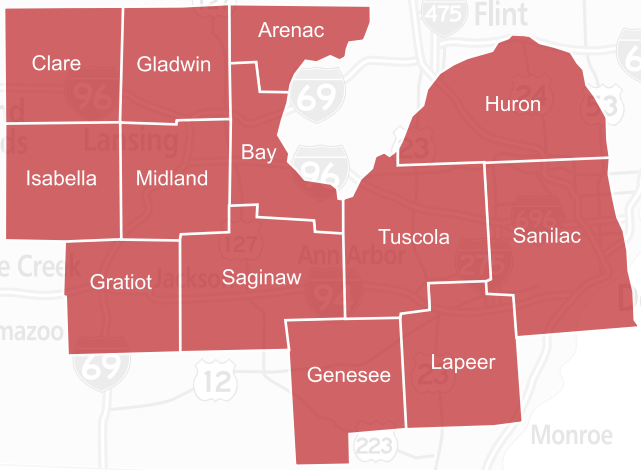
MDOT
Michigan Department of Transportation

2014 Congestion & Mobility Report

Chapter 2
BAY REGION
SUMMARY



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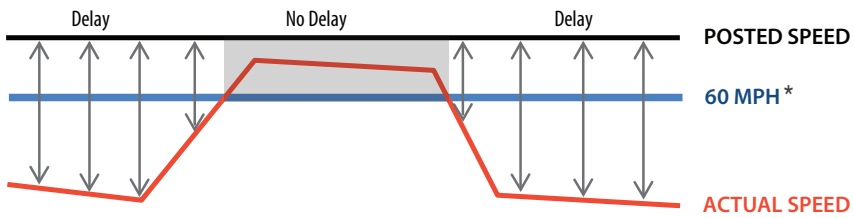
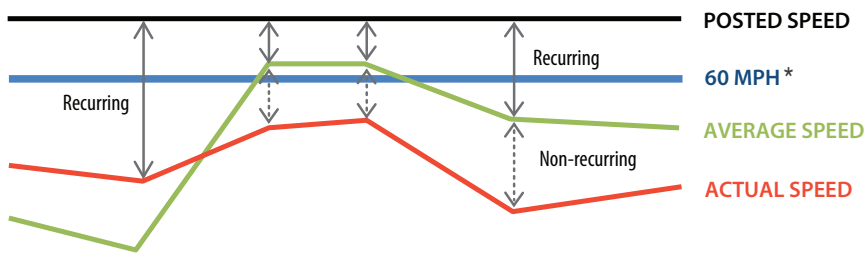
Performance Measures Definitions



Total delay > Delay is calculated by taking the difference between actual speeds when they fall below 60 mph and the posted speed limit for freeways posted at 70 mph. This is to take out the delay caused by the lower average speeds from commercial vehicles.

Total delay per mile > Delay per mile is calculated by taking the total delay and dividing it by the length of the freeway. This was performed for each route in each county.

Non-recurring/recurring delay > Non-recurring delay is calculated by taking the difference between the actual speed (any time the speed falls below 60 mph) and the average speed. Recurring is measured by taking the difference of the total delay and non-recurring delay.



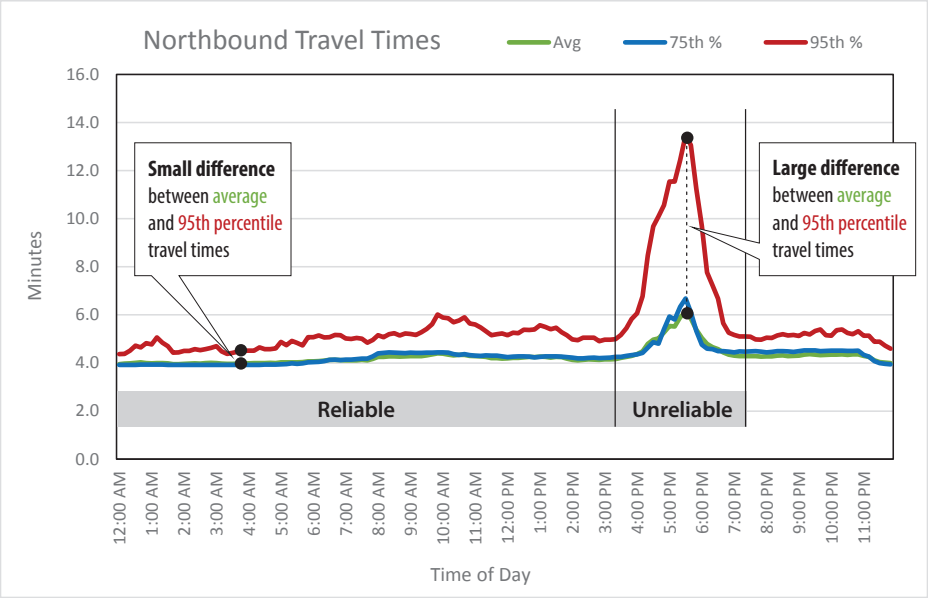
User Delay Cost > User Delay Costs (UDC) is calculated by multiplying delay x hourly volume per hourly user cost. Delay is calculated by taking the difference between actual speeds when they fall below 60 mph and the posted speed limit. Hourly volumes are derived from Average Daily Traffic (ADT) and Commercial Average Daily Traffic (CADT). Hourly user costs are based on Federal Highway Administration (FHWA) publication number FHWA-SA-98-079, "Life-Cycle Cost Analysis in Pavement Design."

Congestion > Congestion is calculated as the number of hours below 45 mph per Traffic Message Channel (TMC). A TMC is a standard for delivering real-time traffic information. They vary from tenths of a mile long to several miles long.

Weighted Congestion > Number of congestion hours multiplied by the segment length. Congestion along longer segments will get more consideration than congestion along shorter segments.

*** On segments with a speed limit of 55 mph, delay is calculated when speeds fall below 55 mph.**

Performance Measures Definitions



Travel Time Reliability > A measure of travel time consistency over a period of time. When travel times are unreliable, customers are more likely to experience unexpected delays. Travel times are shown to be reliable when the 95th percentile travel time remains close to the average travel time.

75th Percentile Travel Time > The amount of time a customer should budget to be on-time three out of four days (75% of the time).

95th Percentile Travel Time > The amount of time a customer should budget to be on-time nineteen out of twenty days (95% of the time). The 95th percentile travel time is also known as the planning time.

Figure 1. 2014 Bay Region user delay cost per mile

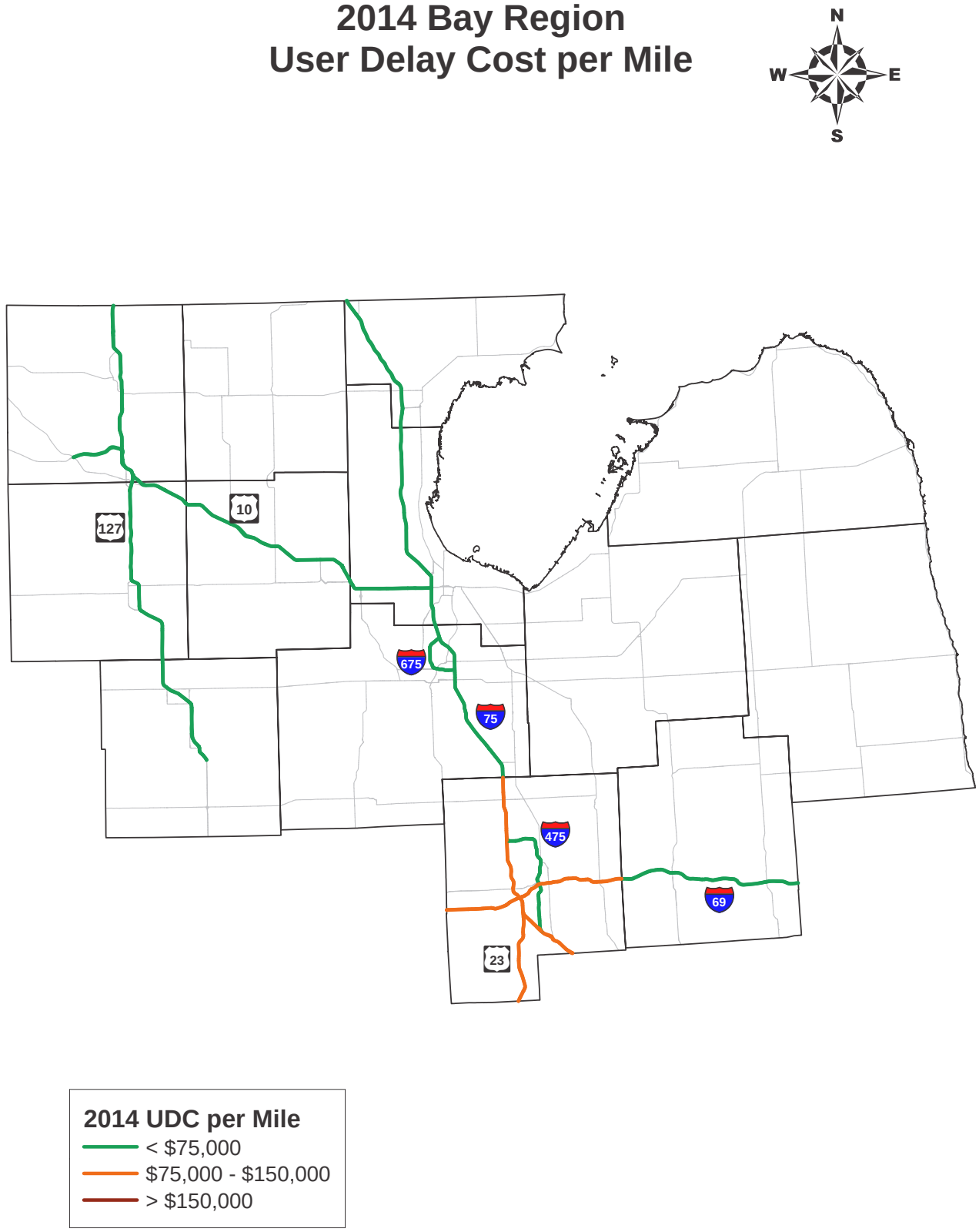


Figure 2. 2014 Bay Region congestion hours northbound/eastbound

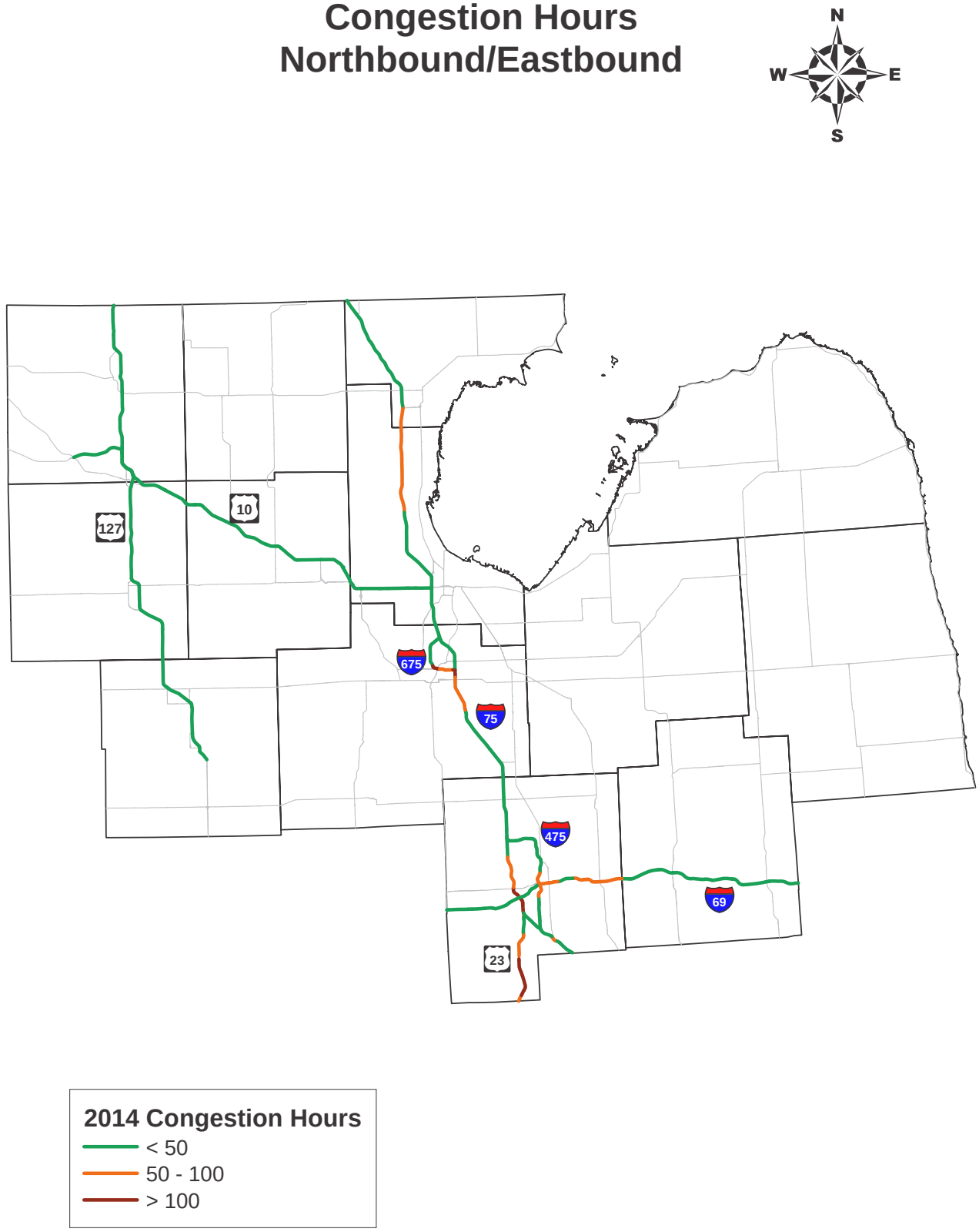


Figure 3. 2014 Bay Region congestion hours southbound/westbound

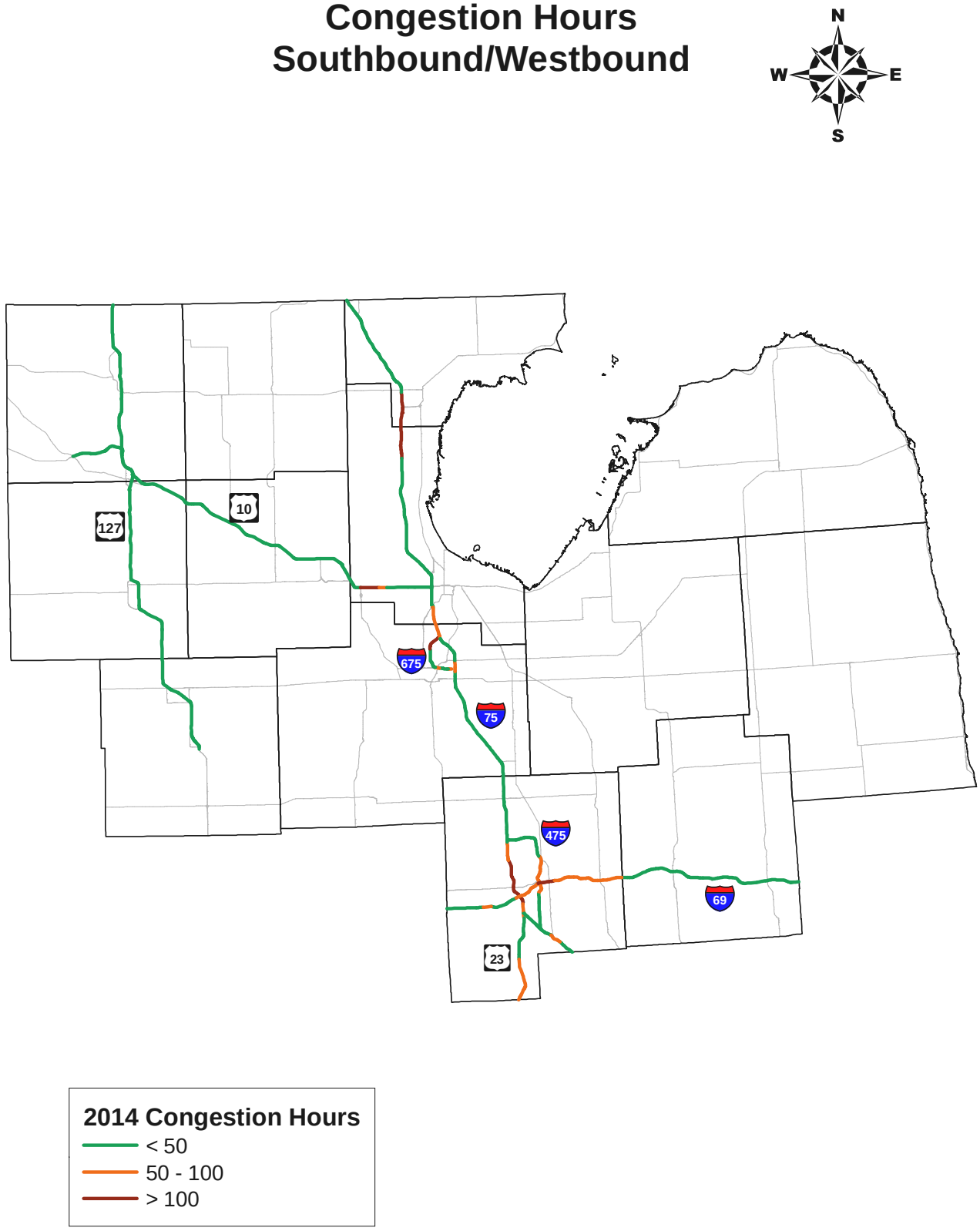


Figure 4. 2014 Bay Region UDC Data 2014

	2012-2013 Average	
Rank	UDC Per Mile	Location (Route, County)
1	$103,387	I-675 Saginaw Co.
2	$100,902	I-69 Genesee Co.
3	$96,953	I-475 Genesee Co.
4	$84,191	US-23 Genesee Co.
5	$82,281	I-75 Genesee Co.
6	$63,996	I-75 Saginaw Co.
7	$45,927	US-10 Bay Co.
8	$36,521	I-69 Lapeer Co.
9	$27,209	I-75 Bay Co.
10	$14,434	US-127 Gratiot Co. (70 mph section)
11	$12,465	US-10 Midland Co.
12	$9,549	US-127 Isabella Co.
13	$8,353	I-75 Arenac Co.
14	$7,837	US-10 Isabella Co.
15	$3,535	US-127 Clare Co.

	2014	
Rank	UDC Per Mile	Location (Route, County)
1	$102,217	I-69 Genesee Co.
2	$94,779	US-23 Genesee Co.
3	$93,116	I-75 Genesee Co.
4	$73,536	I-675 Saginaw Co.
5	$67,904	I-475 Genesee Co.
6	$58,480	I-75 Saginaw Co.
7	$52,443	US-10 Bay Co.
8	$26,712	I-75 Bay Co.
9	$23,562	I-69 Lapeer Co.
10	$10,290	I-75 Arenac Co.
11	$8,556	US-127 Gratiot Co. (70 mph section)
12	$5,604	US-127 Isabella Co.
13	$5,298	US-10 Midland Co.
14	$5,016	US-10 Isabella Co.
15	$2,601	US-127 Clare Co.

	2012-2013 Average	
Rank	Total UDC	Location (Route, County)
1	$4,843,274	I-69 Genesee Co.
2	$4,607,748	I-75 Genesee Co.
3	$3,490,304	I-475 Genesee Co.
4	$3,327,773	I-75 Saginaw Co.
5	$2,104,775	US-23 Genesee Co.
6	$2,067,745	I-675 Saginaw Co.
7	$2,008,654	I-69 Lapeer Co.
8	$1,714,151	I-75 Bay Co.
9	$1,148,174	US-10 Bay Co.
10	$735,420	US-10 Midland Co.
11	$592,010	US-127 Isabella Co.
12	$577,368	US-127 Gratiot Co. (70 mph section)
13	$492,833	I-75 Arenac Co.
14	$266,460	US-10 Isabella Co.
15	$237,575	US-127 Clare Co.
Total =	$28,214,262	

	2014	
Rank	Total UDC	Location (Route, County)
1	$5,214,500	I-75 Genesee Co.
2	$4,906,422	I-69 Genesee Co.
3	$3,040,965	I-75 Saginaw Co.
4	$2,444,542	I-475 Genesee Co.
5	$2,369,468	US-23 Genesee Co.
6	$1,682,851	I-75 Bay Co.
7	$1,470,715	I-675 Saginaw Co.
8	$1,311,067	US-10 Bay Co.
9	$1,295,929	I-69 Lapeer Co.
10	$607,105	I-75 Arenac Co.
11	$347,478	US-127 Isabella Co.
12	$342,231	US-127 Gratiot Co. (70 mph section)
13	$312,570	US-10 Midland Co.
14	$174,810	US-127 Clare Co.
15	$170,532	US-10 Isabella Co.
Total =	$25,691,185	

Chapter 2

Corridor

Interstate 69: **Genesee and Lapeer**

Interstate 75: **Genesee, Saginaw, Bay, and Arenac**

Interstate 475: **Genesee**

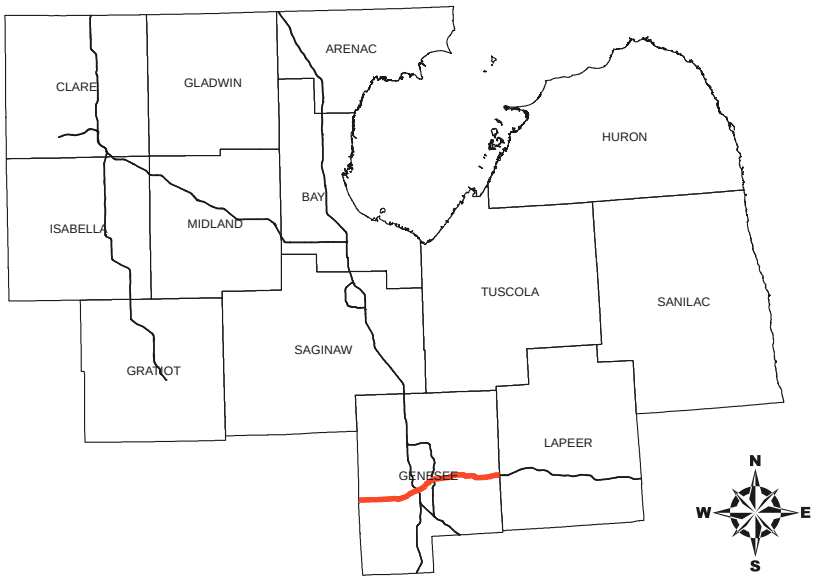
Interstate 675: **Saginaw**

US-10: **Clare, Isabella, Midland, and Bay**

US-23: **Genesee**

US-127: **Gratiot, Isabella, and Clare**

Figure 5. Genesee County I-69 Corridor total user delay cost



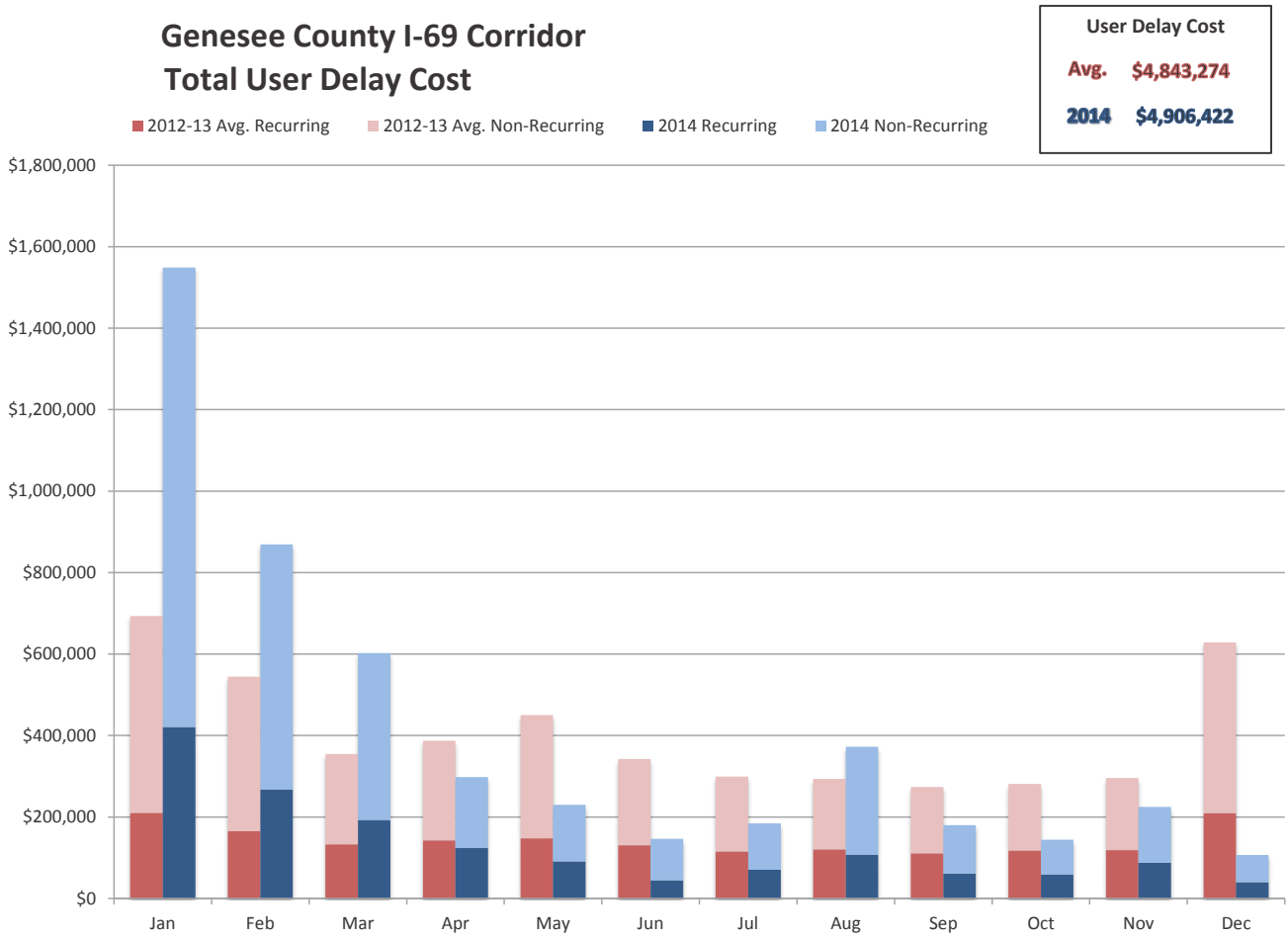
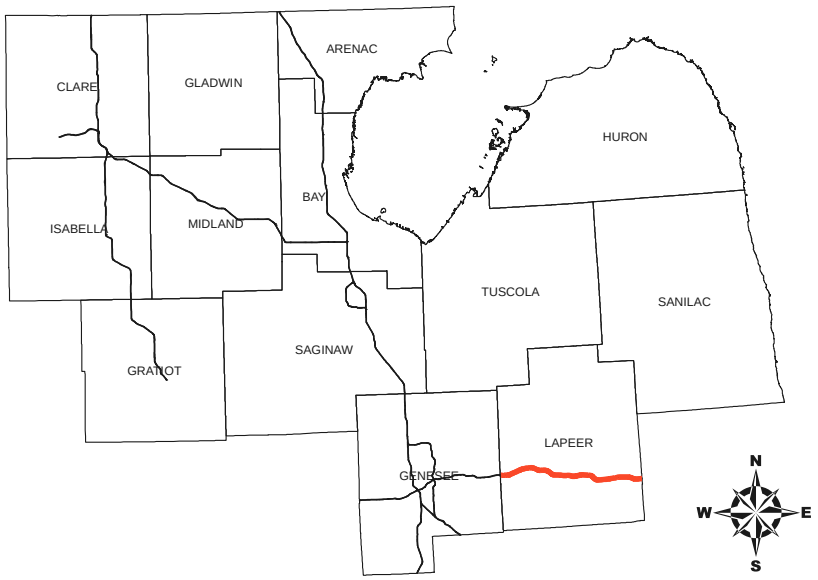


Figure 6. Lapeer County I-69 Corridor total user delay cost



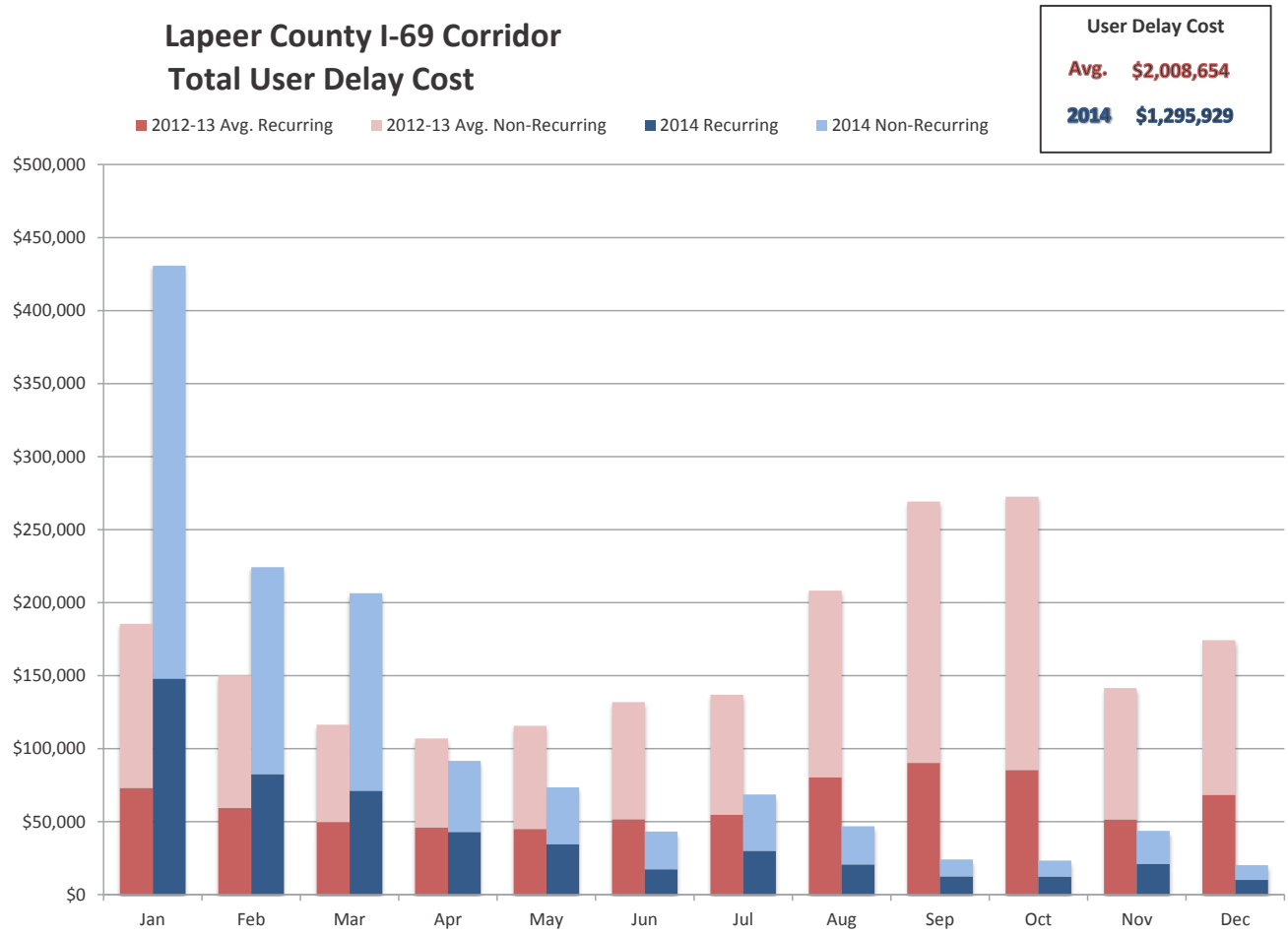


Figure 7. Bay Region I-69 eastbound

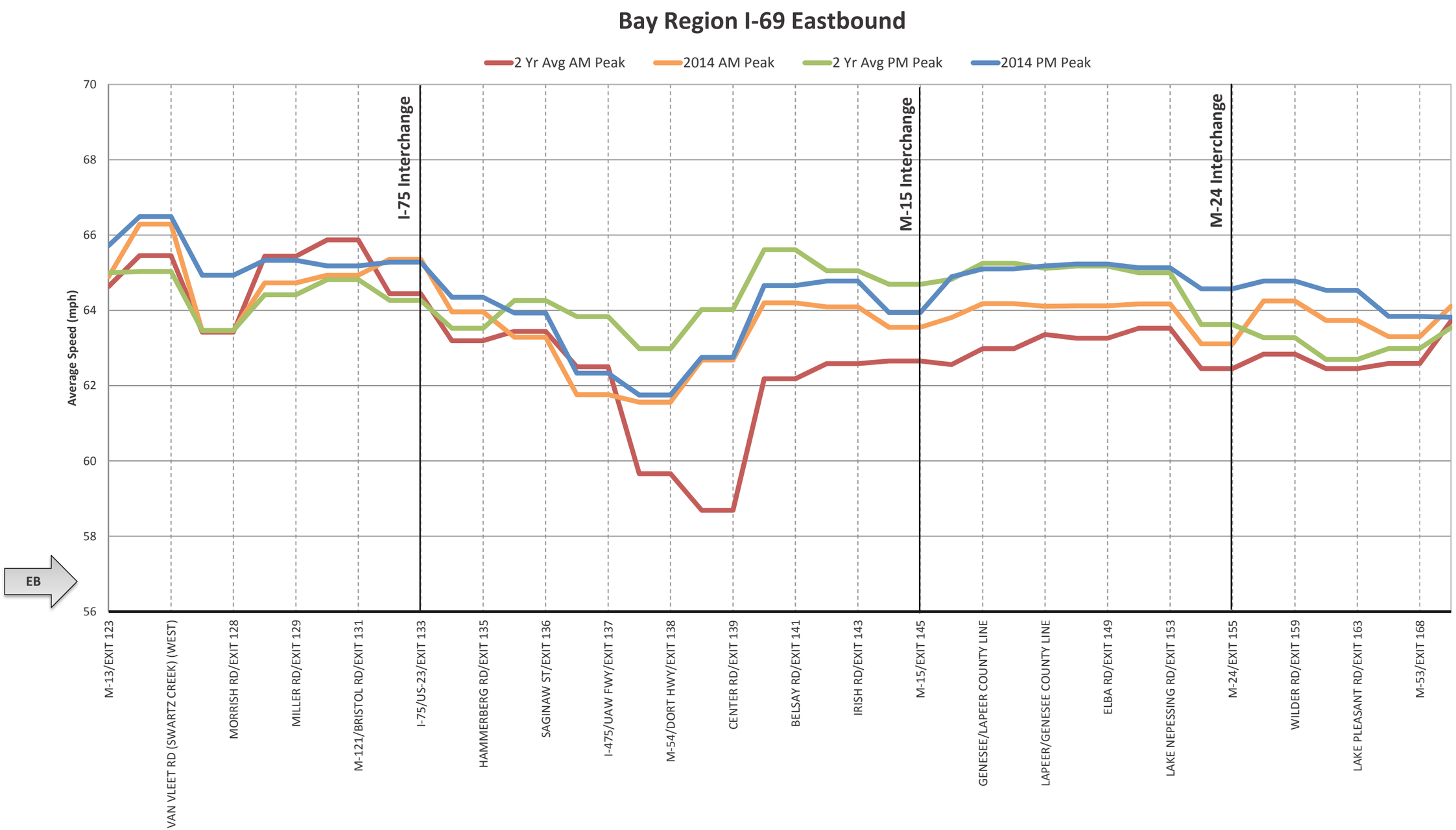
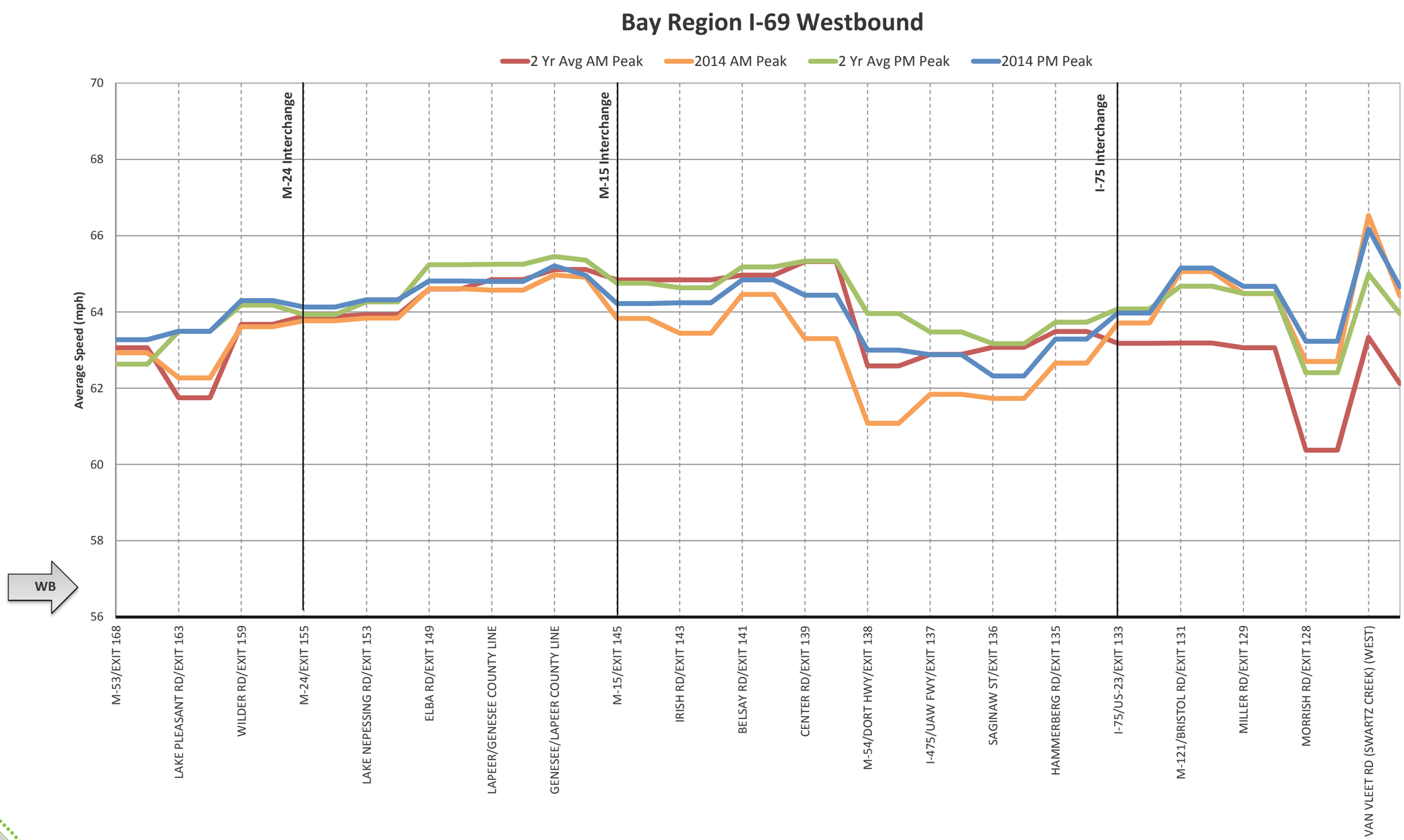


Figure 8. Bay Region I-69 westbound



Travel Time Reliability

Figure 9. Travel time reliability: I-69

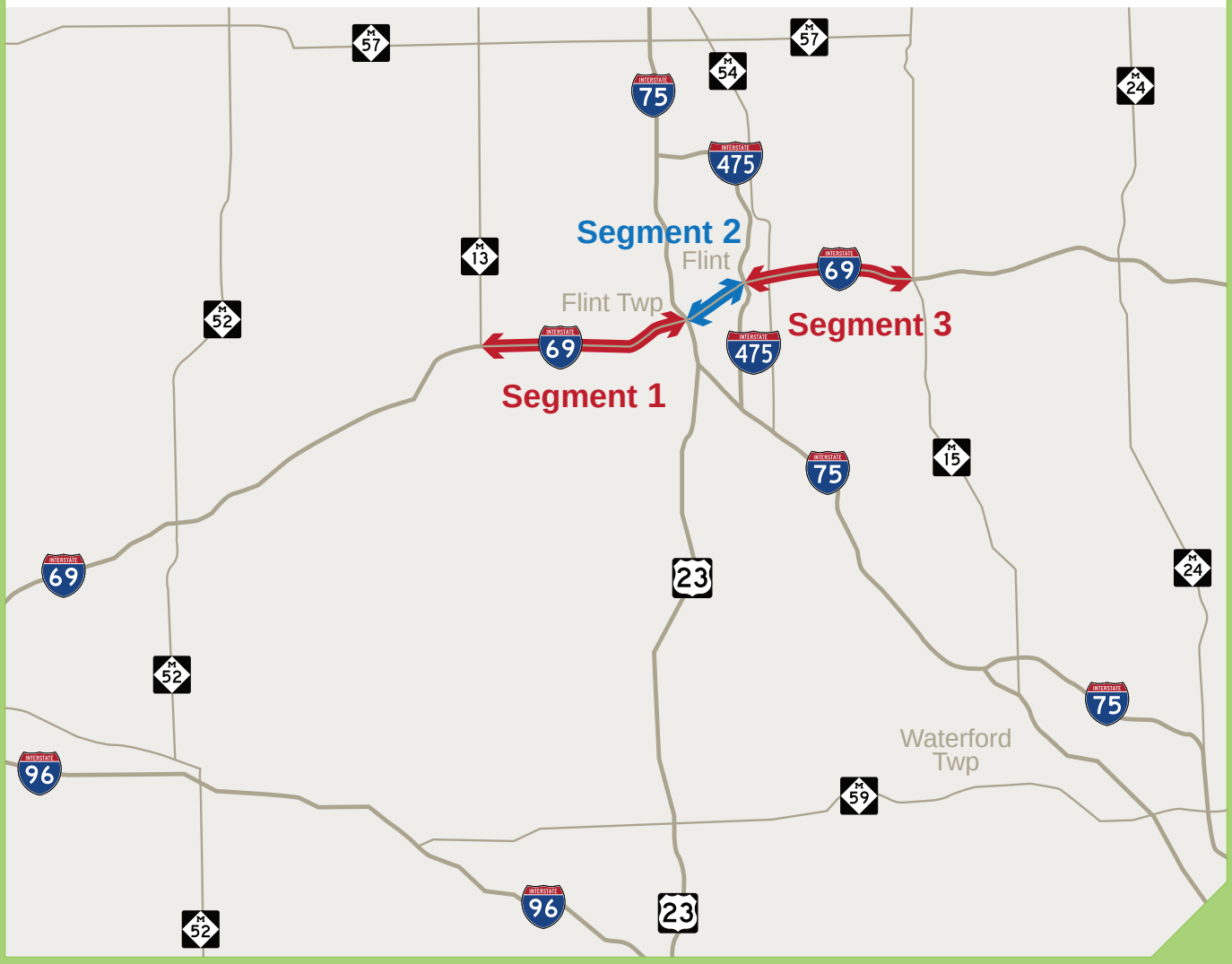
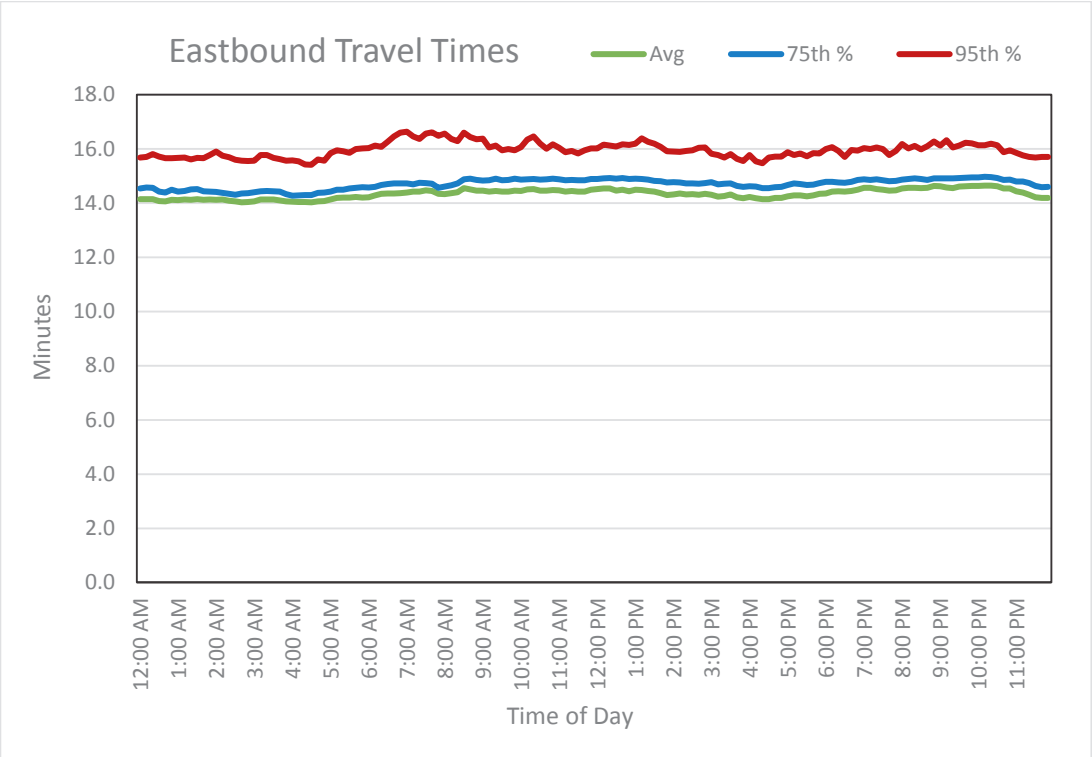


Figure 10. Segment 1- I-69 between M-13 and I-75/US-23

Segment 1

Travel time (minutes) for I-69 between M-13/Exit 123 and I-75/US-23/Exit 133



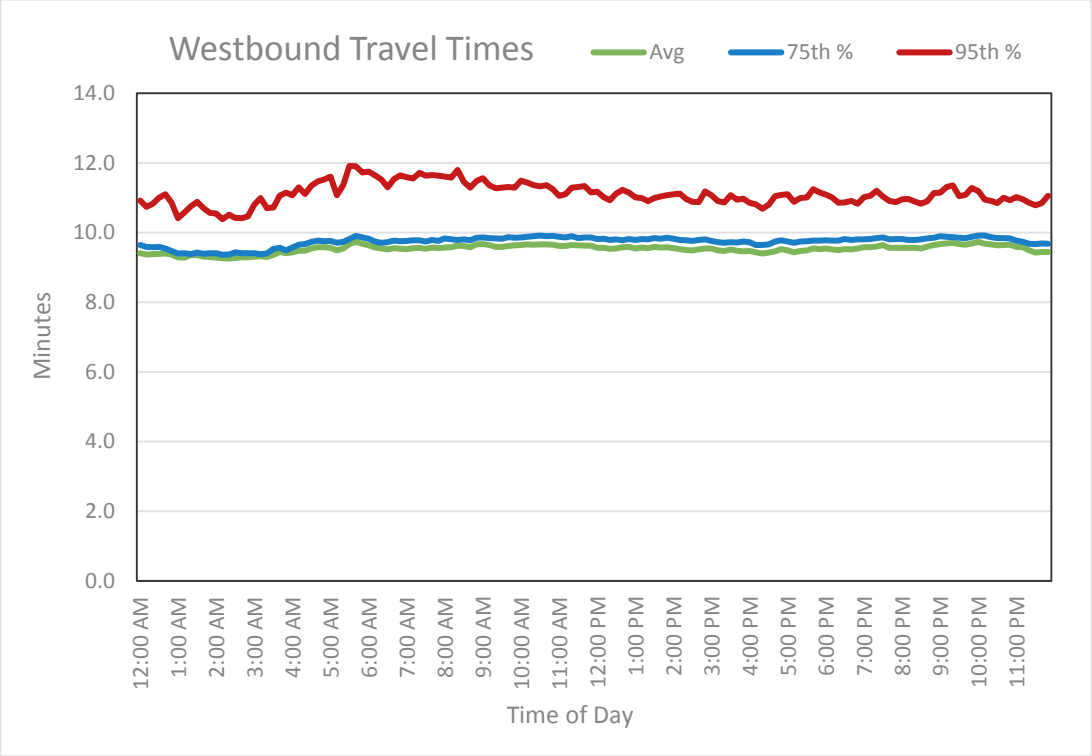
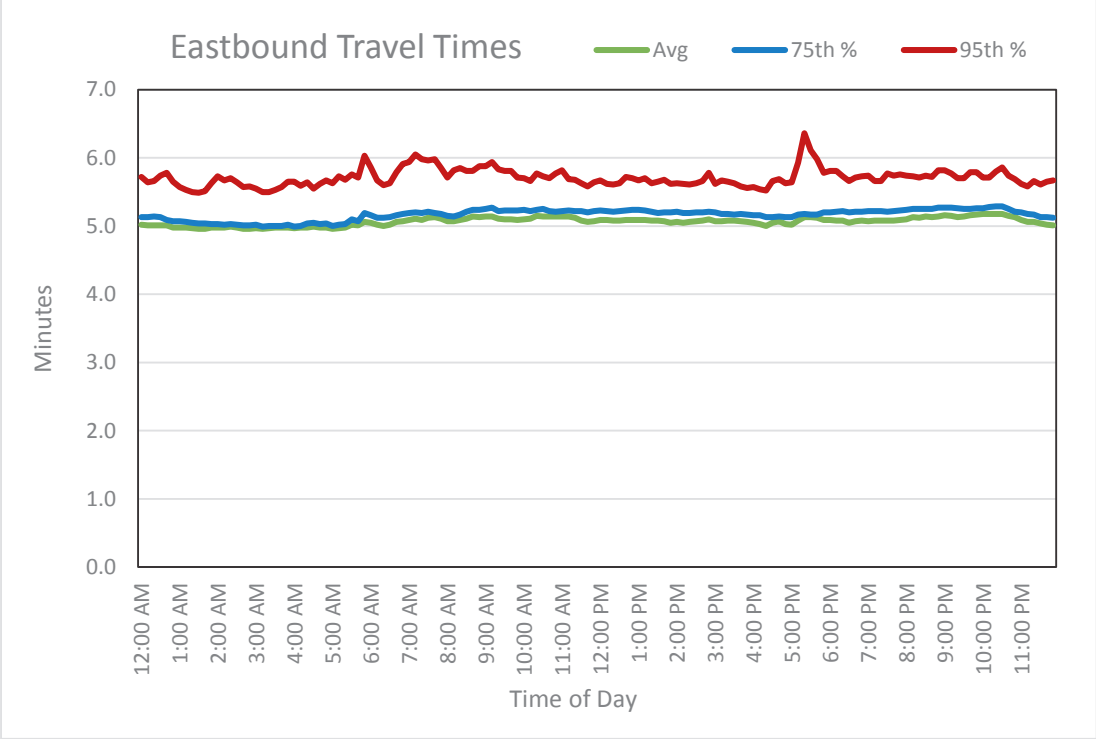


Figure 11. Segment 2- I-69 between I-475/Uaw Fwy and I-75/US-23

Segment 2

Travel time (minutes) for I-69 between I-475/Uaw Fwy/Exit 137 and I-75/US-23/Exit 133



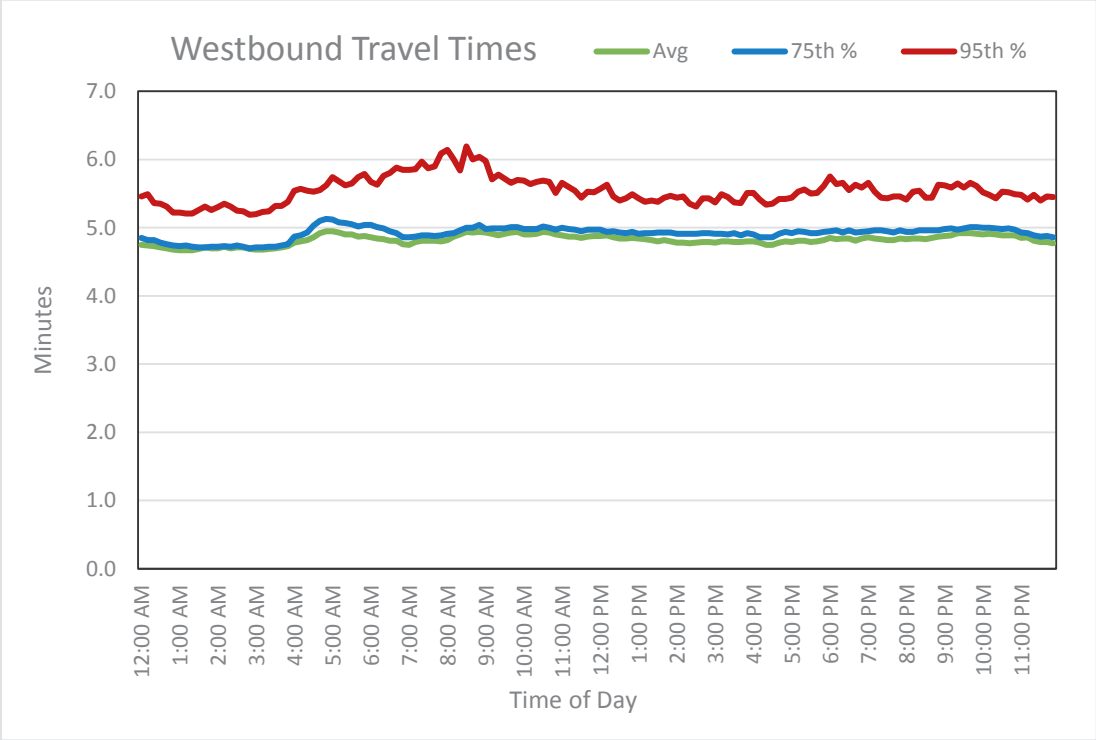
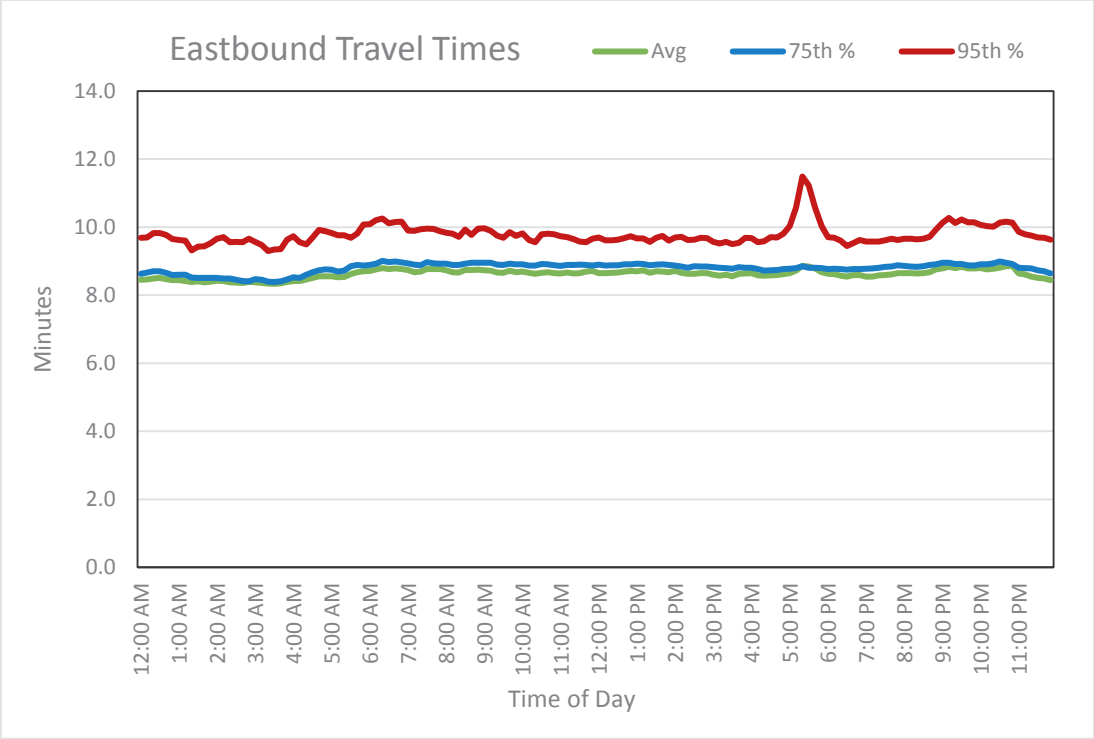
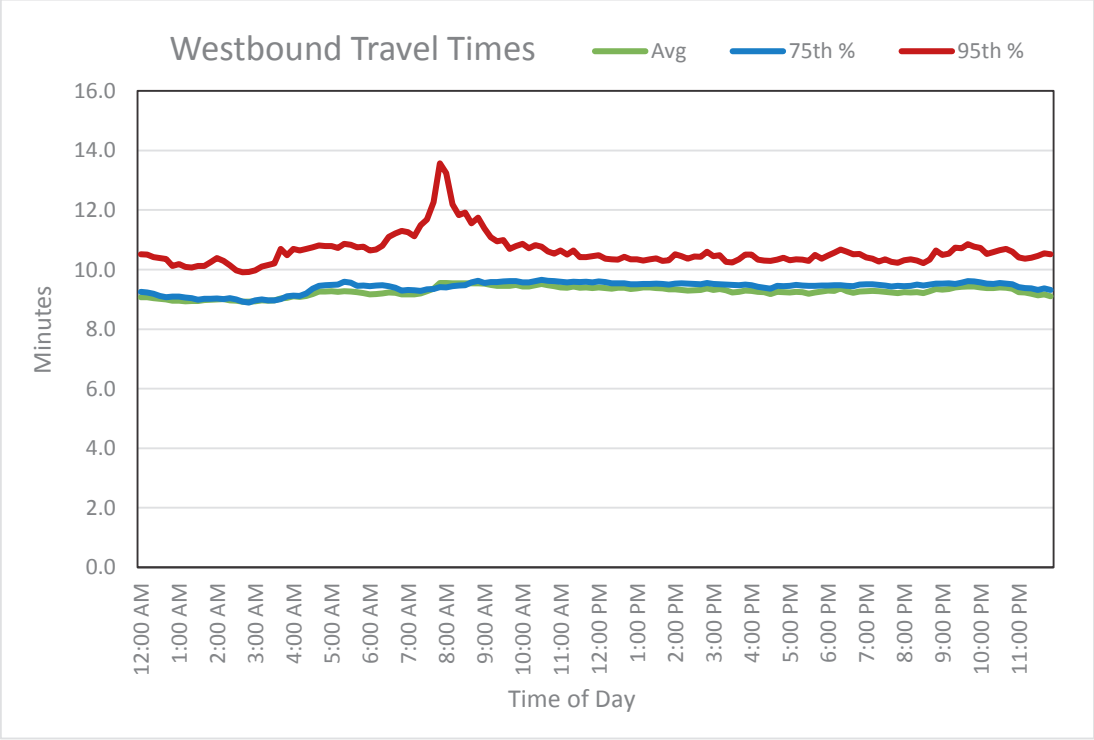


Figure 12. Segment 3- I-69 between I-475/Uaw Fwy and M-15

Segment 3

Travel time (minutes) for I-69 between I-475/Uaw Fwy/Exit 137 and M-15/Exit 145





Chapter 2

Corridor

Interstate 69: **Genesee and Lapeer**

Interstate 75: **Genesee, Saginaw, Bay, and Arenac**

Interstate 475: **Genesee**

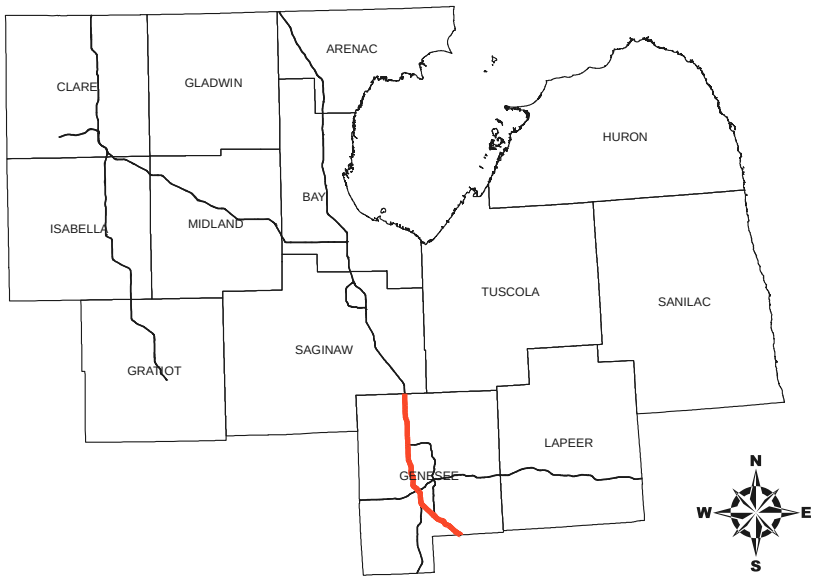
Interstate 675: **Saginaw**

US-10: **Clare, Isabella, Midland, and Bay**

US-23: **Genesee**

US-127: **Gratiot, Isabella, and Clare**

Figure 13. Genesee County I-75 Corridor total user delay cost



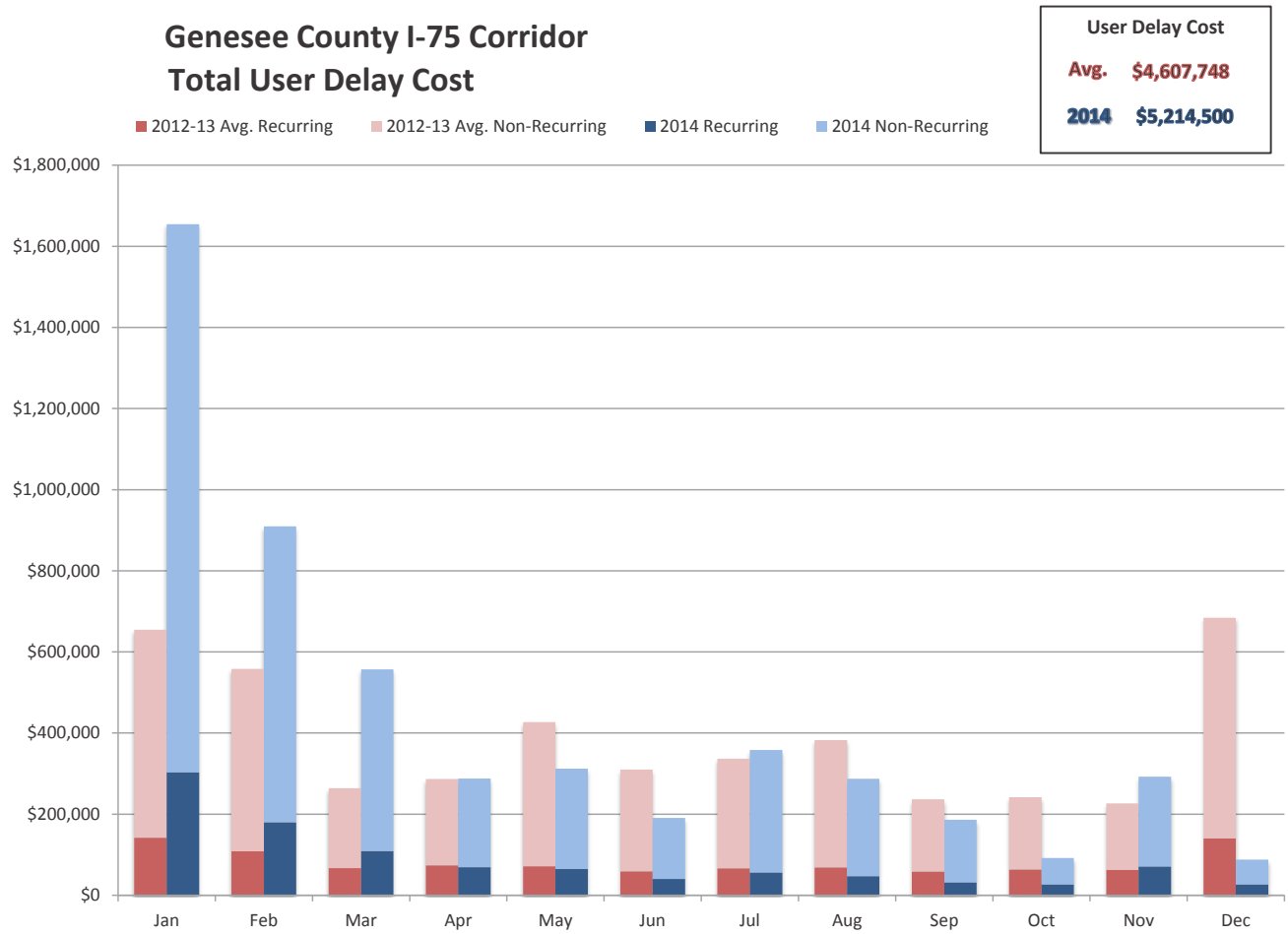
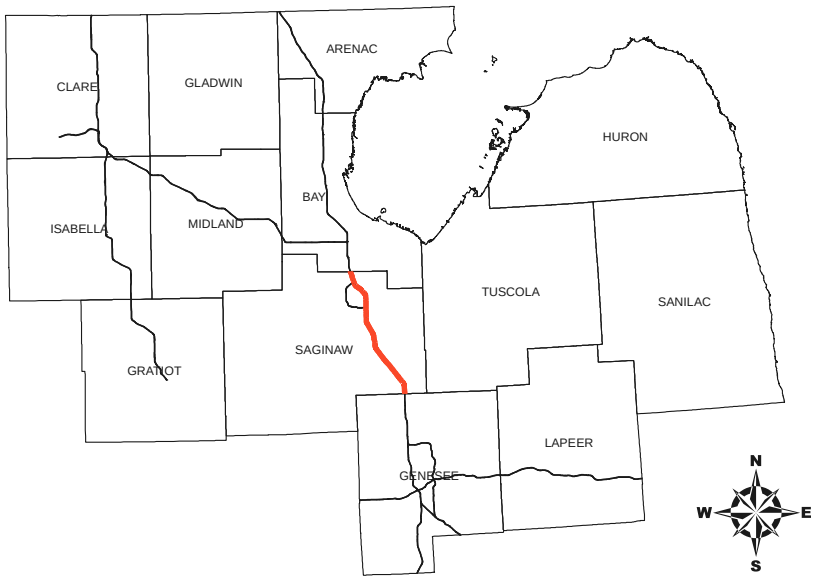


Figure 14. Saginaw County I-75 Corridor total user delay cost



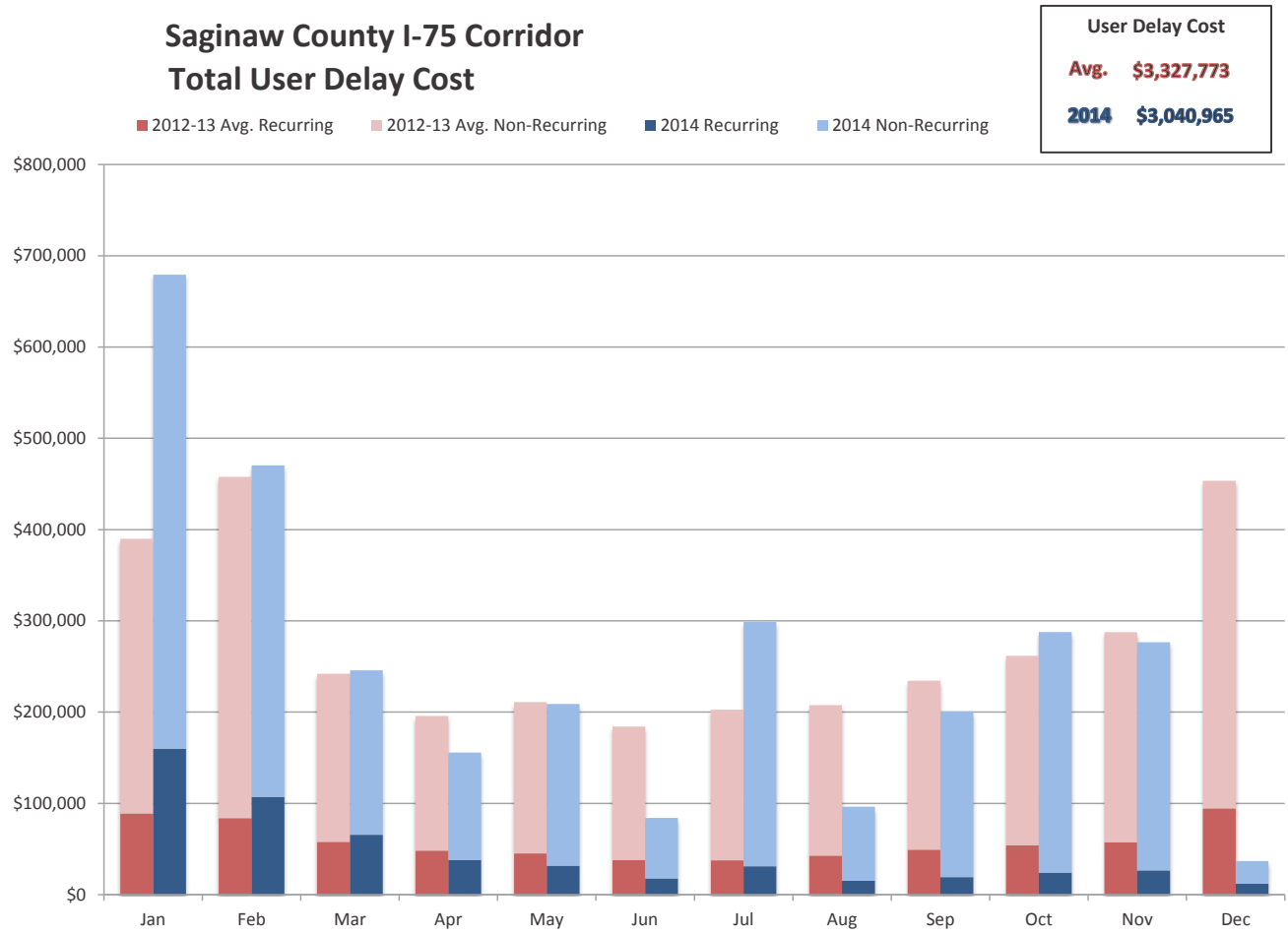
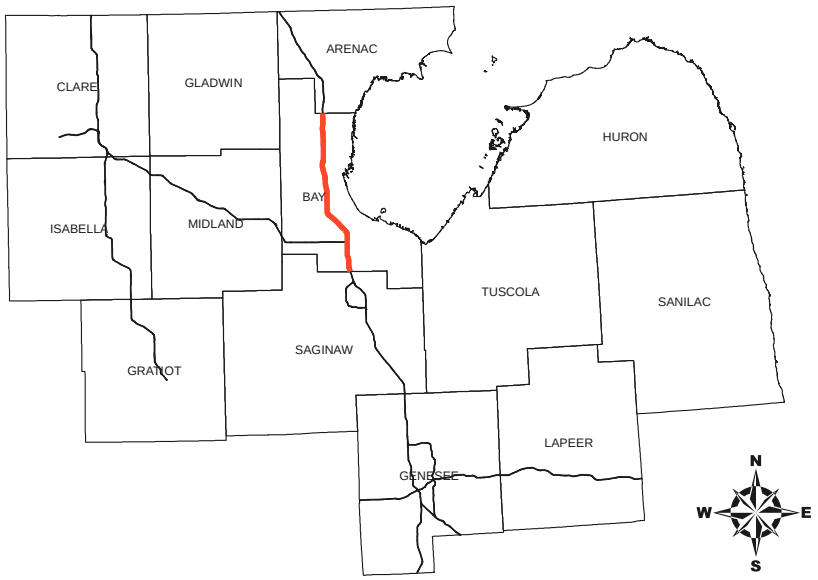


Figure 15. Bay County I-75 Corridor total user delay cost



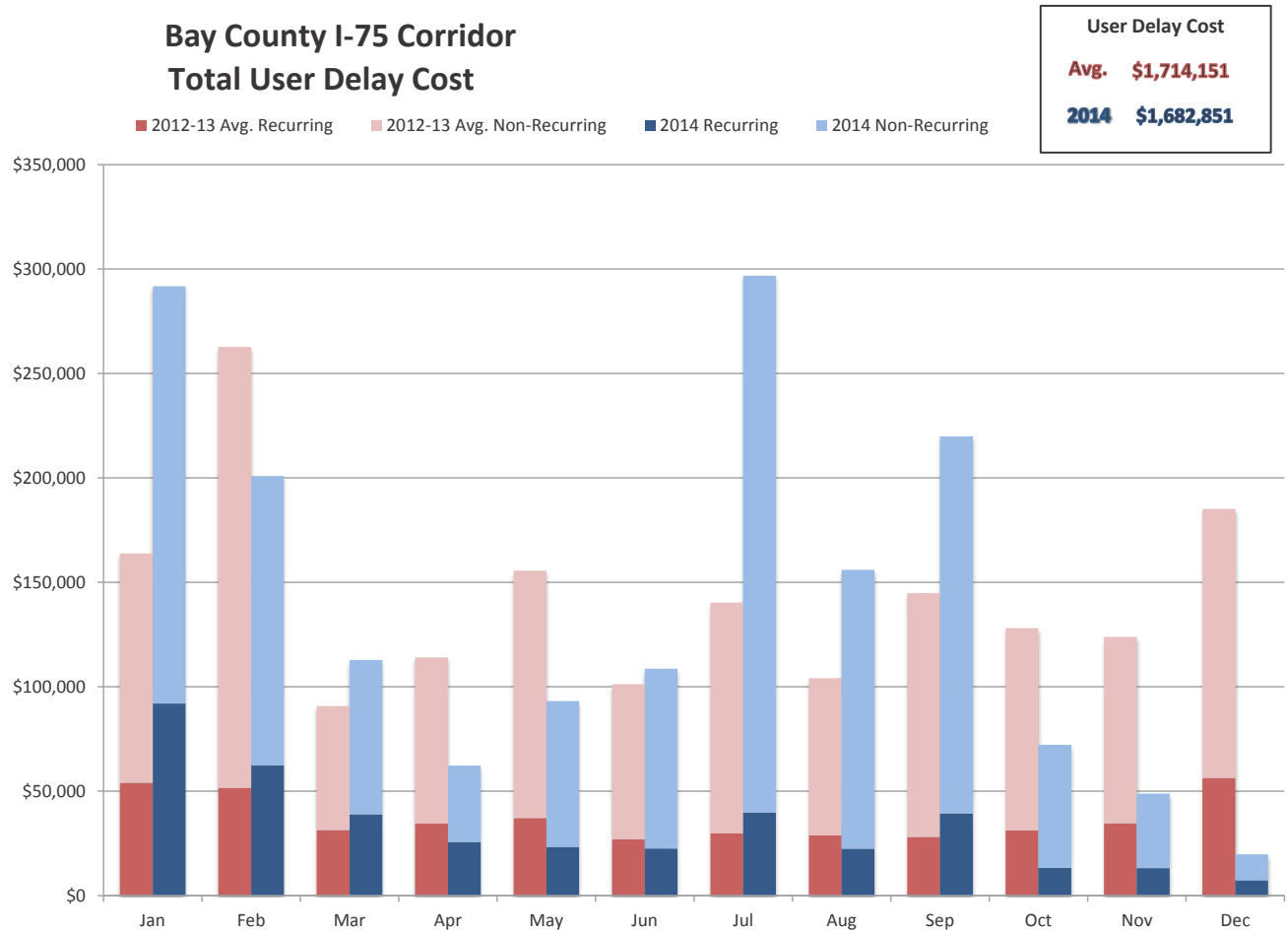
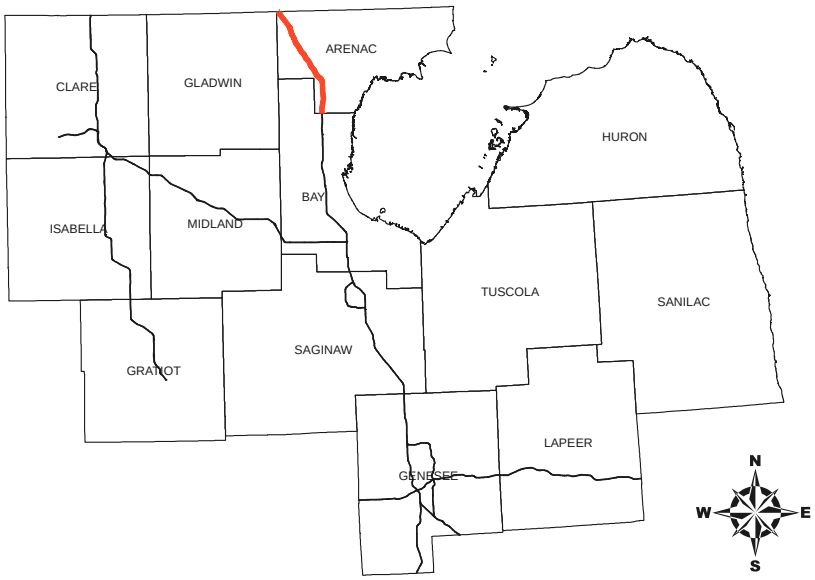


Figure 16. Arenac County I-75 Corridor total user delay cost



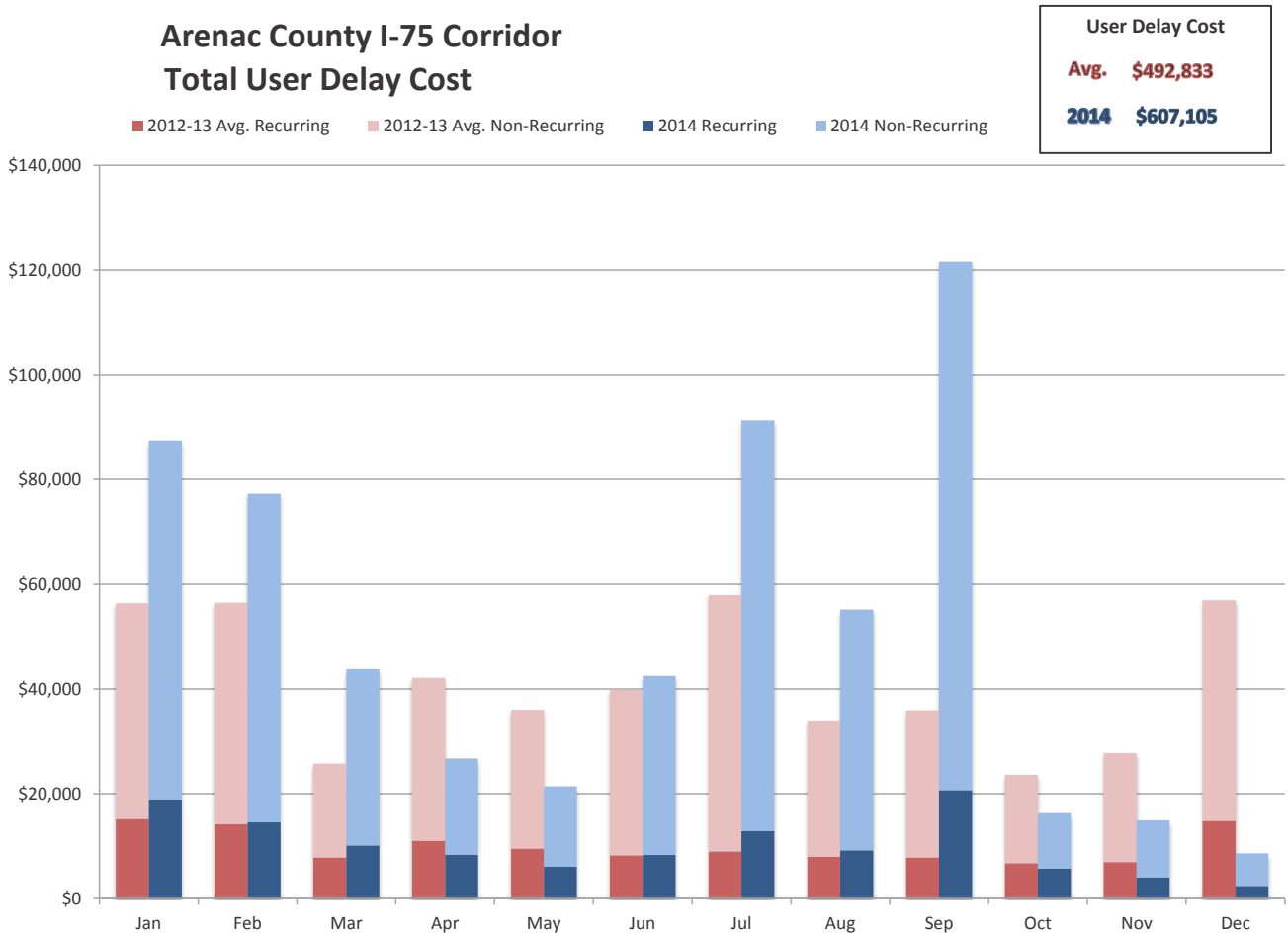


Figure 17. Bay Region I-75 northbound

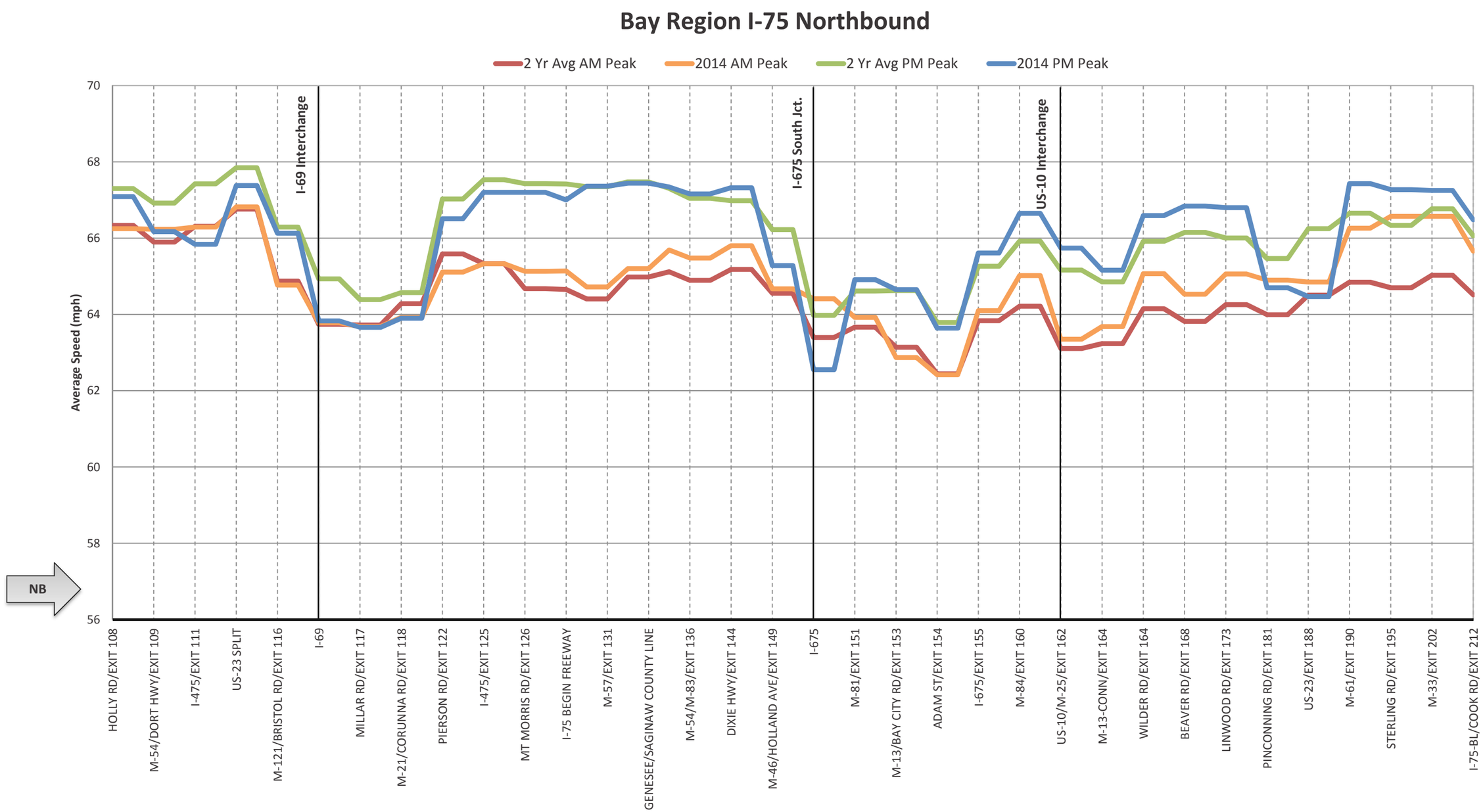
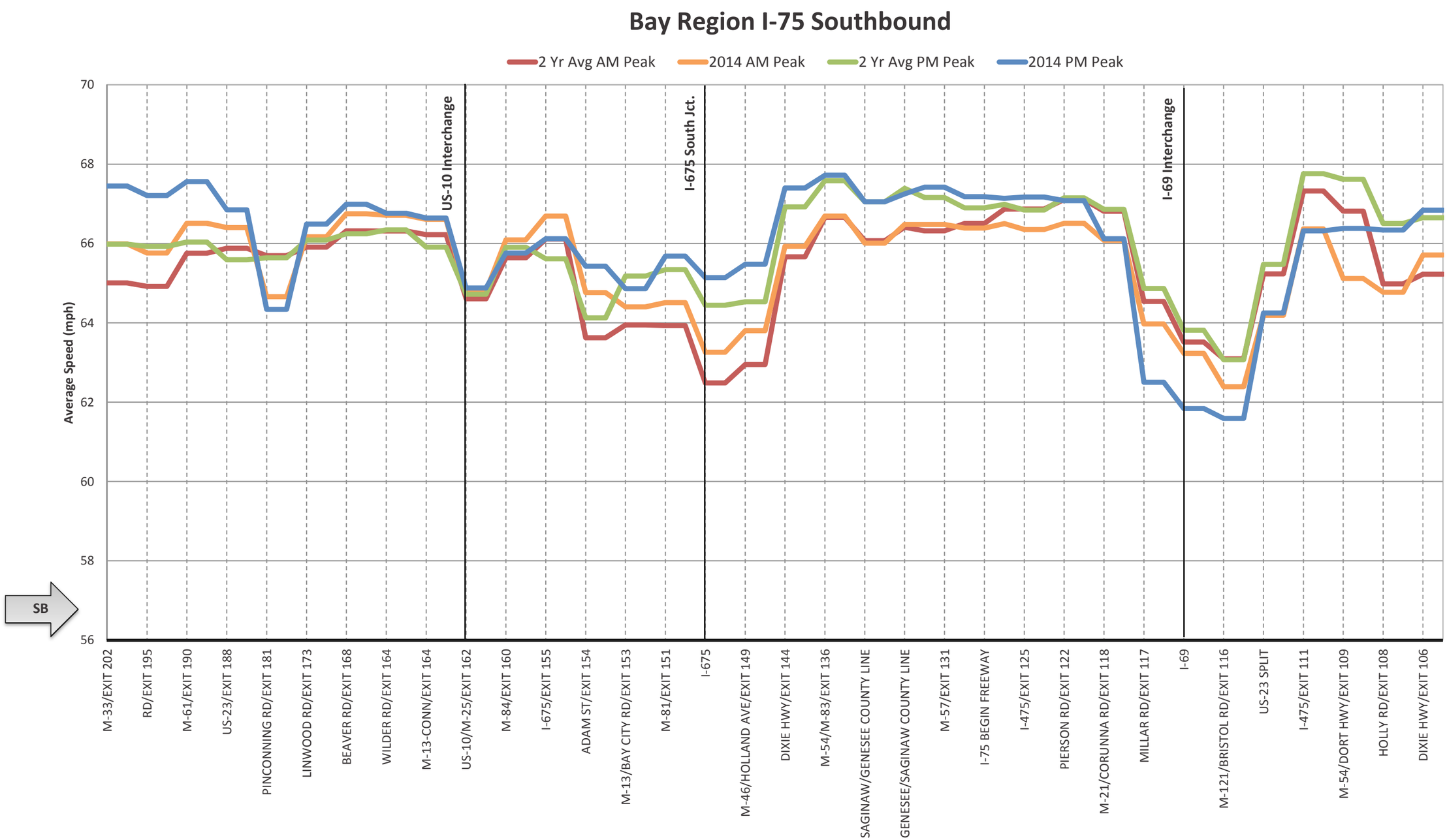


Figure 18. Bay Region I-75 southbound



Travel Time Reliability

Figure 19. Travel time reliability: I-75

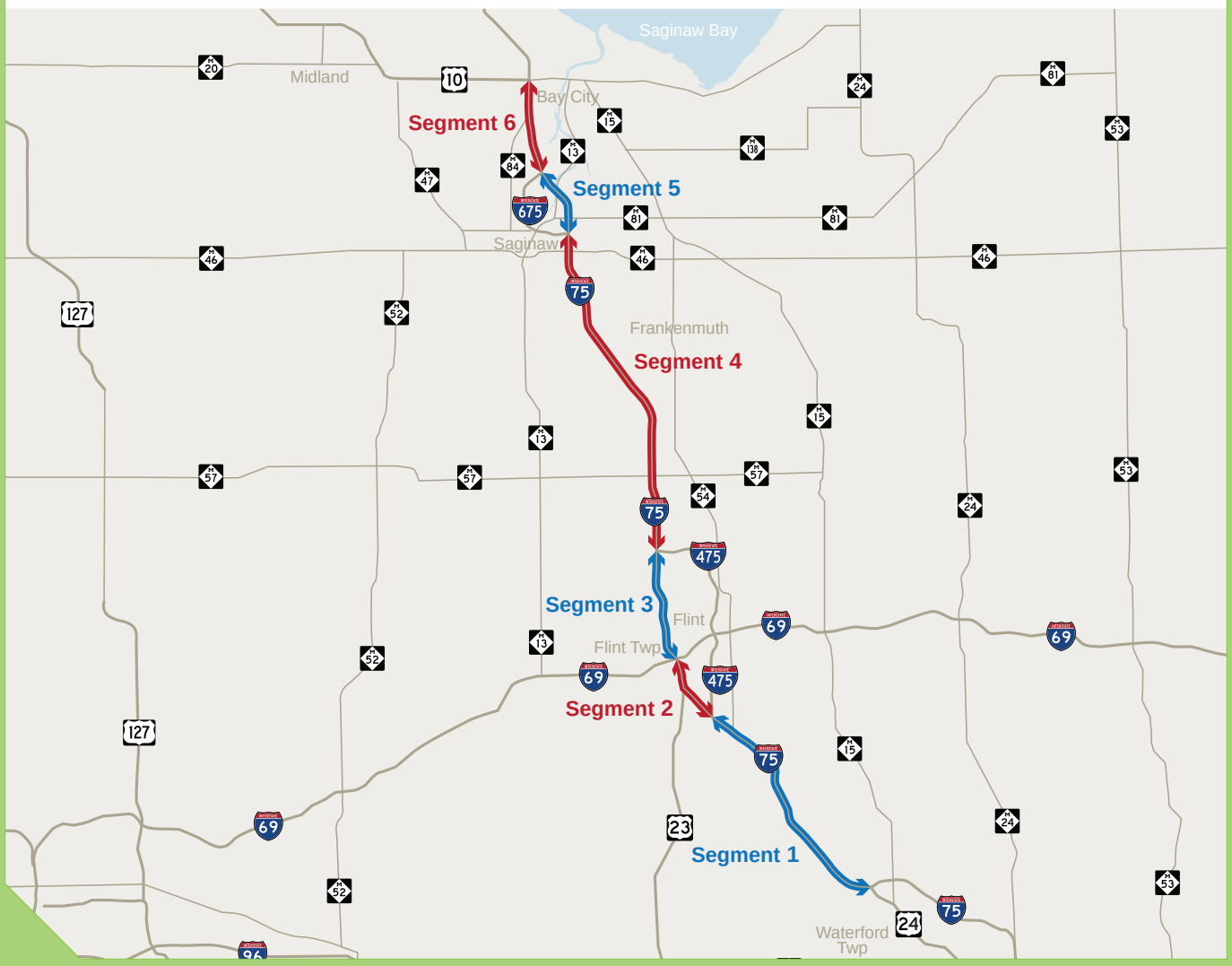
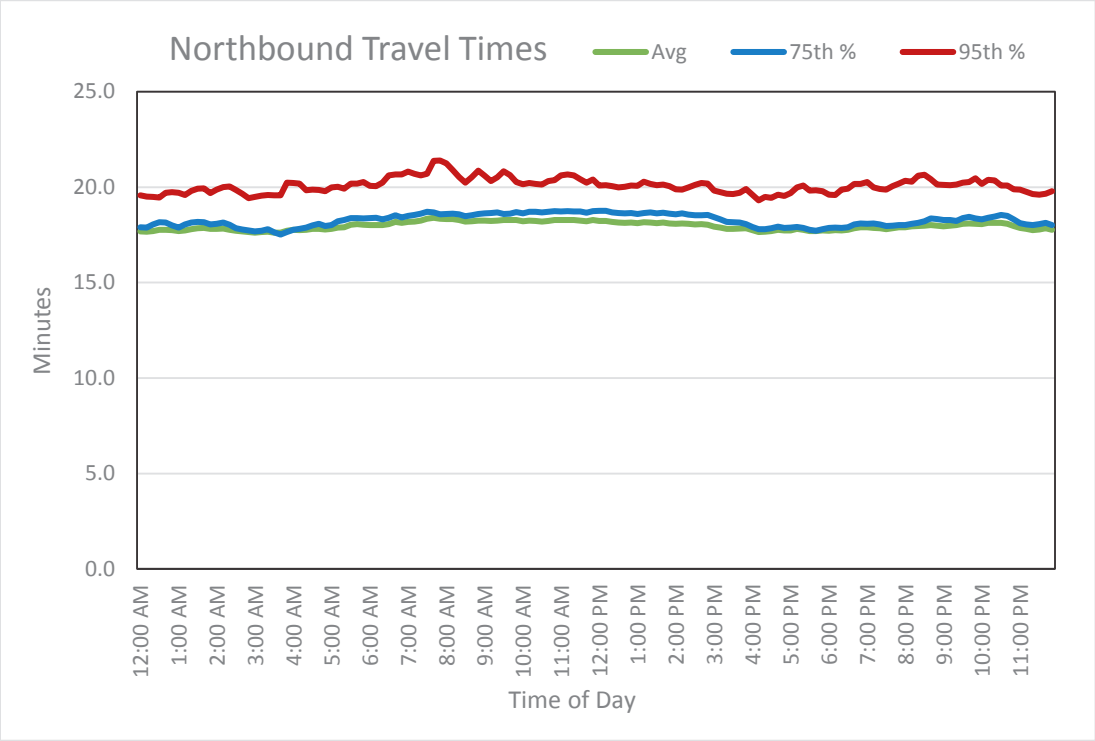


Figure 20. Segment 1- I-75 between US-24/Dixie Hwy and I-475

Segment 1

Travel time (minutes) for I-75 between US-24/Dixie Hwy/Exit 93 and I-475/Exit 111



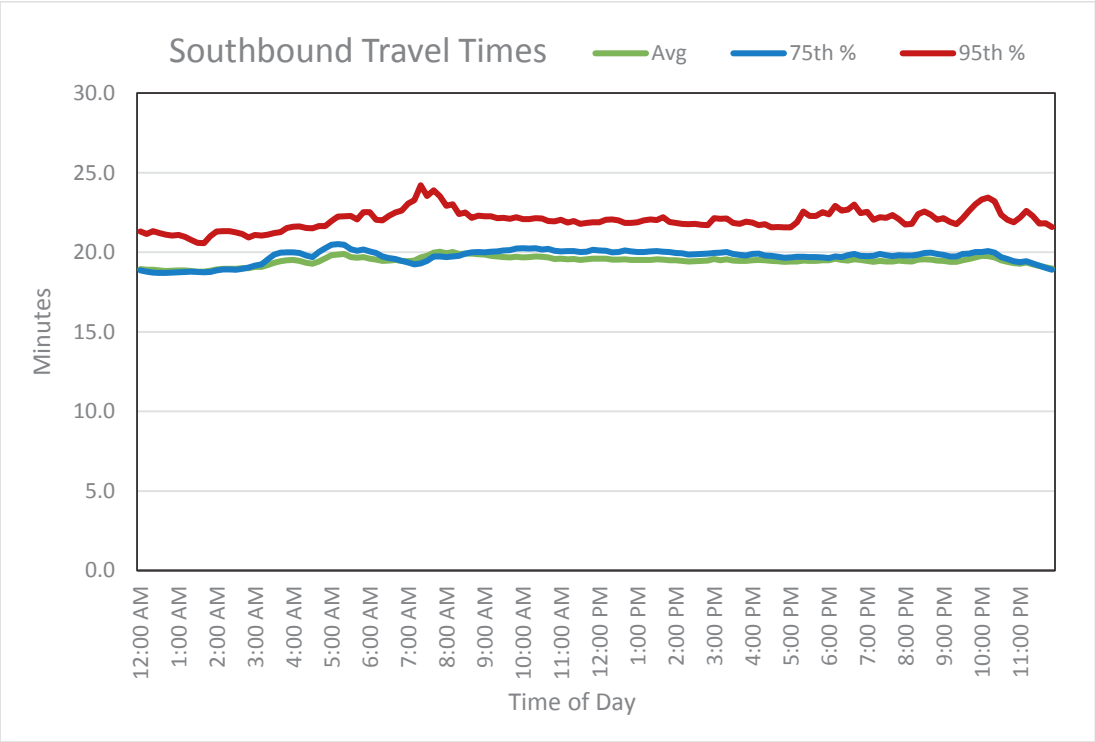
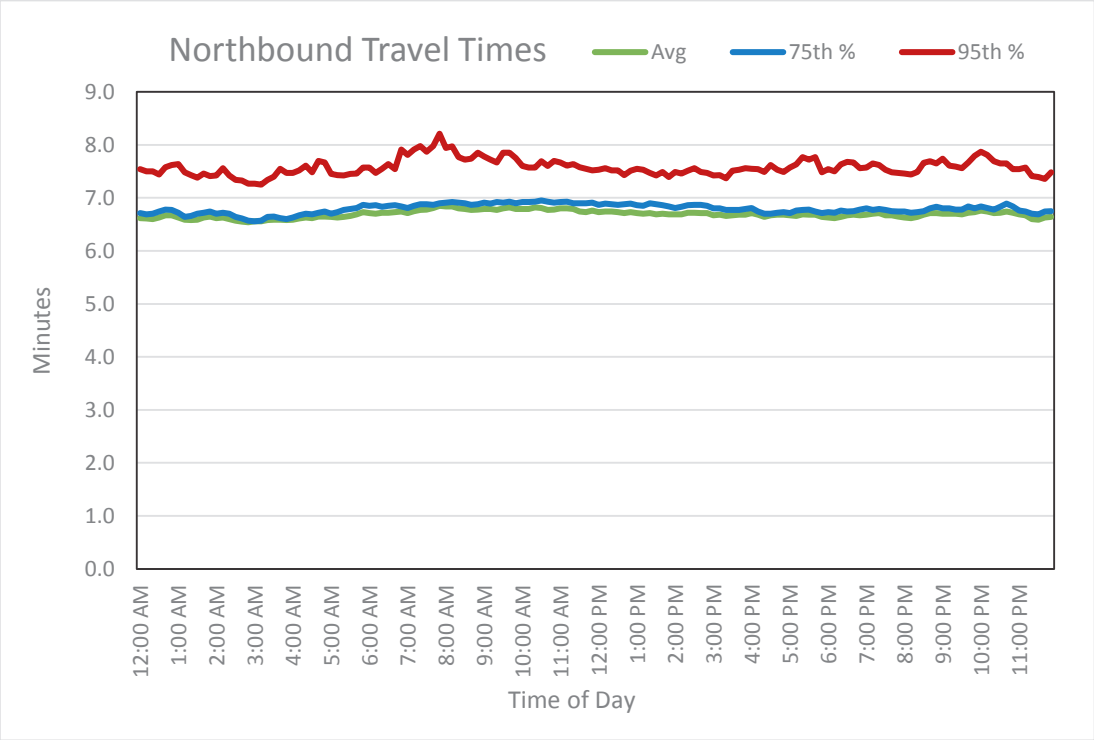


Figure 21. Segment 2- I-75 between I-69 and I-475/Exit 111

Segment 2

Travel time (minutes) for I-75 between I-69 and I-475/Exit 111



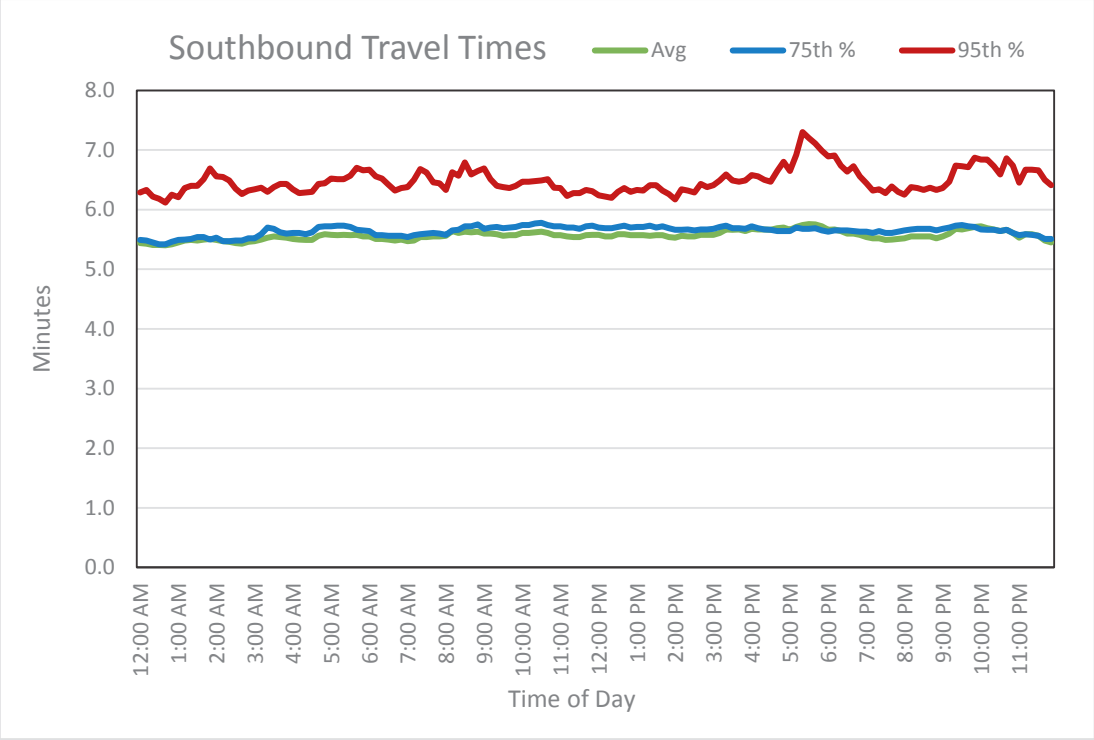
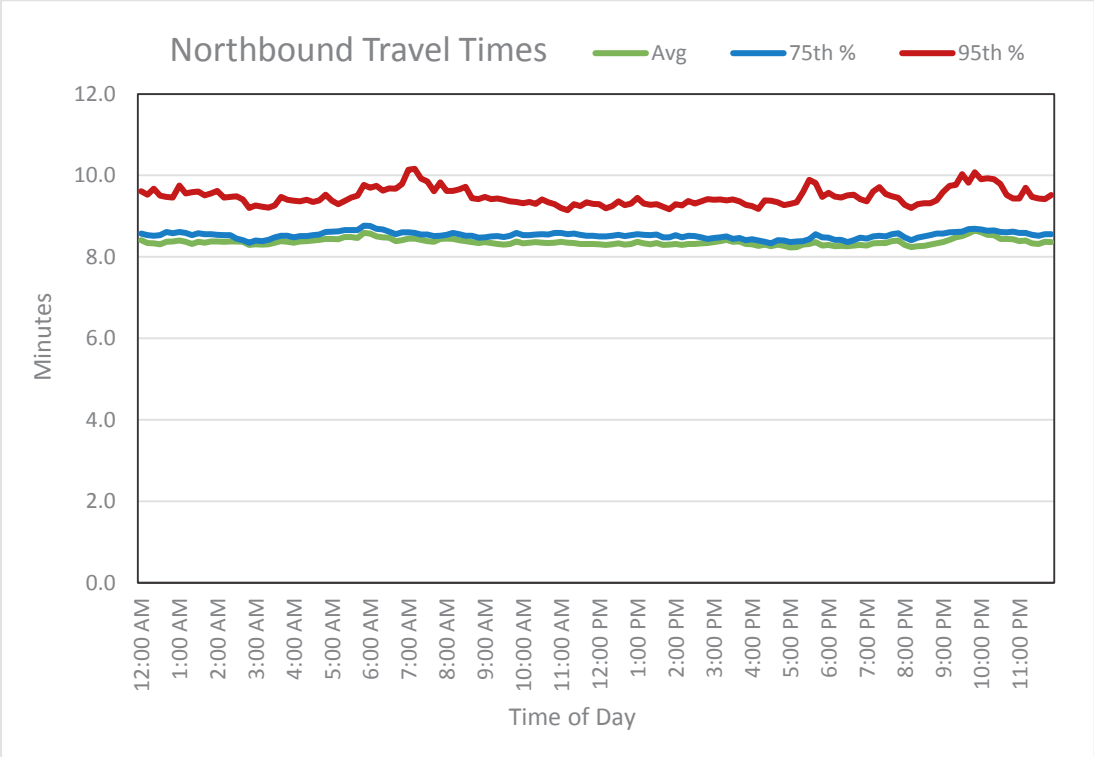


Figure 22. Segment 3- I-75 between I-69 and I-475/Exit 125

Segment 3

Travel time (minutes) for I-75 between I-69 and I-475/Exit 125



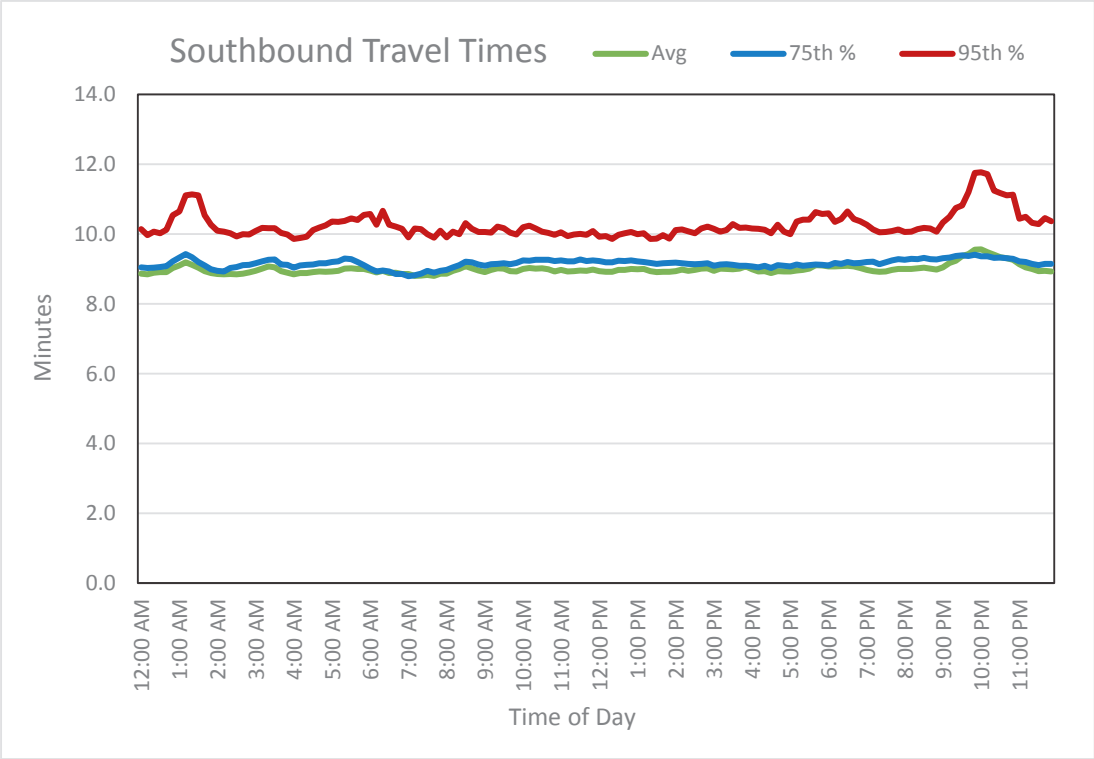
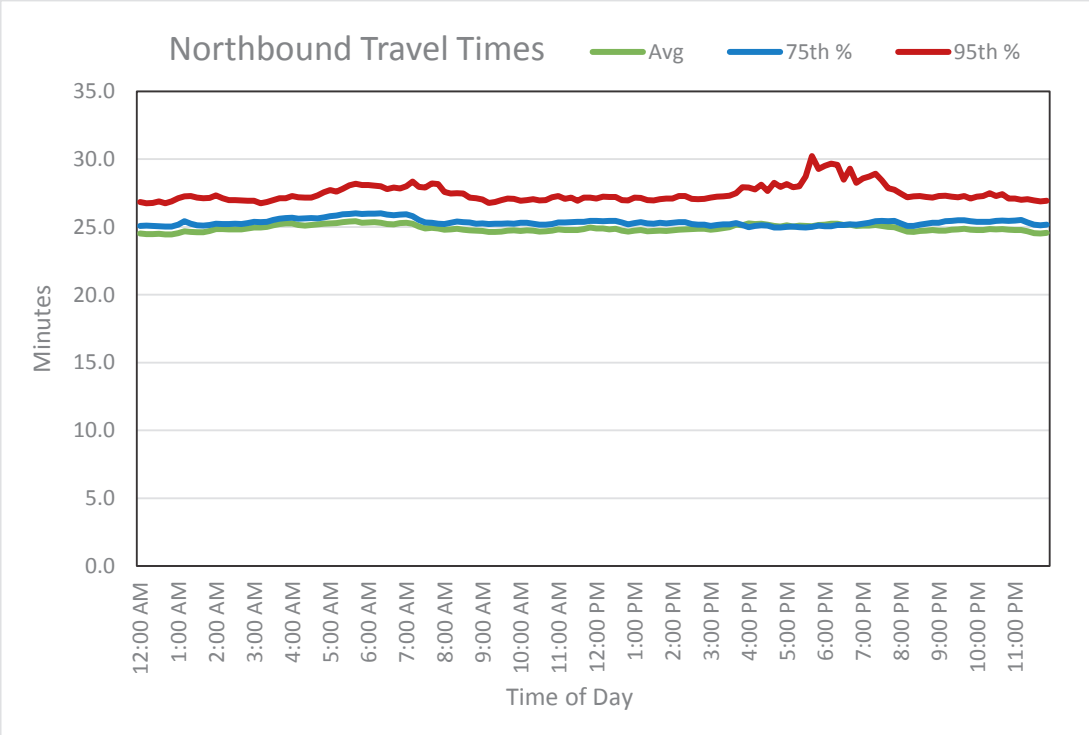


Figure 23. Segment 4- I-75 between I-675 and I-475

Segment 4

Travel time (minutes) for I-75 between I-675 and I-475/Exit 125



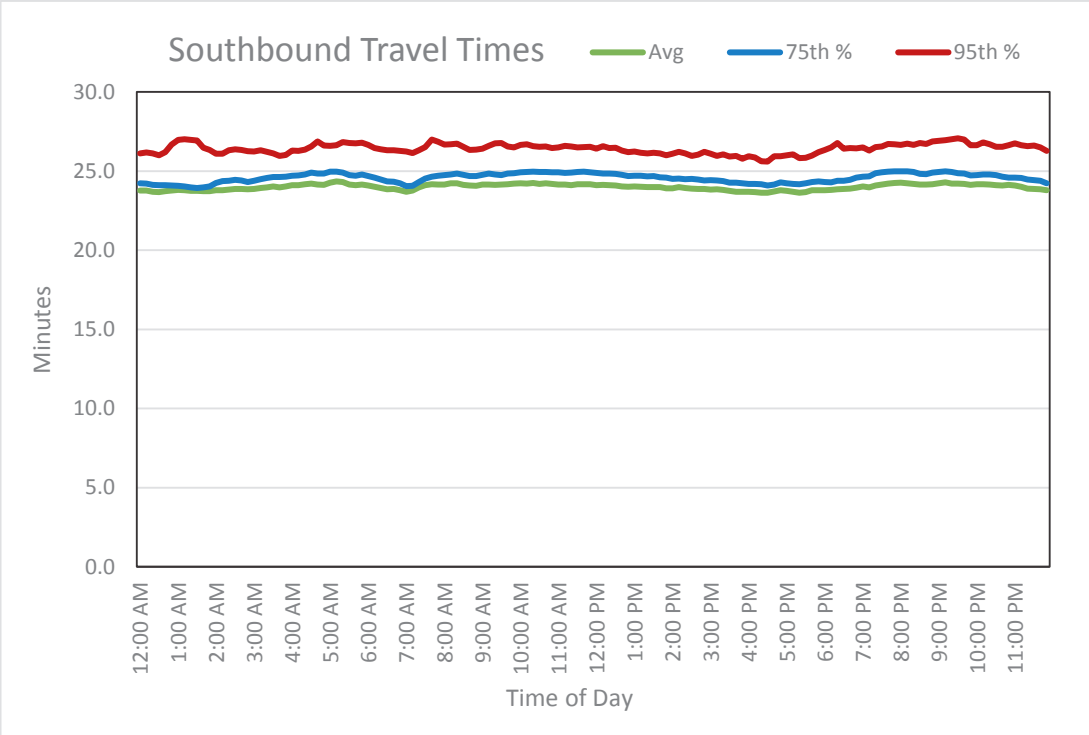
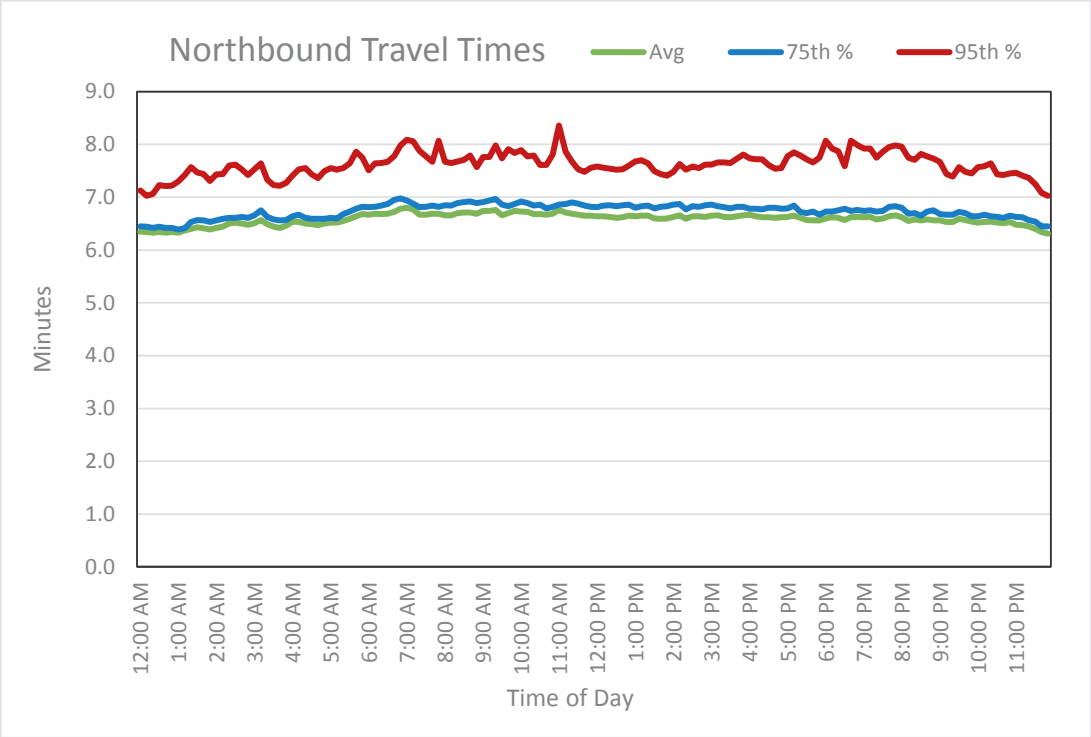


Figure 24. Segment 5- I-75 between I-675/Exit 155 and I-675

Segment 5

Travel time (minutes) for I-75 between I-675/Exit 155 and I-675



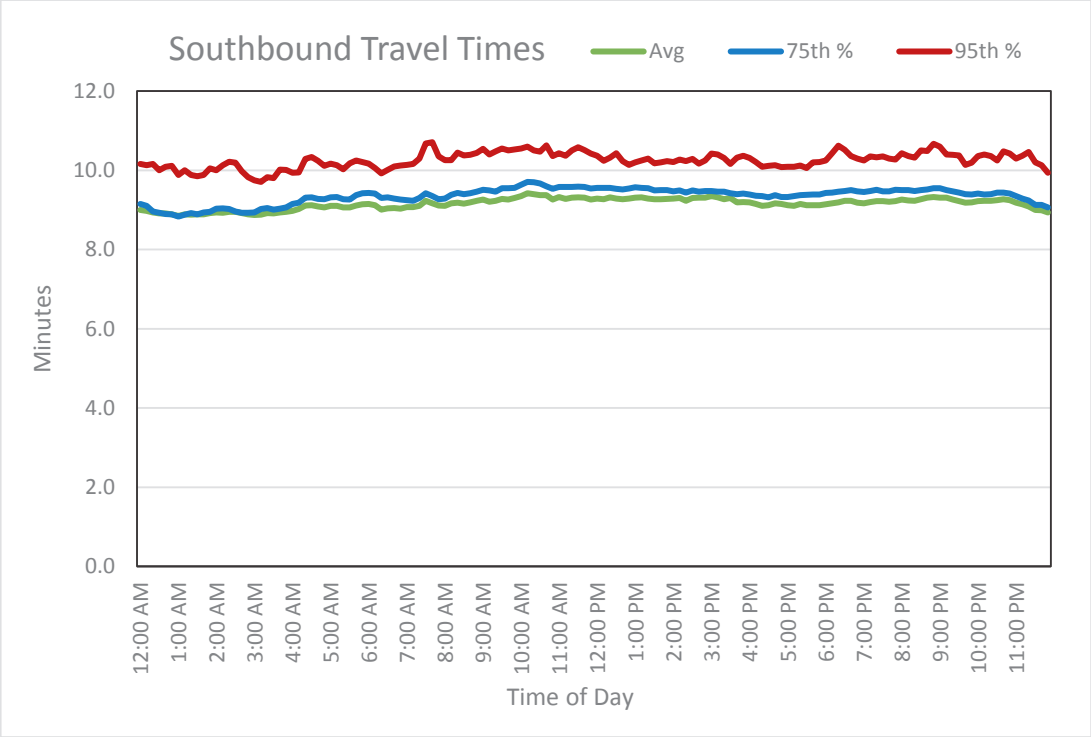
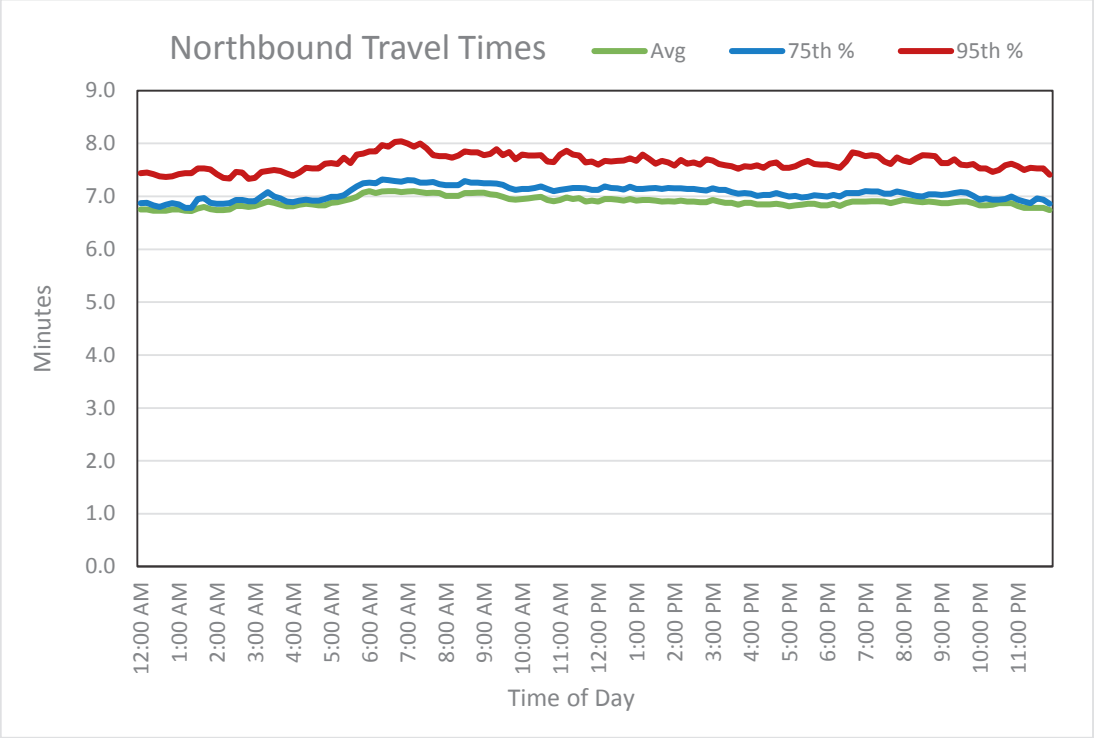
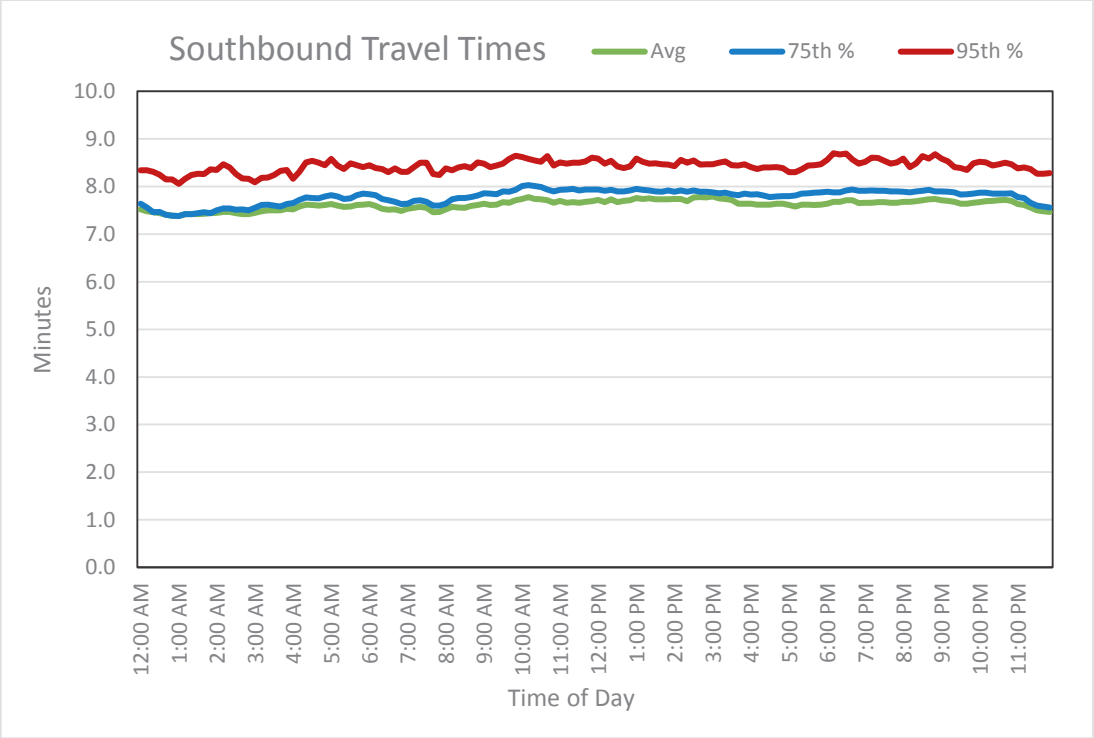


Figure 25. Segment 6- I-75 between I-675/Exit 155 and US-10/M-25

Segment 6

Travel time (minutes) for I-75 between I-675/Exit 155 and US-10/M-25/Exit 162





Chapter 2

Corridor

Interstate 69: **Genesee and Lapeer**

Interstate 75: **Genesee, Saginaw, Bay, and Arenac**

Interstate 475: **Genesee**

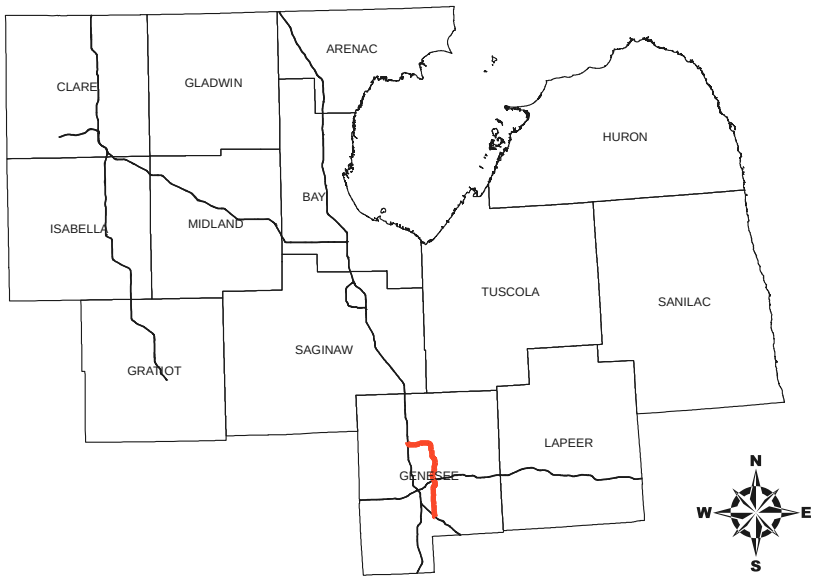
Interstate 675: **Saginaw**

US-10: **Clare, Isabella, Midland, and Bay**

US-23: **Genesee**

US-127: **Gratiot, Isabella, and Clare**

Figure 26. Genesee County I-475 Corridor total user delay cost



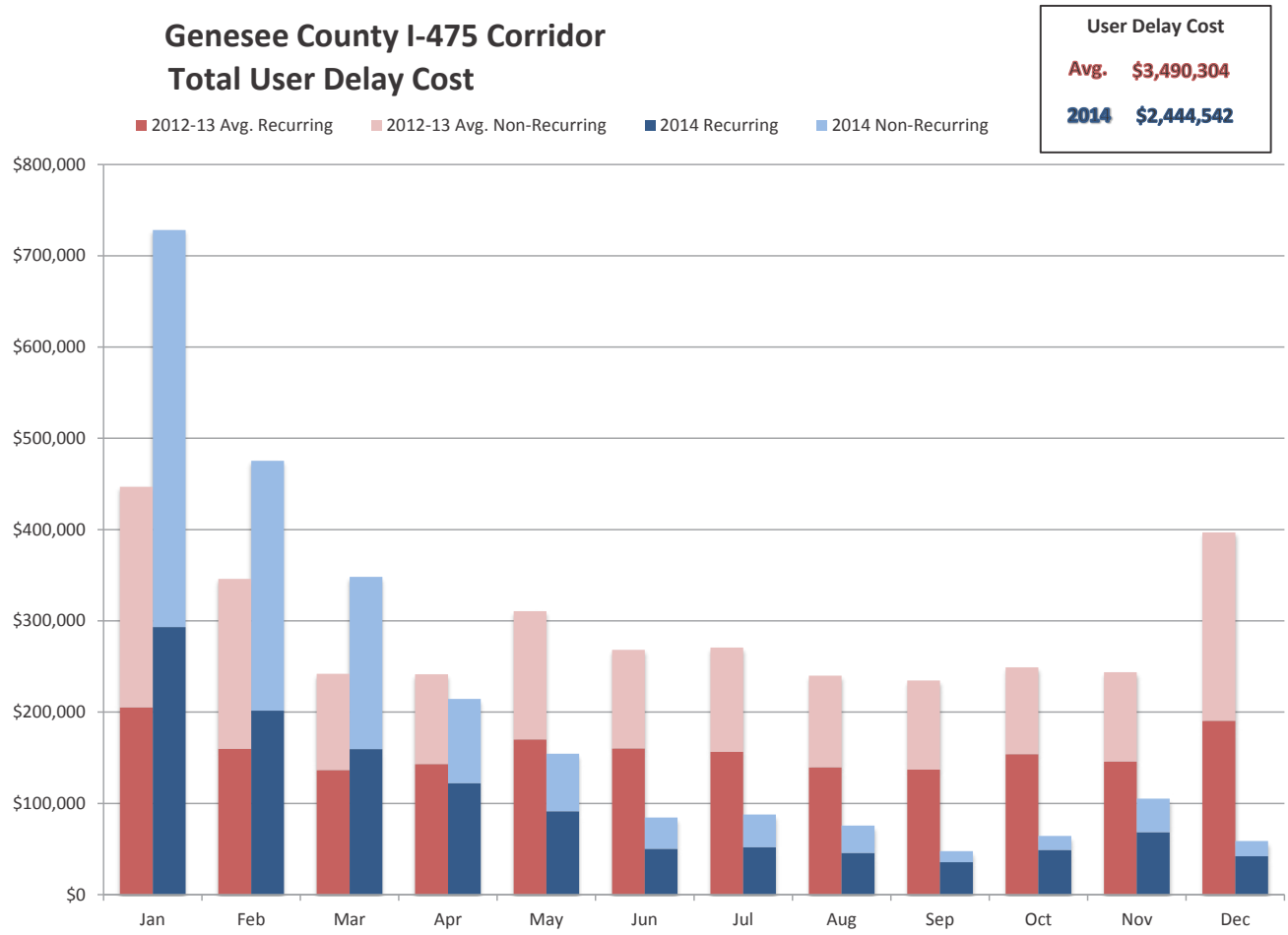


Figure 27. Bay Region I-475 northbound

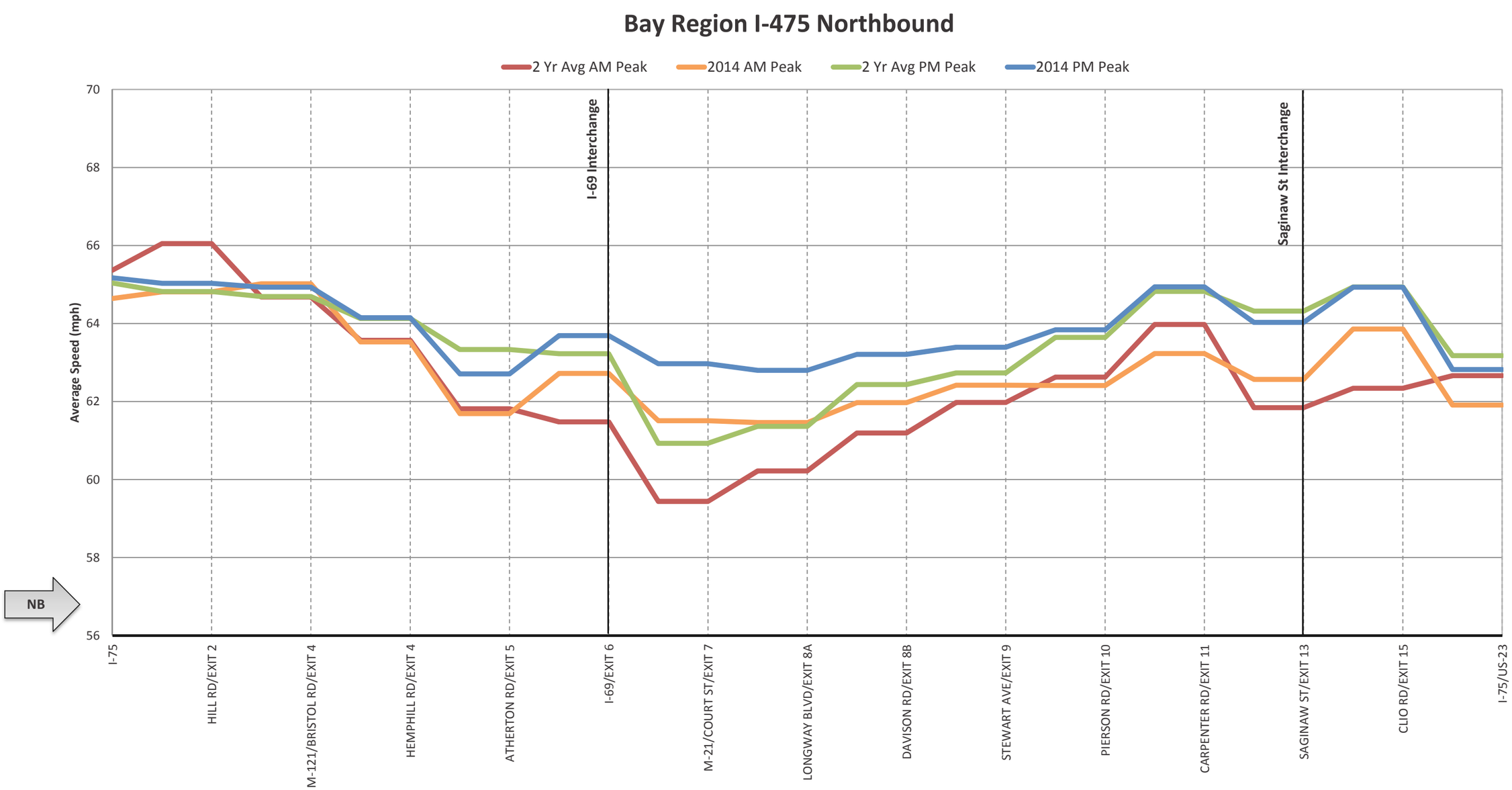
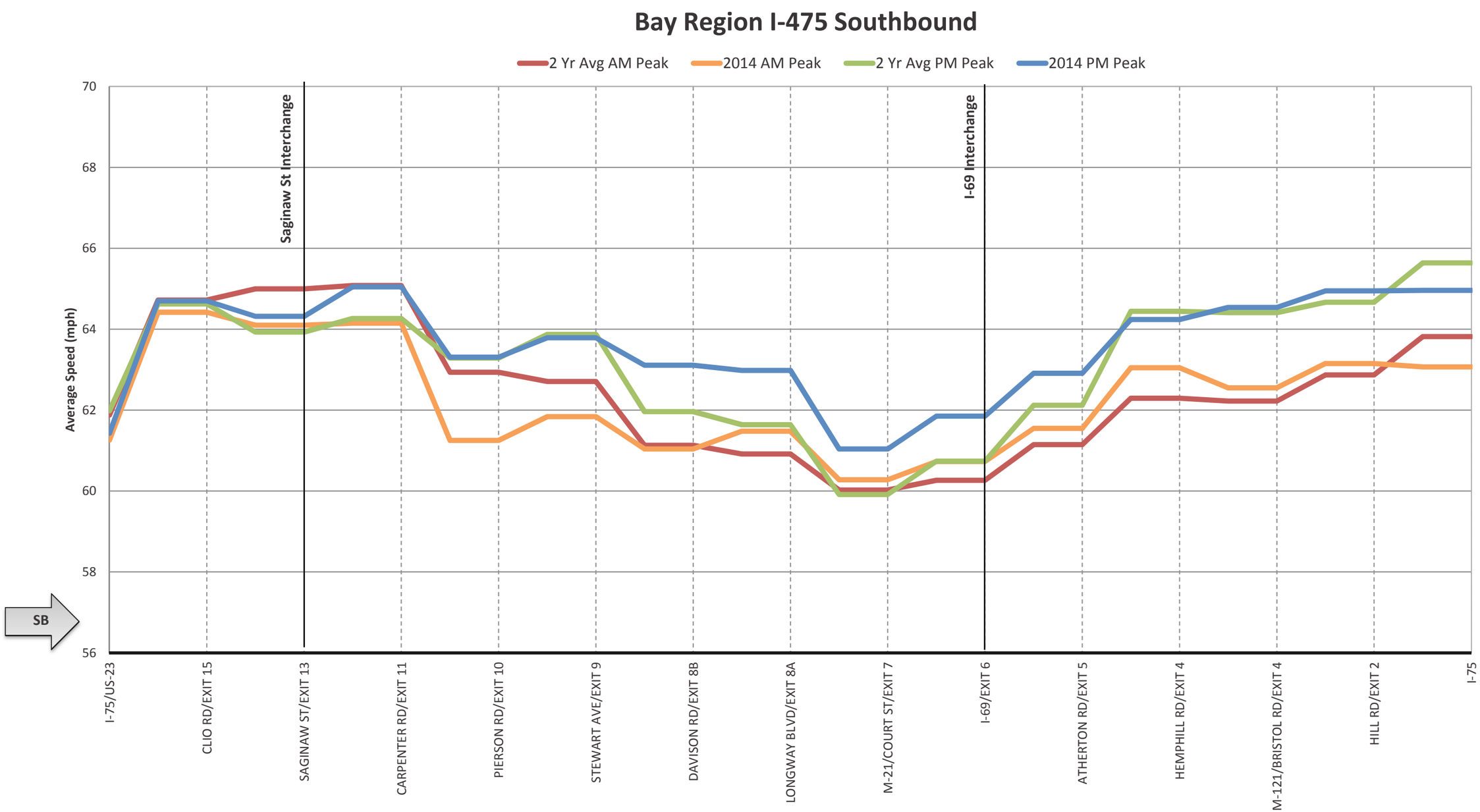


Figure 28. Bay Region I-475 southbound



Travel Time Reliability

Figure 29. Travel time reliability: I-475

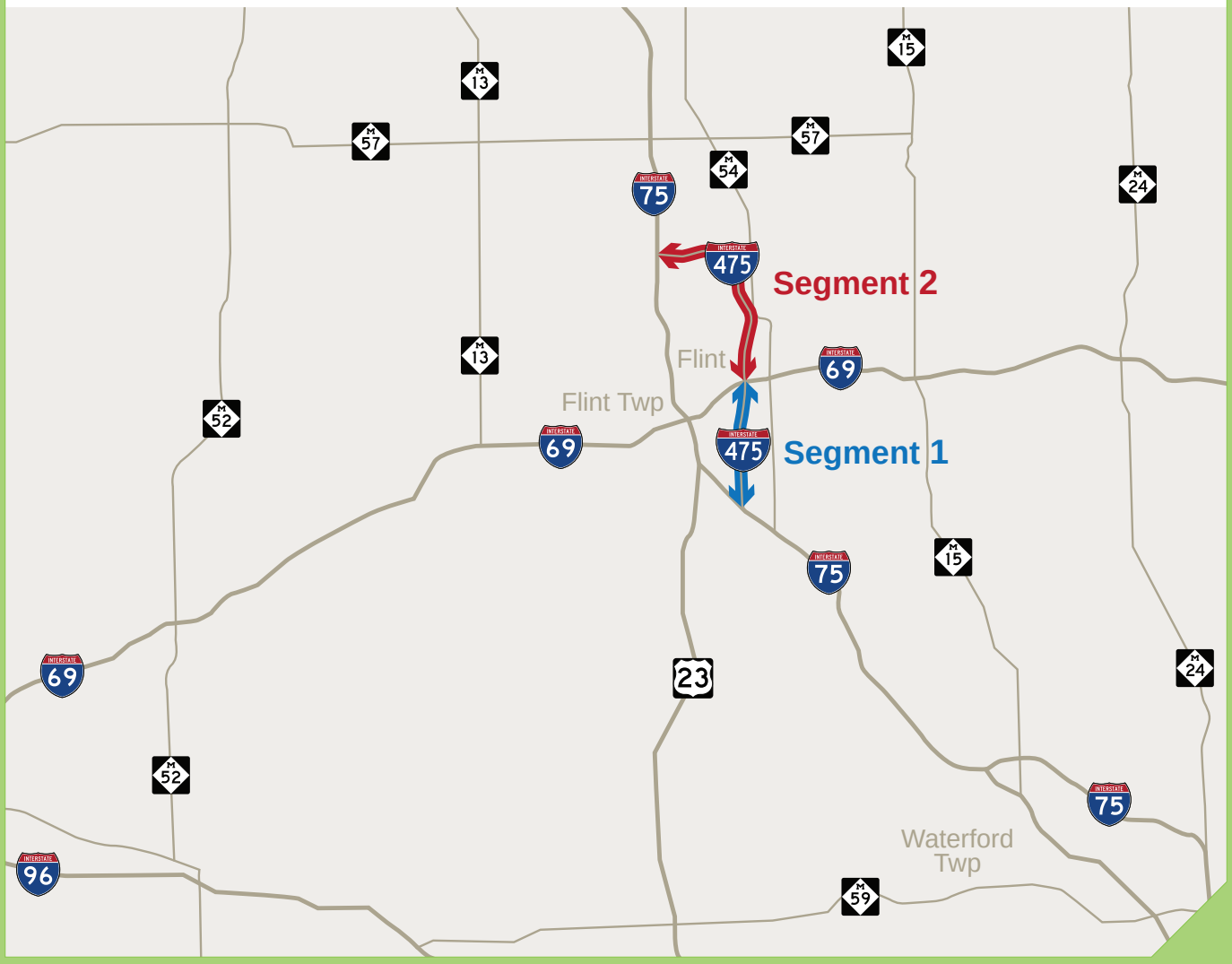
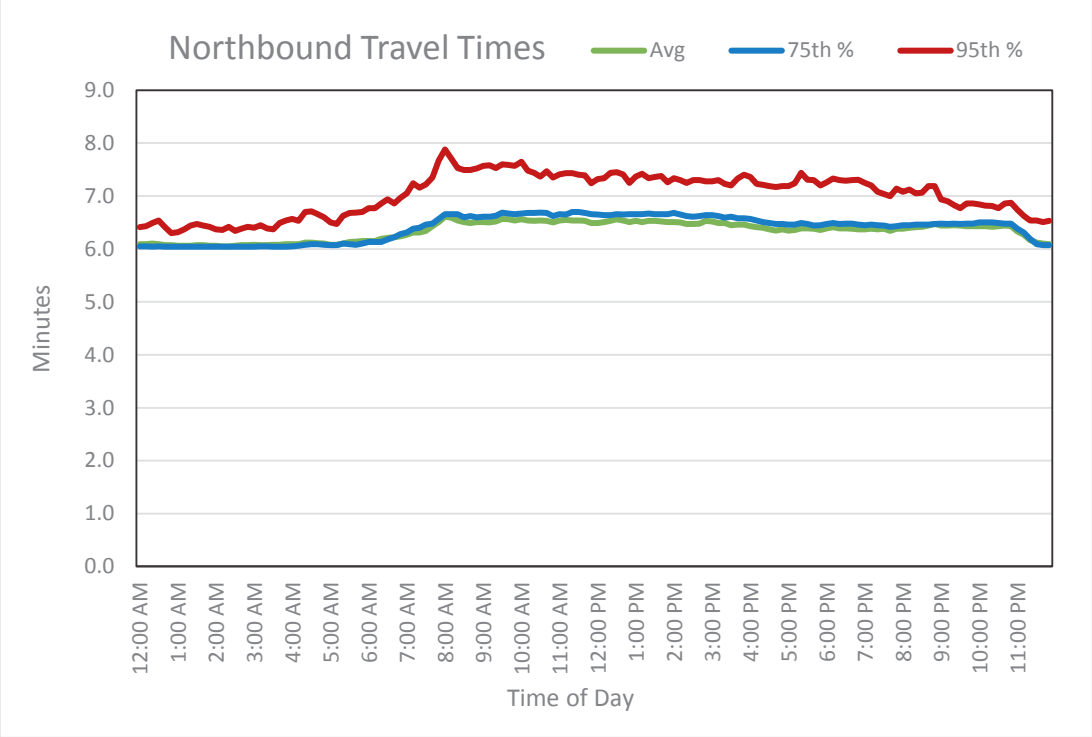


Figure 30. Segment 1- I-475 between I-75 and I-69

Segment 1

Travel time (minutes) for I-475 between I-75 and I-69/Exit 6



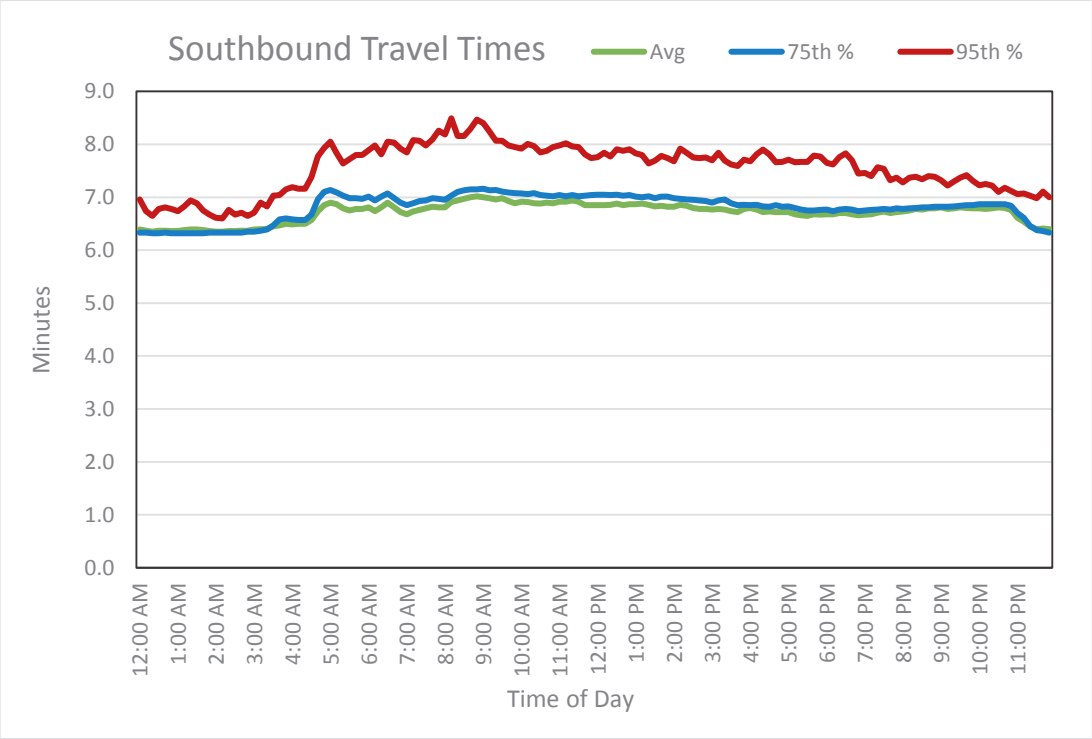
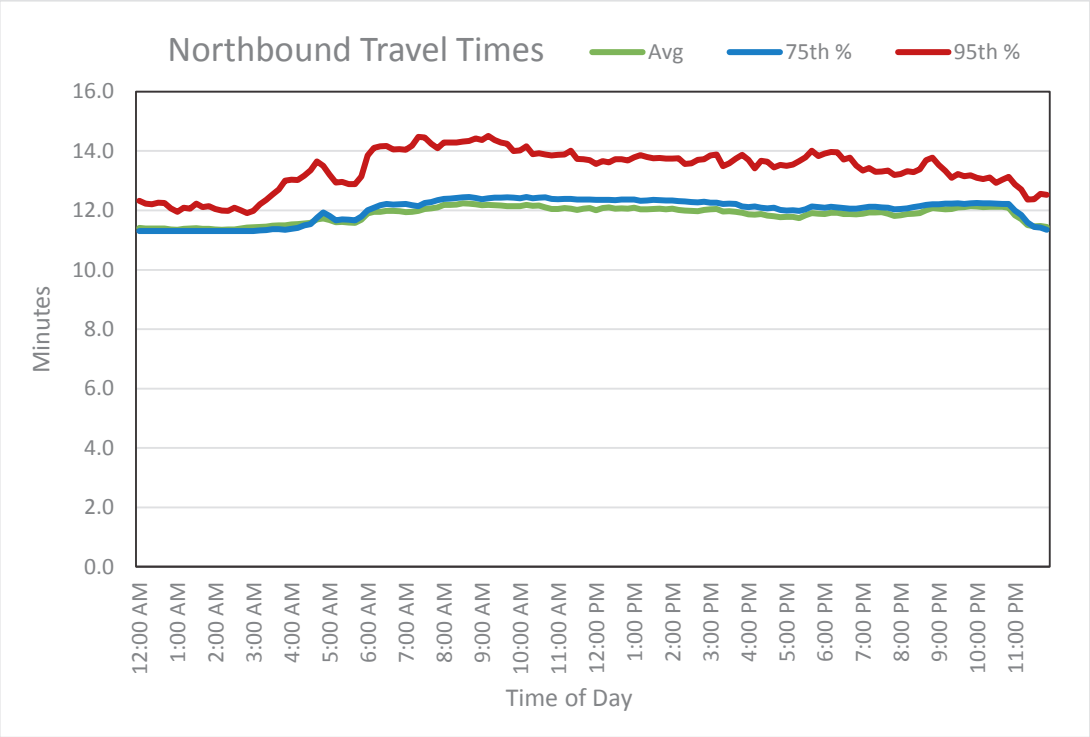
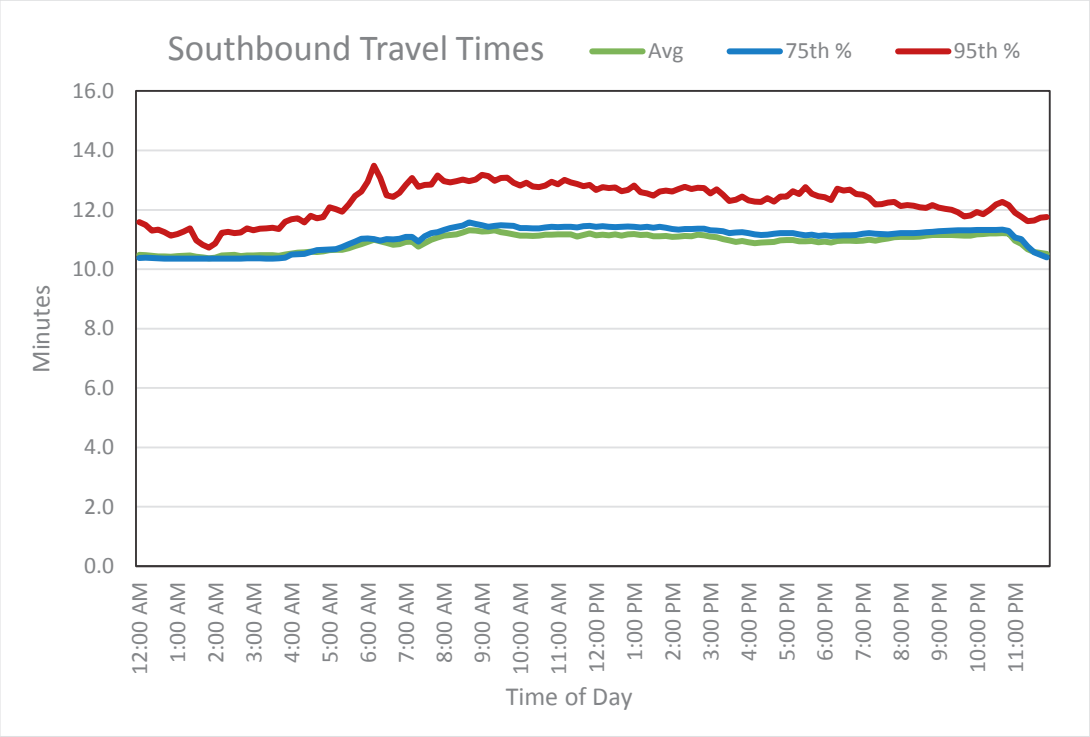


Figure 31. Segment 2- I-475 between I-75/US-23 and I-69

Segment 2

Travel time (minutes) for I-475 between I-75/US-23 and I-69/Exit 6





Chapter 2

Corridor

Interstate 69: **Genesee and Lapeer**

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Interstate 675: **Saginaw**

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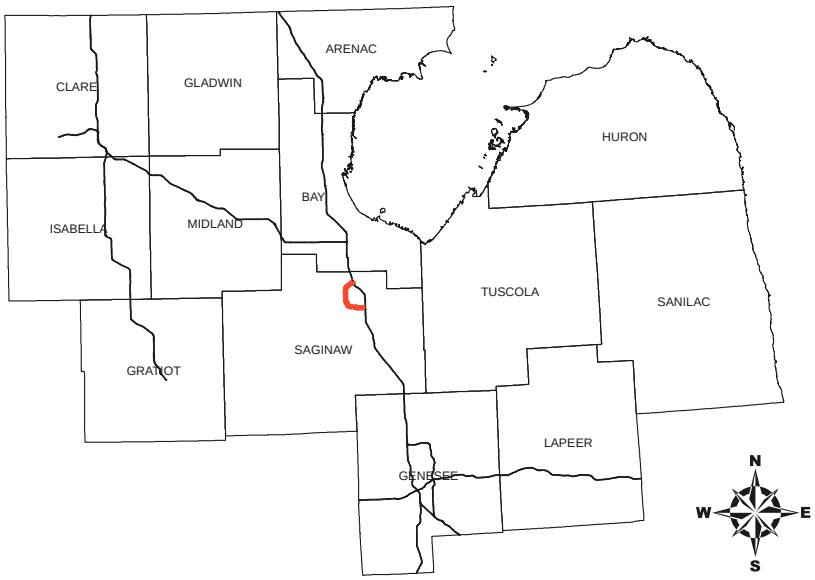
US-23: **Genesee**

US-127: **Gratiot, Isabella, and Clare**

Figure 32. Saginaw County I-675 Corridor total user delay cost



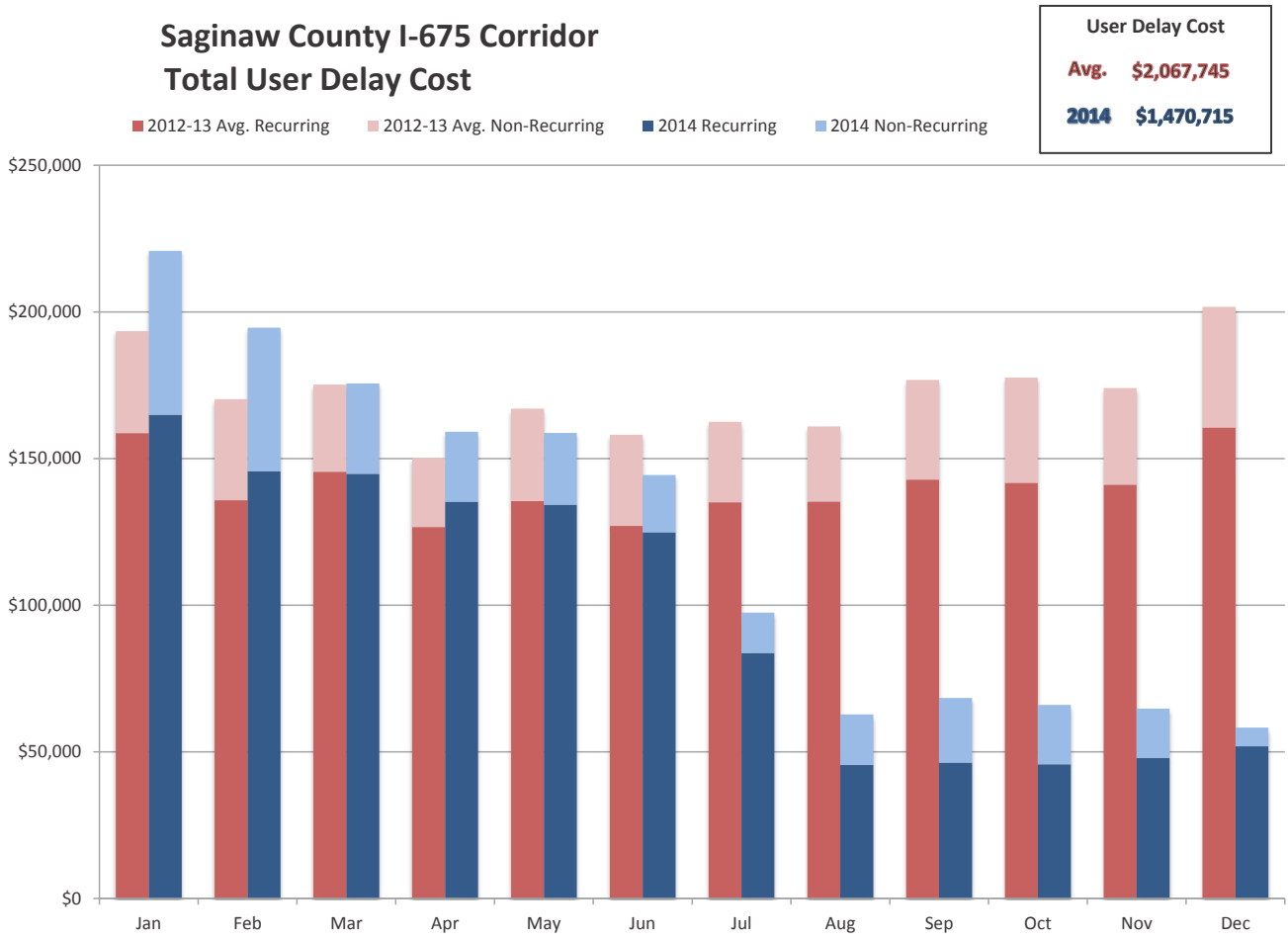


Figure 33. Bay Region I-675 northbound

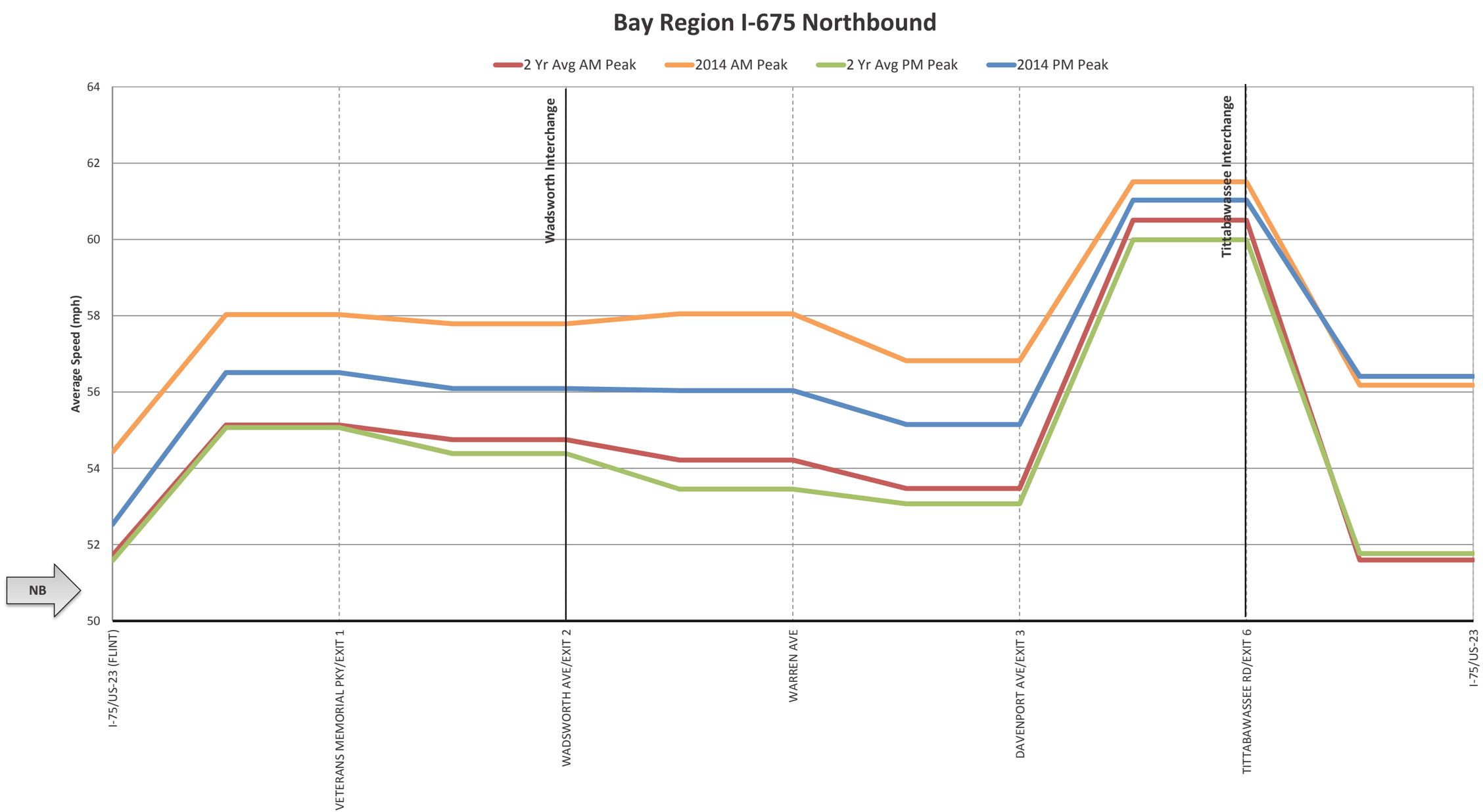
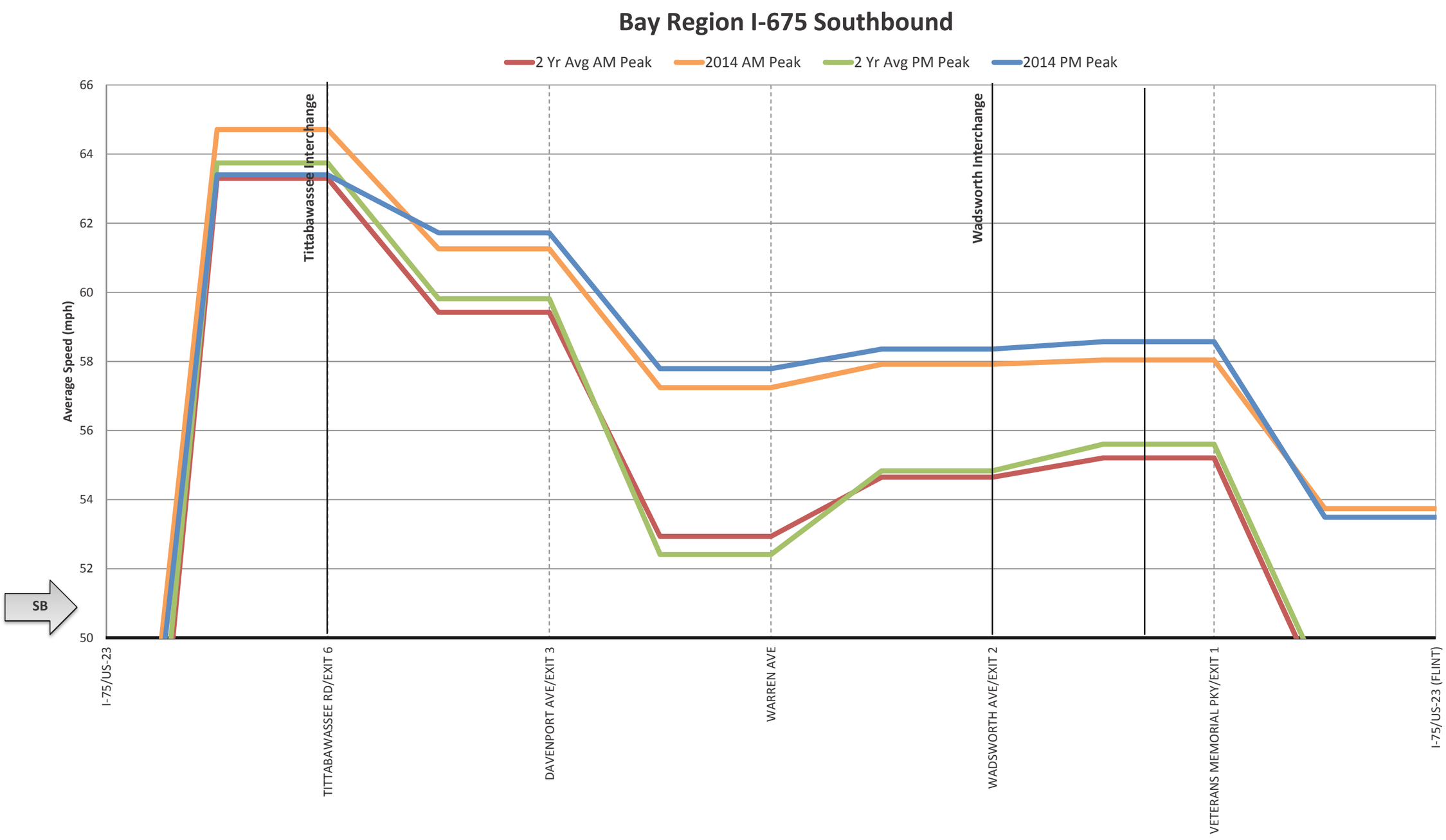


Figure 34. Bay Region I-675 southbound



Travel Time Reliability

Figure 35. Travel time reliability: I-675

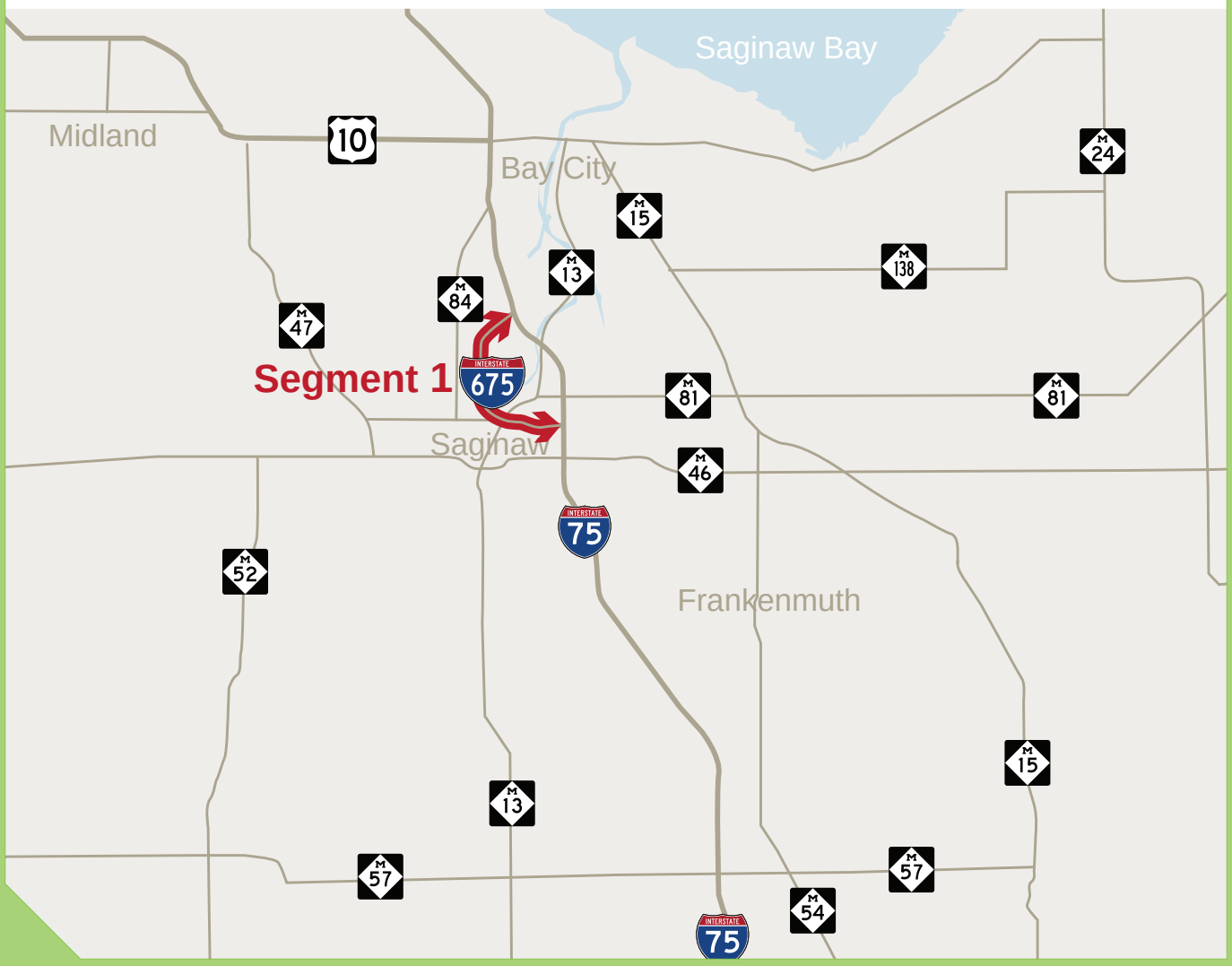
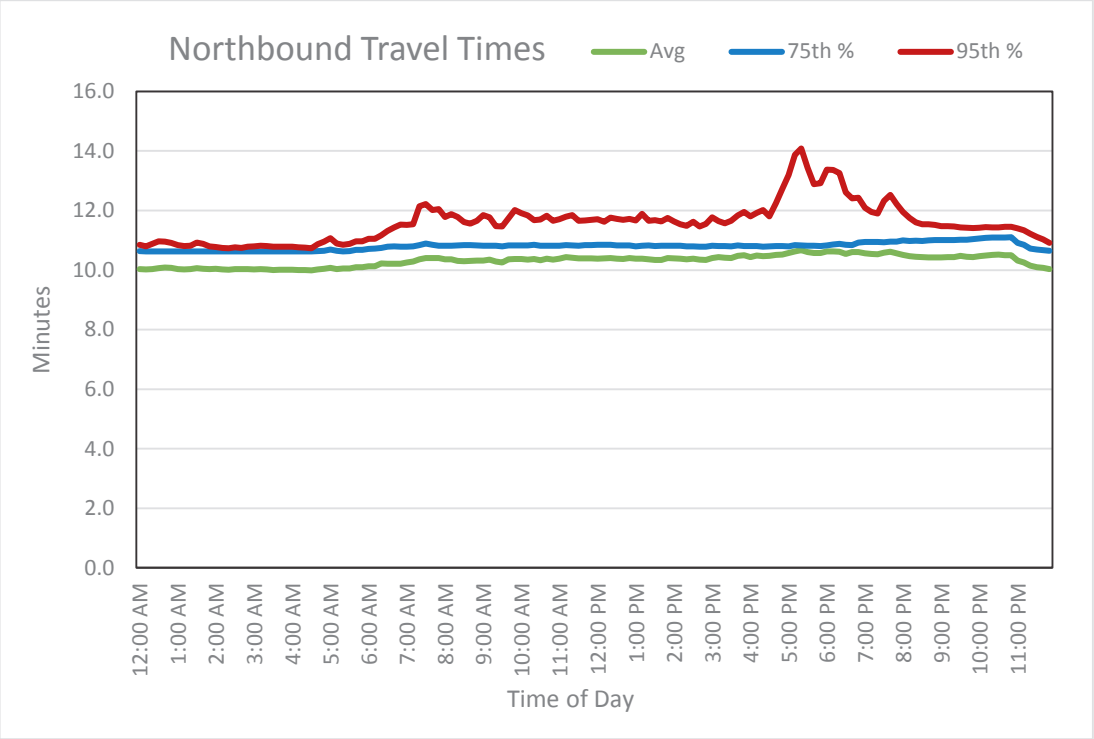
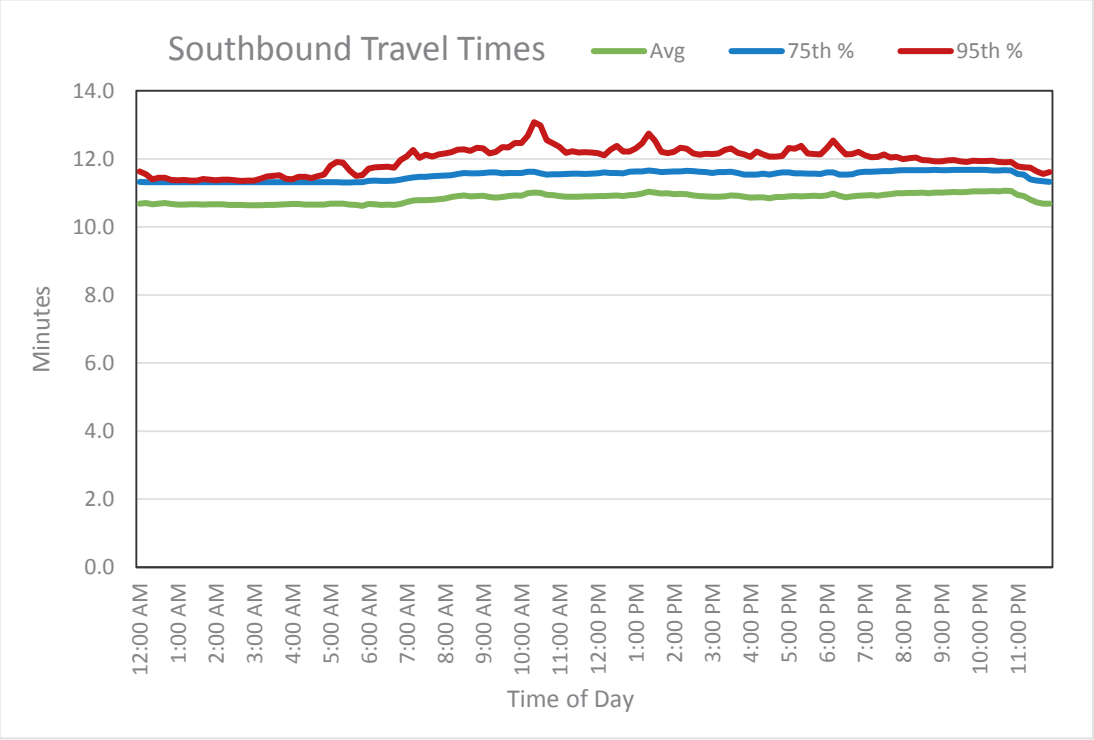


Figure 36. Segment 1- I-675

Segment 1

Travel time (minutes) for I-675





Chapter 2

Corridor

Interstate 69: **Genesee and Lapeer**

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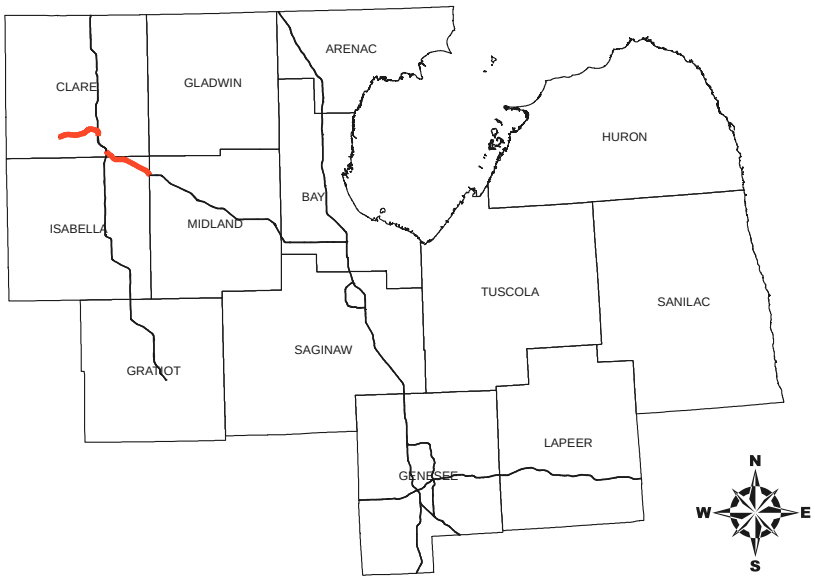
US-23: **Genesee**

US-127: **Gratiot, Isabella, and Clare**

Figure 37. Isabella/Clare Counties US-10 Corridor total user delay cost



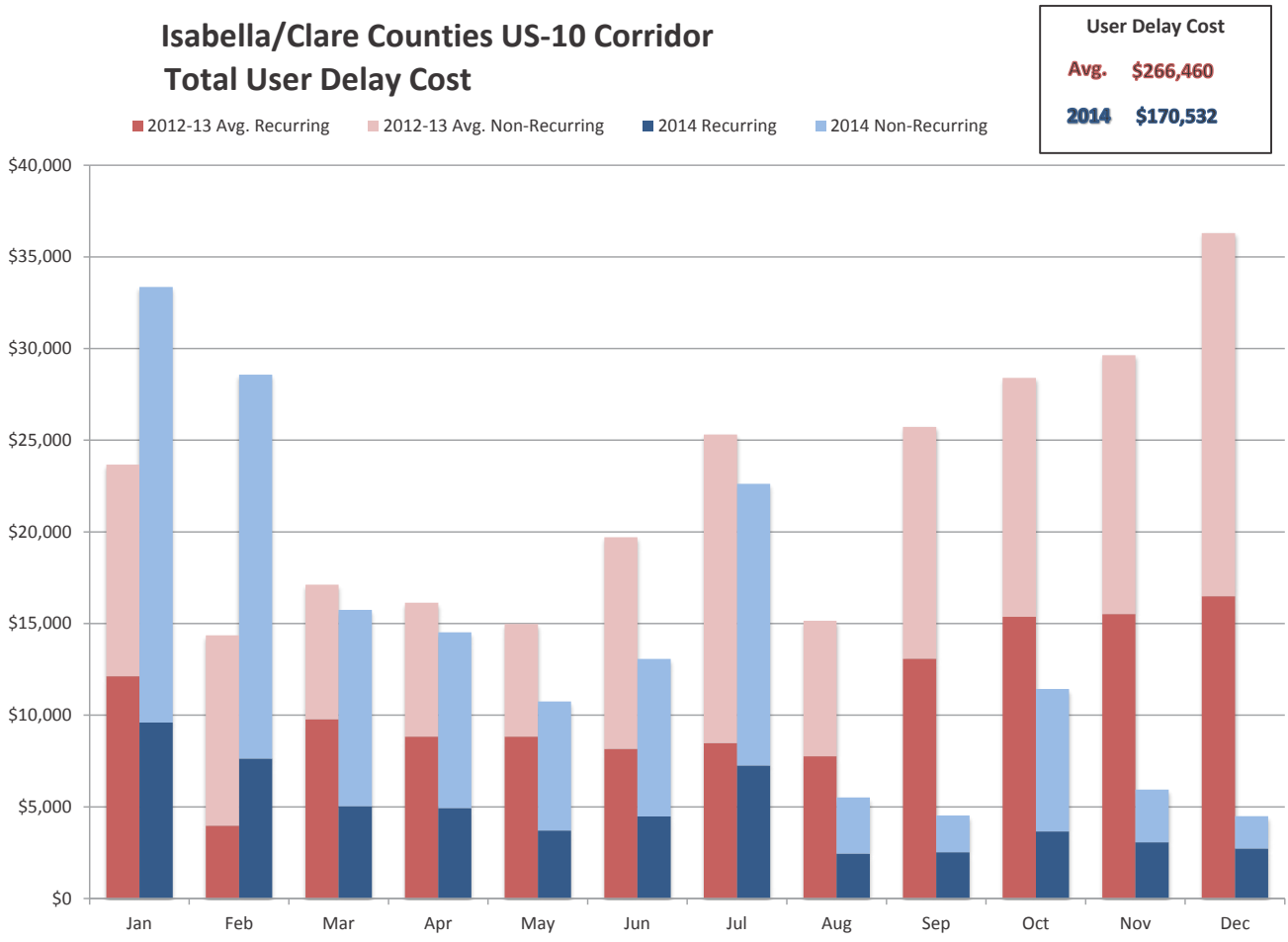
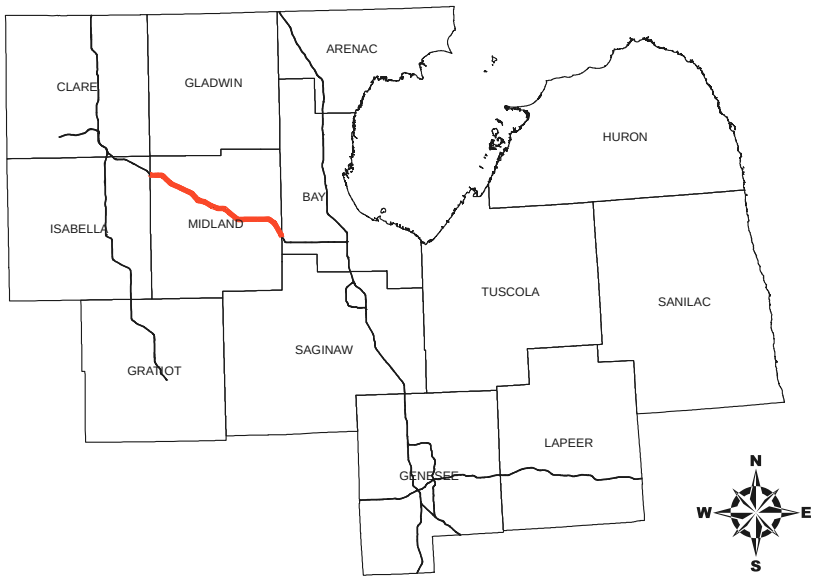


Figure 38. Midland County US-10 Corridor total user delay cost



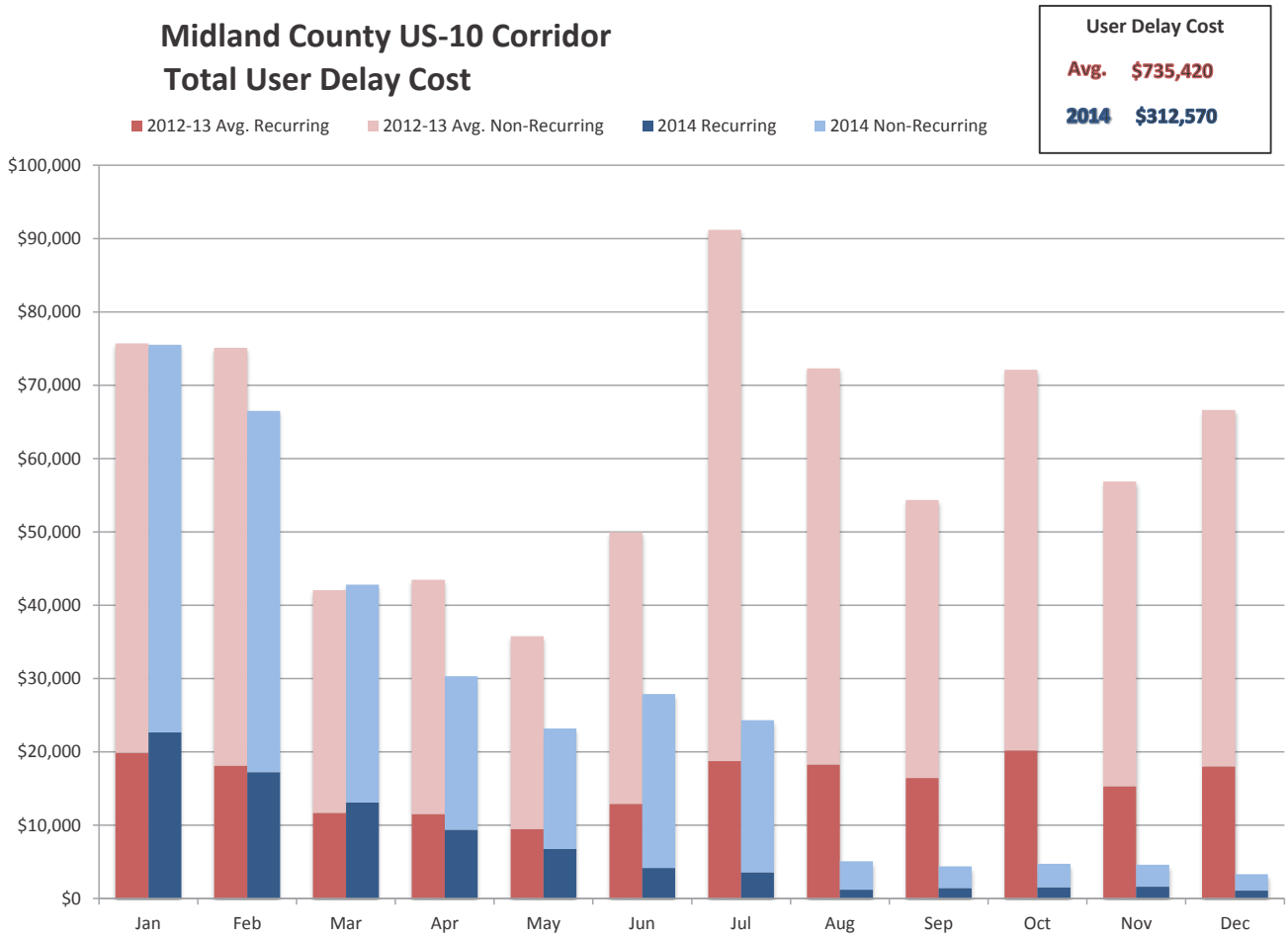
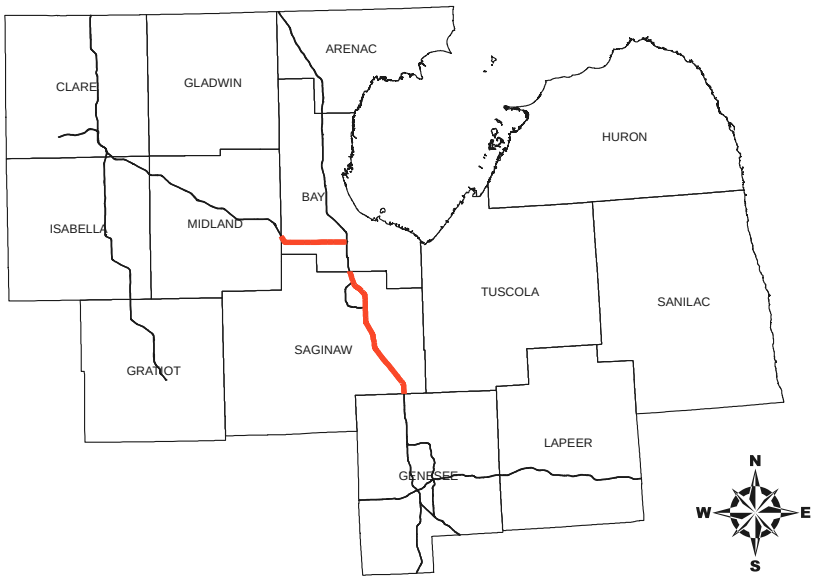


Figure 39. Bay County US-10 Corridor total user delay cost



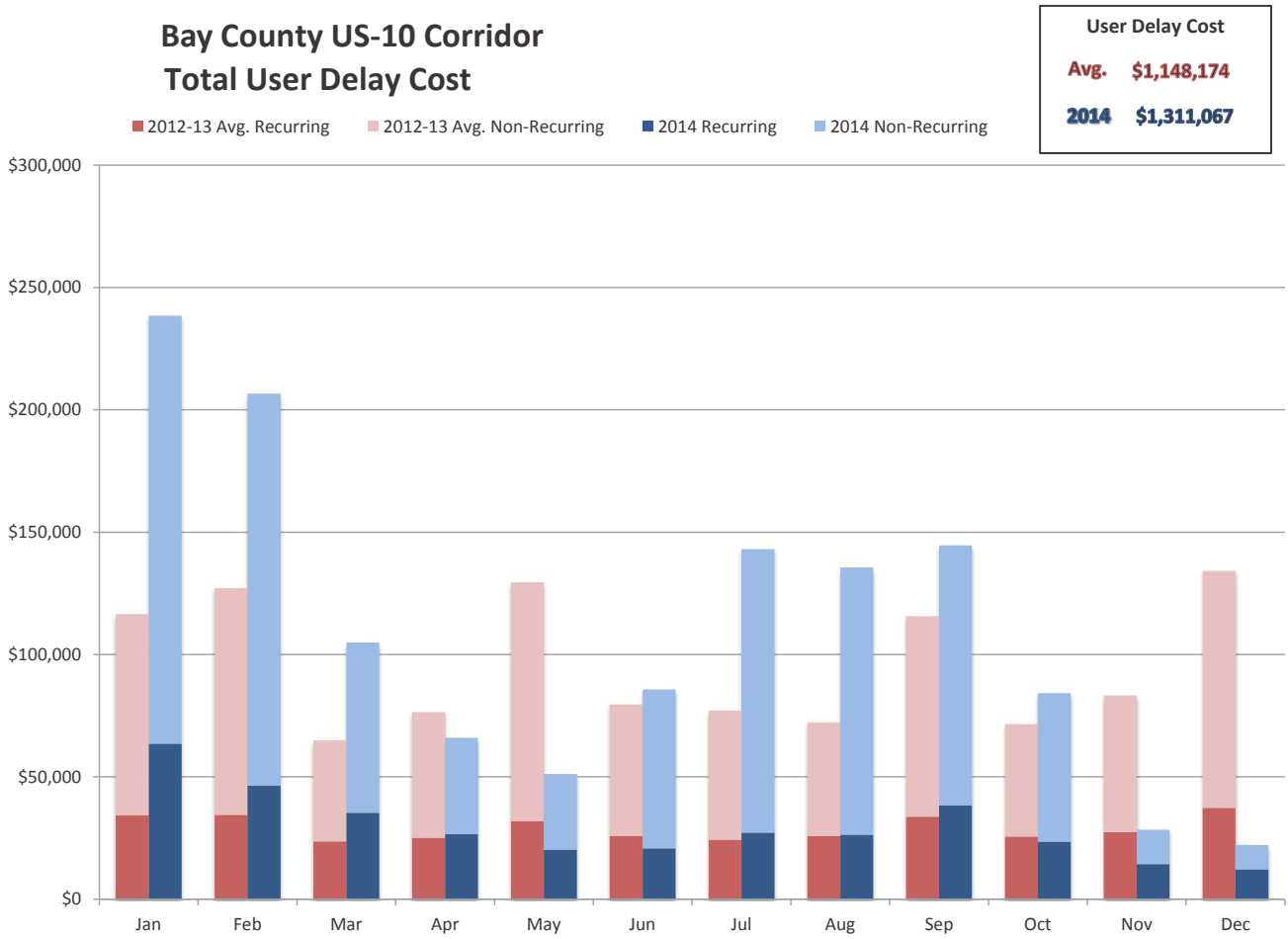


Figure 40. Bay Region US-10 eastbound

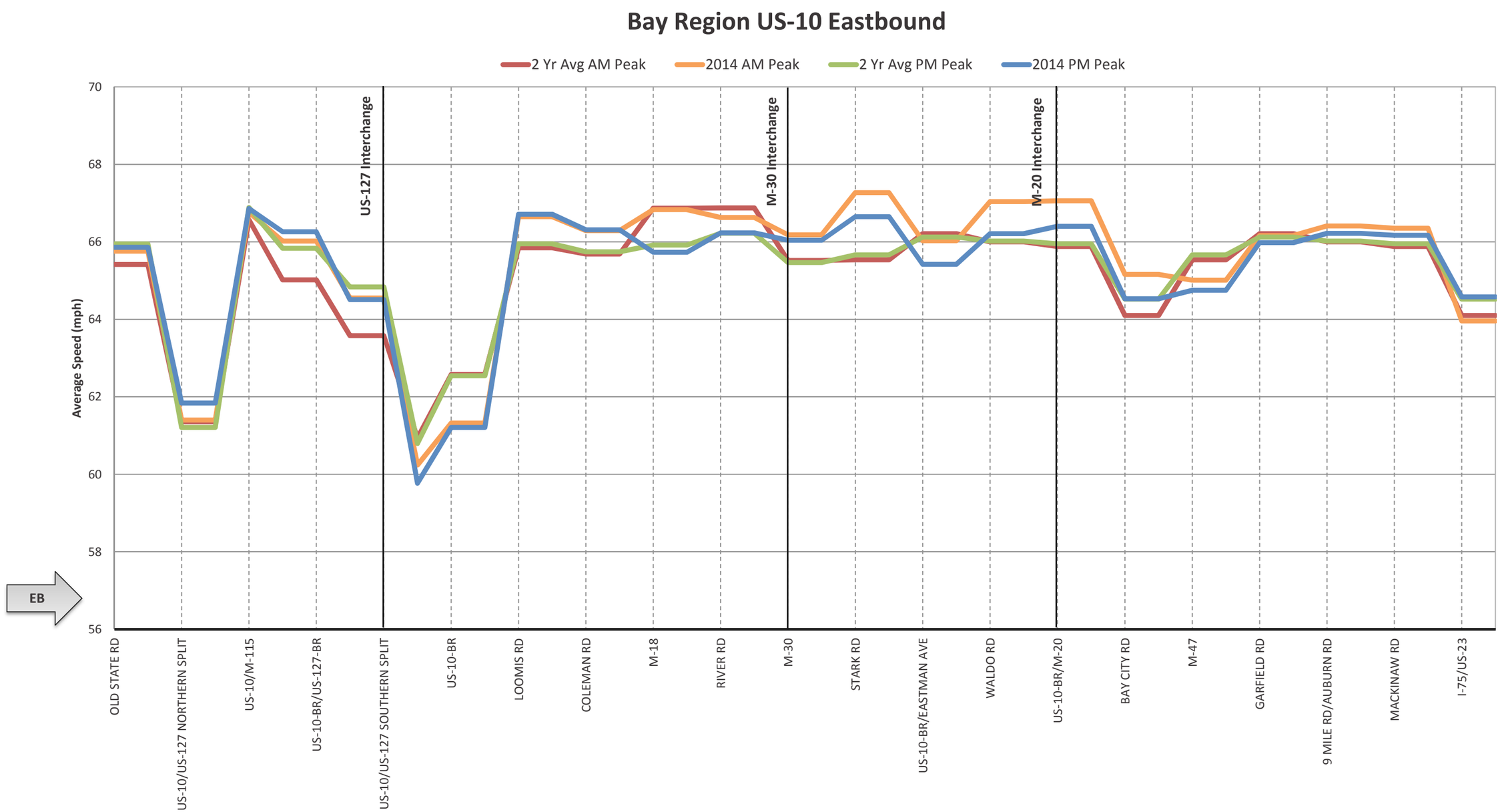
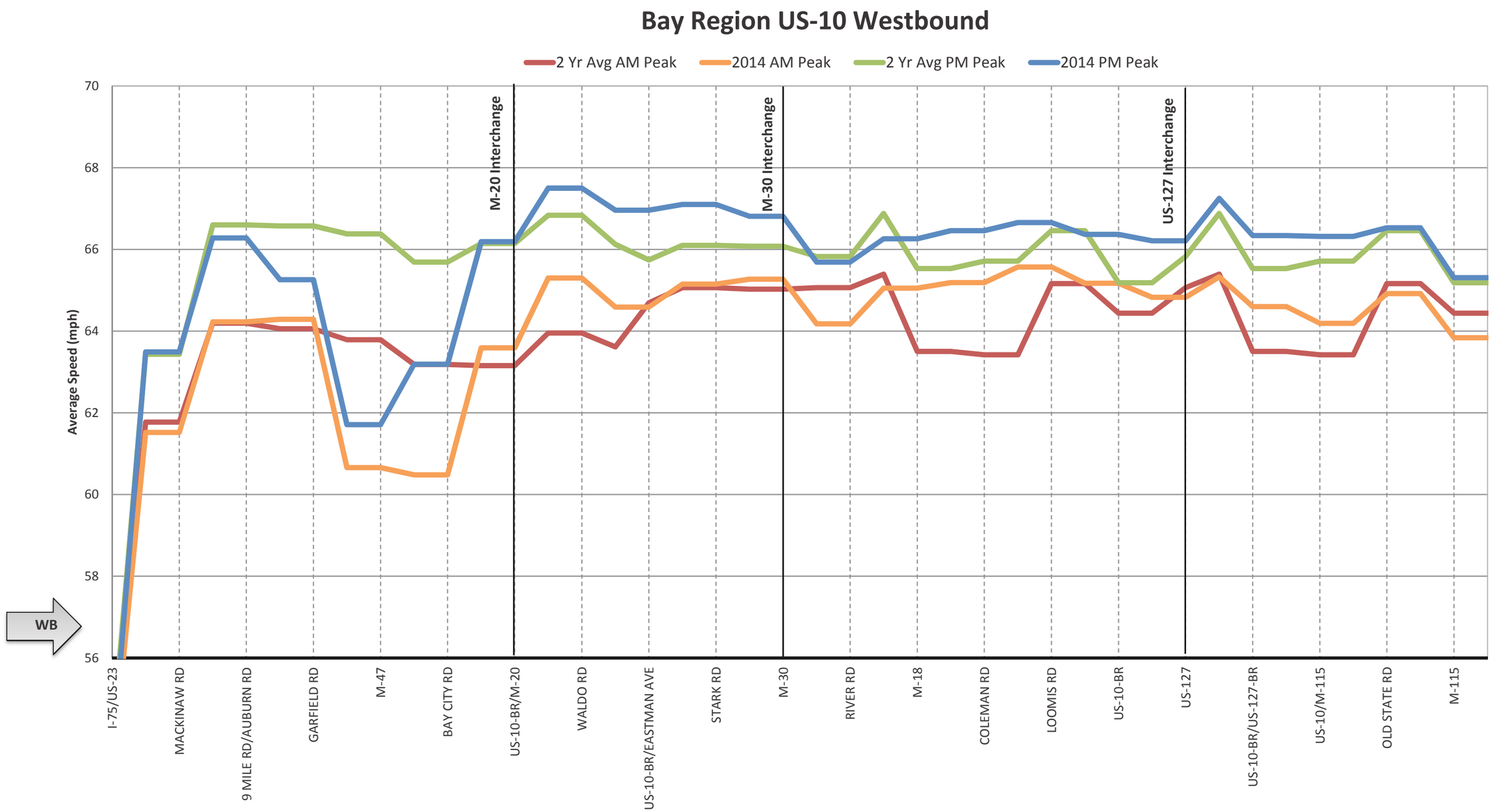


Figure 41. Bay Region US-10 westbound



Chapter 2

Corridor

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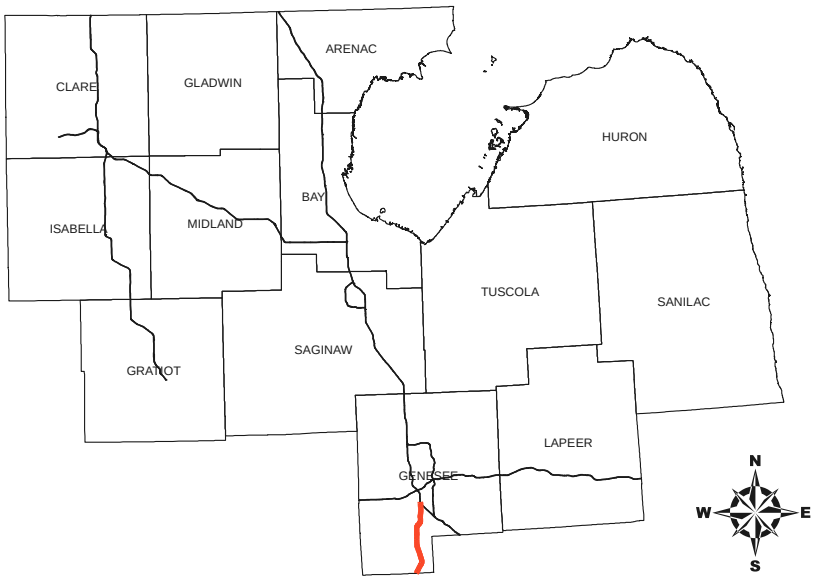
US-23: **Genesee**

US-127: **Gratiot, Isabella, and Clare**

Figure 42. Genesee County US-23 Corridor total user delay cost



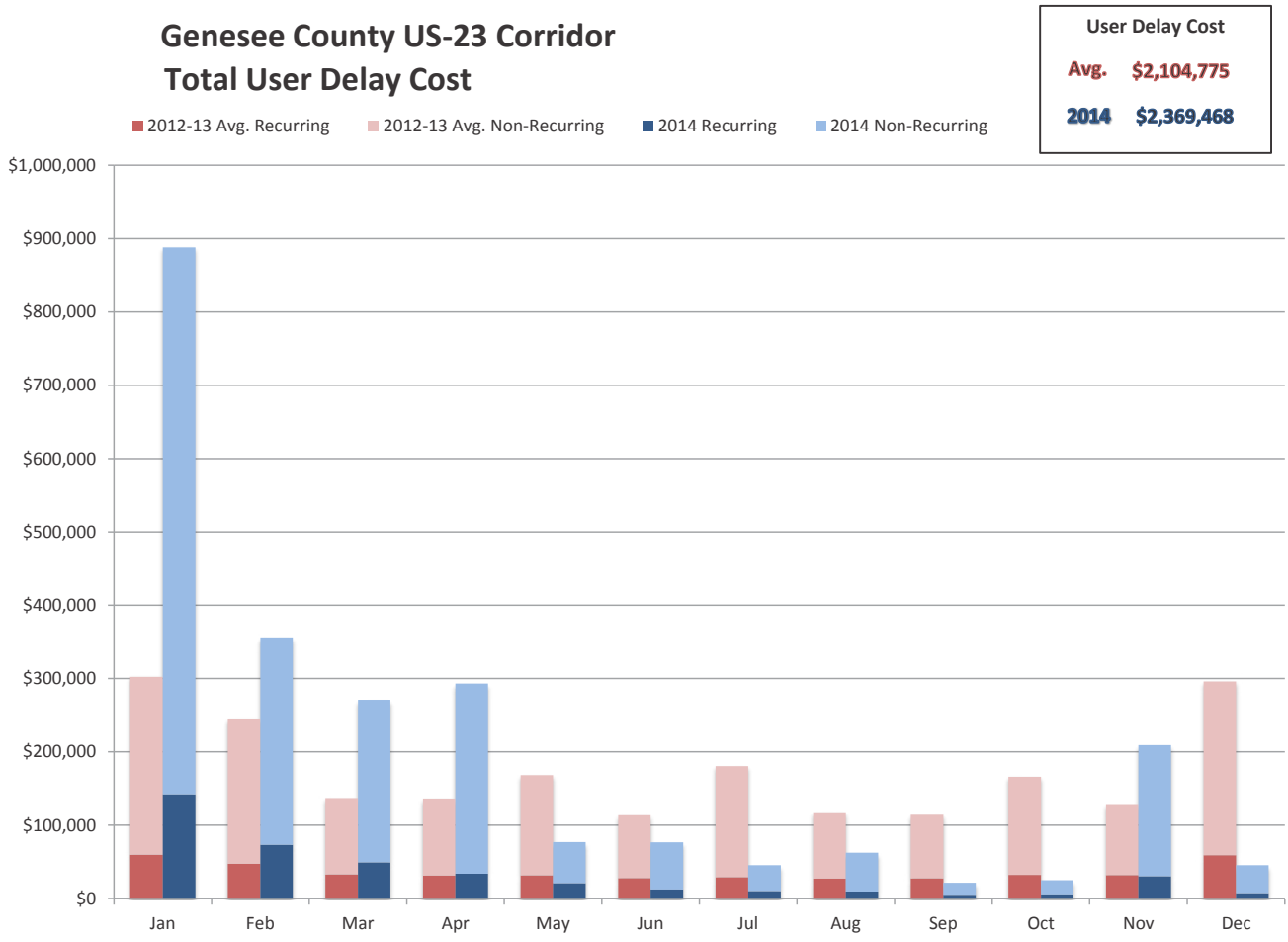


Figure 43. Bay Region US-23 northbound

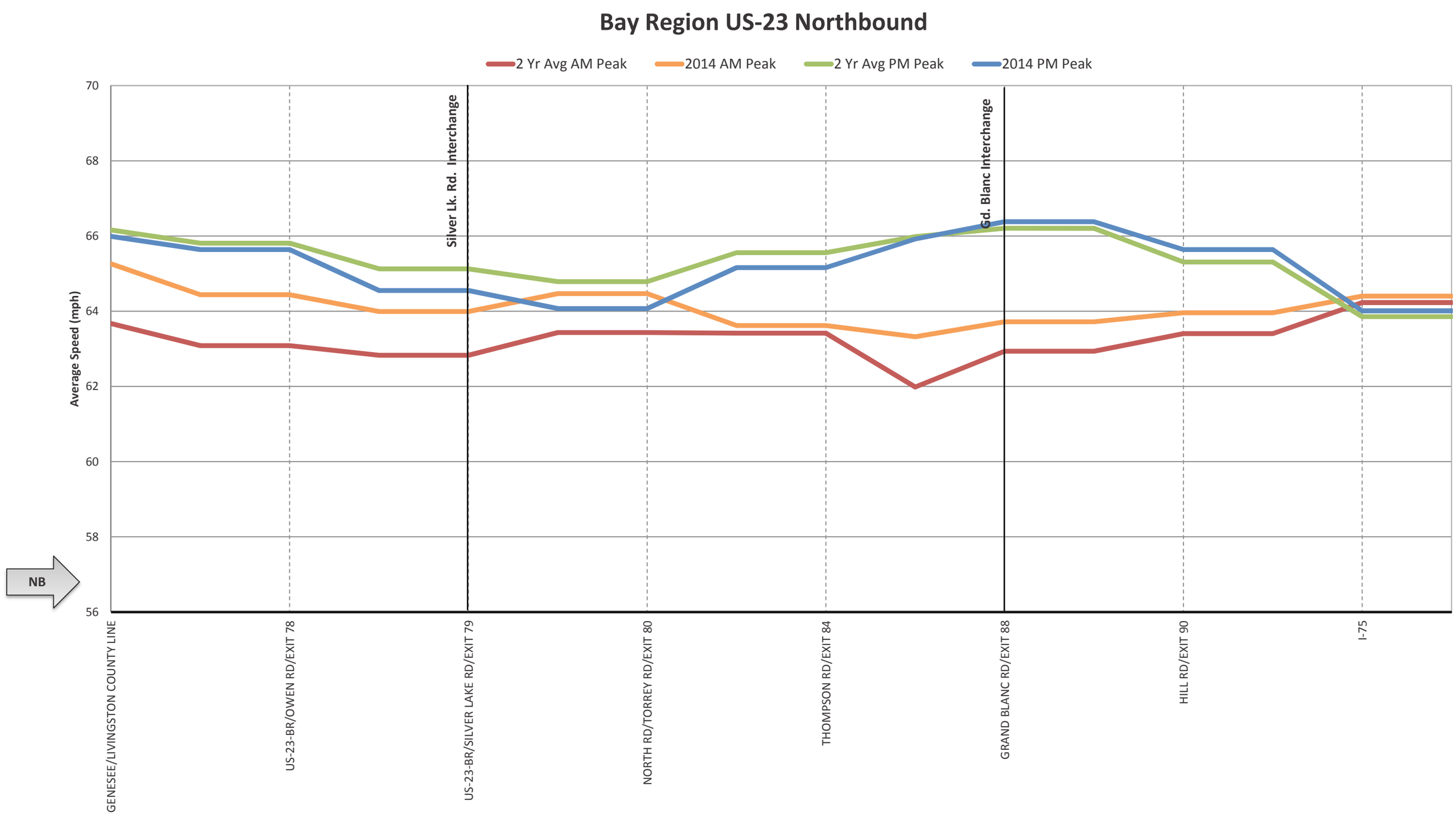
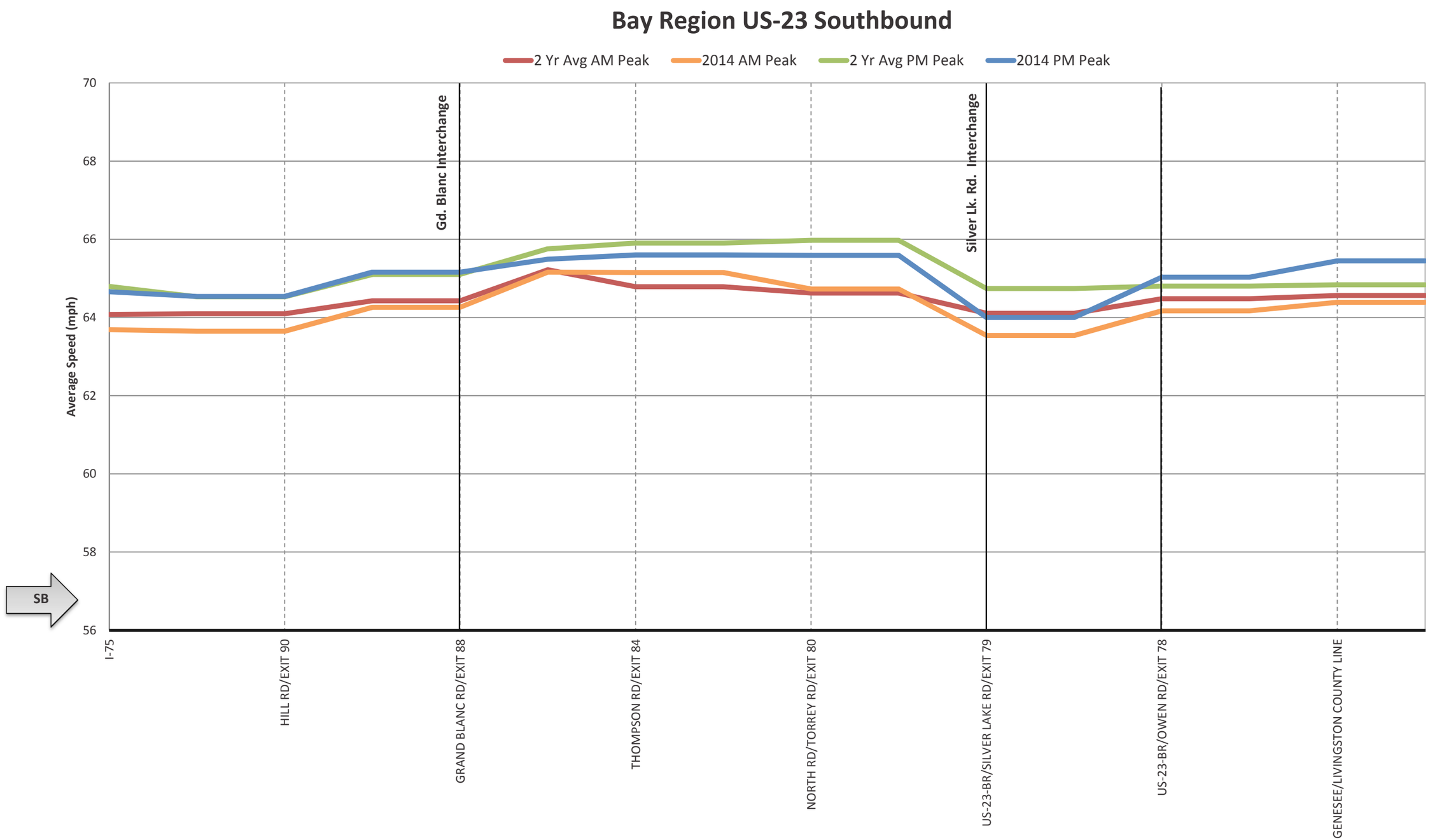


Figure 44. Bay Region US-23 southbound



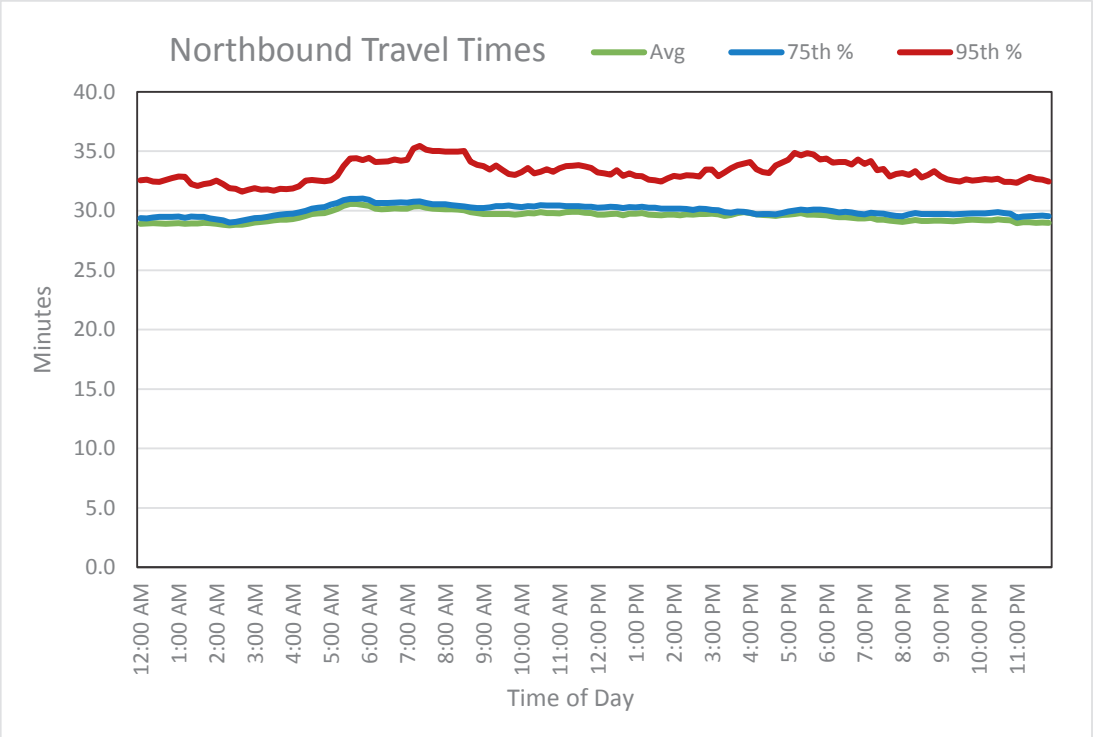
Travel Time Reliability

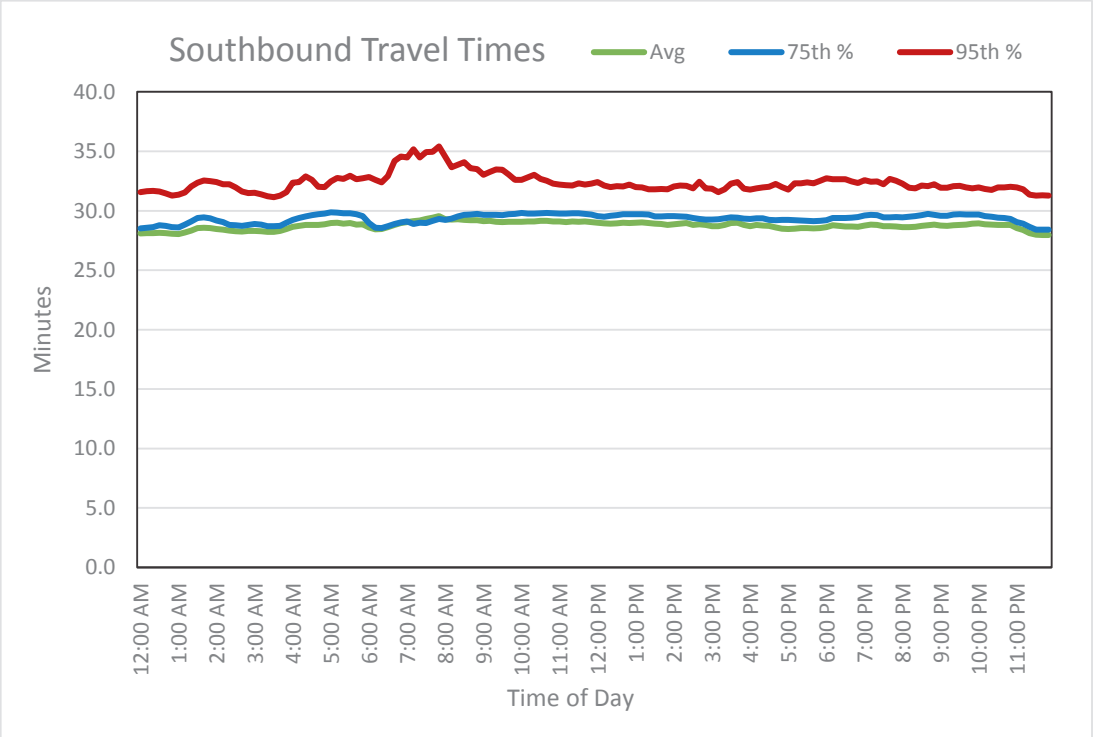
Figure 45. Travel time reliability: US-23

Figure 46. Segment 1- US-23 between I-75 and I-96

Segment 1

Travel time (minutes) for US-23 between I-75 and I-96/Exit 60





Chapter 2

Corridor

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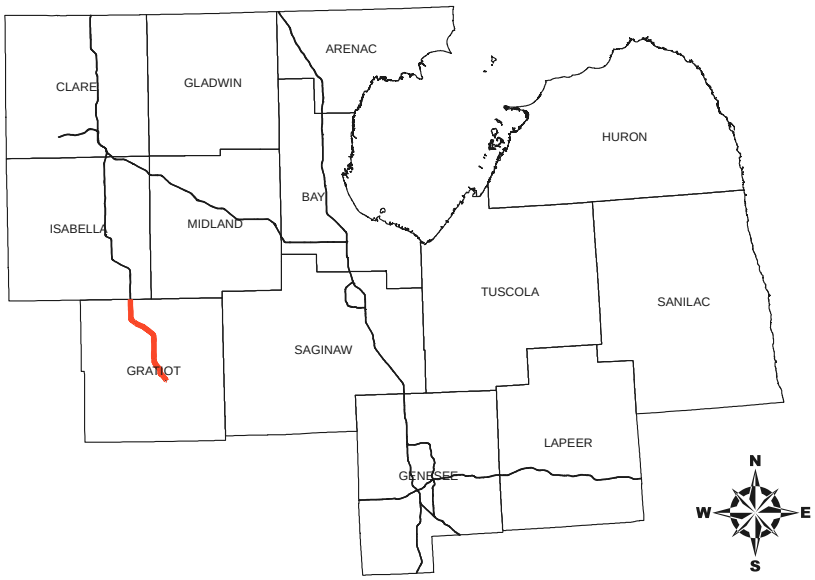
US-23: **Genesee**

US-127: **Gratiot, Isabella, and Clare**

Figure 47. Gratiot County US-127 Corridor total user delay cost



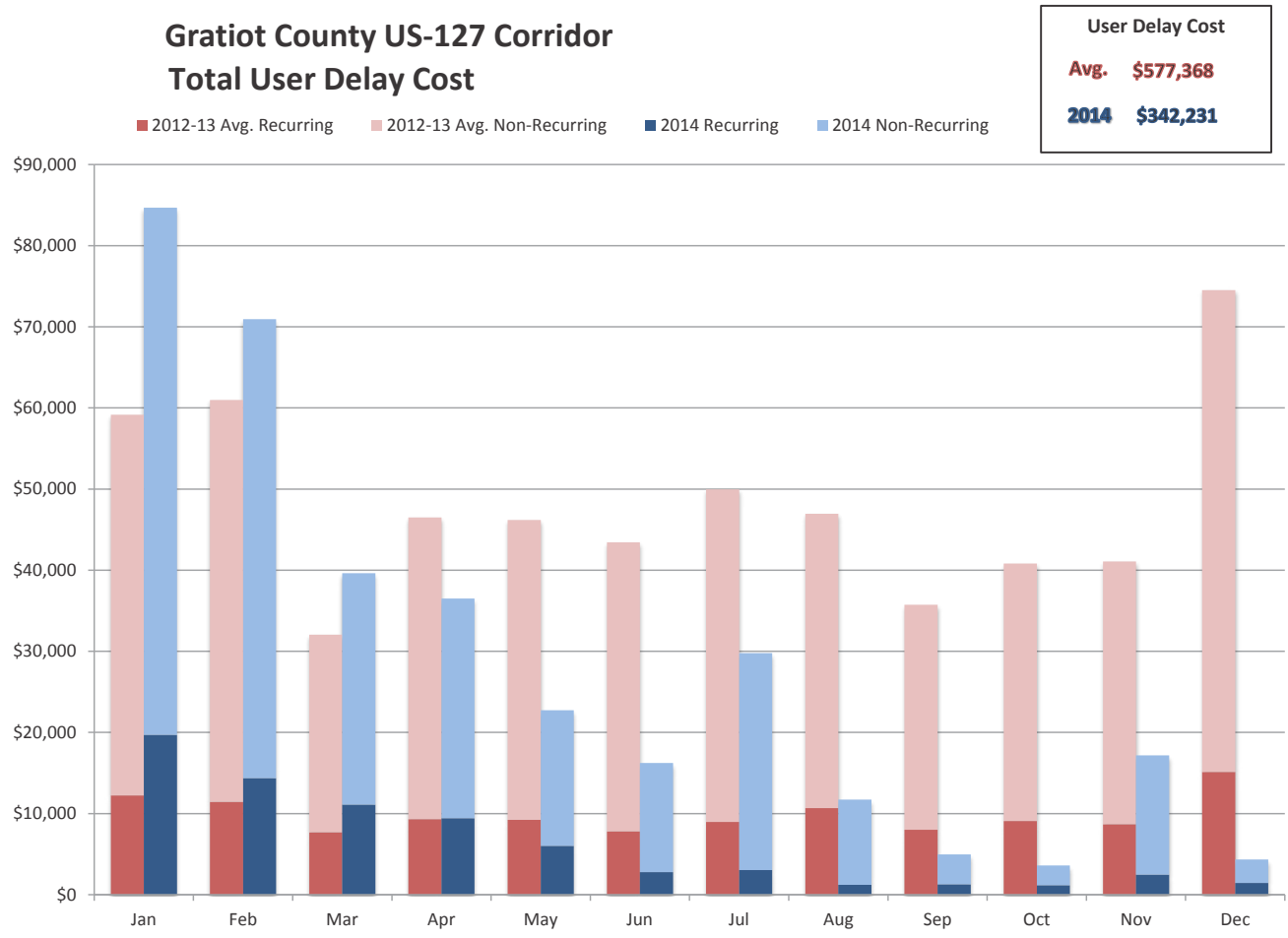
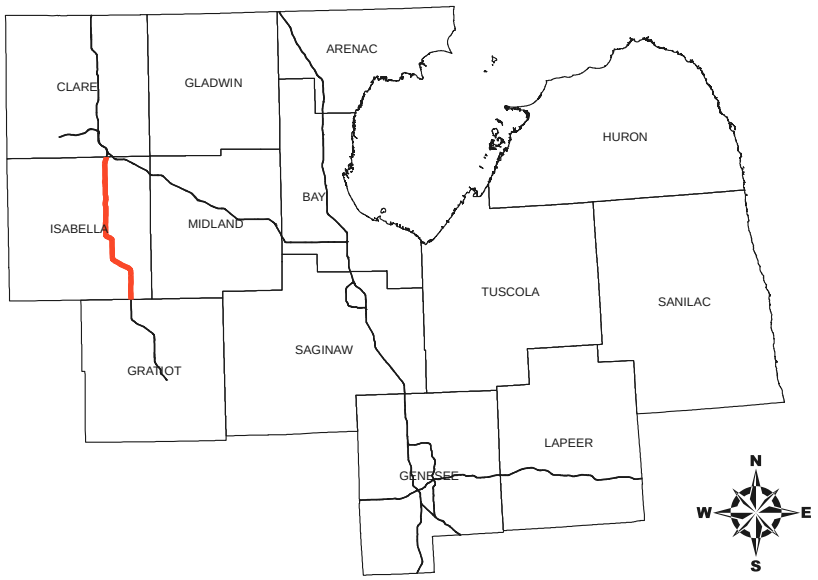


Figure 48. Isabella County US-127 Corridor total user delay cost



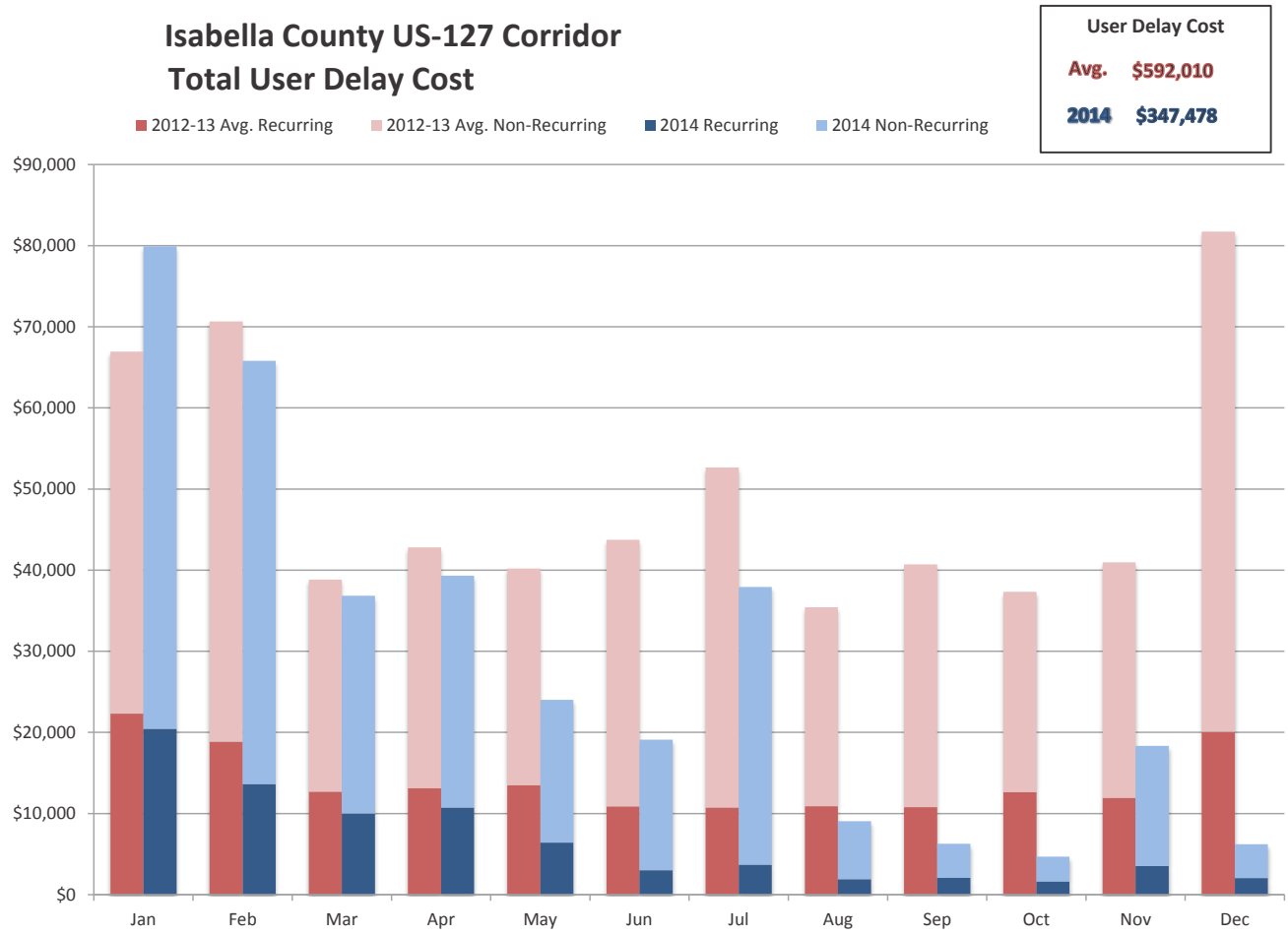
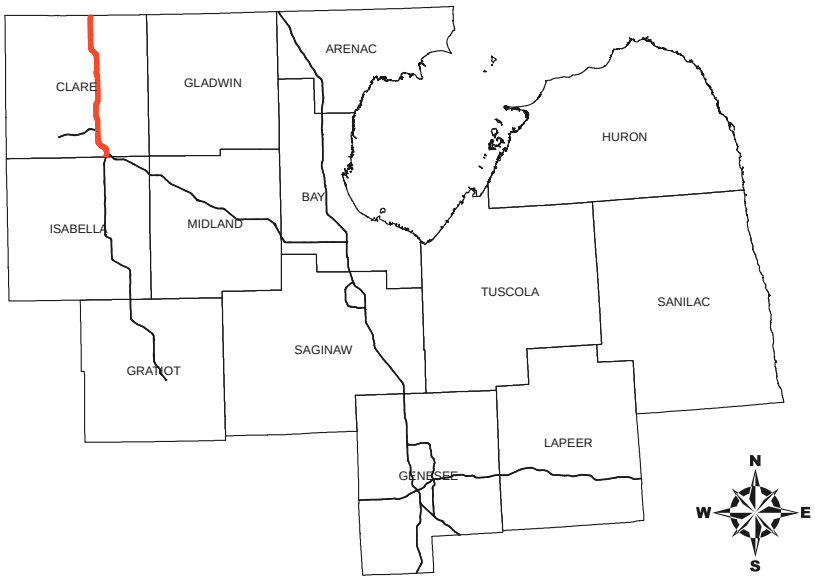


Figure 49. Clare County US-127 Corridor total user delay cost



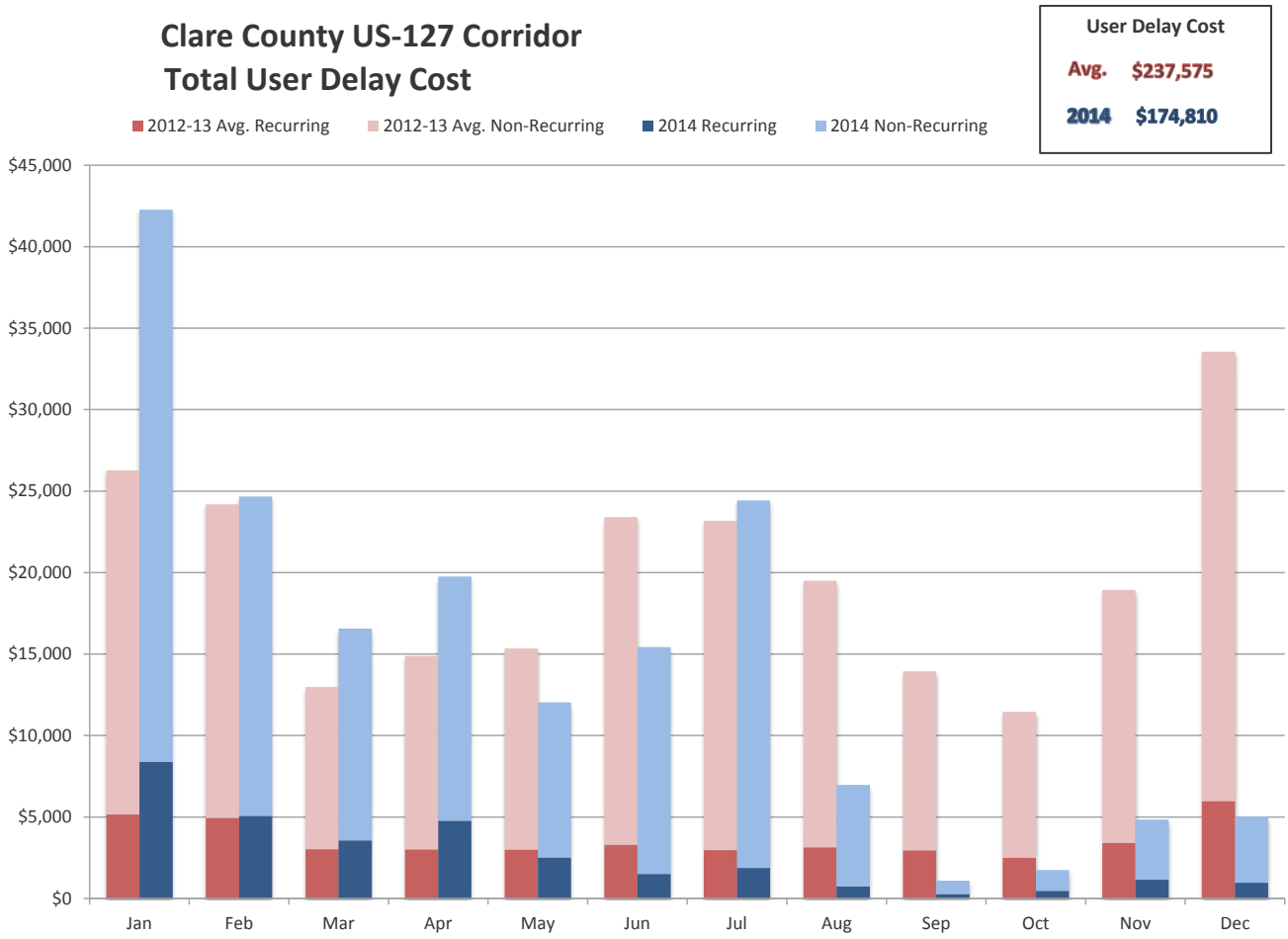


Figure 50. Bay Region US-127 northbound

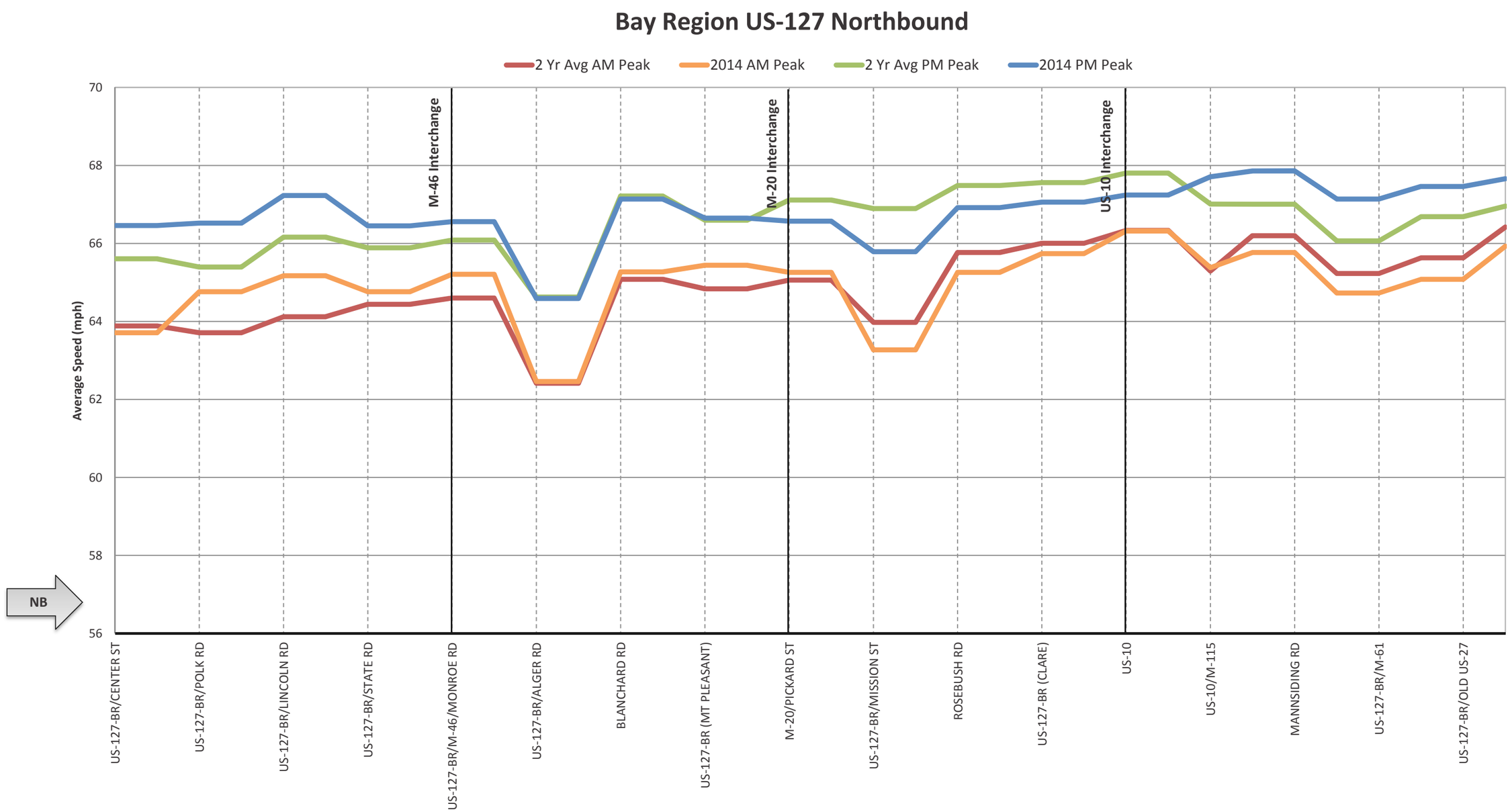
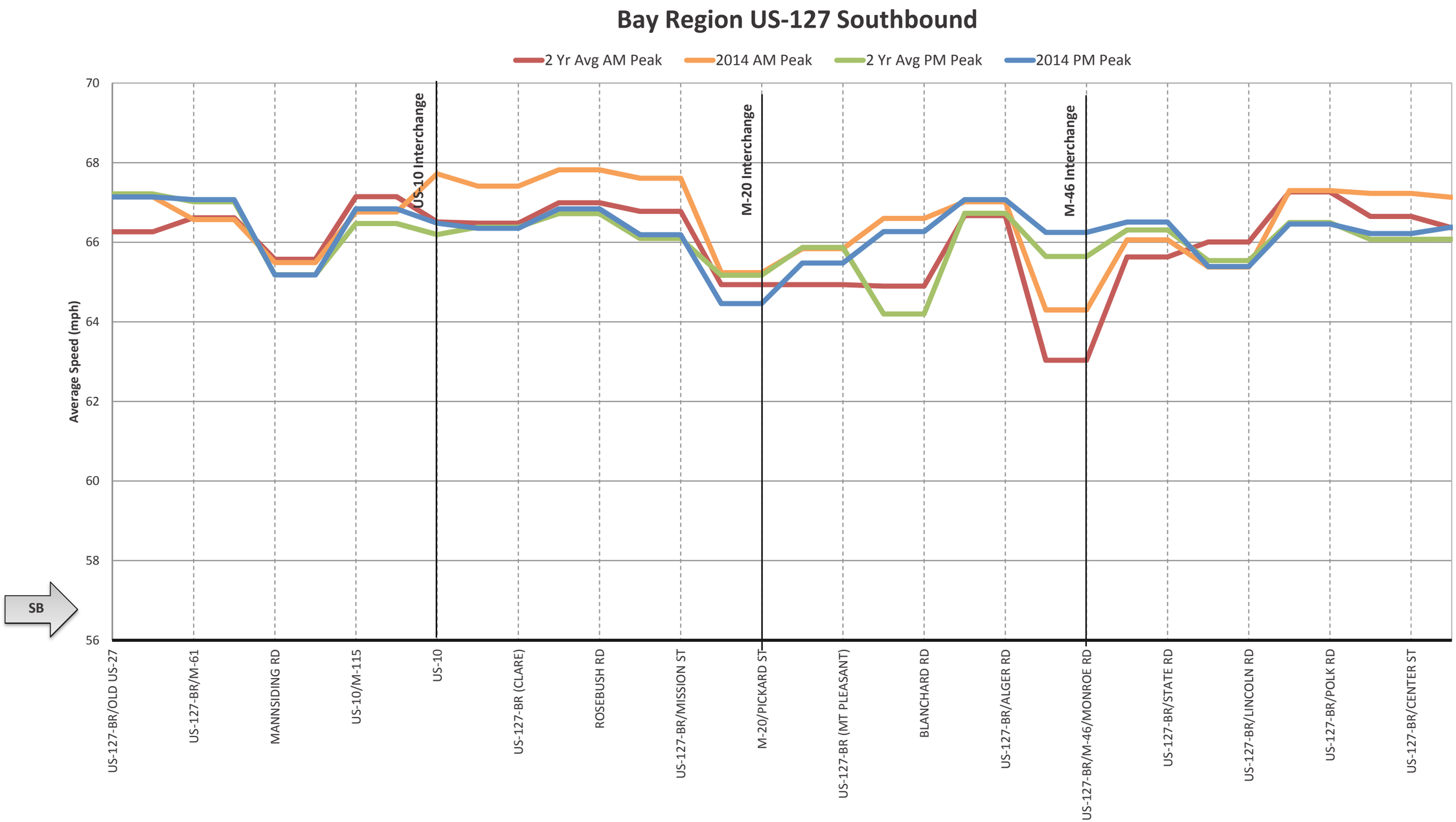


Figure 51. Bay Region US-127 southbound



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