## IV. YEAR 2012 BUILD CONDITIONS

Future traffic operations analyses were conducted for the year 2012 build conditions. The land use, street network assumptions, and operations results are discussed in this section of the report.

### A. Assumed Land Use and Trip Generation Estimates

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 (see Figure 11: Proposed Site Plan dated September 5, 2006). It is assumed that the proposed Phase II development will be completed by year 2011. Land use assumptions and trip generation for the adjacent developments (2012) and Phase II are displayed in the Appendix (Tables A-1 and A-2). Approximately 69 percent of the new development trips generated for the Saturday peak hour are associated with the proposed MOA Phase II development and 31 percent are associated with other adjacent land use developments. For the Thursday peak hour, 48 percent of the new development trips are associated with the proposed MOA Phase II development and 52 percent of the new development trips are associated with other adjacent land use developments.

The following assumptions related to trip generation estimates were used in the analysis:

- Based on data provided by Bass Pro Shops representatives, the daily traffic estimated for a 300,000 square foot store is 10,000 and 20,000 vehicles per day on a weekday and Saturday, respectively. These daily trips are similar to data for a Cabela's store of similar size. Using the peak hour factors for a Cabela's store, trip generation estimates were developed for the weekday and Saturday peak hour conditions.
- Trip generation estimates for the retail use were developed using the existing MOA traffic counts and the plotted ITE retail center curve. Based on the plotted ITE curve for trips versus size, the trip generation rate decreases as the retail square footage increases, due to multi-use trips. Therefore, the multi-use reduction factors (36 and 47 percent for weekday and Saturday peak hour conditions, respectively) calculated through this exercise was applied to the Bass Pro Shops trip generation estimates.
- For the 6,000-seat performing arts center, trip generation estimates were not developed for a Saturday matinee. It is assumed that restrictions will be placed upon the performing arts center to eliminate matinee events from being scheduled during times that would impact Saturday peak conditions.

  In addition, trip generation estimates were not developed for the weekday peak hour condition, since it is assumed that an event at the performing arts center would not generate trips entering/leaving the site during the 4:30 to 5:30 p.m. peak hour. A review of the Ordway Performing Arts Center schedule indicates a majority (only one show per month started at 2:00 p.m.) of the shows, concerts, operas started at 7:30 or 8:00 p.m. Therefore, it also assumed that an event at the performing arts center would have a 7:30 or 8:00 p.m. start time and would not generate trips entering the site during the weekday evening peak hour. If a visitor to the performing arts center chooses to arrive more than two hours prior to the performance, this trip would be considered a multi-use trip and would be accounted for in the retail use trip generation estimates.

## B. Trip Distribution

The directional trip distribution for the site-generated trips is consistent with the *Airport South AUAR* and *Bloomington Central Station Traffic Study*. Figure 12 displays the regional directional distribution percentages for the site. A different trip distribution was used for the MAC expansion, consistent with the *2015 Terminal Expansion Project Minneapolis-Saint Paul International Airport Traffic Report*. Approximately 10 percent of the airport expansion generated trips would travel on the northern segment of 34th Avenue (not in the study area), the remaining 90 percent would use the 34th Avenue interchange to access I-494.

## C. Assumed Roadway Improvements

All roadway improvements included in the year 2012 no build analysis are assumed in the year 2012 build analysis. A significant improvement listed in the *Bloomington Central Station Traffic Study* is the modification of American Boulevard to a westbound one-way roadway between West Road and 34th Avenue. If this improvement is not constructed by year 2012, the intersection along 24th Avenue will operate with less delay and the intersection operations in the immediate Bloomington Central Station area will worsen.

The intersection geometrics shown in the proposed site plan are assumed in the year 2012 build analysis. In addition, to the recommended signal phasing/timing modifications identified at the 34th Avenue/I494 North Ramps and South Ramps, the following improvements with optimized signal timing at all intersections were assumed:

<u>TH 77/I-494 CD Roadway</u>

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

## D. Year 2012 Build Traffic Operations Analysis – Saturday

To determine how well the existing and assumed roadway improvements will accommodate year 2012 build traffic forecasts (see Figures 14 and 15), an operations analysis was conducted for Saturday peak conditions (3:00 – 4:00 pm). Results of the analysis shown in Table 6 indicate that the intersections of Lindau Lane/TH 77 Ramps/IKEA Way, 24th Avenue/I-494 Single-Point Interchange, and American Boulevard/24th Avenue will operate at unacceptable levels of service during the Saturday peak hour.

Figure 11

Figure 12

Figure 13

Figure 14

Figure 15

**Table 6**
**Year 2012 Build Peak Hour Capacity Analysis - Saturday**
**Level of Service Results**

| Intersection | Level of Service |
|---|---|
| | Saturday Peak |
| Lindau Lane/TH 77 Ramps/IKEA Way | **F** (D) |
| Lindau Lane/22nd Avenue | D |
| Lindau Lane/24th Avenue | D |
| Killebrew Drive/TH 77 Ramps/20th Avenue | C |
| Killebrew Drive/22nd Avenue | D |
| Killebrew Drive/24th Avenue | D |
| 24th Avenue/I-494 Single-Point Interchange | **F** (D) |
| 24th Avenue/82nd Street | B |
| American Boulevard/IKEA Driveway * | D/E (A/B) |
| American Boulevard/Thunderbird Road | **F** (B) |
| American Boulevard/24th Avenue | **F** (D) |
| American Boulevard/28th Avenue | A |
| American Boulevard/34th Avenue | B |
| 34th Avenue/I-494 North Ramps | D |
| 34th Avenue/I-494 South Ramps | D |
| 28th Avenue/82nd Street | D |
| Old Shakopee Road/86th Street | B |
| Old Shakopee Road/TH 77 East Ramp | B |

* Indicates an unsignalized intersection. The overall LOS is shown followed by the worst approach LOS.
Note: Parentheses indicate LOS with assumed improvements listed below.

Queuing at all freeway ramp terminal intersections was reviewed and addressed for year 2012 build Saturday p.m. peak hour conditions. Based on the traffic analysis, queuing problems will develop (spillback to the freeway) at the intersections of Lindau Lane/TH 77 Ramps/IKEA Way and 24th Avenue/I-494 Single Point Interchange. With the improvements listed below, these queuing problems are eliminated.

In order for all intersections to operate at acceptable levels of service during year 2012 build (Saturday) conditions, the following improvements shown in Figure 13 are needed:

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.

**Additional Operations Analysis**

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. The previous analysis assumes a three percent distribution to the west on American Boulevard. It was discussed that this value could be increased through the implementation of ITS measures. These motorists would still have a destination/origin on I-494 west, but they would access the freeway using American Boulevard to the Portland Avenue interchange.

Based on existing traffic counts collected at the IKEA driveway and driveway across from Thunderbird Road, it was determined that more than 10 percent of the MOA and IKEA visitors currently leaving the future MOA 2 site travel west on American Boulevard. Therefore, a 10 percent distribution to the west on American Boulevard was assumed reasonable and used to determine operational impacts to area intersections for year 2012 build conditions. The rerouting of traffic does not include the proposed office and hotel uses that span across Lindau Lane or proposed uses constructed on the current MOA site. 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.

## E. Year 2012 Build Traffic Operations Analysis – Thursday

To determine how well the existing and assumed roadway improvements listed above will accommodate year 2012 build traffic forecasts (see Figures 16 and 17), an operations analysis was conducted for Thursday peak conditions. This analysis assumes the additional improvements identified in the previous Saturday peak hour analysis. Although the 2012 build volumes for the Thursday peak hour does not require the westbound triple left-turn improvement at the 24th Avenue/I-494 Single-Point Interchange, it was assumed in the model since it is required for Saturday conditions. Results of the analysis shown in Table 7 indicate that the intersections of American Boulevard/IKEA Driveway, American Boulevard/Thunderbird Road and American Boulevard/24th Avenue will operate at unacceptable levels of service during the Thursday peak hour.

**Table 7**
**Year 2012 Build Peak Hour Capacity Analysis - Thursday**
**Level of Service Results**

| Intersection | Level of Service |
|---|---|
| | Thursday Peak |
| Lindau Lane/TH 77 Ramps/IKEA Way | C |
| Lindau Lane/22nd Avenue | C |
| Lindau Lane/24th Avenue | B |
| Killebrew Drive/TH 77 Ramps/20th Avenue | C |
| Killebrew Drive/22nd Avenue | C |
| Killebrew Drive/24th Avenue | D |
| 24th Avenue/I-494 Single-Point Interchange | D |
| 24th Avenue/82nd Street | B |
| American Boulevard/IKEA Driveway * | **E/F** [(1)] (A/B) |
| American Boulevard/Thunderbird Road | **F** [(1)] (C) |
| American Boulevard/24th Avenue | **F** [(2)] (D) |
| American Boulevard/28th Avenue | A |
| American Boulevard/34th Avenue | C |
| 34th Avenue/I-494 North Ramps | D |
| 34th Avenue/I-494 South Ramps | D |
| 28th Avenue/82nd Street | D |
| Old Shakopee Road/86th Street | B |
| Old Shakopee Road/TH 77 East Ramp | B |

* Indicates an unsignalized intersection. The overall LOS is shown followed by the worst approach LOS.
(1) Poor intersection operations caused from vehicle queues from American Boulevard/24th Avenue
(2) Average vehicle delay of 100 seconds
Levels of service shown in parentheses assume the improvements listed below.

Figure 16

Figure 17

In order for all of the key intersections to operate at acceptable levels of service during the year 2012 build Thursday conditions, the following improvements will be needed:

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

**Additional Operations Analysis**

Similar to year 2012 Saturday build conditions, 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, the intersection delay at American Boulevard/24th Avenue will be reduced by approximately 35 seconds/vehicle. However, 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 at 24th Avenue

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

## V. 2030 BUILD CONDITIONS

Future traffic operations analyses were conducted for the year 2030 build conditions. The land use, street network assumptions, and operations results are discussed in this section of the report.

### A. Assumed Land Use

Land use assumptions and trip generation for Phase II and adjacent developments are also included in the Appendix (Tables A-2 and A-3). Year 2030 build conditions includes additional adjacent developments and background growth beyond year 2012 to year 2030. Approximately 47 percent of the new development trips generated for the Saturday peak hour are associated with the MOA Phase II development and 53 percent are associated with other adjacent land use developments. For the Thursday peak hour, 25 percent of the new development trips are associated with the MOA Phase II development and 75 percent of the new development trips are associated with other adjacent land use developments.