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Memorandum

SRF No. 0158961

To: Bob Derus
City of Dayton
John Seifert
City of Rogers
Bob Byers
Hennepin County

From: Joshua Maus
SRF Consulting Group Inc.

Date: December 23, 2015

Subject: Brockton Lane Area Transportation Study

Introduction

As requested, SRF has completed a traffic study for the Brockton Lane area in Northwest Hennepin County (see Figure 1: Study Area). This study serves as an amendment to the previously conducted *Northwest Hennepin County I-94 Sub-Area Transportation Study* that was completed in 2008. The main objectives of this study are to review existing operations documented in previous studies, determine future capacity improvements for study roadways and identify when those improvements are needed.

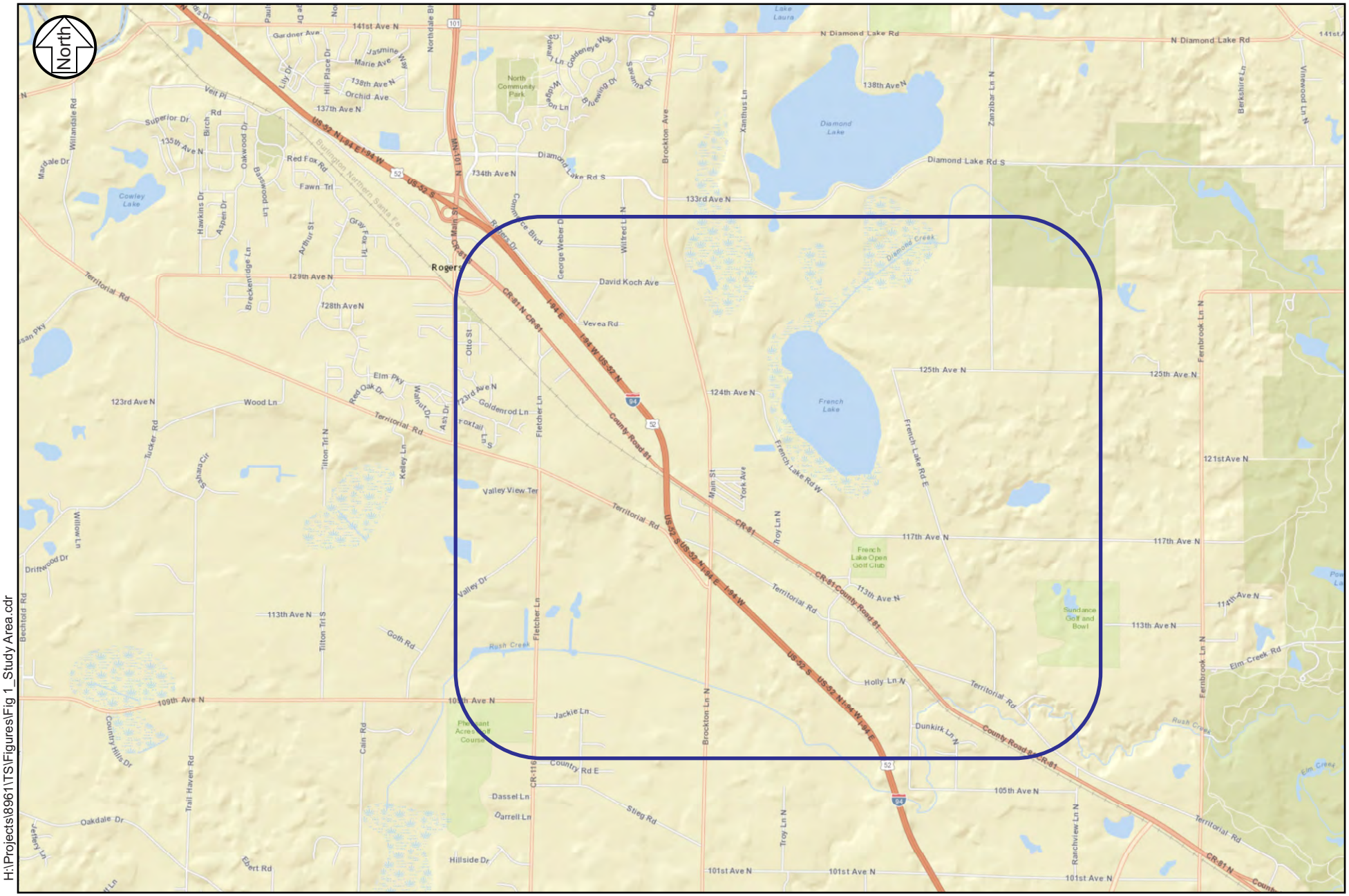
This study includes a planning-level evaluation of the following roadways:

- Brockton Lane from South Diamond Lake Road to Territorial Road
- CSAH 81 from Fletcher Lane to Holly Lane (future Ridgeview Crossing)
- Rogers Drive west of Brockton Lane
- Future Rogers Drive extension East of Brockton Lane
- Future Brockton Interchange and Ridgeview Crossing from CSAH 116 to Zanzibar Lane

Existing Conditions Review

As part of this study, a review of existing conditions was conducted using information provided in the *Kinghorn Development Traffic Impact Study* completed by WSB and Associates dated October 2013. Existing traffic volumes in the Kinghorn study were compared to year 2011 traffic counts collected by SRF Consulting Group for the Brockton Lane Interchange Study. The 2013 volumes were five and 23 percent larger during the a.m. and p.m. peak hours, respectively. Given the amount of development in the area and the increase in congestion on parallel routes, these increases seem reasonable.

The intersection of Brockton Lane and CSAH 81 was analyzed Synchro/SimTraffic using year 2013 volumes provided in the Kinghorn study. The results of the analysis indicated that the intersection currently operates at level of service (LOS) E during both the a.m. and p.m. peak hour. Additional turn lane capacity is needed to mitigate operational issues. These results and recommendations are consistent with those identified in the Kinghorn study (LOS F during both peaks).



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Study Area

Brockton Lane Area Transportation Study

City of Dayton, City of Rogers and Hennepin County

Figure 1

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Future 2040 Conditions

A planning level analysis of the existing and future roadway network was completed. Travel demand forecasts were developed using Met Councils Regional Travel Demand Modal using year 2040 land use and population projections consistent with Met Council's Thrive MSP 2040 Plan. Roadway network assumptions and improvements were developed based on conversations with City and County staff.

Roadway Network Scenarios

The base roadway network scenario for year 2040 conditions assume:

- Rogers Drive extension from its current terminus near Cabela's to Brockton Lane (currently under construction)
- Fletcher Bypass
- New roadway connecting CSAH 116 and Brockton Lane

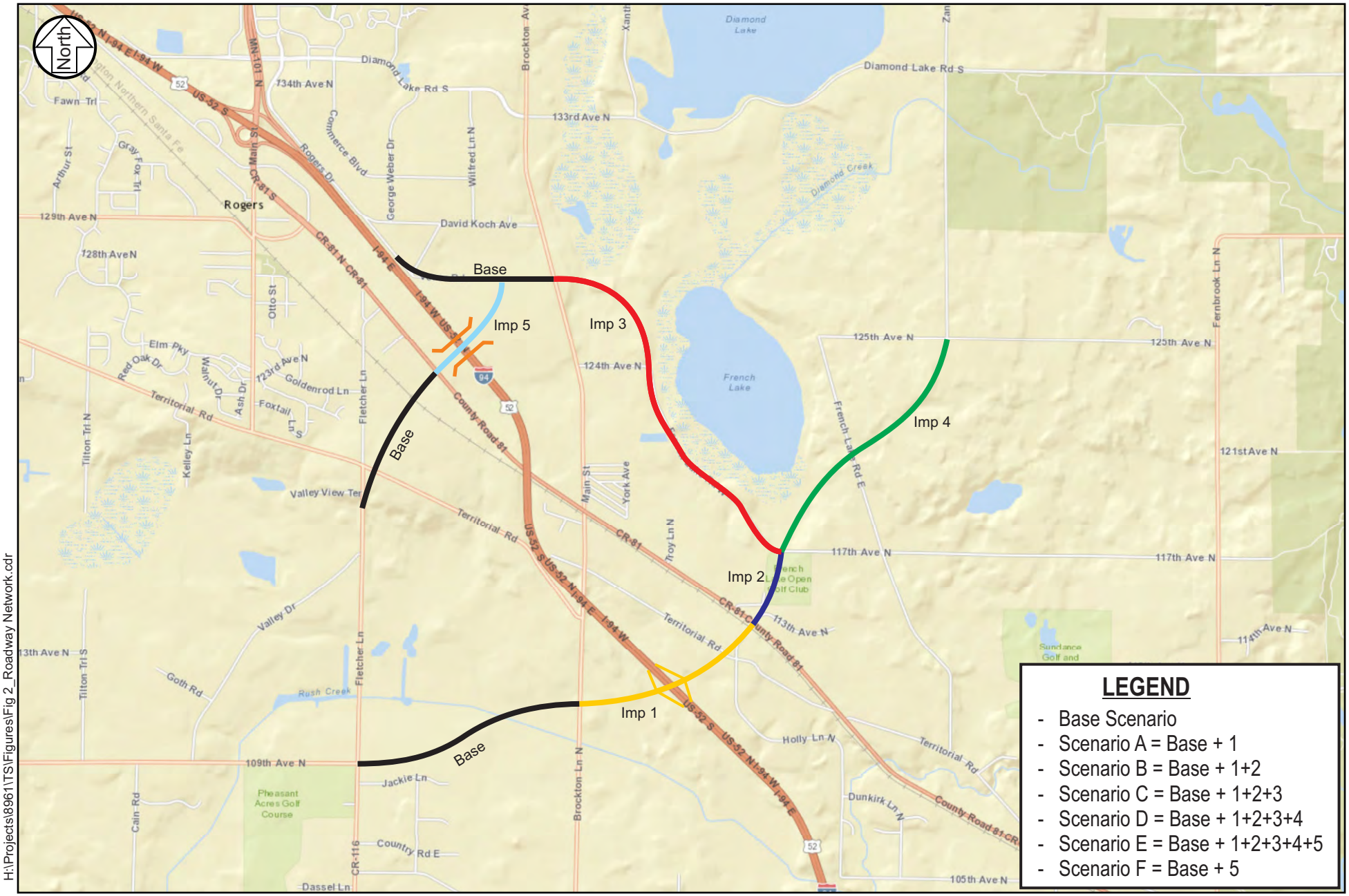
As part of this study, the following roadway network improvements were evaluated to determine what affect they have on the existing and future roadway network. These improvements consist of the following:

- Improvement 1: Brockton Interchange and Ridgeview Crossing from Brockton Lane to CSAH 81
- Improvement 2: Ridgeview Crossing extension to French Lake Road
- Improvement 3: Rogers Drive Extension east of Brockton Lane and reconstruct French Lake Road
- Improvement 4: Ridgeview Crossing extension from French Lake Road to Zanzibar Lane
- Improvement 5: Fletcher Overpass

Six roadway network scenarios were developed using combinations of the five improvements listed above. The roadway network Scenarios are:

- Scenario A: Base network plus Improvement 1
- Scenario B: Base network plus Improvements 1 and 2
- Scenario C: Base network plus Improvements 1, 2 and 3
- Scenario D: Base network plus Improvements 1, 2, 3 and 4
- Scenario E: Base network plus Improvements 1, 2, 3, 4 and 5
- Scenario F: Base network plus Improvement 5
- Scenario G: Base network plus Improvements 2 and 3

The year 2040 roadway network improvements and scenarios are shown in the Figure 2.



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Roadway Network Scenarios

Brockton Lane Area Transportation Study

City of Dayton, City of Rogers and Hennepin County

Figure 2

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Traffic Forecasts

Travel demand forecasts were developed using Met Councils Regional Travel Demand Model that was used for the TH 610 and Brockton Lane Interchange Preliminary Design Projects. This model was updated using year 2040 land use and population projections consistent with Met Council's Thrive MSP 2040 Plan along with land use information from the City of Dayton and Rogers Comprehensive Plans to help allocate future growth between TAZs. Using the model, daily traffic forecasts were developed for the year 2040 Base Condition, and for the six roadway network scenarios listed previously.

Models provide an estimation of traffic forecasts that include many future year assumptions. However, with lack of certainty regarding future-year conditions, the model results should be considered estimates with some margin of error. MnDOT currently considers long-range forecasts to have a precision of +/- 15 percent. Decision-makers and designers should be aware of the uncertainty in long-range forecasts and whether that margin of error would affect outcomes or the recommended improvements.

Planning Level Analysis

A planning level capacity analysis was conducted using the existing and future year 2040 daily traffic forecasts. The following roadway capacities were assumed for the planning level analysis:

- Two-Lane Roadway: 15,000
- Three-Lane Roadway: 17,000
- Four-Lane Roadway: 28,000

This analysis produced roadway segment volume/capacity (V/C) ratios. Segments were considered approaching capacity when the V/C ratio exceeds 0.85, segments were considered over capacity when the V/C ratio exceeds 1.00. Year 2040 daily traffic volumes and V/C ratios for all roadway network scenarios are shown in Table 1.

Additional graphics were prepared to present the information in Table 1 in more easily understood format. This information is shown in Figures 3 through 10 which display daily volume forecasts, over capacity roadway segments, recommended improvements, construction costs and anticipated year of need. It is important to note, that certain recommended improvements will have different anticipated year of need due to the shift in traffic volumes by the roadway network scenarios.

Brockton Lane Users

Using the Regional Travel Demand Model, a select-link analysis was completed for Brockton Lane to understand the trips origins and destinations of motorists that will use Brockton Lane under year 2040 conditions. A majority of future traffic volumes on Brockton Lane between South Diamond Lake Road and CSAH 81, have an origin or destination in the Cities of Rogers or Dayton, with through trips representing less than 10 percent of the total trips. Assuming the Base Condition and excluding the trips that do not have an origin or destination within Rogers or Dayton, approximately two-thirds of the traffic on Brockton Lake has an origin/destination in Rogers, with approximately one-third having an origin/destination in Dayton.

With the addition of the roadway network improvements identified in Scenario E (Brockton Interchange, Ridgeview Crossing from CSAH 116 to Zanzibar Lane, Rogers Drive extension east of Brockton Lane), these values adjust to three-fourths of the traffic has an origin/destination in Rogers, with approximately one-fourth having an origin/destination in Dayton. This shift in traffic is mainly due to the future roadway connection to Zanzibar Lane which provides a more direct route to the future Brockton Interchange for Dayton trips.

Table 1

Roadway Segment Volume/Capacity Analysis

Brockton Lane Area Transportation Study

		Existing Conditions			2040 Conditions															
						Base		Scenario A		Scenario B		Scenario C		Scenario D		Scenario E		Scenario F		Scenario G	
Map ID	Segment	Number of Lanes	Daily Volume	V/C Ratio	Planned Number of Lanes*	Daily Volume	V/C Ratio	Daily Volume	V/C Ratio	Daily Volume	V/C Ratio	Daily Volume	V/C Ratio	Daily Volume	V/C Ratio	Daily Volume	V/C Ratio	Daily Volume	V/C Ratio	Daily Volume	V/C Ratio
1	Brockton Lane: S Diamond Lake Road to Rogers Drive	2	8,700	0.58	2	18,800	1.25	20,000	1.33	19,000	1.27	18,700	1.25	15,600	1.04	15,400	1.03	18,900	1.26	18,800	1.25
2	Brockton Lane: Rogers Drive to CSAH 81	2	10,100	0.67	2	23,100	1.54	23,700	1.58	20,100	1.34	17,900	1.19	16,000	1.07	13,800	0.92	17,500	1.17	21,100	1.41
3	Brockton Lane: CSAH 81 to Territorial Road	2	6,700	0.45	2	19,200	1.28	13,500	0.90	12,600	0.84	12,600	0.84	12,600	0.84	12,000	0.80	18,500	1.23	19,200	1.28
4	CSAH 81: Fletcher Lane to Brockton Lane	2	12,800	0.85	2	15,700	1.05	13,600	0.91	13,600	0.91	13,600	0.91	13,600	0.91	11,600	0.77	12,900	0.86	15,700	1.05
5	CSAH 81: Brockton Lane to Ridgeview Crossing	2	18,800	1.25	2	24,000	1.60	24,400	1.63	22,000	1.47	22,400	1.49	20,400	1.36	20,400	1.36	24,000	1.60	22,000	1.47
6	Rogers Drive: West of Brockton Lane	0	0	0.00	4	7,000	0.25	7,300	0.26	7,100	0.25	7,100	0.25	6,800	0.24	8,700	0.31	10,000	0.36	7,000	0.25
7	Rogers Drive: Brockton Lane to French Lake Road	0	0	0.00	2	0	0.00	0	0.00	0	0.00	4,000	0.27	4,000	0.27	3,500	0.23	0	0.00	2,000	0.13
8	Ridgeview Crossing: CSAH 116 to CSAH 101	0	0	0.00	2	7,000	0.47	15,500	1.03	15,900	1.06	15,900	1.06	16,100	1.07	16,000	1.07	6,700	0.45	7,000	0.47
9	Ridgeview Crossing: CSAH 101 to I-94	0	0	0.00	4	0	0.00	24,000	0.86	25,400	0.91	25,300	0.90	25,700	0.92	25,600	0.91	0	0.00	0	0.00
10	Ridgeview Crossing: I-94 to Territorial Road	0	0	0.00	4	0	0.00	14,400	0.51	17,900	0.64	18,000	0.64	18,900	0.68	18,600	0.66	0	0.00	0	0.00
11	Ridgeview Crossing: Territorial Road to CSAH 81	2	2,000	0.13	4	6,500	0.23	14,500	0.52	18,300	0.65	18,300	0.65	19,400	0.69	19,100	0.68	6,500	0.23	6,500	0.23
12	Ridgeview Crossing: CSAH 81 to French Lake Road	0	0	0.00	2	0	0.00	0	0.00	8,000	0.53	10,000	0.67	16,000	1.07	14,500	0.97	0	0.00	2,000	0.13
13	Ridgeview Crossing: French Lake Road to Zanzibar Lane	0	0	0.00	2	0	0.00	0	0.00	0	0.00	0	0.00	12,000	0.80	11,000	0.73	0	0.00	0	0.00
14	Fletcher Bypass	0	0	0.00	2	6,500	0.43	6,000	0.40	6,000	0.40	6,000	0.40	6,000	0.40	6,500	0.43	8,000	0.53	6,500	0.43
15	Fletcher Overpass	0	0	0.00	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	7,000	0.47	9,000	0.60	0	0.00

* Planned number of lanes is based on future plans or existing conditions. If unknown, segment was assumed to be two lanes.

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Existing Conditions (2014)

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City of Dayton, City of Rogers and Hennepin County

Figure 3

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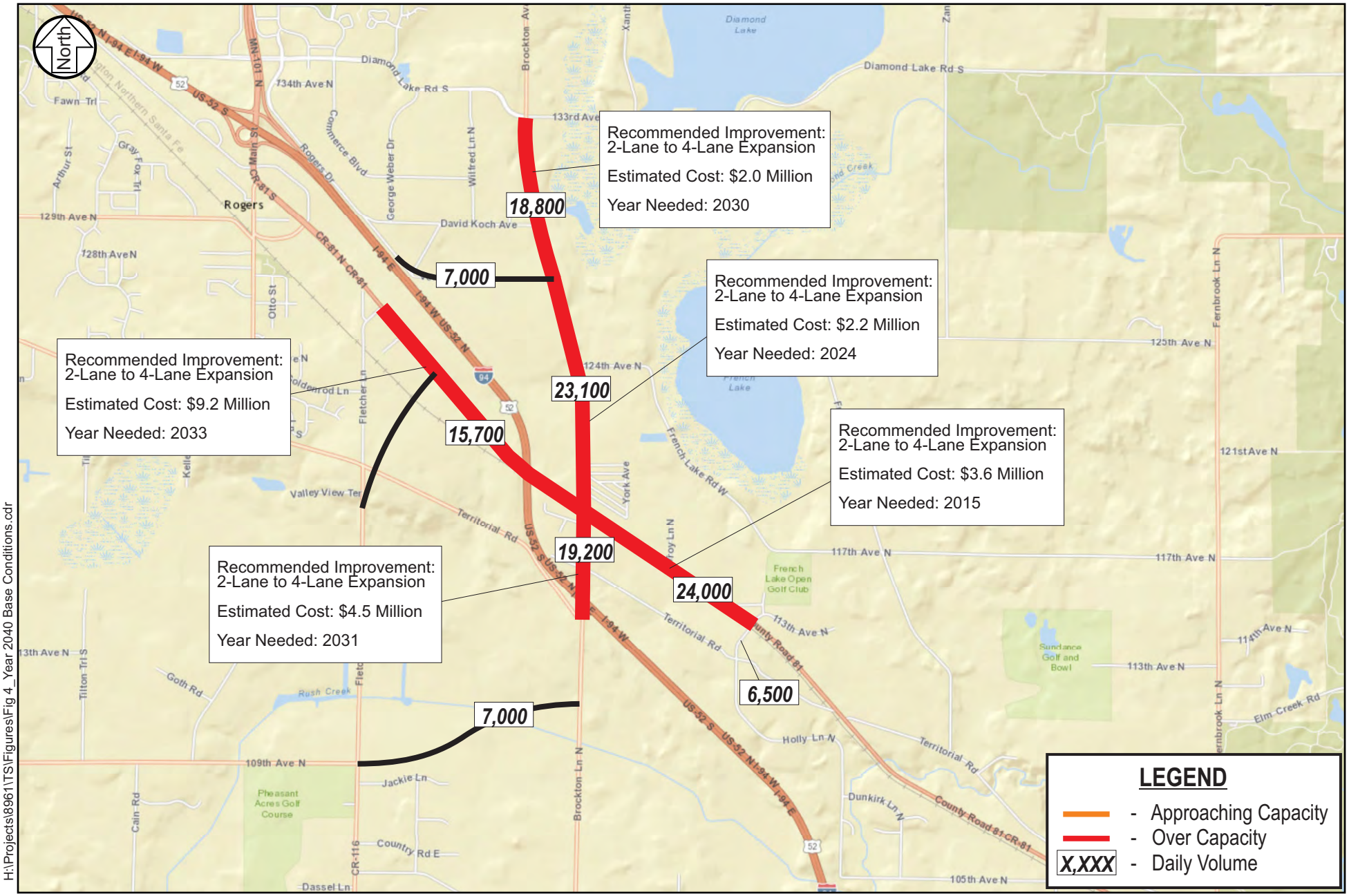

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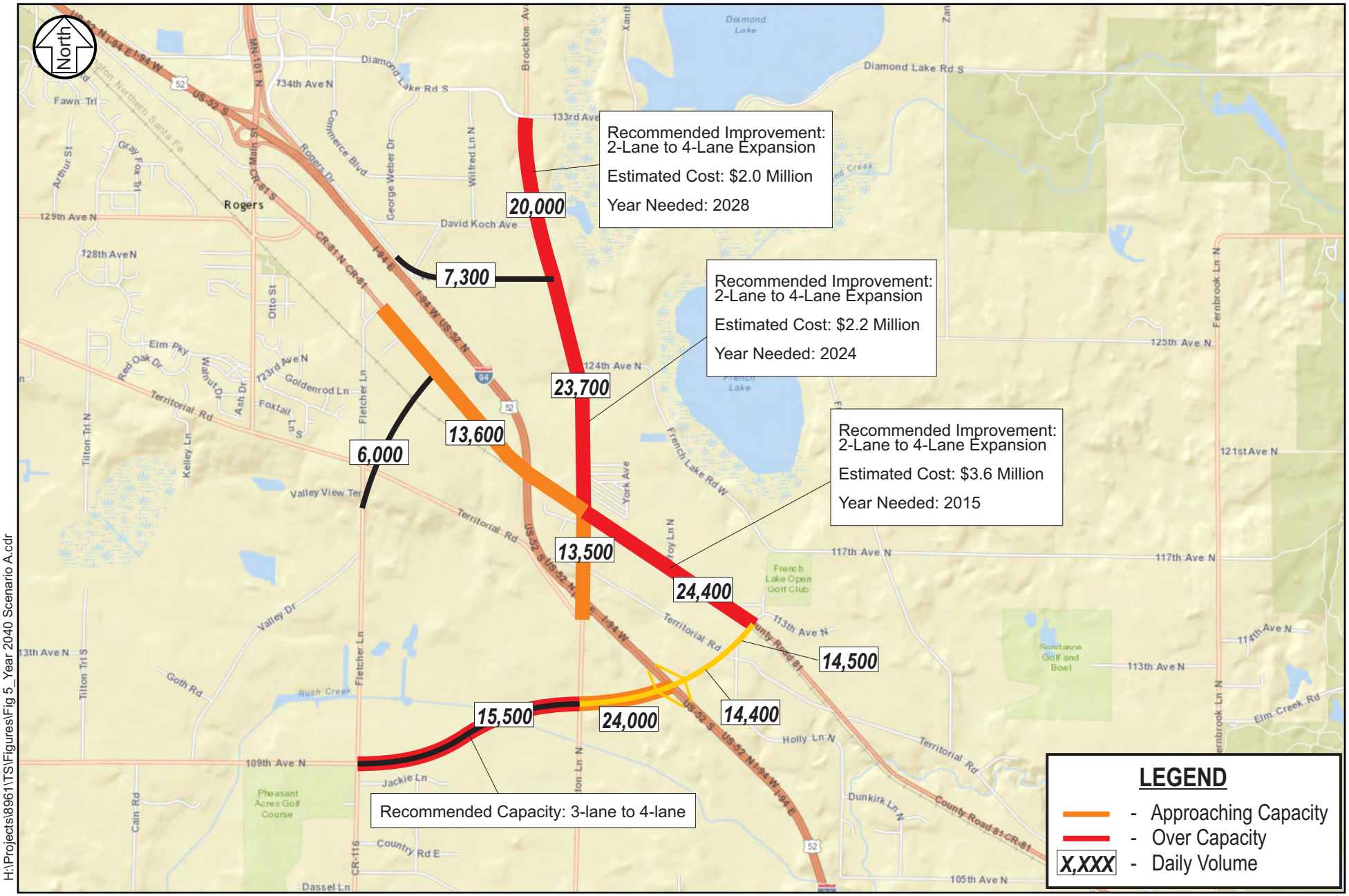
Year 2040 Base Conditions

Brockton Lane Area Transportation Study
City of Dayton, City of Rogers and Hennepin County

Figure 4



H:\Projects\8961\TS\Figures\Fig 5_Year 2040 Scenario A.cdr

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Year 2040 Scenario A Conditions

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City of Dayton, City of Rogers and Hennepin County

Figure 5

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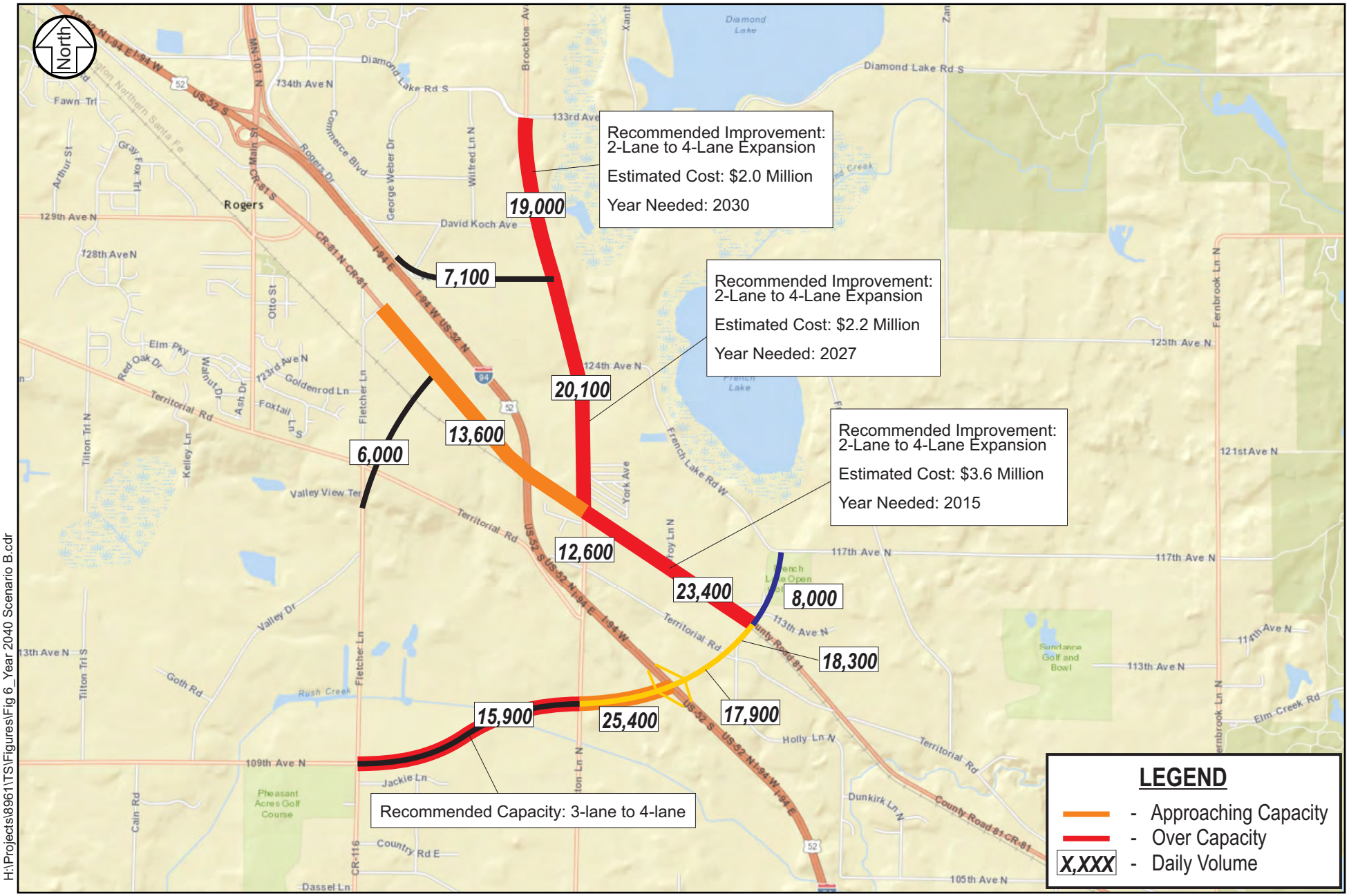

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Year 2040 Scenario B Conditions

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Year 2040 Scenario C Conditions

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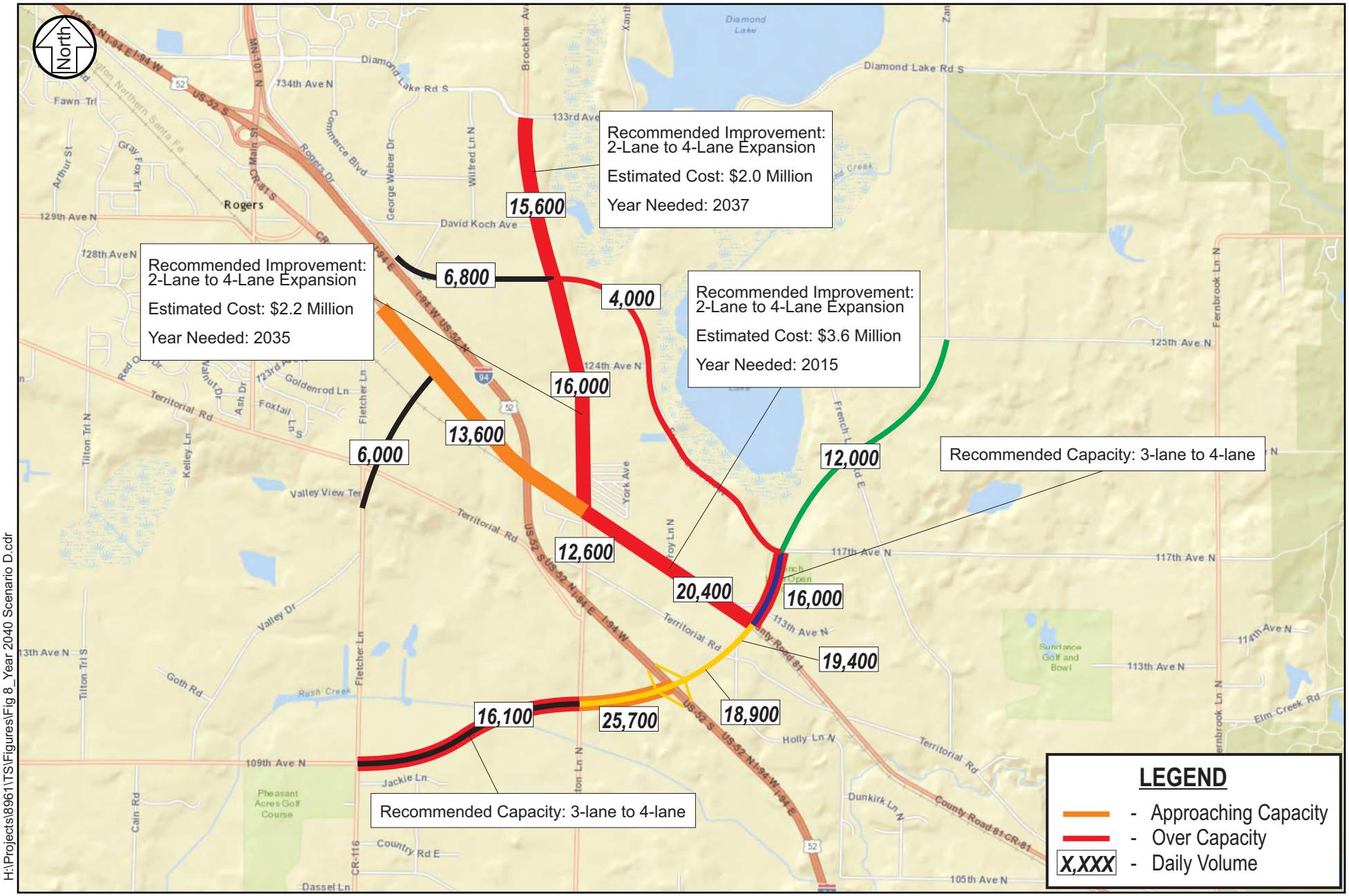
City of Dayton, City of Rogers and Hennepin County

Figure 7



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Year 2040 Scenario D Conditions

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City of Dayton, City of Rogers and Hennepin County

Figure 8

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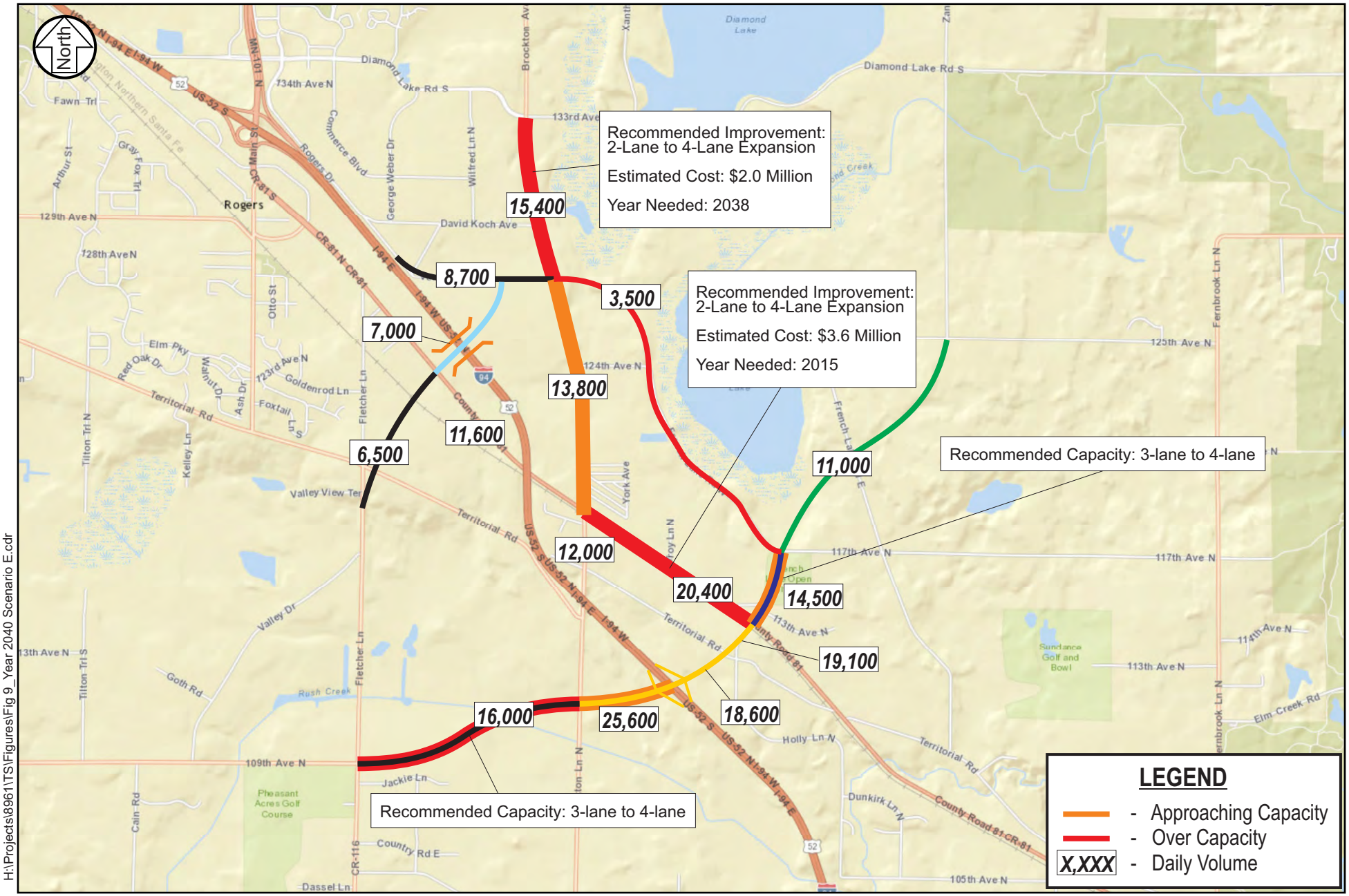

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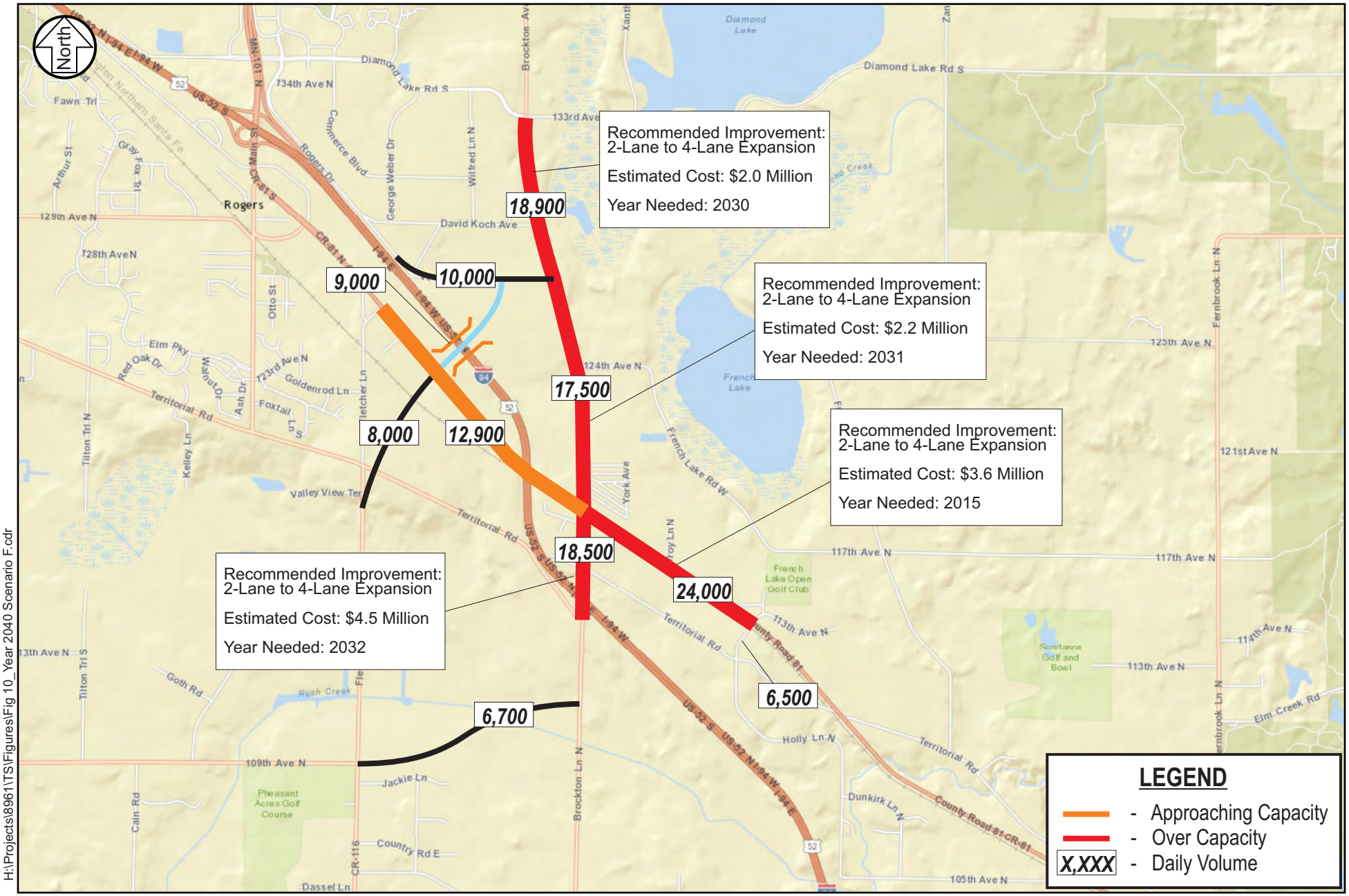
Year 2040 Scenario E Conditions

Brockton Lane Area Transportation Study
City of Dayton, City of Rogers and Hennepin County

Figure 9



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Year 2040 Scenario F Conditions

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City of Dayton, City of Rogers and Hennepin County

Figure 10

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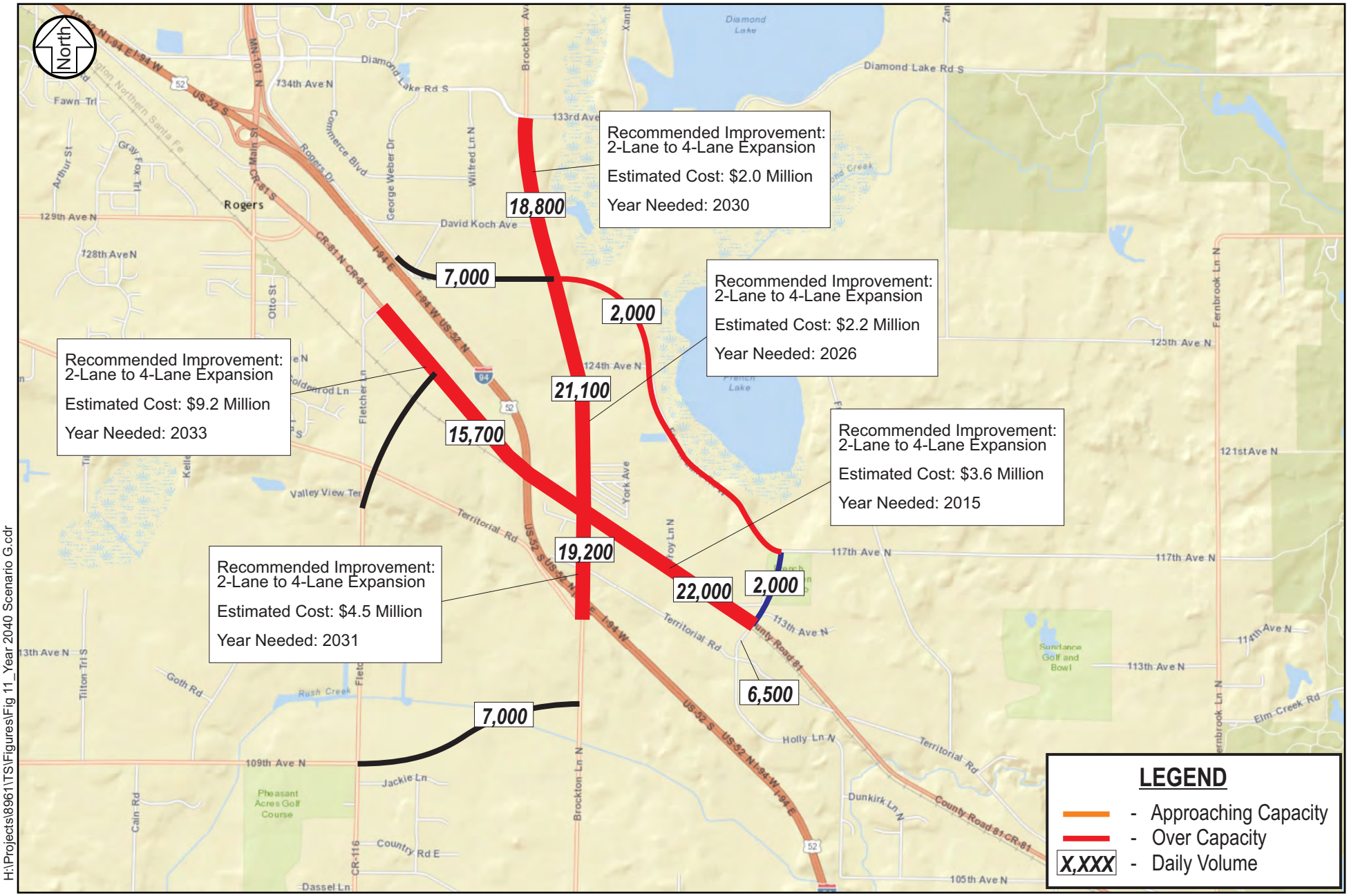

H:\Projects\8961\TS\Figures\Fig 11_Year 2040 Scenario G.cdr

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Year 2040 Scenario G Conditions

Brockton Lane Area Transportation Study
City of Dayton, City of Rogers and Hennepin County

Figure 11

Conclusions and Recommendations

Based on the evaluation of the study area, the following conclusions and recommendations are offered for your consideration:

- Current traffic volumes indicate that the 2-lane segment of CSAH 81 east of Brockton Lane is over capacity.
- Assuming the roadway networks in the Base Scenario and in Scenario A, B, C, D, F and G, Brockton Lane from South Diamond Lake Road to Territorial Road will need to be expanded from 2-lanes to 4-lanes between years 2024 and year 2037.
    - With the addition of all of the roadway improvements assumed in Scenario E, Brockton Lane may not need capacity expansion. Only the segment of Brockton Lane north of Rogers Drive will be over capacity (V/C = 1.03).
    - The addition of the Fletcher overpass by itself (Scenario F, no other roadway improvements), will not provide enough relief to Brockton Lane to reduce the need for expansion.
- By year 2040 under the base roadway network scenario, CSAH 81 west of Brockton Lane will be over capacity (V/C = 1.05) and will need to be expanded from 2-lanes to four-lanes by the year 2033. However, with the construction of any of the improvements listed in Scenario A, B, C, D, E and F, this segment will operate under capacity under its current 2-lane section.
- The current 4-lane section of Rogers Drive west of Brockton Lane will operate under capacity for all roadway network Scenarios.
- Based on the forecasts developed for Scenarios C, D and E, the future extension of Rogers Drive east of Brockton Lane will require a 2-lane roadway.
- The future east-west roadway connecting CSAH 116 and Brockton Lane, will need to be a 2-lane roadway under the base condition. However, with the addition of the Brockton interchange and Ridgeview Crossing, this segment will carry approximately 16,000 vehicles per day, which would be just over the planning level capacity of a 2-lane roadway. This segment of roadway should be constructed as a 3-lane or 4-lane roadway to accommodate the future Brockton interchange and Ridgeview Crossing.
- The current design plans for the Brockton interchange and Ridgeview Crossing from Brockton Lane to CSAH 81 will be able to accommodate year 2040 traffic forecasts under all scenarios.
- The future roadway connection of Ridgeveiw Crossing from CSAH 81 to French Lake Road should be constructed as a 3-lane or 4-lane roadway to accommodate future volumes when the connection to Zanzibar Lane is constructed.
- A 2-lane Fletcher overpass will be able to accommodate year 2040 forecasts.
    - The Fletcher overpass by itself (no other roadway improvements), does provide slight benefit to Brockton Lane and CSAH 81. However, it does not provide enough relief to reduce the amount of improvements identified in the Base condition.

- The recommended improvements identified in this study will reduce V/C ratios under 0.85. However, CSAH 81 east of Brockton Lane will be slightly over the approaching capacity threshold in the Base Scenario (0.86) and in Scenario A (0.87) and F (0.86).
- Assuming the Base roadway network and excluding the trips that do not have an origin or destination within Rogers or Dayton, approximately two-thirds of the traffic on Brockton Lake has an origin/destination in Rogers, with approximately one-third having an origin/destination in Dayton.
    - With the addition of the roadway network improvements identified in Scenario E (Brockton Interchange, Ridgeview Crossing from CSAH 116 to Zanzibar Lane, Rogers Drive extension east of Brockton Lane), these values adjust to three-fourths of the traffic has an origin/destination in Rogers, with approximately one-fourth having an origin/destination in Dayton.