Louisville Southern Indiana Ohio River Bridges

Traffic Forecast

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LSIORB Traffic Forecast Report
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As part of the Louisville Southern Indiana Ohio River Bridge (LSIORB) Supplemental Environmental Impact Statement (SEIS), WSA was asked to update the traffic forecasts to reflect current conditions, assumptions, and new alternatives. The traffic forecasts will be used in the SEIS as part of the evaluation of potential impacts to air quality, noise, highway capacity, historic resources, and environmental justice areas.

WSA used a three-step process to prepare these forecasts.

- First, supplemental traffic data was collected, both from historic traffic records and new on-site counts.
- Second, a new time-of-day travel demand model was developed and the traffic data were used to assist in the calibration of the model.
- Last, output from this model was then refined via the traffic forecasting procedure to focus the macro-scale model results on specific areas near the project.

WSA performed this work under the direction of the Federal Highway Administration (FHWA), Kentucky Transportation Cabinet (KYTC), and Indiana Department of Transportation (INDOT), and in coordination with the Kentuckiana Regional Planning and Development Agency (KIPDA), which serves as the metropolitan planning organization (MPO) for the Louisville metropolitan area. As the MPO, KIPDA maintains the regional travel demand model, which is used as the basis for developing the metropolitan long-range transportation plan.

The Traffic Forecast Report is organized as follows:

- Chapter 1 – Data Collection Results
- Chapter 2 – Existing 2010 Traffic Volumes
- Chapter 3 – Historic Ohio River Bridge Crossings
- Chapter 4 – Description of Alternatives
- Chapter 5 – Forecasting Methodology
- Chapter 6 – Forecasting Results
- Chapter 7 – Changes in Travel Patterns Analysis
- Chapter 8 – Toll Sensitivity Test

1.0 Data Collection Results

This chapter provides an overview of the approach to and methods for collecting travel patterns associated with the three Ohio River crossings in the Louisville area and other major routes within the KIPDA five-county area. Data was collected from historical KYTC and INDOT records, as well as on-site counts conducted in fall 2010 and spring 2011.

1.1 Existing Data

WSA was provided recent traffic data from the KYTC and INDOT. This information included the most recent average annual daily traffic volumes, hourly volumes, and classification counts. KYTC provided records for 1,153 time-of-day counts within Bullitt, Jefferson, and Oldham Counties. The counts were conducted between 2007 and 2010. KYTC classification data was provided separately as part of 1,629 counts collected between 1997 and 2010. INDOT provided records for 237 counts throughout Clark and Floyd Counties, dated 2007 through 2009.

1.2 Supplemental Data Collection

Two rounds of additional vehicle classification counts and turning movement counts were conducted to supplement existing KYTC and INDOT data, the first in September 2010, followed by a second round in March and April 2011. An Origin/Destination Survey was also conducted. Each activity is described below; locations for data collection points are shown in **Figure 1-1**.

1.2.1 24-Hour Vehicle Classification Counts

To supplement data provided by KYTC and INDOT, 56 additional locations were counted on September 29, 2010. The ramp counts were completed using road tubes. The 2010 ramp counts were classified using the standard 13 vehicle classes defined by the Federal Highway Administration (FHWA). These locations represent key ramp locations within the LSIORB study area.

A total of 15 ramp counts were conducted in March 2011, some at locations counted during the September 2010 effort and some at new locations. Four locations were recounted after the Yum! Center (a new sports arena in downtown Louisville) opened in order to update or validate previous counts. No regionally significant change in travel patterns was determined from the opening of the arena.

1.2.2 Turning Movement Counts

Turning movement counts were conducted at three key locations in September 2010. The counts were conducted in coordination with the Origin/Destination Survey and classification counts. During March and April 2011, turning movement counts were conducted at 57 locations in the Louisville metropolitan area.

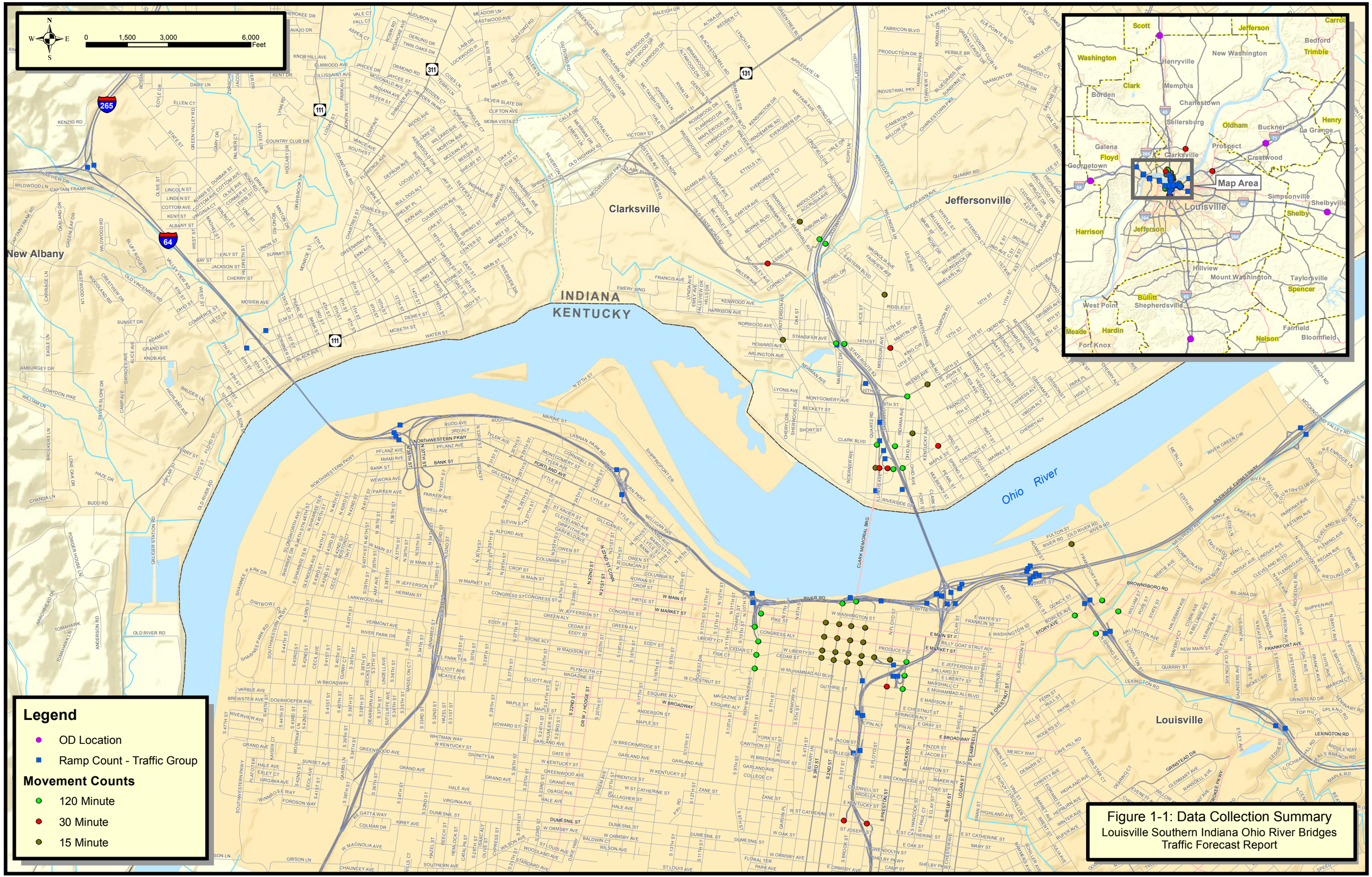


Figure 1-1: Data Collection Summary
Louisville Southern Indiana Ohio River Bridges
Traffic Forecast Report

Turning movement counts were conducted during the AM and PM peak periods. AM counts were generally conducted between 7:00 am and 9:00 am. PM counts were generally conducted between 4:00 pm and 6:00 pm. At key locations, counts were conducted for the complete two-hour period, while at other locations, counts were conducted for 15 or 30 minutes to establish turn percentages.

1.2.3 Origin/Destination Survey

The external Origin/Destination Survey was conducted September 29, 2010, starting at midnight and ending 24 hours later. Five sites were monitored along the interstates near the edge of the KIPDA five-county area to analyze regional traffic movements:

- I-64 in Indiana near the Harrison/Floyd county line
- I-65 in Indiana near the Scott/Clark county line
- I-71 in Kentucky near Crestwood in Oldham County
- I-64 in Kentucky in Shelby County, east of the ongoing construction
- I-65 in Kentucky in Bullitt County, between exit 105 (KY 61 at Boston/Lebanon Junction) and exit 112 (KY 245 at Clermont)

The Origin-Destination study was conducted using camera systems capable of detecting and photographing license plates. Cars and trucks were differentiated along with direction. This study is described in more detail in the *LSIORB Time of Day Model Phase I Final Report* dated December 28, 2010.

2.0 Existing 2010 Traffic Volumes

The majority of the on-site data collection was conducted during 2010, corresponding to the most recent traffic data available from KYTC and INDOT. As a result, 2010 was established as the existing baseline. The 2010 volumes were summarized in the *LSIORB Time of Day Model Phase 1 Final Report.* As part of the traffic forecast process, these raw counts were reviewed and adjusted (as described in Section 5) to establish the 2010 traffic volumes presented in this document.

Table 2-1 illustrates the 2010 Ohio River Bridge traffic volumes. **Table 2-2** illustrates the traffic volumes by time period for each river crossing.

Table 2-1: 2010 Ohio River Bridges Daily Traffic Volumes and Truck Percentages

Crossing	Daily		Truck Percentages	Truck Volumes
I-64 EB	42,400	82,000	10.6%	4,490
I-64 WB	39,600		11.3%	4,470
US 31 SB	11,400	21,900	1.6%	180
US 31 NB	10,500		1.6%	170
I-65 SB	60,100	122,300	24.0%	14,420
I-65 NB	62,200		18.3%	11,380
All Crossings	226,200			35,110

Table 2-2: 2010 Ohio River Bridges Traffic Volumes by Period and Direction

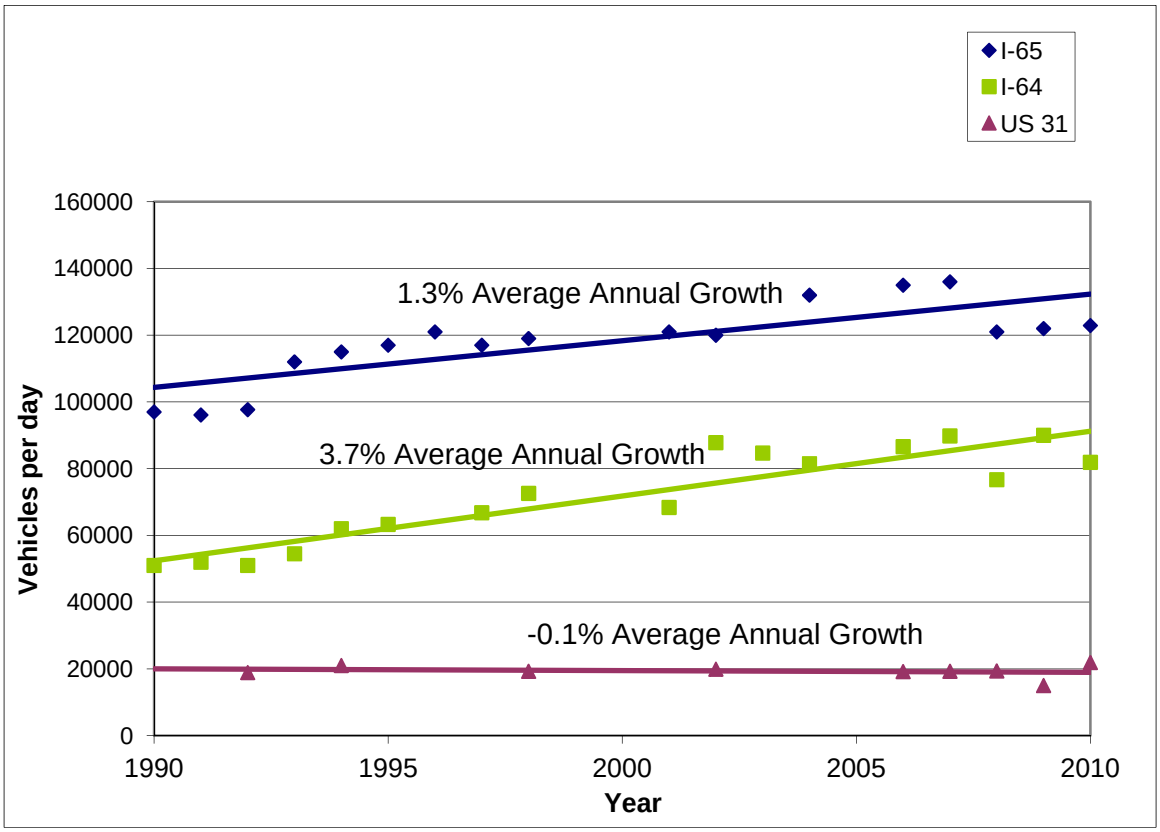
Crossing	AM Period (6:00 - 9:00AM)		Midday Period (9:00AM - 3:00PM)		PM Period (3:00 - 6:00PM)		Nighttime Period (6:00PM - 6:00AM)	
I-64 EB	12,200	16,400	11,500	23,200	8,000	20,500	10,700	21,900
I-64 WB	4,200		11,700		12,500		11,200	
US 31 SB	3,300	4,200	2,800	5,900	3,300	7,100	2,000	4,700
US 31 NB	900		3,100		3,800		2,700	
I-65 SB	12,000	20,500	20,300	40,700	10,700	25,900	17,100	35,200
I-65 NB	8,500		20,400		15,200		18,100	
All Crossings	41,100		69,800		53,500		61,800	

The 2010 daily, AM Peak, and PM Peak traffic volumes are found in **Appendix A**.

3.0 Historic Ohio River Bridge Crossings

As was illustrated in **Table 2-1**, the 2010 average annual daily traffic (AADT) volume for the I-65 Kennedy Bridge was 122,300 vehicles per day (VPD). This is consistent with 2008 and 2009 volumes, but lower than volumes recorded between 2004 and 2007. The recorded AADT for the I-64 Sherman Minton Bridge in 2010 was 82,000 vpd, which is lower than 2006, 2007, and 2009 volumes, but consistent with 2008 volumes. Daily volumes on the US 31 Clark Memorial Bridge were 21,900 vehicles for 2010, which is higher than previous counts. These historical counts for all three bridges are illustrated in **Figure 3-1**.

Figure 3-1: Historic Traffic Volumes on Ohio River Bridges



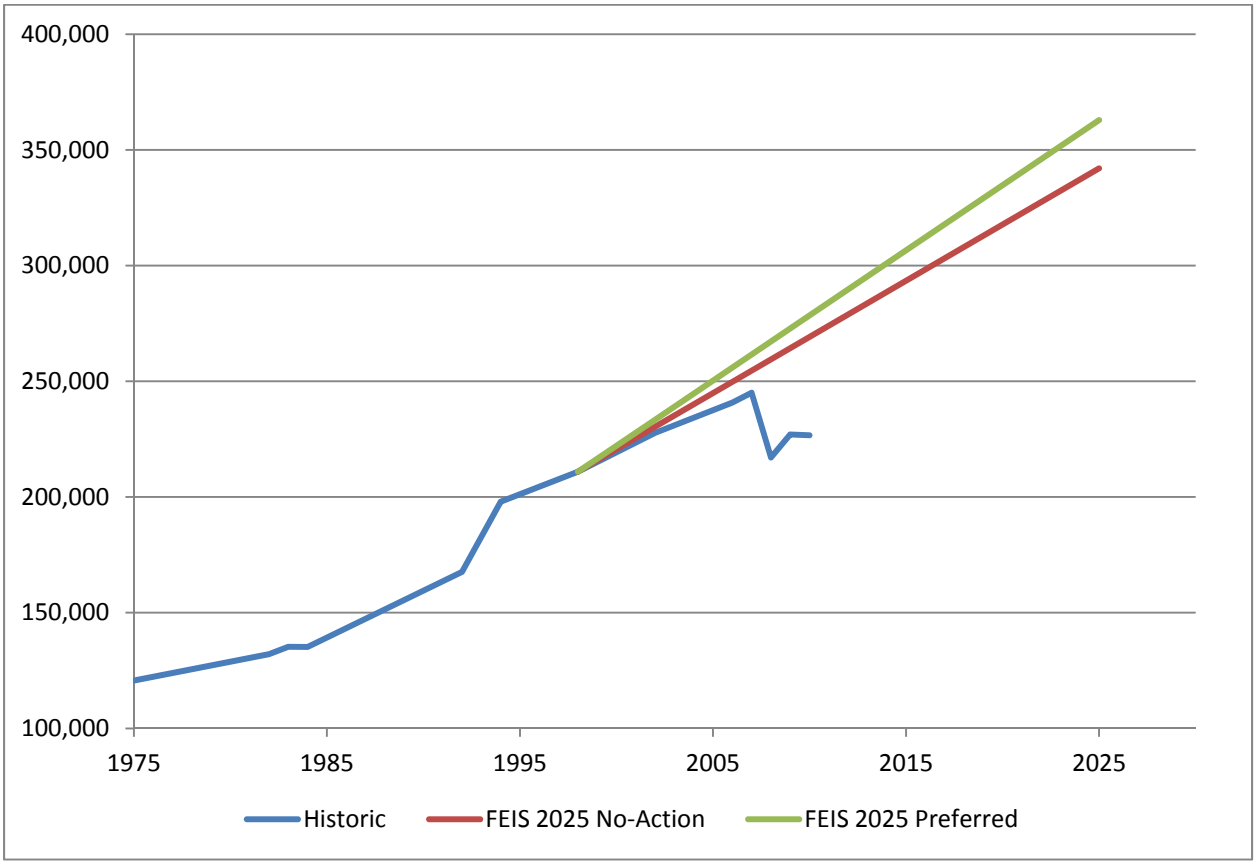
These trends are consistent with national traffic volume trends. As reported by the FHWA Office of Highway Policy Information, travel measured in Millions of Vehicle Miles peaked in 2007 after approximately 50 years of annual increases. Traffic has recovered slightly the past two years, but has generally not recovered to 2007 traffic levels. According to the same report, year-over-year change in VMT for Kentucky for the month of June 2011, which represented the latest available data, has decreased 2.8 percent. Indiana saw a decline of one percent for the same period. So while a recovery is occurring nationally, there are still examples of statewide trends showing limited or declining traffic growth.

The short term trend in VMT decline is not expected to continue long term. Population and employment forecast for the Louisville metropolitan area were provided by KIPDA as part of the development of the LSIORB TOD Model. These forecasts illustrate long term growth. Applying these forecasts to the travel demand modeling process resulted in a corresponding increase in VMT, as illustrated in the following chapters.

While traffic volumes are expected to increase long term, these more recent local and national travel trends are further justification for updating the traffic forecast for the LSIORB project. The growth projections included in the 2003 FEIS should then be compared with the recent volumes as described below.

Figure 3-2 highlights the historic traffic volumes crossing the Ohio River in Louisville along with the traffic projections for the No-Action and FEIS Selected alternatives from the original EIS. These projections were on the high side prior to the downturn in 2008, warranting additional analysis for the SEIS.

Figure 3-2: Original FEIS Daily Traffic Volumes on Ohio River Bridges



4.0 Description of Alternatives

The alternative screening process, documented in the *Range of Alternatives Document* dated October 2011, identified three alternatives that should be analyzed as part of the SEIS document. Below are descriptions of each of these alternatives.

4.1 No-Action Alternative

The No-Action Alternative includes the KIPDA 2030 Long Range Plan improvements, but excludes the East End Bridge, new I-65 second span, and reconfigured Kennedy Interchange.

4.2 FEIS Selected Alternative (non-tolled)

The 2030 FEIS Selected Alternative is the alternative evaluated and selected in the 2003 LSIORB EIS. While some modifications have been recommended since approval in 2003, they were never formally adopted into the EIS; therefore, they were not included in the updated analysis. One exception is the proposed interchange at 10th Street and Port Road along I-265 in Indiana. This interchange was evaluated as a Double Crossover Diamond Interchange. The FEIS Selected Alternative includes a 6-lane East End Bridge, new I-65 second span, and Kennedy Interchange improvements. This alternative did not include tolls.

4.3 Modified Selected Alternative

The Modified Selected Alternative was developed in 2011 as a modification to the FEIS Selected Alternative. The Modified Selected Alternative includes a 4-lane East End Bridge, new I-65 second span, Kennedy Interchange improvements that vary from the FEIS Selected Alternative, and the reconfigured I-265/10th Street/Port Road Interchange. The latter is the same interchange configuration used for the FEIS Selected Alternative. In addition, tolling of the East End Bridge and I-65 over the Ohio River was considered at rates of $1.50 for passenger vehicles, $3.00 for light trucks and $6.00 for heavy trucks. These rates were developed such that traffic on the other toll-free bridges (US 31 and I-64) would continue to maintain good cross river mobility while providing revenue to assist in financing the project. These toll rates are referred to in the SEIS as the “baseline tolling scenario”.

5.0 Forecasting Methodology

Traffic forecasts were developed for the three alternatives outlined above. The future year for the forecasting was set as 2030, which coincides with the most recent KIPDA *Long Range Transportation Plan*.

5.1 Time-of-Day Model

The traffic forecasting work summarized in this report builds upon the completion of the LSIORB Time-of-Day (TOD) Travel Demand Model.

A typical travel demand model, such as the KIPDA model, includes a series of small zones coded with data about population and economic demographics. The model contains information to establish how many trips will travel to and from each of these zones. The entire area is overlaid with a set of links representing major portions of the existing highway network; each major highway is coded to represent the number of lanes, travel speed, and other details. With information about where trips are going to and coming from and the transportation links within a city, the model determines possible paths travelers might take between two points and assigns trips to these links based on travel times, distances, and congestion levels.

Prior to 2011, the KIPDA travel demand model did not have the capability to generate forecasts for a specific time of day. The model generated total daily traffic volumes, and those daily volumes were then used as the basis for estimating the volumes that were expected to occur during the peak hour. Because it only generated daily traffic volumes, this KIPDA model is referred to in this report as a “24-hour model”.

To assist in the evaluation of the LSIORB project, KYTC and INDOT commissioned the development of the new LSIORB TOD model. The LSIORB TOD model is based on the regional travel demand model that is used by KIPDA in metropolitan transportation planning. The LSIORB TOD model was developed to allow for a more detailed analysis of the effects of tolling on traffic patterns. Tolling is being considered to enhance the revenue available for construction of the project.

The LSIORB TOD model enhanced the KIPDA Regional Model by:

- Providing trip purpose stratification[1];
- Creating a time-of-day structure (AM Peak, Midday, PM Peak and Night);
- Updating the mode choice model to reflect the new TOD structure;
- Updating the socioeconomic data to the most recent available from KIPDA;

[1] The KIPDA Model assumes the following trip purposes for internal trip making: Home Based Work (HBW), Home Based Other (HBO) and Non Home Based (NHB). The LSIORB TOD Model takes these internal trip purposes and disaggregates them by income group based on the income of the household making the trip. This stratification is carried through all steps of the model to support the mode choice model and provides additional policy sensitivity in the model by allowing for the flexibility to vary the value of time and other cost parameters by income group.

- Using the latest available traffic volumes, including counts specifically collected for this process;
- Adding a truck model component; and
- Improving the traffic assignment methodology.

The LSIORB TOD model is described in more detail in the *Time-of-Day Travel Demand Model Phase 2 Report* and throughout this document.

The LSIORB TOD model formulated traffic for eight periods, which can be summarized as follows: AM (6AM-7AM, 7AM-8AM, 8AM-9AM), Midday (9AM-3PM), PM (3PM-4PM, 4PM-5PM, 5PM-6PM), and Nighttime (6PM-6AM). The periods are based on time of day factors developed from the 2000 KIPDA Household Survey and count distributions for the external and truck count stations. Switching from a 24-hour model to a LSIORB TOD model eliminated the need to apply design hour and directional factors to daily volumes, thus allowing a greater level of accuracy.[2] The volumes output from the LSIORB TOD model were then used as a starting point in developing the traffic forecast.

5.2 Forecasts from Model Output

The LSIORB TOD model output provides estimated traffic volumes for each highway link in the transportation system. Travel demand models identify regional trends and traffic patterns. The model's projected traffic volumes generally are most accurate for high volume roadways like interstates and expressways. The model's micro-level operations on specific streets are generally less accurate.

In general, traffic forecasting focuses on refining portions of the model output likely to be influenced by the project. In the base year this means making adjustments at specific locations to ensure that corresponding projected volumes match existing conditions. For example, the travel demand model may predict that interstate ramp X will carry 200 vehicles between 4:00 and 5:00 PM. This traffic forecasting analysis compares this volume against the 216 vehicles observed using this ramp and volumes using adjacent streets/ramps and then applies engineering judgment to determine whether the 200 vehicles predicted by the model should be adjusted to better represent the local conditions.

The first step in developing the traffic forecasts for the LSIORB Project using the LSIORB TOD model involved professional traffic engineers reviewing the overall model results for each of the three alternative scenarios. This review occurred initially on a regional level, followed by a review of key roadways to ensure that the model was responding in a reasonable fashion given the changes in roadways and increases in traffic.

Once the LSIORB TOD model was determined to be operating correctly, the second step was to establish the volumes crossing the Ohio River; the river serves as a screenline within the

[2] As noted above, the typical 24-hour model produces estimates of the total daily traffic volumes, and assumptions are then used to estimate the volume at specific times of day. These assumptions address issues such as (1) percentage of daily traffic that will occur during the peak hour, and (2) proportion of vehicles traveling in each direction at peak hour – also known as directional split.

metropolitan area. This step produced forecasts of traffic volumes using each bridge for each time period.

Having established volumes on the Ohio River screenline, the third step was to evaluate major roadway segments and key intersections, moving away from the screenline. In this step, analysts examined base year model output and existing conditions along mainline interstates, interstate ramps, and other major intersecting roadways.

As in the bridge forecasts in the previous step, model volumes were reviewed and adjusted, as needed, to more reflect anticipated changes as they related to existing conditions. Similar adjustments were then applied to other alternative scenarios.

At specified locations, turning movement forecasts were also prepared. The intersections were combined into 11 subareas as illustrated on **Figure 5-1**. At each intersection, approach volumes were recorded from either adjusted segment volumes determined in Step 3, where applicable, or model volumes and compared to existing turn percentages collected during the data collection phase. The approach volumes were aggregated by movement using existing turn percentages and then balanced for each approach. These volumes were then balanced across adjacent intersections within each subarea to create a balanced subsystem.

A truck percentage was derived for each segment and intersection turning movement. For primary routes (interstates and connecting roadways), truck percentages were derived from the LSIORB TOD model and adjusted, as needed, using existing truck percentages collected through the data collection process. On local roadways, where existing truck percentages were not collected, standard KYTC default values were used. These values were then adjusted to balance to the remaining system.

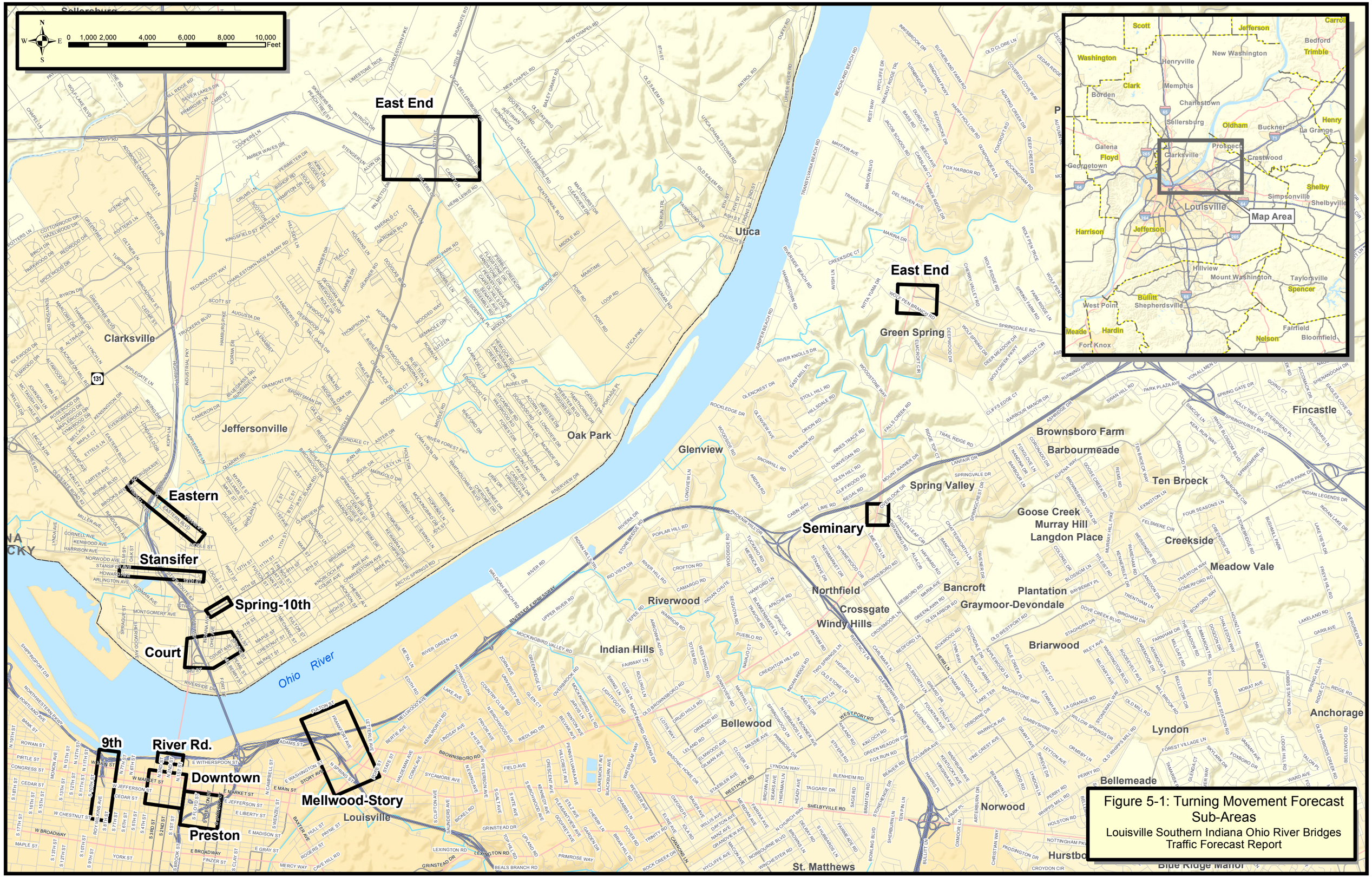


Figure 5-1: Turning Movement Forecast Sub-Areas

Louisville Southern Indiana Ohio River Bridges Traffic Forecast Report

6.0 Forecasting Results

The 2030 forecast results for the three alternatives are presented in the following sections.

6.1 System-wide Comparison of Alternatives

The LSIORB TOD model output was used to provide a system-wide comparison of the alternatives. The three components were vehicle miles of travel (VMT), vehicle hours of travel (VHT), and vehicle hours of delay (VHD)[3] for the five-county Louisville Metropolitan Area and are illustrated in **Table 6-1**. VMT is slightly higher while VHT and VHD are both lower for either build alternative when compared to the No-Action Alternative. In general, motorists are willing to make a longer trip in order to save time, resulting in overall reduced congestion. The reduction in VHT is the same for the two build alternatives. The FEIS Selected Alternative provides somewhat greater reductions in VHD than the Modified Selected Alternative.

Table 6-1: 2030 Travel Summaries

Alternative	VMT	Percent Change	VHT	Percent Change	VHD	Percent Change
No-Action						
Auto	30,946,000		965,000		367,000	
Truck	4,351,000		104,000		30,000	
Total	35,297,000		1,069,000		397,000	
FEIS Selected						
Auto	31,492,000	2%	923,000	-4%	319,000	-13%
Truck	4,334,000	0%	100,000	-4%	27,000	-10%
Total	35,826,000	1%	1,023,000	-4%	346,000	-13%
Modified Selected						
Auto	31,604,000	2%	923,000	-4%	321,000	-13%
Truck	4,336,000	0%	100,000	-4%	27,000	-10%
Total	35,940,000	2%	1,023,000	-4%	348,000	-12%

Note: Percent change is compared to the No-Action Alternative.

6.2 Ohio River Bridge Daily Volumes

Following is a discussion on Ohio River crossing daily volumes, both historically and for the 2030 forecast. This will be further illustrated in the results presented in the following section.

Table 6-2 and **Figure 6-1** illustrates a decline in traffic crossing the Ohio River in 2030 for all three alternatives when compared to the FEIS 2025 No-Action Alternative. As described in Section 3, this trend is explained by the recent interruption in traffic growth nationally since 2007. Long term, continued traffic growth is expected, but based on a lower baseline.

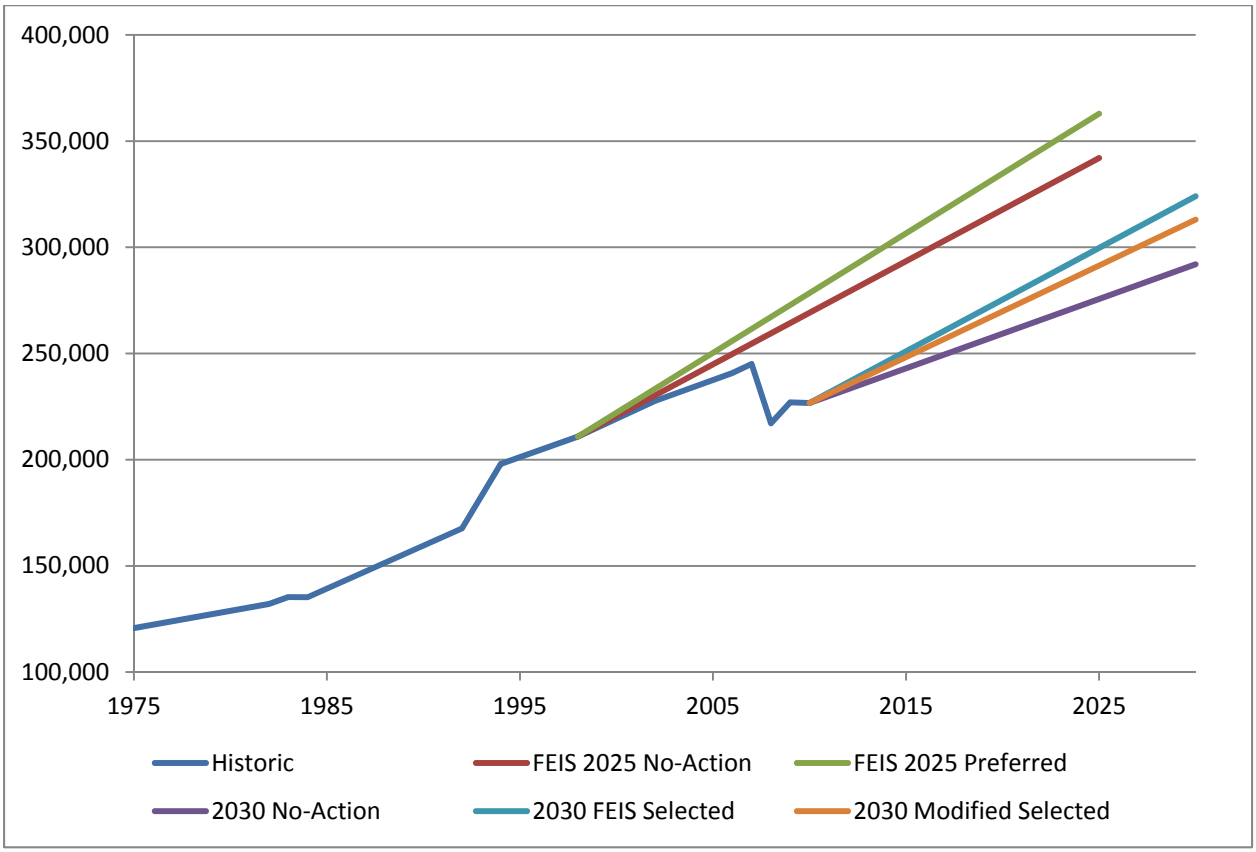
[3] VHD is the difference between the adjusted free flow travel time (free flow time + signal adjustment) and the output time from the traffic assignment. The traffic assignment calculates the loaded time on a link using a volume delay function based on the capacity, volume and parameters for the delay curve.

Table 6-2: Daily Ohio River Crossings Traffic Volumes by Alternative

Alternative	John F. Kennedy Bridge (I-65)	Sherman Minton Bridge (I-64)	Clark Memorial Bridge (US 31)	East End Bridge (I-265)	Total River Crossings
	ADT	ADT	ADT	ADT	ADT
2010 Base Year (Actual Counts)	122,300	82,000	21,900	0	226,200
FEIS 2025 No-Action[1]	178,600	129,700	33,700	0	342,000
FEIS 2025 Preferred[1]	160,800	111,600	20,500	70,000	362,900
2030 No-Action	155,000	112,000	25,000	0	292,000
2030 FEIS Selected	136,000	100,000	28,000	60,000	324,000
2030 Modified Selected	104,000	122,000	35,000	52,000	313,000

1) *The FEIS 2025 No-Action and 2025 Preferred Alternatives are from the 2003 LSIORB EIS.*

Figure 6-1: Projected Daily Traffic Volumes on Ohio River Bridges in Louisville Metropolitan Area



Total bridge crossings are projected to be higher under the 2030 FEIS Selected Alternative and the 2030 Modified Selected Alternative than under the 2030 No-Action Alternative. This increase can be attributed to the fact that the build alternatives decreased the travel time and distance for trips crossing the river, as demonstrated in **Table 6-1**. **Table 6-3** highlights the average yearly growth for each of the alternatives.

Table 6-3: Daily Ohio River Crossings Average Yearly Percent Growth

Historic Growth 1972-2010	Historic Growth 1998-2007	Historic Growth 1998-2010	EIS No-Action 1998-2025	EIS Preferred 1998-2025	No-Action 2010-2030	FEIS Selected 2010-2030	Modified Selected 2010-2030
2.51%	1.80%	0.62%	2.30%	2.67%	1.44%	2.15%	1.90%

In addition to increased traffic, the two build alternatives would cause travel patterns to change (compared to the No-Action Alternative) because of the new East End Bridge, improved access to the US 31 Bridge, and (in the case of the Modified Selected Alternative) the implementation of tolls.

Although the overall volumes were lower than projected in the 2003 FEIS, the 2030 forecasts for the FEIS Selected Alternative follow a similar pattern of redistribution as in the original 2025 analysis presented in the FEIS.

The Modified Selected Alternative exhibits different travel patterns than the FEIS Selected Alternative because tolls are placed on the I-65 Bridges and the East End Bridge. Tolls affect travel patterns for two reasons: first, some people will be unwilling to pay the toll and would divert to either of the other two toll-free bridges, and second, some people would decide to either not make their trip or choose to make the trip but not cross the river (for example, instead of shopping in Louisville, they may choose to either not go shopping or change to shop on their side of the river).

6.3 No-Action Alternative

Table 6-4 illustrates the 2030 No-Action Alternative traffic volumes and truck percentages crossing the river. As illustrated in **Figure 6-1**, all year 2030 bridge volumes were lower than the FEIS 2025 No-Action Alternative. Truck percentages are slightly heavier on I-64 and lower on I-65 when compared to current traffic. **Table 6-5** illustrates the traffic volumes by time period for each river crossing.

Table 6-4: No-Action Alternative
Ohio River Bridges 2030 Daily Traffic Volumes and Truck Percentages

Crossing	Daily		Truck Percentages	Truck Volumes
I-64 EB	56,000	112,000	12.1%	6,780
I-64 WB	56,000		12.3%	6,890
US 31 SB	13,600	25,000	1.6%	220
US 31 NB	11,400		1.6%	180
I-65 SB	77,500	155,000	18.5%	14,340
I-65 NB	77,500		18.2%	14,110
All Crossings	292,000			42,520

Table 6-5: No-Action Alternative
Ohio River Bridge 2030 Traffic Volumes by Period and Direction

Crossing	AM Period (6:00 - 9:00AM)		Midday Period (9:00AM - 3:00PM)		PM Period (3:00 - 6:00PM)		Nighttime Period (6:00PM - 6:00AM)	
I-64 EB	16,000	24,100	18,200	35,500	11,000	28,000	10,800	24,400
I-64 WB	8,100		17,300		17,000		13,600	
US 31 SB	3,400	4,300	5,200	7,900	2,900	7,100	2,100	5,700
US 31 NB	900		2,700		4,200		3,600	
I-65 SB	18,800	30,200	25,000	48,500	15,200	36,800	18,500	39,500
I-65 NB	11,400		23,500		21,600		21,000	
All Crossings	58,600		91,900		71,900		69,600	

Appendix B illustrates the daily, AM Peak, and PM Peak volumes, including turning movements for the subareas indentified in **Figure 5-1**, for the No-Action Alternative.

6.4 FEIS Selected Alternative

Table 6-6 illustrates the 2030 FEIS Selected Alternative traffic volumes and truck percentages crossing the river. As previously discussed, traffic on the I-64 and I-65 bridges is lower under the FEIS Selected Alternative than under the No-Action Alternative. This is offset by the new trips on the East End Bridge resulting in higher overall river crossings.

When compared to the No-Action Alternative, truck percentages are lower on both the I-64 and I-65 bridges, meaning a greater percentage of trucks will divert to the East End Bridge, resulting in approximately 13 percent trucks on the new bridge. **Table 6-7** illustrates the traffic volumes by time period for each river crossing. As was the trend for daily traffic, overall river crossing volumes are higher for each period compared to the No-Action Alternative.

Appendix C illustrates the daily, AM Peak, and PM Peak volumes, including turning movements, for the FEIS Selected Alternative.

Table 6-6: FEIS Selected
Ohio River Bridge 2030 Daily Traffic Volumes and Truck Percentages

Crossing	Daily		Truck Percentages	Truck Volumes
I-64 EB	50,000	100,000	10.3%	5,150
I-64 WB	50,000		10.4%	5,200
US 31 SB	14,300	28,000	1.6%	230
US 31 NB	13,700		1.6%	220
I-65 SB	68,000	136,000	15.4%	10,470
I-65 NB	68,000		15.9%	10,810
East End SB	30,000	60,000	13.5%	4,050
East End NB	30,000		13.2%	3,960
All Crossings	324,000			40,090

Table 6-7: FEIS Selected
Ohio River Bridge 2030 Traffic Volumes by Period and Direction

Crossing	AM Period (6:00 - 9:00AM)		Midday Period (9:00AM - 3:00PM)		PM Period (3:00 - 6:00PM)		Nighttime Period (6:00PM - 6:00AM)	
I-64 EB	14,200	21,500	16,500	32,000	9,700	24,900	9,600	21,600
I-64 WB	7,300		15,500		15,200		12,000	
US 31 SB	3,700	4,700	5,000	9,200	2,700	6,800	2,900	7,300
US 31 NB	1,000		4,200		4,100		4,400	
I-65 SB	20,600	29,300	21,000	39,900	12,300	35,300	14,100	31,500
I-65 NB	8,700		18,900		23,000		17,400	
East End SB	5,200	14,700	8,200	16,400	10,100	15,900	6,500	13,000
East End NB	9,500		8,200		5,800		6,500	
All Crossings	70,200		97,500		82,900		73,400	

6.5 Modified Selected Alternative

Table 6-8 illustrates the 2030 Modified Selected Alternative traffic volumes and truck percentages crossing the river. This alternative included the evaluation of tolls applied to the I-65 and East End Bridges. As a result, overall river crossings are lower than the FEIS Selected Alternative; however, the improvements provide additional capacity for traffic demand compared to the No-Action Alternative.

Truck percentages increase on the I-64 Bridge, diverting around the toll bridges. While truck percentages on the I-65 bridge are higher, the total number of trucks is lower for both the I-65 and East End bridges compared to the FEIS Selected Alternative. **Table 6-9** illustrates the traffic volumes by time period for each river crossing. Individual time period volumes followed a similar trend to daily traffic.

Table 6-8: Modified Selected
Ohio River Bridge 2030 Daily Traffic Volumes and Truck Percentages

Crossing	Daily		Truck Percentages	Truck Volumes
I-64 EB	61,000	122,000	12.2%	7,440
I-64 WB	61,000		12.5%	7,630
US 31 SB	17,500	35,000	1.6%	280
US 31 NB	17,500		1.6%	280
I-65 SB	52,000	104,000	19.1%	9,930
I-65 NB	52,000		19.4%	10,090
East End SB	26,000	52,000	11.6%	3,020
East End NB	26,000		11.5%	2,990
All Crossings	313,000			41,660

Table 6-9: Modified Selected
Ohio River Bridge 2030 Traffic Volumes by Period and Direction

Crossing	AM Period (6:00 - 9:00AM)		Midday Period (9:00AM - 3:00PM)		PM Period (3:00 - 6:00PM)		Nighttime Period (6:00PM - 6:00AM)	
I-64 EB	16,000	24,900	20,600	39,900	11,600	28,500	12,800	28,700
I-64 WB	8,900		19,300		16,900		15,900	
US 31 SB	3,500	6,700	5,600	11,200	3,400	7,000	5,000	10,100
US 31 NB	3,200		5,600		3,600		5,100	
I-65 SB	17,600	22,500	16,300	30,100	9,000	29,100	9,100	22,300
I-65 NB	4,900		13,800		20,100		13,200	
East End SB	4,600	12,500	7,200	14,500	8,500	13,700	5,700	11,300
East End NB	7,900		7,300		5,200		5,600	
All Crossings	66,600		95,700		78,300		72,400	

Appendix D illustrates the daily, AM Peak, and PM Peak volumes, including turning movements, for the Modified Selected Alternative.

7.0 Changes in Travel Patterns Analysis

Changes in travel patterns are being evaluated due to the introduction of tolling and design changes associated with the Modified Selected Alternative. Introducing tolls to previously toll-free facilities can cause some of the pre-toll users to change their travel patterns to un-tolled or lower-cost alternatives. Changes in travel patterns can happen due to:

- Route changes: shift to a toll-free route;
- Mode shift: move to an alternative mode of travel, such as transit or carpool;
- Change of destination: choose a similar or related destination that does not require traversing tolled facility;
- Frequency of use/trip elimination: reducing the frequency of a trip, combining multiple trips, or eliminating the trip altogether.

Changes in travel patterns can result in positive and negative impacts. These changes can, among other benefits, help to reduce peak-period congestion on some facilities. However, changes in travel patterns also may increase traffic volumes on arterial streets that are not suited to that increase. Alternative routes also can be longer than the tolled route, resulting in increased travel time.

The methodology presented in this document provides a means to identify areas that could experience changes in travel patterns as a result of (1) applying tolls to the Downtown (I-65) and East End Bridges and/or (2) the proposed design changes associated with the Modified Selected Alternative. This analysis compares the changes in travel patterns in the year 2030 from the FEIS Selected Alternative to the Modified Selected Alternative.

In order to consider the changes in travel patterns from the implementation of the Modified Selected Alternative, the project team developed a methodology for identifying areas where increases or decreases in traffic may occur. This methodology is based on traffic data and output from the LSIORB TOD model, and can be used to estimate potential changes in traffic conditions in subareas within the Project area. The methodology is intended to identify increases or decreases in traffic that are relevant to the assessment of effects, while screening out increases or decreases that are too small for the model to predict accurately.

This methodology involves running the output from the travel demand model through a series of screens to estimate differences in travel patterns between: 1) the FEIS Selected Alternative, and 2) the Modified Selected Alternative. The model screens are depicted in **Figure 7-1** and **Figure 7-2** for high and low volume streets respectively (discussed further below). The travel demand model output for each roadway segment included in the model passes through one to three levels of screening to determine if the estimated change in traffic on that segment is substantial enough to result in a potential effect.

Figure 7.1: Screening of High Volume Roadways (ADT>5,000)

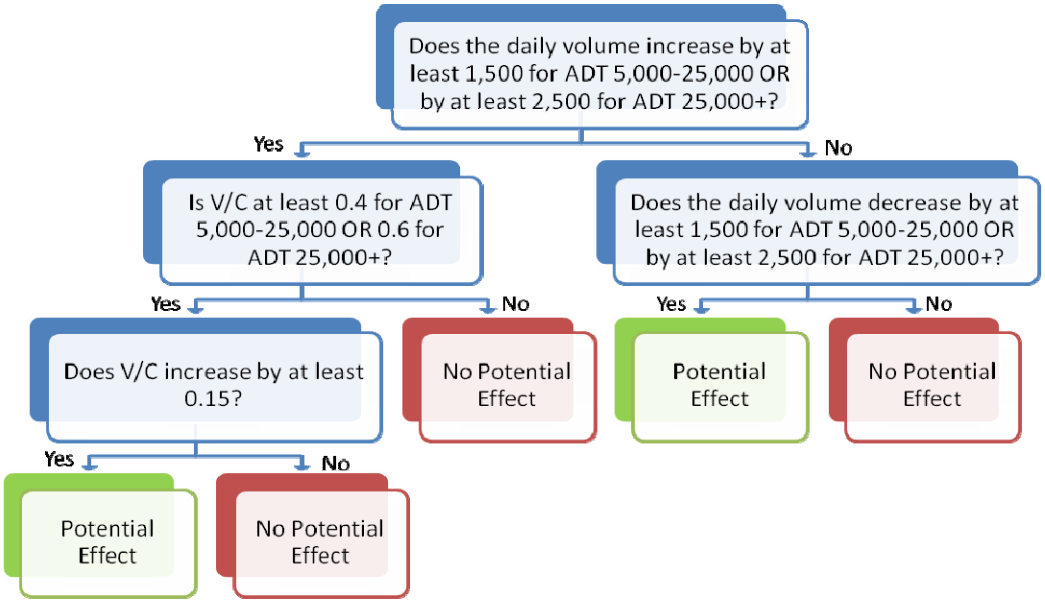
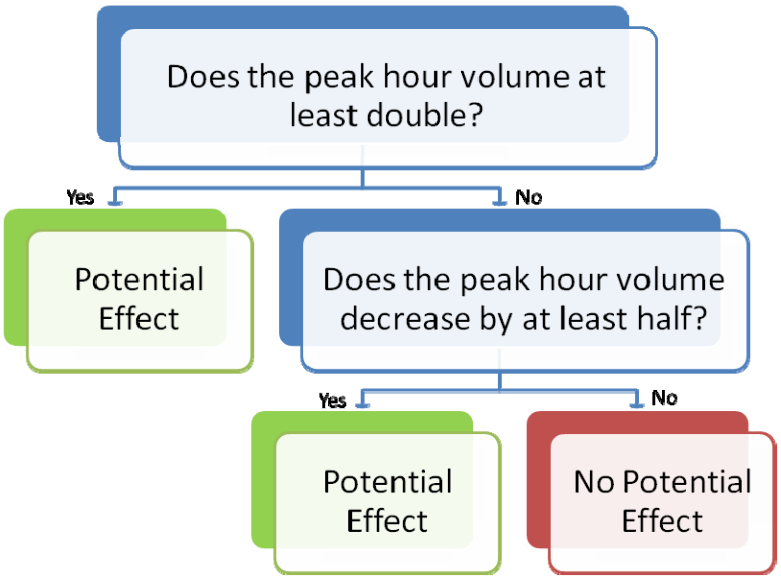


Figure 7.2: Screening of Low Volume Roadways (ADT<5,000)



7.1 How are High Volume Roadways Screened?

This section explains the screening process for "high volume" roadways, i.e., those roadways that carry at least 5,000 vehicles per day. This process is depicted graphically in **Figure 7-1**.

Level 1: For street segments that carry at least 5,000 vehicles per day, the first level of screening considers the actual change in the number of vehicles during a 24-hour period. Daily thresholds of 1,500 vehicles (for street segments carrying 5,000 to 25,000 vehicles per day) and 2,500 vehicles (for street segments carrying over 25,000 vehicles per day) were selected as conservative screening values based on the likelihood to create impacts. The thresholds generally equate to a one to two car per minute change in the traffic volume, which would not be noticeable to a casual observer. Larger traffic volume changes would be necessary to impact noise levels. All changes were measured as the change from the modeled traffic volumes for the FEIS Selected Alternative to the modeled traffic volumes for the Modified Selected Alternative.

Thus, a change in traffic (either increase or decrease) of less than 1,500 or 2,500 vehicles per day between the FEIS Selected Alternative and the Modified Selected Alternative would constitute a minor change in traffic and is unlikely to create potential effects and were dropped from further consideration.

If the daily traffic volume on a segment would increase by at least 1,500 or 2,500 vehicles, respectively, this would constitute a noticeable change in traffic. These segments were then passed to Level 2 for further screening to determine whether the increase in traffic would affect how well the street operates. If the decrease in daily traffic volumes was greater than 1,500 or 2,500 vehicles, respectively then these roadway segments would be considered for potential effect. There is no further screening of decreasing volumes.

Level 2: Segments with an increase greater than 1,500 or 2,500 vehicles per day, respectively, were then screened based on their volume-to-capacity ratio. A volume-to-capacity (v/c) ratio is a general measure of how a street operates. For example, if there are 10 cars using a street (the volume) and the street can carry a maximum of 100 cars (the capacity), then the v/c ratio is 10/100 or 0.1 (i.e., the street is carrying 10% of its maximum capacity).

The v/c ratios used as screening criteria in Level 2 represent the v/c ratios for urban streets where traffic flow is stable (instead of congested, stop-and-go conditions). The *KIPDA Congestion Management Process Overview Report* identifies a v/c ratio of 0.6 on high volume roadways as the "minimal acceptable performance level for urban facilities." Those ratios are 0.4 for street segments carrying 5,000 to 25,000 vehicles per day and 0.6 for street segments carrying over 25,000 vehicles per day. If the v/c ratio is less than 0.4 or 0.6, respectively, the roadway operates at an acceptable level and has enough capacity remaining to absorb additional traffic volumes without having an effect. Therefore, road segments that passed the Level 1 screen, but that had v/c ratios less than 0.4 or 0.6, respectively, were not considered for any further analysis.

If the v/c ratio for a road segment is greater than 0.4 or 0.6, respectively, (meaning that the road segment is already in a relatively congested state), a change in traffic volume could have an effect on how the roadway operates. These segments were further screened to determine whether the anticipated change in the v/c ratio between the FEIS Selected Alternative and the Modified Selected Alternative would be noticeable.

Level 3: Segments with a v/c ratio of at least 0.4 or 0.6, respectively, were then screened based on the change in their v/c ratio between the FEIS Selected Alternative and the Modified Selected Alternative. A 0.15 change in the v/c ratio was identified as the screening criterion at Level 3. This criterion is considered to be a conservative measure because a 0.15 change in the v/c ratio typically constitutes a minor change in congestion levels.

If the v/c ratio would increase by less than 0.15 between the two alternatives, traffic operations would likely not be affected, and effects would be unlikely. Therefore, areas where these segments are located were not considered further analysis. However, if the v/c ratio would increase by 0.15 or more between the two scenarios, traffic operations could be affected and these changes in traffic operations could have an effect.

7.2 How are Low Volume Roadways Screened?

This section explains the screening process for “low volume” roadways, i.e., those roadway segments that carry less than 5,000 vehicles per day. This process is depicted graphically in **Figure 7-2.**

For street segments that carry less than 5,000 vehicles per day, the screening considers the relative change in the number of vehicles during a one-hour period. If traffic volumes during the AM or PM peak hour would at least double, the change is considered likely to create a potential effect. If traffic volumes during the AM or PM peak hour would decrease by at least half, the change also would have the potential to create an effect in commercial areas. Reductions in traffic could potentially affect businesses that rely on pass-by trips. Therefore, areas where such segments are located were considered for further analysis.

If traffic volumes during the AM or PM peak hour would change by less than these levels, this would constitute a minor change in traffic and is unlikely to create a potential effect.

7.3 Results of Screening Analysis

The results of each screen identified above are included in Appendix E. From the initial screen, the shifting of traffic to the Sherman Minton Bridge and the Clark Memorial Bridge is apparent. Because of the tolls being added to I-65 and the East End Bridge, some people are changing their route choice by using these two bridges. In addition to the bridges themselves, increases in traffic can be seen on those arterial or high volume roadways that connect to I-64 and to US 31. Noticeable traffic decreases also occur along the I-65 and I-265 corridors, reflecting the shift of traffic to the Sherman Minton and Clark Memorial Bridges. As the level three screening process is completed, there are several areas that remain as shown on **Figure 7.3**. These are:

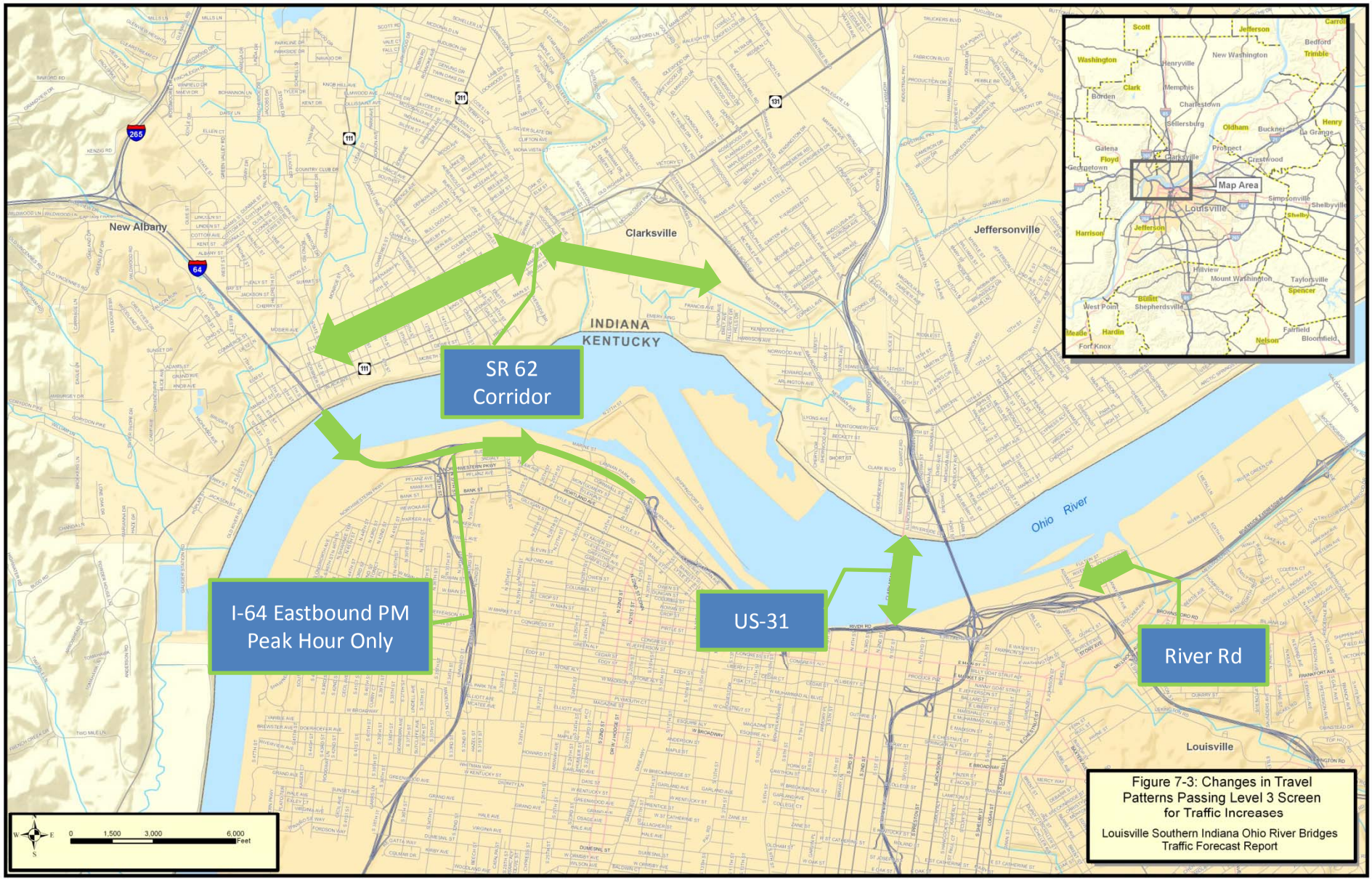


Figure 7-3: Changes in Travel Patterns Passing Level 3 Screen for Traffic Increases

Louisville Southern Indiana Ohio River Bridges Traffic Forecast Report

- I-64 Eastbound from the first interchange in Indiana over the Sherman Minton Bridge to Downtown Louisville. This is a result of traffic changing from the East End Bridge and I-65 to the I-64 corridor (going back to their original routes in the no build condition). Only the PM peak hour passes the level three screening (a change of v/c greater than 0.15) with the changes in mainline v/c ranging from 0.16 to 0.18. With the increase in v/c, traffic operations will deteriorate to unacceptable conditions.
- The SR 62 corridor and the local street connection to I-64 in New Albany. This is a result of people who live or work within the I-64/I-265/I-65 area in New Albany and Clarksville changing their route from SR 62 eastbound toward I-65 to SR 62 westbound toward I-64. This change results in traffic being distributed along several of the east-west downtown streets in New Albany, all flowing to the I-64 ramps. With this change in travel pattern only a few individual model links in New Albany are identified as passing the level three screen. All this traffic funnels to the I-64 interchange where the one-way westbound link under I-64 has a v/c change of 0.25. Even with this level of change, there are enough lanes to safely and efficiently handle the traffic.
- US 31 over the Clark Memorial Bridge passes the level three screening. With the implementation of tolls, this becomes a more attractive alternative route to the I-65 bridge.
- With the removal of the ramps to Frankfort Avenue in Louisville, there is a change in traffic back to the no build condition so several individual model links in that area pass the level 3 screen.
- Paoli Pike (north of I-265) also passes the level three screen. This is related to how the model connections are made further to the north and west of this area pushing more traffic to Paoli Pike than would be otherwise warranted. With changes to the connecting network, traffic volumes would be less and this alternative would not be expected to pass the level three screen.

Changes in truck movement were also reviewed. While some of the regional trucks were projected to change the the Ohio River Bridge they would use (moving from the I-65 Bridge or East End Bridge to the toll-free I-64 Bridge), the local patterns remain the same. The only local roadway segment that shows any change in truck traffic is River Road. This projected increase is related to the removal of the I-71/Frankfort Avenue ramps in the Modified Selected Alternative. This meant that trucks would return to the routes they used under the no build condition.

The methods identified above were intended to use changes in travel patterns to help identify areas where the design modifications and addition of tolls to the SEIS Selected Alternative may have indirect effects caused by the changes in traffic. Based on the analysis, several segments pass the level three screen as stated above. Of those links that passed through level three, the largest volume to capacity increase (v/c change >0.15) was 0.25 as noted above . Based on this analysis and the overall conservative approach imbedded in this methodology, the forecast changes in travel patterns between the FEIS Preferred Alternative and the SEIS Modified Selected Alternative do not result in the identification of any new areas of indirect effects beyond those previously identified with the 2003 FEIS Selected Alternative.

8.0 Toll Sensitivity Test

As described above, the Modified Selected Alternative would include tolling the I-65 and East End bridges. In order to better understand the impacts of the toll on traffic, sensitivity tests were conducted. The project team provided a lower toll rate ($1/$2/$4) and higher rate ($2/$4/$8) for evaluation. The results are presented in **Table 8-1**. As illustrated below, the lower and higher toll rates have less than one percent impact on overall traffic volumes. However at the individual bridge level, traffic increases onto the I-64 and US 31 bridges are greater with the higher toll rate, and less with the lower toll rate.

Table 8-1: Modified Selected Alternative Sensitivity Test

	Modified Selected Alternative Daily Traffic		
Bridge Crossing	Low Toll Rate	$1.50/$3/$6 Toll Rate[3]	High Toll Rate
I-64 EB	58,500	61,900	64,800
I-64 WB	57,600	61,000	63,400
US 31	33,600	35,200	37,100
I-65 SB	55,800	51,400	47,200
I-65 NB	55,700	51,100	47,800
East End SB	25,600	25,000	24,200
East End NB	25,600	24,800	23,800
Total	312,400	310,400	308,300

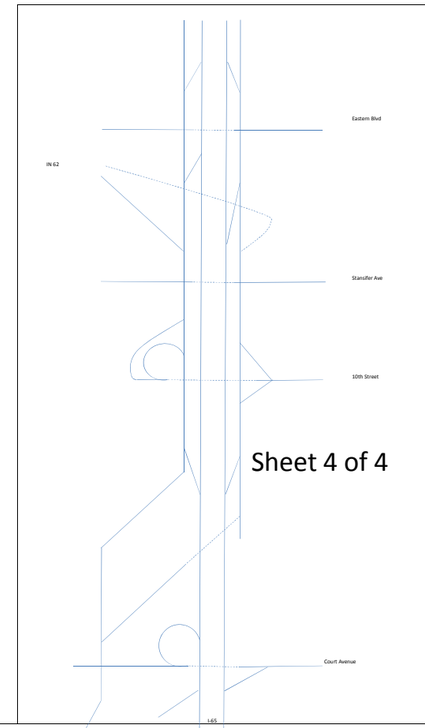
Changes in travel patterns at the lower and higher toll rates mainly occur during off-peak periods and do not change operational conditions during the peak hours for cross-river travel. Effects in these areas were evaluated during the controlling peak hour. Since changes in travel patterns mainly occur during off-peak periods, effects would not change at the lower and higher toll rates during the controlling peak hour. Increasing truck tolls would have less impact on traffic volumes and the distribution between bridges than those identified in the sensitivity test. The areas where changes in travel patterns occur as described in Chapter 7 are the same at the lower and higher toll rates.

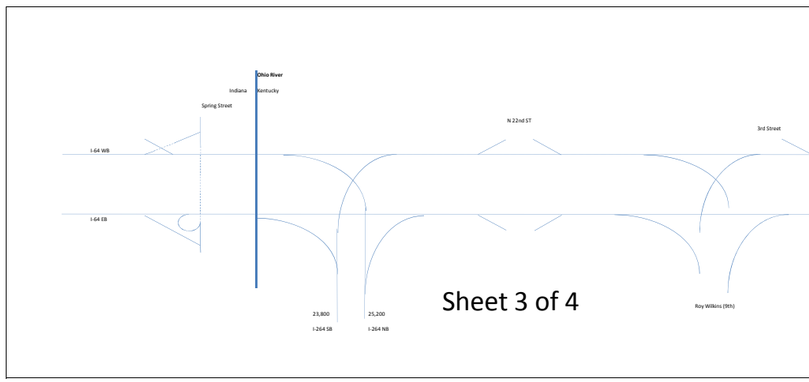
[3] The "$1.50/$3/$6 toll rate" scenario in this table is the "baseline tolling scenario" that was used for developing the traffic forecasts in the SEIS. Under this scenario, the toll rate would be $1.50 for passenger cars, $3.00 for medium trucks, and $6.00 for large trucks each way (in 2010 dollars).

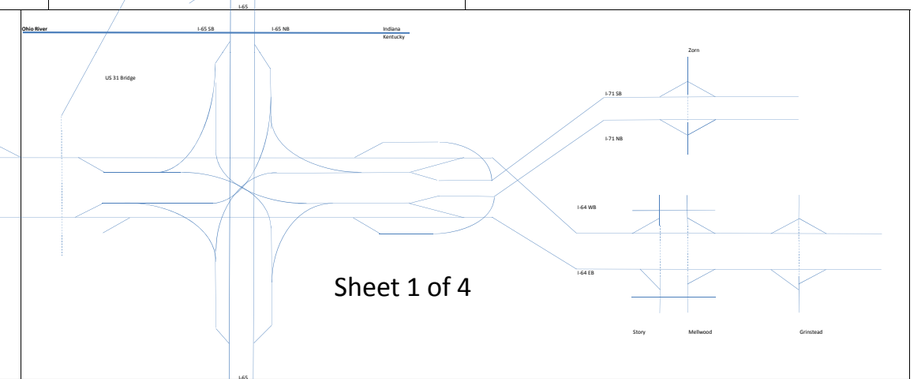
APPENDIX A

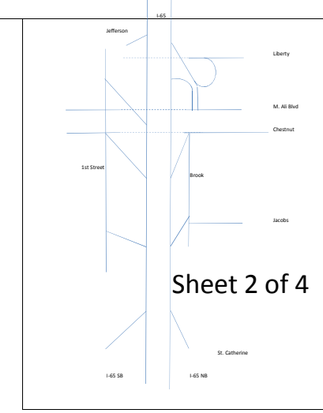
2010 Daily, AM Peak, PM Peak Traffic Volumes

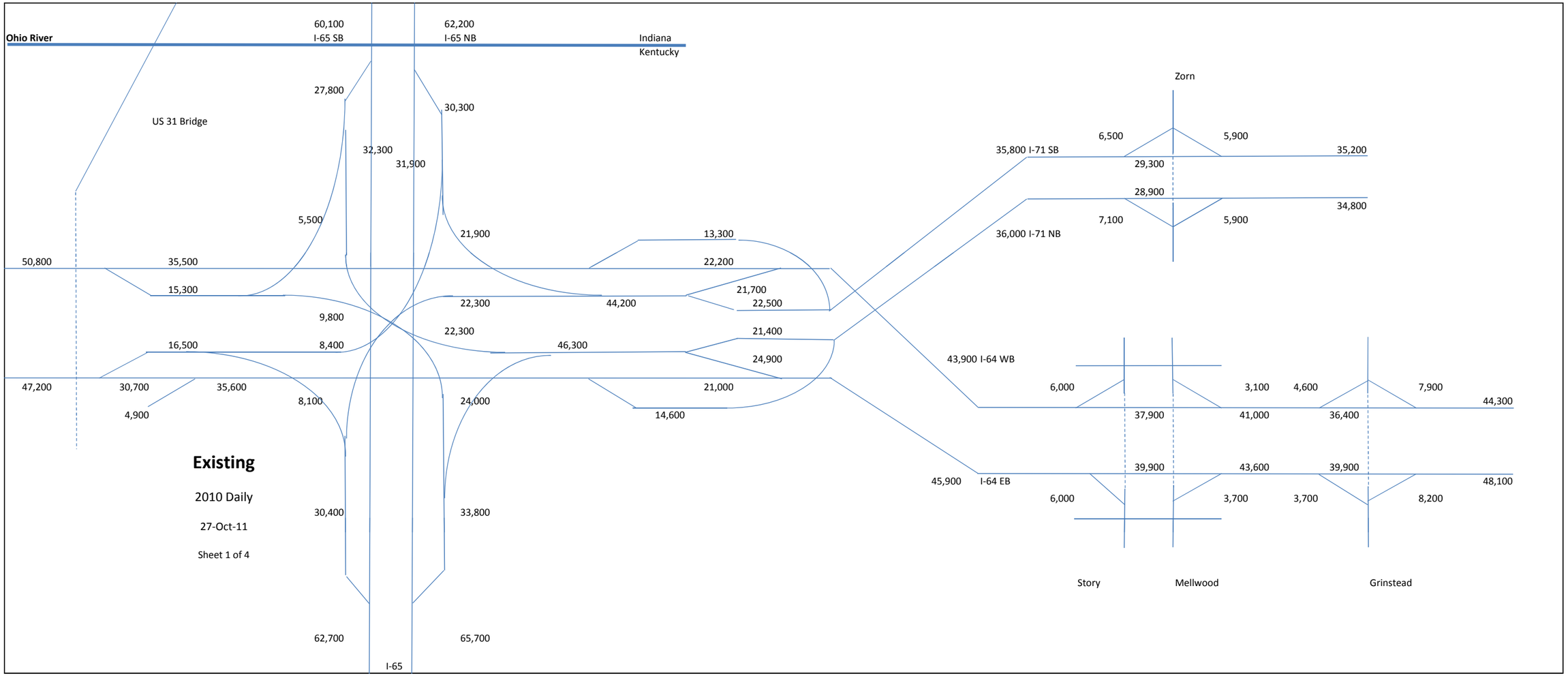
2010 Existing Key










Ohio River
60,100
I-65 SB
62,200
I-65 NB
Indiana
Kentucky
Zorn
27,800
30,300
US 31 Bridge
32,300
31,900
6,500
5,900
35,800 I-71 SB
35,200
29,300
28,900
34,800
7,100
5,900
36,000 I-71 NB
5,500
21,900
13,300
50,800
35,500
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22,300
44,200
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9,800
22,300
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41,000
36,400
39,900
43,600
39,900
45,900
I-64 EB
48,100
6,000
3,700
3,700
8,200
Existing
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27-Oct-11
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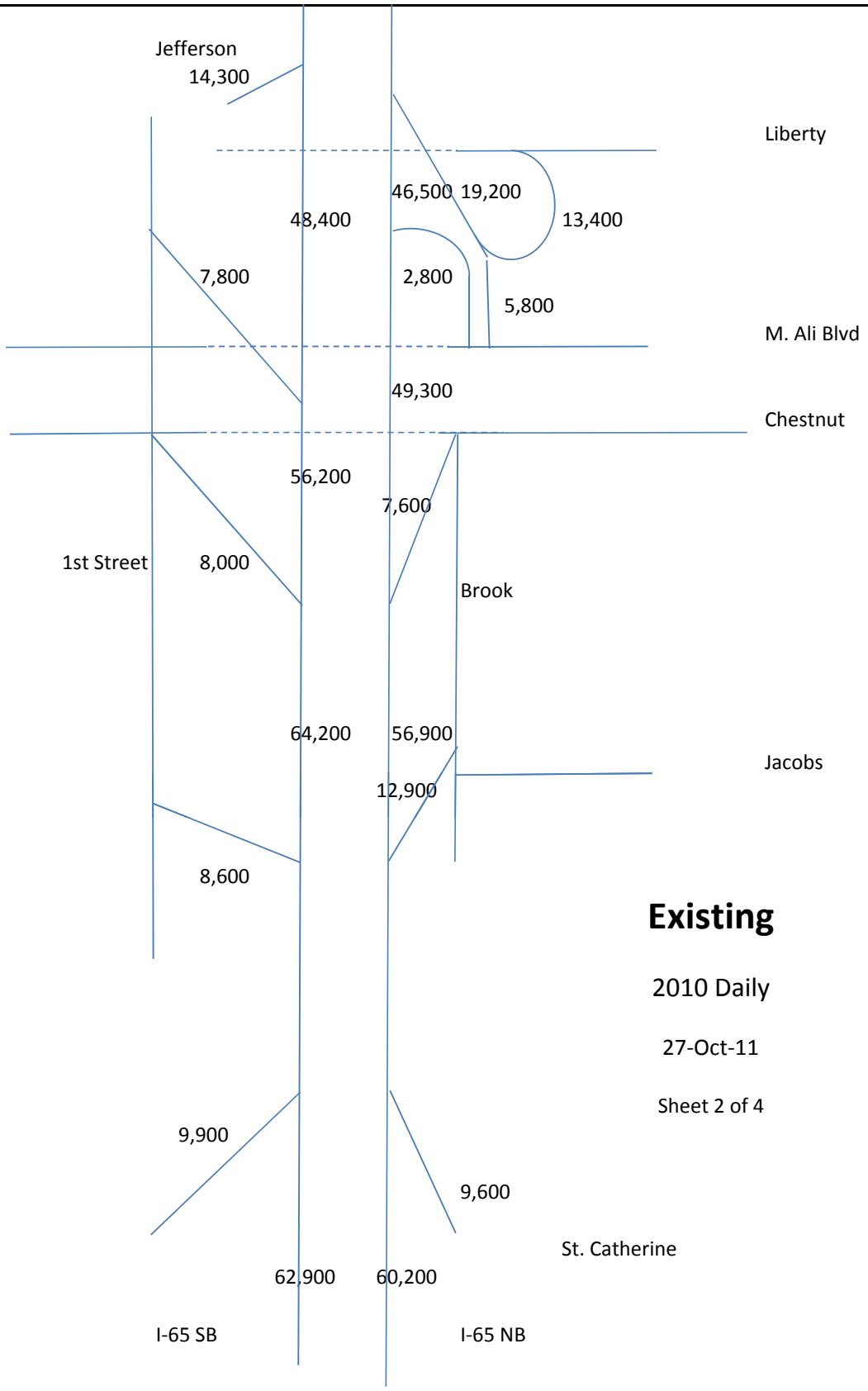
33,800
Story
Mellwood
Grinstead
62,700
65,700
I-65



Existing

2010 Daily

27-Oct-11

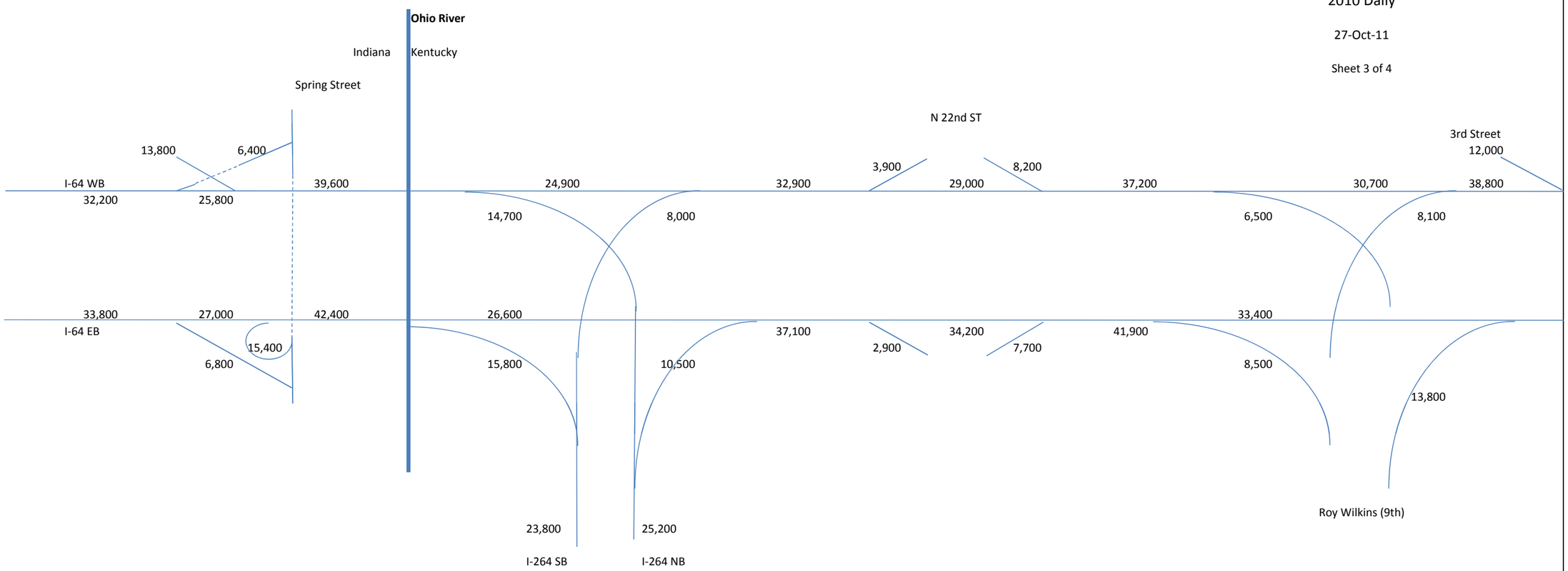
Sheet 2 of 4

Existing

2010 Daily

27-Oct-11

Sheet 3 of 4



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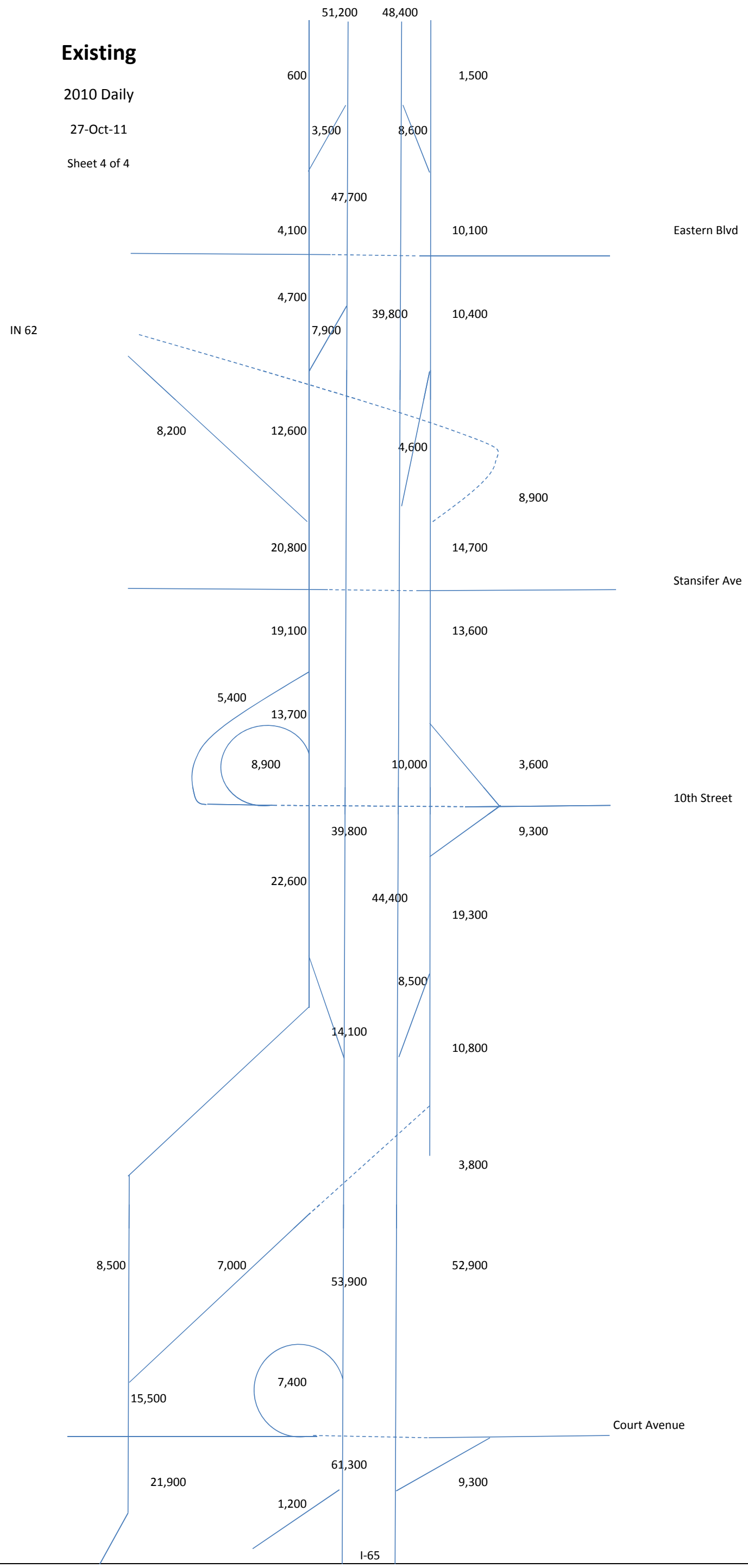
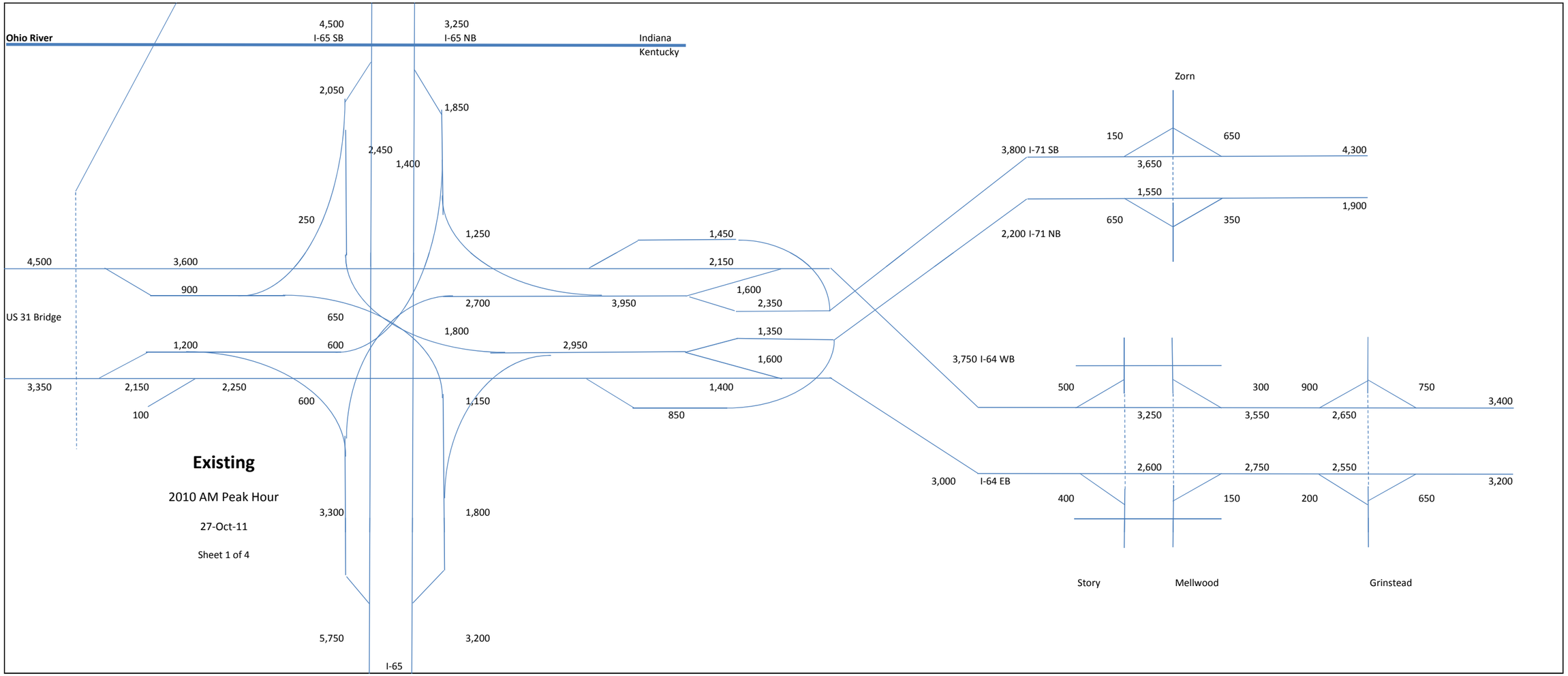
2010 Daily

27-Oct-11

Sheet 4 of 4



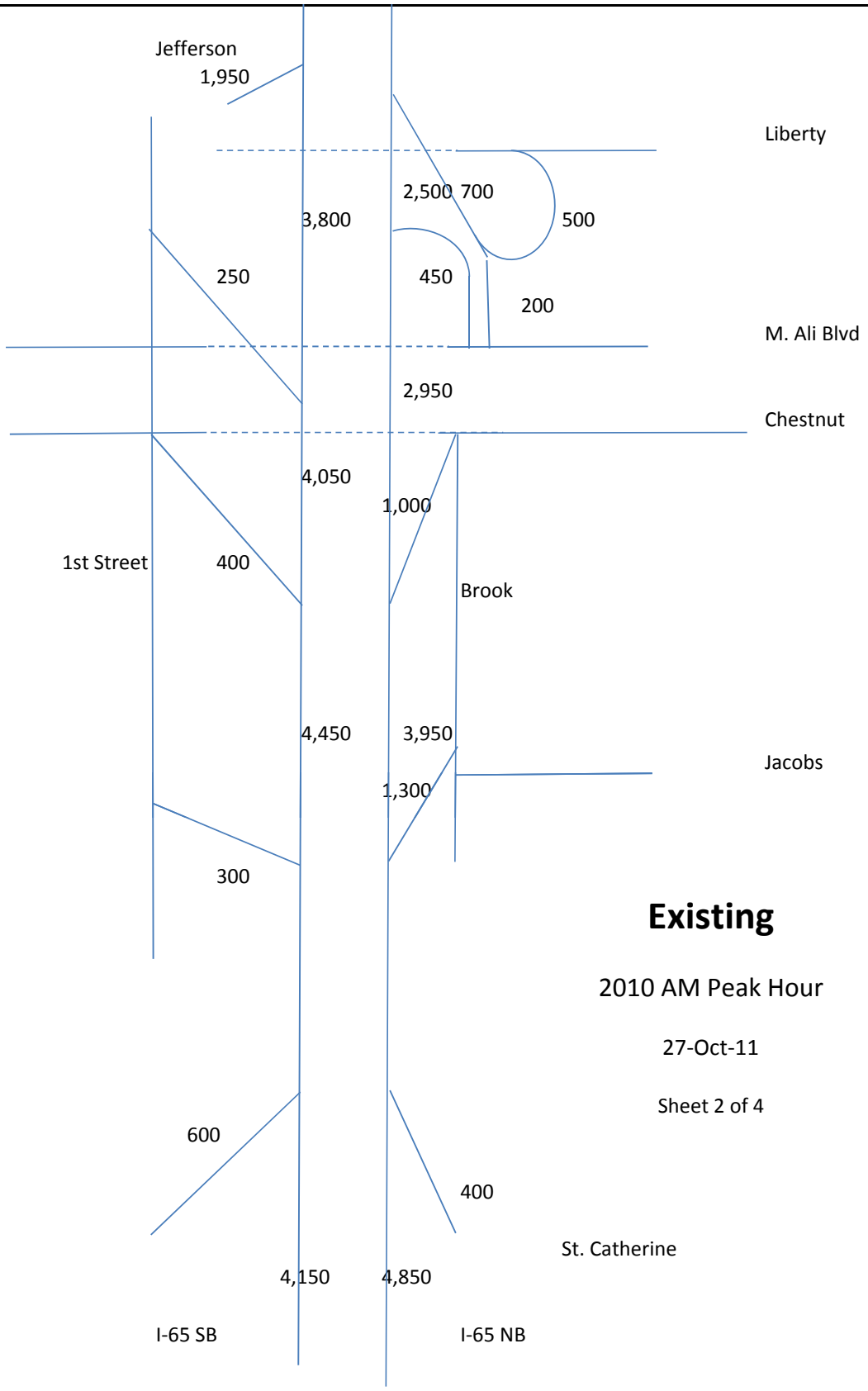


Existing

2010 AM Peak Hour

27-Oct-11

Sheet 1 of 4



Existing

2010 AM Peak Hour

27-Oct-11

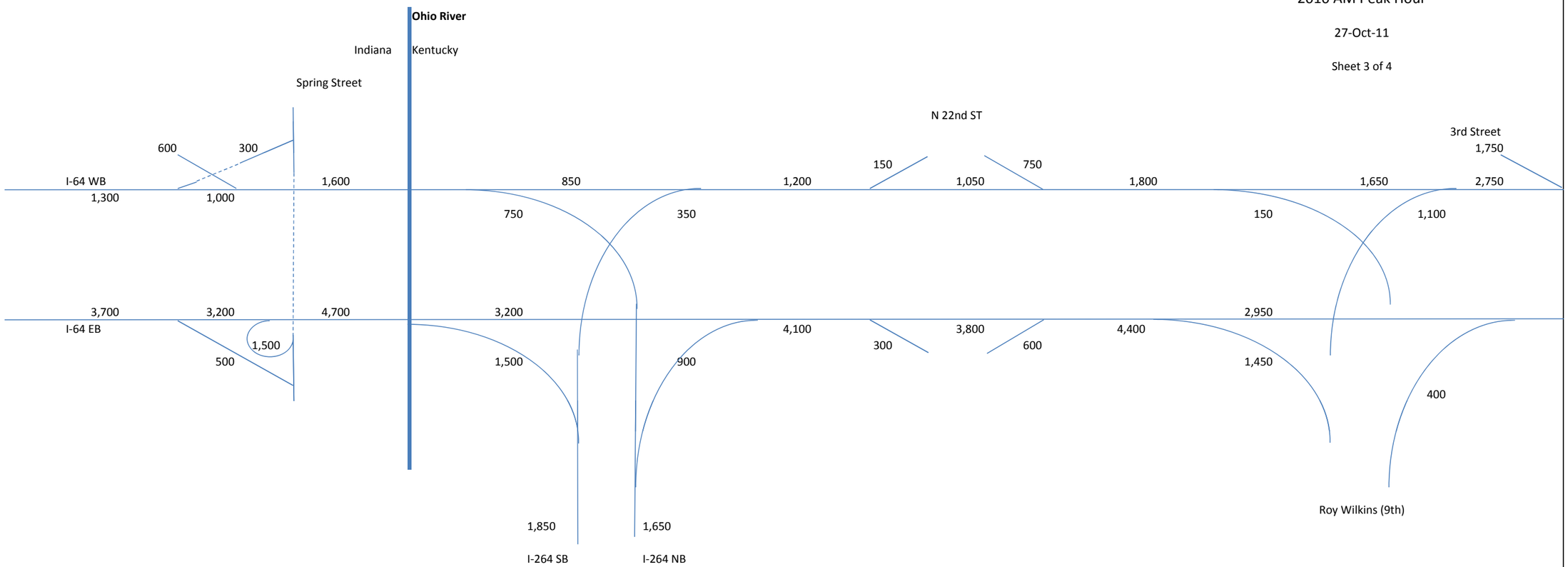
Sheet 2 of 4

Existing

2010 AM Peak Hour

27-Oct-11

Sheet 3 of 4



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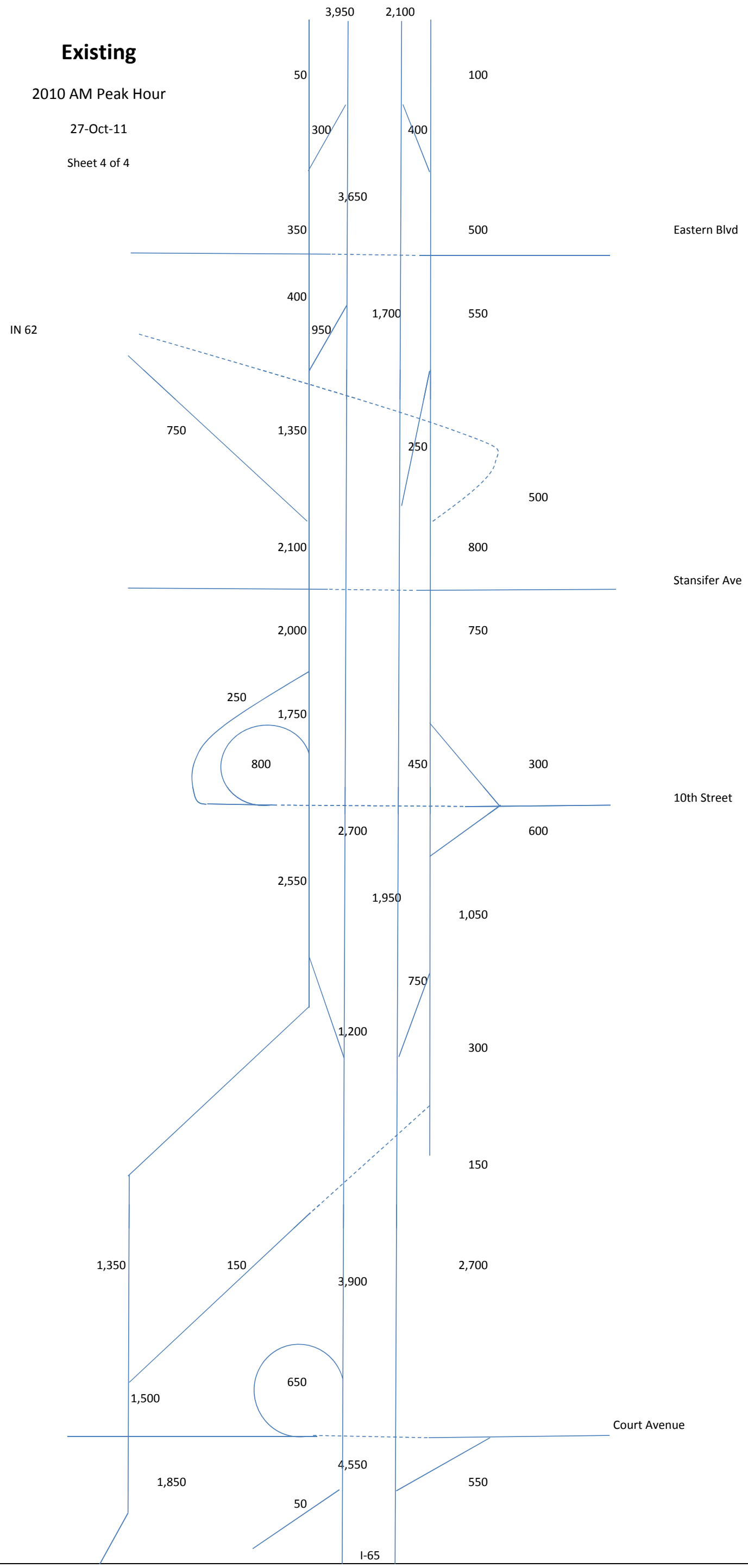
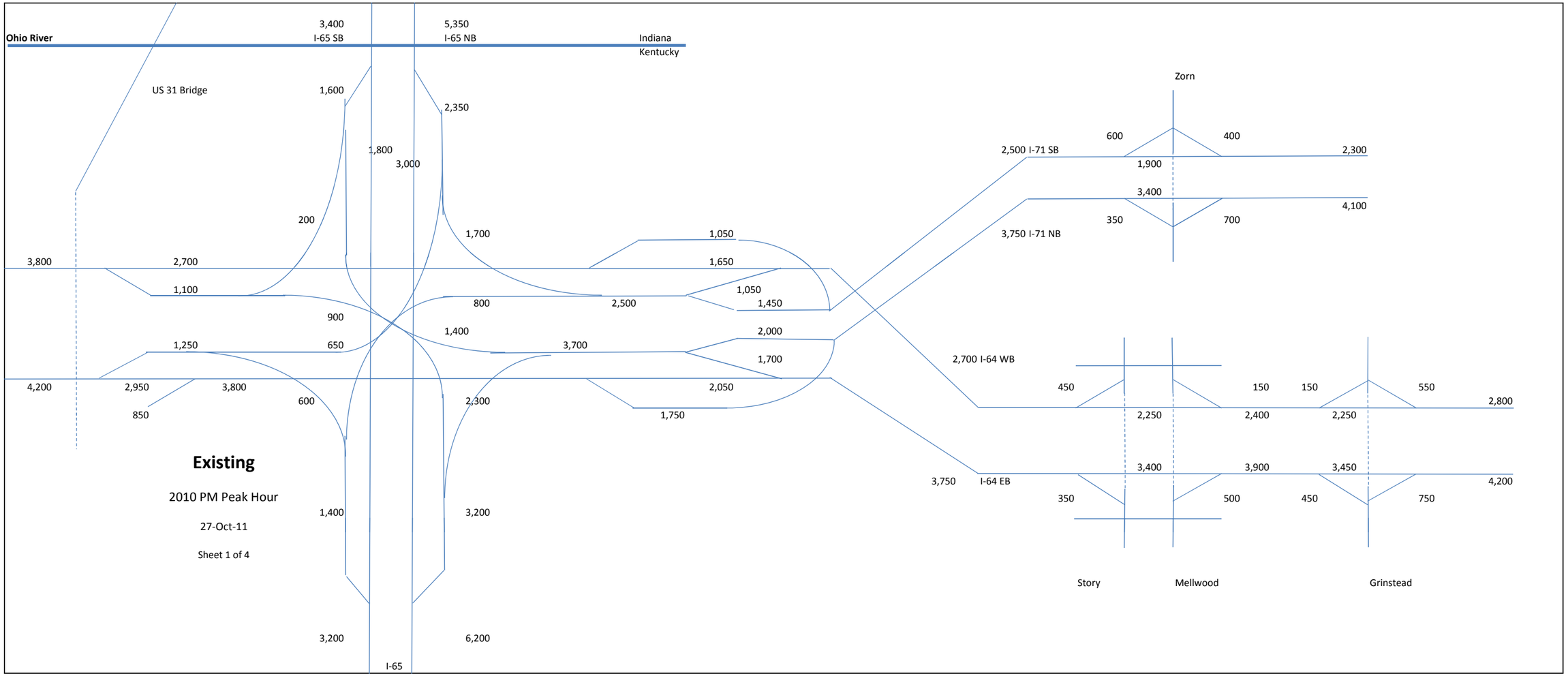
2010 AM Peak Hour

27-Oct-11

Sheet 4 of 4




Ohio River
3,400
I-65 SB
5,350
I-65 NB
Indiana
Kentucky
US 31 Bridge
1,600
2,350
1,800
3,000
200
1,700
1,050
3,800
2,700
1,650
1,100
1,050
800
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4,200
2,950
3,800
2,050
600
2,300
850
1,750
1,400
3,200
3,200
6,200
I-65
Existing
2010 PM Peak Hour
27-Oct-11
Sheet 1 of 4
Zorn
600
400
2,500 I-71 SB
2,300
1,900
3,400
4,100
350
700
3,750 I-71 NB
2,700 I-64 WB
450
150
150
550
2,800
2,250
2,400
2,250
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3,900
3,450
3,750
I-64 EB
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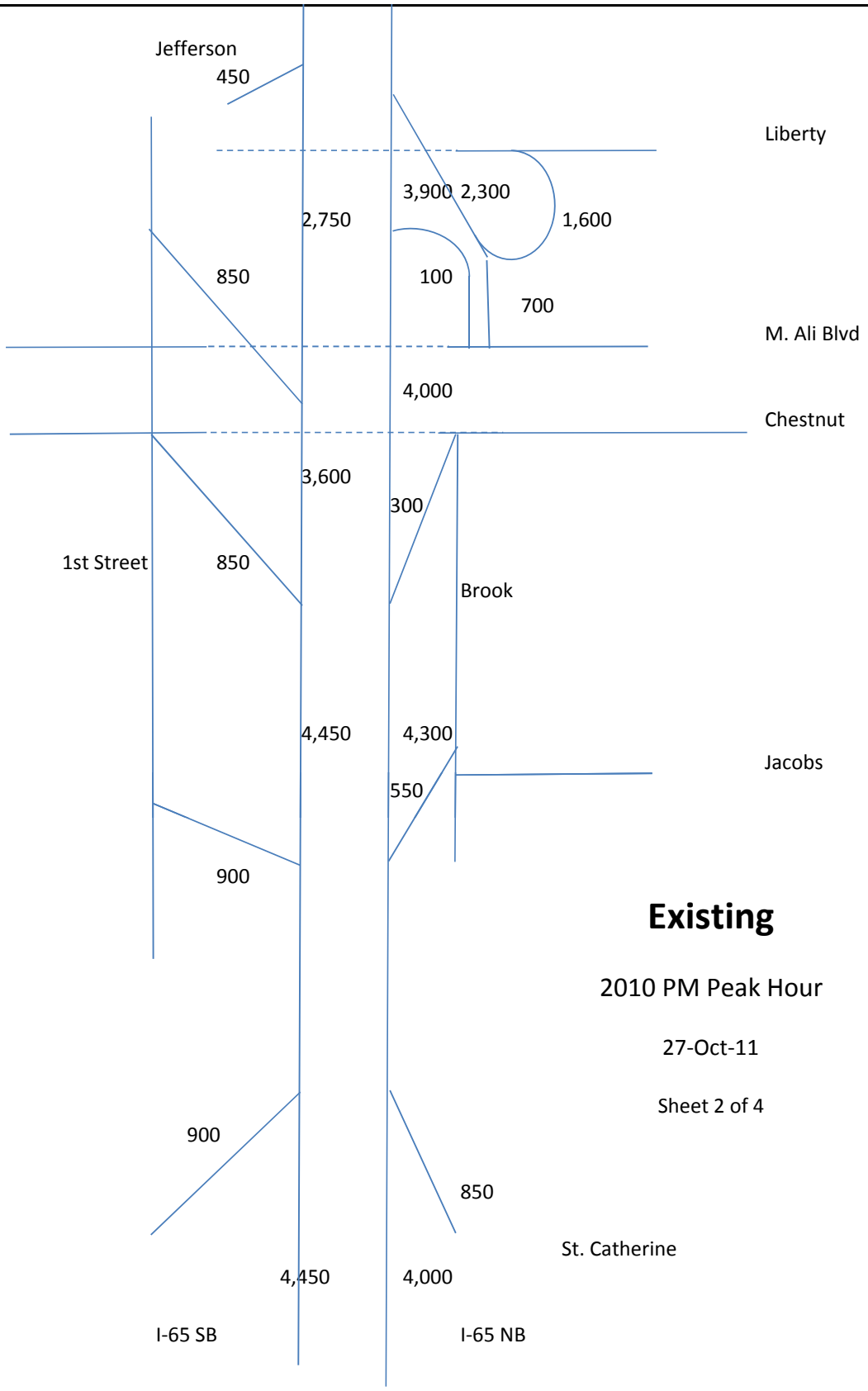
500
450
750
Story
Mellwood
Grinstead



Existing

2010 PM Peak Hour

27-Oct-11

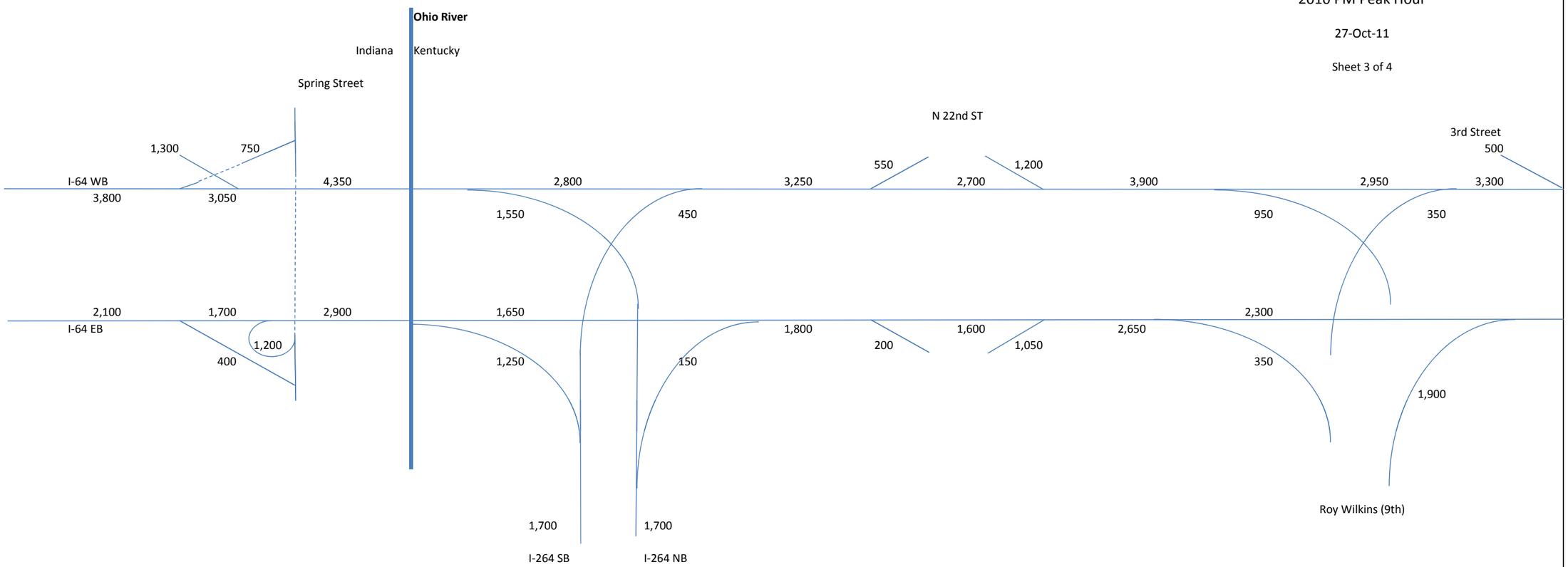
Sheet 2 of 4

Existing

2010 PM Peak Hour

27-Oct-11

Sheet 3 of 4

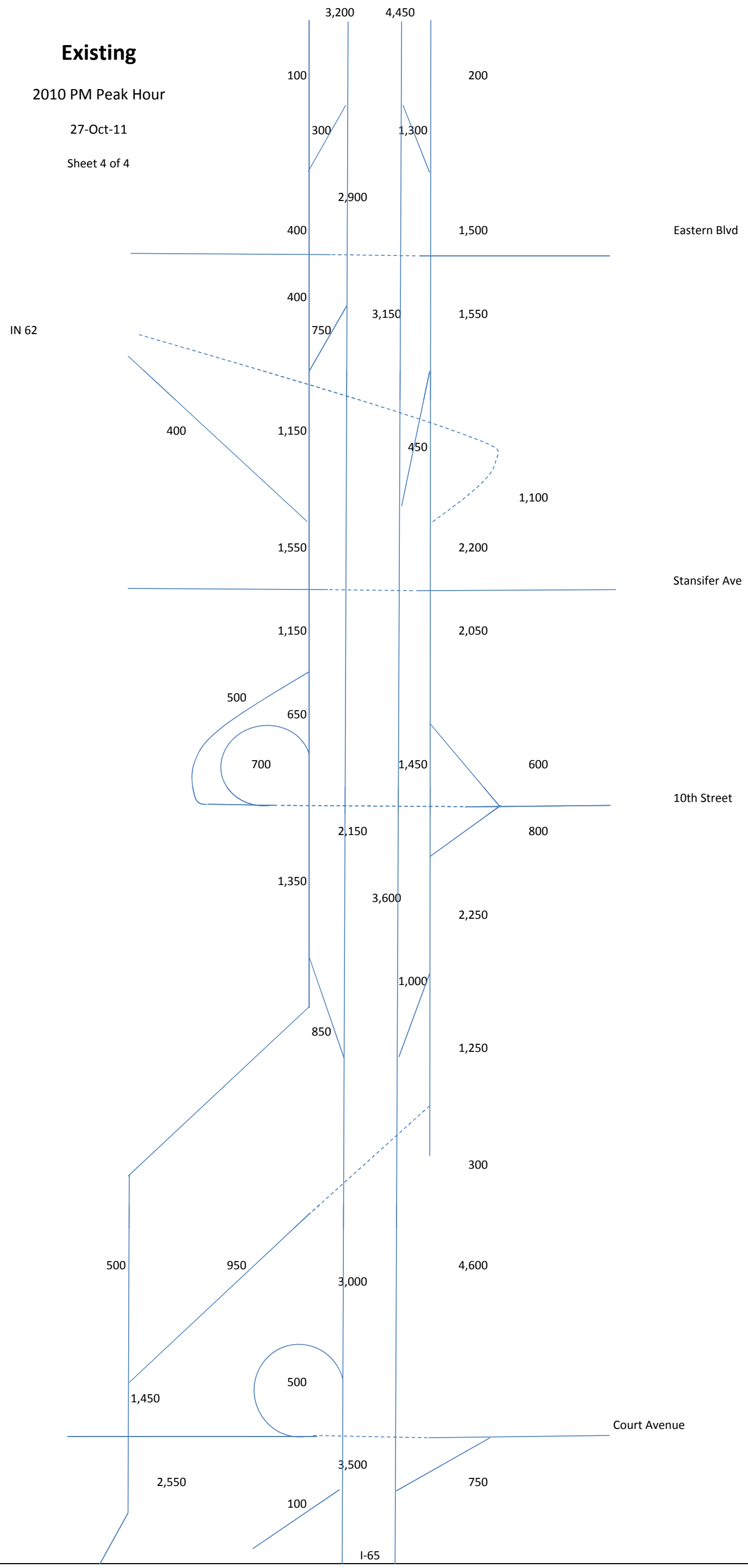


Existing

2010 PM Peak Hour

27-Oct-11

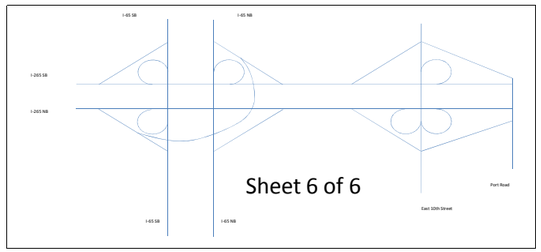
Sheet 4 of 4

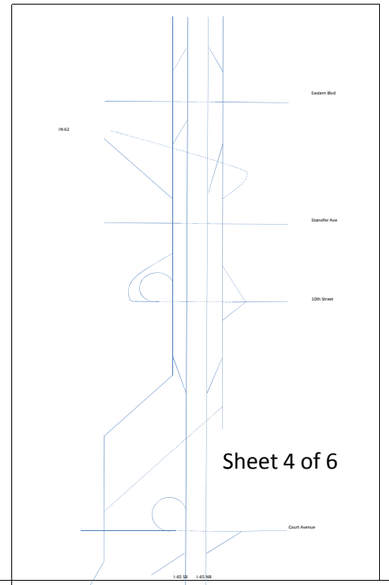


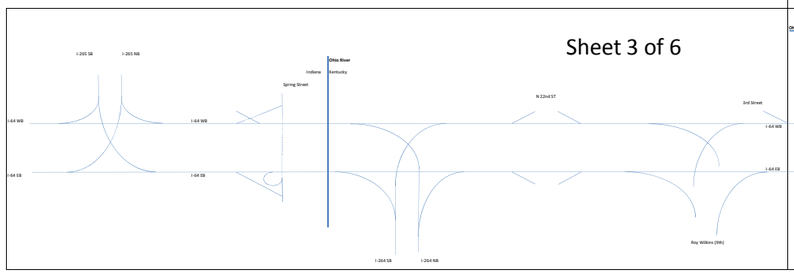
APPENDIX B

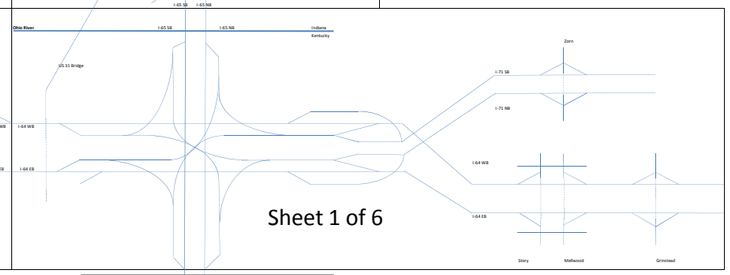
No-Action Daily, AM Peak, PM Peak 2030 Traffic Volumes

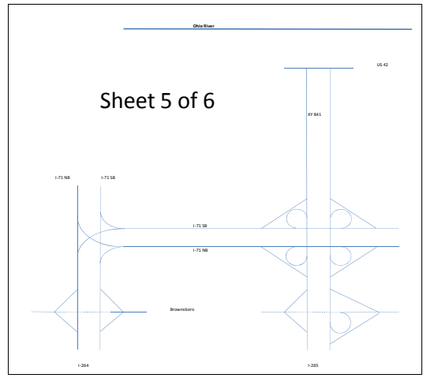
No-Action
Key

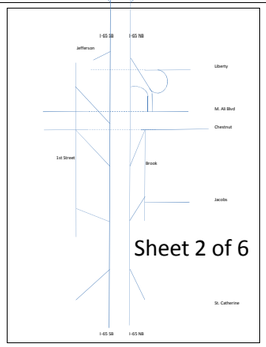


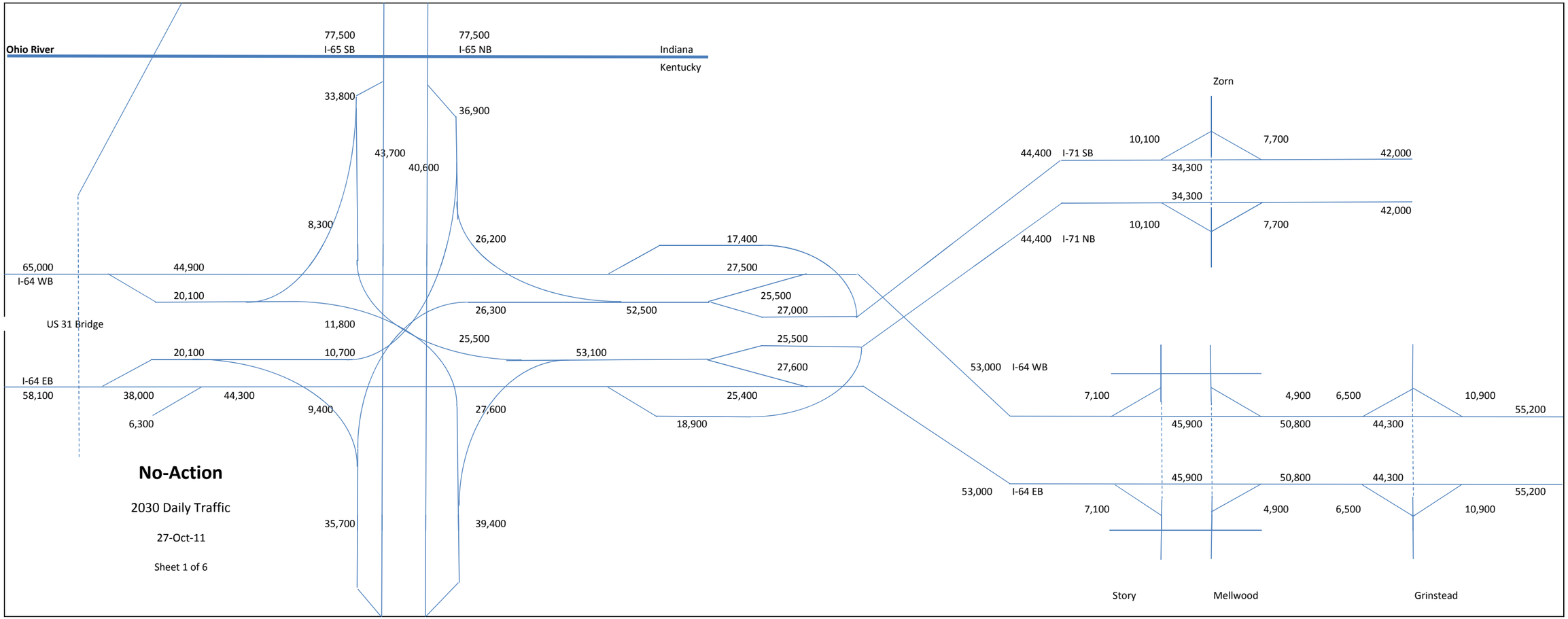










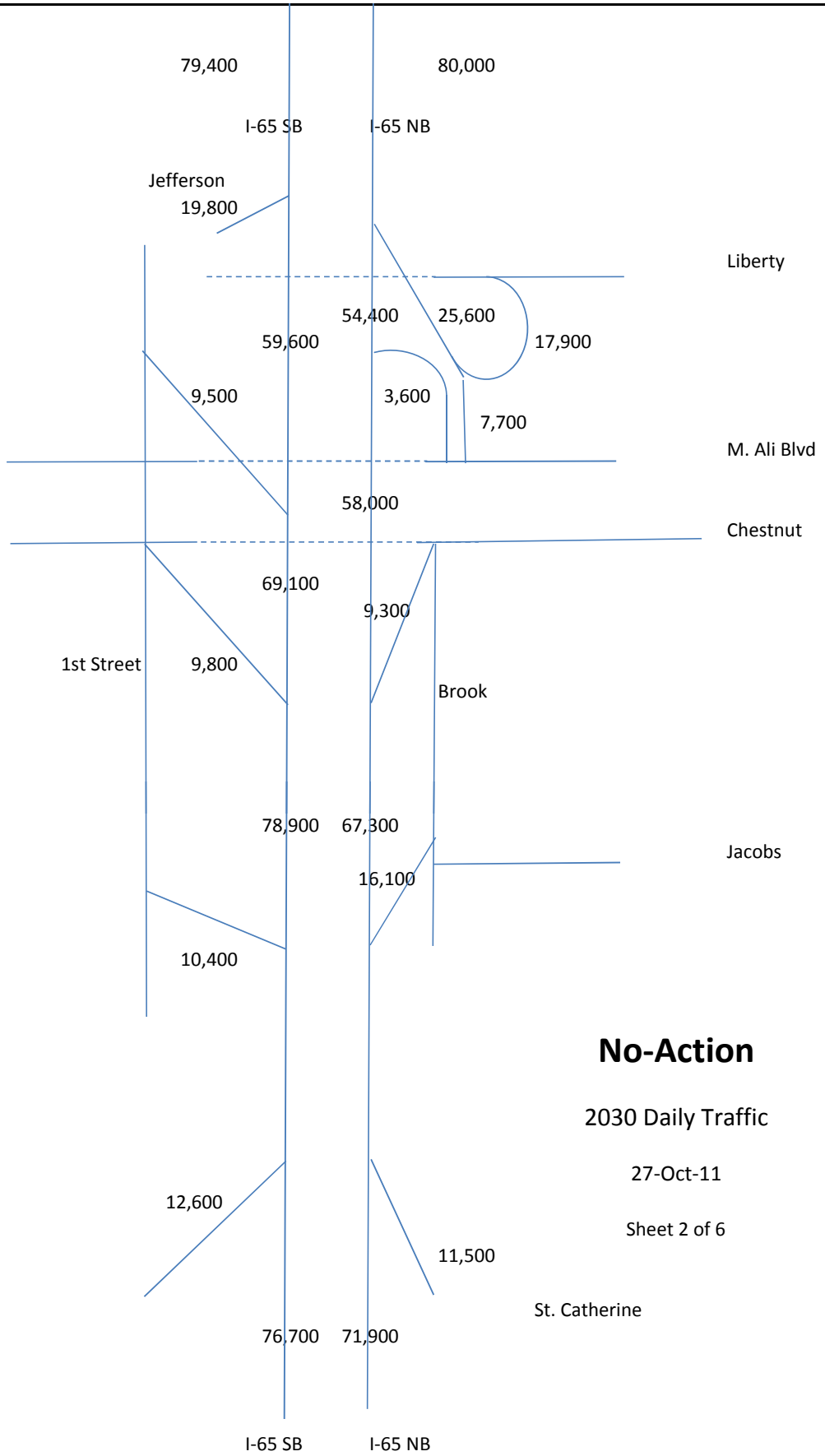


No-Action

2030 Daily Traffic

27-Oct-11

Sheet 1 of 6



No-Action

2030 Daily Traffic

27-Oct-11

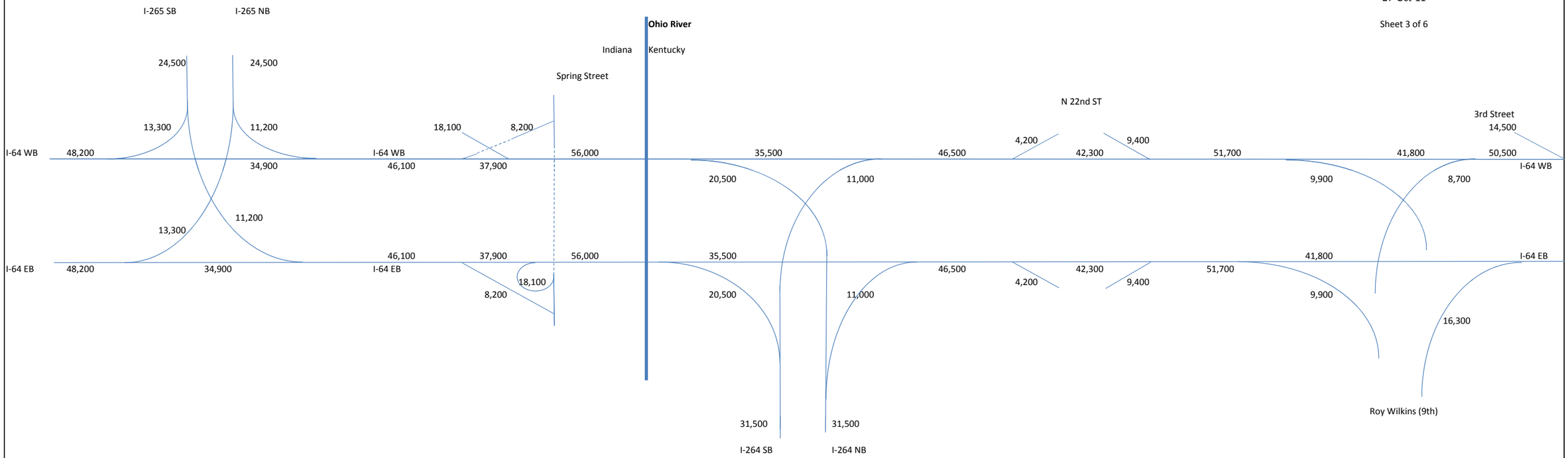
Sheet 2 of 6

No-Action

2030 Daily Traffic

27-Oct-11

Sheet 3 of 6

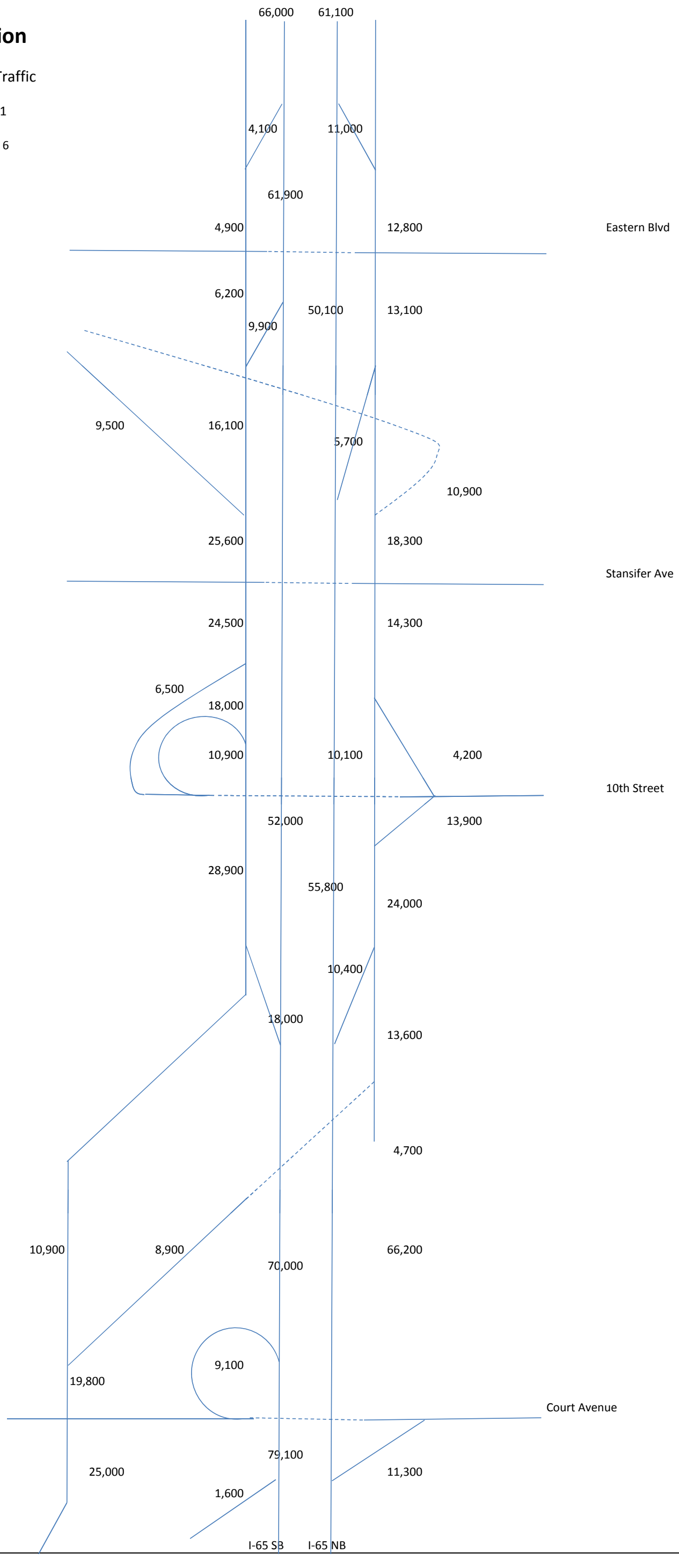


No-Action

2030 Daily Traffic

27-Oct-11

Sheet 4 of 6

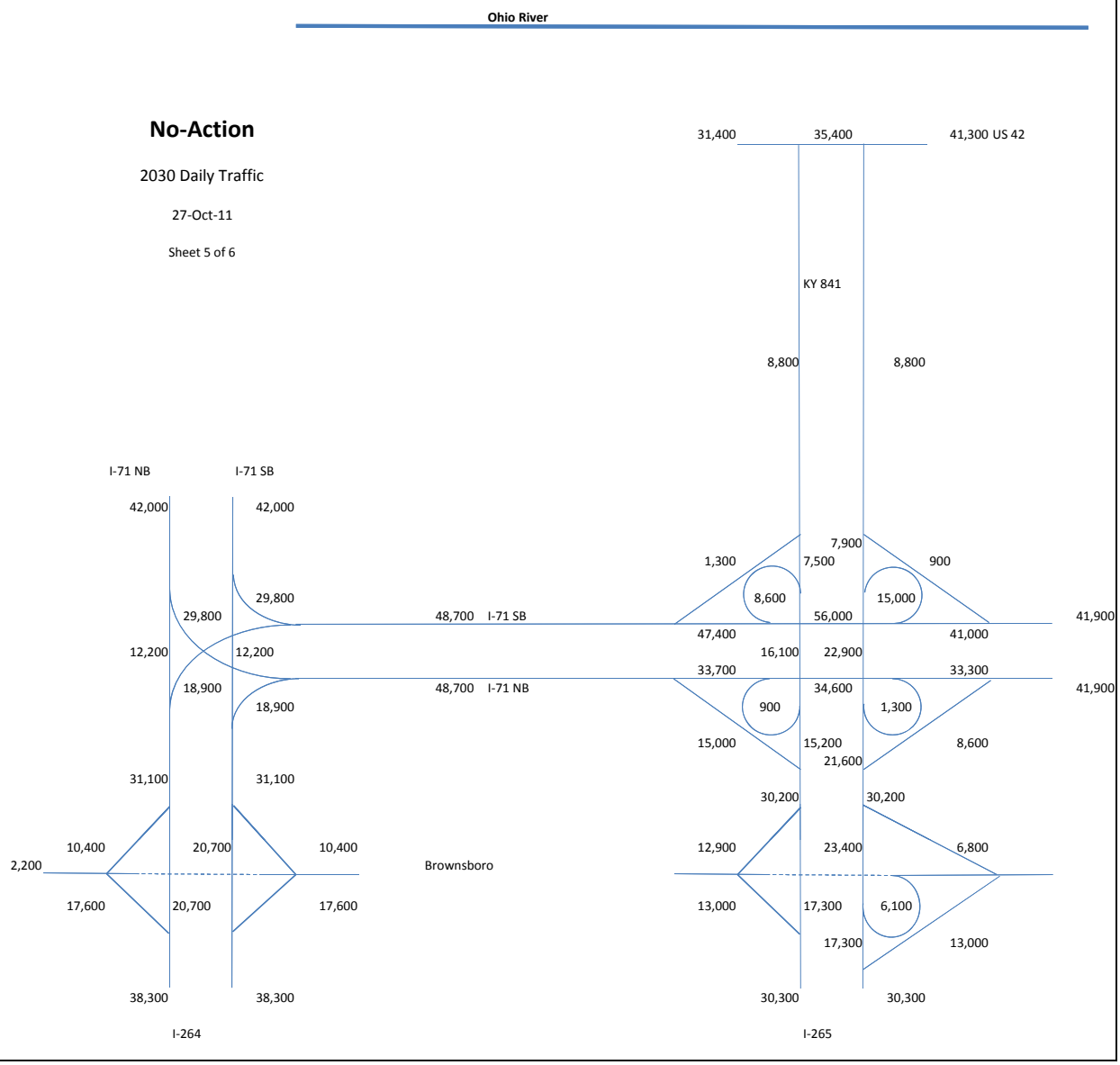


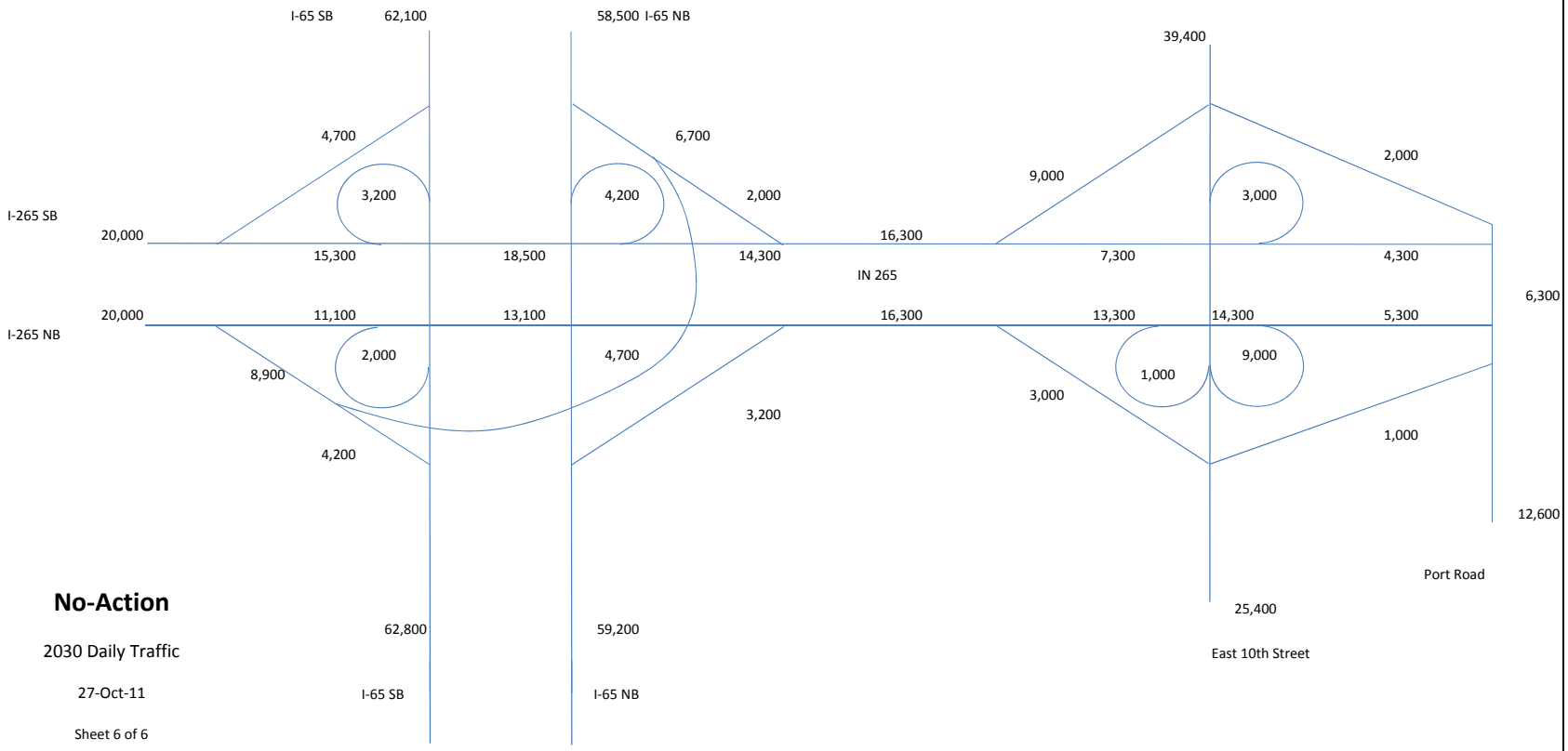
No-Action

2030 Daily Traffic

27-Oct-11

Sheet 5 of 6



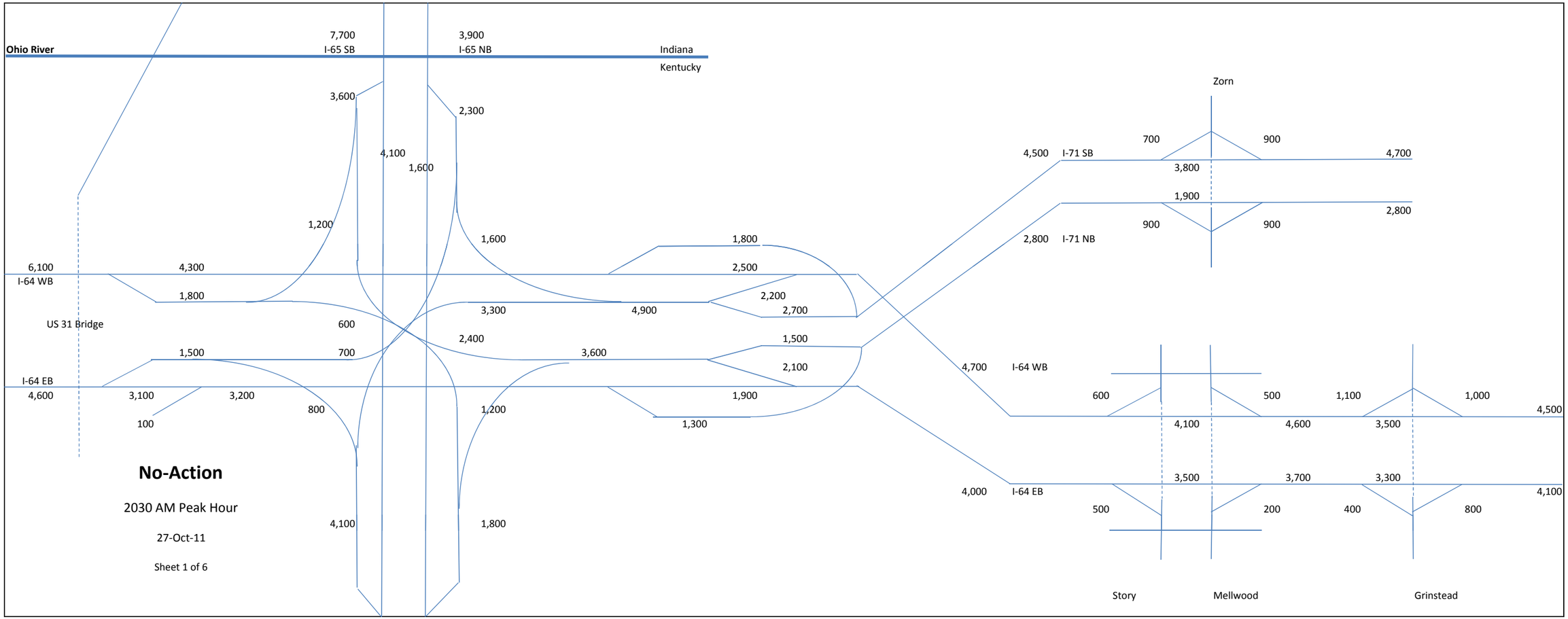


No-Action

2030 Daily Traffic

27-Oct-11

Sheet 6 of 6

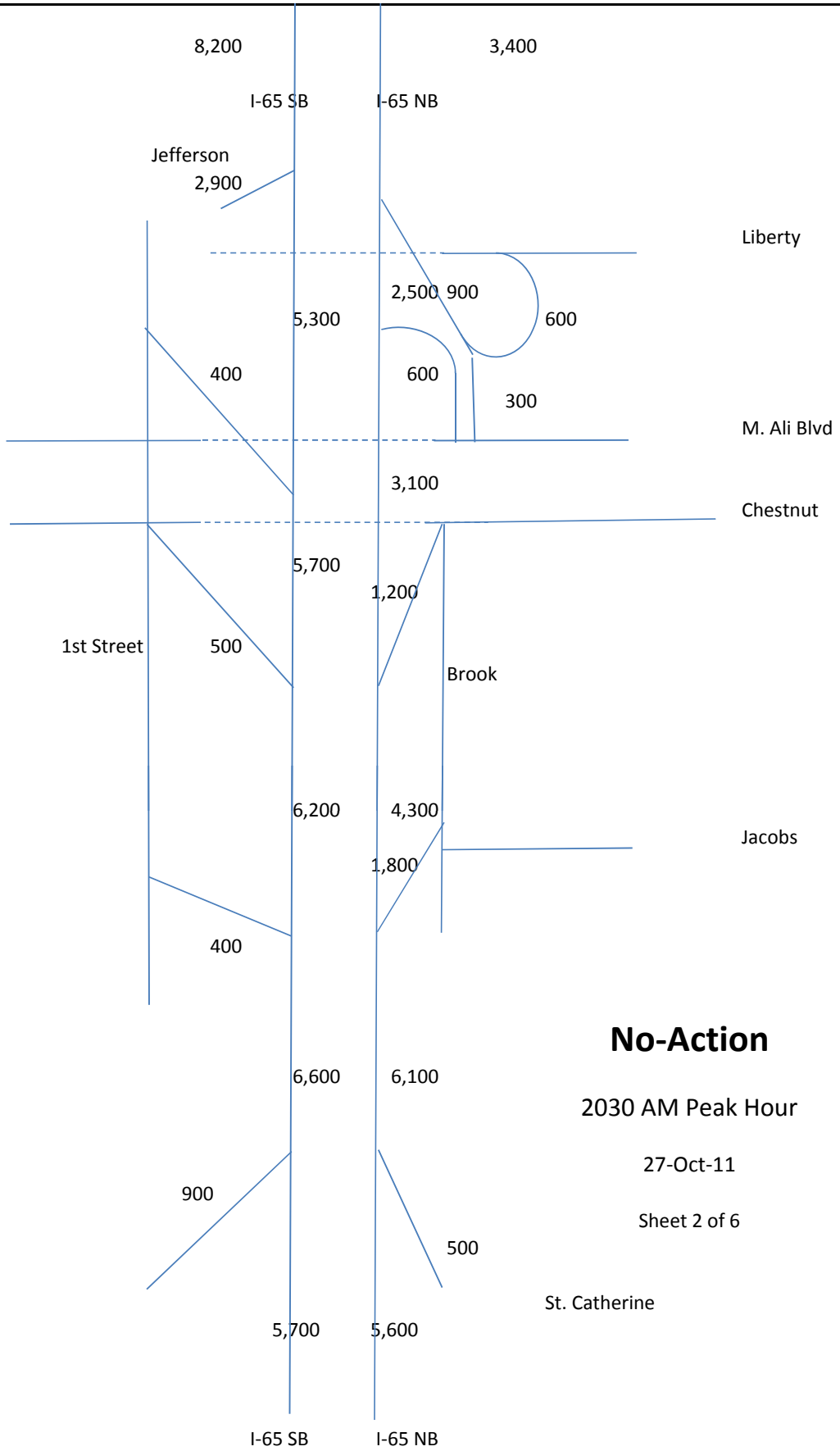


No-Action

2030 AM Peak Hour

27-Oct-11

Sheet 1 of 6



No-Action

2030 AM Peak Hour

27-Oct-11

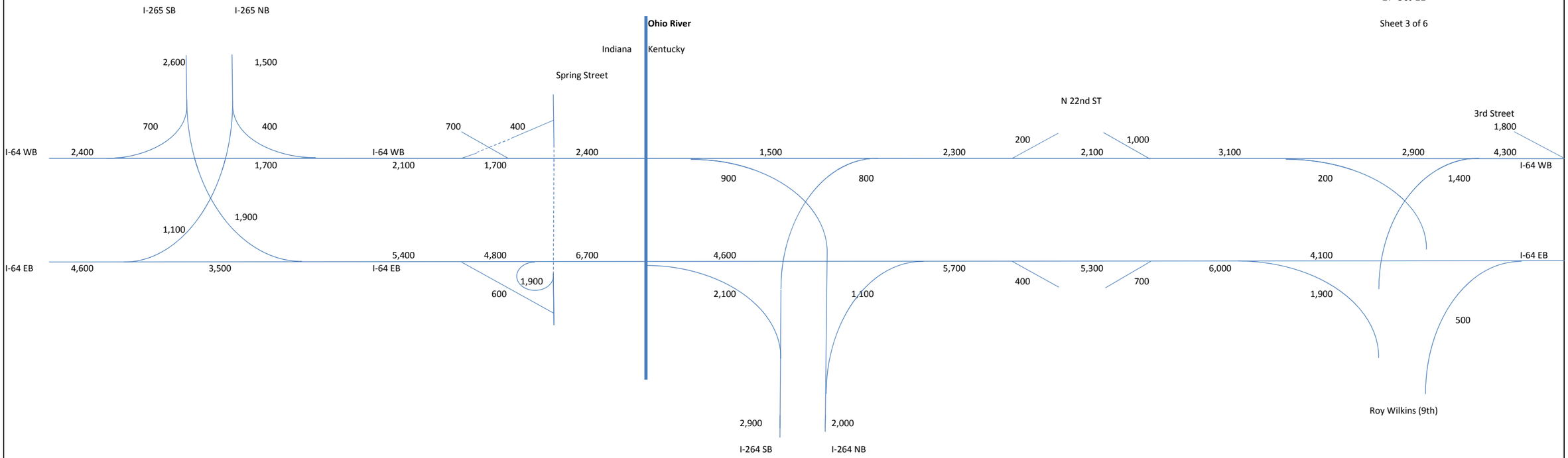
Sheet 2 of 6

No-Action

2030 AM Peak Hour

27-Oct-11

Sheet 3 of 6

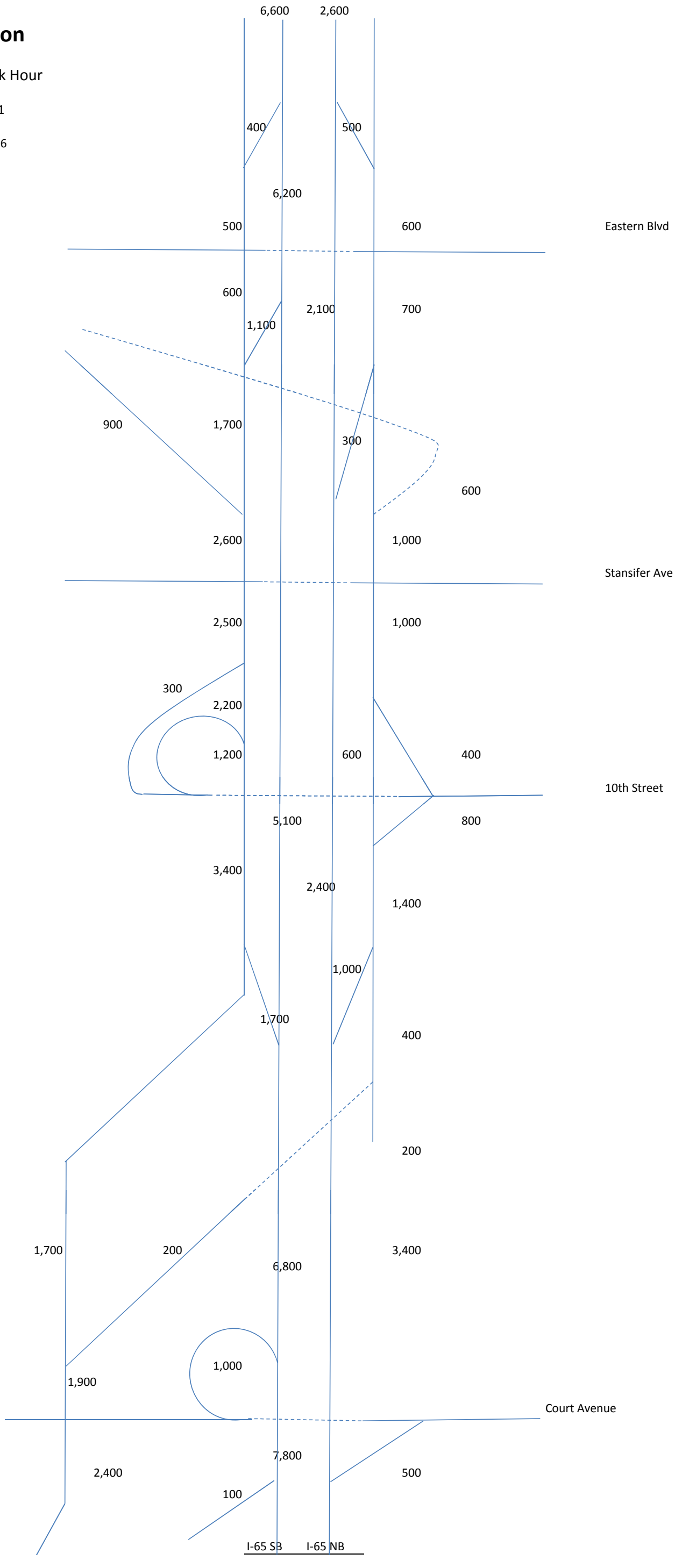


No-Action

2030 AM Peak Hour

27-Oct-11

Sheet 4 of 6

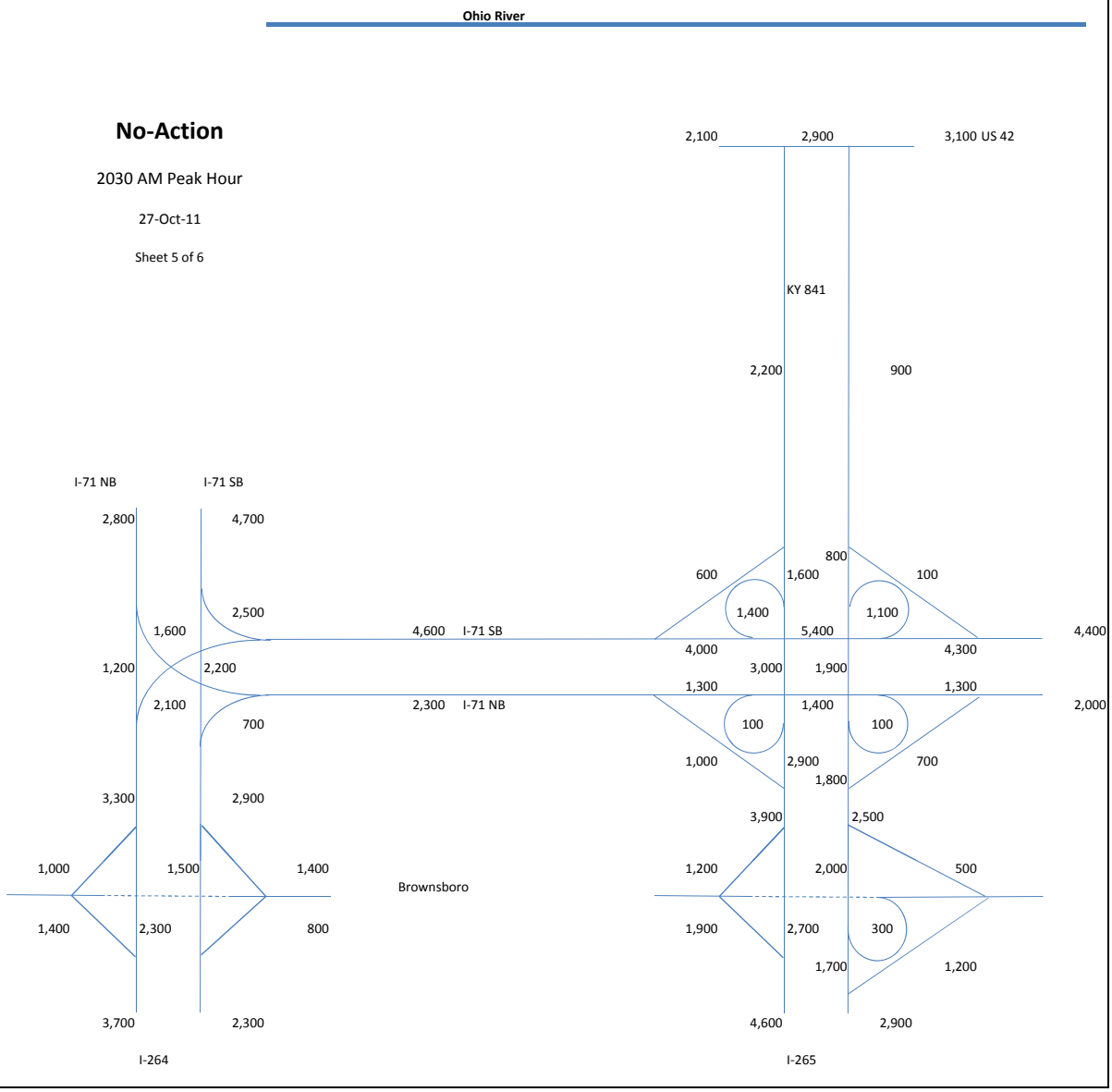


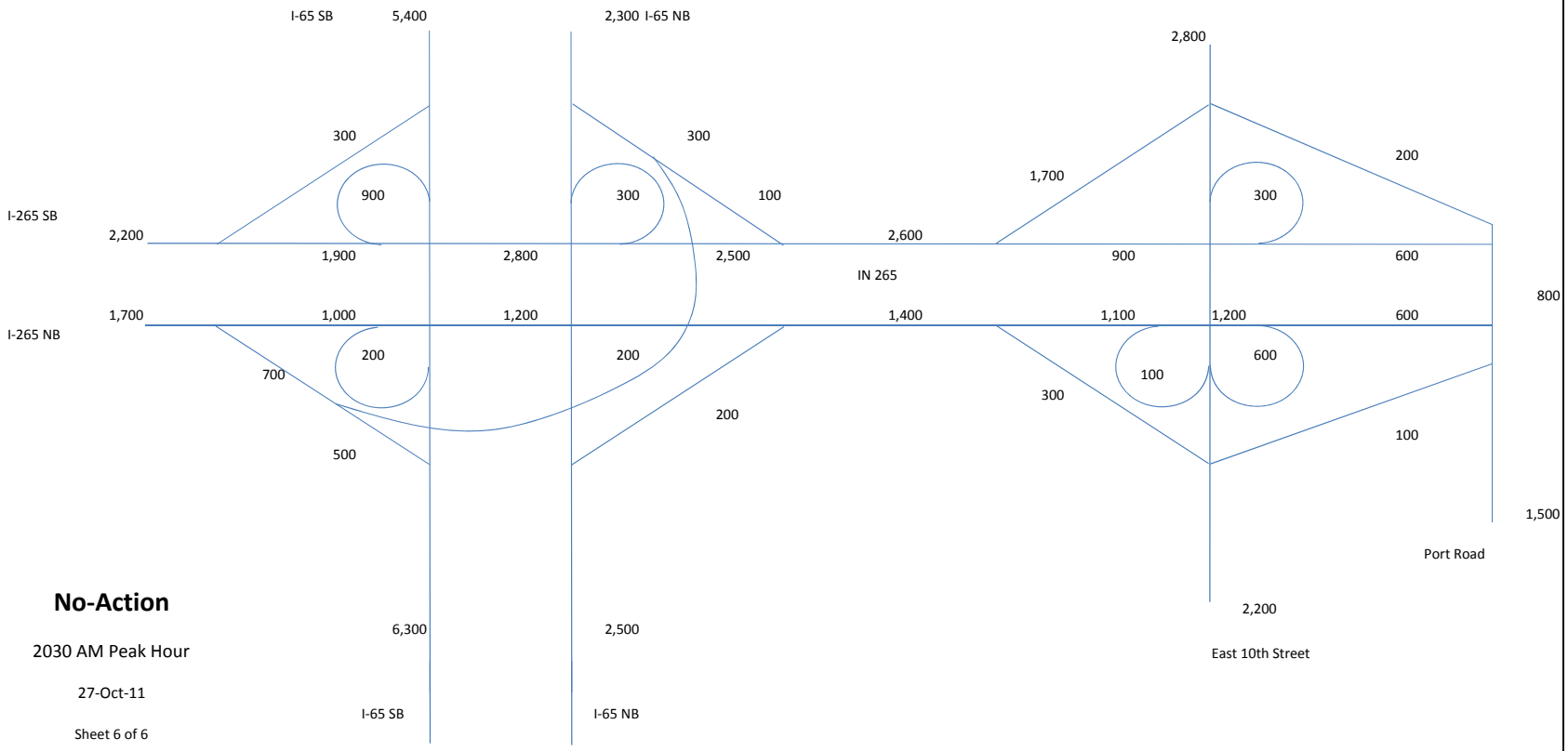
No-Action

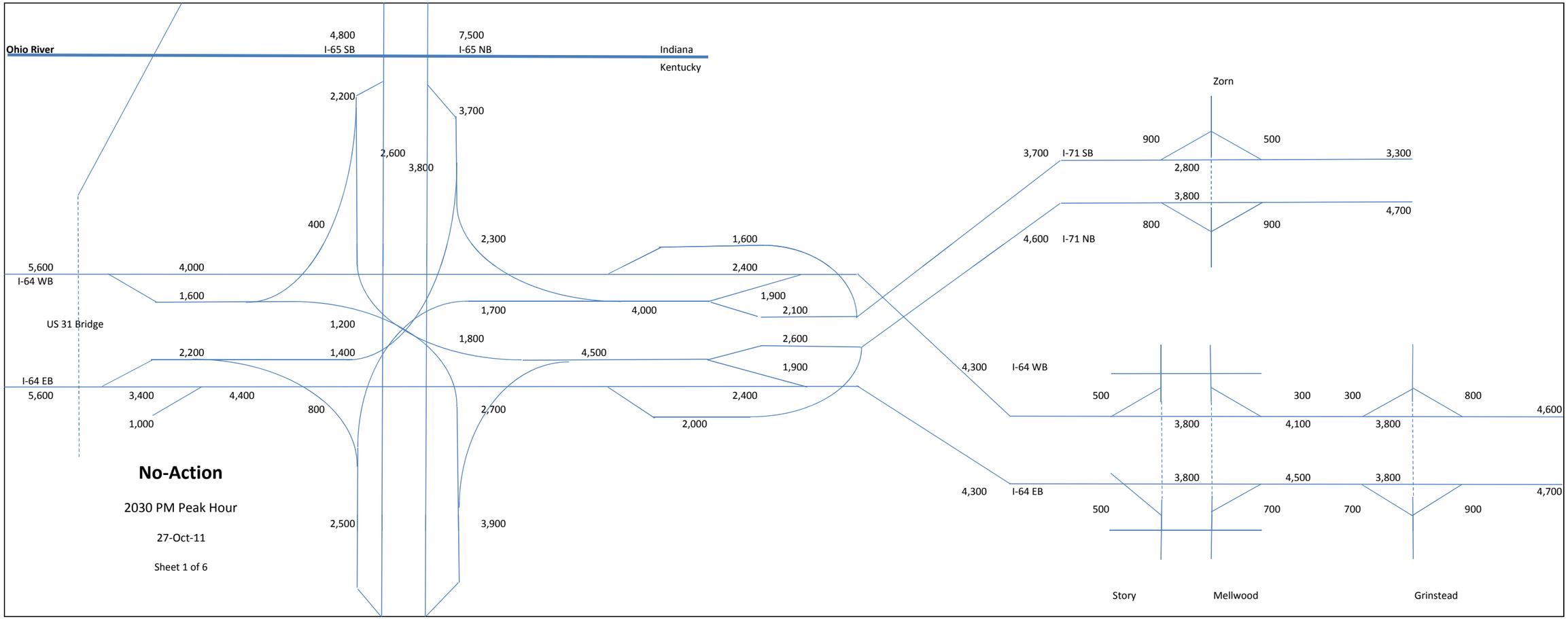
2030 AM Peak Hour

27-Oct-11

Sheet 5 of 6




I-65 SB
5,400
2,300 I-65 NB
2,800
300
300
200
1,700
900
300
100
300
I-265 SB
2,200
2,600
1,900
2,800
2,500
900
600
IN 265
800
1,700
1,000
1,200
1,400
1,100
1,200
600
I-265 NB
200
200
600
700
100
300
200
100
500
1,500
Port Road
No-Action
2,200
6,300
2,500
2030 AM Peak Hour
East 10th Street
27-Oct-11
I-65 SB
I-65 NB
Sheet 6 of 6

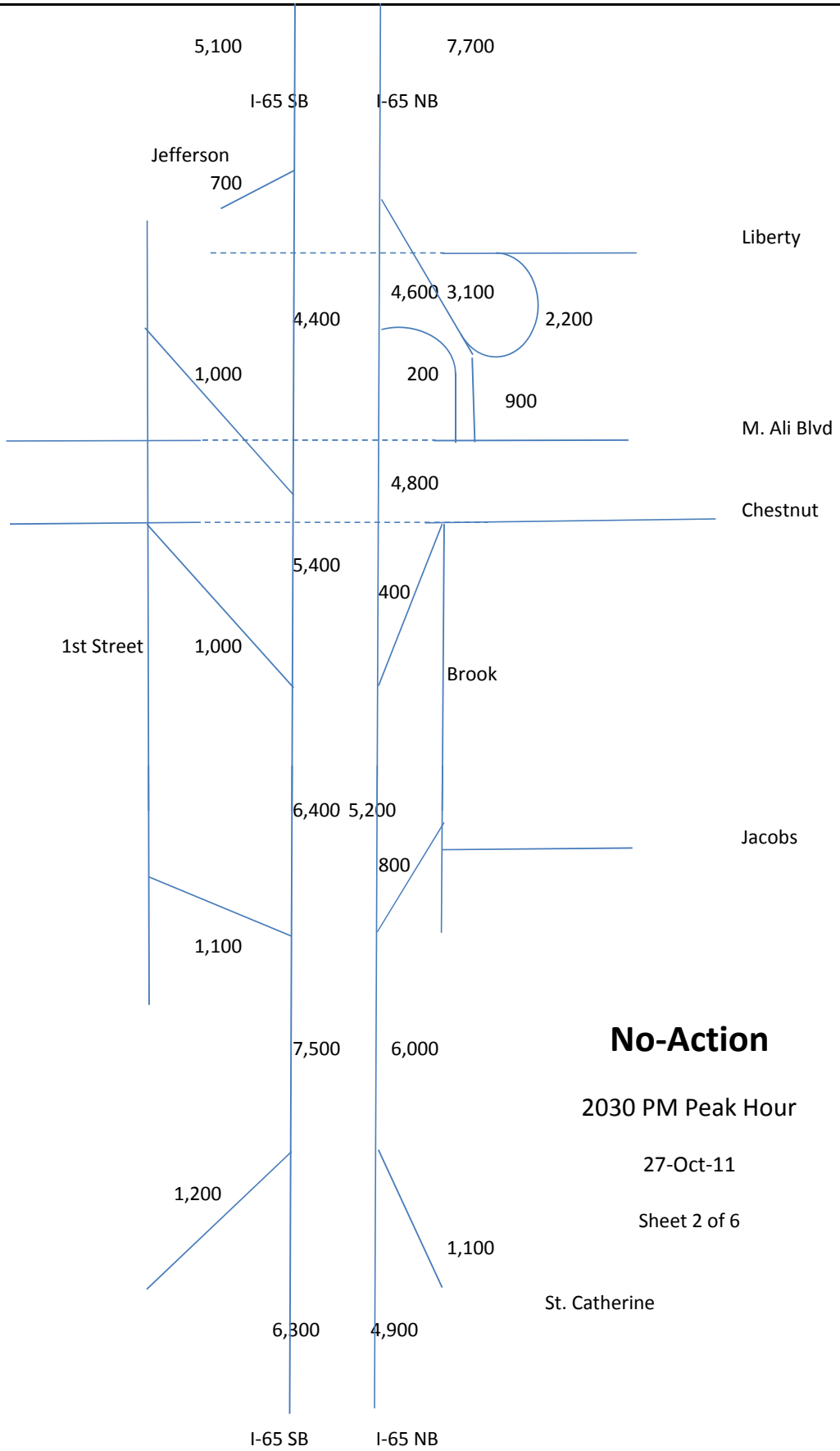


No-Action

2030 PM Peak Hour

27-Oct-11

Sheet 1 of 6



No-Action

2030 PM Peak Hour

27-Oct-11

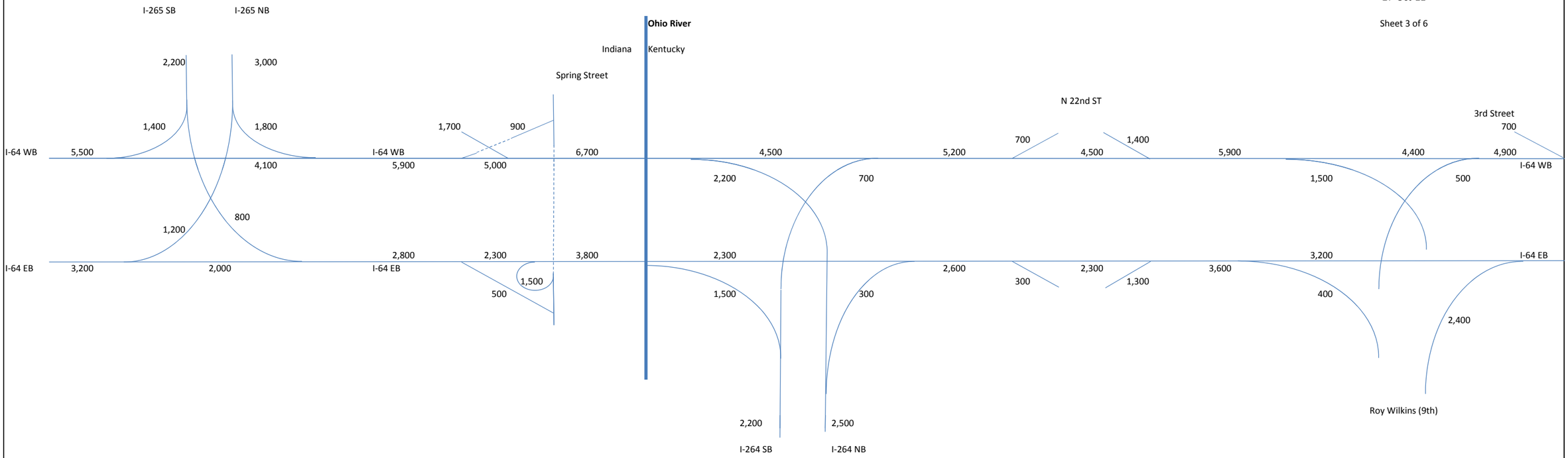
Sheet 2 of 6

No-Action

2030 PM Peak Hour

27-Oct-11

Sheet 3 of 6

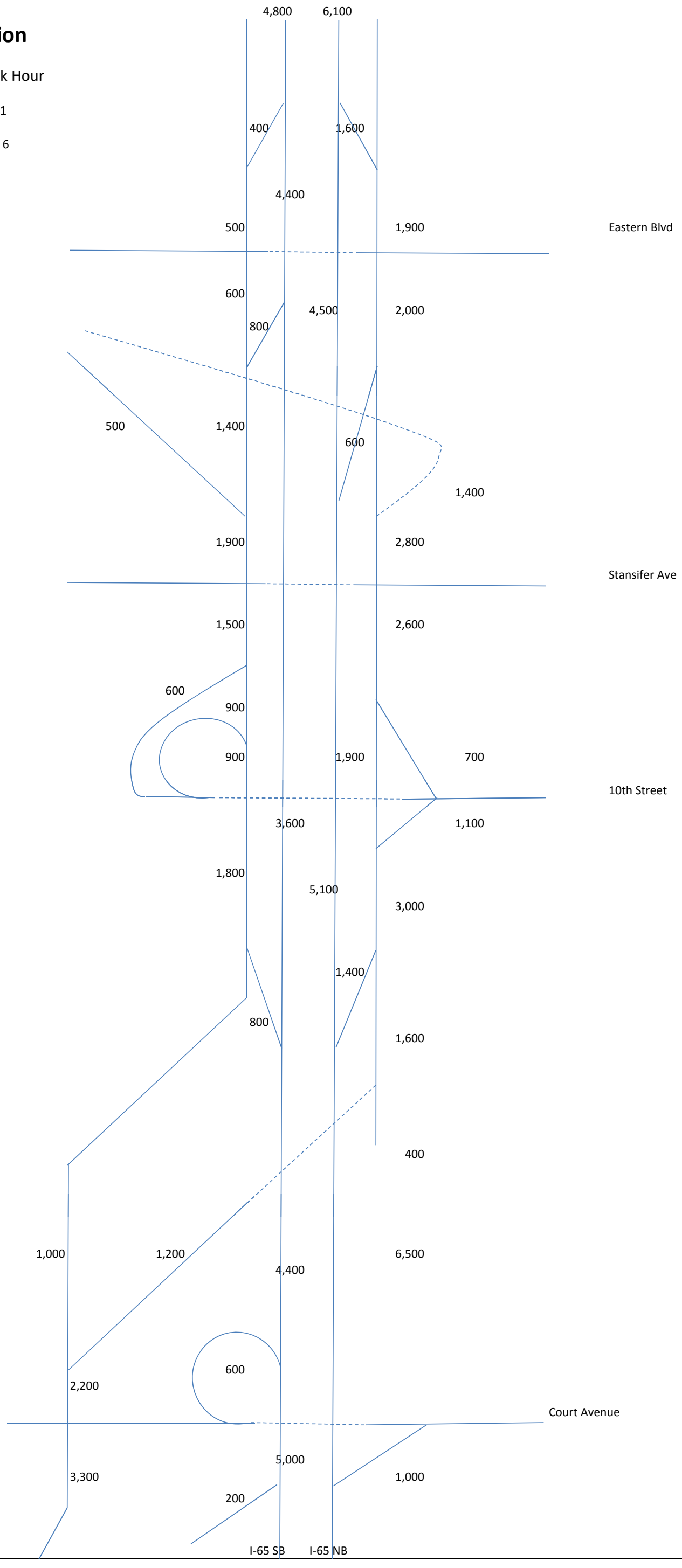


No-Action

2030 PM Peak Hour

27-Oct-11

Sheet 4 of 6

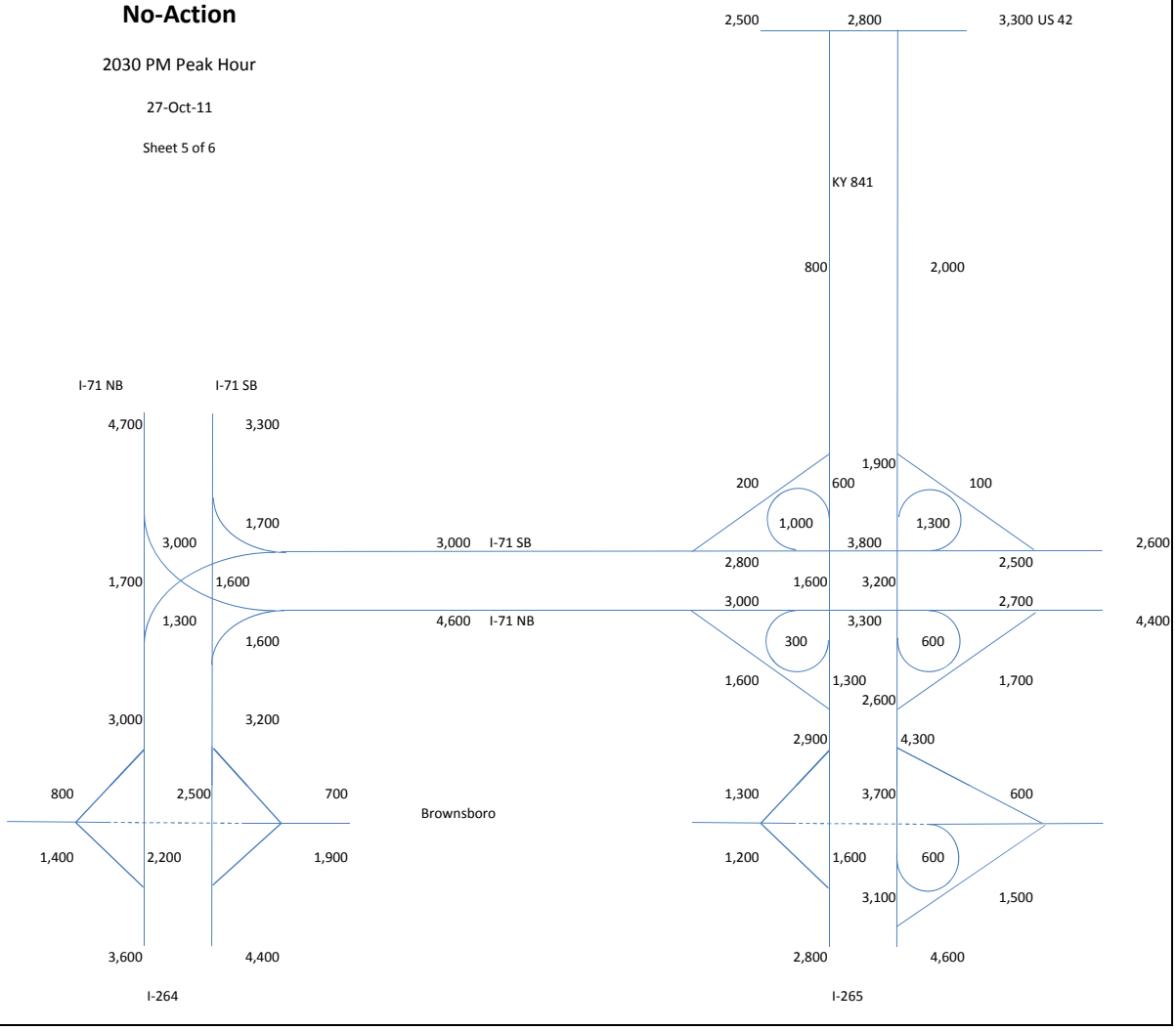


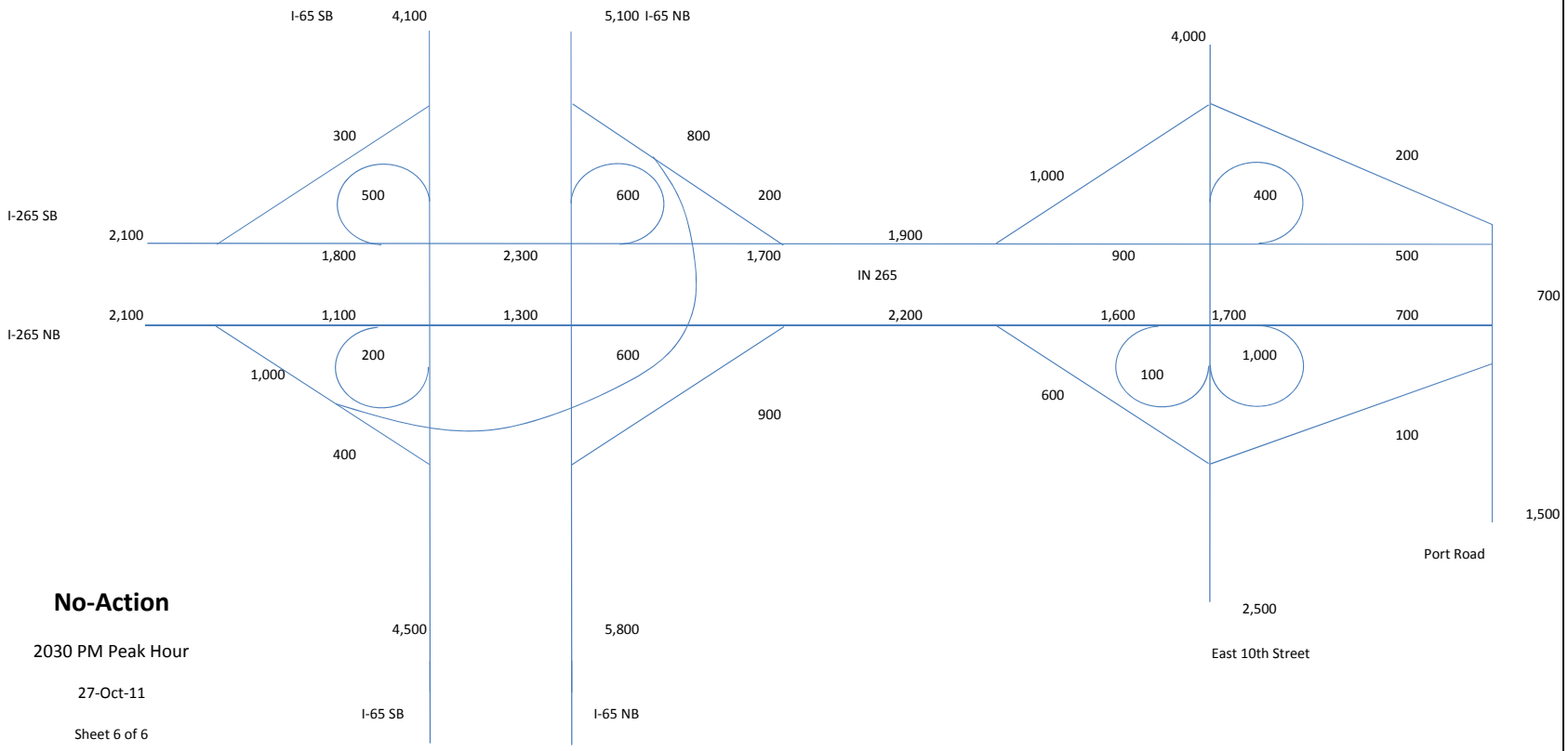
No-Action

2030 PM Peak Hour

27-Oct-11

Sheet 5 of 6



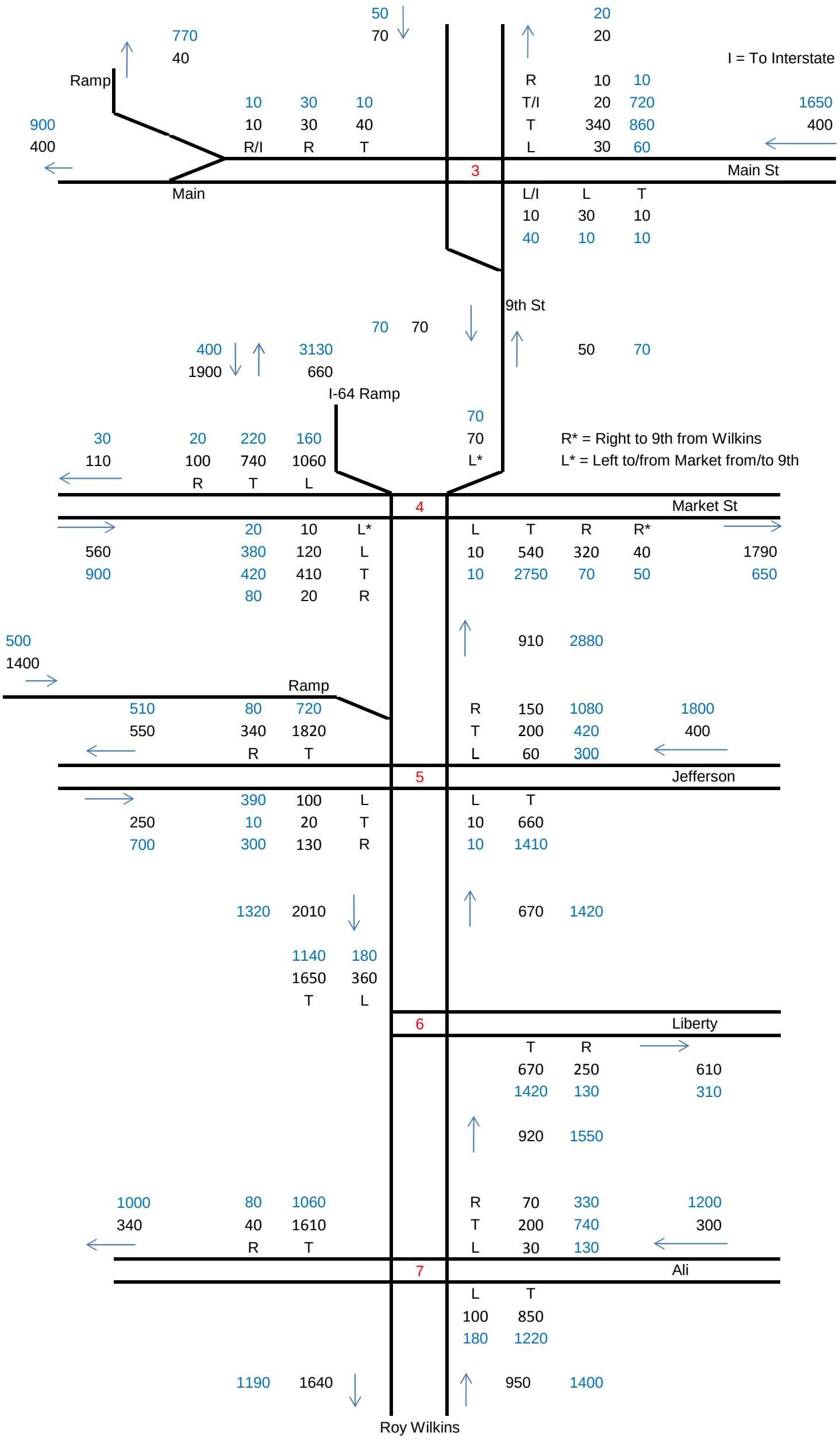

I-65 SB
4,100
5,100 I-65 NB
4,000
300
800
200
1,000
500
600
200
400
I-265 SB
2,100
1,900
1,800
2,300
1,700
900
500
IN 265
700
2,100
1,100
1,300
2,200
1,600
1,700
700
I-265 NB
200
600
1,000
1,000
100
600
900
100
400
1,500
Port Road
No-Action
2,500
4,500
5,800
2030 PM Peak Hour
East 10th Street
27-Oct-11
I-65 SB
I-65 NB
Sheet 6 of 6

9th Street

No-Action 2030 Turning Movement Volumes

AM Peak

PM Peak

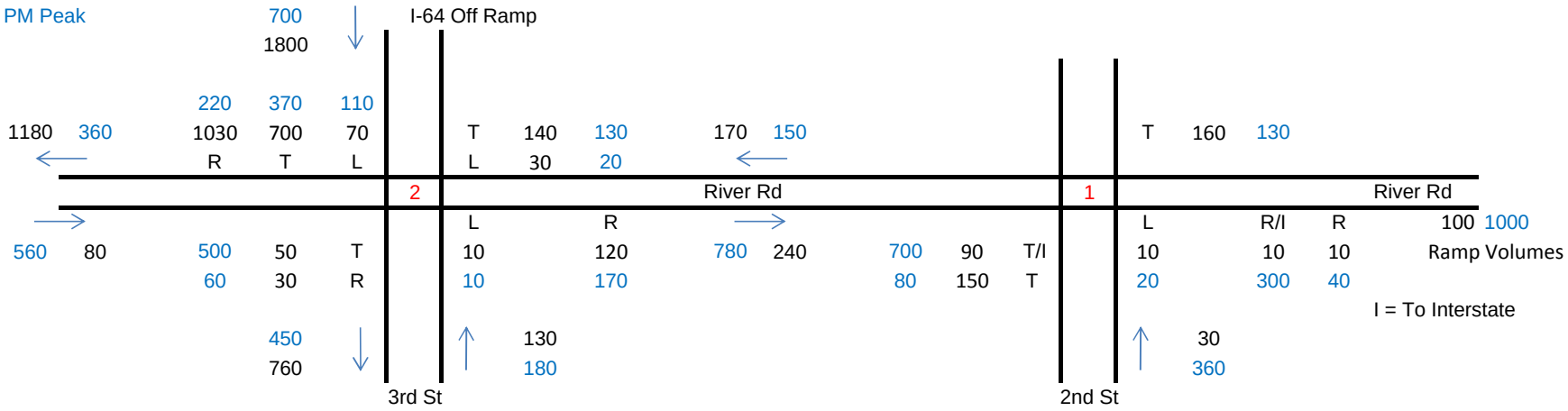


River Road

No-Action 2030 Turning Movement Volumes

AM Peak

PM Peak

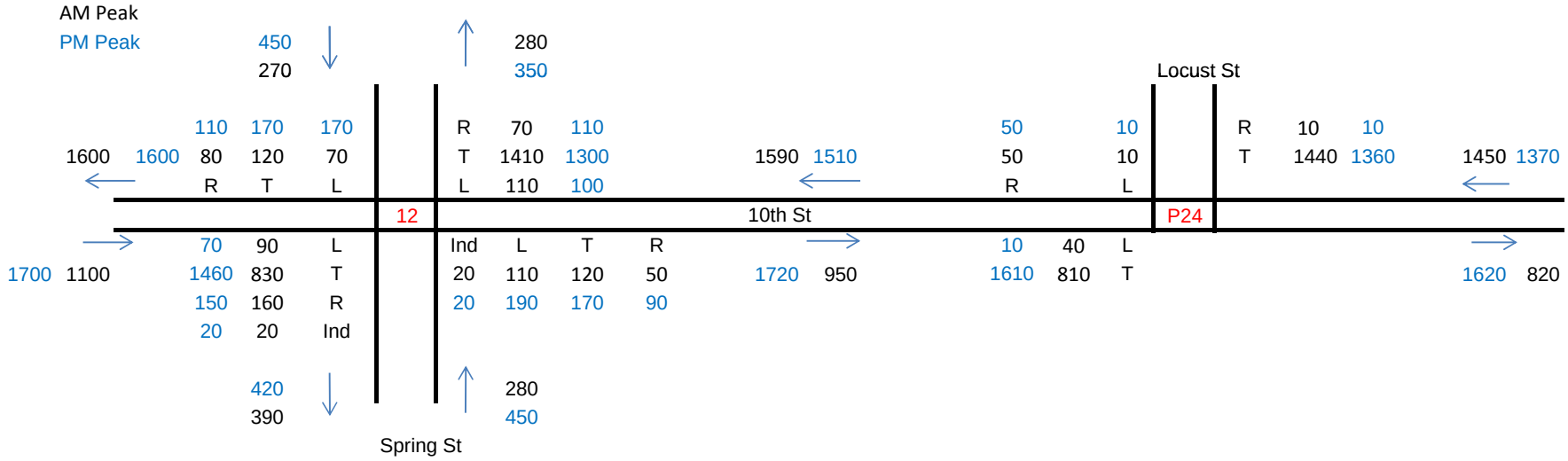


10th

No-Action 2030 Turning Movement Volumes

AM Peak

PM Peak

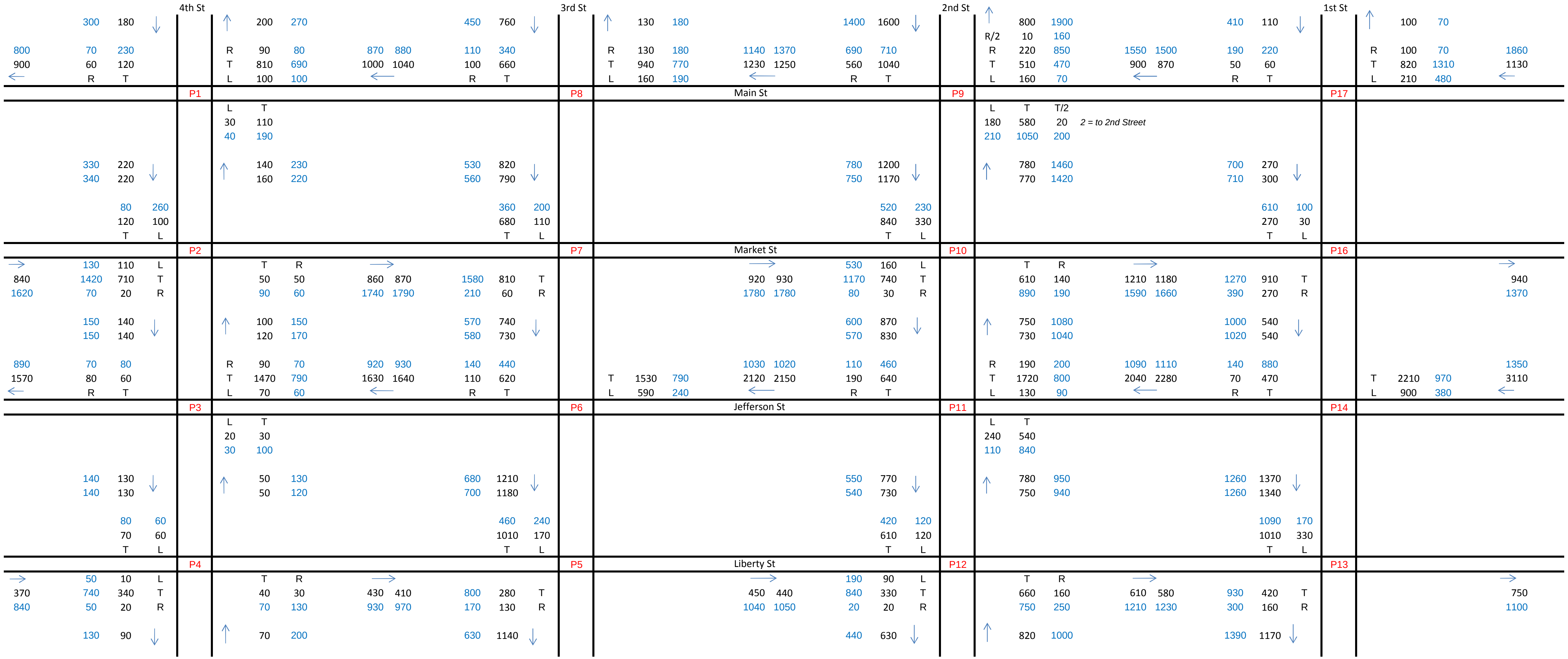


Downtown

No-Action 2030 Turning Movement Volumes

AM Peak

PM Peak

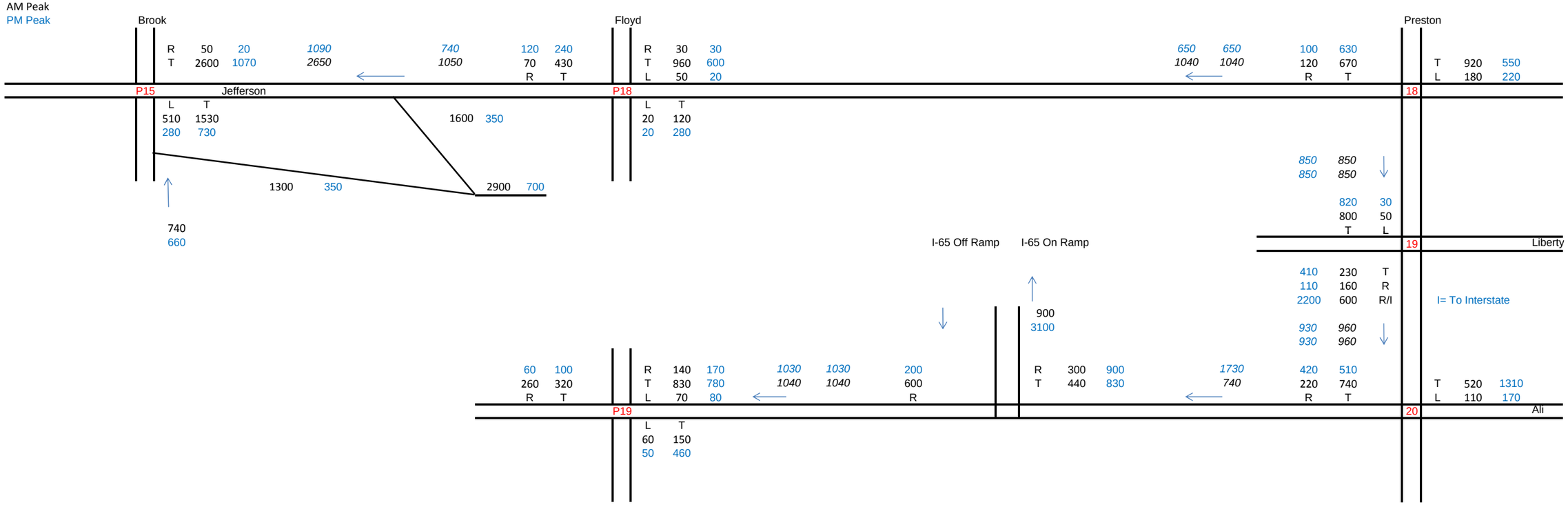


Preston

No-Action 2030 Turning Movement Volumes

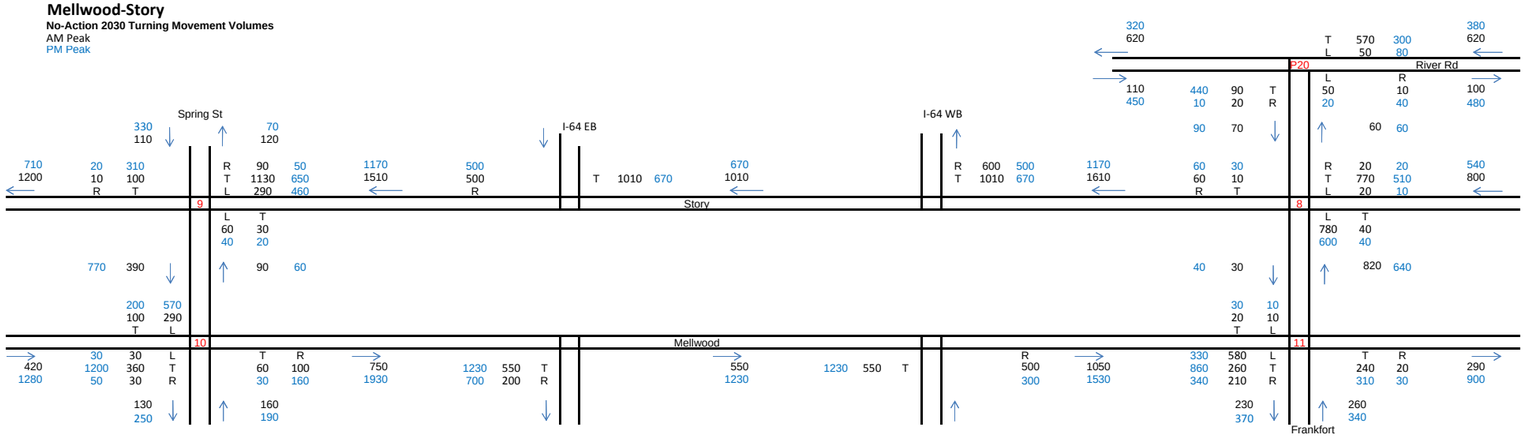
AM Peak

PM Peak



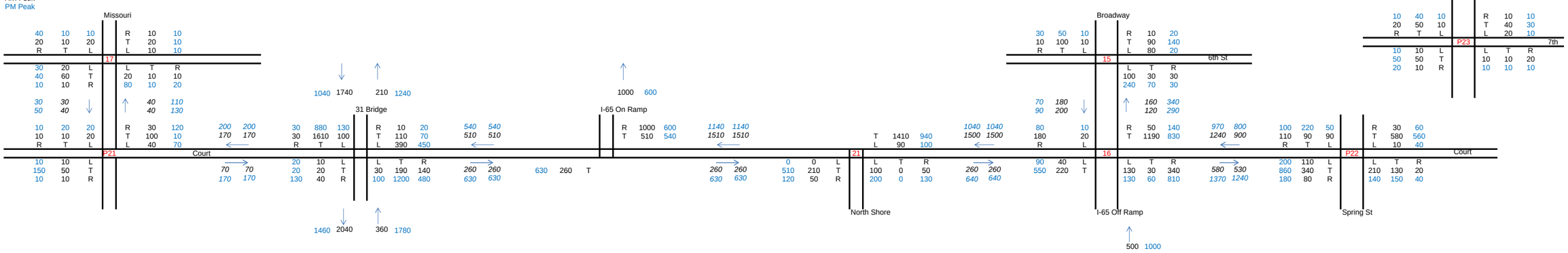
Mellwood-Story

No-Action 2030 Turning Movement Volumes
AM Peak
PM Peak



Court

No-Action 2030 Turning Movement Volumes
AM Peak
PM Peak

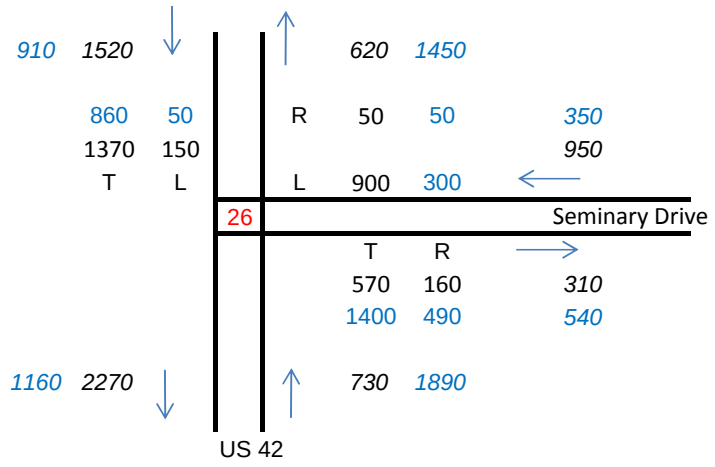


Seminary

No-Action 2030 Turning Movement Volumes

AM Peak

PM Peak

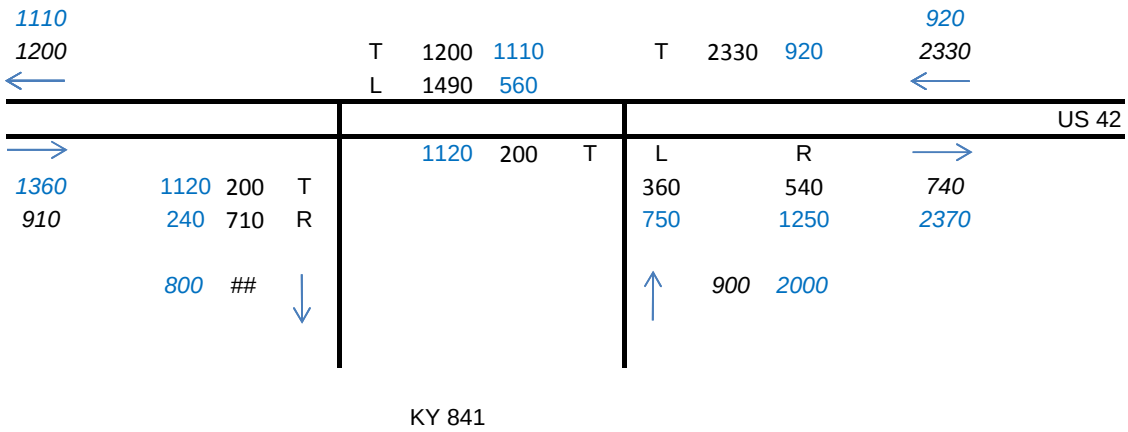


East End

No-Action 2030 Turning Movement Volumes

AM Peak

PM Peak



Eastern

No-Action 2030 Turning Movement Volumes

AM Peak

PM Peak

												500														1900									
												500														600									
20	80	180		R	60	130	1140	1210	260	70	170					1070	1070					R	60	410	770	690	250	170							
10	30	90		T	320	870	440	560	260	30	210		T	300	950	400	400					T	150	360	210	180	120	250							
R	T	L		L	60	140	←		R	T	L		L	100	120	←									←		R	T							
			P28				Eastern					25								24									P27						
40	20	L		L	T	R	→									→		260	150	L		L	T	R	→		180	130	L		L	T			
540	430	T		40	40	110	630	730	510	260	T					470	470	420	320	T		250	390	60	380	360					60	110			
60	50	R		100	70	50	770	920	410	470	R					680	680					710	1230	60	480	440	260	230	R		440	240			
										600																700									
										600																2000									
			Brook									US 31 (SB Frontage)								US 31 (NB Frontage)									Spring							

Stansifer

No-Action 2030 Turning Movement Volumes

AM Peak

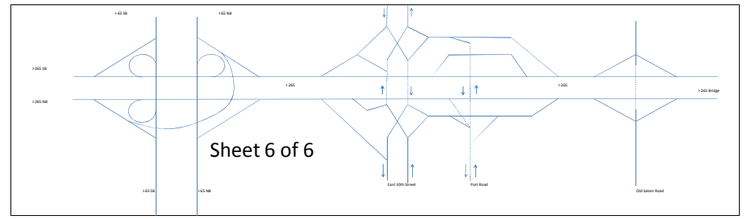
PM Peak

										1900												2800													
										2600												1000													
10	100	80		R	40	150	260	530	300	1310	290					360	360					R	90	460	640	480	110	250	60		R	20	100			
10	70	110		T	20	40	100	170	80	2200	320		T	90	230	250	250					T	200	180	290	270	170	210	50		T	50	210			
R	T	L		L	40	70	←		R	T	L		L	160	130	←									←		R	T	L		L	10	10			
			P26									14				Stansifer Ave				13									P25						
10	10	L		L	T	R	→									→		140	90	L		L	T	R	→		150	100	L		L	T	R			
50	40	T		10	70	20	170	290	180	150	T					470	470	330	380	T		50	820	130	510	350	80	80	T		50	70	10			
10	10	R		10	190	50	180	240	60	140	R					470	470					180	2200	220	550	400	170	170	R		160	320	10			
										1500																									
										2500												1000													
			Clark									SB Frontage								NB Frontage									Spring							
																						1600													

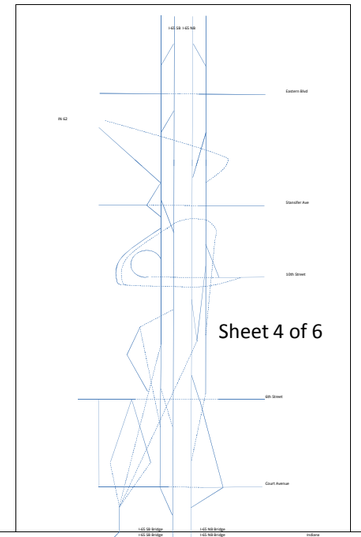
APPENDIX C

FEIS Selected Daily, AM Peak, PM Peak 2030 Traffic Volumes

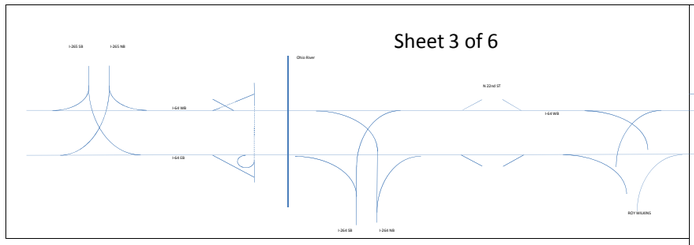
FEIS Selected Key



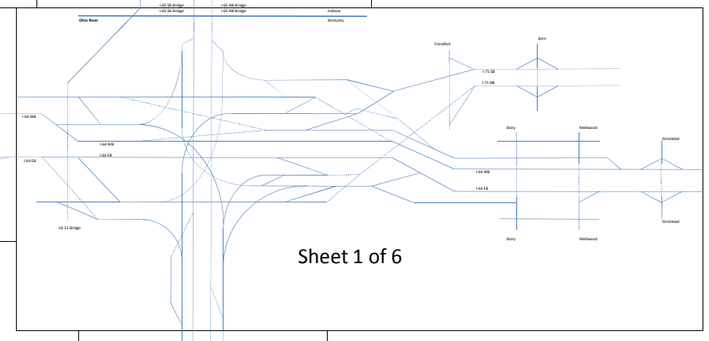
Sheet 6 of 6



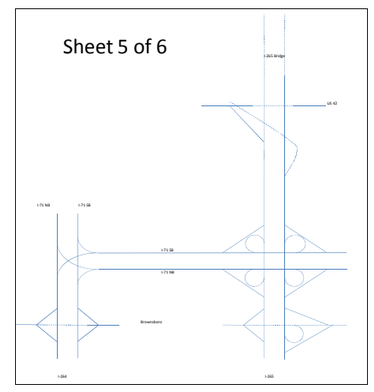
Sheet 4 of 6



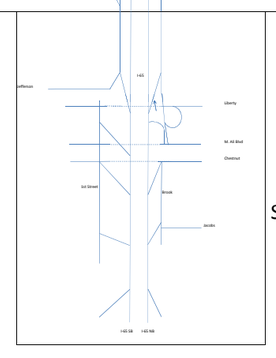
Sheet 3 of 6



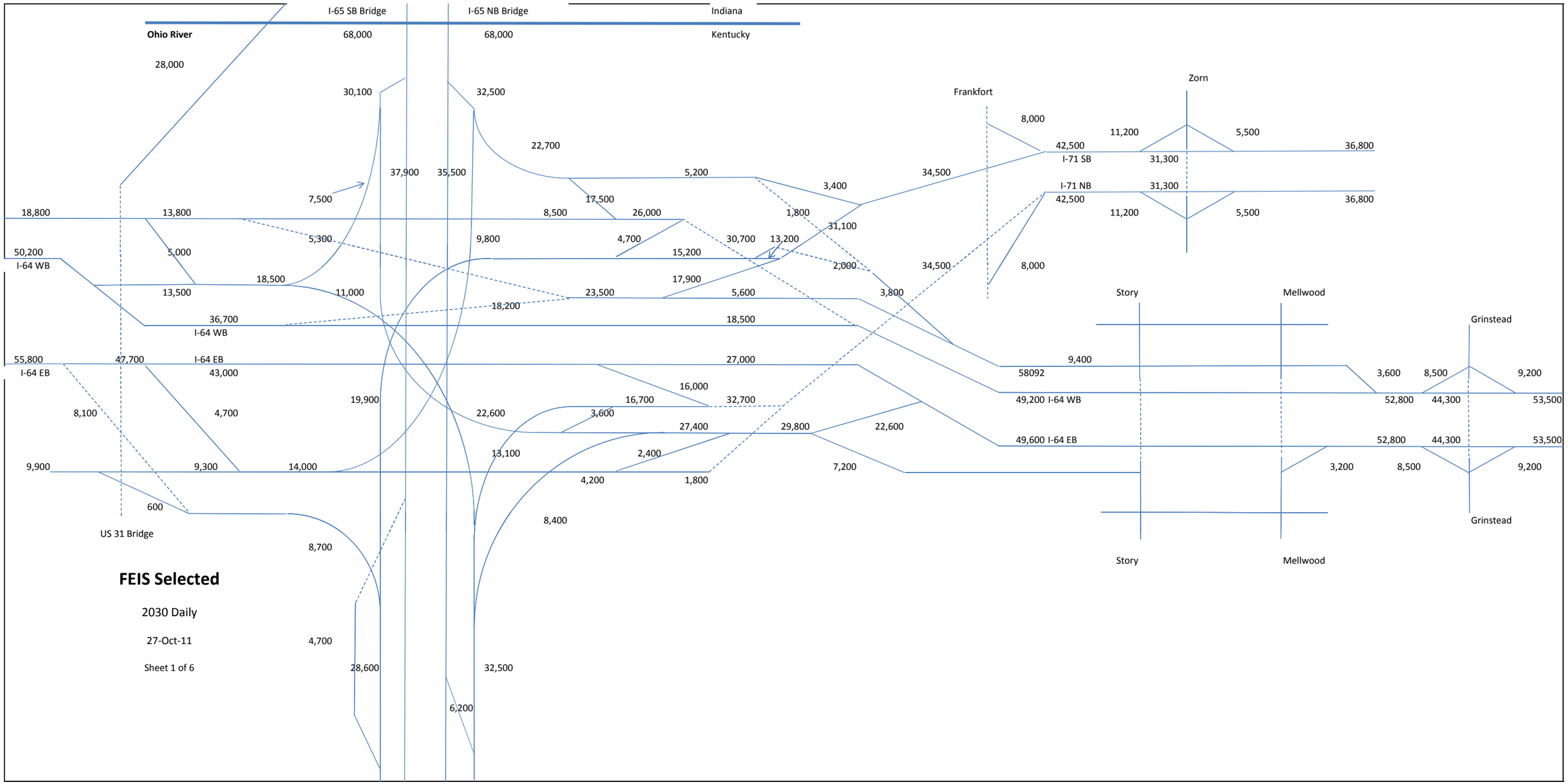
Sheet 1 of 6



Sheet 5 of 6



Sheet 2 of 6

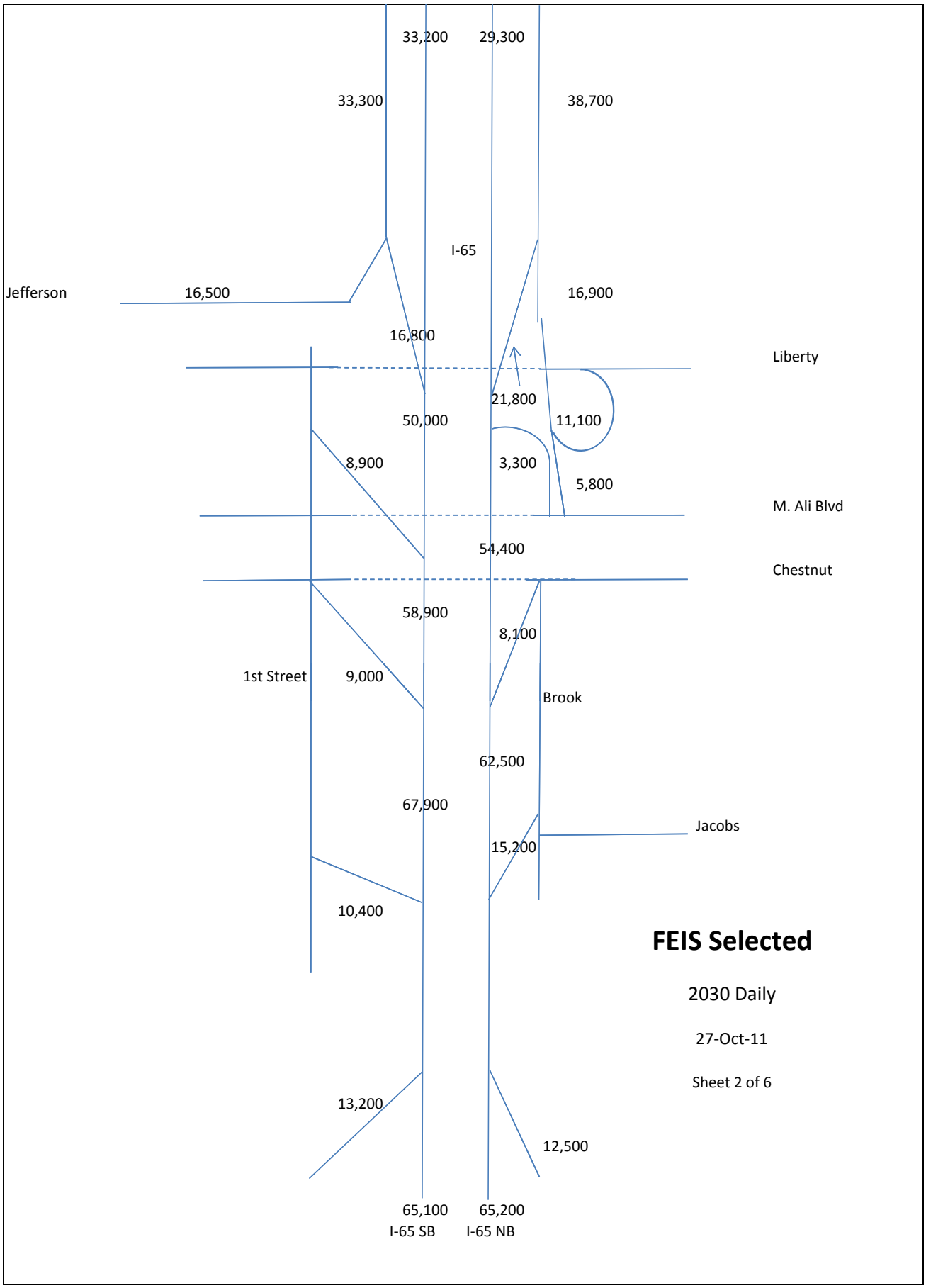


FEIS Selected

2030 Daily

27-Oct-11

Sheet 1 of 6

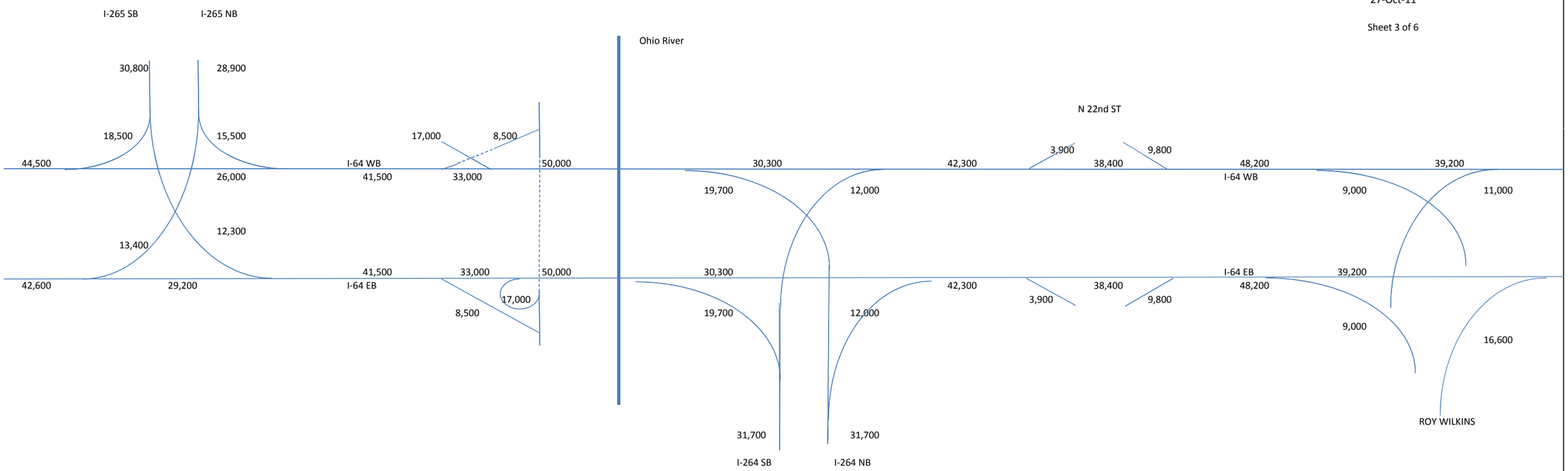

33,200
29,300
33,300
38,700
I-65
Jefferson
16,500
16,900
16,800
Liberty
21,800
50,000
11,100
8,900
3,300
5,800
M. Ali Blvd
54,400
Chestnut
58,900
8,100
1st Street
9,000
Brook
62,500
67,900
Jacobs
15,200
10,400
FEIS Selected
2030 Daily
27-Oct-11
Sheet 2 of 6
13,200
12,500
65,100
65,200
I-65 SB
I-65 NB

FEIS Selected

2030 Daily

27-Oct-11

Sheet 3 of 6

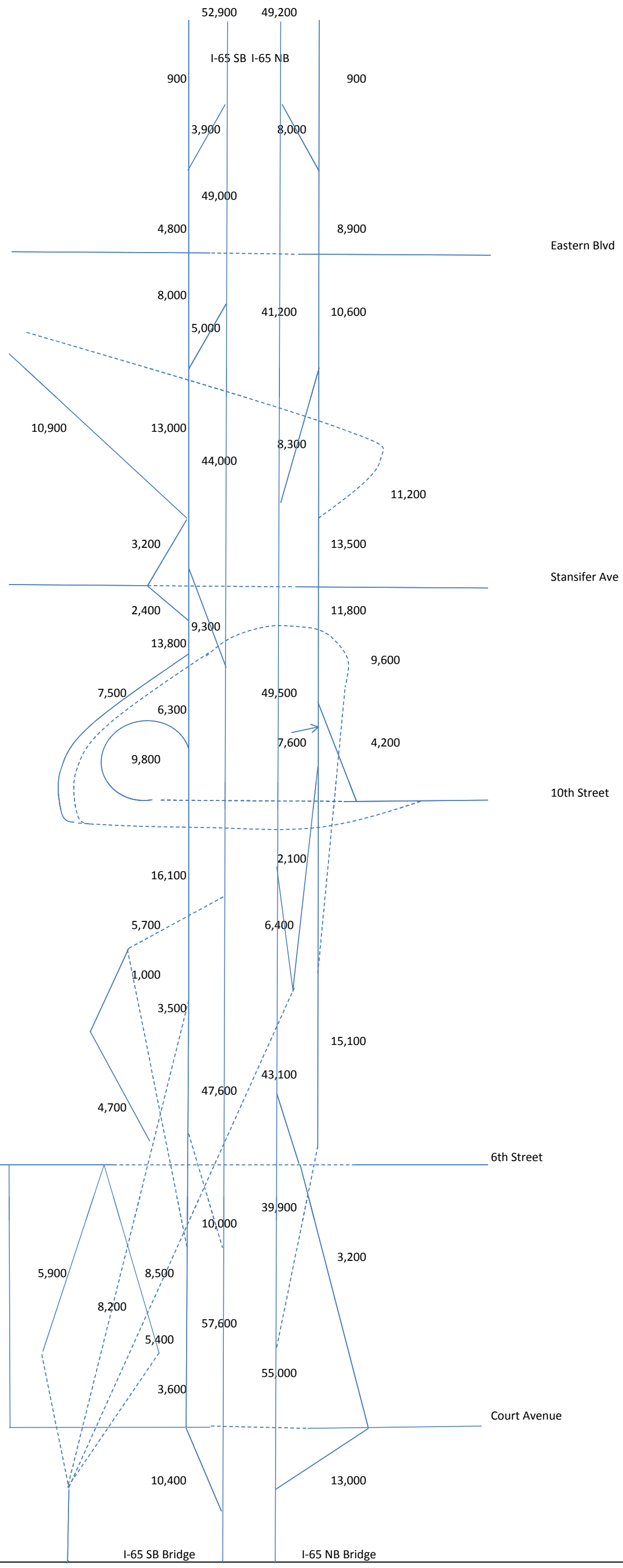


FEIS Selected

2030 Daily

27-Oct-11

Sheet 4 of 6

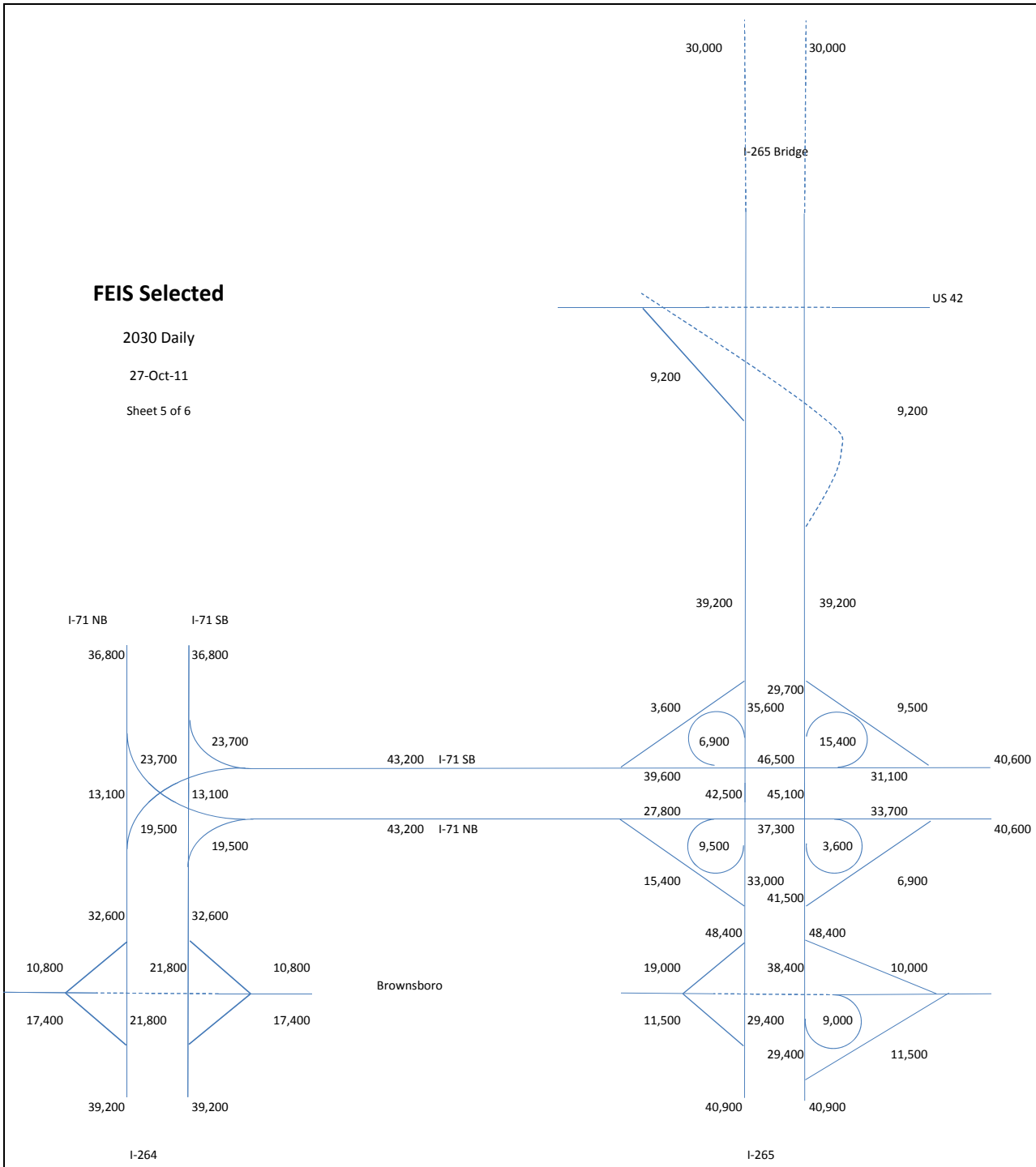


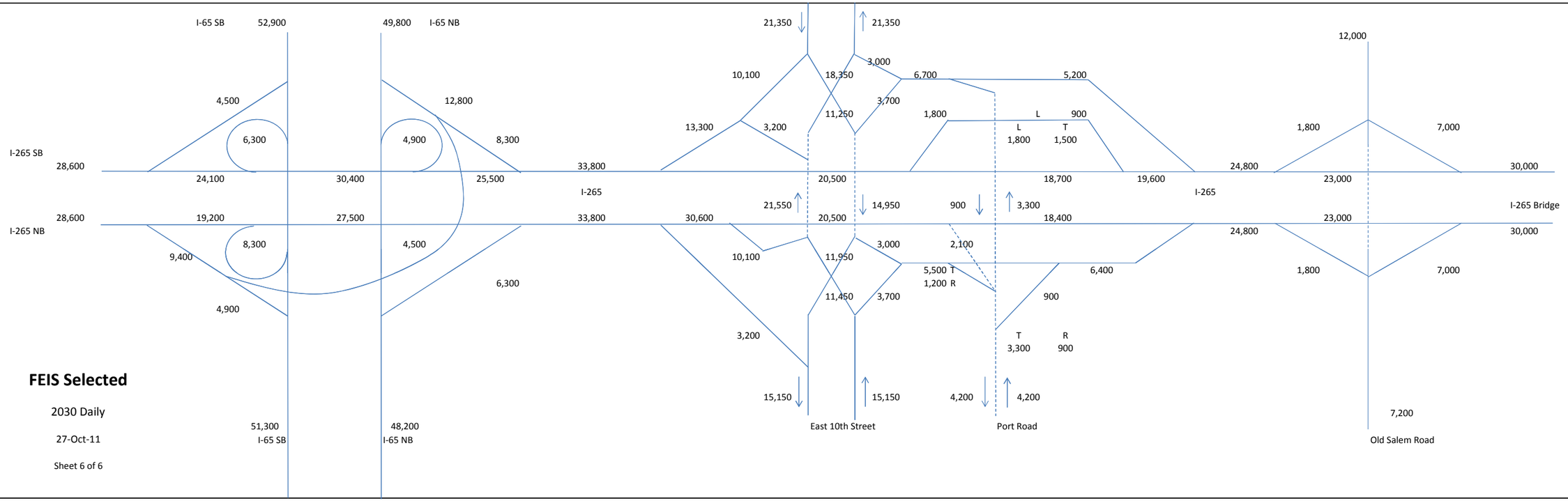
FEIS Selected

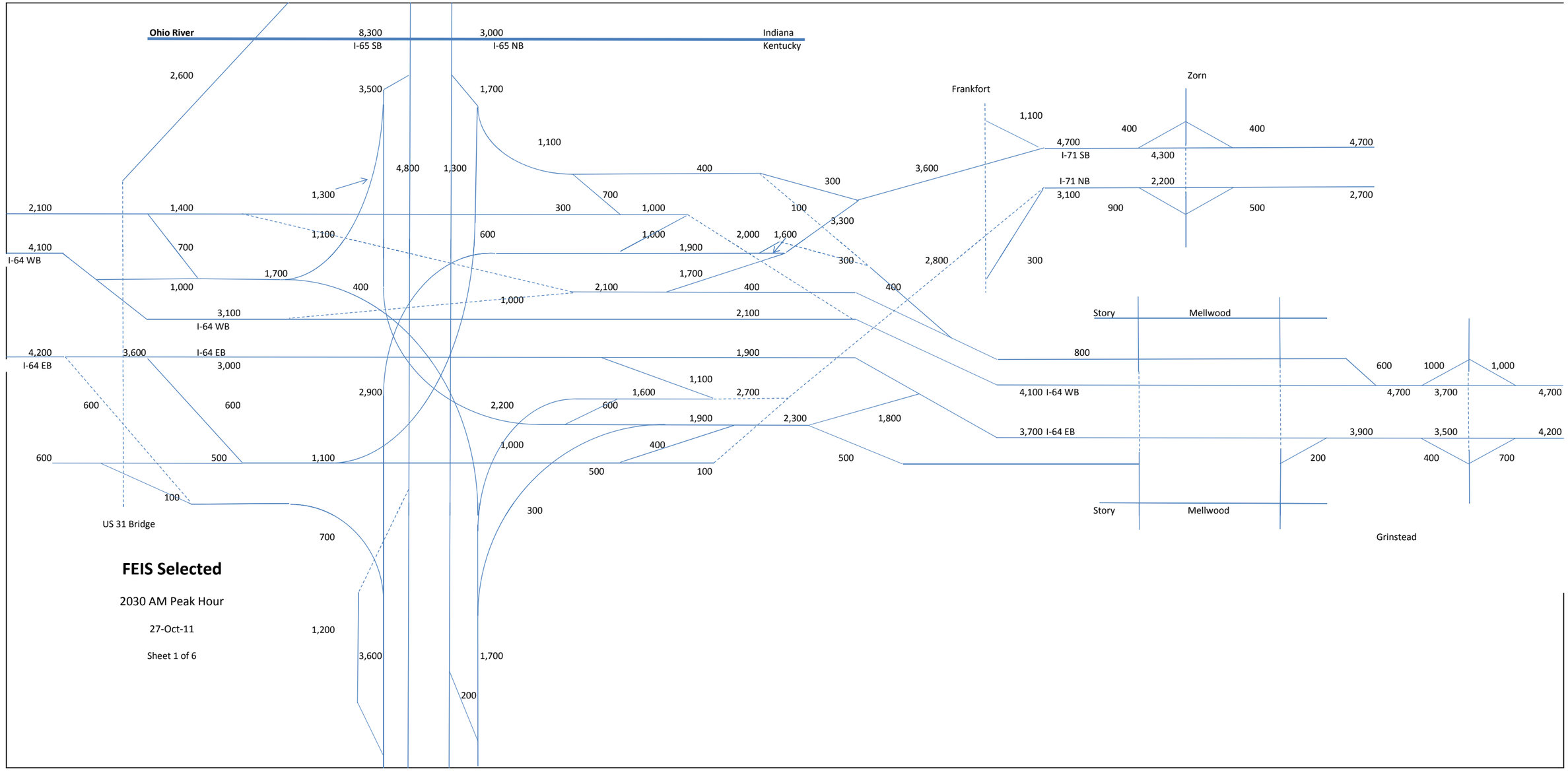
2030 Daily

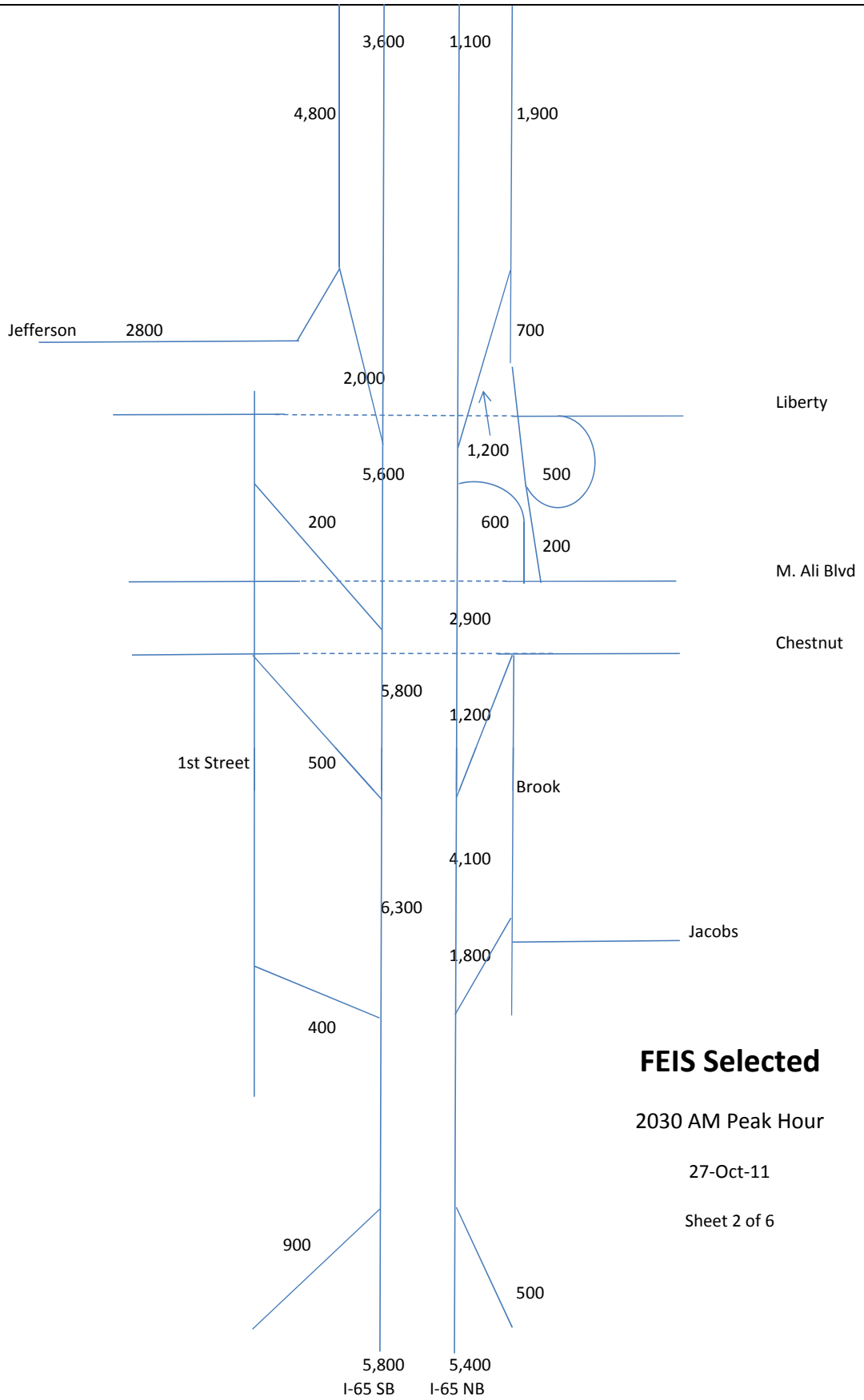
27-Oct-11

Sheet 5 of 6




I-65 SB
52,900
49,800
I-65 NB
21,350
21,350
12,000
3,000
10,100
18,350
6,700
5,200
4,500
12,800
3,700
11,250
1,800
L
900
13,300
3,200
L
T
1,800
1,500
1,800
7,000
6,300
4,900
8,300
I-265 SB
28,600
33,800
24,800
30,000
24,100
30,400
25,500
20,500
18,700
19,600
23,000
I-265
I-265
21,550
14,950
900
3,300
I-265 Bridge
28,600
19,200
27,500
33,800
30,600
20,500
18,400
23,000
I-265 NB
24,800
30,000
8,300
4,500
3,000
2,100
9,400
10,100
11,950
5,500 T
1,200 R
6,400
1,800
7,000
6,300
11,450
3,700
900
4,900
3,200
T
R
3,300
900
FEIS Selected
2030 Daily
15,150
15,150
4,200
4,200
7,200
51,300
48,200
East 10th Street
Port Road
27-Oct-11
I-65 SB
I-65 NB
Old Salem Road
Sheet 6 of 6


Ohio River
8,300
I-65 SB
3,000
I-65 NB
Indiana
Kentucky
2,600
3,500
1,700
Frankfort
Zorn
1,100
400
400
4,700
I-71 SB
4,300
4,700
1,100
4,800
1,300
400
300
3,600
I-71 NB
2,200
3,100
2,700
1,300
700
900
500
2,100
1,400
300
1,000
100
3,300
1,100
600
1,000
2,000
1,600
4,100
700
1,900
I-64 WB
300
2,800
300
1,700
1,700
1,000
400
2,100
400
400
1,000
3,100
2,100
I-64 WB
Story
Mellwood
4,200
3,600
I-64 EB
1,900
800
I-64 EB
3,000
600
1000
1,000
1,100
2,900
1,600
2,700
4,100 I-64 WB
4,700
3,700
4,700
600
600
2,200
600
1,900
2,300
1,800
3,700 I-64 EB
3,900
3,500
4,200
1,000
400
600
500
1,100
500
200
400
700
500
100
100
300
Story
Mellwood
US 31 Bridge
700
Grinstead
FEIS Selected
2030 AM Peak Hour
27-Oct-11
1,200
Sheet 1 of 6
3,600
1,700
200



FEIS Selected

2030 AM Peak Hour

27-Oct-11

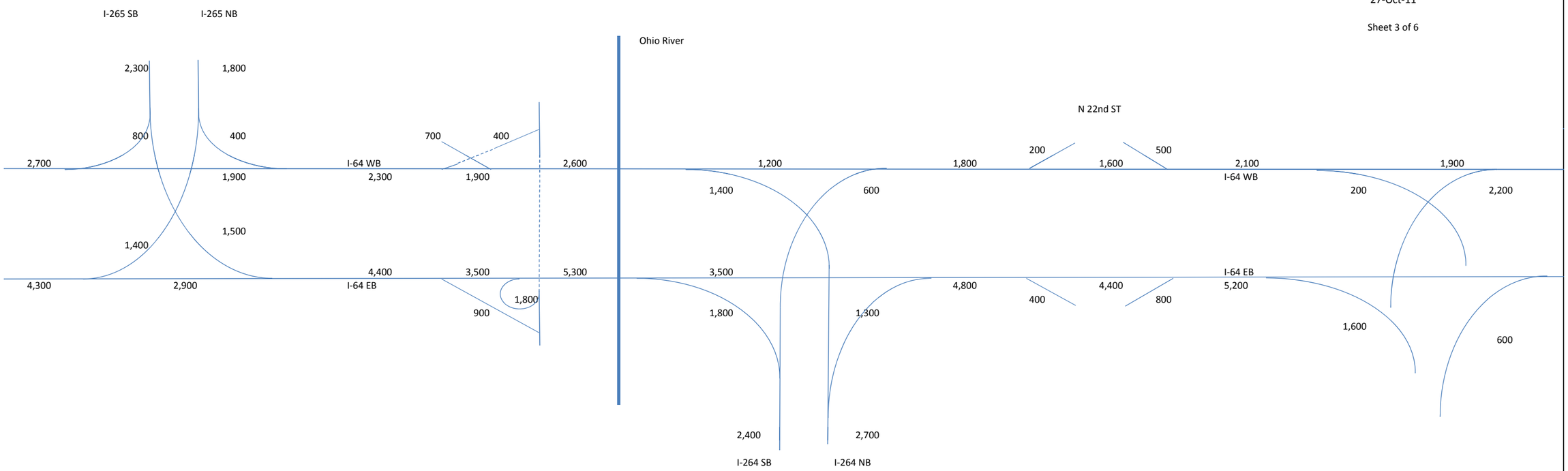
Sheet 2 of 6

FEIS Selected

2030 AM Peak Hour

27-Oct-11

Sheet 3 of 6

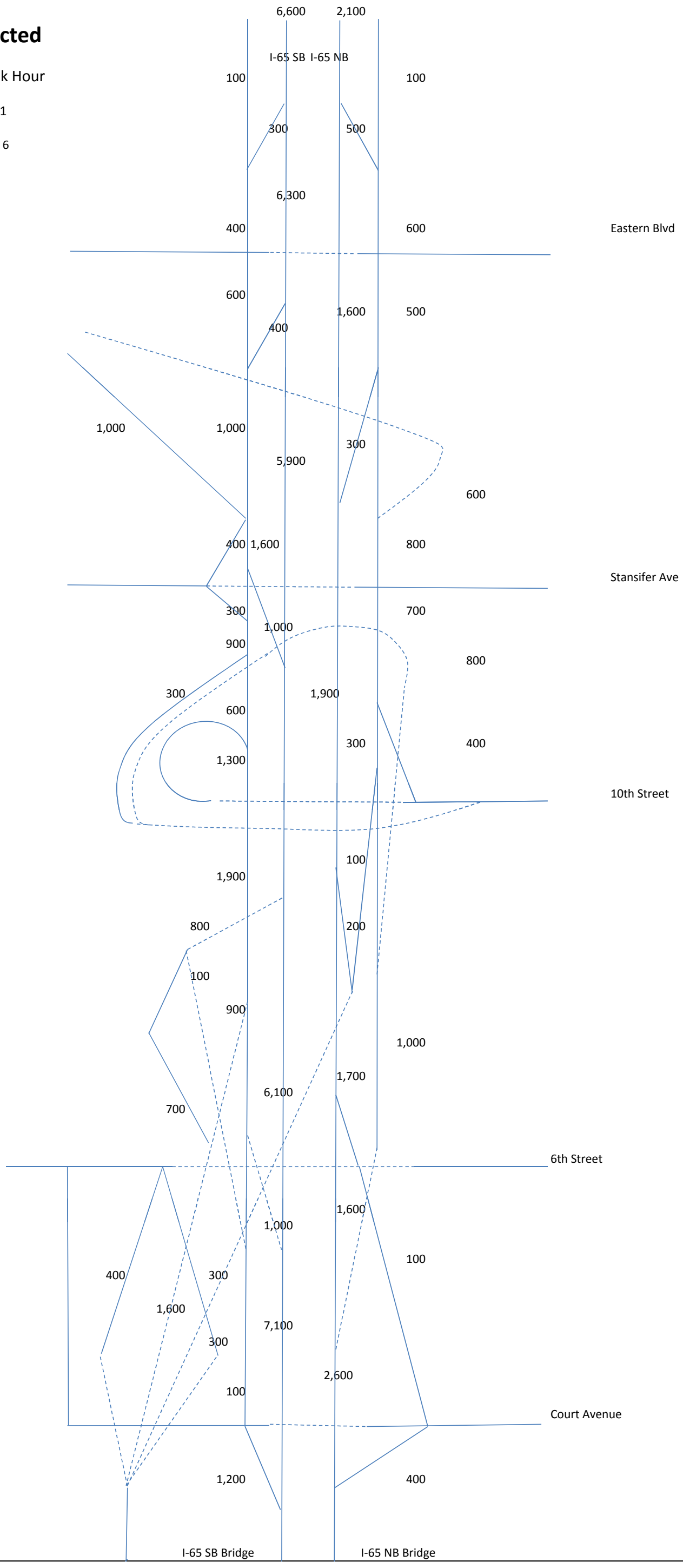


FEIS Selected

2030 AM Peak Hour

27-Oct-11

Sheet 4 of 6

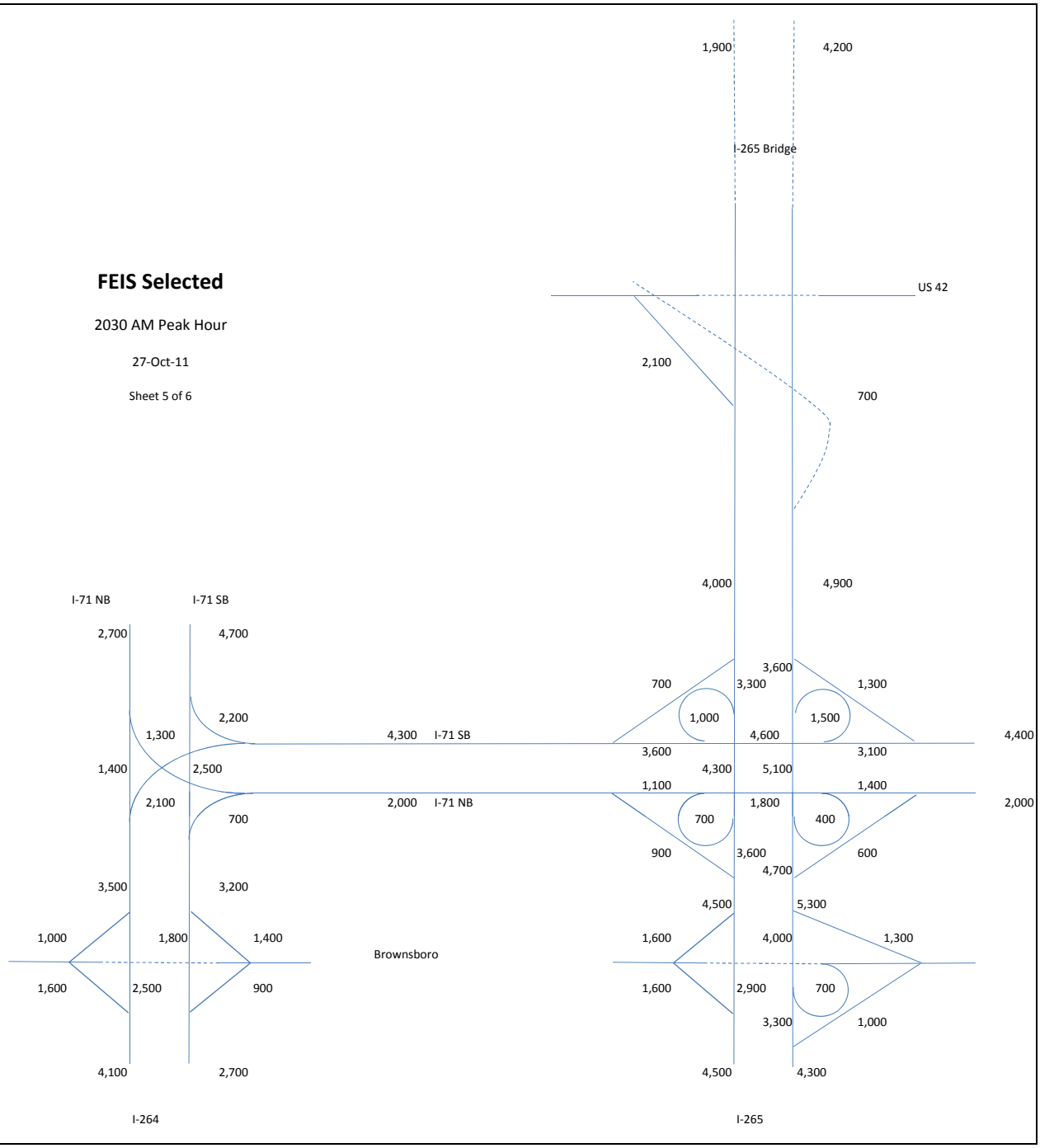


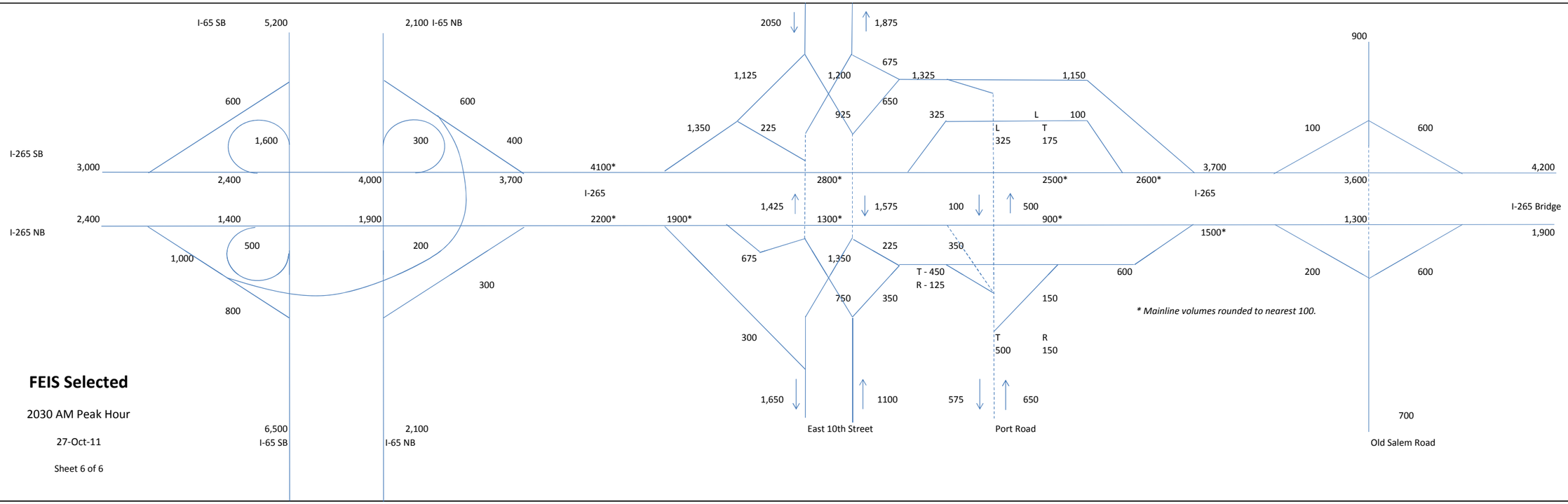
FEIS Selected

2030 AM Peak Hour

27-Oct-11

Sheet 5 of 6



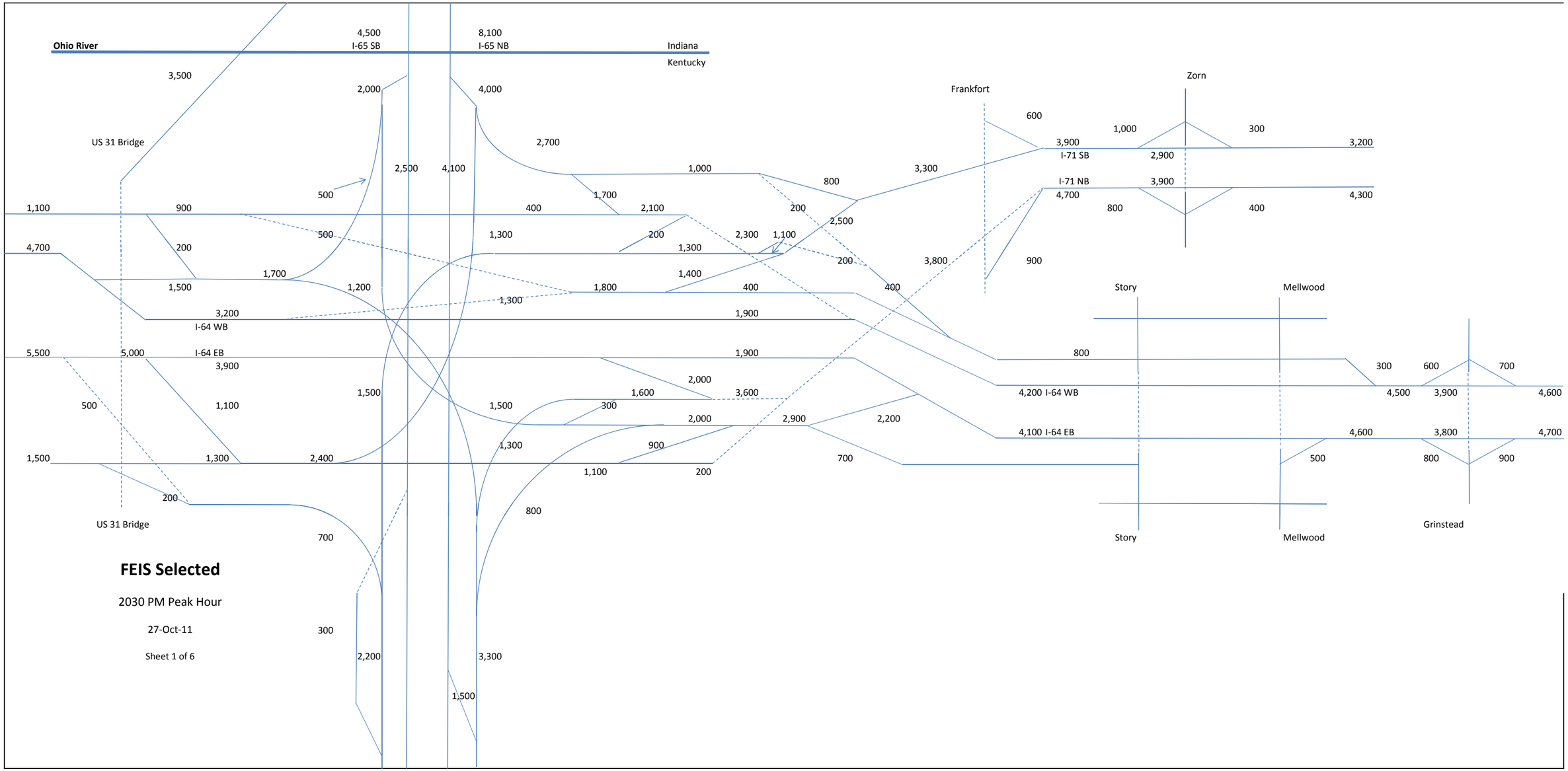


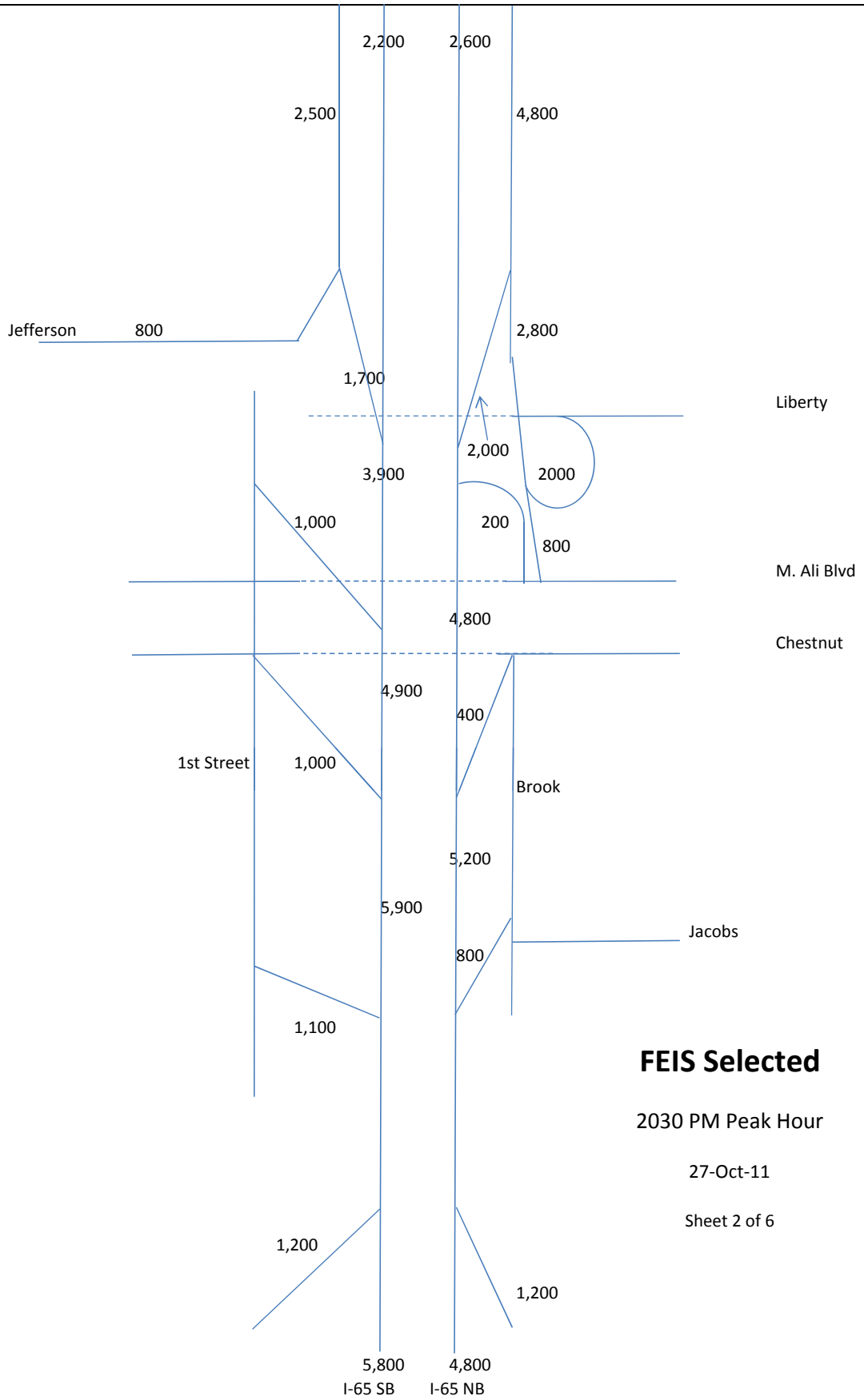
FEIS Selected

2030 AM Peak Hour

27-Oct-11

Sheet 6 of 6


Ohio River
4,500
I-65 SB
8,100
I-65 NB
Indiana
Kentucky
3,500
2,000
4,000
US 31 Bridge
2,700
2,500
4,100
1,000
500
1,700
2,100
1,100
900
400
200
500
1,300
200
2,300
1,100
4,700
200
1,300
1,700
1,400
1,500
1,200
1,800
400
1,300
3,200
1,900
I-64 WB
5,500
5,000
I-64 EB
1,900
3,900
2,000
1,500
1,600
3,600
500
1,100
1,500
300
2,000
2,900
2,200
1,300
900
1,500
1,300
2,400
700
1,100
200
200
800
US 31 Bridge
700
300
2,200
3,300
1,500
Frankfort
600
Zorn
1,000
300
3,900
3,200
I-71 SB
2,900
3,300
800
I-71 NB
3,900
4,700
4,300
800
400
2,500
3,800
900
Story
Mellwood
800
300
600
700
4,200 I-64 WB
4,500
3,900
4,600
4,100 I-64 EB
4,600
3,800
4,700
500
800
900
Grinstead
Story
Mellwood
FEIS Selected
2030 PM Peak Hour
27-Oct-11
Sheet 1 of 6



FEIS Selected

2030 PM Peak Hour

27-Oct-11

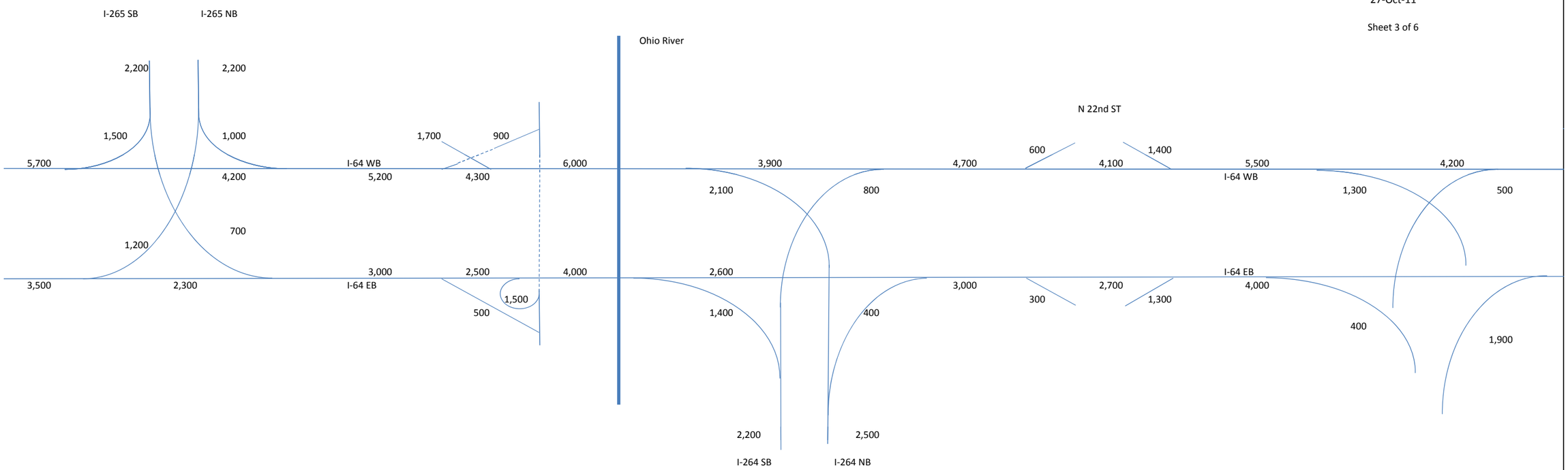
Sheet 2 of 6

FEIS Selected

2030 PM Peak Hour

27-Oct-11

Sheet 3 of 6

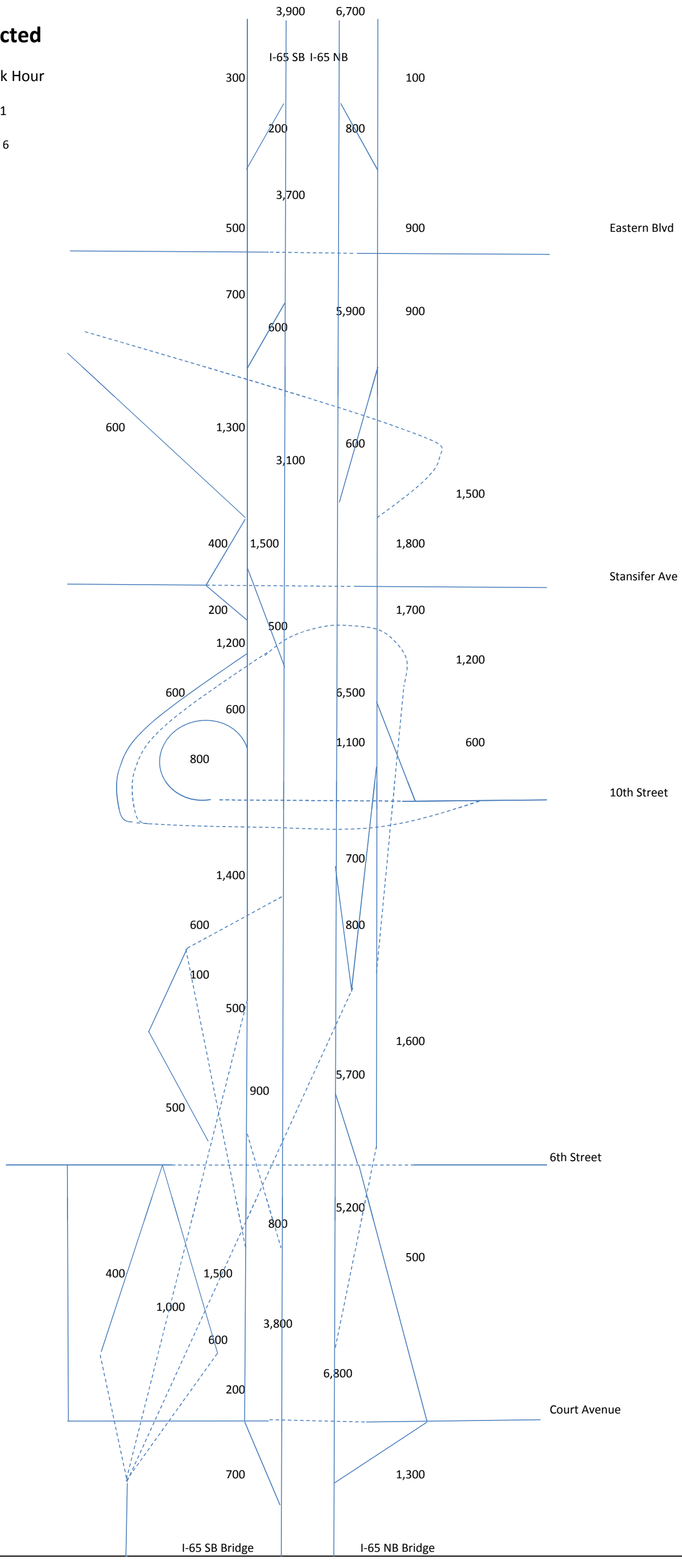


FEIS Selected

2030 PM Peak Hour

27-Oct-11

Sheet 4 of 6

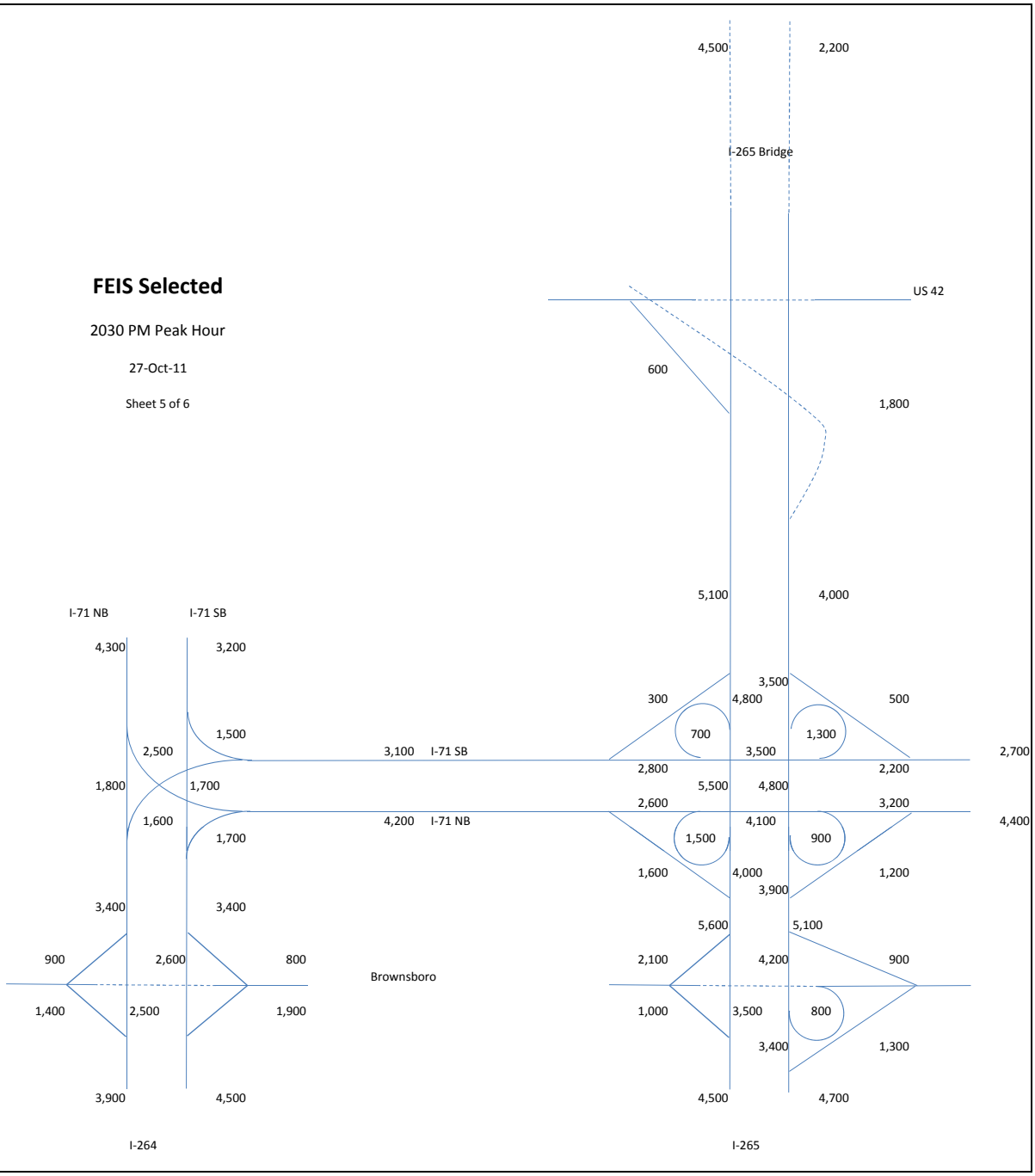


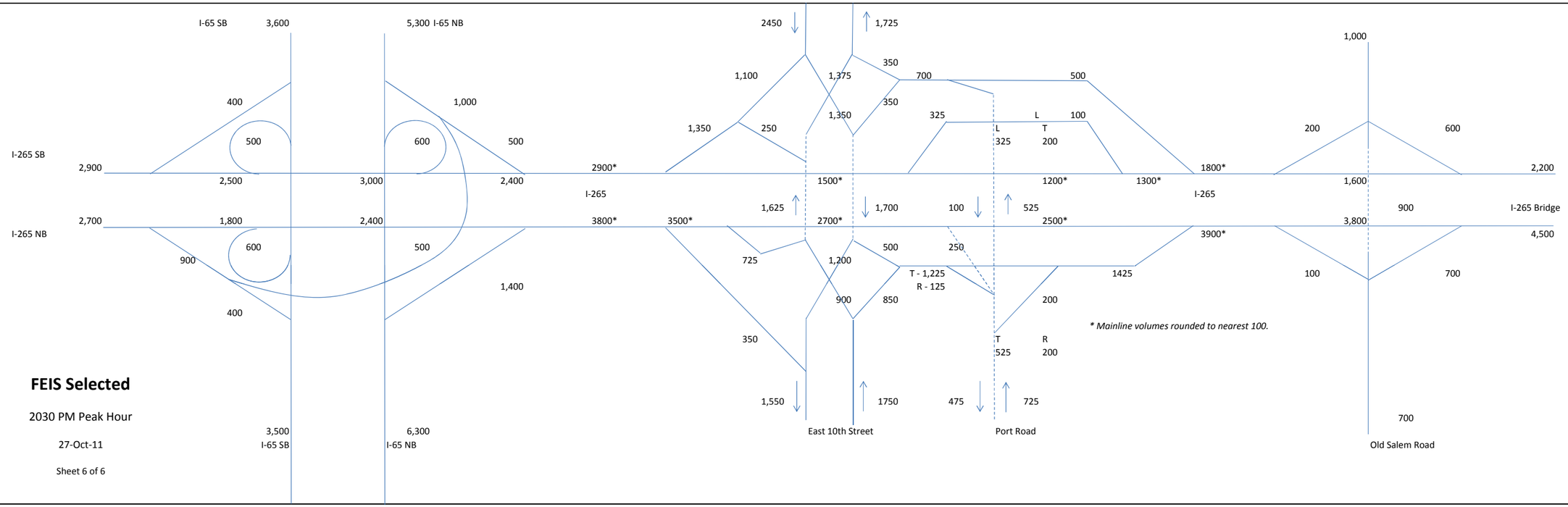
FEIS Selected

2030 PM Peak Hour

27-Oct-11

Sheet 5 of 6



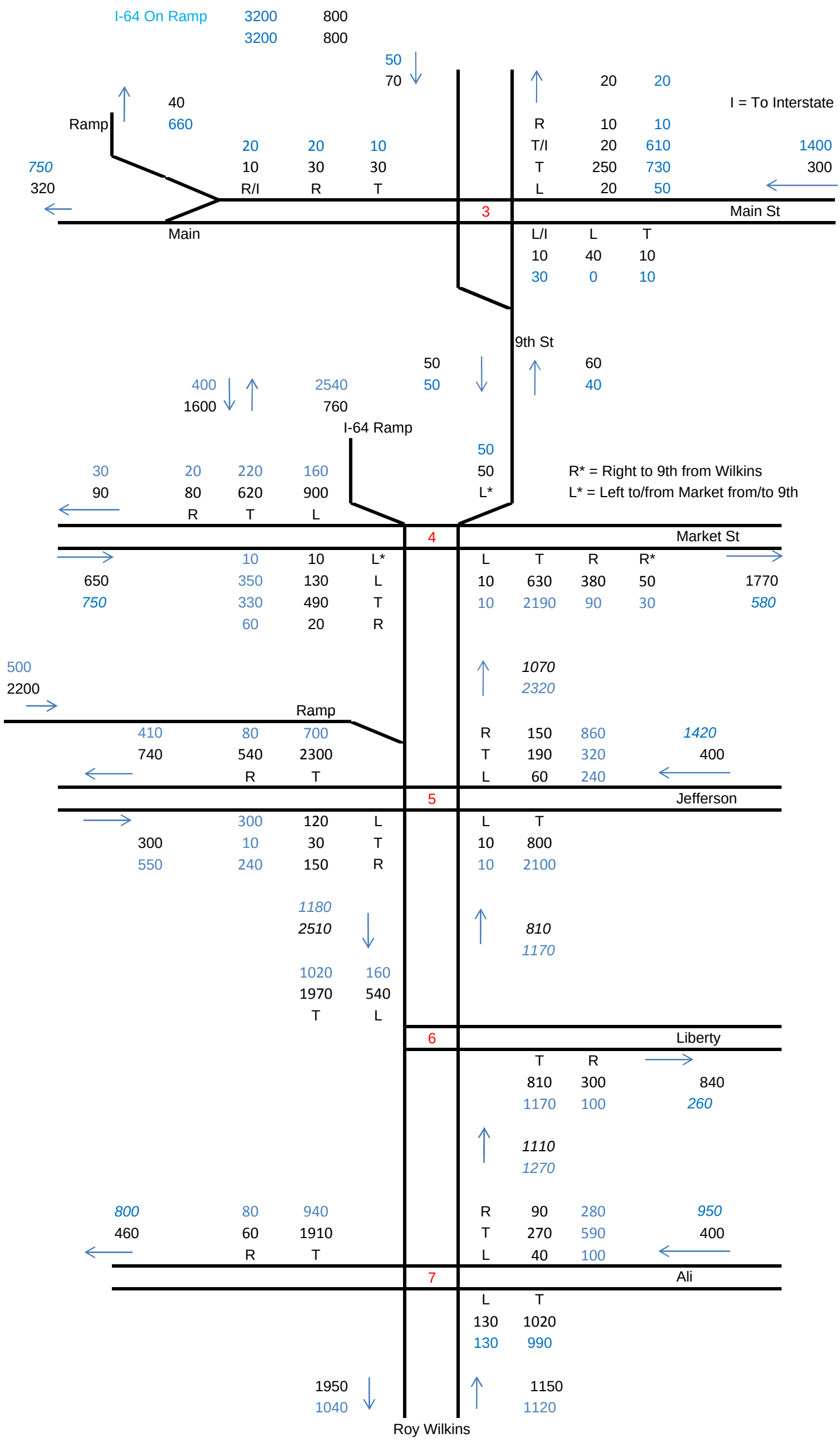

I-65 SB
3,600
5,300 I-65 NB
2450
1,725
1,000
350
1,100
1,375
700
500
400
1,000
350
1,350
325
L
100
1,350
250
L
T
200
200
600
500
600
500
325
I-265 SB
2,900
2900*
1800*
2,200
2,500
3,000
2,400
1500*
1200*
1300*
1,600
I-265
I-265
1,625
1,700
100
525
900
I-265 Bridge
2,700
1,800
2,400
3800*
3500*
2700*
2500*
3,800
I-265 NB
3900*
4,500
600
500
500
250
900
725
1,200
T - 1,225
R - 125
1425
100
700
1,400
900
850
200
400
* Mainline volumes rounded to nearest 100.
350
T
R
525
200
FEIS Selected
1,550
1750
475
725
2030 PM Peak Hour
700
3,500
6,300
East 10th Street
Port Road
27-Oct-11
I-65 SB
I-65 NB
Old Salem Road
Sheet 6 of 6

9th Street

FEIS Selected 2030 Turning Movement Counts

AM Peak

PM Peak

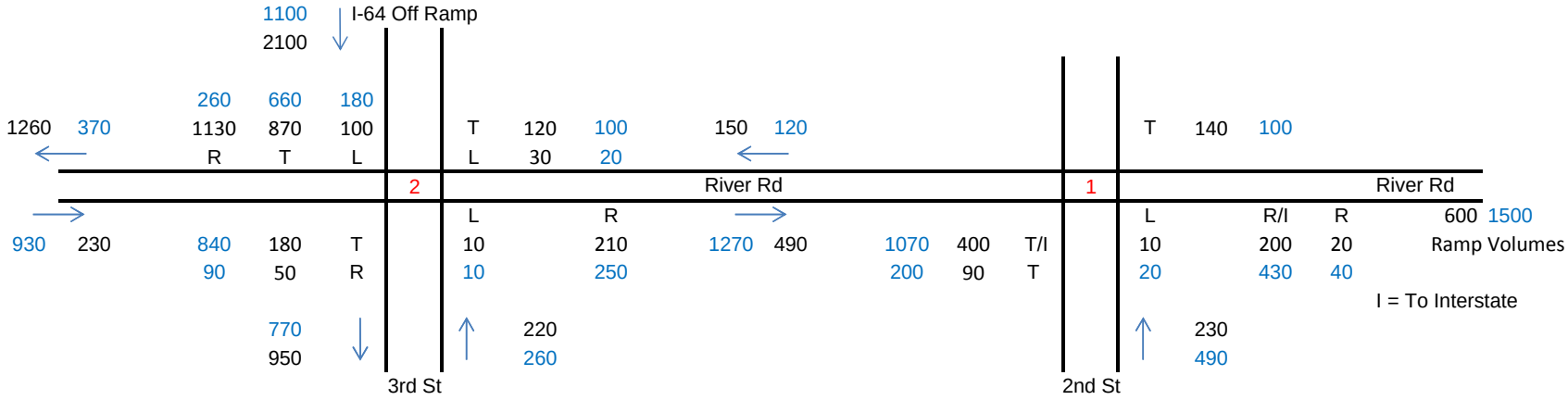


River Road

FEIS Selected 2030 Turning Movement Counts

AM Peak

PM Peak

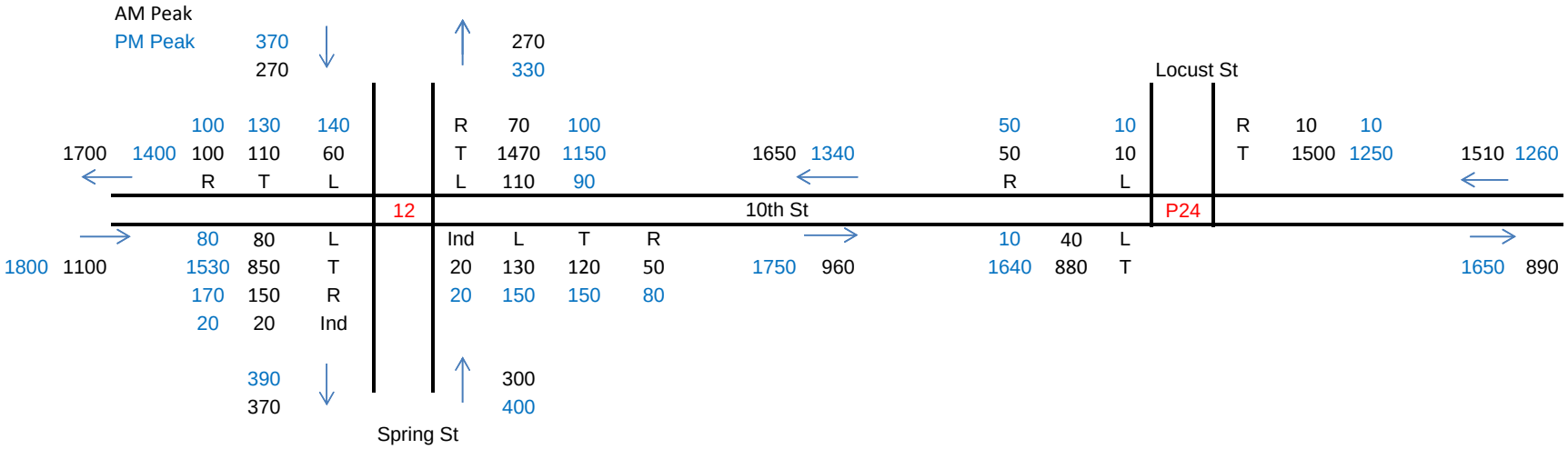


Spring - 10th

FEIS Selected 2030 Turning Movement Counts

AM Peak

PM Peak

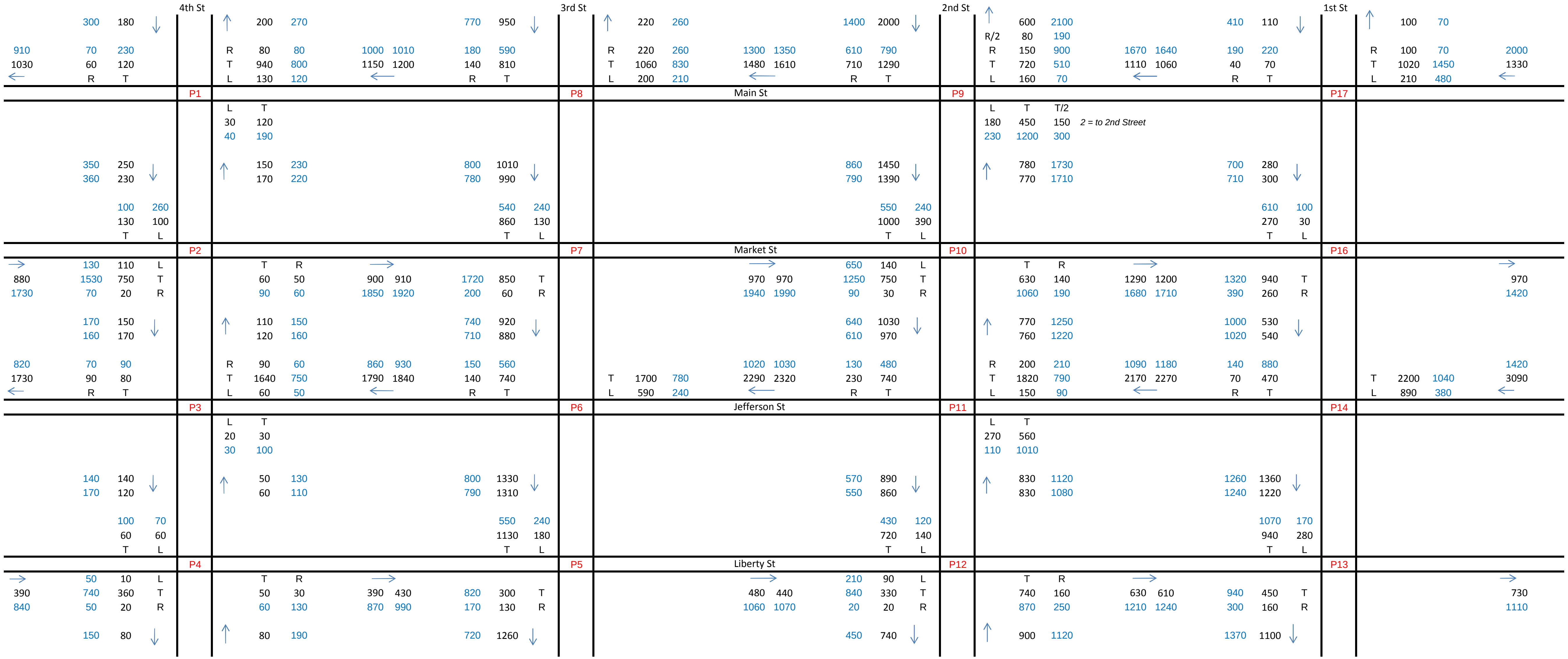


Downtown

FEIS Selected 2030 Turning Movement Counts

AM Peak

PM Peak

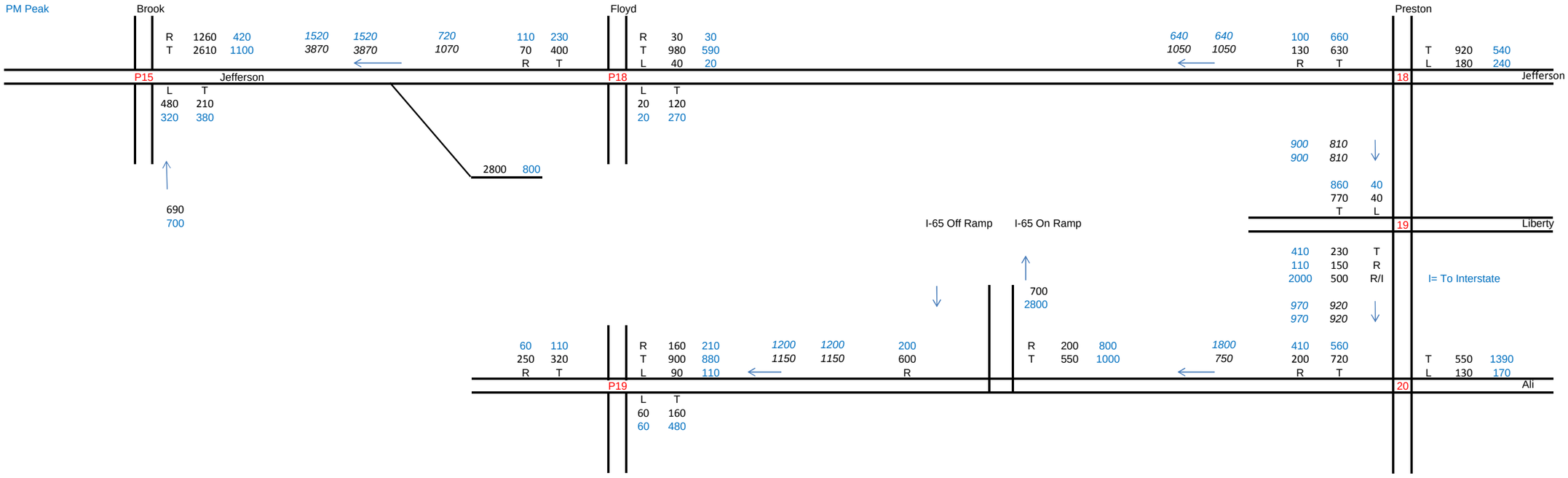


Preston

FEIS Selected 2030 Turning Movement Counts

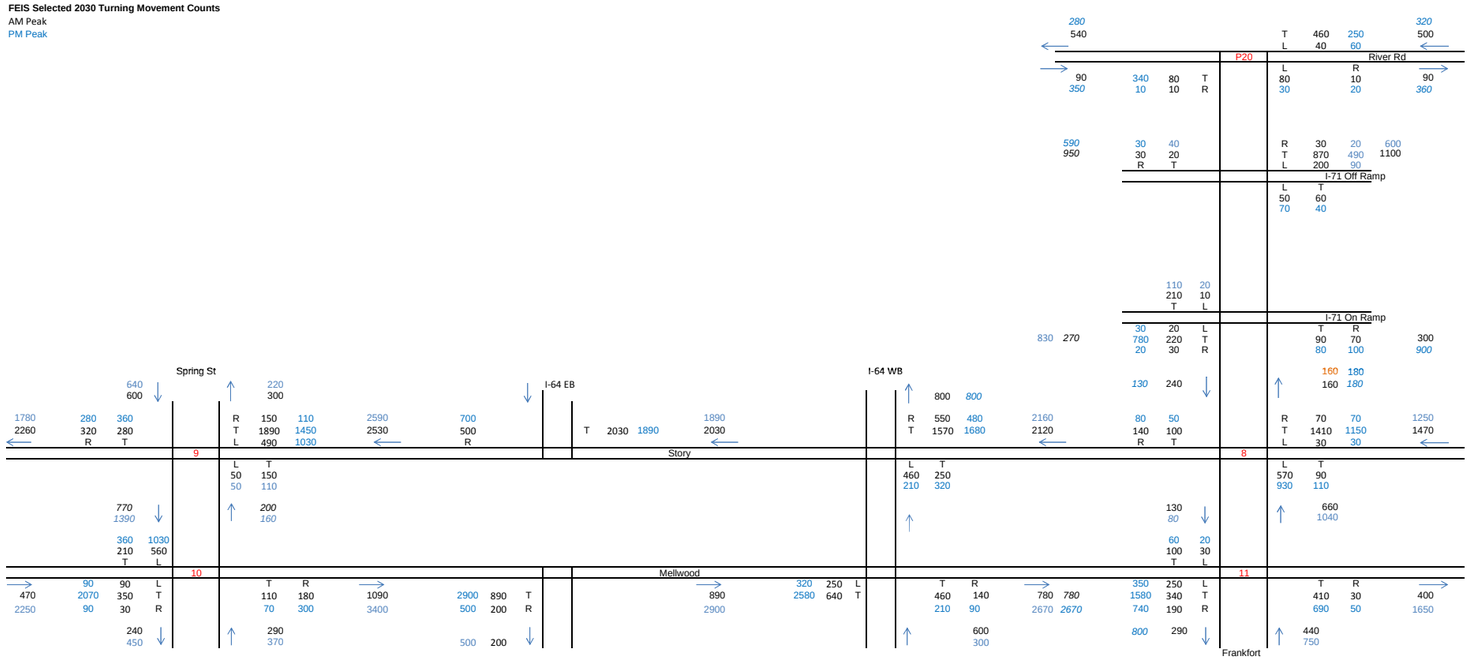
AM Peak

PM Peak



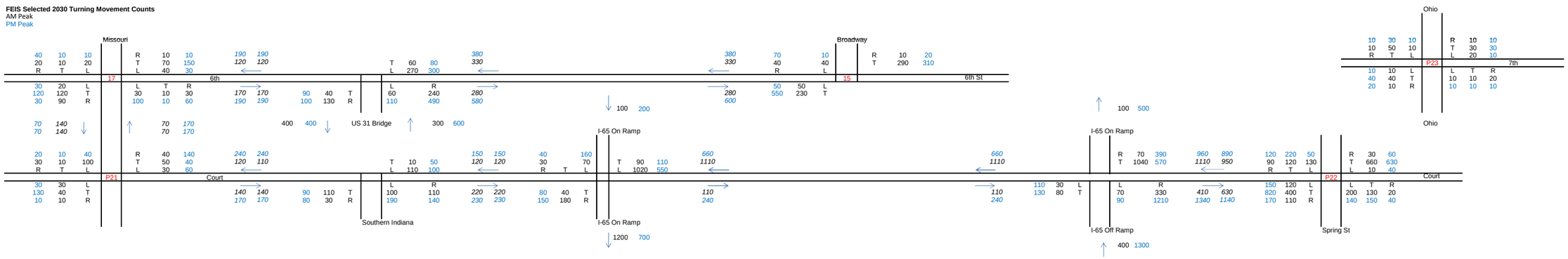
Mellwood-Story

FEIS Selected 2030 Turning Movement Counts
AM Peak
PM Peak



Court

FEIS Selected 2030 Turning Movement Counts
AM Peak
PM Peak

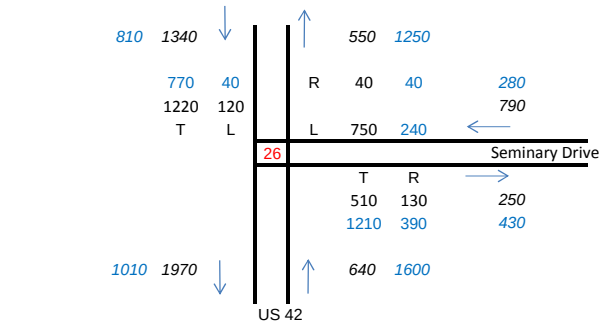


Seminary

FEIS Selected 2030 Turning Movement Counts

AM Peak

PM Peak

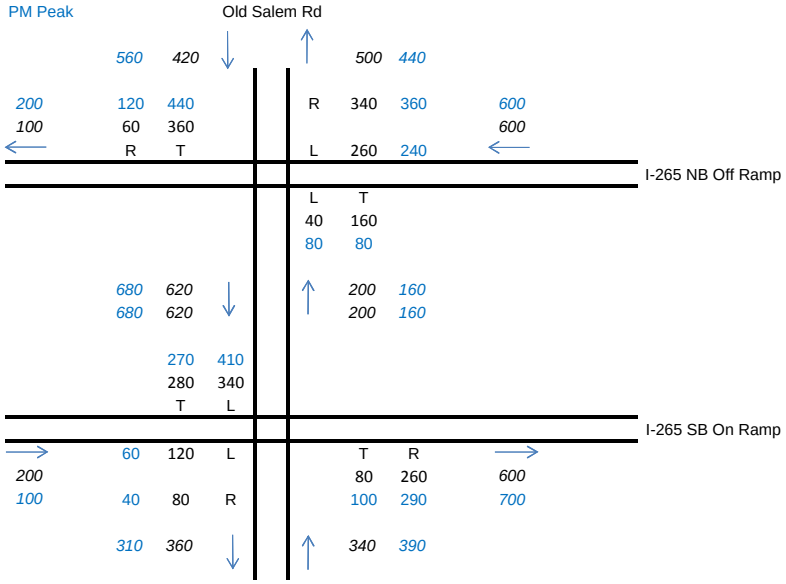


East End

FEIS Selected 2030 Turning Movement Counts

AM Peak

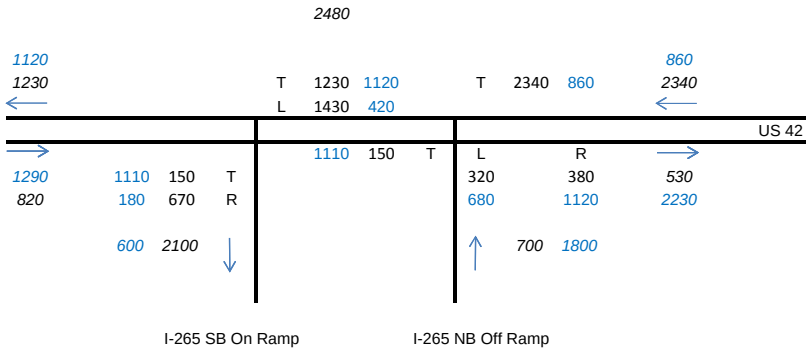
PM Peak



FEIS Selected 2030 Turning Movement Counts

AM Peak

PM Peak

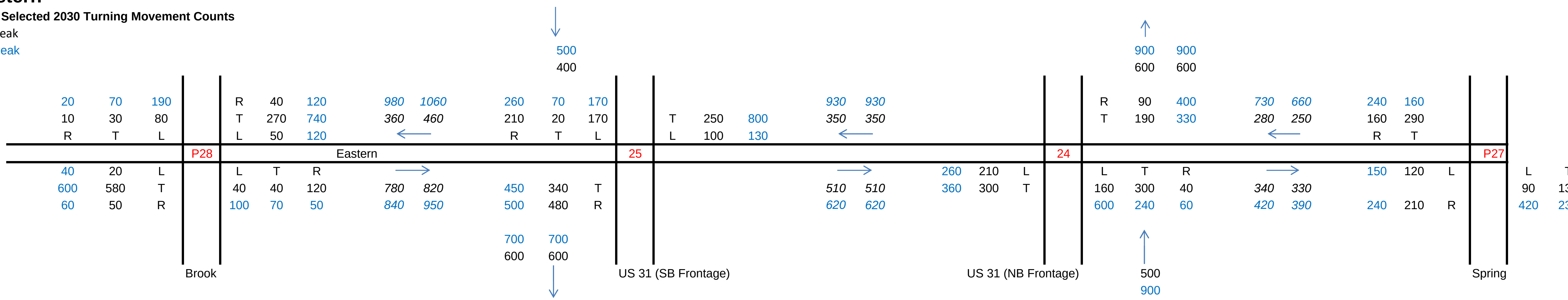


Eastern

FEIS Selected 2030 Turning Movement Counts

AM Peak

PM Peak

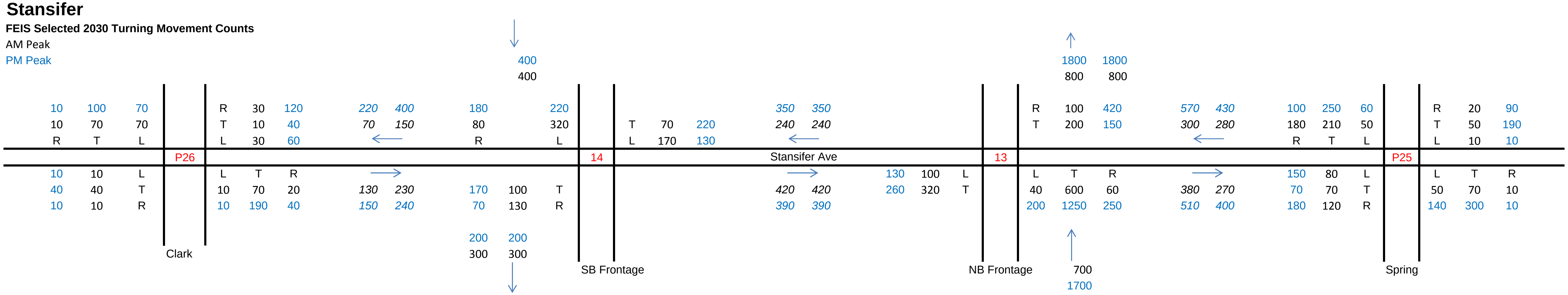


Stansifer

FEIS Selected 2030 Turning Movement Counts

AM Peak

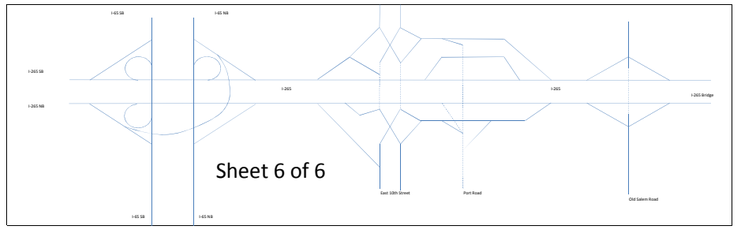
PM Peak



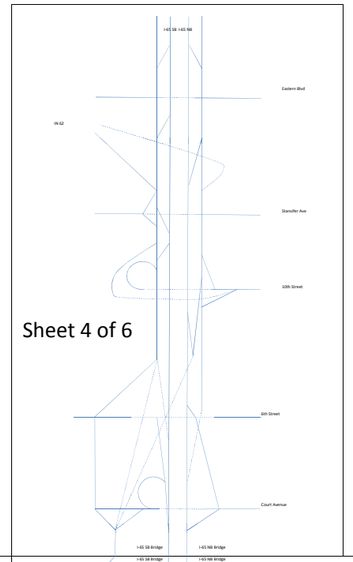
APPENDIX D

Modified Selected Daily, AM Peak, PM Peak 2030 Traffic Volumes

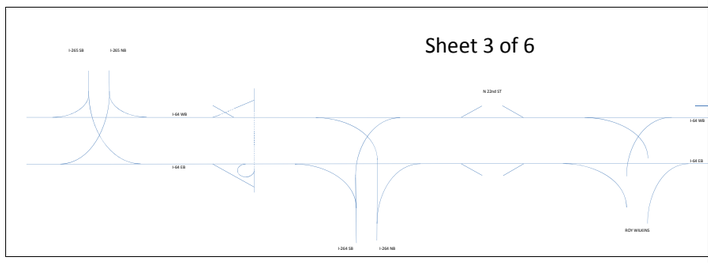
Modified
Selected
Key



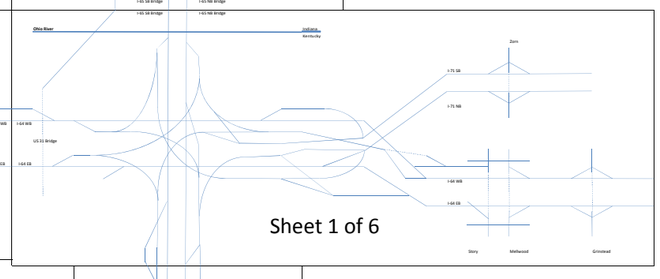
Sheet 6 of 6



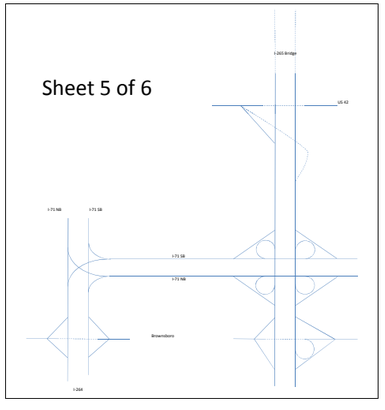
Sheet 4 of 6



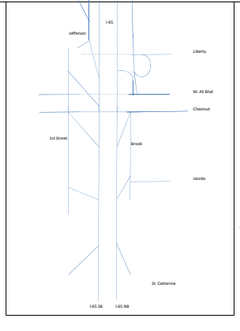
Sheet 3 of 6



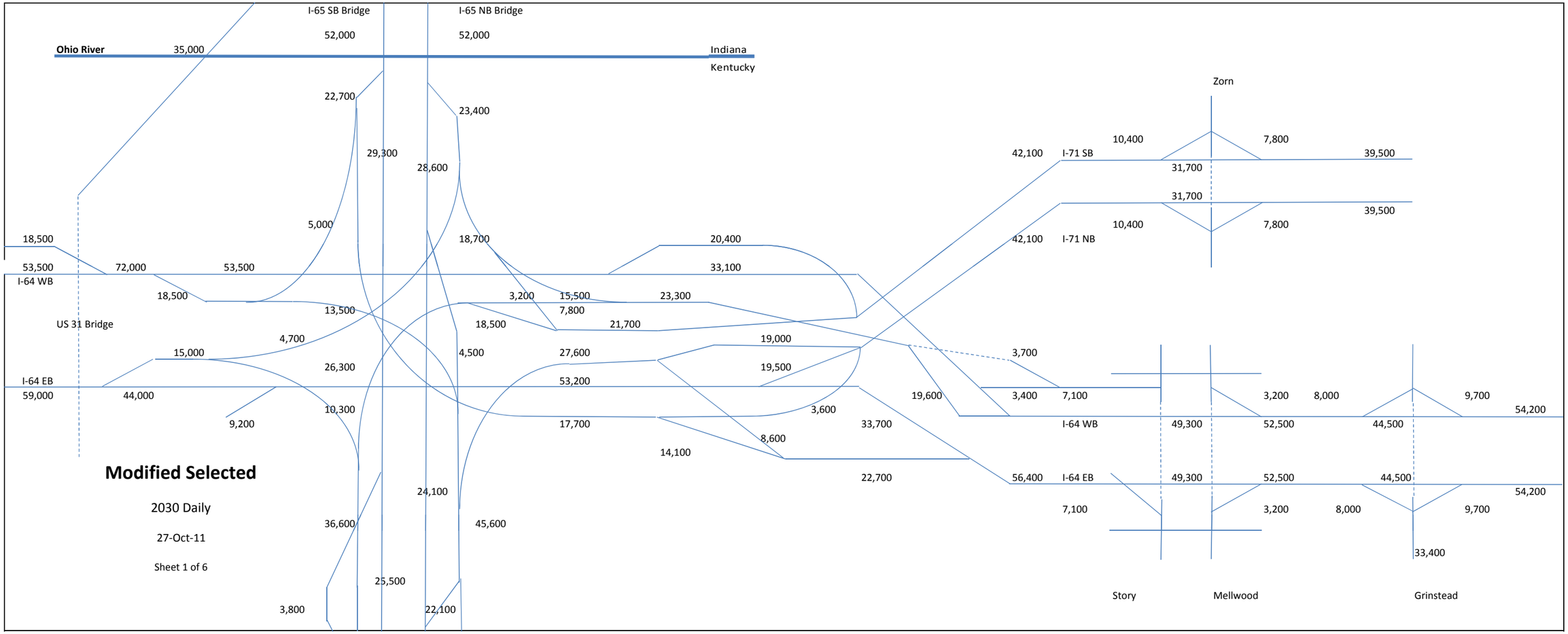
Sheet 1 of 6

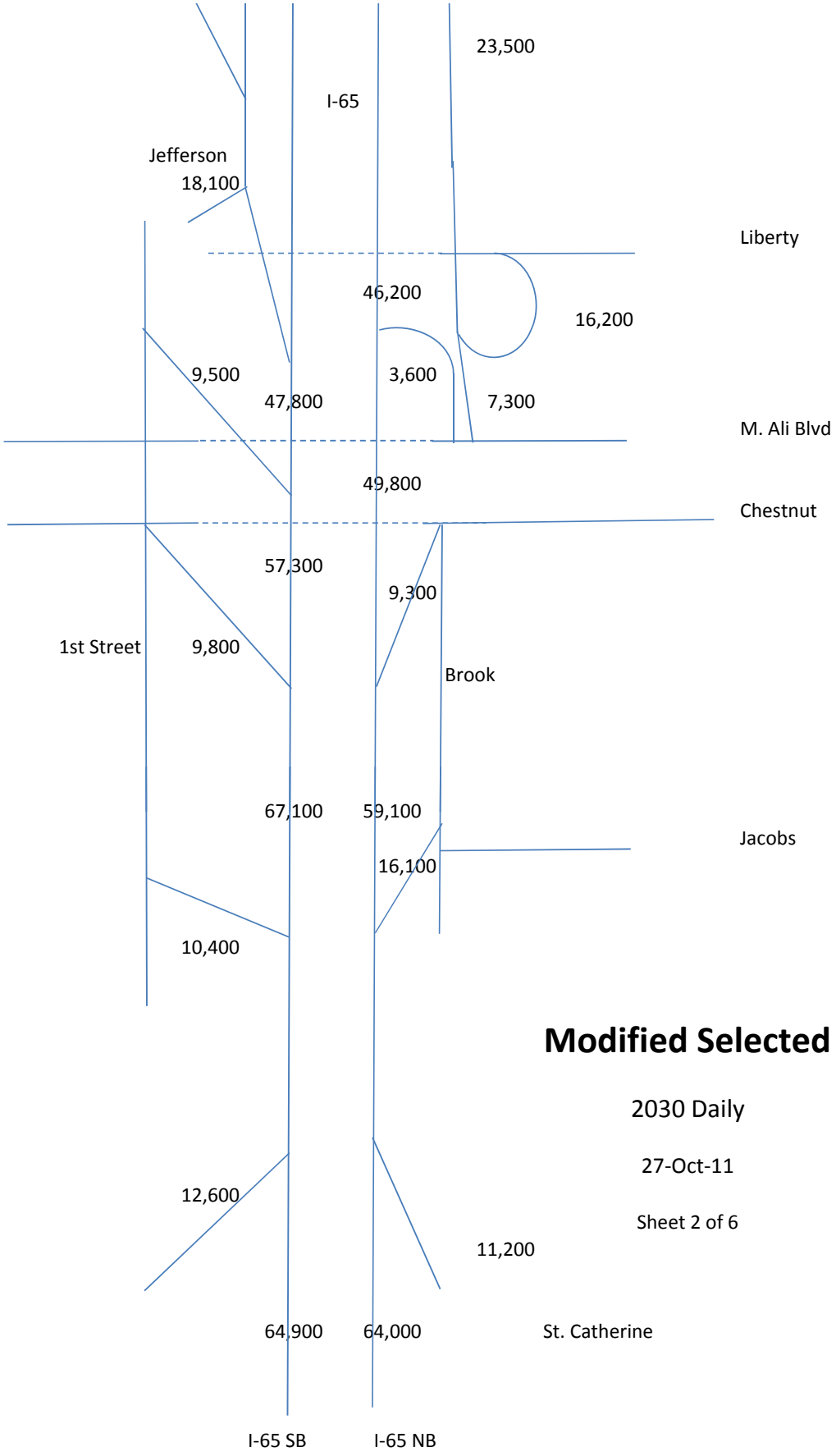


Sheet 5 of 6



Sheet 2 of 6


I-65 SB Bridge
I-65 NB Bridge
52,000
52,000
Ohio River
35,000
Indiana
Kentucky
22,700
23,400
29,300
28,600
5,000
18,500
18,700
20,400
53,500
72,000
53,500
33,100
I-64 WB
18,500
3,200
15,500
23,300
13,500
7,800
US 31 Bridge
18,500
21,700
4,700
19,000
15,000
4,500
27,600
26,300
19,500
I-64 EB
53,200
59,000
44,000
19,600
10,300
3,600
9,200
17,700
33,700
8,600
14,100
22,700
24,100
36,600
45,600
25,500
3,800
22,100
Modified Selected
2030 Daily
27-Oct-11
Sheet 1 of 6
Zorn
10,400
7,800
42,100
I-71 SB
39,500
31,700
31,700
39,500
10,400
7,800
42,100
I-71 NB
3,700
3,400
7,100
3,200
8,000
9,700
54,200
I-64 WB
49,300
52,500
44,500
56,400
I-64 EB
49,300
52,500
44,500
54,200
7,100
3,200
8,000
9,700
33,400
Story
Mellwood
Grinstead



Modified Selected

2030 Daily

27-Oct-11

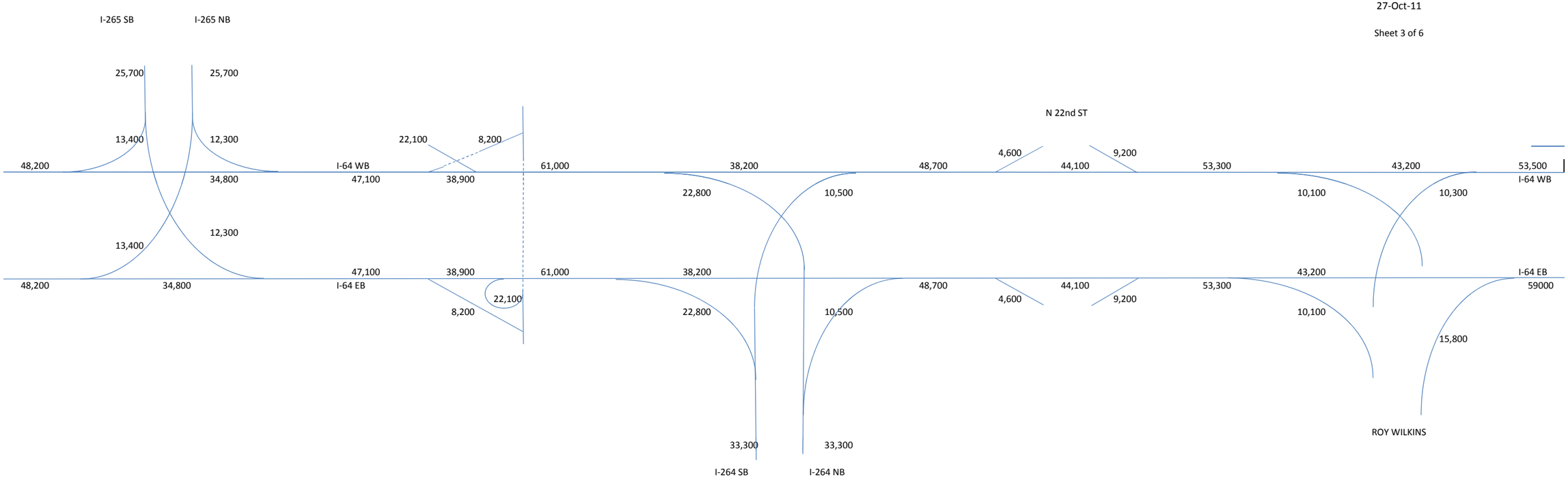
Sheet 2 of 6

Modified Selected

2030 Daily

27-Oct-11

Sheet 3 of 6



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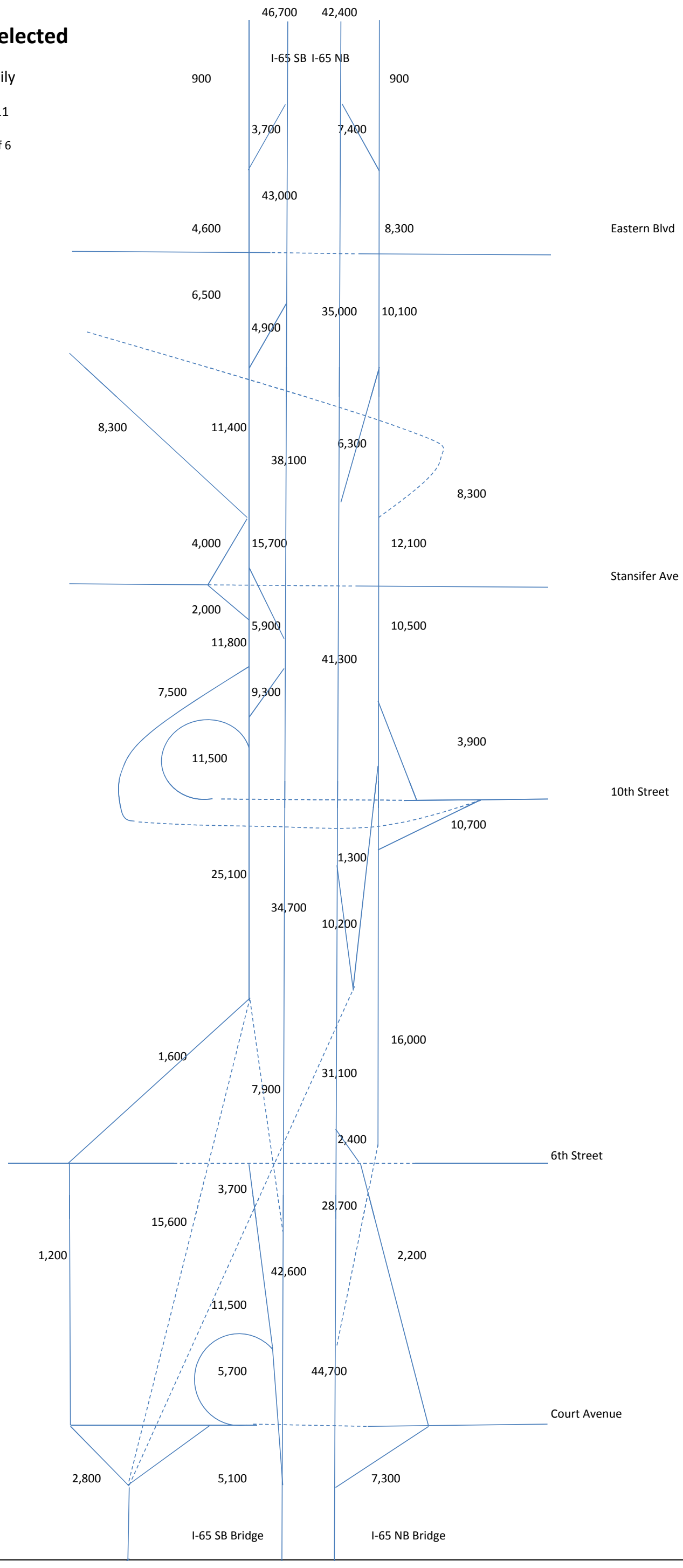
2030 Daily

27-Oct-11

Sheet 4 of 6



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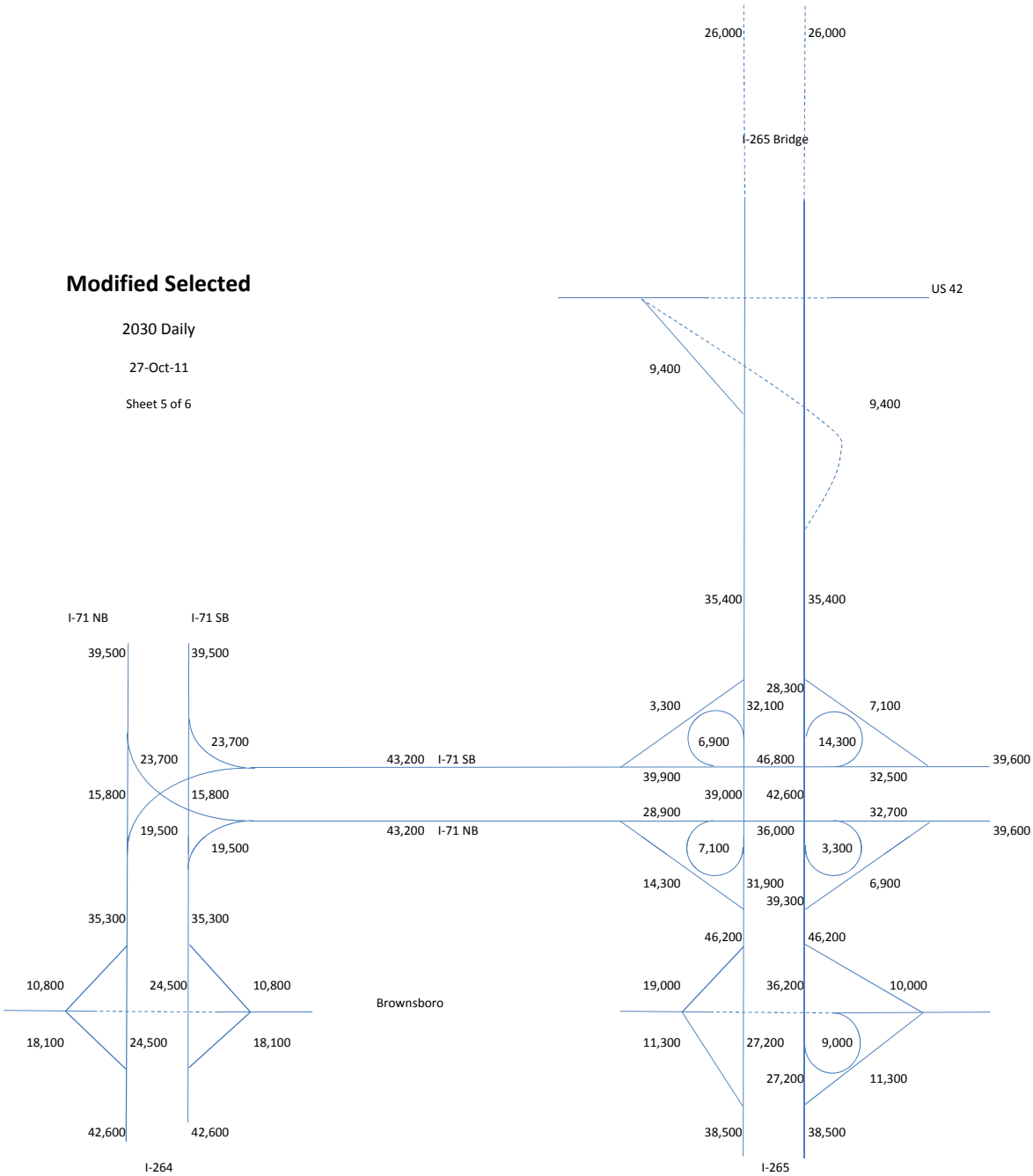
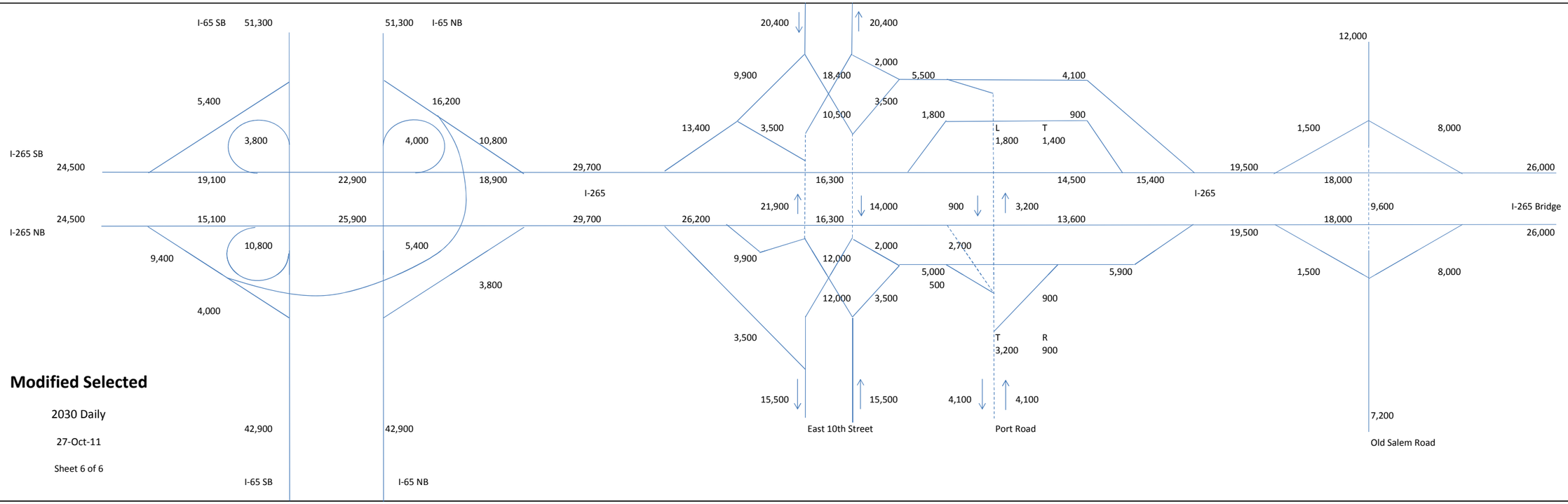
2030 Daily

27-Oct-11

Sheet 5 of 6





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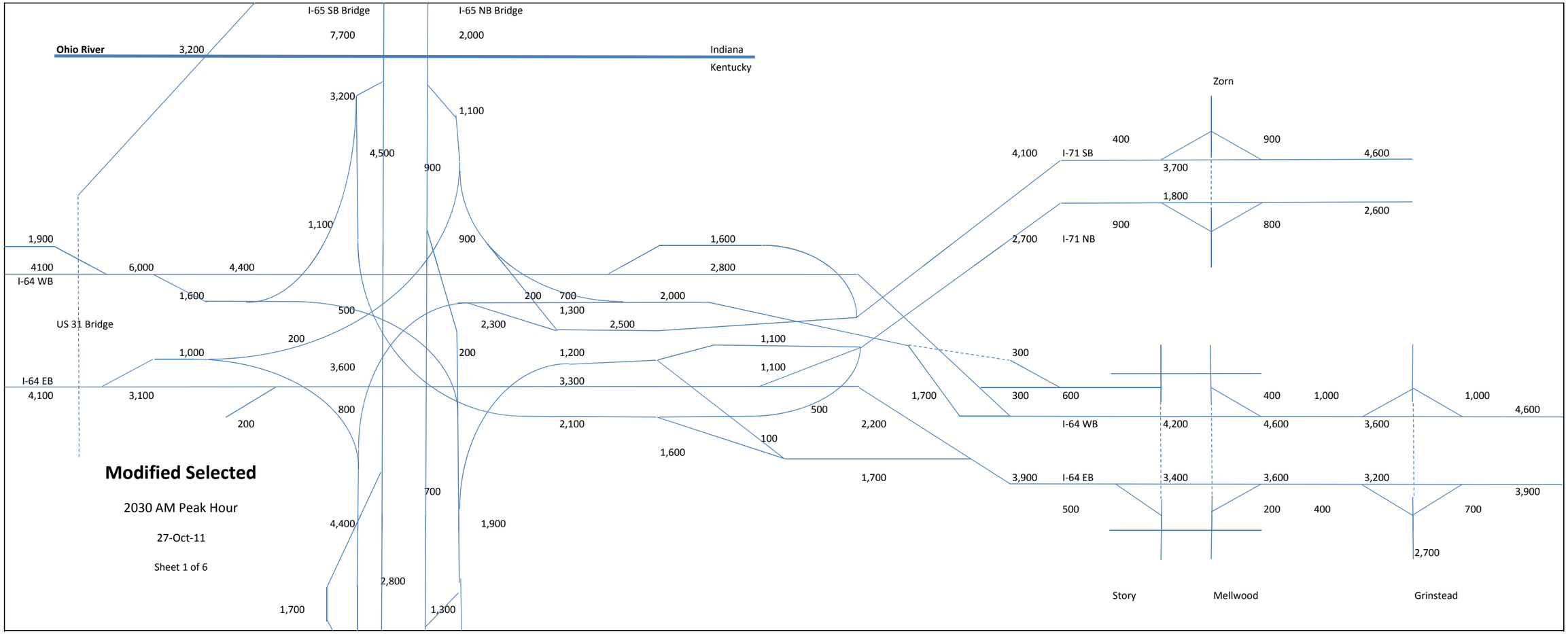
2030 Daily

27-Oct-11

Sheet 6 of 6



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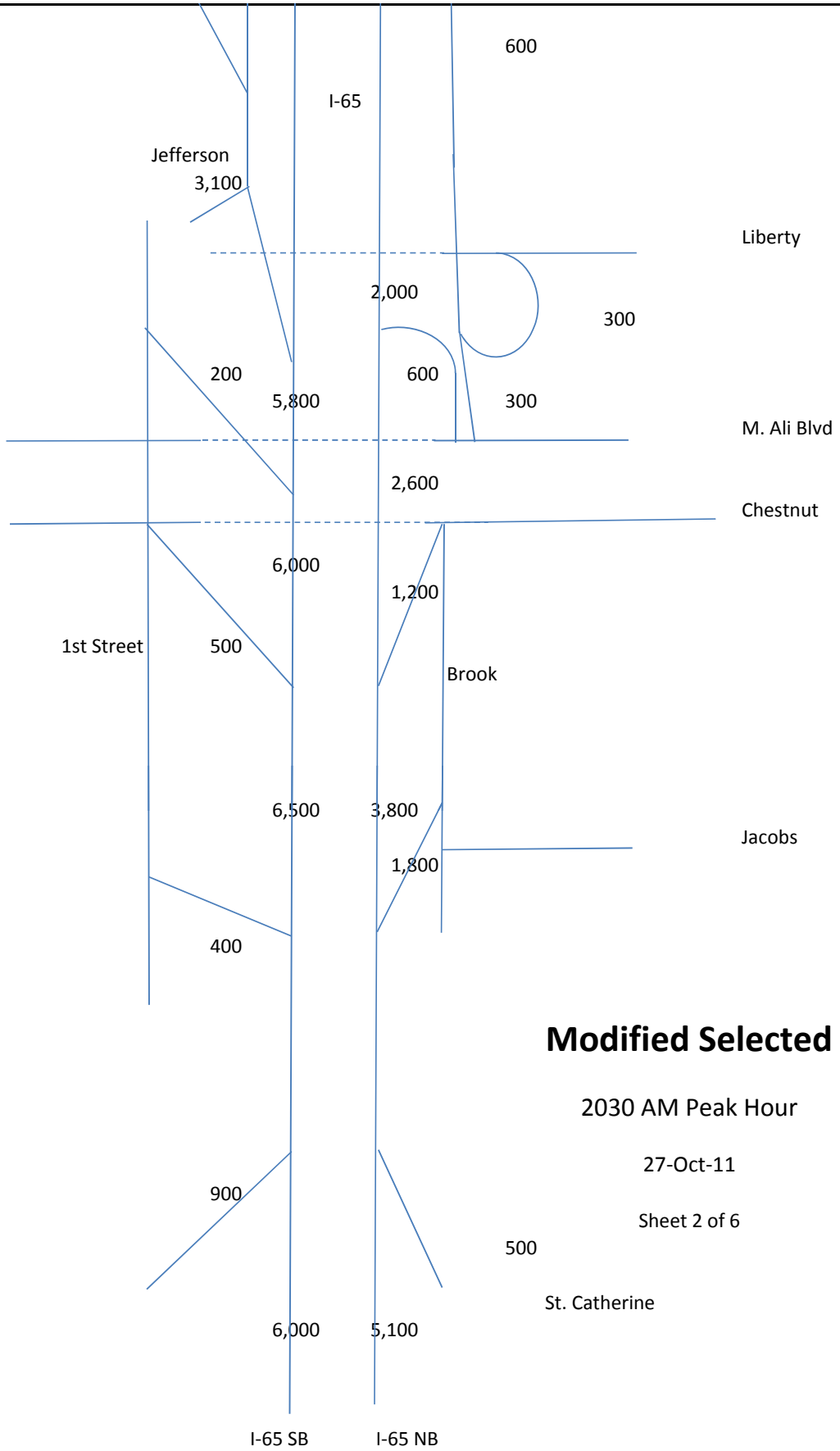
2030 AM Peak Hour

27-Oct-11

Sheet 1 of 6



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2030 AM Peak Hour

27-Oct-11

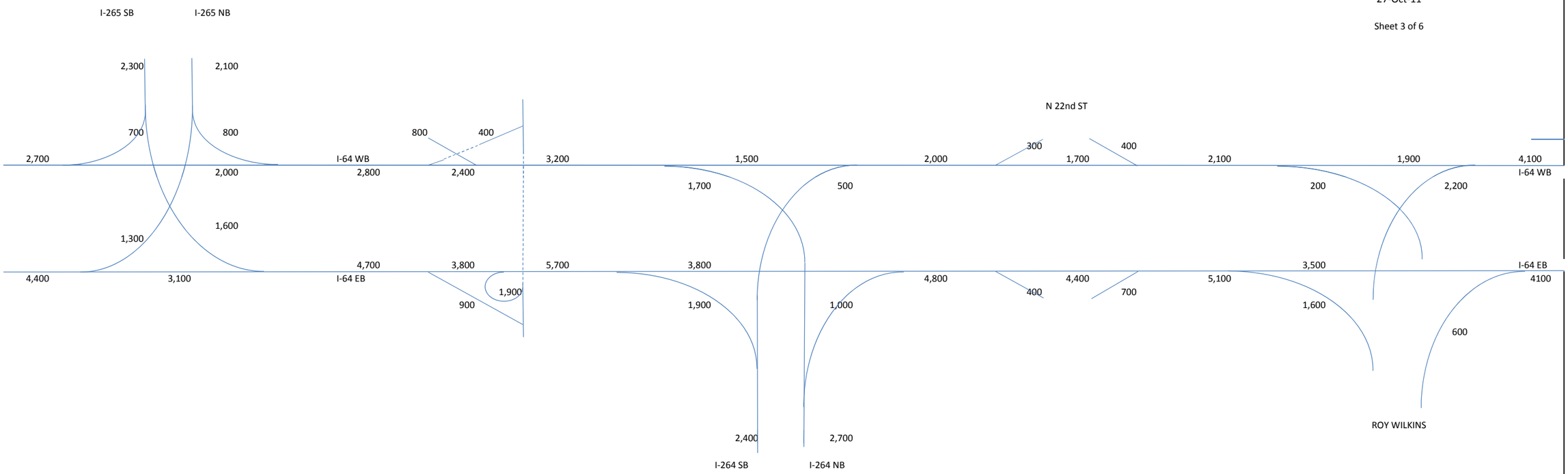
Sheet 2 of 6

Modified Selected

2030 AM Peak Hour

27-Oct-11

Sheet 3 of 6



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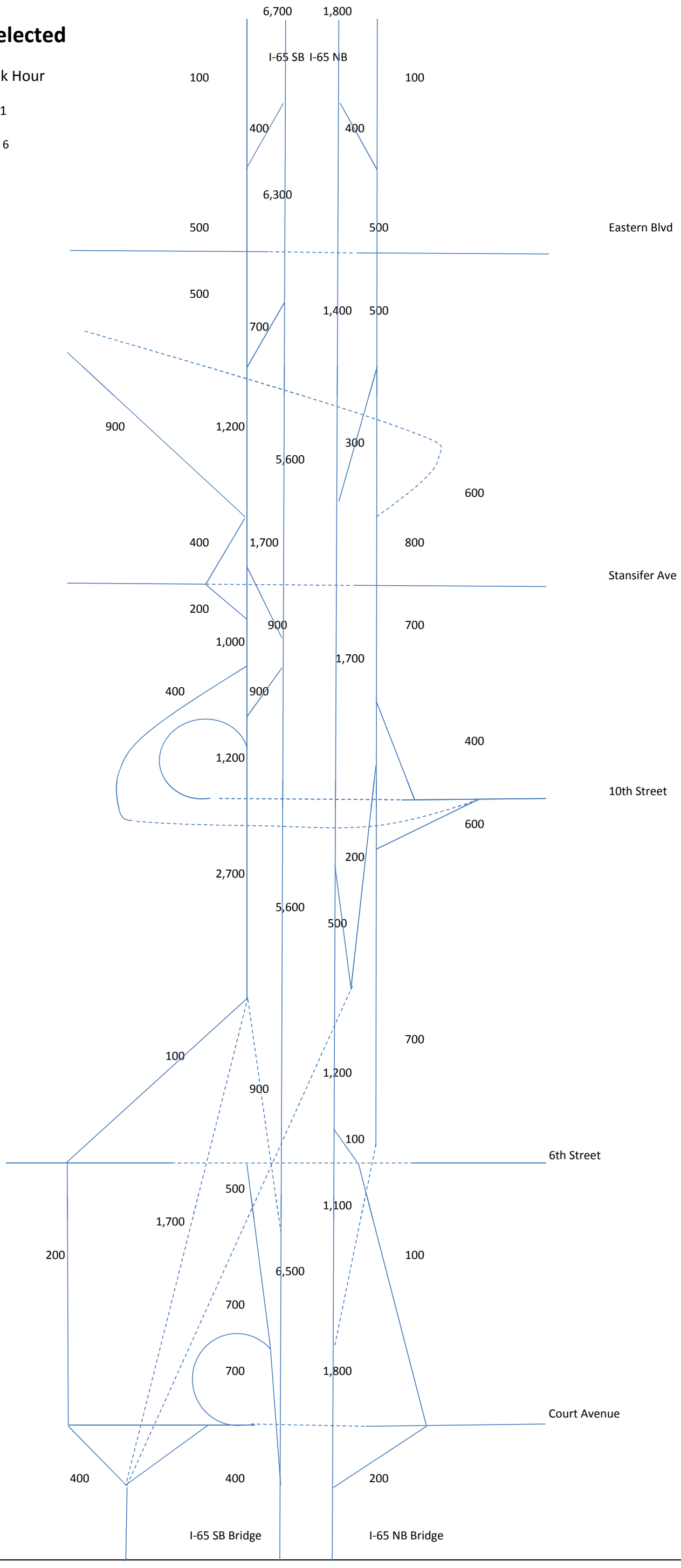
2030 AM Peak Hour

27-Oct-11

Sheet 4 of 6



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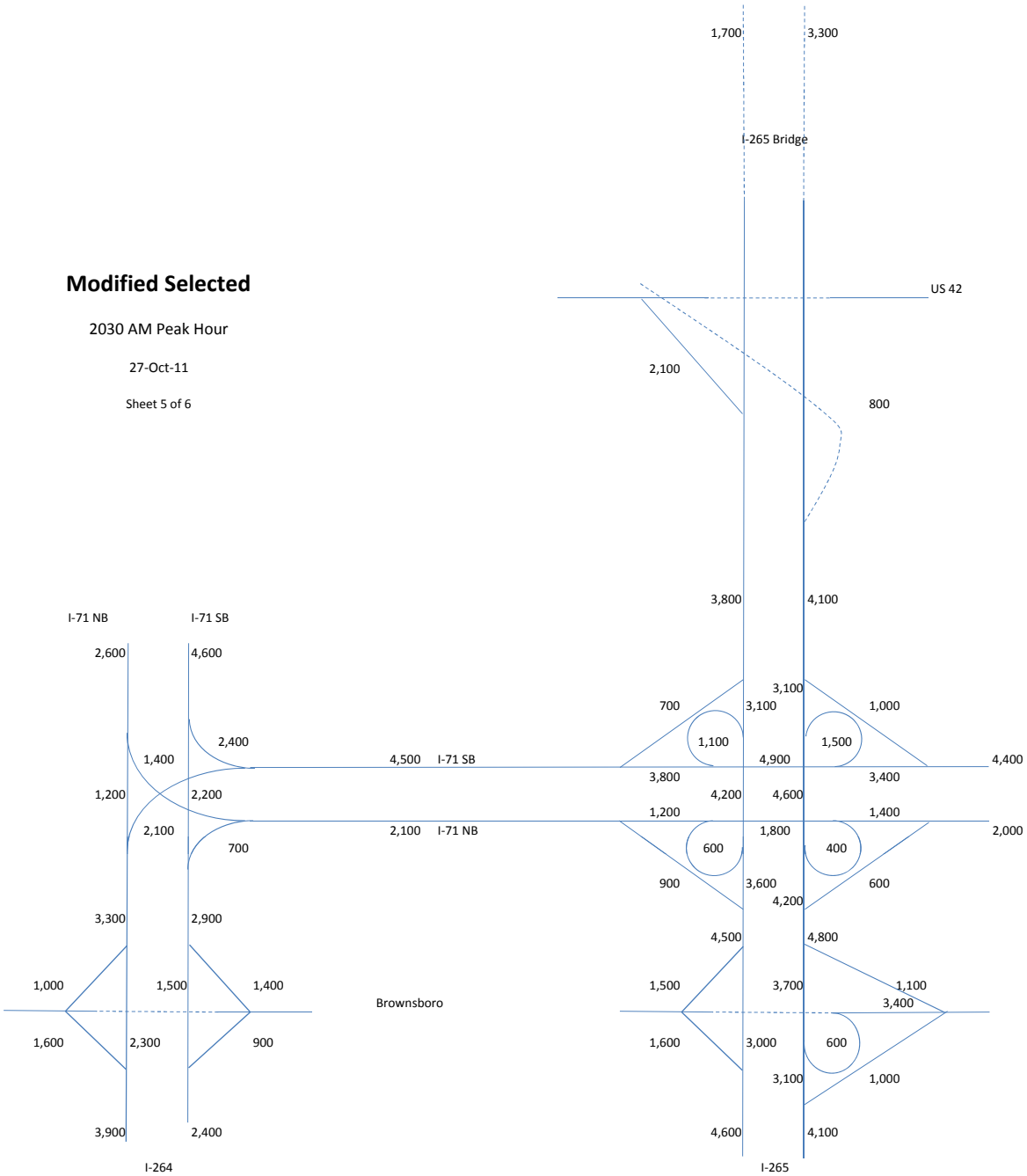
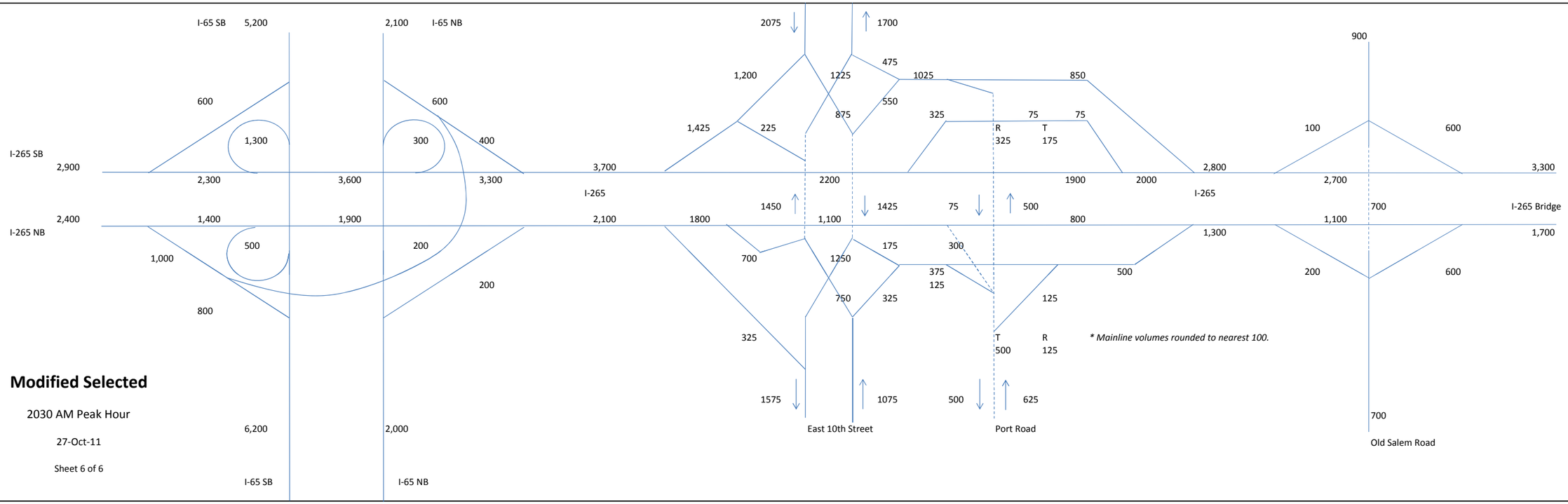
2030 AM Peak Hour

27-Oct-11

Sheet 5 of 6





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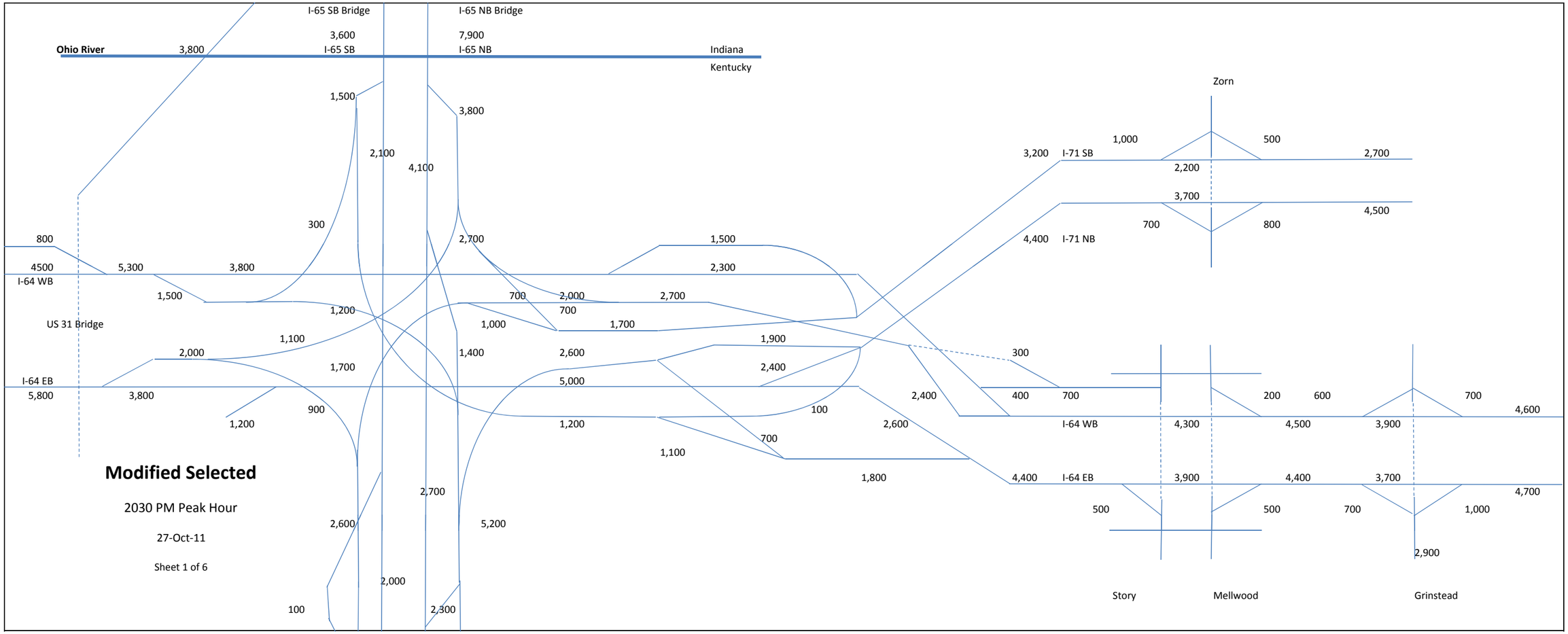
2030 AM Peak Hour

27-Oct-11

Sheet 6 of 6



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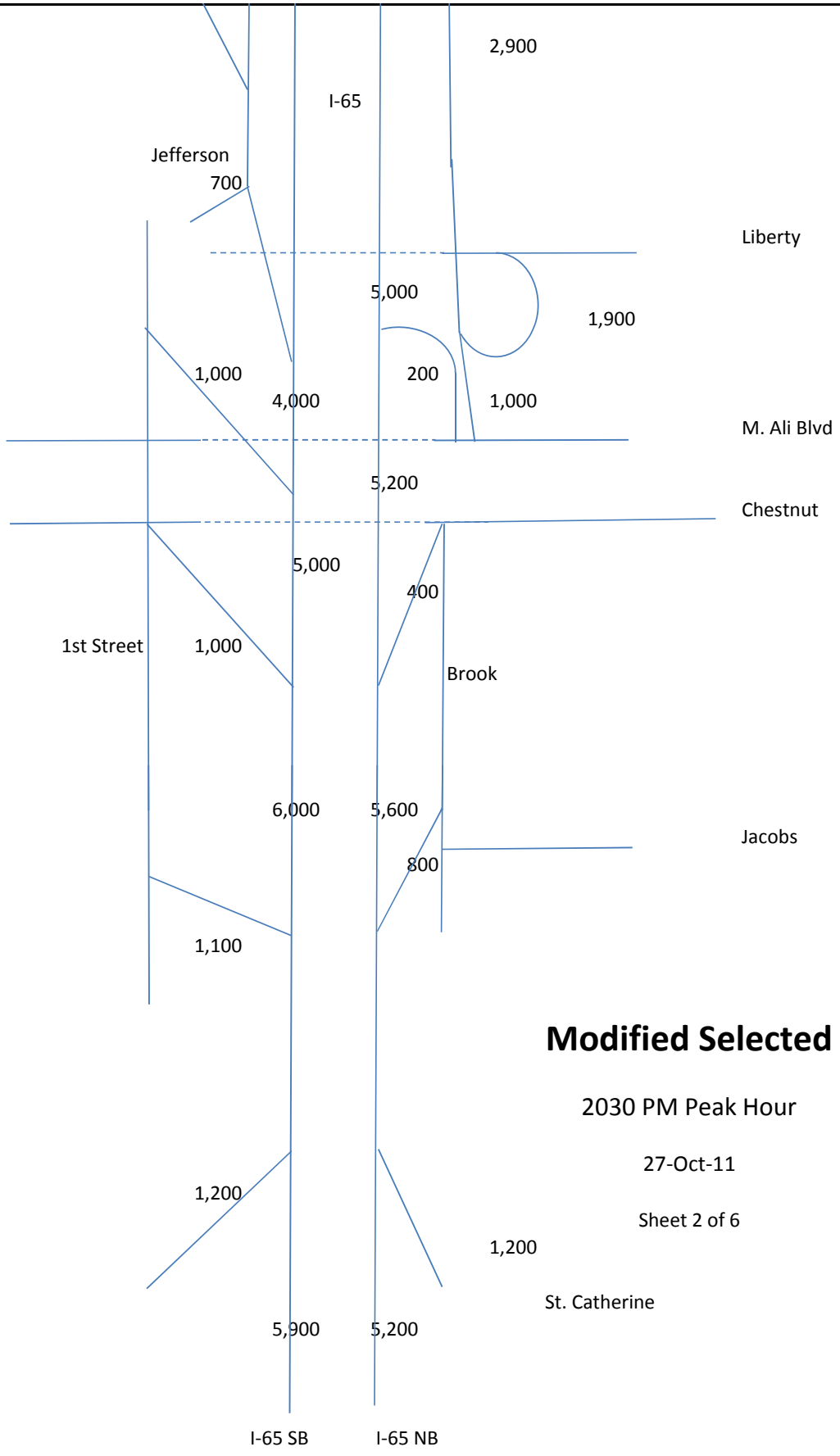
2030 PM Peak Hour

27-Oct-11

Sheet 1 of 6



Modified Selected

2030 PM Peak Hour

27-Oct-11

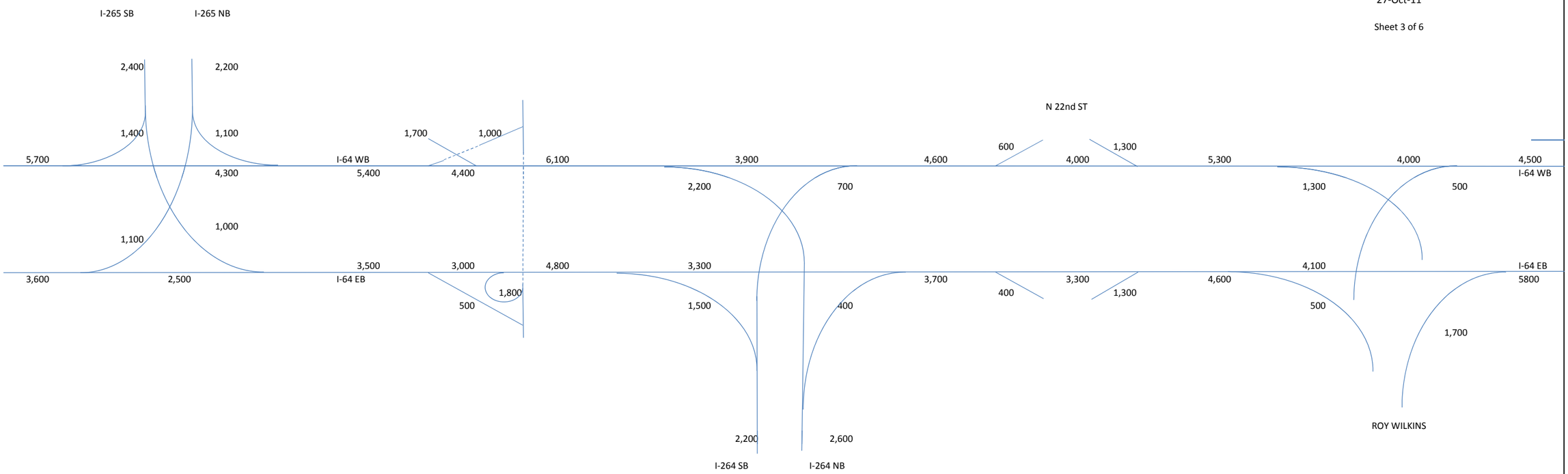
Sheet 2 of 6

Modified Selected

2030 PM Peak Hour

27-Oct-11

Sheet 3 of 6



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2030 PM Peak Hour

27-Oct-11

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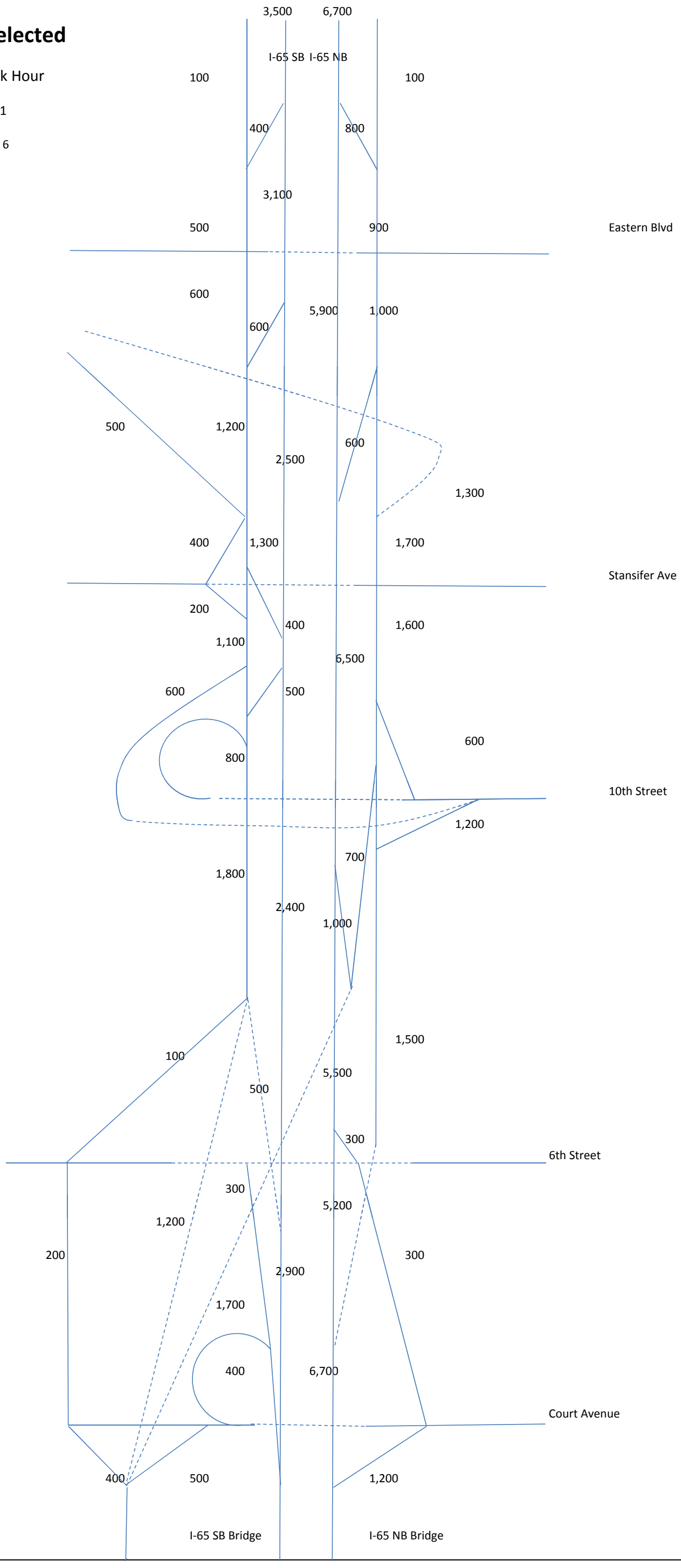

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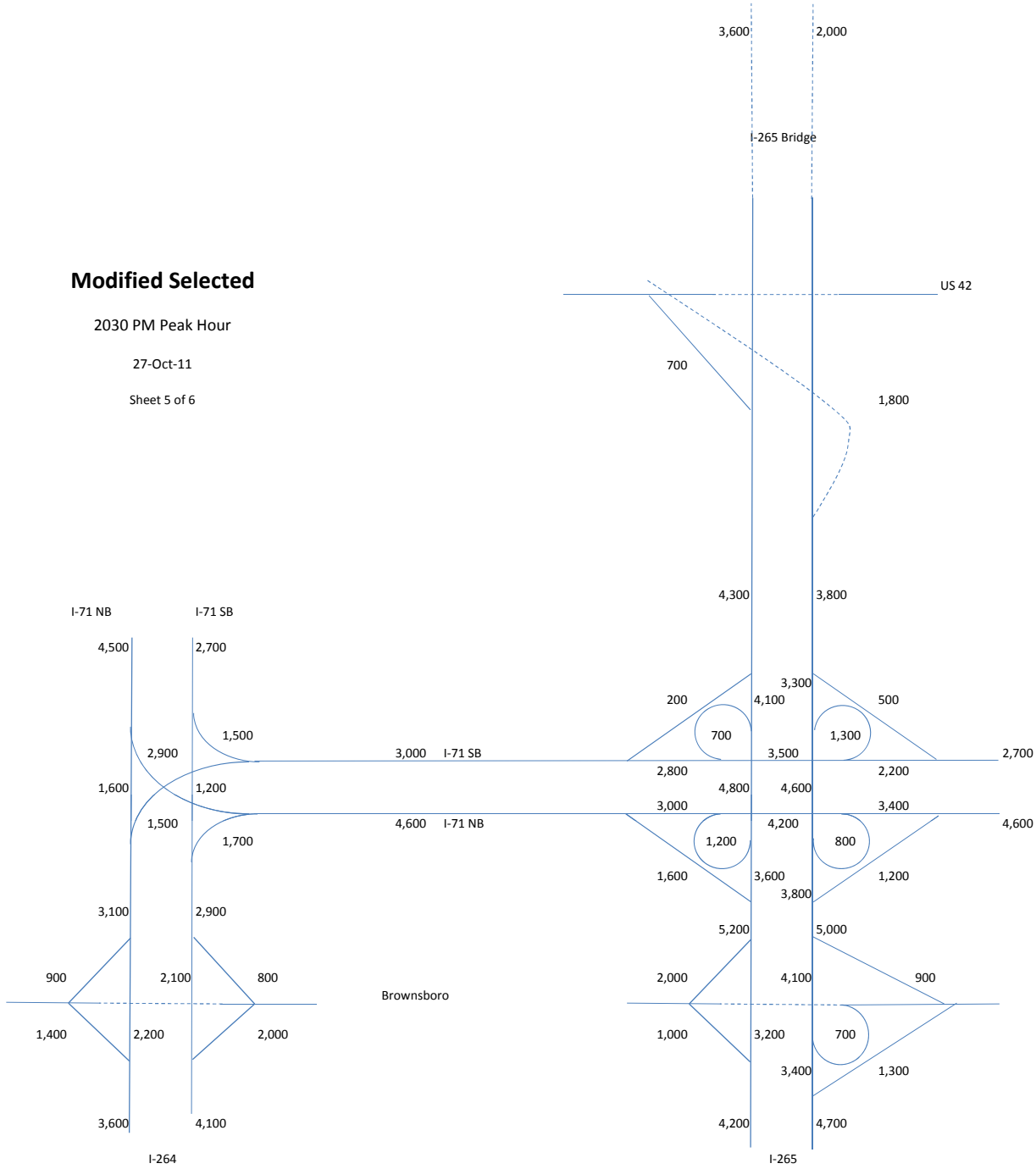
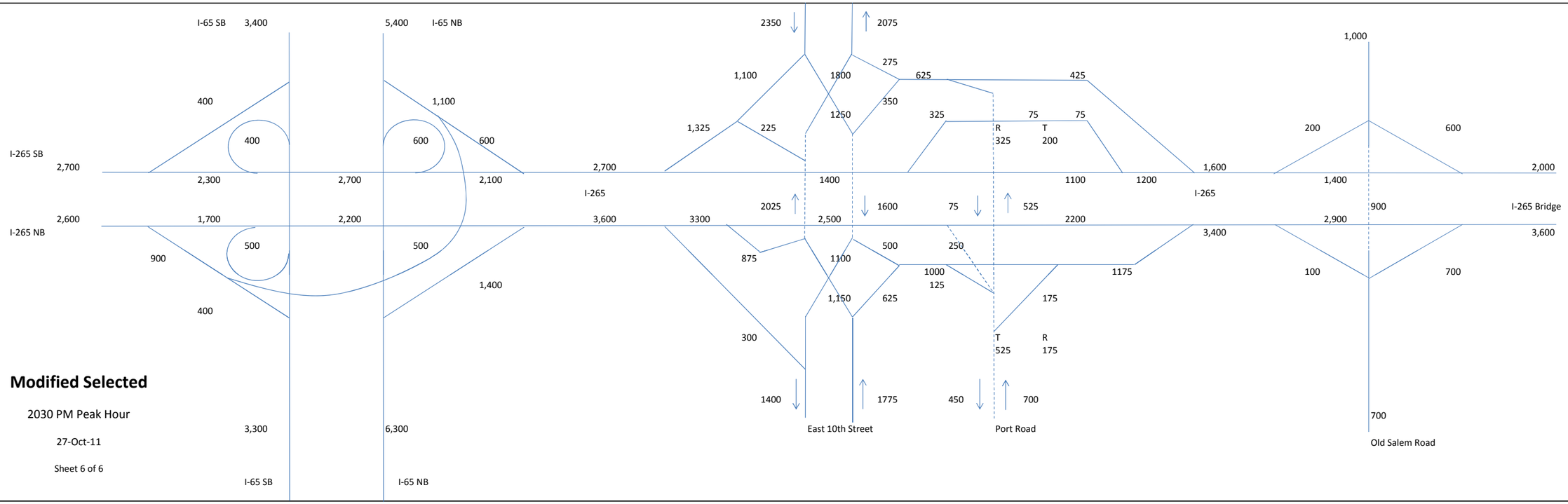
2030 PM Peak Hour

27-Oct-11

Sheet 5 of 6



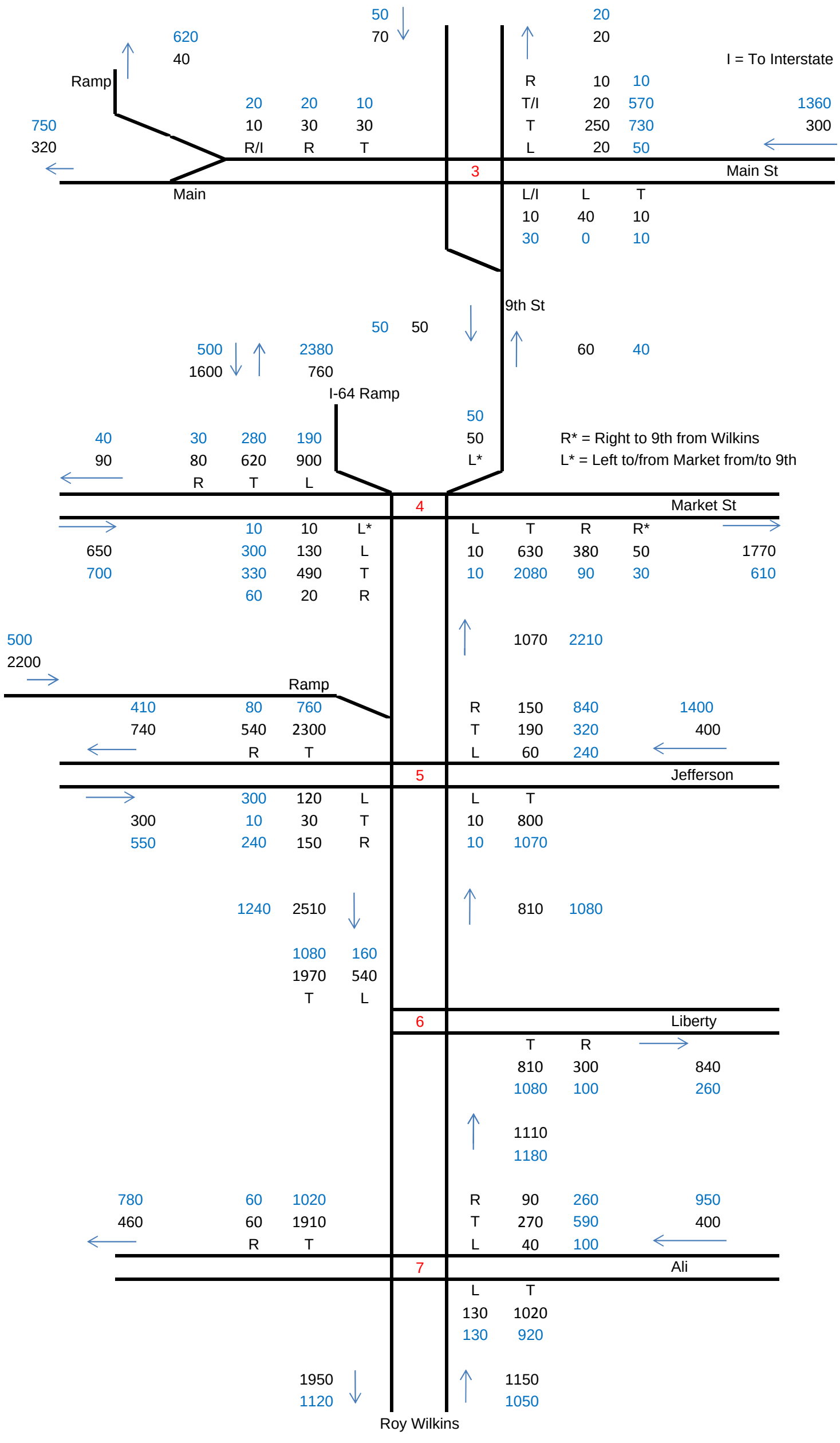

I-65 SB
3,400
5,400
I-65 NB
2350
2075
1,000
275
1,100
1800
625
425
400
1,100
350
1250
325
75
75
1,325
225
R
T
200
600
400
600
600
325
200
I-265 SB
2,700
2,700
2,300
2,700
2,100
1400
1100
1200
1,600
1,400
2,000
I-265
I-265
2025
1600
75
525
900
I-265 Bridge
2,600
1,700
2,200
3,600
3300
2,500
2200
2,900
I-265 NB
3,400
3,600
500
500
500
250
900
875
1100
1000
1175
100
700
125
1,400
1,150
625
175
400
300
T
R
525
175
Modified Selected
1400
1775
450
700
2030 PM Peak Hour
3,300
6,300
East 10th Street
Port Road
700
27-Oct-11
Old Salem Road
Sheet 6 of 6
I-65 SB
I-65 NB

9th Street

Modified Selected 2030 Turning Movements

AM Peak

PM Peak

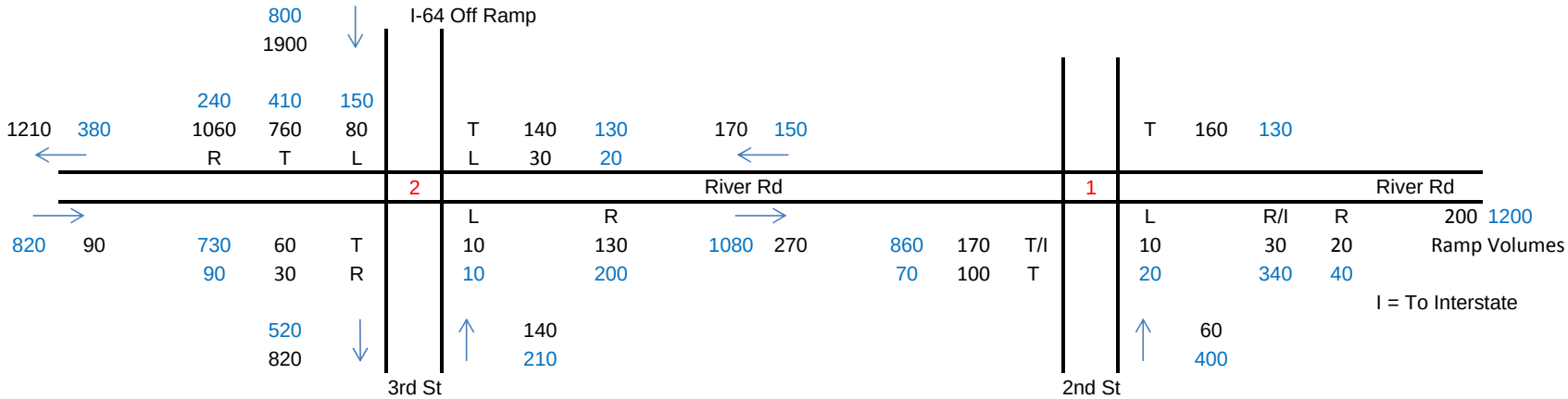


River Road

Modified Selected 2030 Turning Movements

AM Peak

PM Peak

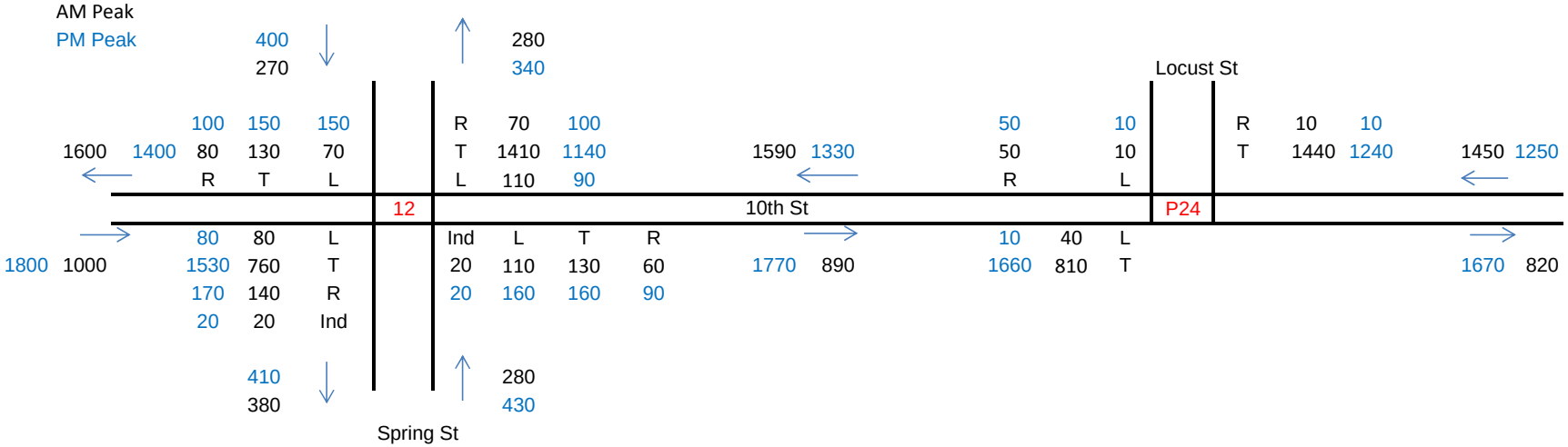


Spring - 10th

Modified Selected 2030 Turning Movements

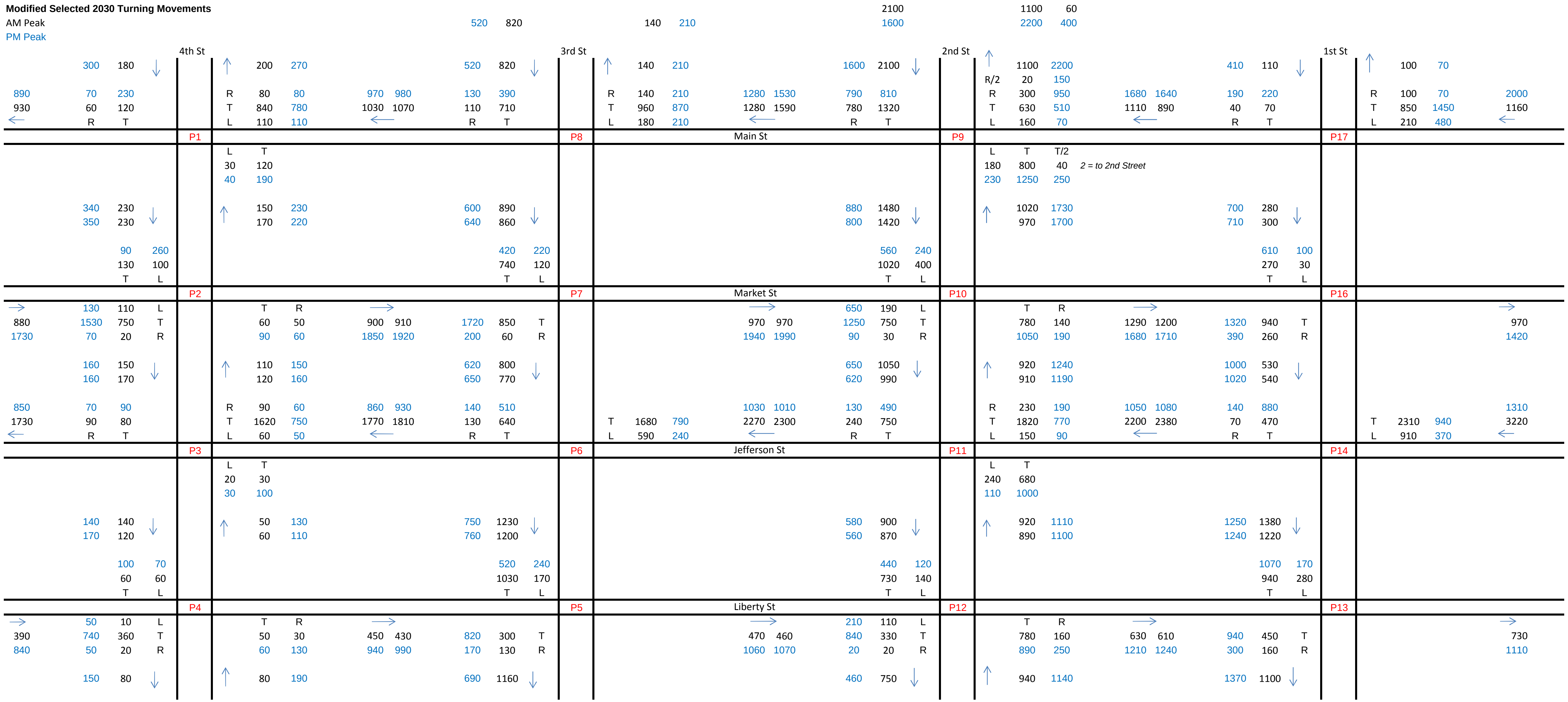
AM Peak

PM Peak



Downtown

Modified Selected 2030 Turning Movements

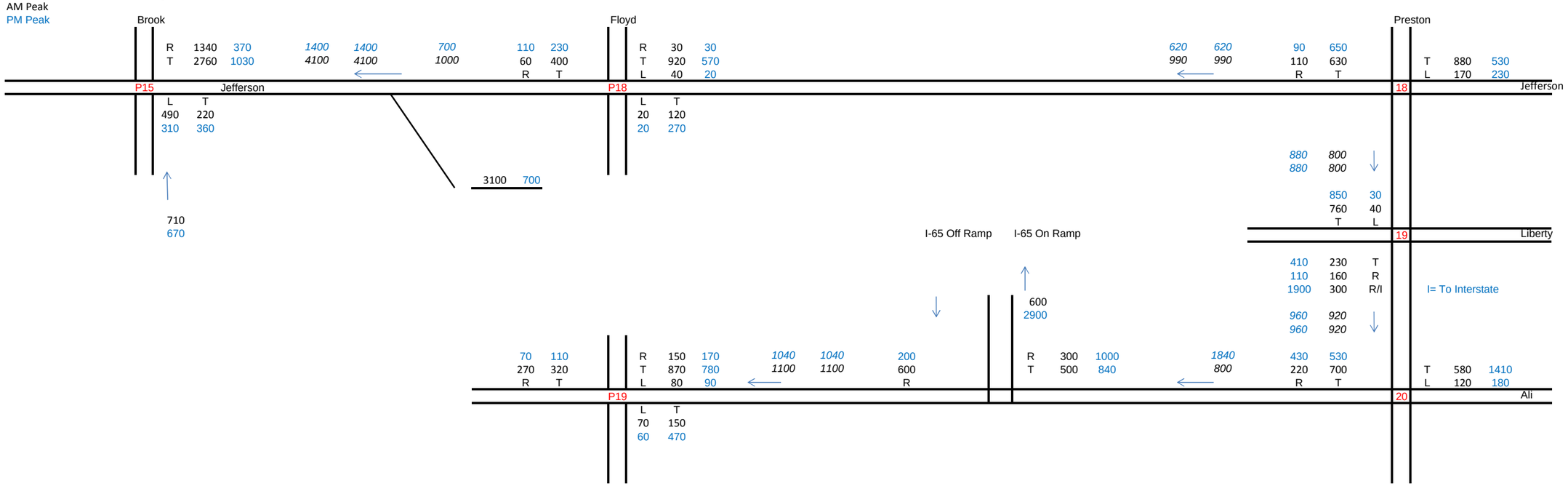


Preston

Modified Selected 2030 Turning Movements

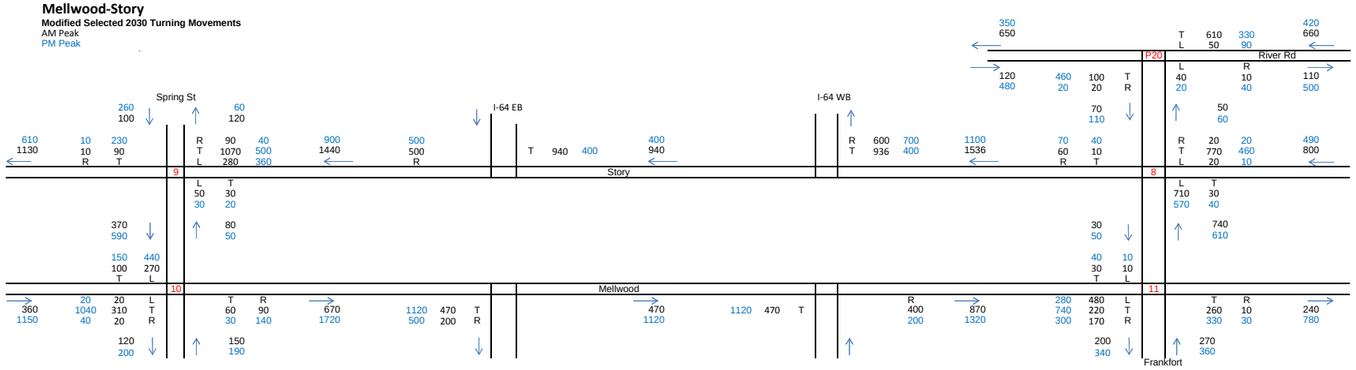
AM Peak

PM Peak



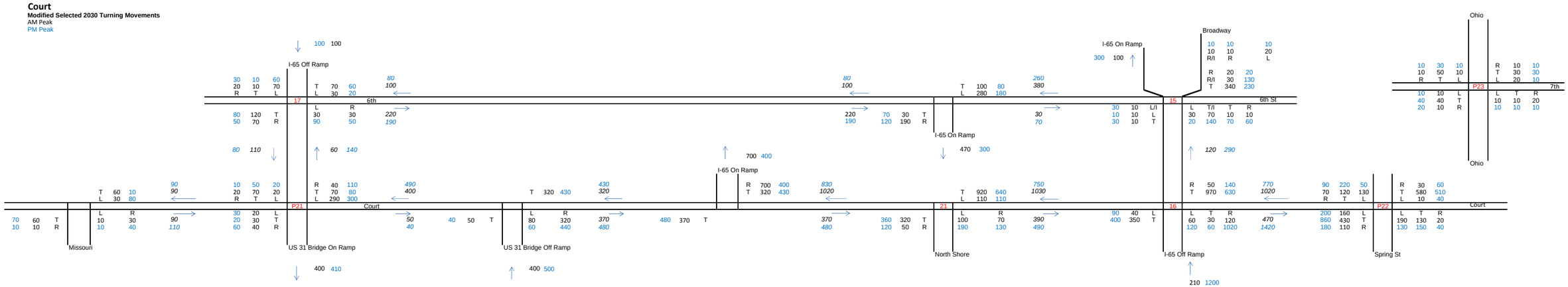
Mellwood-Story

Modified Selected 2030 Turning Movements
AM Peak
PM Peak



Court

Modified Selected 2030 Turning Movements
AM Peak
PM Peak

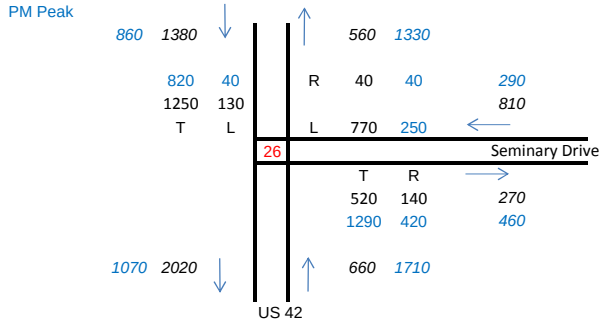


Seminary

Modified Selected 2030 Turning Movements

AM Peak

PM Peak

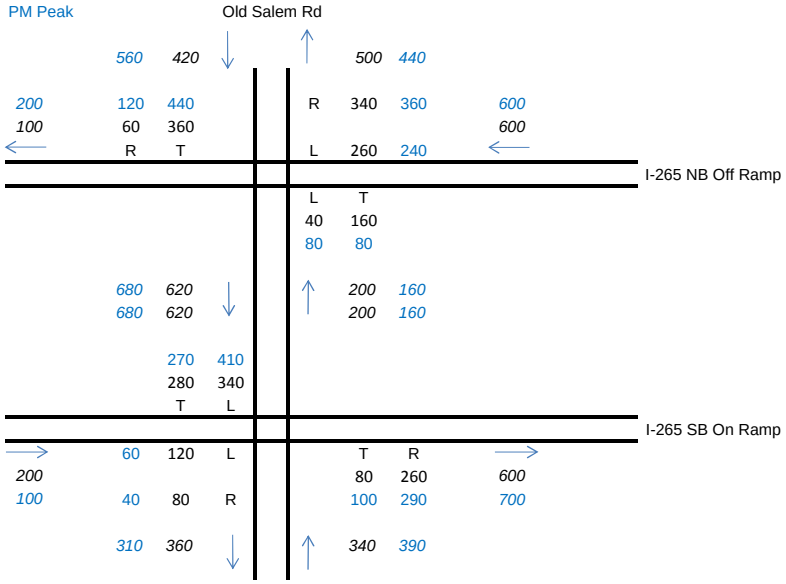


East End

Modified Selected 2030 Turning Movements

AM Peak

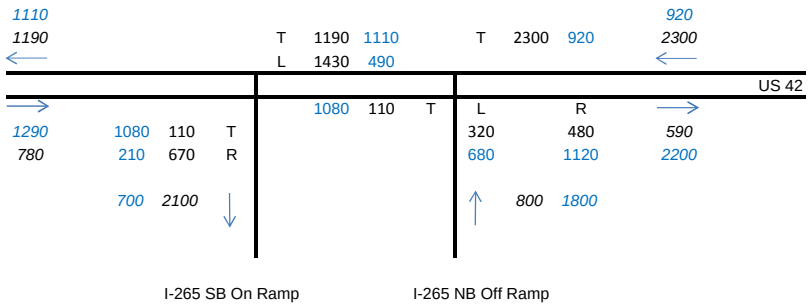
PM Peak



Modified Selected 2030 Turning Movements

AM Peak

PM Peak



Eastern

Modified Selected 2030 Turning Movements

AM Peak

PM Peak

												500												920	900							
												500												490	500							
20	70	190		R	50	130	1080	1160	260	70	170					1000	1000					R	70	390	720	650	230	160			
10	30	80		T	310	820	420	540	260	30	210		T	280	900	380	380					T	170	330	240	220	140	290			
R	T	L		L	60	130	←		R	T	L		L	100	100	←									←		R	T			
			P28				Eastern					25								24									P27		
40	20	L		L	T	R	→									→		260	170	L		L	T	R	→		170	120	L		L	T
580	430	T		40	40	100	610	650	500	280	T					490	490	410	320	T		210	250	40	360	340					70	130
60	50	R		100	70	50	820	930	430	370	R					670	670					670	270	60	470	430	260	220	R		410	230
										600													500								
										500													1000								
			Brook									US 31 (SB Frontage)								US 31 (NB Frontage)									Spring			

Stansifer

Modified Selected 2030 Turning Movements

AM Peak

PM Peak

										400														1710								
										400														770								
10	100	70		R	30	120	220	400	180		220					350	350					R	100	410	560	420	100	250	60		R	20	90
10	70	60		T	10	40	70	170	80		320		T	90	220	200	200					T	160	150	260	240	160	210	50		T	40	180
R	T	L		L	30	60	←		R		L		L	110	130	←									←		R	T	L		L	10	10
			P26									14				Stansifer Ave					13								P25			
10	10	L		L	T	R	→									→		130	90	L		L	T	R	→		140	90	L		L	T	R
40	30	T		10	70	20	110	210	170	120	T					440	440	250	350	T		40	580	80	430	300	70	70	T		40	70	10
10	10	R		10	190	40	150	240	70	90	R					390	390					200	1170	230	480	380	170	140	R		140	300	10
										200																						
			Clark							200		SB Frontage								NB Frontage			700						Spring			
																							1600									

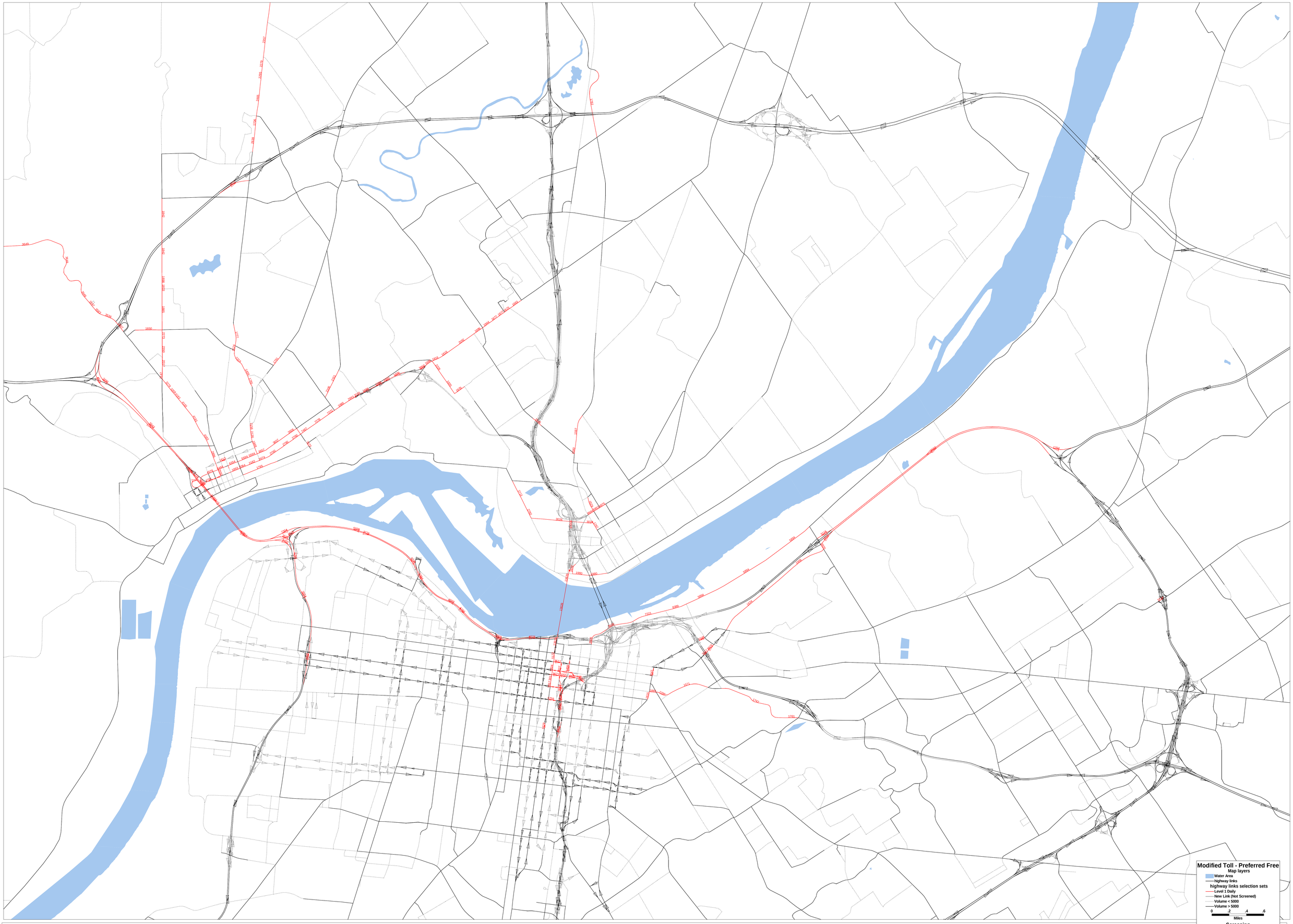
APPENDIX E

Links with Increased Traffic 2003 FEIS Preferred Alternative without Tolls vs. 2011 Modified Alternative with Tolls

Map 1) Daily Level 1 Screening (Increases, ADT > 5,000)
Map 2) AM Peak Hour Level 1 Screening (Increases, ADT < 5,000)
Map 3) AM Peak Hour Level 2 Screening (Increases, ADT > 5,000)
Map 4) AM Peak Hour Level 3 Screening (Increases, ADT > 5,000)
Map 5) PM Peak Hour Level 1 Screening (Increases, ADT < 5,000)
Map 6) PM Peak Hour Level 2 Screening (Increases, ADT > 5,000)
Map 7) PM Peak Hour Level 3 Screening (Increases, ADT > 5,000)

Links with Decreased Traffic 2003 FEIS Preferred Alternative without Tolls vs. 2011 Modified Alternative with Tolls

Map 8) Daily Level 1 Screening (Decreases, ADT > 5,000)
Map 9) AM Peak Hour Level 1 Screening (Increases, ADT < 5,000)
Map 10) PM Peak Hour Level 1 Screening (Increases, ADT < 5,000)



MAP 1

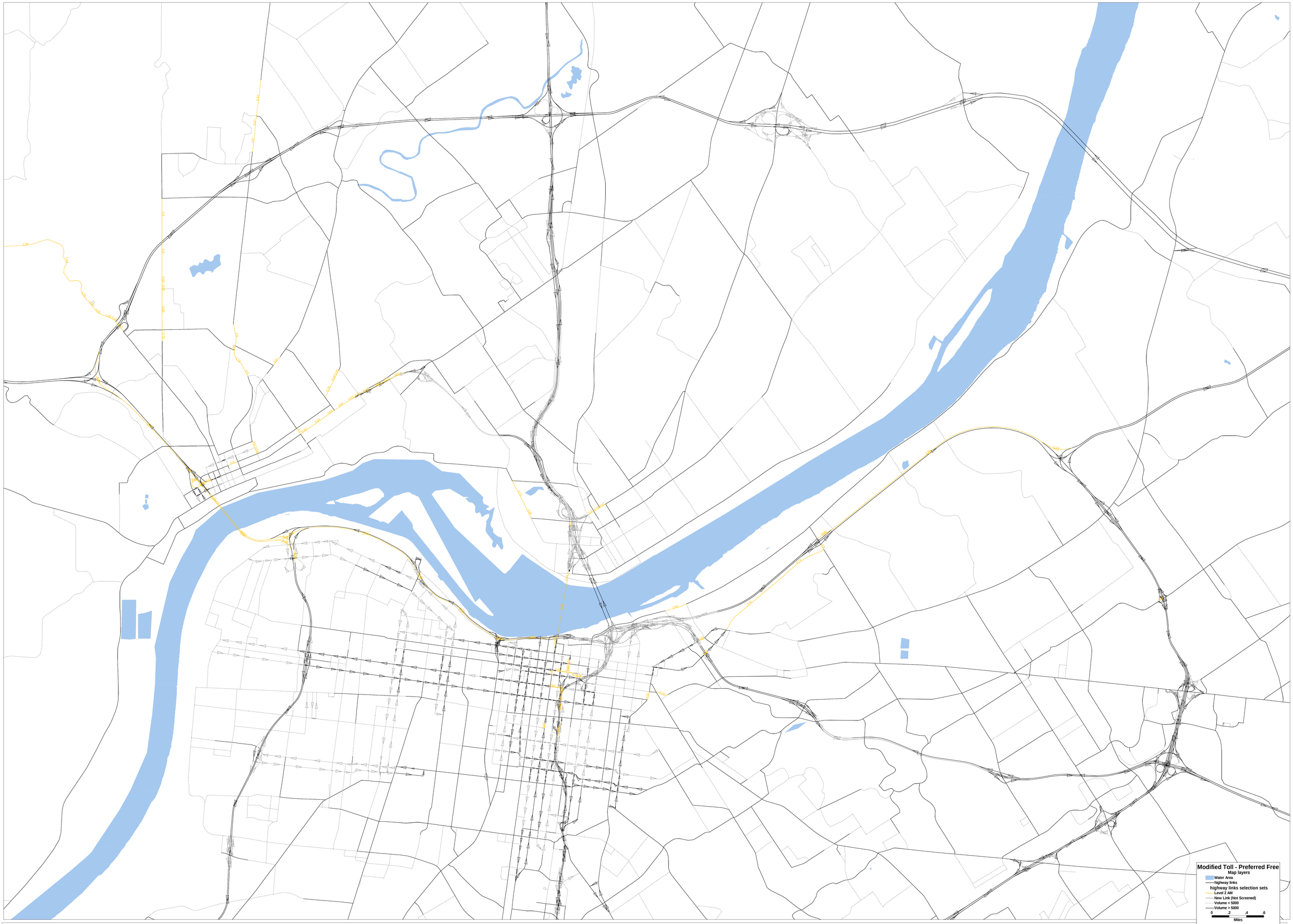
2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

Level 1 Daily Screening (Modified Toll Volumes > 5000)

MAP 2

2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

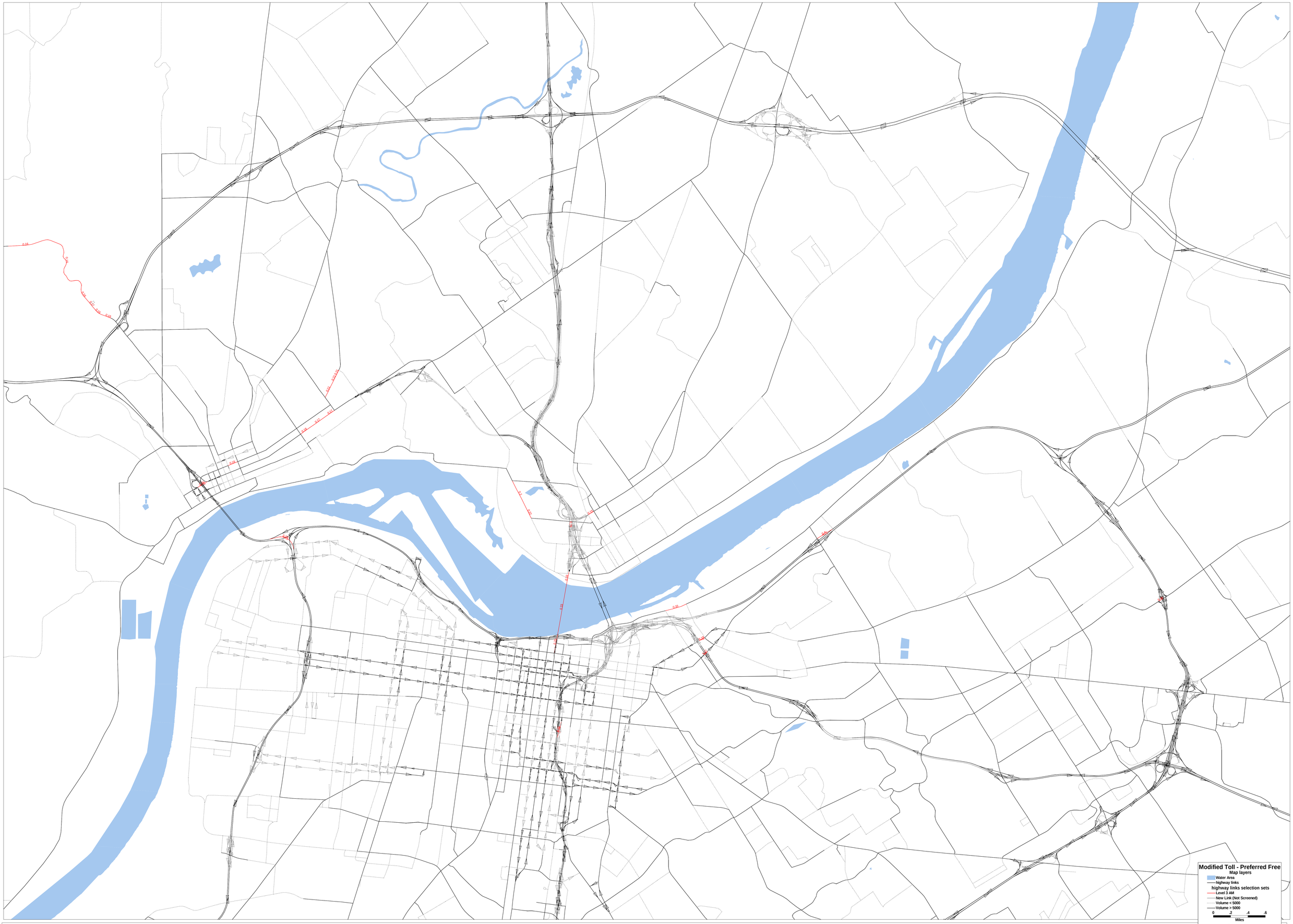
Level 1 AM Screening (Modified Toll Volumes < 5000)



MAP 3

2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

Level 2 AM Screening (Modified Toll Volumes > 5000)



MAP 4

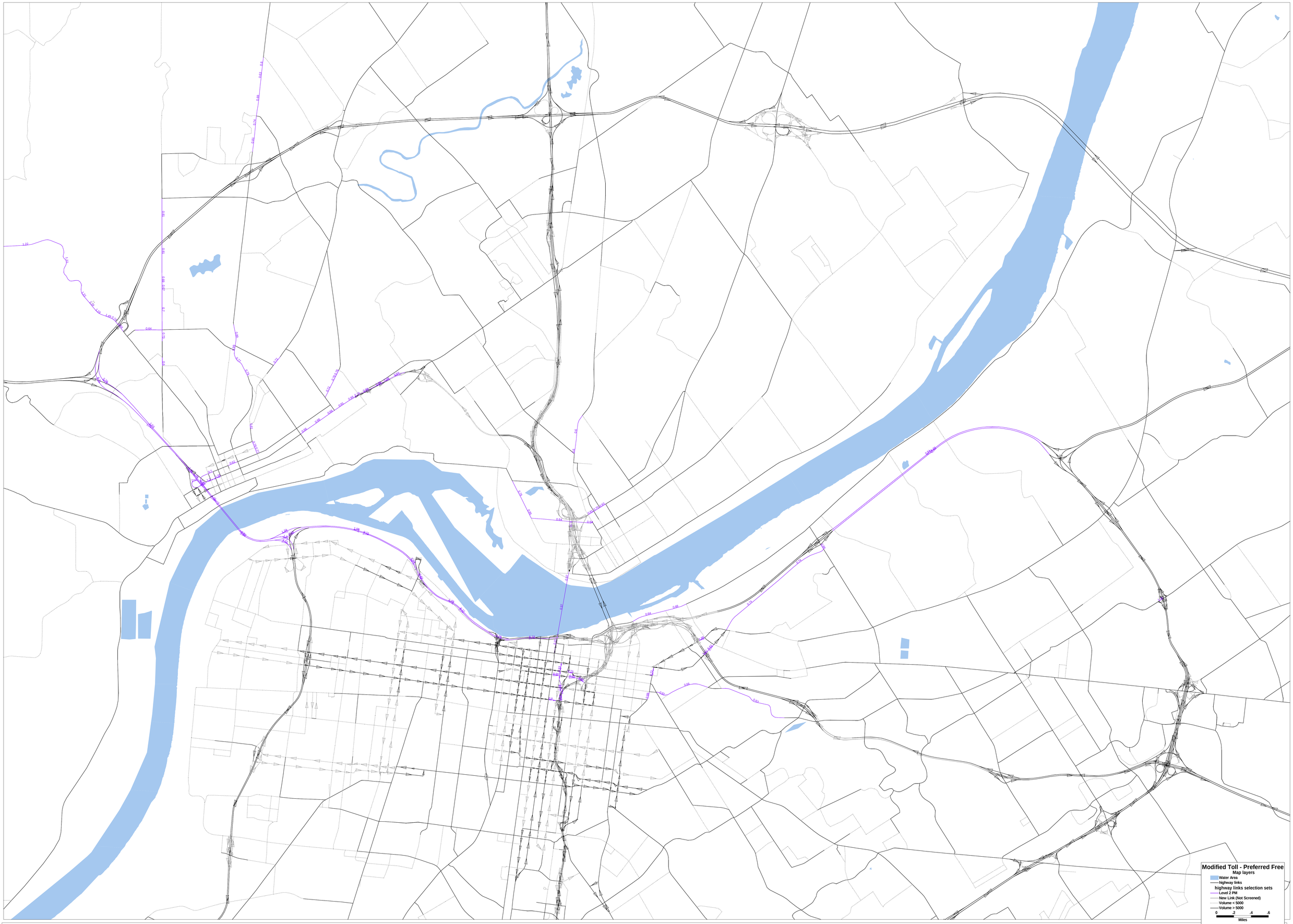
2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

Level 3 AM Screening (Modified Toll Volumes > 5000)

MAP 5

2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

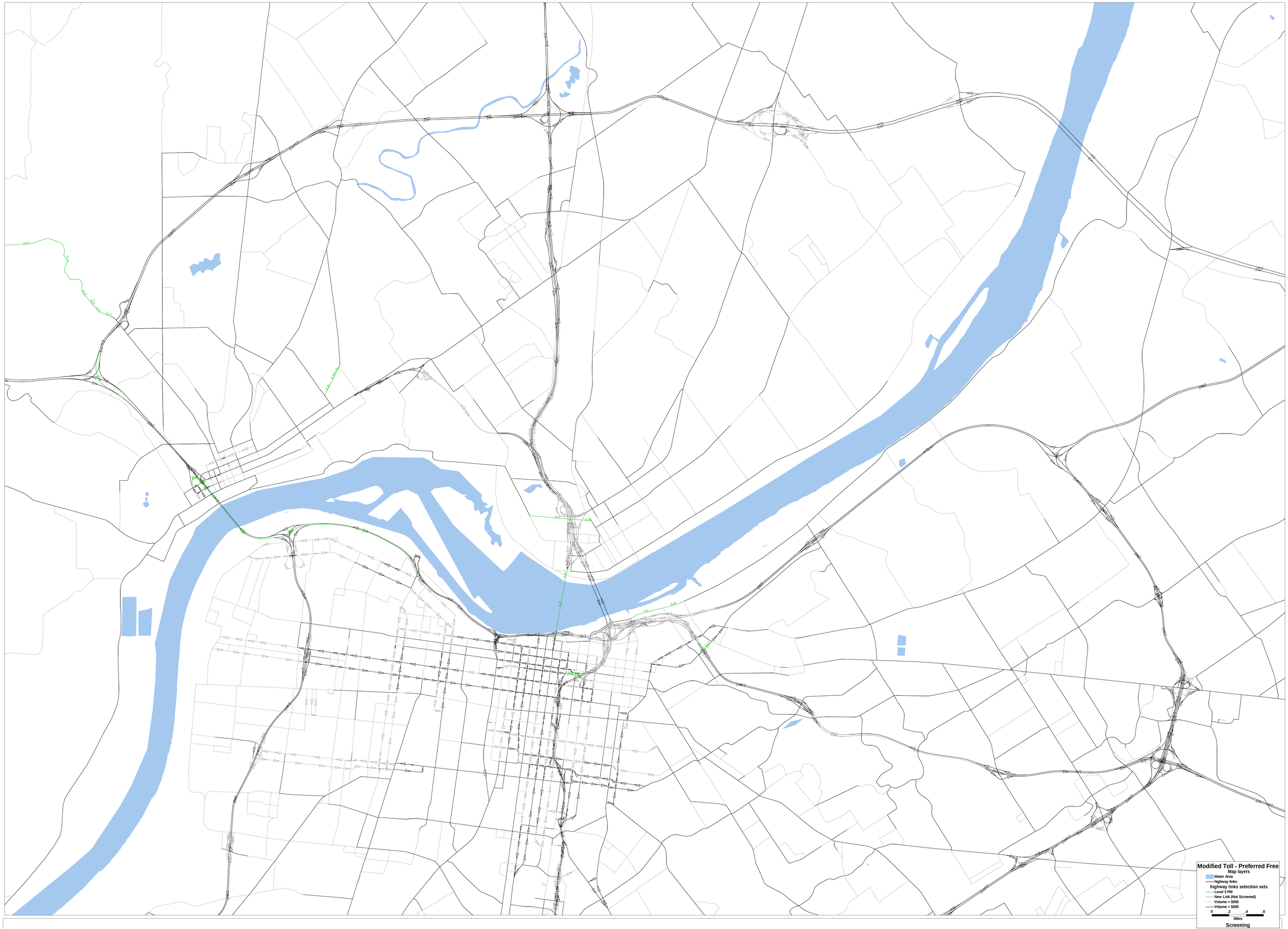
Level 1 PM Screening (Modified Toll Volumes < 5000)



MAP 6

2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

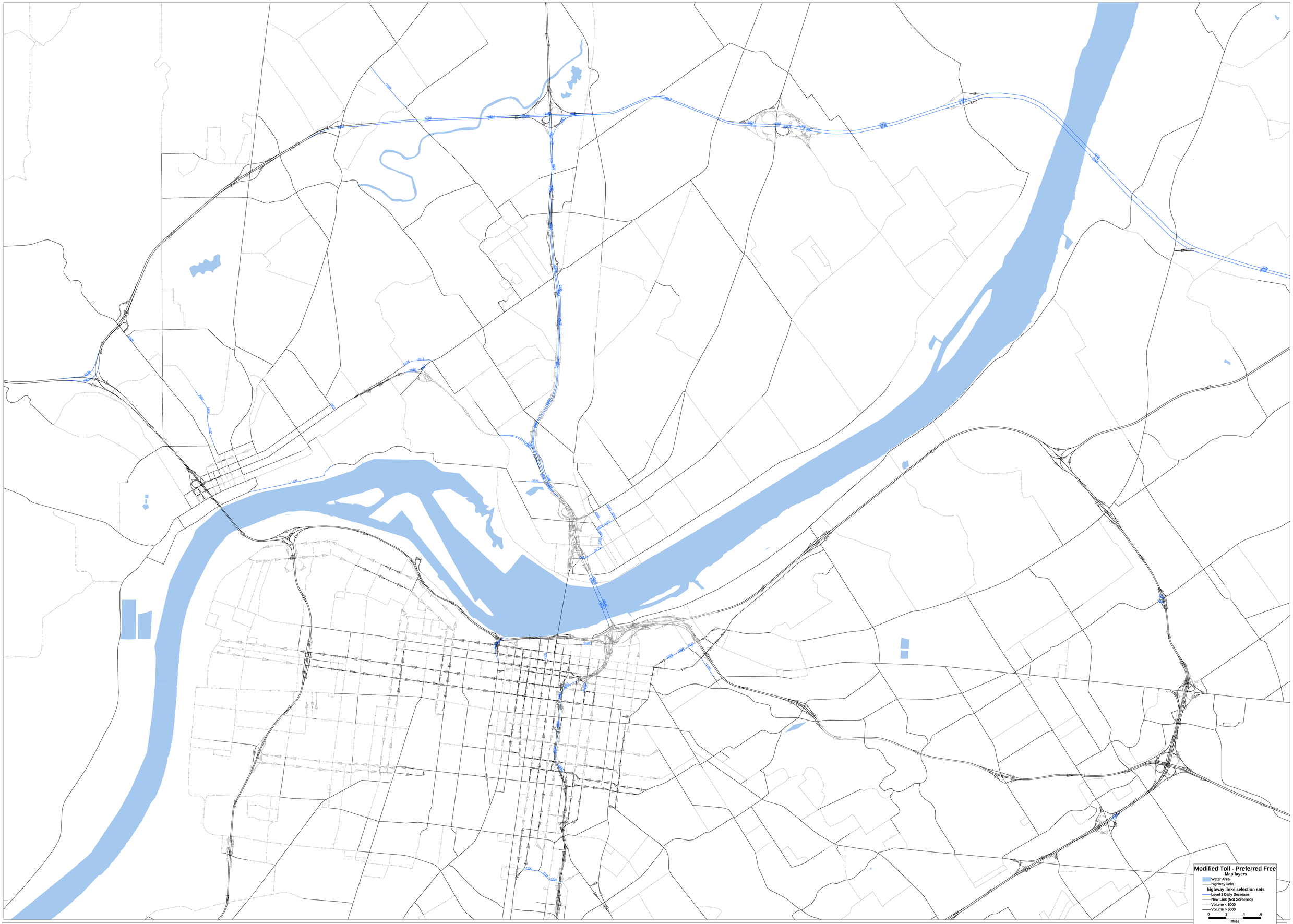
Level 2 PM Screening (Modified Toll Volumes > 5000)



MAP 7

2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

Level 3 PM Screening (Modified Toll Volumes > 5000)



MAP 8

2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

Level 1 Daily Decrease Screening (Modified Toll Volumes > 5000)

MAP 9

2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

Level 1 AM Decrease Screening (Modified Toll Volumes < 5000)

MAP 10

2030 Modified Toll - 2030 Preferred Free Traffic Screening Map

Level 1 PM Decrease Screening (Modified Toll Volumes < 5000)

KENTUCKY TRANSPORTATION CABINET

Kentucky UNBRIDLED SPIRIT™

PREPARED BY:

WilburSmith ASSOCIATES