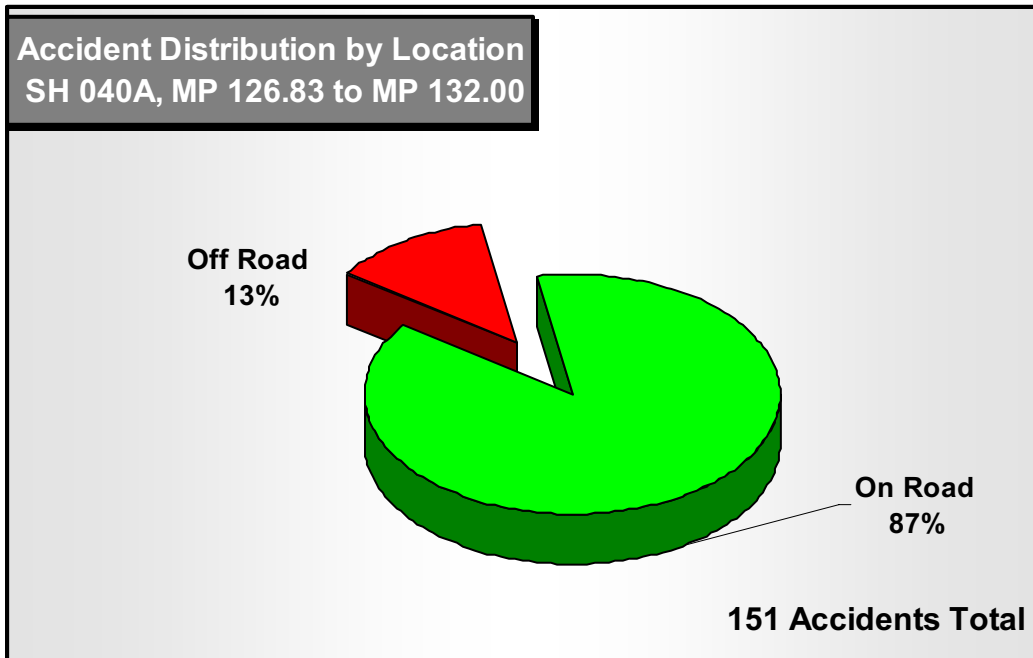


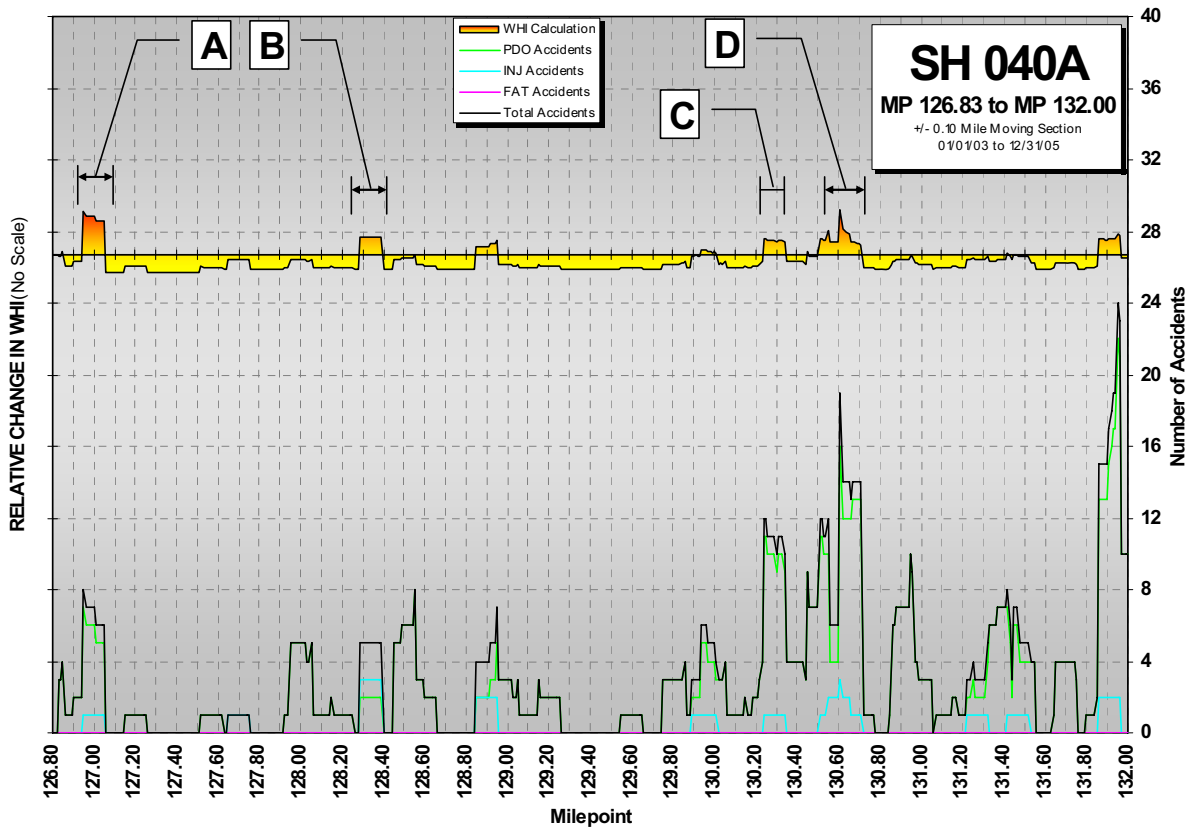
Figure 4 shows the accident distribution, by location, through the entire study section. Most of the accidents were located 'On Road'.

Figure 4



The study section was analyzed further to identify where most of the accidents were occurring. The graph in **Figure 5** is a graphical representation of the Weighted Hazard Index, by location, along the length of the study section. The peaks on the graph indicate locations where accidents are more concentrated relative to traffic volume or where the accident severity is higher. The series of lines plotted at the bottom of the chart show the actual number of accidents in each severity class that account for WHI results in the upper plot. The most prominent peaks of the graph are described below the graph.

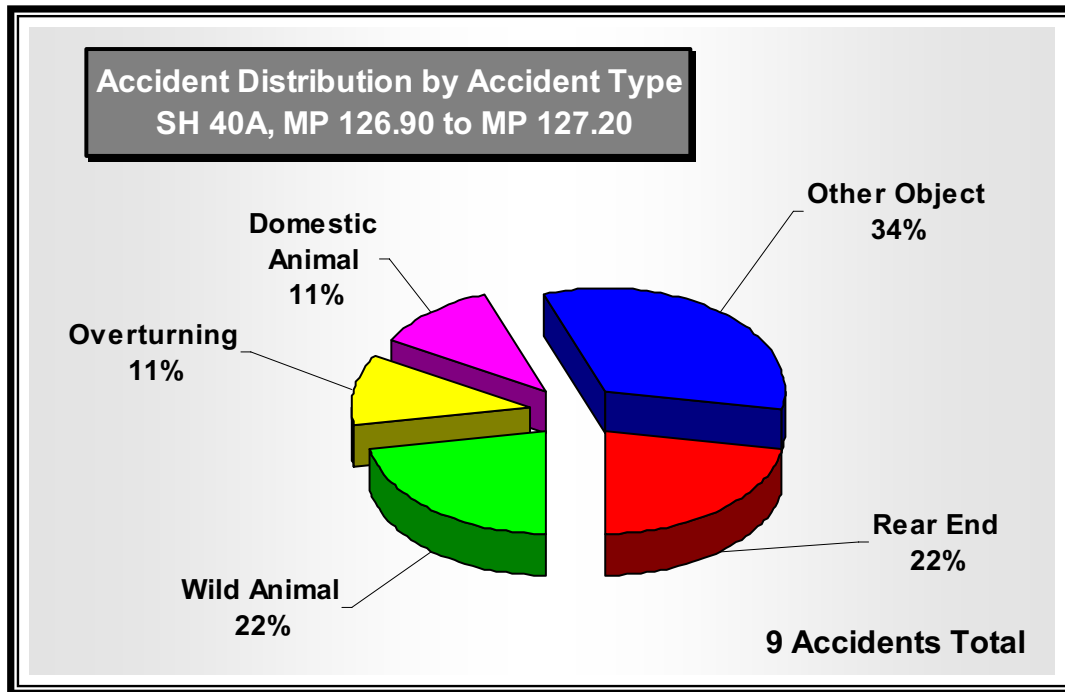
Figure 5



Location A, MP 126.90 to MP 127.20: This segment of SH 40 is a left-hand curve in the eastbound direction. There were nine (9) accidents along this section of SH 40.

Accident types are shown in **Figure 6** in the next page. ‘**Other Object**’, ‘**Rear End**’ and ‘**Wild Animal**’ accidents are the predominant accident types in this segment.

Figure 6



Only one (1) of the nine accidents involved an injury where a vehicle slid on an icy road surface, spun off road, hit a snow bank and overturned. If vehicle slippage on this segment (and entire study section) increases, it is recommended that the Region monitor the road conditions at these locations, and intensify maintenance efforts if indicated.

'Other Object' was the most common accident type at 34% (three accidents) where rock or debris fell from the rear of Vehicle #1 and hit Vehicle #2. The precipitating factors in each of these accidents appeared to be due to random driver error that was not exacerbated by any design-related features of the roadway, so no countermeasures are recommended pertaining to these accidents.

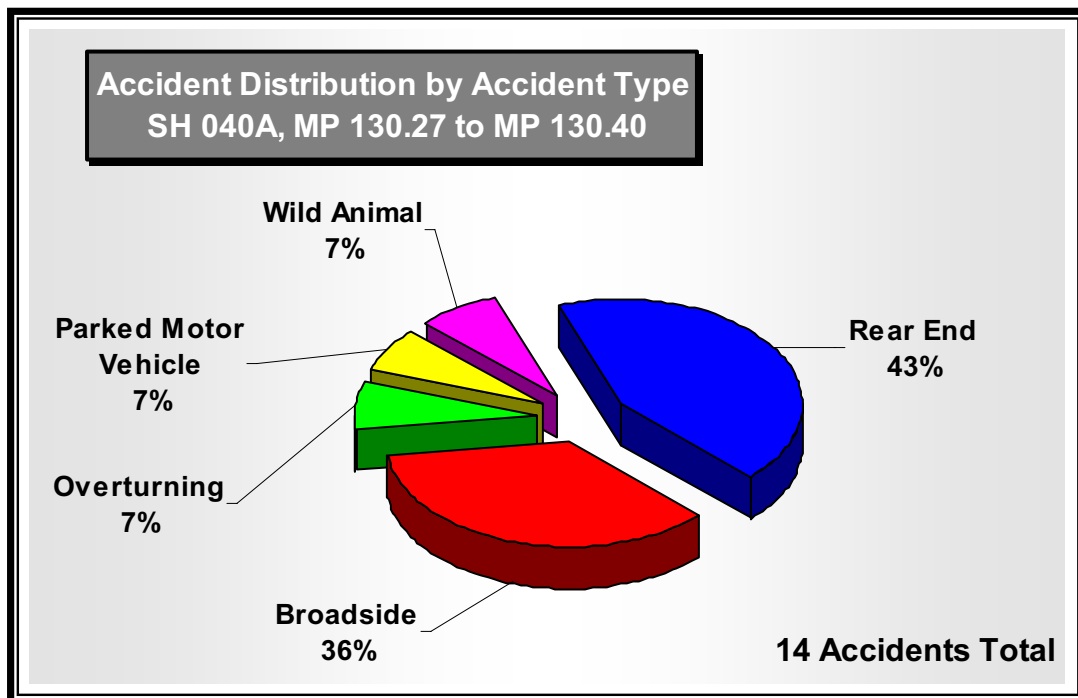
Road conditions did not appear to be a factor as eight (8) of the nine (9) accidents occurred on dry road surfaces.

'Rear-End' and **'Wild Animal'** accidents, each, occurred at a rate of 22% (two accidents). The **'Rear-End'** accident rate is above the average statewide rate for similar facilities. Both rear-end accidents involved westbound vehicles where Vehicle #2 was stopping to turn onto a private driveway, and Vehicle #1 didn't slow down and rear-ended Vehicle #2. A countermeasure the Region may consider is to install curve advance warning signs with a suggested speed limit [W1-1a with W13-1(XX) plaque, or W1-2a] facing eastbound at approximately MP 126.80 and facing westbound at approximately MP 127.30. If the advance warning signs do not work, the Region may consider adding flashing beacons to the signs. The **'Wild Animal'** accident rate is below the statewide average rate; therefore, no countermeasure is warranted.

Location B, MP 128.30 to MP 128.49: This segment of SH 40 is tangent with a right-hand curve at the end of this segment. There were five (5) accidents listed during this study period, and all of these accidents occurred at the unsignalized T-intersection of SH 40 and County Road 42. The spike in the WHI graph was mainly because of three (3) of the accidents involved injuries. Of the five accidents, four (4) were **'Broadside'** accident crashes and the remaining accident was **'Head-On'**. The **'Broadside'** accident rate in this segment is higher than the statewide rate for similar facilities. All five accidents involved a southbound vehicle at County Road 42 making a left turn onto eastbound SH 40 only to collide with a vehicle traveling westbound on SH 40. Based on a review of the video log, there appears to be limited sight distance for southbound County Road 42 traffic. This is because of the high, above grade, embankment along the north side of SH 40, east of County Road 42. This obstruction may have been a factor in the five accidents where the motorists on County Road 42 may have had difficulty seeing westbound vehicles on SH 40 traveling toward the intersection. If there is ample funding available, the Region may consider clearing this embankment to provide adequate entering sight distance for motorists on County Road 42 to make a safe decision when to make a turn onto SH 40. In addition, a low cost countermeasure the Region may consider is to install T-intersection advance warning signs (W2-2) facing eastbound at approximately MP 128.18 and facing westbound at approximately MP 128.52.

Location C, MP 130.27 to MP 130.40: This segment of SH 40 is mainly a tangent section with three (3) unsignalized intersections (Evergreen Drive, Downhill Drive, and County Shop Road). There were 14 accidents along this segment of SH 40. Accident types are shown in **Figure 7** where most of the accidents were **Rear End** at 43% (six accidents), followed by **'Broadside'** at 36% (five accidents). In addition, one of the **'Broadside'** accidents resulted in an injury.

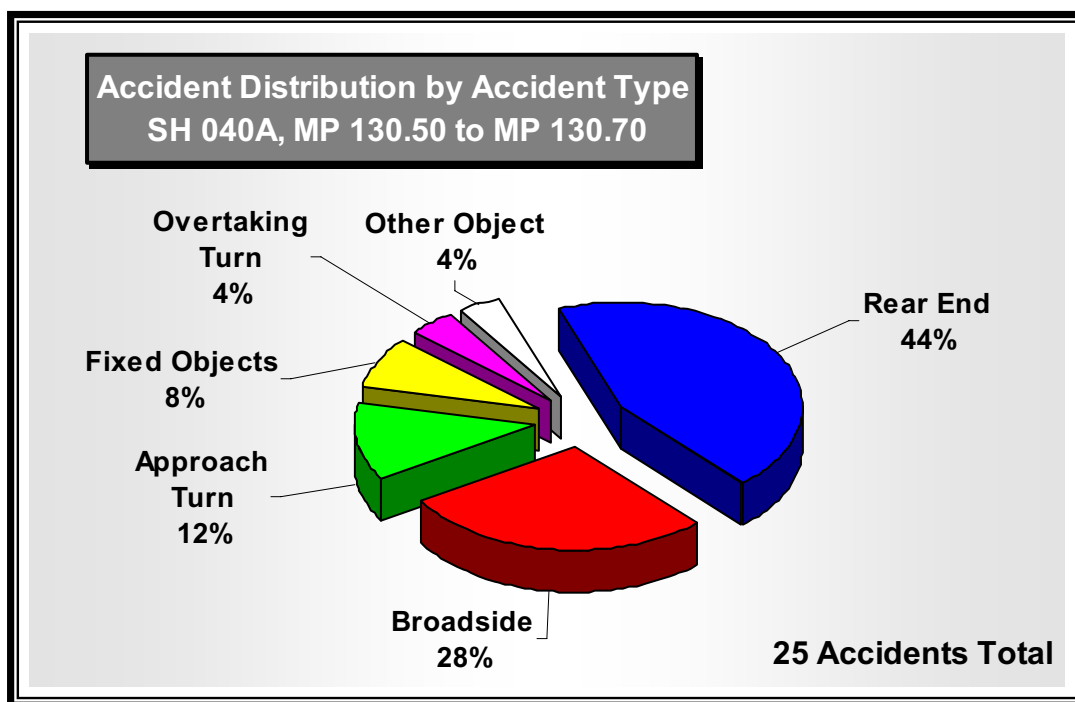
Figure 7



Of the 14 accidents, 10 were located at intersections. Of these 10 accidents, five (5) were 'Rear-End' crashes, and five (5) were 'Broadside' crashes. At the SH 40/Downhill Drive intersection, there were eight (8) accidents; five (5) 'Rear-End' and three (3) 'Broadside'. All but one accident involved a westbound motorist on SH 40, and the rates for these two accident types are above the average statewide rate for similar intersections. Four (4) of the five 'Rear-End' accidents involved two southbound vehicles on Downhill Drive where the driver of Vehicle #1 assumed Vehicle #2 was moving into the intersection and proceeded to move forward only to hit the rear-end of Vehicle #2. All three 'Broadside' accidents were also caused by poor driver decision-making and were unrelated to site conditions. Therefore, there are no cost-effective countermeasures warranted at this location.

Location D. MP 130.50 to MP 130.70: This segment of SH 40 is a right-hand curve in the eastbound direction with a signalized intersection at Elk River Road. There were 25 accidents along this segment of SH 40 where three (3) of the accidents resulted in injuries. Accident types are shown in **Figure 8** where 'Rear End' was the most predominant at 44% (11 accidents) followed by 'Broadside' at 28% (seven accidents). These rates are higher than the statewide average for similar facilities.

Figure 8



There were 11 accidents at the SH 40/Elk River Road signalized intersection where there were four (4) Broadside, four (4) Rear-End crashes, and three (3) Approach Turn crashes. The Broadside and Approach Turn accidents were the result of vehicles attempting to make left-turns from SH 40 onto Elk River Road failed to yield to oncoming traffic, resulting in the accidents. One item worth mentioning is this signalized intersection is a standard two-phase signal where there are no left-turn signal heads. These accident rates are average for similar urban signalized four-leg intersections statewide. However, as the population in the Steamboat Springs area increases, these accident rates potentially could increase. If the signal phase

remains the same. If ample funding is available, the Region should seriously consider adding a protective/permissive left-turn phase in both directions of SH 40.

The remaining accidents in this segment of SH 40 were caused by unsafe driver behavior, and not related to the overall site conditions. Therefore, there are no cost-effective countermeasures warranted in the remainder of this segment.

CONCLUSIONS AND RECOMMENDATIONS

These conclusions and recommendations are based on the analysis of three years of accident history and a review of the video log. The Region is advised to verify, through field survey, the observations made in this report regarding physical features, roadside characteristics and traffic control devices.

Considering the amount of traffic exposure, the accident frequency and severity on SH 40 between MP 126.83 and MP 132.00 is performing better than average when compared to other statewide similar facilities. This fact is reflected by the negative WHI value for each year of the three-year study period.

There were a total of 151 accidents in the study section. The most common type of accident was **'Rear End'**, accounting for 37% (57 accidents) of the total accidents. **'Broadside'** accidents accounted for the second-most at 16% (25 accidents).

The study section was analyzed further to identify where most of the accidents were occurring. **Figure 4** shows a graphical representation of the WHI, by location, along the length of the study section. There were four (4) WHI peaks located at the following segments: **MP 126.90 to 127.20, MP 128.30 to 128.49, MP 130.27 to 130.40, and MP 130.50 to 130.70**. The following safety improvement strategies should be considered for the study section:

- **MP 126.90 to MP 127.20:** This segment of SH 40 is a left-hand curve in the eastbound direction and had a high rate of **'Rear-End'** accidents. A countermeasure the Region may consider is to install curve advance warning signs with a suggested speed limit [W1-1a with W13-1(XX) plaque, or W1-2a] facing eastbound at approximately MP 126.80 and facing westbound at approximately MP 127.30. This would help alert motorists that a curve is ahead and to help reduce the number of rear end accidents. If the signs do not help reduce the accidents, the Region may consider adding flashing beacons to the signs.
- **MP 128.30 to MP 128.49:** This segment of SH 40 is tangent with a right-hand curve at the end of this segment. There were four (4) **'Broadside'** accidents and one **'Rear-End'** accident in this segment. All of the accidents occurred at the unsignalized T-intersection of SH 40 and County Road 42. The spike in the WHI graph was mainly due to three (3) of the accidents involved injuries. The **'Broadside'** accident rate was higher than the statewide average for similar facilities. All five accidents involved a southbound vehicle at County Road 42 making a left turn onto eastbound SH 40 only to collide with a westbound SH 40 vehicle. There is limited sight distance toward westbound SH 40 traffic created by high, above grade, embankment along the north side of SH 40, east of County Road 42. If there is ample funding available, the Region may consider clearing this embankment or provide improved clearing to improve entering sight distance for motorists on County Road 42 to make a safe decision when to make a turn onto SH 40. In addition, a low cost countermeasure the Region may consider is to install T-intersection advance warning signs (W2-2) facing eastbound at approximately MP 128.18 and facing westbound at approximately MP 128.52 to improve alerting the motorists that an intersection is ahead and to help reduce the number of intersection accidents.

- **MP 130.27 to MP 130.40:** This segment of SH 40 is a tangent section with three (3) unsignalized intersections (Evergreen Drive, Downhill Drive, and County Shop Road). There were 14 accidents along this segment of SH 40. Most of the accidents were **Rear End** at 43% (six accidents), followed by **Broadside** at 36% (five accidents). In addition, one of the **Broadside** accidents resulted in an injury. Ten (10) of the 14 accidents were located at intersections. Most of the accidents were caused by poor driver decision-making and were unrelated to site conditions. Therefore, there are no cost-effective countermeasures warranted in this segment.
- **MP 130.50 to MP 130.70:** This segment of SH 40 is a right-hand curve in the eastbound direction with a signalized intersection at Elk River Road. There were 25 accidents along this segment of SH 40 where three (3) of the accidents resulted in injuries. Most of the accidents were **Rear End** at 44% (11 accidents) followed by **Broadside** at 28% (seven accidents). These rates are higher than the statewide average for similar facilities. There were 11 accidents at the SH 40/Elk River Road signalized intersection: Four (4) **Broadside** and **Rear-End** crashes, and three (3) **Approach Turn** crashes. This signalized intersection is a standard two-phase signal where there are no left-turn signal heads. These accident rates are average for similar urban signalized four-leg intersections statewide. However, as the population in the Steamboat Springs area increases, these accident rates potentially could increase if the signal phase remains the same. If ample funding is available, the Region should seriously consider adding a protective/permmissive left-turn phase in both directions of SH 40 to lower the number of these accidents.

Also, the following safety improvement strategies associated with a resurfacing project should be provided:

- Good skid resistance and drainage of the roadway surface.
- Adjustment, repair and upgrade of existing guardrail and bridge rail to meet current standards.
- Elimination of pavement edge drop-offs.
- Superelevation and crown correction where required.
- Appropriate pavement markings, signing and delineation.
- Add more delineators along horizontal curves in the study section.
- Appropriate advance warning signing of intersections and curves.

APPENDIX

Three Year WHI Calculation and Detailed Summary of Traffic Accidents

WHI Calculation and Summary of Traffic Accidents by Year/Weighted Hazard Index

01/01/03 – 12/31/03

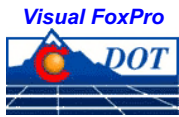
01/01/04 – 12/31/04

01/01/05 – 12/31/05

ARCVIEW Accident Location Map

Stripmap of the Current Traffic Control Devices

Three Year Accident Listing



**Colorado Department of Transportation
Transportation Safety and Traffic Engineering
Detailed Accident Summary Report**

10/06/2008

Job #: 20081006093033

Highway: 40A **Begin:** 126.83 **End:** 132.00 **From:** 01/01/2003 **To:** 12/31/2005

Severity	Multi-Vehicle	Location
PDO: 135	One Vehicle: 41	On Road: 132 Off in Median: 0
INJ: 16 29 :Injured	Two Vehicles: 99	Off Road Left: 4 Unknown: 0
FAT: 0 0 :Killed	Three or More: 11	Off Road Right: 14
Total: 151	Unknown: 0	Off Road at Tee: 1 Total: 151
	Total: 151	

Accident Type		
Overturning: 7	Domestic Animal: 1	Tree: 1
Other Non Collision: 2	Wild Animal: 15	Large Boulder: 1
School Age Peds: 0	Light/Utility Pole: 0	Rocks in Roadway: 1
Other Pedestrians: 0	Traffic Signal Pole: 2	Barricade: 0
Broadside: 25	Sign: 0	Wall/Building: 0
Head On: 1	Bridge Rail: 0	Crash Cushion: 0
Rear End: 57	Guard Rail: 3	Mailbox: 0
Sideswipe (Same): 4	Median Barrier: 0	Other Fixed Object: 0
Sideswipe (Opposite): 3	Bridge Abutment: 0	Involving Other Object: 10
Approach Turn: 4	Column/Pier: 0	Road Maintenance Equipment: 0
Overtaking Turn: 4	Culvert/Headwall: 0	Unknown: 2
Parked Motor Vehicle: 3	Embankment: 1	Total: 151
Railway Vehicle: 0	Curb: 1	Total Fixed Objects: 12
Bicycle: 0	Delineator Post: 2	Total Other Objects: 11
Motorized Bicycle: 0	Fence: 1	

Lighting Conditions	
Daylight: 108	
Dawn or Dusk: 4	
Dark - Lighted: 18	
Dark - Unlighted: 20	
Unknown: 1	
Total: 151	

Weather Conditions		
None: 120	Dust: 0	
Rain: 6	Wind: 2	
Snow/Sleet/Hail: 22	Unknown: 1	
Fog: 0		
Total: 151		

Road Description	
At Intersection: 63	
At Driveway Access: 14	
Intersection Related: 6	
Non Intersection Urban: 32	
In Alley: 0	
Non Intersection Rural: 36	
Highway Interchange: 0	
Unknown: 0	
Total: 151	

Road Conditions	
Dry: 98	
Wet: 14	
Muddy: 0	
Snowy: 7	
Icy: 15	
Slushy: 0	
Foreign Material: 0	
With Road Treatment: 0	
Dry w/Icy Road Treatment: 0	
Wet w/Icy Road Treatment: 1	
Snowy w/Icy Road Treatment: 8	
Icy w/Icy Road Treatment: 6	
Slushy w/Icy Road Treatment: 0	
Unknown: 2	
Total: 151	

Mainline/Ramps/Frontage Rds	
Mainline: 151	
Crossroad (Ramp A): 0	
Frontage Rd: 0	
Ramps	
B: 0	H: 0
C: 0	I: 0
D: 0	J: 0
E: 0	K: 0
F: 0	T: 0
G: 0	
Intsx Frontage/Ramps	
M: 0	N: 0
O: 0	P: 0
HOV Lanes: 0	
Ukwnn: 0	Total: 151

Accident Rates	
PDO: 1.83	MVMT Total: 2.04
Injury: 0.22	MVMT
Fatal: 0.00	100 MVMT

ADT: 13124 **WHI:** -4.95 **Length:** 5.14 **Coris File:** tcoris2005.dbf

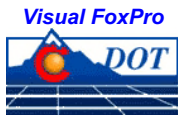
Vehicle Type	Veh 1	Veh 2	Veh 3
Passenger Car/Van:	97	77	8
Passenger Car/Van w/Trl:	0	0	0
Pickup Truck/Utility Van:	41	22	3
Pickup Truck/Utility Van w/Trl:	1	1	0
Truck 10k lbs or Less:	0	2	0
Trucks > 10k lbs/Bus > 15 People:	6	7	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	1	0	0
Motorcycle:	1	0	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	0
Other:	1	0	0
Unknown:	3	1	0
Total:	151	110	11

Vehicle Movement	Veh 1	Veh 2	Veh 3
Going Straight:	85	54	3
Slowing:	10	4	0
Stopped in Traffic:	0	41	8
Making Right Turn:	7	2	0
Making Left Turn:	24	6	0
Making U-Turn:	2	0	0
Passing:	0	0	0
Backing:	11	0	0
Enter/Leave Parked Position:	0	1	0
Starting in Traffic:	3	0	0
Parked:	0	0	0
Changing Lanes:	4	0	0
Avoiding Object in Road:	1	0	0
Weaving:	0	0	0
Other:	2	0	0
Unknown:	2	2	0
Total:	151	110	11

Contributing Factor	Veh 1	Veh 2	Veh 3
No Apparent Contributing Factor:	115	102	10
Asleep at the Wheel:	3	0	0
Illness:	0	0	0
Distracted by Passenger:	0	0	0
Driver Inexperience:	3	0	0
Driver Fatigue:	0	0	0
Driver Preoccupied:	25	3	0
Driver Unfamiliar with Area:	1	0	0
Driver Emotionally Upset:	0	0	0
Evading Law Enforcement Officer:	0	0	0
Physical Disability:	0	0	0
Unknown:	4	5	1
Total:	151	110	11

Direction	Veh 1	Veh 2	Veh 3
North:	10	7	2
Northeast:	0	0	0
East:	54	39	2
Southeast:	1	0	0
South:	24	8	0
Southwest:	0	0	0
West:	59	53	7
Northwest:	0	0	0
Unknown:	3	3	0
Total:	151	110	11

Condition of Driver	Veh 1	Veh 2	Veh 3
No Impairment Suspected:	132	103	10
Alcohol Involved:	2	0	0
RX Drugs or Medication Involved:	1	0	0
Illegal Drugs Involved:	1	0	0
Alcohol and Drugs Involved:	0	0	0
Driver/Pedestrian not Observed:	11	3	0
Unknown:	4	4	1
Total:	151	110	11



**Colorado Department of Transportation
Transportation Safety and Traffic Engineering
General Accident Summary Report**

10/06/2008

Job #: 20081006093133

Highway: 40A **Begin:** 126.83 **End:** 132.00 **From:** 01/01/2003 **To:** 12/31/2003

Severity	
PDO:	42
INJ:	3 4 :Injured
FAT:	0 0 :Killed
Total:	45

Number of Vehicles	
One Vehicle:	17
Two Vehicles:	26
Three or More:	2
Unknown:	0
Total:	45

Location	
On Road:	36
Off Road:	9
Unknown:	0
Total:	45

Accident Type					
Overturning:	3	Sideswipe (Same):	2	Bicycles:	0
Other Non Collision:	1	Sideswipe (Opposite):	1	Domestic Animal:	1
Pedestrians:	0	Approach Turn:	1	Wild Animal:	5
Broadside:	4	Overtaking Turn:	1	Fixed Objects:	5
Head On:	0	Parked Motor Vehicle:	0	Other Objects:	5
Rear End:	16	Railway Vehicle:	0	Unknown:	0
				Total:	45

Lighting Conditions	
Daylight:	26
Dawn or Dusk:	1
Dark - Lighted:	4
Dark - Unlighted:	13
Unknown:	1
Total:	45

Mainline/Ramps/Frontage Rds	
Mainline:	45
Ramps:	0
Frontage Roads:	0
Intsx Frontage/Ramps:	0
HOV Lanes:	0
Unknown:	0
Total:	45

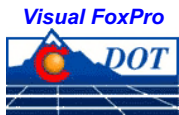
Weather Conditions	
None:	35
Rain:	2
Snow/Sleet/Hail:	7
Fog:	0
Dust:	0
Wind:	0
Unknown:	1
Total:	45

Vehicle Types	Vehicle 1	Vehicle 2	Vehicle 3
Passenger Car/Van:	20	17	1
Passenger Car/Van w/Trl:	0	0	0
Pickup Truck/Utility Van:	20	9	1
Pickup Truck/Utility Van w/Trl:	0	0	0
Truck 10k lbs or Less:	0	0	0
Trucks > 10k lbs/Busses > 15 People:	1	2	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	1	0	0
Motorcycle:	0	0	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	0
Other:	0	0	0
Unknown:	3	0	0
Total:	45	28	2

Road Conditions	
Dry:	27
Wet:	2
Muddy:	0
Snowy:	0
Icy:	7
Slushy:	0
Foreign Material:	0
With Road Treatment:	8
Unknown:	1
Total:	45

Accident Rates	
PDO:	1.91 * * MVMT
INJ:	0.14 * ** 100 MVMT
FAT:	0.00 ** Total: 2.04 *

ADT: 11736 **WHI:** -5.80 **Length:** 5.14 **Coris File:** tcoris2003.dbf



**Colorado Department of Transportation
Transportation Safety and Traffic Engineering
General Accident Summary Report**

10/06/2008

Job #: 20081006093216

Highway: 40A **Begin:** 126.83 **End:** 132.00 **From:** 01/01/2004 **To:** 12/31/2004

Severity			
PDO:	42		
INJ:	8	15 :Injured	
FAT:	0	0 :Killed	
Total:	50		

Number of Vehicles	
One Vehicle:	14
Two Vehicles:	31
Three or More:	5
Unknown:	0
Total:	50

Location	
On Road:	48
Off Road:	2
Unknown:	0
Total:	50

Accident Type					
Overturning:	2	Sideswipe (Same):	0	Bicycles:	0
Other Non Collision:	0	Sideswipe (Opposite):	0	Domestic Animal:	0
Pedestrians:	0	Approach Turn:	2	Wild Animal:	9
Broadside:	9	Overtaking Turn:	2	Fixed Objects:	1
Head On:	1	Parked Motor Vehicle:	1	Other Objects:	4
Rear End:	19	Railway Vehicle:	0	Unknown:	0
				Total:	50

Lighting Conditions	
Daylight:	36
Dawn or Dusk:	1
Dark - Lighted:	8
Dark - Unlighted:	5
Unknown:	0
Total:	50

Mainline/Ramps/Frontage Rds	
Mainline:	50
Ramps:	0
Frontage Roads:	0
Intsx Frontage/Ramps:	0
HOV Lanes:	0
Unknown:	0
Total:	50

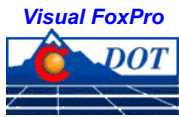
Weather Conditions	
None:	44
Rain:	1
Snow/Sleet/Hail:	4
Fog:	0
Dust:	0
Wind:	1
Unknown:	0
Total:	50

Vehicle Types	Vehicle 1	Vehicle 2	Vehicle 3
Passenger Car/Van:	37	25	5
Passenger Car/Van w/Trl:	0	0	0
Pickup Truck/Utility Van:	9	6	0
Pickup Truck/Utility Van w/Trl:	1	1	0
Truck 10k lbs or Less:	0	1	0
Trucks > 10k lbs/Busses > 15 People:	2	2	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	0	0	0
Motorcycle:	0	0	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	0
Other:	1	0	0
Unknown:	0	1	0
Total:	50	36	5

Road Conditions	
Dry:	36
Wet:	7
Muddy:	0
Snowy:	1
Icy:	2
Slushy:	0
Foreign Material:	0
With Road Treatment:	3
Unknown:	1
Total:	50

Accident Rates		
PDO:	1.66 *	* MVMT
INJ:	0.32 *	** 100 MVMT
FAT:	0.00 **	Total: 1.97 *

ADT: 13461 **WHI:** -4.94 **Length:** 5.14 **Coris File:** tcoris2004.dbf



**Colorado Department of Transportation
Transportation Safety and Traffic Engineering
General Accident Summary Report**

10/06/2008

Job #: 20081006093248

Highway: 40A **Begin:** 126.83 **End:** 132.00 **From:** 01/01/2005 **To:** 12/31/2005

Severity	
PDO:	51
INJ:	5 10 :Injured
FAT:	0 0 :Killed
Total:	56

Number of Vehicles	
One Vehicle:	10
Two Vehicles:	42
Three or More:	4
Unknown:	0
Total:	56

Location	
On Road:	48
Off Road:	8
Unknown:	0
Total:	56

Accident Type		
Overturning:	2	Sideswipe (Same): 2
Other Non Collision:	1	Sideswipe (Opposite): 2
Pedestrians:	0	Approach Turn: 1
Broadside:	12	Overtaking Turn: 1
Head On:	0	Parked Motor Vehicle: 2
Rear End:	22	Railway Vehicle: 0
		Bicycles: 0
		Domestic Animal: 0
		Wild Animal: 1
		Fixed Objects: 6
		Other Objects: 2
		Unknown: 2
		Total: 56

Lighting Conditions	
Daylight:	46
Dawn or Dusk:	2
Dark - Lighted:	6
Dark - Unlighted:	2
Unknown:	0
Total:	56

Mainline/Ramps/Frontage Rds	
Mainline:	56
Ramps:	0
Frontage Roads:	0
Intsx Frontage/Ramps:	0
HOV Lanes:	0
Unknown:	0
Total:	56

Weather Conditions	
None:	41
Rain:	3
Snow/Sleet/Hail:	11
Fog:	0
Dust:	0
Wind:	1
Unknown:	0
Total:	56

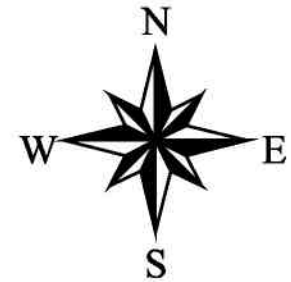
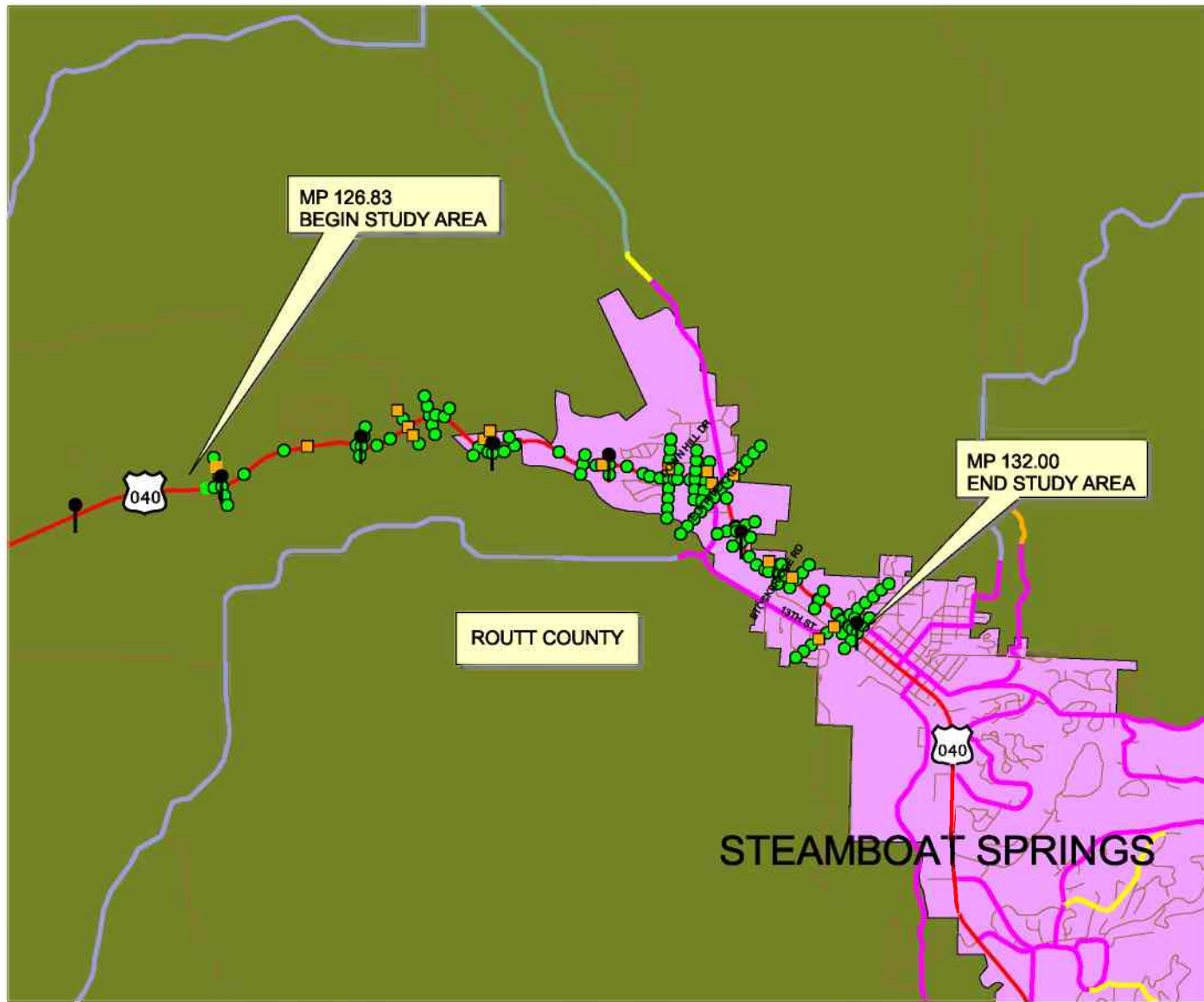
Vehicle Types	Vehicle 1	Vehicle 2	Vehicle 3
Passenger Car/Van:	40	35	2
Passenger Car/Van w/Trl:	0	0	0
Pickup Truck/Utility Van:	12	7	2
Pickup Truck/Utility Van w/Trl:	0	0	0
Truck 10k lbs or Less:	0	1	0
Trucks > 10k lbs/Busses > 15 People:	3	3	0
School Bus < 15 People:	0	0	0
Non School Bus < 15 People:	0	0	0
Motorhome:	0	0	0
Motorcycle:	1	0	0
Bicycle:	0	0	0
Motorized Bicycle:	0	0	0
Farm Equipment:	0	0	0
Hit and Run - Unknown:	0	0	0
Other:	0	0	0
Unknown:	0	0	0
Total:	56	46	4

Road Conditions	
Dry:	35
Wet:	5
Muddy:	0
Snowy:	6
Icy:	6
Slushy:	0
Foreign Material:	0
With Road Treatment:	4
Unknown:	0
Total:	56

Accident Rates	
PDO:	2.07 * * MVMT
INJ:	0.20 * ** 100 MVMT
FAT:	0.00 **
Total:	2.27 *

ADT: 13124 **WHI:** -5.11 **Length:** 5.14 **Coris File:** tcoris2005.dbf

US 40 Accident Locations



LEGEND

- MP
- Injury
- PDO

AUTHORIZED SPEED LIMITS AND RECOMMENDED TRAFFIC CONTROL DEVICES



AUTHORIZED SPEED LIMITS

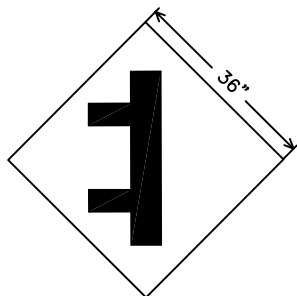
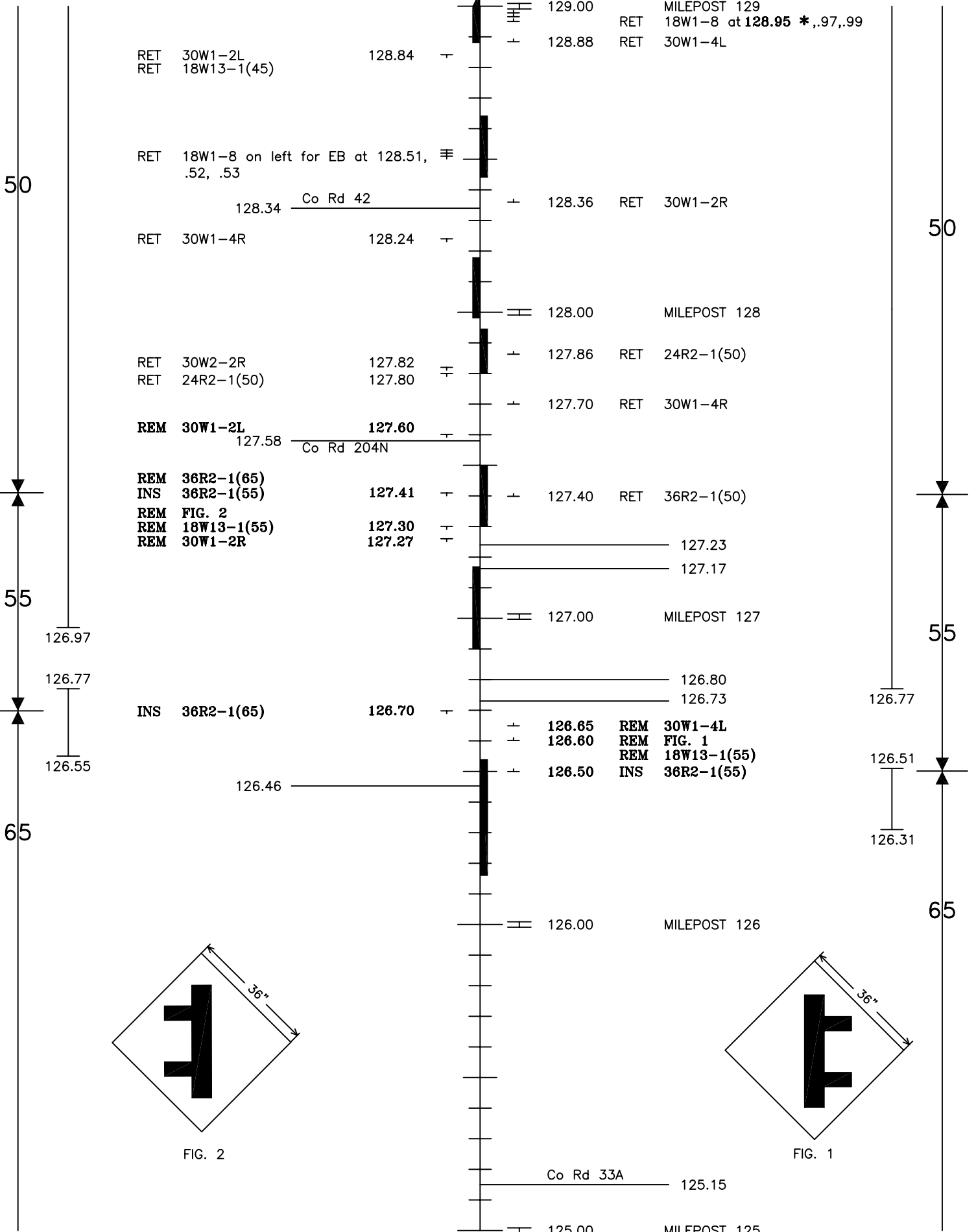


FIG. 2

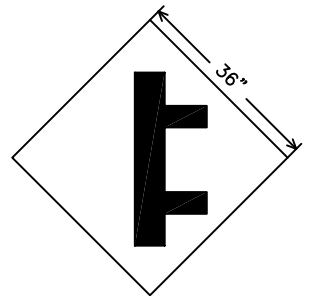
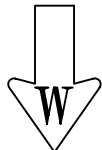


FIG. 1

Traffic Engineer

Date: _____



⏏ = EXTG NO-PASSING ZONE



*MISSING ON 6-13-96
SIGNLOG ON 6-13-96

AUTHORIZED SPEED LIMITS

FILE	MEMO	SHEET	Implemented with changes as marked
880.040.02	5991	9	Date: _____ By: _____

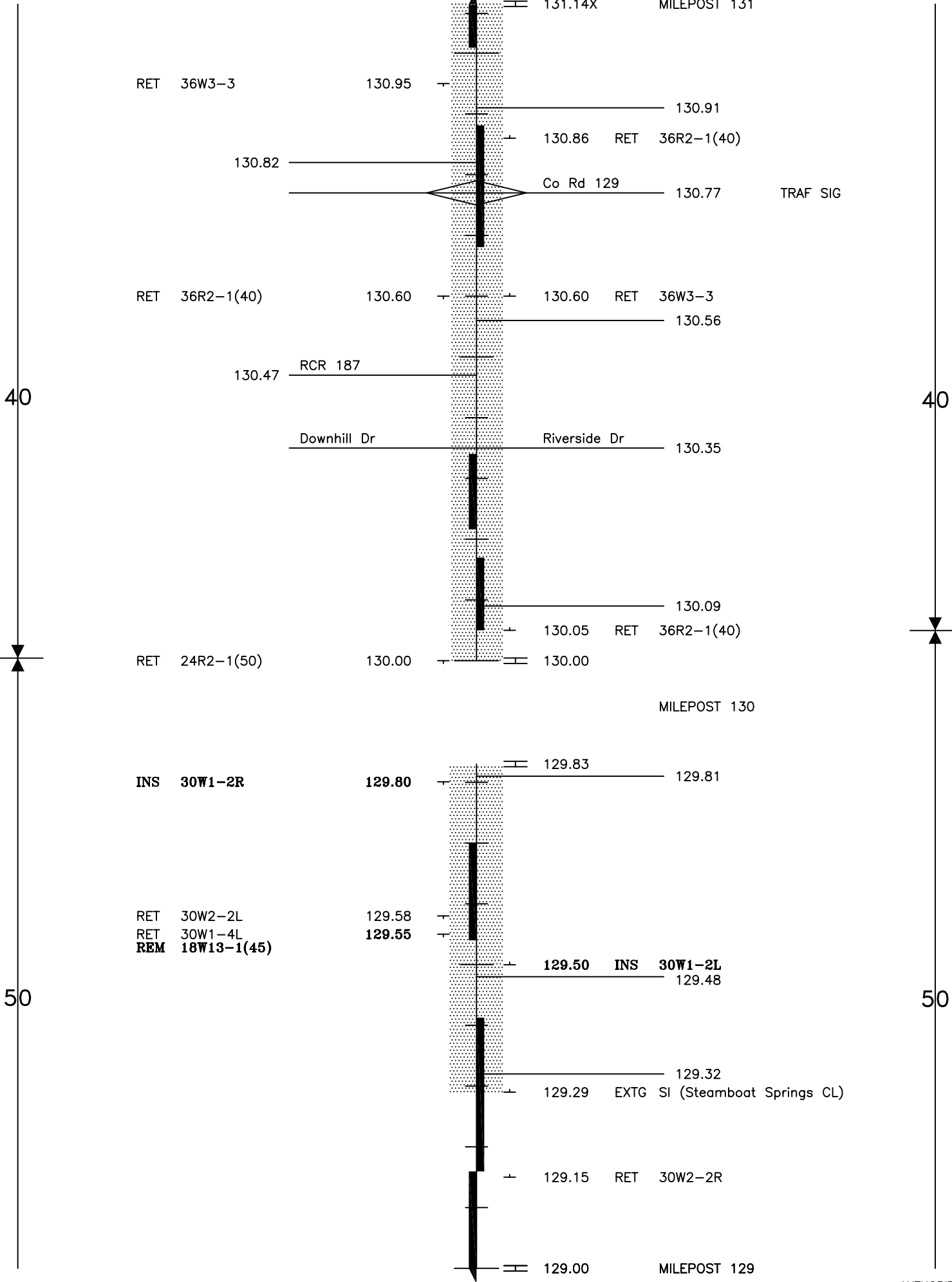
SH 40 FROM STR B-7-D E. OF CRAIG TO SH 34 W. OF GRANBY

SUPERSEDES SHEET 9, MEMO 5973, 06-13-97

AUTHORIZED SPEED LIMITS AND RECOMMENDED TRAFFIC CONTROL DEVICES



AUTHORIZED
SPEED
LIMITS



40

40

50

50

AUTHORIZED
SPEED
LIMITS

Traffic Engineer



Date: _____

SIGNLOG ON 5-15-97

FILE	MEMO	SHEET	Implemented with changes as marked
880.040.02	5973	10	Date: _____ By: _____

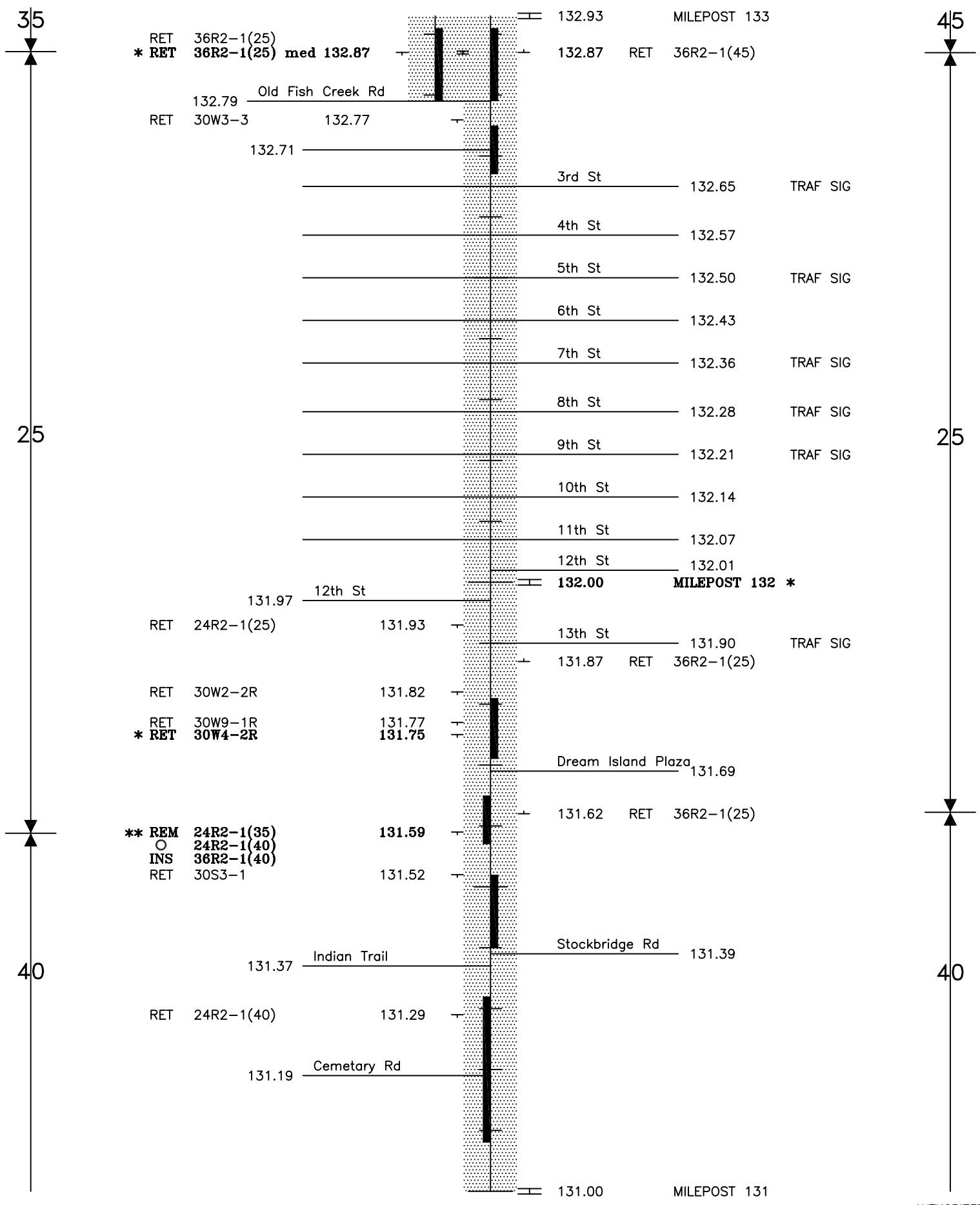
SH 40 FROM STR B-7-D E/O CRAIG TO SH 34 W/O GRANBY

SUPERSEDES SHEET 10, MEMO 5694, 9-16-93

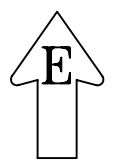
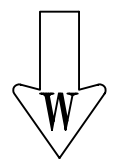
AUTHORIZED SPEED LIMITS AND RECOMMENDED TRAFFIC CONTROL DEVICES



AUTHORIZED SPEED LIMITS



Traffic Engineer
Date: _____



AUTHORIZED SPEED LIMITS
 ○ MISSING DO NOT REINSTALL
 **UNAUTHORIZED
 *MISSING ON 4-29-98
 SIGNLOG ON 4-29-98

	FILE	MEMO	SHEET	Implemented with changes as marked
	880.040.02	6030	11	Date: _____ By: _____

SH 40 FROM E/O CRAIG TO SH 34 W/O GRANBY

SUPERSEDES SHEET 11, MEMO 5694, 9-16-93

COLORADO DEPARTMENT OF TRANSPORTATION TRAFFIC ACCIDENT LOCATIONS



File No

Color Coding: ■ PDO ■ Injury ■ Fatal

Date 10/07/2008

SH No 040A

Region 3

Period 01/01/03

To 12/31/05

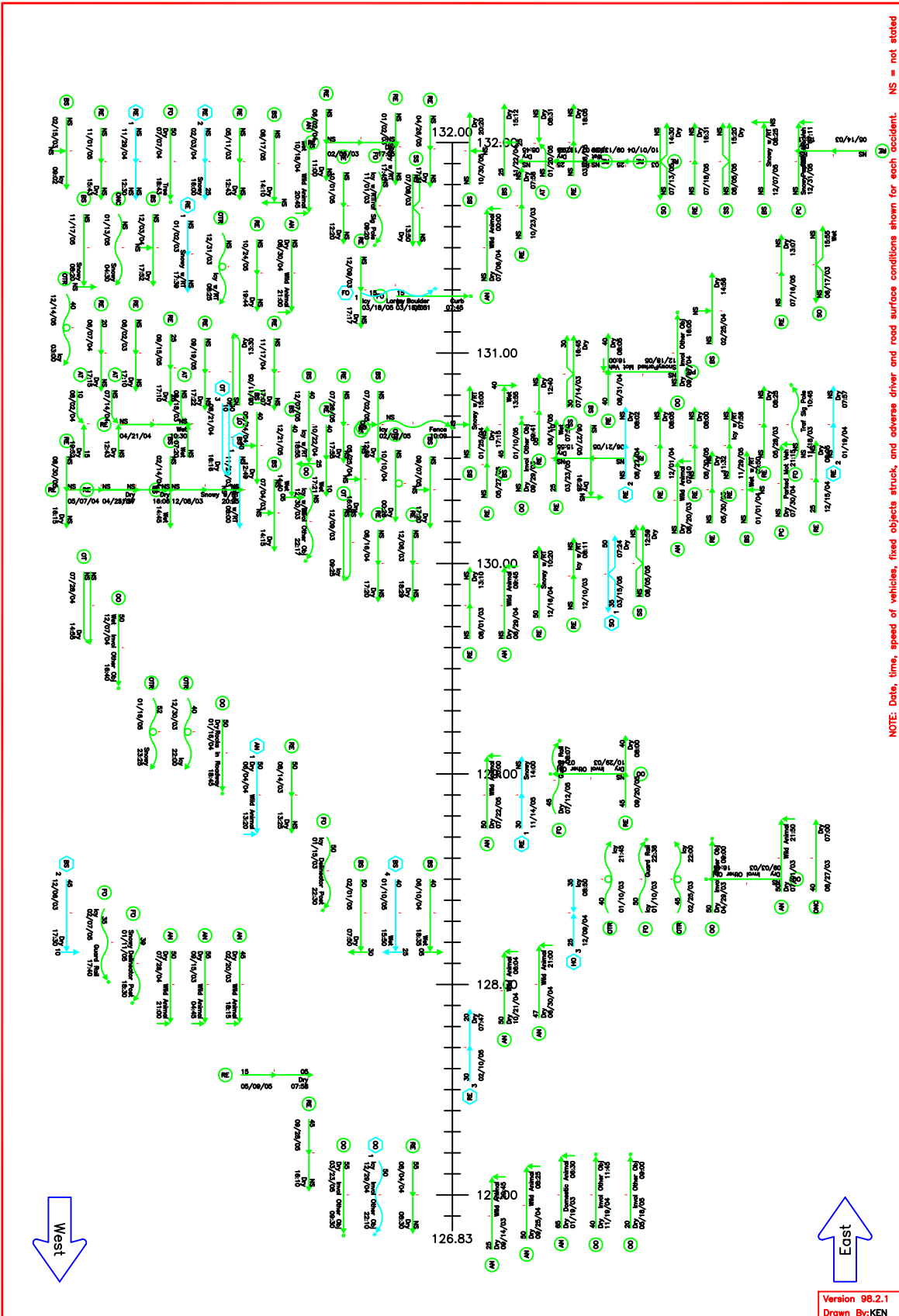
Sheet 1 of 1

Description Accident Diagrams

SH 40

Milepoint 126.83

To 132.00



NOTE: Date, time, speed of vehicles, fixed objects struck, and adverse driver and road surface conditions shown for each accident. NS = not stated

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
1	126.90	9/14/2003	2045	PDO	ON	NON-INTERSECTION RURAL	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	25	GOING STRAIGHT
2	126.95	9/25/2004	0825	PDO	ON	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	WILD ANIMAL	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
3	127.00	8/4/2004	0830	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NOT OBSERVED	NONE APPARENT	55	GOING STRAIGHT
4	127.00	1/19/2003	0630	PDO	ON	NON-INTERSECTION RURAL	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	DOMESTIC ANIMAL	E	PASS CAR/VAN	NOT OBSERVED	NONE APPARENT	65	GOING STRAIGHT
5	127.00	11/19/2004	1145	PDO	ON	NON-INTERSECTION RURAL	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	INVOLVING OTHER OBJECT	E	TRUCK GWV > 10K/BUSSES > 15 PEOPLE	NOT OBSERVED	NONE APPARENT	40	GOING STRAIGHT
6	127.00	12/29/2004	2210	INJ	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	ICY	DARK-UNLIGHTED	WIND	OVERTURNING	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
7	127.00	3/23/2005	0930	PDO	ON	NON-INTERSECTION RURAL	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	INVOLVING OTHER OBJECT	W	TRUCK GWV > 10K/BUSSES > 15 PEOPLE	NOT OBSERVED	NONE APPARENT	55	GOING STRAIGHT
8	127.00	5/18/2005	0900	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	INVOLVING OTHER OBJECT	E	TRUCK GWV > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT	NONE APPARENT	20	MAKING RIGHT TURN
9	127.20	9/28/2005	1610	PDO	ON	NON-INTERSECTION RURAL	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
10	127.57	5/9/2005	0758	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	15	MAKING LEFT TURN
11	127.70	2/10/2005	0747	INJ	ON	NON-INTERSECTION RURAL	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	30	GOING STRAIGHT
12	127.97	10/21/2004	0604	PDO	ON	NON-INTERSECTION RURAL	1	STRAIGHT ON-GRADE	DRY	DARK-UNLIGHTED	NONE	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
13	128.00	2/20/2003	1815	PDO	ON	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	WILD ANIMAL	W	PASS CAR/VAN	NOT OBSERVED	NONE APPARENT	45	GOING STRAIGHT

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Sever-ity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
14	128.00	9/15/2003	0445	PDO	ON	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	WILD ANIMAL	W	PICKUP TRUCK / UTILITY VAN	NOT OBSERVED	NONE APPARENT	55	GOING STRAIGHT
15	128.00	6/30/2004	2100	PDO	ON	NON-INTERSECTION RURAL	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	WILD ANIMAL	E	PASS CAR/VAN	NOT OBSERVED	NONE APPARENT	47	GOING STRAIGHT
16	128.00	7/28/2004	2100	PDO	ON	NON-INTERSECTION RURAL	1	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	WILD ANIMAL	W	PASS CAR/VAN	NOT OBSERVED	NONE APPARENT	50	GOING STRAIGHT
17	128.10	1/11/2005	1830	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-GRADE	SNOWY	DARK-LIGHTED	SNOW/SLEET / HAIL	DELINEATOR POST	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	39	GOING STRAIGHT
18	128.20	2/7/2005	1740	PDO	OFF LEFT	NON-INTERSECTION RURAL	1	STRAIGHT ON-GRADE	ICY	DAWN OR DUSK	SNOW/SLEET / HAIL	GUARD RAIL	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	35	GOING STRAIGHT
19	128.34	12/6/2003	1730	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	10	MAKING LEFT TURN
20	128.34	6/10/2004	1835	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	05	MAKING LEFT TURN
21	128.34	1/10/2005	1550	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN	BROADSIDE	N	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	25	MAKING LEFT TURN
22	128.34	2/1/2005	0750	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	BROADSIDE	N	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	30	MAKING LEFT TURN
23	128.34	12/9/2004	0850	INJ	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEET / HAIL	HEAD-ON	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	25	OTHER
24	128.50	1/10/2003	2145	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	ICY	DARK-UNLIGHTED	SNOW/SLEET / HAIL	OVERTURNING	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
25	128.50	2/25/2003	2200	PDO	OFF LEFT	NON-INTERSECTION RURAL	1	CURVE ON-GRADE	ICY	DARK-UNLIGHTED	SNOW/SLEET / HAIL	OVERTURNING	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
26	128.50	1/10/2003	2238	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	ICY	DARK-UNLIGHTED	SNOW/SLEET / HAIL	GUARD RAIL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
27	128.50	4/29/2003	0900	PDO	ON	NON-INTERSECTION RURAL	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	INVOLVING OTHER OBJECT	E	PICKUP TRUCK / UTILITY VAN	NOT OBSERVED	NONE APPARENT	50	GOING STRAIGHT
28	128.50	9/3/2003	1645	PDO	ON	NON-INTERSECTION RURAL	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	INVOLVING OTHER OBJECT	UK	UNKNOWN	NOT OBSERVED	UNKNOWN	UK	UNKNOWN
29	128.54	1/15/2003	2230	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	ICY	DARK-UNLIGHTED	SNOW/SLEET/HAIL	DELINEATOR POST	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
30	128.60	8/27/2003	0700	PDO	ON	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	OTHER NON-COLLISION	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	40	SLOWING
31	128.60	7/1/2003	2150	PDO	ON	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
32	128.90	8/14/2003	1325	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	50	GOING STRAIGHT
33	128.90	11/14/2005	1400	INJ	ON	NON-INTERSECTION RURAL	2	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL	REAR-END	E	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT	NONE APPARENT	30	GOING STRAIGHT
34	128.90	6/4/2004	1320	INJ	ON	NON-INTERSECTION RURAL	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
35	128.90	7/22/2005	2000	PDO	ON	NON-INTERSECTION RURAL	1	STRAIGHT ON-LEVEL	DRY	DAWN OR DUSK	NONE	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
36	128.97	7/12/2005	0807	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	GUARD RAIL	E	PASS CAR/VAN	NO IMPAIRMENT	ASLEEP AT WHEEL	45	GOING STRAIGHT
37	129.00	9/20/2005	0800	PDO	ON	NON-INTERSECTION RURAL	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	MOTORCYCLE	NO IMPAIRMENT	NONE APPARENT	45	GOING STRAIGHT
38	129.00	10/29/2003	0745	PDO	ON	NON-INTERSECTION RURAL	2	CURVE ON-GRADE	DRY	DAYLIGHT	NONE	INVOLVING OTHER OBJECT	UK	UNKNOWN	UNKNOWN	UNKNOWN	UK	UNKNOWN

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
39	129.10	1/16/2004	1845	PDO	ON	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	ROCKS IN ROADWAY	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
40	129.20	12/30/2003	2200	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	ICY	DARK-UNLIGHTED	SNOW/SLEET/HAIL	EMBANKMENT	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
41	129.20	1/16/2005	2325	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	SNOWY	DARK-UNLIGHTED	NONE	OVERTURNING	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	52	GOING STRAIGHT
42	129.60	12/7/2004	1640	PDO	ON	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	WET	DAWN OR DUSK	NONE	INVOLVING OTHER OBJECT	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	50	GOING STRAIGHT
43	129.80	8/1/2003	1310	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
44	129.80	7/28/2004	1455	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	OVERTAKING TURN	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
45	129.80	6/29/2004	0945	PDO	ON	NON-INTERSECTION URBAN	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
46	129.90	12/16/2004	1020	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	SNOWY W/MIS ICY ROAD TREATMENT	DAYLIGHT	NONE	REAR-END	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	50	SLOWING
47	129.94	12/10/2003	0811	PDO	ON	INTERSECTION RELATED	2	CURVE ON-LEVEL	ICY W/MIS ICY ROAD TREATMENT	DAYLIGHT	NONE	REAR-END	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	SLOWING
48	129.95	3/15/2005	0724	INJ	ON	NON-INTERSECTION URBAN	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	SIDESWIPE OPPOSITE DIRECTION	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	35	GOING STRAIGHT
49	130.00	12/6/2003	1829	PDO	ON	AT INTERSECTION	2	CURVE ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING RIGHT TURN
50	130.00	8/16/2004	1720	PDO	ON	NON-INTERSECTION URBAN	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
51	130.00	8/5/2005	1259	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	SIDESWIPE SAME DIRECTION	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
52	130.10	12/9/2003	0925	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	ICY	DAYLIGHT	SNOW/SLEET/HAIL	OVERTAKING TURN	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING RIGHT TURN
53	130.20	12/30/2003	2217	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	ICY W/MIS ICY ROAD TREATMENT	DARK-UNLIGHTED	NONE	INVOLVING OTHER OBJECT	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	OTHER
54	130.24	7/4/2003	1415	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	BROADSIDE	S	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
55	130.27	8/20/2003	0710	PDO	ON	NON-INTERSECTION URBAN	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
56	130.28	1/1/2004	0050	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET W/MIS ICY ROAD TREATMENT	DARK-LIGHTED	NONE	BROADSIDE	N	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING RIGHT TURN
57	130.29	11/26/2003	0800	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	SNOWY W/MIS ICY ROAD TREATMENT	DAYLIGHT	NONE	BROADSIDE	S	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	00	STARTING IN TRAFFIC
58	130.29	2/14/2004	1445	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
59	130.29	9/7/2005	1720	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
60	130.29	5/30/2003	1132	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
61	130.29	12/8/2003	2025	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	SNOWY W/MIS ICY ROAD TREATMENT	DARK-LIGHTED	NONE	REAR-END	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	SLOWING
62	130.29	4/25/2004	1606	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	S	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	BACKING
63	130.29	5/7/2004	1157	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	BACKING
64	130.29	8/30/2005	1615	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
65	130.36	10/10/2004	0026	PDO	ON	AT DRIVEWAY ACCESS	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	OVERTURNING	W	PASS CAR/VAN	ALCOHOL	NONE APPARENT	UK	GOING STRAIGHT
66	130.38	7/30/2004	2115	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	PARKED MOTOR VEHICLE	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	BACKING
67	130.40	5/25/2004	1609	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	BROADSIDE	S	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
68	130.40	12/15/2004	0805	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	25	SLOWING
69	130.47	5/27/2005	1715	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
70	130.50	6/27/2005	1628	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	BROADSIDE	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING U-TURN
71	130.50	12/21/2005	1440	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	05	MAKING LEFT TURN
72	130.50	10/22/2004	1721	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	40	GOING STRAIGHT
73	130.50	3/23/2005	0750	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	25	GOING STRAIGHT
74	130.50	6/21/2005	1555	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	N	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	BACKING
75	130.50	9/29/2003	0941	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	INVOLVING OTHER OBJECT	E	TRUCK GWV > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
76	130.56	8/24/2004	1249	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
77	130.56	8/27/2004	0802	INJ	ON	AT INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
78	130.56	12/1/2004	0805	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
79	130.56	8/30/2005	0800	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
80	130.56	11/29/2005	0758	PDO	ON	AT INTERSECTION	3	STRAIGHT ON-LEVEL	ICY W/MIS ICY ROAD TREATMENT	DAYLIGHT	NONE	REAR-END	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
81	130.60	8/21/2004	1616	INJ	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	OVERTAKING TURN	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	10	MAKING U-TURN
82	130.66	1/25/2004	1500	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	SNOWY W/MIS ICY ROAD TREATMENT	DAYLIGHT	SNOW/SLEET/HAIL	BROADSIDE	S	PICKUP TRUCK / UTILITY VAN W/TRL	NO IMPAIRMENT	NONE APPARENT	UK	SLOWING
83	130.66	1/10/2005	1355	PDO	ON	AT INTERSECTION	3	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	MAKING LEFT TURN
84	130.66	7/2/2005	1259	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	05	MAKING LEFT TURN
85	130.66	12/7/2005	1855	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	ICY W/MIS ICY ROAD TREATMENT	DARK-LIGHTED	NONE	BROADSIDE	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
86	130.66	5/28/2003	0825	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
87	130.66	1/19/2004	0757	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	SLOWING
88	130.66	4/21/2004	1030	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	SNOW/SLEET/HAIL	REAR-END	S	OTHER - SEE REPORT	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	BACKING
89	130.66	7/26/2005	1755	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	GOING STRAIGHT
90	130.66	8/18/2003	0720	PDO	ON	AT INTERSECTION	3	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN	APPROACH TURN	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
91	130.66	7/14/2004	1243	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	APPROACH TURN	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
92	130.66	8/2/2004	1952	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	APPROACH TURN	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	10	MAKING LEFT TURN
93	130.66	11/18/2003	1045	PDO	OFF LEFT	AT INTERSECTION	1	UNKNOWN	UNKNOWN	UNKNOWN	UNKNOWN	TRAFFIC SIGNAL POLE	E	UNKNOWN	UNKNOWN	UNKNOWN	UK	GOING STRAIGHT

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
94	130.66	2/7/2005	1009	PDO	OFF RIGHT	NON-INTERSECTION URBAN	1	CURVE ON-LEVEL	ICY	DARK-LIGHTED	SNOW/SLEET/HAIL	FENCE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	SLOWING
95	130.72	6/11/2005	1240	PDO	ON	NON-INTERSECTION URBAN	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	05	GOING STRAIGHT
96	130.90	7/14/2003	1645	PDO	ON	AT DRIVEWAY ACCESS	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	SIDESWIPE SAME DIRECTION	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	30	CHANGING LANES
97	130.91	8/31/2004	0805	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	40	GOING STRAIGHT
98	130.91	11/17/2004	1707	PDO	ON	NON-INTERSECTION URBAN	3	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
99	130.91	9/19/2005	1722	PDO	ON	NON-INTERSECTION URBAN	5	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
100	130.91	8/11/2005	1330	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	OVERTAKING TURN	W	PICKUP TRUCK / UTILITY VAN	UNKNOWN	DRIVER PREOCCUPIED	UK	MAKING LEFT TURN
101	130.91	12/18/2005	1600	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL	PARKED MOTOR VEHICLE	UK	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	BACKING
102	130.93	9/15/2005	1710	PDO	ON	NON-INTERSECTION URBAN	5	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	25	GOING STRAIGHT
103	131.00	6/2/2003	1710	PDO	ON	NON-INTERSECTION RURAL	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
104	131.00	6/7/2004	1715	PDO	ON	NON-INTERSECTION URBAN	4	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	UNKNOWN	DRIVER PREOCCUPIED	20	GOING STRAIGHT
105	131.00	9/7/2004	1605	PDO	ON	NON-INTERSECTION URBAN	2	CURVE ON-LEVEL	DRY	DAYLIGHT	NONE	INVOLVING OTHER OBJECT	E	TRUCK GVW > 10K/BUSSES > 15 PEOPLE	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
106	131.12	12/14/2005	0300	PDO	OFF RIGHT	NON-INTERSECTION RURAL	1	CURVE ON-LEVEL	ICY	DARK-UNLIGHTED	WIND	OVERTURNING	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	40	GOING STRAIGHT
107	131.20	2/25/2004	1456	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
108	131.27	3/18/2005	0745	PDO	ON	INTERSECTION RELATED	1	CURVE ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL	CURB	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	15	GOING STRAIGHT
109	131.27	3/18/2005	0801	INJ	OFF LEFT	AT DRIVEWAY ACCESS	1	CURVE ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL	LARGE BOULDER	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	15	MAKING RIGHT TURN
110	131.30	12/9/2003	1717	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DARK-UNLIGHTED	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	CHANGING LANES
111	131.37	3/18/2005	0820	PDO	ON	NON-INTERSECTION URBAN	2	CURVE ON-GRADE	ICY	DAYLIGHT	SNOW/SLEET/HAIL		W	PASS CAR/VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	05	SLOWING
112	131.37	6/9/2005	1239	PDO	ON	AT INTERSECTION	2	CURVE ON-LEVEL	WET	DAYLIGHT	RAIN		SE	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
113	131.38	7/16/2005	1307	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	GOING STRAIGHT
114	131.38	10/24/2005	1944	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	AVOIDING OBJECT IN ROAD
115	131.38	8/30/2004	2100	PDO	ON	AT INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
116	131.41	12/31/2003	0825	PDO	OFF RIGHT	NON-INTERSECTION URBAN	1	CURVE ON-LEVEL	ICY W/VIS ICY ROAD TREATMENT	DAYLIGHT	NONE	OVERTURNING	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
117	131.42	6/17/2003	1555	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	RAIN	SIDESWIPE OPPOSITE DIRECTION	E	PASS CAR/VAN	NO IMPAIRMENT	ASLEEP AT WHEEL	UK	GOING STRAIGHT
118	131.47	1/2/2003	1739	INJ	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	SNOWY W/VIS ICY ROAD TREATMENT	DARK-LIGHTED	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER INEXPERIENCE	UK	GOING STRAIGHT

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
119	131.50	1/13/2005	0430	PDO	OFF RIGHT	AT DRIVEWAY ACCESS	1	STRAIGHT ON-LEVEL	SNOWY	DARK-LIGHTED	SNOW/SLEET/HAIL	OTHER NON-COLLISION	W	PASS CAR/VAN	NOT OBSERVED	NONE APPARENT	UK	MAKING RIGHT TURN
120	131.50	12/3/2004	1752	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	MAKING LEFT TURN
121	131.50	11/17/2005	0820	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL	BROADSIDE	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING RIGHT TURN
122	131.50	7/6/2004	0000	PDO	ON	NON-INTERSECTION URBAN	1	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	WILD ANIMAL	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
123	131.69	7/8/2003	1350	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	SIDESWIPE SAME DIRECTION	W	MOTOR HOME	NO IMPAIRMENT	DRIVER UNFAMILIAR W/AREA	UK	CHANGING LANES
124	131.70	10/23/2003	0758	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
125	131.70	10/1/2005	1220	PDO	ON	INTERSECTION RELATED	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	00	STARTING IN TRAFFIC
126	131.70	11/1/2003	0920	PDO	OFF RIGHT	AT INTERSECTION	1	STRAIGHT ON-LEVEL	ICY W/MIS ICY ROAD TREATMENT	DAYLIGHT	SNOW/SLEET/HAIL	TRAFFIC SIGNAL POLE	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
127	131.85	10/18/2004	2045	PDO	ON	NON-INTERSECTION URBAN	1	CURVE ON-LEVEL	WET	DARK-LIGHTED	NONE	WILD ANIMAL	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
128	131.90	8/17/2005	1410	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	BROADSIDE	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	BACKING
129	131.91	12/7/2005	0825	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	SNOWY W/MIS ICY ROAD TREATMENT	DAYLIGHT	NONE	BROADSIDE	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
130	131.91	5/11/2003	1243	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
131	131.91	7/18/2003	0845	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	N	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	00	STARTING IN TRAFFIC

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

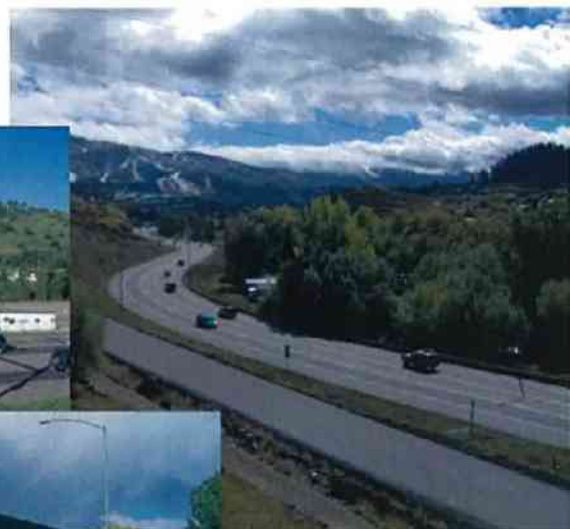
#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
132	131.91	2/3/2004	1600	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	SNOWY	DAYLIGHT	SNOW/SLEET/HAIL	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	UNKNOWN	UK	MAKING LEFT TURN
133	131.91	9/13/2004	1245	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	REAR-END	N	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	25	GOING STRAIGHT
134	131.91	10/1/2004	1559	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	WET	DAYLIGHT	NONE	REAR-END	N	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	03	GOING STRAIGHT
135	131.91	11/29/2004	1230	INJ	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	UNKNOWN	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
136	131.91	7/18/2005	1631	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	ILLEGAL DRUGS	DRIVER PREOCCUPIED	UK	GOING STRAIGHT
137	131.91	11/1/2005	1543	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN
138	131.91	8/5/2005	1520	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	SIDESWIPE SAME DIRECTION	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	CHANGING LANES
139	131.91	7/13/2005	1430	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	SIDESWIPE OPPOSITE DIRECTION	E	PASS CAR/VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	GOING STRAIGHT
140	131.91	12/31/2005	0711	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-GRADE	SNOWY W/VIS ICY ROAD TREATMENT	DAYLIGHT	SNOW/SLEET/HAIL	PARKED MOTOR VEHICLE	E	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	BACKING
141	131.91	7/7/2004	1843	PDO	OFF AT TEE	AT INTERSECTION	1	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	TREE	W	PASS CAR/VAN	ALCOHOL	DRIVER PREOCCUPIED	50	MAKING LEFT TURN
142	131.96	2/15/2003	0902	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	ICY	DAYLIGHT	NONE	BROADSIDE	S	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
143	131.96	10/30/2005	2020	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DARK-LIGHTED	NONE	BROADSIDE	N	PASS CAR/VAN	RX/MEDICATION	ASLEEP AT WHEEL	UK	GOING STRAIGHT
144	131.96	5/14/2003	1651	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	N	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	BACKING
145	131.97	4/26/2005	1731	PDO	ON	NON-INTERSECTION URBAN	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	DRIVER PREOCCUPIED	UK	SLOWING

Accidents on SH 40 from MP 126.83 to MP 132.00 for the Period of January 1, 2003 to December 31, 2005

#	MP	Date	Time	Severity	Location	Road Description	# of Vehicles	Road Contour	Road Condition	Lighting	Weather	Accident Event	DIR	Vehicle Type	Driver Condition	Human Factor	Speed	Vehicle Movement
146	131.98	1/2/2003	1745	PDO	ON	AT DRIVEWAY ACCESS	2	STRAIGHT ON-LEVEL	SNOWY W/MIS ICY ROAD TREATMENT	DARK-LIGHTED	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
147	132.00	11/22/2004	1512	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	BROADSIDE	N	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	25	MAKING LEFT TURN
148	132.00	2/5/2003	1705	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAWN OR DUSK	NONE	REAR-END	S	PICKUP TRUCK / UTILITY VAN	NO IMPAIRMENT	NONE APPARENT	UK	BACKING
149	132.00	6/2/2004	1100	PDO	ON	AT INTERSECTION	3	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	W	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	GOING STRAIGHT
150	132.00	3/8/2005	1805	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-LEVEL	DRY	DAYLIGHT	NONE	REAR-END	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	BACKING
151	132.00	1/20/2005	0831	PDO	ON	AT INTERSECTION	2	STRAIGHT ON-GRADE	DRY	DAYLIGHT	NONE	APPROACH TURN	E	PASS CAR/VAN	NO IMPAIRMENT	NONE APPARENT	UK	MAKING LEFT TURN

WEST STEAMBOAT SPRINGS US HIGHWAY 40 SYSTEM NEEDS STUDY

M.P. 126.83 TO M.P. 131.90 (13TH STREET)
AUGUST 2008



**WEST STEAMBOAT SPRINGS
US HIGHWAY 40
SYSTEM NEEDS STUDY**

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EXECUTIVE SUMMARY

Background and Purpose

US Highway 40 is an important regional transportation route for northwestern Colorado. The western leg of US 40 through Colorado extends from the Utah border east to I-70 near the Town of Empire. Although I-70 is the primary route for interstate traffic, US 40 provides an alternative route into Utah; offering east-west access through Grand, Routt, and Moffat Counties. Along the westernmost portion of the highway, through Routt and Moffat Counties, US 40 serves as the primary roadway for many communities including Steamboat Springs, Hayden, Craig, and Dinosaur. Residents and businesses in Routt County depend heavily on US 40 for local and inter-community travel.

US 40 through West Steamboat is anticipated to experience a doubling of traffic volume demand as major new developments identified in the West of Steamboat Springs Area Plan (WSSAP) are constructed and background traffic increases. Based on existing operational conditions, the current highway and local street network is expected to be insufficient to serve the additional development related traffic demand and regional growth at a level-of-service (LOS) considered “acceptable” in most similar settings.

Initially, this study was conceived to provide policy makers with information regarding existing and anticipated traffic operations on US 40, recommendations for improving deficiencies, and prioritization of the recommendations for incorporation into the City’s Capital Improvements Program (CIP). The analyses; however, revealed that accommodation of the anticipated future traffic volumes, described above, would likely require system level improvements. Recognizing that system level type improvements need comprehensive study of many elements for successful identification and implementation, this document is technical in nature with a traffic engineering focus.

The purposes of the West Steamboat Springs US 40 Systems Needs Study are to identify potential solutions that address the expected change in traffic operational conditions on US 40 due to growth and development of the West Steamboat area; to improve intersection safety between the WSSAP Boundary (M.P. 126.83) and 13th Street (M.P. 131.90; and to improve service for other modes of travel including transit, bikes, and pedestrians. This study was initiated to provide City policy makers with more detail than was provided in the WSSAP about what US 40 improvements might be needed, when improvements would be needed, and where to consider improvements. This study will assist policy makers in making informed decisions about initiating and scoping the NEPA process for US 40 West Steamboat Springs improvements. US 40 is a federal facility and a state highway. Any improvements must be coordinated with CDOT.

Specific objectives of the West Steamboat Springs US 40 System Needs study include:

- Identify future operational characteristics for US 40 in the study area
- Identify potential improvements to US 40 to address capacity concerns
- Evaluate potential for “spot improvements” to address specific concerns
- Evaluate potential to maximize use of current facility through minor changes including re-striping
- Develop opinions of probable cost for potential improvements
- Identify potential improvements as short-term and long-term needs
- Provide information to elected officials regarding future needs on US 40
- Identify potential funding streams for improvements
- Serve as supporting documentation for selecting potential improvements for inclusion in regional planning activities and environmental analysis

Study Area

The study area encompasses approximately 5 miles of US 40 between Milepost 126.83 and Milepost 131.90 (13th Street) in Steamboat Springs, Colorado. The western limit of the project corresponds to the West Steamboat Springs Area Plan (WSSAP) boundary, adopted by the City and County in 2006. Existing land uses differ between the areas within the City and those in the County. Land west of the city limits (US 40 MP 129.3), is generally more rural in character and is currently used for agricultural and residential purposes. Within the city limits, the land use adjacent to US 40 is partially residential and largely commercial or industrial.

Coordination and Public Involvement

Although the City of Steamboat Springs sponsored the System Needs Study, it was conducted in conjunction with the West Steamboat Springs US Highway 40 Access Study which was a cooperative effort between: City of Steamboat Springs, Routt County, and CDOT. In conducting both studies, the City placed a high value on communication and coordination with corridor stakeholders and a public involvement program that engaged these stakeholders in the study process.

The public, including corridor property owners, tenants, potential developers, and the general public, were engaged in the project using several techniques including:

- posting project exhibits and information on the City’s website,
- conducting public meetings, and
- meeting with interested parties one-on-one.

The initial public meeting gathered input for both the access and capacity studies. In subsequent meetings, the public outreach was focused on the Access Study; however, project participants provided substantial input on this study simultaneously.

Recommendations from the System Needs Study will be presented to City Council in a public forum. The public meetings with City Council, along with meetings to discuss potential Capital Improvement Program (CIP) project funding and priorities resulting from the System Needs Study will present additional opportunities for Public Involvement related to this study.

Development of the System Needs Study

Analyses were performed for existing conditions, future background conditions, and projected build out conditions that include the proposed WSSAP developments. Operational characteristics including travel time, queuing, delay, and progression were used to identify potential solutions to capacity deficiencies. Potential solutions included both major and minor system modifications.

To the extent that the current roadway typical section does not provide sufficient through capacity to service projected volumes, a roadway section(s) to accommodate through traffic was identified and incorporated into the evaluations. Further investigation, including National Environmental Policy Act (NEPA) studies, are necessary prior to implementation of capacity improvements to the roadway typical section.

Several of the potential improvements identified through the capacity analyses were designed to a conceptual level and have been presented diagrammatically over the aerial photo used for the project. These designs reflect vehicular lanes (auxiliary and through), shoulders, bicycle and pedestrian features, and traffic control measures. Potential future roadway cross sections have been prepared which include sidewalks and accommodation of bicycles. This study did not include transit analysis, and future studies should look at location of bus stops relative to the pedestrian/bike connections.

The concepts identify areas where additional right-of-way is likely required and considered strategies to minimize right-of-way expansion where feasible. The concepts also identify areas where existing topography (slopes, ditches, etc.) require further investigation to evaluate effects of implementation, possible easements, or additional right-of-way to accommodate proposed improvements.

Additional concepts developed through this study included minor improvements, phased construction of the master concepts, and localized or "spot" improvements. These concepts identify opportunities to achieve operational and capacity benefits through expanded use of existing pavement width, to the extent feasible. Logical potential construction projects have also been identified.

Conceptual opinions of probable cost (OPC) were prepared for each of the identified capacity improvements. The OPCs are provided in the Appendix and were prepared in 2008 dollars based on estimated project quantities, recent Contractor Bids for similar work in similar areas, and engineering judgment. These opinions are conceptual in nature and are not intended as a guaranteed maximum price, but rather as a planning and budgeting tool.

Recommendations

The System Needs Study provides short-term and long-term recommendations. The short-term recommendations identify those improvements that address what are primarily existing deficiencies. The short-term horizon is estimated to be within the next 5 years. Long-term recommendations reflect those studies or improvements needed to address deficiencies anticipated to occur in the future as a result of growth in background traffic volumes and additional traffic resulting from planned development. In particular, the long-term projects identified through this study have been formulated to address the fundamental capacity deficiency along the US 40 corridor and at the congested intersection locations at Elk River Road and 13th Street. While improvements have been identified as short or long term for general planning purposes, the actual implementation of improvements is more closely related to when and where development and additional travel demand occurs than it is to a particular year.

Short Term

- Construct eastbound and westbound left-turn lanes at all full movement intersections along US 40 where they don't presently exist.
- Lengthen auxiliary lanes at Brandon Circle/Sloop Circle to meet current State Highway Access Code Standards. Construct an eastbound left-turn lane and a southbound left-turn lane.
- Re-align Riverside Drive or Downhill Drive to eliminate the offset between the intersections. Construct a southbound left-turn lane and a signal once Manual on Uniform Traffic Control Devices (MUTCD) traffic signal warrants are met.
- Conduct engineering studies to identify whether safety improvements are needed at the CR 42 and 13th Street intersections.
- Construct a southbound left-turn lane at the CR 42 intersection.
- Construct a southbound left-turn lane at Sleepy Bear when access for Steamboat 700 is constructed.
- Construct a northbound and southbound left-turn lane and associated traffic signal improvements at the Elk River Road intersection
- Monitor intersection operations and crash experience at the Conestoga Circle intersection. If redevelopment generates additional traffic at this intersection or if operational or safety problems occur, limit access to right-in, right-out movements only and provide alternate access to the Conestoga neighborhood in accordance with the Access Study.
- Construct minor widening and re-stripe US 40 to four lanes between Elk River Road and the Stockbridge Transit Center.
- Re-stripe existing US 40 to four lanes between the Stockbridge Transit Center and 13th Street

- Convert the existing Stockbridge Transit Center access to right-in, right-out and construct a new, signalized access across from Indian Trails
- Provide on-street bicycle lanes along US 40 in the existing shoulder area and/or the widening areas in accordance with the City's Open Space and Trails Master Plan.
- Continue extending the City's Core Trail per the City's Open Space and Trails Master Plan, including grade separated crossings of US 40.
- Improve pedestrian facilities at intersections and along the highway per the City's Sidewalks Master Plan. The plan identifies US 40, Elk River Road, Downhill Drive and other locations within the West Steamboat Subarea as candidate locations for sidewalk improvements.
- Provide improved pedestrian facilities at signalized intersections, bus stops and other key locations throughout the corridor.
- Improve transit stop location and access. Evaluate options for enhancing transit service along the US 40 corridor.
- Implement the recommendations in the US 40 Access Control plan as development occurs.

Long Term

The West Steamboat Springs US Highway 40 System Needs Study has identified that short-term, spot improvements at intersections will not be sufficient to accommodate future traffic projections. The candidate long-term strategies that were considered in this study were not subjected to rigorous technical evaluation and by no means reflect the universe of potential solutions. Identifying a locally-preferred, long term solution for US 40 or the bottlenecks at Elk River Road and 13th Street must be developed in coordination with CDOT and in accordance with procedures outlined in the National Environmental Policy Act (NEPA). Through formal scoping, the level of required NEPA study (Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement) will be determined and the extent to which the study investigates such elements as project purpose and need, alternative definitions, transportation impacts, environmental impacts, and public and agency outreach will be established. It is clear; however, from this conceptual evaluation that in several locations even minor expansion of the highway footprint may not be accommodated within the existing right-of-way.

The following long-term improvement projects have been considered in the System Needs Study. Those that result in major capacity enhancements appear to be worthy of further scrutiny as part of a NEPA evaluation process:

- Continue to monitor and implement any short-term improvement that has not yet been completed.
- Periodically monitor intersection traffic volumes and construct traffic signals when MUTCD warrants are met:
 - Brandon Circle/Sloop Circle
 - CR 42
 - Steamboat 700 / Sleepy Bear Mobile Home Park
 - Snow Bowl Plaza
 - Re-aligned Downhill Drive / Riverside Drive intersection
 - Logger's Lane
- Construct a second southbound left-turn lane at the Elk River Road / US 40 intersection when volumes warrant
- Construct a second westbound left-turn lane at the 13th Street / US 40 intersection when volumes warrant. The need and timing of this improvement depends upon whether a solution is implemented for the bottleneck at 13th Street.
- Widening of US 40 to two eastbound lanes between Brandon Circle/Sloop Circle and 13th Street. Widening of US 40 to two westbound lanes between 13th Street and the Routt County Rifle Club (i.e., the four lane alternative)
- Four lane alternative with widening of US 40 to six lanes between Downhill Drive and Kamar Plaza (i.e., the six lane alternative)
- Two lane roundabout at the intersection of Elk River Road
- Southbound Elk River Road to eastbound US 40 flyover ramp
- Urban "tight" diamond interchange at Elk River Road
- Single point urban interchange at Elk River Road
- Yampa Avenue Extension (13th Street)
- Howelsen Parkway Extension (13th Street)

Next Steps

The Systems Needs Study represents the first step in an overall process to diagnose and address capacity deficiencies along the US 40 Corridor in West Steamboat Springs. The products of the study include the identification of short-term and long-term improvements needed to address existing and projected transportation deficiencies.

The short-term improvements identified in the System Needs Study reflect those projects that are largely geared toward addressing either existing operational or safety deficiencies along US 40 or minor improvements related specifically to new development. The short-term projects are generally smaller scale improvements that can be implemented over time through the City's annual Capital Improvement Program (CIP) or similar programs.

The System Needs Study anticipates that background traffic growth, particularly when combined with the traffic generated by planned developments within the WSSAP, will be significant. As a by-product of development, short-term, relatively easy to implement projects will not be sufficient to address the long-term transportation needs within West Steamboat Springs. A more comprehensive investigation of build-out traffic conditions needs to be conducted in accordance with the National Environmental Policy Act (NEPA), particularly as it relates to corridor-wide capacity improvements to US 40, and the bottlenecks at Elk River Road and 13th Street.

The timing (i.e., short-term or long-term) of these improvements is difficult to precisely determine as it is dependent upon a number of outside influences including the pace of development and related changes in underlying travel patterns. The City should continue to monitor development and the resulting changes in traffic to determine the appropriate time frame for implementation of these other projects.

1.0 INTRODUCTION

1.1 *Background*

US 40 is an important regional transportation route for northwestern Colorado. The western leg of US 40 through Colorado extends from the Utah border east to I-70 near the Town of Empire. Although I-70 is the primary route for interstate traffic, US 40 provides an alternative route into Utah; offering east-west access through Grand, Routt, and Moffat Counties. Along the westernmost portion of the highway, through Routt and Moffat Counties, US 40 serves as the primary roadway for many communities including Steamboat Springs, Hayden, Craig, and Dinosaur. Residents and businesses in Routt County depend heavily on US 40 for local and inter-community travel.

In addition to traffic typical of urbanized areas, US 40 traffic includes significant commuter and recreational elements. The commuters travel between Craig, Hayden, and Steamboat Springs for employment supporting the Steamboat Ski and Resort Area and other businesses in Steamboat Springs. The substantial size of the commuter population supports a regional bus service between Steamboat Springs and Craig which is operated by Steamboat Springs Transit (SST). In addition, outdoor recreational opportunities are a significant draw to the Routt County area for residents and guests alike, including skiing, hiking, fishing, hunting, camping, rafting, and cycling. The user mix results in a wide range of vehicle types including semi-trucks, single unit trucks, recreational vehicles, buses, and passenger vehicles using US 40.

The City of Steamboat Springs recognizes that effective mobility along US 40 is essential to the on-going vitality of the City and the region. Based on the WSSAP, significant urban growth is anticipated in the near to mid-term west of the city limits. Upon development, this area is expected to annex into the City. WSSAP development, along with potential redevelopment within the City west of downtown, is expected to generate a substantial increase in travel demand along US 40. Additionally, the Northwest Transportation Planning Region has identified US 40 through Steamboat Springs as a priority in the 2035 Regional Transportation Plan (2035 RTP). Strategies for implementing improvements along the US 40 corridor identified in the 2035 RTP include constructing intersection improvements, expanding transit service, constructing shoulders, adding auxiliary lanes (passing, turn, accel/decel), implementing land use planning and access management, and providing pedestrian/bike connectors near congested towns. To help accommodate anticipated future growth while maintaining mobility and safe access along US 40, the West Steamboat Springs US 40 System Needs Study and the West Steamboat Springs US 40 Access Study were initiated in May 2007. The Access Study was completed in May 2008.

1.2 Purpose

US 40 through West Steamboat is anticipated to experience a doubling of traffic volume demand as major new developments identified in the WSSAP are constructed and background traffic increases. Based on existing operational conditions, the current highway and local street network is expected to be insufficient to serve the additional development related traffic demand and regional growth at a level-of-service (LOS) considered “acceptable” in most similar settings.

The purposes of the West Steamboat Springs US 40 Systems Needs Study are to identify potential solutions that address the expected change in traffic operational conditions on US 40 due to growth and development of the West Steamboat area; to improve intersection safety between the WSSAP Boundary (M.P. 126.83) and 13th Street (M.P. 131.90); and to improve service for other modes of travel including transit, bikes, and pedestrians. This study was initiated to provide City policy makers with more detail than was provided in the WSSAP about what US 40 improvements might be needed, when improvements would be needed, and where to consider improvements. This study will assist policy makers in making informed decisions about initiating and scoping the NEPA process for US 40 West Steamboat Springs improvements. US 40 is a federal facility and a state highway. Any improvements must be coordinated with CDOT.

Specific objectives of the West Steamboat Springs US 40 System Needs Study include:

- Identify future operational characteristics for US 40 in the study area
- Identify potential improvements to US 40 to address capacity concerns
- Evaluate potential for “spot improvements” to address specific concerns
- Evaluate potential to maximize use of current facility through minor changes including re-striping
- Develop opinions of probable cost for potential improvements
- Identify potential improvements as short-term and long-term needs
- Provide information to elected officials regarding future needs on US 40
- Identify potential funding streams for improvements
- Serve as supporting documentation for selecting potential improvements for inclusion in regional planning activities and environmental analysis

1.3 Study Area

The study area encompasses approximately 5 miles of US 40 between Milepost 126.83 and Milepost 131.90 (13th Street) in Steamboat Springs, Colorado. The western limit of the project corresponds to the WSSAP boundary, adopted by the City and County in 2006. Existing land uses differ between the areas within the City and those in the County. Land west of the city limits (US 40 MP 129.3), in the County, is generally more rural in character and is currently used for agricultural and residential purposes. Within the city limits, the land use adjacent to US 40 is partially residential and largely commercial or industrial. Most land within the WSSAP boundary, northwest of Steamboat Springs, is also within the Urban Growth Boundary (UGB) and is expected to annex into the City upon development. The WSSAP anticipates that land within the UGB, surrounding the existing Steamboat II and Heritage Park neighborhoods, will develop as high density residential with small commercial centers. The land southwest of Steamboat Springs, outside the WSSAP boundary, is expected to remain located within the County's sole jurisdiction and is zoned agricultural. The Yampa River and Union Pacific Railroad are located in close proximity to the south edge of US 40 in the County.

The overall study area for the West Steamboat Springs US Highway 40 System Needs Study is shown in Figure 1.

1.4 Project Coordination

Although the City of Steamboat Springs initiated the System Needs Study, it was developed in conjunction with the Access Study which was a cooperative effort between: City of Steamboat Springs, Routt County, and CDOT. In conducting the studies, the City placed a high value on communication and coordination with corridor stakeholders and a public involvement program that engaged these stakeholders in the study process.

1.5 Public Involvement

The public, including corridor property owners, tenants, potential developers, and the general public, were engaged in the project using several techniques including:

- posting project exhibits and information on the City's website,
- conducting public meetings, and
- meeting with interested parties one-on-one.

A public informational meeting was held at Centennial Hall on August 27, 2007. The purposes of this meeting were to introduce the public to the System Needs Study and the concurrent Access Study and to gather public input on traffic and access concerns within the corridor. The meeting format was similar to an Open House with exhibits presenting project goals, access management principles and techniques, general corridor information, and a project schedule. The meeting was advertised through the local paper (Steamboat Pilot & Today) and on the City's website. Eleven people signed in at the meeting. There were several comments related to pedestrian and bicycle facility improvements throughout the corridor. In addition, concerns about the operation of the existing traffic signal at the intersection of US 40 and Elk River Road and the potential for a traffic signal at Steamboat II were also expressed.

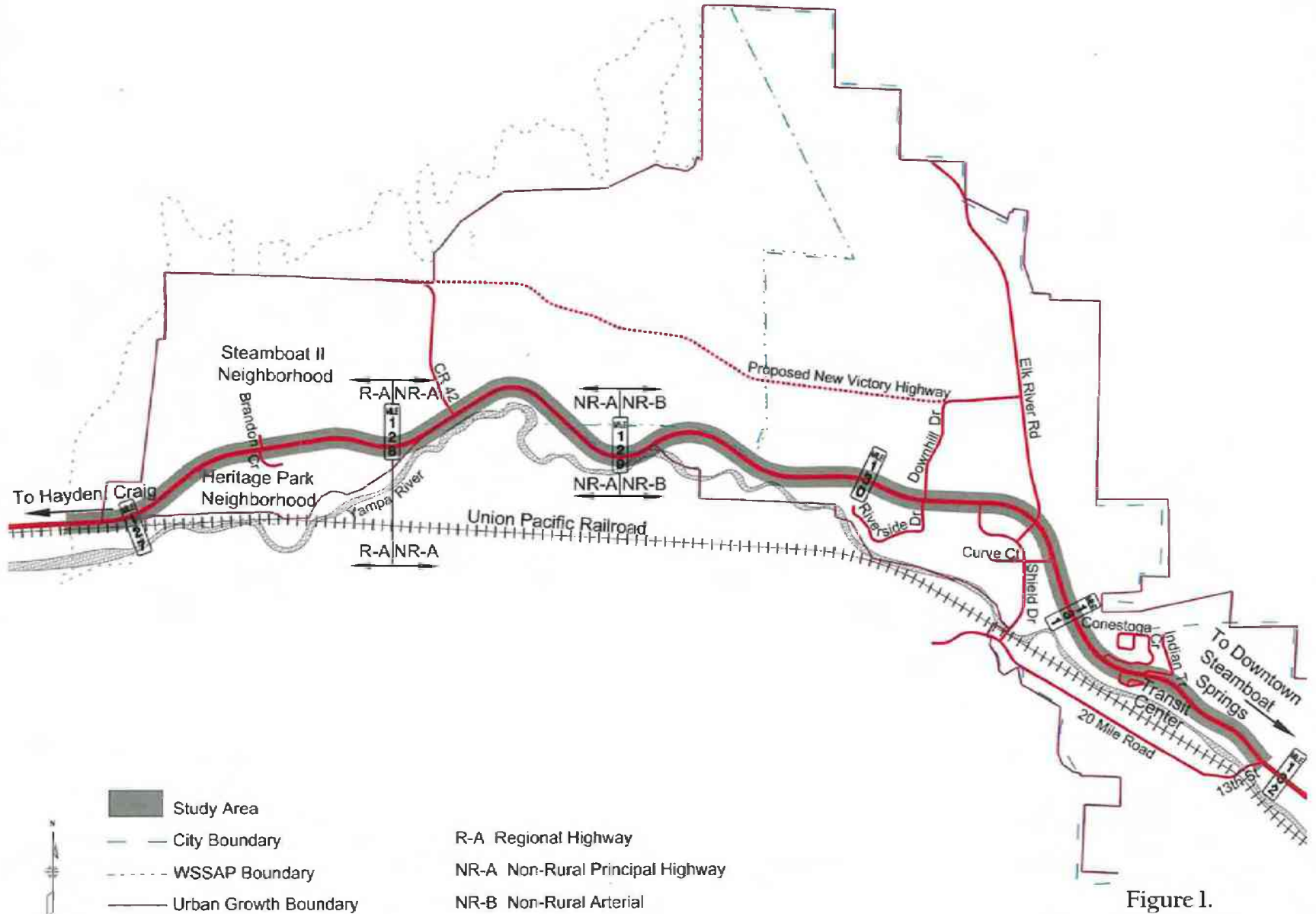


Figure 1. Vicinity Map

Additional public meetings were held on December 12, 2007 and January 31, 2008. Approximately 50 people attended the December open house and 90 to 100 attended the meeting in January. The primary focus of these public meetings was to review and provide comment on the concurrent Access Study. However, comments relating to the System Needs Study were also obtained and recorded.

As an expansion of the meetings described above, the project team identified several key stakeholders and affected parties within the corridor and invited them to attend a one-on-one meeting with the team or project team representatives. Attendance at these meetings was strong. Approximately, 12 meetings were held with Colorado Mountain College, Church of Christ, Steamboat 700, and others. Several meetings resulted in follow-up discussions and longer-term dialogue.

The Access Study was adopted by the City of Steamboat Springs and Routt County with an accompanying Intergovernmental Agreement (IGA) in May, 2008. The Colorado Department of Transportation plans to adopt the study and sign the IGA later in 2008. Recommendations from the System Needs Study will be presented to City Council in a public forum. The public meetings with City Council, along with meetings to discuss potential Capital Improvement Program (CIP) project funding and priorities resulting from the System Needs Study will present additional opportunities for Public Involvement related to this study.

2.0 EXISTING CONDITIONS

2.1 Roadway

There are four basic roadway cross-sections present along US Highway 40 within the study area. The western sections include one lane in each direction with shoulders at a minimum. Lane widths are generally 12' wide with 8' paved shoulders. Auxiliary lanes are developed at most major intersections within the study area and at some business driveways. However, several of these lanes do not meet current design standards and are typically too short and/or too narrow. A continuous right turn acceleration / deceleration lane exists for eastbound traffic between Riverside Plaza and Curve Court. A continuous two-way left turn lane also exists in this segment and extends beyond 13th Street. The continuous two-way left-turn lane varies from 12' to 16' in width. The eastern section, just west of 13th Street, is an urban section with curb and gutter and includes two lanes in each direction with a continuous two-way left turn lane.



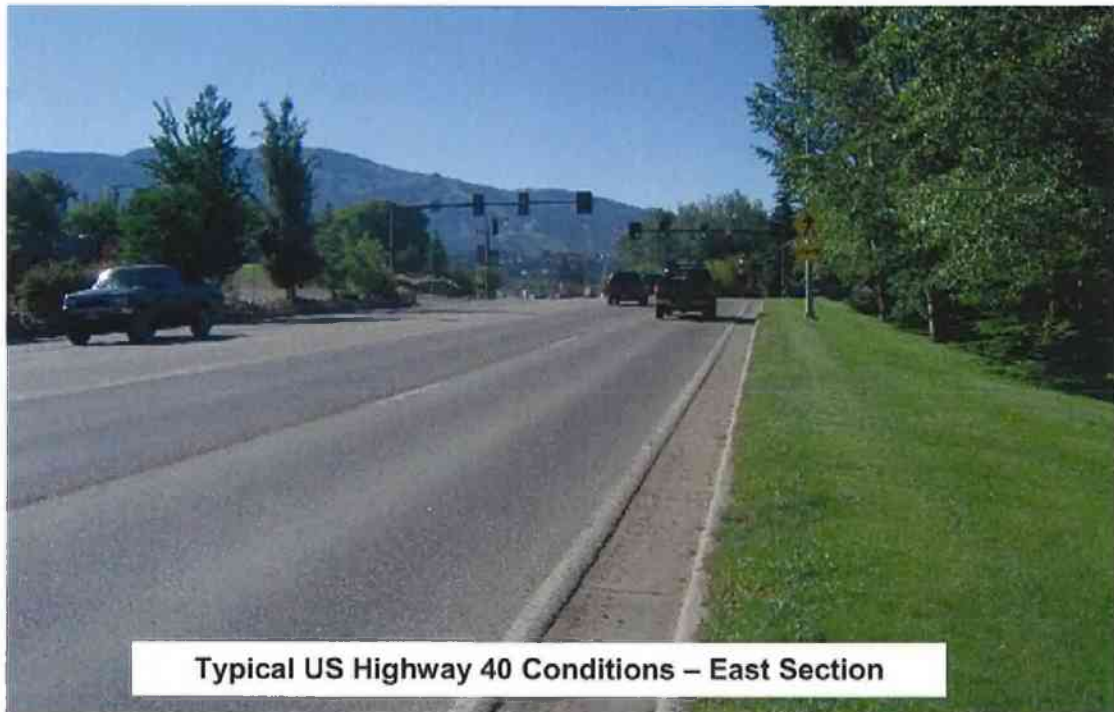


Figure 2 illustrates the four basic roadway cross-sections present within the study area.

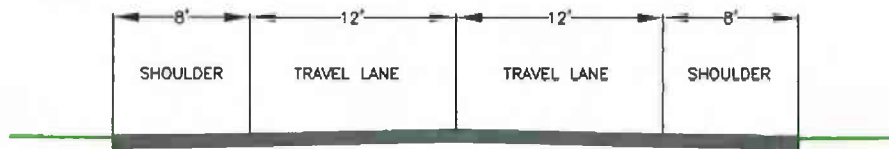
Pedestrian and bicycle facilities in the corridor are sporadic and are generally implemented as properties redevelop. On the south side of US 40, detached sidewalk exists between Shield Drive and Logger's Lane and at the Stockbridge Transit Center. Sidewalk has recently been constructed along US 40 at the new Community Center and at Riverside Plaza, but is disconnected between the sites. On the north side of US 40 a detached sidewalk runs between Downhill Drive and the Big-O-Tires access with a disconnected segment in front of Robinson Brick. Pedestrians have access to signalized crossings of US 40 only at Elk River and 12th street. Access to the Yampa River Core Trail, an off-street shared use path, to/from US 40 is available near the Stockbridge Transit Center. The trail currently connects to US 40 at an unsignalized location, though access is available via the parking lot to the Stockbridge signal. There is no designated bike lane within the corridor, however the US 40 shoulder is typically greater than 4 feet with a few exceptions including the eastbound direction between Logger's Lane and Napa Auto Parts, at selected intersections, and in curbed sections.

Steamboat Springs Transit has local and regional bus routes serving the West Steamboat Springs area. During the Summer, local route frequencies are approximately every 20 minutes between the hours of 6:30 a.m. and 10:00 p.m. Local stops exist at a number of locations along US 40 including Steamboat Campground, Snow Bowl Plaza, Riverside Plaza, Riverside Drive / Downhill Drive, Alpine Taxi, and the Stockbridge Transit Center.

Regional service extends along US 40 between Craig and Steamboat (inbound to Steamboat in the morning and outbound in the afternoon). Regional boardings occur at Steamboat II, 7-11, and Downhill Drive while drop offs occur upon request at any of the local route stops. Maps showing the local and regional bus routes are contained in the Appendix.

The horizontal alignment of US 40 within the corridor is curvilinear, mostly due to topographical constraints. The highway alignment is characterized as a relatively consistent pattern of reverse curves with design speeds ranging from 45 mph to 75 mph. In general, the natural grade rises dramatically on the north side of US 40; several locations with steep cut slopes are located adjacent to the highway. On the south side of the highway, the land tends to be significantly lower than US 40, especially in the western portion of the corridor where the Yampa River is in close proximity to the highway; guardrail protects several of these fill slopes. Based on the posted speed, two horizontal curves within the project limits are considered substandard when compared with current standard design criteria for a typical design speed. The two curves are located just east of CR 42 near the Routt County Hills Rifle Club and M&M Auto, and are influenced by significant physical constraints including a large hill on the north and the Yampa River on the south. Based on available accident data for the area, there is no indication of an accident rate that exceeds the statewide average for similar locations near these curves.

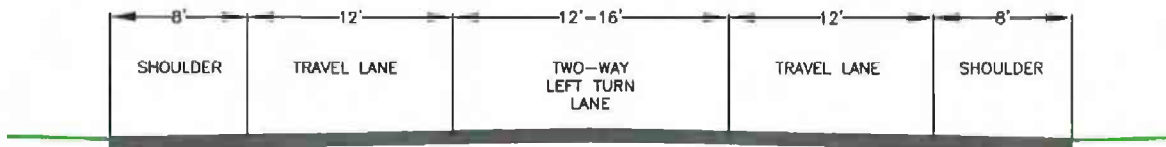
The highway profile throughout the study area is relatively gradual with the exception of a one-half mile segment east of Brandon Circle/Sloop Circle with an approximate 5% grade hill. Due to the horizontal and vertical curvature in this area, the access points between Brandon Circle/Sloop Circle and CR 42 have limited intersection sight distance, as do the Sleepy Bear Mobile Home Park and the Yampa River access points located further east.



SECTION ONE

ONE TRAVEL LANE AND SHOULDER IN EACH DIRECTION

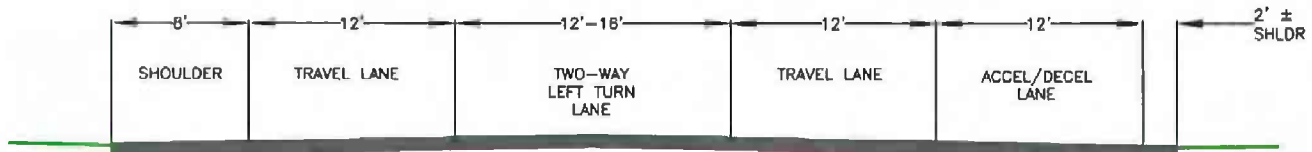
WEST OF RIVERBEND TRAIL TO EAST OF CR 42: AUXILIARY LANES AT BRANDON CIRCLE
 EAST AND WEST OF STEAMBOAT 700
 RIVERSIDE PLAZA WEST TO NAPA AUTO PARTS: AUXILIARY LANES AT PUBLIC ROADWAYS



SECTION TWO

ONE TRAVEL LANE AND SHOULDER IN EACH DIRECTION WITH
 TWO-WAY LEFT TURN LANE

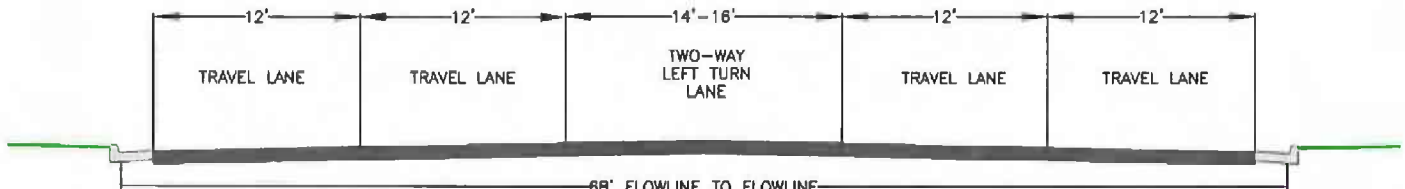
ROUTT COUNTY RIFLE CLUB: AUXILIARY LANES
 YAMPA RIVER ACCESS TO SNOW BOWL PLAZA: AUXILIARY LANES
 LOGGER'S LANE TO 13TH STREET: AUXILIARY LANES AT TRANSIT CENTER AND DREAM ISLAND PLAZA



SECTION THREE (LOOKING EAST)

ONE TRAVEL LANE IN EACH DIRECTION, TWO-WAY LEFT TURN LANE AND A
 CONTINUOUS EASTBOUND RIGHT TURN ACCELERATION/DECELERATION LANE WITH
 SHOULDERS

NAPA AUTO PARTS TO LOGGER'S LANE:
 (ADDITIONAL AUXILIARY LANES AT ELK RIVER ROAD AND KAMAR PLAZA)



68' FLOWLINE TO FLOWLINE

SECTION FOUR

TWO TRAVEL LANES IN EACH DIRECTION, TWO-WAY LEFT TURN LANE AND CURB &
 GUTTER

13TH STREET TO 12TH STREET

Figure 2
 US 40 Existing Typical Cross-Sections

The posted speed limit varies between 25 mph, near the downtown core of Steamboat Springs, and 55 mph, west of Steamboat II. A school zone exists on either side of Brandon Circle/Sloop Circle for the Christian Heritage School of Steamboat Springs with a 40 mph speed limit (when flashing). The approximate locations of speed limit changes throughout the corridor are summarized in Tables 1 and 2:

Table 1 Eastbound Speed Limits

Approximate Milepost	Approximate Location	Eastbound Speed Limit
West to MP 127.5	WSSAP Boundary to west of Steamboat II	55 mph
MP 127.5 to MP 129.7	West of Steamboat II to Steamboat Campground	50 mph
MP 129.7 to MP 131.7	Steamboat Campground to Dream Island Plaza	40 mph
MP 131.7 to East	Dream Island Plaza to 13 th Street	25 mph

Table 2 Westbound Speed Limits

Approximate Milepost	Approximate Location	Westbound Speed Limit
MP 127.5 to West	West of Steamboat II to WSSAP Boundary	55 mph
MP 130.0 to MP 127.5	Snow Bowl Plaza to west of Steamboat II	50 mph
MP 131.6 to MP 130.0	Dream Island Plaza to Snow Bowl Plaza	40 mph
East to MP 131.6	13 th Street to Dream Island Plaza	25 mph

Existing signalized intersections on US 40 are located at Elk River Road, Stockbridge Transit Center, and 13th Street. There are also several locations where intersecting roadways do not align across US 40 including: the area around the Steamboat Golf Club, the Sleepy Bear Mobile Home Park, the area between Riverside Drive and Shield Drive, and the area between Logger's Lane and Indian Trails.

2.2 Right-of-Way

The US 40 right-of-way (ROW) varies between 80-ft and 200-ft in width within the study area and is generally centered on the US 40 centerline. As shown in Table 3, there are a number of locations where steep cut and fill slopes exist either within or immediately adjacent to the US 40 ROW.

Table 3 US 40 Right-of-Way (ROW) Summary

Milepost Range	Width	Notable Features
126.83 - 128.21	150'	Steep cut slopes both sides at Steamboat Golf Club (MP 127.31) and on north side west of Steamboat II (MP 127.67). Steep cut slopes on both sides at MP 128.00.
128.21 - 128.77	200'	Steep cut slopes to the north. Steep fill slopes to the Yampa River at CR 42 (MP 128.41) and the US 40 curve (near MP 128.65)
128.77 - 129.85	varies (100' - 250')	Steep terrain to both the north and south.
129.85 - 131.06	100'	Developed business area
131.06 - 131.56	varies (80' - 250')	Steep cut slopes to the north from Conestoga Circle (MP 131.3) east.
131.56 - 131.90	80'	Steep terrain to the north opposite Dream Island Plaza (MP 131.83); fully developed to the south

2.3 Crash History

Crash data for US 40 was obtained from CDOT for the period between January 1, 2000 and December 31, 2004. A total of 125 access related crashes were reported along US 40 during this period. Of these reported crashes, 18 (14.4%) had at least one injury, none were fatal, and the remaining 107 crashes (85.6%) resulted in property damage only. Approximately fifty percent (50%) of all crashes occurring in the US 40 corridor between 2003 and 2004 were access-related.

In summary, a majority of access related crashes fell into three categories: rear end crashes (45.6%), broadside crashes (24.0%), and approach turn crashes (9.6%). Most crashes occurred during daylight hours and adverse weather conditions were generally not a factor. In addition, a majority of crashes occurred east of Downhill Drive, within the city limits, where access points are more frequent and traffic volumes are higher.

CDOT also determined the Weighted Hazard Index (WHI) for the US 40 corridor. The WHI is a statistic that compares crash data from a particular section of highway with crash data from other sections of highway with similar characteristics in the State. WHI is computed by considering crash frequency, crash severity, traffic volumes within a section, length of a section, and crash history of similar highways. A positive WHI value indicates that a highway section has a higher crash frequency/severity history than the statewide average. A WHI value of zero indicates a crash frequency/severity history equal to the statewide average. Similarly, a negative WHI value indicates a lower than average crash frequency/severity history, when compared with the statewide average. The average WHI for the entire corridor is -6.26, indicating that fewer crashes occur on US 40 between MP 126 and MP 132 than on similar Colorado highways.

In reviewing the crash data in more detail, several access points along US 40 experienced some crash recurrence during this period including CR 42, Downhill Drive, Elk River Road, and 13th Street. These individual access points and the section of US 40 between Downhill Drive and Elk River Road have positive WHI values on the order of 2 to 3. With the exception of CR 42, the higher crash locations are at major intersections within the corridor and correlate to high traffic locations with numerous, closely spaced access points. Based on the character of these locations and the types of access related crashes experienced throughout the corridor, implementing access management techniques will reduce the number of conflict points, thereby increasing the potential to reduce crashes between the major intersections.

A full summary report and a detailed list of crashes by milepost are included in the Appendix.

2.4 Traffic Volumes

Weekend traffic volume data for US 40 from County Road (CR) 33A to east of 13th Street was collected on the weekend of June 1-3, 2007, the weekend of the annual Steamboat Springs Marathon. The City identified this weekend as a typical peak season event where US 40 experiences a slight increase in traffic. Traffic data collected included intersection turning movement counts (TMC) and average daily traffic (ADT). ADT counts identify the volume of traffic traveling on the highway for an entire day. For this study, ADT counts were collected at the following locations:

- ✓ East of CR B9
- ✓ Between Brandon Circle and CR 42
- ✓ Between CR 42 and Elk River Road
- ✓ Between 13th Street and Elk River Road
- ✓ East of 13th Street

TMC data provides distribution information for vehicles entering and exiting the corridor at key intersections. The locations where peak hour weekend (AM and PM) TMC were collected at the following locations:

- Brandon Circle/Sloop Circle
- CR 42
- KOA west access
- KOA east access
- Snow Bowl Plaza
- Riverside Plaza west
- Riverside Plaza east
- Riverside Drive/Downhill Drive
- Lagoon Court/County Shop Road
- Shield Drive
- Elk River Road
- Curve Court
- Loggers Lane
- Conestoga Circle
- Stockbridge Multi-Modal Transit Center
- Indian Trails
- Dream Island Plaza
- 13th Street
- Other driveway locations

In reviewing the weekend traffic volume data collected and comparing them with weekday counts conducted for previous studies in the area, an inconsistency was identified. The weekend counts for this project seemed significantly lower than weekday counts taken for previous projects, especially as compared to the ADT counts. In order to verify if the weekend counts were low, additional peak hour weekday counts were collected at the following intersections on September 12, 2007 after school was in session:

- ✓ Brandon Circle/Sloop Circle
- ✓ CR 42
- ✓ Riverside Drive/Downhill Drive
- ✓ Elk River Road
- ✓ 13th Street

As expected, the weekday peak hour volumes were much higher than the previously obtained weekend peak hour volumes. The higher weekday counts were used to create an existing traffic model for US 40. The supplemental weekday traffic volumes replaced weekend counts at the locations listed previously. The weekend counts were used for all of the additional intersections in the model; however, the through volumes on US 40 were adjusted to account for the additional traffic volumes during the weekday peak hours to balance the volumes in the traffic model. The turning movements onto or off of US 40 were adjusted for some intersections to account for typical weekday travel patterns based on the adjacent land use.

The existing ADT volumes and the AM and PM peak hour turning movements for the corridor are summarized in Figures 3a and 3b. The ADT volumes range from about 7,700 vehicles per day (vpd) west of Steamboat II to about 30,400 vpd approaching downtown Steamboat Springs. The peak hour traffic volumes are generally higher in the eastbound direction during the AM peak hour and in the westbound direction during the PM peak hour.

Within the study area, existing traffic signals are located at Elk River Road, Stockbridge Transit Center, and 13th Street. Based on the existing traffic counts used in the System Needs Study, none of the other full-movement intersection locations within the study area currently meet MUTCD traffic signal warrants. However, the Downhill Drive and CR 42 intersections nearly meet Warrant 3, Peak Hour. Traffic volumes and crash experience at these two locations should be monitored periodically to determine when MUTCD warrants are met. As development occurs and traffic volumes increase in the future, traffic signals may be warranted at additional full-movement intersection locations as described in the US Highway 40 Access Study.

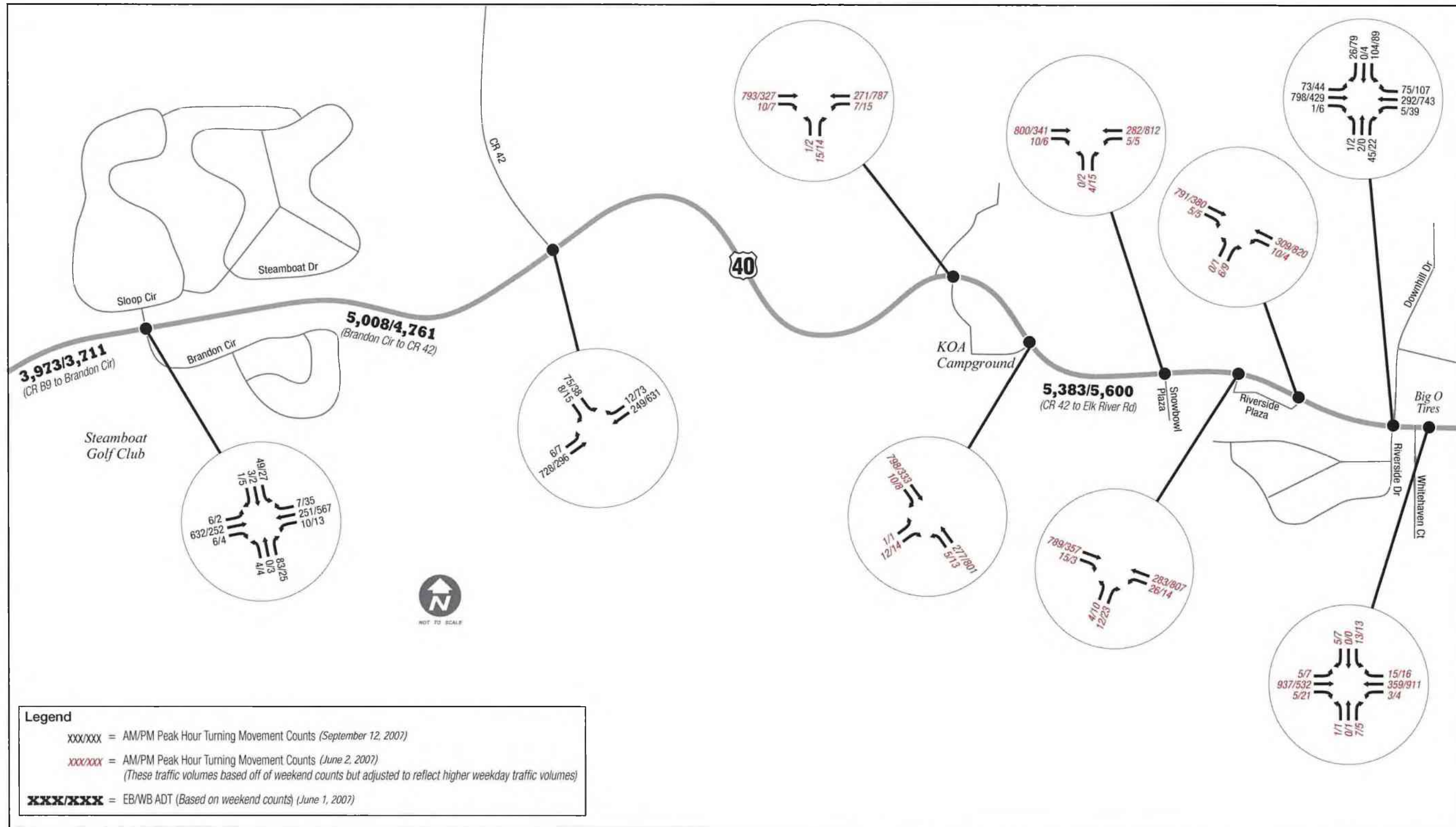


Figure 3a
Existing Traffic Volumes
MP 126.87 to MP 130.33

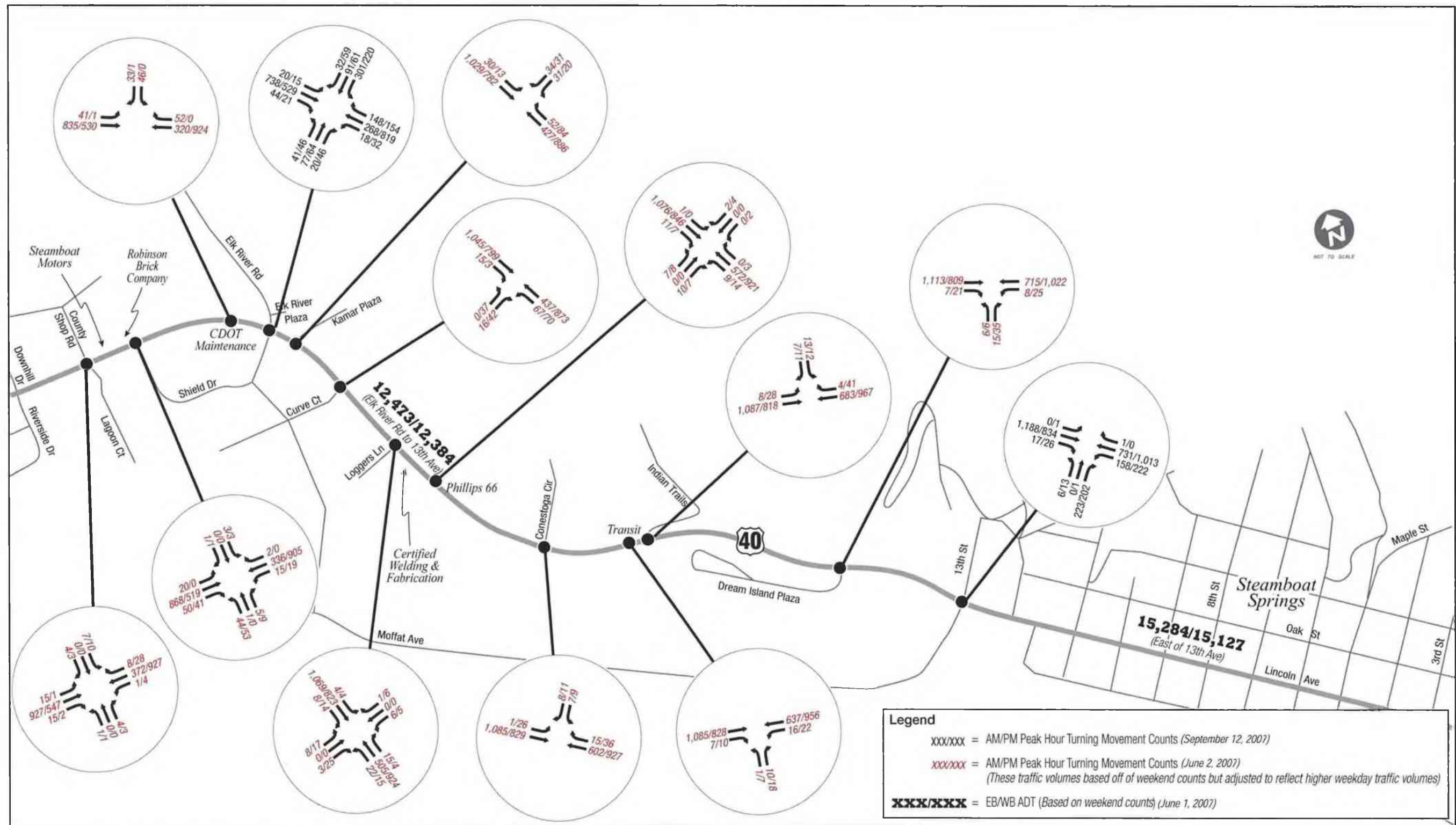


Figure 3b
Existing Traffic Volumes
MP 130.33 to MP 131.91

2.5 Operations

Collected traffic data, geometric information, and traffic signal timing data were used to develop an existing conditions traffic model for this study. AM and PM peak hour turning movements were used to evaluate intersection Level of Service (LOS) at major intersections along the US 40 corridor. LOS is a measure of the quality of traffic flow and is defined by a letter grade ranging from A (free flow) to F (forced flow). LOS D is generally considered acceptable for peak period conditions in urban areas and is established in the City's traffic study guidelines as the target LOS. Additionally, traffic conditions along the US 40 corridor as a whole (i.e., Arterial LOS) were evaluated based upon average travel speed. The analyses described above were completed using methods documented in the *Highway Capacity Manual, 2000* (HCM). Table 4 provides LOS criteria for signalized intersections, unsignalized intersections, and arterials.

Table 4 LOS Criteria (Source: *Highway Capacity Manual, 2000*)

Level-of-Service (LOS)	Average Delay		Arterial Travel Speed (MPH)	LOS Description
	Signalized Intersection (sec/veh)	Unsignalized Intersection (sec/veh)		
A	<= 10	0 – 10	30	Free Flow / Insignificant Delays
B	> 10 – 20	> 10 – 15	24	Stable Flow / Minimal Delays
C	> 20 – 35	>15 – 25	18	Stable Flow / Acceptable Delays
D	> 35 – 55	>25 – 35	14	Approaching Unstable Flow / Tolerable Delays
E	> 55 – 80	> 35 – 50	10	Unstable Flow / Significant Delays
F	> 80	> 50	<10	Forced Flow / Excessive Delays

The study analyses revealed that most major corridor intersections operate at LOS C or better under existing conditions. A few intersections operate at LOS D and 2 intersections fall below LOS D during one peak hour period. Intersections operating at LOS E or F include Brandon Circle/ Sloop Circle and Downhill Drive (AM peak). LOS results summarized in Table 5 indicate that isolated operational deficiencies exist today.

In each case, the reduced LOS is due to minor street approach delays, and in particular, the southbound left turn movement. An unsignalized side street approach is expected to experience delay during the peak hour. In cases where the side street volume is relatively low compared to the through volume, the overall LOS can still be considered acceptable even though the side street operates below LOS D. Poor LOS and lengthy side street delays for unsignalized intersections that meet or are close to meeting MUTCD traffic signal warrants (e.g., Downhill Drive) are more problematic and typically are considered candidate locations for transportation improvements.

Table 5 Existing Major Intersection LOS

Intersection	Existing Conditions			
	AM		PM	
	Delay (sec.)	LOS	Delay (sec.)	LOS
13 th Street (signal)	10.1	B	9.0	A
Stockbridge Transit Center (signal)	5.3	A	4.8	A
Conestoga Circle	17.0	C	25.1	D
Curve Court	29.6	D	33.4	D
Logger's Lane	25.1	D	22.5	C
Elk River Road (signal)	39.8	D	32.4	C
Shield Drive	21.3	C	31.4	D
Downhill Drive	64.8	F	32.4	D
Snow Bowl Plaza	17.1	C	11.3	B
Sleepy Bear	19.1	C	11.5	B
CR 42	18.0	C	14.1	B
Brandon Circle/Sloop Circle	71.6	F	20.9	C

During the course of the System Needs Study, City staff and the public raised concerns regarding vehicle queue lengths for southbound Elk River Road at US 40. Based on the intersection analysis, existing peak hour queues average approximately 200-ft in length.

Arterial LOS, another measure used to determine corridor traffic conditions, is based on the average travel speed experienced along a segment of the corridor as determined using the traffic model. In conducting the analysis, US 40 was separated into segments using definitions provided in the HCM based upon roadway characteristics including spacing between signals, free-flow speeds, and overall roadway geometry as defined in the HCM. The US 40 corridor was segmented as follows:

- Brandon Circle/Sloop Circle to Snow Bowl Plaza – Urban Class I
- Snow Bowl Plaza to Curve Court – Urban Class II
- Curve Court to 13th Street – Urban Class II

The segment from Brandon Circle/Sloop Circle to Snow Bowl Plaza was categorized as a high-speed principal arterial (Urban Class I) segment. As defined by the HCM, an Urban Class I roadway is an arterial with a high-speed design, very low access point density, with auxiliary lanes, and no adjacent parking. This segment of US 40 has a typical free-flow speed between 45 to 55 mph, adjacent development is low density, and signals are infrequent and spaced at long intervals.

The US 40 segments from Snow Bowl Plaza to Curve Court and Curve Court to 13th Street were categorized as intermediate principal arterial (Urban Class II) segments. This HCM classification is defined as an urban street with moderate access-point density, some separate or continuous left-turn lanes, higher density roadside development than a typical suburban design, signals at closer spacing, and typical free-flow speeds between 30 to 40 mph.

Table 6 provides arterial LOS results for the existing condition. The results show that the US 40 corridor, as a whole, currently operates at a good level of service (LOS C or better). This indicates that while some individual intersections experience peak hour delay, the roadway segments generally serve existing traffic volumes adequately.

Table 6 Existing US 40 Arterial LOS

Direction	Link	Existing LOS	
		AM	PM
Eastbound	Brandon to Snow Bowl	B	A
	Snow Bowl to Curve Court	C	B
	Curve Court to 13th Street	C	B
Westbound	13th to Curve Court	B	B
	Curve Court to Snow Bowl	B	C
	Snow Bowl to Brandon	A	A

Urban Class I*

Urban Class II**

*Urban Class I = Uncongested speeds range from 45 to 55 MPH with a typical uncongested speed of 50 MPH.

**Urban Class II = Uncongested speeds range from 35 to 45 MPH with a typical uncongested speed of 40 MPH.

2.6 Existing Deficiencies

Based on the site and geometric conditions, crash history, traffic volumes, and LOS analyses described previously, existing deficiencies were identified at the following locations within the study area:

Brandon Circle/ Sloop Circle

- The side street approach (southbound) experiences LOS F conditions during the AM peak hour

CR 42

- Crash frequency and severity (WHI) exceeds statewide averages for similar locations

Downhill Drive

- The side street approach (southbound) experiences LOS F conditions during the AM peak hour
- The intersection offset between Downhill Drive and Riverside Drive is undesirable and results in unnecessary vehicle conflicts and driver confusion. The capacity of the intersection is also limited by narrow side street lanes and inadequate auxiliary lane geometry.
- Crash frequency and severity (WHI) exceeds statewide averages for similar locations

Elk River Road

- Intersection geometry requires split traffic signal phases resulting in inefficient operations
- Crash frequency and severity (WHI) exceeds statewide averages for similar locations
- Curb ramps and sidewalk connections are lacking on some approaches
- At this location, public opinion is particularly negative regarding the quality of traffic flow

13th Street

- Crash frequency and severity (WHI) exceeds statewide averages for similar locations
- Curb ramps and other sidewalk connections are lacking at all approaches

3.0 PROJECTED FUTURE CONDITIONS

3.1 *Future Development*

Throughout the corridor dramatic changes in land use are anticipated in coming years. As discussed in the Introduction, the City of Steamboat Springs and Routt County have adopted the West Steamboat Springs Area Plan (WSSAP) for the area west of the city limits. Within the WSSAP boundary and the urban growth boundary (UGB), the City and County anticipate significant urban growth, which is expected to annex into the City, in the near to mid-term. There are several potential developments in different stages of the local planning process in this area. A development known as Steamboat 700 makes up a majority of the land within the WSSAP boundary. Steamboat 700 currently has an application into the City for annexation. Most other areas within the County, adjacent to US 40 and outside the WSSAP boundary, are expected to retain their rural character. The City is also experiencing some growth and redevelopment near US 40 within the current city limits between Downhill Drive and 13th Street. These developments, including Sunlight, Overlook, and others are also expected to increase travel demand along US 40.

Future development generated traffic was included in the future traffic volumes used for this study. The recommendations presented in this report consider the transportation effects of proposed developments likely to occur within the study area within twenty years and the mobility needs of the community and the region. The recommendations strive to accommodate realistic levels of growth while understanding future traffic patterns, in order to develop a transportation network with the components necessary for future expansion.

Traffic impact studies or traffic/development data collected from the individual developments was used to project trip generation from these developments. The information collected from individual developments was unadjusted by the project team. Developments specifically considered in this study include: Steamboat 700, Overlook Residential Development, Routt County Courthouse (now completed and in use), and Sunlight Development. Sunlight and Overlook are currently in the planning process and have not yet been approved by the City. Since it is likely that some similar development will occur in these areas, the proposed site traffic was included in this study.

The initial trip generation provided by the Steamboat 700 development includes aggressive alternate mode assumptions in accordance with the WSSAP. If the Steamboat 700 development does not achieve the infrastructure and travel behavior changes needed to increase the use of alternative modes, the estimates of future traffic that were used in the System Needs Study could be underestimated. The traffic estimates for the other planned developments did not include alternative mode trip reductions. As shown in Table 7, the WSSAP also provides land use projections for the remaining area outside of Steamboat 700. Since development of this area is not yet contemplated, the WSSAP land use projections were not used in this study.

Table 7 Land Use Comparison of WSSAP and Steamboat 700

Land Uses	West Steamboat Springs Area Plan*	Steamboat 700 (estimated)
Residential	1,100 to 2,600 dwelling units	2,100 dwelling units
Commercial	1,100,000 to 2,400,000 square feet	260,000 square feet + 80 room hotel
Civic	Elementary school Middle school 1 additional school site Fire station	None

*Land use densities assume high levels of transit use, widening of US 40 to four lanes, and resolution of the 13th Street bottleneck (source: West Steamboat Springs Area Plan Update)

In addition to traffic increases associated with planned developments, a significant amount of general background traffic growth was also assumed in the System Needs Study as discussed in the following section of this report. Validation of the System Needs Study's conclusions should continue based on actual proposed developments as the information becomes available.

3.2 Travel Demand Forecasts

Daily and peak hour traffic volume forecasts were developed for three future development scenarios identified by the project team. The Future Background reflects projected traffic volumes developed by applying a corridor growth factor to the existing traffic volumes. The growth factor that was applied is based on traffic volume increases along the US 40 corridor between 1986 and 2005 and reflects a stable growth condition in the area.

The second scenario, known as the Future No Action, augments the Future Background to include traffic generated from WSSAP developments, Overlook, the Routt County Courthouse, and Sunlight. The future alternative routes identified in the WSSAP are also included in the Future No Action.

The Future Build, refines the Future No Action to include the proposed access control measures summarized in the West Steamboat Springs US Highway 40 Access Study. Table 8 summarizes the different traffic scenarios analyzed.

Table 8 Traffic Scenario Summary

Traffic Scenario	Description
Existing	Existing traffic volumes collected in June/Sept. 2007
Future Background	<i>Existing</i> + corridor growth factor
Future No Action	<i>Future Background</i> + traffic generated from known developments + future WSSAP alternative routes
Future Build	<i>Future No Action</i> + proposed access control measures and alternative routes recommended by the US 40 Access Study

The City's Community Plan indicates that impacts to any identified bypass alternative to address the 13th Street bottleneck were too great of impact to the community and future improvements should focus on expanding existing systems and improving alternate mode travel. Based on that guidance, this study did not include evaluation of a bypass route that could address the bottleneck 13th Street or the new bottleneck identified at Elk River Road, but the study did evaluate capacity improvements at those locations.

The following provides a more detailed discussion of the Future Background, Future No Action, and Future Build traffic scenarios:

Future Background

Twenty-year traffic growth factors were gathered from the CDOT website for US 40 through Steamboat Springs. At milepost (MP) 126, the growth factor is 1.29 (representing annual growth of 1.3 percent per year). The growth factor for MP 129 is 1.42 (1.8 percent per year), and for MP 132 the growth factor is 1.47 (1.9 percent per year). Historical traffic volumes along US 40 were also reviewed for 1986-2005 and 20-year growth factors were calculated for that timeframe. Table 9 displays the historical daily traffic volumes for each US 40 milepost.

Table 9
Historical Average Daily Traffic Volumes (1986-2005)

Year	Milepost		
	126	129	132
1986	3,200	5,300	12,100
1987	3,600	6,500	14,000
1988	2,350	3,100	12,600
1989	2,450	3,250	12,900
1990	2,700	3,600	15,400
1991	3,350	7,000	16,700
1992	3,556	7,620	18,545
1993	3,700	7,800	19,500
1994	4,050	6,800	18,900
1995	4,100	6,900	17,000
1996	4,155	6,977	19,070
1997	4,214	7,092	17,318
1998	4,407	7,647	17,854
1999	4,339	7,302	22,811
2000	4,339	7,384	21,267
2001	5,185	10,161	21,267
2002	4,931	10,987	21,627
2003	4,931	10,987	20,714
2004	4,700	13,300	22,200
2005	4,800	12,600	23,700

The 20-year growth factors calculated from the historical data were higher than the current factors found on the CDOT website. The historical growth factors were calculated as 1.86 (3.14 percent per year) at MP 126, 3.11 (5.83 percent per year) at MP 129 and 1.78 (2.93 percent per year) at MP 132.

The historical volumes show a large increase between 2000 and 2001 at MP 129. This is most likely caused by the addition of area developments around this time; therefore, further calculations were made to determine the 20-year factors using data between 1986-2000 and 2001-2005. Table 10 displays the results of the 20-year factor calculations.

Table 10
20-Year Background Growth Factors

Time Period	MP 126	MP 129	MP 132
CDOT Historic	1.29	1.42	1.47
1986-2005	1.86	3.11	1.78
1986-2000	1.97	2.06	2.00
2001-2005	0.72	2.71	1.49

Based on the results in Table 10, a 20-year growth factor of 2.0 was deemed reasonable and was therefore used in the West Steamboat Springs US Highway 40 System Needs Study. This growth factor is consistent with the stable growth from 1986-2000 and falls in between the lower historic growth factor and the higher growth factor from the 1986-2005 calculation. This growth factor was applied to existing traffic volumes (all movements) to determine the Future Background traffic volumes shown in Figures 4a and 4b.

For the Future Background, average daily traffic ranges from approximately 16,400 vehicles per day (vpd) west of Steamboat II to approximately 60,900 vpd on approach to downtown; reflecting a doubling of existing traffic volumes. Generally, these projections suggest the need for significant capacity improvements on US 40.

The Future Background traffic volumes suggest that most of the full movement intersections identified in the Access Study will meet Manual on Uniform Traffic Control Devices (MUTCD) traffic signal warrants in the future. The following intersections potentially warrant signalization within the next 20 years:

- Brandon Circle/ Sloop Circle
- CR 42
- Steamboat 700/Sleepy Bear Mobile Home Park
- Snow Bowl Plaza
- Downhill Drive
- Logger's Lane

For the purpose of the System Needs Study, traffic signals were assumed at the intersections listed above and at the existing signalized intersections under the Future Build scenario. Each of these locations is identified in the Access Study as eligible for signalization when warranted per MUTCD standards and when funding is available.

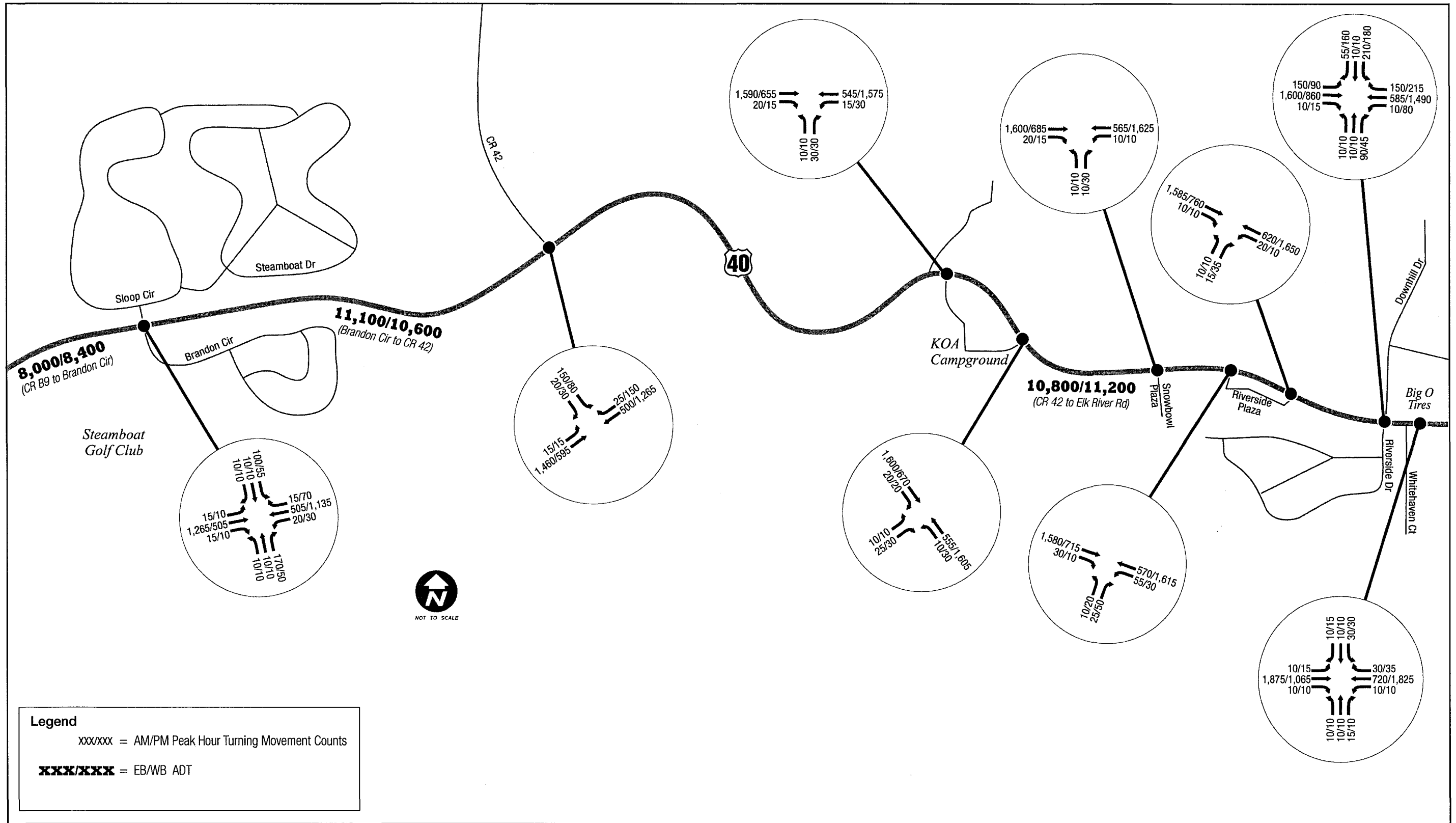


Figure 4a
 Future Background Traffic Volumes
 MP 126.87 to MP 130.33

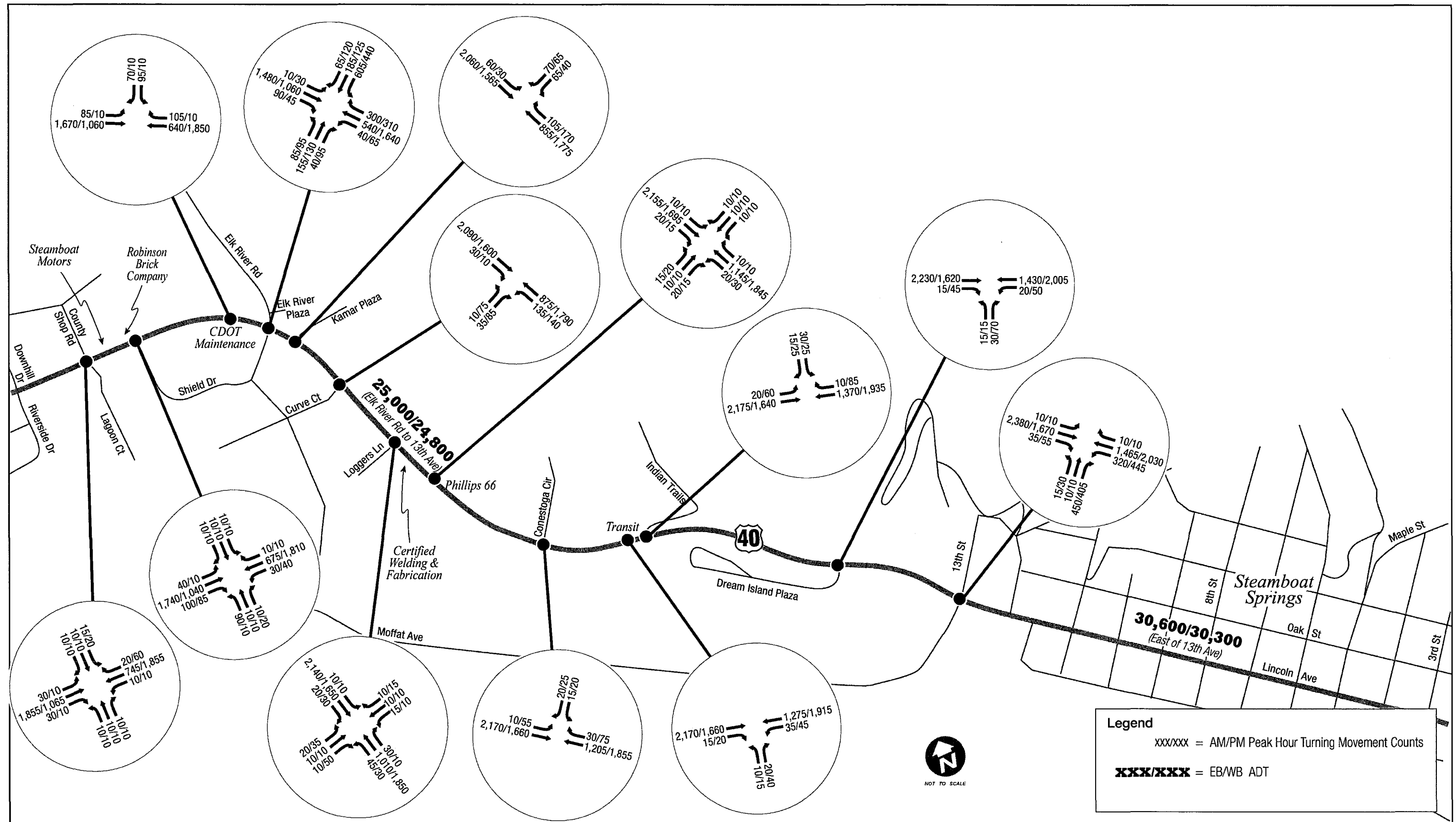


Figure 4b
 Future Background Traffic Volumes
 MP 130.33 to MP 131.91

Future Background Plus Development - No Action

Since the West Steamboat area is anticipated to experience significant growth, development information provided for proposed developments was used to develop two additional future traffic scenarios (Future No Action and Future Build) that reflect horizon or build-out year conditions. In addition to the traffic volume growth reflected in the Future Background scenario, the Future No Action also includes traffic generated from proposed large developments (Steamboat 700, Overlook Residential Development, Routt County Courthouse, and Sunlight Development) and the planned alternative routes identified in the WSSAP without the addition of the access and related circulation improvements identified in the Access Study. The alternate routes generally include the extension of the New Victory Highway, the creation of the Slate Creek Connector, and additional connections to US 40 at Sleepy Bear, County Road 42, and the Rifle Club. The Future No Action represents conditions without implementation of Access Study recommendations; therefore it provides a basis of comparison with the Future Build.

The projected traffic volumes for the Future No Action are summarized in Figures 5a and 5b. Since traffic generation from planned developments is included, the Future No Action traffic volumes are higher than those of the Future Background. For example, peak hour traffic volumes between Elk River Road and 13th Street are approximately 22% higher under the Future No Action when compared to the Future Background. East of 13th Street, the Future No Action volumes are approximately 18% higher than the Future Background.

For the Future No Action, average daily traffic volumes (estimated using results for the peak hour), range from approximately 17,400 vehicles per day (vpd) west of Steamboat II to approximately 71,700 vpd on approach to downtown. Generally, these projections indicate that the additional traffic contributed by planned area developments is significant.

Future Background Plus Development - Build

The Future Build improves upon the Future No Action to include the access and circulation recommendations of the West Steamboat Springs US Highway 40 Access Study. Some of the proposed Access Study improvements necessitate changes to area traffic patterns. For example, if an existing full movement access location was converted to a $\frac{3}{4}$ access allowing left turns in but not out, all vehicles that would have previously turned left out at the intersection were redistributed under the Future Build as either right turns exiting the access and u-turning at another location, or using adjacent intersections through shared off-network access.

The projected traffic volumes for the Future Build are summarized in Figures 6a and 6b. As with the Future No Action, Future Build traffic volumes are significantly higher than those of the Future Background. For example, average daily traffic (ADT) volumes between CR 42 and Elk River Road are approximately 11% higher under the Future Build than the Future Background. The disparity grows as you approach downtown Steamboat Springs (22% between Elk River Road and 13th Avenue and 18% east of 13th Avenue).

In the Future Build, average daily traffic ranges from approximately 17,400 vehicles per day (vpd) west of Steamboat II to approximately 71,700 vpd on approach to downtown.

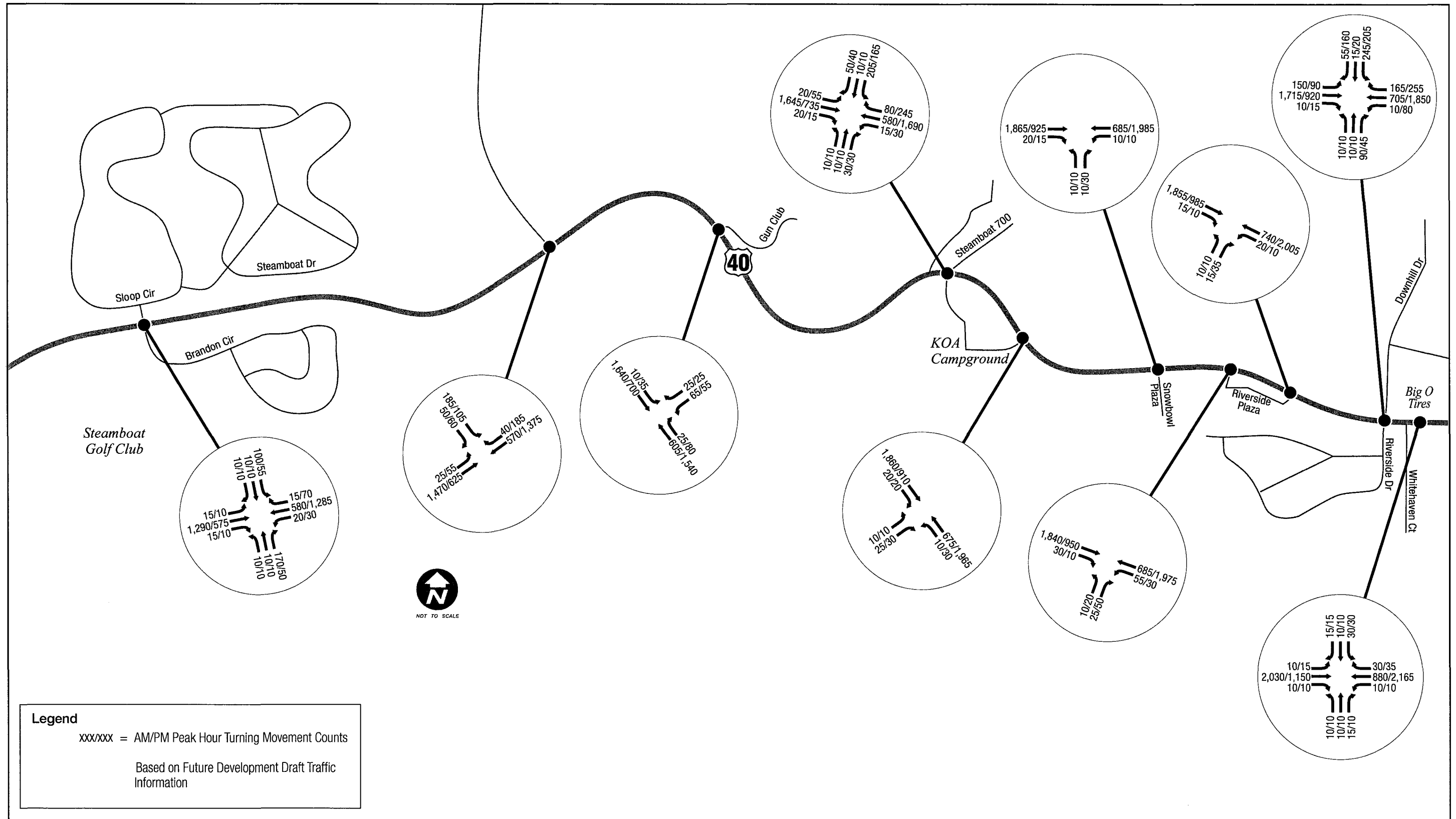


Figure 5a
 Future No Action Traffic Volumes
 MP 126.87 to MP 130.33

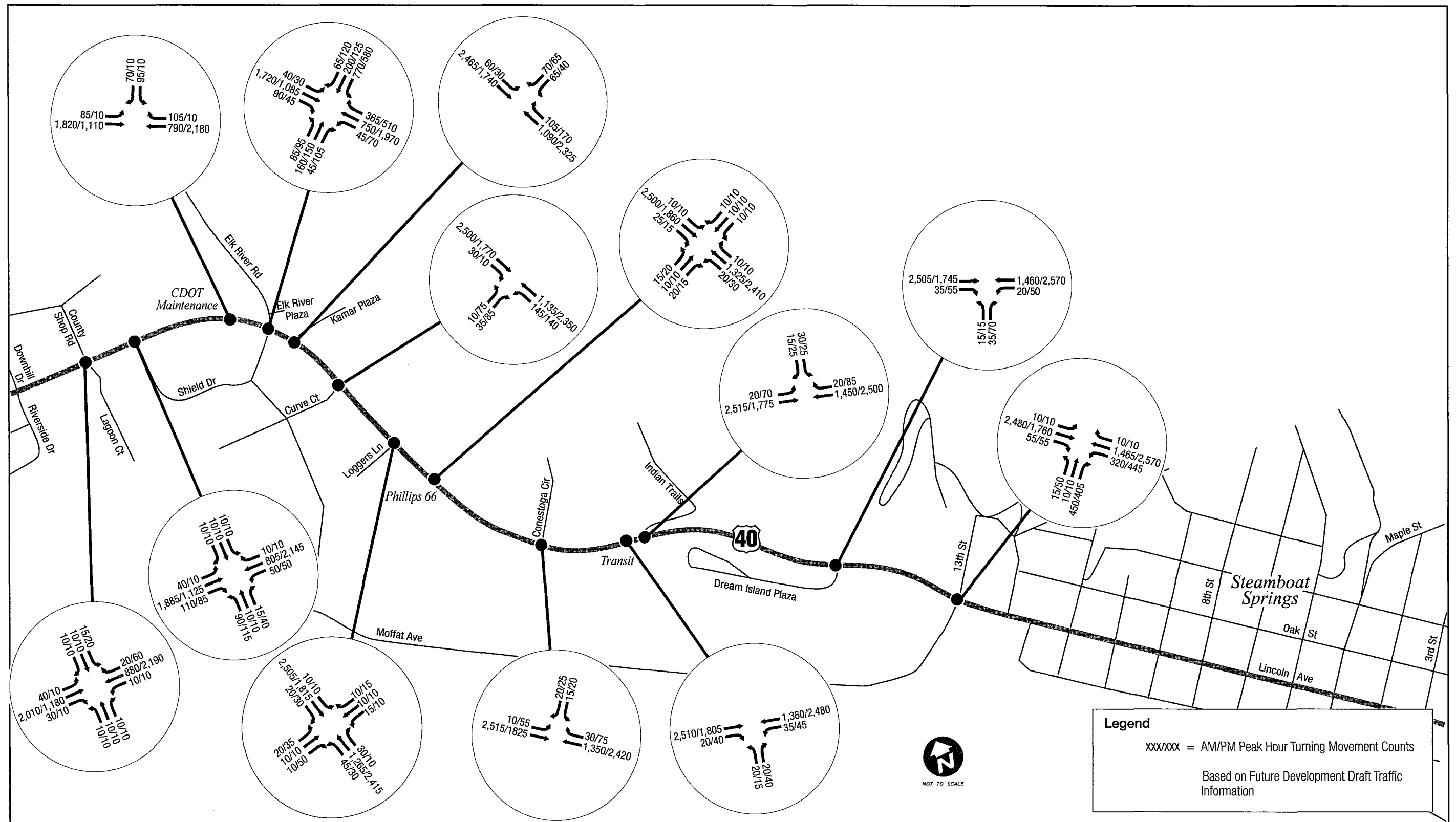


Figure 5b
 Future No Action Traffic Volumes
 MP 130.33 to MP 131.91

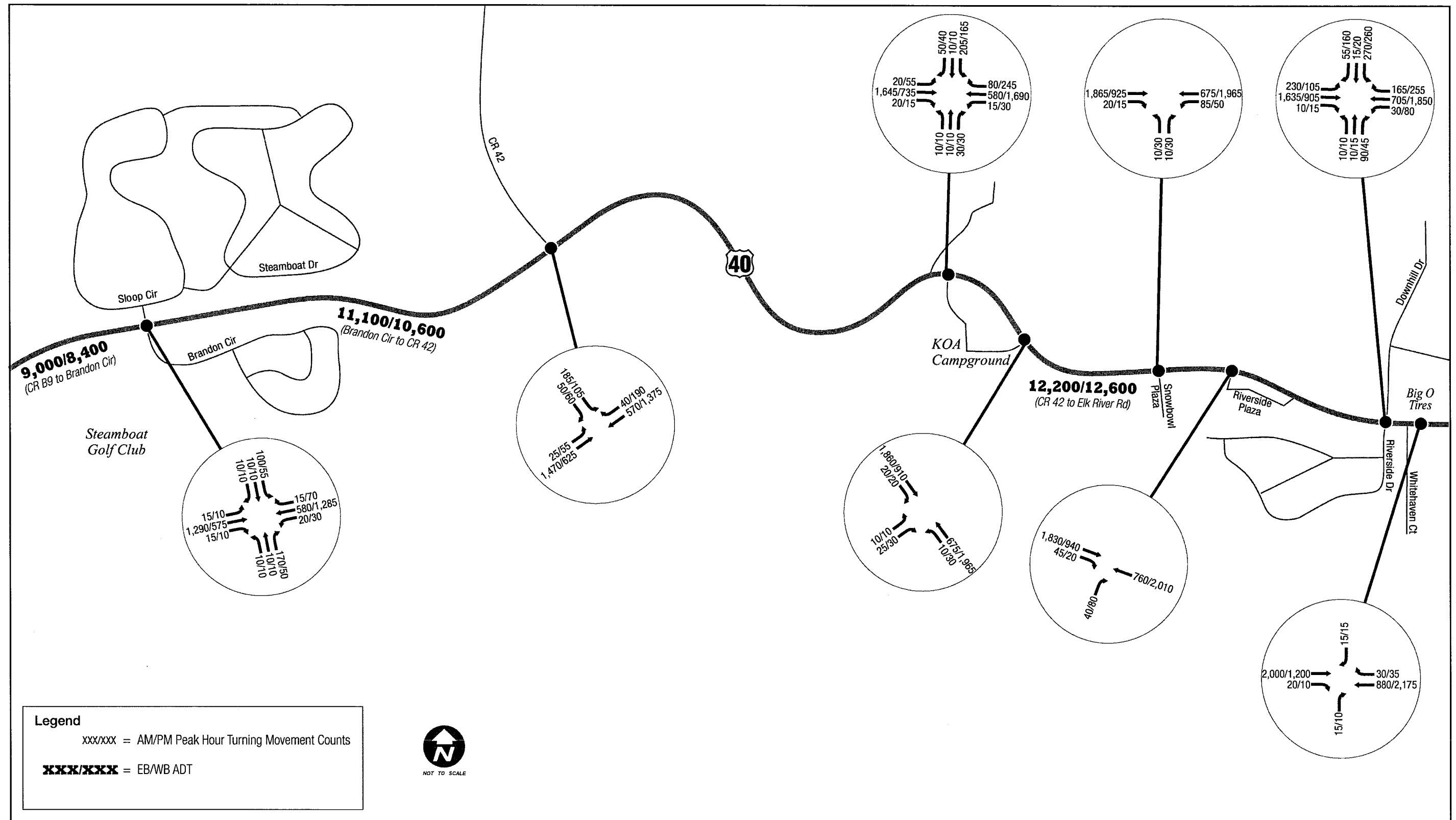


Figure 6a
 Future Build Traffic Volumes
 MP 126.87 to MP 130.33

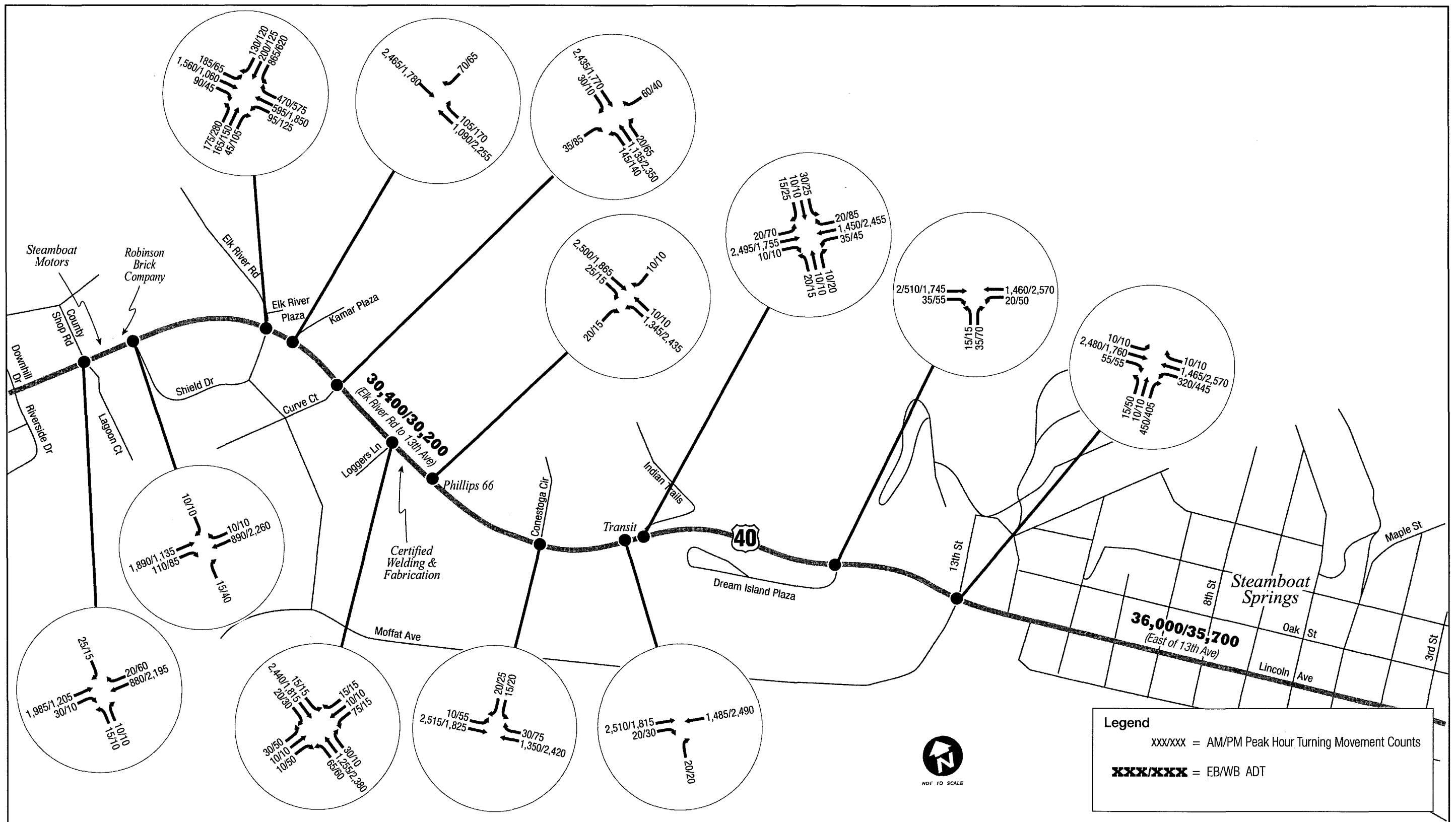


Figure 6b
 Future Build Traffic Volumes
 MP 130.33 to MP 131.91

Table 11 provides a summary of average daily traffic volumes at key points along the US 40 corridor.

Table 11
Average Daily Traffic Projections

Location	Average Daily Traffic Volume (ADT)			
	Existing	Future Background	Future Background plus Development No Action	Future Background plus Development Build
West of Steamboat II	7,680	16,400	17,400	17,400
Steamboat II to CR 42	9,770	21,700	21,700	21,700
CR 42 to Elk River Road	10,990	22,000	24,900	24,800
Elk River Road to 13 th Street	24,860	49,800	61,100	60,600
East of 13 th Street	30,410	60,900	71,700	71,700

3.3 Operations

Projected traffic volumes, geometric information, and traffic signal timing data were used to develop the traffic models for each future traffic scenario. The AM and PM peak hour turning movements shown in Figures 4, 5 and 6 were used to evaluate future intersection LOS and LOS for specific movements at major intersections within the corridor. Additionally, the future arterial LOS of the US 40 corridor was evaluated.

As with the existing LOS analysis, methods documented in the *Highway Capacity Manual 2000* were used to evaluate future traffic conditions.

Future Background

The projected AM and PM peak hour turning movements for the Future Background, shown in Figures 4a and 4b, were used to evaluate future LOS for the major intersections within the corridor. Unlike existing conditions, Future Background Model conditions exhibit mostly poor traffic operations during AM and PM peak hours.

Intersection LOS and Arterial LOS for the Future Background Model case are summarized in Tables 12 and 13 respectively.

Table 12 Future Background Major Intersection LOS

Intersection	Future Background			
	AM		PM	
	Delay (sec.)	LOS	Delay (sec.)	LOS
13 th Street (signal)	> 100	F	23.2	C
Stockbridge Transit Center (signal)	> 100	F	> 100	F
Conestoga Circle	> 100	F	> 100	F
Logger's Lane	> 100	F	> 100	F
Curve Court	> 100	F	> 100	F
Elk River Road (signal)	> 100	F	> 100	F
Shield Drive	> 100	F	> 100	F
Downhill Drive	> 100	F	> 100	F
Snow Bowl Plaza	59.7	F	19.7	C
Sleepy Bear	> 100	F	19.7	C
CR 42	> 100	F	42.2	E
Brandon Circle/Sloop Circle	> 100	F	> 100	F

The results show that without supplemental improvement to US 40, all of the intersections with the exceptions of 13th Street, Snow Bowl, Sleepy Bear and CR 42 are projected to operate at LOS F under the Future Background scenario. In contrast to the Existing traffic condition; the LOS and delay issues of the Future Background are a result of side street delays as well as mainline capacity deficiencies along US 40.

The length of the southbound vehicle queue at the intersection of Elk River Road and US 40 is approximately 250-ft during the Future Background peak hour. This represents an increase of approximately 25% when compared to the existing condition.

Table 13 Future Background US 40 Arterial LOS

Direction	Link	Future Background Scenario	
		AM	PM
		LOS	LOS
Eastbound	Brandon to Snow Bowl	F	A
	Snow Bowl to Curve Court	F	F
	Curve Court to 13th Street	C	C
Westbound	13th to Curve Court	C	F
	Curve Court to Snow Bowl	C	F
	Snow Bowl to Brandon	A	A

Urban Class I

Urban Class II

The arterial LOS results indicate that intersection improvements alone are unlikely to produce operational results of LOS D or better for the corridor. For the Future Background, arterial LOS for the westbound direction continues to achieve LOS C or better during the AM peak hour but the eastbound direction operates at LOS F between Brandon Circle and Curve Court. In the PM peak hour, both directions experience LOS F operations between Snow Bowl and Curve Court with westbound LOS F extending to 13th Street. These results indicate that additional travel lanes, other capacity enhancements and/or travel demand management strategies are required along the corridor to serve the travel demand.

Future Background Plus Development - No Action

The Future No Action includes traffic generated by planned developments including Steamboat 700, Overlook, the Routt County Courthouse, and Sunlight. For this reason, Future No Action traffic volumes are generally higher than those of the Future Background. As mentioned previously, the traffic projections for Steamboat 700 included aggressive alternative mode trip reductions in accordance with the WSSAP. If, upon development of Steamboat 700, these alternative mode trip reductions are not realized, the future traffic estimates used in the System Needs Study could be underestimated. The Future No Action also includes the planned alternate routes identified in the WSSAP without the addition of the access and related circulation improvements identified in the Access Study. As shown in Table 14 and Table 15, the Future No Action model experiences somewhat worse operations than the Future Background Model as a result.

Table 14 Future No Action Major Intersection LOS

Intersection	Future No Action			
	AM		PM	
	Delay (sec.)	LOS	Delay (sec.)	LOS
13 th Street (signal)	> 100	F	40.6	D
Stockbridge Transit Center (signal)	> 100	F	>100	F
Conestoga Circle	> 100	F	> 100	F
Logger's Lane	> 100	F	> 100	F
Curve Court	> 100	F	> 100	F
Elk River Road (signal)	> 100	F	> 100	F
Shield Drive	> 100	F	> 100	F
Downhill Drive (signal)	> 100	F	> 100	F
Snow Bowl Plaza	> 100	F	30.5	D
Sleepy Bear (signal)	> 100	F	> 100	F
Routt County Rifle Club	44.1	E	42.8	E
CR 42 (signal)	94.3	F	65.7	E
Brandon Circle/Sloop Circle (signal)	79.6	E	7.1	A

Table 15 Future No Action US 40 Arterial LOS

Direction	Link	Future No Action LOS	
		AM	PM
Eastbound	Brandon to Snow Bowl	F	E
	Snow Bowl to Curve Court	F	F
	Curve Court to 13th Street	C	C
Westbound	13th to Curve Court	D	F
	Curve Court to Snow Bowl	D	F
	Snow Bowl to Brandon	B	B

Urban Class I

Urban Class II

Although the level-of-service results for both the Future Background and Future No Action are both poor, vehicle delays for the Future No Action are shown to be considerably worse. The reason for this is that once intersections reach LOS F conditions, even small increases in traffic volumes typically translate into large increases in delay (source: HCM 2000).

As shown in Table 11, Future No Action volumes exceed those of the Future Background by as much as 22 percent. The corresponding increase in delay will be a much larger percentage and is a direct result of the additional corridor development that is included in the Future No Action.

The LOS results for the Future Background suggest that additional capacity improvements will be needed in the future to accommodate background traffic growth. However, the need for these capacity improvements will be hastened, potentially by several years, if Steamboat 700 and other WSSAP developments are constructed over the shorter term. The actual timing of these planned developments must be considered when evaluating improvement needs. If Steamboat 700 develops in the near or intermediate term for example, the development may trigger the need for capacity improvements at a much earlier time than would be required based on background traffic growth. As Table 11 shows, traffic volumes from planned development (subtract Future Background from Future No Action) results in an average daily traffic increase east of Elk River Road of over 10,000 vehicles per day.

Future Background Plus Development - Build

As shown in Tables 14 and 16, intersection levels-of-service for the Future Build are generally comparable or slightly improved when compared to the Future No Action. The only exception is at Snow Bowl, where the access control measures in the Future Build result in increased turning movement volumes and the installation of a traffic signal when compared to the No Action.

A comparison between the arterial LOS results for the Future No Action (Table 15) and Future Build (Table 17) reveals that the Future Build LOS is generally comparable to or slightly lower than the Future No Action. Unlike the Future No Action, the Future Build includes traffic signals at Logger's Lane, Snow Bowl, and the Routt County Rifle Club. Although the additional traffic signals tend to improve the levels-of-service for individual intersections by providing opportunities for side-street traffic, they also result in more frequent interruptions to traffic along US 40 which increases corridor travel times and decreases arterial LOS.

While future operations on US 40 are expected to perform below acceptable levels in many locations, the Future Build model results in reduced vehicle queue lengths at most intersections along US 40 when compared to the Future No Action when the access control measures are considered. However, at the intersection of Elk River Road and US 40, vehicle queue lengths for both the Future No Action and Future Build traffic scenarios average 480-ft during peak hours. This length of queue is approximately twice as long as experienced under the Future Background and is a direct result of the New Victory Highway connection to Elk River Road.

Table 16 Future Build Major Intersection LOS

Intersection	Future Build			
	AM		PM	
	Delay (sec.)	LOS	Delay (sec.)	LOS
13 th Street (signal)	> 100	F	35.3	D
Stockbridge Transit Center (signal)	> 100	F	63.7	F
Conestoga Circle	> 100	F	> 100	F
Logger's Lane (signal)	> 100	F	> 100	F
Curve Court	> 100	F	> 100	F
Elk River Road (signal)	> 100	F	> 100	F
Shield Drive	> 100	F	> 100	F
Downhill Drive (signal)	> 100	F	> 100	F
Snow Bowl Plaza (signal)	> 100	F	> 100	F
Sleepy Bear (signal)	> 100	F	> 100	F
Routt County Rifle Club (signal)	35.7	D	30.4	C
CR 42 (signal)	94.3	F	65.7	E
Brandon Circle/Sloop Circle (signal)	79.6	E	7.1	A

Table 17 Future Build US 40 Arterial LOS

Direction	Link	Future Build LOS	
		AM	PM
Eastbound	Brandon to Snow Bowl	F	F
	Snow Bowl to Curve Court	F	F
	Curve Court to 13th Street	C	C
Westbound	13th to Curve Court	F	F
	Curve Court to Snow Bowl	E	F
	Snow Bowl to Brandon	A	B

Urban Class I

Urban Class II

3.4 Future Deficiencies

Based on the geometric conditions, future traffic projections, and LOS analyses described previously, virtually all of the full movement intersections in the study area will experience failing LOS during peak traffic hours. Arterial LOS is also anticipated to be poor, for all but the eastbound segment of US 40 between Curve Court and 13th Street and the westbound segment of US 40 between Snow Bowl and Brandon Circle/Sloop Circle.

The Future Build traffic volume projections suggest that additional auxiliary lanes will be required at a number of the full-movement intersections, including the following:

- All full movement intersections along US 40 will meet volume thresholds requiring exclusive left-turn lanes in the eastbound and westbound directions. Exclusive left-turn lanes are lacking at the following locations (shown in the US Highway 40 Access Study as ultimately remaining full-movement):
 - Eastbound at Brandon Circle/Sloop Circle
 - Westbound at Snow Bowl Plaza
 - Eastbound at Sleepy Bear (future Steamboat 700)
 - Eastbound at Routt County Rifle Club (future connection to New Victory Highway)
- A second westbound left-turn lane will be warranted at 13th Street.
- Exclusive left-turn lanes will be warranted at the following locations on approach to US 40:
 - Southbound Elk River Road (2 left-turn lanes)
 - Northbound Elk River Road
 - Southbound Downhill Drive
 - Southbound Sleepy Bear / Steamboat 700
 - Southbound CR 42
 - Southbound Brandon Circle

4.0 POTENTIAL SOLUTIONS

Since the analysis shows that each of the three future scenarios (Future Background, Future No Action and Future Build) will require improvements in order to provide acceptable LOS, a fourth scenario was developed to demonstrate how some of the potential solutions conceptually identified in this study may alleviate traffic congestion and improve LOS. The long-term strategies for US 40 and for the bottlenecks at Elk River Road and 13th Street that were considered in this study were not subjected to rigorous technical evaluation and by no means reflect the universe of potential solutions. Additional solutions, or combinations thereof, including transit service improvements, travel demand management programs, and potential projects outside the study limits could also be considered.

Identifying a locally-preferred, long term solution to US 40 and the two bottlenecks must be developed in cooperation with CDOT and in accordance with procedures outlined in the National Environmental Policy Act (NEPA). Through formal scoping, the level of required NEPA study (Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement) will be determined along with the extent of investigation for such elements as project purpose and need, alternative definitions, transportation impacts, environmental impacts, and public and agency outreach.

Continued alternative refinement and input from the City will be used to develop system level recommendations; however, it is apparent that significant improvements to US 40 are necessary to provide long-term mobility quality for the West Steamboat Springs area.

4.1 System Improvements

As demonstrated in the previous tables, growth in background traffic volumes combined with traffic from planned development can be expected to result in LOS which decline throughout the US 40 corridor, as well as at individual intersections. While the improvements recommended in the WSSAP and the Access Study will result in some localized improvement, they are not sufficient to address the system-wide deficiencies that are projected to exist.

To evaluate the potential for various improvements to achieve a corridor operational result of LOS D or better (based on *2000 Highway Capacity Manual*), a fourth scenario Future Build with Improvements was analyzed for the various roadway network configurations. The two main configurations are four-lane US 40 and six-lane US 40, as described below:

Four Lane Alternative: Two eastbound lanes from Brandon Circle to 13th Street; Two westbound lanes from 13th Street to Routt County Rifle Club (proposed future full movement intersection per the Access Study) A variety of different intersection alternatives were analyzed with the four-lane scenario including:

- Roundabout: Two lane roundabout at US 40 / Elk River Road
- Flyover: Flyover ramp for southbound Elk River Road to eastbound US 40

- Grade separated interchanges
 - Urban “tight” diamond interchange at US 40 / Elk River Road
 - Single Point Urban Interchange (SPUI) at US 40 / Elk River Road

Six Lane Alternative: Same as Four Lane Alternative except three through lanes in each direction between Downhill Drive and Kamar Plaza.

Each of the above network conditions include alternate routes identified in the WSSAP and the Access Study. Results of these analyses are summarized, by direction, in Table 18 using US 40 travel times for comparison.

Table 18 US 40 Travel Times (Brandon Circle/Sloop Circle to 13th Street)

Direction	Alternative	AM Travel Time (min)	PM Travel Time (min)
Eastbound	Existing	8.0	7.5
	Future Build Model	54.2	46.3
	4 lane	29.7	9.2
	6 lane	11.7	8.5
	Roundabout	10.6	8.1
	Flyover	10.8	8.3
	Interchange	8.5	8.3
Westbound	Existing	7.0	7.5
	Future Build Model	16.4	38.8
	4 lane	9.1	21.7
	6 lane	8.6	11.7
	Roundabout	8.3	10.0
	Flyover	9.0	10.5
	Interchange	8.1	8.8

Existing – Existing (2007) Model; **Future Build Model** – Future Background plus development with access and circulation improvements from the US 40 Access Study; **4 Lane** – 2 lanes EB from Brandon to 13th, 2 lanes WB from 13th to Routt County Rifle Club, intersection at Elk River Road; **6 Lane** – Same as 4 lane model, except 6 lane section from Downhill Drive to Kamar; **Roundabout** – Same as 4 lane, includes 2 lane roundabout at Elk River Road; **Flyover** – Same as 4 lane model, includes flyover for SB to EB left turns at Elk River Road; **Interchange** – Same as 4 lane model, includes interchange at Elk River Road

A review of the travel time results indicates a substantial operational benefit may be gained in the future by expanding US 40 to provide two through travel lanes in each direction. These results assume signalization of major corridor intersections meeting signal warrants. The travel time results further suggest that the 6-lane, roundabout, flyover, and interchange alternatives would result in Future Build travel times that are comparable to existing. One limitation of the roundabout alternative is unused capacity. As studied, the roundabout solution has little unused capacity; therefore, ability to accommodate additional traffic resulting from variations in traffic generation assumptions used in this study (compared to actual development) is very limited. The interchange alternatives produce the best operational results; however, interchange alternatives are also the most expensive to implement with significant property needs, access limitations and major structure construction.

Arterial LOS is provided in Table 19 for the 4 lane and 6 lane widening options. As the results show, widening alone is not sufficient to achieve the LOS objectives (LOS D or better).

Table 19 Future Build US 40 Arterial LOS (Widening Alternatives)

Direction	Link	4 Lane		6 Lane	
		AM	PM	AM	PM
Eastbound	Brandon to Snow Bowl	F	B	C	B
	Snow Bowl to Curve Court	F	D	D	C
	Curve Court to 13th Street	C	C	E	C
Westbound	13th to Curve Court	C	F	B	D
	Curve Court to Snow Bowl	C	F	C	E
	Snow Bowl to Brandon	B	C	C	D

Urban Class I
 Urban Class II

Conceptual opinions of probable cost for the widening options are provided in the Appendix. These opinions include construction elements only. Cost for such items as acquisition of right-of-way (ROW) and mitigation of environmental aspects are not included. Initial evaluations indicate that widening costs for 4 lane alternatives could range from \$6M to \$8M (2008 dollars) per mile. Typical cross sections for the conceptual 4 lane alternatives are shown in Figure 7. Overall corridor maps showing variations on the 4 lane alternatives are provided in the Appendix.

In an attempt to further improve the arterial LOS for the widening alternatives, a number of alternatives were considered to address the corridor's most critical intersection (Elk River Road). East of Elk River Road, US 40 is the primary transportation link from West Steamboat Springs to downtown. The New Victory Highway provides a valuable alternate route to US 40 between CR 42 and Elk River Road but does not provide additional access to downtown. As a result, traffic between West Steamboat Springs and downtown must still pass through the intersection of Elk River Road and US 40. For this reason, the southbound left-turn and the westbound right-turn volumes at the intersection increase dramatically with the addition of the New Victory Highway. Conceptual alternatives for the US 40 and Elk River Road intersection were therefore identified to add capacity for these movements and/or for conflicting movements.

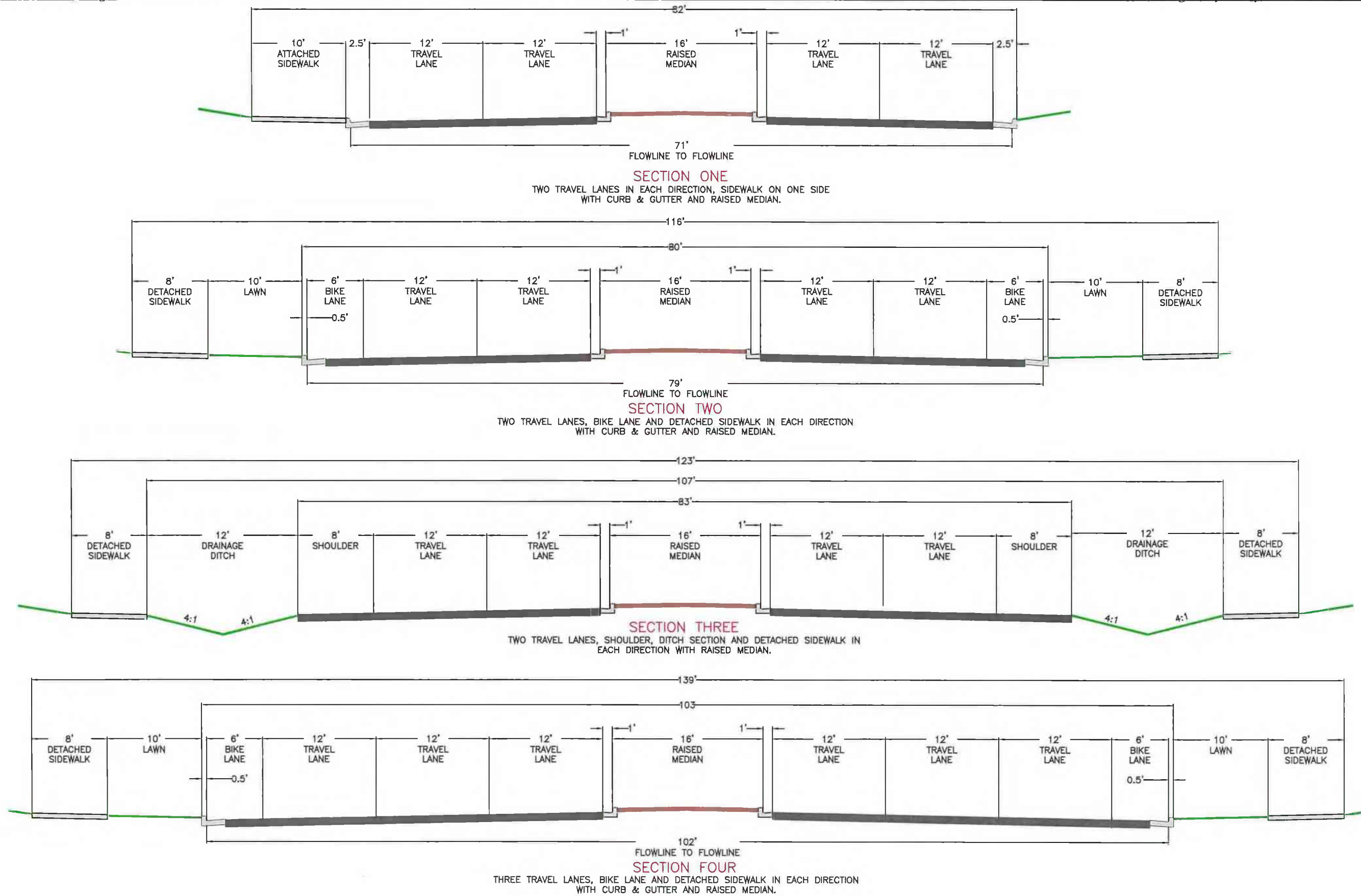


Figure 7
Conceptual Typical Sections

Elk River Road Roundabout

A double lane roundabout with a westbound right-turn bypass lane would accommodate the anticipated traffic volumes and improve the operation of the intersection without the use of a traffic signal. Included in this concept are bike lanes, detached sidewalks, and crosswalks for full pedestrian use of the intersection. See Figure 8 for a conceptual layout of the Elk River Road Roundabout Concept.

In terms of construction, it would also be relatively easy to incorporate the roundabout into a proposed expansion of US 40. The roundabout would require some additional ROW and has an estimated cost of \$2.6M in 2008 dollars. Accesses immediately adjacent to the intersection also have the potential to be impacted.

Based on the results of the intersection LOS analysis, a two-lane roundabout would operate at a LOS D during the Future Build AM peak hour and LOS C during the Future Build PM peak hour.

A roundabout would be an intermediate- to long-term improvement due to its ability to accommodate the Future Build traffic projections. However, it is noteworthy that the two lane roundabout alternative does not have significant unused capacity. Based on preliminary estimates, the roundabout begins to fail at volumes that exceed the Future Build projections by 10 percent or more – suggesting that the useful life of the roundabout solution may be limited if growth in traffic volumes exceeds projections.

A roundabout may work effectively as an interim solution in combination with a long-term interchange solution. In this case, preliminary designs for the ultimate solution should be designed in conjunction with the roundabout design to provide efficient incorporation of future construction phases. The useful life of the roundabout as an interim solution depends directly on the location and level of development of the WSSAP area.



**WEST STEAMBOAT SPRINGS US HIGHWAY 40
SYSTEM NEEDS STUDY**

ELK RIVER ROAD
 ROUNDABOUT CONCEPT
 FIGURE 8
 PAGE 45

Elk River Road Flyover

A flyover ramp from the north leg of Elk River Road to the east leg of US 40 would separate the southbound left-turn movement from the other intersection movements. Traffic on the flyover would merge onto eastbound US 40 west of Curve Court. See Figure 9 for a conceptual layout of the Elk River Road Flyover Concept.

By creating a continuous left-turn movement, the flyover accommodates the most critical intersection movement; however, this concept does not create any other improvements to the intersection to account for the growth of other traffic movements. The flyover structure also limits the flexibility of future changes to the intersection's configuration. A flyover is estimated to cost \$8M in 2008 dollars and will require additional ROW as well as relocation of the detached sidewalk located parallel to US 40. The flyover concept also significantly limits the ability to provide access to parcels immediately adjacent to the intersection which, upon further study, may render this alternative infeasible.

Elk River Road Interchange

While an interchange is the most expensive option, it also provides the greatest capacity to accommodate Future Build traffic volumes. Based on a preliminary assessment of existing conditions, two interchange options would best fit in the limited available ROW: a diamond interchange and a single point urban interchange (SPUI). In both cases, US 40 has been realigned, includes two through lanes and a median, and travels over Elk River Road. The SPUI utilizes one traffic signal to control all ramp traffic while the diamond interchange has two signals to separately control eastbound and westbound ramp traffic. The grade separation between US 40 and Elk River Road creates uninterrupted traffic flow on US 40 while providing room for Elk River Road traffic to merge on and off without crossing movements. See Figures 10 and 11 for conceptual layouts of the Elk River Road Diamond Interchange and Single Point Urban Interchange Concepts, respectively.

The interchange would be a long-term intersection improvement. In terms of construction, it would be relatively easy to incorporate an interchange into an expansion of US 40 and provide capacity for long-term growth. Due primarily to a larger bridge structure, construction of a SPUI is more expensive than an urban diamond interchange: \$21.0M and \$18.0M in 2008 dollars, respectively. Although construction of a SPUI is more expensive, it takes up less space and therefore less ROW is needed and fewer accesses are potentially affected than with an urban diamond interchange. An interchange would significantly limit the ability to provide access to parcels immediately adjacent to the intersection which, upon further study, may render this alternative infeasible.

Tables 20 and 21 present the intersection and arterial LOS results for the Elk River Road alternatives.







ELK RIVER ROAD SINGLE POINT URBAN INTERCHANGE ('SPUI') CONCEPT
 FIGURE 11
 PAGE 49

Table 20 Future Build Elk River Road Intersection LOS

Alternative	Future Build			
	AM		PM	
	Delay (sec.)	LOS	Delay (sec.)	LOS
4 Lane	65.8	E	47.8	D
6 Lane	50.0	D	36.3	D
Roundabout	32.9	D	16.3	C
Flyover	37.3	D	29.2	C
Interchange	39.0	D	55.5	E

Table 21 Future Build US 40 Arterial LOS (Elk River Road Alternatives)

Direction	Link	Roundabout		Flyover		Interchange	
		AM	PM	AM	PM	AM	PM
Eastbound	Brandon to Snow Bowl	B	B	C	B	B	B
	Snow Bowl to Curve Court	E	B	D	C	B	B
	Curve Court to 13th Street	C	C	D	C	C	C
Westbound	13th to Curve Court	B	C	C	B	B	C
	Curve Court to Snow Bowl	C	D	C	D	B	B
	Snow Bowl to Brandon	B	C	C	D	B	C

Urban Class I

Urban Class II

13th Street

The 13th Street intersection is the second of two primary “bottlenecks” along US 40 within West Steamboat Springs. As described in the WSSAP, the 13th Street area is severely constrained by steep slopes, the Yampa River and Howelsen Hill – all of which make additional capacity in this location difficult and expensive to obtain. Alternatives for 13th Street were identified in several previous planning studies, including the Mobility and Circulation Plan (1998) and the Steamboat Springs Area Community Plan Update (2003).

According to the previous studies, the two most promising concepts to address the 13th Street bottleneck include the Howelsen Parkway Extension and the Yampa Avenue Extension. The Community Plan Update determined that both of these concepts improve conditions at the intersection, but neither was selected for further action at the time based on overall impacts to the community.

Based upon the Mobility and Circulation Plan, the estimated cost for the Yampa Avenue Extension is \$500,000 (1998 dollars) and the estimated cost for the Howelsen Extension is \$2.9M (1998 dollars).

4.2 Spot Improvements

Spot improvements, as defined in this study, reflect relatively minor projects that have been identified to address a location-specific operational issue or deficiency. Spot improvements are not intended to address larger, widespread issues like mainline capacity of US 40 or the bottlenecks at Elk River Road or 13th Street.

Each of the proposed spot improvements can be characterized as having independent utility and as a stand-alone project. These projects are also of the sort that can typically be accomplished through the City’s Capital Improvement Program (CIP) or a similar program. In terms of implementation, these projects have been separated into short-term and long-term projects under Section 5 of the report. However, demand for construction of these projects is largely dependent on when and where development and additional travel demand occurs. The following provides a summary of potential projects considered for spot improvements along the US 40 corridor:

Brandon Circle/Sloop Circle

S.P. #1: Construct an exclusive eastbound left-turn lane from US 40 to Brandon Circle/Sloop Circle. Improve other auxiliary lanes to meet State Highway Access Code requirements.

S.P. #2: Construct an exclusive southbound left-turn lane at the Brandon Circle/Sloop Circle / US 40 intersection.

Figure 12 provides a conceptual illustration of the Brandon Circle/Sloop Circle spot improvements.



CR 42

S.P. #3: Conduct an engineering study to identify potential causes for elevated WHI. Potential improvements include signing & striping modifications, auxiliary lane improvements, intersection channelization, and/or lighting.

S.P. #4: Construct an exclusive southbound left-turn lane at the US 40 intersection. See Figure 13 for a conceptual depiction of this spot improvement.

Downhill Drive

S.P. #5: Eliminate offset intersection by re-aligning Downhill Drive to align with Riverside Drive or re-aligning Riverside Drive to align with Downhill Drive prior to installation of a traffic signal (when warranted). Re-aligning this intersection will improve efficiency and provide an opportunity for future traffic signalization. Future traffic volumes result in a large enough southbound left-turn from Downhill Drive to require an exclusive left-turn lane. Eastbound and westbound left-turn lanes on US 40 are also provided. In addition to the roadway changes, pedestrian curb ramps on each corner are proposed, as well as sidewalk along US 40 connecting the southeast curb ramp to the existing sidewalk at Shield Drive. See Figure 14 for conceptual layouts of the Downhill Drive/Riverside Drive Realignment Concepts.

Downhill Drive to Kamar Plaza

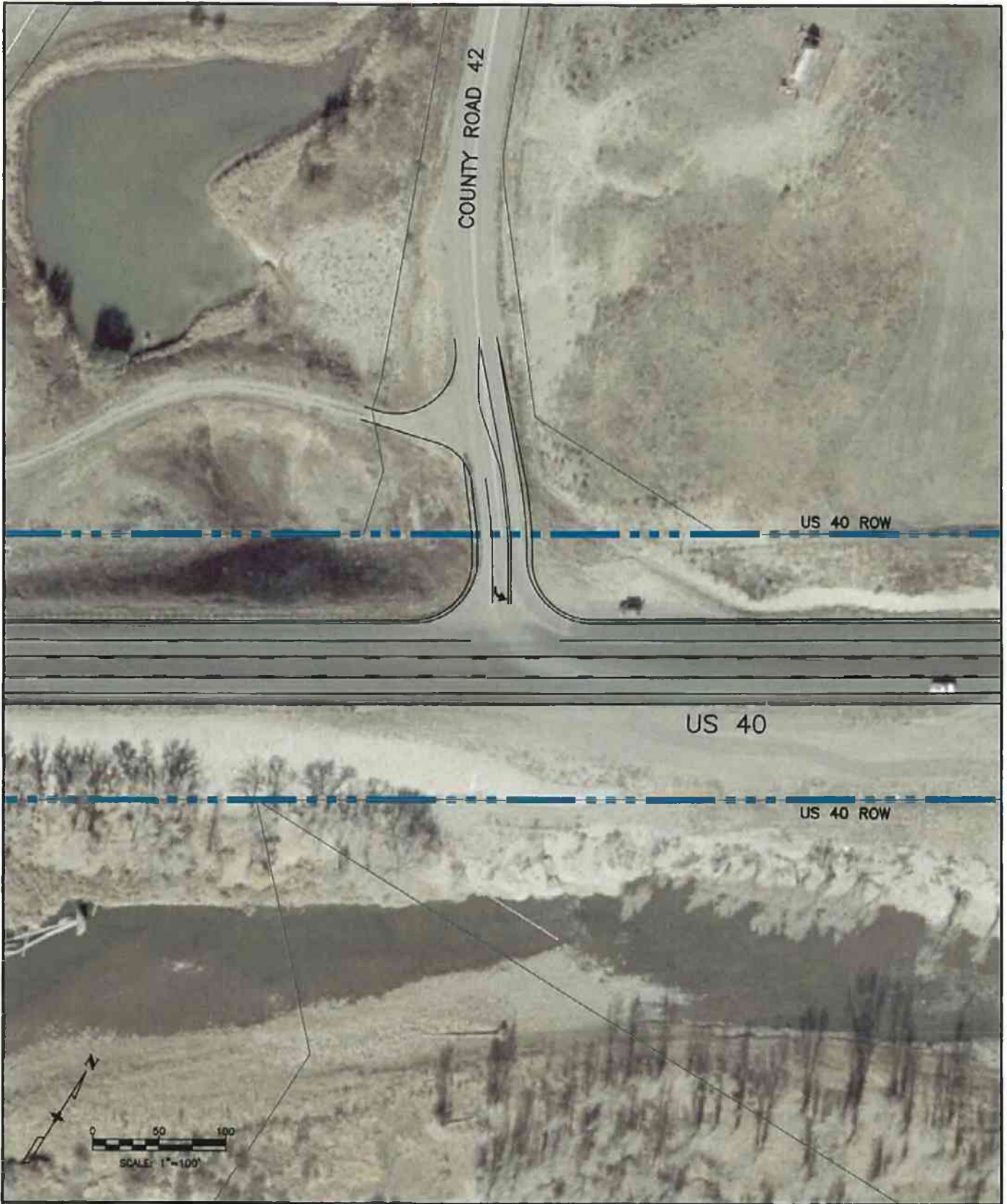
S.P. #6: Re-stripe US 40 to include two westbound lanes between Downhill Drive and Kamar Plaza. Construct a westbound right turn lane at Elk River Road and modify the existing traffic signal.

S.P. #7: Construct a northbound left-turn lane for Elk River Road and re-stripe US 40 to 4 lanes between Downhill Drive and Kamar Plaza. Construct a westbound right-turn lane at Elk River Road and modify the existing traffic signal.

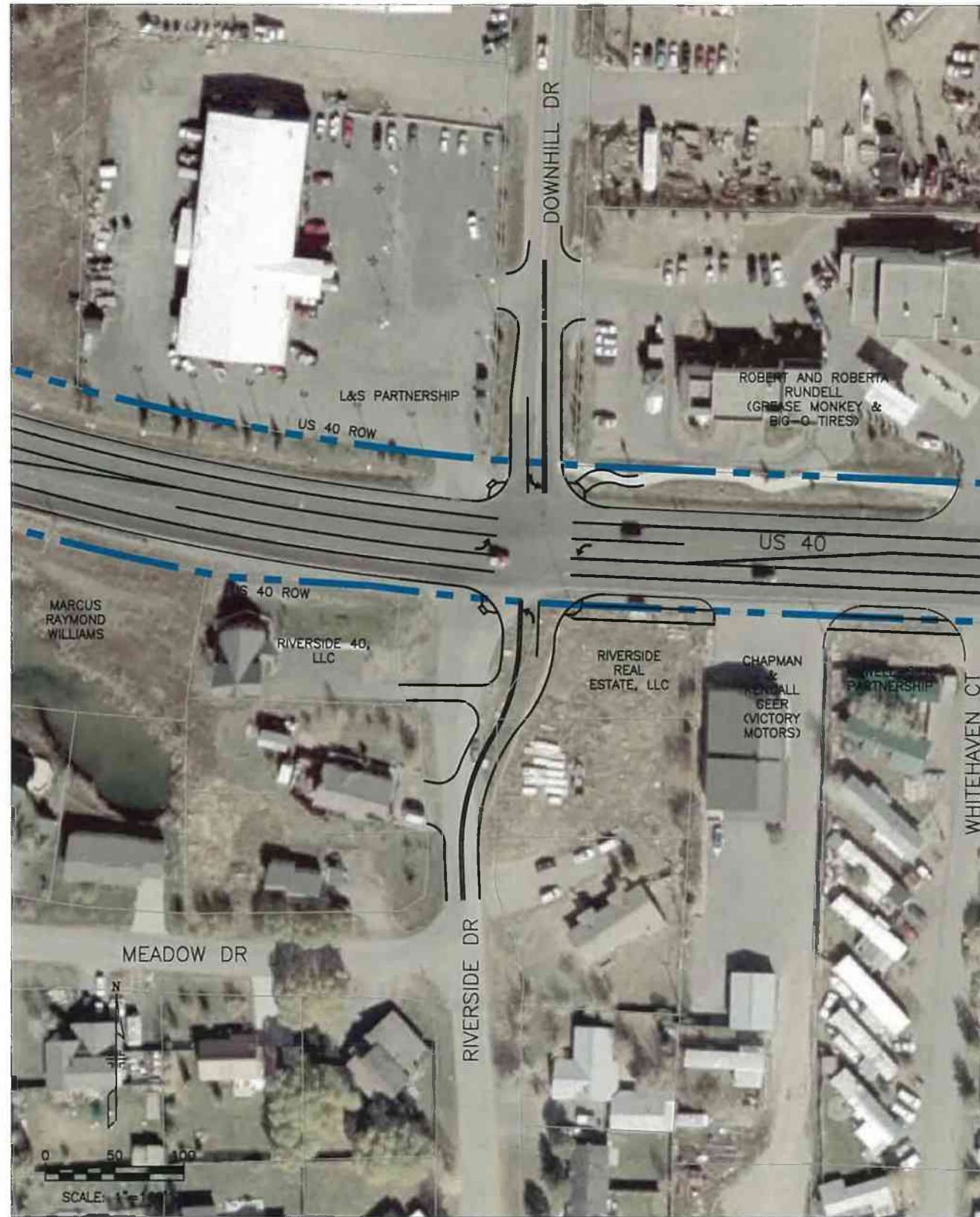
Elk River Road

S.P. #8: Construct a single northbound left turn lane and a single southbound left turn lane and improve lane alignments across US 40. Implement traffic signal timing improvements. See Figure 15 for the Elk River Road Left-Turn Lane Concept.

S.P. #9: Once warranted, construct a second southbound left turn lane for Elk River Road at US 40 and implement traffic signal timing improvements. See Figure 16 for a conceptual layout of the Elk River Road Double Left-Turn Lane Concept.



RIVERSIDE REALIGNMENT

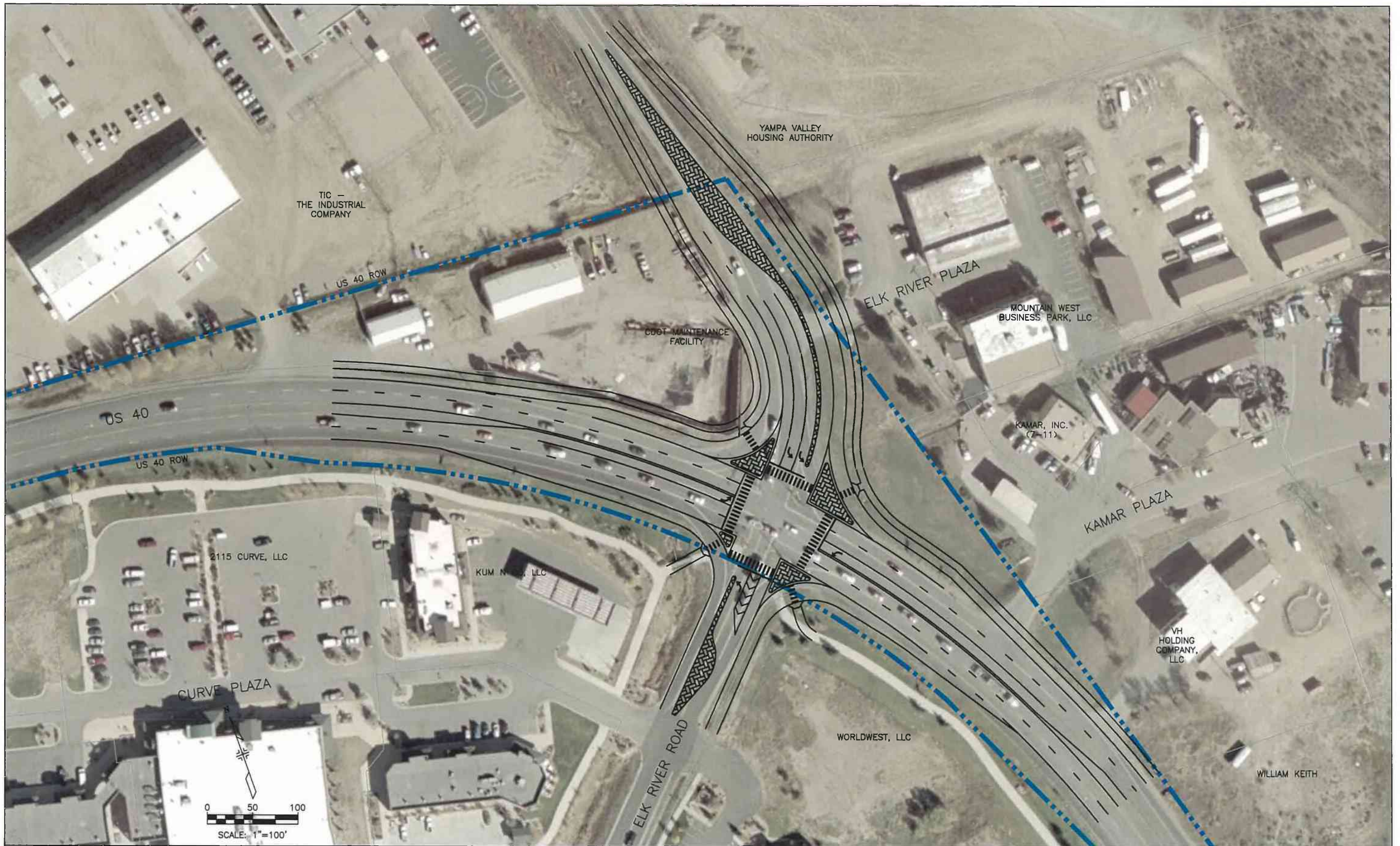


DOWNHILL REALIGNMENT



NOTE: THE INTERSECTION OF DOWNHILL DRIVE/RIVERSIDE DRIVE & US 40 SHOULD BE REALIGNED TO ELIMINATE THE EXISTING OFFSET INTERSECTION CONFIGURATION AS SHOWN, EITHER SIDE MAY BE REALIGNED TO ACHIEVE THE DESIRED INTERSECTION CONFIGURATION. ADDITIONAL STREET RIGHT-OF-WAY IS REQUIRED FOR EITHER OPTION. REALIGNMENT SHALL OCCUR WHEN THE SIDE OF THE HIGHWAY REDEVELOPS AND INCREASES TRAVEL DEMAND AT THE INTERSECTION MORE THAN 20% OF WHEN THE CITY HAS FUNDING AVAILABLE TO COMPLETE THE PROJECT.





Once the planned New Victory Highway is implemented, traffic volumes at the intersection of Elk River Road and US 40 will dramatically change. As a result of these changes, further improvements to the signalized at-grade intersection of Elk River Road and US 40, including potentially the widening of US 40 to provide two through lanes in each direction, will likely not be sufficient to maintain an acceptable LOS long-term. In an attempt to identify potential long-term strategies for the intersection, a number of additional capacity improvements were considered in this study, including:

- Widening US 40 to provide three through lanes in each direction between Downhill Drive and Kamar Plaza,
- A 2-lane roundabout in place of a signalized intersection,
- A signalized intersection with a flyover ramp for the southbound to eastbound left-turn movement,
- An urban “tight” diamond interchange, and
- A single point urban interchange.

Each of the above described improvements is discussed in the System Improvements section of this report.

Elk River Road to Stockbridge Transit Center

S.P. #9: Construct minor widening between Elk River Road and Stockbridge Transit Center and re-stripe US 40 to provide 4 through lanes.

Stockbridge Transit Center to 13th Street

S.P. #10: Convert the existing Stockbridge Transit Center access to right-in, right-out and construct a new, signalized access across from Indian Trails.

S.P. #11: Restripe US 40 to provide two through lanes in each direction between the Stockbridge Transit Center and 13th Street.

Figure 17 provides a conceptual illustration of the Stockbridge Transit Center/Indian Trails Intersection Improvement Concept.

13th Street

S.P. #12: Conduct an engineering study at the intersection to identify potential causes for elevated WHI. Potential improvements include signing & pavement markings, geometric / sight distance improvements, hazard elimination, or traffic signal modifications.



4.3 Community Values

A Project Evaluation Criteria and Ranking Matrix was developed for this project that takes into consideration the concerns and values of the citizens of City of Steamboat Springs. The public and agency outreach conducted for this project, and for the concurrent West Steamboat Springs US Highway 40 Access Study, revealed a number of common themes including:

- The need to address existing traffic “bottlenecks”, particularly at the Elk River Road and 13th Street intersections,
- A goal of reducing dependency on the automobile by promoting the use of alternative modes,
- Reducing traffic congestion along US 40,
- Improving safety along roadways within West Steamboat Springs, and
- In identifying potential improvements, consider more than just those related to highway capacity

Staff and residents of the City of Steamboat Springs have identified the need to incorporate pedestrian, bicycle, and transit modes into all improvement options. While the LOS analyses conducted for the study did not specifically take into account the effects that these types of expanded facilities would have on area wide vehicular transportation demand, they do have the potential to influence, in a positive way, the volume of vehicular traffic utilizing the US 40 corridor.

Selection of a locally preferred corridor solution requires more thorough study than can be completed in the West Steamboat Springs US Highway 40 System Needs Study. The Project Criteria Evaluation and Ranking Matrix has been included in the Appendix to document the issues deemed most important to the community at the time of this study and to provide a starting point for more detailed future evaluations.

5.0 RECOMMENDATIONS & NEXT STEPS

The System Needs Study provides short-term and long-term recommendations. The short-term recommendations identify those improvements that address what are primarily existing deficiencies. The short-term horizon is estimated to be within the next 5 years. Long-term recommendations reflect those studies or improvements needed to address deficiencies anticipated to occur in the future as a result of growth in background traffic volumes and additional traffic resulting from planned development. In particular, the long-term projects identified through this study have been formulated to address the fundamental capacity deficiency along the US 40 corridor and at the congested intersection locations at Elk River Road and 13th Street. While the recommended improvements, including spot improvements, have been identified as short or long term for general planning purposes, demand for implementation of improvements is more closely related to when and where development and additional travel demand occurs than it is to a particular year.

5.1 *Short Term*

- Construct eastbound and westbound left-turn lanes at all full movement intersections along US 40 where they don't presently exist.
- Lengthen auxiliary lanes at Brandon Circle/Sloop Circle to meet current State Highway Access Code Standards. Construct an eastbound left-turn lane and a southbound left-turn lane.
- Re-align Riverside Drive or Downhill Drive to eliminate the offset between the intersections. Construct a southbound left-turn lane and a signal once Manual on Uniform Traffic Control Devices (MUTCD) traffic signal warrants are met.
- Conduct engineering studies to identify whether safety improvements are needed at the CR 42 and 13th Street intersections.
- Construct a southbound left-turn lane at the CR 42 intersection.
- Construct a southbound left-turn lane at Sleepy Bear when access for Steamboat 700 is constructed.
- Construct a northbound and southbound left-turn lane and associated traffic signal improvements at the Elk River Road intersection
- Monitor intersection operations and crash experience at the Conestoga Circle intersection. If redevelopment generates additional traffic at this intersection or if operational or safety problems occur, limit access to right-in, right-out movements only and provide alternate access to the Conestoga neighborhood in accordance with the Access Study.
- Construct minor widening and re-stripe US 40 to four lanes between Elk River Road and the Stockbridge Transit Center.
- Re-stripe existing US 40 to four lanes between the Stockbridge Transit Center and 13th Street

- Convert the existing Stockbridge Transit Center access to right-in, right-out and construct a new, signalized access across from Indian Trails
- Provide on-street bicycle lanes along US 40 in the existing shoulder area and/or the widening areas in accordance with the City's Open Space and Trails Master Plan.
- Continue extending the City's Core Trail per the City's Open Space and Trails Master Plan, including grade separated crossings of US 40.
- Improve pedestrian facilities at intersections and along the highway per the City's Sidewalks Master Plan. The plan identifies US 40, Elk River Road, Downhill Drive and other locations within the West Steamboat Subarea as candidate locations for sidewalk improvements.
- Provide improved pedestrian facilities at signalized intersections, bus stops and other key locations throughout the corridor.
- Improve transit stop location and access. Evaluate options for enhancing transit service along the US 40 corridor.
- Implement the recommendations in the US 40 Access Control plan as development occurs.

5.2 Long Term

The West Steamboat Springs US Highway 40 System Needs Study has identified that short-term, spot improvements at intersections will not be sufficient to accommodate future traffic projections. The candidate long-term strategies that were considered in this study were not subjected to rigorous technical evaluation and by no means reflect the universe of potential solutions. Identifying a locally-preferred, long term solution to US 40 and/or the bottlenecks at Elk River Road and 13th Street must be developed in coordination with CDOT and in accordance with procedures outlined in the National Environmental Policy Act (NEPA). Through formal scoping, the level of required NEPA study (Categorical Exclusion, Environmental Assessment, or Environmental Impact Statement) will be determined and the extent to which the study investigates such elements as project purpose and need, alternative definitions, transportation impacts, environmental impacts, and public and agency outreach. It is clear; however, from this conceptual evaluation that in several locations even minor expansion of the highway footprint may not be accommodated within the existing right-of-way.

The following long-term improvement projects have been considered in the System Needs Study. Those that result in major capacity enhancements appear to be worthy of further scrutiny as part of a NEPA evaluation process:

- Continue to monitor and implement any short-term improvement that has not yet been completed.

- Periodically monitor intersection traffic volumes and construct traffic signals when MUTCD warrants are met:
 - Brandon Circle/Sloop Circle
 - CR 42
 - Steamboat 700 / Sleepy Bear Mobile Home Park
 - Snow Bowl Plaza
 - Re-aligned Downhill Drive / Riverside Drive intersection
 - Logger's Lane
- Construct a second southbound left-turn lane at the Elk River Road / US 40 intersection when volumes warrant
- Construct a second westbound left-turn lane at the 13th Street / US 40 intersection when volumes warrant. The need and timing of this improvement depends upon whether a solution is implemented for the bottleneck at 13th Street.
- Widening of US 40 to two eastbound lanes between Brandon Circle/Sloop Circle and 13th Street. Widening of US 40 to two westbound lanes between 13th Street and the Routt County Rifle Club (i.e., the four lane alternative)
- Four lane alternative with widening of US 40 to six lanes between Downhill Drive and Kamar Plaza (i.e., the six lane alternative)
- Two lane roundabout at the intersection of Elk River Road
- Southbound Elk River Road to eastbound US 40 flyover ramp
- Urban "tight" diamond interchange at Elk River Road
- Single point urban interchange at Elk River Road
- Yampa Avenue Extension (13th Street)
- Howelsen Parkway Extension (13th Street)

More detailed information on the various potential transportation projects is provided in the Appendix.

5.3 Next Steps

The Systems Needs Study represents the first step in an overall process to diagnose and address capacity deficiencies along the US 40 Corridor in West Steamboat Springs. The products of the study include the identification of short-term and long-term improvements needed to address existing and projected transportation deficiencies.

The short-term improvements identified in the System Needs Study reflect those projects that are largely geared toward addressing either existing operational or safety deficiencies along US 40 or minor improvements related specifically to new development. The short-term projects are generally smaller scale improvements that can be implemented over time through the City's annual Capital Improvement Program (CIP) or similar programs.

The System Needs Study anticipates that background traffic growth, particularly when combined with the traffic generated by planned developments within the WSSAP, will be significant. As a by-product of development, short-term, relatively easy to implement projects will not be sufficient to address the long-term transportation needs within West Steamboat Springs. A more comprehensive investigation of build-out traffic conditions needs to be conducted in accordance with the National Environmental Policy Act (NEPA), particularly as it relates to corridor-wide capacity improvements to US 40, and the bottlenecks at Elk River Road and 13th Street.

The timing (i.e., short-term or long-term) of these improvements is difficult to precisely determine as it is dependent upon a number of outside influences including the pace of development and related changes in underlying travel patterns. The City should continue to monitor development and the resulting changes in traffic to determine the appropriate time frame for implementation of these other projects.