MEMORANDUM

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To: **CyRide / ISU Intermodal Facility Steering Committee**

Date: August 31, 2009

Subject: **Traffic Analysis for Campustown Site**

This memorandum provides a traffic analysis for the proposed Campustown site. This document also provides a cursory evaluation of potential improvements to the roadways and intersections surrounding the proposed site. Elements included in this review include the following:

- Projected daily and PM peak hour trip generation and trip distribution for the Campustown intermodal facility.
- Existing / build condition traffic volumes.
- Existing / build condition daily traffic operations developed using volume / capacity (v/c) ratios.
- Existing / build condition PM peak hour traffic operations.
- Geometric improvements / modifications to accommodate the proposed site.
- Geometric modifications to relieve traffic impacts to surrounding neighborhoods.

Trip Generation and Distribution

The Campustown intermodal facility will include a 750 space parking garage and multiple bus bays for transit operations. The four primary users of the parking garage include: 1) students who live in on-campus residence halls, 2) faculty/staff parking spaces, 3) retail trips associated with Campustown redevelopment, and 4) vanpool trips. Daily trip generation for the parking garage (not including transit trips) is summarized below:

- Student parking: assumed 20% of spaces would make one roundtrip.
- Faculty/staff parking: assumed 2.5 trips per parking space per day.
- Campustown “retail” parking: assumed each parking space would turnover three times per day.
- Vanpool parking: assumed 50 trips during AM and PM peak periods.

It is important to note that the student parking is currently present at the proposed site and would not lead to “new” vehicle trips for the surrounding street system. The proposed

faculty/staff parking spaces are a replacement for an existing parking lot located north of Lincoln Way and east of Sheldon Avenue. The traffic generated by faculty/staff members would also not be "new" trips, but would results in a redistribution of traffic to the surrounding street system.

The PM peak hour trip generation (not including transit trips) is summarized in below:

- Student parking: assumed 10% of spaces would make a trip with 85% outbound from the parking garage and the remaining inbound.
- Faculty/staff parking: assumed 75% of the parking spaces would have a trip made with all of trips being outbound from the parking garage.
- Campustown "retail" parking: assumed 90% of parking space would turnover during the PM peak hour.
- Vanpool parking: assumed 50 trips during the PM peak hour with 80% outbound.

Total peak hour trip generation from the intermodal facility is estimated to be approximately 440 vehicles. These trips were distributed to the surrounding street network using the trip distributions shown in Figure 1. Daily traffic associated with the proposed intermodal facility is shown in Figure 2.

Traffic Volumes

Daily no-build and build traffic volumes are summarized in Figure 3 and Figure 4. Existing daily traffic volumes were taken from the *Ames Traffic Flow Map* produced by the Iowa DOT. The existing daily volumes represent average values developed through a combination of traffic volumes shown on the 1999, 2003 and 2007 versions of that map. The build condition traffic volumes are typically two to five percent higher then existing volumes.

Daily Traffic Operations

An assessment of daily traffic operations was performed for the key roadway segments with and without the proposed facility. This assessment was completed by developing volume / capacity (v/c) ratios. Capacity values for different roadway types were taken from work completed for the 2030 Ames Area MPO Long Range Transportation Plan. The daily traffic operations are summarized in Figure 5 and Figure 6. As shown in these figures the v/c ratios change by small increments between the existing and proposed conditions.

PM Peak Traffic Operations

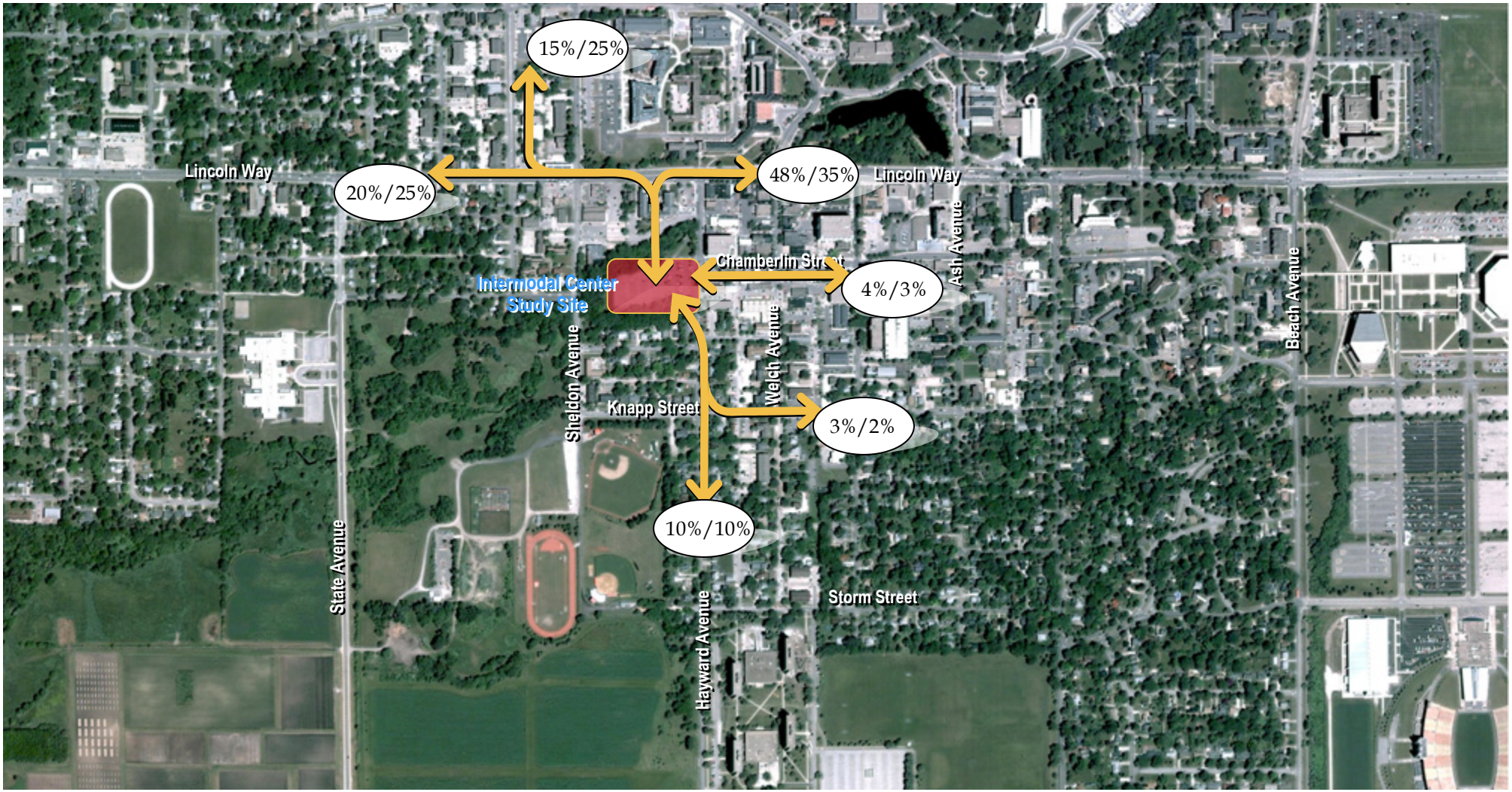
The proposed facility is anticipated to experience more peak hour traffic during the PM peak period due to the Campustown retail parking spaces are more active during that time period. The PM peak hour traffic analysis was completed using the Synchro software package. The PM peak hour traffic analysis with and without the proposed facility are summarized in Figures 5 and 6. The overall intersection operations in the PM peak for proposed conditions are similar to those for existing conditions. The intersection of Lincoln Way / Hayward Avenue can

accommodate a significant amount of northbound traffic because there is no conflicting traffic due to the three-leg intersection design. At the Lincoln Way / Sheldon Avenue intersection the redistribution of traffic results in more even northbound / southbound traffic volumes.

Site Geometric Improvements

In order to accommodate traffic flow to the proposed facility a few improvements / modifications are recommended. Some of these improvements will also enhance the safety of the proposed facility. A list of proposed improvements is provided below and summarized in Figure 7:

- On-Street Parking Restrictions: It is also recommended that on-street parking be removed near the proposed access points on both Hayward and Sheldon Avenue to provide adequate sight distance for vehicles entering those roadways from the facility.
- Hayward Access Right-Turn Lane: It is recommended that a southbound to westbound right-turn lane be provided for the Hayward Avenue access driveway to the parking garage. This turn lane can improve traffic operations and safety.
- Sheldon Avenue/Lincoln Way Left-Turn Lanes: Left-turn lanes are recommended for the northbound/ southbound approaches at the Lincoln Way/Sheldon Avenue intersection in order to improve intersection capacity and operations. This modification would require roadway widening, but is expected to fit within the existing right-of-way. The northbound approach on Sheldon Avenue to Lincoln Way will also need to be reconfigured to provide a separate left turn lane. The existing northbound left/through lane and the short right turn lane would be reconfigured as a northbound through/right turn lane and a northbound left turn lane. It is recommended that the northbound left-turn lane at the intersection of Lincoln Way / Hayward Avenue should be at least 150’ long and clearly marked.
- Lincoln Way / Hayward Avenue Left-Turn Lane: The westbound to southbound left-turn movement at this intersection currently operates in permissive mode only. With the proposed facility in place it is recommended that left-turn movement be changed to protected/permissive operations.
- Pavement Conditions: It is recommended that an assessment of pavement conditions be completed for Hayward and Sheldon Avenue between Lincoln Way and the proposed site. This assessment would evaluate the current pavement conditions and its ability to accommodate the proposed bus traffic.



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3%/2% - Non-Student Trips / Student Trips

Figure 1
Person Trip Directional Distribution

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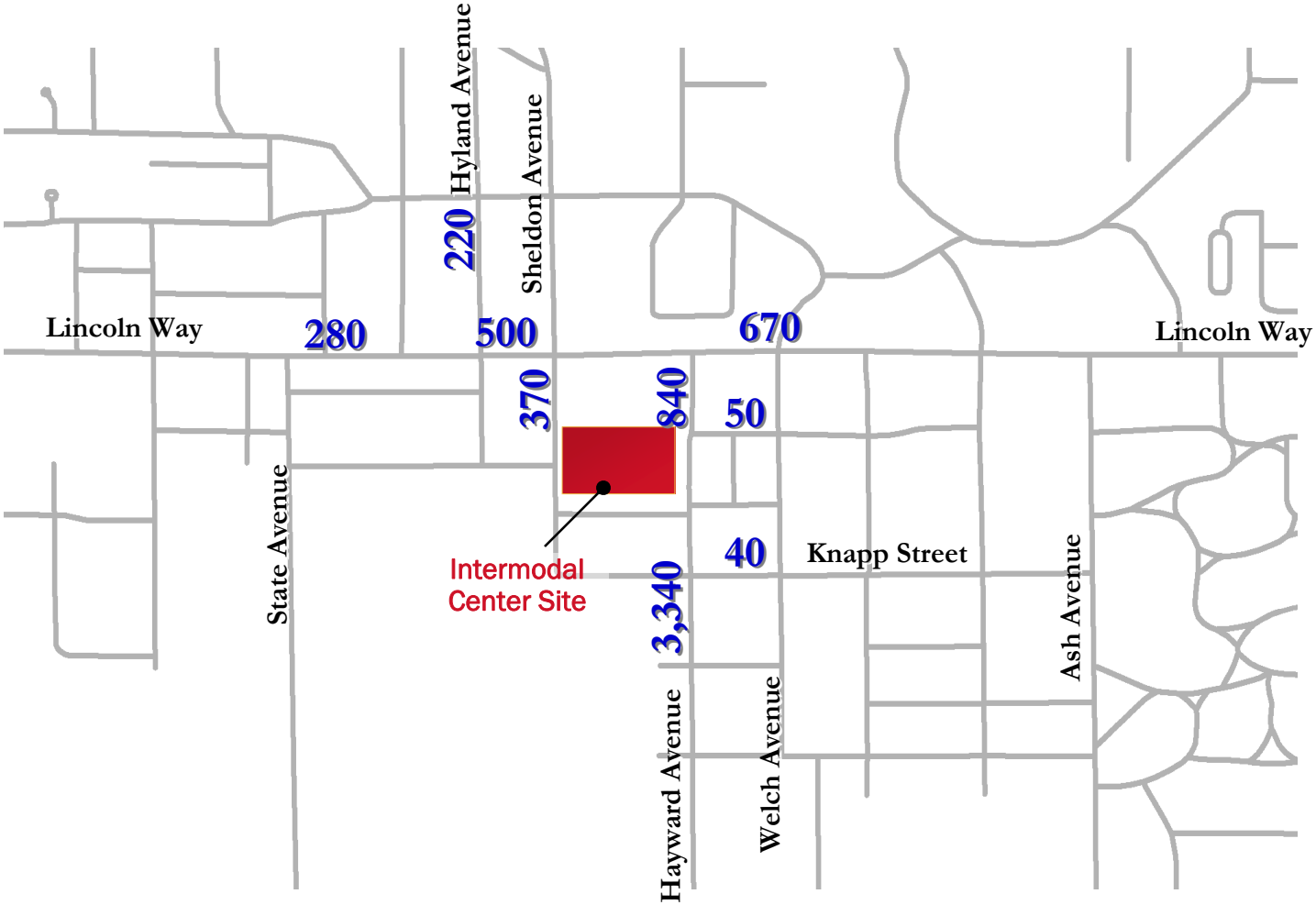

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100 - Intermodal Center Daily Two-Way Trips

Figure 2
Intermodal Center Traffic Distribution

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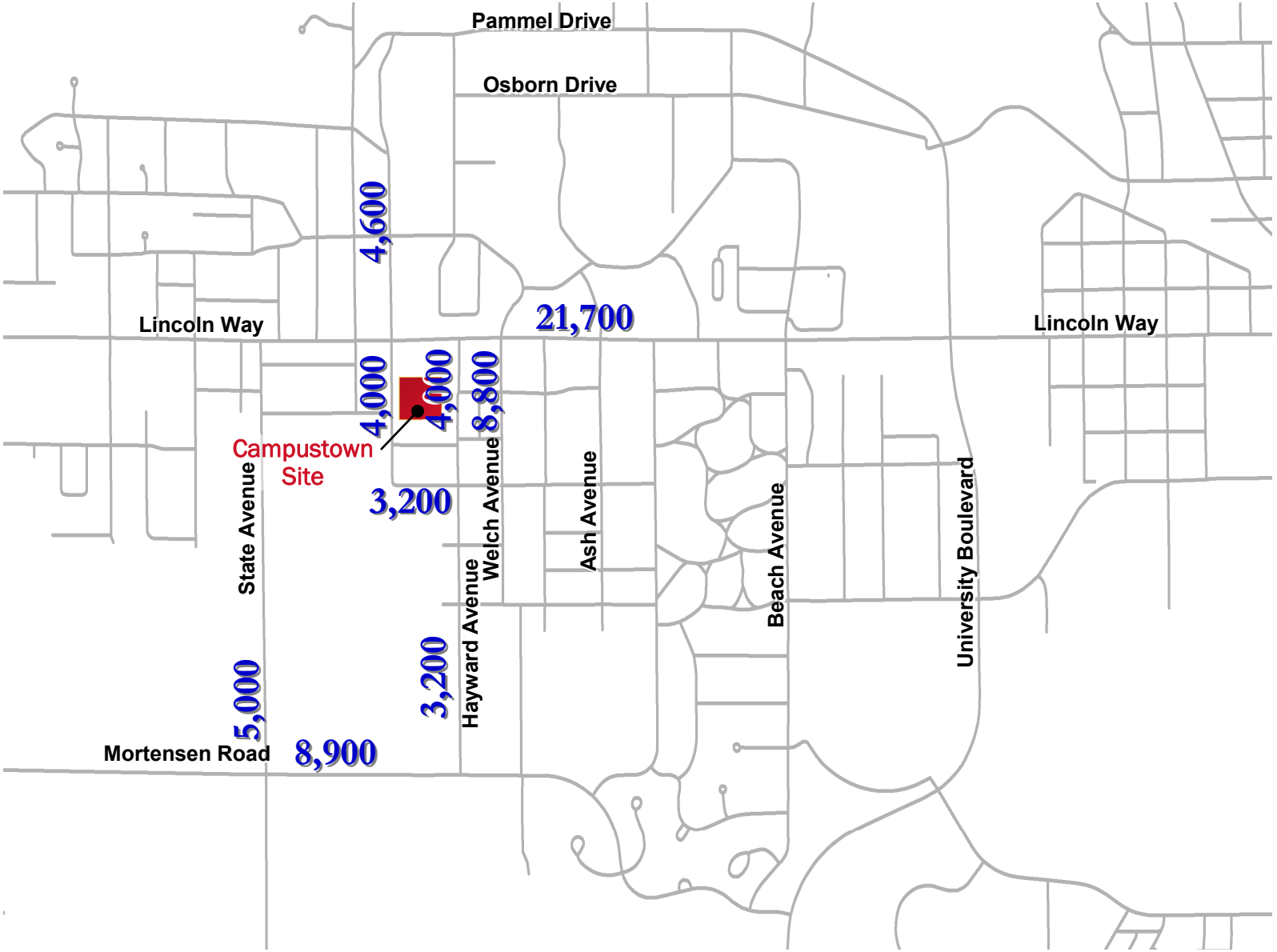

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8,900 - Average of 1999 and 2007 Average Daily Traffic

Source: Iowa DOT

Figure 3
Current Average Daily Traffic Volume

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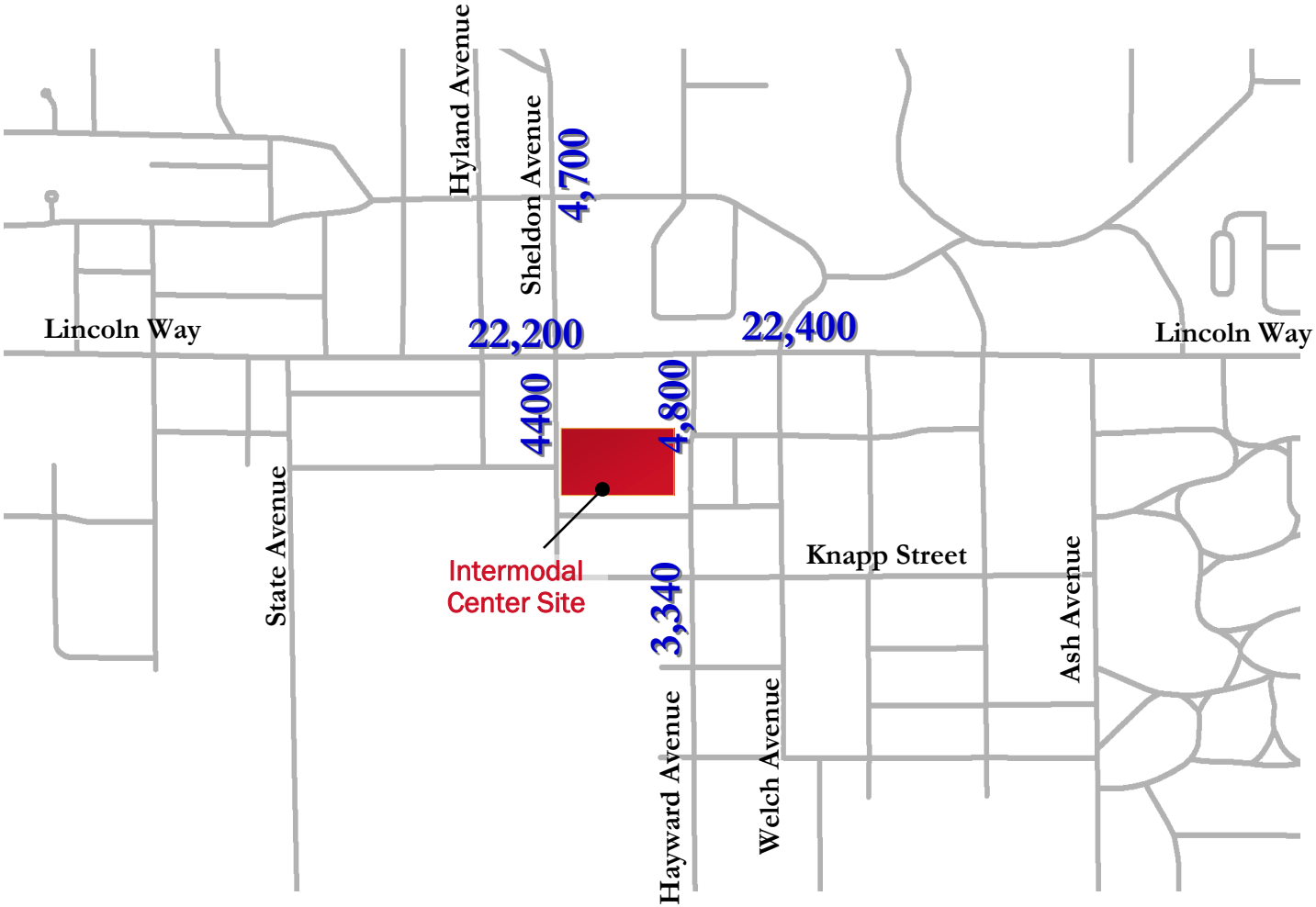

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100 - Intermodal Center Daily Two-Way Trips

Figure 4
Daily Traffic After Opening the Intermodal Facility

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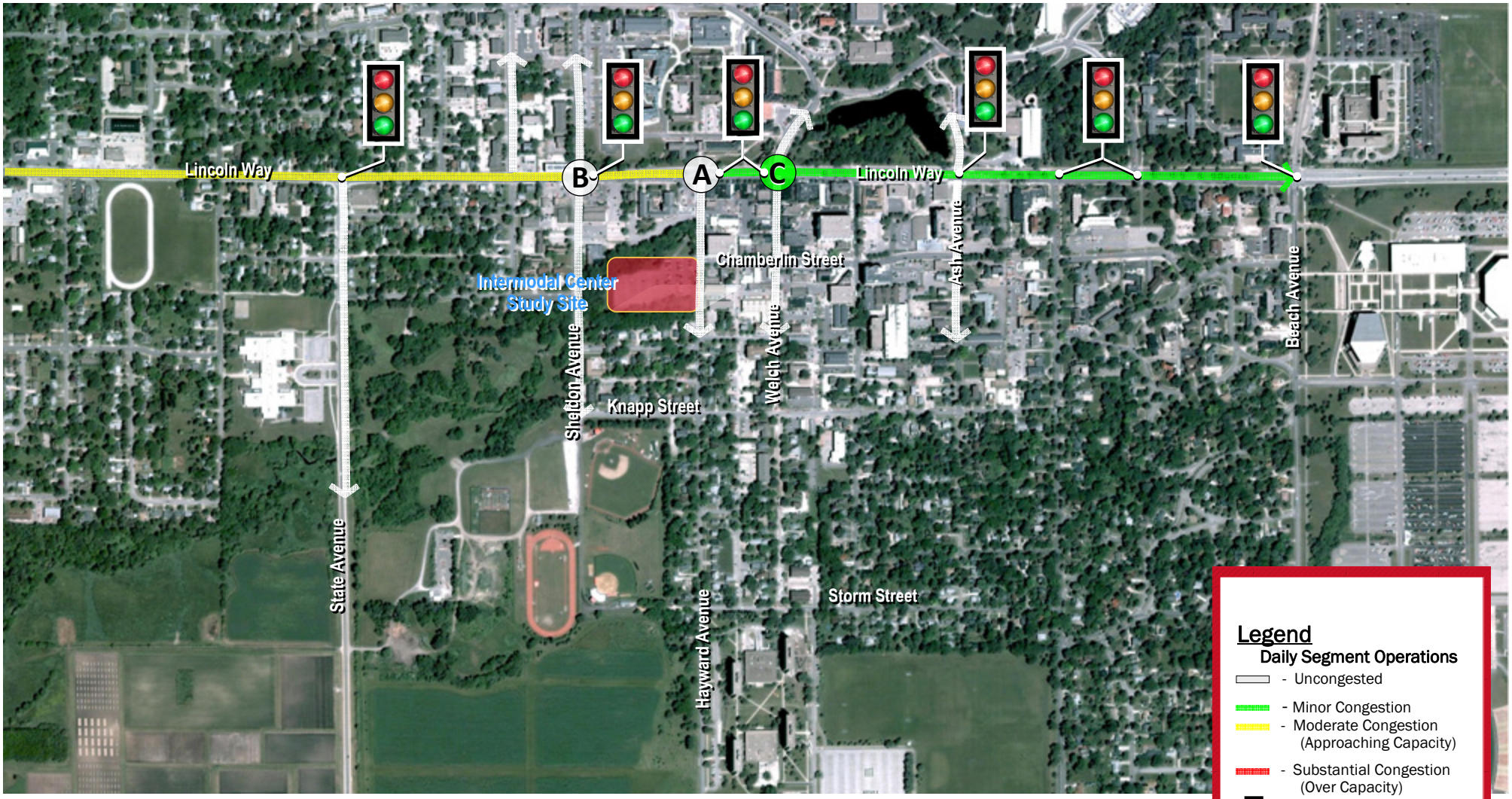

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Figure 5
Current (2008) Traffic Operations

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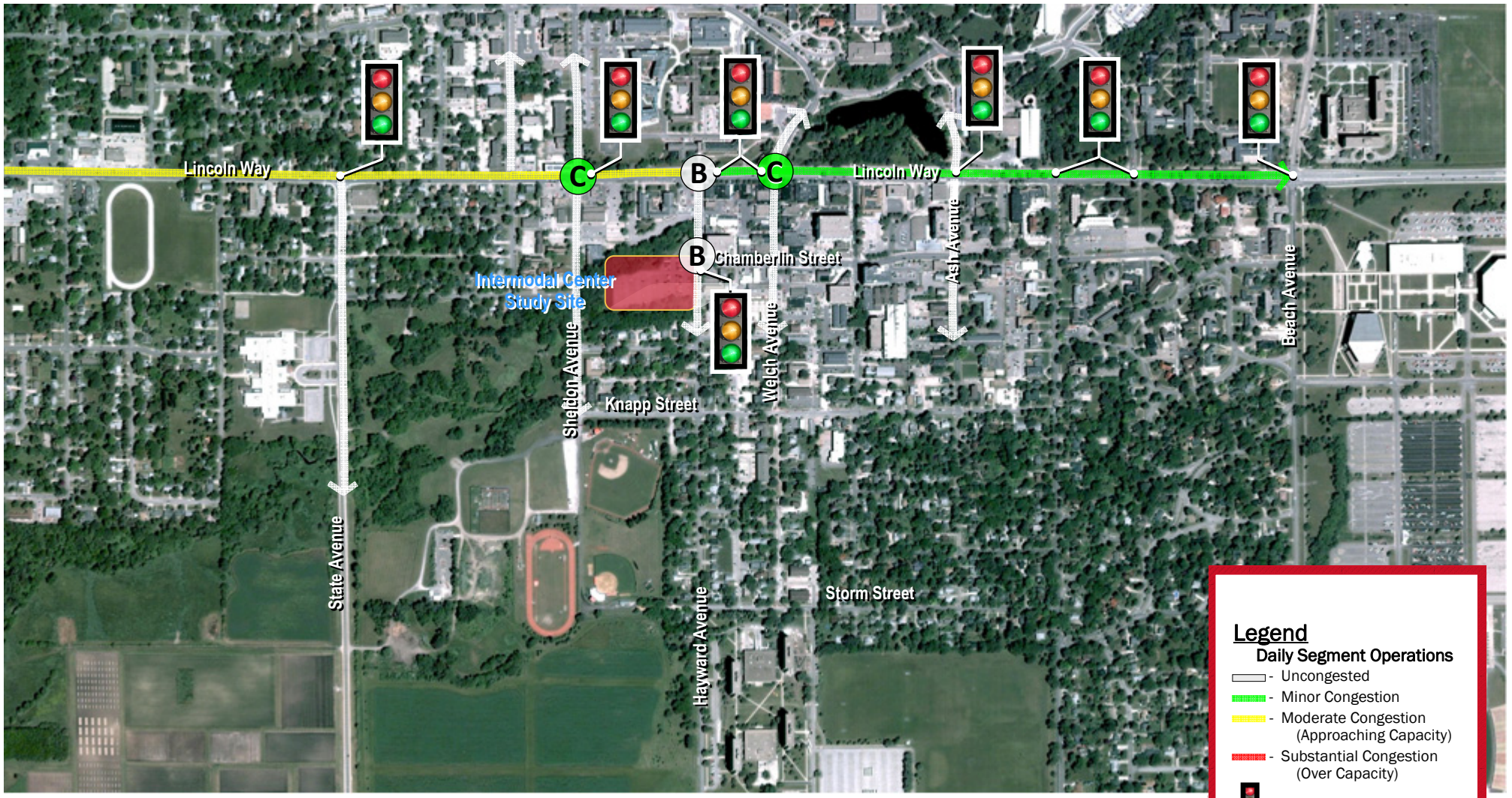

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Figure 6
Build (2011) Traffic Operations

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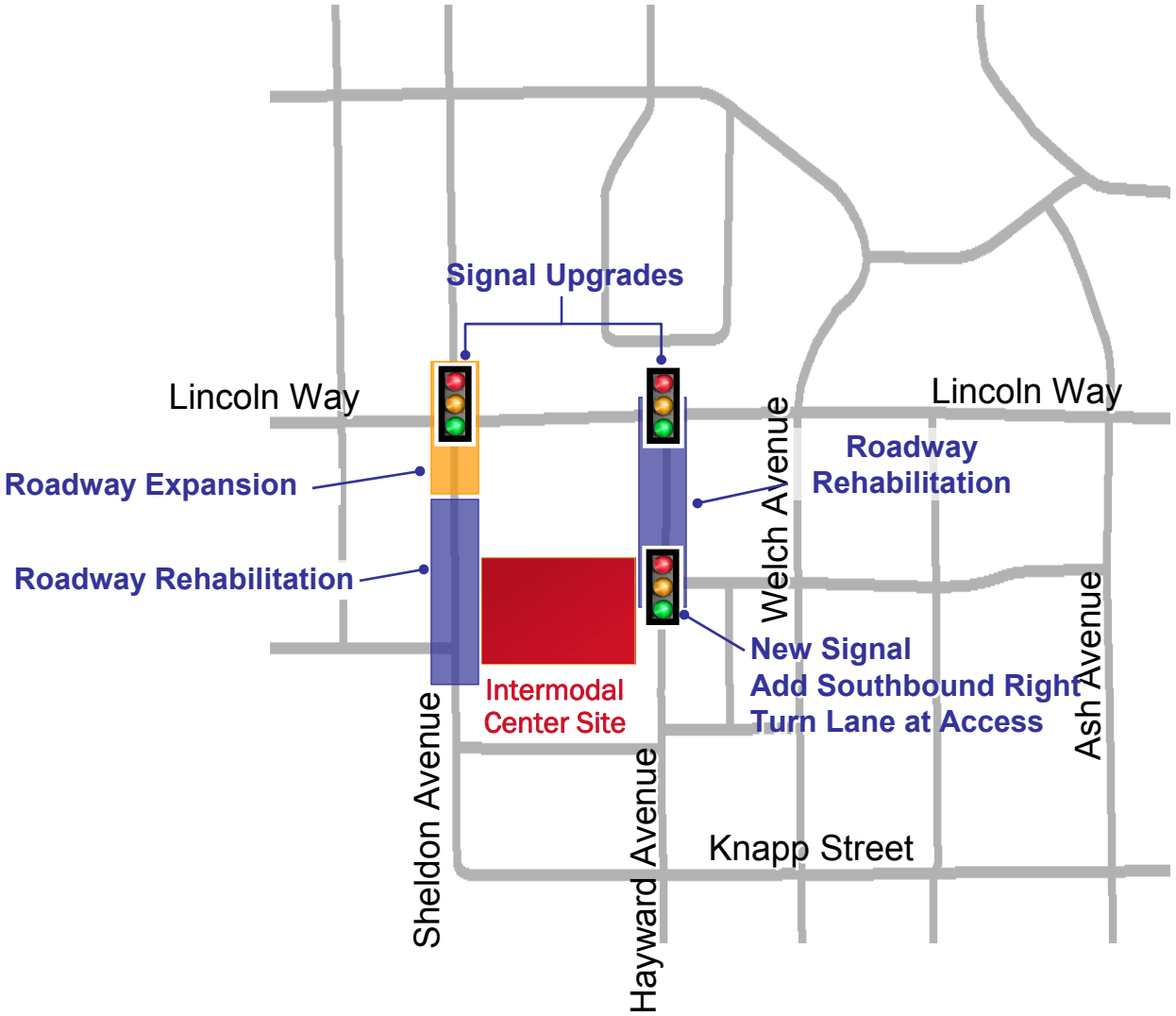

Figure 7
Roadway Infrastructure Improvements

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