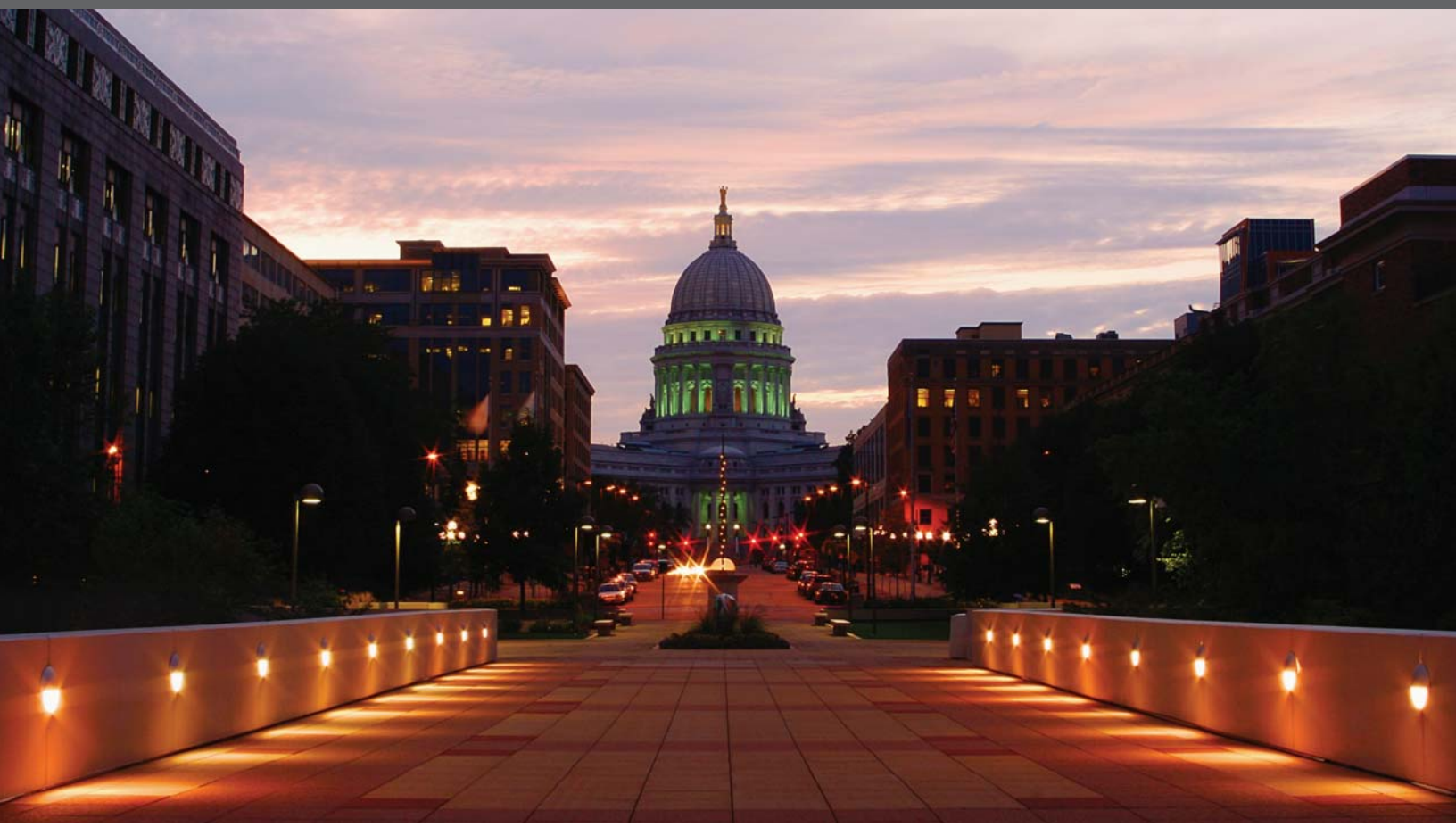
Southwest Region Freeway
ITS Benefit/Cost Analysis Final Report



prepared for
Wisconsin Department of Transportation

prepared by
SRF Consulting Group, Inc.

in conjunction with
Cambridge Systematics, Inc.

August 2009

WISCONSIN DEPARTMENT OF TRANSPORTATION

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August 26, 2009

Document Overview

INTRODUCTION

The objective of this project was to complete a moderately-detailed, planning-level analysis of the benefits of deploying selected Intelligent Transportation Systems (ITS) elements along freeway segments in the Wisconsin Department of Transportation's (WisDOT) Southwest Region. The analysis helped determine which ITS elements should be considered for deployment.

The analysis used the ITS Deployment Analysis System (IDAS) to determine benefit/cost (B/C) ratios at various levels of ITS deployment intensity for both present and future conditions. ITS elements at each intensity level were proposed based on the WisDOT Traffic Operations Infrastructure Plan (TOIP) while considering existing ITS deployments. The final benefit/cost ratios were used by WisDOT to determine which ITS elements should be considered for deployment. The following Table lists the recommendations for each segment:

Recommended Deployment	IDAS Initial Capital Cost	IDAS O & M Cost	2005 Net Benefits	2035 Net Benefits
Segment A Medium (4 Lane)	$3,292,427	$228,903	$5,344,000	$11,556,000
Segment A High (6 Lane)	$4,186,602	$273,175	$2,454,000	$15,841,000
Segment B Medium	$4,908,544	$444,631	$16,288,000	$31,462,000
Segment C Medium (4 Lane)	$2,231,068	$95,146	$2,803,000	$13,766,000
Segment C High (6 Lane)	$2,789,320	$137,767	$3,026,000	$11,878,000
Segment D Medium	$1,765,049	$225,922	$3,262,000	$18,722,000
Segment E Medium	$568,932	$43,398	$615,000	$1,357,000
Segment F Medium	$1,885,631	$109,903	$2,323,000	$6,907,000

All values are dollars per year except Initial Capital Cost

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1.0 Introduction and Background

1.1 PROJECT OBJECTIVES

The objective of this project was to complete a moderately-detailed, planning-level analysis of the benefits of deploying selected Intelligent Transportation Systems (ITS) elements along freeway segments in the Wisconsin Department of Transportation's (WisDOT) Southwest Region. The analysis helped determine which ITS elements should be considered for deployment. The ITS elements currently being discussed for possible implementation in this region include:

- Closed-circuit television (CCTV)
- System detector stations (SDS)
- Semi-permanent sites for portable changeable message signs (PCMS)
- Dynamic message signs (DMS)
- Arterial traffic signal system enhancements and integrated corridor traffic management strategies
- Ramp metering
- Ramp closure gates
- Crash investigation sites (CIS)
- Law enforcement pads (LEP)
- Freeway service patrol (FSP)
- Fiber optic communications

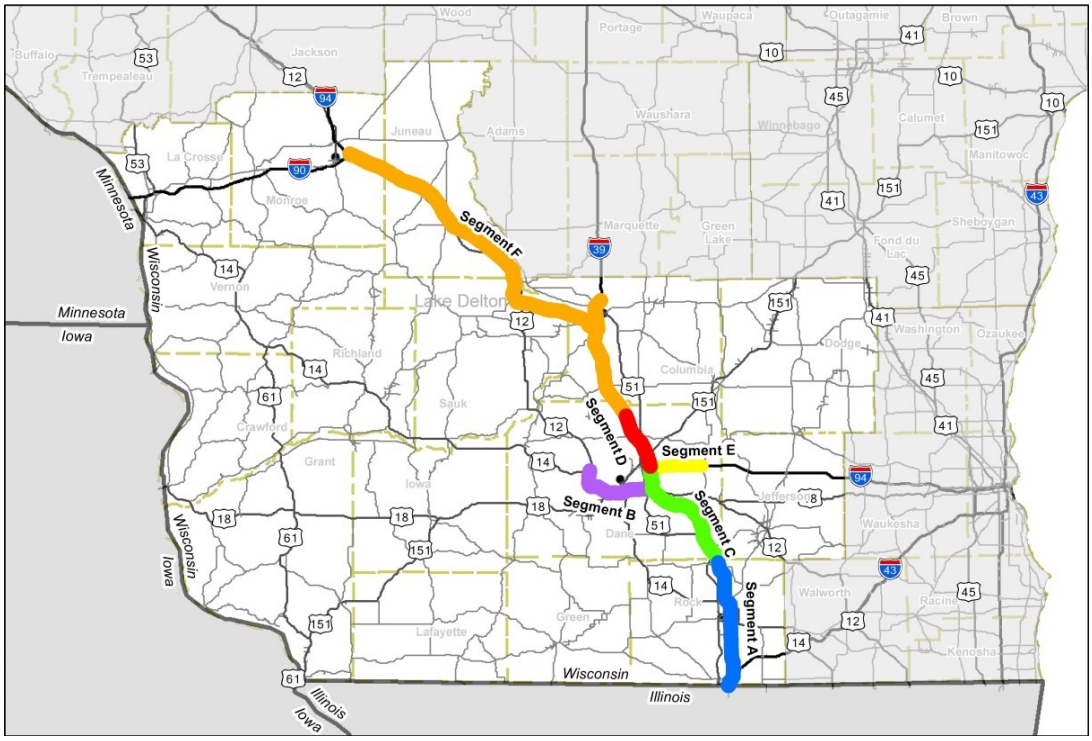
The analysis used the ITS Deployment Analysis System (IDAS) to determine benefit/cost (B/C) ratios at various levels of ITS deployment intensity for both present and future conditions. ITS elements were proposed based on the WisDOT Traffic Operations Infrastructure Plan (TOIP) while considering existing ITS deployments as well as future predictions. Future traffic conditions were predicted using the Dane and Rock County Travel Demand Models provided by local Metropolitan Planning Organizations (MPO) as well as the Statewide Planning Model. The final benefit/cost ratios may then be used by WisDOT to determine which ITS elements should be considered for deployment.

1.2 PROJECT CORRIDORS

The analysis was performed for six individual freeway segments falling within three WisDOT TOIP Corridors: Badger State Corridor, South Central Connection Corridor and Capitol Corridor. The following segments within these TOIP corridors were evaluated:

- **Segment A –** I-39/90 from the Illinois state border to the Rock County/Dane County line.
- **Segment B –** USH 12 Beltline from Parmenter St to I-39/90.
- **Segment C –** I-39/90 from the Rock County/Dane County line to the Badger Interchange.
- **Segment D –** I-39/90/94 from the Badger Interchange to the Dane County/Columbia County line.
- **Segment E –** I-94 from the Badger Interchange to STH 73.
- **Segment F –** I-90/94 from the Dane County/Columbia County line to the I-90/94 "Tomah Split", including a spur of I-39 through Portage.

Figure 1.1 WisDOT SW Region Segment Map



1.3 CORRIDOR CHARACTERISTICS

As mentioned, the six segments for analysis fall within the following corridors. WisDOT TOIP corridor descriptions are:

- **Badger State Corridor –** The Badger State Corridor includes the Madison MPO and Chippewa Falls – Eau Claire MPO Regions as well as I-94 from Eau Claire to Madison, I-90 from Tomah to Madison and I-39 from Portage to Madison. The Corridor includes a system interchange with I-90 and I-94 near Tomah. The Corridor experiences significant regional traffic, high peeking on weekends (Friday afternoon and evening and Sunday afternoon), and weather disturbances during the winter months.

  Segments B, D, and F fall entirely within the Badger State Corridor.

- **Capitol Corridor –** The Capitol Corridor includes the Madison MPO and Milwaukee-Waukesha Regions as well as I-94 from Madison to Milwaukee, WIS 151/19/16 from Madison to Milwaukee, and US 18 from Madison to Milwaukee. The Corridor includes system interchanges with US 41/45 and I-43 in Milwaukee. The Corridor experiences significant regional traffic, high peaking on weekends (Friday afternoon and evening and Sunday afternoon), and recurring congestion during the weekday peak periods in the Milwaukee-Waukesha urban areas and weather disturbances during the winter months.

  Segment E falls entirely within the Capitol Corridor.

- **South Central Connection Corridor –** The South Central Corridor includes the Madison MPO and Janesville-Beloit Regions as well as I-39/90 from the Illinois border to Madison, and US 14, WIS 59/213 from Beloit to Madison, and US 51 from Beloit to Madison. The Corridor experiences significant regional traffic, high peeking on weekends (Friday afternoon and evening and Sunday afternoon), and weather disturbances during the winter months.

  Segments A and C fall entirely within the South Central Connection Corridor.

TOIP corridor maps are presented in Appendix A.

The combination of the six counties of the SW Region Freeway ITS Benefit/Cost Analysis is projected to grow at a pace exceeding that of Wisconsin as a whole over the next 25 years. According to projections by the Wisconsin Department of Administration, the combined total population of Columbia, Dane, Juneau, Monroe, Rock and Sauk Counties is expected to grow 33.6% from 2005-2035. The total Wisconsin growth rate for the same period of time is projected to be 19.0%. Dane County leads the projected 2005-2035 growth at 42.2%, followed by the combined population growth from Columbia, Monroe, and Sauk counties at

28.9%. Only Juneau and Rock Counties are projected to grow at a pace below the statewide average. Table 1.1 summarizes population projections for the analysis area and the State of Wisconsin.

Table 1.1 Population Projections for Columbia, Dane, Juneau, Monroe, Rock and Sauk Counties

	Population				Growth
County	**2005**	**2015**	**2025**	**2035**	**2005 to 2035**
Columbia	55,021	59,762	64,617	67,935	23.5%
Dane	459,834	523,818	592,917	653,876	42.2%
Juneau	26,719	28,449	30,066	30,806	15.3%
Monroe	43,189	47,507	51,743	54,682	26.6%
Rock	157,373	167,277	176,727	183,361	16.5%
Sauk	59,460	67,041	74,807	80,563	35.5%
Study Area Total	801,596	893,854	990,877	1,071,223	33.6%
Wisconsin	5,589,920	5,988,420	6,390,900	6,653,970	19.0%
Study Area as % of State	14.3%	14.9%	15.5%	16.1%	

Source: State of Wisconsin – Department of Administration

1.4 TOIP RECOMMENDATIONS

The TOIP recommends deployment density classes for the level of ITS element deployments that should be considered for a given segment of roadway. The deployment density classes, ranging from baseline to high, were identified based on a variety of operational performance measures including traffic volumes and patterns, safety and the impacts of weather and special events. The TOIP Spectrum of Deployment Density provides planners and designers with a range of ITS options for each deployment density class. The Spectrum of Deployment Density Charts as presented in the WisDOT TOIP is shown in Appendix B.

The TOIP also prioritized corridors by their need for ITS investment on three levels: Priority, Emerging Priority and Remaining. The Badger State Corridor is the first corridor on the priority list, followed by the Capitol Corridor. The South Central Connection Corridor is the fourth corridor on the priority list.

The Badger State Corridor has recommended ranges from medium to high deployment densities within the study area. The Capitol Corridor has a recommended low deployment density within the study area. The South Central Connection Corridor has recommended ranges from medium to high with the majority of the study area falling within the high deployment density. Further details on the recommendations of the TOIP can be found on the project's website: visit http://www.topslab.wisc.edu/workgroups/toip.html.

2.0 Description of Alternatives

In order to determine benefit/cost ratios for the deployment of varying levels of ITS intensity, alternatives were created. Several alternatives were created and analyzed to recommend an appropriate level of ITS intensity to meet long-term infrastructure goals. Currently, ITS is deployed in various intensities throughout the study area. In order to enable an accurate IDAS analysis, the study area was broken into segments.

Three ITS deployment intensity alternatives were developed for each of the six Southwest Region freeway segments. ITS deployments for one of the three alternatives were based on the recommendations of the TOIP. The other two alternatives were developed by either increasing or decreasing ITS deployment intensity levels.

Two additional alternatives were also identified. The segment of I-39/90 from the USH 12 Beltline interchange to the Illinois border (Segment A and a portion of Segment C) is being considered for an upgrade to six lanes. Considering an additional lane in each travel direction will relieve some congestion, ITS elements were tailored to the proposed configuration. For both the 4-lane and 6-lane scenarios, the high-level of ITS deployment intensity alternative was analyzed for both segments A and C. Thus, a total of 20 alternatives were analyzed. The basis of each alternative is presented in Table 2.1.

Table 2.1 Basis of Alternatives

SW Region Freeway Segment	Alternative	Description
A	Low ITS Deployment Intensity	Existing ITS elements
	Medium ITS Deployment Intensity	TOIP based intensity
	4-Lane High ITS Deployment Intensity	Increase of the TOIP based intensity including planned ITS elements with no timetable for deployment
	6-Lane High ITS Deployment Intensity	Modified 4-lane high ITS deployment intensity considering reduced congestion
B	Low ITS Deployment Intensity	Existing ITS elements
	Medium ITS Deployment Intensity	Intensity between existing ITS elements and TOIP based intensity
	High ITS Deployment Intensity	TOIP based intensity
C	Low ITS Deployment Intensity	Decrease of the TOIP based intensity including existing ITS elements
	Medium ITS Deployment Intensity	TOIP based intensity
	4-Lane High ITS Deployment Intensity	Increase of the TOIP based intensity
	6-Lane High ITS Deployment Intensity	Modified 4-lane high ITS deployment intensity considering reduced congestion
D	Low ITS Deployment Intensity	Decrease of the TOIP based intensity including existing ITS elements
	Medium ITS Deployment Intensity	TOIP based intensity
	High ITS Deployment Intensity	Increase of the TOIP based intensity
E	Low ITS Deployment Intensity	TOIP based intensity
	Medium ITS Deployment Intensity	Increase of the TOIP based intensity
	High ITS Deployment Intensity	Second increase of the TOIP based intensity
F	Low ITS Deployment Intensity	Decrease of the TOIP based intensity (fewer elements north of Wisconsin Dells)
	Medium ITS Deployment Intensity	TOIP based intensity
	High ITS Deployment Intensity	Increase of the TOIP based intensity (heavier concentration of elements from Wisconsin Dells and to the south)

Proposed ITS deployments were primarily based on the WisDOT TOIP recommendations. Locations of individual elements were recommended based on the TOIP Spectrum of Deployment Density. The TOIP however, does not include all ITS deployments considered in this analysis or propose exact element locations.

The table in Appendix C lists a detailed breakdown of elements and field approaches analyzed per ITS deployment. With this information, a series of figures were created to present the 20 alternatives. Each figure shows ITS deployments with locations of individual elements. Figure 2.1 shows a low level of ITS deployment intensity for Segment B[1], which happens to be the existing ITS deployment. Figure 2.2 shows a medium ITS deployment intensity while Figure 2.3 shows a high ITS deployment intensity for the same segment. A complete set of figures for the 20 alternatives is located in Appendix D, while the corresponding ITS element data is presented in Appendix E.

[1]Fish Hatchery Road south of the Beltline is of increasing average daily traffic. Fish Hatchery Road is not part of this report but will need to be addressed in the future for ITS deployments. A northbound DMS is proposed on Verona Rd in Segment B medium and high ITS deployment intensity maps. This site, prior to McKee Rd was proposed by WisDOT Southwest Region personnel due to the long range vision of Verona Road as a freeway and projected heavy traffic volumes on McKee Rd between Verona Rd (USH 151) and Fish Hatchery Rd. This DMS is not included in the ITS B/C analysis.

Figure 2.1 Segment B – Low ITS Deployment Intensity

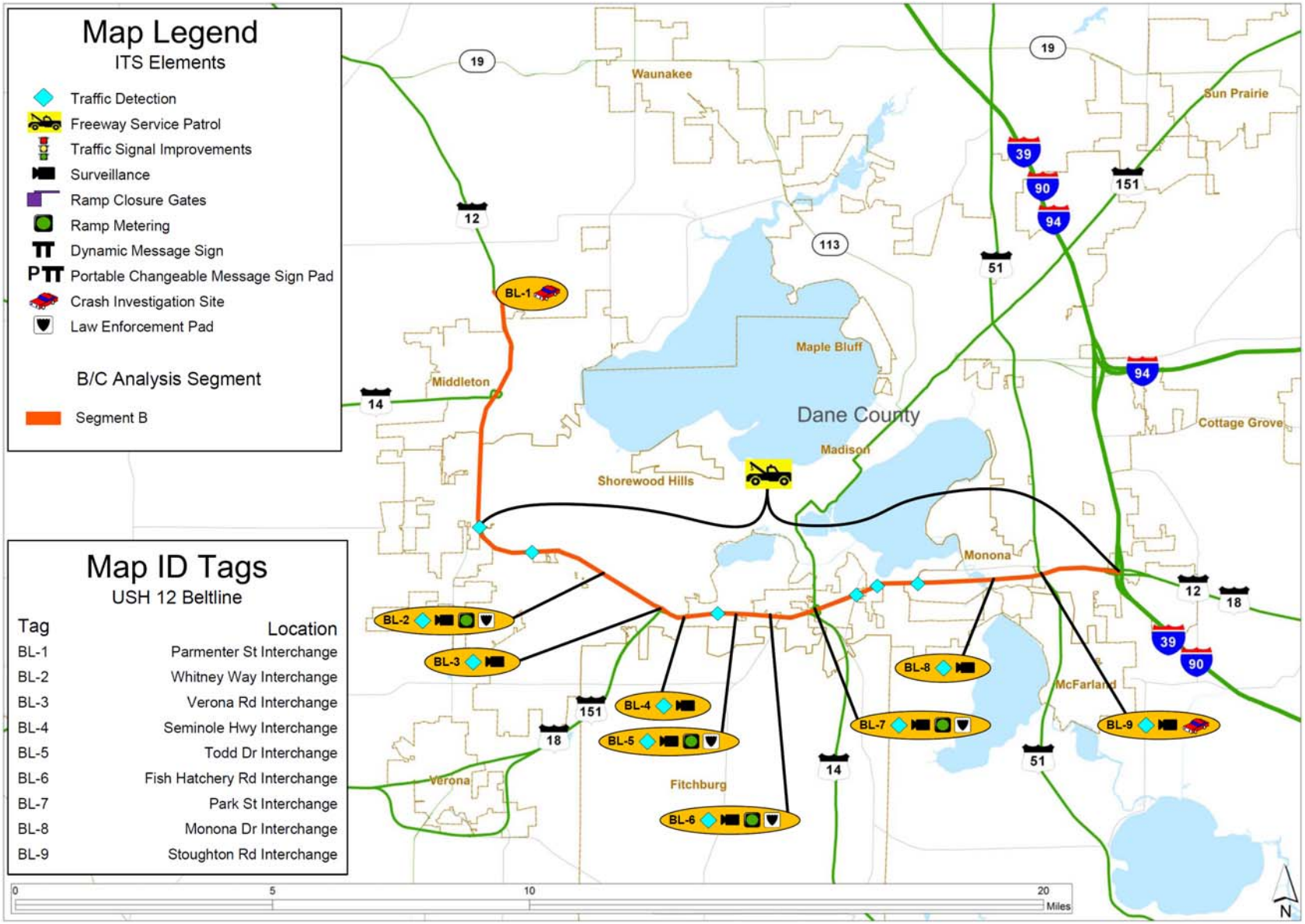


Figure 2.2 Segment B – Medium ITS Deployment Intensity

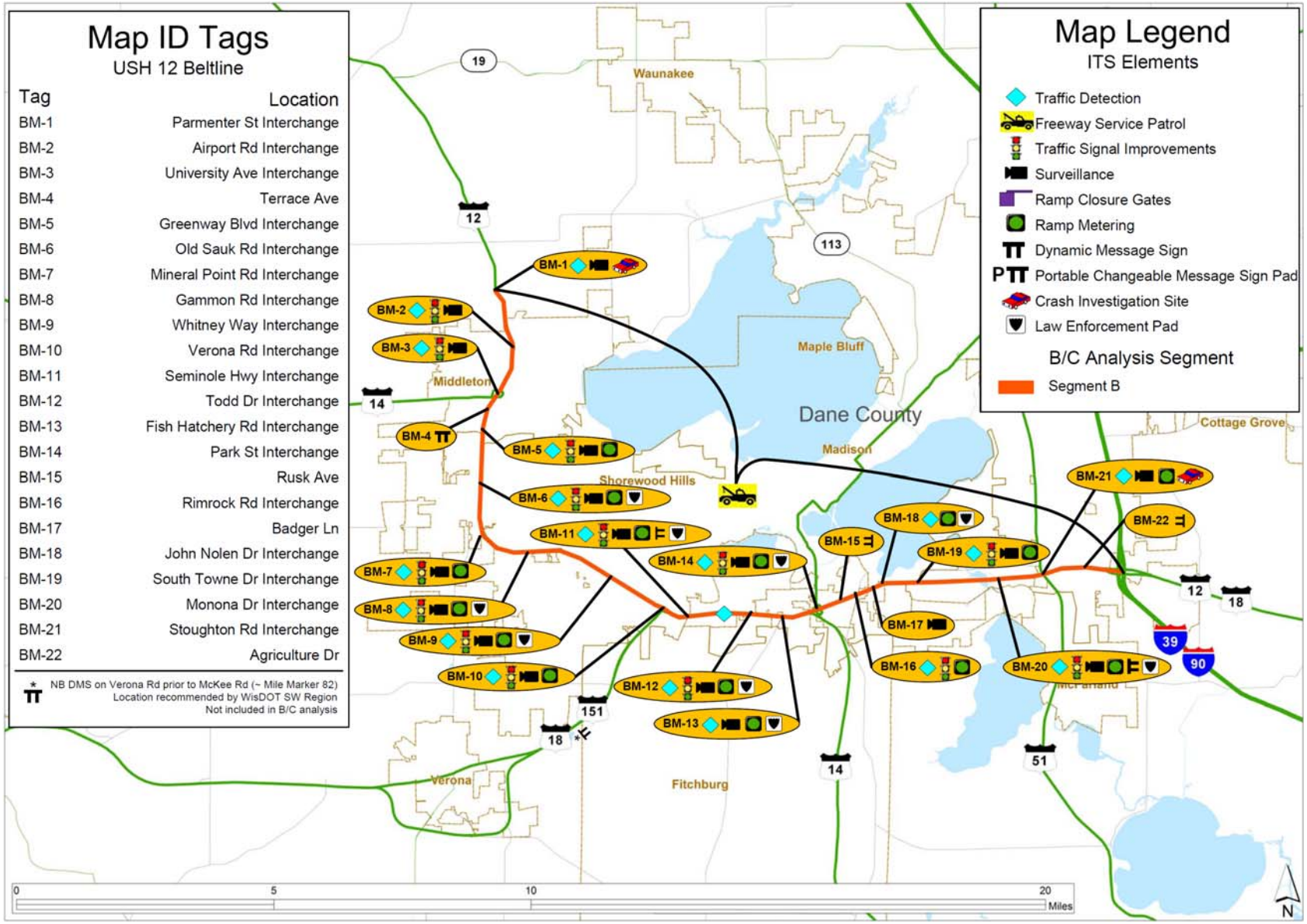
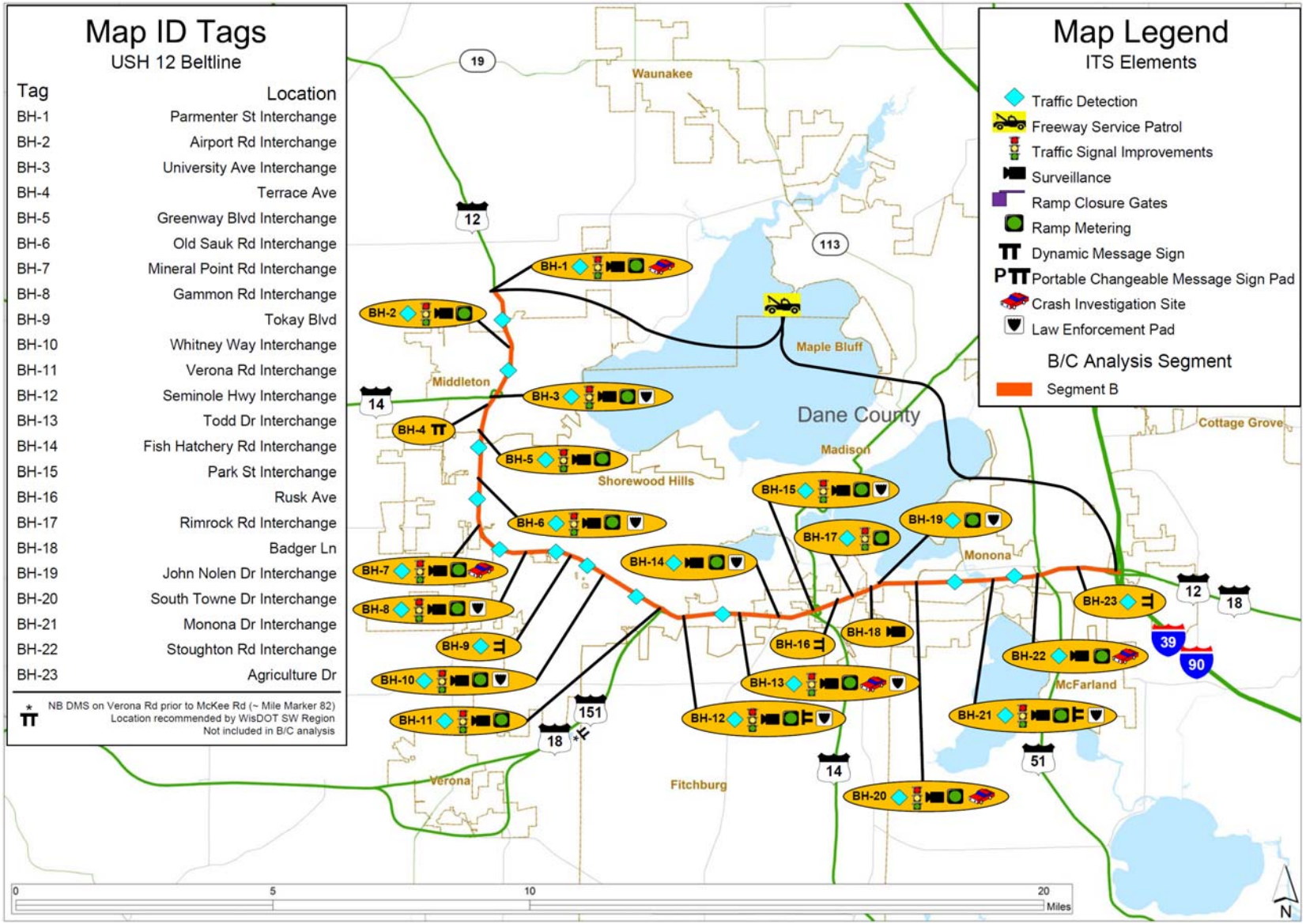


Figure 2.3 Segment B – High ITS Deployment Intensity (TOIP Based)



2.1 COST ASSUMPTIONS

Initial capital costs, annual operations and maintenance (O&M) costs and useful lives were assigned to each ITS element based on information from the IDAS database, project experience, the TOIP and the Research and Innovative Technology Administration of the USDOT. A summary of this information is presented in Table 2.2. Basic capital cost assumptions and quantities for each alternative are presented in Table 2.3.

Table 2.2 ITS Deployment Cost Assumptions

ITS Element	Unit Capital Cost (2007 Dollars)	Unit Annual Operations & Maintenance Cost (2007 Dollars)	Estimated Useful Life	Cost Assumption Source
Traffic Detection				
Mainline	$25,000	$800	10	Derived*
Diamond Interchange	$79,000	$2,500	10	Derived*
Cloverleaf or Nontraditional Interchange	$153,000	$4,900	10	Derived*
Freeway Service Patrol	$65,000	$101,400	5	IDAS
Traffic Signal Improvements	Varying costs	Varying costs	20	TOIP Appendix C – Signal System Operations Infrastructure Plan and Cost Estimates
CCTV Surveillance	$40,000	$2,300	10	TOIP Appendix A – Traffic Management and Surveillance Operations Infrastructure Plan and Cost Estimates, Derived
Ramp Closure Gates				
Vertical Drop Gate	$19,000	$1,900	10	WisDOT
Type III Barricades	$1,300	$130	10	Derived*
Ramp Metering				
Ramp Meter	$50,000	$5,000	5	Research and Innovative Technology Administration – USDOT, Derived*
Ramp Meter with HOV	$65,000	$6,500	5	Research and Innovative Technology Administration – USDOT, Derived*
Dynamic Message Sign	$197,000	$19,700	10	Derived*
Portable Changeable Message Sign + Pad	$32,000	$3,200	10	Derived*
Crash Investigation Sites (Alternative funding assumed)	$0	$0	20	N/A
Law Enforcement Pads (Alternative funding assumed)	$0	$0	20	N/A
Fiber Optic Communications (per mile)	$54,000	$1,100	20	Derived*

*Derived: Determined from ITS and Transportation Project Experience

Table 2.3 Basic Capital Cost Assumptions and Quantities

Device	Unit Cost	Unit	Quantities by Segment																			Estimated Life
			A L	**A** Med	**A** 4-L	**A** 6-L	**B** L	**B** Med	**B** H	**C** L	**C** Med	**C** 4-L	**C** 6-L	**D** L	**D** Med	**D** H	**E** L	**E** Med	**E** H	**F** L	F Med	F H	
Mainline Traffic Detection	$25,000	2 radar sensors	7	4	18	10	14	19	30	6	8	20	13	5	6	12	1	2	8	7	11	15	10
Diamond Interchange Traffic Detection	$79,000	4 radar sensors	0	3	3	3	0	0	0	0	1	1	1	0	0	0	1	1	1	4	4	4	10
Cloverleaf/Nontraditional interchange traffic detection	$153,000	8 radar sensors	0	3	3	3	0	0	0	0	1	1	1	0	2	2	0	0	0	1	1	2	10
CCTV Surveillance	$40,000	camera	7	10	12	12	8	17	17	3	7	10	10	3	7	10	2	3	4	12	16	23	10
Vertical Drop Ramp Closure Gates	$19,000	gate	0	16	16	16	0	0	0	0	6	6	6	0	9	9	4	4	4	0	21	21	10
Type III Barricades Ramp Closure Gates	$1,300	3 barricades plus storage	16	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	12	12	10
Ramp Metering	$50,000	on ramp (2 lane)	0	0	0	0	3	16	20	0	0	0	0	0	2	3	0	0	0	0	0	0	5
Ramp Metering with HOV	$65,000	on ramp (2 lane plus HOV)	0	0	0	0	3	15	17	0	0	0	0	0	2	2	0	0	0	0	0	0	5
DMS	$197,000	sign	0	0	0	0	0	5	6	0	1	3	3	0	3	3	1	1	2	0	0	0	10
Portable CMS plus Pad	$32,000	sign and pad	0	3	4	4	0	0	0	0	3	1	1	0	0	0	1	2	2	2	4	5	10
Fiber Optic Cable	$54,000	mile	0	25.3	25.3	25.3	0	17.7	17.7	0	20.0	20.0	20.0	0	0	0	0	0	0	0	0	0	20
Crash Investigation Site and or Law Enforcement Pad	Alternative funding source assumed		3	3	6	6	6	14	18	1	1	3	7	1	3	5	0	0	1	4	4	5	20
Median Crossover Law Enforcement Pad	Alternative funding source assumed		18	18	18	22	2	2	2	16	16	16	16	3	3	3	6	6	6	56	56	56	20
Traffic signal Improvements	Varying costs		See Appendix E for a detailed list of recommendations																			20
Freeway Service Patrol	$65,000		See Appendix E for a detailed list of recommendations																			5

2.2 BENEFIT ASSUMPTIONS

In calculating benefits, there are several key inputs to the IDAS modeling: IDAS utilizes regional travel demand models as the basis of the benefit/cost analysis. A description of IDAS is found in Appendix I. In this study, three regional models were utilized: the Rock County Travel Demand Model, Dane County Travel Demand Model and the Statewide Planning Model. The Rock County travel demand model was used to evaluate segment A while the Dane County travel demand model was used to evaluate segments B, C, D and E in the greater Madison area. The WisDOT statewide model was used to evaluate proposed ITS deployments in segment F, which extended northwest from the Madison area along the I-90/I-94 corridor through Columbia, Sauk, Juneau and Monroe Counties. These counties were not covered by a regional model since they are not part of a Metropolitan Planning Organization (MPO).

The travel demand models were imported into IDAS and utilized individually to conduct the analysis. As the models were imported, volumes at the boundary points were examined to make sure that model volumes were reasonably consistent. In general, the boundary volumes were close and significant adjustments to the models were not required. It should also be noted that the spreadsheet technique used with the statewide model does not incorporate analysis or air quality benefits. While these benefits are generally a very small proportion of the total, the benefits for Segment F are slightly underestimated.

Both costs and benefits were calculated for a base year of 2005 and a future year of 2035. An annual adjustment rate of 5 percent was used and the costs and benefits were presented in 2007 dollars.

IDAS requires benefit parameters to estimate the impacts of various deployments. While IDAS includes default parameters based on national studies it also can accommodate information from other sources. In this project, several sources were used including national defaults, the results of customer surveys conducted in Michigan and Ohio, and the results of research conducted for this project and a similar project conducted on the USH 41 corridor in WisDOT's Northeast Region. The parameters used are shown in Table 2.4 below.

Table 2.4 Comparison of Impact Parameters Used for IDAS Analysis

Deployment	Benefit	Parameter
Freeway Management System (DMS, CCTV, Detection)[b]	% of drivers who divert.	25%
	% of time useful information is provided.	5%
	Estimated time saved.	5 minutes
Additional Benefits from Detection and Surveillance Deployment	Incident duration reduction.	1%
	Fuel consumption reduction.	1%
	Fatality reduction.	1%
	Emissions reduction.	1%
Freeway Service Patrols[a]	Reduction in incident duration.	5%
	Reduction in fuel consumption.	1%
	Reduction in fatality rate.	1%
Traffic Signal Improvements[d]	Increase in corridor capacity	11%
Ramp Closure Gates[e]	Crash reduction – Fatality.	80%
	Crash reduction – Injury.	80%
	Crash reduction – PDO.	80%
	Reduced operating costs through reduction in police presence.	$50/hour
	PCT of time gate closed (28 hours/year).	0. 30%
Ramp Metering	Increase in capacity on metered Beltline links	5%
	Increase in capacity on other metered freeway links	13.5%
	Reduction in capacity on metered ramps	-27%
	Reduction in crashes on metered links	13.5%
Crash Investigation Sites[c]	Reduction in incident duration.	5%
	Reduction in fuel consumption.	1%
	Reduction in fatality rate.	1%
Law Enforcement Pads[e]	Crash reduction – Fatality.	17%
	Crash reduction – Injury.	7%
	Crash reduction – PDO.	5%
	Travel time reduction.	-5%
	% of time pad occupied.	2%

[a] IDAS defaults modified based on initial runs.
[b] Based on Ohio and Michigan customer survey data.
[c] Used same parameters as Freeway Service Patrols – no research found.
[d] IDAS default modified based on results of other IDAS projects.
[e] *Desktop Reference for crash Reduction Factors* Report No. FHWA-SA-07-015, Federal Highway Administration, U.S. DOT, September, 2007, p.89.

Once benefit parameters were calculated, they were monetized in order to permit direct comparison of the various benefit categories. Although IDAS contains default economic parameters, WisDOT provided a set of economic parameters in a recently issued draft of the WisDOT *Traffic Guidelines Manual, 16-20-70, Financial Assumptions for Engineering Economic Analysis*, January 2008. WisDOT also provided a second resource: *Transportation Engineering Economic Analysis Manual, Chapter 3 Valuation of Costs and Benefits, Topic 1 Financial Assumptions and Parameters, Draft #1E* September 19, 2008. These parameters were incorporated into the analysis and are shown in Table 2.5. All dollar values used in the analysis are in 2007 dollars, in order to facilitate comparison of alternatives across different years.

Table 2.5 Economic Parameters

General Parameters	Value
Number of travel days in a year	286
Year of dollar values	2007
Discount rate	5%
Average vehicle occupancy	1.25
Value of Time (Dollars per Hour)	
Value of in-vehicle time	$9.14
Value of in-vehicle time (commercial)	$20.44
Value of out-vehicle time (commercial)	$20.44
Value of out-vehicle time	$9.14
Value of reduced delay time	$9.14
Fuel costs (gallon)	$2.79
Emission Cost (Dollars per Ton)	
HC/ROG	$2,529.30
NOX	$5,319.51
CO	$5,544.78
PM_{10}	$15,777.47
CO_2	$5.08
SO_2	$5.08
GW	$0.00
Accident Cost (Dollars per Accident)	
Fatality	$4,092,800
Injury	$48,576
Property damage	$2,251
Operating Costs	
Fuel costs (gallon)	$2.79
Nonfuel operating costs (dollars per mile)	$0.09
Noise damage Costs (dollars per mile)	$0.009

3.0 Results of Analysis

This section includes maps and descriptions of the alternatives evaluated along with the results of the IDAS analysis. The financial results of the benefit/cost analysis are presented in both graphic and tabular format. Monetized benefits and costs are presented on an annual basis. The benefit/cost analysis was developed by monetizing different types of benefits including travel time savings in vehicle-hours of travel, reduction in accidents, fuel cost savings and various types of emissions. These benefit measures are presented in tabular format and are expressed as daily totals. Performance Impacts are presented in Appendix F and Traffic Volumes are presented in Appendix G.

3.1 SEGMENT A

The benefit/cost results for Segment A deployments are shown graphically in Figure 3.1 and in tabular format in Tables 3.1 and 3.2. Net benefits and benefit/cost ratios are large in the base year analysis and increase significantly in the 2035 analysis period. The low deployment scenario produces net benefits of roughly $1.8 million annually in the base year, increasing to around $5 million annually under the medium and four-lane high scenarios.

The potential future expansion of I-39/I-90 to six lanes provides significant congestion relief in the base year scenario. As a result, the ITS high scenario, with 6-lanes only produces about $2.5 million in annual net benefits, indicating there is less ITS investment needed if the highway is widened. With substantial increases in traffic projected along this segment, the net benefits increase significantly to 2035. Under the low scenario, net benefits increase to almost $5 million annually while under the medium deployment net benefits roughly double to over $11 million. While the net benefits for the medium and high scenarios are similar in 2005; by 2035 the extra investment made in the high scenario results in increased benefits. Annual net benefits are roughly $19 million for the high four-lane scenario in 2035 and nearly $16 million for the 6-lane scenario. This indicates that the six-lane highway attracts more traffic and begins to experience congestion by 2035, with the high investment in ITS providing significant relief.

Both capital and O&M costs are substantially greater for the medium scenario over the low scenario with a much smaller increase to implement the high scenario. However, it appears that the additional deployments required to go from medium to high can be programmed in the future. Benefit/cost ratios are highly positive for all options for Segment A. Under all scenarios, travel time benefits constitute a large majority of all benefits.

Figure 3.1 Segment A - IDAS Results

Segment A - IDAS Results

WI/IL State Line - Rock/Dane County Line

Description

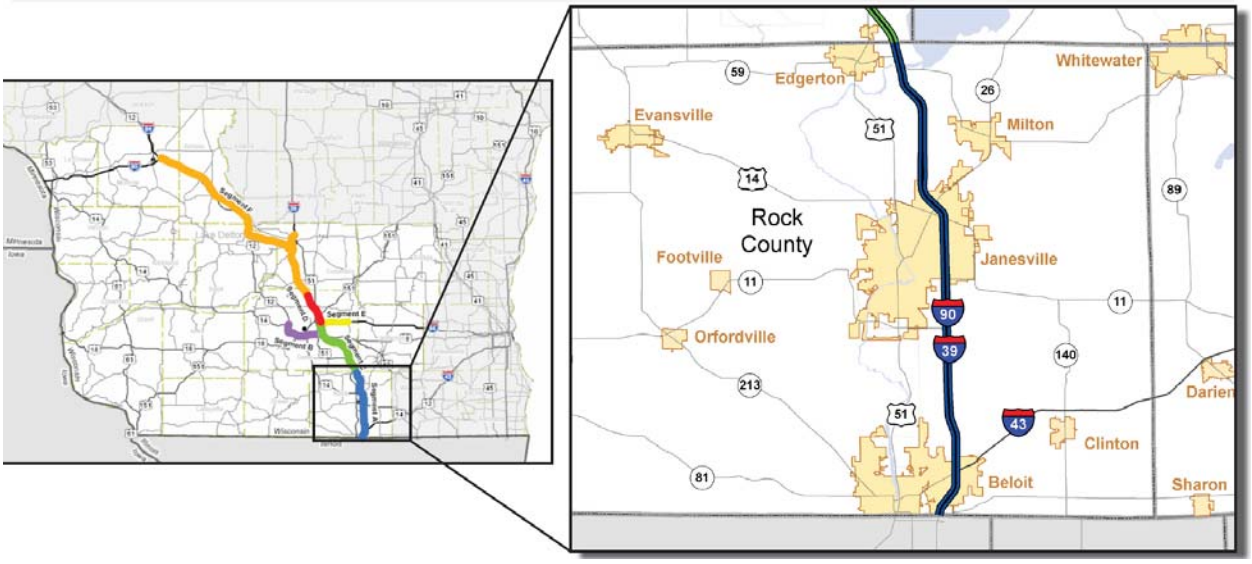
Segment A consists of the I-39/I-90 corridor through Rock County from the Illinois border to the Dane County line. This corridor experiences significant regional traffic, high peaking on weekends (Friday afternoon and evening and Sunday afternoon) and significant weather disturbances during the winter months. ITS deployment options (ranging from Low to High) are briefly described below. The benefit/cost ratios for each option (for the base year 2005 and forecast year 2035) are found below, showing how much value will be returned for each dollar spent.

Low — Includes CCTV and detection at major interchanges as well as ramp closure gates, crash investigation sites, and law enforcement pads

Medium — Adds additional CCTV and detection as well as portable CMS, freeway service patrol, signal improvements, ramp closure gates, and fiber optic communications

High (4L) — Assumes 4 lanes of traffic, increases level of detection density over Medium alternative as well as adds crash investigation sites

High (6L) — Assumes 6 lanes of traffic, similar to High (4L), slightly reduced detection levels and slight increase of law enforcement pads



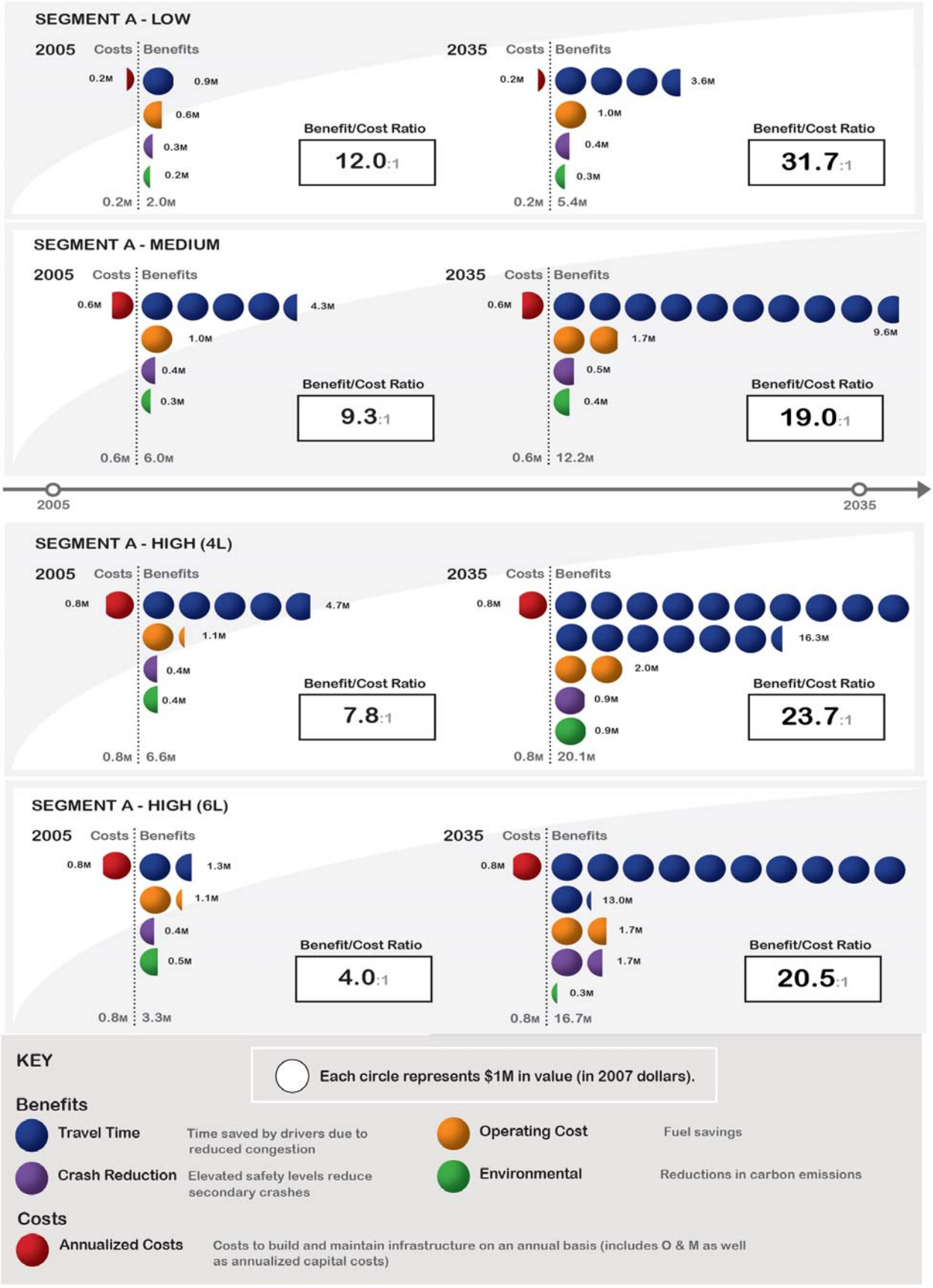

SEGMENT A - LOW
2005
Costs
Benefits
0.2M
0.9M
0.6M
0.3M
0.2M
0.2M
2.0M
Benefit/Cost Ratio
12.0:1
2035
Costs
Benefits
0.2M
3.6M
1.0M
0.4M
0.3M
0.2M
5.4M
Benefit/Cost Ratio
31.7:1
SEGMENT A - MEDIUM
2005
Costs
Benefits
0.6M
4.3M
1.0M
0.4M
0.3M
0.6M
6.0M
Benefit/Cost Ratio
9.3:1
2035
Costs
Benefits
0.6M
9.6M
1.7M
0.5M
0.4M
0.6M
12.2M
Benefit/Cost Ratio
19.0:1
2005
2035
SEGMENT A - HIGH (4L)
2005
Costs
Benefits
0.8M
4.7M
1.1M
0.4M
0.4M
0.8M
6.6M
Benefit/Cost Ratio
7.8:1
2035
Costs
Benefits
0.8M
16.3M
2.0M
0.9M
0.9M
0.8M
20.1M
Benefit/Cost Ratio
23.7:1
SEGMENT A - HIGH (6L)
2005
Costs
Benefits
0.8M
1.3M
1.1M
0.4M
0.5M
0.8M
3.3M
Benefit/Cost Ratio
4.0:1
2035
Costs
Benefits
0.8M
13.0M
1.7M
1.7M
0.3M
0.8M
16.7M
Benefit/Cost Ratio
20.5:1
KEY
Each circle represents $1M in value (in 2007 dollars).
Benefits
Travel Time
Time saved by drivers due to reduced congestion
Operating Cost
Fuel savings
Crash Reduction
Elevated safety levels reduce secondary crashes
Environmental
Reductions in carbon emissions
Costs
Annualized Costs
Costs to build and maintain infrastructure on an annual basis (includes O & M as well as annualized capital costs)

Table 3.1 Segment A 2005 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment A Low	$923,000	$255,000	$625,000	$239,000	$2,042,000	$170,000	$32,718	$482,136	$1,872,000	12.0
Segment A Medium	$4,336,000	$351,000	$1,036,000	$262,000	$5,985,000	$641,000	$228,903	$3,292,427	$5,344,000	9.3
Segment A High (4L)	$4,723,000	$363,000	$1,067,000	$436,000	$6,589,000	$846,000	$279,388	$4,380,777	$5,743,000	7.8
Segment A High (6L)	$1,298,000	$426,000	$1,090,000	$453,000	$3,267,000	$813,000	$273,175	$4,186,602	$2,454,000	4.0

All values are dollars per year except Initial Capital Cost

Table 3.2 Segment A 2035 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment A Low	$3,610,000	$425,000	$1,008,000	$346,000	$5,389,000	$170,000	$32,718	$482,136	$5,219,000	31.7
Segment A Medium	$9,548,000	$494,000	$1,738,000	$417,000	$12,197,000	$641,000	$228,903	$3,292,427	$11,556,000	19.0
Segment A High (4L)	$16,322,000	$855,000	$2,001,000	$909,000	$20,087,000	$846,000	$279,388	$4,380,777	$19,241,000	23.7
Segment A High (6L)	$13,022,000	$1,653,000	$1,705,000	$274,000	$16,654,000	$813,000	$273,175	$4,186,602	$15,841,000	20.5

All values are dollars per year except Initial Capital Cost

3.2 SEGMENT B

The benefit/cost results for Segment B deployments are shown graphically in Figure 3.2 and in tabular format in Tables 3.3 and 3.4. Net benefits and benefit/cost ratios are large in the base year analysis and roughly double under all three scenarios to 2035. The low deployment scenario produces net benefits of roughly $4 million annually in the base year, increasing to around $16 million annually for both the medium and high scenarios.

By 2035, the net benefits under the low scenario increase to roughly $10 million annually while net benefits under both the medium and high scenarios increase to the range of $31 to $34 million annually. Benefit/cost ratios for all three scenarios are similar, with the high scenario slightly lower than the others in both 2005 and 2035. In all cases, the benefit/cost ratio is very high, exceeding 10 in 2005 and in the range of 22-30 in 2035.

Capital costs jump significantly from $1 million for the low scenario to $5 million for the medium scenario and $6 million for the high. While the increase from low to medium results in a substantial increase in net benefits, the additional money spent for the high scenario does not yield significant additional benefits either in the present or in the future.

The majority of benefits in 2005 are in travel time savings, and the percentage increases significantly by 2035. There are also significant benefits in accident reduction and operating cost and air quality benefits increase substantially from 2005 to 2035.

Figure 3.2 Segment B - IDAS Results

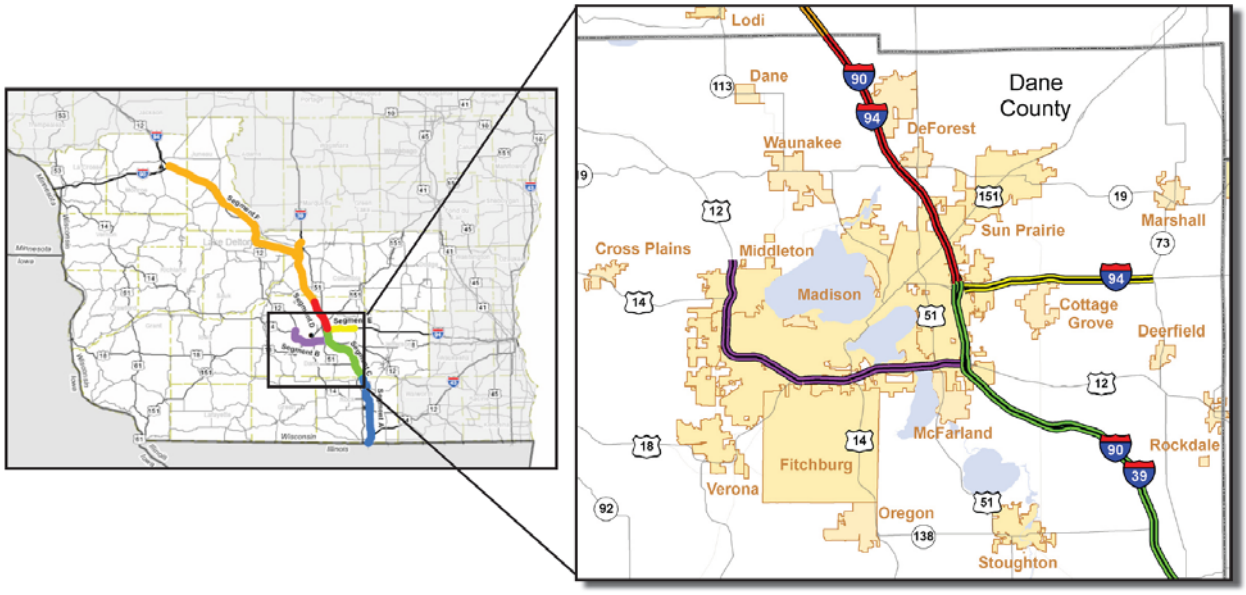
Segment B - IDAS Results

I-39/90 - Parmenter Street Interchange

Description

Segment B consists of the U.S. 12 and U.S. 12/18 corridor through the Madison region, commonly known as the Beltline. The Segment begins at I-39/90 and ends at the Parmenter Street Interchange. ITS deployment options (ranging from Low to High) are briefly described below. The benefit/cost ratios for each option (for the base year 2005 and forecast year 2035) are found below, showing how much value will be returned for each dollar spent.

Low	Includes CCTV, detection, ramp metering, freeway service patrol, crash investigation sites, and law enforcement pads
Medium	Adds additional CCTV, detection, and ramp metering as well as DMS, signal improvements, law enforcement pads and fiber optics communications
High	Adds detection, ramp metering, DMS, signal improvements, crash investigation sites and law enforcement pads



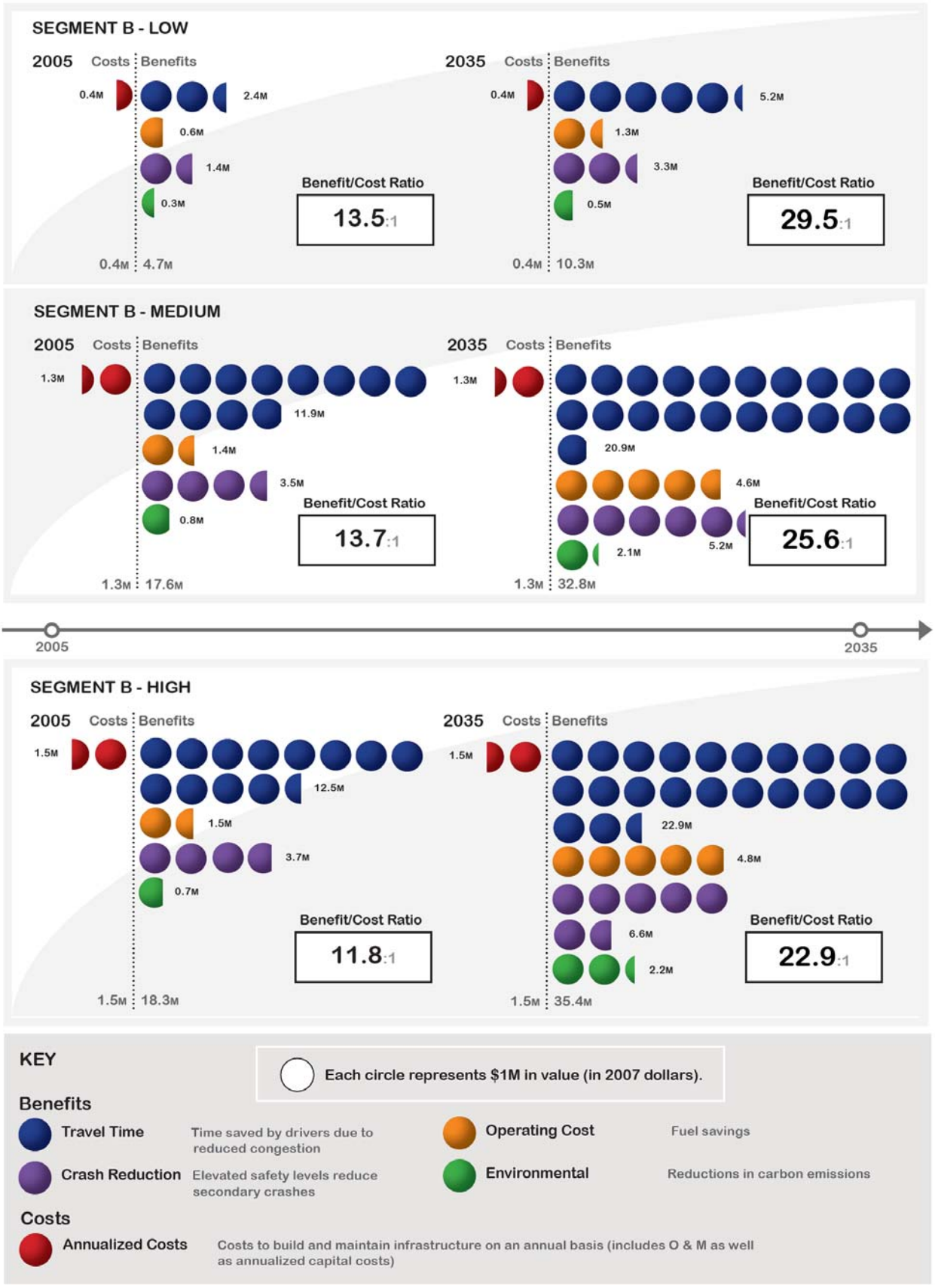

SEGMENT B - LOW
2005
Costs
Benefits
0.4M
2.4M
0.6M
1.4M
0.3M
0.4M
4.7M
Benefit/Cost Ratio
13.5:1
2035
Costs
Benefits
0.4M
5.2M
1.3M
3.3M
0.5M
0.4M
10.3M
Benefit/Cost Ratio
29.5:1
SEGMENT B - MEDIUM
2005
Costs
Benefits
1.3M
11.9M
1.4M
3.5M
0.8M
1.3M
17.6M
Benefit/Cost Ratio
13.7:1
2035
Costs
Benefits
1.3M
20.9M
4.6M
5.2M
2.1M
1.3M
32.8M
Benefit/Cost Ratio
25.6:1
2005
2035
SEGMENT B - HIGH
2005
Costs
Benefits
1.5M
12.5M
1.5M
3.7M
0.7M
1.5M
18.3M
Benefit/Cost Ratio
11.8:1
2035
Costs
Benefits
1.5M
22.9M
4.8M
6.6M
2.2M
1.5M
35.4M
Benefit/Cost Ratio
22.9:1
KEY
Each circle represents $1M in value (in 2007 dollars).
Benefits
Travel Time
Time saved by drivers due to reduced congestion
Crash Reduction
Elevated safety levels reduce secondary crashes
Operating Cost
Fuel savings
Environmental
Reductions in carbon emissions
Costs
Annualized Costs
Costs to build and maintain infrastructure on an annual basis (includes O & M as well as annualized capital costs)

Table 3.3 Segment B 2005 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment B Low	$2,383,000	$1,388,000	$649,000	$307,000	$4,727,000	$351,000	$160,680	$1,048,544	$4,376,000	13.5
Segment B Medium	$11,903,000	$3,479,000	$1,428,000	$759,000	$17,569,000	$1,281,000	$444,631	$4,908,544	$16,288,000	13.7
Segment B High	$12,456,000	$3,658,000	$1,473,000	$731,000	$18,318,000	$1,546,000	$520,456	$6,008,544	$16,772,000	11.8

All values are dollars per year except Initial Capital Cost

Table 3.4 Segment B 2035 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment B Low	$5,213,000	$3,333,000	$1,324,000	$470,000	$10,340,000	$351,000	$160,680	$1,048,544	$9,989,000	29.5
Segment B Medium	$20,862,000	$5,235,000	$4,564,000	$2,082,000	$32,743,000	$1,281,000	$444,631	$4,908,544	$31,462,000	25.6
Segment B High	$22,896,000	$5,599,000	$4,751,000	$2,157,000	$35,403,000	$1,546,000	$520,456	$6,008,544	$23,857,000	22.9

All values are dollars per year except Initial Capital Cost

3.3 SEGMENT C

The benefit/cost results for Segment C deployments are shown graphically in Figure 3.3 and in tabular format in Tables 3.5 and 3.6. Like segment A, there are two "high" scenarios, one with the current four-lane alignment of I-39/I-90 and one with an expansion to six lanes. Parts of I-94 and US-12 are also included in this segment. Benefit/cost ratios for all of the scenarios are positive and similar for 2005, ranging from 4 to 9. Net benefits are only about $200,000 annually for limited low scenario but range from $2.8 million to $3 million annually for the medium scenario and the two high scenarios. In Segment A in Rock County, the 2005 net benefits for the 4-lane ITS high scenario were significantly greater than those for the 6-lane section. In Segment C in Dane County, the net benefits are very similar whether the highway is four lanes or six lanes. Under the four lane scenario, the ITS system provides greater travel time relief, while under the six-lane scenario accident reduction is greater.

By 2035, the larger investments in the medium and high scenarios begin to yield greater net benefits. Under the low scenario, annual net benefits increase to around $600,000 while the medium and high scenarios experience much greater increases in both actual and percentage terms. The four-lane high scenario has the highest level of net benefits in 2035 at nearly $16 million annually, reflecting the high congestion levels that are projected without additional capacity. The net benefits for the medium scenario increase to nearly $13.7 million annually while the high 6-lane scenario has over $11.8 million in annual net benefits. Benefit/cost ratio increases to 9 for the low scenario, with all other scenarios over 25.

Capital costs for the low scenario are only around $270,000 but range from $2 million to $3 million for the medium and high scenarios. With a 6-lane I-39/I-90, the additional investment in the high scenario would yield minimal additional benefits. If the highway is not expanded, however, the additional investment in the high scenario would yield greater benefits, particularly in future years.

Travel time savings constitute the majority of benefits in both 2005 and 2035 but the percentage of the total increases dramatically between the two years. The six-lane high scenario does show relatively low percentage of travel time benefits in the base year with the greatest amount of benefit coming from accident reduction. By 2035 the percentage of travel time benefits for the six-lane alternative increases to that of the other scenarios. However, travel time savings continue to be greater for the medium and high four-lane scenarios.

Figure 3.3 Segment C - IDAS Results

Segment C - IDAS Results

Rock/Dane County Line - Interstate 94

Description

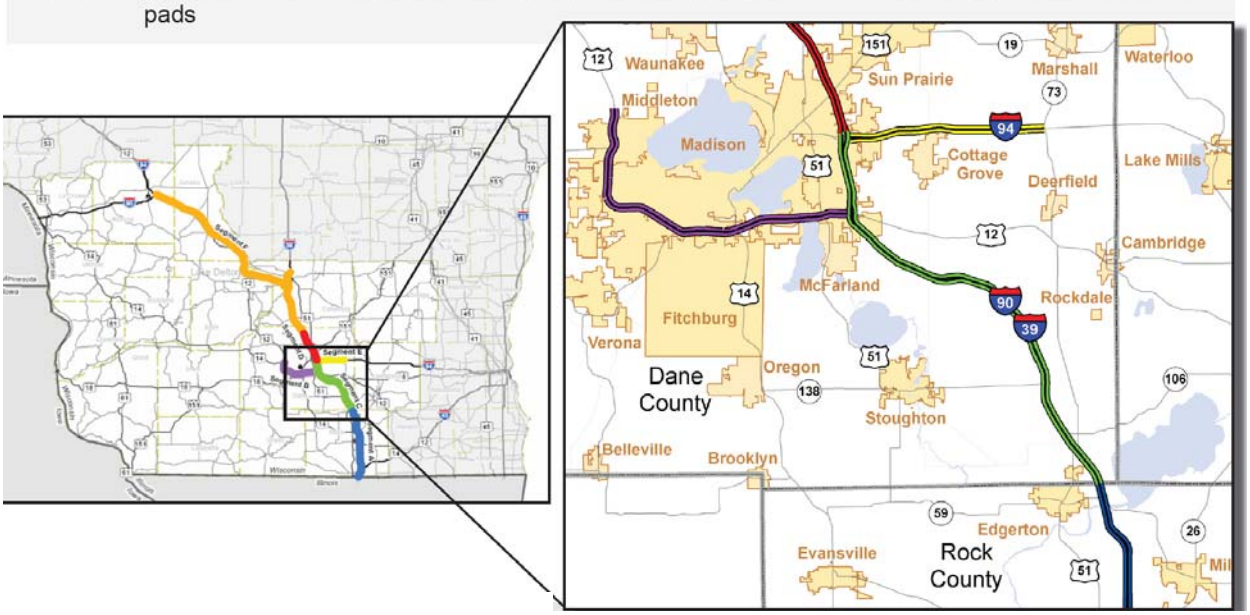
Segment C consists of the I-39/I-90 corridor through most of Dane County from the Rock County line to I-94. This corridor experiences significant regional traffic, high peaking on weekends (Friday afternoon and evening and Sunday afternoon) and significant weather disturbances during the winter months. ITS deployment options (ranging from Low to High) are briefly described below. The benefit/cost ratios for each option (for the base year 2005 and forecast year 2035) are found below, showing how much value will be returned for each dollar spent.

Low — Includes CCTV and detection as well as ramp closure gates, crash investigation sites, and law enforcement pads

Medium — Adds additional CCTV and detection as well as DMS, portable CMS, freeway service patrol, signal improvements, and fiber optic communications

High (4L) — Assumes 4 lanes of traffic, increases level of detection density over Medium alternative as well as adds DMS and crash investigation sites with a decrease in portable CMS

High (6L) — Assumes 6 lanes of traffic, decrease in detection from High (4L) alternative, adds law enforcement pads



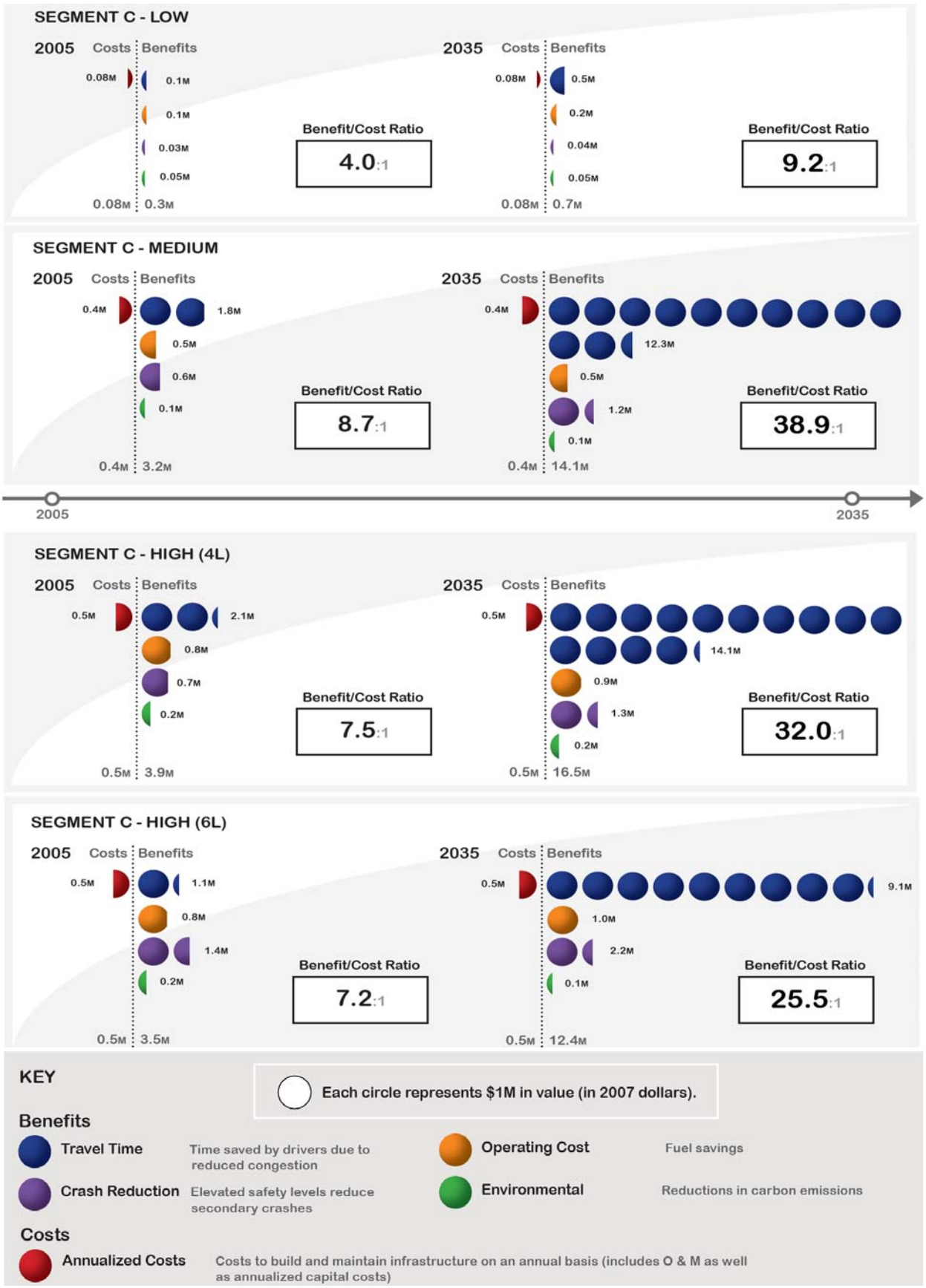

SEGMENT C - LOW
2005
Costs
Benefits
0.08M
0.1M
0.1M
0.03M
0.05M
0.08M
0.3M
Benefit/Cost Ratio
4.0:1
2035
Costs
Benefits
0.08M
0.5M
0.2M
0.04M
0.05M
0.08M
0.7M
Benefit/Cost Ratio
9.2:1
SEGMENT C - MEDIUM
2005
Costs
Benefits
0.4M
1.8M
0.5M
0.6M
0.1M
0.4M
3.2M
Benefit/Cost Ratio
8.7:1
2035
Costs
Benefits
0.4M
12.3M
0.5M
1.2M
0.1M
0.4M
14.1M
Benefit/Cost Ratio
38.9:1
2005
2035
SEGMENT C - HIGH (4L)
2005
Costs
Benefits
0.5M
2.1M
0.8M
0.7M
0.2M
0.5M
3.9M
Benefit/Cost Ratio
7.5:1
2035
Costs
Benefits
0.5M
14.1M
0.9M
1.3M
0.2M
0.5M
16.5M
Benefit/Cost Ratio
32.0:1
SEGMENT C - HIGH (6L)
2005
Costs
Benefits
0.5M
1.1M
0.8M
1.4M
0.2M
0.5M
3.5M
Benefit/Cost Ratio
7.2:1
2035
Costs
Benefits
0.5M
9.1M
1.0M
2.2M
0.1M
0.5M
12.4M
Benefit/Cost Ratio
25.5:1
KEY
Each circle represents $1M in value (in 2007 dollars).
Benefits
Travel Time
Time saved by drivers due to reduced congestion
Operating Cost
Fuel savings
Crash Reduction
Elevated safety levels reduce secondary crashes
Environmental
Reductions in carbon emissions
Costs
Annualized Costs
Costs to build and maintain infrastructure on an annual basis (includes O & M as well as annualized capital costs)

Table 3.5 Segment C 2005 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment C Low	$112,000	$29,000	$121,000	$48,000	$310,000	$77,000	$11,359	$277,282	$233,000	4.0
Segment C Medium	$1,881,000	$635,000	$528,000	$122,000	$3,166,000	$363,000	$95,146	$2,231,068	$2,803,000	8.7
Segment C High (4L)	$2,126,000	$702,000	$831,000	$217,000	$3,876,000	$515,000	$143,204	$2,959,223	$3,361,000	7.5
Segment C High (6L)	$1,115,000	$1,446,000	$777,000	$173,000	$3,511,000	$485,000	$137,767	$2,789,320	$3,026,000	7.2

All values are dollars per year except Initial Capital Cost

Table 3.6 Segment C 2035 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment C Low	$467,000	$40,000	$152,000	$51,000	$710,000	$77,000	$11,359	$277,282	$633,000	9.2
Segment C Medium	$12,298,000	$1,205,000	$518,000	$108,000	$14,129,000	$363,000	$95,146	$2,231,068	$13,766,000	38.9
Segment C High (4L)	$14,075,000	$1,302,000	$882,000	$200,000	$16,459,000	$515,000	$143,204	$2,959,223	$15,944,000	32.0
Segment C High (6L)	$9,052,000	$2,233,000	$985,000	$93,000	$12,363,000	$485,000	$137,767	$2,789,320	$11,878,000	25.5

All values are dollars per year except Initial Capital Cost

3.4 SEGMENT D

The benefit/cost results for Segment D deployments are shown graphically in Figure 3.4 and in tabular format in Tables 3.7 and 3.8. This segment includes the section of I-90/I-94 running north and northwest of Madison. In the 2005 base year, the return on investment in ITS is proportionally similar for all three scenarios. Annual net benefits are approximately $290,000 for the low scenario, $3.2 million for the medium scenario and $3.4 million for the high scenario. Benefit/cost ratios for all three are very close, ranging between 7 and 7.5.

By 2035 the larger investments in the medium and high scenarios begin to yield greater net benefits and higher benefit/cost ratios. Under the low scenario, net benefits increase to $870,000 annually while under the medium and high scenarios, the increase is much greater in percentage terms to $18 million and $19 million respectively. The benefit/cost ratio for the low scenario increases to 20.5, but exceeds 35 for both the medium and high scenarios. Capital costs for the high scenario, however, are about $300,000 greater than for the medium scenario ($1.76 million vs. $2.07 million) so that the marginal benefit for the high scenario is limited.

Unlike most of the other segments evaluated, the greatest value of benefits in 2005 comes from accident reduction, rather than travel time savings. Base year travel time savings are quite low compared to other segments. By 2035, however, travel time savings increase dramatically, indicating a much higher level of congestion in the system. While other benefits increase over the 30-year period, travel time savings constitute the vast majority of benefits by 2035. In the medium scenario for example, the percentage of total benefit value from travel time savings increases from 27% in 2005 to over 70% in 2035. Similar changes are found in the other scenarios.

Figure 3.4 Segment D - IDAS Results

Segment D - IDAS Results

I-39/90/94 Interchange - Columbia County Line

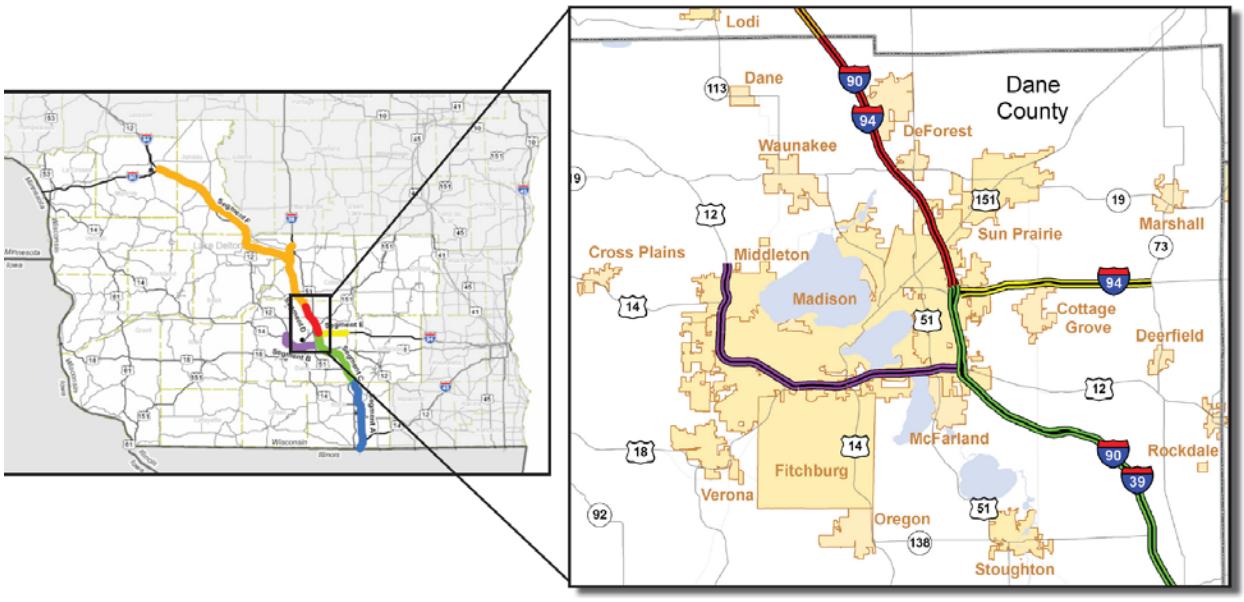
Description

Segment D consists of I-39/90/94 from the point the Interstates join up to the Dane/Columbia County line. ITS deployment options (ranging from Low to High) are briefly described below. The benefit/cost ratios for each option (for the base year 2005 and forecast year 2035) are found below, showing how much value will be returned for each dollar spent.

Low — Includes limited CCTV and detection, crash investigation sites, and law enforcement pads

Medium — Adds additional CCTV and detection, as well as freeway service patrol, ramp metering, ramp closure gates, DMS, and law enforcement pads

High — Adds additional CCTV and detection, ramp metering, crash investigation sites, and law enforcement pads



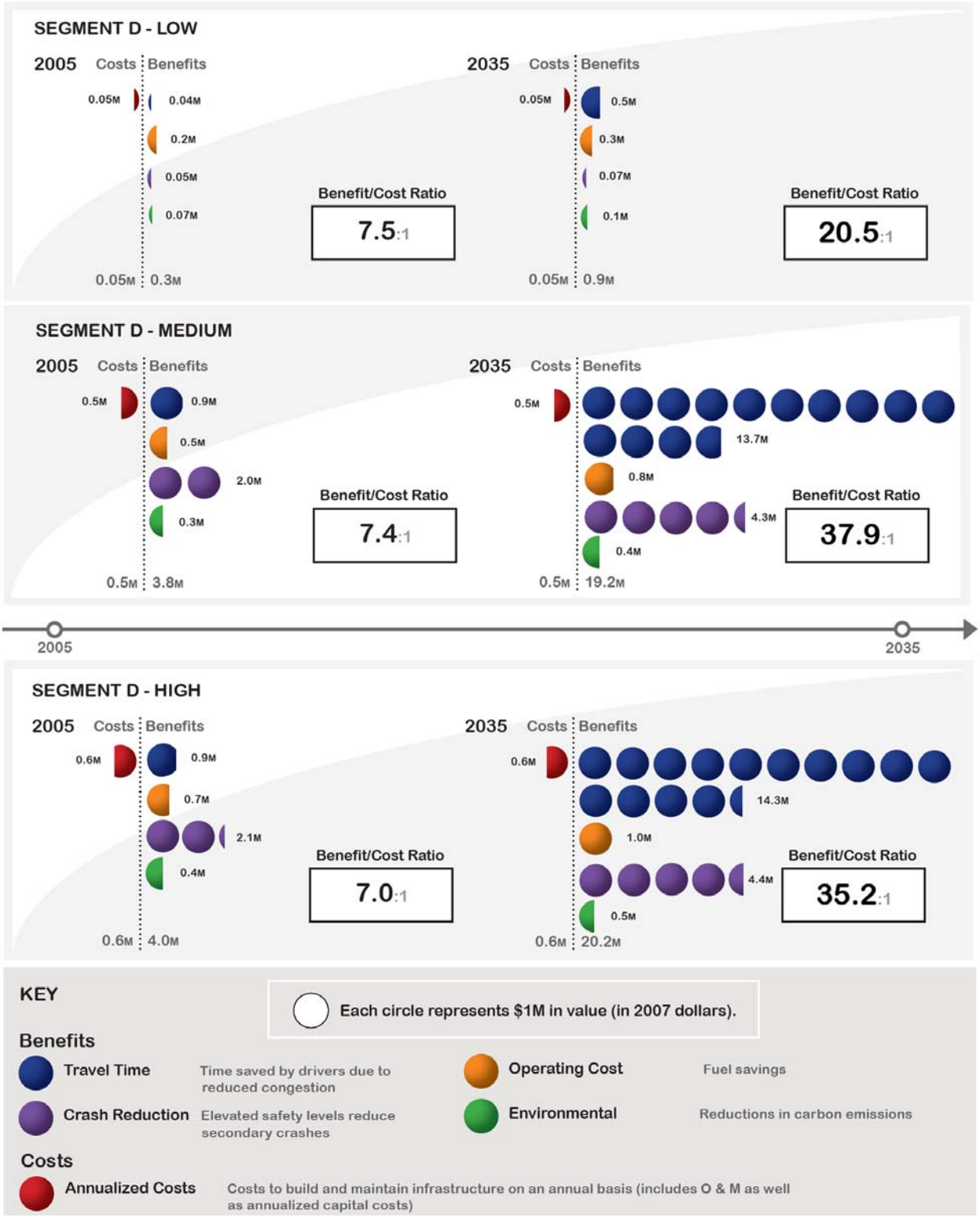

SEGMENT D - LOW
2005
Costs
Benefits
0.05M
0.04M
0.2M
0.05M
0.07M
0.05M
0.3M
Benefit/Cost Ratio
7.5:1
2035
Costs
Benefits
0.05M
0.5M
0.3M
0.07M
0.1M
0.05M
0.9M
Benefit/Cost Ratio
20.5:1
SEGMENT D - MEDIUM
2005
Costs
Benefits
0.5M
0.9M
0.5M
2.0M
0.3M
0.5M
3.8M
Benefit/Cost Ratio
7.4:1
2035
Costs
Benefits
0.5M
13.7M
0.8M
4.3M
0.4M
0.5M
19.2M
Benefit/Cost Ratio
37.9:1
2005
2035
SEGMENT D - HIGH
2005
Costs
Benefits
0.6M
0.9M
0.7M
2.1M
0.4M
0.6M
4.0M
Benefit/Cost Ratio
7.0:1
2035
Costs
Benefits
0.6M
14.3M
1.0M
4.4M
0.5M
0.6M
20.2M
Benefit/Cost Ratio
35.2:1
KEY
Each circle represents $1M in value (in 2007 dollars).
Benefits
Travel Time
Time saved by drivers due to reduced congestion
Crash Reduction
Elevated safety levels reduce secondary crashes
Operating Cost
Fuel savings
Environmental
Reductions in carbon emissions
Costs
Annualized Costs
Costs to build and maintain infrastructure on an annual basis (includes O & M as well as annualized capital costs)

Table 3.7 Segment D 2005 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment D Low	$38,000	$46,000	$181,000	$73,000	$338,000	$45,000	$10,583	$237,864	$293,000	7.5
Segment D Medium	$899,000	$2,043,000	$520,000	$307,000	$3,769,000	$507,000	$225,922	$1,765,049	$3,262,000	7.4
Segment D High	$925,000	$2,078,000	$663,000	$353,000	$4,019,000	$572,000	$242,136	$2,075,728	$3,447,000	7.0

All values are dollars per year except Initial Capital Cost

Table 3.8 Segment D 2035 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment D Low	$492,000	$69,000	$261,000	$99,000	$921,000	$45,000	$10,583	$237,864	$876,000	20.5
Segment D Medium	$13,671,000	$4,333,000	$787,000	$438,000	$19,229,000	$507,000	$225,922	$1,765,049	$18,722,000	37.9
Segment D High	$14,291,000	$4,388,000	$989,000	$491,000	$20,159,000	$572,000	$242,136	$2,075,728	$19,587,000	35.2

All values are dollars per year except Initial Capital Cost

3.5 SEGMENT E

The benefit/cost results for Segment E deployments are shown graphically in Figure 3.5 and in tabular format in Tables 3.9 and 3.10. Segment E includes the section of I-94 east of the I-39/I-90 interchange. Levels of investment proposed for this segment are modest compared to most of the others, ranging from $470,000 for the low scenario to just over $900,000 for the high scenario. The range of net benefits and benefit/cost ratios is very narrow as well with net benefits ranging from $350,000 annually in 2005 for the low scenario to approximately $790,000 annually for the high scenario. Benefit/cost ratios range from 4.4 for the low scenario to 5.9 for the medium.

Lower traffic growth is projected along this segment than on most of the others in the Southwest region. Net benefits roughly double under all scenarios by 2035 with $770,000 in annual net benefits for the low scenario, $1.35 million for the medium scenario and just under $1.9 million for the high scenario. There is a slightly bigger spread in benefit/cost ratios, ranging from 8.3 for the low scenario to 11.9 for the medium scenario. The high scenario benefit/cost ratio increases from 4.9 in 2005 to just over 10 in 2035.

Travel time savings constitute the majority of benefits for all scenarios in both 2005 and 2035. The percentage of benefit value resulting from travel time savings increases slightly from 2005 to 2035.

Figure 3.5 Segment E - IDAS Results

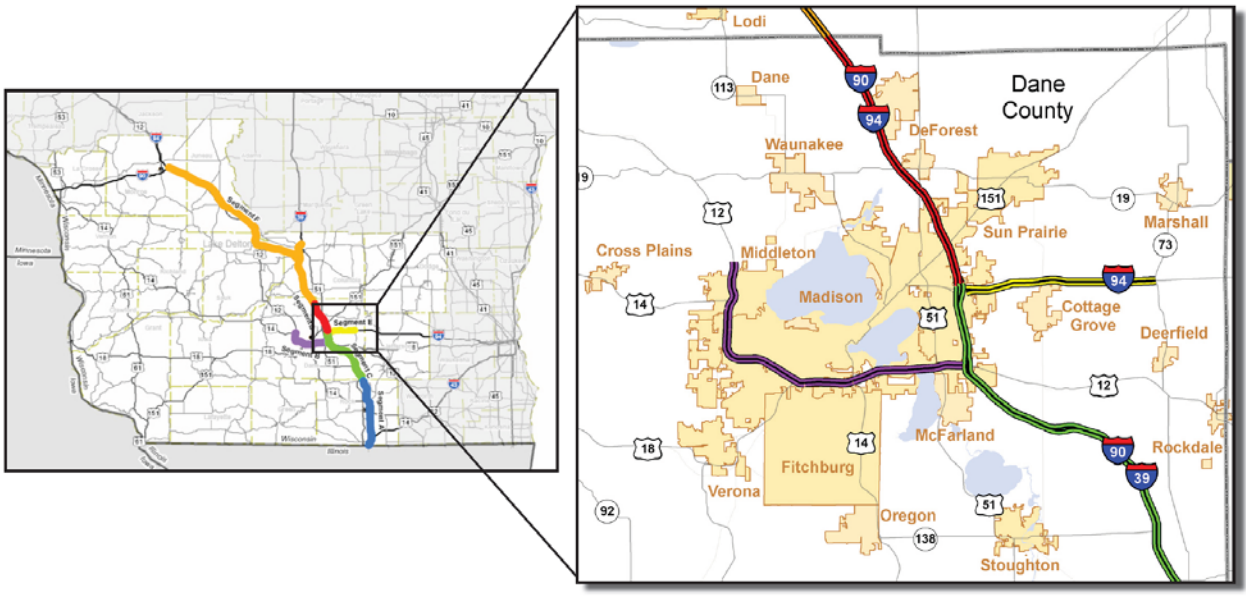
Segment E - IDAS Results

State Highway 73 - I-39/90/94 Interchange

Description

Segment E consists of I-94 from State Highway 73 to the I-39/90/94 Interchange. ITS deployment options (ranging from Low to High) are briefly described below. The benefit/cost ratios for each option (for the base year 2005 and forecast year 2035) are found below, showing how much value will be returned for each dollar spent.

Low	Includes limited CCTV and detection, one DMS, one portable CMS, ramp closure gates, and law enforcement pads
Medium	Adds additional CCTV and detection and a portable CMS
High	Adds additional CCTV and detection, one DMS, and a crash investigation site



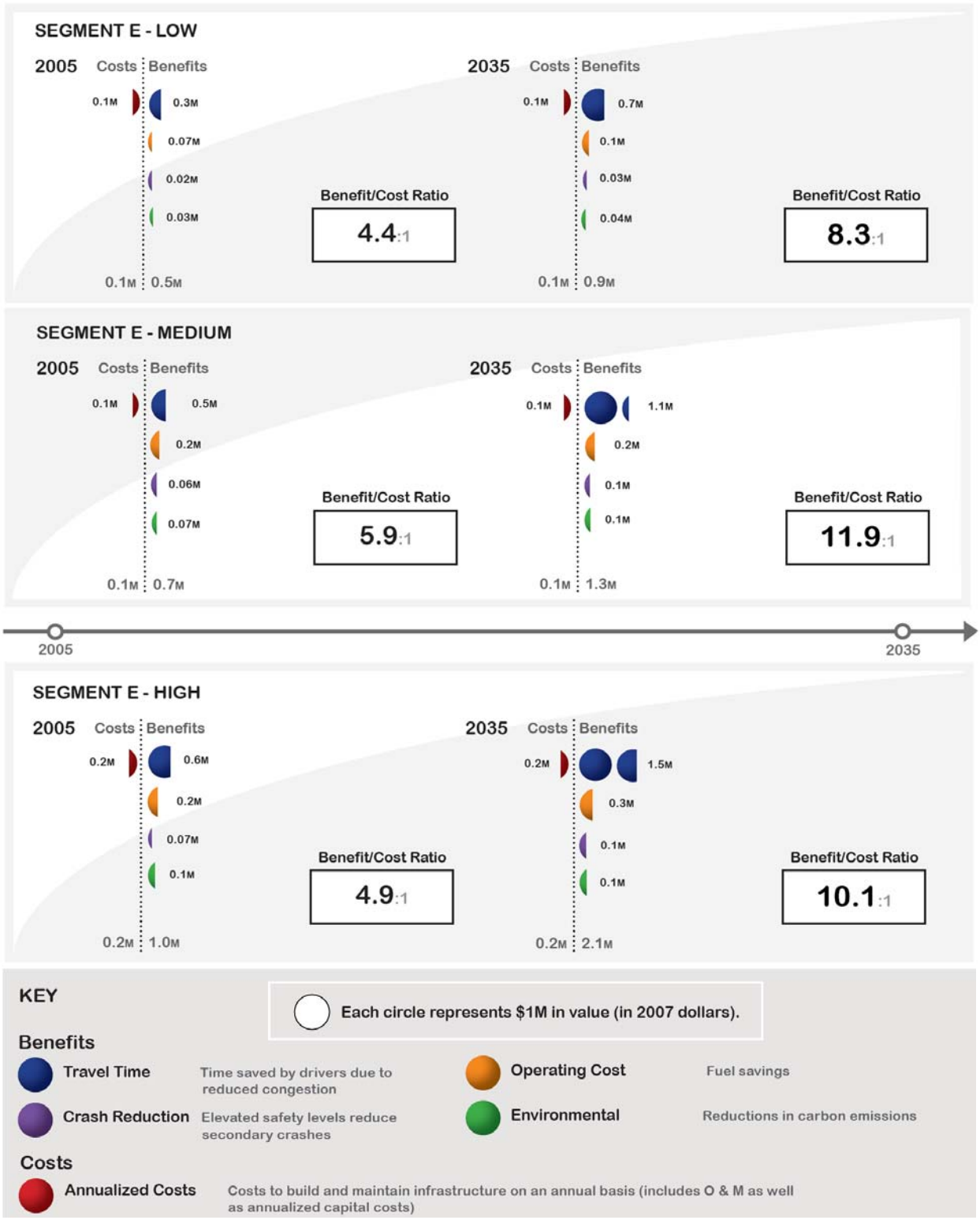

SEGMENT E - LOW
2005
Costs
Benefits
0.1M
0.3M
0.07M
0.02M
0.03M
0.1M
0.5M
Benefit/Cost Ratio
4.4:1
2035
Costs
Benefits
0.1M
0.7M
0.1M
0.03M
0.04M
0.1M
0.9M
Benefit/Cost Ratio
8.3:1
SEGMENT E - MEDIUM
2005
Costs
Benefits
0.1M
0.5M
0.2M
0.06M
0.07M
0.1M
0.7M
Benefit/Cost Ratio
5.9:1
2035
Costs
Benefits
0.1M
1.1M
0.2M
0.1M
0.1M
0.1M
1.3M
Benefit/Cost Ratio
11.9:1
2005
2035
SEGMENT E - HIGH
2005
Costs
Benefits
0.2M
0.6M
0.2M
0.07M
0.1M
0.2M
1.0M
Benefit/Cost Ratio
4.9:1
2035
Costs
Benefits
0.2M
1.5M
0.3M
0.1M
0.1M
0.2M
2.1M
Benefit/Cost Ratio
10.1:1
KEY
Each circle represents $1M in value (in 2007 dollars).
Benefits
Travel Time
Time saved by drivers due to reduced congestion
Operating Cost
Fuel savings
Crash Reduction
Elevated safety levels reduce secondary crashes
Environmental
Reductions in carbon emissions
Costs
Annualized Costs
Costs to build and maintain infrastructure on an annual basis (includes O & M as well as annualized capital costs)

Table 3.9 Segment E 2005 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment E Low	$332,000	$19,000	$74,000	$34,000	$459,000	$105,000	$37,282	$474,757	$354,000	4.4
Segment E Medium	$450,000	$56,000	$160,000	$74,000	$740,000	$125,000	$43,398	$568,932	$615,000	5.9
Segment E High	$588,000	$74,000	$233,000	$103,000	$998,000	$204,000	$69,417	$944,660	$794,000	4.9

All values are dollars per year except Initial Capital Cost

Table 3.10 Segment E 2035 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment E Low	$706,000	$28,000	$102,000	$39,000	$875,000	$105,000	$37,282	$474,757	$770,000	8.3
Segment E Medium	$1,079,000	$89,000	$228,000	$86,000	$1,482,000	$125,000	$43,398	$568,932	$1,357,000	11.9
Segment E High	$1,498,000	$117,000	$330,000	$118,000	$2,063,000	$204,000	$69,417	$944,660	$1,859,000	10.1

All values are dollars per year except Initial Capital Cost

3.6 SEGMENT F

The benefit/cost results for Segment F deployments are shown graphically in Figure 3.6 and in tabular format in Tables 3.11 and 3.12. It is important to note that Segment F includes I-90/I-94 from the Dane/Columbia County border north to Tomah and covers four counties that are not in an MPO travel demand model. Because of this, the statewide model was used to analyze this segment. The statewide model, due to its size and resource requirements, could not be imported into IDAS. The spreadsheet technique used replicates the IDAS analysis accurately for travel time, accident reduction and operating cost benefits. Air quality benefits, however, cannot be calculated using this technique and are thus not included. Therefore, the benefit for this segment is slightly underestimated although air quality benefits generally constitute a very small percentage of overall benefit.

Unlike most other segments, the initial capital investment levels proposed for Segment F are relatively similar at $1.15 million for the low scenario and $1.89 million for the medium. Investment in the high scenario is much greater, at $3.41 million. Net benefits in 2005 range from: $1.57 million annually for the low scenario, $2.3 million annually for the medium scenario and $2.3 million annually for the high scenario. Benefit/cost ratios for both low and medium investment are around 6 to 8, dropping to under 5 for the high scenario.

By 2035 net benefits increase to approximately: $4.6 million annually for the low scenario, $6.9 million annually for the medium and $7.3 million annually for the high scenario. Benefit/cost for the low and medium scenarios increases to over 17, while for the high scenario it is approximately 11. The capital cost of the high scenario, which is roughly twice that of the medium scenario, does not appear to produce a commensurate increase in benefits.

Under the base year scenario, the largest amount of monetary benefit is in fuel operating cost savings. Travel time savings are relatively low, probably a result of the fact that this stretch of highway has substantial excess capacity. By 2035, traffic volumes increase to the point where travel time savings and fuel operating cost savings are very close. As mentioned earlier, the methodology used does not allow calculation of environmental benefits.

Figure 3.6 Segment F - IDAS Results

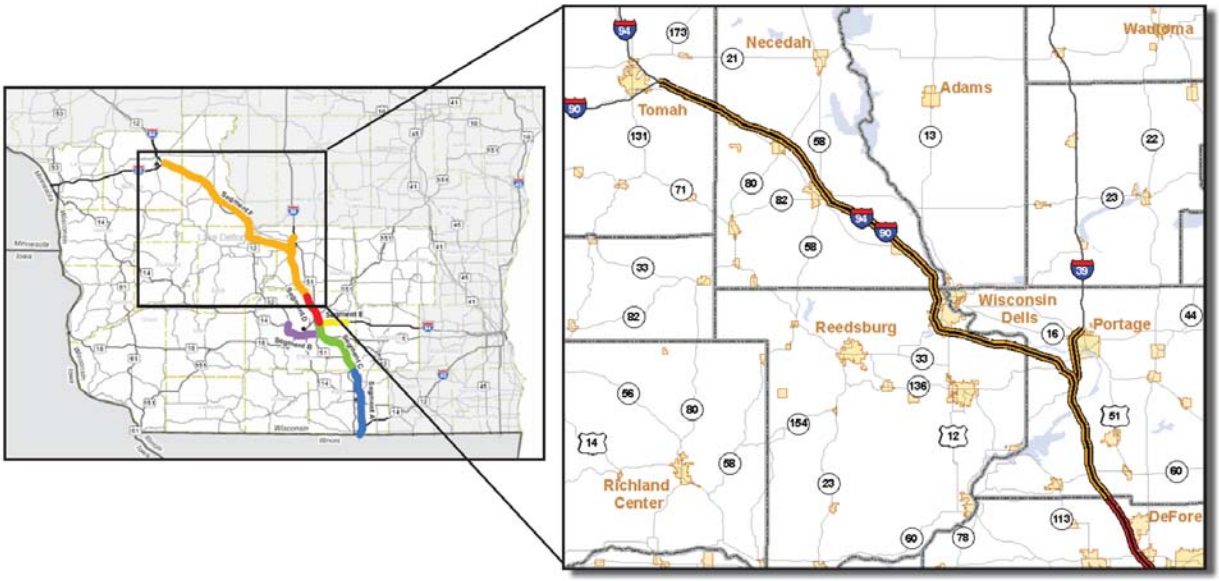
Segment F - IDAS Results

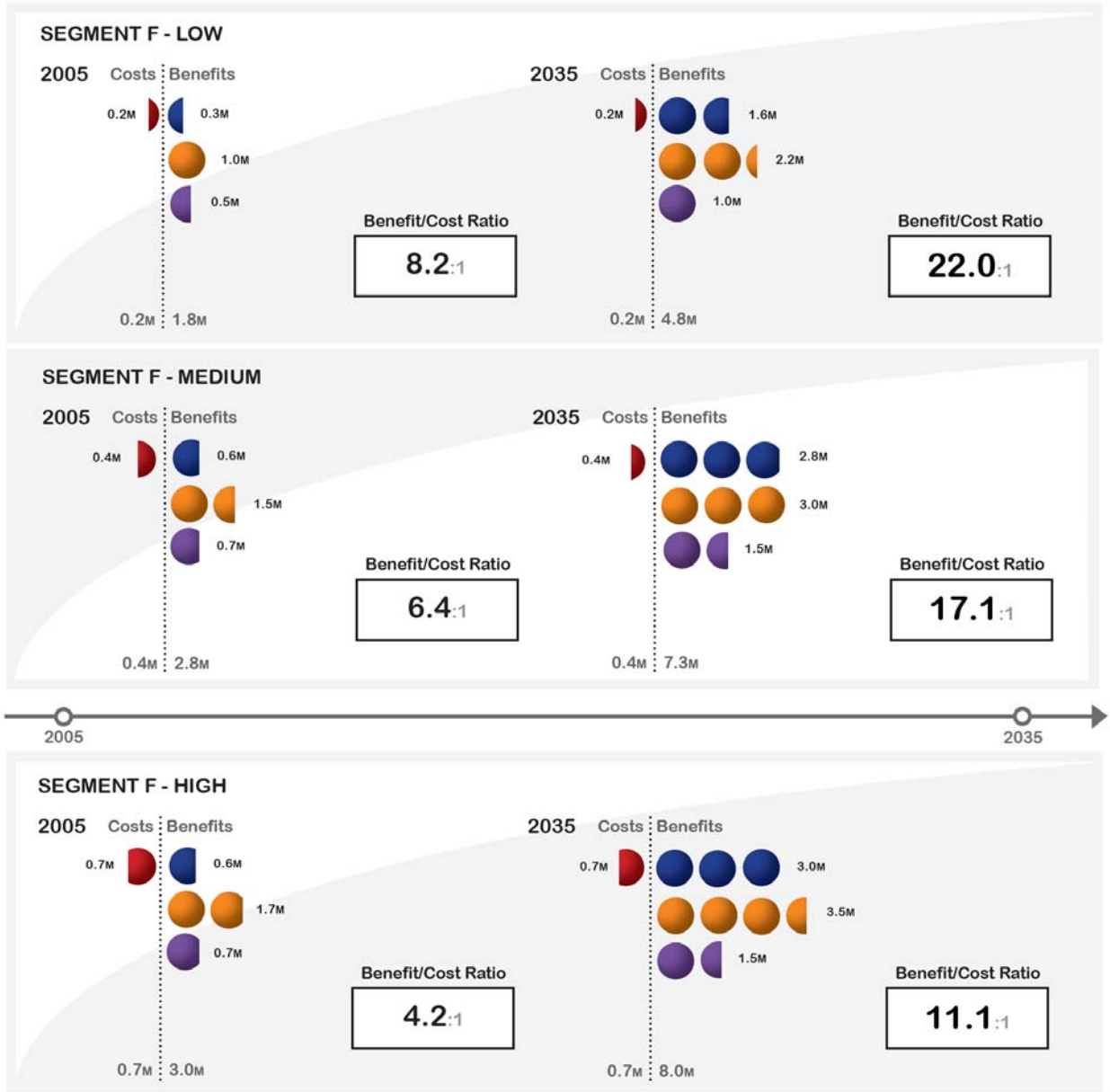
Columbia/Dane County Line - Tomah

Description

Segment F consists of portions of I-39/90/94, I-39, and I-90/94. The segment begins at the Columbia/Dane County line and ends at Tomah. ITS deployment options (ranging from Low to High) are briefly described below. The benefit/cost ratios for each option (for the base year 2005 and forecast year 2035) are found below, showing how much value will be returned for each dollar spent.

Low	Includes CCTV and detection as well as portable CMS, crash investigation sites, and law enforcement pads
Medium	Adds additional CCTV and detection as well as ramp closure gates and portable CMS
High	Adds additional CCTV and detection as well as signal improvements, portable CMS, and law enforcement pads





KEY

Each circle represents $1M in value (in 2007 dollars).

Benefits

- **Travel Time** — Time saved by drivers due to reduced congestion
- **Crash Reduction** — Elevated safety levels reduce secondary crashes
- **Operating Cost** — Fuel savings
- **Environmental** — Reductions in carbon emissions

Costs

- **Annualized Costs** — Costs to build and maintain infrastructure on an annual basis (includes O & M as well as annualized capital costs)

Table 3.11 Segment F 2005 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment F Low	$256,000	$494,000	$1,041,000	$0	$1,791,000	$218,000	$52,913	$1,153,398	$1,573,000	8.2
Segment F Medium	$605,000	$691,000	$1,457,000	$0	$2,753,000	$430,000	$109,903	$1,885,631	$2,323,000	6.4
Segment F High	$620,000	$713,000	$1,691,000	$0	$3,024,000	$722,000	$185,243	$3,407,961	$2,302,000	4.2

All values are dollars per year except Initial Capital Cost

Table 3.12 Segment F 2035 Monetized Benefits

Deployments	Travel Time	Accident Reduction	Operating Cost	Environmental	Total	Annualized Cost	O&M Costs	Initial Capital	Net Benefits	B/C Ratio
Segment F Low	$1,568,000	$1,037,000	$2,185,000	$0	$4,790,000	$218,000	$52,913	$1,153,398	$4,572,000	22.0
Segment F Medium	$2,840,000	$1,447,000	$3,050,000	$0	$7,337,000	$430,000	$109,903	$1,885,631	$6,907,000	17.1
Segment F High	$3,015,000	$1,515,000	$3,495,000	$0	$8,025,000	$722,000	$185,243	$3,407,961	$7,303,000	11.1

All values are dollars per year except Initial Capital Cost

3.7 SUMMARY OF RESULTS

Based on the analysis conducted, all scenarios defined are cost-effective based on the benefit/cost ratios. In general, the medium level deployment scenarios appear to provide the optimal investment in ITS over the 30-year period. While the low scenarios are cost-effective, they tend to produce a small level of net benefits. In many cases, the benefit/cost ratio increases with the additional investment required to implement the medium scenario. The high investment scenarios always increase the net benefits, but in general do not provide a level of additional benefit commensurate with the additional investment. In every segment in both base and future years, the benefit/cost ratio for the high scenario is lower than that for the medium scenario, although in some cases the differences are small.

Based on a combination of net benefit and benefit/cost ratio, segments A and B are the highest priority for short-term investment followed by segments C and D. Projected growth levels in all segments over time are high enough to justify ITS investments in all segments included in the study.

4.0 Recommendation

4.1 METHODOLOGY AND RECOMMENDATION

The following methodology guided the systematic approach in choosing a recommended deployment density for each segment.

- By looking at the Benefit/Cost ratios in both 2005 and 2035; eliminate any scenarios that have a significantly lower B/C ratio.
- Compare the initial capital cost between the scenarios to determine how much additional capital cost is required to advance from a low to medium and medium to high scenario.
- Compare the annualized net benefits to determine how much benefit is gained by advancing from a low to medium and a medium to high deployment density.
- Consider the realized benefits influencing the B/C ratio.

Table 4.1 Recommended Deployment

Recommended Deployment	IDAS Initial Capital Cost	IDAS O & M Cost	2005 Net Benefits	2035 Net Benefits
Segment A Medium (4 Lane)	$3,292,427	$228,903	$5,344,000	$11,556,000
Segment A High (6 Lane)	$4,186,602	$273,175	$2,454,000	$15,841,000
Segment B Medium	$4,908,544	$444,631	$16,288,000	$31,462,000
Segment C Medium (4 Lane)	$2,231,068	$95,146	$2,803,000	$13,766,000
Segment C High (6 Lane)	$2,789,320	$137,767	$3,026,000	$11,878,000
Segment D Medium	$1,765,049	$225,922	$3,262,000	$18,722,000
Segment E Medium	$568,932	$43,398	$615,000	$1,357,000
Segment F Medium	$1,885,631	$109,903	$2,323,000	$6,907,000

All values are dollars per year except Initial Capital Cost

A. TOIP Corridor Recommendations

Figure A.1 Badger State Corridor TOIP Recommendations

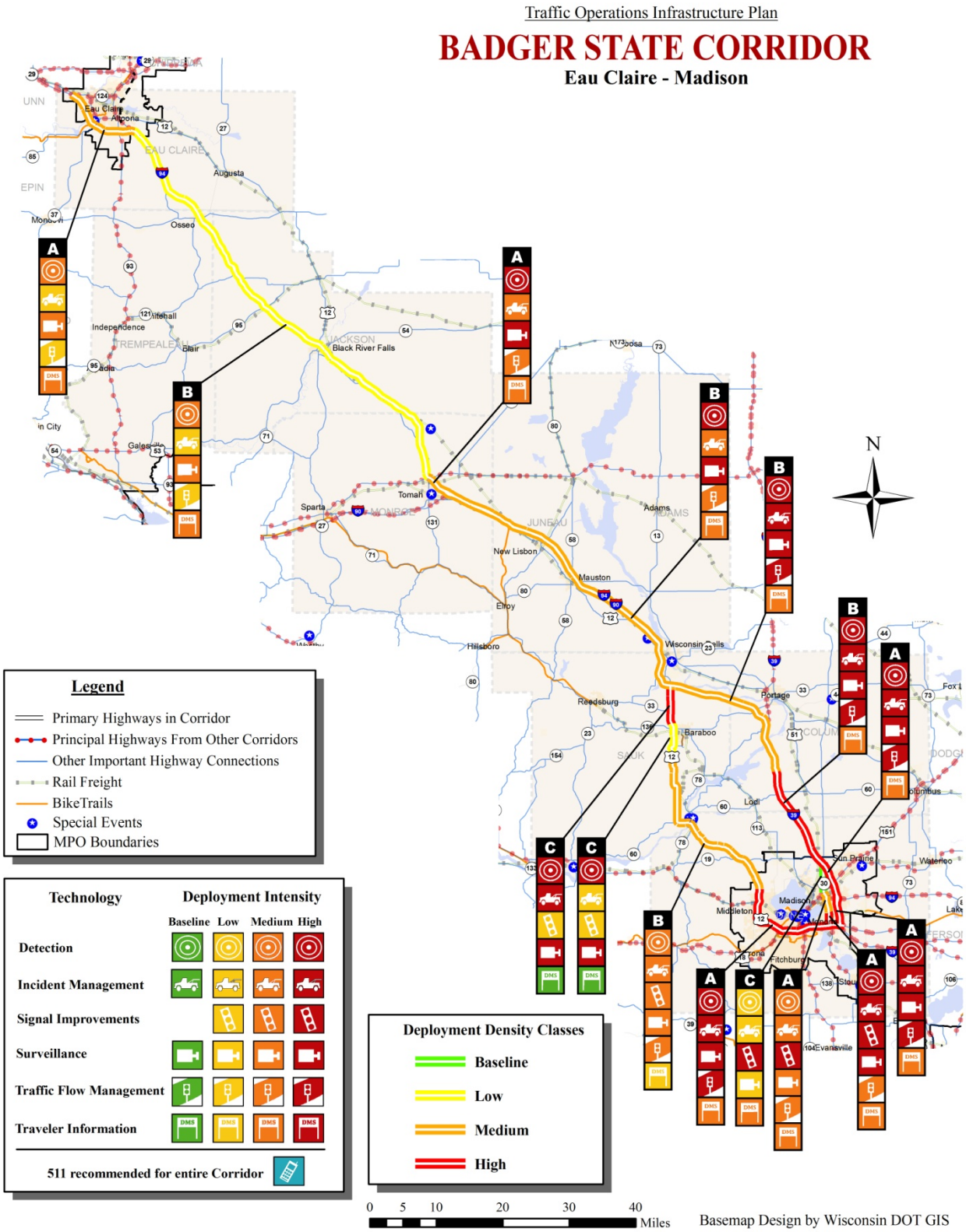


Figure A.2 Capitol Corridor TOIP Recommendations

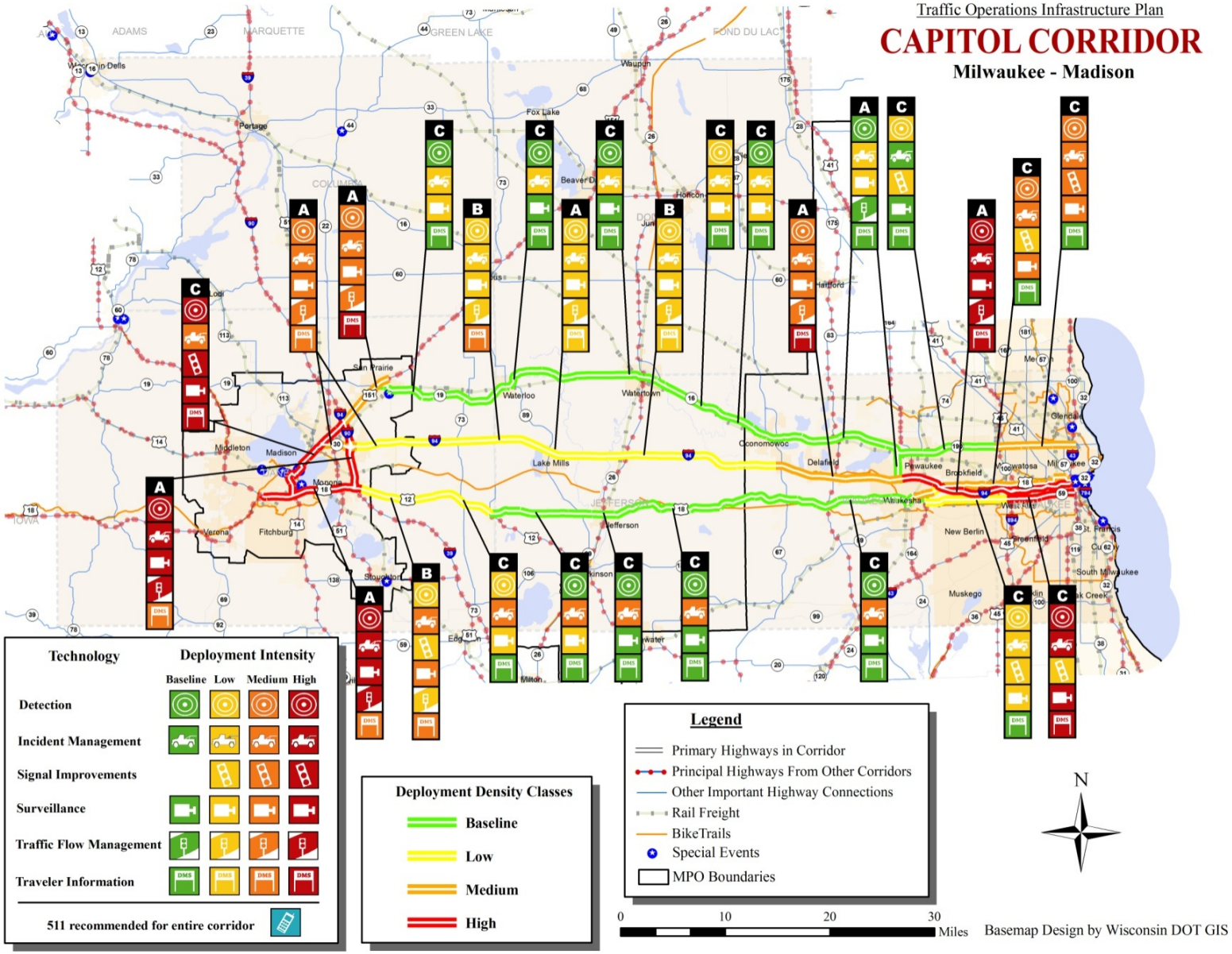
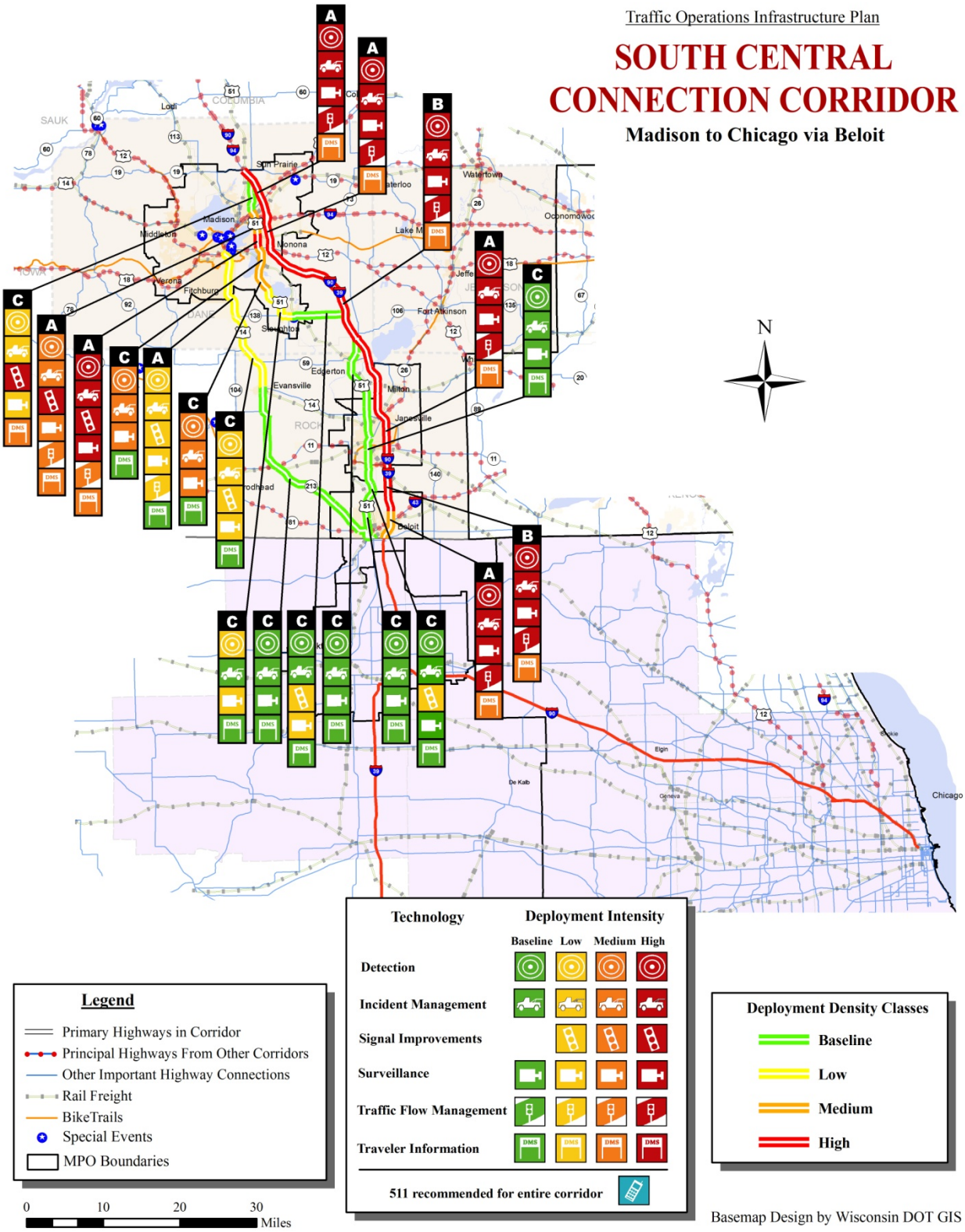
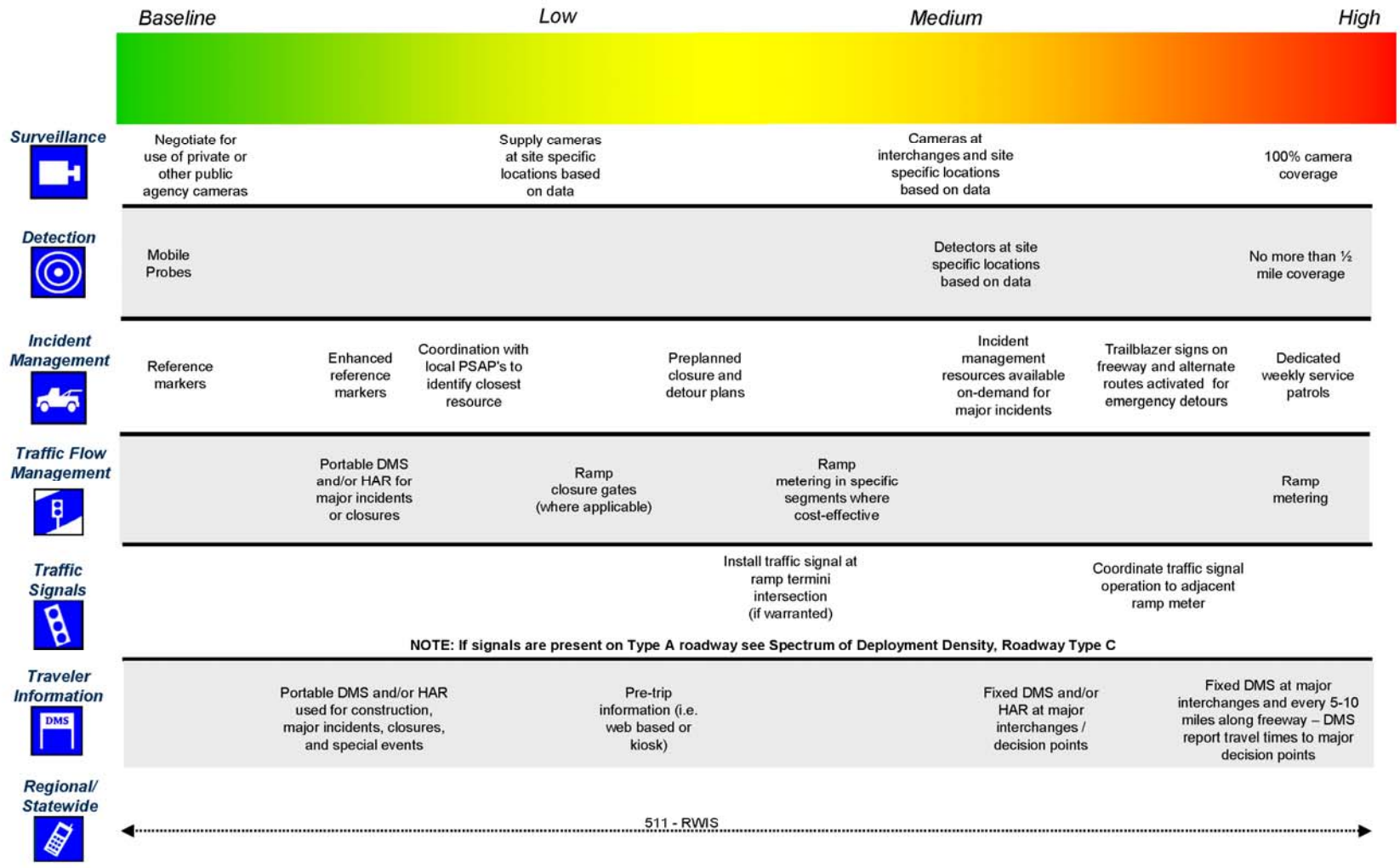


Figure A.3 South Central Connection Corridor TOIP Recommendation



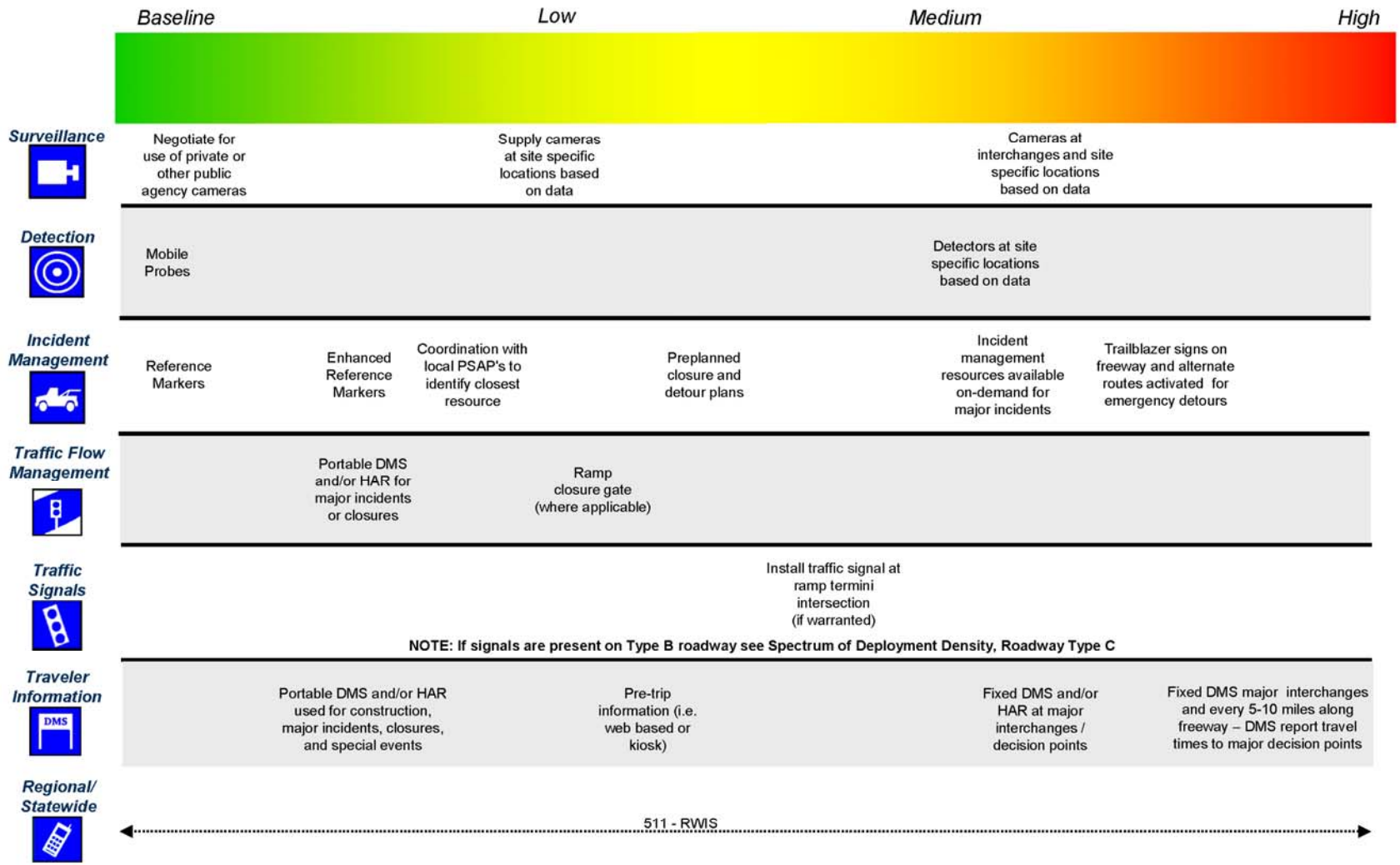
B. Spectrum of Deployment Density

Figure B.1 Spectrum of Deployment Density (Roadway Type A)



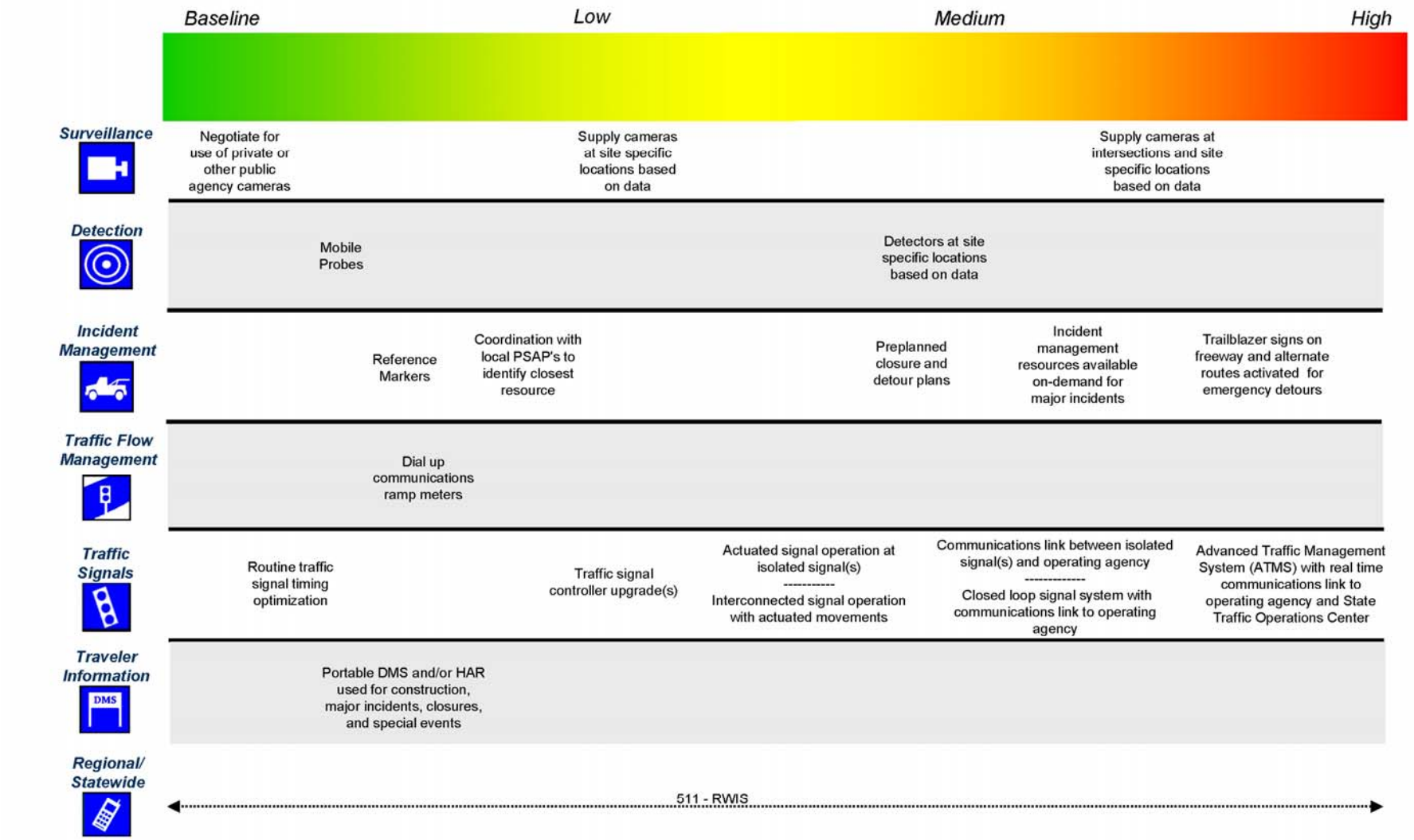
Spectrum of Deployment Density
Roadway Type A – Urban Interstate/Expressway

Figure B.2 Spectrum of Deployment Density (Roadway Type B)



Spectrum of Deployment Density
Roadway Type B – Rural Interstate/Expressway

Figure B.3 Spectrum of Deployment Density (Roadway Type C)

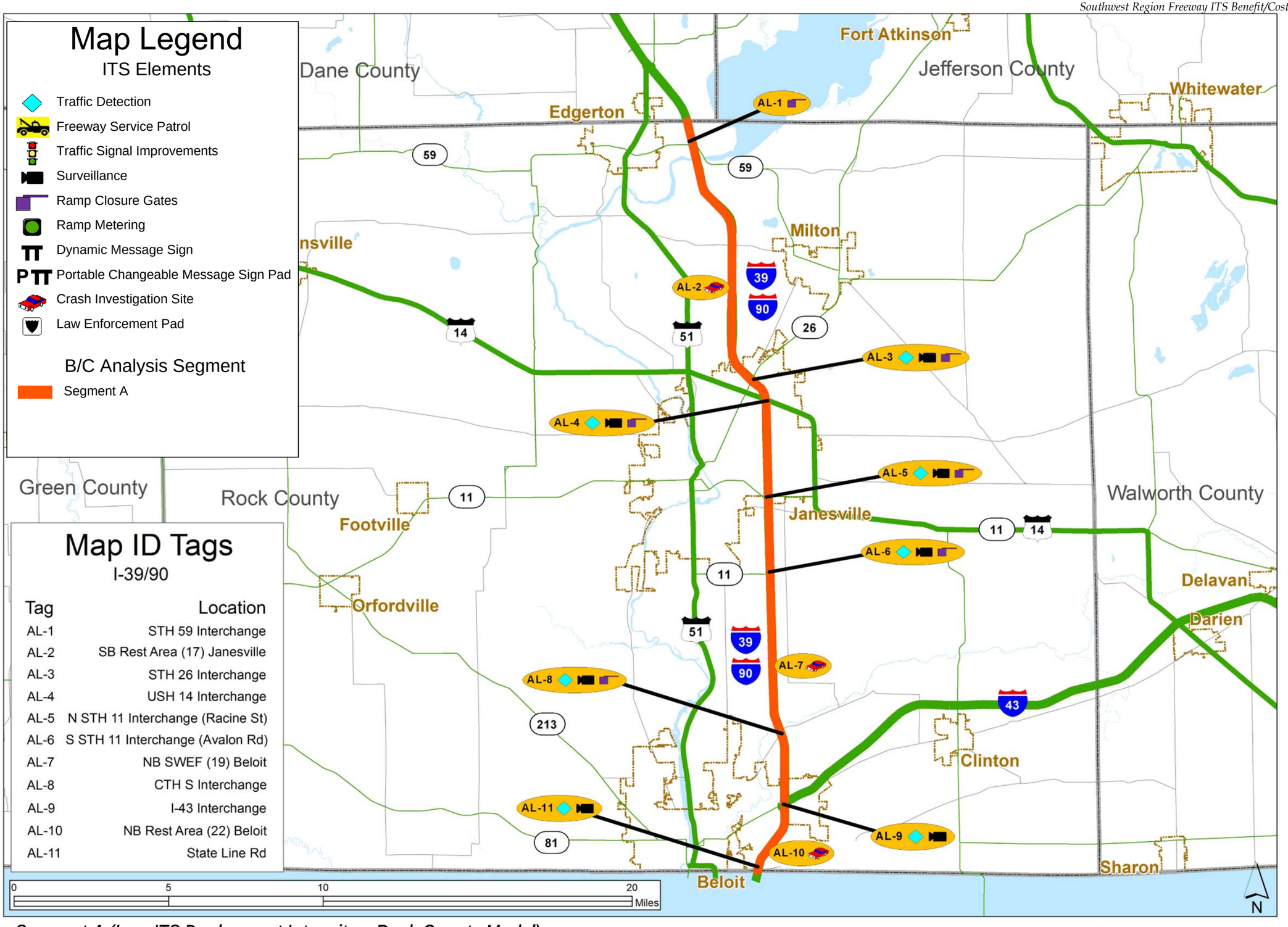


C. Proposed ITS Elements and Field Approach

Table C.1 Proposed ITS Elements and Field Approach

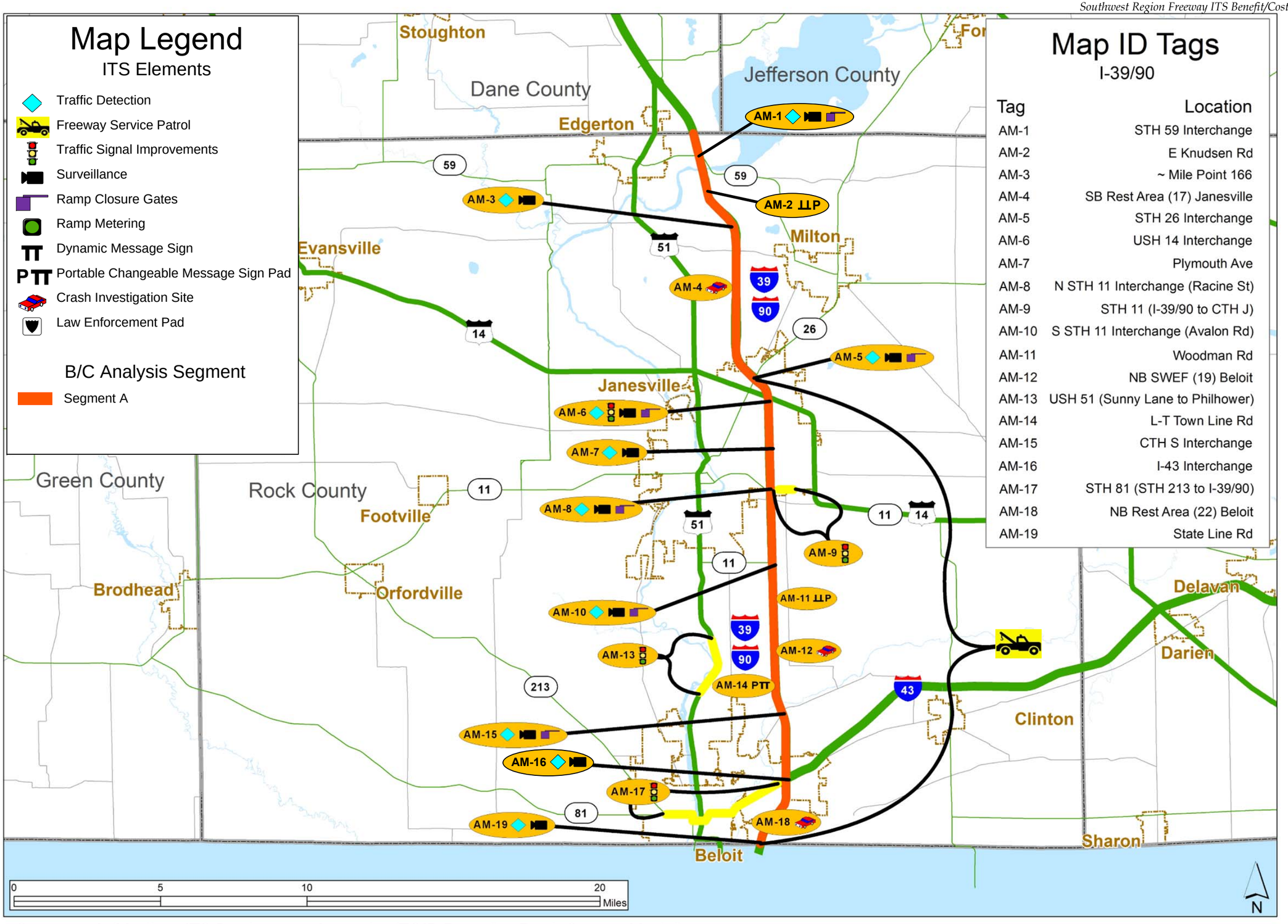
ITS Deployment	Equivalent Map Title	Elements per Deployment	Field Approach	Notes
Traffic volume and speed detection systems	**Traffic Detection**	Mainline non-intrusive detection (2) radar sensors including poles, foundations, cabling,, conduit, etc.	Detection between interchanges (urban and rural) Detection at interchanges of all types (rural only)	A two sensor approach is conservative. The majority of Wisconsin's non-intrusive freeway system detector stations (SDS) in the SW Region involve a single radar sensor. Two sensors are used where the freeway is too wide for a single detector.
		Diamond interchange non-intrusive detection (4) radar sensors including poles, foundations, cabling,, conduit, etc.	Detection at diamond, or equivalent, interchanges where no ramp metering is expected prior to 2035 (urban)	Due to the planning nature of the TOIP, the document did not specify exact locations for detection or specify a system-wide detection approach. Non-intrusive detection for this B/C analysis has been broken into three categories (mainline, diamond interchange, and cloverleaf or non-traditional interchange).
		Cloverleaf or non-traditional interchange detection (8) radar sensors including poles, foundations, cabling,, conduit, etc.	Detection at cloverleaf, or non-traditional, interchanges where ramp metering is not expected prior to 2035 (urban)	An eight sensor approach is conservative.
Freeway Service Patrol	**Freeway Service Patrol**	(1) freeway service patrol truck operating during peak periods throughout recommended segments	Proposed on specific urban segments It is assumed a single vehicle would patrol each segment	Ongoing statewide freeway service patrol contract negotiations have the potential to set costs statewide.
Arterial Traffic Signal System enhancements and Integrated Corridor Traffic Management strategies	**Traffic Signal Improvements**	Various traffic signal improvements	Ramp termini signal improvements per the TOIP as well as segment signal improvements for USH 51 in the Madison Area (Blue Route) and various segments in Rock County	
Closed-Circuit Television	**Surveillance**	(1) complete camera system including pole, foundation, pole-mounted cabinet, cabling, conduit, video codec, etc.	Cameras proposed at specific locations based on a 1-mile viewing radius assumption Multiple cameras proposed at a number of very large system-to-system interchanges (per recommendation of WisDOT SW Region) at high deployment intensity levels only	
Ramp Gates	**Ramp Closure Gates**	Vertical Drop Gate (1) manually operated vertical drop gate per interchange onramp	Proposed at Interstate interchange onramps with mainline volumes greater than 35,000 (Based on Traffic Incident Management Enhancement – Gate and Barricade Deployment Recommendations).	
		Type III Barricades (3) type III barricades and on-site storage per interchange onramp	Proposed at Interstate interchange onramps with mainline volumes less than 35,000 (Based on Traffic Incident Management Enhancement – Gate and Barricade Deployment Recommendations).	
Provision for future Ramp Metering	**Ramp Metering**	Ramp metering (1) set of ramp meters including in-pavement loop vehicle detection	Ramp meters considered in the Madison area where future traffic volumes may warrant ramp metering. No ramp meters considered on existing system-to-system interchanges.	
		Ramp metering with HOV bypass lane (1) set of ramp meters plus an additional meter for an HOV bypass lane, including in-pavement loop vehicle detection	Ramp meters considered in the Madison area where future traffic volumes may warrant ramp metering. No ramp meters considered on existing system-to-system interchanges. HOV bypass lanes considered at alternate metered interchanges, except where currently existing	
Dynamic Message Signs	**Dynamic Message Sign**	(1) overhead dynamic message sign including sign bridge, cabling, conduit, etc.	Proposed at specific locations in and near the Madison area	
Semi-permanent sites for Portable Changeable Message Signs	**Portable Changeable Message Sign Pad**	(1) Portable Changeable message sign and pad	Proposed at specific urban/rural locations prior to major decision points outside the Madison area	
Crash Investigation Sites	**Crash Investigation Site**	Mainline CIS (1) mainline CIS	Proposed at locations between interchanges, either on long stretches between interchanges or areas with concrete median barriers	Many CIS were proposed based on input from law enforcement. Mainline crash investigation sites could be used by law enforcement as well. It is assumed that funding for this improvement would originate elsewhere
		Offramp CIS (1) offramp CIS	Proposed at interchange offramps	Many CIS were proposed based on input from law enforcement. It is assumed that funding for this improvement would originate elsewhere
Law Enforcement Pads	**Law Enforcement Pad**	Paved Median Crossover (1) paved median crossover LEP	Proposed at specific locations with wide medians under 6-lane scenarios	It is assumed that funding for this improvement would originate elsewhere
		Mainline LEP (1) mainline CIS	Proposed at difficult enforcement locations with concrete median barriers	Many LEP were proposed based on input from law enforcement. It is assumed that funding for this improvement would originate elsewhere
		Onramp LEP (1) onramp LEP	Proposed at metered onramps with HOV lanes	Many LEP were proposed based on input from law enforcement. It is assumed that funding for this improvement would originate elsewhere
Fiber Optic Communications	**N/A**	(Per mile) 72 strand single-mode trunk (armored) cable, direct-buried for installation, including hand holes / splice vaults	Proposed on segments without existing DOT fiber	

D. ITS Elements Maps



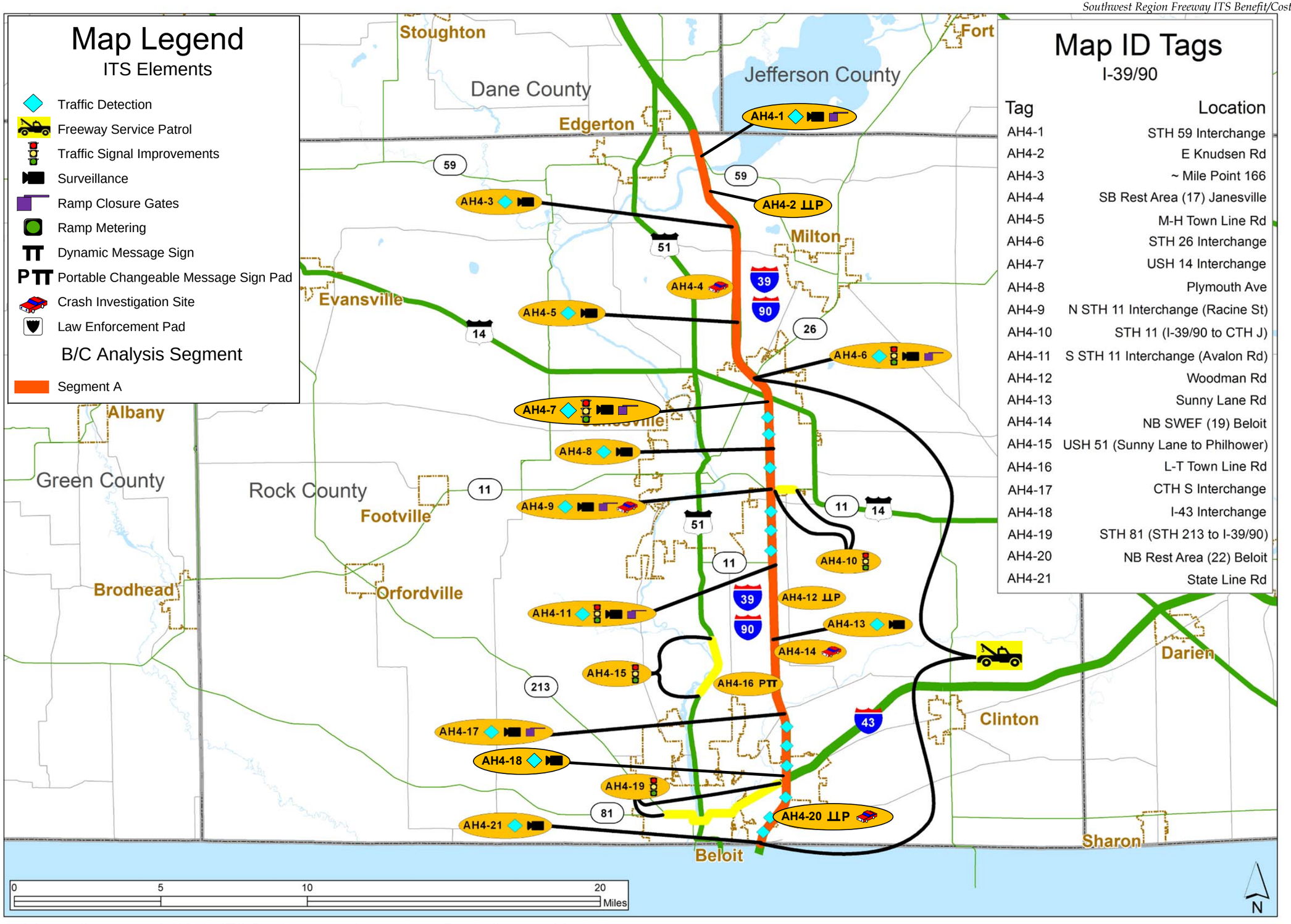
Segment A (Low ITS Deployment Intensity – Rock County Model)

Figure D.1



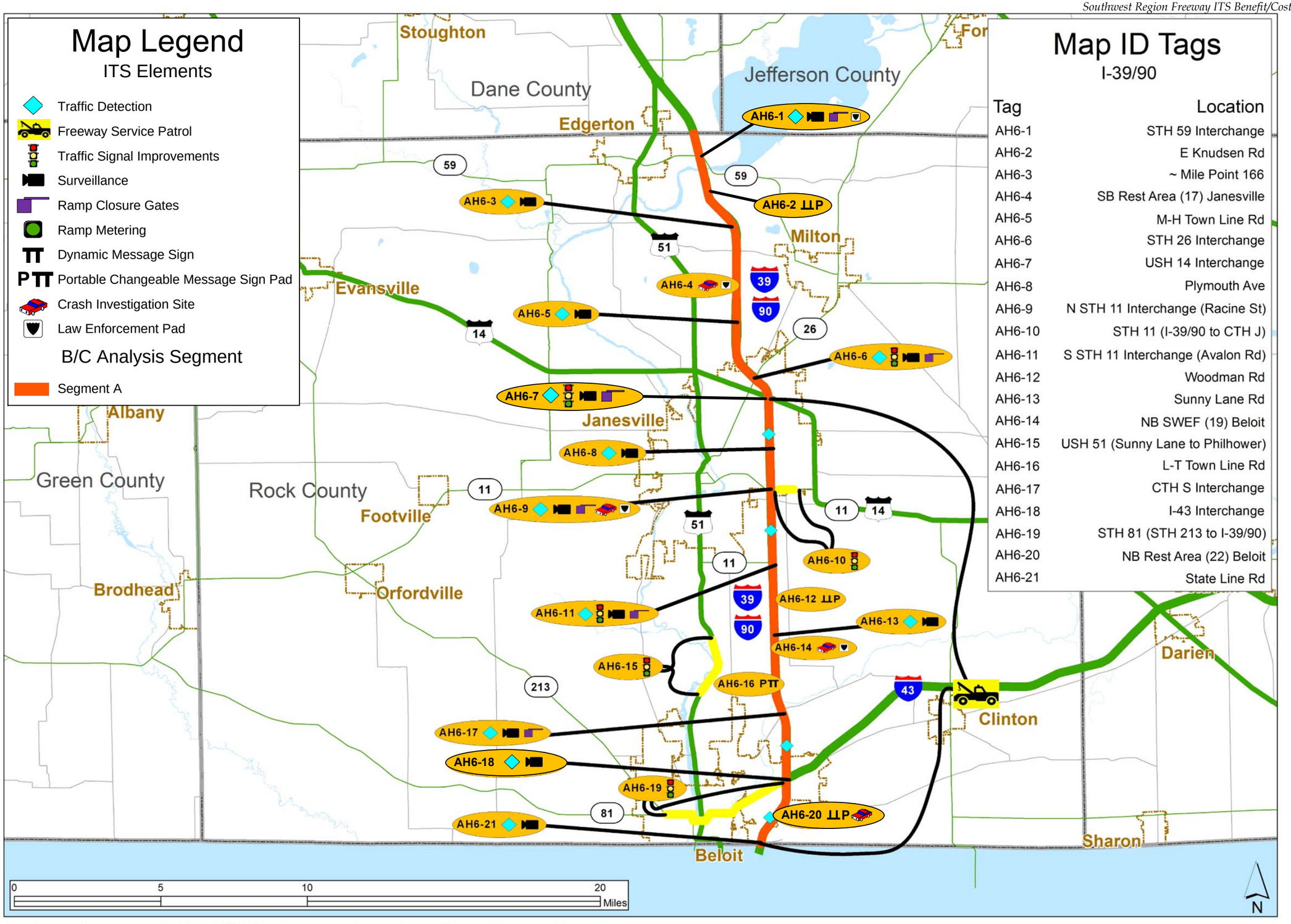
Segment A (Medium ITS Deployment Intensity (TOIP Based) – Rock County Model)

Figure D.2



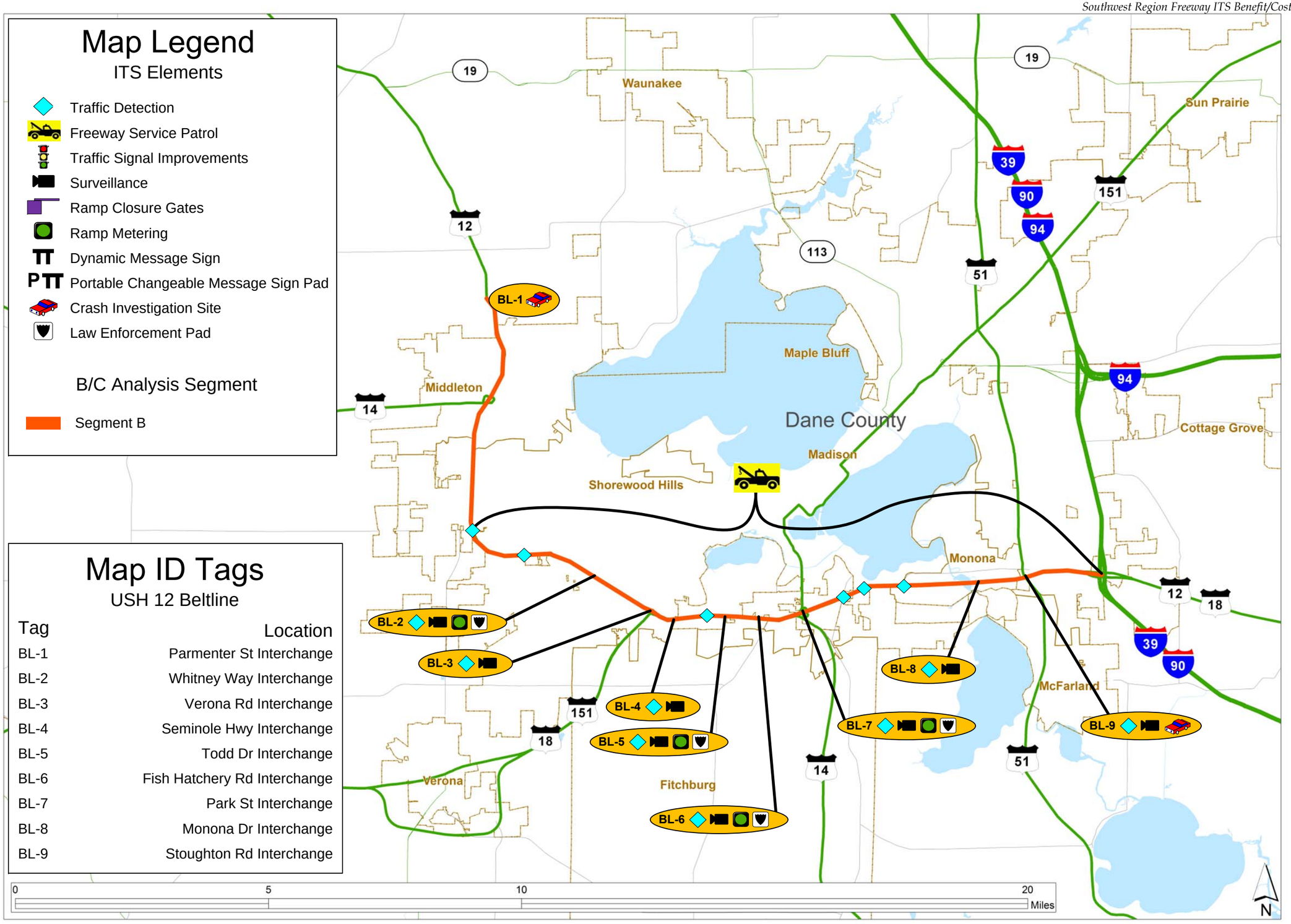
4-Lane Segment A (High ITS Deployment Intensity – Rock County Model)

Figure D.3



6-Lane Segment A (High ITS Deployment Intensity – Rock County Model)

Figure D.4



Segment B (Low ITS Deployment Intensity – Dane County Model)

Figure D.5

Map ID Tags

USH 12 Beltline

Tag	Location
BM-1	Parmenter St Interchange
BM-2	Airport Rd Interchange
BM-3	University Ave Interchange
BM-4	Terrace Ave
BM-5	Greenway Blvd Interchange
BM-6	Old Sauk Rd Interchange
BM-7	Mineral Point Rd Interchange
BM-8	Gammon Rd Interchange
BM-9	Whitney Way Interchange
BM-10	Verona Rd Interchange
BM-11	Seminole Hwy Interchange
BM-12	Todd Dr Interchange
BM-13	Fish Hatchery Rd Interchange
BM-14	Park St Interchange
BM-15	Rusk Ave
BM-16	Rimrock Rd Interchange
BM-17	Badger Ln
BM-18	John Nolen Dr Interchange
BM-19	South Towne Dr Interchange
BM-20	Monona Dr Interchange
BM-21	Stoughton Rd Interchange
BM-22	Agriculture Dr

* NB DMS on Verona Rd prior to McKee Rd (~ Mile Marker 82)
Location recommended by WisDOT SW Region
Not included in B/C analysis

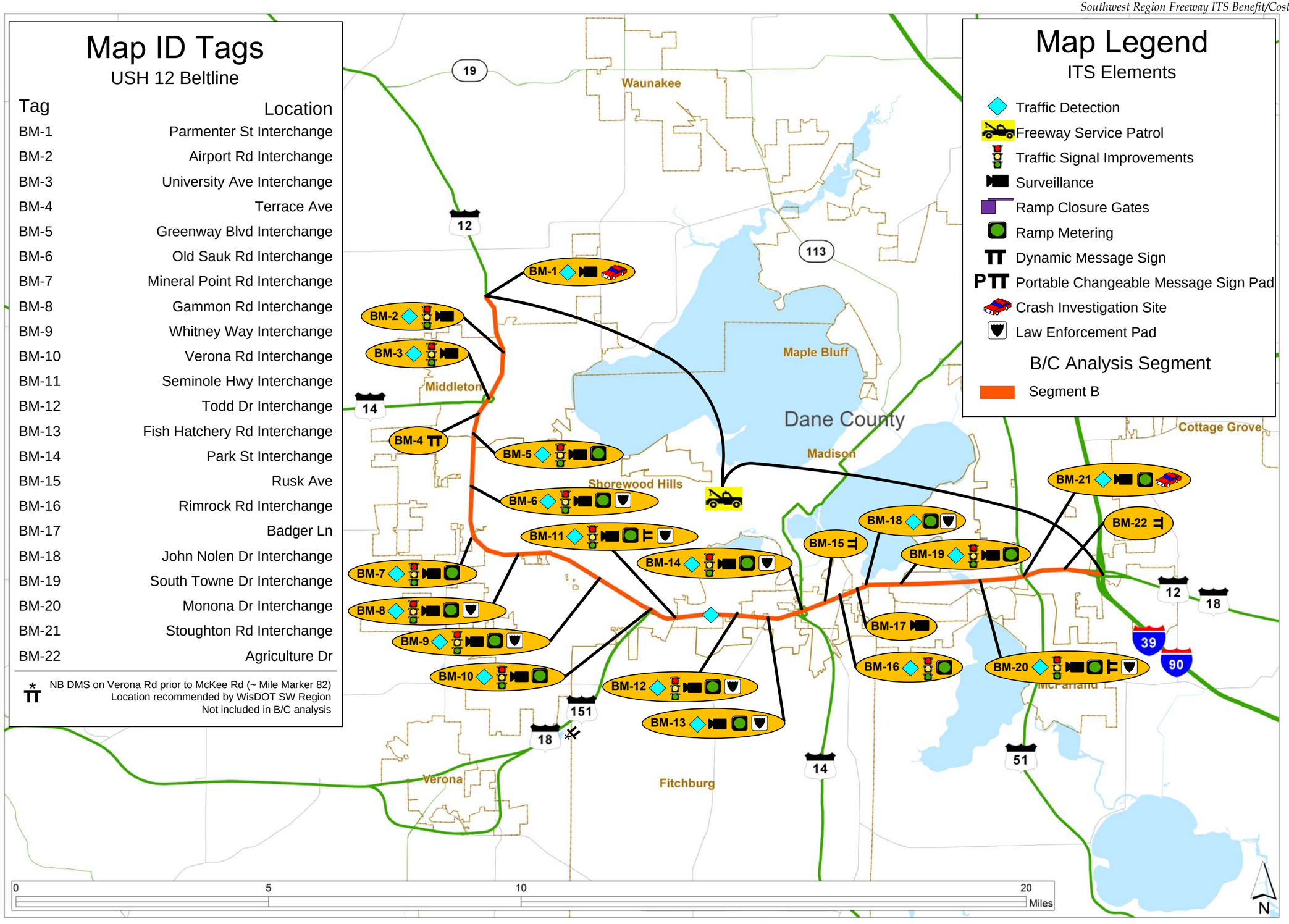
Map Legend

ITS Elements

- Traffic Detection
- Freeway Service Patrol
- Traffic Signal Improvements
- Surveillance
- Ramp Closure Gates
- Ramp Metering
- Dynamic Message Sign
- Portable Changeable Message Sign Pad
- Crash Investigation Site
- Law Enforcement Pad

B/C Analysis Segment

- Segment B



Segment B (Medium ITS Deployment Intensity – Dane County Model)

Figure D.6

Map ID Tags

USH 12 Beltline

Tag	Location
BH-1	Parmenter St Interchange
BH-2	Airport Rd Interchange
BH-3	University Ave Interchange
BH-4	Terrace Ave
BH-5	Greenway Blvd Interchange
BH-6	Old Sauk Rd Interchange
BH-7	Mineral Point Rd Interchange
BH-8	Gammon Rd Interchange
BH-9	Tokay Blvd
BH-10	Whitney Way Interchange
BH-11	Verona Rd Interchange
BH-12	Seminole Hwy Interchange
BH-13	Todd Dr Interchange
BH-14	Fish Hatchery Rd Interchange
BH-15	Park St Interchange
BH-16	Rusk Ave
BH-17	Rimrock Rd Interchange
BH-18	Badger Ln
BH-19	John Nolen Dr Interchange
BH-20	South Towne Dr Interchange
BH-21	Monona Dr Interchange
BH-22	Stoughton Rd Interchange
BH-23	Agriculture Dr

* NB DMS on Verona Rd prior to McKee Rd (~ Mile Marker 82)
Location recommended by WisDOT SW Region
Not included in B/C analysis

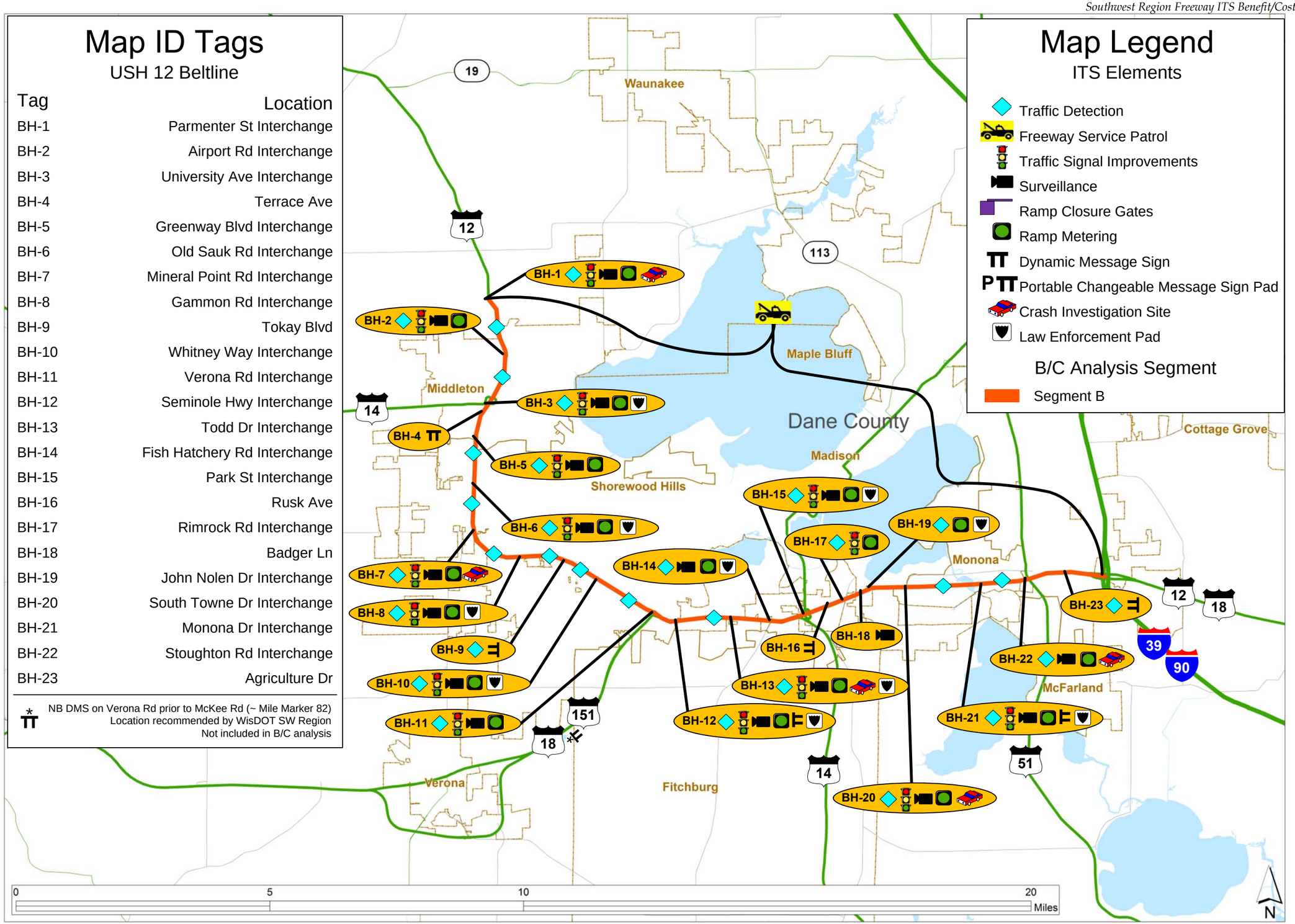
Map Legend

ITS Elements

- Traffic Detection
- Freeway Service Patrol
- Traffic Signal Improvements
- Surveillance
- Ramp Closure Gates
- Ramp Metering
- Dynamic Message Sign
- Portable Changeable Message Sign Pad
- Crash Investigation Site
- Law Enforcement Pad

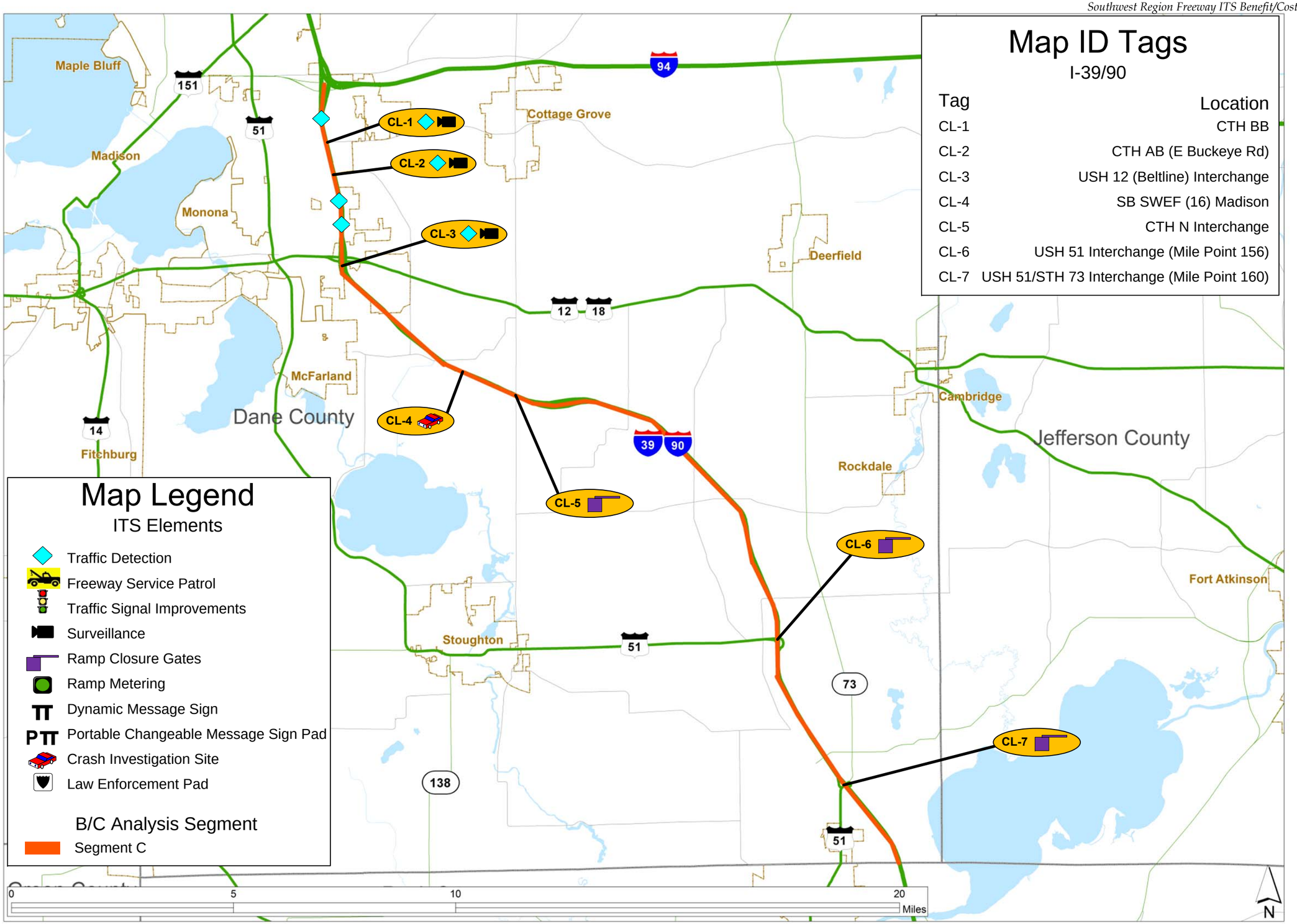
B/C Analysis Segment

- Segment B



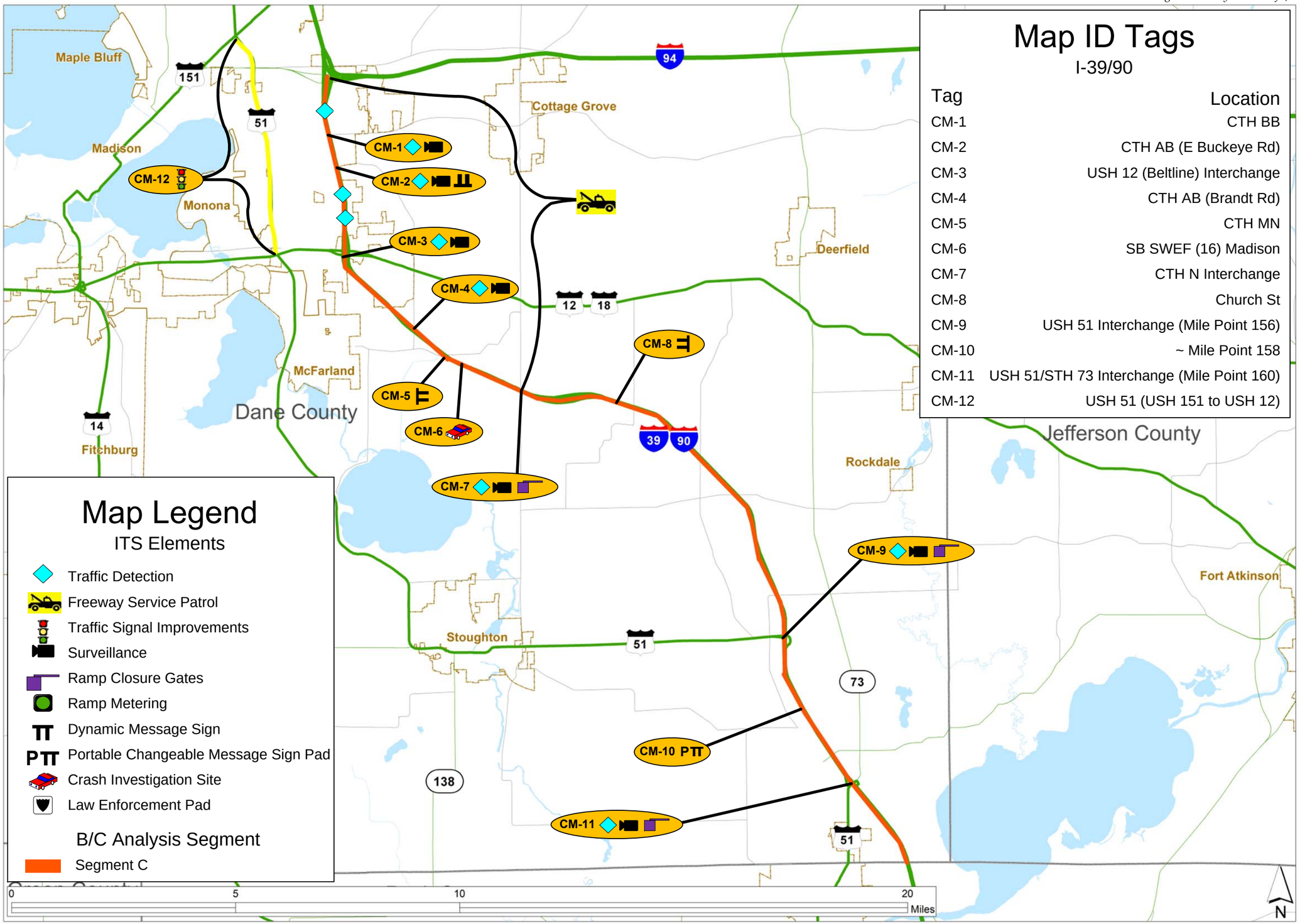
Segment B (High ITS Deployment Intensity (TOIP Based) – Dane County Model)

Figure D.7



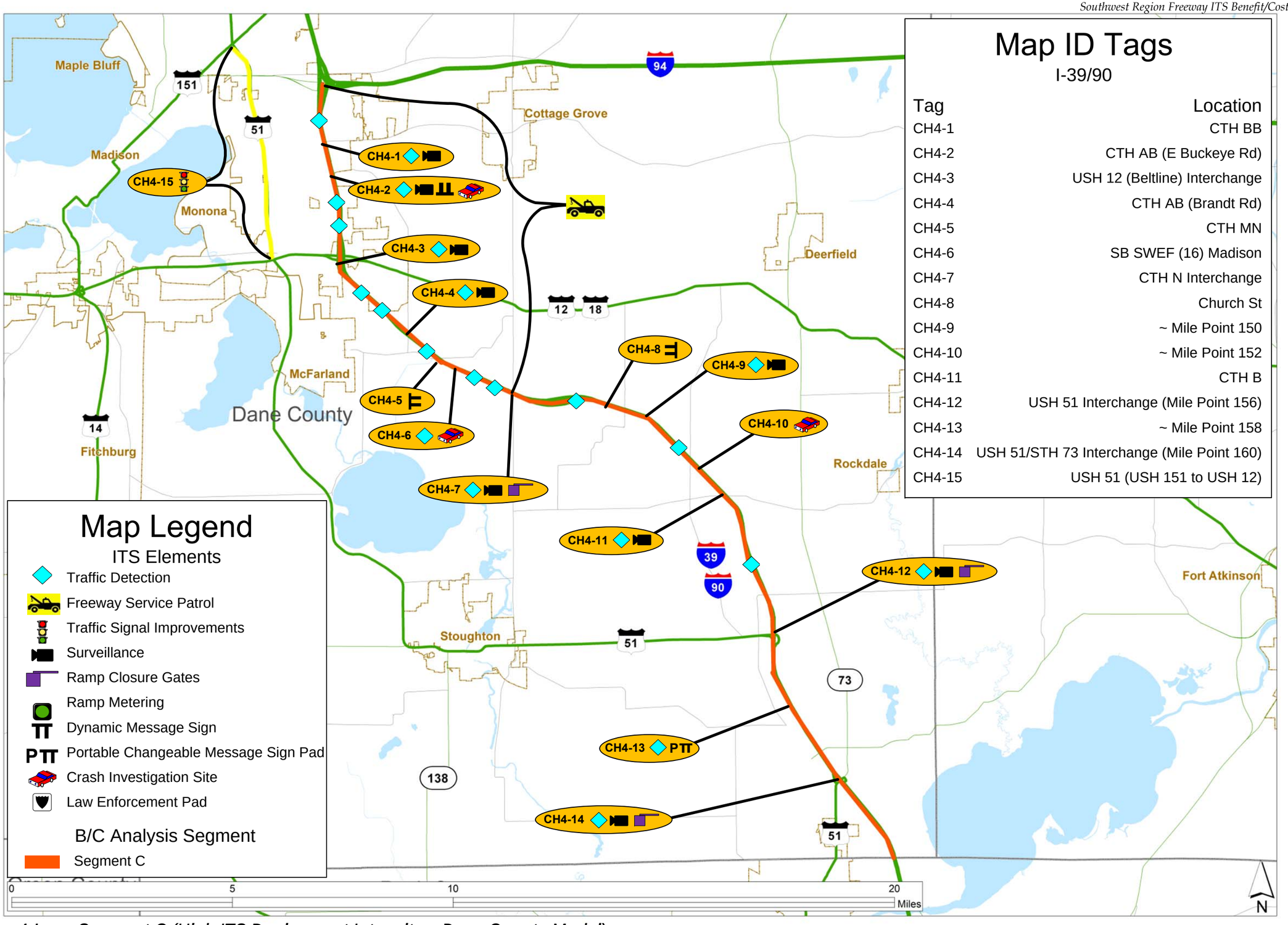
Segment C (Low ITS Deployment Intensity – Dane County Model)

Figure D.8



Segment C (Medium ITS Deployment Intensity (TOIP Based) – Dane County Model)

Figure D.9



Map ID Tags

I-39/90

Tag	Location
CH4-1	CTH BB
CH4-2	CTH AB (E Buckeye Rd)
CH4-3	USH 12 (Beltline) Interchange
CH4-4	CTH AB (Brandt Rd)
CH4-5	CTH MN
CH4-6	SB SWEF (16) Madison
CH4-7	CTH N Interchange
CH4-8	Church St
CH4-9	~ Mile Point 150
CH4-10	~ Mile Point 152
CH4-11	CTH B
CH4-12	USH 51 Interchange (Mile Point 156)
CH4-13	~ Mile Point 158
CH4-14	USH 51/STH 73 Interchange (Mile Point 160)
CH4-15	USH 51 (USH 151 to USH 12)

Map Legend

ITS Elements

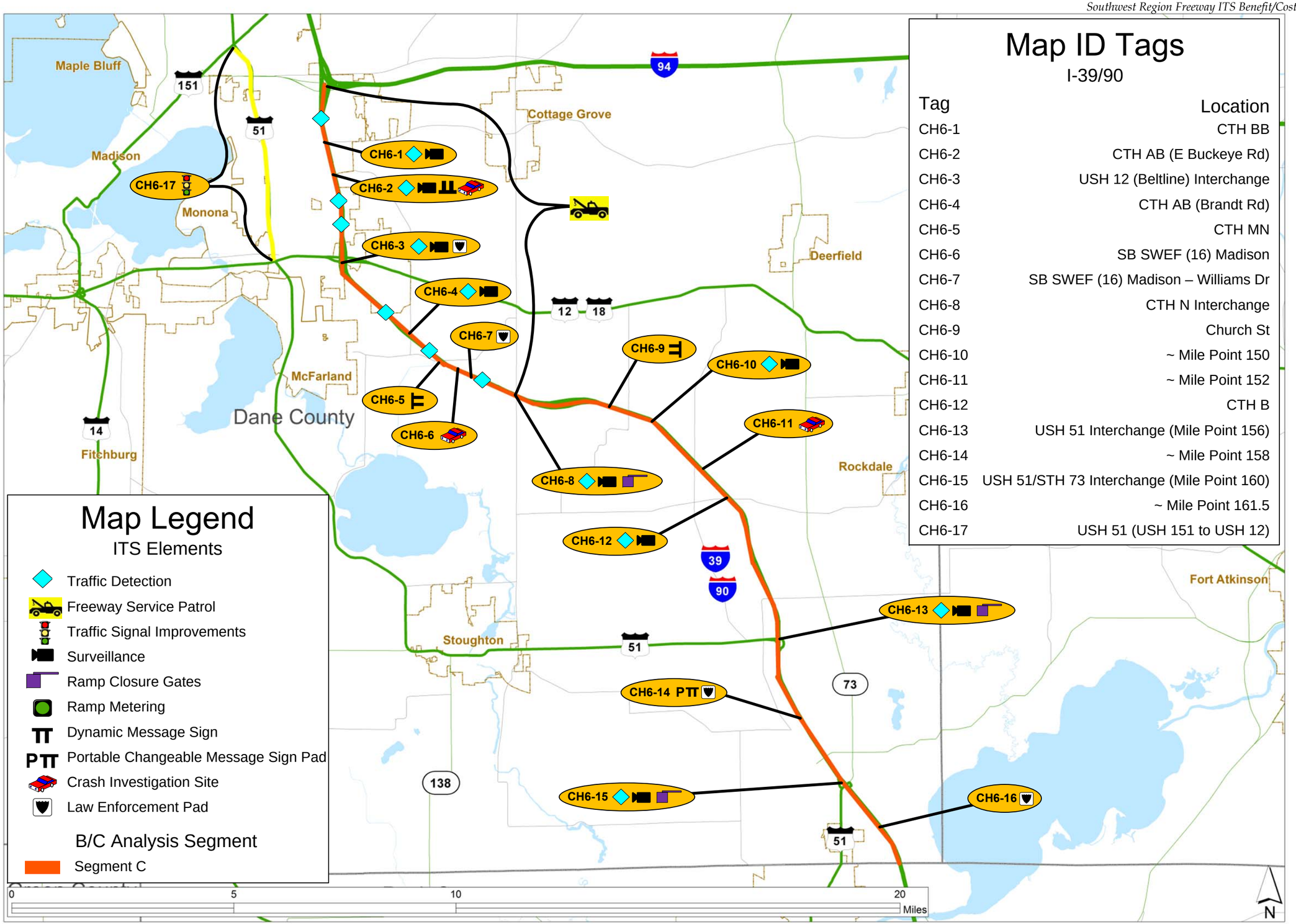
- Traffic Detection
- Freeway Service Patrol
- Traffic Signal Improvements
- Surveillance
- Ramp Closure Gates
- Ramp Metering
- Dynamic Message Sign
- Portable Changeable Message Sign Pad
- Crash Investigation Site
- Law Enforcement Pad

B/C Analysis Segment

- Segment C

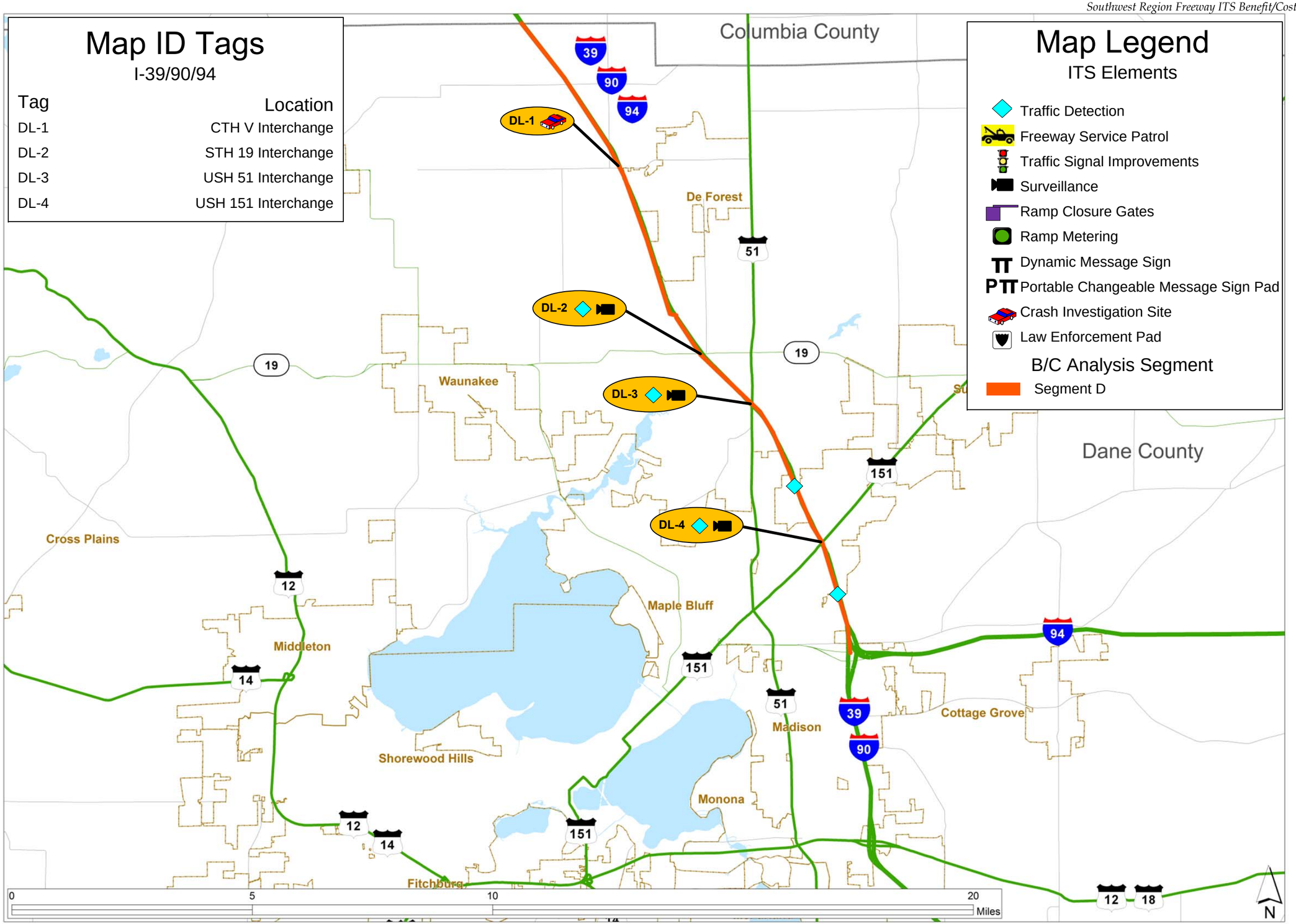
4-Lane Segment C (High ITS Deployment Intensity – Dane County Model)

Figure D.10



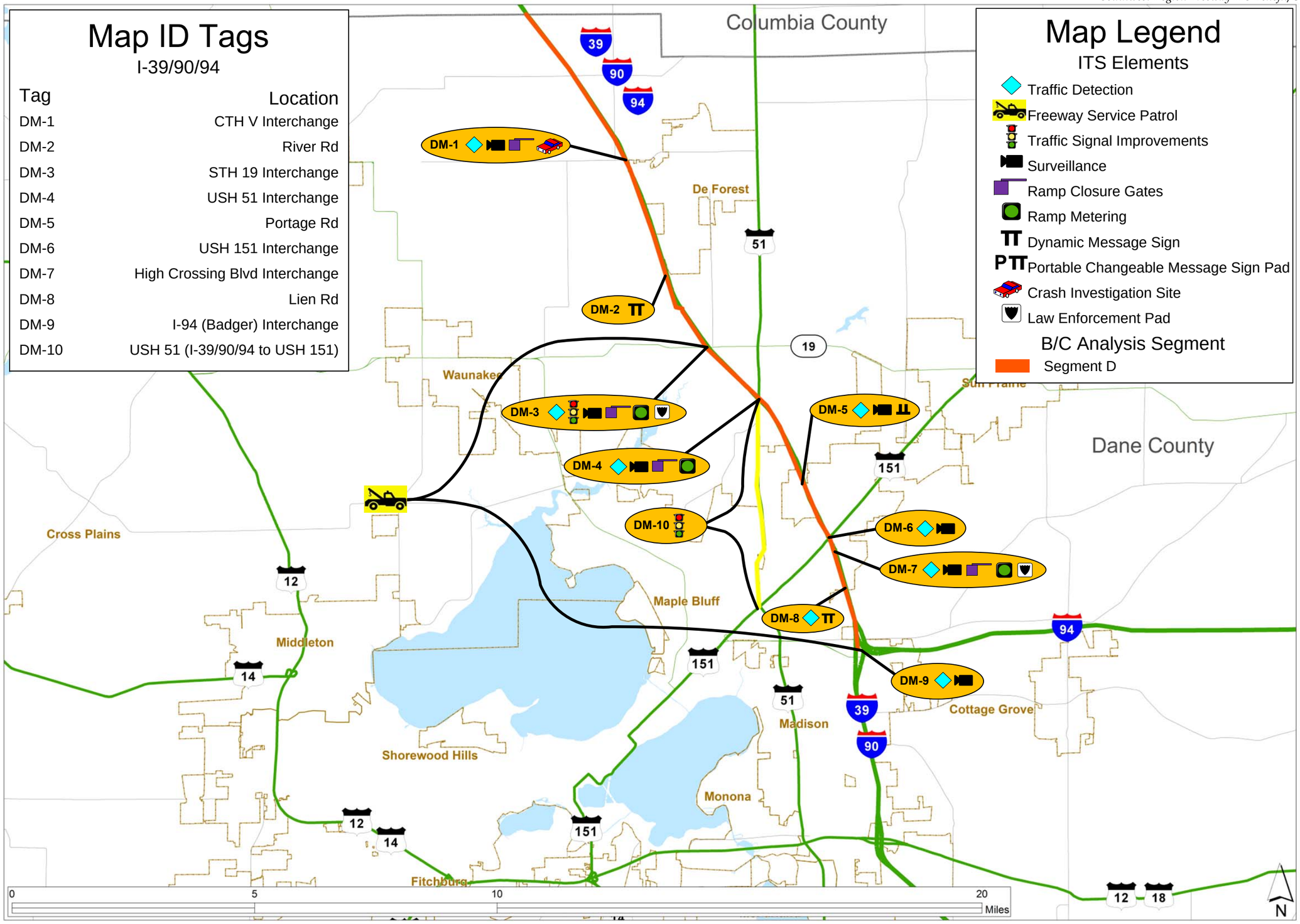
6-Lane Segment C (High ITS Deployment Intensity – Dane County Model)

Figure D.11



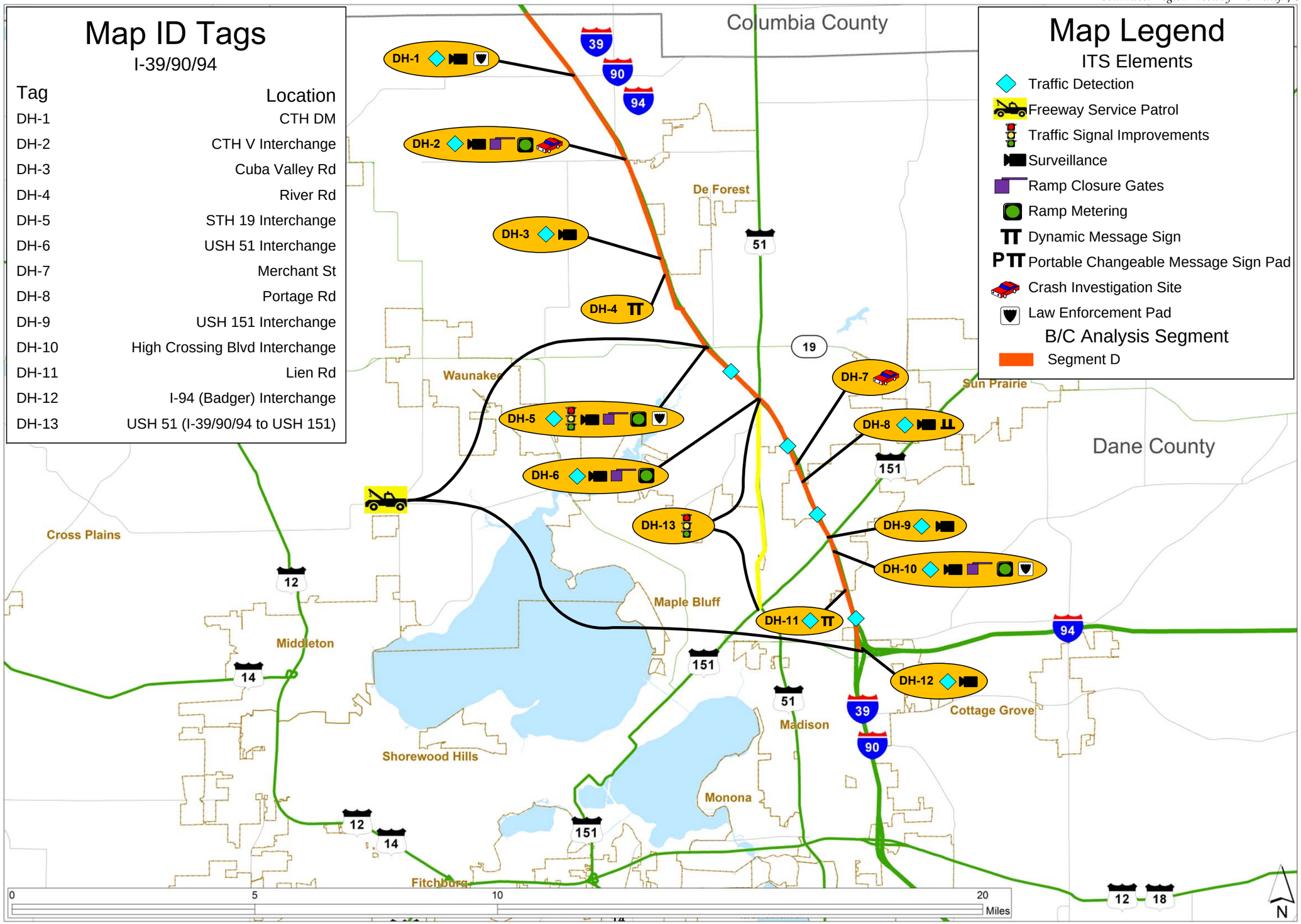
Segment D (Low ITS Deployment Intensity – Dane County Model)

Figure D.12



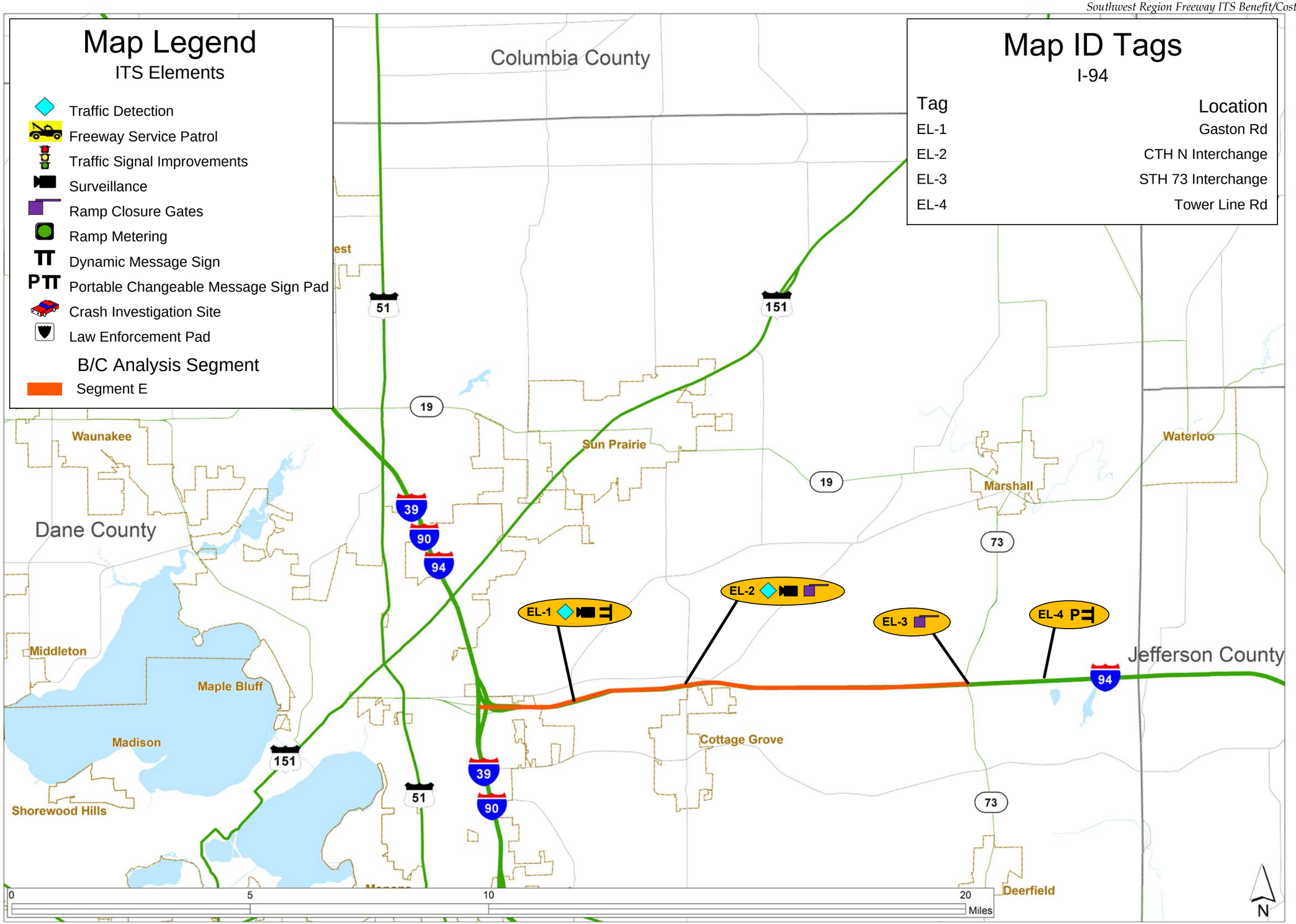
Segment D (Medium ITS Deployment Intensity (TOIP Based) – Dane County Model)

Figure D.13



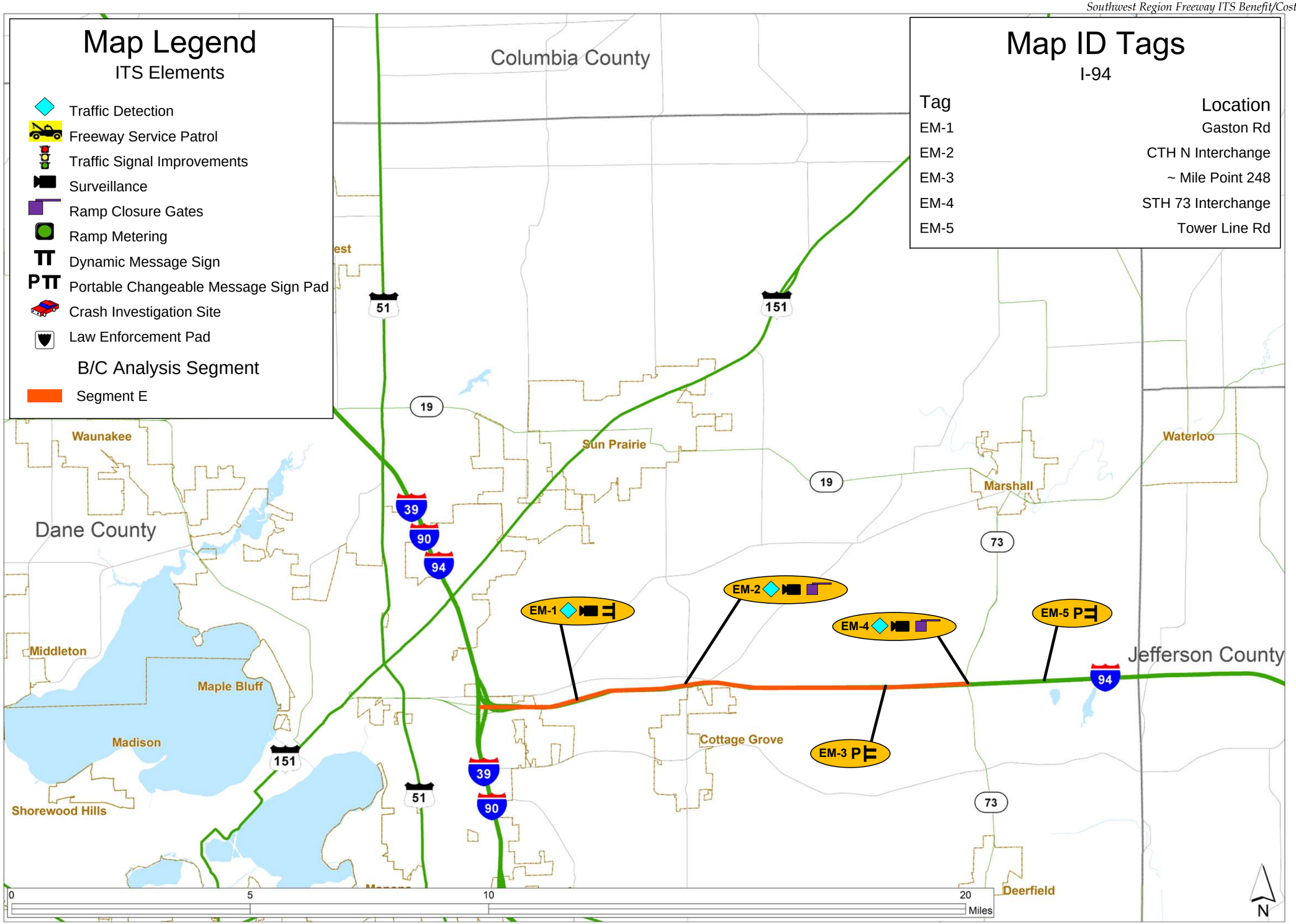
Segment D (High ITS Deployment Intensity – Dane County Model)

Figure D.14



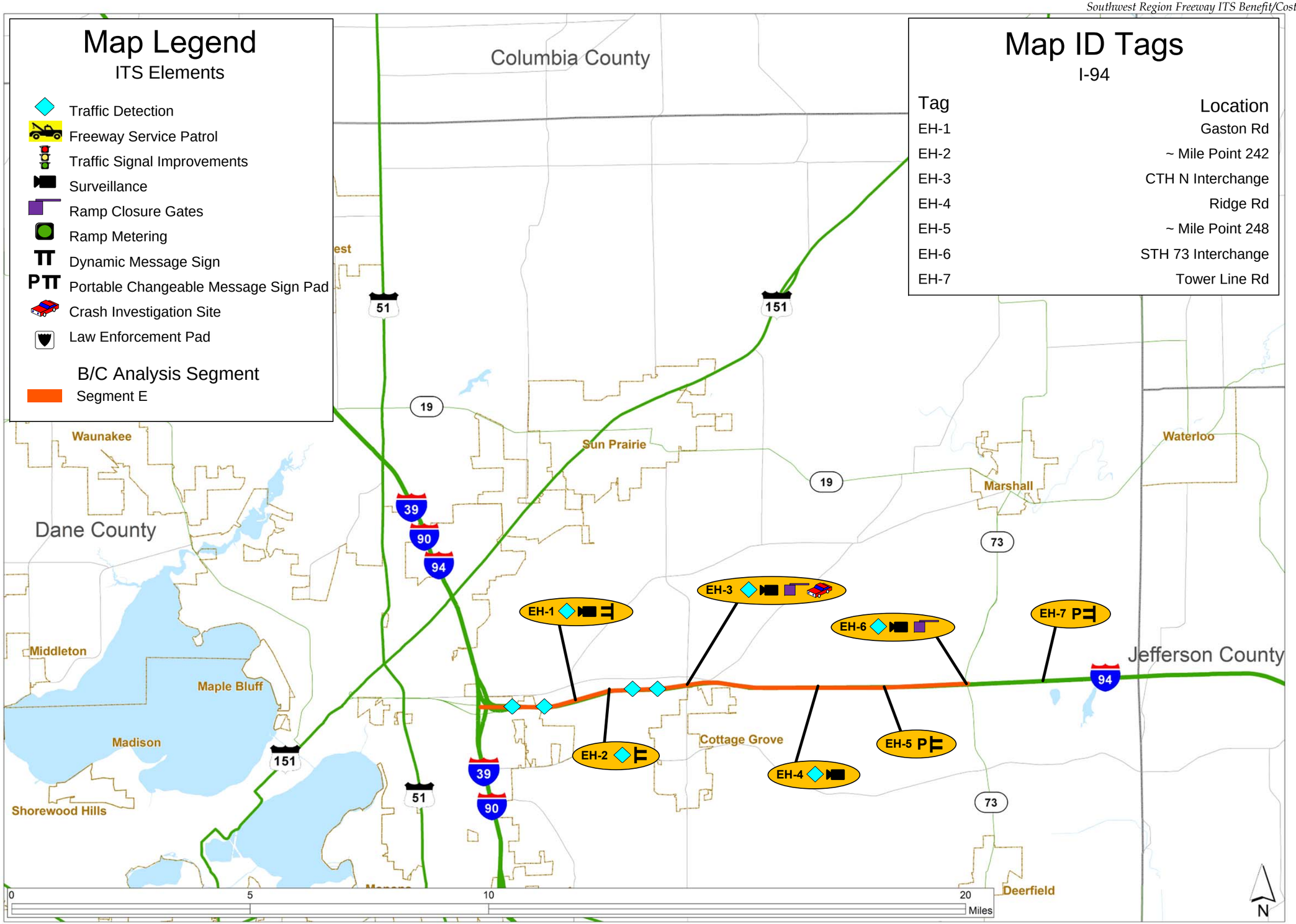
Segment E (Low ITS Deployment Intensity (TOIP Based) – Dane County Model)

Figure D.15



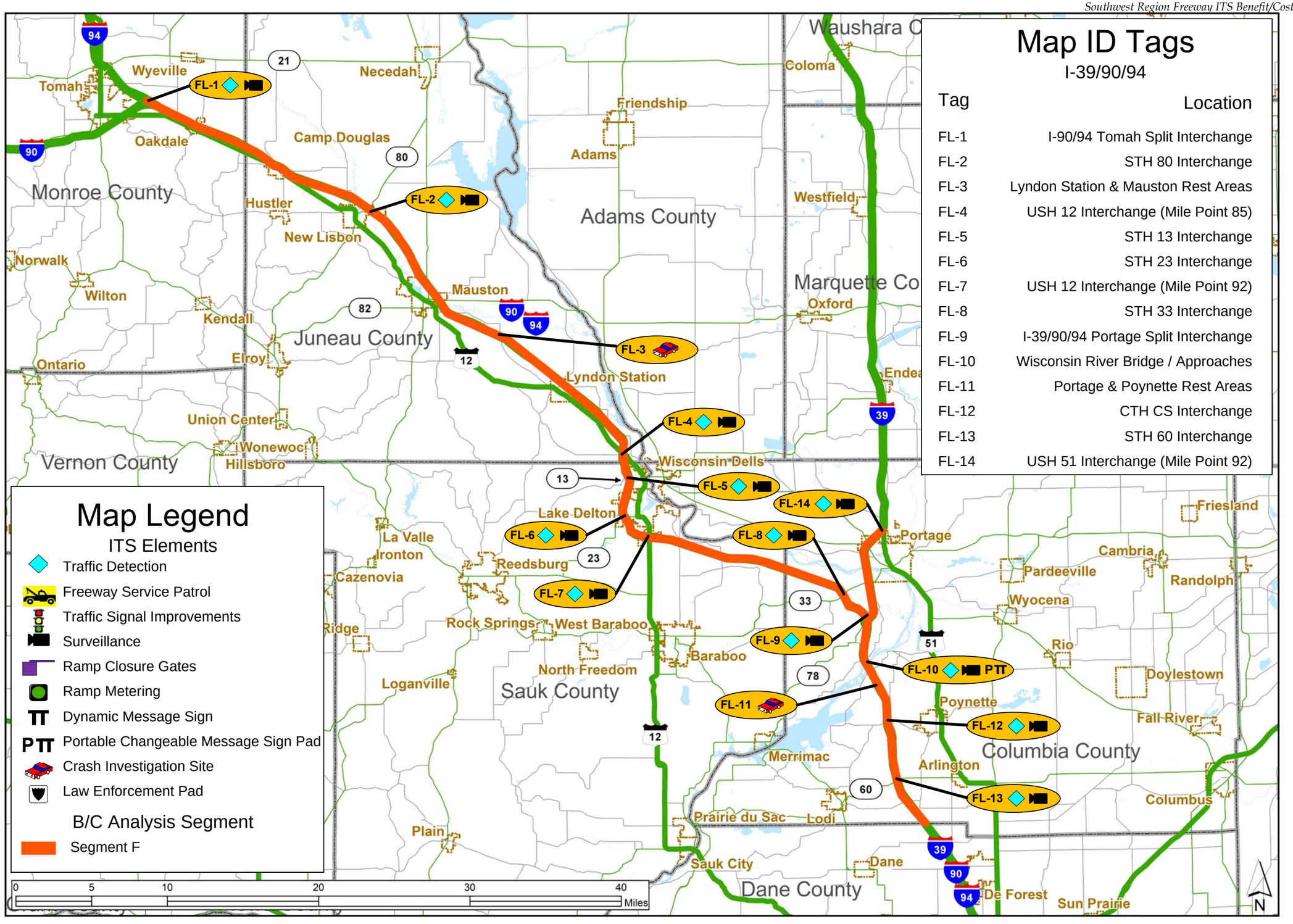
Segment E (Medium ITS Deployment Intensity – Dane County Model)

Figure D.16



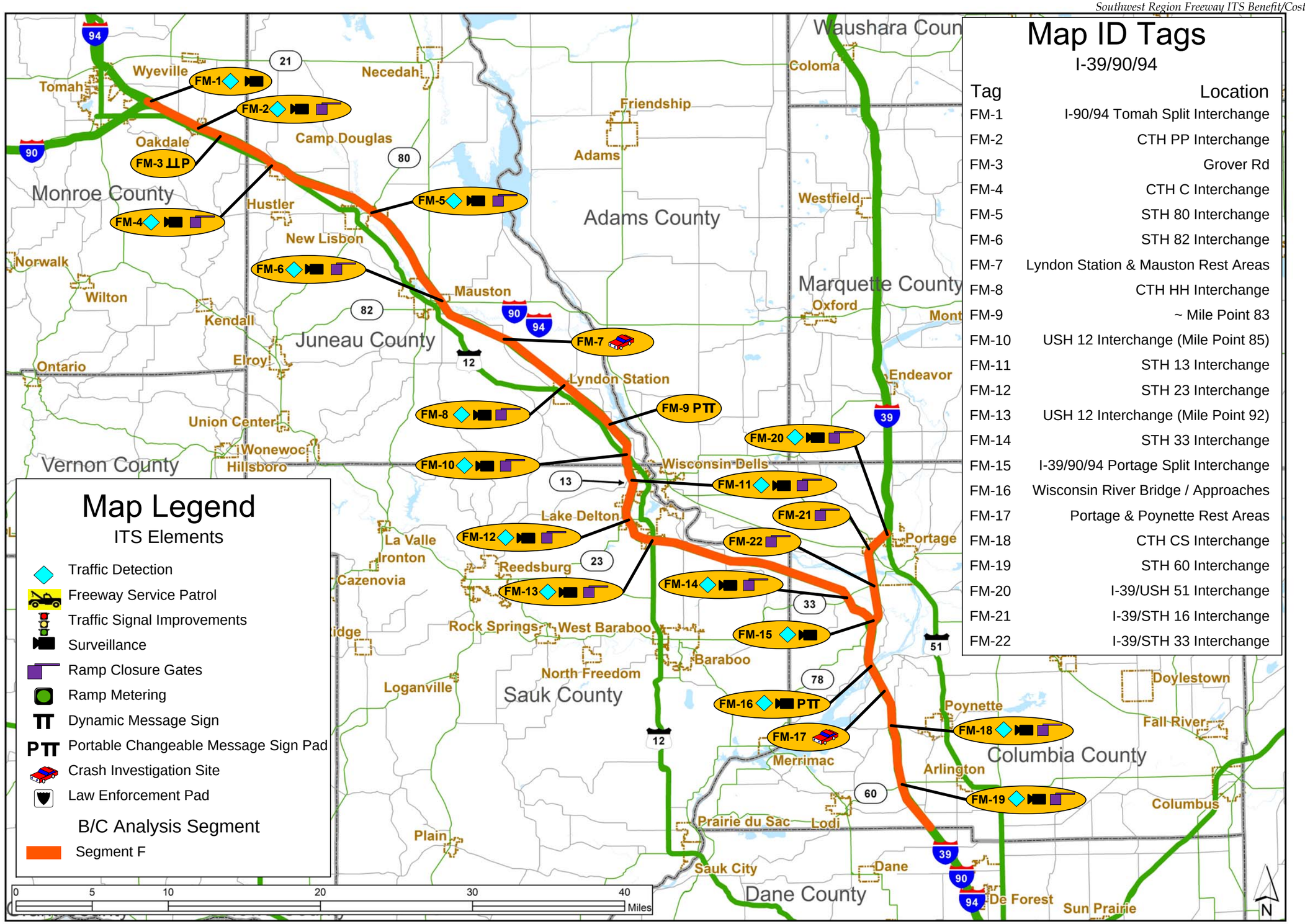
Segment E (High ITS Deployment Intensity – Dane County Model)

Figure D.17



Segment F (Low ITS Deployment Intensity - Statewide Model)

Figure D.18



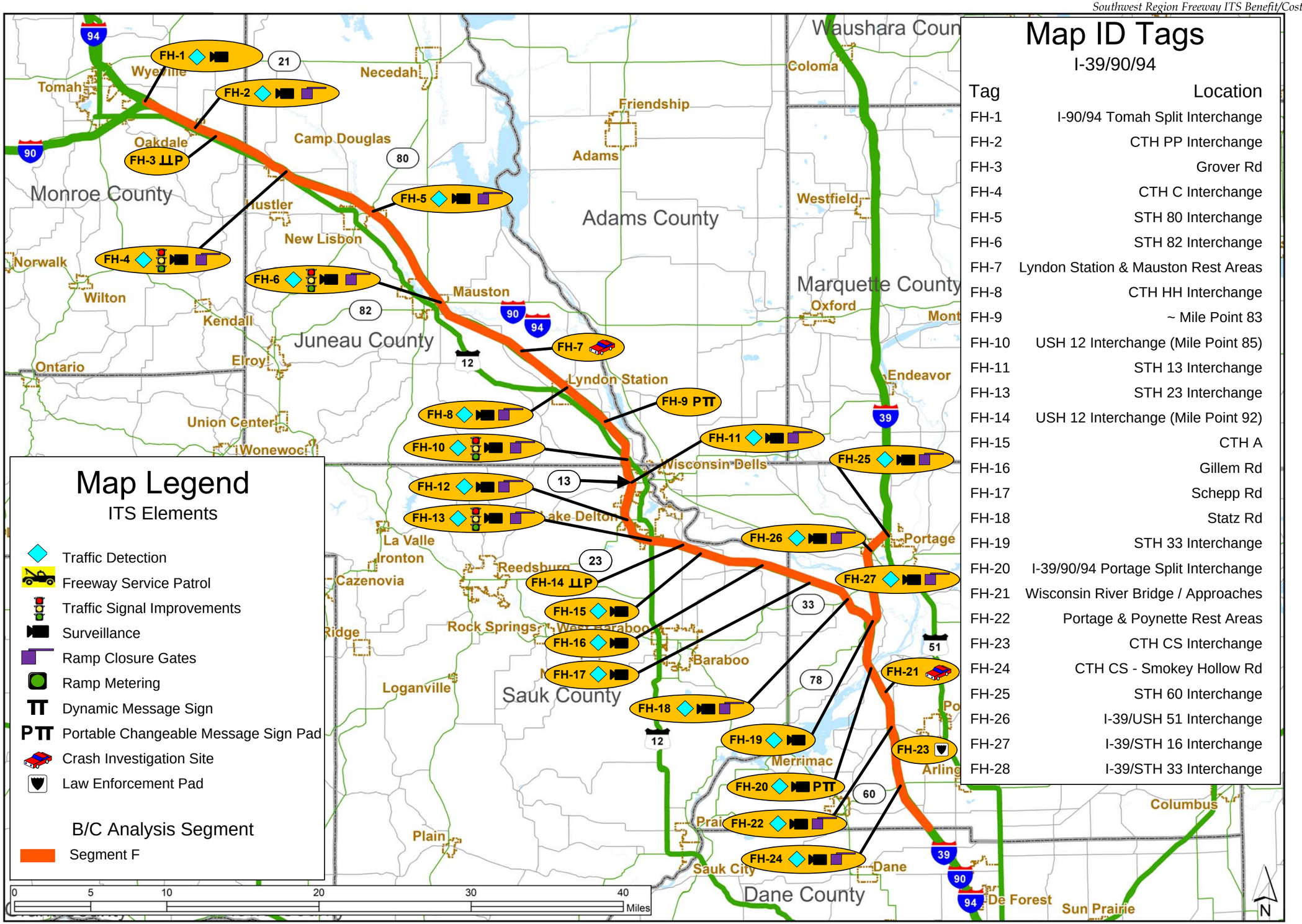
Map ID Tags

I-39/90/94

Tag	Location
FM-1	I-90/94 Tomah Split Interchange
FM-2	CTH PP Interchange
FM-3	Grover Rd
FM-4	CTH C Interchange
FM-5	STH 80 Interchange
FM-6	STH 82 Interchange
FM-7	Lyndon Station & Mauston Rest Areas
FM-8	CTH HH Interchange
FM-9	~ Mile Point 83
FM-10	USH 12 Interchange (Mile Point 85)
FM-11	STH 13 Interchange
FM-12	STH 23 Interchange
FM-13	USH 12 Interchange (Mile Point 92)
FM-14	STH 33 Interchange
FM-15	I-39/90/94 Portage Split Interchange
FM-16	Wisconsin River Bridge / Approaches
FM-17	Portage & Poynette Rest Areas
FM-18	CTH CS Interchange
FM-19	STH 60 Interchange
FM-20	I-39/USH 51 Interchange
FM-21	I-39/STH 16 Interchange
FM-22	I-39/STH 33 Interchange

Segment F (Medium ITS Deployment Intensity (TOIP Based) - Statewide Model)

Figure D.19



Segment F (High ITS Deployment Intensity – Statewide Model)

Figure D.20

E. ITS Elements Spreadsheets

Segment A - Low ITS Deployment Intensity

Approximate Corridor Capital Cost
$475,800
Approximate Corridor Annual O & M Cost
$23,780

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	AL-3	I-39/90	State Highway 26 Interchange	Existing	Mainline	$25,000	$800	
	AL-4	I-39/90	US Highway 14 Interchange	Existing	Mainline	$25,000	$800	
	AL-5	I-39/90	N Jct State Highway 11 (Racine St) Interchange	Existing	Mainline	$25,000	$800	
	AL-6	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	Existing	Mainline	$25,000	$800	
	AL-8	I-39/90	County Road S Interchange	Existing	Mainline	$25,000	$800	
	AL-9	I-39/90	Interstate 43 Interchange	Existing	Mainline	$25,000	$800	
	AL-11	I-39/90	State Line Rd	Existing	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol						N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements							N/A	N/A	

Ramp Termini

Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
				N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	AL-3	I-39/90	State Highway 26 Interchange	Existing	$40,000	$2,300	
	AL-4	I-39/90	US Highway 14 Interchange	Existing	$40,000	$2,300	
	AL-5	I-39/90	N Jct State Highway 11 (Racine St) Interchange	Existing	$40,000	$2,300	
	AL-6	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	Existing	$40,000	$2,300	
	AL-8	I-39/90	County Road S Interchange	Existing	$40,000	$2,300	
	AL-9	I-39/90	Interstate 43 Interchange	Existing	$40,000	$2,300	
	AL-11	I-39/90	State Line Rd	Existing	$40,000	$2,300	

Onramp

ITS Element	Map ID	Roadway	At	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	AL-1	I-39/90	State Highway 59 Interchange	State Highway 59	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-1	I-39/90	State Highway 59 Interchange	State Highway 59	SB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-3	I-39/90	State Highway 26 Interchange	SB State Highway 26	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-3	I-39/90	State Highway 26 Interchange	NB State Highway 26	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-3	I-39/90	State Highway 26 Interchange	SB State Highway 26	SB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-3	I-39/90	State Highway 26 Interchange	NB State Highway 26	SB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-4	I-39/90	US Highway 14 Interchange	EB US Highway 14	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-4	I-39/90	US Highway 14 Interchange	WB US Highway 14	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-4	I-39/90	US Highway 14 Interchange	EB US Highway 14	SB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-4	I-39/90	US Highway 14 Interchange	WB US Highway 14	SB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-5	I-39/90	N Jct State Highway 11 (Racine St) Interchange	State Highway 11 (Racine Rd)	NB I-39/90	Existing	Type III Barricades	$1,300	$130	To be converted from a cloverleaf to diamond interchange
	AL-5	I-39/90	N Jct State Highway 11 (Racine St) Interchange	State Highway 11 (Racine Rd)	SB I-39/90	Existing	Type III Barricades	$1,300	$130	To be converted from a cloverleaf to diamond interchange
	AL-6	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	State Highway 11 (Avalon Rd)	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-6	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	State Highway 11 (Avalon Rd)	SB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-8	I-39/90	County Road S Interchange	County Road S	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	AL-8	I-39/90	County Road S Interchange	County Road S	SB I-39/90	Existing	Type III Barricades	$1,300	$130	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	AL-2	I-39/90	SB Rest Area (17) Janesville South of Manogue Rd	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	AL-7	I-39/90	NB SWEF (19) Beloit ~ Mile Marker 180	Existing SWEF	1		$0	$0	Could be signed as a designated CIS at minimal cost
	AL-10	I-39/90	NB Rest Area (22) Beloit Colley Rd	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-39/90	South of State Highway 59 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Knudsen Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of County Road M	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	Manogue Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Kennedy Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of State Highway 26 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of US Highway 14 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of US Highway 14 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of N Jct State Highway 11 (Racine St) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of N Jct State Highway 11 (Racine St) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of S Jct State Highway 11 (Avalon Rd) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of S Jct State Highway 11 (Avalon Rd) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	Sunny Lane Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of County Road S Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of County Road S Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Interstate 43 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of Interstate 43 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	State Line Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment A (TOIP Based) - Medium ITS Deployment Intensity

Approximate Corridor Capital Cost
$3,391,200
Approximate Corridor Annual O & M Cost
$235,770

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	AM-1	I-39/90	State Highway 59 Interchange	New	Mainline	$25,000	$800	
	AM-3	I-39/90	~ Mile Marker 166	New	Mainline	$25,000	$800	
	AM-5	I-39/90	State Highway 26 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	AM-6	I-39/90	US Highway 14 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	AM-7	I-39/90	Plymouth Ave	New	Mainline	$25,000	$800	
	AM-8	I-39/90	N Jct State Highway 11 (Racine St) Interchange	New	Diamond Interchange	$79,000	$2,500	To be converted from a cloverleaf to diamond interchange
	AM-10	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	New	Diamond Interchange	$79,000	$2,500	
	AM-15	I-39/90	County Road S Interchange	New	Diamond Interchange	$79,000	$2,500	
	AM-16	I-39/90	Interstate 43 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	AM-19	I-39/90	State Line Rd	Existing	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	I-39/90	State Highway 26 Interchange	Illinois State Line	New	$65,000	$101,400	Freeway Service Patrol costs may be established through a statewide contract

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	AM-9	State Highway 11	I-39/90	County Road J	1	Actuated signal operation at isolated signal.	$13,000	$600	
	AM-13	US Highway 51	Sunny Lane Rd		1	One (1) traffic signal controller upgrade. Actuated signal operation at isolated signal.	$21,000	$1,000	
	AM-17	State Highway 81	State Highway 213	I-39/90	12	Twelve (12) traffic signal controller upgrades. Interconnected signal operation with actuated movement (four (4) signals from Lee Lane east to I-39/I-90 - 0.65 mi.). Interconnected signal operation with actuated movements (two (2) signals from Liberty Avenue to Portland Avenue - 0.25 mi.). Actuated signal operation at isolated signals.	$327,000	$16,140	

Ramp Termini

Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
AM-6	I-39/90	US Highway 14	Provide communications link between ramp termini signal and operating agency.	$3,000	$400	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	AM-1	I-39/90	State Highway 59 Interchange	New	$40,000	$2,300	
	AM-3	I-39/90	~ Mile Marker 166	New	$40,000	$2,300	
	AM-5	I-39/90	State Highway 26 Interchange	Existing	$40,000	$2,300	
	AM-6	I-39/90	US Highway 14 Interchange	Existing	$40,000	$2,300	
	AM-7	I-39/90	Plymouth Ave	New	$40,000	$2,300	
	AM-8	I-39/90	N Jct State Highway 11 (Racine St) Interchange	Existing	$40,000	$2,300	
	AM-10	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	Existing	$40,000	$2,300	
	AM-15	I-39/90	County Road S Interchange	Existing	$40,000	$2,300	
	AM-16	I-39/90	Interstate 43 Interchange	Existing	$40,000	$2,300	
	AM-19	I-39/90	State Line Rd	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	AM-1	I-39/90	State Highway 59 Interchange	State Highway 59	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-1	I-39/90	State Highway 59 Interchange	State Highway 59	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-5	I-39/90	State Highway 26 Interchange	SB State Highway 26	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-5	I-39/90	State Highway 26 Interchange	NB State Highway 26	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-5	I-39/90	State Highway 26 Interchange	SB State Highway 26	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-5	I-39/90	State Highway 26 Interchange	NB State Highway 26	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-6	I-39/90	US Highway 14 Interchange	EB US Highway 14	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-6	I-39/90	US Highway 14 Interchange	WB US Highway 14	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-6	I-39/90	US Highway 14 Interchange	EB US Highway 14	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-6	I-39/90	US Highway 14 Interchange	WB US Highway 14	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-8	I-39/90	N Jct State Highway 11 (Racine St) Interchange	State Highway 11 (Racine Rd)	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	To be converted from a cloverleaf to diamond interchange
	AM-8	I-39/90	N Jct State Highway 11 (Racine St) Interchange	State Highway 11 (Racine Rd)	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	To be converted from a cloverleaf to diamond interchange
	AM-10	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	State Highway 11 (Avalon Rd)	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-10	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	State Highway 11 (Avalon Rd)	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-15	I-39/90	County Road S Interchange	County Road S	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AM-15	I-39/90	County Road S Interchange	County Road S	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	AM-2	I-39/90 NB	E Knudsen Rd	New	$32,000	$3,200	
	AM-11	I-39/90 NB	1-2 Miles prior to S Jct State Highway 11 (Avalon Rd) Interchange The PDMS would be placed in the vicinity of Woodman Rd	New	$32,000	$3,200	
	AM-14	I-39/90 SB	1-2 Miles prior to County Road S Interchange The PDMS would be placed in the vicinity of L-T Town Line Rd	New	$32,000	$3,200	
					$96,000	$9,600	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	AM-4	I-39/90	SB Rest Area (17) Janesville South of Manogue Rd	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	AM-12	I-39/90	NB SWEF (19) Beloit ~ Mile Marker 180	Existing SWEF	1		$0	$0	Could be signed as a designated CIS at minimal cost
	AM-18	I-39/90	NB Rest Area (22) Beloit Colley Rd	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-39/90	South of State Highway 59 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Knudsen Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of County Road M	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	Manogue Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Kennedy Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of State Highway 26 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of US Highway 14 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of US Highway 14 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of N Jct State Highway 11 (Racine St) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of N Jct State Highway 11 (Racine St) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of S Jct State Highway 11 (Avalon Rd) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of S Jct State Highway 11 (Avalon Rd) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	Sunny Lane Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of County Road S Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of County Road S Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Interstate 43 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of Interstate 43 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	State Line Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications	N/A	I-39/90	North Rock County Line	South Rock County Line	25.3	New	$1,366,200	$27,830	Not shown on map

Segment A (4-Lane) - High ITS Deployment Intensity

Approximate Corridor Capital Cost
$4,487,200
Approximate Corridor Annual O & M Cost
$287,770

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
	AH4-1	I-39/90	State Highway 59 Interchange	New	Mainline	$25,000	$800	
	AH4-3	I-39/90	~ Mile Marker 166	New	Mainline	$25,000	$800	
	AH4-5	I-39/90	M-H Town Line Rd	New	Mainline	$25,000	$800	
	AH4-6	I-39/90	State Highway 26 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	AH4-7	I-39/90	US Highway 14 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	N/A	I-39/90	Randolph Road	New	Mainline	$25,000	$800	
	N/A	I-39/90	Mt Zion Ave	New	Mainline	$25,000	$800	
	AH4-8	I-39/90	Plymouth Ave	New	Mainline	$25,000	$800	
	N/A	I-39/90	Ruger Ave	New	Mainline	$25,000	$800	
	AH4-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	New	Diamond Interchange	$79,000	$2,500	To be converted from a cloverleaf to diamond interchange
	N/A	I-39/90	~ Mile Marker 175.5	New	Mainline	$25,000	$800	
Traffic Detection	N/A	I-39/90	~ Mile Marker 176	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 176.5	New	Mainline	$25,000	$800	
	AH4-11	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	New	Diamond Interchange	$79,000	$2,500	
	AH4-13	I-39/90	Sunny Lane Rd	New	Mainline	$25,000	$800	
	AH4-17	I-39/90	County Road S Interchange	New	Diamond Interchange	$79,000	$2,500	
	N/A	I-39/90	~ Mile Marker 183.5	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 184	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 184.5		Mainline	N/A	$800	
	AH4-18	I-39/90	Interstate 43 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	N/A	I-39/90	~ Mile Marker 185.5	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 186	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 186.5	New	Mainline	$25,000	$800	
	AH4-21	I-39/90	State Line Rd	Existing	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	I-39/90	State Highway 26 Interchange	Illinois State Line	New	$65,000	$101,400	Freeway Service Patrol costs may be established through a statewide contract

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
	AH4-10	State Highway 11	I-39/90	County Road J	1	Actuated signal operation at isolated signal.	$13,000	$600	
	AH4-15	US Highway 51	Sunny Lane Rd	Philhower Rd	1	One (1) traffic signal controller upgrade. Actuated signal operation at isolated signal.	$21,000	$1,000	
Traffic Signal Improvements	AH4-19	State Highway 81	State Highway 213	I-39/90	12	Twelve (12) traffic signal controller upgrades. Interconnected signal operation with actuated movement (four (4) signals from Lee Lane east to I-39/I-90 - 0.65 mi.). Interconnected signal operation with actuated movements (two (2) signals from Liberty Avenue to Portland Avenue - 0.25 mi.). Actuated signal operation at isolated signals.	$327,000	$16,140	

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
	AH4-6	I-39/90	State Highway 26	Install traffic signal at ramp termini intersection (if warranted). Provide communications link from ramp termini signal to operating agency.	$328,000	$16,400	
	AH4-7	I-39/90	US Highway 14	Provide communications link between ramp termini signal and operating agency.	$3,000	$400	
	AH4-11	I-39/90	S Jct State Highway 11 (Avalon Rd)	Install traffic signal at ramp termini intersection (if warranted). Provide communications link from ramp termini signal to operating agency.	$331,000	$16,600	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
	AH4-1	I-39/90	State Highway 59 Interchange	New	$40,000	$2,300	
	AH4-3	I-39/90	~ Mile Marker 166	New	$40,000	$2,300	
	AH4-5	I-39/90	M-H Town Line Rd	New	$40,000	$2,300	
	AH4-6	I-39/90	State Highway 26 Interchange	Existing	$40,000	$2,300	
	AH4-7	I-39/90	US Highway 14 Interchange	Existing	$40,000	$2,300	
CCTV Surveillance Camera	AH4-8	I-39/90	Plymouth Ave	New	$40,000	$2,300	
	AH4-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	Existing	$40,000	$2,300	
	AH4-11	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	Existing	$40,000	$2,300	
	AH4-13	I-39/90	Sunny Lane Rd	New	$40,000	$2,300	
	AH4-17	I-39/90	County Road S Interchange	Existing	$40,000	$2,300	
	AH4-18	I-39/90	Interstate 43 Interchange	Existing	$40,000	$2,300	
	AH4-21	I-39/90	State Line Rd	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
	AH4-1	I-39/90	State Highway 59 Interchange	State Highway 59	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-1	I-39/90	State Highway 59 Interchange	State Highway 59	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-6	I-39/90	State Highway 26 Interchange	SB State Highway 26	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-6	I-39/90	State Highway 26 Interchange	NB State Highway 26	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-6	I-39/90	State Highway 26 Interchange	SB State Highway 26	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-6	I-39/90	State Highway 26 Interchange	NB State Highway 26	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-7	I-39/90	US Highway 14 Interchange	EB US Highway 14	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-7	I-39/90	US Highway 14 Interchange	WB US Highway 14	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-7	I-39/90	US Highway 14 Interchange	EB US Highway 14	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
Ramp Closure Gates	AH4-7	I-39/90	US Highway 14 Interchange	WB US Highway 14	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	State Highway 11 (Racine Rd)	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	To be converted from a cloverleaf to diamond interchange
	AH4-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	State Highway 11 (Racine Rd)	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	To be converted from a cloverleaf to diamond interchange
	AH4-11	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	State Highway 11 (Avalon Rd)	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-11	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	State Highway 11 (Avalon Rd)	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-17	I-39/90	County Road S Interchange	County Road S	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH4-17	I-39/90	County Road S Interchange	County Road S	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	AH4-2	I-39/90 NB	E Knudsen Rd	New	$32,000	$3,200	
	AH4-12	I-39/90 NB	1-2 Miles prior to S Jct State Highway 11 (Avalon Rd) Interchange The PDMS would be placed in the vicinity of Woodman Rd	New	$32,000	$3,200	
	AH4-16	I-39/90 SB	1-2 Miles prior to County Road S Interchange The PDMS would be placed in the vicinity of L-T Town Line Rd	New	$32,000	$3,200	
	AH4-20	I-39/90 NB	NB Rest Area (22) Beloit Colley Rd	New	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	AH4-4	I-39/90	SB Rest Area (17) Janesville South of Manogue Rd	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	AH4-4	I-39/90	South of Manogue Rd	New	1		$0	$0	Along mainline outside shoulder on NB side, opposite SB rest stop, could potentially be used as a LEP as well Survey recommended
	AH4-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	New	1	1	$0	$0	Interchange to be converted to a diamond, opportunity for offramp CIS
	AH4-14	I-39/90	~ Mile Marker 180	New		1	$0	$0	Along mainline outside shoulder on SB side, opposite NB SWEF site, could potentially be used as a LEP as well Survey recommended
	AH4-14	I-39/90	NB SWEF (19) Beloit ~ Mile Marker 180	Existing SWEF	1		$0	$0	Could be signed as a designated CIS at minimal cost
	AH4-20	I-39/90	NB Rest Area (22) Beloit Colley Rd	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-39/90	South of State Highway 59 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Knudsen Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of County Road M	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	Manogue Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Kennedy Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of State Highway 26 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of US Highway 14 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of US Highway 14 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of N Jct State Highway 11 (Racine St) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of N Jct State Highway 11 (Racine St) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of S Jct State Highway 11 (Avalon Rd) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of S Jct State Highway 11 (Avalon Rd) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	Sunny Lane Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of County Road S Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of County Road S Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	North of Interstate 43 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	South of Interstate 43 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	State Line Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications	N/A	I-39/90	North Rock County Line	South Rock County Line	25.3	New	$1,366,200	$27,830	Not shown on map

Segment A (6-Lane) - High ITS Deployment Intensity

Approximate Corridor Capital Cost
$4,312,200
Approximate Corridor Annual O & M Cost
$281,370

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	AH6-1	I-39/90	State Highway 59 Interchange	New	Mainline	$25,000	$800	
	AH6-3	I-39/90	~ Mile Marker 166	New	Mainline	$25,000	$800	
	AH6-5	I-39/90	M-H Town Line Rd	New	Mainline	$25,000	$800	
	AH6-6	I-39/90	State Highway 26 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	AH6-7	I-39/90	US Highway 14 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	N/A	I-39/90	Randolph Road	New	Mainline	$25,000	$800	
	AH6-8	I-39/90	Plymouth Ave	New	Mainline	$25,000	$800	
	AH6-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	New	Diamond Interchange	$79,000	$2,500	To be converted from a cloverleaf to diamond interchange
	N/A	I-39/90	~ Mile Marker 176	New	Mainline	$25,000	$800	
	AH6-11	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	New	Diamond Interchange	$79,000	$2,500	
	AH6-13	I-39/90	Sunny Lane Rd	New	Mainline	$25,000	$800	
	AH6-17	I-39/90	County Road S Interchange	New	Diamond Interchange	$79,000	$2,500	
	N/A	I-39/90	~ Mile Marker 184	New	Mainline	$25,000	$800	
	AH6-18	I-39/90	Interstate 43 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	N/A	I-39/90	~ Mile Marker 186	New	Mainline	$25,000	$800	
	AH6-21	I-39/90	State Line Rd	Existing	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From		Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	I-39/90	State Highway 26 Interchange	Illinois State Line	New	$65,000	$101,400	Freeway Service Patrol costs may be established through a statewide contract

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	AH6-10	State Highway 11	I-39/90	County Road J	1	Actuated signal operation at isolated signal.	$13,000	$600	
	AH6-15	US Highway 51	Sunny Lane Rd	Philhower Rd	1	One (1) traffic signal controller upgrade. Actuated signal operation at isolated signal.	$21,000	$1,000	
	AH6-19	State Highway 81	State Highway 213	I-39/90	12	Twelve (12) traffic signal controller upgrades. Interconnected signal operation with actuated movement (four (4) signals from Lee Lane east to I-39/I-90 - 0.65 mi.). Interconnected signal operation with actuated movements (two (2) signals from Liberty Avenue to Portland Avenue - 0.25 mi.). Actuated signal operation at isolated signals.	$327,000	$16,140	

Ramp Termini

Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
AH6-6	I-39/90	State Highway 26	Install traffic signal at ramp termini intersection (if warranted). Provide communications link from ramp termini signal to operating agency.	$328,000	$16,400	
AH6-7	I-39/90	US Highway 14	Provide communications link between ramp termini signal and operating agency.	$3,000	$400	
AH6-11	I-39/90	S Jct State Highway 11 (Avalon Rd)	Install traffic signal at ramp termini intersection (if warranted). Provide communications link from ramp termini signal to operating agency.	$331,000	$16,600	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	AH6-1	I-39/90	State Highway 59 Interchange	New	$40,000	$2,300	
	AH6-3	I-39/90	~ Mile Marker 166	New	$40,000	$2,300	
	AH6-5	I-39/90	M-H Town Line Rd	New	$40,000	$2,300	
	AH6-6	I-39/90	State Highway 26 Interchange	Existing	$40,000	$2,300	
	AH6-7	I-39/90	US Highway 14 Interchange	Existing	$40,000	$2,300	
	AH6-8	I-39/90	Plymouth Ave	New	$40,000	$2,300	
	AH6-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	Existing	$40,000	$2,300	
	AH6-11	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	Existing	$40,000	$2,300	
	AH6-13	I-39/90	Sunny Lane Rd	New	$40,000	$2,300	
	AH6-17	I-39/90	County Road S Interchange	Existing	$40,000	$2,300	
	AH6-18	I-39/90	Interstate 43 Interchange	Existing	$40,000	$2,300	
	AH6-21	I-39/90	State Line Rd	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	AH6-1	I-39/90	State Highway 59 Interchange	State Highway 59	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-1	I-39/90	State Highway 59 Interchange	State Highway 59	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-6	I-39/90	State Highway 26 Interchange	SB State Highway 26	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-6	I-39/90	State Highway 26 Interchange	NB State Highway 26	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-6	I-39/90	State Highway 26 Interchange	SB State Highway 26	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-6	I-39/90	State Highway 26 Interchange	NB State Highway 26	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-7	I-39/90	US Highway 14 Interchange	EB US Highway 14	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-7	I-39/90	US Highway 14 Interchange	WB US Highway 14	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-7	I-39/90	US Highway 14 Interchange	EB US Highway 14	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-7	I-39/90	US Highway 14 Interchange	WB US Highway 14	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	State Highway 11 (Racine Rd)	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	To be converted from a cloverleaf to diamond interchange
	AH6-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	State Highway 11 (Racine Rd)	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	To be converted from a cloverleaf to diamond interchange
	AH6-11	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	State Highway 11 (Avalon Rd)	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-11	I-39/90	S Jct State Highway 11 (Avalon Rd) Interchange	State Highway 11 (Avalon Rd)	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-17	I-39/90	County Road S Interchange	County Road S	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	AH6-17	I-39/90	County Road S Interchange	County Road S	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	AH6-2	I-39/90 NB	E Knudsen Rd	New	$32,000	$3,200	
	AH6-12	I-39/90 NB	1-2 Miles prior to S Jct State Highway 11 (Avalon Rd) Interchange The PDMS would be placed in the vicinity of Woodman Rd	New	$32,000	$3,200	
	AH6-16	I-39/90 SB	1-2 Miles prior to County Road S Interchange The PDMS would be placed in the vicinity of L-T Town Line Rd	New	$32,000	$3,200	
	AH6-20	I-39/90 NB	NB Rest Area (22) Beloit Colley Rd	New	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
	AH6-4	I-39/90	SB Rest Area (17) Janesville South of Manogue Rd	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	AH6-4	I-39/90	South of Manogue Rd	New	1		$0	$0	Along mainline outside shoulder on NB side, opposite SB rest stop, could potentially be used as a LEP as well Survey recommended
Crash Investigation Site	AH6-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	New	1	1	$0	$0	Interchange to be converted to a diamond, opportunity for offramp CIS
	AH6-14	I-39/90	~ Mile Marker 180	New		1	$0	$0	Along mainline outside shoulder on SB side, opposite NB SWEF site, could potentially be used as a LEP as well Survey recommended
	AH6-14	I-39/90	NB SWEF (19) Beloit ~ Mile Marker 180	Existing SWEF	1		$0	$0	Could be signed as a designated CIS at minimal cost
	AH6-20	I-39/90	NB Rest Area (22) Beloit Colley Rd	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
	AH6-1	I-39/90	State Highway 59 Interchange	New	1	1		$0	$0	
	N/A	I-39/90	South of State Highway 59 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	North of Knudsen Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	North of County Road M	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	Manogue Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	AH6-4	I-39/90	SB Rest Area (17) Janesville South of Manogue Rd	New		1		$0	$0	Allow for LEP at existing rest stop
	N/A	I-39/90	North of Kennedy Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	North of State Highway 26 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	North of US Highway 14 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	South of US Highway 14 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	North of N Jct State Highway 11 (Racine St) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
Law Enforcement Pad	AH6-9	I-39/90	N Jct State Highway 11 (Racine St) Interchange	New	1	1		$0	$0	Interchange to be converted to a diamond, opportunity for onramp LEP
	N/A	I-39/90	South of N Jct State Highway 11 (Racine St) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	North of S Jct State Highway 11 (Avalon Rd) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	South of S Jct State Highway 11 (Avalon Rd) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	Sunny Lane Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	AH6-14	I-39/90	NB SWEF (19) Beloit ~ Mile Marker 180	New	1			$0	$0	Allow for LEP at existing SWEF
	N/A	I-39/90	North of County Road S Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	South of County Road S Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	North of Interstate 43 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	South of Interstate 43 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	N/A	I-39/90	State Line Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map. Median crossover may become too narrow to be a safe LEP location

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications	N/A	I-39/90	North Rock County Line	South Rock County Line	25.3	New	$1,366,200	$27,830	Not shown on map

Segment B - Low ITS Deployment Intensity

Approximate Corridor Capital Cost
$1,080,000
Approximate Corridor Annual O & M Cost
$165,500

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	N/A	USH 12 Beltline	Mineral Point Rd Interchange	Existing	Mainline	$25,000	$800	
	N/A	USH 12 Beltline	Gammon Rd Interchange	Existing	Mainline	$25,000	$800	
	BL-2	USH 12 Beltline	Whitney Way Interchange	Existing	Mainline	$25,000	$800	
	BL-3	USH 12 Beltline	Verona Rd Interchange	Existing	Mainline	$25,000	$800	
	BL-4	USH 12 Beltline	Seminole Hwy Interchange	Existing	Mainline	$25,000	$800	
	N/A	USH 12 Beltline	Landmark Pl	Existing	Mainline	$25,000	$800	
	BL-5	USH 12 Beltline	Todd Dr Interchange	Existing	Mainline	$25,000	$800	
	BL-6	USH 12 Beltline	Fish Hatchery Rd Interchange	Existing	Mainline	$25,000	$800	
	BL-7	USH 12 Beltline	Park St Interchange	Existing	Mainline	$25,000	$800	
	N/A	USH 12 Beltline	Rimrock Rd Interchange	Existing	Mainline	$25,000	$800	
	N/A	USH 12 Beltline	John Nolen Dr Interchange	Existing	Mainline	$25,000	$800	
	N/A	USH 12 Beltline	South Towne Dr Interchange	Existing	Mainline	$25,000	$800	
	BL-8	USH 12 Beltline	Monona Dr Interchange	Existing	Mainline	$25,000	$800	
	BL-9	USH 12 Beltline	Stoughton Rd Interchange	Existing	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	US 12 Beltline	Mineral Point Rd	I-39/90	Existing	$65,000	$101,400	Freeway Service Patrol costs may be established through a statewide contract

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements									

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	BL-2	USH 12 Beltline	Whitney Way Interchange	Existing	$40,000	$2,300	
	BL-3	USH 12 Beltline	Verona Rd Interchange	Existing	$40,000	$2,300	
	BL-4	USH 12 Beltline	Seminole Hwy Interchange	Existing	$40,000	$2,300	
	BL-5	USH 12 Beltline	Todd Dr Interchange	Existing	$40,000	$2,300	
	BL-6	USH 12 Beltline	Fish Hatchery Rd Interchange	Existing	$40,000	$2,300	
	BL-7	USH 12 Beltline	Park St Interchange	Existing	$40,000	$2,300	
	BL-8	USH 12 Beltline	Monona Dr Interchange	Existing	$40,000	$2,300	
	BL-9	USH 12 Beltline	Stoughton Rd Interchange	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates								N/A	N/A	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering	BL-2	USH 12 Beltline	Whitney Way	EB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BL-5	USH 12 Beltline	Todd Dr Interchange	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	
	BL-6	USH 12 Beltline	SB Fish Hatchery Rd	WB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BL-6	USH 12 Beltline	NB Fish Hatchery Rd	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	
	BL-7	USH 12 Beltline	SB Park St	WB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BL-7	USH 12 Beltline	NB Park St	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	WB CIS	EB CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	BL-1	US 12 Beltline	Parmenter St Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost
	BL-9	US 12 Beltline	Stoughton Rd Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	WB Onramp LEP	EB Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	US 12 Beltline	Forward Dr	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	BL-2	US 12 Beltline	Whitney Way	Existing Onramp LEP		1		$0	$0	
	BL-5	US 12 Beltline	Todd Dr Interchange	Existing Onramp LEP	1			$0	$0	
	BL-6	US 12 Beltline	Fish Hatchery Rd Interchange	Existing Onramp LEP	2			$0	$0	
	BL-7	US 12 Beltline	Park St Interchange	Existing Onramp LEP	2			$0	$0	
	N/A	US 12 Beltline	Agriculture Dr	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment B - Medium ITS Deployment Intensity

Approximate Corridor Capital Cost
$5,030,800
Approximate Corridor Annual O & M Cost
$457,970

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	BM-1	US 12 Beltline	Parmenter St Interchange	New	Mainline	$25,000	$800	
	BM-2	US 12 Beltline	Airport Rd Interchange	New	Mainline	$25,000	$800	
	BM-3	US 12 Beltline	University Ave Interchange	New	Mainline	$25,000	$800	Folded diamond interchange with extra off ramp to Parmenter St
	BM-5	US 12 Beltline	Greenway Blvd Interchange	New	Mainline	$25,000	$800	
	BM-6	US 12 Beltline	Old Sauk Rd Interchange	New	Mainline	$25,000	$800	
	BM-7	US 12 Beltline	Mineral Point Rd Interchange	Existing	Mainline	$25,000	$800	
	BM-8	US 12 Beltline	Gammon Rd Interchange	Existing	Mainline	$25,000	$800	
	BM-9	US 12 Beltline	Whitney Way Interchange	Existing	Mainline	$25,000	$800	
	BM-10	US 12 Beltline	Verona Rd Interchange	Existing	Mainline	$25,000	$800	
	BM-11	US 12 Beltline	Seminole Hwy Interchange	Existing	Mainline	$25,000	$800	1/2 diamond interchange
	N/A	US 12 Beltline	Landmark Pl	Existing	Mainline	$25,000	$800	
	BM-12	US 12 Beltline	Todd Dr Interchange	Existing	Mainline	$25,000	$800	
	BM-13	US 12 Beltline	Fish Hatchery Rd Interchange	Existing	Mainline	$25,000	$800	
	BM-14	US 12 Beltline	Park St Interchange	Existing	Mainline	$25,000	$800	
	BM-16	US 12 Beltline	Rimrock Rd Interchange	Existing	Mainline	$25,000	$800	
	BM-18	US 12 Beltline	John Nolen Dr Interchange	Existing	Mainline	$25,000	$800	2 fly under ramps
	BM-19	US 12 Beltline	South Towne Dr Interchange	Existing	Mainline	$25,000	$800	
	BM-20	US 12 Beltline	Monona Dr Interchange	Existing	Mainline	$25,000	$800	
	BM-21	US 12 Beltline	Stoughton Rd Interchange		Mainline	N/A	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	US 12 Beltline	Parmenter St	I-39/90	New	$65,000	$101,400	Freeway Service Patrol costs may be established through a statewide contract

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note

Ramp Termini

ITS Element	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	BM-2	US 12 Beltline	Airport Rd	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BM-3	US 12 Beltline	University Ave	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BM-5	US 12 Beltline	Greenway Blvd	One (1) traffic signal controller upgrade. Provide communication link to operating agency and State Traffic Operations Center.	$14,000	$800	
	BM-6	US 12 Beltline	Old Sauk Rd	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BM-7	US 12 Beltline	Mineral Point Rd	One (1) traffic signal controller upgrade. Provide communication link to operating agency and State Traffic Operations Center.	$14,000	$800	
	BM-8	US 12 Beltline	Gammon Rd	One (1) traffic signal controller upgrade. Provide communication link to operating agency and State Traffic Operations Center.	$14,000	$800	
	BM-9	US 12 Beltline	Whitney Way	One (1) traffic signal controller upgrade.	$8,000	$400	
	BM-10	US 12 Beltline	Verona Rd	One (1) traffic signal controller upgrade.	$8,000	$400	
	BM-11	US 12 Beltline	Seminole Hwy	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BM-12	US 12 Beltline	Todd Dr	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BM-14	US 12 Beltline	Park St	One (1) traffic signal controller upgrade.	$8,000	$400	
	BM-16	US 12 Beltline	Rimrock Rd	One (1) traffic signal controller upgrade.	$8,000	$400	
	BM-19	US 12 Beltline	South Towne Dr	One (1) traffic signal controller upgrade.	$8,000	$400	
	BM-20	US 12 Beltline	Monona Dr	One (1) traffic signal controller upgrade.	$8,000	$400	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	BM-1	US 12 Beltline	Parmenter St Interchange	New	$40,000	$2,300	
	BM-2	US 12 Beltline	Airport Rd Interchange	New	$40,000	$2,300	
	BM-3	US 12 Beltline	University Ave Interchange	New	$40,000	$2,300	
	BM-5	US 12 Beltline	Greenway Blvd Interchange	New	$40,000	$2,300	
	BM-6	US 12 Beltline	Old Sauk Rd Interchange	New	$40,000	$2,300	
	BM-7	US 12 Beltline	Mineral Point Rd Interchange	New	$40,000	$2,300	
	BM-8	US 12 Beltline	Gammon Rd Interchange	New	$40,000	$2,300	
	BM-9	US 12 Beltline	Whitney Way Interchange	Existing	$40,000	$2,300	
	BM-10	US 12 Beltline	Verona Rd Interchange	Existing	$40,000	$2,300	
	BM-11	US 12 Beltline	Seminole Hwy Interchange	Existing	$40,000	$2,300	
	BM-12	US 12 Beltline	Todd Dr Interchange	Existing	$40,000	$2,300	
	BM-13	US 12 Beltline	Fish Hatchery Rd Interchange	Existing	$40,000	$2,300	
	BM-14	US 12 Beltline	Park St Interchange	Existing	$40,000	$2,300	
	BM-17	US 12 Beltline	Badger Ln	New	$40,000	$2,300	
	BM-19	US 12 Beltline	South Towne Dr Interchange	New	$40,000	$2,300	
	BM-20	US 12 Beltline	Monona Dr Interchange	Existing	$40,000	$2,300	
	BM-21	US 12 Beltline	Stoughton Rd Interchange	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates								N/A	N/A	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering	BM-5	USH 12 Beltline	Greenway Blvd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-6	USH 12 Beltline	Old Sauk Rd	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-6	USH 12 Beltline	Old Sauk Rd	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-7	USH 12 Beltline	Mineral Point Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-7	USH 12 Beltline	Mineral Point Rd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-8	USH 12 Beltline	Gammon Rd	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-8	USH 12 Beltline	Gammon Rd	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-9	USH 12 Beltline	Whitney Way	EB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BM-9	USH 12 Beltline	Whitney Way	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-10	USH 12 Beltline	Verona Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-10	USH 12 Beltline	Verona Rd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-11	USH 12 Beltline	Seminole Hwy	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-12	USH 12 Beltline	Todd Dr	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-12	USH 12 Beltline	Todd Dr	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	
	BM-13	USH 12 Beltline	SB Fish Hatchery Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-13	USH 12 Beltline	NB Fish Hatchery Rd	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-13	USH 12 Beltline	SB Fish Hatchery Rd	WB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BM-13	USH 12 Beltline	NB Fish Hatchery Rd	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	
	BM-14	USH 12 Beltline	SB Park St	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-14	USH 12 Beltline	NB Park St	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-14	USH 12 Beltline	SB Park St	WB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BM-14	USH 12 Beltline	NB Park St	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	
	BM-16	USH 12 Beltline	Rimrock Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-16	USH 12 Beltline	Rimrock Rd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-18	USH 12 Beltline	John Nolen Dr	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-18	USH 12 Beltline	John Nolen Dr	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-19	USH 12 Beltline	South Towne Dr	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-19	USH 12 Beltline	South Towne Dr	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BM-20	USH 12 Beltline	Monona Dr	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-20	USH 12 Beltline	Monona Dr	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BM-21	USH 12 Beltline	Stoughton Rd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	BM-4	US 12 Beltline EB	Terrace Ave	New	$197,000	$19,700	
	N/A	Verona Rd NB	1-2 Miles prior to McKee Rd (potential future interchange) The PDMS would be placed in the vicinity of Mile Marker 82	New	N/A	N/A	Location recommended by WisDOT SW Region DMS not included in analysis
	BM-11	US 12 Beltline EB	Seminole Hwy	New	$197,000	$19,700	
	BM-15	US 12 Beltline WB	Rusk Ave	New	$197,000	$19,700	
	BM-20	US 12 Beltline EB	Monona Dr	New	$197,000	$19,700	
	BM-22	US 12 Beltline WB	Agriculture Dr	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	WB CIS	EB CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	BM-1	US 12 Beltline	Parmenter St Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost
	BM-21	US 12 Beltline	Stoughton Rd Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	WB Onramp LEP	EB Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	BM-6	US 12 Beltline	Old Sauk Rd Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BM-8	US 12 Beltline	Gammon Rd Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	N/A	US 12 Beltline	Forward Dr	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	BM-9	US 12 Beltline	Whitney Way Interchange	Existing Onramp LEP		1		$0	$0	
	BM-9	US 12 Beltline	Whitney Way Interchange	New	1			$0	$0	Onramp LEP coincides with proposed HOV lane
	BM-11	US 12 Beltline	Seminole Hwy Interchange	New		1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BM-12	US 12 Beltline	Todd Dr Interchange	Existing Onramp LEP	1			$0	$0	
	BM-13	US 12 Beltline	Fish Hatchery Rd Interchange	New		1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BM-13	US 12 Beltline	Fish Hatchery Rd Interchange	Existing Onramp LEP	2			$0	$0	
	BM-14	US 12 Beltline	Park St Interchange	New		1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BM-14	US 12 Beltline	Park St Interchange	Existing Onramp LEP	2			$0	$0	
	BM-18	US 12 Beltline	John Nolen Dr Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BM-20	US 12 Beltline	Monona Dr Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	N/A	US 12 Beltline	Agriculture Dr	Existing Paved Median Crossover			1	$0	$0	Not shown on map

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications	N/A	US 12 Beltline	Parmenter St Interchange	I-39/90 Interchange	17.7	New	$955,800	$19,470	Not shown on map

Segment B (TOIP Based) - High ITS Deployment Intensity

Approximate Corridor Capital Cost
$6,163,800
Approximate Corridor Annual O & M Cost
$536,070

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
	BH-1	US 12 Beltline	Parmenter St Interchange	New	Mainline	$25,000	$800	
	N/A	US 12 Beltline	Springton Dr	New	Mainline	$25,000	$800	
	BH-2	US 12 Beltline	Airport Rd Interchange	New	Mainline	$25,000	$800	
	N/A	US 12 Beltline	Donna Dr	New	Mainline	$25,000	$800	
	BH-3	US 12 Beltline	University Ave Interchange	New	Mainline	$25,000	$800	Folded diamond interchange with extra off ramp to Parmenter St
	BH-5	US 12 Beltline	Greenway Blvd Interchange	New	Mainline	$25,000	$800	
	N/A	US 12 Beltline	Boothbay Circle	New	Mainline	$25,000	$800	
	BH-6	US 12 Beltline	Old Sauk Rd Interchange	New	Mainline	$25,000	$800	
	N/A	US 12 Beltline	Brule St	New	Mainline	$25,000	$800	
	BH-7	US 12 Beltline	Mineral Point Rd Interchange	Existing	Mainline	$25,000	$800	
	N/A	US 12 Beltline	Zor Shrine Pl	New	Mainline	$25,000	$800	
	BH-8	US 12 Beltline	Gammon Rd Interchange	Existing	Mainline	$25,000	$800	
	N/A	US 12 Beltline	Yellowstone Dr	New	Mainline	$25,000	$800	
	BH-9	US 12 Beltline	Tokay Blvd	New	Mainline	$25,000	$800	
Traffic Detection	BH-10	US 12 Beltline	Whitney Way Interchange	Existing	Mainline	$25,000	$800	
	N/A	US 12 Beltline	Whitcomb Dr	New	Mainline	$25,000	$800	
	BH-11	US 12 Beltline	Verona Rd Interchange	Existing	Mainline	$25,000	$800	
	BH-12	US 12 Beltline	Seminole Hwy Interchange	Existing	Mainline	$25,000	$800	1/2 diamond interchange
	N/A	US 12 Beltline	Landmark Pl		Mainline	N/A	$800	
	BH-13	US 12 Beltline	Todd Dr Interchange	Existing	Mainline	$25,000	$800	
	BH-14	US 12 Beltline	Fish Hatchery Rd Interchange	Existing	Mainline	$25,000	$800	
	BH-15	US 12 Beltline	Park St Interchange	Existing	Mainline	$25,000	$800	
	BH-17	US 12 Beltline	Rimrock Rd Interchange	Existing	Mainline	$25,000	$800	
	BH-19	US 12 Beltline	John Nolen Dr Interchange	Existing	Mainline	$25,000	$800	2 fly under ramps
	BH-20	US 12 Beltline	South Towne Dr Interchange	Existing	Mainline	$25,000	$800	
	N/A	US 12 Beltline	~ Mile Marker 264.5	New	Mainline	$25,000	$800	
	BH-21	US 12 Beltline	Monona Dr Interchange	Existing	Mainline	$25,000	$800	
	N/A	US 12 Beltline	Edna Taylor Pkwy	New	Mainline	$25,000	$800	
	BH-22	US 12 Beltline	Stoughton Rd Interchange	Existing	Mainline	$25,000	$800	
	BH-23	US 12 Beltline	Agriculture Dr	New	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	US 12 Beltline	Parmenter St	I-39/90	New	$65,000	$101,400	Freeway Service Patrol costs may be established through a statewide contract

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
	BH-1	US 12 Beltline	Parmenter St	Install traffic signal at ramp termini intersection (if warranted). Provide communication link to operating agency and State Traffic Operations Center.	$331,000	$16,600	
	BH-2	US 12 Beltline	Airport Rd	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BH-3	US 12 Beltline	University Ave	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BH-5	US 12 Beltline	Greenway Blvd	One (1) traffic signal controller upgrade. Provide communication link to operating agency and State Traffic Operations Center.	$14,000	$800	
	BH-6	US 12 Beltline	Old Sauk Rd	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
Traffic Signal Improvements	BH-7	US 12 Beltline	Mineral Point Rd	One (1) traffic signal controller upgrade. Provide communication link to operating agency and State Traffic Operations Center.	$14,000	$800	
	BH-8	US 12 Beltline	Gammon Rd	One (1) traffic signal controller upgrade. Provide communication link to operating agency and State Traffic Operations Center.	$14,000	$800	
	BH-10	US 12 Beltline	Whitney Way	One (1) traffic signal controller upgrade.	$8,000	$400	
	BH-11	US 12 Beltline	Verona Rd	One (1) traffic signal controller upgrade.	$8,000	$400	
	BH-12	US 12 Beltline	Seminole Hwy	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BH-13	US 12 Beltline	Todd Dr	Provide communication link to operating agency and State Traffic Operations Center.	$6,000	$400	
	BH-15	US 12 Beltline	Park St	One (1) traffic signal controller upgrade.	$8,000	$400	
	BH-17	US 12 Beltline	Rimrock Rd	One (1) traffic signal controller upgrade.	$8,000	$400	
	BH-20	US 12 Beltline	South Towne Dr	One (1) traffic signal controller upgrade.	$8,000	$400	
	BH-21	US 12 Beltline	Monona Dr	One (1) traffic signal controller upgrade.	$8,000	$400	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
	BH-1	US 12 Beltline	Parmenter St Interchange	New	$40,000	$2,300	
	BH-2	US 12 Beltline	Airport Rd Interchange	New	$40,000	$2,300	
	BH-3	US 12 Beltline	University Ave Interchange	New	$40,000	$2,300	
	BH-5	US 12 Beltline	Greenway Blvd Interchange	New	$40,000	$2,300	
	BH-6	US 12 Beltline	Old Sauk Rd Interchange	New	$40,000	$2,300	
	BH-7	US 12 Beltline	Mineral Point Rd Interchange	New	$40,000	$2,300	
	BH-8	US 12 Beltline	Gammon Rd Interchange	New	$40,000	$2,300	
	BH-10	US 12 Beltline	Whitney Way Interchange	Existing	$40,000	$2,300	
CCTV Surveillance Camera	BH-11	US 12 Beltline	Verona Rd Interchange	Existing	$40,000	$2,300	
	BH-12	US 12 Beltline	Seminole Hwy Interchange	Existing	$40,000	$2,300	
	BH-13	US 12 Beltline	Todd Dr Interchange	Existing	$40,000	$2,300	
	BH-14	US 12 Beltline	Fish Hatchery Rd Interchange	Existing	$40,000	$2,300	
	BH-15	US 12 Beltline	Park St Interchange	Existing	$40,000	$2,300	
	BH-18	US 12 Beltline	Badger Ln	New	$40,000	$2,300	
	BH-20	US 12 Beltline	South Towne Dr Interchange	New	$40,000	$2,300	
	BH-21	US 12 Beltline	Monona Dr Interchange	Existing	$40,000	$2,300	
	BH-22	US 12 Beltline	Stoughton Rd Interchange	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates								N/A	N/A	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering	BH-1	USH 12 Beltline	Parmenter St	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-2	USH 12 Beltline	Airport Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-3	USH 12 Beltline	University Ave	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-3	USH 12 Beltline	University Ave	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-5	USH 12 Beltline	Greenway Blvd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-5	USH 12 Beltline	Greenway Blvd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-6	USH 12 Beltline	Old Sauk Rd	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-6	USH 12 Beltline	Old Sauk Rd	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-7	USH 12 Beltline	Mineral Point Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-7	USH 12 Beltline	Mineral Point Rd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-8	USH 12 Beltline	Gammon Rd	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-8	USH 12 Beltline	Gammon Rd	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-10	USH 12 Beltline	Whitney Way	EB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BH-10	USH 12 Beltline	Whitney Way	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-11	USH 12 Beltline	Verona Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-11	USH 12 Beltline	Verona Rd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-12	USH 12 Beltline	Seminole Hwy	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-13	USH 12 Beltline	Todd Dr	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-13	USH 12 Beltline	Todd Dr	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	
	BH-14	USH 12 Beltline	SB Fish Hatchery Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-14	USH 12 Beltline	NB Fish Hatchery Rd	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-14	USH 12 Beltline	SB Fish Hatchery Rd	WB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BH-14	USH 12 Beltline	NB Fish Hatchery Rd	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	
	BH-15	USH 12 Beltline	SB Park St	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-15	USH 12 Beltline	NB Park St	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-15	USH 12 Beltline	SB Park St	WB USH 12 Beltline	Existing	Ramp Meter with HOV	$65,000	$6,500	
	BH-15	USH 12 Beltline	NB Park St	WB USH 12 Beltline	Existing	Ramp Meter	$50,000	$5,000	
	BH-17	USH 12 Beltline	Rimrock Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-17	USH 12 Beltline	Rimrock Rd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-19	USH 12 Beltline	John Nolen Dr	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-19	USH 12 Beltline	John Nolen Dr	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-20	USH 12 Beltline	South Towne Dr	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-20	USH 12 Beltline	South Towne Dr	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-21	USH 12 Beltline	Monona Dr	EB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-21	USH 12 Beltline	Monona Dr	WB USH 12 Beltline	New	Ramp Meter with HOV	$65,000	$6,500	
	BH-22	USH 12 Beltline	Stoughton Rd	EB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	
	BH-22	USH 12 Beltline	Stoughton Rd	WB USH 12 Beltline	New	Ramp Meter	$50,000	$5,000	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	BH-4	US 12 Beltline EB	Terrace Ave	New	$197,000	$19,700	
	BH-9	US 12 Beltline WB	Tokay Blvd	New	$197,000	$19,700	
	N/A	Verona Rd NB	1-2 Miles prior to McKee Rd (potential future interchange) The PDMS would be placed in the vicinity of Mile Marker 82	New	N/A	N/A	Location recommended by WisDOT SW Region DMS not included in analysis
	BH-12	US 12 Beltline EB	Seminole Hwy	New	$197,000	$19,700	
	BH-16	US 12 Beltline WB	Rusk Ave	New	$197,000	$19,700	
	BH-21	US 12 Beltline EB	Monona Dr	New	$197,000	$19,700	
	BH-23	US 12 Beltline WB	Agriculture Dr	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	WB CIS	EB CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	BH-1	US 12 Beltline	Parmenter St Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost
	BH-7	US 12 Beltline	Mineral Point Rd Interchange	New	1	1	$0	$0	Offramp CIS
	BH-13	US 12 Beltline	Todd Dr Interchange	New	1	1	$0	$0	Offramp CIS
	BH-20	US 12 Beltline	South Towne Dr Interchange	New	1	1	$0	$0	Offramp CIS
	BH-22	US 12 Beltline	Stoughton Rd Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	WB Onramp LEP	EB Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	BH-3	US 12 Beltline	University Ave Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BH-6	US 12 Beltline	Old Sauk Rd Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BH-8	US 12 Beltline	Gammon Rd Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	N/A	US 12 Beltline	Forward Dr	Existing Paved Median Crossover			1	$0	$0	Not shown on map
	BH-10	US 12 Beltline	Whitney Way Interchange	Existing Onramp LEP		1		$0	$0	
	BH-10	US 12 Beltline	Whitney Way Interchange	New	1			$0	$0	Onramp LEP coincides with proposed HOV lane
	BH-12	US 12 Beltline	Seminole Hwy Interchange	New		1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BH-13	US 12 Beltline	Todd Dr Interchange	Existing Onramp LEP	1			$0	$0	
	BH-14	US 12 Beltline	Fish Hatchery Rd Interchange	New		1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BH-14	US 12 Beltline	Fish Hatchery Rd Interchange	Existing Onramp LEP	2			$0	$0	
	BH-15	US 12 Beltline	Park St Interchange	New		1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BH-15	US 12 Beltline	Park St Interchange	Existing Onramp LEP	2			$0	$0	
	BH-19	US 12 Beltline	John Nolen Dr Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	BH-21	US 12 Beltline	Monona Dr Interchange	New	1	1		$0	$0	Onramp LEP coincides with proposed HOV lane
	N/A	US 12 Beltline	Agriculture Dr	Existing Paved Median Crossover			1	$0	$0	Not shown on map

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications	N/A	US 12 Beltline	Parmenter St Interchange	I-39/90 Interchange	17.7	New	$955,800	$19,470	Not shown on map

Segment C - Low ITS Deployment Intensity

Approximate Corridor Capital Cost
$277,800
Approximate Corridor Annual O & M Cost
$12,480

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	N/A	I-39/90	Spicebush Ln	Existing	Mainline	$25,000	$800	
	CL-1	I-39/90	County Road BB	Existing	Mainline	$25,000	$800	
	CL-2	I-39/90	County Road AB (E Buckeye Rd)	Existing	Mainline	$25,000	$800	
	N/A	I-39/90	Oxbow Ct	Existing	Mainline	$25,000	$800	
	N/A	I-39/90	World Dairy Dr	Existing	Mainline	$25,000	$800	
	CL-3	I-39/90	US Highway 12 (Beltline) Interchange	Existing	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol						N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements									

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At		Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	CL-1	I-39/90	County Road BB	Existing	$40,000	$2,300	
	CL-2	I-39/90	County Road AB (E Buckeye Rd)	Existing	$40,000	$2,300	
	CL-3	I-39/90	US Highway 12 (Beltline) Interchange	Existing	$40,000	$2,300	

Onramp

ITS Element	Map ID	Roadway	At	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	CL-5	I-39/90	County Road N Interchange	County Road N	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	CL-5	I-39/90	County Road N Interchange	County Road N	SB I-39/90	Existing	Type III Barricades	$1,300	$130	
	CL-6	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	SB US Highway 51	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	CL-6	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	SB US Highway 51	SB I-39/90	Existing	Type III Barricades	$1,300	$130	
	CL-7	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	US Highway 51 / State Highway 73	NB I-39/90	Existing	Type III Barricades	$1,300	$130	
	CL-7	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	US Highway 51 / State Highway 73	SB I-39/90	Existing	Type III Barricades	$1,300	$130	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	CL-4	I-39/90	SB SWEF (16) Madison ~ Mile Marker 145.5	Existing SWEF		1	$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-39/90	South of I-94 (Badger) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of US Highway 12 (Beltline) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of Siggelkow Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road AB	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road MN	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	West of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	East of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	West of Church St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road BN	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	West of County Road W	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of Church Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of N Jct US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South of N Jct US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of S Jct US Highway 51 / State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South of S Jct US Highway 51 / State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South Dane County Line	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment C (TOIP Based) - Medium ITS Deployment Intensity

Approximate Corridor Capital Cost
$2,298,000
Approximate Corridor Annual O & M Cost
$98,000

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	N/A	I-39/90	Spicebush Ln	Existing	Mainline	$25,000	$800	
	CM-1	I-39/90	County Road BB	Existing	Mainline	$25,000	$800	
	CM-2	I-39/90	County Road AB (E Buckeye Rd)	Existing	Mainline	$25,000	$800	
	N/A	I-39/90	Oxbow Ct	Existing	Mainline	$25,000	$800	
	N/A	I-39/90	World Dairy Dr	Existing	Mainline	$25,000	$800	
	CM-3	I-39/90	US Highway 12 (Beltline) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	CM-4	I-39/90	County Road AB (Brandt Rd)	New	Mainline	$25,000	$800	
	CM-7	I-39/90	County Road N Interchange	New	Diamond Interchange	$79,000	$2,500	
	CM-9	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	New	Mainline	$25,000	$800	2 fly under ramps
	CM-11	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	New	Mainline	$25,000	$800	Folded diamond interchange

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	I-39/90	I-94 (Badger Interchange)	County Road N	New	N/A	N/A	Costs accounted for under Segment D. A single freeway service patrol unit would patrol from STH 19 to CTH N. Freeway Service Patrol costs may be established through a statewide contract.

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	CM-12	US Highway 51	US Highway 151 (E Washington Ave)	US 12 Beltline	9	Nine (9) traffic signal controller upgrades and communications link to operating agency and State Traffic Operations Center	$99,000	$5,400	

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	CM-1	I-39/90	County Road BB	Existing	$40,000	$2,300	
	CM-2	I-39/90	County Road AB (E Buckeye Rd)	Existing	$40,000	$2,300	
	CM-3	I-39/90	US Highway 12 (Beltline) Interchange	Existing	$40,000	$2,300	
	CM-4	I-39/90	County Road AB (Brandt Rd)	New	$40,000	$2,300	
	CM-7	I-39/90	County Road N Interchange	New	$40,000	$2,300	
	CM-9	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	New	$40,000	$2,300	
	CM-11	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	New	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	CM-7	I-39/90	County Road N Interchange	County Road N	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CM-7	I-39/90	County Road N Interchange	County Road N	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CM-9	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	SB US Highway 51	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CM-9	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	SB US Highway 51	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CM-11	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	US Highway 51 / State Highway 73	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CM-11	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	US Highway 51 / State Highway 73	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	CM-2	I-39/90 NB	County Road AB (E Buckeye Rd)	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	CM-5	I-39/90 SB	County Road MN	New	$32,000	$3,200	
	CM-8	I-39/90 NB	Church St	New	$32,000	$3,200	
	CM-10	I-39/90 SB	1-2 Miles prior to S Jct US Highway 51 / State Highway 73 Interchange The PDMS would be placed in the vicinity of Mile Marker 158	New	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	CM-6	I-39/90	SB SWEF (16) Madison ~ Mile Marker 145.5	Existing SWEF		1	$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-39/90	South of I-94 (Badger) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of US Highway 12 (Beltline) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of Siggelkow Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road AB	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road MN	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	West of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	East of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	West of Church St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road BN	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	West of County Road W	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of Church Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of N Jct US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South of N Jct US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of S Jct US Highway 51 / State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South of S Jct US Highway 51 / State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South Dane County Line	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications	N/A	I-39/90	US Highway 12 (Beltline) Interchange	South Dane County Line	20.0	New	$1,080,000	$22,000	Not shown on map.

Segment C (4-Lane) - High ITS Deployment Intensity

Approximate Corridor Capital Cost
$3,048,000
Approximate Corridor Annual O & M Cost
$147,500

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	N/A	I-39/90	Spicebush Ln	Existing	Mainline	$25,000	$800	
	CH4-1	I-39/90	County Road BB	Existing	Mainline	$25,000	$800	
	CH4-2	I-39/90	County Road AB (E Buckeye Rd)	Existing	Mainline	$25,000	$800	
	N/A	I-39/90	Oxbow Ct	Existing	Mainline	$25,000	$800	
	N/A	I-39/90	World Dairy Dr	Existing	Mainline	$25,000	$800	
	CH4-3	I-39/90	US Highway 12 (Beltline) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	N/A	I-39/90	~ Mile Marker 143	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 143.5	New	Mainline	$25,000	$800	
	CH4-4	I-39/90	County Road AB (Brandt Rd)	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 145	New	Mainline	$25,000	$800	
	CH4-6	I-39/90	~ Mile Marker 145.5	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 146	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 146.5	New	Mainline	$25,000	$800	
	CH4-7	I-39/90	County Road N Interchange	New	Diamond Interchange	$79,000	$2,500	
	N/A	I-39/90	~ Mile Marker 148.5	New	Mainline	$25,000	$800	
	CH4-9	I-39/90	~ Mile Marker 150	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 151	New	Mainline	$25,000	$800	
	CH4-11	I-39/90	County Road B	New	Mainline	$25,000	$800	
	N/A	I-39/90	Hammen Dr	New	Mainline	$25,000	$800	
	CH4-12	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	New	Mainline	$25,000	$800	2 fly under ramps
	CH4-13	I-39/90	~ Mile Marker 158	New	Mainline	$25,000	$800	
	CH4-14	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	New	Mainline	$25,000	$800	Folded diamond interchange

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	I-39/90	I-94 (Badger Interchange)	County Road N	New	N/A	N/A	Costs accounted for under Segment D. A single freeway service patrol unit would patrol from STH 19 to CTH N. Freeway Service Patrol costs may be established through a statewide contract.

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	CH4-15	US Highway 51	US Highway 151 (E Washington Ave)	US 12 Beltline	9	Nine (9) traffic signal controller upgrades and communications link to operating agency and State Traffic Operations Center	$99,000	$5,400	

Ramp Termini

ITS Element	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	CH4-1	I-39/90	County Road BB	Existing	$40,000	$2,300	
	CH4-2	I-39/90	County Road AB (E Buckeye Rd)	Existing	$40,000	$2,300	
	CH4-3	I-39/90	US Highway 12 (Beltline) Interchange	Existing	$40,000	$2,300	Additional camera to cover the northern part of the large USH 12 (Beltline) Interchange
	CH4-4	I-39/90	County Road AB (Brandt Rd)	New	$40,000	$2,300	
	CH4-7	I-39/90	County Road N Interchange	New	$40,000	$2,300	
	CH4-9	I-39/90	~ Mile Marker 150	New	$40,000	$2,300	
	CH4-11	I-39/90	County Road B	New	$40,000	$2,300	
	CH4-12	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	New	$40,000	$2,300	
	CH4-14	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	New	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	CH4-7	I-39/90	County Road N Interchange	County Road N	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH4-7	I-39/90	County Road N Interchange	County Road N	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH4-12	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	SB US Highway 51	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH4-12	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	SB US Highway 51	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH4-14	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	US Highway 51 / State Highway 73	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH4-14	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	US Highway 51 / State Highway 73	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	CH4-2	I-39/90 NB	County Road AB (E Buckeye Rd)	New	$197,000	$19,700	
	CH4-5	I-39/90 SB	County Road MN	New	$197,000	$19,700	
	CH4-8	I-39/90 NB	Church St	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	CH4-13	I-39/90 SB	1-2 Miles prior to S Jct US Highway 51 / State Highway 73 Interchange The PDMS would be placed in the vicinity of Mile Marker 158	New	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	CH4-2	I-39/90	Eastridge Ct (North of County Road AB (E Buckeye Rd))	New	1	1	$0	$0	Along mainline outside shoulder in each direction, could potentially be used as a LEP as well Survey recommended
	CH4-6	I-39/90	SB SWEF (16) Madison ~ Mile Marker 145.5	Existing SWEF		1	$0	$0	Could be signed as a designated CIS at minimal cost
	CH4-10	I-39/90	~ Mile Marker 152 (South of Koshkonong Rd)	New	1	1	$0	$0	Along mainline outside shoulder in each direction, could potentially be used as a LEP as well Survey recommended

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
	N/A	I-39/90	South of I-94 (Badger) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of US Highway 12 (Beltline) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of Siggelkow Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road AB	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road MN	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	West of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	East of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
Law Enforcement Pad	N/A	I-39/90	West of Church St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	County Road BN	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	West of County Road W	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of Church Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of N Jct US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South of N Jct US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	North of S Jct US Highway 51 / State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South of S Jct US Highway 51 / State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90	South Dane County Line	Existing Paved Median Crossover			1			

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications	N/A	I-39/90	US Highway 12 (Beltline) Interchange	South Dane County Line	20.0	New	$1,080,000	$22,000	Not shown on map.

Segment C (6-Lane) - High ITS Deployment Intensity

Approximate Corridor Capital Cost
$2,873,000
Approximate Corridor Annual O & M Cost
$141,900

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	N/A	I-39/90	Spicebush Ln	Existing	Mainline	$25,000	$800	
	CH6-1	I-39/90	County Road BB	Existing	Mainline	$25,000	$800	
	CH6-2	I-39/90	County Road AB (E Buckeye Rd)	Existing	Mainline	$25,000	$800	
	N/A	I-39/90	Oxbow Ct	Existing	Mainline	$25,000	$800	
	N/A	I-39/90	World Dairy Dr	Existing	Mainline	$25,000	$800	
	CH6-3	I-39/90	US Highway 12 (Beltline) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	N/A	I-39/90	~ Mile Marker 143.5	New	Mainline	$25,000	$800	
	CH6-4	I-39/90	County Road AB (Brandt Rd)	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 145	New	Mainline	$25,000	$800	
	N/A	I-39/90	~ Mile Marker 146	New	Mainline	$25,000	$800	
	CH6-8	I-39/90	County Road N Interchange	New	Diamond Interchange	$79,000	$2,500	
	CH6-10	I-39/90	~ Mile Marker 150	New	Mainline	$25,000	$800	
	CH6-12	I-39/90	County Road B	New	Mainline	$25,000	$800	
	CH6-13	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	New	Mainline	$25,000	$800	
	CH6-15	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	New	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From		Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	I-39/90	I-94 (Badger Interchange)	County Road N	New	N/A	N/A	Costs accounted for under Segment D. A single freeway service patrol unit would patrol from STH 19 to CTH N. Freeway Service Patrol costs may be established through a statewide contract.

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	CH6-17	US Highway 51	US Highway 151 (E Washington Ave)	US 12 Beltline	9	Nine (9) traffic signal controller upgrades and communications link to operating agency and State Traffic Operations Center	$99,000	$5,400	

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	CH6-1	I-39/90	County Road BB	Existing	$40,000	$2,300	
	CH6-2	I-39/90	County Road AB (E Buckeye Rd)	Existing	$40,000	$2,300	
	CH6-3	I-39/90	US Highway 12 (Beltline) Interchange	New	$40,000	$2,300	Additional camera to cover the northern part of the large USH 12 (Beltline) Interchange
	CH6-3	I-39/90	US Highway 12 (Beltline) Interchange	Existing	$40,000	$2,300	
	CH6-4	I-39/90	County Road AB (Brandt Rd)	New	$40,000	$2,300	
	CH6-8	I-39/90	County Road N Interchange	New	$40,000	$2,300	
	CH6-10	I-39/90	~ Mile Marker 150	New	$40,000	$2,300	
	CH6-12	I-39/90	County Road B	New	$40,000	$2,300	
	CH6-13	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	New	$40,000	$2,300	
	CH6-15	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	New	$40,000	$2,300	

Onramp

ITS Element	Map ID	Roadway	At	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	CH6-8	I-39/90	County Road N Interchange	County Road N	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH6-8	I-39/90	County Road N Interchange	County Road N	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH6-13	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	SB US Highway 51	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH6-13	I-39/90	N Jct US Highway 51 (Mile Marker 156) Interchange	SB US Highway 51	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH6-15	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	US Highway 51 / State Highway 73	NB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	
	CH6-15	I-39/90	S Jct US Highway 51 / State Highway 73 (Mile Marker 160) Interchange	US Highway 51 / State Highway 73	SB I-39/90	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	CH6-2	I-39/90 NB	County Road AB (E Buckeye Rd)	New	$197,000	$19,700	
	CH6-5	I-39/90 SB	County Road MN	New	$197,000	$19,700	
	CH6-9	I-39/90 NB	Church St	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	CH6-14	I-39/90 SB	~ Mile Marker 158	New	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	CH6-2	I-39/90	Eastridge Ct (North of County Road AB (E Buckeye Rd))	New	1	1	$0	$0	Along mainline outside shoulder in each direction, could potentially be used as a LEP as well Survey recommended
	CH6-6	I-39/90	SB SWEF (16) Madison ~ Mile Marker 145.5	Existing SWEF		1	$0	$0	Could be signed as a designated CIS at minimal cost
	CH6-11	I-39/90	~ Mile Marker 152 (South of Koshkonong Rd)	New	1	1	$0	$0	Along mainline outside shoulder in each direction, could potentially be used as a LEP as well Survey recommended

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
	N/A	I-39/90	South of I-94 (Badger) Interchange	Existing Paved Median Crossover			1	$0	$0	
	N/A	I-39/90	North of US Highway 12 (Beltline) Interchange	Existing Paved Median Crossover			1	$0	$0	
	CH6-3	I-39/90	South end of US Highway 12 (Beltline) Interchange	New			1	$0	$0	Wide median at the southern end of the interchange makes this site a good LEP location in the 6 lane scenario Survey recommended
	N/A	I-39/90	North of Siggelkow Rd	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	County Road AB	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	County Road MN	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location
	CH6-7	I-39/90	Between Existing SWEF and Williams Dr	New			1	$0	$0	Wide median makes this site a good LEP location in the 6 lane scenario
	N/A	I-39/90	West of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	East of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	
Law Enforcement Pad	N/A	I-39/90	West of Church St	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	County Road BN	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	West of County Road W	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location
	N/A	I-39/90	North of Church Rd	Existing Paved Median Crossover			1	$0	$0	
	N/A	I-39/90	North of N Jct US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	
	N/A	I-39/90	South of N Jct US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location
	CH6-14	I-39/90	~ Mile Marker 158	New			1	$0	$0	Wide median makes this site a good LEP location in the 6 lane scenario Survey recommended
	N/A	I-39/90	North of S Jct US Highway 51 / State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	
	N/A	I-39/90	South of S Jct US Highway 51 / State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	
	CH6-16	I-39/90	~ Mile Marker 161.5	New			1	$0	$0	Wide median makes this site a good LEP location in the 6 lane scenario
	N/A	I-39/90	South Dane County Line	Existing Paved Median Crossover			1	$0	$0	Median crossover may become too narrow to be a safe LEP location

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications	N/A	I-39/90	US Highway 12 (Beltline) Interchange	South Dane County Line	20.0	New	$1,080,000	$22,000	Not shown on map.

Segment D - Low ITS Deployment Intensity

Approximate Corridor Capital Cost
$245,000
Approximate Corridor Annual O & M Cost
$10,900

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
	DL-2	I-39/90/94	State Highway 19 Interchange	New	Mainline	$25,000	$800	
	DL-3	I-39/90/94	US Highway 51 Interchange	Existing	Mainline	$25,000	$800	
Traffic Detection	N/A	I-39/90/94	Portage Rd	Existing	Mainline	$25,000	$800	
	DL-4	I-39/90/94	US Highway 151 Interchange	Existing	Mainline	$25,000	$800	
	N/A	I-39/90/94	Lien Rd	Existing	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol						N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements									

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
	DL-2	I-39/90/94	State Highway 19 Interchange	Existing	$40,000	$2,300	
CCTV Surveillance Camera	DL-3	I-39/90/94	US Highway 51 Interchange	Existing	$40,000	$2,300	
	DL-4	I-39/90/94	US Highway 151 Interchange	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates								N/A	N/A	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	DL-1	I-39/90/94	County Road V Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
	N/A	I-39/90/94	North Dane County Line	Existing Paved Median Crossover			1	$0	$0	Narrow crossover, may not be a safe location for law enforcement. Not shown on map.
Law Enforcement Pad										
	N/A	I-39/90/94	South of County Road V Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of Badger Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment D (TOIP Based) - Medium ITS Deployment Intensity

Approximate Corridor Capital Cost
$1,818,000
Approximate Corridor Annual O & M Cost
$232,700

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	DM-1	I-39/90/94	County Road V Interchange	New	Mainline	$25,000	$800	
	DM-3	I-39/90/94	State Highway 19 Interchange	New	Mainline	$25,000	$800	
	DM-4	I-39/90/94	US Highway 51 Interchange	New	Mainline	$25,000	$800	
	DM-5	I-39/90/94	Portage Rd	Existing	Mainline	$25,000	$800	
	DM-6	I-39/90/94	US Highway 151 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	DM-7	I-39/90/94	High Crossing Blvd Interchange	New	Mainline	$25,000	$800	1/2 diamond interchange
	DM-8	I-39/90/94	Lien Rd	Existing	Mainline	$25,000	$800	
	DM-9	I-39/90/94	I-94 (Badger) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	I-39/90/94	State Highway 19	I-94 (Badger Interchange)	New	$65,000	$101,400	Costs accounted for under Segment D. A single freeway service patrol unit would patrol from STH 19 to CTH N. Freeway Service Patrol costs may be established through a statewide contract.

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	DM-10	US Highway 51	I-39/90/94	US Highway 151 (E Washington Ave)	3	Two (2) traffic signal controller upgrades and communications link to operating agency and State Traffic Operations Center	$22,000	$1,200	

Ramp Termini

Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
DM-3	I-39/90/94	State Highway 19		$3,000	$200	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	DM-1	I-39/90/94	County Road V Interchange	New	$40,000	$2,300	
	DM-3	I-39/90/94	State Highway 19 Interchange	Existing	$40,000	$2,300	
	DM-4	I-39/90/94	US Highway 51 Interchange	Existing	$40,000	$2,300	
	DM-5	I-39/90/94	Portage Rd	New	$40,000	$2,300	
	DM-6	I-39/90/94	US Highway 151 Interchange	Existing	$40,000	$2,300	
	DM-7	I-39/90/94	High Crossing Blvd Interchange	New	$40,000	$2,300	
	DM-9	I-39/90/94	I-94 (Badger) Interchange	New	$40,000	$2,300	

Onramp

ITS Element	Map ID	Roadway	At	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	DM-1	I-39/90/94	County Road V Interchange	County Road V	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DM-1	I-39/90/94	County Road V Interchange	County Road V	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DM-3	I-39/90/94	State Highway 19 Interchange	State Highway 19	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DM-3	I-39/90/94	State Highway 19 Interchange	State Highway 19	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DM-4	I-39/90/94	US Highway 51 Interchange	SB US Highway 51	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DM-4	I-39/90/94	US Highway 51 Interchange	NB US Highway 51	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DM-7	I-39/90/94	High Crossing Blvd Interchange	High Crossing Blvd	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering	DM-3	I-39/90/94	State Highway 19	SB Interstate 39/90/94	New	Ramp Meter with HOV	$65,000	$6,500	
	DM-4	I-39/90/94	US Highway 51	SB Interstate 39/90/94	New	Ramp Meter	$50,000	$5,000	
	DM-4	I-39/90/94	US Highway 51	SB Interstate 39/90/94	New	Ramp Meter	$50,000	$5,000	
	DM-7	I-39/90/94	High Crossing Blvd	SB Interstate 39/90/94	New	Ramp Meter with HOV	$65,000	$6,500	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	DM-2	I-39/90/94 SB	River Rd	New	$197,000	$19,700	
	DM-5	I-39/90/94 NB	Portage Rd	New	$197,000	$19,700	
	DM-8	I-39/90/94 SB	Lien Rd	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	DM-1	I-39/90/94	County Road V Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-39/90/94	North Dane County Line	Existing Paved Median Crossover			1	$0	$0	Narrow crossover, may not be a safe location for law enforcement. Not shown on map.
	N/A	I-39/90/94	South of County Road V Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	DM-3	I-39/90/94	State Highway 19 Interchange	New		1		$0	$0	
	DM-7	I-39/90/94	High Crossing Blvd Interchange	New		1		$0	$0	
	N/A	I-39/90/94	North of Badger Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment D - High ITS Deployment Intensity

Approximate Corridor Capital Cost
$2,138,000
Approximate Corridor Annual O & M Cost
$249,400

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	DH-1	I-39/90/94	County Road DM	New	Mainline	$25,000	$800	
	DH-2	I-39/90/94	County Road V Interchange	New	Mainline	$25,000	$800	
	DH-3	I-39/90/94	Cuba Valley Rd	New	Mainline	$25,000	$800	
	DH-5	I-39/90/94	State Highway 19 Interchange	New	Mainline	$25,000	$800	
	N/A	I-39/90/94	~ Mile Marker 131.5	New	Mainline	$25,000	$800	
	DH-6	I-39/90/94	US Highway 51 Interchange	New	Mainline	$25,000	$800	
	N/A	I-39/90/94	Hoepker Rd	New	Mainline	$25,000	$800	
	DH-8	I-39/90/94	Portage Rd	Existing	Mainline	$25,000	$800	
	N/A	I-39/90/94	Diloreto Ave	New	Mainline	$25,000	$800	
	DH-9	I-39/90/94	US Highway 151 Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	DH-10	I-39/90/94	High Crossing Blvd Interchange	New	Mainline	$25,000	$800	1/2 diamond interchange
	DH-11	I-39/90/94	Lien Rd	Existing	Mainline	$25,000	$800	
	N/A	I-39/90/94	Valley Edge Dr	New	Mainline	$25,000	$800	
	DH-12	I-39/90/94	I-94 (Badger) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol	N/A	I-39/90/94	State Highway 19	I-94 (Badger Interchange)	New	$65,000	$101,400	Costs accounted for under Segment D. A single freeway service patrol unit would patrol from STH 19 to CTH N. Freeway Service Patrol costs may be established through a statewide contract.

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	DH-13	US Highway 51	I-39/90/94	US Highway 151 (E Washington Ave)	3	Two (2) traffic signal controller upgrades and communications link to operating agency and State Traffic Operations Center	$22,000	$1,200	

Ramp Termini

Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
DH-5	I-39/90/94	State Highway 19	Provide communication link to operating agency and State Traffic Operations Center.	$3,000	$200	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	DH-1	I-39/90/94	County Road DM	New	$40,000	$2,300	
	DH-2	I-39/90/94	County Road V Interchange	New	$40,000	$2,300	
	DH-3	I-39/90/94	Cuba Valley Rd	New	$40,000	$2,300	
	DH-5	I-39/90/94	State Highway 19 Interchange	Existing	$40,000	$2,300	
	DH-6	I-39/90/94	US Highway 51 Interchange	Existing	$40,000	$2,300	
	DH-8	I-39/90/94	Portage Rd	New	$40,000	$2,300	
	DH-9	I-39/90/94	US Highway 151 Interchange	Existing	$40,000	$2,300	
	DH-10	I-39/90/94	High Crossing Blvd Interchange	New	$40,000	$2,300	
	DH-12	I-39/90/94	I-94 (Badger) Interchange	New	$40,000	$2,300	
	DH-12	I-39/90/94	I-94 (Badger) Interchange	New	$40,000	$2,300	Additional camera to cover the large Badger Interchange

Onramp

ITS Element	Map ID	Roadway	At	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	DH-2	I-39/90/94	County Road V Interchange	County Road V	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DH-2	I-39/90/94	County Road V Interchange	County Road V	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DH-5	I-39/90/94	State Highway 19 Interchange	State Highway 19	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DH-5	I-39/90/94	State Highway 19 Interchange	State Highway 19	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DH-6	I-39/90/94	US Highway 51 Interchange	SB US Highway 51	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DH-6	I-39/90/94	US Highway 51 Interchange	NB US Highway 51	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DH-6	I-39/90/94	US Highway 51 Interchange	SB US Highway 51	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DH-6	I-39/90/94	US Highway 51 Interchange	NB US Highway 51	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	DH-10	I-39/90/94	High Crossing Blvd Interchange	High Crossing Blvd	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering	DH-2	I-39/90/94	County Road V Interchange	SB Interstate 39/90/94	New	Ramp Meter	$50,000	$5,000	
	DH-5	I-39/90/94	State Highway 19	SB Interstate 39/90/94	New	Ramp Meter with HOV	$65,000	$6,500	
	DH-6	I-39/90/94	US Highway 51	SB Interstate 39/90/94	New	Ramp Meter	$50,000	$5,000	
	DH-6	I-39/90/94	US Highway 51	SB Interstate 39/90/94	New	Ramp Meter	$50,000	$5,000	
	DH-10	I-39/90/94	High Crossing Blvd	SB Interstate 39/90/94	New	Ramp Meter with HOV	$65,000	$6,500	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	DH-4	I-39/90/94 SB	River Rd	New	$197,000	$19,700	
	DH-8	I-39/90/94 NB	Portage Rd	New	$197,000	$19,700	
	DH-11	I-39/90/94 SB	Lien Rd	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	DH-2	I-39/90/94	County Road V Interchange	Existing Park and Ride	1	1	$0	$0	Could be signed as a designated CIS at minimal cost
	DH-7	I-39/90/94	Merchant St	New	1	1	$0	$0	Along mainline outside shoulder in each direction, could potentially be used as a LEP as well Survey recommended

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-39/90/94	North Dane County Line	Existing Paved Median Crossover			1	$0	$0	Narrow crossover, may not be a safe location for law enforcement. Not shown on map.
	DH-1	I-39/90/94	South of County Road DM	*New (See Note)	1	1		$0	$0	*NO INTERCHANGE. The proposed law enforcement pads at this location are along mainline outside shoulder. Survey recommended
	N/A	I-39/90/94	South of County Road V Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	DH-5	I-39/90/94	State Highway 19 Interchange	New	1	1		$0	$0	
	DH-10	I-39/90/94	High Crossing Blvd Interchange	New		1		$0	$0	
	N/A	I-39/90/94	North of Badger Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment E (TOIP Based) - Low ITS Deployment Intensity

Approximate Corridor Capital Cost
$489,000
Approximate Corridor Annual O & M Cost
$38,400

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	EL-1	I-94	Gaston Rd	Existing	Mainline	$25,000	$800	
	EL-2	I-94	County Road N Interchange	New	Diamond Interchange	$79,000	$2,500	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol						N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M
Traffic Signal Improvements								

Ramp Termini

Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	EL-1	I-94	Gaston Rd	Existing	$40,000	$2,300	
	EL-2	I-94	County Road N Interchange	Existing	$40,000	$2,300	

Onramp

ITS Element	Map ID	Roadway	At	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	EL-2	I-94	County Road N Interchange	County Road N	EB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EL-2	I-94	County Road N Interchange	County Road N	WB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EL-3	I-94	State Highway 73 Interchange	State Highway 73	EB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EL-3	I-94	State Highway 73 Interchange	State Highway 73	WB I-94	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	EL-1	I-94 WB	Gaston Rd	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	EL-4	I-94 WB	Tower Line Rd	New	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-94	East of Sprecher Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	East of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of Baxter Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	East of Baxter Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of Ridge Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	East of Ridge Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment E - Medium ITS Deployment Intensity

Approximate Corridor Capital Cost
$586,000
Approximate Corridor Annual O & M Cost
$44,700

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	EM-1	I-94	Gaston Rd	Existing	Mainline	$25,000	$800	
	EM-2	I-94	County Road N Interchange	New	Diamond Interchange	$79,000	$2,500	
	EM-4	I-94	State Highway 73 Interchange	New	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol						N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements									

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	EM-1	I-94	Gaston Rd	Existing	$40,000	$2,300	
	EM-2	I-94	County Road N Interchange	Existing	$40,000	$2,300	
	EM-4	I-94	State Highway 73 Interchange	Existing	$40,000	$2,300	

Onramp

ITS Element	Map ID	Roadway	At	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	EM-2	I-94	County Road N Interchange	County Road N	EB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EM-2	I-94	County Road N Interchange	County Road N	WB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EM-4	I-94	State Highway 73 Interchange	State Highway 73	EB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EM-4	I-94	State Highway 73 Interchange	State Highway 73	WB I-94	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	EM-1	I-94 WB	Gaston Rd	New	$197,000	$19,700	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	EM-3	I-94 EB	1-2 miles prior to State Highway 73 The PDMS would be placed in the vicinity of Mile Marker 248	New	$32,000	$3,200	
	EM-5	I-94 WB	Tower Line Rd	New	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-94	East of Sprecher Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	East of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of Baxter Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	East of Ridge Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment E - High ITS Deployment Intensity

Approximate Corridor Capital Cost
$973,000
Approximate Corridor Annual O & M Cost
$71,500

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	N/A	I-94	~ Mile Marker 240.5	New	Mainline	$25,000	$800	
	N/A	I-94	~ Mile Marker 241	New	Mainline	$25,000	$800	
	EH-1	I-94	Gaston Rd	Existing	Mainline	$25,000	$800	
	EH-2	I-94	~ Mile Marker 242	New	Mainline	$25,000	$800	
	N/A	I-94	~ Mile Marker 242.5	New	Mainline	$25,000	$800	
	N/A	I-94	~ Mile Marker 243	New	Mainline	$25,000	$800	
	EH-3	I-94	County Road N Interchange	New	Diamond Interchange	$79,000	$2,500	
	EH-4	I-94	Ridge Rd	New	Mainline	$25,000	$800	
	EH-6	I-94	State Highway 73 Interchange	New	Mainline	$25,000	$800	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol						N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements									

Ramp Termini

	Map ID	Roadway	Interchange with				Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	EH-1	I-94	Gaston Rd	Existing	$40,000	$2,300	
	EH-3	I-94	County Road N Interchange	Existing	$40,000	$2,300	
	EH-4	I-94	Ridge Rd	New	$40,000	$2,300	
	EH-6	I-94	State Highway 73 Interchange	New	$40,000	$2,300	

Onramp

ITS Element	Map ID	Roadway	At	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	EH-3	I-94	County Road N Interchange	County Road N	EB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EH-3	I-94	County Road N Interchange	County Road N	WB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EH-6	I-94	State Highway 73 Interchange	State Highway 73	EB I-94	New	Vertical Drop Gate	$19,000	$1,900	
	EH-6	I-94	State Highway 73 Interchange	State Highway 73	WB I-94	New	Vertical Drop Gate	$19,000	$1,900	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign	EH-1	I-94 WB	Gaston Rd	New	$197,000	$19,700	
	EH-2	I-94 EB	1-2 miles prior to County Road N The DMS would be placed in the vicinity of Mile Marker 242	New	$197,000	$19,700	
Portable Changeable Message Sign Pad	EH-5	I-94 EB	1-2 miles prior to State Highway 73 The PDMS would be placed in the vicinity of Mile Marker 248	New	$32,000	$3,200	
	EH-7	I-94 WB	Tower Line Rd	New	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	EH-3	I-39/90	County Road N Interchange	New	1	1	$0	$0	Offramp CIS Survey recommended

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-94	East of Sprecher Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	East of County Road N Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of Baxter Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	East of Ridge Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-94	West of State Highway 73 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment F - Low ITS Deployment Intensity

Approximate Corridor Capital Cost
$1,188,000
Approximate Corridor Annual O & M Cost
$54,500

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	FL-1	I-90/94	Interstate 90/94 Tomah Split Interchange	New	Mainline	$25,000	$800	Y interchange
	FL-2	I-90/94	State Highway 80 Interchange	New	Mainline	$25,000	$800	
	FL-4	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	New	Diamond Interchange	$79,000	$2,500	
	FL-5	I-90/94	State Highway 13 Interchange	New	Diamond Interchange	$79,000	$2,500	2 fly under ramps
	FL-6	I-90/94	State Highway 23 Interchange	New	Diamond Interchange	$79,000	$2,500	
	FL--7	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	FL-8	I-90/94	State Highway 33 Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FL-9	I-39/90/94	Interstate 39/90/94 Portage Split Interchange	New	Mainline	$25,000	$800	
	FL-10	I-39/90/94	Wisconsin River Bridge	New	Mainline	$25,000	$800	
	FL-12	I-39/90/94	County Road CS Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FL-13	I-39/90/94	State Highway 60 Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FL-14	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	New	Diamond Interchange	$79,000	$2,500	

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol						N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements								

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	FL-1	I-90/94	Interstate 90/94 Tomah Split Interchange	New	$40,000	$2,300	
	FL-2	I-90/94	State Highway 80 Interchange	New	$40,000	$2,300	
	FL-4	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	New	$40,000	$2,300	
	FL-5	I-90/94	State Highway 13 Interchange	New	$40,000	$2,300	
	FL-6	I-90/94	State Highway 23 Interchange	New	$40,000	$2,300	
	FL--7	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	New	$40,000	$2,300	
	FL-8	I-90/94	State Highway 33 Interchange	New	$40,000	$2,300	
	FL-9	I-39/90/94	Interstate 39/90/94 Portage Split Interchange	New	$40,000	$2,300	
	FL-10	I-39/90/94	Wisconsin River Bridge	Existing	$40,000	$2,300	
	FL-12	I-39/90/94	County Road CS Interchange	New	$40,000	$2,300	
	FL-13	I-39/90/94	State Highway 60 Interchange	New	$40,000	$2,300	
	FL-14	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates								N/A	N/A	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	FL-10	I-39/90/94 EB	Approach to Wisconsin River Bridge	Existing	$32,000	$3,200	
	FL-10	I-39/90/94 WB	Approach to Wisconsin River Bridge	Existing	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	FL-3	I-90/94	EB Rest Area (9) Lyndon Station North of 57th St	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	FL-3	I-90/94	WB Rest Area (10) Mauston South of 57th St	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost
	FL-11	I-39/90/94	EB Rest Area (11) Portage North of Black Rd	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	FL-11	I-39/90/94	WB Rest Area (12) Poynette North of Black Rd	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
	N/A	I-90/94	East of Tomah Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	West of County Road PP Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of County Road PP Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of County Road W	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of County Road C Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of County Road C Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	39th St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 80 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 80 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Meyer Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Fairway Ln	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Sherman St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 82 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of 19th Ave	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road N	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	58th St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of County Road HH Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of County Road HH Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of 63rd St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	28th Ave	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road H	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Trout Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 23 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Xanadu Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	West of US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
Law Enforcement Pad	N/A	I-90/94	County Road A	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Gillem Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road T	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Van Hoosen Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Hein Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of Sauk/Columbia County Line	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Blount Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of Cascade Mountain Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Portage Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of Portage Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of Ziehmke Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of County Road U	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	County Road V	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	Earnie Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of Black Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of County Road CS Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of Smokey Hollow Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of State Highway 60 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of State Highway 60 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of State Highway 16 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of State Highway 16 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of Wisconsin River	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of Cascade Mountain Rd Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment F (TOIP Based) - Medium ITS Deployment Intensity

Approximate Corridor Capital Cost
$1,926,600
Approximate Corridor Annual O & M Cost
$114,760

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	FM-1	I-90/94	Interstate 90/94 Tomah Split Interchange	New	Mainline	$25,000	$800	Y interchange
	FM-2	I-90/94	County Road PP Interchange	New	Mainline	$25,000	$800	
	FM-4	I-90/94	County Road C Interchange	New	Mainline	$25,000	$800	
	FM-5	I-90/94	State Highway 80 Interchange	New	Mainline	$25,000	$800	
	FM-6	I-90/94	State Highway 82 Interchange	New	Mainline	$25,000	$800	
	FM-8	I-90/94	County Road HH Interchange	New	Mainline	$25,000	$800	
	FM-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	New	Diamond Interchange	$79,000	$2,500	
	FM-11	I-90/94	State Highway 13 Interchange	New	Diamond Interchange	$79,000	$2,500	2 fly under ramps
	FM-12	I-90/94	State Highway 23 Interchange	New	Diamond Interchange	$79,000	$2,500	
	FM-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	FM-14	I-90/94	State Highway 33 Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FM-15	I-39/90/94	Interstate 39/90/94 Portage Split Interchange	New	Mainline	$25,000	$800	
	FM-16	I-39/90/94	Wisconsin River Bridge	New	Mainline	$25,000	$800	
	FM-18	I-39/90/94	County Road CS Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FM-19	I-39/90/94	State Highway 60 Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FM-20	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	New	Diamond Interchange	$79,000	$2,500	

ITS Element	Map ID	Roadway	From	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol					N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements									

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	FM-1	I-90/94	Interstate 90/94 Tomah Split Interchange	New	$40,000	$2,300	
	FM-2	I-90/94	County Road PP Interchange	New	$40,000	$2,300	
	FM-4	I-90/94	County Road C Interchange	New	$40,000	$2,300	
	FM-5	I-90/94	State Highway 80 Interchange	New	$40,000	$2,300	
	FM-6	I-90/94	State Highway 82 Interchange	New	$40,000	$2,300	
	FM-8	I-90/94	County Road HH Interchange	New	$40,000	$2,300	
	FM-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	New	$40,000	$2,300	
	FM-11	I-90/94	State Highway 13 Interchange	New	$40,000	$2,300	
	FM-12	I-90/94	State Highway 23 Interchange	New	$40,000	$2,300	
	FM-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	New	$40,000	$2,300	
	FM-14	I-90/94	State Highway 33 Interchange	New	$40,000	$2,300	
	FM-15	I-39/90/94	Interstate 39/90/94 Portage Split Interchange	New	$40,000	$2,300	
	FM-16	I-39/90/94	Wisconsin River Bridge	Existing	$40,000	$2,300	
	FM-18	I-39/90/94	County Road CS Interchange	New	$40,000	$2,300	
	FM-19	I-39/90/94	State Highway 60 Interchange	New	$40,000	$2,300	
	FM-20	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	Existing	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	FM-2	I-90/94	County Road PP Interchange	County Road PP	WB I-90/94	New	Type III Barricades	$1,300	$130	
	FM-2	I-90/94	County Road PP Interchange	County Road PP	EB I-90/94	New	Type III Barricades	$1,300	$130	
	FM-4	I-90/94	County Road C Interchange	County Road C	WB I-90/94	New	Type III Barricades	$1,300	$130	
	FM-4	I-90/94	County Road C Interchange	County Road C	EB I-90/94	New	Type III Barricades	$1,300	$130	
	FM-5	I-90/94	State Highway 80 Interchange	State Highway 80	WB I-90/94	New	Type III Barricades	$1,300	$130	
	FM-5	I-90/94	State Highway 80 Interchange	State Highway 80	EB I-90/94	New	Type III Barricades	$1,300	$130	
	FM-6	I-90/94	State Highway 82 Interchange	State Highway 82	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-6	I-90/94	State Highway 82 Interchange	EB State Highway 82	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-6	I-90/94	State Highway 82 Interchange	WB State Highway 82	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-8	I-90/94	County Road HH Interchange	County Road HH	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-8	I-90/94	County Road HH Interchange	County Road HH	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	US Highway 12	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	US Highway 12	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-11	I-90/94	State Highway 13 Interchange	SB State Highway 13	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-11	I-90/94	State Highway 13 Interchange	SB State Highway 13	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-12	I-90/94	State Highway 23 Interchange	State Highway 23	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-12	I-90/94	State Highway 23 Interchange	State Highway 23	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	SB US Highway 12	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	NB US Highway 12	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	SB US Highway 12	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	NB US Highway 12	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-14	I-90/94	State Highway 33 Interchange	State Highway 33	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-14	I-90/94	State Highway 33 Interchange	State Highway 33	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-18	I-39/90/94	County Road CS Interchange	County Road CS	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-18	I-39/90/94	County Road CS Interchange	County Road CS	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-19	I-39/90/94	State Highway 60 Interchange	State Highway 60	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-19	I-39/90/94	State Highway 60 Interchange	State Highway 60	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FM-20	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	US Highway 51	NB I-39	New	Type III Barricades	$1,300	$130	
	FM-20	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	US Highway 51	SB I-39	New	Type III Barricades	$1,300	$130	
	FM-21	I-39	State Highway 16 (Mile Marker 89 - Portage) Interchange	State Highway 16	NB I-39	New	Type III Barricades	$1,300	$130	
	FM-21	I-39	State Highway 16 (Mile Marker 89 - Portage) Interchange	State Highway 16	SB I-39	New	Type III Barricades	$1,300	$130	
	FM-22	I-39	State Highway 33 (Mile Marker 87 - Portage) Interchange	State Highway 33	NB I-39	New	Type III Barricades	$1,300	$130	
	FM-22	I-39	State Highway 33 (Mile Marker 87 - Portage) Interchange	State Highway 33	SB I-39	New	Type III Barricades	$1,300	$130	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	FM-3	I-90/94 WB	1-2 Miles prior to County Road PP Interchange The PDMS would be placed in the vicinity of Grover Rd	New	$32,000	$3,200	
	FM-9	I-90/94 EB	1-2 Miles prior to US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange The PDMS would be placed in the vicinity of Mile Marker 83	New	$32,000	$3,200	
	FM-16	I-39/90/94 EB	Approach to Wisconsin River Bridge	Existing	$32,000	$3,200	
	FM-16	I-39/90/94 WB	Approach to Wisconsin River Bridge	Existing	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	FM-7	I-90/94	EB Rest Area (9) Lyndon Station North of 57th St	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	FM-7	I-90/94	WB Rest Area (10) Mauston South of 57th St	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost
	FM-17	I-39/90/94	EB Rest Area (11) Portage North of Black Rd	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	FM-17	I-39/90/94	WB Rest Area (12) Poynette North of Black Rd	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-90/94	East of Tomah Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	West of County Road PP Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of County Road PP Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of County Road W	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of County Road C Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of County Road C Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	39th St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 80 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 80 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Meyer Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Fairway Ln	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Sherman St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 82 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of 19th Ave	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road N	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	58th St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of County Road HH Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of County Road HH Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of 63rd St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	28th Ave	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road H	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Trout Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 23 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Xanadu Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	West of US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road A	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Gillem Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road T	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Van Hoosen Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Hein Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of Sauk/Columbia County Line	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Blount Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of Cascade Mountain Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Portage Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of Portage Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of Ziehmke Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of County Road U	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	County Road V	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	Earnie Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of Black Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of County Road CS Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of Smokey Hollow Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of State Highway 60 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of State Highway 60 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of State Highway 16 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of State Highway 16 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of Wisconsin River	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of Cascade Mountain Rd Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

Segment F - High ITS Deployment Intensity

Approximate Corridor Capital Cost
$3,494,600
Approximate Corridor Annual O & M Cost
$192,360

ITS Element	Map ID	Roadway	At	Category	Type	Capital Cost	Annual O & M	Note
Traffic Detection	FH-1	I-90/94	Interstate 90/94 Tomah Split Interchange	New	Mainline	$25,000	$800	Y interchange
	FH-2	I-90/94	County Road PP Interchange	New	Mainline	$25,000	$800	
	FH-4	I-90/94	County Road C Interchange	New	Mainline	$25,000	$800	
	FH-5	I-90/94	State Highway 80 Interchange	New	Mainline	$25,000	$800	
	FH-6	I-90/94	State Highway 82 Interchange	New	Mainline	$25,000	$800	
	FH-8	I-90/94	County Road HH Interchange	New	Mainline	$25,000	$800	
	FH-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	New	Diamond Interchange	$79,000	$2,500	
	FH-11	I-90/94	State Highway 13 Interchange	New	Diamond Interchange	$79,000	$2,500	2 fly under ramps
	FH-12	I-90/94	State Highway 23 Interchange	New	Diamond Interchange	$79,000	$2,500	
	FH-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	FH-15	I-90/94	Gillem Rd	New	Mainline	$25,000	$800	
	FH-16	I-90/94	Schepp Rd	New	Mainline	$25,000	$800	
	FH-17	I-90/94	Statz Rd	New	Mainline	$25,000	$800	
	FH-18	I-90/94	State Highway 33 Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FH-19	I-39/90/94	Interstate 39/90/94 Portage Split Interchange	New	Mainline	$25,000	$800	
	FH-20	I-39/90/94	Wisconsin River Bridge	New	Mainline	$25,000	$800	
	FH-22	I-39/90/94	County Road CS Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FH-24	I-39/90/94	State Highway 60 Interchange	New	Mainline	$25,000	$800	Folded diamond interchange
	FH-25	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	New	Diamond Interchange	$79,000	$2,500	
	FH-26	I-39	State Highway 16 (Mile Marker 89 - Portage) Interchange	New	Cloverleaf or Non-traditional Interchange	$153,000	$4,900	
	FH-27	I-39	State Highway 33 (Mile Marker 87 - Portage) Interchange	New	Mainline	$25,000	$800	Folded diamond interchange

ITS Element	Map ID	Roadway	From	To	Category	Capital Cost	Annual O & M	Note
Freeway Service Patrol						N/A	N/A	

Segments

ITS Element	Map ID	Roadway	From	To	# of Signal Systems	Improvement	Capital Cost	Annual O & M	Note

Ramp Termini

	Map ID	Roadway	Interchange with	Improvement	Capital Cost	Annual O & M	Note
Traffic Signal Improvements	FH-4	I-90/94	County Road C	Install traffic signal at ramp termini intersection (if warranted).	$325,000	$16,200	
	FH-6	I-90/94	State Highway 82	Install traffic signal at ramp termini intersection (if warranted).	$325,000	$16,200	
	FH-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells)	Install traffic signal at ramp termini intersection (if warranted). Provide communications link to operating agency and State Traffic	$331,000	$16,600	
	FH-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton)	Two (2) traffic signal controller upgrades. Provide communications link to operating agency and State Traffic Operations Center.	$22,000	$1,200	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
CCTV Surveillance Camera	FH-1	I-90/94	Interstate 90/94 Tomah Split Interchange	New	$40,000	$2,300	
	FH-1	I-90/94	Interstate 90/94 Tomah Split Interchange	New	$40,000	$2,300	Additional camera to cover the large Tomah Split Interchange
	FH-2	I-90/94	County Road PP Interchange	New	$40,000	$2,300	
	FH-4	I-90/94	County Road C Interchange	New	$40,000	$2,300	
	FH-5	I-90/94	State Highway 80 Interchange	New	$40,000	$2,300	
	FH-6	I-90/94	State Highway 82 Interchange	New	$40,000	$2,300	
	FH-8	I-90/94	County Road HH Interchange	New	$40,000	$2,300	
	FH-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	New	$40,000	$2,300	
	FH-11	I-90/94	State Highway 13 Interchange	New	$40,000	$2,300	
	FH-12	I-90/94	State Highway 23 Interchange	New	$40,000	$2,300	
	FH-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	New	$40,000	$2,300	
	FH-15	I-90/94	Gillem Rd	New	$40,000	$2,300	
	FH-16	I-90/94	Schepp Rd	New	$40,000	$2,300	
	FH-17	I-90/94	Statz Rd	New	$40,000	$2,300	
	FH-18	I-90/94	State Highway 33 Interchange	New	$40,000	$2,300	
	FH-19	I-39/90/94	Interstate 39/90/94 Portage Split Interchange	New	$40,000	$2,300	
	FH-19	I-39/90/94	Interstate 39/90/94 Portage Split Interchange	New	$40,000	$2,300	Additional camera to cover the large Petro Interchange
	FH-20	I-39/90/94	Wisconsin River Bridge	Existing	$40,000	$2,300	
	FH-22	I-39/90/94	County Road CS Interchange	New	$40,000	$2,300	
	FH-24	I-39/90/94	State Highway 60 Interchange	New	$40,000	$2,300	
	FH-25	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	Existing	$40,000	$2,300	
	FH-26	I-39	State Highway 16 (Mile Marker 89 - Portage) Interchange	New	$40,000	$2,300	
	FH-27	I-39	State Highway 33 (Mile Marker 87 - Portage) Interchange	New	$40,000	$2,300	

ITS Element	Map ID	Roadway	At	Onramp From	Onramp To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Closure Gates	FH-2	I-90/94	County Road PP Interchange	County Road PP	WB I-90/94	New	Type III Barricades	$1,300	$130	
	FH-2	I-90/94	County Road PP Interchange	County Road PP	EB I-90/94	New	Type III Barricades	$1,300	$130	
	FH-4	I-90/94	County Road C Interchange	County Road C	WB I-90/94	New	Type III Barricades	$1,300	$130	
	FH-4	I-90/94	County Road C Interchange	County Road C	EB I-90/94	New	Type III Barricades	$1,300	$130	
	FH-5	I-90/94	State Highway 80 Interchange	State Highway 80	WB I-90/94	New	Type III Barricades	$1,300	$130	
	FH-5	I-90/94	State Highway 80 Interchange	State Highway 80	EB I-90/94	New	Type III Barricades	$1,300	$130	
	FH-6	I-90/94	State Highway 82 Interchange	State Highway 82	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-6	I-90/94	State Highway 82 Interchange	EB State Highway 82	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-6	I-90/94	State Highway 82 Interchange	WB State Highway 82	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-8	I-90/94	County Road HH Interchange	County Road HH	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-8	I-90/94	County Road HH Interchange	County Road HH	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	US Highway 12	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-10	I-90/94	US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	US Highway 12	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-11	I-90/94	State Highway 13 Interchange	SB State Highway 13	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-11	I-90/94	State Highway 13 Interchange	SB State Highway 13	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-12	I-90/94	State Highway 23 Interchange	State Highway 23	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-12	I-90/94	State Highway 23 Interchange	State Highway 23	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	SB US Highway 12	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	NB US Highway 12	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	SB US Highway 12	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-13	I-90/94	US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	NB US Highway 12	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-18	I-90/94	State Highway 33 Interchange	State Highway 33	WB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-18	I-90/94	State Highway 33 Interchange	State Highway 33	EB I-90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-22	I-39/90/94	County Road CS Interchange	County Road CS	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-22	I-39/90/94	County Road CS Interchange	County Road CS	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-24	I-39/90/94	State Highway 60 Interchange	State Highway 60	NB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-24	I-39/90/94	State Highway 60 Interchange	State Highway 60	SB I-39/90/94	New	Vertical Drop Gate	$19,000	$1,900	
	FH-25	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	US Highway 51	NB I-39	New	Type III Barricades	$1,300	$130	
	FH-25	I-39	US Highway 51 (Mile Marker 92 - Portage) Interchange	US Highway 51	SB I-39	New	Type III Barricades	$1,300	$130	
	FH-26	I-39	State Highway 16 (Mile Marker 89 - Portage) Interchange	State Highway 16	NB I-39	New	Type III Barricades	$1,300	$130	
	FH-26	I-39	State Highway 16 (Mile Marker 89 - Portage) Interchange	State Highway 16	SB I-39	New	Type III Barricades	$1,300	$130	
	FH-27	I-39	State Highway 33 (Mile Marker 87 - Portage) Interchange	State Highway 33	NB I-39	New	Type III Barricades	$1,300	$130	
	FH-27	I-39	State Highway 33 (Mile Marker 87 - Portage) Interchange	State Highway 33	SB I-39	New	Type III Barricades	$1,300	$130	

ITS Element	Map ID	Roadway Onramps	From	To	Category	Type	Capital Cost	Annual O & M	Note
Ramp Metering							N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Dynamic Message Sign					N/A	N/A	

ITS Element	Map ID	Roadway	At	Category	Capital Cost	Annual O & M	Note
Portable Changeable Message Sign Pad	FH-3	I-90/94 WB	1-2 Miles prior to County Road PP Interchange The PDMS would be placed in the vicinity of Grover Rd	New	$32,000	$3,200	
	FH-9	I-90/94 EB	1-2 Miles prior to US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange The PDMS would be placed in the vicinity of Mile Marker 83	New	$32,000	$3,200	
	FH-14	I-90/94 WB	1-2 Miles prior to US Highway 12 (Mile Marker 92 - Lake Delton) Interchange The PDMS would be placed in the vicinity of County Road A	New	$32,000	$3,200	
	FH-20	I-39/90/94 EB	Approach to Wisconsin River Bridge	Existing	$32,000	$3,200	
	FH-20	I-39/90/94 WB	Approach to Wisconsin River Bridge	Existing	$32,000	$3,200	

ITS Element	Map ID	Roadway	At	Category	NB (WB) CIS	SB (EB) CIS	Capital Cost	Annual O & M	Note
Crash Investigation Site	FH-7	I-90/94	EB Rest Area (9) Lyndon Station North of 57th St	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	FH-7	I-90/94	WB Rest Area (10) Mauston South of 57th St	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost
	FH-21	I-39/90/94	EB Rest Area (11) Portage North of Black Rd	Existing Rest Stop		1	$0	$0	Could be signed as a designated CIS at minimal cost
	FH-21	I-39/90/94	WB Rest Area (12) Poynette North of Black Rd	Existing Rest Stop	1		$0	$0	Could be signed as a designated CIS at minimal cost

ITS Element	Map ID	Roadway	At	Category	NB (WB) Onramp LEP	SB (EB) Onramp LEP	Median LEP	Capital Cost	Annual O & M	Note
Law Enforcement Pad	N/A	I-90/94	East of Tomah Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	West of County Road PP Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of County Road PP Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of County Road W	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of County Road C Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of County Road C Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	39th St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 80 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 80 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Meyer Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Fairway Ln	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Sherman St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 82 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of 19th Ave	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road N	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	58th St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of County Road HH Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of County Road HH Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of 63rd St	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	28th Ave	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of US Highway 12 (Mile Marker 85 - Wisconsin Dells) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road H	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Trout Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 23 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Xanadu Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	West of US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of US Highway 12 (Mile Marker 92 - Lake Delton) Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road A	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Gillem Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	County Road T	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Van Hoosen Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Hein Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	East of Sauk/Columbia County Line	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	Blount Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	South of Cascade Mountain Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-90/94	North of Portage Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of Portage Split Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of Ziehmke Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of County Road U	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	County Road V	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	Earnie Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of Black Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of County Road CS Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	FH-23	I-39/90/94	Between County Road CS Interchange and Smokey Hollow Rd	New			1	$0	$0	Wide median allows for safer median LEP Survey recommended
	N/A	I-39/90/94	South of Smokey Hollow Rd	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	North of State Highway 60 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39/90/94	South of State Highway 60 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of US Highway 51 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of State Highway 16 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of State Highway 16 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of Wisconsin River	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	South of State Highway 33 Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.
	N/A	I-39	North of Cascade Mountain Rd Interchange	Existing Paved Median Crossover			1	$0	$0	Not shown on map.

ITS Element	Map ID	Roadway	From	To	Distance	Category	Capital Cost	Annual O & M	Note
Fiber Optic Communications							N/A	N/A	

F. Performance Impacts

Table F.1 2005 Segment A Performance Impacts

	Segment A			
	Low	**Medium**	**High (4L)**	**High (6L)**
Change in VMT	0	288	270	1,123
Baseline VMT	4,710,869	4,710,869	4,710,869	4,734,720
Improvement VMT	4,710,869	4,711,157	4,711,138	4,735,843
ATIS Savings (hours)	0.00	86.40	113.56	116.27
Baseline Delay (hours)	6,293.00	6,293.00	6,293.00	503.58
Improved Delay (hours)	6,120.93	5,611.85	5,600.19	468.15
Delay Reduction	-172.07	-681.14	-692.81	-35.43
Baseline Fatalities	0.059009	0.059009	0.059009	0.058907
Improved Fatalities	0.058882	0.058816	0.058813	0.058694
Fatality Reduction	-0.0001269	-0.00019296	-0.00019606	-0.00021261
Baseline Injuries	5.497653	5.497653	5.497653	5.434256
Improved Injuries	5.495915	5.496022	5.495827	5.431354
Injury Reduction	-0.001738191	-0.001630895	-0.001826492	-0.002902552
Baseline Fuel	219,096.07	219,096.07	219,096.07	221,928.31
Improved Fuel	218,521.58	218,135.43	218,107.66	220,896.08
Fuel Reduction	-574.492188	-960.6431122	-988.416092	-1,032.2298
Baseline HC/ROG (tons)	5.14	5.14	5.14	5.19
Improved HC/ROG (tons)	5.12	5.12	5.11	5.16
HC/ROG Reduction	-0.01493645	-0.01592493	-0.0271137	-0.02772399
Baseline NO_x (tons)	9.75	9.75	9.75	10.00
Improved NO_x (tons)	9.71	9.72	9.69	9.94
NO_x Reduction	-0.03686619	-0.03479028	-0.05947941	-0.060372291
Baseline CO (tons)	29.37	29.37	29.37	30.73
Improved CO (tons)	29.28	29.26	29.19	30.54
CO Reduction	-0.09572	-0.1101	-0.18219	-0.190988679

Table F.2 2035 Segment A Performance Impacts

	Segment A			
	Low	**Medium**	**High (4L)**	**High (6L)**
Change in VMT	0	-557	1,140	2,456
Baseline VMT	7,971,605	7,971,605	7,971,605	8,041,815
Improvement VMT	7,971,605	7,971,048	7,972,745	8,044,270
ATIS Savings (hours)	0.00	135.88	186.03	210.60
Baseline Delay (hours)	23,818.36	23,818.36	23,818.36	20,661.56
Improved Delay (hours)	23,145.26	22,318.51	21,688.82	18,974.93
Delay Reduction	-673.09	-1,499.85	-2,129.53	-1,686.63
Baseline Fatalities	0.102387	0.102387	0.102387	0.097885
Improved Fatalities	0.102193	0.102114	0.102037	0.097452
Fatality Reduction	-0.00019346	-0.00027318	-0.00035001	-0.00043278
Baseline Injuries	10.023963	10.023963	10.023963	9.395548
Improved Injuries	10.020245	10.021742	10.014893	9.367239
Injury Reduction	-0.00371838	-0.00222154	-0.009069771	-0.028309808
Baseline Fuel	379,244.97	379,244.97	379,244.97	362,579.05
Improved Fuel	378,317.97	377,661.32	377,374.13	360,945.83
Fuel Reduction	-927.0078	-1,583.65042	-1,870.847961	-1,633.218521
BaselineHC/ROG(tons)	9.25	9.25	9.25	8.77
Improved HC/ROG (tons)	9.22	9.22	9.19	8.73
HC/ROG Reduction	-0.026451	-0.03065368	-0.0622863	-0.03260759
Baseline NO_x (tons)	14.66	14.66	14.66	15.75
Improved NO_x (tons)	14.62	14.62	14.61	15.74
NO_x Reduction	-0.040364	-0.03975802	-0.05353414	-0.00431406
Baseline CO (tons)	51.54	51.54	51.54	47.30
Improved CO (tons)	51.40	51.36	51.10	47.16
CO Reduction	-0.14838	-0.188325	-0.44474	-0.139167

Table F.3 2005 Segment B Performance Impacts

	Segment B		
	Low	**Medium**	**High**
Change in VMT	50	-4,043	-4,465
Baseline VMT	12,389,693	12,389,693	12,389,693
Improvement VMT	12,389,743	12,385,650	12,385,228
ATIS Savings (hours)	0.00	167.73	167.50
Baseline Delay (hours)	11,368.84	11,368.84	11,368.84
Improved Delay (hours)	10,975.88	10,220.77	10,103.77
Delay Reduction	-392.96	-1,148.06	-1,265.07
Baseline Fatalities	0.151094	0.151094	0.151094
Improved Fatalities	0.150668	0.150203	0.150154
Fatality Reduction	-0.0004258	-0.00089093	-0.00094033
Baseline Injuries	13.661441	13.661441	13.661441
Improved Injuries	13.640185	13.600802	13.597860
Injury Reduction	-0.0212563	-0.060638952	-0.06358091
Baseline Fuel	581,349.24	581,349.24	581,349.24
Improved Fuel	580,751.40	580,141.95	580,112.20
Fuel Reduction	-597.84073	-1,207.2876	-1,237.03973
Baseline HC/ROG (tons)	15.18	15.18	15.18
Improved HC/ROG (tons)	15.16	15.14	15.14
HC/ROG Reduction	-0.0151446	-0.039212631	-0.0386842
Baseline NO_x (tons)	26.86	26.86	26.86
Improved NO_x (tons)	26.83	26.83	26.83
NO_x Reduction	-0.0289519	-0.02153033	-0.0208762
Baseline CO (tons)	108.00	108.00	108.00
Improved CO (tons)	107.86	107.60	107.62
CO Reduction	-0.1424838	-0.3982481	-0.38323977

Table F.4 2035 Segment B Performance Impacts

	Segment B		
	Low	**Medium**	**High**
Change in VMT	-422	-2,600	-2,706
Baseline VMT	18,460,436	18,460,436	18,460,436
Improvement VMT	18,460,014	18,457,836	18,457,730
ATIS Savings (hours)	0.00	208.59	208.63
Baseline Delay (hours)	44,747.48	44,747.48	44,747.48
Improved Delay (hours)	43,999.90	43,955.09	43,646.88
Delay Reduction	-747.58	-792.39	-1,100.60
Baseline Fatalities	0.227340	0.227340	0.227340
Improved Fatalities	0.226489	0.226051	0.225989
Fatality Reduction	-0.00085117	-0.00128893	-0.001351757
Baseline Injuries	21.110843	21.110843	21.110843
Improved Injuries	21.052745	21.017543	21.009893
Injury Reduction	-0.0580982	-0.0932997	-0.10094974
Baseline Fuel	885,141.99	885,141.99	885,141.99
Improved Fuel	883,935.64	881,011.12	880,842.49
Fuel Reduction	-1,206.3512	-4,130.87546	-4,299.503906
Baseline HC/ROG (tons)	23.85	23.85	23.85
Improved HC/ROG (tons)	23.82	23.75	23.75
HC/ROG Reduction	-0.02439758	-0.09736857	-0.099874569
Baseline NO_x (tons)	36.80	36.80	36.80
Improved NO_x (tons)	36.76	36.75	36.75
NO_x Reduction	-0.03224048	-0.0410107	-0.042415586
Baseline CO (tons)	167.59	167.59	167.59
Improved CO (tons)	167.36	166.47	166.43
CO Reduction	-0.22868055	-1.11723546	-1.15779084

Table F.5 2005 Segment C Performance Impacts

	Segment C			
	Low	**Medium**	**High (4L)**	**High (6L)**
Change in VMT	0	-3,732	-3,732	-3,210
Baseline VMT	12,389,693	12,389,693	12,389,693	12,387,308
Improvement VMT	12,389,693	12,385,961	12,385,961	12,384,099
ATIS Savings (hours)	0.00	118.52	118.52	119.03
Baseline Delay (hours)	11,368.84	11,368.84	11,368.84	8,711.13
Improved Delay (hours)	11,348.08	10,949.70	10,903.98	8,460.24
Delay Reduction	-20.75	-419.13	-464.86	-250.90
Baseline Fatalities	0.151094	0.151094	0.151094	0.150951
Improved Fatalities	0.151075	0.150886	0.150841	0.150424
Fatality Reduction	-1.92E-05	-0.00020776	-0.00025291	-0.000526672
Baseline Injuries	13.661441	13.661441	13.661441	13.636755
Improved Injuries	13.661457	13.652389	13.652417	13.618272
Injury Reduction	1.597E-05	-0.009052657	-0.009024166	-0.018483034
Baseline Fuel	581,349.24	581,349.24	581,349.24	584,347.37
Improved Fuel	581,237.90	580,961.88	580,683.26	583,717.79
Fuel Reduction	-111.3359	-387.3571167	-665.9821167	-629.5877075
Baseline HC/ROG (tons)	15.18	15.18	15.18	15.22
Improved HC/ROG (tons)	15.18	15.17	15.16	15.21
HC/ROG Reduction	-0.002604	-0.011842762	-0.01666597	-0.010384904
Baseline NO_x (tons)	26.86	26.86	26.86	27.06
Improved NO_x (tons)	26.85	26.82	26.81	27.02
NO_x Reduction	-0.006563	-0.037576242	-0.050001188	-0.032216981
Baseline CO (tons)	108.00	108.00	108.00	109.33
Improved CO (tons)	107.98	107.97	107.93	109.27
CO Reduction	-0.020201	-0.027894258	-0.068728685	-0.06312212

Table F.6 2035 Segment C Performance Impacts

	Segment C			
	Low	**Medium**	**High (4L)**	**High (6L)**
Change in VMT	0	3,310	3,310	3,580
Baseline VMT	18,460,436	18,460,436	18,460,436	18,462,541
Improvement VMT	18,460,436	18,463,746	18,463,746	18,466,121
ATIS Savings (hours)	0.00	167.34	167.34	174.05
Baseline Delay (hours)	44,747.48	44,747.48	44,747.48	39,169.68
Improved Delay (hours)	44,660.47	43,254.12	42,922.73	38,120.55
Delay Reduction	-87.01	-1,493.36	-1,824.75	-1,049.12
Baseline Fatalities	0.227340	0.227340	0.227340	0.226809
Improved Fatalities	0.227314	0.227106	0.227041	0.226093
Fatality Reduction	-2.657E-05	-0.000234	-0.000299	-0.000716043
Baseline Injuries	21.110843	21.110843	21.110843	20.942812
Improved Injuries	21.110866	21.086558	21.086600	20.910059
Injury Reduction	2.2411E-05	-0.024285	-0.024244	-0.032752927
Baseline Fuel	885,141.99	885,141.99	885,141.99	891,066.31
Improved Fuel	885,002.85	884,578.43	884,243.88	890,065.94
Fuel Reduction	-139.14063	-563.5638	-898.1107	-1,000.376831
Baseline HC/ROG (tons)	23.85	23.85	23.85	23.89
Improved HC/ROG (tons)	23.85	23.83	23.82	23.87
HC/ROG Reduction	-0.0034018	-0.020892	-0.02767	-0.019548047
Baseline NO_x (tons)	36.80	36.80	36.80	37.60
Improved NO_x (tons)	36.79	36.82	36.81	37.61
NO_x Reduction	-0.0081024	0.0288605	0.0167918	0.009539935
Baseline CO (tons)	167.59	167.59	167.59	170.46
Improved CO (tons)	167.57	167.51	167.47	170.40
CO Reduction	-0.0201035	-0.081056	-0.119222	-0.054223265

Table F.7 2005 Segment D Performance Impacts

	Segment D		
	Low	**Medium**	**High**
Change in VMT	0	-122	-122
Baseline VMT	12,389,693	12,389,693	12,389,693
Improvement VMT	12,389,693	12,389,571	12,389,571
ATIS Savings (hours)	0.00	102.27	102.27
Baseline Delay (hours)	11,368.84	11,368.84	11,368.84
Improved Delay (hours)	11,361.78	11,224.82	11,219.99
Delay Reduction	-7.06	-144.02	-148.85
Baseline Fatalities	0.151094	0.151094	0.151094
Improved Fatalities	0.151063	0.150510	0.150487
Fatality Reduction	-3.078E-05	-0.00058356	-0.0006073
Baseline Injuries	13.661441	13.661441	13.661441
Improved Injuries	13.661471	13.628565	13.628582
Injury Reduction	2.921E-05	-0.03287612	-0.0328594
Baseline Fuel	581,349.24	581,349.24	581,349.24
Improved Fuel	581,183.43	580,874.88	580,742.41
Fuel Reduction	-165.80469	-474.361023	-606.82977
Baseline HC/ROG (tons)	15.18	15.18	15.18
Improved HC/ROG (tons)	15.17	15.16	15.16
HC/ROG Reduction	-0.004534	-0.01332474	-0.0159883
Baseline NO_x (tons)	26.86	26.86	26.86
Improved NO_x (tons)	26.84	26.82	26.81
NO_x Reduction	-0.0109024	-0.03736473	-0.0439623
Baseline CO (tons)	108.00	108.00	108.00
Improved CO (tons)	107.97	107.86	107.85
CO Reduction	-0.0292721	-0.13482265	-0.1538942

Table F.8 2035 Segment D Performance Impacts

	Segment D		
	Low	**Medium**	**High**
Change in VMT	0	5,995	5,995
Baseline VMT	18,460,436	18,460,436	18,460,436
Improvement VMT	18,460,436	18,466,431	18,466,431
ATIS Savings (hours)	0.00	153.80	153.80
Baseline Delay (hours)	44,747.48	44,747.48	44,747.48
Improved Delay (hours)	44,655.78	43,135.43	43,019.80
Delay Reduction	-91.70	-1,612.05	-1,727.68
Baseline Fatalities	0.227340	0.227340	0.227340
Improved Fatalities	0.227294	0.226388	0.226352
Fatality Reduction	-4.591E-05	-0.0009518	-0.0009884
Baseline Injuries	21.110843	21.110843	21.110843
Improved Injuries	21.110887	21.028723	21.028748
Injury Reduction	4.363E-05	-0.0821206	-0.0820949
Baseline Fuel	885,141.99	885,141.99	885,141.99
Improved Fuel	884,902.52	884,260.48	884,075.03
Fuel Reduction	-239.46875	-881.50793	-1,066.9611
Baseline HC/ROG (tons)	23.85	23.85	23.85
Improved HC/ROG (tons)	23.84	23.82	23.82
HC/ROG Reduction	-0.0070424	-0.0273699	-0.0312661
Baseline NO_x (tons)	36.80	36.80	36.80
Improved NO_x (tons)	36.78	36.81	36.80
NO_x Reduction	-0.013648	0.01244653	0.00407327
Baseline CO (tons)	167.59	167.59	167.59
Improved CO (tons)	167.55	167.34	167.32
CO Reduction	-0.0406227	-0.2530325	-0.2737559

Table F.9 2005 Segment E Performance Impacts

	Segment E		
	Low	**Medium**	**High**
Change in VMT	0	0	0
Baseline VMT	12,389,693	12,389,693	12,389,693
Improvement VMT	12,389,693	12,389,693	12,389,693
ATIS Savings (hours)	59.65	80.07	103.26
Baseline Delay (hours)	11,368.84	11,368.84	11,368.84
Improved Delay (hours)	11,366.65	11,365.08	11,362.49
Delay Reduction	-2.18	-3.76	-6.34
Baseline Fatalities	0.151094	0.151094	0.151094
Improved Fatalities	0.151082	0.151064	0.151052
Fatality Reduction	-1.2132E-05	-3.02E-05	-4.23E-05
Baseline Injuries	13.661441	13.661441	13.661441
Improved Injuries	13.661453	13.661177	13.661188
Injury Reduction	1.207E-05	-0.000264	-0.000253
Baseline Fuel	581,349.24	581,349.24	581,349.24
Improved Fuel	581,281.69	581,202.76	581,135.21
Fuel Reduction	-67.546875	-146.4844	-214.0313
Baseline HC/ROG (tons)	15.18	15.18	15.18
Improved HC/ROG (tons)	15.18	15.17	15.17
HC/ROG Reduction	-0.00192887	-0.004185	-0.005864
Baseline NO_x (tons)	26.86	26.86	26.86
Improved NO_x (tons)	26.85	26.85	26.84
NO_x Reduction	-0.00478172	-0.010391	-0.01455
Baseline CO (tons)	108.00	108.00	108.00
Improved CO (tons)	107.99	107.97	107.96
CO Reduction	-0.01383758	-0.030308	-0.042306

Table F.10 2035 Segment E Performance Impacts

	Segment E		
	Low	**Medium**	**High**
Change in VMT	0	0	0
Baseline VMT	18,460,436	18,460,436	18,460,436
Improvement VMT	18,460,436	18,460,436	18,460,436
ATIS Savings (hours)	96.72	129.41	164.50
Baseline Delay (hours)	44,747.48	44,747.48	44,747.48
Improved Delay (hours)	44,712.72	44,675.78	44,632.73
Delay Reduction	-34.76	-71.70	-114.75
Baseline Fatalities	0.227340	0.227340	0.227340
Improved Fatalities	0.227322	0.227293	0.227274
Fatality Reduction	-1.85645E-05	-4.75E-05	-6.6E-05
Baseline Injuries	21.110843	21.110843	21.110843
Improved Injuries	21.110862	21.110374	21.110390
Injury Reduction	1.84178E-05	-0.00047	-0.000453
Baseline Fuel	885,141.99	885,141.99	885,141.99
Improved Fuel	885,048.19	884,932.79	884,838.98
Fuel Reduction	-93.796875	-209.2031	-303.0156
Baseline HC/ROG (tons)	23.85	23.85	23.85
Improved HC/ROG (tons)	23.85	23.84	23.84
HC/ROG Reduction	-0.002835751	-0.006182	-0.008643
Baseline NO_x (tons)	36.80	36.80	36.80
Improved NO_x (tons)	36.79	36.78	36.78
NO_x Reduction	-0.005768061	-0.013617	-0.018474
Baseline CO (tons)	167.59	167.59	167.59
Improved CO (tons)	167.57	167.56	167.54
CO Reduction	-0.015345573	-0.03346	-0.046366

Table F.11 2005 Segment F Performance Impacts

	Segment F		
	Low	**Medium**	**High**
Change in VMT	0	0	0
Baseline VMT	2,827,067	2,827,067	2,827,067
Improvement VMT	2,827,067	2,827,067	2,827,067
ATIS Savings (hours)	27.61	87.72	87.72
Baseline Delay (hours)	1,258.12	1,258.12	1,258.12
Improved Delay (hours)	1,237.99	1,233.14	1,230.32
Delay Reduction	-20.13	-24.98	-27.79
Baseline Fatalities	0.050039	0.050039	0.050039
Improved Fatalities	0.049707	0.049574	0.049559
Fatality Reduction	-0.000332038	-0.000465	-0.00048
Baseline Injuries	4.803187	4.803187	4.803187
Improved Injuries	4.803519	4.803652	4.803667
Injury Reduction	0.000332038	0.0004646	0.0004796
Baseline Fuel	144,312.80	144,312.80	144,312.80
Improved Fuel	143,355.19	142,973.07	142,757.68
Fuel Reduction	-957.6121854	-1,339.732	-1,555.126
Baseline HC/ROG (tons)	0.00	0.00	0.00
Improved HC/ROG (tons)	0.00	0.00	0.00
HC/ROG Reduction	0	0	0
Baseline NO_x (tons)	0.00	0.00	0.00
Improved NO_x (tons)	0.00	0.00	0.00
NO_x Reduction	0	0	0
Baseline CO (tons)	0.00	0.00	0.00
Improved CO (tons)	0.00	0.00	0.00
CO Reduction	0	0	0

Table F.12 2035 Segment F Performance Impacts

	Segment F		
	Low	**Medium**	**High**
Change in VMT	0	0	0
Baseline VMT	5,484,308	5,484,308	5,484,308
Improvement VMT	5,484,308	5,484,308	5,484,308
ATIS Savings (hours)	90.55	225.42	225.42
Baseline Delay (hours)	3,125.58	3,125.58	3,125.58
Improved Delay (hours)	2,923.86	2,821.55	2,788.87
Delay Reduction	-201.71	-304.03	-336.70
Baseline Fatalities	0.097072	0.097072	0.097072
Improved Fatalities	0.096375	0.096098	0.096052
Fatality Reduction	-0.000697745	-0.000974	-0.00102
Baseline Injuries	9.317839	9.317839	9.317839
Improved Injuries	9.318537	9.318813	9.318859
Injury Reduction	0.000697745	0.0009739	0.0010198
Baseline Fuel	279,699.70	279,699.70	279,699.70
Improved Fuel	277,689.25	276,893.58	276,484.18
Fuel Reduction	-2,010.451063	-2,806.123	-3,215.515
Baseline HC/ROG (tons)	0.00	0.00	0.00
Improved HC/ROG (tons)	0.00	0.00	0.00
HC/ROG Reduction	0	0	0
Baseline NO_x (tons)	0.00	0.00	0.00
Improved NO_x (tons)	0.00	0.00	0.00
NO_x Reduction	0	0	0
Baseline CO (tons)	0.00	0.00	0.00
Improved CO (tons)	0.00	0.00	0.00
CO Reduction	0	0	0

G. Traffic Volumes

Segment A Traffic Data

I-90/39 SB (Read Down)		
Description	**2005 AADT**	**2035 AADT**
Start		
North County Line to STH 59	**21,800**	**45,100**
STH 59 SB Off-Ramp	700	10,400
STH 59 SB On-Ramp	3,200	2,200
STH 59 to STH 26	**24,300**	**36,900**
STH 26 SB Off-Ramp (N)	3,000	6,700
STH 26 SB Off-Ramp (S)	N/A	N/A
STH 26 SB On-Ramp (N)	3,900	2,300
STH 26 SB On-Ramp (S)	0	400
STH 26 to USH 14	**25,200**	**32,900**
STH 14 SB Off-Ramp (N)	N/A	N/A
STH 14 SB Off-Ramp (S)	2,500	2,900
STH 14 SB On-Ramp (N)	N/A	N/A
STH 14 SB On-Ramp (S)	5,300	6,600
USH 14 to N Jct STH 11	**28,000**	**36,600**
N Jct STH 11 SB Off-Ramp (N)	1,200	7,100
N Jct STH 11 SB Off-Ramp (S)	300	700
N Jct STH 11 SB On-Ramp (N)	1,500	2,600
N Jct STH 11 SB On-Ramp (S)	1,600	8,000
N Jct STH 11 to S Jct STH 11	**29,600**	**39,400**
S Jct STH 11 SB Off-Ramp	2,200	9,600
S Jct STH 11 SB On-Ramp	1,600	8,500
S Jct STH 11 to CTH S	**29,000**	**38,300**
CTH S SB Off-Ramp	3,200	9,200
CTH S SB On-Ramp	100	6,700
CTH S to I-43	**25,900**	**35,800**
I-43 SB Off-Ramp (N)	2,800	4,600
I-43 SB Off-Ramp (S)	200	500
I-43 SB On-Ramp (N)	3,200	3,000
I-43 SB On-Ramp (S)	1,300	5,100
I-43 to STH 75 (Illinois)	**27,400**	**38,800**
End		

I-90/39 NB (Read Up)		
Description	**2005 AADT**	**2035 AADT**
End		
STH 59 to North County Line	**22,000**	**45,100**
STH 59 NB On-Ramp	700	10,400
STH 59 NB Off-Ramp	2,400	2,000
STH 26 to STH 59	**23,700**	**36,700**
STH 26 NB On-Ramp (S)	1,300	2,200
STH 26 NB On-Ramp (N)	400	3,800
STH 26 NB Off-Ramp (S)	4,700	5,200
STH 26 NB Off-Ramp (N)	N/A	N/A
USH 14 to STH 26	**26,700**	**35,900**
USH 14 NB On-Ramp (S)	N/A	N/A
USH 14 NB On-Ramp (N)	3,300	3,100
USH 14 NB Off-Ramp (S)	400	1,400
USH 14 NB Off-Ramp (N)	3,700	2,700
N Jct STH 11 to USH 14	**27,500**	**36,900**
N Jct STH 11 NB On-Ramp (S)	900	400
N Jct STH 11 NB On-Ramp (N)	900	2,300
N Jct STH 11 NB Off-Ramp (S)	2,400	3,500
N Jct STH 11 NB Off-Ramp (N)	1,300	1,900
S Jct STH 11 to N Jct STH 11	**29,400**	**39,600**
S Jct STH 11 NB On-Ramp	2,400	9,800
S Jct STH 11 NB Off-Ramp	1,300	8,900
CTH S to S Jct STH 11	**28,300**	**38,700**
CTH S NB On-Ramp	2,800	14,200
CTH S NB Off-Ramp	100	9,600
I-43 to CTH S	**25,600**	**34,100**
I-43 NB On-Ramp(S)	2,500	3,200
I-43 NB On-Ramp(N)	300	500
I-43 NB Off-Ramp(S)	3,500	7,400
I-43 NB Off-Ramp(N)	1,000	900
STH 75 (Illinois) to I-43	**27,300**	**38,700**
Start		

Segment B Traffic Data

I-12/18 Beltline SB/EB (Read Down)		
Description	**2000 AADT**	**2030 AADT**
Start		
North of Parmenter Street	**13,800**	**23,500**
Parmeter Street SB/EB Off-Ramp	1,100	3,000
Parmeter Street SB/EB On-Ramp	100	700
Parmenter Street to Airport Road	**12,800**	**21,200**
Airport Road SB/EB Off-Ramp	1,100	1,800
Airport Road SB/EB On-Ramp	2,300	4,300
Airport Road to University Avenue	**14,000**	**23,700**
University Avenue SB/EB Off-Ramp	-	-
University Avenue SB/EB On-Ramp	-	-
University Avenue to Greenway Blvd	**26,700**	**36,400**
Greenway Blvd SB/EB Off-Ramp	2,800	5,000
Greenway Blvd SB/EB On-Ramp	5,300	7,900
Greenway Blvd to Old Sauk Road	**29,200**	**39,300**
Old Sauk Road SB/EB Off-Ramp	4,000	7,800
Old Sauk Road SB/EB On-Ramp	6,600	8,500
Old Sauk Road to Mineral Point Road	**31,800**	**40,000**
Mineral Point Road SB/EB Off-Ramp	10,900	12,700
Mineral Point Road SB/EB On-Ramp	10,000	13,000
Mineral Point Road to Gammon Road	**30,900**	**40,300**
Gammon Road SB/EB Off-Ramp	8,700	11,900
Gammon Road SB/EB On-Ramp	15,600	15,300
Gammon Road to Whitney Way	**37,800**	**43,700**
Whitney Way SB/EB Off-Ramp	5,600	6,900
Whitney Way SB/EB On-Ramp	13,800	12,900
Whitney Way to Verona Road	**46,000**	**49,700**
Verona Road SB/EB Off-Ramp	6,800	8,000
Verona Road SB/EB On-Ramp	24,500	29,000
Verona Road to Seminole Hwy	**63,700**	**70,700**
Seminole Hwy SB/EB Off-Ramp	N/A	N/A
Seminole Hwy SB/EB On-Ramp	4,800	3,600
Seminole Hwy to Todd Drive	**68,500**	**74,300**
Todd Drive SB/EB Off-Ramp	4,700	4,900
Todd Drive SB/EB On-Ramp	3,200	4,900
Todd Drive to Fish Hatchery Road	**67,000**	**74,300**
Fish Hatchery Road SB/EB Off-Ramp (W)	4,900	5,600
Fish Hatchery Road SB/EB Off-Ramp (E)	6,600	8,200
Fish Hatchery Road SB/EB On-Ramp (W)	400	300
Fish Hatchery Road SB/EB On-Ramp (E)	10,400	12,500
Fish Hatchery Road to Park Street	**66,300**	**73,300**
Park Street SB/EB Off-Ramp (W)	6,100	9,000
Park Street SB/EB Off-Ramp (E)	4,300	2,600
Park Street SB/EB On-Ramp (W)	4,700	3,000
Park Street SB/EB On-Ramp (E)	1,600	5,900
Park Street to Rimrock Road	**62,200**	**70,600**
Rimrock Road SB/EB Off-Ramp	11,700	13,000
Rimrock Road SB/EB On-Ramp	6,200	7,700
Rimrock Road to John Nolen Drive	**56,700**	**65,300**
John Nolen Drive SB/EB Off-Ramp	3,700	3,100
John Nolen Drive SB/EB On-Ramp	14,700	16,400
John Nolen Drive to South Towne Drive	**67,700**	**78,600**
South Towne Drive SB/EB Off-Ramp	10,600	13,800
South Towne Drive SB/EB On-Ramp	4,500	4,700
South Towne Drive to Monona Drive	**61,600**	**69,500**
Monona Drive SB/EB Off-Ramp	10,000	10,300
Monona Drive SB/EB On-Ramp	1,000	3,600
Monona Drive to Stoughton Road	**52,600**	**62,800**
Stoughton Road SB/EB Off-Ramp	23,700	27,500
Stoughton Road SB/EB On-Ramp	3,400	5,300
Stoughton Road to I-90	**32,300**	**40,600**
End		

I-12/18 Beltline NB/WB (Read Up)		
Description	**2000 AADT**	**2030 AADT**
End		
North of Parmenter Street	**12,700**	**22,800**
Parmenter Street NB/WB On-Ramp	700	1,500
Parmenter Street NB/WB Off-Ramp	200	900
Airport Road to Parmenter Street	**12,200**	**22,200**
Airport Road NB/WB On-Ramp	900	1,600
Airport Road NB/WB Off-Ramp	2,800	5,100
University Avenue to Airport Road	**14,100**	**25,700**
University Avenue NB/WB On-Ramp	-	-
University Avenue NB/WB Off-Ramp	-	-
Greenway Blvd to University Avenue	**26,600**	**36,400**
Greenway Blvd NB/WB On-Ramp	3,000	5,200
Greenway Blvd NB/WB Off-Ramp	5,400	7,800
Old Sauk Road to Greenway Blvd	**29,000**	**39,000**
Old Sauk Road NB/WB On-Ramp	4,700	7,900
Old Sauk Road NB/WB Off-Ramp	6,500	8,100
Mineral Point Road to Old Sauk Road	**30,800**	**39,200**
Mineral Point Road NB/WB On-Ramp	10,900	12,500
Mineral Point Road NB/WB Off-Ramp	10,600	14,300
Gammon Road to Mineral Point Road	**30,500**	**41,000**
Gammon Road NB/WB On-Ramp	8,100	11,800
Gammon Road NB/WB Off-Ramp	15,200	15,300
Whitney Way to Gammon Road	**37,600**	**44,500**
Whitney Way NB/WB On-Ramp	6,900	9,400
Whitney Way NB/WB Off-Ramp	15,100	14,600
Verona Road to Whitney Way	**45,800**	**49,700**
Verona Road NB/WB On-Ramp	6,900	7,400
Verona Road NB/WB Off-Ramp	25,000	27,800
Seminole Hwy to Verona Road	**63,900**	**70,100**
Seminole Hwy NB/WB On-Ramp	N/A	N/A
Seminole Hwy NB/WB Off-Ramp	5,800	7,600
Todd Drive to Seminole Hwy	**69,700**	**77,700**
Todd drive NB/WB On-Ramp	5,400	7,700
Todd drive NB/WB Off-Ramp	4,500	6,000
Fish Hatchery Road to Todd Drive	**68,800**	**76,000**
Fish Hatchery Road NB/WB On-Ramp (E)	4,300	5,100
Fish Hatchery Road NB/WB On-Ramp (W)	8,700	9,600
Fish Hatchery Road NB/WB Off-Ramp (E)	N/A	N/A
Fish Hatchery Road NB/WB Off-Ramp (W)	10,400	11,100
Park Street to Fish Hatchery Road	**66,200**	**72,400**
Park Street NB/WB On-Ramp (E)	6,500	7,300
Park Street NB/WB On-Ramp (W)	5,500	4,000
Park Street NB/WB Off-Ramp (E)	N/A	N/A
Park Street NB/WB Off-Ramp (W)	9,200	8,300
Rimrock Road to Park Street	**63,400**	**69,400**
Rimrock Road NB/WB On-Ramp	8,300	8,900
Rimrock Road NB/WB Off-Ramp	4,800	10,100
John Nolen Drive to Rimrock Road	**59,900**	**70,600**
John Nolen Drive NB/WB On-Ramp	6,600	6,300
John Nolen Drive NB/WB Off-Ramp	15,300	15,800
South Towne Drive to John Nolen Drive	**68,600**	**80,100**
South Towne Drive NB/WB On-Ramp	10,700	14,500
South Towne Drive NB/WB Off-Ramp	4,600	5,300
Monona Drive to South Towne Drive	**62,500**	**70,900**
Monona Drive NB/WB On-Ramp	10,300	10,900
Monona Drive NB/WB Off-Ramp	2,000	5,200
Stoughton Road to Monona Drive	**54,200**	**65,200**
Stoughton Road NB/WB On-Ramp	23,900	26,600
Stoughton Road NB/WB Off-Ramp	3,800	6,200
I-90 to Stoughton Road	**34,100**	**44,800**
Start		

The model that was created for Dane County initially assigned capacities to the network that kept volumes lower than what they are in actuality. A revision to the model is currently in process to more accurately forecast traffic along this corridor, which will result in higher volumes than what we will report.

Segment C Traffic Data

I-90/39 SB (Read Down)		
Description	**2000 AADT**	**2030 AADT**
Start		
Badger Interchange to Beltline	**37,800**	**51,600**
Beltline SB Off-Ramp (N)	14,900	17,400
Beltline SB Off-Ramp (S)	2,000	5,700
Beltline SB On-Ramp (N)	100	100
Beltline SB On-Ramp (S)	11,700	12,000
Beltline to CTH N	**32,700**	**40,600**
CTH N SB Off-Ramp	4,900	4,500
CTH N SB On-Ramp	900	3,500
CTH N to N Jct USH 51	**28,700**	**39,600**
N Jct USH 51 SB Off-Ramp	800	1,200
N Jct USH 51 SB On-Ramp	2,100	4,400
N Jct USH 51 to S Jct USH 51/STH 73	**30,000**	**42,800**
S Jct USH 51/STH 73 SB Off-Ramp	2,200	2,400
S Jct USH 51/STH 73 SB On-Ramp	2,200	7,300
South of S Jct USH 51/STH 73	**30,000**	**47,700**
End		

I-90/39 NB (Read Up)		
Description	**2000 AADT**	**2030 AADT**
End		
Beltline to Badger Interchange	**36,000**	**45,400**
Beltline NB On-Ramp (S)	N/A	N/A
Beltline NB On-Ramp (N)	15,200	17,300
Beltline NB Off-Ramp (S)	100	700
Beltline NB Off-Ramp (N)	11,700	8,800
CTH N to Beltline	**32,600**	**37,600**
CTH N NB On-Ramp	4,800	4,500
CTH N NB Off-Ramp	900	6,300
N Jct USH 51 to CTH N	**28,700**	**39,400**
N Jct USH 51 NB On-Ramp	500	1,000
N Jct USH 51 NB Off-Ramp	2,000	4,100
S Jct USH 51/STH 73 to N Jct USH 51	**30,200**	**42,500**
S Jct USH 51/STH 73 NB On-Ramp	2,300	2,400
S Jct USH 51/STH 73 NB Off-Ramp	2,100	7,600
South of S Jct USH 51/STH 73	**30,000**	**47,700**
Start		

Segment D Traffic Data

I-90/94 SB (Read Down)		
Description	**2000 AADT**	**2030 AADT**
Start		
N of CTH V	**34,700**	**52,300**
CTH V SB Off-Ramp	1,600	3,300
CTH V SB On-Ramp	5,200	7,100
CTH V to STH 19	**38,300**	**56,100**
STH 19 SB Off-Ramp	2,700	5,800
STH 19 SB On-Ramp	6,200	9,200
STH 19 to USH 51	**41,800**	**59,500**
USH 51 SB Off-Ramp (N)	9,400	13,000
USH 51 SB Off-Ramp (S)	N/A	N/A
USH 51 SB On-Ramp (N)	1,900	2,400
USH 51 SB On-Ramp (S)	200	900
USH 51 to USH 151	**34,500**	**49,800**
USH 151 SB Off-Ramp (N)	8,100	11,100
USH 151 SB Off-Ramp (S)	100	3,200
USH 151 SB On-Ramp (N)	9,300	11,400
USH 151 SB On-Ramp (S)	600	7,700
USH 151 to High Crossing Blvd	**36,200**	**54,600**
High Crossing Blvd SB Off-Ramp	N/A	N/A
High Crossing Blvd SB On-Ramp	3,500	5,400
High Crossing Blvd to Badger Interchange	**39,700**	**60,000**
Badger Interchange SB Off-Ramp (N)	9,600	13,000
Badger Interchange SB Off-Ramp (S)	1,200	6,600
Badger Interchange SB On-Ramp (N)	5,400	6,600
Badger Interchange SB On-Ramp (S)	3,500	4,600
Badger Interchange to Beltline	**37,800**	**51,600**
End		

I-90/94 NB (Read Up)		
Description	**2000 AADT**	**2030 AADT**
End		
North of CTH V	**34,700**	**52,300**
CTH V NB On-Ramp	1,500	3,300
CTH V NB Off-Ramp	5,300	7,400
STH 19 to CTH V	**38,500**	**56,400**
STH 19 NB On-Ramp	2,600	3,700
STH 19 NB Off-Ramp	5,800	7,400
USH 51 to STH 19	**41,700**	**60,100**
USH 51 NB On-Ramp (N)	400	400
USH 51 NB On-Ramp (S)	8,500	12,000
USH 51 NB Off-Ramp (N)	2,500	2,900
USH 51 NB Off-Ramp (S)	N/A	N/A
USH 151 to USH 51	**35,300**	**50,600**
USH 151 NB On-Ramp (N)	2,500	6,200
USH 151 NB On-Ramp (S)	6,900	9,400
USH 151 NB Off-Ramp (N)	0	0
USH 151 NB Off-Ramp (S)	9,500	14,000
High Crossing Blvd to USH 151	**35,400**	**49,000**
High Crossing Blvd NB On-Ramp	N/A	N/A
High Crossing Blvd NB Off-Ramp	3,300	7,600
Badger Interchange to High Crossing Blvd	**38,700**	**56,600**
Badger Interchange NB On-Ramp (N)	9,100	13,000
Badger Interchange NB On-Ramp (S)	2,400	8,700
Badger Interchange NB Off-Ramp (N)	5,100	5,900
Badger Interchange NB Off-Ramp (S)	3,700	4,600
Beltline to Badger Interchange	**36,000**	**45,400**
Start		

Segment E Traffic Data

I-94 EB (Read Down)		
Description	**2000 AADT**	**2030 AADT**
Start		
Badger Interchange to CTH N	**24,700**	**35,400**
CTH N EB Off-Ramp	4,600	6,200
CTH N EB On-Ramp	1,500	3,600
CTH N to STH 73	**21,600**	**32,800**
STH 73 EB Off-Ramp	4,900	4,900
STH 73 EB On-Ramp	700	3,800
East of STH 73	**17,400**	**31,700**
End		

I-94 WB (Read Up)		
Description	**2000 AADT**	**2030 AADT**
End		
CTH N to Badger Interchange	**24,400**	**35,700**
CTH N WB On-Ramp	4,300	6,200
CTH N WB Off-Ramp	1,500	3,600
STH 73 to CTH N	**21,600**	**33,100**
STH 73 WB On-Ramp	4,900	5,100
STH 73 WB Off-Ramp	700	3,700
East of STH 73	**17,400**	**31,700**
Start		

Segment F Traffic Data

I-90/94 SB (Read Down)		
Description	**2000 AADT**	**2030 AADT**
Start		
North of I-90 Split	**16,500**	**26,900**
I-90 SB Off-Ramp	1,400	1,600
I-90 SB On-Ramp	7,600	11,000
I-90 Split to CTH PP	**22,700**	**36,300**
CTH PP SB Off-Ramp	2,200	3,200
CTH PP SB On-Ramp	300	400
CTH PP to CTH C	**20,800**	**33,500**
CTH C SB Off-Ramp	700	800
CTH C SB On-Ramp	300	400
CTH C to STH 80	**20,400**	**33,100**
STH 80 SB Off-Ramp	900	1,200
STH 80 SB On-Ramp	800	1,100
STH 80 to STH 82	**20,300**	**33,000**
STH 82 SB Off-Ramp	2,900	3,600
STH 82 SB On-Ramp	1,600	2,000
STH 82 to CTH HH	**19,000**	**31,400**
CTH HH SB Off-Ramp	400	400
CTH HH SB On-Ramp	300	600
CTH HH to STH 16	**18,900**	**31,600**
STH 16 SB Off-Ramp	1,700	4,500
STH 16 SB On-Ramp	900	1,500
STH 16 to STH 13	**18,100**	**28,600**
STH 13 SB Off-Ramp	3,400	13,400
STH 13 SB On-Ramp	6,700	15,500
STH 13 to STH 23	**21,400**	**30,700**
STH 23 SB Off-Ramp	1,100	800
STH 23 SB On-Ramp	1,400	800
STH 23 to USH 12	**21,700**	**30,700**
USH 12 SB Off-Ramp	4,000	5,300
USH 12 SB Off-Ramp	1,600	4,600
USH 12 to STH 33	**19,300**	**30,000**
STH 33 SB Off-Ramp	2,600	3,300
STH 33 SB On-Ramp	1,300	3,000
STH 33 to I-39	**18,000**	**29,700**
I-39 SB Off-Ramp	100	200
I-39 SB On-Ramp	8,900	13,200
I-39 to CTH CS	**26,800**	**42,700**
CTH CS SB Off-Ramp	1,100	1,500
CTH CS SB On-Ramp	800	1,000
South of CTH CS	**26,500**	**42,200**
End		

I-90/94 NB (Read Up)		
Description	**2000 AADT**	**2030 AADT**
End		
North of I-90 Split	**16,000**	**26,300**
I-90 Split NB On-Ramp	1,000	1,200
I-90 Split NB Off-Ramp	6,900	9,900
CTH PP to I-90 Split	**21,900**	**35,000**
CTH PP NB On-Ramp	1,400	2,000
CTH PP NB Off-Ramp	300	400
CTH C to CTH PP	**20,800**	**33,400**
CTH C NB On-Ramp	700	700
CTH C NB Off-Ramp	200	200
STH 80 to CTH C	**20,300**	**32,900**
STH 80 NB On-Ramp	800	1,000
STH 80 NB Off-Ramp	1,100	1,000
STH 82 to STH 80	**20,600**	**32,900**
STH 82 NB On-Ramp	2,700	3,500
STH 82 NB Off-Ramp	900	1,900
CTH HH to STH 82	**18,800**	**31,300**
CTH HH NB On-Ramp	400	400
CTH HH NB Off-Ramp	300	600
STH 16 to CTH HH	**18,700**	**31,500**
STH 16 NB On-Ramp	1,300	4,600
STH 16 NB Off-Ramp	900	1,400
STH 13 to STH 16	**18,300**	**28,300**
STH 13 NB On-Ramp	3,500	11,900
STH 13 NB Off-Ramp	6,800	14,200
STH 23 to STH 13	**21,600**	**30,600**
STH 23 NB On-Ramp	1,100	800
STH 23 NB Off-Ramp	1,400	2,400
USH 12 to STH 23	**21,900**	**32,200**
USH 12 NB On-Ramp	3,800	5,300
USH 12 NB Off-Ramp	1,700	2,900
STH 33 to USH 12	**19,800**	**29,800**
STH 33 NB On-Ramp	3,200	10,200
STH 33 NB Off-Ramp	1,400	9,600
I-39 to STH 33	**18,000**	**29,200**
I-39 NB On-Ramp	600	700
I-39 NB Off-Ramp	9,900	15,700
CTH CS to I-39	**27,300**	**44,200**
CTH CS NB On-Ramp	1,200	1,600
CTH CS NB Off-Ramp	800	1,000
South of CTH CS	**26,900**	**43,600**
Start		

Segment F Traffic Data

I-39 SB (Read Down)		
Description	**2000 AADT**	**2030 AADT**
Start		
North of STH 16	**9,400**	**15,200**
STH 16 SB Off-Ramp	2,500	2,500
STH 16 SB On-Ramp	300	0
STH 16 to STH 33	**7,200**	**12,700**
STH 33 SB Off-Ramp	400	900
STH 33 SB On-Ramp	3,800	3,600
STH 33 to Cascade Mtn Road	**10,600**	**15,400**
Cascade Mtn Road SB Off-Ramp	0	0
Cascade Mtn Road SB On-Ramp	**0**	**0**
I-39 South of Cascade Mtn Road	**10,600**	**15,400**
End		

I-39 NB (Read Up)		
Description	**2000 AADT**	**2030 AADT**
End		
North of STH 16	**9,600**	**15,500**
STH 16 NB On-Ramp	2,200	2,400
STH 16 NB Off-Ramp	200	700
STH 33 to STH 16	**7,600**	**13,800**
STH 33 NB On-Ramp	500	1,000
STH 33 NB Off-Ramp	4,000	4,500
Cascade Mtn Road to STH 33	**11,100**	**17,300**
Cascade Mtn Road NB On-Ramp	0	0
Cascade Mtn Road NB Off-Ramp	0	0
I-39 South of Cascade Mtn Road	**11,100**	**17,300**
Start		

H. CMS cost/benefit memorandum

TO: Christopher Hedden

FROM: Shawn Pope

DATE: September 8, 2008

RE: Changeable Message Signs

Objective: Research the cost/benefit differences between portable changeable message signs (CMS) versus fixed CMS.

While there have been studies that have shown the benefits of both portable and fixed CMS, no studies were found which compared the two ITS technologies in relative terms of cost/benefits. According to research and state guidelines, portable changeable message signs are traditionally used to inform the motorist of unusual driving conditions including work zones, incidents, and future construction.[1] These serve different roles than fixed message signs which usually display daily travel times and congestions levels.

Portable changeable message signs have been studied which regards to congestion relief and accident reduction but only in the cases dealing with work zones. Fixed message signs have also been studied; however, it is difficult to measure the effect of fixed CMS directly because it is usually part of a larger ITS system. Many of the studies relied on driver surveys to measure the trip diversion rates and gauge the net social benefit of the fixed CMS.[2]

[1] Portable Changeable Message Sign Handbook: FHWA-RD-03-066

[2] Guidelines for the Evaluation of Dynamic Message Sign Performance: FHWA/TX-07/0-4772-1

I. IDAS Description

IDAS DESCRIPTION

This section presents a brief overview of the ITS Deployment Analysis (IDAS) system software used to conduct the benefit/cost analysis for this project. More detail on IDAS can be found at http://idas.camsys.com/. This software package was used to conduct the benefit-cost analysis of ITS alternatives. IDAS is a sketch-planning software and analysis methodology developed by Cambridge Systematics for the Federal Highway Administration (FHWA).

IDAS was developed to assist state, regional, and local agencies in integrating ITS into the transportation planning process. Planners and others can use IDAS to calculate relative costs and benefits of ITS investments. IDAS currently can predict costs, benefits, and impacts for more than 60 types of ITS investments in combination or isolation.

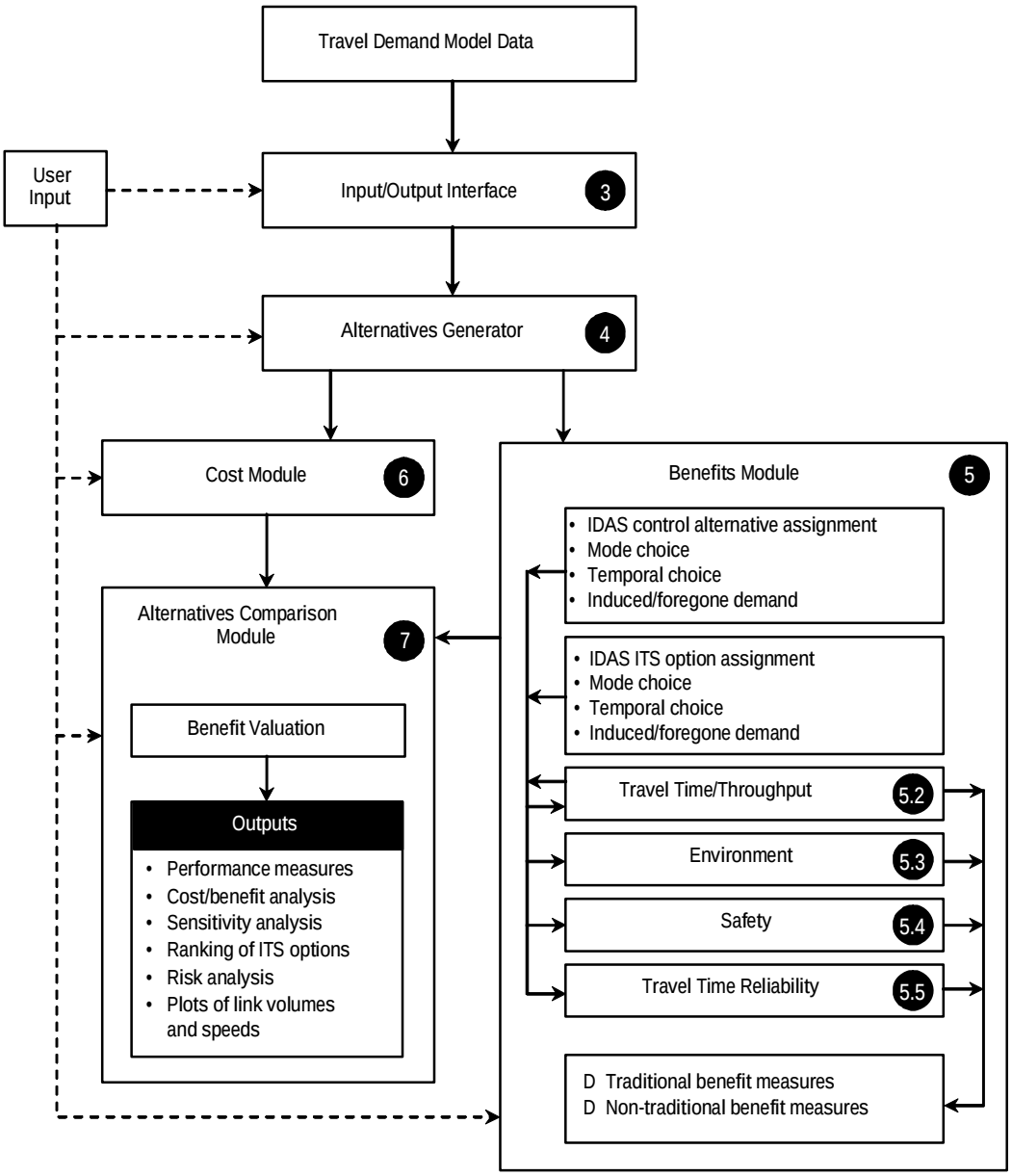
In order to be consistent with current transportation planning processes, IDAS operates as a postprocessor to travel demand models used by Metropolitan Planning Organizations (MPO) and by state Departments of Transportation (DOT). Although IDAS is a sketch-planning tool, it can implement the modal split and/or traffic assignment steps associated with a traditional planning model. These steps are key to estimating the changes in modal, route and temporal decisions of travelers resulting from ITS technologies. For this analysis, three models were utilized, one from the Dane County MPO region, one from the Rock County MPO region and the Statewide Planning Model. Since these models were developed as part of a statewide model development effort, the methodology used is consistent.

There are a wide range of ITS improvements that can be assessed in IDAS, including Freeway Management Systems, Advanced Public Transit Systems, Incident Management, Emergency Management, Advanced Traveler Information Systems and many others. The set of impacts evaluated by IDAS included changes in user mobility, travel time/speed, travel time reliability, fuel costs, operating costs, accident costs, emissions, and noise. The performance of selected ITS options can be viewed by market sector, facility type, and district. IDAS is comprised of the following five different analysis modules:

- Input/output interface module (IOM)
- Alternatives generator module (AGM)
- Benefits module
- Cost module
- Alternatives comparison module (ACM)

The input/output interface is used to specify and translate the data files provided by the regional travel demand models, and convert the data into a format that can be used internally by the IDAS model. The alternatives generator module allows an analyst to use a graphical user interface (GUI) to define and code ITS improvements into IDAS.

IDAS estimates both traditional benefits of ITS deployment, such as, improvement in average travel time, and nontraditional benefits such as, reduction in travel time variability. The cost module allows the user to define the incremental costs of the various ITS deployments being studied, including capital costs, and operating and maintenance costs. The user can modify IDAS-supplied default values for the proportion of the costs borne by the public and private sectors. Finally, the alternative comparison module provides the analyst with information regarding the value of user benefits from ITS deployments, the associated costs of the deployments, and a comparison of the benefits and costs for different ITS deployment options.



The specific performance measures generated by IDAS include the following:

- Vehicle miles of travel (VMT)
- Vehicle hours of travel (VHT)
- Average speed
- Person hours of travel (PHT)
- Number of person trips
- Number of accidents
  - Fatality
  - Injury
  - Property damage only
- Travel time reliability (hours of unexpected delay)
- Fuel consumption (gallons)
- Emissions
  - Hydrocarbon and reactive organic gases
  - Carbon monoxide
  - Nitrous oxides
  - PM_{10}

IDAS Benefit-Cost Summary, details the results of the benefits valuation (value of time saved, value of accident reductions, etc.), cost analysis of the ITS option, net annual benefit, and benefit-cost ratio. These include the following:

- Annual Benefits
  - Change in user mobility
  - Change in user travel time (in-vehicle, out-of-vehicle, and travel time reliability)
  - Change in costs paid by users (fuel costs, nonfuel operating costs, and accident costs – internal only)
  - Change in external costs (accident costs – external only, HC/ROG, NO_x, CO, PM_{10}, CO_2, global warming, noise, other mileage-based external costs, other trip-based external costs)
  - Change in public agencies costs (efficiency included)
  - Other calculated benefits
  - User-defined additional benefits
- Annual costs

- Average annual private sector costs
- Average annual public sector costs
- Net benefit (annual benefit minus annual cost)
- B/C ratio (annual benefit/annual cost)

J. References

1. State of Wisconsin – Department of Administration
   Population & household projections: 2000-2035. Retrieved March 2009 from http://www.doa.state.wi.us/section_detail.asp?linkcatid=11&linkid=64&locid=9

2. State of Wisconsin – Department of Transportation
   Traffic guidelines manual, 16-20-70, financial assumptions for engineering economic analysis, January 2008

3. State of Wisconsin – Department of Transportation
   Transportation engineering economic analysis manual, chapter 3 valuation of costs and benefits, topic 1 financial assumptions and parameters, Draft #1E, September 19, 2008

4. Wisconsin Traffic Operations and Safety Laboratory
   Wisconsin traffic operations infrastructure plan. Retrieved March 2009 from http://www.topslab.wisc.edu/workgroups/toip.html

5. Cambridge Systematics, Inc.
   Intelligent transportation systems deployment analysis system. Retrieved March 2009 from http://idas.camsys.com/