# Section Four
# South Segment
## (US-23/M-14 interchange to north of North Territorial Road interchange)

### SOUTH SEGMENT LIMITS

The limits of the South Segment are from north of North Territorial Road to north of the West US-23BR/M-14 interchange. This section consists of six miles of freeway and includes one local interchange at North Territorial Road and three structures. Traffic analyses of the area of influence were extended to south of the east M-14 interchange.
This segment connects Northfield Township, Ann Arbor Township and the City of Ann Arbor in Washtenaw County.

### PAVEMENT AND BRIDGE CONDITION

Built in the 1960s, the pavement of the south section is concrete with bituminous overlay. Most of the pavement in this section has a remaining service life of 8 to 12 years **(Figure 4-1: Pavement Conditions-Remaining Service Life)**. The Ride Quality Index measures pavement roughness and is shown in **Figure 4-2: (Pavement Conditions-Ride Quality Index)** for the south segment. **Table 4-1** provides vital bridge information for the South Segment structures.

TABLE 4-1

**US-23 BRIDGE STATISTICS - SOUTH SEGMENT**

| Facility Carried | Year Reconstructed (rehabilitated) | Overall structure Rating | Last inspection date* | Under-clearance | Structure number |
|---|---|---|---|---|---|
| North Territorial Overpass | 1957 | Fair | 5/2006 | 14’4”L, 14’6”R | S07 |
| Joy Road Overpass | 1962 | Fair | 5/2006 | 14’4”L, 14’4”R | S06 |
| Warren Road Overpass | 1962 | Fair | 5/2006 | 14’8”L, 14’2”R | S05 |

**As of March 2008*

### TYPICAL RIGHT-OF-WAY

The right-of-way along the South Section roadway is 150 feet wide along the center of the roadway. Individual interchange aerial photos located in the *South Segment Structure*s section illustrate more detailed right-of-way information near the interchanges.

FIGURE 4-1

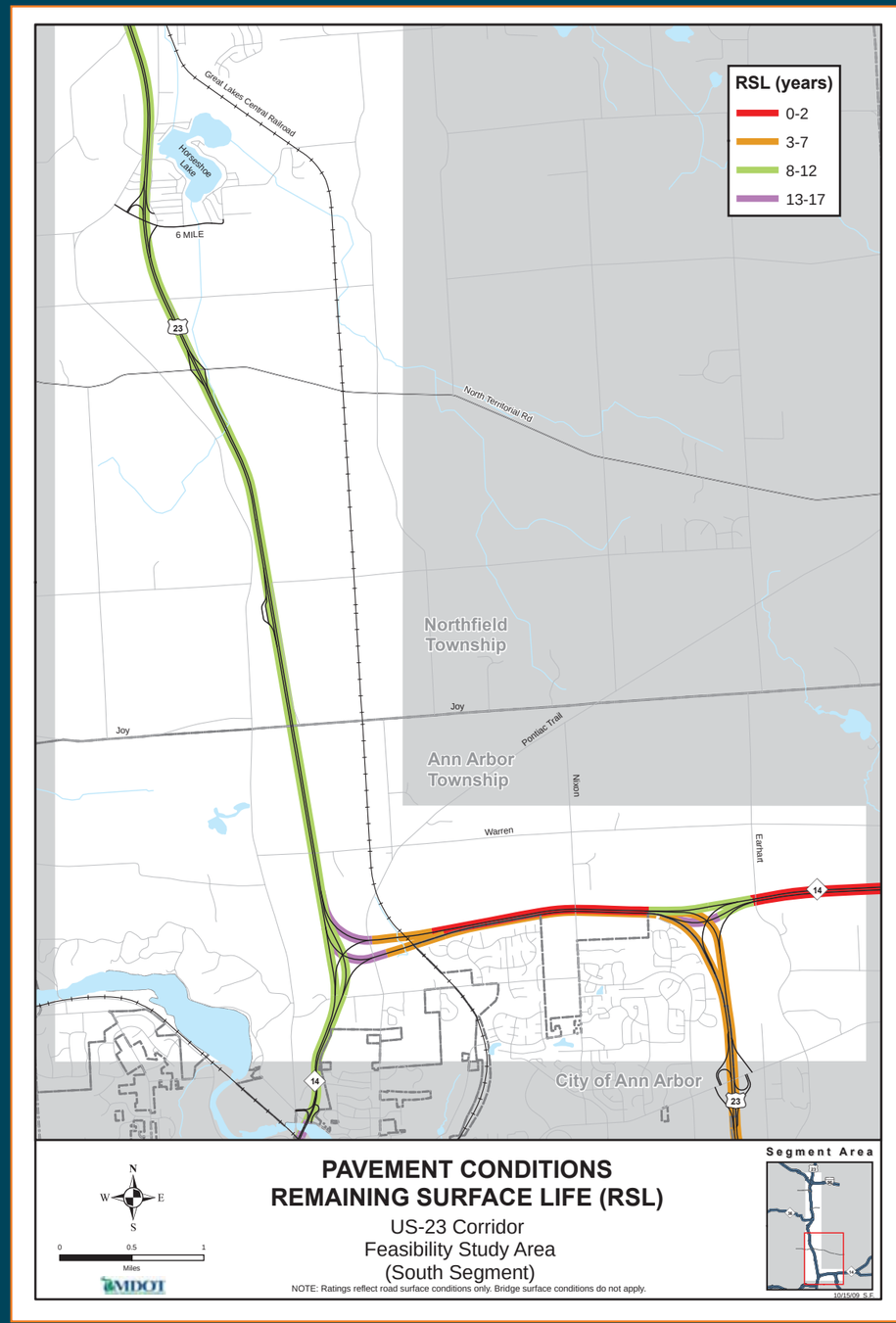
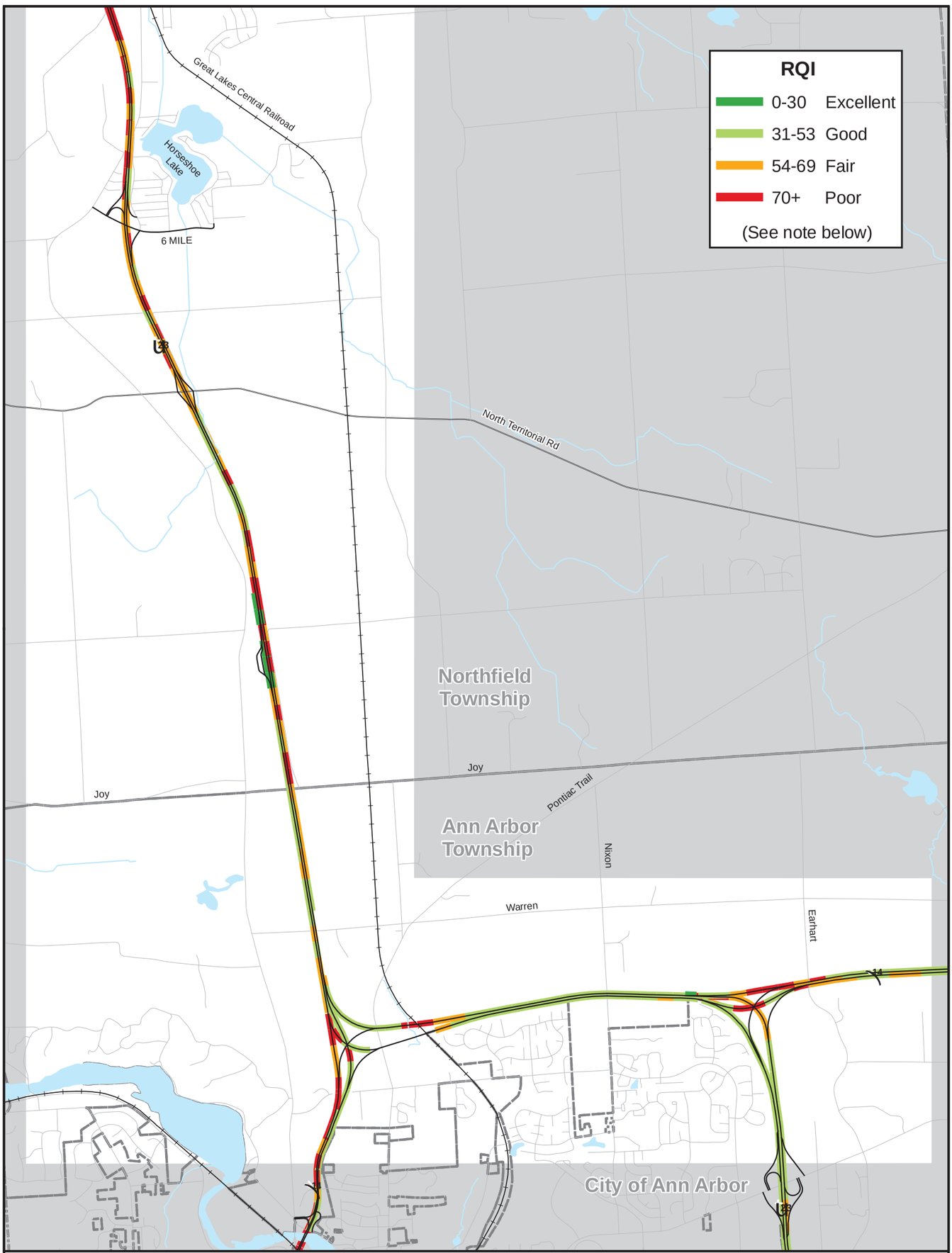


FIGURE 4-2




# PAVEMENT CONDITIONS
# RIDE QUALITY INDEX (RQI)

US-23 Corridor
Feasibility Study Area
(South Segment)

NOTE: Missing RQI data reflects no available data at this time.

10/15/09 S.F.

## TRAFFIC CONDITIONS

### *2007 Freeway Segments Analyses (Existing Conditions)*

The AM Peak Hour period for the US-23 corridor between the North Territorial Road interchange and M-14 occurs on weekdays between 7:30-8:30. **Table 4-2** shows the US-23 AM and PM Peak Hour data on basic freeway segments for the 2007 Base Year under No-Build conditions. The PM Peak Hour period for US-23 corridor between the North Territorial Road interchange and M-14 occurs on weekdays between 5:00-6:00. The southbound traffic between North Territorial and US-23/M-14 and SB US-23 south of M-14 operates at an unacceptable LOS during the AM Peak Hour. The northbound traffic between US-23/M-14 and North Territorial operates at an unacceptable LOS during the PM Peak Hour. **(Figure 4-3: Existing 2007 AM/PM Peak Hour LOS)**.

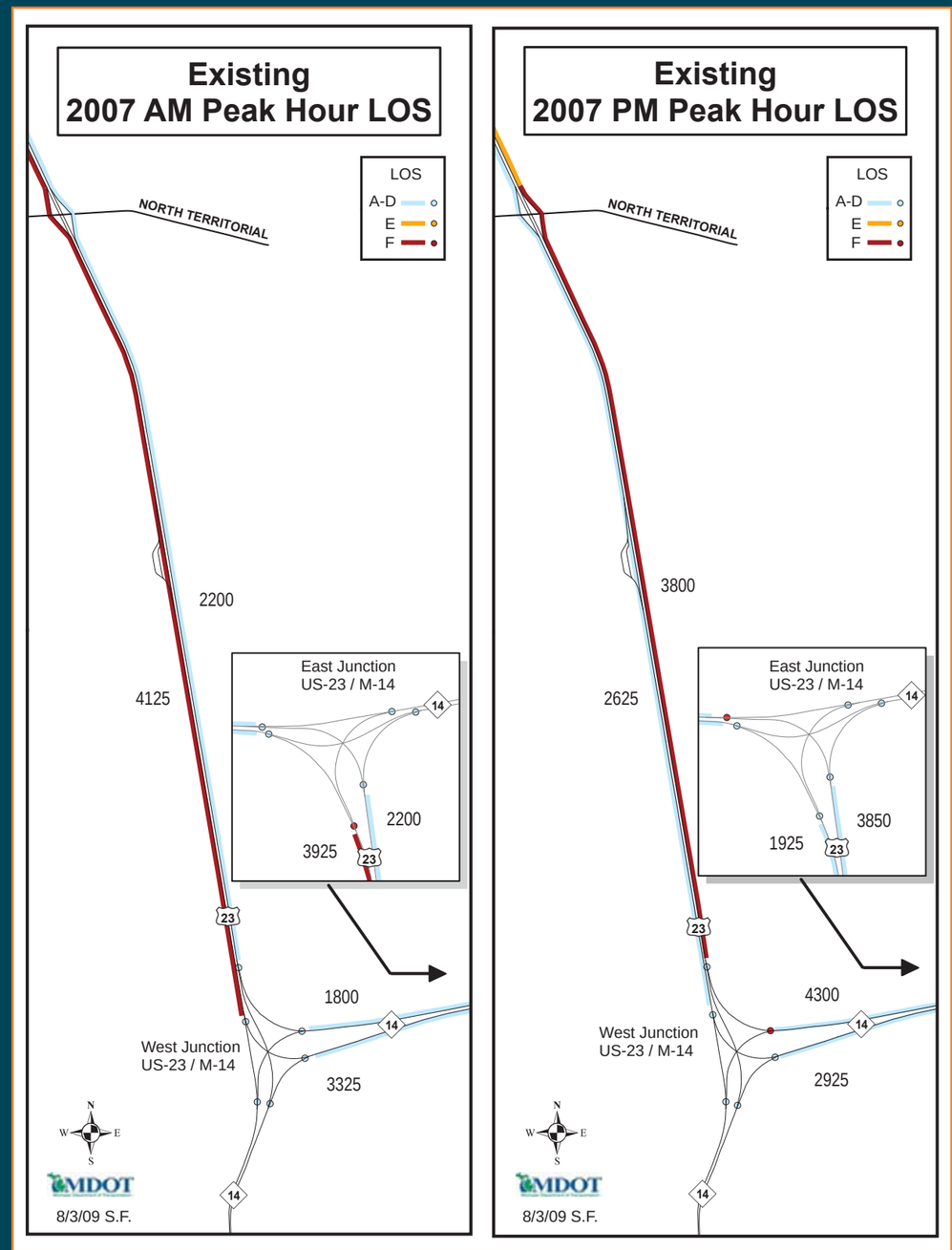
TABLE 4-2

**EXISTING (2007) AM & PM PEAK HOURS LEVEL OF SERVICE BASIC FREEWAY SEGMENTS**

| | 2007 Southbound US-23 AM Peak | | | | 2007 Southbound US-23 PM Peak | | | |
|---|---|---|---|---|---|---|---|---|
| **Freeway Segment To/From** | **Volume, V** | **Flow Rate, Pc/hr** | **Density*, Pc/mi/ln** | **LOS** | **Volume, V** | **Flow Rate, Pc/hr** | **Density*, Pc/mi/ln** | **LOS** |
| North Territorial to M-14/ US-23BR | 4,125 | 2,429 | >45 | F | 2,625 | 1,546 | 22.2 | C |
| US-23BR/M-14 To US-23/M-14* | 3,325 | 1,305 | 18.6 | C | 2,925 | 1,148 | 16.4 | B |
| US-23/M-14 To Plymouth* | 3,925 | 2,311 | 40.8 | E | 1,925 | 1,134 | 16.2 | B |
| | **2007 Northbound US-23 AM Peak** | | | | **2007 Northbound US-23 PM Peak** | | | |
| **Freeway Segment To/From** | **Volume, V** | **Flow Rate, Pc/hr** | **Density*, Pc/mi/ln** | **LOS** | **Volume, V** | **Flow Rate, Pc/hr** | **Density*, Pc/mi/ln** | **LOS** |
| Plymouth To US-23/M-14* | 2,200 | 864 | 12.3 | B | 3,850 | 1,511 | 21.7 | C |
| US-23/M-14 To US-23BR/M-14* | 1,800 | 707 | 10.1 | A | 4,300 | 1,688 | 24.5 | C |
| M-14/US-23BR to North Territorial | 1,950 | 1,148 | 16.4 | B | 3,800 | 2,238 | 37.9 | E |

**Outside of Project Area*

FIGURE 4-3



### *2030 Forecasted Freeway Segments Analyses (No-Build Conditions)*

The SEMCOG Planning Model, coupled with a review of historical growth provided the future year (2030) peak-hour traffic projections for the South Segment. **Table 4-3** shows US-23 AM and PM Peak Hour data on basic freeway segments for 2030 Future Year under No-Build conditions. The southbound traffic between North Territorial and US-23/M-14 and SB US-23 south of M-14 operates at an unacceptable LOS during the 2030 AM Peak Hour. The northbound traffic between US-23/M-14 and North Territorial operates at an unacceptable LOS during the 2030 PM Peak Hour. **(Figure 4-4: Projected No Build 2030 AM/PM Peak Hour LOS)**.

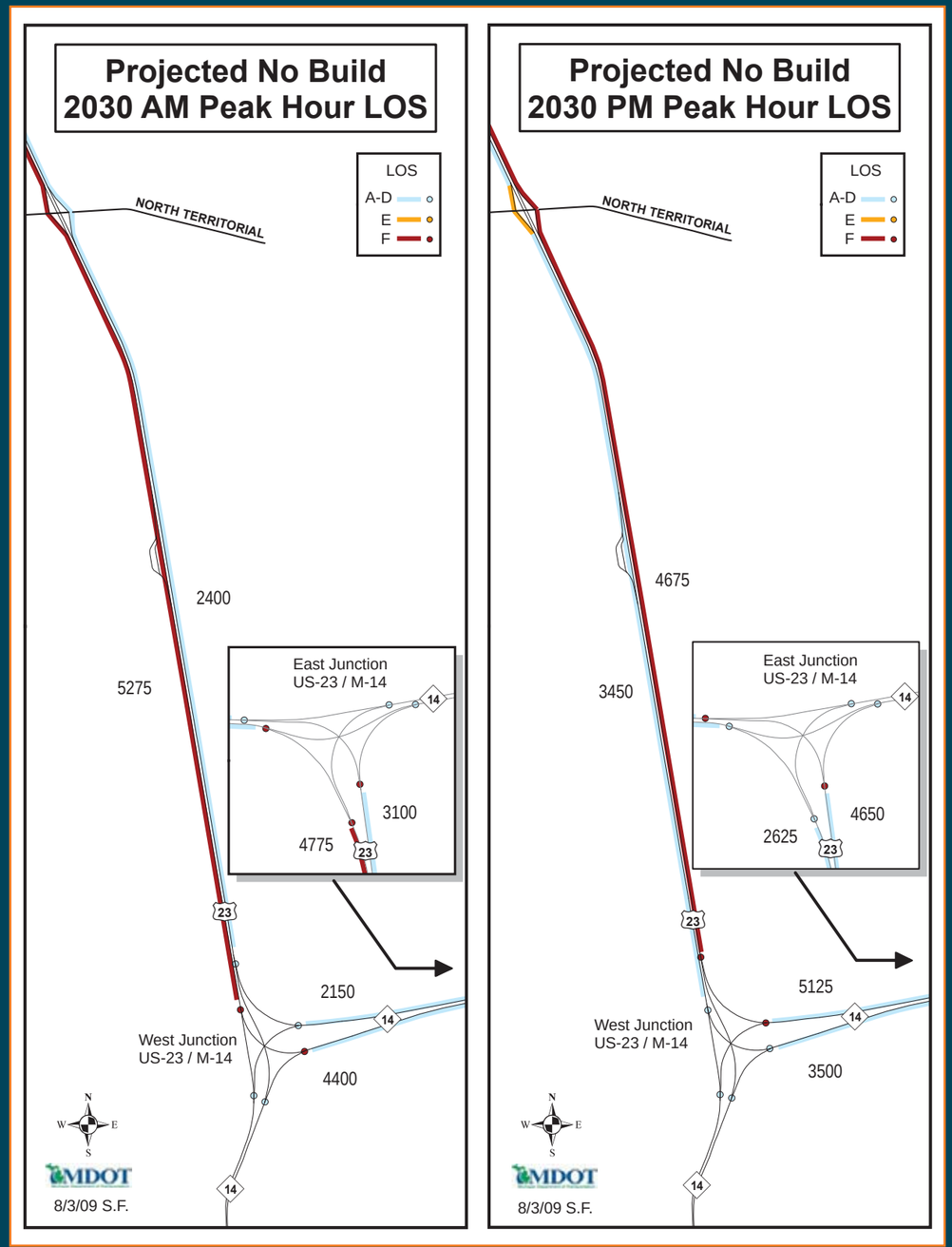
TABLE 4-3

**FUTURE (2030) AM & PM PEAK HOURS LEVEL OF SERVICE BASIC FREEWAY SEGMENTS (NO BUILD SERVICE)**

| | 2030 Southbound US-23 AM Peak | | | | 2030 Southbound US-23 PM Peak | | | |
|---|---|---|---|---|---|---|---|---|
| **Freeway Segment To/From** | **Volume, V** | **Flow Rate, Pc/hr** | **Density*, Pc/mi/ln** | **LOS** | **Volume, V** | **Flow Rate, Pc/hr** | **Density*, Pc/mi/ln** | **LOS** |
| **North Territorial to M-14/US-23BR** | 5,275 | 3,106 | >45 | F | 3,450 | 2,032 | 31.6 | D |
| **US-23BR/M-14 To US-23/M-14*** | 4,400 | 1,727 | 25.2 | C | 3,500 | 1,374 | 19.6 | C |
| **US-23/M-14 To Plymouth*** | 4,775 | 2,812 | >45 | F | 2,625 | 1,546 | 22.2 | C |
| | **2030 Northbound US-23 AM Peak** | | | | **2030 Northbound US-23 PM Peak** | | | |
| **Freeway Segment To/From** | **Volume, V** | **Flow Rate, Pc/hr** | **Density*, Pc/mi/ln** | **LOS** | **Volume, V** | **Flow Rate, Pc/hr** | **Density*, Pc/mi/ln** | **LOS** |
| **Plymouth To US-23/M-14*** | 3,100 | 1,217 | 17.4 | B | 4,650 | 1,826 | 27.0 | D |
| **US-23/M-14 To US-23BR/M-14*** | 2,150 | 844 | 12.1 | B | 5,125 | 2,012 | 31.1 | D |
| **M-14/US-23BR to North Territorial** | 2,400 | 1,413 | 20.2 | C | 4,675 | 2,753 | >45 | F |

**Outside of Project Area*

FIGURE 4-4



### *2007 Ramp/Merge/Weave Analyses (Existing Conditions)*

**Table 4-4** provides merge/weave traffic analyses along the mainline US-23 Corridor in the AM and PM Peak Hour under existing conditions. The analyses shows undesirable LOS for all southbound merge/weave movements near Territorial Road in the AM Peak Hour and all the northbound movements in the PM Peak Hour.

TABLE 4-4

**EXISTING (2007) AM & PM PEAK HOUR LEVEL OF SERVICE MERGE / WEAVE ANALYSIS**

| | Fwy. Volume (vph) | Ramp Volume (vph) | Adj. Ramp Name | Adj. Ramp Volume | Freeway Flow Rate | Ramp Flow Rate | Adj. Ramp Flow | Density | Merge/ Diverge LOS |
|---|---|---|---|---|---|---|---|---|---|
| **2007 Southbound US-23 AM Peak** | | | | | | | | | |
| **N. Territorial Off Ramp** | 4,200 | 425 | N. Territorial On Ramp | 350 | 4,858 | 479 | 395 | 43.9 | F |
| **N. Territorial On Ramp** | 3,775 | 350 | N. Territorial Off Ramp | 425 | 4,446 | 395 | 479 | 41.8 | F |
| **2007 Northbound US-23 AM Peak** | | | | | | | | | |
| **N. Territorial Off Ramp** | 1,950 | 150 | N. Territorial On Ramp | 225 | 2,297 | 169 | 254 | 21.1 | C |
| **N. Territorial On Ramp** | 1,800 | 225 | N. Territorial Off Ramp | 150 | 2,120 | 254 | 169 | 21.9 | C |
| **2007 Southbound US-23 PM Peak** | | | | | | | | | |
| **N. Territorial Off Ramp** | 2,625 | 225 | N. Territorial On Ramp | 225 | 3,092 | 254 | 254 | 28.7 | D |
| **N. Territorial On Ramp** | 2,400 | 225 | N. Territorial Off Ramp | 225 | 2,827 | 254 | 254 | 28.1 | D |
| **2007 Northbound US-23 PM Peak** | | | | | | | | | |
| **N. Territorial Off Ramp** | 3,800 | 300 | N. Territorial On Ramp | 550 | 4,476 | 338 | 620 | 39.9 | F |
| **N. Territorial On Ramp** | 3,500 | 550 | N. Territorial Off Ramp | 300 | 4,122 | 620 | 338 | 40.2 | F |

**Figure 4-5 (US-23/East and West Junctions of M-14)** depicts the ramp locations of the east and west junction of US-23 and M-14 by letter, as documented in the following merge/weave analyses tables.

**Table 4-5** summarizes ramp junction performance at interchanges along US-23 at the M-14 west and east junctions under existing (2007) conditions. All junctions operated at an acceptable LOS during the AM peak hour, except where southbound US-23 merges with westbound M-14 in the west junction, and westbound M-14 to southbound US-23 in the east junction, operating at LOS F. In the PM peak hour, multiple junctions were found to operate at an unacceptable LOS. These three ramps operate at LOS F: the western junction of the northbound US-23 ramp to westbound M-14 and the eastern junction of northbound US-23 to eastbound M-14 and westbound M-14 to northbound US-23.

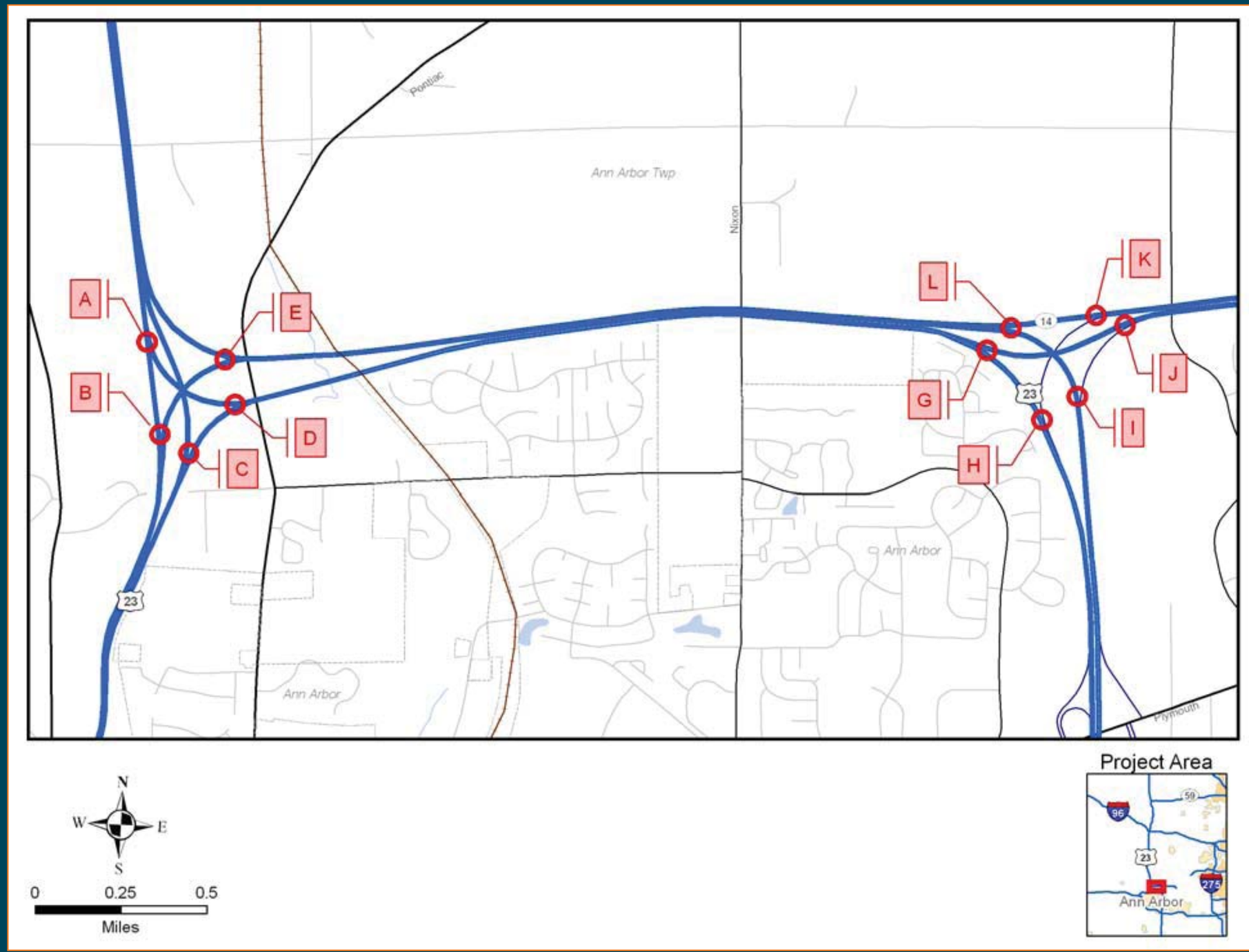
TABLE 4-5

**EXISTING (2007) AM AND PM PEAK HOUR LEVEL OF SERVICE US-23 AND M-14 RAMP FREEWAY JUNCTIONS (WEST AND EAST)**

| West Junction | | | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mainline | Ramp | Fwy. Volume (vph) | Ramp Volume (vph) | Density | Merge/ Diverge LOS | Fwy. Volume (vph) | Ramp Volume (vph) | Density | Merge/ Diverge LOS |
| **A** | SB US-23 | To WB M-14 | 4125 | 2625 | 27.6 | F | 2625 | 1525 | 12.6 | B |
| **B** | WB M-14 | From SB US-23 | 1500 | 700 | 12.6 | B | 1100 | 2300 | 22.6 | C |
| **C** | EB M-14 | To NB US-23 | 1550 | 850 | 3.8 | A | 3200 | 1800 | 20.5 | C |
| **D** | EB M-14 | From SB US-23 | 2625 | 700 | 26.2 | C | 1525 | 1400 | 22.2 | C |
| **E** | NB US-23 | To WB M-14 | 1800 | 700 | 8.7 | A | 4300 | 2300 | 33.7 | F |
| **F** | NB US-23 | From EB M-14 | 1100 | 850 | 16.4 | B | 2000 | 1800 | 32.7 | D |
| **East Junction** | | | **AM Peak Hour** | | | | **PM Peak Hour** | | | |
| | **Mainline** | **Ramp** | **Fwy. Volume (vph)** | **Ramp Volume (vph)** | **Density** | **Merge/ Diverge LOS** | **Fwy. Volume (vph)** | **Ramp Volume (vph)** | **Density** | **Merge/ Diverge LOS** |
| **G** | SB US-23 | To EB M-14 | 3325 | 700 | 13.3 | B | 2925 | 2100 | 9.3 | A |
| **H** | SB US-23 | From WB M-14 | 2625 | 1300 | 35.5 | F | 825 | 1100 | 17.4 | B |
| **I** | NB US-23 | To EB M-14 | 2200 | 1200 | 13.0 | B | 3850 | 950 | 29.7 | F |
| **J** | EB M-14 | From NB US-23 | 700 | 1200 | 19.2 | B | 2100 | 950 | 29.8 | D |
| **K** | WB M-14 | To SB US-23 | 2100 | 1300 | 16.5 | B | 2500 | 1100 | 20.6 | C |
| **L** | NB US-23 | From WB M-14 | 1000 | 800 | 6.5 | A | 2900 | 1400 | 29.2 | F |

**vph – volume per hour*

FIGURE 4-5


Pontiac
Ann Arbor Twp
Nixon
A
B
C
D
E
G
H
I
J
K
L
14
23
Ann Arbor
Ann Arbor
Plymouth
N
W
E
S
0
0.25
0.5
Miles
Project Area
96
59
23
275
Ann Arbor

### *2030 Forecasted Ramp/Merge/Weave Analyses (No-Build Conditions)*

**Table 4-6** provides forecasted 2030 merge/weave traffic analyses along the mainline US-23 Corridor in the AM and PM Peak Hour under No-Build conditions. The analysis shows undesirable LOS and increased density for all ramps going southbound in the morning peak hours. All merge/weave movements show unacceptable LOS in the PM Peak Hour.

TABLE 4-6

**FUTURE (2030) NO BUILD AM AND PM PEAK HOUR LEVEL OF SERVICE RAMP/MERGE/WEAVE ANALYSES (NO-BUILD CONDITIONS)**

| 2030 Southbound US-23 AM Peak No Build | Fwy. Volume (vph) | Ramp Volume (vph) | Adj. Ramp Name | Adj. Ramp Volume | Freeway Flow Rate | Ramp Flow Rate | Adj. Ramp Flow | Density | Merge/ Diverge LOS |
|---|---|---|---|---|---|---|---|---|---|
| **N. Territorial Off Ramp** | 5,450 | 775 | N. Territorial On Ramp | 600 | 6,419 | 875 | 677 | 57.3 | F |
| **N. Territorial On Ramp** | 4,675 | 600 | N. Territorial Off Ramp | 775 | 5,506 | 677 | 875 | 52.1 | F |
| **2030 Northbound US-23 AM Peak No Build** | **Fwy. Volume (vph)** | **Ramp Volume (vph)** | **Adj. Ramp Name** | **Adj. Ramp Volume** | **Freeway Flow Rate** | **Ramp Flow Rate** | **Adj. Ramp Flow** | **Density** | **Merge/ Diverge LOS** |
| **N. Territorial Off Ramp** | 2,400 | 225 | N. Territorial On Ramp | 325 | 2,827 | 254 | 367 | 25.7 | C |
| **N. Territorial On Ramp** | 2,175 | 325 | N. Territorial Off Ramp | 225 | 2,562 | 367 | 254 | 26.1 | C |
| **2030 Southbound US-23 PM Peak No Build** | **Fwy. Volume (vph)** | **Ramp Volume (vph)** | **Adj. Ramp Name** | **Adj. Ramp Volume** | **Freeway Flow Rate** | **Ramp Flow Rate** | **Adj. Ramp Flow** | **Density** | **Merge/ Diverge LOS** |
| N. Territorial Off Ramp | 3,575 | 475 | N. Territorial On Ramp | 375 | 4,211 | 536 | 395 | 38.3 | E |
| N. Territorial On Ramp | 3,100 | 375 | N. Territorial Off Ramp | 475 | 3,651 | 395 | 536 | 35.6 | E |
| **2030 Northbound US-23 PM Peak No Build** | **Fwy. Volume (vph)** | **Ramp Volume (vph)** | **Adj. Ramp Name** | **Adj. Ramp Volume** | **Freeway Flow Rate** | **Ramp Flow Rate** | **Adj. Ramp Flow** | **Density** | **Merge/ Diverge LOS** |
| **N. Territorial Off Ramp** | 4,175 | 875 | N. Territorial On Ramp | 450 | 4,976 | 987 | 508 | 49.5 | F |
| **N. Territorial On Ramp** | 4,625 | 450 | N. Territorial Off Ramp | 875 | 5,506 | 508 | 987 | 48.7 | F |

**Table 4-7** provides forecasted 2030 performance for both the east and west junction of US-23 and M-24 under the No-Build condition (with no geometric or operational improvements). For the west junction, in the AM Peak Hour, the southbound US-23 to Westbound M-14 and Eastbound M-14 movements are expected to operate at LOS F. In the PM Peak Hour, northbound US-23 to westbound M-14, eastbound M-14 to northbound US-23 and southbound US-23 to westbound M-14 are also expected to operate at LOS F.

Three east junction ramps perform at unacceptable levels of service in the AM peak hour by 2030, along with two ramps during the PM peak hour. In the AM peak hour, southbound US-23 to eastbound M-14, southbound US-23 from westbound M-14, and northbound US-23 to eastbound M-14 are anticipated to operate at LOS F. In the PM peak hour, northbound US-23 to eastbound M-14 and northbound US-23 from westbound M-14 perform at LOS F.

TABLE 4-7

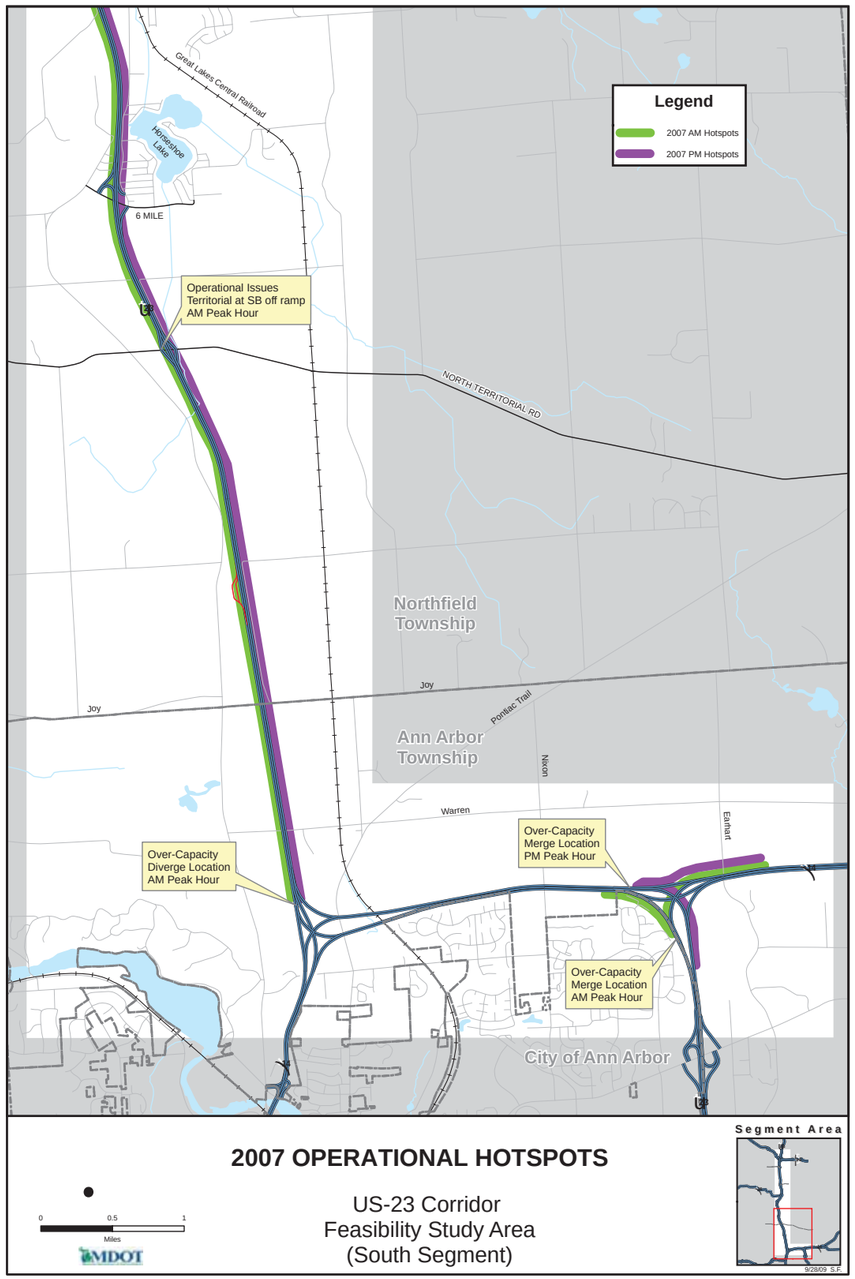
**FUTURE (2030) NO BUILD AM AND PM PEAK HOUR LEVEL OF SERVICE US-23 AND M-14 RAMP FREEWAY JUNCTIONS (WEST AND EAST)**

| West Junction | | | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Mainline | Ramp | Fwy. Volume (vph) | Ramp Volume (vph) | Density | Merge/ Diverge LOS | Fwy. Volume (vph) | Ramp Volume (vph) | Density | Merge/ Diverge LOS |
| **A** | SB US-23 | To WB M-14 | 5275 | 3600 | 39.2 | F | 3450 | 2050 | 20.9 | C |
| **B** | WB M-14 | From SB US-23 | 1675 | 700 | 14.2 | B | 1400 | 2450 | 26.7 | F |
| **C** | EB M-14 | To NB US-23 | 1750 | 950 | 5.8 | A | 3450 | 2000 | 23.0 | C |
| **D** | EB M-14 | From SB US-23 | 3600 | 800 | 36.1 | F | 2050 | 1450 | 27.4 | C |
| **E** | NB US-23 | To WB M-14 | 2150 | 700 | 12.2 | B | 5125 | 2000 | 41.9 | F |
| **F** | NB US-23 | From EB M-14 | 1450 | 950 | 20.4 | C | 2675 | 2000 | 40.5 | F |
| **East Junction** | | | **AM Peak Hour** | | | | **PM Peak Hour** | | | |
| | **Mainline** | **Ramp** | **Fwy. Volume (vph)** | **Ramp Volume (vph)** | **Density** | **Merge/ Diverge LOS** | **Fwy. Volume (vph)** | **Ramp Volume (vph)** | **Density** | **Merge/ Diverge LOS** |
| **G** | SB US-23 | To EB M-14 | 4400 | 925 | 24.1 | F | 3500 | 2300 | 15.1 | B |
| **H** | SB US-23 | From WB M-14 | 3475 | 1300 | 43.2 | F | 1200 | 1425 | 23.6 | C |
| **I** | NB US-23 | To EB M-14 | 3100 | 1850 | 22.2 | F | 4650 | 1100 | 37.9 | F |
| **J** | EB M-14 | From NB US-23 | 925 | 1850 | 26.8 | C | 2300 | 1100 | 32.9 | D |
| **K** | WB M-14 | To SB US-23 | 2200 | 1300 | 17.5 | B | 3000 | 1425 | 25.6 | C |
| **L** | NB US-23 | From WB M-14 | 1250 | 900 | 9.7 | A | 3550 | 1575 | 36.7 | F |

**vph – volume per hour / For locations see Figure 4-5*

**Figure 4-6: 2007 Operational Hotspots and Figure 4-7: 2030 Operational Hotspots** provide a summary of the primary traffic and operational concerns along the South Segment under 2007 Base Year and 2030 Future Year conditions. The 2007 Base Year and 2030 Future Year AM and PM Peak Hour traffic schematics for the Territorial Road and east and west junctions of the US-23/M-14 interchanges along with their existing aerials are located at the end of this section. **(Figures 4-11 through 4-15)** These No-Build schematics include detailed turning movements at the interchange termini.

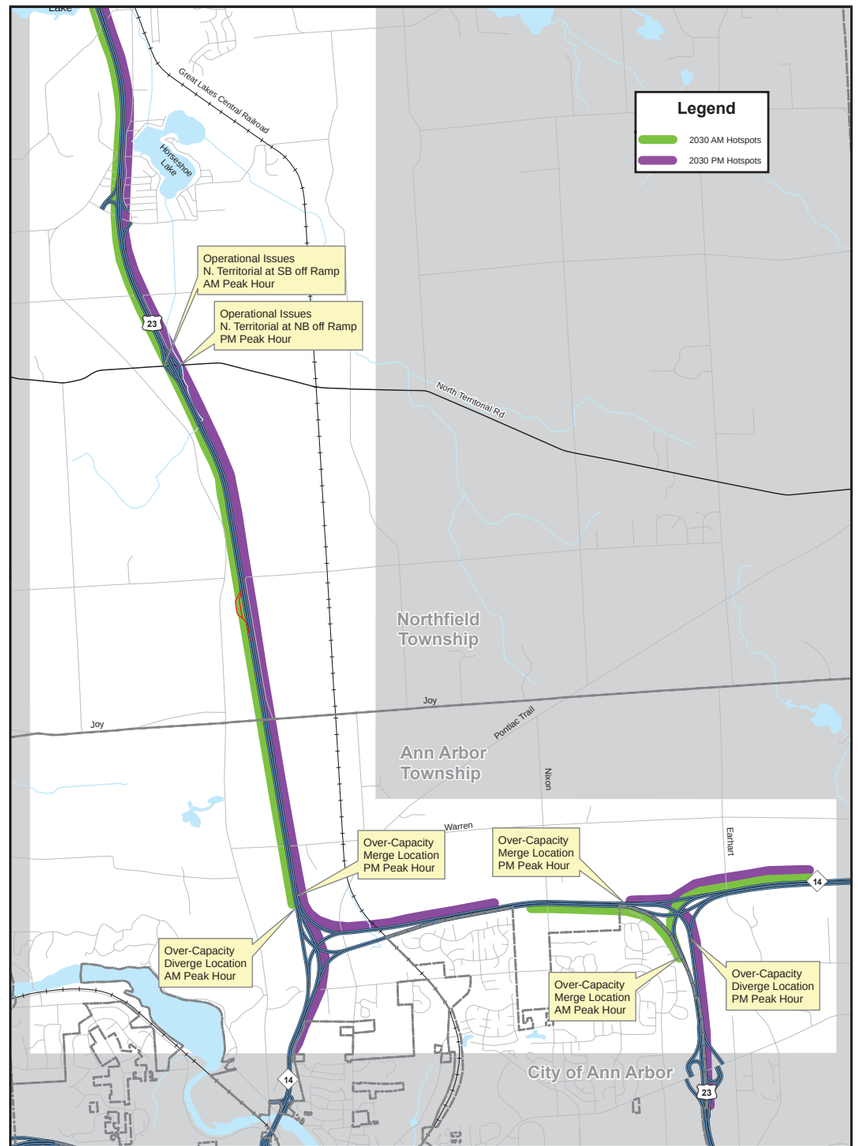
FIGURE 4-6




**2007 OPERATIONAL HOTSPOTS**

US-23 Corridor
Feasibility Study Area
(South Segment)

FIGURE 4-7




**2030 OPERATIONAL HOTSPOTS**

US-23 Corridor
Feasibility Study Area
(South Segment)

### *Safety*

**Table 4-8** provides crash data covering the South Segment between March 2005 and March 2008. Crashes total 238 and are broken down into nine categories as shown in the table. The most common crash type is the Fixed Object totaling 88 crashes, 37 percent of the total. About 85 percent of the crashes took place during the hours of darkness, and in icy or wet conditions. There were a total of two fatalities and 52 injuries during this three-year period.

**Figure 4-8: Crashes South Segment** distinguishes the incapacitating injuries and fatalities from the remaining crashes by location in the south segment. **Figure 4-9: Crash Patterns and Planned Improvements** provides crash patterns and planned improvements along the south segment.

TABLE 4-8

**US-23 CRASH TYPES SOUTH SEGMENT 3/2005-3/2008**

| Crash Type | Count |
|---|---|
| Misc. 1 Vehicle | 18 |
| Overturn | 8 |
| Fixed Object | 88 |
| Other Object | 5 |
| Animal | 24 |
| Angle Straight | 13 |
| Rear-End Straight | 38 |
| Side Swipe Same | 38 |
| Other | 6 |
| **Total** | **238** |

### *Mobility*

Under existing conditions, there is no fixed-route transit service offered along this segment of the US-23 corridor or on nearby arterial roadways. The Ann Arbor Transportation Authority (AATA) and Northfield's Human Services People's Express (PEX) offers demand-responsive para-transit services in the vicinity, although neither plays a significant role in supporting travel along the corridor itself.

MDOT operates and maintains a carpool lot at the US-23/North Territorial Road interchange. The lot is paved, with 40 marked spaces and is heavily used. Although not in service, the Coalition is also pursuing the initiation of commuter transit and rail commuter service paralleling this corridor.

## POTENTIAL ENVIRONMENTAL IMPACTS AND ASSOCIATED CONSTRAINTS

The potential impacts to resources in the south segment of the study area are mainly related to the Huron River. The Huron River has an associated 100-year floodplain; any fill in this regulated area will require a Part 31 permit from the MDEQ. Additionally, any work within the Huron River may be subject to "no work" dates during the breeding season of March 1 through May 31. **Figure 4-10: Constraints Map** illustrates the Constraints Map for the South Segment.

FIGURE 4-8

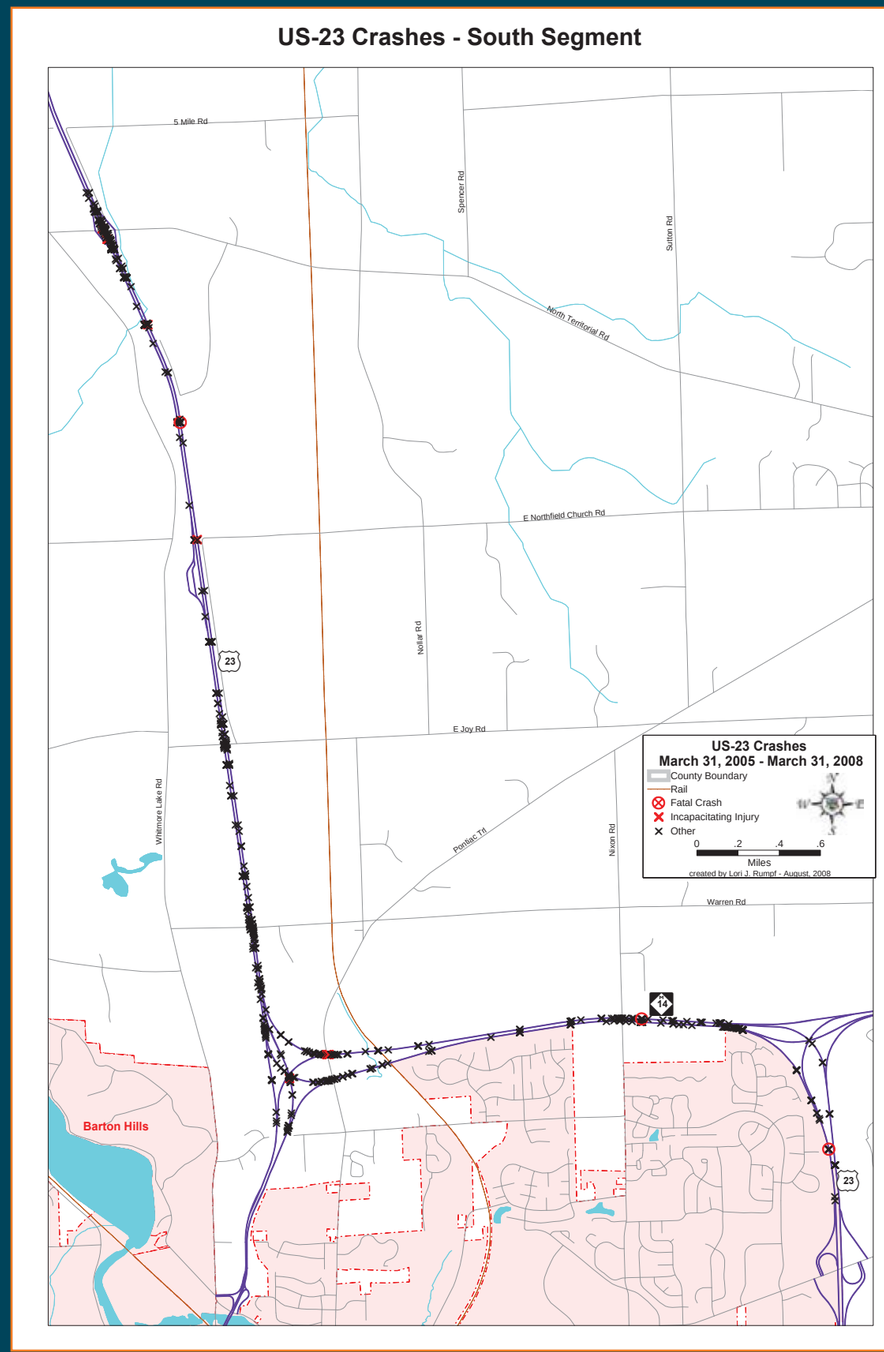
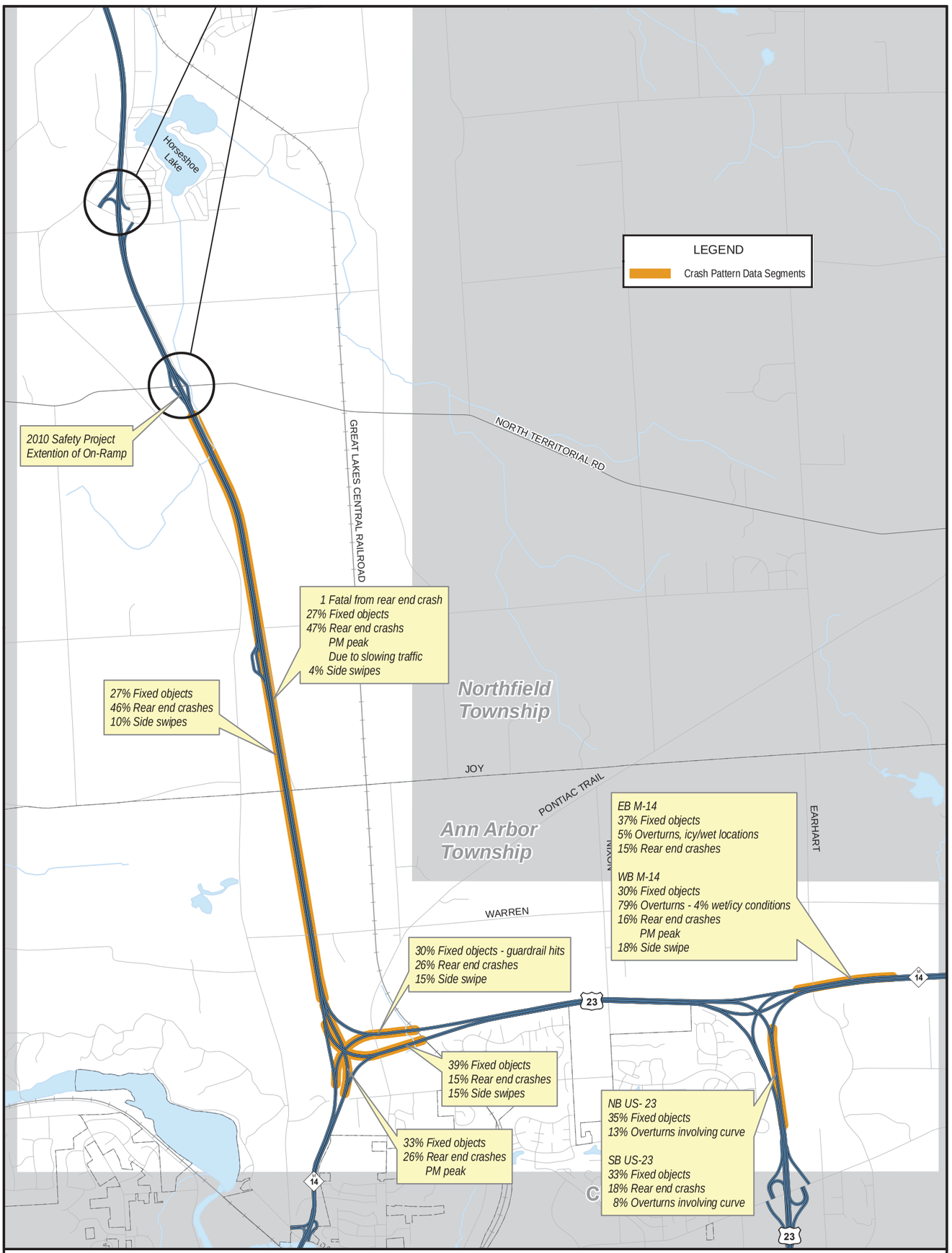


FIGURE 4-9




N
W E
S

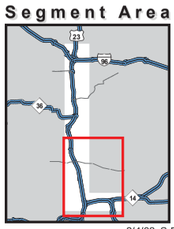
0 0.5 1
Miles

MDOT

# US-23 Corridor Feasibility Study Area (South Segment)

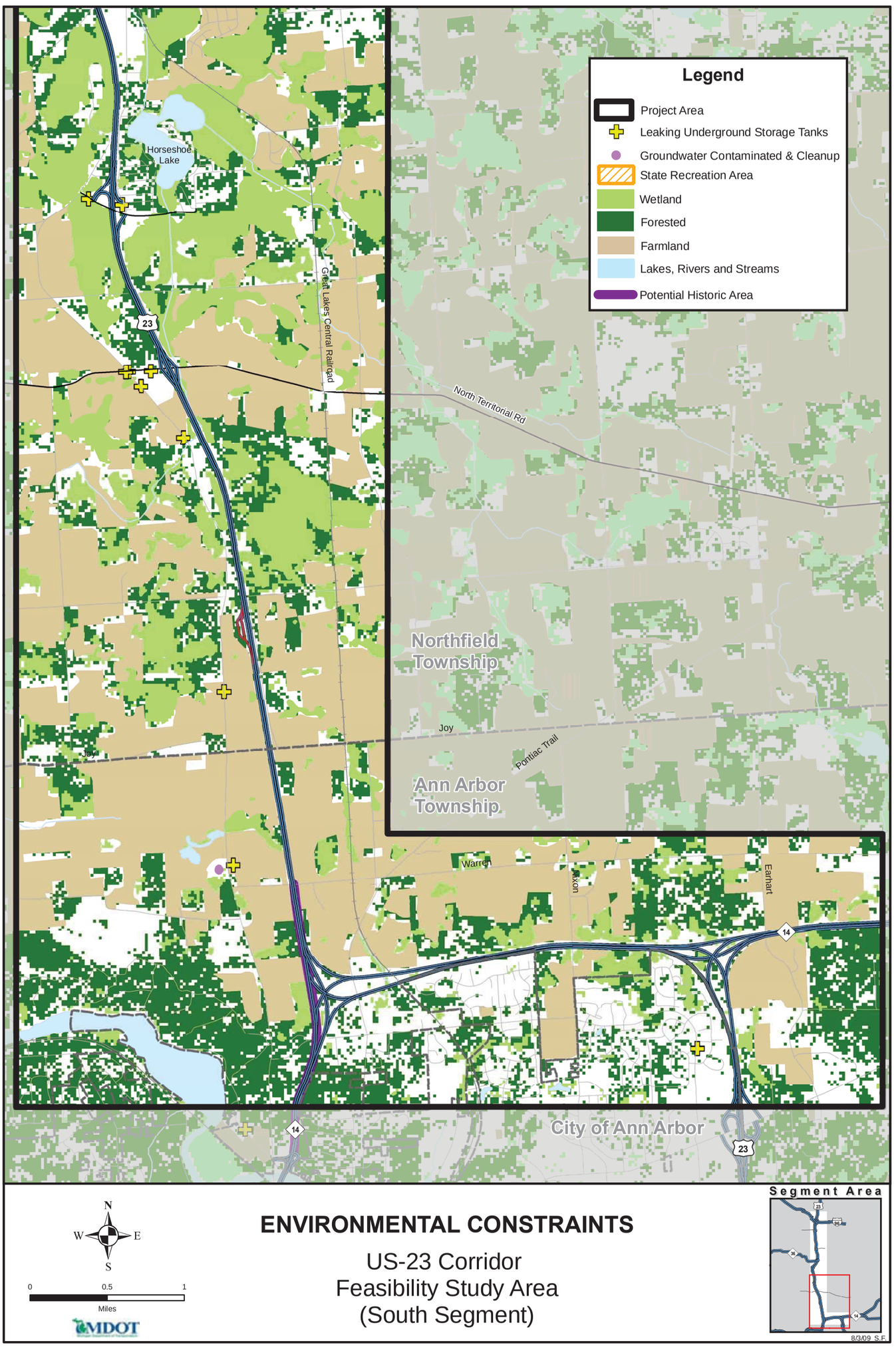
Crash Patterns and Planned Improvements

Segment Area



3/4/08 S.F.

FIGURE 4-10




## ENVIRONMENTAL CONSTRAINTS

US-23 Corridor
Feasibility Study Area
(South Segment)

FIGURE 4-11


Existing 2007 Peak-Hour Volumes
East Junction
Legend
xxx AM Peak-Hr
(xxx) PM Peak-Hr
800 (1400)
1000 (2900)
700 (2100)
2625 (825)
1300 (1100)
950 (1200)
14
23
Future 2030 Peak-Hour Volumes
East Junction
Legend
xxx AM Peak-Hr
(xxx) PM Peak-Hr
900 (1575)
1250 (3550)
725 (2300)
3475 (1200)
1300 (1425)
1850 (1100)
10/12/09 S.F.
MDOT

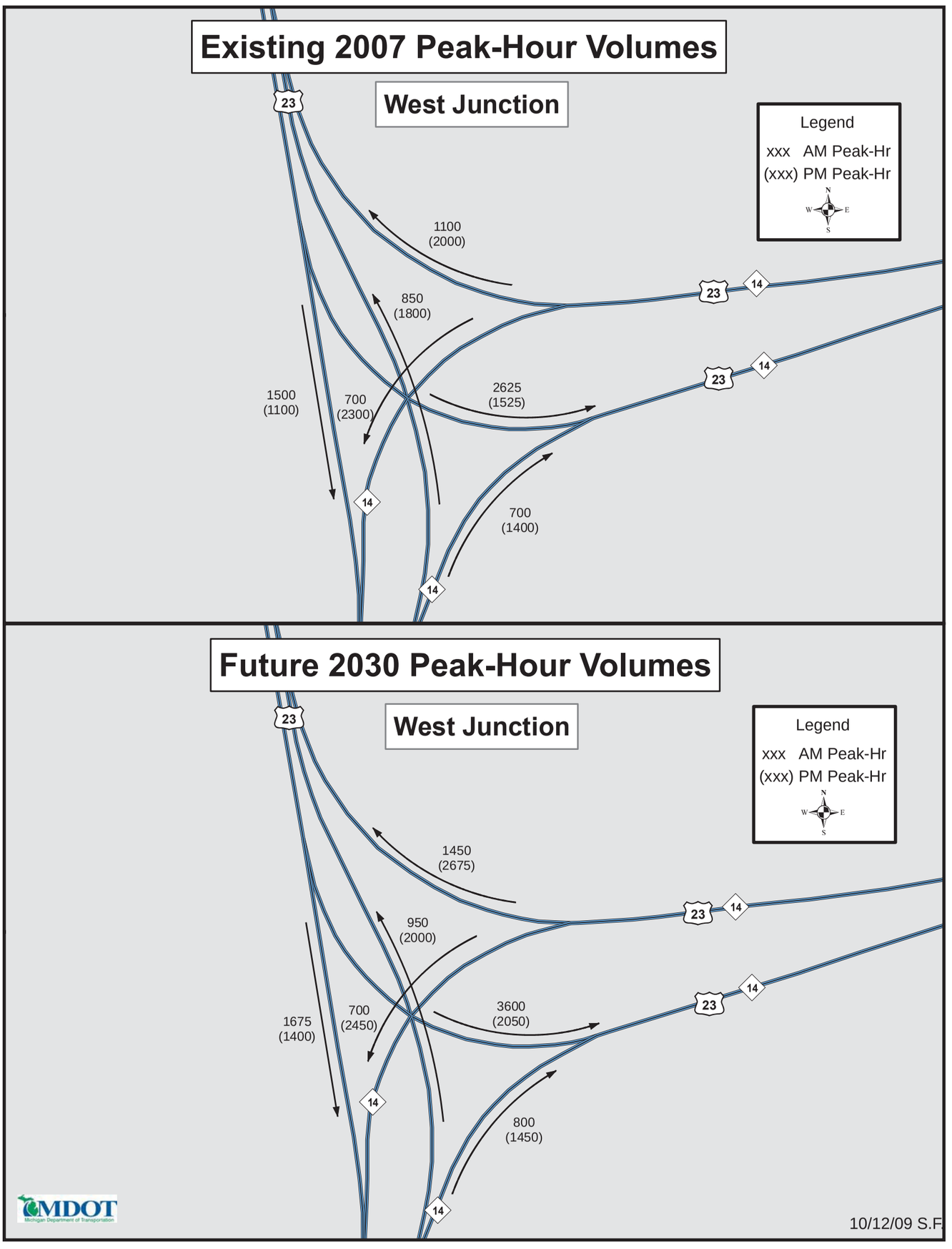

Existing 2007 Peak-Hour Volumes
West Junction
Legend
xxx AM Peak-Hr
(xxx) PM Peak-Hr
N
W
E
S
23
14
1100
(2000)
850
(1800)
1500
(1100)
700
(2300)
2625
(1525)
700
(1400)
Future 2030 Peak-Hour Volumes
West Junction
Legend
xxx AM Peak-Hr
(xxx) PM Peak-Hr
1450
(2675)
950
(2000)
1675
(1400)
700
(2450)
3600
(2050)
800
(1450)
MDOT
Michigan Department of Transportation
10/12/09 S.F.

FIGURE 4-12

FIGURE 4-13

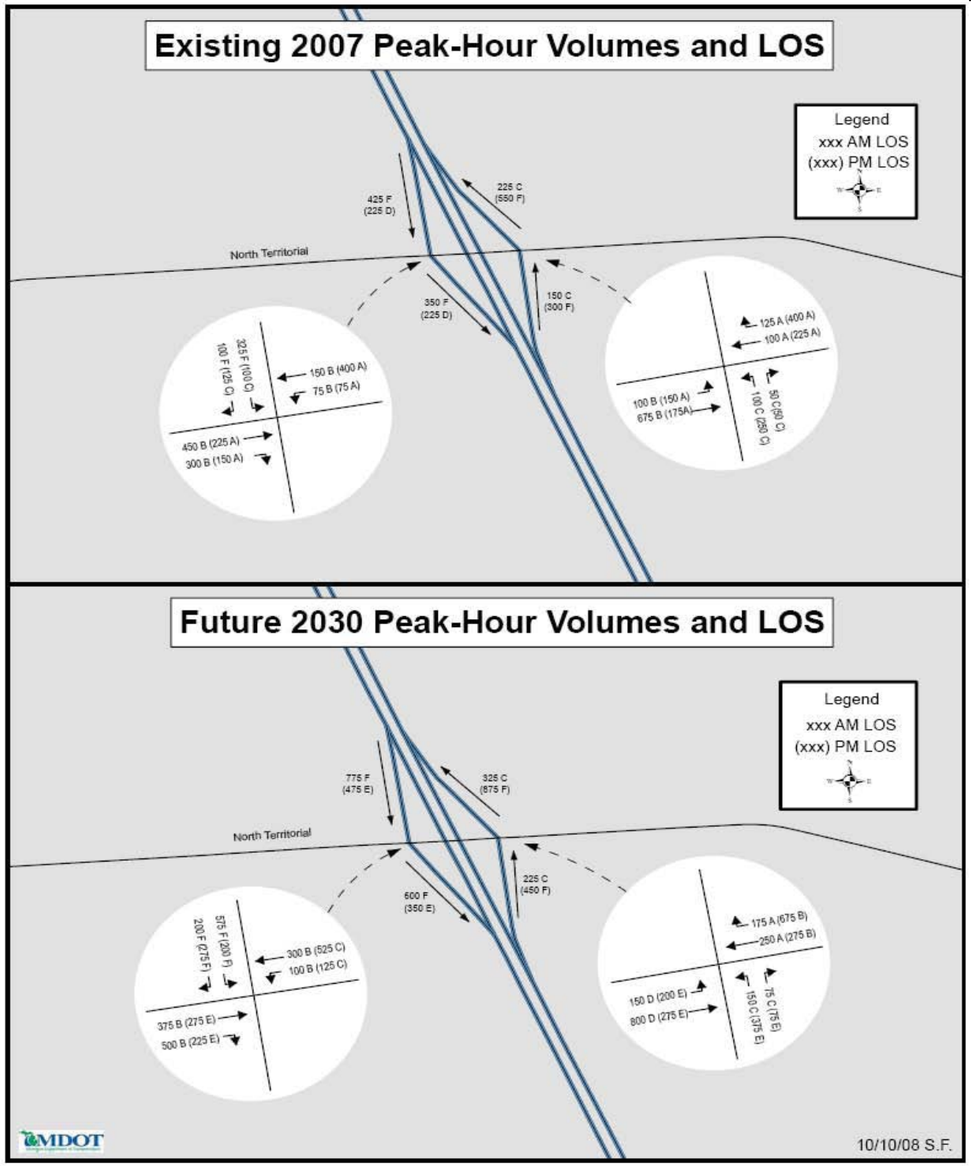

MDOT Michigan Department of Transportation

EXISTING WEST JUNCTION OF US-23/M-14 INTERCHANGE

| DATE | CONT. SEC. | JOB NO. | DESIGN UNIT | SHEET NO. R.O.W | SHEET NO. CONST. |
|---|---|---|---|---|---|
| 08/03/09 | 47013 | 101993 | HULLEY | | |

DATE: 08/03/09
WORKED ON BY: M. Sanchez
DATE:
CHECKED BY:
FILE NAME: 23-14 Interchg W-Ex.dgn

FIGURE 4-14

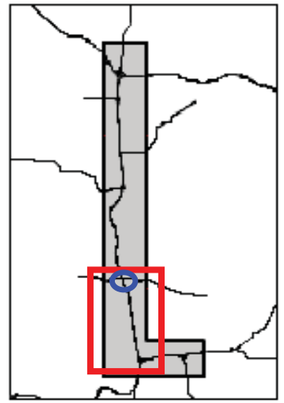



## Issues and Constraints

**1** Short taper/merge length on exit/entrance ramps.

**2** Structure in poor condition.

Project Area



**3** Local Service Road and Carpool lot access connected to entrance ramp

FIGURE 4-15


NORTH TERRITORIAL RD.
EX 60' ROW
EX 65' ROW
SHORT TAPER LENGTH ON EXIT RAMP
US-23(SB)
US-23(NB)
FRONTAGE RD.
EX 125' ROW
EX 130' ROW
EX 70' ROW
STRUCTURE IN FAIR CONDITION WITH 14'-4"L & 14'-6"R UNDER-CLEARANCE FOR US-23 TRAFFIC
SHORT MERGE LENGTH ON ENTRANCE RAMP
LOCAL SERVICE ROAD AND CAR POOL LOT ACCESS CONNECTED TO ENTRANCE RAMP
EX. CAR POOL LOT
SHORT MERGE LENGTH ON ENTRANCE RAMP
SHORT TAPER LENGTH ON EXIT RAMP
EX 50' ROW
EX 60' ROW
US-23(SB)
US-23(NB)
EX 125' ROW
EX 125' ROW
NORTH TERRITORIAL RD.
LEGEND
EX. PARCEL LINES
EX. RIGHT OF WAY
EX. LIMITED ACCESS RIGHT OF WAY
EX. BRIDGE STRUCTURE
NORTH
100'
0
200'
SCALE: 1" = 200'
MDOT Michigan Department of Transportation
EXISTING US-23/N. TERRITORIAL RD. INTERCHANGE
DATE 09/19/08
CONT. SEC. 47013
JOB NO. 101993
DESIGN UNIT HULLEY
SHEET NO. R.O.W
CONST.
DATE: 09/19/08
WORKED ON BY: M. Sanchez
CHECKED BY:
FILE NAME: N. Territorial-Ex.dgn