



# Synchro Traffic Analysis - Appendix

# B

## SYNCHRO TRAFFIC ANALYSIS

To analyze the effects of the various street design alternatives on traffic flow, HPE used Synchro traffic analysis software, from Trafficware, Inc., and the companion program SimTraffic. These are micro-level transportation analysis software packages that allow very detailed simulation of existing and future traffic conditions. Synchro allows the analyst to optimize intersection signal timings and experiment with alternative intersection configurations to find a street design that best meets the needs of the transportation system and the community context. At the level of a charrette study, this Synchro analysis should be considered a conceptual evaluation to identify options for further analysis, and not a detailed traffic analysis.

For the Midtown study, HPE used existing traffic counts that were available from VDOT. These counts included segment Average Daily Traffic (ADT) volumes. HPE converted these volumes to PM peak hour volumes using the K-factors provided with the traffic counts. At the time of the charrette and follow-up analysis, turning movement counts at the intersection were unavailable. HPE estimated turning movements based on relative traffic volumes at intersections and surrounding land uses. If turning movement counts become available, additional analysis could be conducted using the Synchro networks already prepared for this study.

HPE prepared four Synchro scenarios using a street network surrounding the Midtown study area. The scenarios are described below:

- 1. Existing Network, Existing Traffic:** This was the "baseline" analysis. The existing street network and existing traffic volumes were loaded into Synchro to establish initial Levels of Service (LOS) at key intersections in the study area.
- 2. Existing Network, Future Traffic:** Traffic was grown by 10% to represent future growth in the area, distributed over the current street system.
- 3. Future Network, Future Traffic:** The future traffic was redistributed over the proposed alternative network.
- 4. Crosstown Connector, Future Traffic:** The Crosstown Connector proposed improvements were added to the existing network to create a Crosstown Connector network. Future traffic was distributed over the Crosstown Connector network.

## SYNCHRO RESULTS

The intersection LOS at 14 key intersections from Scenario 1 was compared to LOS for the same intersections in the other scenarios. These results are included in the Appendix. The baseline analysis indicated that most intersections were functioning at LOS C or better, with two intersections along Langhorne Road functioning at LOS D. Table 1 indicates the LOS for each intersection under each scenario.

Traffic was grown by 10% for the future analysis. The comparisons indicated that Scenario 2, Future Traffic on the Existing System, yield the worst intersection LOS. All but 3 intersections dropped in LOS. Along the Crosstown Connector corridor, one intersection dropped to LOS F (Park Avenue at Langhorne Road.)

Under Scenario 4, with the Crosstown Connector improvements and future traffic, nine intersections dropped in LOS, with five dropping to LOS F, three to LOS E, and one to LOS C. Along the Crosstown Connector route, one intersection improved to LOS A - Lakeside Drive at Oakley Avenue, and one intersection dropped to LOS E - Park Avenue at Langhorne Road.

Under Scenario 3, Future Traffic with the proposed alternative network, 6 intersections dropped in LOS, with two intersections dropping to LOS E, three dropping to LOS D, and one dropping to LOS C. One intersection improved to LOS B.

Along the Crosstown Connector route, one intersection dropped to LOS D - Park Avenue at Memorial Avenue, and one improved to LOS B - Kemper Street at 12th Avenue.

**TABLE 1: INTERSECTION LOS BY SYNCHRO SCENARIO**

Level of Service (LOS)

Intersection	Existing Network/Existing Traffic	Existing Network/Future Traffic	Crosstown Network/Future Traffic	Proposed Network/Future Traffic
<b>Lakeside @ Old Forest</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>C</b>
<b>Lakeside @ Oakley</b>	<b>B</b>	<b>B</b>	<b>A</b>	<b>B</b>
<b>Allegheny @ Atherholt</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>C</b>
<b>Lakeside @ Murrell</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>	<b>NA</b>
<b>Lakeside @ Memorial</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>D</b>
<b>Park @ Langhorne</b>	<b>D</b>	<b>F</b>	<b>E</b>	<b>D</b>
<b>Kemper @ Fort</b>	<b>B</b>	<b>B</b>	<b>B</b>	<b>B</b>
<b>Park @ Kemper</b>	<b>C</b>	<b>C</b>	<b>C</b>	<b>B</b>
Oakley @ Memorial	C	E	E	D
Oakley @ Fort	D	F	F	E
12th @ Fort	E	F	F	F
Langhorne @ 12th	C	F	F	E
Langhorne @ Fort	C	F	E	D
Langhorne @ Memorial	D	F	E	NA
Langhorne @ Murrell	B	E	E	B
Langhorne @ Atherholt	B	C	C	C

**Bold** intersections are on Crosstown Connector Route

Based on this initial computer analysis, HPE draws the following conclusions:

1. The greatest degradation in LOS under future traffic scenarios is along Langhorne Road, en route to the hospital, and none of the alternative networks directly address this problem. The proposed alternative network does result in the least reduction in LOS along this corridor, which is attributed to the additional routing possibilities available under this network.

2. The proposed Crosstown Connector treatment and the proposed alternative treatment appear to break even in terms of over all performance from a traffic management perspective. However, the proposed alternative treatment is more walkable and represents a more context sensitive design. This alternative will create the least disruption to the area and will provide the greatest amenity in terms of a walkable, livable streetscape. For example, Figures 4 and 5 illustrate the treatment of Lakeside Drive along the redeveloped Pittman Plaza, adjacent to the high school, with the proposed Crosstown treatment and the proposed alternative treatment. The Crosstown treatment does not carry significantly more traffic, and it seriously impairs the walkability of this area.

3. As mentioned above, the analysis at this level is conceptual, and the findings are guidance for further study, not final recommendations or findings.



**FIGURE 4: LAKESIDE DRIVE WITH CROSTOWN CONNECTOR STREET SECTION**



**FIGURE 5: LAKESIDE DRIVE WITH PROPOSED STREET SECTION**