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## MEMORANDUM

TO: Ryan Barney

FROM: Graham Johnson, PE

DATE: July 6, 2015

RE: Highway 23 North Gap - Daily Traffic Forecasts  
SEH No. MNT08 132980

Highway 23 (TH 23) extends across the state of Minnesota from Interstate 90, in the southwest corner of the state, to Interstate 35 in the City of Duluth. TH 23 is an interregional corridor that connects regional trade centers including the cities of Marshall, Willmar, St Cloud, and Duluth-Superior. The segment of TH 23 between Willmar and Interstate 94 (I-94) is approximately 53 miles. Of this total distance, approximately 38 miles of TH 23 is currently a 4-lane roadway, this leaves approximately 15 miles of TH 23 as a 2-lane roadway. There are two different 2-lane sections along TH 23 which are between the cities of New London and Paynesville and between the cities of Paynesville and Richmond.

MnDOT District 8 has already completed a study of the 2-lane section of TH 23 between the cities of New London and Paynesville. This project will address the 2-lane section of TH 23 between the cities of Paynesville and New Richmond; an approximate 8.9 mile section of TH 23.

As part of the project, traffic forecasts were developed based on historical annual average daily traffic (AADT) data. Based on an estimated timeline for the proposed upgrading of TH 23, AADT forecasts were prepared for the years 2020 and 2040.

The AADT forecasts for the TH 23 segments were developed based on a regression analysis of historical data. Historical AADT data for TH 23 was obtained from MnDOT for the 21 year period of 1992 to 2013. There were two AADT volumes that covered the 2-lane section of TH 23; an additional AADT on either side of the 2-lane section was also included for comparison. County Roads with access to TH 23 were also included in the regression analysis.

Table 1 represents the historical AADT demands obtained from MnDOT along TH 23 and Table 2 represents all of the county roads with access to the mainline TH 23. MnDOT collected TH 23 demands on a 2-year schedule while the county road system demands were collected on a 4-year schedule. MnDOT switched from an 'even' year count to an 'odd' year between 2006 and 2009; there is limited 2013 data available and is currently labeled as "DRAFT" demands.

Table 3 represents the regression analysis of the historical AADT demands. The linear growth rate was calculated from the existing AADT traffic demands.

Within the 2-lane project limits, TH 23 has an approximate growth rate of 2.2% to 2.3% per year. The TH 23 project forecast AADT demands are approximately 12,200 and 14,000 vehicles per day, which is well below the capacity of the proposed 4-lane roadway. Growth on the county road system ranges from 0.9% to 3.1% per year. The highest forecast demand on the county roads connecting to TH 23 within the

project limits is approximately 2,700 vehicles per day; therefore all of the connecting roadways are well below the capacity of a typical 2-lane facility.

*Table 1 Historical AADT Demands – Trunk Highways*

| Route       | Description           | 1992  | 1994  | 1996  | 1998   | 2000   | 2002   | 2004   | 2006   | 2009   | 2011   | 2013   |
|-------------|-----------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| Old TH 23** | CR 33 to TH 23 Bypass | 4,200 | 4,150 | 4,950 | 5,400  | 6,100  | 6,100  | 6,000  | 7,100  | 6,900  | 7,300  | 2,550  |
| TH 23**     | Paynesville Bypass    |       |       |       |        |        |        |        |        |        |        | 5,800  |
| TH 23*      | Bypass to CR 12/CR 43 | 4,200 | 4,150 | 4,950 | 5,400  | 6,100  | 6,100  | 6,000  | 7,100  | 6,900  | 7,300  | 7,600  |
| TH 23*      | CR 12/CR 43 to CR 9   | 5,600 | 5,900 | 6,300 | 6,800  | 7,600  | 8,000  | 8,300  | 8,400  | 8,700  | 9,200  | 8,700  |
| TH 23       | CR 9 to CR 71         | 5,500 | 7,300 | 9,100 | 10,000 | 11,300 | 10,900 | 10,800 | 11,300 | 11,000 | 11,400 | 11,100 |
| TH 22       | South of TH 23        | 1,200 | 1,350 | 1,500 | 1,550  | 1,400  | 1,550  | 1,600  | 1,300  | 1,450  | 1,500  | 1,400  |

\*TH23 Project Study Segments.

\*\*This segment of TH 23 recently changed by the new bypass of Paynesville.

*Table 2 Historical AADT Demands – County Highways*

| Route  | Description                                 | 1995  | 1997 | 1999  | 2001 | 2003  | 2005 | 2007  | 2009  | 2011 | 2013  |
|--------|---|-------|------|-------|------|-------|------|-------|-------|------|-------|
| CR 123 | East of TH 23;<br>East of Paynesville       |       |      | 245   |      | 315   |      | 355   | 335   |      |       |
| CR 123 | South of TH 23;<br>253 <sup>rd</sup> Avenue | 230   |      | 280   |      | 320   |      | 375   | 345   |      |       |
| CR 10  | North of TH 23                              | 590   |      | 740   |      | 770   |      | 800   | 720   |      | 810   |
| CR 114 | North of TH 23                              | 370   |      | 440   |      | 410   |      | 450   | 455   |      |       |
| CR 123 | South of TH 23;<br>East of Roscoe           | 315   |      | 400   |      | 310   |      | 400   | 365   |      |       |
| CR 12  | North of TH 23                              | 740   |      | 900   |      | 1,000 |      | 1,050 | 1,100 |      | 1,200 |
| CR 43  | South of TH 23                              | 700   |      | 1,150 |      | 1,400 |      | 1,450 | 1,400 |      | 1,500 |
| CR 9   | North of TH 23                              | 1,600 |      | 2,200 |      | 2,200 |      | 2,300 | 2,450 |      |       |

Table 3 Forecast AADT Demands

| Route       | Description                              | 2020 AADT | 2040 AADT | Growth Rate*** |
|-------------|--|-----------|-----------|----------------|
| Old TH 23** | CR 33 to TH 23 Bypass                    | 3,000     | 4,100     | 2.3%           |
| TH 23**     | Paynesville Bypass                       | 6,700     | 9,200     | 2.2%           |
| TH 23*      | Bypass to CR 12/CR 43                    | 8,800     | 12,200    | 2.2%           |
| TH 23*      | CR 12/CR 43 to CR 9                      | 10,100    | 14,000    | 2.3%           |
| TH 23       | CR 9 to CR 71                            | 13,000    | 18,300    | 2.4%           |
| TH 22       | South of TH 23                           | 1,530     | 1,600     | 0.2%           |
| CR 123      | East of TH 23; East of Paynesville       | 450       | 660       | 3.1%           |
| CR 123      | South of TH 23; 253 <sup>rd</sup> Avenue | 460       | 660       | 2.9%           |
| CR 10       | North of TH 23                           | 880       | 1,070     | 1.2%           |
| CR 114      | North of TH 23                           | 510       | 610       | 1.1%           |
| CR 123      | South of TH 23; East of Roscoe           | 400       | 470       | 0.9%           |
| CR 12       | North of TH 23                           | 1,370     | 1,850     | 2.0%           |
| CR 43       | South of TH 23                           | 1,810     | 2,700     | 3.0%           |
| CR 9        | North of TH 23                           | 3,010     | 4,030     | 2.1%           |

\*TH23 Project Study Segments.

\*\*This segment of TH 23 recently changed by the new bypass of Paynesville.

\*\*\*Linear growth rate from existing 2009/2011/2013 AADT