

6.0 CONCLUSIONS

The following section provides a general summary of the Traffic Impact Study (TIS) prepared for Empire Township, including a brief summary of each chapter. However, it is recommended that the reader review the document in its entirety, to understand the methodology, results and conclusions made in preparing the traffic analysis.

6.1 Project Description and Purpose

A consortium of mine operators and landowners propose to open new mines and expand existing aggregate mining areas to include a total area of approximately 3,600 acres in the northwest portion of Empire Township, Dakota County. Mining would be conducted in a similar manner to the current practices at existing mines within and adjacent to the Mining Area.

The various mine operators have investigated the potential for aggregate production in this area. In addition, the Minnesota Geologic Survey (MGS), Minnesota Department of Natural Resources (DNR), Metropolitan Council (METC) and local governments have conducted studies of available mineral aggregates in the metropolitan area. These studies, together with investigations conducted by mining companies, have revealed extensive reserves of mineral aggregates in portions of Empire Township. Over the next 30 to 40 years the Mining Consortium will remove and process approximately 200 million tons of sand and gravel reserves within the Mining Area.

This TIS has been prepared to provide a detailed analysis of potential traffic impacts that may result from the proposed project, and to identify options for mitigating these impacts. The findings of this study will be incorporated into the EIS.

6.2 Project Methodology and Assumptions

The analysis approach for the Empire Township TIS was to evaluate the existing conditions to develop a base condition for determining the impact of future land use development on the traffic network within the study area. Consideration of other relevant development traffic generation and applying the forecast Mining Area site-generated traffic to the analysis network was also included to obtain forecast conditions for analysis and comparison.

- A total of 20 key intersections along 160th Street, TH 3, Pilot Knob Road and 170th Street were identified and included in the traffic analysis. In addition, two at-grade railroad crossings on 160th Street and 170th Street were evaluated for potential impacts to upstream intersections.
- In addition to accounting for regional background growth projections in the traffic analysis, four planned land development parcels were

also considered. These planned developments include the 781-acre Farmington/Seed Genstar, 154 acre Heritage, Brandtjen/Nordic Square and Cobblestone Lake parcels.

- The traffic analysis was conducted for the Existing Year 2004 Conditions, two Forecast Year 2005 Conditions, three Forecast Year 2015 Conditions and three Forecast Year 2025 Conditions; each during the AM and PM peak periods. Each study year period evaluated a No-Build and Build scenario. Under the 2015 and 2025 Forecast Conditions, the No-Build scenarios included an evaluation of a background growth only, and a background growth plus planned future developments condition. The Build scenarios evaluated the mining operation plus background growth plus planned future developments condition.
- A comparison between the No-Build and Build conditions for each study year allowed the study to identify the level of impacts that will be expected as a result of the background growth, the impact of the four planned future land developments and the additional impacts of the proposed mining project.
- The traffic analysis evaluated existing traffic data to determine the peak period for evaluation. As a result, the traffic analyses were completed for the typical weekday AM and PM peak hour periods.
- Seasonal adjustment factors were developed and applied to convert field collected traffic data to annual average weekday traffic volumes. The Mining Consortium provided existing records to support the development of the seasonal mining export factors. As a result, the peak month of October was used as the basis for the traffic impact evaluation.
- Amongst intersection turning movement, hourly tube, signal timing and roadway characteristics data collection, commercial truck percentages were field collected on roadways surrounding the proposed project and included in the traffic analysis. The peak hour truck percentages on the surrounding roadways were found to range from 7 to 28 percent. The traffic analysis utilized these percentages as the base condition and made subsequent adjustments to account for the addition and/or relocation of the projected mining truck forecasts.
- Although no capital improvement projects are planned within the study area, several improvement measures are required as a result of the environmental reports prepared for Genstar, Brandtjen and Cobblestone Lake residential developments. These measures are required to accommodate traffic volumes at the full development potential. Therefore, the previous study report mitigation plans were considered a base condition in this TIS. The improvement measures required as a result of the planned residential development studies are listed in Section 6.4.1.

- The forecast No-Build traffic generation estimates were developed based on the Dakota County Regional Model, the 2025 Dakota County Official Forecasts and all traffic projections made in the Cobblestone Lake AUAR, Genstar AUAR and Brandtjen EAW.
- The four planned development parcels are expected to generate an additional 4,965 AM peak hour, 6,929 PM peak hour and 75,500 daily vehicle trips by Year 2015, above and beyond regional background growth, on the roadway system. By Year 2025, the four planned development parcels are expected to generate 5,453 AM peak hour, 7,505 PM peak hour and 82,300 daily vehicle trips, above and beyond regional background growth, on the roadway system. The No-Build volumes with respect to the planned developments were distributed and assigned to the roadway network consistent with the previously prepared AUAR and EAW documents.
- The mining company phasing, methodologies for developing existing and future material export quantities, plant locations and access points under both the No-Build and Build Conditions for the forecast years 2005, 2015 and 2025 were documented. These items formulate the foundation for the expected traffic generation as a result of the proposed project.
- The mining companies currently generate truck and other mining site related traffic under the existing condition due to nearby facilities and currently leased properties. Into the future, the mining companies are expected to generate traffic under both the No-Build and Build cases; however, under substantially different levels. Based on the trip generation methodology and procedures employed, documented in Section 2.6.3, the proposed project is expected to generate the following number of total trips (truck volume plus other vehicle volume):
 - 2004 Existing: 503 AM peak hour, 299 PM peak hour and 6,346 daily vehicle trips.
 - 2005 No-Build: 513 AM peak hour, 306 PM peak hour and 6,475 daily vehicle trips.
 - 2005 Build: 528 AM peak hour, 313 PM peak hour and 6,649 daily vehicle trips.
 - 2015 No-Build: 109 AM peak hour, 66 PM peak hour and 1,568 daily vehicle trips.
 - 2015 Build: 779 AM peak hour, 450 PM peak hour and 9,665 daily vehicle trips.
 - 2025 No-Build: 40 AM peak hour, 24 PM peak hour and 408 daily vehicle trips.

- 2025 Build: 1,041 AM peak hour, 595 PM peak hour and 12,827 daily vehicle trips.
- The proposed project equates to increase of 3,319 total vehicles between 2015 and existing conditions and approximately 6,481 total vehicles between 2025 and existing conditions.
- The regional directional distributions were developed based on evaluating the Mining Consortium proposed market areas and utilizing the Metropolitan Council growth projections. Mining vehicle trips were assigned to roadways and intersections based on trip routes developed using the travel demand model and reviewing logical trip paths.

6.3 Traffic Operation Analysis

In order to determine the impacts of the proposed project on the surrounding roadway network, a traffic operation analysis has been performed. The analysis process includes determining LOS and queue lengths at each of the key intersections for the existing and future conditions described previously.

- The analysis was conducted based on the established methodologies in the Highway Capacity Manual, 2000 Edition, using the computer software Synchro. Synchro was used to evaluate the signalized intersections within the study area. The unsignalized intersections were analyzed using SimTraffic, a microscopic computer model, more appropriate for estimating operations at stop controlled intersections.
- Deficiencies in the overall intersection delay, the individual movement delay and the movement queues were identified and evaluated to determine the impacts to the intersection and overall system traffic operations.

6.3.1 Existing Condition

The analysis found that the existing roadway network is able to accommodate the current traffic levels. No operational deficiencies were found during the AM and PM peak hours of traffic with exception to the Cedar Avenue/160th Street intersection. During the PM peak hour Cedar Avenue and 160th Street intersection experiences occasional periods of congestion and vehicle queuing.

6.3.2 Forecast Year 2005 Conditions

Operationally, it does not appear that the system will be impacted by the future Year 2005 conditions.

1. The 2005 No-Build (background growth only) scenario

All intersections were found to be operating at acceptable levels during both the AM and PM peak hours. The only exception is the Cedar Avenue/160th

Street intersection, which is expected to operate poorly during the PM peak hour.

2. 2005 Build (mining operation plus background growth only) scenario

Similarly, all intersections were found operating at acceptable levels during both the AM and PM peak hours. The only exception is the Cedar Avenue/160th Street intersection, which is expected to operate poorly during the PM peak hour.

The results of the analysis found no impacts with respect to the proposed project.

6.3.3 Forecast Year 2015 Conditions

The results of the traffic analysis for the 2015 conditions found significant intersection deficiencies due to the four planned developments. Additional impacts due to the proposed project were also found.

1. 2015 No-Build (background growth only) and 2015 No-Build (background growth plus planned land developments) scenarios.

In general, either a vehicle delay or queue length deficiency was identified during either the AM or PM peak periods (Refer to Section 4.3.1 for additional details and discussion). The following list all deficient intersections found in the 2015 No-Build analysis:

- 150th Street at Pilot Knob Road
- Cedar Avenue at 160th Street
- TH 3 at 170th Street
- Pilot Knob Road at Dodd Boulevard
- Pilot Knob Road at 170th Street
- 160th Street at Pilot Knob Road
- TH 3 at Elm Street

2. 2015 Build (mining operation plus background growth plus planned land developments) scenario.

Additional deficiencies specific to the proposed project were identified at the following intersections (Refer to Section 4.3.1 for additional details and discussion). If an intersection is already listed above, and is now listed below, the proposed project has created an additional deficiency requiring a separate mitigation measure.

- TH 3 at 160th Street
- TH 3 at 170th Street

6.3.4 Forecast Year 2025 Conditions

The results of the traffic analysis for the 2025 conditions found significant intersection deficiencies due to the four planned developments. Additional impacts due to the proposed project were also found.

3. 2025 No-Build (background growth only) and 2025 No-Build (background growth plus planned land developments) scenarios.

In general, either a vehicle delay or queue length deficiency was identified during either the AM or PM peak periods (Refer to Section 4.3.1 for additional details and discussion). Most deficiencies found in 2015 are only worsened in the 2025 scenarios; however, a few additional intersection deficiencies were identified. The following list all deficient intersections found in the 2025 No-Build analysis:

- 150th Street at Pilot Knob Road
- Cedar Avenue at 160th Street
- TH 3 at 170th Street
- TH 3 at Elm Street
- Pilot Knob Road at Dodd Boulevard
- Pilot Knob Road at 170th Street
- 160th Street at Pilot Knob Road
- 160th Street at Galaxie Avenue
- TH 3 at 150th Street

4. 2025 Build (mining operation plus background growth plus planned land developments) scenario.

Additional deficiencies specific to the proposed project were identified at the following intersections (Refer to Section 4.3.1 for additional details and discussion). If an intersection is already listed above, and is now listed below, the proposed project has created an additional deficiency requiring a separate mitigation measure.

- TH 3 at 160th Street
- TH 3 at 170th Street
- Pilot Knob Road at 170th Street

6.3.5 Railroad Grade Crossing

An analysis of the two at-grade railroad crossing was completed under each of the scenarios for the existing Year 2004, forecast Year 2005, forecast Year 2015 and forecast Year 2025 conditions. The consideration in the railroad grade crossing queue analysis was to determine if the train crossings will produce a vehicle

queue long enough to impact adjacent intersection operations. The results of the analysis found that an impact is not expected in any of the scenarios.

6.4 Improvement and Mitigation Options

To address traffic operation deficiencies, potential improvement and mitigation options were developed and evaluated. In the following, the term “improvement” refers to any measure required to improve the transportation system due to impacts resulting from the background growth projections or the four planned land developments. The term “mitigation” refers to any measures required to correct impacts, specifically as a result of the proposed project.

As presented previously, the projected increase in traffic volumes as a result of background regional growth and the four planned developments (Genstar, Brandtjen, Cobblestone and Heritage) were found to be the primary traffic impact. As such, significant improvement measures are expected to be necessary in the future to accommodate this anticipated traffic growth. The potential improvement measures were generally found to provide sufficient excess capacity to accommodate the proposed project traffic volume increase. However, a few additional mitigation strategies were found necessary to mitigate for localized impacts.

6.4.1 Improvements Required by Planned Residential Development Studies

The improvement measures refer to those items identified as part of the previous EAW and AUAR traffic studies completed for the Cobblestone Lake, Brandtjen and Genstar developments¹ to mitigate their individual impacts. **Figure 6-1** and the following detail the improvements required by Year 2015 as a result of the planned residential development studies.

1. 160th Street at Aggregate Industries Mining Access (future Cobblestone Lake and Brandtjen Entrance)
 - On the north approach, provide one left turn lane and one shared through/right-turn lane.
 - On the south approach, provide one left turn lane and one shared through/right-turn lane.
 - Install a traffic signal.
2. 160th Street at Diamond Path
 - On the north approach, provide one left turn lane, one through lane and one right turn lane.
 - On the south approach, provide one left turn lane, one through lane and one right turn lane.

¹ An environmental review was not required for the Heritage development.

- Extend Diamond Path southward to 170th Street.
 - Install a traffic signal.
3. Pilot Knob Road at Dodd Boulevard

On the east approach, provide one shared through/left turn lane and one exclusive right turn lane. (The following section will provide an improvement to this approach).
 4. Construct the 195th Street extension.
 5. Construct the 208th Street extension
 6. On TH 3, provide a four-lane cross-section from north of Elm Street to approximately 500 feet north of 160th Street. (The following section will provide further improvement to TH 3).
 7. Provide an exclusive 300-foot left turn and right turn lane on both the northbound and southbound approaches at the TH 3/170th Street intersection.

6.4.2 Improvements Not Previously Identified

In addition to the measures listed previously in Section 6.4.1, several additional improvement measures will be required to accommodate traffic generated from the background growth and the four planned land developments (Brandtjen, Cobblestone Lake, Genstar and Heritage). **Figure 6-2** illustrates the additional improvements required to accommodate the planned residential developments.

Of the measures illustrated in **Figure 6-2**, the following improvements are required by Year 2015:

1. Cedar Avenue at 160th Street (Refer to Section 5.2.3)
 - Reconstruct northbound and southbound to include three through lanes in each direction.
 - Add dual left turn lanes on all four approaches. The southbound left turn lanes should provide at least 400 feet of storage.
2. Pilot Knob Road

Reconstruct Pilot Knob Road to include three lanes of travel in both the northbound and southbound directions. The six-lane section should extend from 150th Street to south of 170th Street.
3. 150th Street

Reconstruct 150th Street to include three lanes of travel in both the eastbound and westbound directions. The six-lane section should begin and end at a point between TH 3 and Pilot Knob Road and then extend westward. Although the study area did not evaluate intersections west of

Pilot Knob Road, it is expected the six-lane section would need to be continued west of Cedar Avenue into Burnsville.

4. 150th Street at Pilot Knob Road

- In addition to the eastbound/westbound six lane section, construct a free right turn movement for eastbound-to-southbound. The eastbound-to-southbound right turn movement should be designed to allow a continuous right turn movement into its own dedicated lane of travel. The dedicated lane would be the start of the third southbound travel lane on Pilot Knob Road.
- Add a second left turn lane on both the eastbound and westbound approaches.

5. 160th Street at Pilot Knob Road

In addition to the northbound/southbound six lane section, construct a second left turn lane on the southbound approach.

6. Pilot Knob Road at 170th Street

- In addition to the northbound/southbound six lane roadway, reconstruct both the eastbound and westbound approaches to include one exclusive left turn lane, one through lane and one exclusive right turn lane. The westbound left turn lane and right turn lanes should include approximately 450 feet of storage.
- Change the eastbound and westbound signal phasing to a protected/permissive left turn operation.

7. TH 3 at 170th Street

Install a traffic signal with protected left turn phasing for northbound/southbound TH 3 and permissive only phasing for eastbound and westbound left turn movements.

8. TH 3 at Elm Street

Extend the northbound left turn lane to include 300 feet of storage.

Of the measures illustrated in **Figure 6-2**, the following improvements are required by Year 2025, in addition to those required by 2015:

1. 160th Street

Reconstruct 160th Street to include three lanes of travel in both the eastbound and westbound directions. The six-lane section should begin and end at a point just west of Diamond Path and then extend westward beyond Cedar Avenue. The transition point, west of Cedar Avenue, should be included in the scope of a future traffic study.

2. 160th Street at Galaxie Avenue

- In addition to the eastbound/westbound six lane roadway, construct a second left turn lane on the southbound approach. The southbound approach should consist of two left turn lanes and one shared through/right turn lane. The left most left turn lane should include approximately 300 feet of storage. The right most left turn lane should extend the full length of roadway.
 - Re-strip the northbound approach to include one exclusive left turn lane and one shared through/right turn lane.
 - Change the northbound/southbound left turn phasing to protected only.
3. Pilot Knob Road at Dodd Boulevard
 - Add a second left turn lane on the eastbound approach with approximately 300 feet of storage.
 - Change the lane assignment on the westbound approach to one left turn lane and one shared through/right turn lane.
 - Change the eastbound/westbound left turn phasing to protected only.
 4. Pilot Knob Road at 170th Street
 - Construct a second left turn lane on the southbound approach.
 - To accommodate the southbound dual left turn lanes, a second eastbound lane, east of Pilot Knob Road, will need to be constructed. The eastbound second receiving lane should allow for a minimum of 500 feet prior to transitioning back to one lane of travel.
 5. TH 3

Extend the four-lane roadway cross-section to north of 150th Street. The four-lane roadway should begin and end at approximately ¼ to ½ mile north of 150th Street.
 6. TH 3 at CSAH 66

Evaluate the need and justification for constructing a traffic signal system.

6.4.3 Potential Regional Improvement

Several intersections including Cedar Avenue at 160th Street, Pilot Knob at 160th Street, and Pilot Knob at 150th Street will essentially be fully improved with the measures identified in the previous section. However, even with these improvements, near capacity operations are expected by Year 2025. The Sand and Gravel TIS identified and evaluated only one improvement strategy (i.e., roadway widening) to address future capacity needs, since these deficiencies are outside the scope of the study. A more appropriate approach to managing the increase in future travel demand would be to identify regional infrastructure improvements. Consistent with the 2025 Dakota County Transportation Plan, the following provides a few regional improvement strategies that should be considered and further studied:

- The feasibility and regional benefit of providing freeway design with grade separated interchanges along Cedar Avenue.
- The feasibility of providing a grade separated interchange at Pilot Knob Road and 160th Street.
- The feasibility and regional volume benefit of providing additional east/west collector roadways, providing access from the study area to west of Cedar Avenue. Dakota County has already identified 180th Street as a viable east/west alternative. Local agencies should continue working together to make necessary efforts to accelerate further planning and potentially its implementation.
- Improvement of Biscayne Avenue to a north/south collector arterial.
- Improvement of Flagstaff Avenue, south of 160th Street, to a collector arterial.

Managing the future increases in background travel demand through regional infrastructure improvement strategies, as listed above, are likely to lessen the need for widening the major arterials beyond their existing four-lane cross-sections. Providing additional east/west corridors (i.e., 180th Street extension) would be expected to lessen the volume demand along 160th Street, which would stand to benefit the Pilot Knob Road/160th Street intersection. A larger scale study would better identify the appropriate mix of east/west corridors, freeway facilities, grade separations and improvements actually required for the larger intersections (i.e., Pilot Knob Road at 160th Street – grade separation may no longer need to be further studied if other east/west corridors attract traffic). Improving Biscayne Avenue to a north/south collector roadway would be expected to benefit both TH 3 and Pilot Knob Road. However, a study determining the actual benefit, feasibility, and its benefit to TH 3 and Pilot Knob traffic volumes should be conducted.

6.4.4 Mitigation Option 1

Mitigation Option 1 is defined by the identification of mitigation measures required in addressing traffic impacts found as a result of the proposed Mining Area project. **Figure 6-3** illustrates the mitigation measures required under Mitigation Option 1.

Of the mitigation measures illustrated in **Figure 6-3**, the following are required by Year 2015:

1. TH 3 at 160th Street
Construct a second northbound left turn lane. The northbound left turn lanes should include a minimum of 300 feet of storage.
2. TH 3 at 170th Street
 - Reconstruct both the eastbound and westbound approaches to include one exclusive left turn lane, one through lane and one

exclusive right turn lane. The left turn lane and right turn lanes should include approximately 250 feet of storage.

- Construct a second left turn lane on the southbound approach.
- To accommodate the southbound dual left turn lanes, a second eastbound lane, east of TH 3, will need to be constructed. The eastbound second receiving lane should allow for a minimum of 500 feet prior to transitioning back to one lane of travel.
- The eastbound and westbound left turn movements should operate under protected/permissive signal operations.

Of the mitigation measures illustrated in **Figure 6-3**, the following are required by Year 2025, in addition to those required by 2015:

1. TH 3 at 160th Street

Construct a free right turn movement on the eastbound approach. The free right turn movement should be designed to provide an acceleration lane for turning vehicles to merge with the southbound traffic. Adequate distance and geometric design elements should be utilized to allow vehicles to flow freely, accelerate and merge safely with the southbound traffic flow, without coming to a stop or yield.

2. TH 3 at 170th Street

- Construct a second left turn lane on the northbound and southbound approaches.
- To accommodate the northbound dual left turn lanes, a second westbound lane, west of TH 3, will need to be constructed. The westbound second receiving lane should allow for a minimum of 500 feet prior to transitioning back to one lane of travel.

3. Pilot Knob Road at 170th Street

Provide a westbound right turn overlap signal phase.

Several measures for Year 2015 and Year 2025, in addition to the required improvement measures (Section 6.4.1 and 6.4.2) previously identified, were evaluated for the TH 3/160th Street, TH 3/170th Street and Pilot Knob Road/170th Street intersection. The results of the analysis found acceptable operations expected in Year 2015; however, the TH 3/170th Street intersection is expected to operate unacceptably by Year 2025.

6.4.5 Mitigation Option 2

Mitigation Option 2 was developed to address the Year 2025 deficiency at the TH 3/170th Street intersection under Mitigation Option 1. Plant access for the anticipated Aggregate Industries and McNamara was relocated to Biscayne

Avenue. **Figure 6-4** and the following detail the mitigation measures required under Mitigation Option 2.

1. TH 3 at 160th Street

Construct a second northbound left turn lane. The northbound left turn lanes should include a minimum of 300 feet of storage.

2. TH 3 at 170th Street

- Reconstruct both the eastbound and westbound approaches to include one exclusive left turn lane, one through lane and one exclusive right turn lane. The left turn lane and right turn lanes should include a minimum of 250 feet of storage.
- The eastbound and westbound left turn movements should operate under protected/permissive signal operations.

3. 160th Street

Extend the four-lane roadway cross-section eastward, to transition to/from the two-lane cross-section east of Biscayne Avenue.

4. 160th Street at Biscayne Avenue

- Install a traffic control signal system with protected left turn phasing for eastbound and westbound and protected/permissive phasing for southbound/northbound
- Construct the northbound and southbound approaches to include one exclusive left turn and one shared through/right turn lane. The left turn lanes should include approximately 300 feet of storage.
- In addition to the four-lane roadway cross-section and the existing exclusive left turn lanes, construct 300-foot exclusive right turn lanes on the eastbound and westbound approaches.

5. Biscayne Avenue at 170th Street

The eastbound and westbound approaches should operate under a stop control. The northbound and southbound movements would have the right-of-way.

All intersections were found to operate acceptable under Year 2025 forecast volume projections. In addition, Mitigation Option 2 was found to better disperse mining related traffic and took advantage of under utilized roadways and intersections.

6.4.6 Other Potential Mitigation

In addition to the traffic operation impacts and the respective mitigation measures necessary to mitigate mining traffic (Mitigation Option 1 or Mitigation Option 2),

the mining companies may be responsible for the reconstruction of two segments of roadway:

- 170th Street, between the railroad tracks and Biscayne Avenue; and
- Biscayne Avenue, between 160th Street and 180th Street.

If the roadways are lowered to gain access to material beneath the road surface and/or to provide reasonable access to properties adjacent to the these roadways, then the mining operators benefiting from the material would need to participate in the reconstruction the new lower roads. The Mining Consortium would be partially responsible for re-building these roadway facilities to Dakota County design standards for highway geometrics and pavement integrity to accommodate the truck and vehicle traffic volume. Phased mining of the material beneath these roadways, the building of the new roadway alignment, and cost sharing will be coordinated at a future date between the Mining Consortium and Dakota County.

6.5 Summary of Results

As documented in this Traffic Impact Study, many analysis scenarios for several study years were evaluated. In addition, many potential improvement measures and mitigation measures were identified to accommodate the forecast background growth/planned developments and the proposed project, respectively. With implementation of the various potential improvements and mitigation measures, acceptable traffic operations within the study area can be expected. **Table 6-1** presents a summary of the AM peak hour intersection LOS for each intersection, under every scenario evaluated in the Traffic Study. **Table 6-2** presents a summary of the PM peak hour intersection LOS for each intersection, under every scenario evaluated in the TIS.

Table 6-1. AM Peak Hour Overall Intersection Level of Service Summary

INTERSECTION	2004 Existing	2005 No-Build (Background)	2005 Build (Mining + Background)	2015 No-Build (Background)	2015 No-Build (Background + Planned Developments) ¹	2015 Build (Mining + Background + Planned Developments) ¹	2025 No-Build (Background)	2025 No-Build (Background + Planned Developments) ¹	2025 Build (Mining + Background + Planned Developments) ¹	2015 No-Build (Background + Planned Developments w/ Improvement) ²	2015 Build (Mining + Background + Planned Developments w/ Mitigation Option 1) ³	2025 No-Build (Background + Planned Developments w/ Improvement) ⁴	2025 Build (Mining + Background + Planned Developments w/ Mitigation Option 1) ⁵	2025 Build (Mining + Background + Planned Developments w/ Mitigation Option 2) ⁶
TH 3 at 150 th Street	C	C	C	C	C	D	C	D	D	C	C	C	C	C
150 th Street at Pilot Knob Road	D	D	D	D	E	E	D	E	E	C	D	D	D	D
160 th Street at Cedar Avenue	C	D	D	D	D	E	D	E	F	C	D	C	D	D
160 th Street at Galaxie	A	A	A	A	A	A	A	A	B	A	A	A	A	A
160 th Street at Foliage	A	A	A	A	A	B	A	A	B	A	A	A	A	A
160 th Street at Flagstaff	B	B	B	B	B	C	B	B	B	B	B	B	B	B
160 th Street at Pilot Knob Road	C	C	C	C	C	D	C	D	E	C	C	C	D	D
160 th Street at A.I. Mining Access	A/C	A/C	A/B	A/A	B	B	A/A	B	B	B	B	B	B	B
160 th Street at Diamond Path	A/B	A/C	A/B	A/A	A	B	A/B	A	B	A	B	A	B	B
160 th Street at Shannon Parkway	A/B	A/B	A/C	A/A	A/C	A/D	A/A	A/C	A/D	A/CC	A/D	A/C	A/E	A/E
160 th Street at Chippendale	A/A	A/A	A/A	A/A	A/B	A/C	A/A	A/C	A/C	A/A	A/B	A/B	A/D	A/D
160 th Street at TH 3	C	C	C	C	C	D	C	C	D	C	C	C	C	D
160 th Street at Biscayne Avenue	A/B	A/B	A/B	A/B	A/B	A/C	A/B	A/C	A/C	A/B	A/A	A/C	A/C	C
Pilot Knob Rd at Dodd Boulevard	B	C	C	C	D	D	E	F	F	C	C	D	D	D
Pilot Knob Road at 170 th Street	B	B	B	B	C	D	C	D	E	C	D	C	D	C
TH 3 at 170 th Street	A/D	A/C	A/C	A/D	F/F	F/F	C/F	F/F	F/F	B	D	B	F	D
170 th Street at Biscayne Avenue	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A
TH 3 at CSAH 66	A/A	A/A	A/B	A/B	A/C	A/C	A/C	A/E	B/F	A/C	A/C	B/F	B/F	B/F
TH 3 at Elm Street	B	B	B	B	B	B	B	B	B	B	B	B	B	B
TH 3 at 220 th Street	B	B	B	B	B	B	B	B	B	B	B	B	B	B

¹Includes all improvement measures identified in Section 5.1

²Includes all improvement measures identified in Section 5.1 and 5.2.1

³Includes all improvement measures identified in Section 5.1, Section 5.2.1, Section 5.2.2 and Section 5.3.1

⁴Includes all improvement measures identified in Section 5.1, Section 5.2.2

⁵Includes all improvements measures identified in Section 5.1, Section 5.2.2, Section 5.3.1 and Section 5.3.2

⁶Includes all improvement measures identified in Section 5.1, 5.2.1, Section 5.2.2 and Section 5.4.1

Source: URS Corporation

Table 6-2. PM Peak Hour Overall Intersection Level of Service Summary

INTERSECTION	2004 Existing	2005 No-Build (Background)	2005 Build (Mining + Background)	2015 No-Build (Background)	2015 No-Build (Background + Planned Developments) ¹	2015 Build (Mining + Background + Planned Developments) ¹	2025 No-Build (Background)	2025 No-Build (Background + Planned Developments) ¹	2025 Build (Mining + Background + Planned Developments) ¹	2015 No-Build (Background + Planned Developments w/ Improvement) ²	2015 Build (Mining + Background + Planned Developments w/ Mitigation Option 1) ³	2025 No-Build (Background + Planned Developments w/ Improvement) ⁴	2025 Build (Mining + Background + Planned Developments w/ Mitigation Option 1) ⁵	2025 Build (Mining + Background + Planned Developments w/ Mitigation Option 2) ⁶
TH 3 at 150 th Street	C	C	C	C	D	D	D	D	D	D	D	C	D	D
150 th Street at Pilot Knob Road	C	C	C	C	F	F	D	F	F	C	C	C	D	D
160 th Street at Cedar Avenue	D	D	D	E	F	F	F	F	F	D	D	D	D	D
160 th Street at Galaxie	B	B	B	C	C	D	D	D	E	D	D	B	B	B
160 th Street at Foliage	A	A	A	B	B	A	B	B	B	B	B	B	A	A
160 th Street at Flagstaff	A	A	A	B	B	C	B	C	C	B	C	B	B	A
160 th Street at Pilot Knob Road	C	C	C	C	E	E	D	E	F	D	D	D	D	D
160 th Street at A.I. Mining Access	A/D	A/C	A/D	A/A	B	B	A/A	B	B	B	B	B	B	B
160 th Street at Diamond Path	A/C	A/D	A/D	A/C	B	B	B/F	B	C	B	B	B	C	C
160 th Street at Shannon Parkway	A/B	A/B	A/B	A/B	A/D	A/D	A/B	A/D	A/E	A/D	A/E	A/D	A/F	A/F
160 th Street at Chippendale	A/C	A/C	A/C	A/C	A/D	A/F	A/C	A/E	A/E	A/E	A/E	A/F	A/F	A/F
160 th Street at TH 3	C	C	C	C	C	D	C	D	E	C	D	D	D	D
160 th Street at Biscayne Avenue	A/A	A/A	A/A	A/A	A/C	A/C	A/C	A/D	A/D	A/C	A/C	A/C	A/E	C
Pilot Knob Rd at Dodd Boulevard	A	B	B	B	C	C	C	E	E	B	C	C	C	C
Pilot Knob Road at 170 th Street	C	C	C	D	D	D	E	F	F	C	C	C	D	D
TH 3 at 170 th Street	A/C	A/C	A/C	A/C	B/F	F/F	A/D	C/F	F/F	B	C	B	D	C
170 th Street at Biscayne Avenue	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A	A/A
TH 3 at CSAH 66	A/B	A/B	A/C	A/C	A/D	A/D	A/D	A/F	A/F	A/D	A/D	B/F	B/F	A/F
TH 3 at Elm Street	B	B	B	B	C	C	B	C	C	C	C	C	C	C
TH 3 at 220 th Street	B	B	B	B	C	C	C	C	C	C	C	C	C	C

¹Includes all improvement measures identified in Section 5.1

²Includes all improvement measures identified in Section 5.1 and 5.2.1

³Includes all improvement measures identified in Section 5.1, Section 5.2.1, Section 5.2.2 and Section 5.3.1

⁴Includes all improvement measures identified in Section 5.1, Section 5.2.2

⁵Includes all improvements measures identified in Section 5.1, Section 5.2.2, Section 5.3.1 and Section 5.3.2

⁶Includes all improvement measures identified in Section 5.1, 5.2.1, Section 5.2.2 and Section 5.4.1

Source: URS Corporation