



MEMORANDUM

DATE: January 30, 2017
TO: Jim Miles, MnDOT District Traffic Engineer
FROM: Bob Green, PE, PTOE
SUBJECT: SP 6982-322 (I35) Twin Ports Interchange Layouts and Modeling
Traffic Forecast Assumptions

This memorandum summarizes the assumptions that will be used when developing forecasts for the Twin Ports Layout and Modeling project. The project scope requires development of forecasts for the following:

- Year 2020 (year of opening)
- Year 2040 (20 years after construction)
- Year 2070 (because of the amount of structures on the project, this will be used as a high-level sensitivity analysis of the preferred alternative)

Traffic data was collected in August 2016. Freeway traffic volumes were collected by setting up five portable trailers with Wavetronix detectors. The Wavetronix units provide a breakdown by speed, class, and lane utilization. In addition, video for turning movement counts was collected during the same time period for the ramps at I-35/27th Avenue and the US-53/21st Avenue ramps. This data will be factored as appropriate for seasonal variation and growth in traffic to develop the design hour volumes for the scenarios listed above.

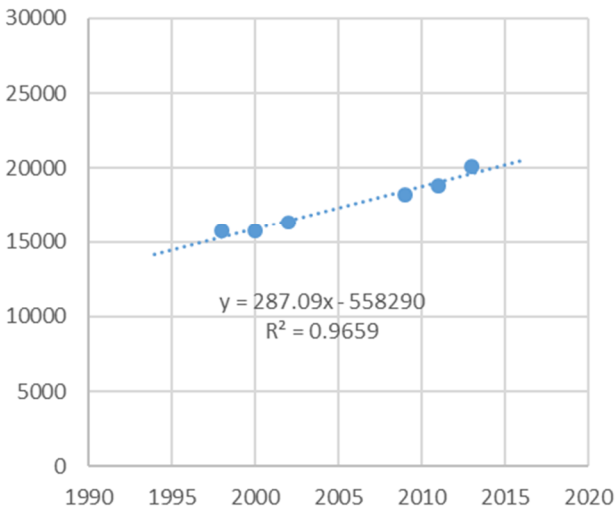
A review of the Average Annual Daily Traffic (AADT) volumes was conducted to determine historic growth rate trends. Data was available back to 1994. Four locations were reviewed:

- US-53 west of I-35
- I-35 south of interchange near Central Avenue
- I-535 east of I-35
- I-35 north of interchange near Garfield overpass

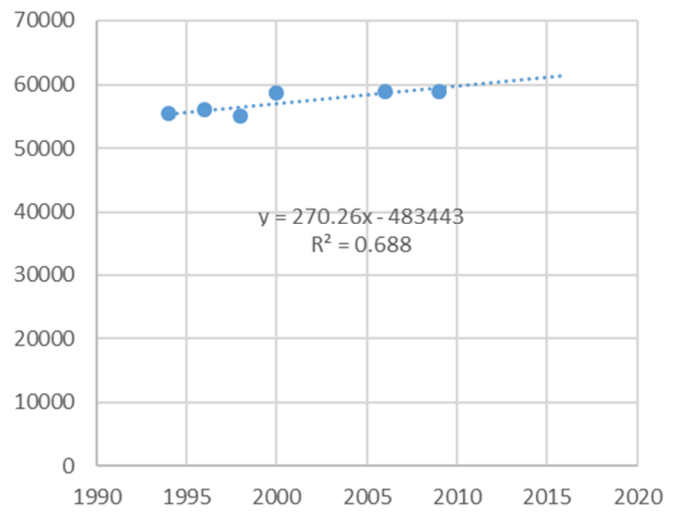
Table 1 on the next page documents the linear growth rate trends for each of the four sections.

Table 1
Historical Growth Rates

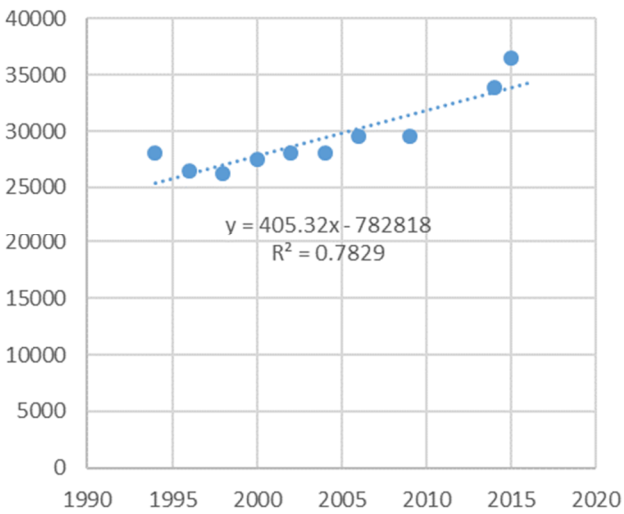
US-53 AADT



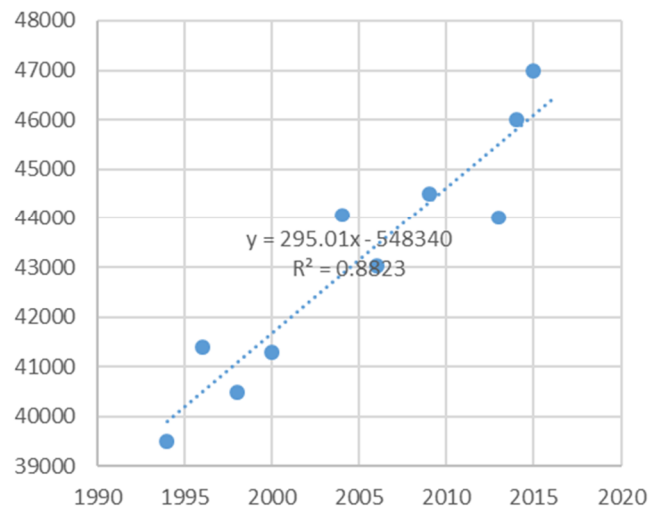
I-35 North of Interchange AADT



I-535 AADT



I-35 South of Interchange AADT



Forecast traffic volumes based on the historical growth trends are shown in Table 2. For Year 2070, a growth factor of 0.25% per year was used between 2040 and 2070, so that the forecast is not overly conservative.

**Table 2
 Forecast Traffic Volumes**

Segments	Estimated AADT (1)	Forecast Year AADT (2, 4, 5)			Annual Growth Rate (3)
	2016	2020	2040	2070	Based on Linear Model
US 53	20,481	21,500	27,400	29,500	1.22%
I-35 South of Interchange	46,402	47,500	53,500	57,700	0.59%
I-35 North of Interchange	61,406	62,400	67,900	73,200	0.42%
I-535	34,315	35,800	44,000	47,400	1.04%
SUM/AVG	162,604	167,200	192,800	207,800	0.71%

1. 2016 AADT forecast from linear model
2. 2040 AADT forecast by linear model
3. Annual growth rate developed based on 2040 and 2016 AADT from model
4. 2020 AADT developed based on 2040 AADT and annual growth rate based on linear model
5. 2070 AADT developed based on 2040 AADT and 0.25% annual growth rate

Seasonal Variation in Traffic Counts

Seasonal adjustment factors are used to adjust short duration counts to a “normalized” Average Annual Traffic volume. The data collection for Twin Ports occurred in August. Based on the Automatic Traffic Recorder and Weigh-in-Motion data listed below in Table 3, the seasonal adjustment factor would be 0.85.

**Table 3
 Seasonal Variation Adjustment Factors**

Counter	Year	Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ATR 103	2015	2mi south on I-35	1.07	1.02	1.00	0.97	0.94	0.88	0.86	0.85	0.88	0.89	0.98	1.02
ATR 110	2015	4 mi west on US-53	1.07	1.04	1.01	0.97	0.93	0.87	0.86	0.85	0.94	0.96	1.01	0.96
WIM 38	2013	1 mi east on I-535	1.02	0.94	0.93	0.96	0.89	0.87	0.86	0.85	0.87	0.87	0.95	0.98
Average			1.05	1.00	0.98	0.97	0.92	0.87	0.86	0.85	0.90	0.91	0.98	0.99

Conclusions

- The seasonal variation factor of 0.85 will be applied to “normalize” the peak hour volumes.
- The growth factors for each road segment will be applied as documented in Table 2.