Chapter 5
NORTH REGION
SUMMARY
PERFORMANCE MEASURE 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 TSC.

**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 x 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.
2013 North Region
User Delay Cost per Mile

UDC per Mile
- $< 25,000
- $25,000 - $50,000
- $50,000 - $100,000
- $> 100,000

Map showing different regions with UDC color codes.
Figure 2

2013 North Region Congestion Hours
Northbound/Eastbound

Congestion Hours
- < 50
- 50 - 100
- 100 - 150
- > 150

Traverse City TSC
Gaylord TSC
Alpena TSC
Cadillac TSC
Figure 3

2013 North Region
Congestion Hours
Southbound/Westbound

Congestion Hours
- < 50
- 50 - 100
- 100 - 150
- > 150
Figure 4

Cadillac TSC US-31 Corridor
User Delay Cost

Total UDC
2012: $200,209
2013: $206,283

Cadillac TSC US-31 Corridor
2012 User Delay Cost

Recurring Non-Recurring
44% 56%
Car $78,325 Truck $8,808 Truck $13,287 Car $99,590

2012 UDC: $200,209

Cadillac TSC US-31 Corridor
2013 User Delay Cost

Recurring Non-Recurring
35% 65%
Car $64,477 Truck $7,101
Truck $13,200 Car $111,425

2013 UDC: $206,283
Figure 5

Cadillac TSC US-31 Northbound
Average Weekday AM Peak Speed

Cadillac TSC US-31 Northbound
Average Weekday PM Peak Speed
Figure 6

Cadillac TSC US-31 Southbound
Average Weekday AM Peak Speed

Cadillac TSC US-31 Southbound
Average Weekday PM Peak Speed
Figure 7

Cadillac TSC US-31 Corridor - Northbound
2012 Congestion

Cadillac TSC US-31 Corridor - Northbound
2013 Congestion
Figure 8

Cadillac TSC US-31 Corridor - Southbound 2012 Congestion

Cadillac TSC US-31 Corridor - Southbound 2013 Congestion
Figure 9

Cadillac TSC US-131 Corridor
User Delay Cost

- Total UDC
  - 2012: $1,353,625
  - 2013: $1,117,978

2012 User Delay Cost:
- Recurring: 76%
- Non Recurring: 24%
- Total UDC: $1,353,625

2013 User Delay Cost:
- Recurring: 72%
- Non Recurring: 28%
- Total UDC: $1,117,978
Figure 11

Cadillac TSC US-131 Southbound
Average Weekday AM Peak Speed

MM 148 - MM 196

MM 148 - MM 196

Cadillac TSC US-131 Southbound
Average Weekday PM Peak Speed

MM 148 - MM 196
Figure 12

Cadillac TSC US-131 Corridor - Northbound
Summer Friday Peak Speed

- Peak Hour
  - 2012: 12:00
  - 2013: 13:00
  - Ave: 12:00

Cadillac TSC US-131 Corridor - Southbound
Summer Sunday Peak Speed

- Peak Hour
  - 2012: 2:00
  - 2013: 2:00
  - Ave: 2:00
Figure 13

Cadillac TSC US-131 Corridor - Northbound
2012 Congestion

Cadillac TSC US-131 Corridor - Northbound
2013 Congestion
Figure 14

Cadillac TSC US-131 Corridor - Southbound
2012 Congestion

MM 148 - MM 196

Cadillac TSC US-131 Corridor - Southbound
2013 Congestion

MM 148 - MM 196
Gaylord TSC I-75 Northbound
Average Weekday AM Peak Speed

Gaylord TSC I-75 Northbound
Average Weekday PM Peak Speed
Figure 18

Gaylord TSC I-75 Corridor - Northbound
Summer Friday Peak Speed

Peak Hour
2012: 18:00
2013: 13:00
Ave: 19:00

Gaylord TSC I-75 Corridor - Southbound
Summer Sunday Peak Speed

Peak Hour
2012: 09:00
2013: 18:00
Ave: 19:00

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Figure 19

Gaylord TSC I-75 Corridor - Northbound
2012 Congestion

MM 205 - MM 338

Gaylord TSC I-75 Corridor - Northbound
2013 Congestion

MM 205 - MM 339
Figure 21

Gaylord TSC US-127 Corridor
User Delay Cost

Gaylord TSC US-127 Corridor
2012 User Delay Cost
- Recurring
- Non Recurring

18%

18%

82%

2012 UDC: $282,133

Gaylord TSC US-127 Corridor
2013 User Delay Cost
- Recurring
- Non Recurring

21%

79%

2013 UDC: $199,676

Total UDC
2012: $282,133
2013: $199,676
Figure 22

Gaylord TSC US-127 Northbound
Average Weekday AM Peak Speed

Gaylord TSC US-127 Northbound
Average Weekday PM Peak Speed
Figure 23

Gaylord TSC US-127 Southbound
Average Weekday AM Peak Speed

Gaylord TSC US-127 Southbound
Average Weekday PM Peak Speed
Figure 25

Gaylord TSC US-127 Corridor - Northbound
2012 Congestion

Gaylord TSC US-127 Corridor - Northbound
2013 Congestion
Figure 26

Gaylord TSC US-127 Corridor - Southbound
2012 Congestion

Gaylord TSC US-127 Corridor - Southbound
2013 Congestion
Notes
Providing the highest quality integrated transportation services for economic benefit and improved quality of life.