MEMORANDUM

URS
999 18th Street, Suite 900
Denver, Colorado 80202
Phone: (303) 293-8080
Fax: (303) 293-8585

To: **Dennis Clowers, City of Oklahoma City**

From: **Nate Larson, PE, PTOE**
Amy Lewin, EI
Donny Allison

Cc: **Russell Claus, City of Oklahoma City**
Sara Jane Maclennan, AICP, ASLA
Ted Ritschard, PE

Date: **June 6, 2007**

Subject: **Broadway/Gaylord Realignment Proposal between 2nd and 4th**

This memorandum documents a brief technical analysis of a proposed realignment of Broadway/EK Gaylord Boulevard between NW 2nd (Robert S. Kerr Avenue) and 4th Streets in downtown Oklahoma City.

1. EXISTING CONFIGURATION

The existing alignment of the Broadway/Gaylord transition features a 1-block shift in the continuous arterial represented by the two north-south streets. This shift takes place over 2 blocks, from 2nd to 4th. It allows for the orderly flow of north-south traffic through the area and balances the need for north-south throughput with the need for access to and from the east-west streets that serve the downtown core. While the shift is not ideal, it has been designed to make the best possible use of the street right of way available and appears to function well in general today. The existing street network in the area is shown over a recent aerial photo in **Figure 1**.

2. PROPOSED CONFIGURATION

URS has been asked to evaluate the merits of the following changes to the roadway network:

- Remove the existing southeast-to-northwest roadway that connects the 2nd/Gaylord and 4th/Broadway intersections;
- Extend EK Gaylord Blvd north from 2nd to 4th; and
- Extend Dean A. McGee/3rd Street east from Broadway to Gaylord.

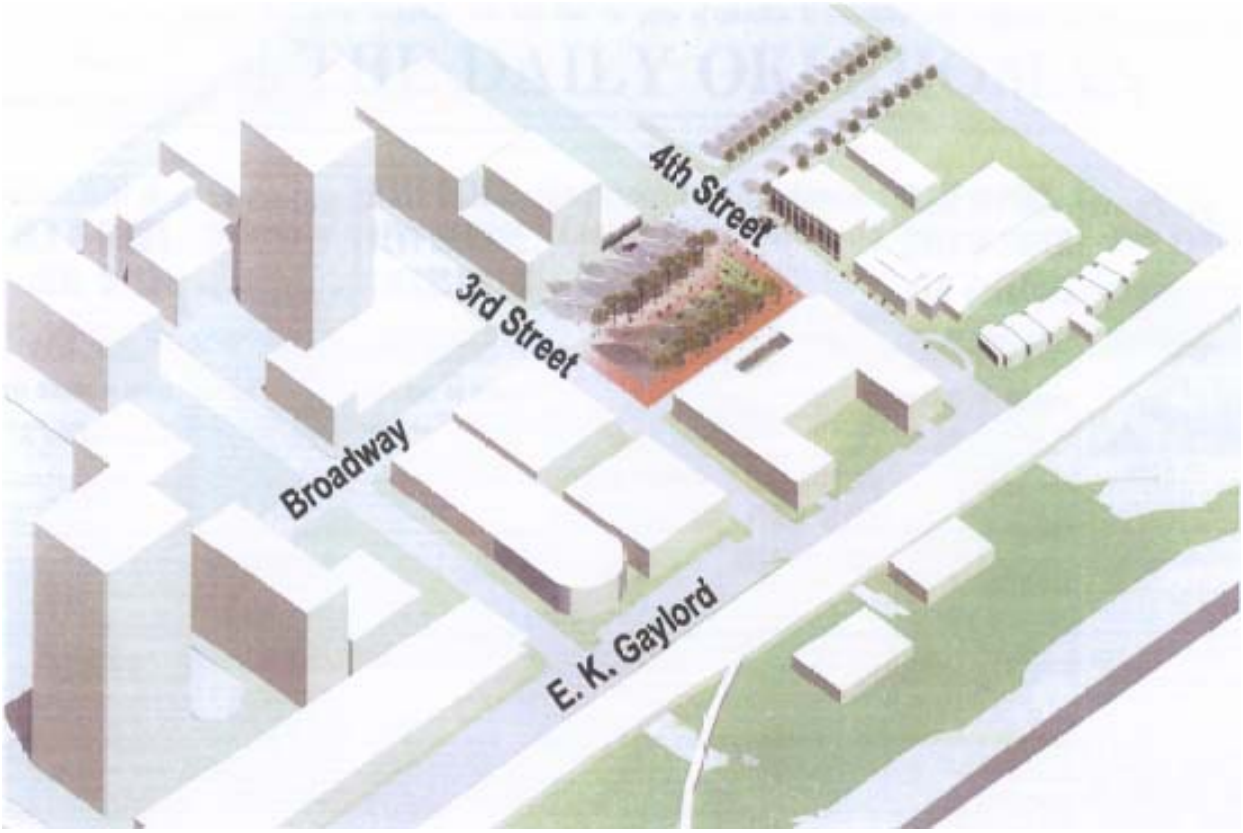
Figure 1. Study Vicinity, Recent Conditions

(not to scale; north = toward the top of the page)

Source: Google Maps, 2007

This proposal is made partially in the interest of opening more space for development, including the development of a park and the potential relocation of Chamber of Commerce facilities into the two-block area affected. An oblique sketch of the proposal is shown in **Figure 2**.

Figure 2. Street Realignment Proposal
(not to scale; north = toward the upper right corner of the page)



Source: OKC Studio Proposal, "An Opportunity of a Lifetime"

3. FORECASTING AND ANALYSIS METHODOLOGY

In order to project reasonable long-term traffic for this area, the project team turned to the 2030 ACOG travel demand model, which includes the relocation of I-40 and the new interchange at Shields. The current projections for daily traffic in the area were used in this analysis. To generate peak hour intersection turning movement estimates, the project team assumed that 10% of the daily demand occurs during the p.m. peak hour and that 60% of the p.m. peak hour demand on 2-way streets is oriented away from downtown. The resulting estimates of 2030 p.m. peak hour directional link traffic volume were parsed into intersection turning movements using the industry standard practice outlined in NCHRP Report 255. Those turning movements were subject to slight adjustments as needed to balance inbound and outbound traffic flows to account for parking maneuvers. To account for the proposed roadway geometry changes, turning movements were adjusted based on basic judgment as to the overall origins and destinations of traffic entering and leaving the area.

Intersection operations were examined using the Synchro traffic analysis software (by Trafficware, Version 6), which reports intersection Level of Service, ranging from A (best) to F (worst) in general accordance with the procedures of Transportation Research Board Special Report 209, the Highway Capacity Manual. A companion program to Synchro called SimTraffic was also used to evaluate a basic non-calibrated simulation of traffic conditions.

4. 2030 OPERATIONAL ANALYSIS

The estimated 2030 p.m. peak hour intersection turning movement estimates and resulting overall intersection levels of service for the Existing and Proposed configurations are shown in **Figures 3** and **4**, respectively.

The projected intersection analysis showed poor operating conditions at the 5th/Broadway and 6th/Broadway intersections. These intersections and their volumes are not expected to be affected significantly by the proposed street alignment change.

5. IMPACTS ASSESSMENT AND MITIGATION ANALYSIS

While the overall intersection LOS in the primary affected 2-block area could be considered acceptable, the simulation analysis showed considerable difficulty with lane choice and queuing with both of the proposed configurations. While the existing configuration responds well to the large amount of north-south through traffic demand at intersections, the proposed configurations require all through volume to make two low-speed turning movements to complete the transition from Gaylord to Broadway (or vice versa). These slower turning movements and the additional distance traveled would introduce signal progression difficulties not found in the existing configuration. The analysis team does not consider the Proposed 2-way configuration acceptable from a traffic operations standpoint under the conditions analyzed.

The 1-way street configuration was examined as a mitigation to these impacts. One-way streets can be an effective tool in managing large traffic volumes because they allow intersections to operate more efficiently for vehicular through traffic by eliminating the need for one signal phase. The 1-way configuration tested for this analysis would feature the following 1-way street segments:

- Gaylord 1-way Northbound from 2nd to 4th;
- 4th 1-way Westbound from Gaylord to Broadway; and
- Broadway 1-way Southbound from 4th to 2nd.

The 2030 p.m. peak hour intersection turning movement estimates and resulting overall intersection levels of service for the 1-way configuration is shown in **Figure 5**.

The 1-way configuration would have some of the same problems with lane choice and overall inefficiency as the Proposed 2-way configuration, but would feature slightly better intersection operations on paper.

6. OTHER CONSIDERATIONS

Street Hierarchy and Function. Gaylord and Broadway are significant resources in the City's downtown arterial street network. Arterials perform a very important function in any urban transportation network by allowing traffic to enter and leave an area, or to travel through it, with optimum efficiency. One of the critical defining characteristics of an arterial is orderly linear traffic flow, so as to allow for the maximum potential for signal progression and the minimization of stops. Whereas local streets provide access and by definition carry lower traffic volumes, it is crucial for arterials to have consistent speed and design characteristics to carry higher volumes efficiently. Forcing the majority of the traffic to turn is simply not appropriate

for an arterial roadway.

Figure 3. 2030 Peak Hour Volume and LOS: Existing Configuration

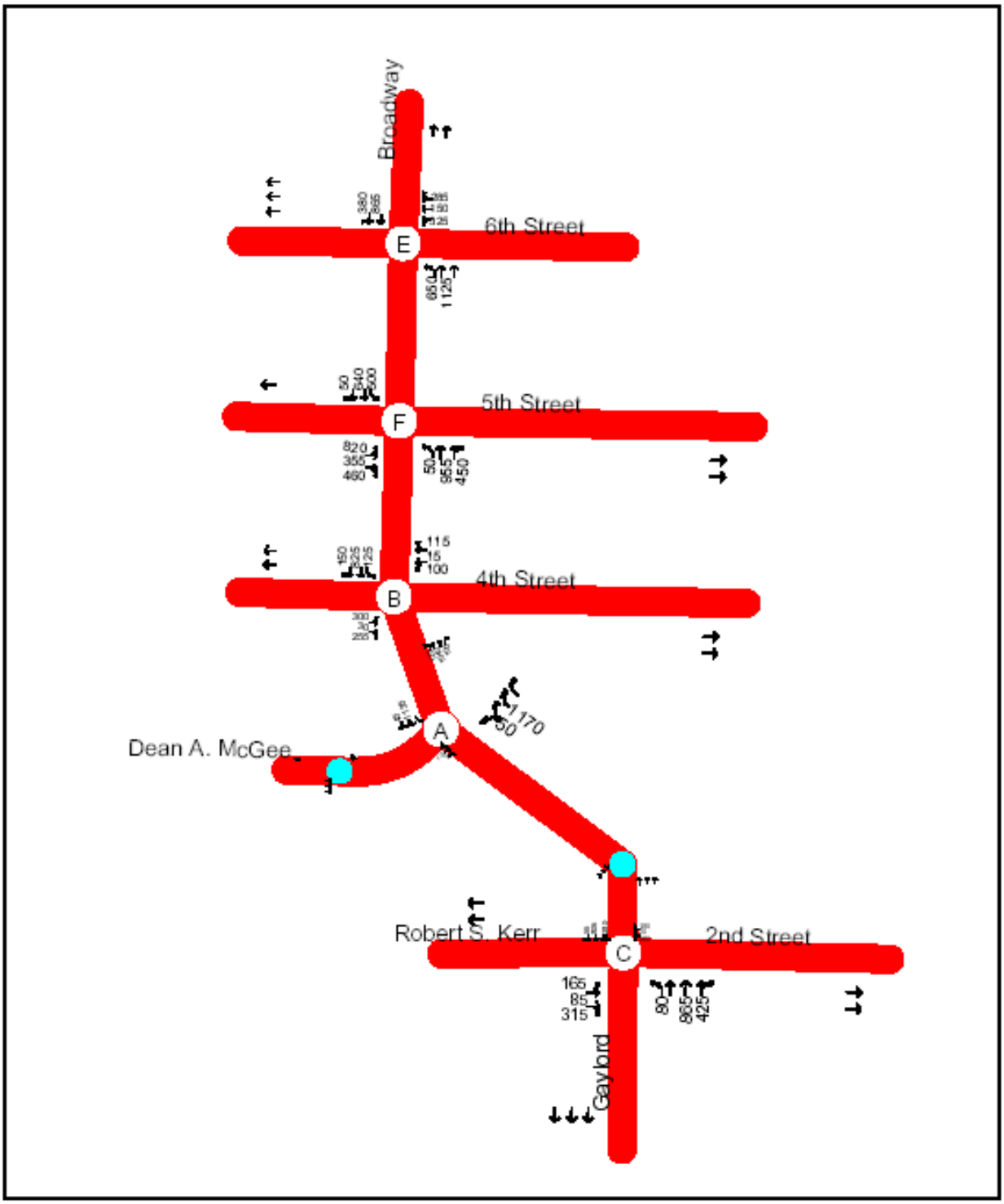


Figure 4. 2030 Peak Hour Volume and LOS: Proposed 2-Way Configuration

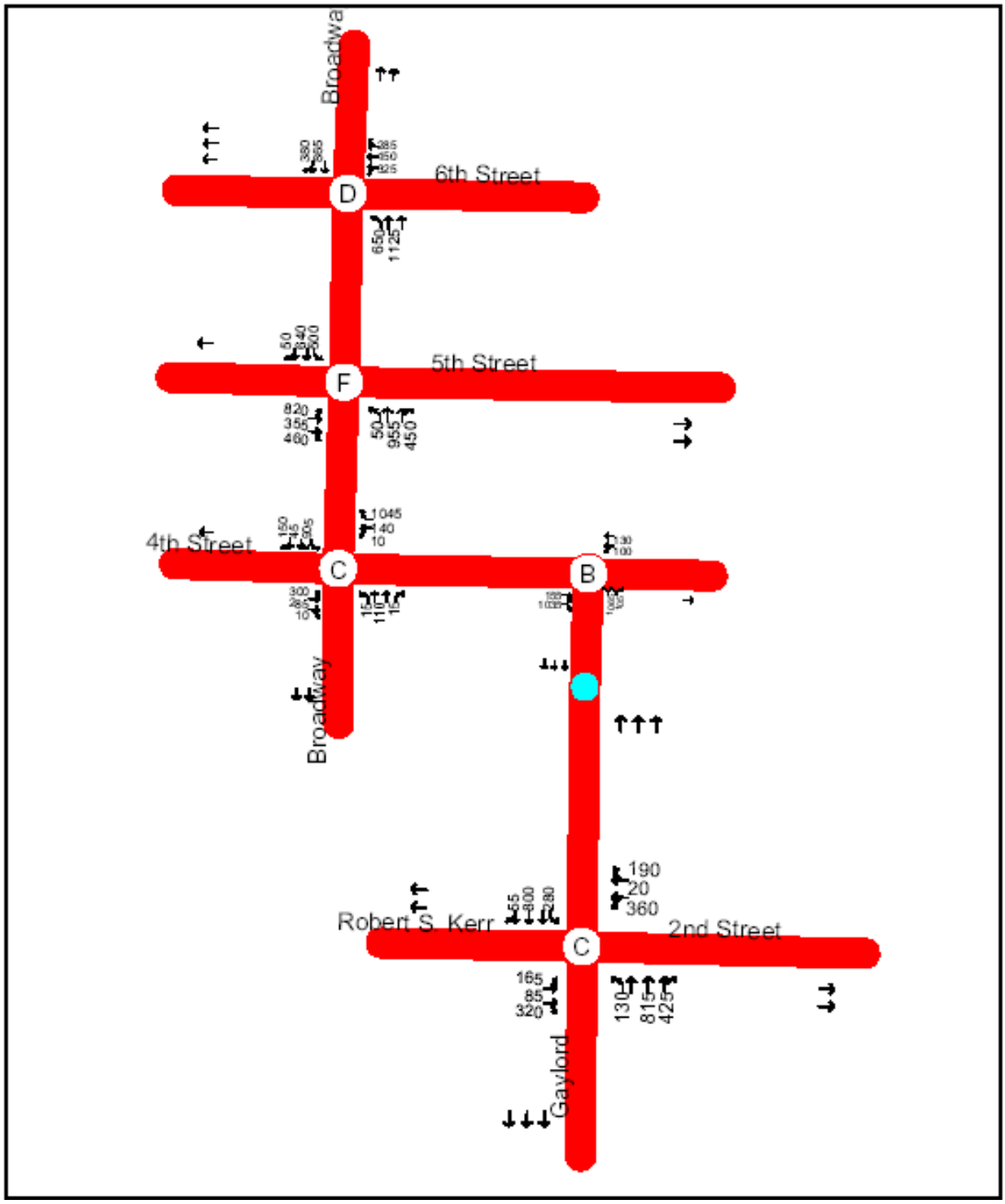
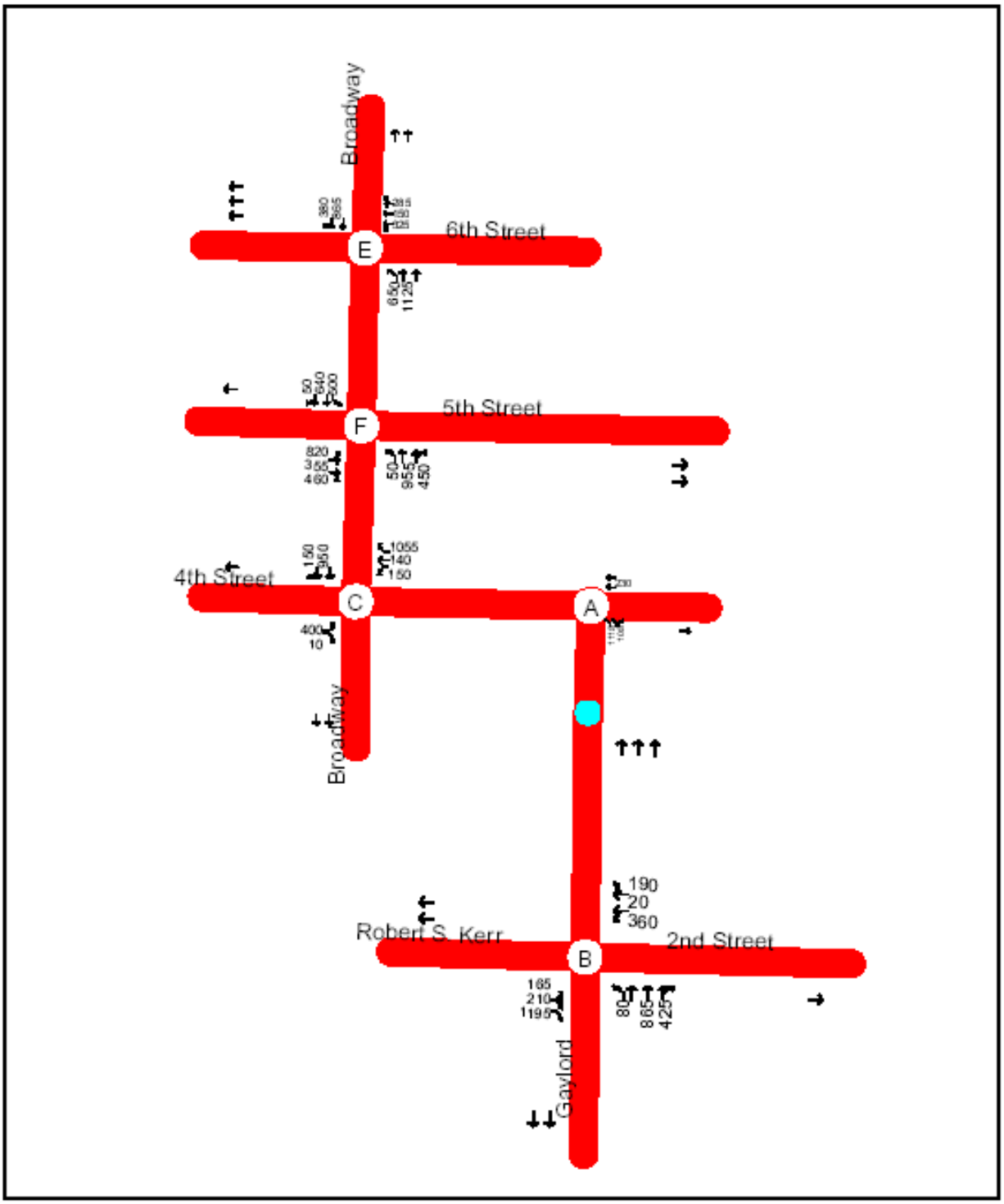


Figure 5. 2030 Peak Hour Volume and LOS: 1-Way Mitigation Configuration



Pedestrian Circulation. The large amount of through traffic in this area will not be friendly to pedestrian circulation, especially given that at the key intersections of 4th/Broadway and 2nd/Gaylord much of the traffic will be making a turn. High turning traffic volumes can be dangerous for pedestrians because there can be confusion between pedestrians and turning drivers about who has the right of way and because turning drivers could have a stronger tendency than non-turning drivers to have trouble seeing or noticing pedestrians in an intersection. The location of a park and/or a school in such an environment would not seem to be advisable.

Property Access. The large amount of turning traffic, long queues, and difficult lane choices could make parking and access confusing for local traffic. Additionally, the introduction of new 1-way street segments could compound an already confusing and difficult traffic circulation environment downtown.

4th Street Undercrossing. One outgrowth of the proposed extension of Gaylord north to 4th could be the potential diversion of some downtown exiting traffic bound for I-235 via Harrison Street from 5th Street to 4th. The 4th Street railroad undercrossing is considered substandard, and the introduction of additional traffic to this undercrossing could result in operational problems and/or increased accidents. Photos of the 4th Street undercrossing are shown in **Figures 6** and **7**.

7. CONCLUSION AND RECOMMENDATION

The basic traffic engineering analysis documented in this memorandum leads the analysis team to conclude that the proposed realignment would result in substantial additional traffic delay, longer queues, and increased circulation difficulty, as well as potential safety risk to pedestrians and drivers alike. In addition, the 4th Street railroad undercrossing is considered substandard and may require replacement for the proposed realignment to operate acceptably. If the proposed realignment is to proceed, the proponents must show the detailed traffic engineering impacts, specifically including a.m. and p.m. peak hour intersection delay, traffic signal progression and vehicle queuing. It appears at this time that if the existing transition is removed, some form of 1-way street restrictions would be required for long-term operational success, and the City should understand and be willing to accept the traffic circulation impacts of such restrictions. Based on the analysis conducted to date, we recommend that the City not allow the proposed street realignment.

Figure 6. 4th Street Undercrossing, Looking West

Figure 7. 4th Street Undercrossing, Looking East