

Technical Memorandum

To: Jerome Adams, MnDOT

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Date: January 3, 2019

Re: Alternatives Analysis
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97 (I-94 Resurfacing)
S.P. 229-010-001 (Brockton Interchange)

The purpose of this technical memorandum is to document the evaluation of project alternatives for the I-94 Unbonded Overlay (UBOL) Resurfacing from Maple Grove to Rogers and the Brockton interchange. The project is located along I-94 between the cities of Rogers, Dayton and Maple Grove as shown on **Figure 1**.

The project will address poor pavement conditions along 9.6 miles of I-94 between the I-494/I-694 interchange in Maple Grove to TH 101 in Rogers, Minnesota. The project also includes the construction of a new interchange to the east of Brockton Lane in the City of Dayton. The project will also address mobility in both the westbound and eastbound directions of I-94 from TH 610 to TH 101. Other portions of the project will address poor pavement and lack of truck parking capacity at the Elm Creek Rest Area in Maple Grove, addressing ADA compliance within the MnDOT right of way, addressing deficient stormwater management systems, and addressing the lack of a commercial vehicle enforcement lane along this portion of I-94.

The project scoping included the analysis of several alternatives, including the No Build Alternative. The alternatives were evaluated based on the ability to meet the purpose of the project as well as environmental impacts. The purpose of the project is:

To improve the ride quality and restore the pavement structure of I-94 between the I-494/I-694 interchange in Maple Grove and TH 101 in Rogers, improve mobility between TH 610 in Maple Grove and TH 101 in Rogers consistent with the performance criteria identified in the *TH 610 Interstate Access Request*, and provide vehicle mobility to I-94 between Maple Grove Parkway and TH 101 to improve transportation system connectivity and to accommodate planned regional growth in the area.

In addition, the purpose of the project is to address drainage deficiencies along I-94 in the project area, address ADA deficiencies within the MnDOT right of way, address the need to improve commercial vehicle enforcement operations and improve the pavement and truck capacity at the Elm Creek Rest Area.

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A. No Build Alternative

The No Build Alternative provides the basis of comparison, or benchmark, for the Build Alternatives and includes impacts associated with doing nothing. The No Build Alternative will result in no improvements being made along the I-94 project area. Pavement will not be resurfaced, new travel lanes will not be added, an interchange will not be constructed near Brockton Lane, the Elm Creek Rest Area will not be improved, a commercial vehicle inspection site will not be added, and ADA improvements will not be constructed. The ride quality and pavement structure of I-94 in the project area will continue to deteriorate, mobility and congestion concerns will remain. Without an interchange near Brockton Lane, local access to I-94 will continue to be limited and congestion will increase at the existing interchanges at TH 101 and I-94, and Maple Grove Parkway and I-94. The No Build Alternative does not preclude ongoing maintenance work.

B. I-94 Build Alternatives

1. I-94 Alternatives Considered

Four main alternatives were considered for I-94 in the project area. The paragraphs below describe the alternatives considered. All build alternatives include the following:

- Resurfacing of both westbound and eastbound I-94 via a UBOL for the length of the project.
- Reconstruction of shoulders adjacent to both the inside and outside lanes.
- Full-depth pavement reconstruction or overlays for the interchange ramps at Weaver Lake Road and Maple Grove Parkway.
- Full-depth pavement reconstruction at the parking lot and entrance/exit ramp to the Elm Creek Rest Area.
- Construction of 12 additional truck parking spaces at the Elm Creek Rest Area.
- Construction of a deer compost area in the City of Dayton.
- Construction of a commercial vehicle inspection site on westbound I-94 between 3,300 feet north of CSAH 81 and 6,300 feet south of TH 101 in Rogers.
- Replacement of deficient culverts and addition of stormwater treatment areas within the project limits.
- Pedestrian improvements to meet ADA requirements within the MnDOT right of way.

Alternative I-94-1: Added capacity westbound between TH 610 and TH 101

Alternative I-94-1 evaluates three options (1a, 1b, and 1c) for adding capacity on westbound I-94. The three capacity options include:

a) Alternative I-94-1a: Construction of auxiliary lane westbound between TH 610 and proposed Brockton interchange.

Alternative I-94-1a includes construction of one westbound 12-foot wide auxiliary lane with six-foot-wide shoulder between TH 610 and the proposed Brockton interchange (see **Figures 2 and 3**). Auxiliary lanes are lanes leading up to, or away from, entrance and exit ramps and allow traffic to change speed, merge in to/out of the travel lanes, for truck climbing and facilitate the positioning of drivers at exits and the merging of drivers at entrances. They are used to balance the traffic load and maintain a more uniform level of service on the highway.

b) Alternative I-94-1b: Construction of a travel lane westbound between TH 610 and TH 101.

Alternative I-94-1b includes construction of an additional westbound 12-foot-wide general-purpose travel lane with a 10-foot-wide shoulder between TH 610 and TH 101 (see **Figures 2 and 3**). This also includes the addition of bridge struts to the center piers of the bridges for the BNSF Railroad, CSAH 81 and Brockton Lane to accommodate an additional lane as well as construction of center median barriers between the proposed Brockton interchange and CSAH 81.

c) Alternative I-94-1c: Construction of a dynamic shoulder westbound TH 610 and TH 101.

Alternative I-94-1c includes construction of a dynamic shoulder westbound between the proposed Brockton interchange and TH 101 (see **Figures 2 and 3**). The dynamic shoulder will be 14-foot-wide and would only be used during peak periods when the capacity is needed. During off peak periods, it would function as a normal shoulder. Dynamic shoulders can be a cost-effective solution to improve operations by providing additional capacity when it is needed most and continuing to preserve the use of a shoulder as a refuge area during most of the day for safety reasons. Dynamic shoulders are often used in situations where construction of additional thru travel lanes is not feasible. This alternative will require additional electronic signage via Intelligent Transportation Systems (ITS) to inform drivers of when the dynamic shoulder was open as a travel lane.

This alternative also includes the addition of bridge struts to the center piers of the bridges for the BNSF Railroad, CSAH 81 and Brockton Lane to accommodate an additional lane as well as construction of center median barriers between the proposed Brockton interchange and CSAH 81.

Alternative I-94-2: Added capacity eastbound between from TH 610 to TH 101

Alternative I-94-2 evaluates three options (2a, 2b, and 2c) for adding capacity on eastbound I-94. The three capacity options include:

a) Alternative I-94-2a: Construction of auxiliary lane eastbound between TH 610 and proposed Brockton interchange.

Alternative I-94-2a includes the construction of one eastbound 12-foot-wide auxiliary lane with six-foot-wide shoulder between TH 610 and the proposed Brockton interchange (see **Figures 2 and 3**).

b) Alternative I-94-2b: Construction of a travel lane on eastbound I-94 between TH 610 and TH 101.

Alternative I-94-2b will involve the construction of an additional 12-foot-wide general-purpose travel lane with a 10-foot-wide shoulder on eastbound I-94 between TH 101 and TH 610 (see **Figures 2 and 3**). This alternative includes the construction of a third thru lane on eastbound I-94 through the TH 101 interchange. This also includes the addition of bridge struts to the center piers of the bridges for the BNSF Railroad, CSAH 81 and Brockton Lane to accommodate an additional lane as well as construction of center median barriers between the proposed Brockton interchange and CSAH 81.

c) Alternative I-94-2c: Construction of dynamic shoulder eastbound between TH 610 and TH 101.

Alternative I-94-2c includes construction of a dynamic shoulder eastbound between the TH 610 and TH 101 (see **Figures 2 and 3**). The dynamic shoulder will be 14-foot-wide and would only be used during peak periods when the capacity is needed. This alternative also includes the addition of bridge struts to the center piers of the bridges for the BNSF Railroad, CSAH 81 and Brockton Lane to accommodate an additional lane as well as construction of center median barriers between the proposed Brockton interchange and CSAH 81.

Alternative I-94-3: Eliminate center lane merge on westbound I-94 at the junction of I-94 and I-494 by adding a lane from the I-494/I-694 interchange to the Maple Grove Parkway exit.

The Value Engineering team recommended evaluating the elimination of the center lane merge on westbound I-94 at the junction of I-94 and I-494 by adding a lane from this junction to the Maple Grove Parkway exit (see **Figures 2 and 3**). This area was raised as a safety concern.

Alternative I-94-4: Construction of an eastbound auxiliary lane between Maple Grove Parkway and Weaver Lake Road.

An eastbound auxiliary lane was evaluated between Maple Grove Parkway and Weaver Lake Road (see **Figures 2 and 3**). This alternative was considered since it was identified as part of an evaluation of an add-on to the selected alternative.

Other Alternatives Considered

During project scoping, extending TH 610 into a full interchange as well as adding MnPASS lanes were discussed. TH 610 currently allows for westbound traffic on TH 610 to go westbound on I-94. Additionally, traffic in eastbound I-94 can exit to eastbound TH 610. Extending TH 610 into a full interchange would involve reconstructing the interchange to include full interstate access to I-94 and TH 610. MnPASS lanes would involve constructing additional managed high occupancy vehicle (HOV) lanes for travel during peak travel times.

2. Evaluation of I-94 Alternatives

The I-94 Mainline alternatives were first evaluated relative to the project purpose. Alternatives that did not meet the project purpose were eliminated from further consideration. The remaining alternatives were evaluated in more detail relative to their environmental and transportation impacts. A benefit cost analysis was also completed. The impacts evaluated included (see **Table 1**):

- Vehicle miles traveled
- Vehicle hours traveled
- Level of service
- Maintenance

- Safety
- Wetland
- Floodplain
- Section 4(f) and 6(f)
- Historical and archaeological
- Threatened and endangered species
- Tree removal
- Contaminated materials
- Visual impacts
- Air and noise
- Environmental justice
- Right of way impacts
- Farmland
- Additional impervious

Initial Screening of Alternatives

The following alternatives were eliminated because they do not meet the project purpose or because they were determined to have operational or safety concerns.

Alternative I-94-1c: Add dynamic shoulders westbound between TH 610 and TH 101.

Alternative I-94-1c could be a cost-effective solution to improve operations by providing additional capacity when it is needed most and continuing to preserve the use of a shoulder as a refuge area during most of the day for safety reasons. This option adds capacity during the peak periods but does not require as much pavement as the other alternatives. This option would also meet the requirements in the TH 610 IAR.

However, because the lane will be open when congestion reaches a certain threshold, 24/7 monitoring of traffic will be required. As the lane approaches the TH 101 interchange and departs the proposed Brockton interchange, it will become a merging lane for exiting/entering traffic as well. Additional signage and lane striping will be required to make the transition from a travel lane to an exit lane clear to avoid driver confusion. Extra monitoring by law enforcement will also be required to provide faster response to incidents when the lane is being used for travel, as well as monitoring for drivers illegally using the dynamic shoulder during off-peak hours when it is closed for travel and is reserved as a refuge for incidents.

This alternative will provide the least improvement in terms of vehicle mobility when compared to other alternatives and will not be consistent with the rest of the I-94 corridor because there are no other dynamic lanes on I-94 in Minnesota and drivers are not familiar with them.

Based on the initial screening, Alternative I-94-1c was removed from further consideration based on the following:

- The use of dynamic shoulders through interchange ramps is considered poor design from a geometrics perspective. Lane striping becomes challenging and drivers may not recognize the transition in the lane from a travel to exit/entry lane, which may lead to driver confusion and increased crashes.

- The added signage, ITS, traffic volume monitoring, variable speed limits, queue warning and ramp metering systems, and law enforcement required for dynamic shoulders will increase the cost of operating and maintaining the roadway into the future.
- Dynamic lanes are not used elsewhere on I-94 in Minnesota. This will not be a design that is consistent with the rest of the corridor.
- There is no constraint precluding the construction of an auxiliary or travel lane.
- Local partners and law enforcement do not support this alternative as they believe it will lead to an increase in crashes resulting from driver confusion due to lack of familiarity with the design.

Alternative I-94-2c: Add dynamic shoulders eastbound between TH 610 and TH 101.

Alternative 1-94-2c was removed from further consideration for the same reasons that Alternative I-94-1c was removed.

Alternative I-94-3: Eliminate center lane merge on westbound I-94 at the junction of I-94 and I-494 by adding a lane from the I-494/I-694 interchange to the Maple Grove Parkway exit.

A crash analysis was completed of the section of I-94 that included the center lane merge. This section of I-94 does not have above average crash rates or crash types that would indicate a safety problem. Eliminating the center lane merge involves either adding a lane to I-94 or reducing the entrance from I-494 to one lane. Other issues also exist at this location, which includes weaving traffic from I-494 to the Weaver Lake Road exit. This is also a Tier III MnPASS corridor. MnDOT has done some preliminary design work at this location that includes improvements to address these issues and the preliminary cost of the improvements within this area is significantly more than budgeted for this resurfacing project.

The Metropolitan Council and MnDOT are doing a two-year study of system interchanges in the Twin Cities Metropolitan area to prioritize the system interchanges where improvements are needed. The I-494/I-694 interchange, which includes this segment, is included in that study. The I-94 UBOL project is identified as a resurfacing project that will be coordinated with the construction of the Brockton interchange in 2020 and address the congestion created by the TH 610 access. The addition of a lane between I-494 and Maple Grove Parkway goes beyond the scope of this project and is inconsistent with the identified resurfacing project.

Alternative I-94-4: Eastbound auxiliary lane between Maple Grove Parkway and Weaver Lake Road

This alternative also goes beyond the purpose of this project. The existing traffic volumes and speeds show congestion downstream from this location, so there will be limited benefit in terms of improving vehicle mobility. The crash analysis did not indicate a safety problem in this section of I-94. The exit volume to Weaver Lake Road is relatively light and the entrance and exit to the Elm Creek Rest Area is also located between Maple Grove Parkway and Weaver Lake Road. Overall, this alternative will not address mobility on I-94 between TH 610 and TH 101 outlined in the TH 610 IAR and therefore was rejected as it was not consistent with the purpose of the project.

Other Alternatives Considered

The other alternatives that were considered include reconstruction of TH 610 into a full interchange as well as adding MnPASS lanes. The TH 610 extension project is not yet identified in any regional plans nor has funding been identified. Regarding adding MnPASS lanes, the project area is a MnPASS Tier III corridor. Tier III is the lowest priority for MnPASS lanes and therefore construction of managed lanes would not be considered until the end of the 20-year plan. Therefore, these options were eliminated from further consideration.

Evaluation of Remaining Alternatives

The remaining alternatives were evaluated relative to transportation and environmental factors discussed at the beginning of this section. **Table 1** provides a summary of the benefits and impacts relative to the criteria. The evaluation is discussed below.

No Build

Continued maintenance would occur in the No Build alternative. Recurrent rehabilitation through diamond grinding will continue to reduce the structural capacity of the roadway by reducing concrete thickness, and continued maintenance efforts will become more frequent and costlier. Thus, the No Build Alternative is not considered a practical solution to address long-term needs and is not pursued. The No Build Alternative was evaluated as a basis against which to compare the Build Alternatives in the evaluation of environmental impacts but was not identified as the preferred alternative because it does not meet the project purpose.

Alternative I-94-1a: Construction of auxiliary lane westbound between TH 610 and the proposed Brockton interchange.

Alternative I-94-1a will provide some improvement to the project area in terms of mobility by adding capacity between the TH 610 entrance and the exit to the proposed Brockton interchange. This alternative will meet the requirements of the TH 610 IAR. A benefit-cost analysis was completed for Alternative I-94-1a. The westbound auxiliary lane with the Brockton interchange will reduce the daily vehicle hours of travel relative to the No Build alternative by 380 vehicle hours per day. It does increase vehicle miles of travel because I-94 becomes a more attractive alternative for trips and therefore some users will travel farther to take advantage of the higher speeds. The net present value of the user benefits for this lane is \$34,252,500 compared to a construction cost of \$1,284,900. Although the auxiliary lane has a high benefit cost ratio, it was determined that an auxiliary lane will provide less benefit than an additional travel lane. Also, an additional westbound travel lane is being constructed along I-94 west of the UBOL project area, between St. Michael and Albertville.

With the westbound auxiliary lane alternative between TH 610 and the proposed Brockton interchange, this alternative has less impervious and a smaller project footprint and therefore has the least amount of environmental impact as shown on **Table 1**.

Alternative I-94-1b: Construction of a travel lane westbound between TH 610 and TH 101.

Alternative I-94-1b will improve mobility between TH 610 and TH 101 through a reduction in congestion and reduced travel delays and will maintain consistency in the lane configuration on I-94 when considering the additional lane being added to I-94 between St. Michael and Albertville. Additionally, Alternative I-94-1b will mitigate the operational issues outlined in the TH 610 IAR. The added travel lane reduces travel time by 358 hours per day more than just a westbound auxiliary lane from TH 610 to Brockton interchange. The net user benefits of the

added lane are \$15 million more than just an auxiliary lane and the added cost is only \$3 million more.

With the westbound travel lane alternative between TH 610 and TH 101, this alternative has a larger project footprint than Alternative I-94-1a. There is slightly more wetland impact and tree removal, and more additional impervious than Alternative I-94-1a as shown on **Table 1**.

Alternative I-94-2a: Construction of auxiliary lane eastbound between TH 610 and proposed Brockton interchange.

Alternative I-94-2a will provide some improvement to the project area in terms of mobility by adding capacity between the proposed Brockton interchange and TH 610. This alternative will meet the TH 610 IAR. The eastbound auxiliary lane with the Brockton interchange will reduce the daily vehicle hours of travel relative to the No Build alternative by 240 vehicle hours per day. It does increase vehicle miles of travel because I-94 becomes a more attractive alternative for trips and therefore some users will travel farther to take advantage of the higher speeds. The net present value of the user benefits for this lane is \$24,105,900 compared to a construction cost of \$1,710,000. Although the auxiliary lane has a high benefit cost ratio it was determined that an auxiliary lane will provide less benefit than an additional travel lane between TH 101 and TH 610.

In addition, the auxiliary lane proposed as part of Alternative I-94-2a will not maintain route consistency as well as an additional travel lane. MnDOT is constructing a third lane on I-94, west of the UBOL project between Albertville and St. Michael. There are currently three eastbound travel lanes on I-94 between TH 241 and TH 101 (western limits of the UBOL project), but the third lane ends at the exit to TH 101. There is already some congestion that occurs at this lane drop and volumes are forecast to increase. Not extending the third lane through the TH 101 interchange will increase the congestion and backups at this lane drop.

With the eastbound auxiliary lane alternative between TH 610 and the proposed Brockton interchange, this alternative has less impervious and a smaller project footprint. This alternative has less wetland impact than Alternative I-94-2b, but the same amount of floodplain impact and tree removal as shown in **Table 1**.

Alternative I-94-2b: Construction of a travel lane on eastbound I-94 between TH 610 and TH 101.

Alternative I-94-2b addresses vehicle mobility through a reduction in congestion and reduced travel delays and will maintain route consistency in the lane configuration on I-94 when considering the additional lane being added to I-94 between St. Michael and Albertville and the existing three lane section between TH 241 and TH 101. This alternative will also meet the TH 610 IAR.

A primary mobility benefit will be that traffic currently traveling on the third lane of eastbound I-94 west of TH 101 will be able to remain in a travel lane as opposed to merging into two lanes of traffic at the exit to TH 101. This will reduce the bottleneck at that location, which is causing operational issues. Additionally, Alternative I-94-2b will mitigate the operational issues outlined in the IAR. An analysis of travel delay determined that vehicle hours within the segment between TH 610 and TH 101 will be reduced on eastbound I-94 by 582 vehicle hours/day. Some of this is the result of the reduced bottleneck at the TH 101 entrance onto eastbound I-94. The added travel lane reduces travel time by 342 hours per day more than just a westbound auxiliary lane from TH 610 to

Brockton. The net user benefits of the added lane are \$20 million more than just an auxiliary lane and the added cost is only \$3.1 million more.

With the eastbound travel lane alternative between TH 610 and TH 101, this alternative has a larger project footprint than Alternative I-94-2a. There is more wetland impact and additional impervious surface, but there is the same floodplain and tree removal impact as shown on **Table 1**.

Table 1 - I-94 Alternatives Evaluation Summary

Evaluation Criteria	No Build	I 94 1a Auxiliary Lanes WB	I 94 1b Added Lanes WB	I 94 2a Auxiliary Lanes EB	I 94 2b: Added Lanes EB
Change in Daily Vehicle Hours of Travel from 2040 No-build	0	(380)	(738)	(240)	(582)
Change in Daily Vehicle Miles of Travel from 2040 No-build	0	2,950	11,611	2,327	6,646
Construction Cost	0	\$1,284,900	\$4,318,500	\$1,710,000	\$4,856,600
Net Benefit Compared to No-build	0	\$34,252,500	\$49,514,790	\$24,105,900	\$44,664,400
Wetland Impact (acres)	0	0.1	0.5	0.5	1.5
Floodplain Impact (cubic yards)	0	0	0	1,850	1,850
Section 4(f) Impact	No	No	No	No	No
Section 6(f) Impact	No	No	No	No	No
Historical	No	No	No	No	No
Archaeological	No	No	No	No	No
Threatened and Endangered Species (state and federal)	No	No	No	No	No
Tree Removal (acres)	0	0.1	0.2	0.7	0.7
Contaminated Materials	No	No	No	No	No
Visual Impacts	No	No	No	No	No
Air Quality	No	No	No	No	No
Noise	No	Yes	Yes	Yes	Yes
Environmental Justice	No	No	No	No	No
Right of Way (permanent right of way acquisition)	None	Low	Medium	Low	Medium
Farmland	None	None	None	None	None
Additional Impervious	0	3.8	7.3	3.5	9.7

Comparing alternatives I-94-1a, I-94 1b, I-94-2a, and I-94-2b, these alternatives have no impact on Section 4(f) and 6(f) resources, historical or archaeological resources, threatened and endangered species, contaminated materials, visual impacts, environmental justice, or farmland. For westbound alternatives I-94-1a and I-94-1b, the wetland and floodplain impacts are the same; the tree removal is slightly higher in Alternative I-94-1b as well as having a greater amount of additional impervious surface since the additional lane is longer than in Alternative I-94-1a. However, Alternative I-94-1b provides better traffic operations and has a higher net benefit than Alternative I-94-1a.

For eastbound alternatives I-94-2a and I-94-2b, the floodplain and tree removal impacts are the same; the wetland impacts are higher in Alternative I-94-2b as well as having a greater amount of additional impervious surface since the additional lane is longer than in Alternative I-94-2a. However, Alternative I-94-2b provides better traffic operations and has a higher net benefit than Alternative I-94-2a.

They have the same impacts associated with floodplain, tree removal, and right-of-way impacts. Alternative I-94-1a and 2a (auxiliary lanes) has less wetland impact and less additional impervious surface than Alternative I-94-1b and 2b (added travel lanes). However, Alternatives I-94-1b and 2b provide better mobility, route consistency, reduced vehicle hours, and benefit/cost than I-94-1a and 2a.

C. Brockton Interchange Alternatives

Background

In 2008, the I-94 Sub-Area Study¹ was completed in collaboration with the FHWA, MnDOT, Metropolitan Council, Hennepin County, and the cities of Dayton, Rogers, Corcoran, Maple Grove, and Hassan Township. The purpose of the plan was to investigate the local roadway system in northwest Hennepin County and the impacts an interchange at Brockton Lane may have on the regional area. The results of the analysis indicated that a new interchange near Brockton Lane would help balance traffic on the overall system and improve safety by ensuring regional traffic use of the freeway system, rather than on local roadways.

As part of the I-94 Sub-Area Study, the Brockton Lane area was identified as the location for a future interchange for the following reasons:

- The Brockton Lane area was identified as the location for future access to I-94 due to spacing from the other I-94 access points as well as connections to the arterial system.
- The I-94 and Brockton Lane area is located at the confluence of several key minor arterial roadways in the study area, including Brockton Lane and CSAH 81. These roadways serve to accommodate major traffic movements to and from the north.

In 2011, a Technical Advisory Committee was formed to begin the process of evaluating alternatives for a Brockton interchange. A Project Steering Committee (PSC) was developed that included the cities of Dayton, Rogers, Corcoran, Maple Grove, and Hassan Township, FHWA, MnDOT, Metropolitan Council, Hennepin County, Three Rivers Park District, community representatives, special interest groups, and local business and private sector partners. The PSC confirmed the location of the I-94 and Brockton Lane area interchange on April 27, 2011, where FHWA and MnDOT representatives indicated that the Brockton location was the best location due

¹ Hennepin County. *Northwest Hennepin County I-94 Sub-Area Transportation Study*. 2008.

to spacing with other system interchanges. The Metropolitan Council also supported the interchange in this location². This document is included in **Exhibit A**.

In 2011, the PSC also began the process of evaluating alternatives for a Brockton interchange. The PSC committee met several times and three public meetings were held. The PSC reviewed seven preliminary concepts and via a screening process, narrowed the interchange alternatives to three alternatives and with one base alternative (overpass). The three alternatives included:

- Partial cloverleaf (parclo) at the Brockton Lane alignment with northeast/southwest loops
- Diverging diamond interchange at the Brockton Lane alignment
- Offset diverging diamond interchange, east of Brockton Lane

These remaining alternatives went through a more detailed evaluation process focusing on transportation needs, social, environmental, and economic impacts. Additional information about the 2011 public input process can be found in *the Environmental Assessment Worksheet for Interstate 94/Brockton Interchange Project*³.

Ultimately, the PSC recommended an interchange offset to the east from Brockton Lane. The offset was chosen based on comments received at an open house supporting the offset concept over the other concepts primarily because it allowed for greater flexibility in terms of construction staging and expansion and will be the least disruptive to local residents and businesses. Other influencing factors leading to recommending the offset design over the other alternatives included:

- Met the overall study goals of meeting transportation needs, enhancing safety, enhance mobility, and balancing of the planned land use development
- Provided better balance of traffic volumes on local roadways
- Provided better local traffic circulation and support of land use
- Provided acceptable operations at most study intersections
- Provided good spacing of access on I-94 and local roadways
- Provided comparable project costs to the other alternatives
- Supported overwhelmingly by local residents and businesses

In 2011, the PSC also recommended a partial cloverleaf (parclo) as the recommended interchange design. The parclo was chosen since it provided high capacity for traffic, which was based on the significant development growth that was forecasted in the area. Since 2011, the development forecasts have been adjusted to show less development growth than anticipated in 2011.

In 2013, the City of Dayton began working on obtaining funding and right of way for the interchange. Obtaining this right of way was completed after the City of Dayton finished the "Interstate 94/Brockton Interchange Project Environmental Assessment Worksheet (EAW)" dated August 2012. The Negative Declaration of Need for an Environmental Impact Statement for that EAW was issued in February 2013. The city completed the first round of right of way acquisition based on the interchange EAW in 2013. The second round of right of way acquisition will begin when the Findings of No Significant Impact (FONSI) is received for this I-94 UBOL Resurfacing Environmental Assessment/Environmental Assessment Worksheet (EA/EAW) in May 2019.

² Source: Interchange Review Committee. Communication to Samantha Orduno. November 7, 2012.

³ Source: City of Dayton. *Environmental Assessment Worksheet for Interstate 94/Brockton Interchange Project*. August 2012.

As part of this I-94 EA/EAW, configurations for the interchange were reexamined. The recommended offset location for the interchange east of Brockton Lane remained constant in this evaluation. This analysis considered the adjusted lower growth forecasts and changes to the I-94 corridor that occurred since 2011, such as the completion of the partial interchange at TH 610 in Maple Grove. From this analysis, four alternatives were considered for the offset Brockton interchange. Only alternatives that met the purpose and need were carried forward for additional study. A description of the alternatives is provided below.

1. Brockton Interchange Alternatives Considered

Four alternatives were considered for the Brockton interchange in the project area. The paragraphs below describe the alternatives considered. All build alternatives include the following:

- Construction of the new Dayton Parkway as a four-lane road with signals and 12-foot-wide lanes in each direction between Brockton Lane and CSAH 81 with full access at I-94.
- Reconstruction of approximately 1,890 feet of Brockton Lane at the new Dayton Parkway intersection with two thru lanes, two left turn lanes, and one right turn lane in the northbound and eastbound directions.
- Reconstruction of approximately 3,175 feet of CSAH 81 at the new Dayton Parkway intersection with two thru lanes, two left turn lanes, and one right turn lane in the westbound and eastbound directions on CSAH 81; and two left turn lanes, one thru lane to future development, and one right turn lane in the northbound direction.
- Construction of an at-grade crossing of the BNSF railroad crossing.
- Construction of a 10-foot-wide trail along Dayton Parkway.
- Construction of stormwater BMPs to treat stormwater to state and federal requirements.

Brockton 1 - Partial Cloverleaf (Parclo)

The Brockton 1 Alternative is a partial cloverleaf (Parclo) interchange as shown in **Figure 4**. A parclo is a modification of a traditional cloverleaf interchange and has four ramps and two loops. A loop ramp from the interchange to eastbound I-94 will be constructed in the northwest quadrant of the interchange, and a loop ramp from westbound I-94 to the interchange will be constructed in the northeast quadrant of the interchange. Ramps from I-94 westbound and eastbound to the interchange will be constructed in the southeast and northwest quadrants. An entrance ramp from the interchange to eastbound and westbound I-94 will be constructed in the southwest and northeast quadrants of the interchange. A five-lane bridge will be required.

Brockton 2 - Standard Diamond

The Brockton 2 Alternative is a standard diamond as shown on **Figure 5**. A standard diamond has four ramps for exiting and entering on to I-94. This alternative has sufficient capacity for vehicles, but not as much as the parclo alternative. Some heavy moves prevent free flow during peak traffic time. A six-lane bridge will be required due to double left-turn lanes.

Brockton 3 - Diverging Diamond

The Brockton 3 Alternative is a diverging diamond interchange (DDI) as shown on **Figure 6**. This type of interchange design includes the two directions of traffic on the bridge crossing to the opposite side on either side of the bridge. Traffic on the new Dayton Parkway will travel east-west through the interchange. Traffic headed eastbound or westbound I-94 will take ramps to I-94. The diverging diamond design, which shifts heavy left-turn movements over to the left side of the roadway, will reduce conflicts with thru

traffic on new Dayton Parkway and will allow greater progression for left turns. A four-lane bridge will be required.

Brockton 4 - Folded Diamond

The Brockton 4 Alternative is a folded diamond interchange as shown on **Figure 7**. This interchange includes two ramps and two loops like the parclo except that the loops and ramps are all on the same side of the bridge.

2. Evaluation of Brockton Alternatives

The alternatives were evaluated based on the purpose and need, operations and cost, and environmental impacts. The alternatives were initially screened based on the following criteria:

- Determination if the alternative met the purpose of the project
- Evaluation of the cost-benefit
- Evaluation of the impact on traffic operations

Based on this initial screening, some alternatives were rejected before they were further screened for environmental factors. Alternatives that were not rejected with the initial screen were then evaluated based on environmental impacts. These environmental impacts included:

- Wetland
- Floodplain
- Section 4(f) and 6(f)
- Historical and archaeological
- Threatened and endangered species
- Tree removal
- Contaminated materials
- Visual impacts
- Air and noise
- Environmental justice
- Right-of-way impacts
- Farmland
- Additional impervious

Brockton 1 - Partial Cloverleaf (Parclo)

The parclo interchange alternative has the highest traffic capacity. It also has the highest right-of-way impacts, requires more maintenance, and has the highest costs as shown in **Table 2**. However, it does meet the purpose of the project. Therefore, this alternative was carried forward for additional screening.

Table 2 summarizes the additional environmental screening. This alternative had the most wetland impact, tree removal, farmland impact, and added the most impervious surface compared to the other alternatives.

Brockton 2 - Standard Diamond

This alternative has sufficient initial capacity with fewer right-of-way impacts in the northwest quadrant but more right-of-way impacts in the southeast quadrant as shown on **Table 2**. However, this alternative did not have the flexibility needed to add capacity in the future to accommodate long-term planned growth within the region. While this alternative was rejected early in the process based on operations and long-term expansion ability, it was included for additional environmental analysis.

Table 2 summarizes the additional environmental screening. This alternative had the second least amount of wetland impact but had more floodplain impact and high farmland impact. This alternative was in the middle compared to the other alternatives on tree removal.

Brockton 3 - Diverging Diamond

This alternative has sufficient capacity and allows for more efficient left turn movements for vehicles as shown on **Table 2**. The right-of-way needs less than other alternatives. While this type of design is unconventional, it is occurring more frequently in the Twin Cities metropolitan area. This alternative is less costly than the parclo alternative. This alternative meets the purpose of the project. Therefore, this alternative was carried forward for additional screening.

Table 2 summarizes the additional environmental screening. This alternative had the least wetland impact and the least amount of tree removal and farmland impact. It had less floodplain impact and the least amount of additional impervious surface.

Brockton 4 - Folded Diamond

This alternative has sufficient capacity but has heavy left turn movements. This results in long queues which can cause vehicles to back up and cause congestion in other intersections and along the eastbound and westbound ramps. To accommodate the needed capacity, the bridge will be a five-lane bridge as shown on **Table 2**. Additional right-of-way will be needed for the ramps on the east side of I-94. However, this alternative meets the project purpose. Therefore, this alternative was carried forward for additional screening.

Table 2 summarizes the additional environmental screening. This alternative had the higher wetland impact, more floodplain impact, and more tree removal. It was in the middle of the other alternatives for farmland and additional impervious surface.

Table 2 - Brockton Interchange Operations Evaluation

		Interchange Alternative							
		1. Parclo		2. Standard Diamond	3. Diverging Diamond		4. Folded Diamond		
		AM	PM		AM	PM	AM	PM	
OPERATIONS	2040 Intersection Level of Service (LOS) Reduced Build of Intersections	Eastbound Ramps	A	A	This alternative was rejected early in the evaluation process since it did not have the needed future capacity to accommodate long-term growth in the region and would have been very difficult to expand capacity due to the standard diamond design.	A	B	B	C
		Westbound Ramps	A	B		B	B	B	B
		CR101/CR81	D/C	D/C		D/C	D/C	D/C	D/C
	2040 Intersection Level of Service (LOS) Growth Scenario with Ultimate Intersections	Eastbound Ramps	B	A		B	B	D	E
		Westbound Ramps	B	C		C	B	D	F
		CR101/CR81	D/D	E/D		D/D	E/D	D/D	E/D
	Level of Difficulty to Increase Capacity		Positive This design offers significantly more capacity at outset. Expansion will not be needed		More Negative Expansion would be needed and it would be difficult to expand	Positive This design offers significantly more capacity at outset. Expansion will not be needed		Slightly positive Requires construction of two additional ramps. Easy to implement. Will require access permit with FHWA	
	Number of Bridge Lanes Needed		5			4		5	
	Number of Ramps Needed		6			4		4	
Right of Way Impacts		Slightly negative Additional ROW in NW quadrant			Slightly positive No ROW in NW quadrant Additional ROW in SE quadrant		Slightly negative Additional ROW in NW quadrant		
Cost		\$26.2M			\$24.4M		\$24.0M		
Operational Impacts		Two signals; Larger bridge; Two additional ramps			2 signals		2 signals		
Pedestrian Elements		Neutral Peds cross at signals – trail shifts from west to west side avoid merging conditions			Neutral Peds cross at signals – trail in center median on bridge; less conventional		Positive Peds have no ramps to cross; trail on east side		
Snow and Ice Maintenance (ease of U-turn)		Poor			Fair		Fair		

		Interchange Alternative			
		1. Parclo	2. Standard Diamond	3. Diverging Diamond	4. Folded Diamond
ENVIRONMENTAL EVALUATION	Comments	<u>Pros:</u> Highest capacity Heavy movements have right turns Highest movement accelerate on downgrade; up on stop <u>Cons:</u> Has more potential ROW impacts Highest cost More maintenance		<u>Pros:</u> Improved traffic operations Some additional ROW impacts in SE quadrant Removes conflicting left movements Best acceleration/deceleration features Narrower bridge and only 4 ramps <u>Cons:</u> Unconventional design	<u>Pros:</u> Large westbound movement on free-flow loop Trail unimpeded on east side of bridge Ability to add ramps at future date Lower cost Flexibility to connect local street <u>Cons:</u> Less intuitive to the driver Less reserve capacity One entrance ramp on loop – lower acceleration More ROW impact
	Wetland Impact (acres)	3.7	2.5	1.9	3.7
	Floodplain Impact (cubic yards)	18,590	19,170	18,590	19,170
	Section 4(f) Impact	No	No	No	No
	Section 6(f) Impact	No	No	No	No
	Historical	No	No	No	No
	Archaeological	No	No	No	No
	Threatened and Endangered Species (state and federal)	No	No	No	No
	Tree Removal	11.1	7.8	5.48	9.1
	Contaminated Materials	No	No	No	No
	Visual Impacts	No – consistent with corridor	No – consistent with corridor	No – consistent with corridor	No – consistent with corridor
	Air Quality	No	No	No	No
	Noise	No	No	No	No
	Environmental Justice	No	No	No	No
	Right of Way (permanent right of way acquisition)	High	Medium	Medium	Medium
Farmland (acres)	11.3	11.3	9.3	10.1	
Additional Impervious (acres)	19.8	16.8	16.7	17.7	

	Positive/Good/Best		Neutral		Poor/More Negative
	Slightly Positive		Slightly Negative		

D. Alternatives Under Consideration in the EA

Following analysis of all alternatives, a recommendation was made for which alternatives to carry forward into environmental impact analysis. The preferred alternative for further study (hereby also referred to as the project) combines Alternatives I-94-1b and I-94-2b (added travel lanes) and the Brockton Alternative 3 (Diverging Diamond Interchange). This combined alternative is the alternative studied that best meets the purpose and need of the project and/or had lesser amounts of environmental impacts and thus will be carried forward for additional study. In addition to the Preferred Alternative, a No Build Alternative will also be evaluated as a basis of comparison. Both the Preferred and No Build Alternatives are described in detail below.

1. No Build Alternative

The No Build Alternative will result in no improvements being made to I-94. Pavement will not be resurfaced, new lanes will not be added, the Elm Creek Rest Area will not be repaved or expanded, and the Brockton interchange will not be constructed.

The No Build Alternative does not preclude ongoing maintenance work. The No Build Alternative provides the basis of comparison, or benchmark, for the Build Alternatives and includes impacts associated with doing nothing. Recurrent rehabilitation and resurfacing through diamond grinding will continue to reduce the structural capacity of the roadway by reducing concrete thickness, and continued maintenance efforts will become more frequent and costlier. The No Build Alternative was evaluated as further described in this section as a basis against which to compare the Build Alternatives in the evaluation of environmental impacts.

2. Preferred Alternative (I-94-1b, I-94-2b and Brockton 3)

See **Figures 8A-G** for the preferred alternative layout. Alternative I-94-1b and I-94-2b have received local support from the cities of Dayton, Maple Grove, and Rogers as well as the I-94 West Corridor Coalition. These entities indicate the preferred alternative will ensure full movement to and from TH 101 and allow the local roadway system to function as designed, without further overloading from the proposed Brockton interchange if the lanes end there. In addition, local law enforcement working along the corridor support this alternative. Letters of support are included in **Exhibit A**.

The following text details key components of the preferred alternative.

UBOL

The project will include the resurfacing of 9.6 miles of both eastbound and westbound I-94 between the I-494/I-694 interchange in Maple Grove and TH 101 in Rogers via an unbonded concrete overlay (UBOL). Resurfacing will be accomplished by placing a 10.5-inch unbonded concrete overlay over the existing concrete traffic lanes and over the existing bituminous shoulders.

Travel Lanes

The preferred alternative includes the construction of additional 12-foot-wide travel lanes with 10-foot-wide shoulders on both eastbound and westbound I-94 between TH 610 and TH 101. To accommodate the addition of the eastbound travel lane near TH 101, an additional lane will be added on eastbound I-94 from the end of the exit ramp to TH 101 to the end of the entrance ramp from TH 101.

Other I-94 Roadway Improvements

In addition to the UBOL and additional travel lanes, the following improvements will also be constructed:

- In-kind reconstruction of shoulder on both the inside and outside lanes
- Addition of bridge struts to the BNSF Railroad Bridge, CSAH 81 bridge, the existing

- Full-depth pavement reconstruction or overlays of the interchange ramps at Weaver Lake Road, and Maple Grove Parkway.
- Construction of center median barrier from east of the Brockton interchange to west of CSAH 81.
- Full-depth pavement reconstruction at the parking lot and entrance/exit ramp to the Elm Creek Rest Area.
- Construction of 12 additional truck parking spaces at the Elm Creek Rest Area.
- Construction of a deer compost area in the City of Dayton.
- Construction of a commercial vehicle inspection site on westbound I-94 between 3,300 feet north of CSAH 81 and 6,300 feet south of TH 101 in Rogers.
- Pedestrian improvements to meet ADA requirements within the limits of the project within MnDOT right-of-way.
- Replacement of culverts along the I-94 corridor.
- Stormwater treatment via wet ponds and infiltration basins.

MnDOT has committed to maintaining six-lanes of traffic during construction of the preferred alternative. To meet this commitment for the maintenance of traffic, an advanced temporary widening project is needed to facilitate completion of the overall project by 2021. The environmental impacts associated with this advanced temporary work are noted when applicable in the environmental review sections of this document. The work associated with the advanced temporary widening is listed below:

- Westbound between the I-694/494 interchange and TH 610, a 7-foot outside shoulder section will be reinforced. This work will begin in 2019 and be removed as part of the project completion.
- Westbound between TH 610 and TH 101, the temporary widening will be used as the base for the permanent lane in the westbound direction. This work will begin in 2019.
- Eastbound along the length of the project, the center shoulder will be reinforced with an 8-foot section.

Brockton Interchange

The Brockton interchange will include the construction of a new DDI interchange east of Brockton Lane in Dayton, Minnesota as shown on **Figure 8E**. The new 0.92-mile Dayton Parkway will be constructed as a four-lane roadway with signals and 12-foot-wide lanes in each direction at its new intersection on the east side of Brockton Lane, continue to the east, and then curve to the northeast with a four-lane bridge over I-94 and then continue to connect to CSAH 81 to the northeast. The DDI will have one-lane ramps in the four quadrants of the interchange.

Brockton Lane will be reconstructed for approximately 1,890 feet at the new Dayton Parkway intersection with two thru lanes, two left turn lanes, and one right turn lane in the northbound, southbound, and eastbound directions. The right turn lane in the southbound direction is for planned future development of the county road in this location to the west.

CSAH 81 will be reconstructed for approximately 3,175 feet at the new Dayton Parkway intersection with two thru lanes, two left turn lanes, and one right turn lane in the westbound and eastbound directions on CSAH 81 as well as two left turn lanes, one thru lane, and one right turn lane in the northbound direction.

Dayton Parkway will have an at-grade crossing of the BNSF railroad crossing just west of CSAH 81. A 10-foot-wide trail along Dayton Parkway will also be constructed.

Stormwater treatment via wet ponds and infiltration basins will be constructed to meet water quality and quantity treatment requirements.

The City of Dayton is responsible for acquiring right-of-way for the interchange location as well as removal of structures that are in the location of where Dayton Parkway will be constructed.

Elm Creek Rest Area

The Elm Creek Rest Area will be improved through the resurfacing of the parking lot and entrance/exit ramps (see **Figure 9**). Improvements will also include the addition of 12 parking spaces for semi-trucks and ADA improvements to sidewalks and parking lot to meet ADA requirements. No building improvements are proposed.

Commercial Vehicle Inspection Site

An inspection site for enforcement of commercial vehicle weight limits will be constructed along westbound I-94. The lane to the inspection site will be 20-foot-wide and located between 3,300 feet north of CSAH 81 and 6,300 feet south of TH 101 in Rogers (see **Figure 10**).

Deer Compost Area

There is a deer compost area located in the MnDOT right-of-way at the existing westbound MnDOT wayside in the City of Dayton. This deer compost area is within the Brockton interchange location and needs to be relocated from the current location. The deer composting location receives roadkill deer from the MnDOT highway system in the metro area. To address the waste, the deer are composted.

Deer composting involves the controlled, aerobic, biological decomposition of organic matter into a stable product. Composting allows natural decomposition to occur at a faster rate. The dead animals are placed on a concrete slab. Wood chips are layered over the dead animals. The temperature of the pile needs to be monitored to ensure the proper temperature of composting occurs. The wood chips keep scavenger animals and odors to a minimum.

A new deer composting area will be constructed to replace the existing area. While the area is currently proposed near the new Brockton interchange as shown on **Figure 11**, MnDOT and the City of Dayton will coordinate to find a location more suitable for both entities.

A summary of the impacts associated with the no build and preferred alternatives are listed in **Table 3**. The I-94-1b and 2b alternative has similar environmental impacts with I-94-1a and 2a except that it has more wetland and additional impervious surface impacts. However, Alternative I-94-1b and 2b provide better mobility, route consistency, reduced vehicle hours, and benefit/cost than 1a and 2a and therefore it is the preferred alternative. The DDI alternative provides the best operations and can handle future growth in the area. Additionally, it had lower wetland impact, lower floodplain impact, and the least amount of tree removal, farmland impact, and additional impervious surface. Therefore, the Brockton 3 DDI is the preferred alternative.

Table 3 - Summary of Impacts of the Preferred Alternative

Possible Impacts	Preferred Alternative		
	No Build Alternative	I 94 1b and 2b:	Brockton 3
Wetland Impact (acres)	0	2.0	1.9
Floodplain Impact (cubic yards)	0	1,850	18,590
Section 4(f) and 6(f) Impact	None	None – to be address with Limited Use Permits	No
Historic/Archaeological	No	No	No
Threatened and Endangered Species (state and federal)	No	No	No
Tree Removal	No	0.9 acre	5.48
Contaminated Materials	No	No	No
Visual Quality	No	No	No – consistent with corridor
Air Quality	No	No	No
Noise	No	Yes	No
Environmental Justice	No	No	No
Right of Way Impact (permanent right of way acquisition)	None	Low	Medium
Farmland Impacts (acres)	None	None	9.3
Additional Impervious (acres)	0	17	16.7
Change in Daily Vehicle Hours of Travel from 2040 No-Build	0	1320	Included in Added Lanes
Change in Daily Vehicle Miles of Travel- from 2040 No-Build	0	18,257	Included in Added Lanes
Construction Cost	0	\$9,175,100	To Be Determined
Net Benefit Compared to No-Build	0	\$94,180,000	Included in Added Lanes

FIGURES

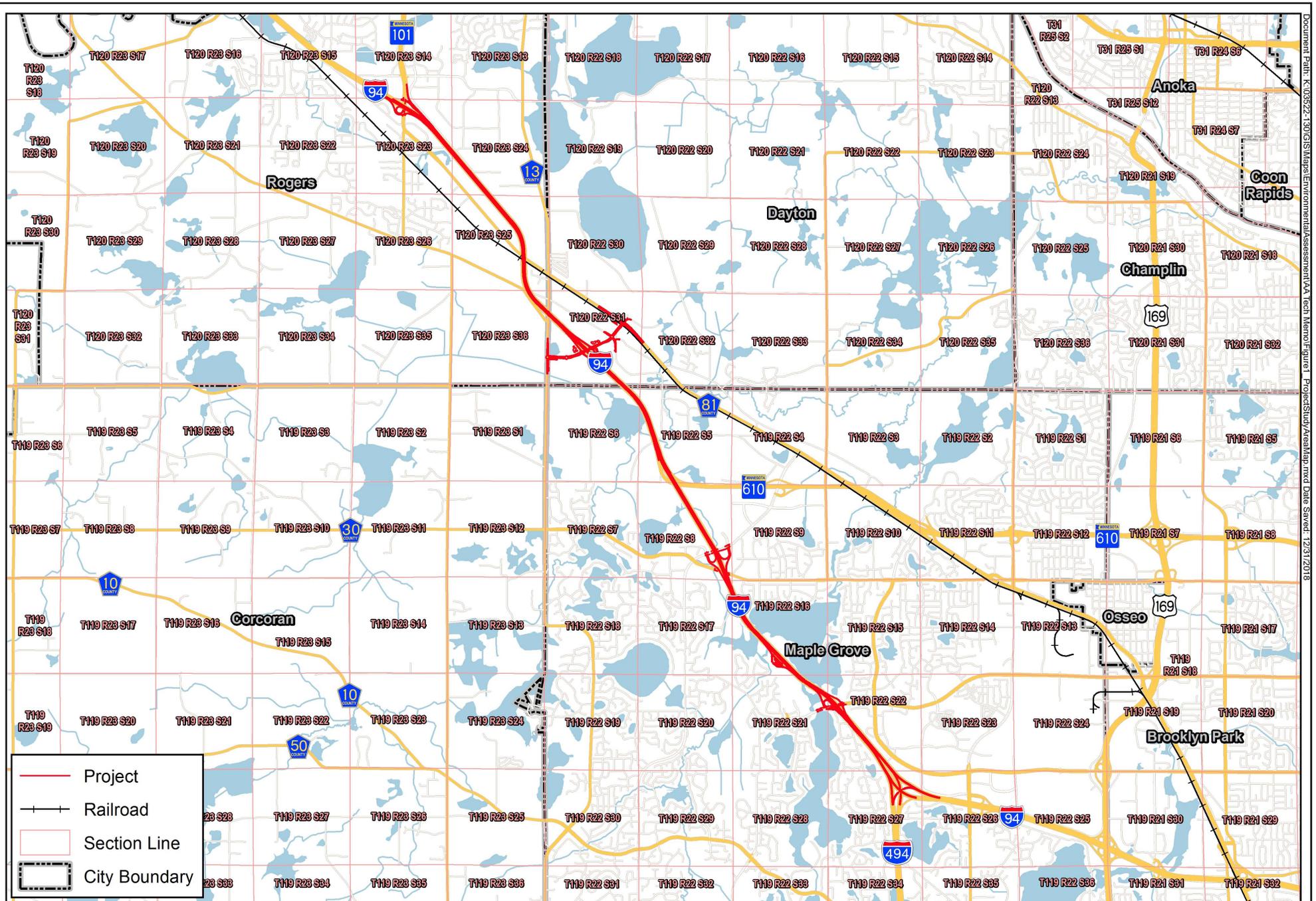
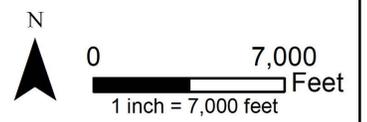


Figure 1 - Project Study Area Map
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota



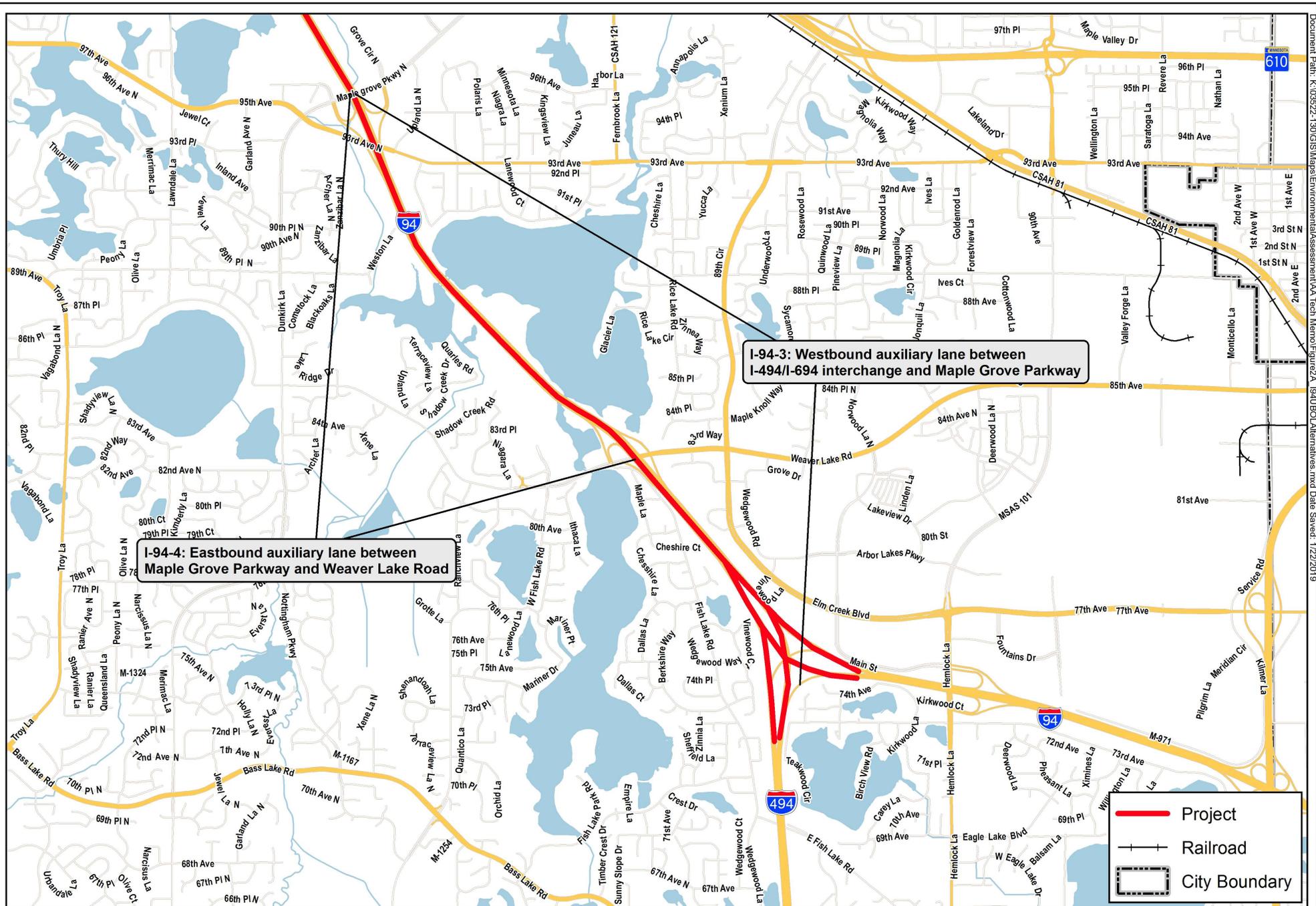
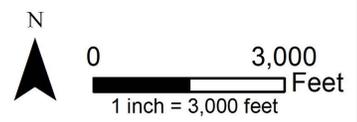


Figure 2A - I-94 UBOL Alternatives
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota



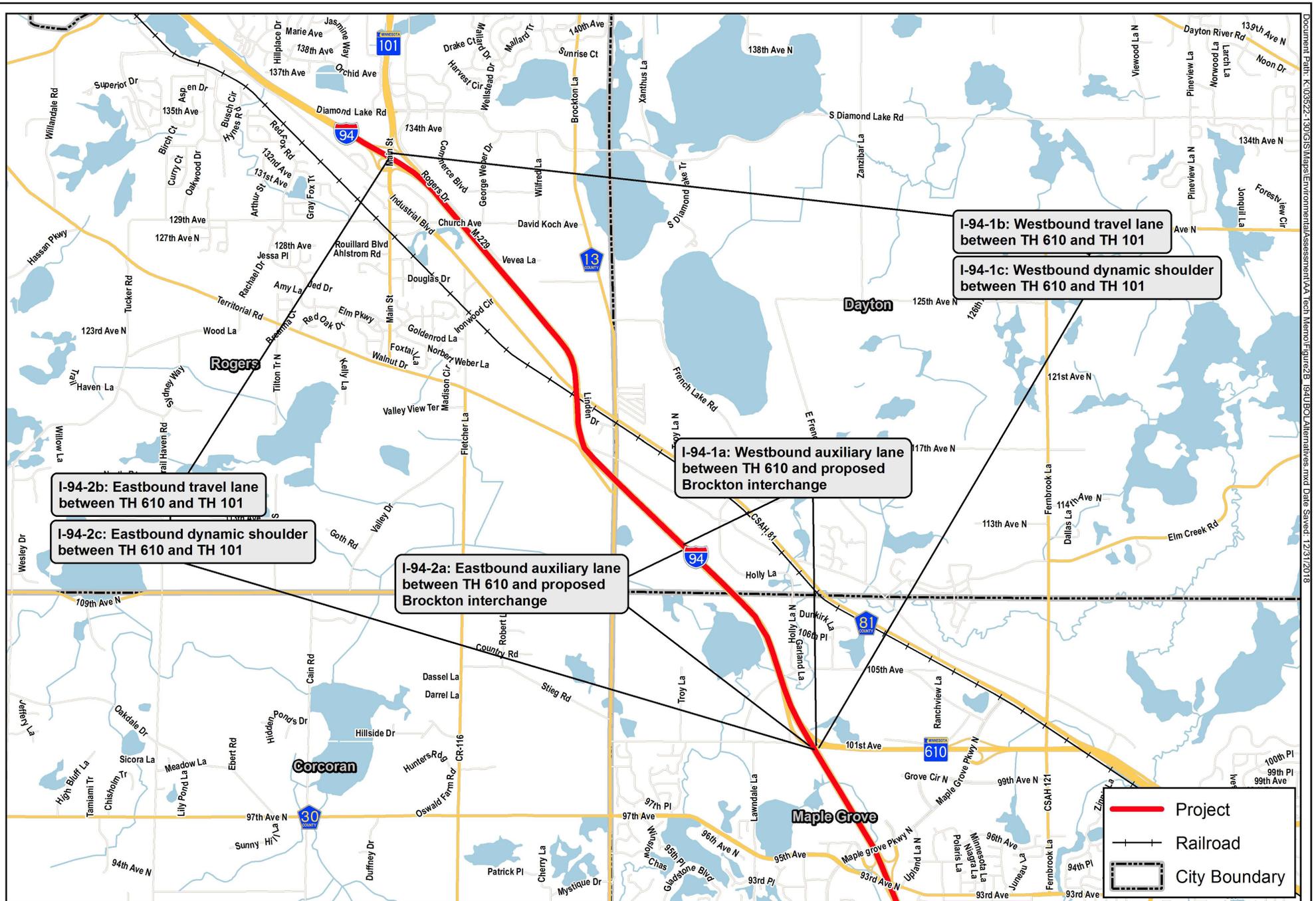
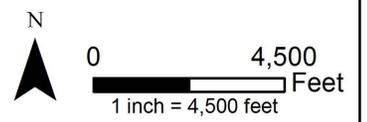
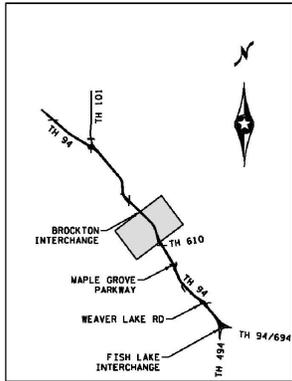
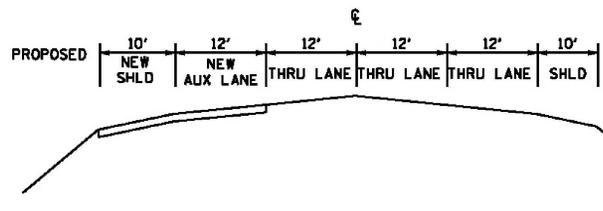


Figure 2B - I-94 UBOL Alternatives
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota

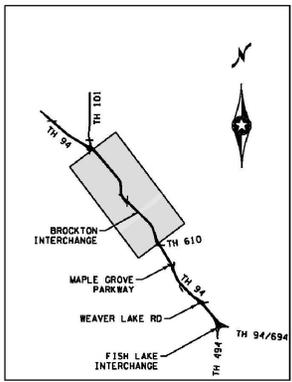
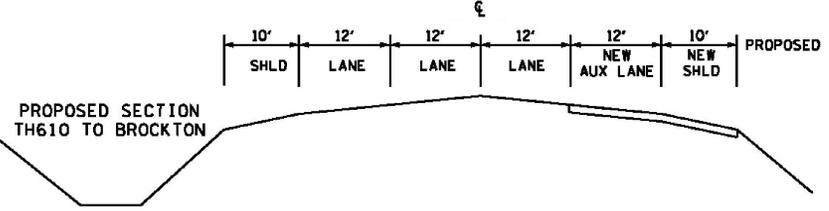




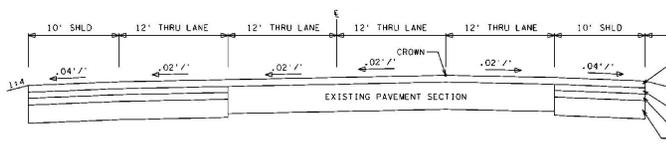
I-94-2a: Eastbound auxiliary lane between TH 610 and proposed Brockton interchange



I-94-1a: Westbound auxiliary lane between TH 610 and proposed Brockton interchange



I-94-2b: Eastbound travel lane between TH 610 and TH 101



I-94-1b: Westbound travel lane between TH 610 and TH 101

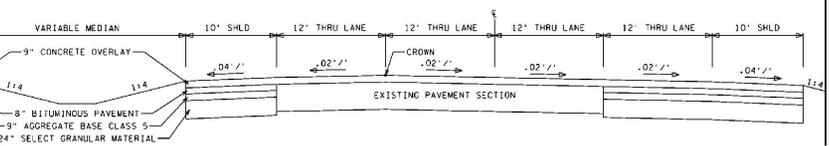
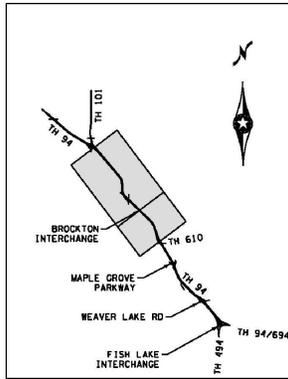
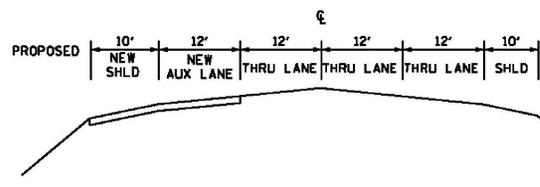


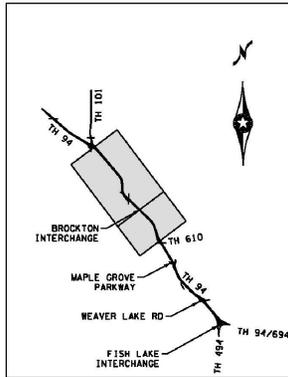
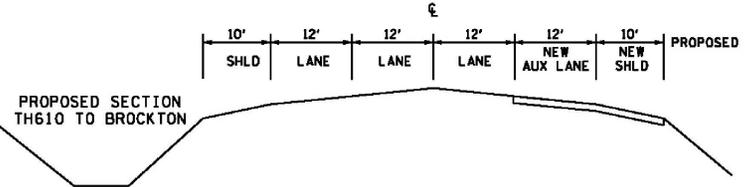
Figure 3A - I-94 UBOL Alternatives (Typical Sections)
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota



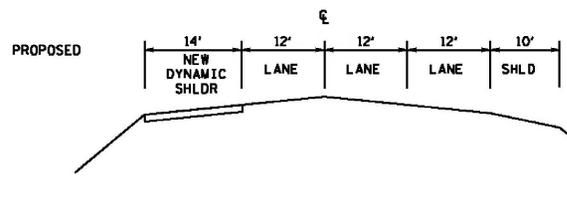
I-94-2c: Eastbound dynamic shoulder between TH 610 and TH 101



I-94-1c: Westbound dynamic shoulder between TH 610 and TH 101



I-94-2c: Eastbound dynamic shoulder between TH 610 and TH 101



I-94-1c: Westbound dynamic shoulder between TH 610 and TH 101

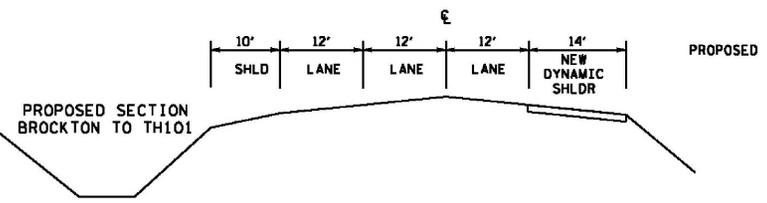


Figure 3B - I-94 UBOL Alternatives (Typical Sections)
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota

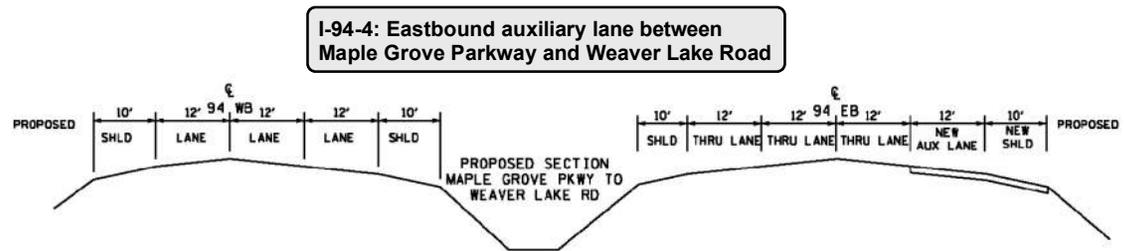
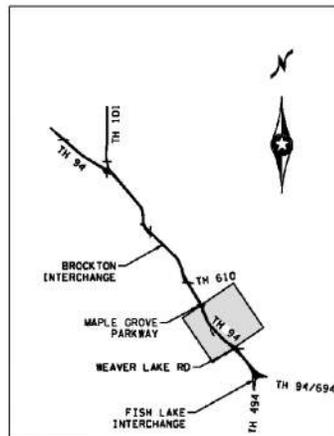
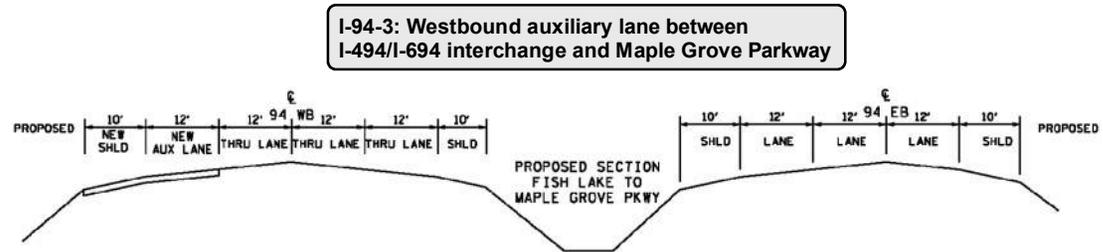
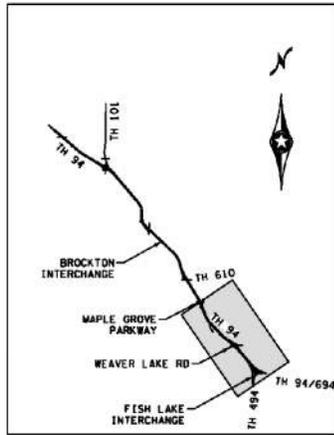
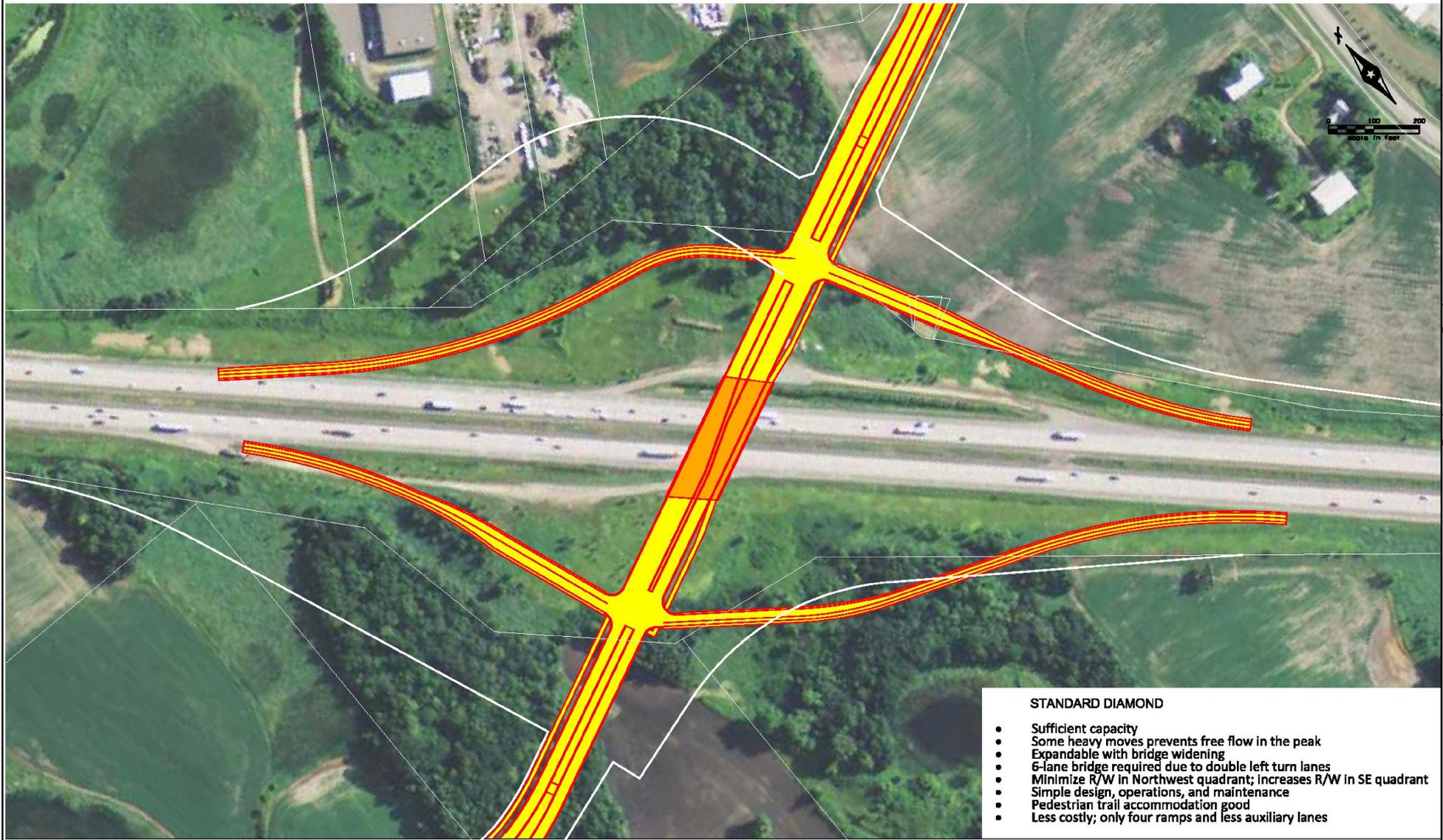


Figure 3C - I-94 UBOL Alternatives (Typical Sections)
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota



Figure 4 - Brockton Interchange Alternative 1: Partial Cloverleaf
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota

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STANDARD DIAMOND

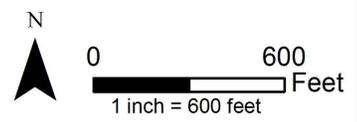
- Sufficient capacity
- Some heavy moves prevents free flow in the peak
- Expandable with bridge widening
- 6-lane bridge required due to double left turn lanes
- Minimize R/W in Northwest quadrant; increases R/W in SE quadrant
- Simple design, operations, and maintenance
- Pedestrian trail accommodation good
- Less costly; only four ramps and less auxiliary lanes

Figure 5 - Brockton Interchange Alternative 2: Standard Diamond
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota



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Figure 6 - Brockton Interchange Alternative 3: Diverging Diamond
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota



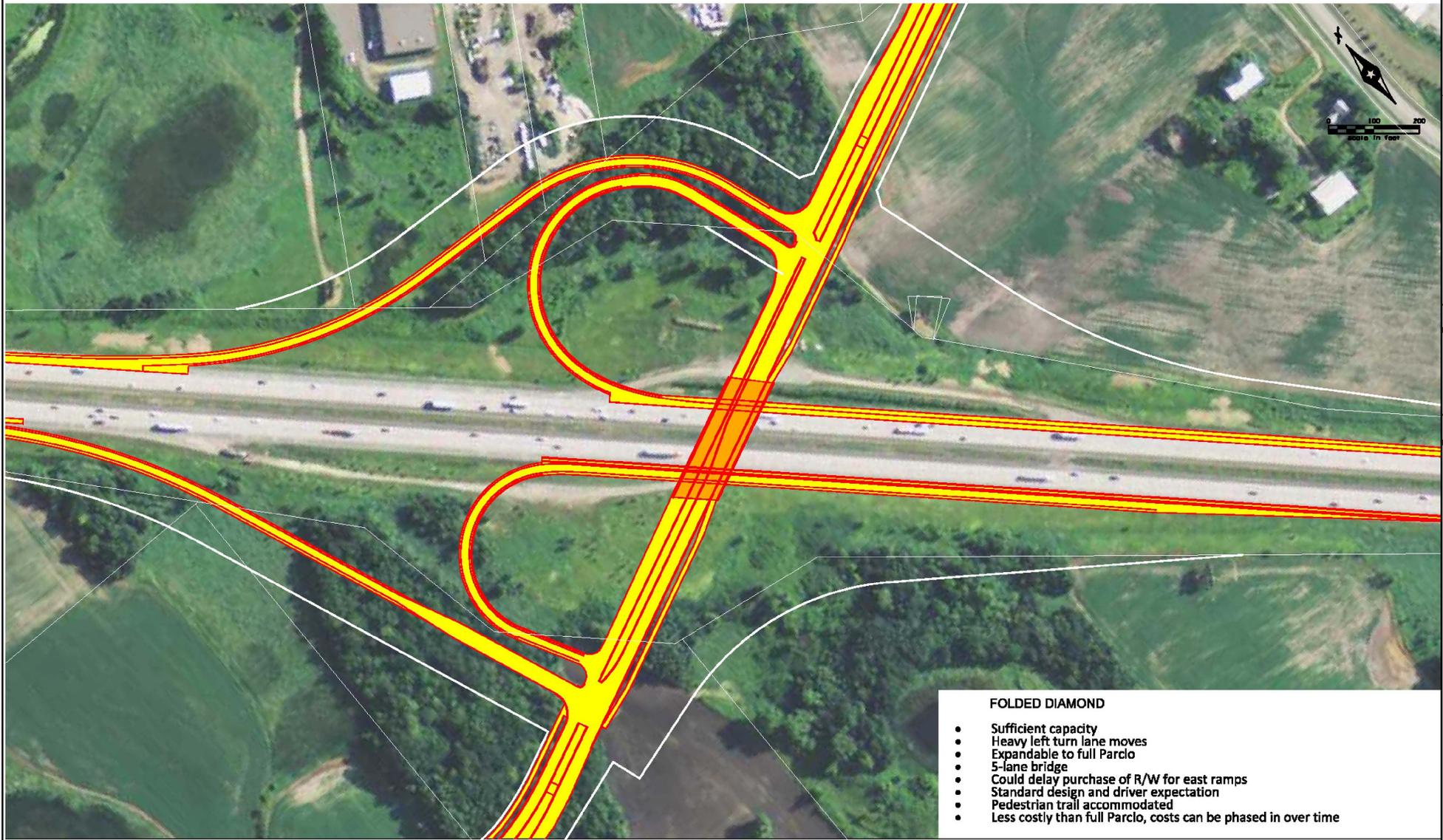
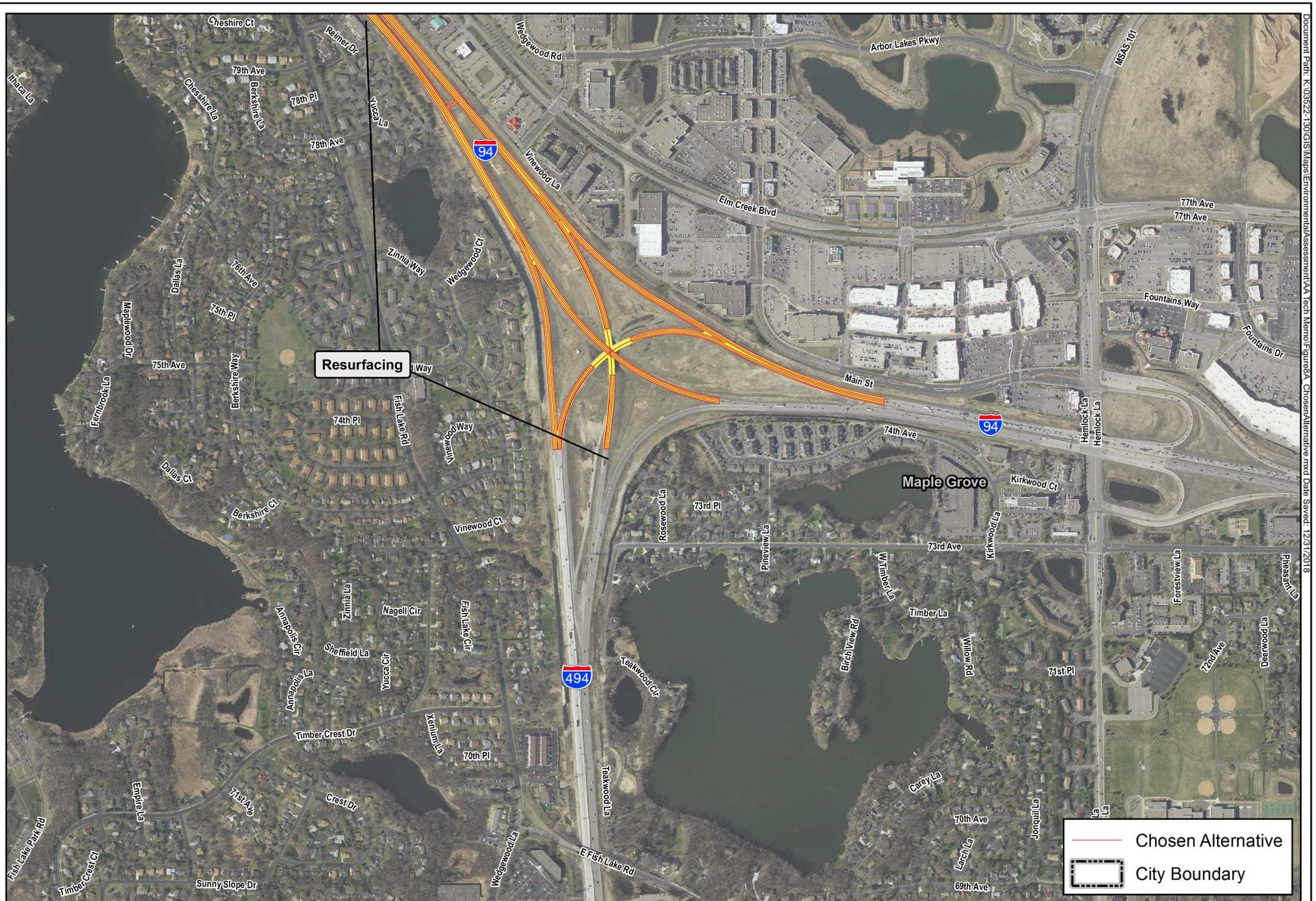


Figure 7 - Brockton Interchange Alternative 4: Folded Diamond
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota



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Figure 8A - Chosen Alternative
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota

Chosen Alternative
 City Boundary

N

0 1,000
 Feet
 1 inch = 1,000 feet

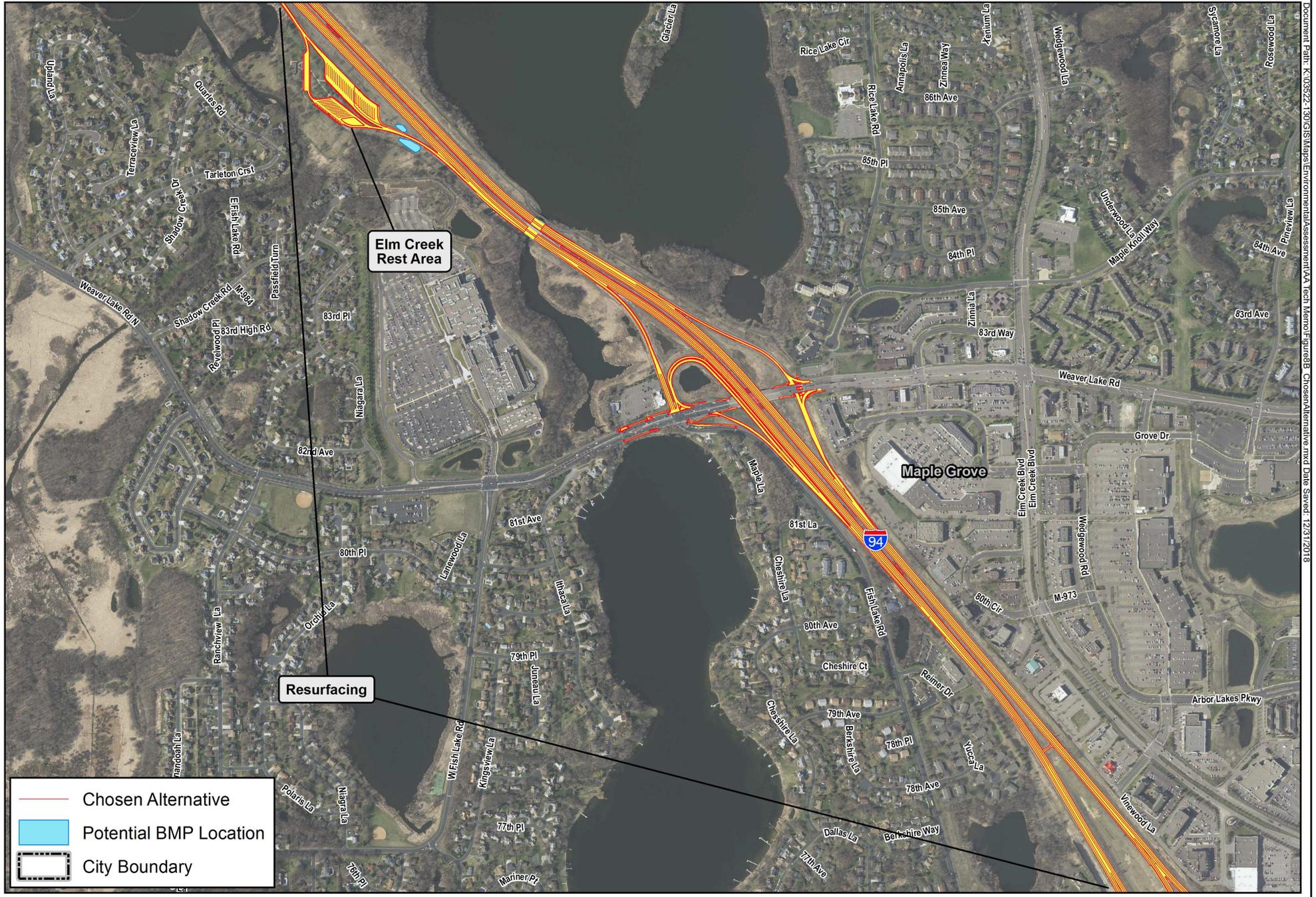
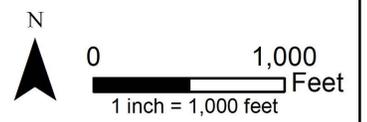


Figure 8B - Chosen Alternative
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota



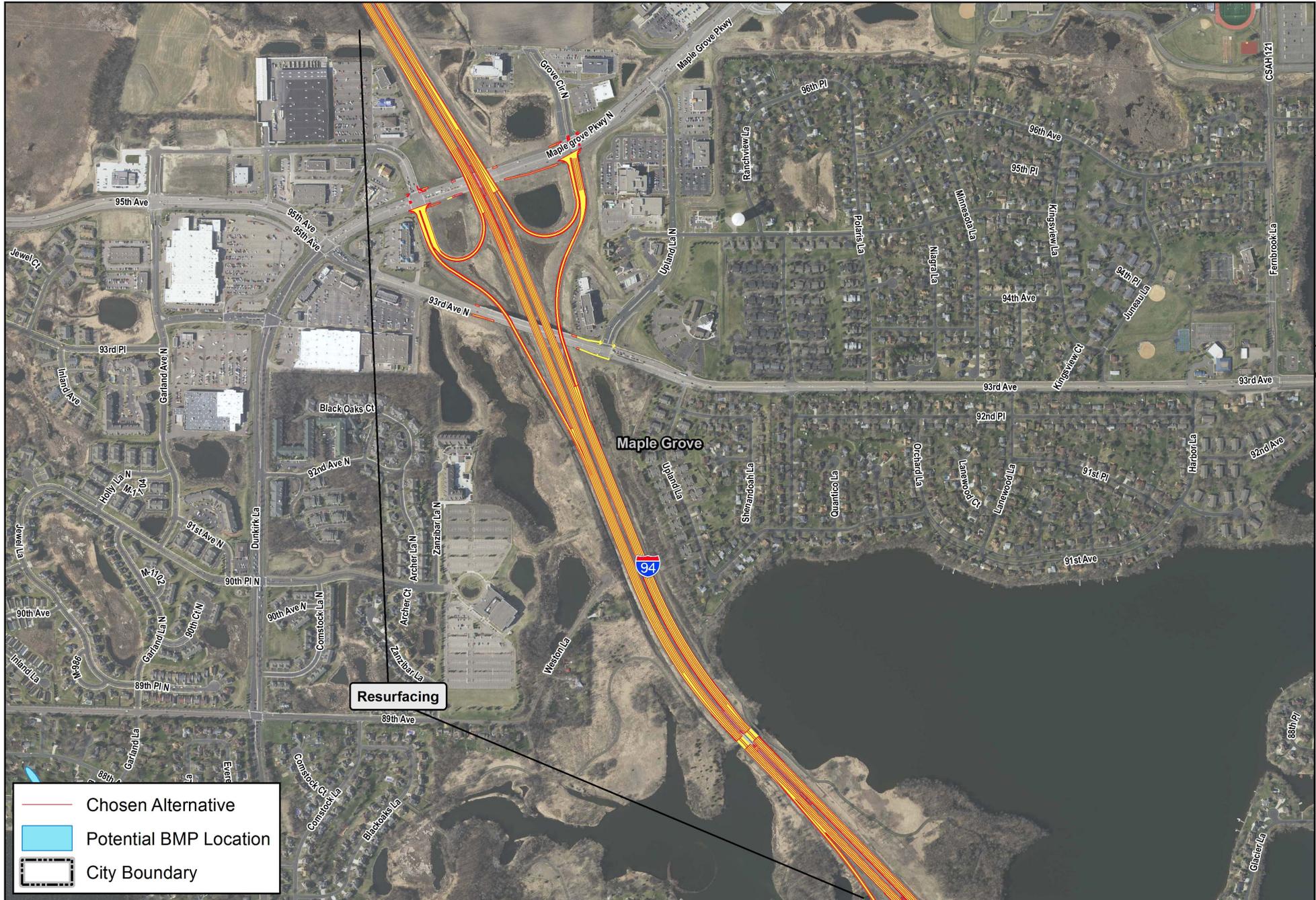


Figure 8C - Chosen Alternative
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota

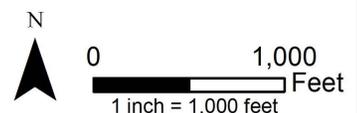
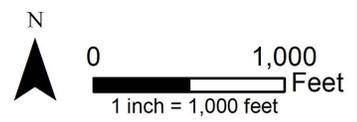




Figure 8D - Chosen Alternative
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota



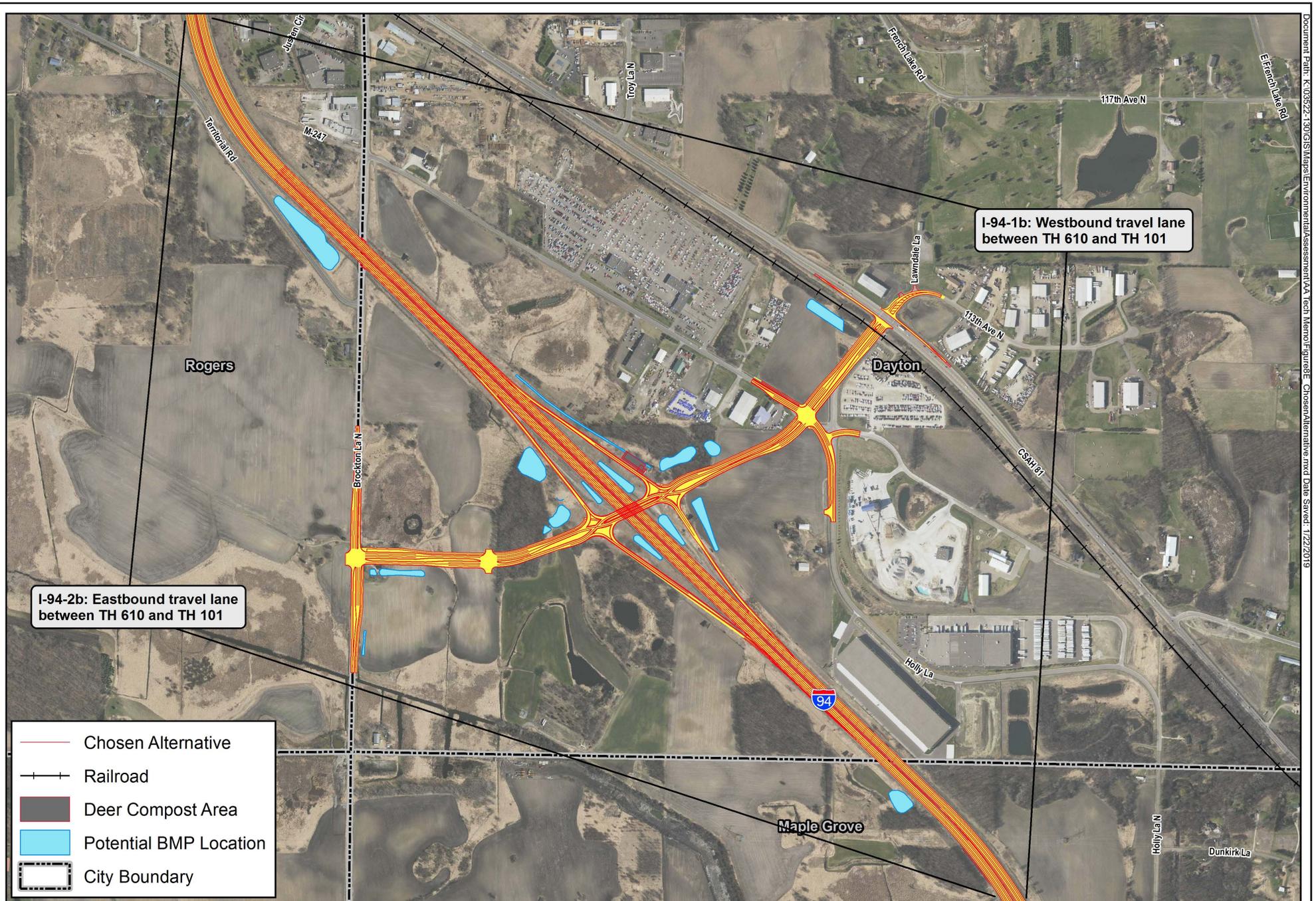


Figure 8E - Chosen Alternative
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota

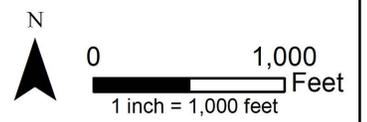




Figure 8F - Chosen Alternative
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota

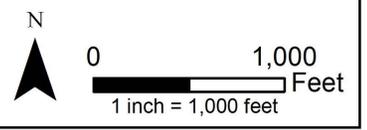




Figure 8G - Chosen Alternative
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
 S.P. 2780-97
 MnDOT and City of Dayton, Minnesota

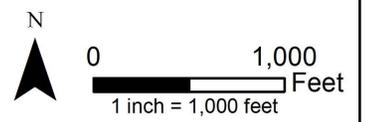




Figure 9 - Elm Creek Rest Area Proposed Improvements
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota

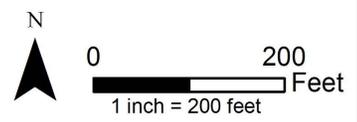




Figure 10 - Commercial Vehicle Inspection Site
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota

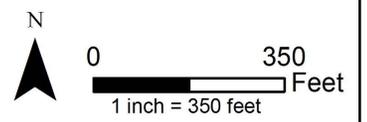




Figure 11 - Deer Compost Area
I-94 UBOL Resurfacing Maple Grove to Rogers and Brockton Interchange
S.P. 2780-97
MnDOT and City of Dayton, Minnesota

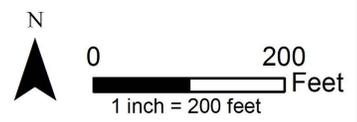


Exhibit A
Supporting Documentation



City of
Maple Grove



CITY OF
DAYTON



THE CITY OF
ROGERS
MINNESOTA

July 26, 2018

April Crockett
MnDOT West Area Manager of Program Delivery
1500 West Co Rd B-2
Roseville, MN 55113
Dear Ms. Crockett:

As representatives of the cities of Dayton, Maple Grove, and Rogers, we are excited to see the progress toward the start of the 2020 I-94 Unbonded Overlay project between I-494 and TH101. We recognize the importance of this project in maintaining and extending the useful life of the existing regional transportation network.

As you are well aware, additional capacity along this segment of I-94 is very much needed. The free flow of traffic is critical to the long term viability of our local communities – both economically and in terms of livability – in addition to being necessary for regional travel and commerce.

We understand that the current project scope includes auxiliary lanes eastbound and westbound, from TH 610 to the Brockton Interchange. We are requesting, via this letter, that these lanes be continued as additional lanes (add lanes) through/under TH 101, connecting with the existing auxiliary lanes between TH 101 and HWY 241. Extending the additional lanes will ensure full movement to/from TH 101 and will allow the local roadway system to function as designed, without further overloading from the Brockton Interchange if the lanes are stopped there.

This project, along with the construction of the Brockton Interchange, represents an exciting potential to reshape and improve regional traffic movement while beginning to alleviate current congestion and while anticipating a rise in traffic movement through the TH 101 and I-94 corridor with the completion of Corridors of Commerce projects on TH 169 and I-94. The inclusion of eastbound and westbound add lanes from TH 610 through TH 101 in this project will support state and local economic development, increased freight mobility, improved safety, and an improved quality of life via reduced commuting times.

Local investments in projects such as the Brockton Interchange and other previous improvements illustrate the commitment by our communities to remain partners in solving regional traffic issues. Along with such local investment, federal and state investment in the upcoming Corridors of Commerce projects on TH 169 and I-94 reflect a recognition that significant expansion of the regional transportation network is needed in this area.

Finally, it is our strong preference and respectful request that additional capacity be achieved via the addition of permanent add lanes, as opposed to dynamic shoulders or other managed lane concepts. We therefore support the inclusion of full additional lanes from TH-610 under and through TH 101 as part of these projects.

Thank you for your consideration and for your continued partnership on these important improvements.

Sincerely,

Tim McNeil
Mayor of Dayton

Mark Steffenson
Mayor of Maple Grove

Rick Ihli
Mayor of Rogers

Cc: Jerome Adams, MnDOT Project Manager

August 2, 2018



April Crockett
MnDOT West Area Manager of Project Delivery
1500 West Co Rd B-2
Roseville, MN 55113

Dear Ms. Crockett,

As a coalition, we are deeply invested in the growth and development of the I-94 West Corridor. We are looking forward to the upcoming I-94 Unbonded Overlay project between I-494 and TH 101 that is expected to begin in 2020. This is a vital project that will directly contribute to the long-term success of the corridor. We strongly encourage and support adding needed permanent lane capacity along the corridor with this project.

We understand that the current project scope includes adding auxiliary lanes eastbound and westbound from TH 610 to the Brockton Interchange. We are respectfully requesting that these lanes be continued in both directions as additional lanes through/under TH 101, connecting with the existing auxiliary lanes between TH 101 and HWY 241. Extending these additional lanes to/from/through TH 101 will allow the local roadway and interstate/highway system to function as planned/designed without further overloading any one interchange.

Permanent add lanes will reduce regional traffic issues and should be implemented, as opposed to dynamic shoulders or other managed lane options. Adding eastbound and westbound lanes from TH 610 through TH 101 will benefit state and community development, increased freight mobility, improve safety and enhance the quality of life due to a reduction in commute time.

Our state and region's economy require a sound transportation system that supports growth by connecting people, businesses, jobs, and resources. The traffic congestion and issues caused by the current lack of efficient transportation infrastructure is detrimental by this growth. As our state and region continues to grow, our infrastructure should be able to serve its purposes as people travel from the Metro to the rest of the state.

The proposed projects are positioned to have an immediate and long-lasting impact on our communities and the state as a whole. As a voice for transportation growth, the Coalition is asking that you extend your support for permanent capacity improvements along these vital transportation projects.

Sincerely,

A handwritten signature in blue ink that reads 'Steve Bot'.

Steve Bot
I-94 West Corridor Coalition Chair

Cc: Jerome Adams, MnDOT Project Manager
Brian Isaacson, MnDOT Metro District Planning Director