

- Based on the percent breakdown of traffic using the intersection of American Boulevard/24th Avenue during year 2030 build Thursday conditions, further review of the total amount of future development for the entire study area should be considered.

## VI. OTHER ISSUES

### A. Site Plan Review

As part of this study, SRF staff worked closely with the site design engineer to review and modify on-site intersection and roadway geometrics to provide the necessary lane configurations, turn lane lengths and intersection spacing to provide adequate on-site operations during peak hour conditions.

To determine how well the on-site intersections will accommodate year 2030 build traffic forecasts, an operations analysis was conducted for Saturday peak hour conditions. Results of the analysis shown in Table 11 indicate that all key intersections on-site are expected to operate at acceptable levels of service for year 2030 build Saturday conditions.

**Table 11**  
**Year 2030 Build Peak Hour Capacity Analysis - Saturday**  
**Internal Intersection Level of Service Results**

| Intersection                                     | Level of Service |
|--|------------------|
|  | Saturday Peak    |
| Northbound TH 77 CD Ramps/East Ramp Roundabout * | A <sup>(1)</sup> |
| East Ramp Roadway/Nordstrom's Access             | A                |
| IKEA Way/IKEA Driveway *                         | A/B              |
| IKEA Way/North Ring Road *                       | B/B              |
| Thunderbird Road/North Ring Road *               | A/D              |
| 22nd Avenue/Main Parking Access                  | C                |
| 22nd Avenue/Large Vehicle Access *               | A/A              |

\* Indicates an unsignalized intersection. The overall LOS is shown followed by the worst approach LOS.

<sup>(1)</sup> Level of Service results are similar with both Synchro/SimTraffic and RODEL traffic models.

In addition to the intersection operations analysis, on-site plan review comments are summarized below:

- Queuing at all adjacent intersections along American Boulevard and Lindau Lane was reviewed and addressed for future peak conditions. Intersection geometrics and lane configurations will accommodate future traffic forecasts. Heavy vehicle queues are not expected to develop from the adjacent intersections, backing on-site to block internal intersections.

Based on the traffic simulation of year 2030 build conditions (Saturday), the southbound average queues on IKEA Way and 22nd Avenue at Lindau Lane are not expected to extend back into the first internal intersections to the north. In addition, the southbound 95th percentile queues on IKEA Way are not expected to extend back to the first internal intersection. However, the southbound 95th percentile queues on 22nd Avenue are expected to extend back to the first internal intersection during peak Saturday conditions.

Based on the traffic simulation of year 2030 build conditions (Saturday), the northbound average and 95th percentile queues at American Boulevard are not expected to spill back into the T-intersection to the south. However, the westbound right-turning vehicles may queue back onto the north ring road to the east. This queue will not impact the entering traffic at the T-intersection south of American Boulevard

- Queuing at all internal intersections was reviewed and addressed for future peak conditions. Intersection geometrics and lane configurations will accommodate future traffic forecasts. Heavy vehicle queues are not expected to develop from the internal intersections, backing into the adjacent American Boulevard and Lindau Lane intersections.

## **B. Impacts to IKEA Store**

With the proposed site plan dated September 5, 2006, operational impacts to the IKEA Store are minimal. The current layout locates the main parking ramp adjacent to 24th Avenue. As previously stated, access to the main parking ramp is provided along American Boulevard west of 24th Avenue and along the main internal roadway north of the Lindau Lane/22nd Avenue intersection. Therefore, the majority of the travel patterns for new trips will occur on the east side of the proposed MOA 2 site. This will allow the necessary capacity for IKEA Way to operate at acceptable levels of operation during Saturday peak conditions for IKEA customers.

As previously stated, the southbound average and 95th percentile queues along IKEA Way are not expected to block the first internal intersection to the north. According to the proposed site plan, a smaller parking structure will be provided at the north end of IKEA Way. However, this parking area will mainly serve the office use at the north end of the site. Peak conditions for the office use are during the weekday evening period, which does not conflict with IKEA's Saturday peak condition.

Currently, IKEA has a separate full-access along American Boulevard, west of the American Boulevard/Thunderbird Road signalized access to MOA 2. As development of the MOA 2 site occurs, other options to attract IKEA customers to use this access during Saturday peak conditions should be considered.

## VII. CONCLUSIONS AND RECOMMENDATIONS

The proposed Mall of America Phase II development consists of 1,907,691 square feet of retail/mixed use, 1250 hotel rooms, 300 residential condos, and 615,000 square feet of office assumed to be completed by year 2011.

Based on this traffic analysis, the following conclusions and recommendations are offered for your consideration:

### A. Existing Conditions

- Existing turning movement counts, geometrics, traffic controls, and LRT operations were all collected in April and May of 2005. The Thursday p.m. peak hour turning movement counts that were collected were factored by 1.3 to replicate typical traffic volumes experienced during August. The Saturday peak hour turning movement counts were not factored because historical data indicated that the Saturday counted has similar traffic volumes compared to a typical Saturday peak that would occur in August.
- Results of the existing traffic operations analysis indicate that the intersections of Lindau Lane/TH 77 Ramps/IKEA Way and Killebrew Drive/22nd Avenue are currently operating at unacceptable levels of service during the Saturday peak hour. To improve operations at these intersections, the following improvements are recommended:

#### Lindau Lane/TH 77 Ramps/IKEA Way

- Eliminate access from northbound TH 77 to eastbound Lindau Lane
- Remove concrete median on the west approach to allow southbound TH 77 traffic to make an eastbound right-turn movement on Lindau Lane to the existing MOA near Nordstrom's

#### Killebrew Drive/22nd Avenue

- Construct an additional eastbound left-turn lane to provide dual left-turn lanes

### B. Year 2012 No Build Conditions

- The 2012 no build Saturday peak hour analysis assumes the recommended improvements from the existing analysis, assumed roadway improvements listed in the *Bloomington Central Station Traffic Study*, and assumed roadway improvements listed in the Airport South CIP. Results of the analysis indicate that all key intersections will operate at acceptable levels of service during the Saturday peak hour.

- The 2012 no build Thursday p.m. peak hour analysis assumes the recommended improvements from the existing analysis, assumed roadway improvements listed in the *Bloomington Central Station Traffic Study*, and assumed roadway improvements listed in the Airport South CIP. Results of the analysis indicate that all key intersections will operate at acceptable levels of service during the Thursday p.m. peak hour except the 34th Avenue/I-494 North and South ramp intersections. In order for these intersections to operate at acceptable levels of service, the following additional improvement is recommended:

34th Avenue/I-494 North Ramps and South Ramps

- Replace the existing “all-red” traffic phase with each LRT train crossing to a northbound/southbound “green” phase.

**C. Year 2012 Build Conditions**

- Based on the 2012 build Saturday analysis, the following additional improvements are needed for all intersections to operate at acceptable levels of service:

TH 77/I-494 CD Roadway

- Construct a new ramp from the TH 77/I-494 CD roadway to Thunderbird Road (see Figure 13)

TH 77 CD Roadway

- Construct a new access to/from the TH 77 CD roadway to/from the existing MOA parking ramp (see Figure 13).

American Boulevard/24th Avenue

- Construct an additional southbound right-turn lane. Extend both turn lanes to the I-494 single-point interchange (see Figure 13)

24th Avenue/I-494 Single-Point Interchange

- Construct an additional westbound left-turn lane (triple lefts) (see Figure 13).

Killebrew Drive/20th Avenue

- Eliminate the “free” southbound right-turn lane
- Construct dual right-turn lanes with overlap signal timing

- The westbound triple left-turn lane improvement recommended for year 2012 build conditions is necessary for the heavy westbound to southbound movement during the Saturday peak hour. It is possible that some motorists may choose the alternate route using the 34th Avenue interchange and American Boulevard to the current Mall of America and proposed Phase II. In addition, wayfinding improvements may be proposed under a separate upcoming study. Therefore, a sensitivity analysis was completed to determine how many vehicles would need to use the alternate route to eliminate the westbound triple left-turn lane improvement. Based on the sensitivity analysis results, approximately 300 vehicles would need to divert to the 34th Avenue interchange. These additional vehicles would not create any new operational problems at the 34th Avenue interchange in its current configuration or with its proposed improvements during the Saturday peak hour.
- An additional analysis was conducted to determine how the key intersections would operate if a larger percentage of traffic would use American Boulevard to the west. With a 10 percent distribution to the west, approximately 300 new trips during the Saturday peak hour would use American Boulevard to the west. Based on the analysis, all improvements recommended in the previous section are still needed even with the new assumed distribution to the west on American Boulevard. It is important to note that based on the analysis, it is not necessary to direct more traffic to use American Boulevard to the west to achieve acceptable intersection operations. However, any increase above the three percent distribution will provide benefits to the operations at American Boulevard/24th Avenue during Saturday peak hour conditions.
- Based on the 2012 build Thursday analysis, the following additional improvements are needed for all intersections to operate at acceptable levels of service:

American Boulevard/24th Avenue

- Extend the southbound left most left-turn lane to 500 feet
  - Extend the eastbound left-turn lanes to 500 feet
  - Extend the westbound left-turn lanes to 500 feet
  - Construct an additional westbound right-turn lane to provide three westbound right-turn lanes
  - The westbound approach should have four approach lanes that begin at 28th Avenue, two of these lanes would be trap right-turn lanes at the intersection
- An additional analysis was conducted to determine how the key intersections would operate if a larger percentage of traffic would use American Boulevard to the west. With a 10 percent distribution to the west, approximately 250 new trips during the Thursday p.m. peak hour would use American Boulevard to the west. Based on the analysis, the following improvements will still be needed to achieve acceptable operations at the intersection of American Boulevard/24th Avenue during the Thursday p.m. peak hour:

American Boulevard/24th Avenue

- Extend the southbound left most left-turn lane to 500 feet
- Extend the eastbound left-turn lanes to 500 feet

#### **D. Year 2030 Build Conditions**

- The 2030 build Saturday peak hour analysis assumed all of the improvements from the 2012 build analyses. In addition, the following additional improvements were assumed:

##### American Boulevard/34th Avenue (listed in the Bloomington Central Station Traffic Study)

- Eliminate the southbound free right-turn lane
- Construct southbound dual right-turn lanes that extend from the I-494 South Ramps

##### 24th Avenue/82nd Street

- On the north approach, convert the right/through lane into a trap right-turn lane. This improvement will create better lane utilization upstream at the single-point interchange.

##### Old Shakopee Road

- Reconstruction of Old Shakopee Road between Cedar Avenue and Killebrew Avenue

- Based on the 2030 build Saturday analysis, all of the key intersections are expected to operate at acceptable levels of service, with the exception of the 24th Avenue/I-494 Single-Point Interchange (near the LOS D/E threshold). The following additional improvements are not needed from a level of service perspective, but are recommended to improve overall operations and reduce queues:

##### Killebrew Avenue at 22nd Avenue

- Add overlap signal phasing for the southbound right-turn movement

##### Killebrew Avenue at 24th Avenue

- Extend the eastbound left-turn lanes to 400 feet

- An additional analysis was conducted to determine how the key intersections would operate if a larger percentage of traffic would use American Boulevard to the west. With a 10 percent distribution to the west, approximately 300 new trips during the Saturday peak hour would use American Boulevard to the west. With the increase of traffic using American Boulevard to the west, the 24th Avenue/I-494 Single-Point Interchange is expected to improve to LOS D during the Saturday peak hour. In addition to routing traffic to the west on American Boulevard, traffic traveling to the mall from the east on I-494 could be directed to 34th Avenue. This could also provide relief to the single-point interchange.
- The 2030 build Thursday p.m. peak hour analysis assumed all of the improvements from the 2030 build Saturday peak hour analysis. Based on the 2030 build Thursday analysis, four key intersections are expected to operate at unacceptable levels of service with the following recommended improvements:

#### Killebrew Avenue at 24th Avenue

- Extend the westbound left-turn lanes to 500 feet
- Extend the third westbound through lane back to the intersection of Old Shakopee Road/28th Avenue

#### 28th Avenue/82nd Street

- Construct an additional westbound left-turn lane

#### American Boulevard/34th Avenue

- Eliminate the westbound free right-turn lane
- Construct westbound dual right-turn lanes

#### 34th Avenue/I-494 North Ramps and South Ramps (Figure 22)

- Reconstruct the interchange to include loops in the northwest and southwest quadrants. These improvements will eliminate two major traffic conflicts with LRT operations, the westbound to southbound movement, and the southbound to eastbound movement. Improvements at the 34th Avenue/I-494 Ramps are a result of increased traffic volumes due to background growth, adjacent developments, and LRT operations.
- An additional analysis was conducted to determine how the key intersections would operate if a larger percentage of traffic would use American Boulevard to the west. With a 10 percent distribution to the west, approximately 250 new trips during the Thursday p.m. peak hour would use American Boulevard to the west. With the increase of traffic using American Boulevard to the west, three key intersections are expected to operate at unacceptable levels of service for year 2030 build Thursday p.m. peak hour conditions.
- The combination of peak hour trips from redevelopment sites to the east and south with the proposed MOA 2 peak hour trips traveling through the 24th Avenue intersections exceed the capacity of their at-grade design during year 2030 build Thursday conditions. In order to improve operations to acceptable operations, the following comments are provided:
  - Further review of the feasibility of a grade-separated intersection at American Boulevard/24th Avenue should be considered.
  - Mn/DOT has recently selected a consultant for the Travel Demand Forecasting and Concept Development project for the I-494/TH 77 corridors. Results of this study will provide forecast traffic volumes for the area from a regional perspective to compare with the local traffic model and future volumes developed for the MOA Phase II Traffic Study and supplemental analyses. This will allow us to determine whether adjustments could be made. In addition, a new connection from Thunderbird Road or areas east of 24th Avenue to the CD roadway will be considered as part of this study.

- Based on the percent breakdown of traffic using the intersection of American Boulevard/24th Avenue during year 2030 build Thursday conditions, further review of the total amount of future development for the entire study area should be considered.

## **E. Site Plan Review**

- As part of this study, SRF staff worked closely with the site design engineer to review and modify on-site intersection and roadway geometrics to provide the necessary lane configurations, turn lane lengths and intersection spacing to provide adequate on-site operations during peak hour conditions. Results of the analysis indicate that all key intersections on-site are expected to operate at acceptable levels of service for year 2030 build Saturday conditions.
- Queuing at all adjacent intersections along American Boulevard and Lindau Lane was reviewed and addressed for future peak conditions. Intersection geometrics and lane configurations will accommodate future traffic forecasts. Heavy vehicle queues are not expected to develop from the adjacent intersections, backing on-site to block internal intersections.
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