I-264/US 42 Interchange Scoping Study
Item No. 5-390.00
Jefferson County, Kentucky

Prepared for:
Kentucky Transportation Cabinet

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Executive Summary

Project Background

The existing I-264 / US 42 Interchange is a congested interchange in a densely developed area of northeast Jefferson County. US 42 is a major arterial that links northeastern Jefferson and Oldham Counties to downtown Louisville and results in existing traffic volumes that are at or near capacity of the interchange. Crash data analysis revealed the following three locations in the interchange area as requiring further study:

- I-264 eastbound off-ramp gore (rear-end crashes due to queues created by congestion at signal)
- US 42 near Rudy Lane (rear end and turning crashes at Rudy Lane intersection)
- Old Brownsboro Road (crashes occurring in the congested area approaching US 42)

Existing traffic and crash data analysis, along with input from local elected officials, identified the following goals and objectives of the I-264 and US 42 Interchange project:

- Limit congestion and delay
- Improve safety
- Minimize right of way impacts
- Aesthetically fit the community
- Minimize number of traffic signals
- Provide direct access to Old Brownsboro Road
- Increase pedestrian accessibility
- Provide bicycle lanes

To analyze the impacts of the proposed alternatives, a VISSIM traffic simulation model was developed and calibrated to replicate the existing conditions. The VISSIM model and field observations indicated the three movements within the interchange that are the problematic:

- The Westbound US 42 left turn onto Westbound I-264 traffic backed up through the interchange.
- The Westbound I-264 exit ramp to Eastbound US 42 traffic caused the exit ramp traffic to backup onto I-264.
- The Eastbound I-264 exit ramp to Eastbound US 42 traffic caused the exit ramp to back up onto I-264.

The Eastbound I-264 exit ramp traffic to Eastbound US 42 also had a secondary issue. Nearly 43% of the vehicles turning right onto Eastbound US 42 immediately turned right onto Old Brownsboro Road.

Alternatives

Five initial interchange alternatives were identified for the I-264 / US 42 interchange:

- Alternative 1 Single Point Urban Interchange (SPUI)
- Alternative 2 Compressed Diamond Interchange (CDI)
- Alternative 3 Diverging Diamond Interchange (DDI)
- Alternative 4 Split Diamond Interchange (SDI)
- Alternative 5 Tight Urban Diamond Interchange (TUDI)

Each of the interchange Alternatives included a Ramp Split option as an optional direct connection from the Eastbound I-264 exit ramp to Old Brownsboro Road. The Ramp Split option significantly improves the travel times of each alternative by eliminating the conflicts along US 42.

Each interchange Alternative also included a Right In / Right Out (RIRO) option for Old Brownsboro Road at US 42. The RIRO Option was analyzed with and without the

Ramp Split and was shown to significantly reduce PM travel times for both directions of I-264 to US 42 EB with Alternative 1.

In addition to the 5 interchange alternatives, 12 initial Access Management (AM) Options were also identified. These options are intended to be either a part of the I-264 / US 42 Interchange project or could be constructed as separate access management projects.

Meetings

The project team evaluated the alternatives in a two-step process to reach the two final alternatives that were presented at the Public Meeting. Alternatives were evaluated based on the following criteria:

- Right-of-Way Impacts: additional acreage and number of business and residential relocations.
- Construction Impacts: Maintenance of Traffic difficulty (high, med, low), ability to utilize existing bridge, additional bridge lanes required, addition or reduction of traffic signals, impact to existing utilities, and potential for interim construction.
- Measures of Effectiveness (MOE): Objective measures of how well the interchange performed based on the modeling tools used in the evaluation--Included travel times, level of service, intersection delay, and maximum queue lengths.
- Cost: Estimated construction costs only for the initial and FHWA evaluations. Right of way and utility relocation costs were added for the final evaluation.
- Other: Environmental impacts, bicycle and pedestrian access and driver expectancy.

Alternatives 1 and 2 were presented at the public meetings with the Ramp Split and RIRO options. Comments received from the public meetings indicated most people preferred Alternative 1 and the ramp split option.

Interim Solutions

Four Interim Solutions were identified as viable options to improve the interchange performance and remain in place with ultimate construction of either alternative. These improvements would only be a temporary fix and would require additional improvements at a future date.

- IS 1: Convert Old Brownsboro Road Intersection at US 42 to RIRO.
- IS 2: Provide Ramp Split to Old Brownsboro Road.
- IS 3: Close US 42 entrance to Brownsboro Center, and construct channelized turn lane to westbound I-264.
- IS 4: Construct second lane of westbound I-264 entrance ramp.

Low-Cost Options

Three Low-Cost Options were identified as options that could be constructed with the existing interchange configuration--and improve the interchange performance--but not necessarily remain in place with ultimate construction of either final alternative.

- LC 1: Construct full length dual left turn lane for westbound US 42 to I-264.
- LC 2: Construct second left turn lane on eastbound I-264 exit ramp.
- LC 3: Construct second exit lane on westbound I-264 exit ramp.

Project Team Recommendations

After preliminary analyses and meetings with the public and local elected officials, the project team recommends the following:

- Alternative 1 SPUI with RIRO at Old Brownsboro Road as the preferred Alternative.
- Access between US 42 and Old Brownsboro Road should be reconnected by the Lime Kiln realignment Option (AM 12C).
- Implement AM 1 (extending right turn lane on US 42 EB to Rudy Lane) and AM 3 (closing entrance at Brownsboro Center at US 42 and Rudy Lane).
- Lower cost options should be studied in Phase 1 for AM 2 (widening Rudy Lane). Additional study of AM 9 (limit through access between US 42 and Old Brownsboro Road) and AM 10 (close multiple access locations on US 42) is also recommended in Phase 1.
- The Ramp Split option has been advanced as a recommendation with evaluation of the FHWA's policy for new or modified access points on the Interstate System and has been included in this study as Chapter 11. Additional analysis to demonstrate that a signalized intersection will improve queuing for the Ramp Split option at Old Brownsboro Road is included.
- Implement all four interim solutions.
- Study all three low-cost options in Phase 1 once traffic patterns stabilize from the new Westport Road Interchange.
- Explore bicycle, pedestrian, and public transportation access considerations in final design.

The SPUI Alternative would require that the existing structure be replaced and may also require a grade change on US 42 to develop adequate clearance over I-264. While the opposing turn lanes create a narrower bridge at the signal, ramps converging at the single point create skewed beams that increase the cost of the structure. The limited right of way could result in diversions or detours such as re-routing traffic to Westport Road during bridge construction. A detailed MOT plan and public information plan will be required.

Based on discussions with FHWA, an Interchange Modification Study (IMS) will be required for this project. The ramp split option will not require adjacent interchanges be analyzed but the ultimate interchange would require the adjacent interchanges be included.

Costs

Preliminary cost estimates indicate construction costs associated with the proposed recommendations as follows:

Recommendation	***Cost***
Alternative 1 SPUI	$15,400,000
Ramp Split	$400,000
RIRO @ Old Brownsboro	$100,000
Access Management 1	$160,000
Access Management 3	$30,000
Access Management 12C	$1,600,000
Interim Solution 1	$1,675,000
Interim Solution 2	$600,000
Interim Solution 3	$40,000
Interim Solution 4	$2,000,000
Low Cost 1	$950,000
Low Cost 2	$325,000
Low Cost 3	$1,700,000

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Chapter 1

1.0 Introduction

The existing I-264 / US 42 Interchange is a congested interchange in a densely developed area of northeast Jefferson County. US 42 is a major arterial that links northeastern Jefferson and Oldham Counties to downtown Louisville. It is lined with existing residential and commercial developments, resulting in existing traffic volumes that are at or near capacity of the interchange.

The few unimproved tracts within the study area are currently approved for development which will further increase the congestion and delay for users of the corridor. One such development, Fresh Market, has just opened. Three other larger multiuse developments are in various stages of planning and/or construction.

The purpose of this study is to identify an interchange design that is financially feasible, Interim Solutions for the Preferred Alternative, and Low-Cost Options that can be applied to the existing interchange. These Low-Cost Options will immediately reduce the congestion and improve safety for the traveling public through this interchange while limiting right-of-way impacts to the community.

Due to budgetary concerns, right-of-way constraints, and the close proximity to adjacent interchanges, the Project Team chose not to study multi-level flyover ramp configurations or fully directional interchanges.

Chapter 2

2.0 Purpose and Need

The purpose of the I-264 and US 42 Interchange project is to reduce the congestion and delay within the US 42 interchange area and thereby improve the safety both on US 42 and I-264 within the project limits.

The existing I-264 / US 42 Interchange does not have adequate capacity or storage to accommodate the current left-turn and through-traffic volumes during the peak hours. Commuters often sit through green phases at signalized intersections due to queues from other intersections.

Figure 1 School bus sits through green phase at signal.

These delays cause long queues on the I-264 exit ramps, creating a safety concern. As normal growth and new developments occur in the project area, the problem will continue to degrade, resulting in longer travel times.

Figure 2 Exit ramp queues back up onto I-264.

The goals and objectives of the interchange project are to limit the congestion and delay on US 42 and increase safety of I-264, while minimizing the right-of-way impacts to the community.

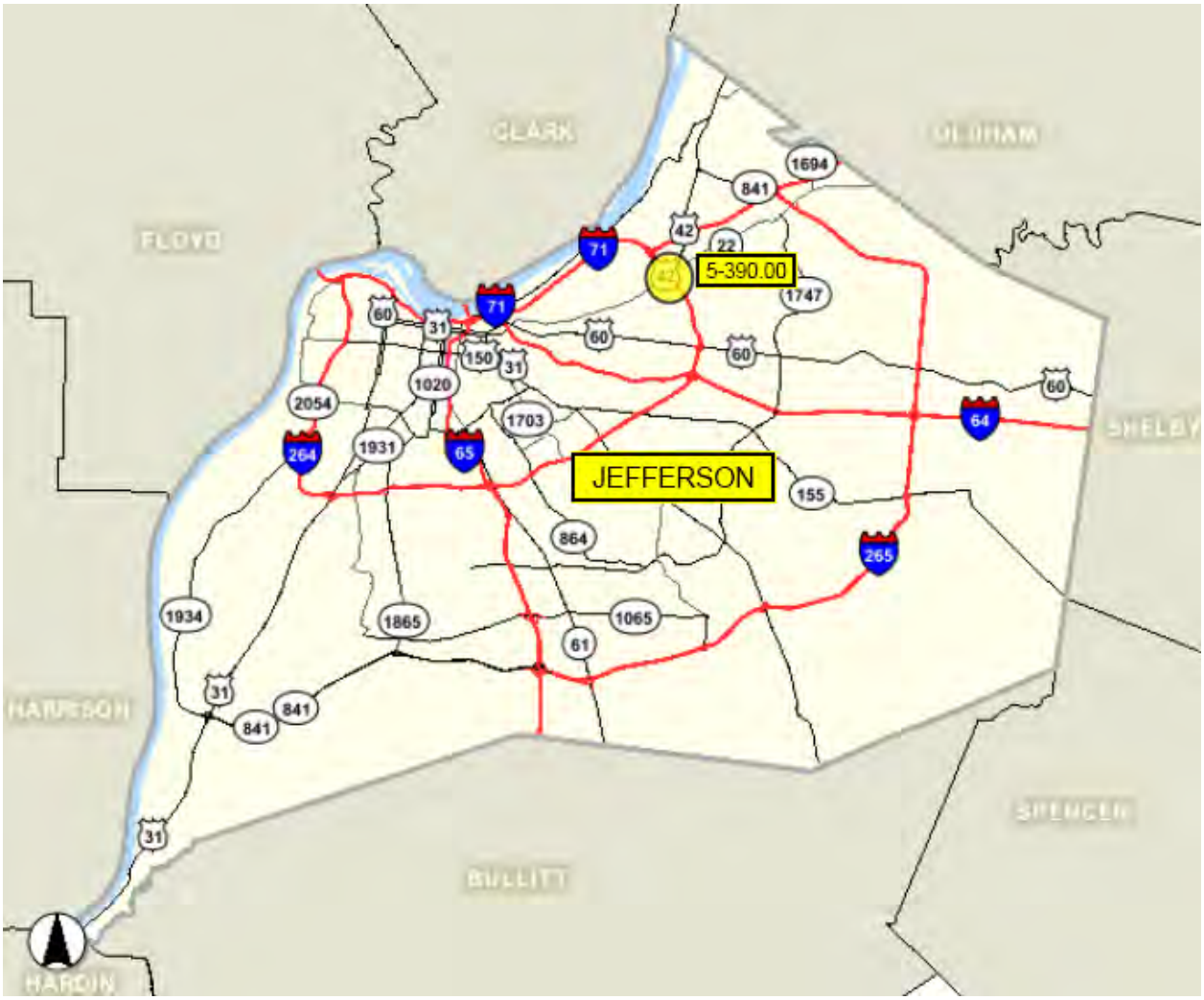

Figure 3 Project Location Map

Chapter 3

3.0 Study Area

The I-264 / US 42 Interchange is located in northeastern Jefferson County one-half mile southeast of the I-264 / I-71 Interchange.

3.1 Adjacent Transportation Projects

Two major transportation projects are located on I-264 at each end of the I-264 / US 42 Interchange study area.

A Single Point Urban Interchange (SPUI) has been constructed at the new Westport Road Interchange located 1.2 miles southeast of US 42. The new structure and additional Watterson Expressway lanes are now open to traffic. Construction is complete on Westport Road and the interchange ramps were completely opened to traffic in 2010.

An interchange study is underway for improvements to the existing I-264 / I-71 Interchange. The results of this study will determine the final location of the I-264 westbound exit and eastbound entrance ramps at US 42 and will address the weave sections between the two interchanges.

3.2 Existing Roadways

I-264 is classified as an urban interstate connecting I-64, I-65, and I-71. It is a

southern loop around downtown Louisville from I-64 in the northwest to I-71 in the northeast. To be consistent with the existing I-264 signing, the lanes traveling toward I-71 are considered Eastbound, and the lanes traveling away from I-71 toward Westport Road and on to I-64 are considered Westbound in this report.

The study portion of I-264 was constructed as a four-lane divided highway. A third Eastbound lane has just been added via construction of the new interchange at Westport Road. The new lane begins south of the new interchange and ends as a lane drop at the newly improved two-lane exit to US 42. A third Westbound lane has been added 1800 feet south of the existing Westbound entrance ramp from US 42 and continues through the new Westport Road interchange.

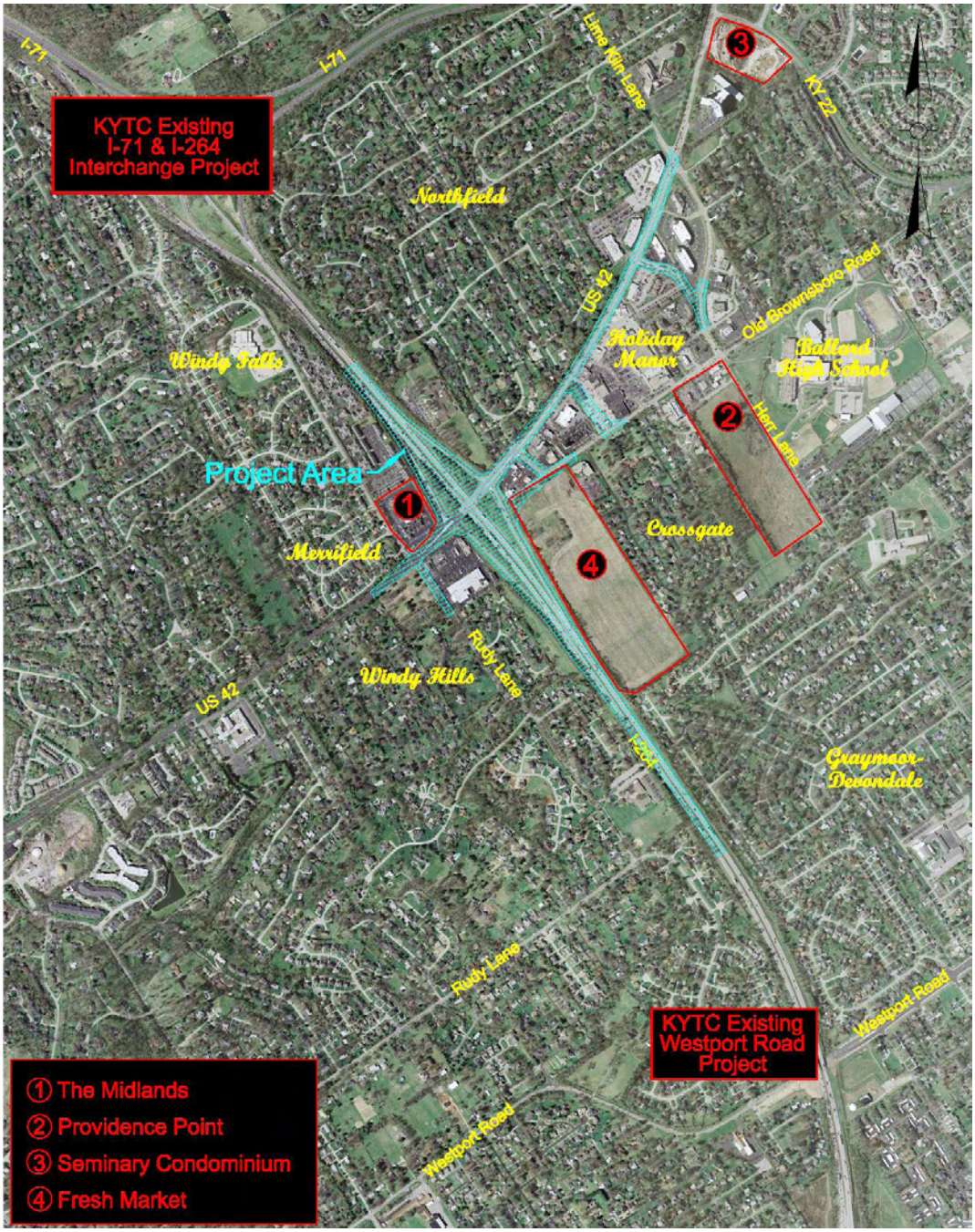

Figure 4 Project Study Area

The existing I-264 / US 42 interchange is a Compressed Diamond Interchange (CDI). The entrance ramps are both single-lane entrances to I-264. The westbound exit ramp is a single-lane exit. The eastbound exit ramp has recently been improved to a two-lane exit. The ramps have multiple turn lanes at the signalized intersections with US 42, where the ramp termini along US 42 are 400 feet apart.

US 42 is classified as a principal urban arterial with four lanes to the west of the interchange and five lanes to the east. A six-lane section consisting of two westbound through lanes, two eastbound through lanes, and two turning lanes exist between the ramp signals. Two Westbound turning lanes are carried over I-264, while one turn lane in each direction exists east of the structure.

Two more signalized intersections occur on US 42 just outside the interchange. Rudy Lane is 550 feet west and Old Brownsboro Road is 500 feet east of the interchange. A third signalized intersection is 1,000 feet east of Old Brownsboro Road at the entrance to the Holiday Manor Shopping Center. The study limits along US 42 are from Rudy Lane to the entrance to Holiday Manor.

Old Brownsboro Road (formerly KY 22) was converted to a Louisville Metro maintained street with the realignment of KY 22 to intersect US 42 at Seminary Road east of the study area. Despite the realignment of KY 22, Old Brownsboro Road still carries significant traffic volumes between US 42 and Herr Lane. The study limits along Old Brownsboro Road are from US 42 to Herr Lane.

3.3 Crash Data Analysis

The Kentucky Transportation Cabinet provided crash data for 2005 thru 2007. The Crash data was analyzed based on the methodology created by the Kentucky Transportation Center. Roadway segments based on traffic volumes and geometric characteristics are used to identify crash concentrations. High crash frequencies are demonstrated on 1/10-mile spots along the roadway.

A Crash Rate Factor (CRF) was calculated for each spot and segment. The CRF is a ratio of the crash rate to the average crash rate for sections of roadway of the same functional classification. A CRF of greater than 1.0 indicates that the crashes are not statistically random occurrences, and that those spots or segments should be further studied.

Three locations were identified as having CRF's above 1.0. The I-264 eastbound off-ramp gore--where many rear-end crashes occurred due to queues created by congestion at the signal--had the highest CRF of 3.29. US 42 near Rudy Lane had a CRF of 1.19 with most crashes being rear-end and turning crashes at the Rudy Lane intersection. Old Brownsboro Road (formerly KY 22) had a CRF of 1.10 with crashes occurring in the congested area approaching US 42 (See Table 1).

US 42 at I-264 Interchange Improvement Scoping Study

Spot Crash Data Analysis Spreadsheet

Kentucky Method Spot Analysis

Route	Begin MP	End MP	Length (Miles)	2007 ADT	# Lanes	Divided/ Undivided	Rural/ Urban	Avg. Crash Rate	# Years	Critical Crash Rate	Crashes				Critical Rate Factor
											Fatal	Injury	PDO	Total	
KY 22	0	0.1	0.1	19,300	2	Undivided	Urban	0.26	3	0.569	0	2	7	9	**0.75**
KY 22	0.1	0.2	0.1	19,300	2	Undivided	Urban	0.26	3	0.569	0	1	8	9	**0.75**
US 42	5.65	5.75	0.1	21,863	4	Undivided	Urban	0.43	3	0.796	0	3	19	22	**1.15**
US 42	5.75	5.85	0.1	56,100	4	Undivided	Urban	0.43	3	0.654	0	1	26	27	**0.67**
US 42	5.85	5.95	0.1	32,778	4	Undivided	Urban	0.43	3	0.726	0	2	20	22	**0.84**
US 42	5.95	6.05	0.1	32,778	4	Undivided	Urban	0.43	3	0.726	0	0	4	4	**0.15**
US 42	6.05	6.15	0.1	32,778	4	Undivided	Urban	0.43	3	0.726	0	4	6	10	**0.38**
US 42	6.3	6.4	0.1	32,778	4	Undivided	Urban	0.43	3	0.726	0	0	4	4	**0.15**
I-264	22	22.1	0.1	71,408	4	Divided	Urban	0.1	3	0.199	0	8	43	51	**3.29**
I-264	22.1	22.2	0.1	71,408	4	Divided	Urban	0.1	3	0.199	0	2	6	8	**0.52**
I-264	22.2	22.3	0.1	71,408	4	Divided	Urban	0.1	3	0.199	0	0	8	8	**0.52**
I-264	22.3	22.4	0.1	71,408	4	Divided	Urban	0.1	3	0.199	0	0	2	2	**0.13**
I-264	22.4	22.5	0.1	71,408	4	Divided	Urban	0.1	3	0.199	0	0	4	4	**0.26**

Segment Crash Data Analysis Spreadsheet

Kentucky Method Segment analysis

Route	Begin MP	End MP	Length (Miles)	2007 ADT	# Lanes	Divided/ Undivided	Rural/ Urban	Avg. Crash Rate	# Years	Critical Crash Rate	Crashes				Critical Rate Factor
											Fatal	Injury	PDO	Total	
KY 22	0	0.152	0.152	19,300	2	Undivided	Urban	260	3	507.32	0	3	15	18	**1.10**
KY 42	5.65	6.335	0.685	32,778	2	Undivided	Urban	430	3	539.76	0	10	79	89	**0.67**
I-264	22	22.5	0.5	71,408	2	Divided	Urban	100	3	142.48	0	10	63	73	**1.31**

Table 1 Spot and Segment Crash Data Analysis

Figure 5 Locations of Crashes 2005-2007

3.4 Existing Structure

An existing six-lane structure bridges US 42 over I-264. The existing structure is a four-span structure with spans of 40'-60'-60'-40' that was built around 1966 and was widened 12' on the north side in 1989. The superstructure consists of 36-inch deep rolled steel beams composite with a reinforced concrete deck that was built in a simple span configuration.

Figure 6 Existing Structure over I-264

The substructure consists of spill through abutments and open column piers with spread footings bearing on rock. All substructures are skewed right 5 degrees 36 minutes to the long chord of US 42. Original plans show a 16'-3" minimum vertical clearance. Widening plans show a 16'0" minimum clearance. However, a March 2007 inspection report lists minimum clearances of 16'-9" for eastbound lanes, and 16'-8" for westbound lanes. Piers are located within the clear zone of the Watterson Expressway, and guardrail protects drivers from direct collisions in the median and outside shoulders.

The 2007 inspection report indicates that the existing concrete deck, deck joints, and paint are all in poor condition. The joints are leaking badly, and the steel beams below are rusted. The abutment walls have cracks with efflorescence, and the pier caps are deteriorating with concrete delamination, spalls, and exposed rebar.

3.5 Existing Right of Way

The existing right of way along I-264 is 200 feet wide and tapers out to 660 feet at the widest part of the interchange. Existing right of way and property lines from LOJIC mapping are included on Figure 8.

The existing right of way along US 42 is approximately 128 feet wide. Existing businesses and parking lots abut the right of way along the commercial areas. A landscaped buffer space with sidewalks define the northern right of way of US 42 along the residential area of Northfield.

The existing right of way of Old Brownsboro Road is 150 ft wide along the short segment that intersects US 42. It varies from 30 ft to 80 ft wide along the tangent segment that intersects Herr Lane. This corridor also consists of businesses and parking lots abutting the right of way in the commercial areas, while buffer space fronts residential areas.

3.6 Existing Utilities

Most major utilities exist within the study area. Cable, electric, and telephone are overhead. Gas, sewer and water are under ground. The most significant potential utility impact is to a 12-inch water main that runs along the south side of US 42 attached to the underside of the structure over I-264.

Figure 7 Existing 12" Water Main over I-264

Figure 8--Existing Right of Way

Chapter 4

4.0 Environmental Overview

Through the analysis of three alternatives, it has been determined that the construction of improved transportation facilities in the vicinity of the I-264/US 42 interchange is expected to result in impacts to the environment. The data acquired for the study area will be utilized in future decision making to determine the suitability of the project and proposed alternatives.

4.1 Socioeconomic Considerations

The project study area is generally located in a mixed-use, urban area of Louisville. Much of the area surrounding the study area consists of single-family residential properties. These areas appear to have some cohesion, and they display the types of characteristics that are represented by similarities in design, style, age, ethnicity, race, culture, income, family composition, education, and religion.

Community cohesion in the residential units or small clusters along the secondary and side roads in the project area will not be adversely affected by any potential displacements, and it is expected that these neighborhoods will continue to thrive. Single-family residential properties make up the majority of residential land uses within the project study area. It is unknown if any community cohesion exists within this community. Since the area is a mixed-use, urban area, any acquisition, business or residential, may affect the surrounding community or those living within the study area; however, the project is anticipated to have positive, long-term effects on employment, income, and business activity as a whole.

The majority of commercial land uses are small businesses used by area residents; therefore, the mixed-use nature of the project area is expected to be maintained. Services, facilities, and access to existing development will be maintained.

No community resources, such as churches, hospitals, and schools, will be adversely affected in the proposed project corridor. Ballard High School, which is located southeast of the project area, will benefit from the proposed intersection improvements through improved access. Students will benefit from the new road because much of the current traffic will travel on the new road during peak demand periods. The proposed interchange improvements will also improve access and safety for police and emergency vehicles that service hospital facilities located in and around Louisville.

Disproportionately high and adverse human health or environmental effects on minority and low-income populations are not anticipated with the construction of this project. Windshield surveys of the project area and the use of 2000 U.S. Census information revealed no such populations present in the study area; however, more specific alignment information will indicate the type and quantity of impacts expected from the project. One other tool for analysis of environmental justice is the use of statistics to determine if one population is unfairly affected compared to the general population.

Based on the current level of information available, no significant adverse social and economic impacts are anticipated from any of the proposed alignments; however, these preliminary findings will require validation

through appropriate detailed environmental Base Studies required in future phases.

4.2 Air Quality Considerations

The U. S. Environmental Protection Agency (EPA) has identified seven air pollutants of national concern, including carbon monoxide (CO), nitrogen oxides (NO_x), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), sulfur oxides (SO_x), and lead (Pb). FHWA requires, by the development of air quality base studies, the modeling of CO, if needed, to determine and compare calculated existing and future concentrations with the National Ambient Air Quality Standards (NAAQS) and, if required, a qualitative hot spot analysis for $PM_{2.5}$.

A CO analysis will not be required because traffic projections will not exceed the 80,000 average daily traffic (ADT) threshold. Jefferson County is currently designated by the U.S. Environmental Protection Agency (EPA) to be in maintenance for O_3. Carbon Monoxide is not considered a concern for this project. Projects within Jefferson County that increase roadway capacity will be required to comply with the fine particulate, PM2.5, hotspot consideration requirements. In addition, a Mobile Source Air Toxics (MSATs) analysis will be required for the proposed project.

4.3 Highway Noise Considerations

To determine potential noise impacts from construction and operation of the proposed project, each representative noise-sensitive land use will need to be identified in conjunction with specific alignment alternatives and existing measured ambient noise levels. The procedure for conducting field monitoring will be based on FHWA requirements and KYTC Noise Abatement Policy. Noise levels will be measured in terms of L_{eq}, which reflects the average equivalent steady state sound level; in a stated time period, usually one hour, it would contain the same acoustic energy as the time-varying sound level during the same time period. For future noise level predictions, FHWA TNM (Traffic Noise Model) 2.5 will be used for noise impact analysis.

Given the location of the project area, the vehicle mix, patterns and volumes of traffic, and the commercial nature of the area, highway noise impacts are not expected to influence project feasibility or location decisions; however, a project-specific noise impact analysis will be required to verify noise impact conditions. The proximity of neighborhoods to I-264 has been a concern of residents for improvements along the Interstate.

4.4 Water Quality and Aquatic Ecosystems

The Kentucky Energy and Environment Cabinet, Division of Water (KDOW) was consulted for information on surface and groundwater. Based on the records review, the majority of the study area is located within an area of high karst potential; however, no sinkholes are known to exist in the project area. No springs were identified within the study area during the literature review.

One intermittent tributary to Goose Creek was identified at the northern corner of the study area during the field assessment. This stream emerges from a stormwater sewer outlet and immediately exits the study area to the north, with approximately 100 feet of stream located within the study area. No formal jurisdictional determination regarding this ecological feature has been made.

4.5 Wild and Scenic Rivers

No wild and scenic rivers or Outstanding Resource Waters, as reported by the KDOW, registered natural areas, exemplary natural communities, or wildlife or waterfowl refuges are located in the project study area. No land and water areas or facilities established or funded from the Land and Water Conservation Fund Act are located in the project study area.

4.6 Wetlands

The NWI map identifies no wetlands within the study area. The USGS topographic map and NHD map identify no streams within the study area.

One potential emergent wetland was identified in an agricultural field along the southern boundary of the study area during the field assessment. This potentially isolated wetland is less than 0.1 acre in size and is located near the study area boundary. No formal jurisdictional determination regarding this ecological feature has been made.

4.7 Floodplains

Floodplain information was obtained from the Federal Emergency Management Agency's (FEMA) Q3 digital flood data, as appended by the state of Kentucky. The entire site is located outside of the 100-year floodplain.

4.8 Threatened/Endangered Species and Terrestrial Ecosystems

The U.S. Fish and Wildlife Service (USFWS 2008) lists fourteen species as potentially occurring in Jefferson County, Kentucky (See Table 2). No specific surveys for

Threatened and Endangered Species with Potential to Occur				
Species	**Common Name**	**Status**	**Habitat Present**	**Species Observed**
Mammals				
Myotis grisescens	Gray Bat	E	No	No
Myotis sodalist	Indiana Bat	E	Yes	No
Mussels				
Pleurobema clava	Clubshell	E	No	No
Cyprogenia stegaria	Fanshell	E	No	No
Potamilus capax	Fat Pocketbook	E	No	No
Plethobasus cooperianus	Orangefoot Pimpleback	E	No	No
Obovaria retusa	Ring Pink	E	No	No
Lampsilis abrupt	Pink Mucket	E	No	No
Plethobasus cyphyus	Sheep Nose	C	No	No
Pleurobema plenum	Rough Pigtoe	E	No	No
Plants				
Trifolium stoloniferum	Running Buffalo Clover	E	No	No
Birds				
Sterna antillarum	Interior Least Tern	E	No	No
Insects				
Nicrophorus americanus	American Burying Beetle	E	No	No
Pseudanopthalmus troglodytes	Louisville Cave Beetle	C	No	No
E = Federally Endangered Species; C = Federally Threatened Species				

Table 2 Potential Jefferson County Species

protected species have been performed at this time. More detailed protected species surveys would need to be performed in order to determine potential impacts from this project to protected species.

Potential summer maternity/roosting habitat for the federally endangered Indiana bat (*Myotis sodalis*) includes snags or live trees with exfoliating bark or cavities. Limited habitat for the species was identified within the project site during the field assessment in the form of individual trees located in wooded fencerows and portions of the residential development. No winter habitat for this species, which includes caves and abandoned mines, was observed on the site. The study area is located within 2.5 miles of a known maternity roost for this species; therefore, further coordination will be required with USFWS.

The preferred habitat for the federally endangered American Burying Beetle is not well understood. Current information suggests this species is found in many types of habitats with a slight preference for grasslands and open understory oak-hickory forests. It is suggested that carrion availability may be the greatest factor for determining where the species can survive. This species buries carrion and then lays eggs in the soil adjacent to the buried carcass; therefore, soil characteristics are of great importance to this species, and developed areas do not represent suitable habitat. Based on the developed nature of the study area, it appears that the proposed project is not likely to have an adverse impact on this species.

4.9 UST/Hazmat

Environmental Data Resources, Inc. (EDR) of Milford, Connecticut, was contracted to perform an electronic database report for the proposed area of interest. EDR reported 10 sites, several of which are fuel stations, with environmental records within the search area (EDR 2009). These 10 sites were confirmed within the search radius for the databases in which they were listed and were of environmental interest in connection with the proposed project. In addition, EDR listed 19 sites with incorrect or incomplete addresses (also referred to as “orphan sites”), preventing proper identification of their location.

An Environmental Site Assessment of the project area conducted in accordance with ASTM Practice E 1527 and KYTC Guidance, should be accomplished during future NEPA phases of the project to formally confirm UST/Hazmat findings; however, based on currently available information, no significant hazardous materials or underground storage tank issues are anticipated for this project regardless of the alignment selected.

4.10 Cultural Resources

A Cultural Historic Overview was completed in May 2009 for the study area. Records research and a windshield survey were conducted to identify potentially historic structures. No previously recorded sites are located within the project scoping study area. Six previously recorded sites are located within a one-mile radius of the project: Jf-486; Jf-487; Jf-527; Jf-528; Jf-529; and Jf-593.

Three sites, Jf-527, Jf-528, and Jf-593, are located southwest of the scoping study area. Springfield, the home of President Zachary Taylor (Jf-527), is a National Historic Landmark. The property is located on Apache Road approximately one mile northwest of US 42. Jf-528 is the Zachary Taylor National Cemetery/Taylor Burial

Ground; this site is listed in the National Register of Historic Places. The historic boundary for the Zachary Taylor National Cemetery includes the stone entrance gates adjacent to the western US 42 right-of-way; these features are approximately 600 feet south of the southern perimeter of the scoping study area. The Taylor-Oldham-Herr House (Jf-593) is located on Ballard Mill Lane and separated from US 42 by recent residential development.

Two of the previously recorded properties (Jf-486 and Jf-487) are located east of US 42. These sites are designated as Kentucky Historic Survey level resources; their National Register eligibility has not been assessed. Jf-486 is identified as a two-story, three-bay, wood dwelling that is part of a small agricultural complex. This site is located directly east of the northbound I-264 exit ramp for US 42. Jf-487 is a one and one-half story, frame dwelling located east of KY 22 (Brownsboro Road) and south of Herr Lane. Jf-529, a dwelling, is located northwest of the project scoping study area.

If the project advances using federal funds, a historical baseline analysis will be required. Since a reconstruction project has the potential to have adverse impacts to historic resources, Section 106 of the National Historic Preservation Act of 1966 initiation would begin once the environmental documentation and design of any future project started.

4.11 Archaeological Sites and Districts

Even though a low to moderate potential for intact archaeological sites has been projected, the project area has not been subjected to a Phase I archaeological investigation, and the presence of currently unidentified archaeological sites within the project area is possible. Small seasonal prehistoric camps and isolated lithic scatters are the most probable. In addition, the presence of historic archaeological sites (e.g.., farms, barns, and outbuildings), such as those depicted on historic maps, could occur in the project area in close proximity to historic sites and/or modern transportation routes.

At this time, no regulatory requirements for further archaeological investigations at the proposed reconstruction of the I-264/US 42 interchange project site are warranted; however, if regulatory requirements mandate, the proposed project area should be subjected to a Phase I archaeological investigation. The most efficient and practical methodology to be used for this effort is shovel test probe (STP) excavations and visual inspection of the proposed project area.

The information presented in this overview report does not meet the requirements of Section 106 of the National Historic Preservation Act of 1966 or other federal and state regulations. Consultation is required between the Federal Highway Administration (FHWA) and the Kentucky Heritage Council (KHC) to determine the level of additional investigations necessary to fully comply with Section 106 regulations should any federal money be used in future phases.

Chapter 5

5.0 Traffic Forecasting

Data collected for this study involved peak period turning movement counts at seven different intersections and other corridor data needed to calibrate the VISSIM traffic simulation model. The VISSIM traffic simulation model was used to evaluate each of the proposed alternatives and the effectiveness of each one in relieving congestion along US 42 and queuing on the I-264 off-ramps.

5.1 Traffic Forecasting Methodology

A variety of data sources was used to arrive at traffic forecasts for the study area. The forecast uses the KIPDA travel model output as a guide for developing traffic growth rate factors, which is preferable to merely applying growth factors derived from past trends. Fueling this forecast is the realization that several roadway projects will impact traffic flow patterns and volumes in the near future, not the least of which is the construction of the Westport Road Interchange. Urban Travel Demand Forecasting Models, while inherently inaccurate at the micro level of analysis, do provide a window into general travel pattern changes. Therefore, determining growth rates from the model and applying them to actual traffic counts should yield reasonably accurate traffic forecasts.

This report includes the following traffic forecast:

- Average Daily Traffic (ADT) forecast for the base year 2012, intermediate year 2020, and future year 2030
- ADT and Design Hourly Volume (DHV) forecasts for intersections within the study area

5.2 Existing Traffic Volumes

The turning movement volumes used for this project include counts provided by KYTC as well as counts performed by Palmer Engineering. The turning movement counts provided by KYTC were part of a signal timing study conducted by URS in May 2008 and included the following intersections:

- US 42 @ Rudy Lane
- US 42 @ I-264 WB Ramps
- US 42 @ I-264 EB Ramps
- US 42 @ Old Brownsboro Road

Palmer Engineering conducted three supplemental turning movement counts in January 2009 during the AM peak period (6:00 AM – 8:00 AM) and the PM peak period (2:00 PM – 6:00 PM) for the following intersections:

- US 42 @ Holiday Manor
- Old Brownsboro Road @ Holiday Manor
- Old Brownsboro Road @ Herr Lane/ Lime Kiln Lane

The counts were conducted in 15-minute intervals to obtain peak hour factors. While conducting the turning movement counts, truck volumes were also counted to determine the heavy vehicle percentage.

5.3 Future Traffic Volumes

Traffic count data was expanded to 2012 using growth factors for each intersection approach from the KIPDA provided link data and then smoothed and balanced. The primary objective was to preserve and expand on the turning movements found in the traffic counts as opposed to model-produced turning movements, which usually prove to be unreliable. Given that future year forecasts are inherently less accurate

over a long period of time, average growth factors were established based on the KIPDA model output for the US 42 corridor, as well as Old Brownsboro Road, and Lime Kiln Lane for 2020 and 2030. The growth factors for US 42, Old Brownsboro Road, and Lime Kiln Lane were applied to the 2012 forecasts to arrive at 2020 and 2030 forecasts.

The 2012 volumes along US 42 were expanded from 2012 to 2020 by applying a growth factor of approximately 10% (1.3% per year) and from 2012 to 2030 by applying a growth factor of approximately 20% (0.8% per year). Volumes along Old Brownsboro Road were expanded from 2012 to 2020 by applying a growth factor of approximately 2.5% (0.3% per year); from 2012 to 2030, there was no additional growth. Volumes on Lime Kiln Lane were forecast to remain essentially the same as 2012 for 2020 and 2030.

The area surrounding the I-264/US 42 interchange is undergoing several changes that make forecasting for this scoping study relatively complex. Several developments within and adjacent to the study area are scheduled to be completed by 2012. The travel model did not take into account the proposed developments, requiring the volumes generated and distributed by these developments to be added into the forecasts for 2012, 2020, and 2030. Four approved developments were identified that would generate traffic; thus, these were included in the traffic forecasts.

These developments include:

(1) ***The Midlands***--a 36+/- acre multi-use development located off Old Brownsboro Road adjacent to the I-264 Eastbound exit;

(2) ***Providence Point***--a multi-use development just south of Old Brownsboro Road on Herr Lane across from Ballard High School;

(3) ***Seminary Condominium Complex***--a new 91-unit condominium located just east of the study limits on the corner of US 42 and KY 22 (Seminary Road);

(4) ***Fresh Market***--a 5-acre redevelopment of the former Brownsboro Inn to a retail center on US 42 adjacent to the I-264 Westbound exit.

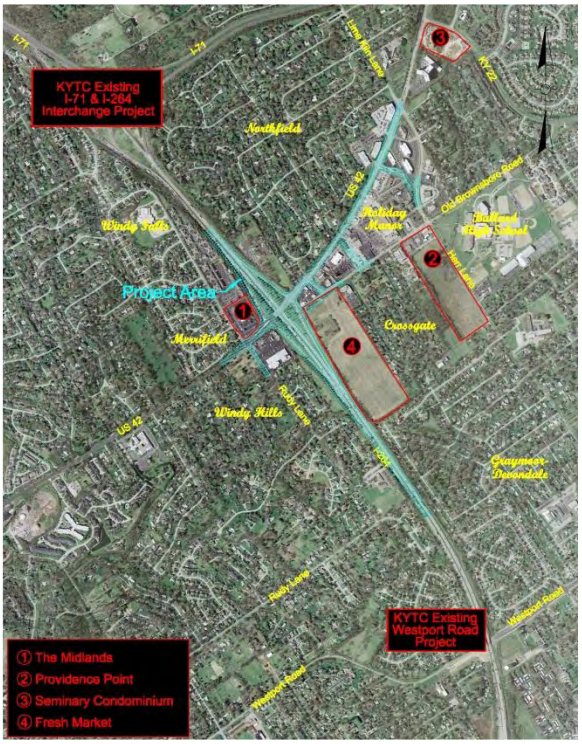

Figure 9 Area Developments

KYTC District 5 and Louisville Metro provided information concerning The Midlands, Providence Point, Seminary Condominium Complex, and the Fresh Market. A supplemental report has also been published, which adds Providence Point and the Seminary Condominium

complex to The Midlands development traffic. Louisville Metro provided the Fresh Market traffic impact study as well as some additional information concerning the Seminary Condominium complex.

The Midlands supplemental report incrementally included each additional development but did not separate background traffic from site-generated traffic in every case. Therefore, in order to separate site-generated traffic from background traffic, these studies had to be reverse engineered to determine the trips from each. After determining the site-generated traffic for each proposed development, these new traffic numbers were added to the 2012 forecasts and also to 2020 and 2030 in order to analyze the combined traffic in the study area.

While the use of the KIPDA model as a basis for the forecasts has some inherent risk due to the probable error that is considered acceptable with regional travel models, a decision was made to use this information source because of its ability to take into account all of the impending road network changes. Several of the roadway projects that will impact traffic flow patterns and volumes in the future, including the construction of the Westport Road Interchange, completed in 2010, and the widening of US 42 from I-264 to I-71, scheduled for 2015.

Forecasts for future phases of study for this project should be updated based on counts taken following the opening of the Westport Road interchange. This forecast should occur long enough after the opening of the interchange to allow traffic demand to find a new balance between the two interchanges.

Chapter 6

6.0 Alternative Development

In order to propose initial alternatives that would control the congestion and delay on US 42, the operational problems of the existing interchange were identified.

6.1 No Build

To aid in identifying the operational problem areas in the existing interchange, a No Build VISSIM model was created of the existing conditions. VISSIM is a behavior-based, microscopic simulation model software package that provides a graphic and numeric representation of lane geometry, driver behavior, signal timing, and traffic volumes. The model evaluates the performance of a network or intersection using measures of effectiveness such as travel time and queue length.

To calibrate the VISSIM model, a travel time study was conducted for various movements through the existing interchange. The VISSIM model was developed using existing signal timing obtained from Louisville Metro.

The calibrated VISSIM model and field observations indicated the three most problematic movements of the interchange.

- The Westbound US 42 left turn onto Westbound I-264 traffic backed up through the interchange.
- The Westbound I-264 exit ramp to Eastbound US 42 traffic caused the exit ramp traffic to backup onto I-264.
- The Eastbound I-264 exit ramp to Eastbound US 42 traffic caused the exit ramp to back up onto I-264.

The Eastbound I-264 exit ramp traffic to Eastbound US 42 also had a secondary issue. Nearly 43% of the vehicles turning right onto Eastbound US 42 immediately turned right onto Old Brownsboro Road. A direct connection to Old Brownsboro Road could significantly decrease the traffic through the US 42 signals at the eastbound ramp and Old Brownsboro Road.

Route	AM		PM	
	Field Measured	Model	Field Measured	Model
I-264 @ Westport Road to US 42 @ Lime Kiln Lane	-	-	*7.8*	*8.2*
I-264/I-71 @ Gore to Old Brownsboro Road @ Herr Lane	-	-	*5.4*	*5.2*
Old Brownsboro Road @ Herr Lane to US 42 @ Rudy Lane	*5.2*	*5.2*	*5.1*	*5.5*
US 42 @ Lime Kiln Lane to SB I-264 @ Ramp Gore	-	-	*2.8*	*3.4*
Old Brownsboro Road @ Herr Lane to SB I-264 @ Ramp LT	*4.9*	*4.8*	-	-

Table 3 Travel Time Calibration of VISSIM Model

6.2 Interchange Alternatives

A meeting was held with Local Elected Officials (LEO's) on April 7, 2009, to give an overview of the project and to get their input on interchange types that would be acceptable to the community.

The existing VISSIM Model was shown to the attendees, and the problematic areas previously identified were discussed. A brainstorming session was held to identify other areas of concern, community needs and conceptual goals for the interchange. The attendees indicated that they would prefer that the proposed interchange meet the following conditions:

- Minimize the congestion and delay through the US 42 Interchange
- Improve safety
- Minimize the right-of-way impact on the community
- Aesthetically fit the community
- Minimize the number of traffic signals
- Provide direct access to Old Brownsboro Road
- Increase pedestrian accessibility
- Provide bicycle lanes

From that brain storming session and follow-up project team discussions, five initial interchange alternatives were identified based on the community preferences. Due to right-of-way constraints, community aesthetics, the close proximity to adjacent interchanges, and budgetary concerns, no flyover ramp configurations or fully directional interchanges were considered.

The five initial interchange alternatives identified were:

- Alternative 1: Single Point Urban Interchange (SPUI)
- Alternative 2: Compressed Diamond Interchange (CDI)
- Alternative 3: Diverging Diamond Interchange (DDI)
- Alternative 4: Split Diamond Interchange (SDI)
- Alternative 5: Tight Urban Diamond Interchange (TUDI)

Ramp Split Option: Each of the interchange Alternatives included an optional direct connection from the Eastbound I-264 exit ramp to Old Brownsboro Road. This direct connection has long been a desire of the LEO's to keep the Eastbound I-264 traffic going to Old Brownsboro Road off US 42. The Ramp Split option would require FHWA approval.

The interchange Alternatives are further described and shown with the Ramp Split option (dashed) on the following pages.

All of the Alternatives are shown with a six-lane section for I-264 under US 42. As discussed in section 3.1, the I-264 lanes will be controlled by adjacent transportation projects. The six-lane section shown assumes that future widening of the existing four-lane section will occur in the median, but it is not part of this project.

All of the proposed I-264 entrance and exit ramp configurations shown can be tied to the existing or future ramp gore locations.

Alternative 1: Single Point Urban Interchange (SPUI)

The SPUI has one signalized intersection for all the through and left turning movements of the interchange. The single signal replaces the two existing signals and creates additional spacing to the intersections at Rudy Lane and Old Brownsboro Road. Opposing two-lane left turning movements operate simultaneously, providing for a more efficient use of green time when high left-turn volumes are present.

The SPUI Alternative would require that the existing structure be replaced and may also require a grade change on US 42 to develop adequate clearance over I-264. While the opposing turn lanes create a narrower bridge at the signal, ramps converging at the single point create skewed beams that increase the cost of the structure.

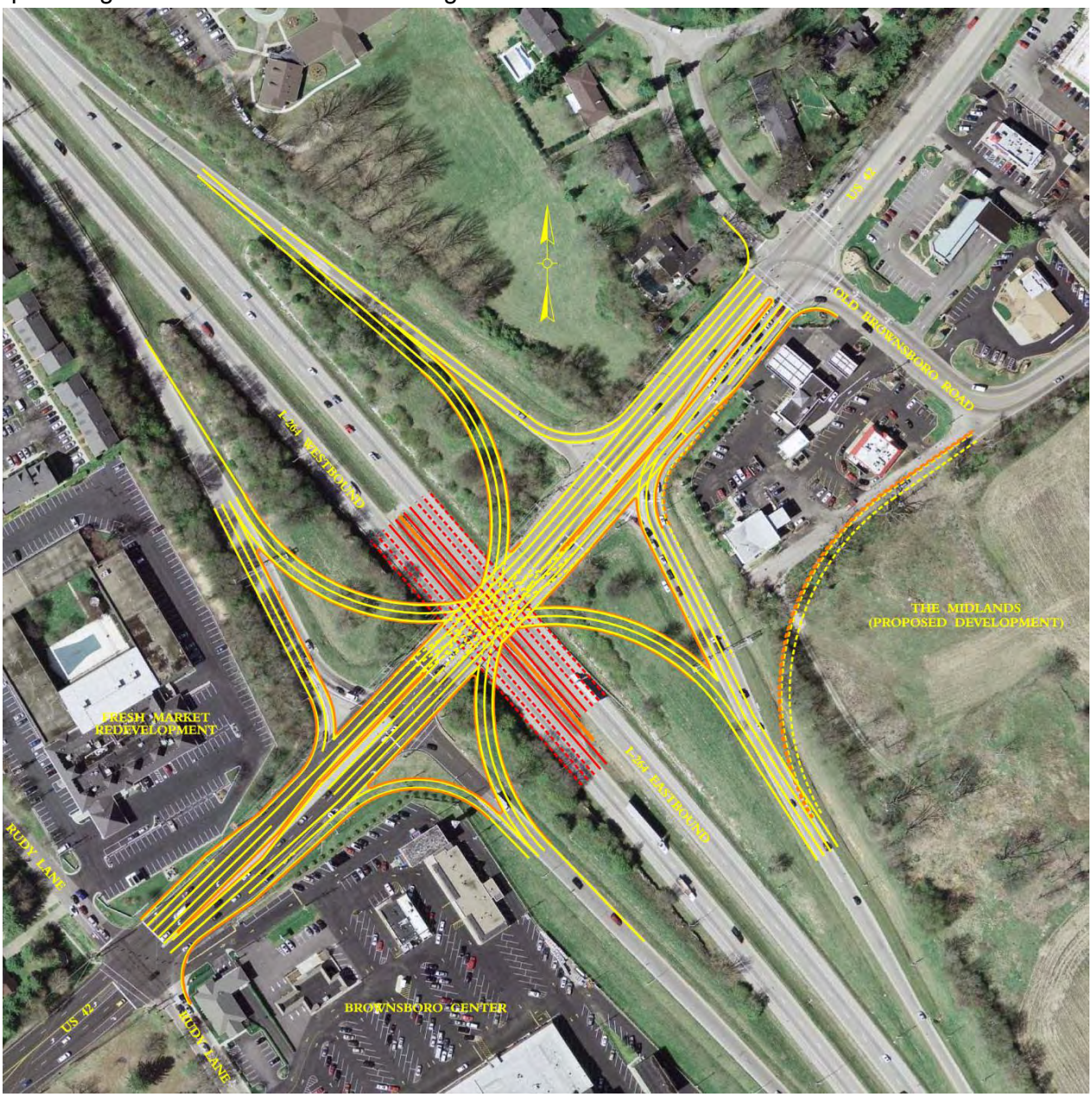

Figure 10 Initial Alternative 1: Single Point Urban Interchange (SPUI)

Alternative 2: Compressed Diamond Interchange (CDI)

The CDI is a slight variation of the conventional diamond interchange with ramp termini intersection spacing between 400 to 800 feet apart. It is often used in urban areas where there is limited right of way. The existing I-264 / US 42 Interchange is a CDI with ramp spacing of 500 feet. This alternative would be an expansion of the existing interchange geometry. Additional lanes would be added to the ramps and US 42 to provide additional capacity and storage.

The CDI Alternative would require widening of the existing structure over I-265. With two-lane left-turn lanes in each direction, the total bridge width would need to add two lanes to the existing structure. The additional bridge width would make tapering to the existing US 42 at Rudy Lane and Old Brownsboro Road more difficult.

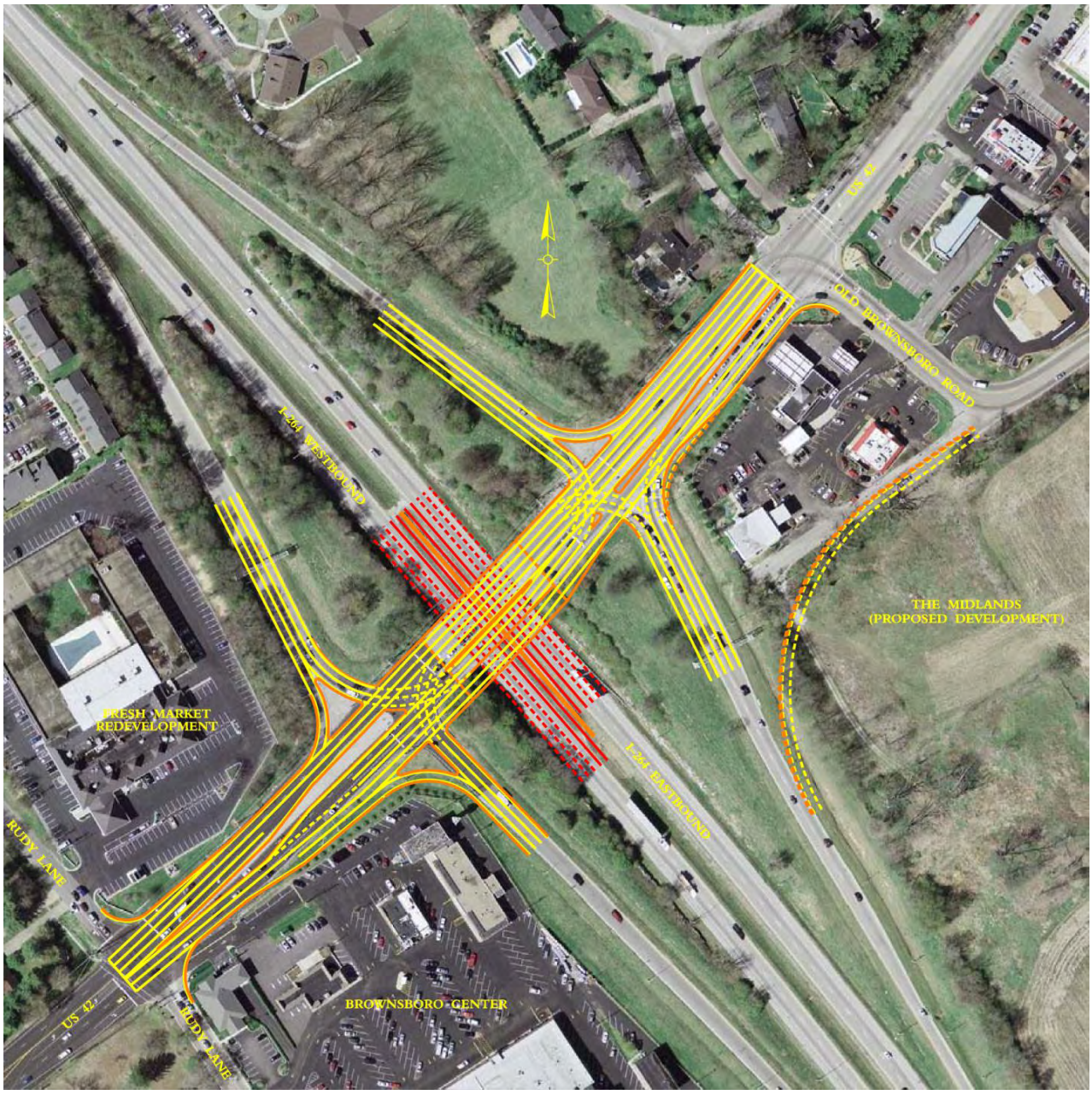

Figure 11 Initial Alternative 2: Compressed Diamond Interchange (CDI)

Alternative 3: Diverging Diamond Interchange (DDI)

The DDI is a unique form of diamond interchange that uses geometric configuration and signals at the ramp terminals to cross over through traffic and left-turning traffic to the left side of the roadway between the signals. This cross over allows left-turning movements within the interchange to be unopposed movements. Right-turning movements onto the entrance ramps occur just prior to the signals and are also unopposed movements. By crossing left-turns over to the other side, two-phase signals are used, which improve signal efficiency.

The DDI is new to the United States with only one open to traffic at this time, which creates concerns for driver expectancy and signing. The DDI Alternative may allow the existing structure over I-264 to remain in place.

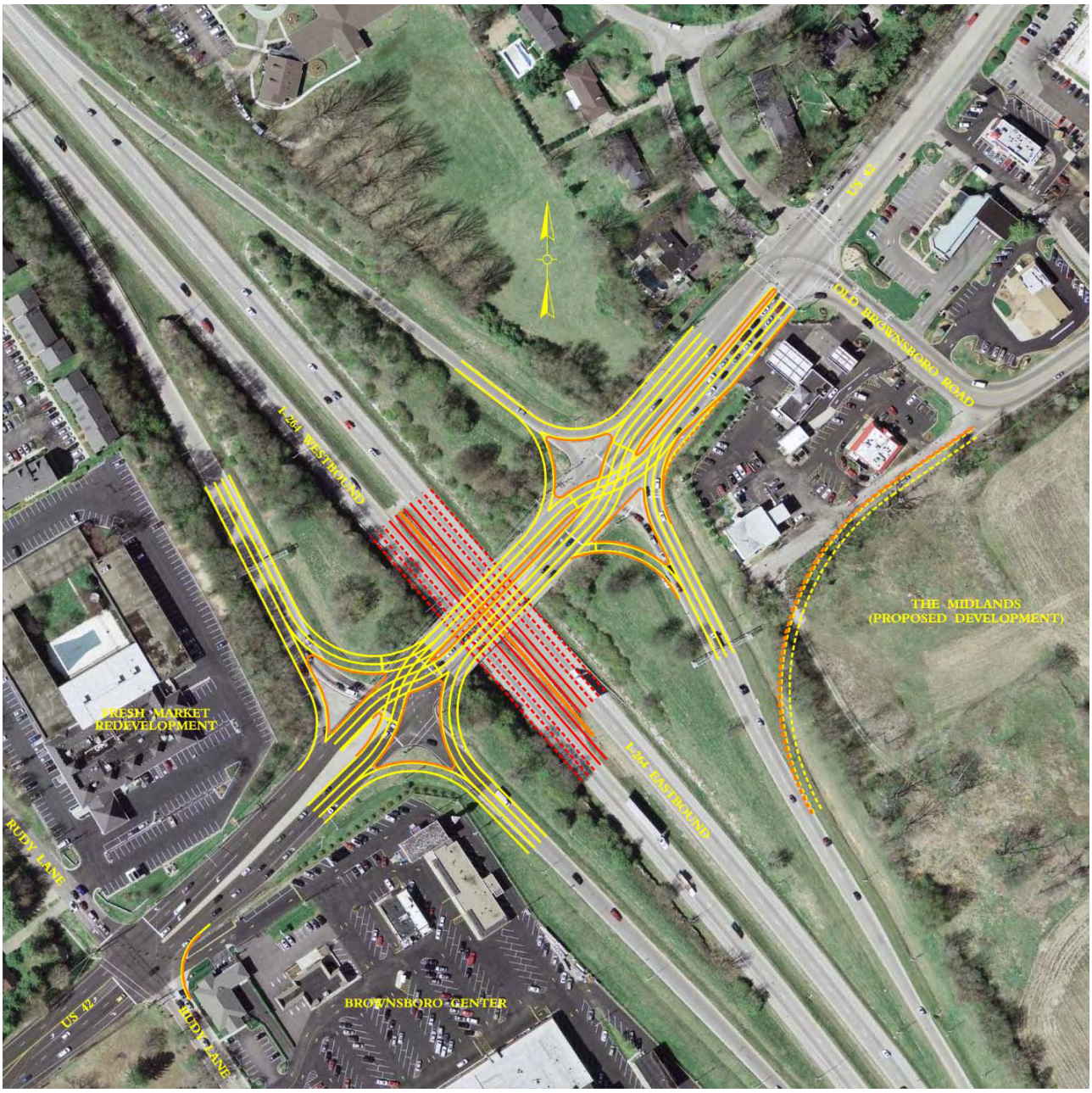

Figure 12 Initial Alternative 3: Diverging Diamond Interchange (DDI)

Alternative 4: Split Diamond Interchange (SDI)

The SDI is an interchange that is used when closely spaced cross roads are present. Such a condition would exist if Old Brownsboro Road were to be extended across I-264 in its former location just south of US 42.

The SDI was identified as a possible means to provide direct connectivity from the I-264 Eastbound Exit Ramp to Old Brownsboro Road without the need for the slip ramp.

The SDI Alternative would allow the existing structure over I-264 to remain in place with just one lane added; however, a second structure would also have to be constructed south on I-264. An additional signal would also be added along the I-264 Eastbound Off-Ramp where crossing the connection to Old Brownsboro Road.

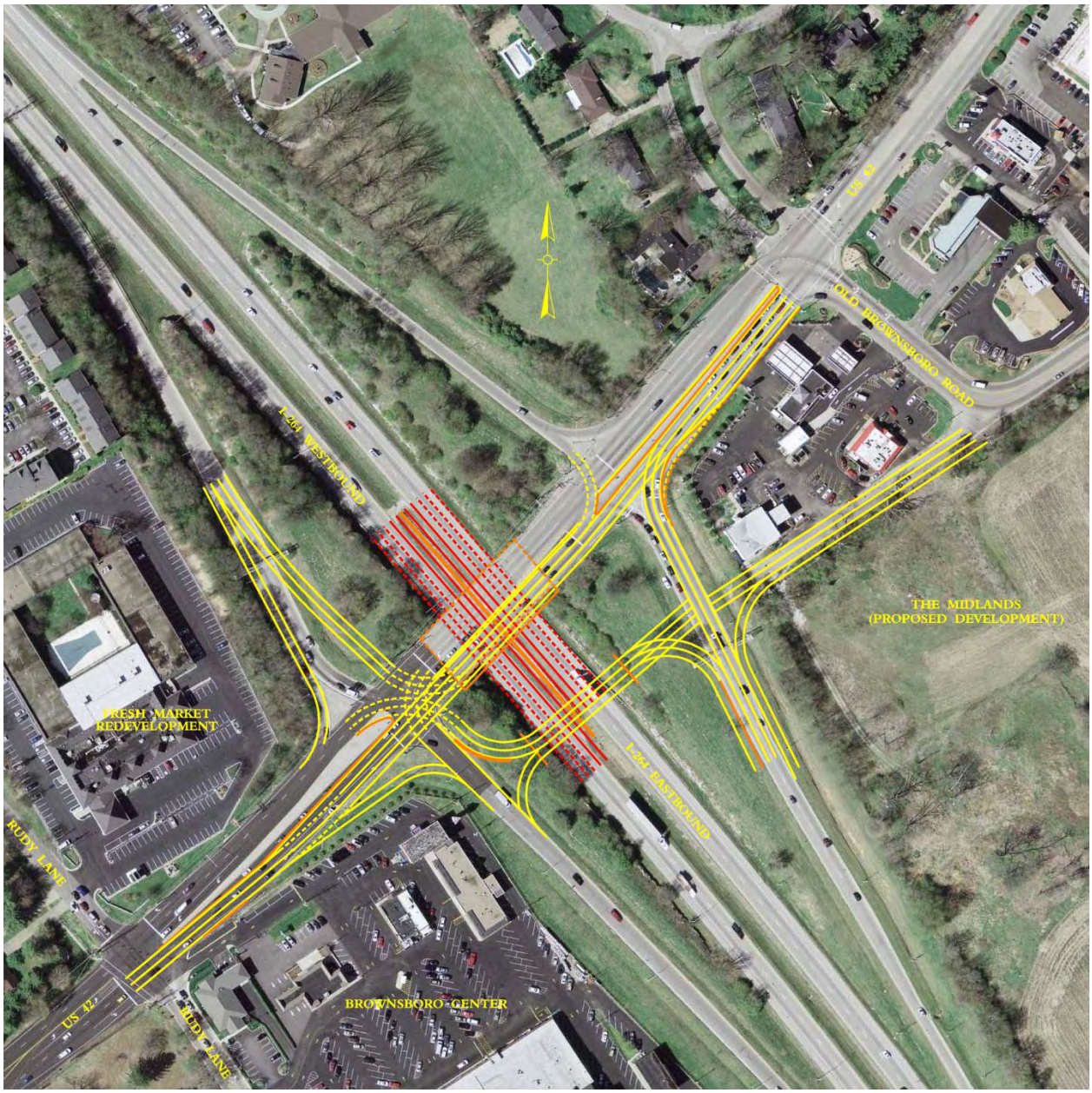

Figure 13 Initial Alternative 4: Split Diamond Interchange (SDI)

Alternative 5: Tight Urban Diamond Interchange (TUDI)

The TUDI is a variation of the conventional diamond interchange with ramp termini intersection spacing less than 400 feet apart. This close spacing allows the two signals to operate together as a 4-phase overlap system. No left-turn storage occurs between the signals. The TUDI is commonly used in urban areas with limited right of way.

The TUDI Alternative would require widening of the existing structure over I-264, and retaining walls would be required along the relocated eastbound ramps.

An advantage of the TDUI is that spacing between the eastbound ramps signal and the Old Brownsboro Road signal would be increased to allow more room for lane choice.

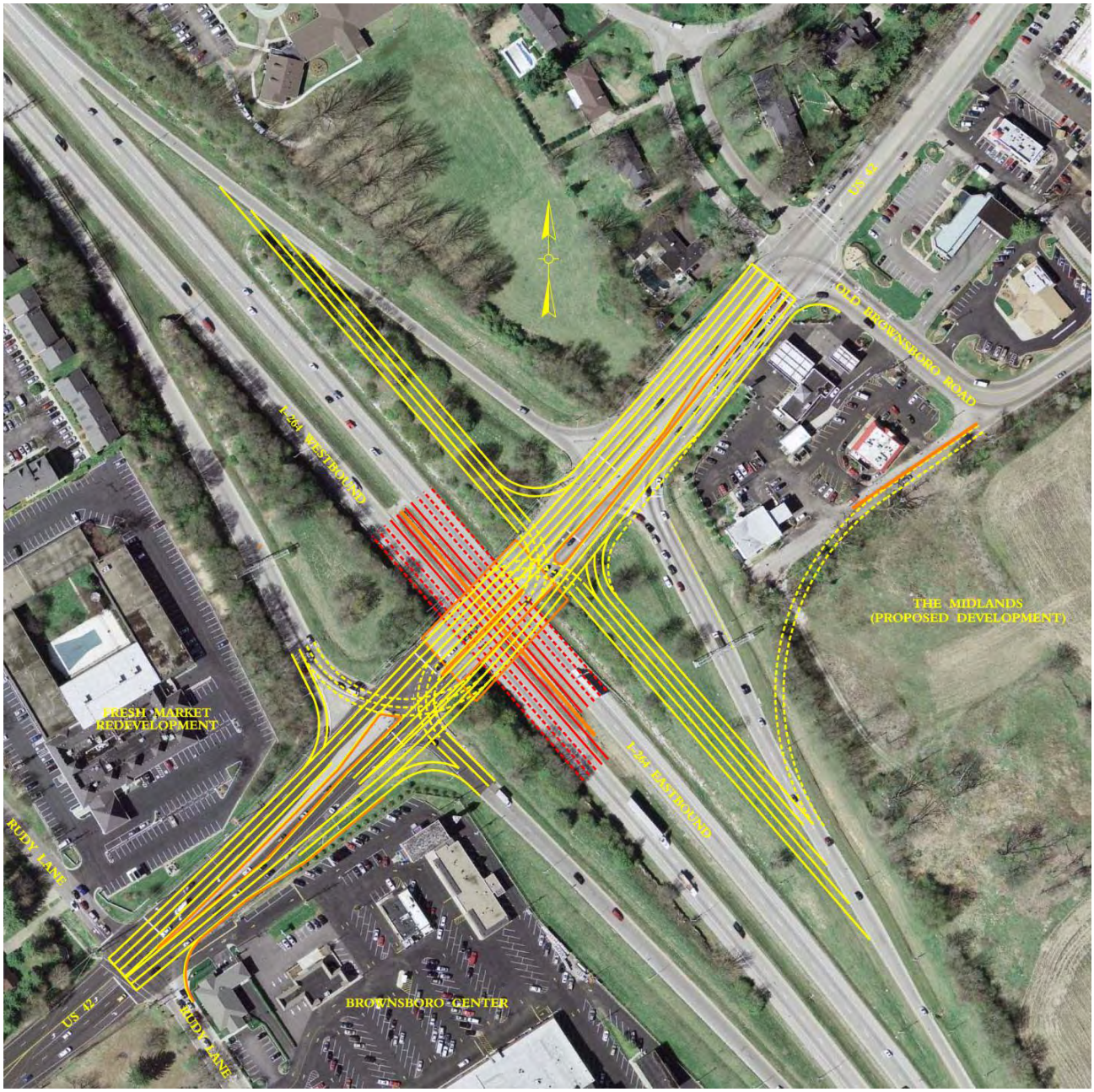

Figure 14 Initial Alternative 5: Tight Urban Diamond Interchange (TUDI)

6.3 Access Management Options

In addition to the 5 interchange alternatives, 12 initial Access Management (AM) Options were also identified at the LEO meeting and follow up team discussions. The options are intended to be either a part of the I-264 / US 42 Interchange project, or they could be broken out as separate access management projects.

The options identified are listed in Table 4, and shown in Figures 15 thru 30. Some options can be used together while others are mutually exclusive. While some options for access management are in conflict with other proposed options, all that were suggested at the LEO Meeting were developed and considered.

Option		Description
AM1		Extend right-turn lane on US 42 EB to Rudy Lane
AM 2		Widen Rudy Lane to provide left-turn lane into Brownsboro Center
AM 3		Close entrance to Brownsboro Center at US 42 and Rudy Lane
AM 4		Add left-turn lane on US 42 EB at Northfield / Old Brownsboro Road
AM 5		Add right-turn lane on US 42 WB at Northfield / Old Brownsboro Road
AM 6		Reduce median barrier on US 42 to extend left-turn lane on US 42 WB to I-264
AM 7		Extend median barrier on US 42 to limit the entrance to Northfield to Right In / Right Out only and allow mid block U-turn on US 42
AM 8		Close Northfield entrance at Old Brownsboro Road and utilize Glenview Avenue
AM 9		Limit through access between US 42 and Old Brownsboro Road between KFC and AAA
AM 10		Close multiple access locations on US 42
AM 11		Close or limit access to / from US 42 at Old Brownsboro Road Option A, B, or C (Use with AM 12 Option A, B, or C)
	A	Right In / Right Out (RIRO) to / from Old Brownsboro Road at US 42
	B	Cul-de-sac short leg of Old Brownsboro Road with access to / from US 42
	C	Cul-de-sac short leg of Old Brownsboro Road
AM 12		Relocate existing turning movements removed by AM 11 between US 42 and Old Brownsboro Road. Option A, B, or C
	A	Access road across from Glenview Avenue between existing developments
	B	Access road near Glenview Avenue normal to US 42
	C	Extend Glen Eagle Road to Lime Kiln Lane.

Figure 15 Initial Access Management Option 1

Figure 16 Initial Access Management Option 2

Figure 17 Initial Access Management Option 3

Figure 18 Initial Access Management Option 4

Figure 19 Initial Access Management Option 5

Figure 20 Initial Access Management Option 6

Figure 21 Initial Access Management Option 7

Figure 22 Initial Access Management Option 8

Figure 23 Initial Access Management Option 9

Figure 24 Initial Access Management Option 10

Figure 25 Initial Access Management Option 11A

Figure 26 Initial Access Management Option 11B

Figure 27 Initial Access Management Option 11C

Figure 28 Initial Access Management Option 12A

Figure 29 Initial Access Management Option 12B

Figure 30 Initial Access Management Option 12C

Chapter 7

7.0 Alternative Evaluation Process

The project team evaluated the alternatives in a two-step process to arrive at two final alternatives to present at the Public Meeting. Alternatives were eliminated at the Alignment Review Meeting held on July 20, 2009, and the FHWA Evaluation Meeting held on August 17, 2009, based on the following criteria.

Right of Way Impacts: Additional acreage and the number of business and residential relocations;

Construction Impacts: Maintenance of Traffic difficulty (high, med, low), ability to utilize the existing bridge, additional bridge lanes required, addition or reduction of traffic signals, impact to existing utilities, and the potential for interim construction;

Measures of Effectiveness (MOE): Objective measures of how well the interchange performed based on the modeling tools used in the evaluation. Measures selected included travel times, level of service, intersection delay, and maximum queue lengths;

Cost: Estimated construction costs only for the initial and FHWA evaluations. Right of way and utility relocation costs were added for the final evaluation. No attempt was made in this study to estimate user costs.

Other: Environmental impacts, bicycle and pedestrian access and driver expectancy;

7.1 Initial Evaluation

The Initial Project Team Evaluation occurred at the Alignment Review meeting. The purpose of the meeting was to select three interchange alternatives to advance for further study, evaluate the impact of the Ramp Split option, and determine which access management options should be carried forward.

Prior to the meeting a second interchange option was identified. The Right In / Right Out (RIRO) Option for Old Brownsboro Road at US 42, formerly shown as access management option 11A, was determined to have the potential to provide a significant positive impact on the congestion in the interchange. The RIRO was added and evaluated as an interchange option.

To evaluate the impacts of each alternative, travel times were measured for the critical routes listed in Table 5.

2030 Travel Times

VISSIM models were created for the No Build and the five initial alternatives using design year 2030 forecasted volumes. The No Build (2030) model created such congested conditions that travel times could not be quantified, so 2012 volumes were used in the No Build condition for comparison purposes.

The two left-turn lanes from US 42 to Westbound I-264 shown in all five initial alternatives could not accommodate the 2030 turning volumes; thus, each of the alternatives was modified to include three left-turning lanes. The three-lane ramp required to accept the turning lanes tapered to a two-lane entrance onto I-264. The additional entrance lane was carried to the new lane added by the Westport Road Interchange construction.

The Ramp Split and RIRO interchange options were modeled as a second and third variation of the Alternative 5 model only to reduce the number of models created. The project team assumed that the Ramp Split and RIRO options would have similar impacts in the other Alternatives. The RIRO option was modeled with the left-turning traffic from Old Brownsboro Road re-routed to existing Lime Kiln Lane (new AM12D) only.

The Travel Time 2030 route selected to measure the benefits of the Old Brownsboro Road RIRO relocation options at Glenview (AM 12A&B), Glen Eagle (AM 12C), and existing Lime Kiln Lane (new AM 12D), was from Herr Lane to Rudy Lane.

Results

The interchange MOE revealed that Alternative 4 SDI was the least effective, and that there was no significant improvement shown between Alternative 2 CDI, and the similar but more expensive Alternative 5 TUDI.

The MOE for the Old Brownsboro Road RIRO relocation revealed that the Glen Eagle option was the most effective. However, the other options were also effective, and the team decided that the final decision on the relocation could possibly be more dependent upon other criteria.

		AM 12B at Glenview	AM 12C at Glen Eagle	AM 12D Existing at Lime Kiln
Right of Way				
Additional Acres	Acres	0.9	1.2	0
Business Relocations	No.	3	0	0
Residential Relocations	No.	0	0	0
Construction				
Maintenance of Traffic	H/M/L	Med	Med	Low
New/Add Signals	No.	0	0	-1
Utility Impacts	H/M/L	Med	Med	Low
Travel Time (2030)		AM/PM	AM/PM	AM/PM
Herr Lane to Rudy Lane	Min.	10.8/11.8	7.1/8.3	-
		w/ ALT 3	*w/ALT 3*	
Cost				
Construction Cost	$	$ 1,600,000	$ 1,600,000	$ 100,000
Other				
Environmental Impacts	H/M/L	Med	Low	Low
Bicycle/Pedestrian Access	H/M/L	High	High	Med
Driver Expectancy	H/M/L	Med	Low	Low

Table 6 Initial Evaluation RIRO Relocation

		No Build	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5		AM 12D
		No Build	SPUI	Compressed Diamond	Diverging Diamond	Split Diamond	Tight Diamond	Ramp Split	Old Brownsboro Rt-In/Rt-Out
Right of Way									
Additional Acres	Acres	0	0.2	0.2	0	0.6	0.2	1.1	0
Business Relocations	No.	0	0	0	0	0	0	0	0
Residential Relocations	No.	0	0	0	0	0	0	0	0
Construction									
Maintenance of Traffic	H/M/L	NA	High	Low	High	Med	Low	Low	Low
Use Existing Bridge	Y/N	Yes	No	Yes	Yes	Yes	Yes	NA	NA
New/Add Bridge lanes	No.	0	1	3	-1	1	3	0	0
New/Add Signals	No.	0	-1	0	0	1	0	0	-1
Utility Impacts	H/M/L	NA	High	Med	Low	Med	Med	Low	Low
Interim Const. Potential	H/M/L	NA	Low	High	Low	Med	Med	High	High
Travel Time (2030)		(2012)AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM
US 42 WB to I-264 SB	Min.	7.3/4.5	4.0/4.8	6.7/6.7	7.1/7.5	9.3/6.2	5.0/8.2	6.7/4.5	7.0/5.8
I-264 SB to US 42 EB	Min.	3.5/5.0	4.4/6.0	4.9/6.0	9.6/7.0	9.0/8.1	3.7/6.9	3.3/6.7	3.3/4.8
I-264 NB to US 42 EB	Min.	2.8/8.3	3.4/8.6	4.5/10.5	3.3/9.0	4.7/8.2	3.8/10.6	3.7/4.0	3.1/6.8
								w/ ALT 5	*w/ ALT 5*
Cost									
Construction Cost	$	$ -	$ 15,400,000	$ 10,500,000	$ 8,600,000	$ 10,800,000	$ 12,300,000	$ 400,000	$ 100,000
Other									
Environmental Impacts	H/M/L	NA	Low	Low	Low	Low	Low	Low	Low
Bicycle/Pedestrian Access	H/M/L	NA	Low	High	High	Med	High	NA	Med
Driver Expectancy	H/M/L	High	Med	High	Low	Low	High	Med	Low

Table 5 Initial Evaluation Interchange Decision Matrix

		AM1	AM2	AM4	AM6	AM7	AM8	AM9	AM10
		Rudy Rt	Rudy Add. Lane	Northfield Lt Turn	Extend WB Left	No 42 Lt & Northfield Rt-In/Rt-Out	Close Northfield Access	Close KFC Cut thru	Close Misc. US 42 Access
Right of Way									
Additional Acres	Acres	0.04	0.12	0	0	0	0	0	0
Business Relocations	No.	0	0	0	0	0	0	0	0
Residential Relocations	No.	0	0	0	0	0	0	0	0
Construction									
Maintenance of Traffic	H/M/L	Low	Low	Low	Low	Low	Low	Low	Low
New/Add Signals	No.	0	0	0	0	0	Maybe	0	0
Utility Impacts	H/M/L	Low	Med	NA	NA	NA	Low	Low	Low
Cost									
Construction Cost	$	$ 160,000	$ 900,000	$ 30,000	$ 50,000	$ 70,000	$ 150,000	$ 30,000	$ 150,000
Other									
Environmental Impacts	H/M/L	Low	Low	Low	Low	Low	Low	Low	Low
Neighborhood Impacts	H/M/L	Low	Low	Low	Low	Med	High	Low	Low
Driver Expectancy	H/M/L	High	High	High	Med	Low	Low	Med	Med

Table 7 Initial Evaluation Access Management Decision Matrix

The project team decided to advance Alternative 1 (SPUI), Alternative 2 (CDI) and Alternative 3 (DDI), the Ramp Split Option, the RIRO Option, and all three RIRO relocation options (Glenview, Glen Eagle, and existing Lime Kiln Lane). The team also decided to advance access management options 1, 2 (combined with 3), 4, 6, 7, 9, and 10 for further analysis.

7.2 FHWA Evaluation

FHWA input occurred at the FHWA Coordination Meeting on August 17, 2009. The purpose of the meeting was for the FHWA to review the three previously advanced alternatives, to discuss the feasibility of the Ramp Split and RIRO interchange options, and to determine which alternatives should be advanced to the Public Meeting.

The Measures of Effectiveness for the FHWA Evaluation included Level of Service (LOS), Intersection Delay, Travel Time (2030), and Queue Length.

According to the Highway Capacity Manual, LOS is defined in terms of delay. Delay results in driver discomfort, frustration, fuel consumption, and lost travel time. Delay is caused by a number of factors including traffic signal timing, geometrics, and traffic congestion at an intersection.

LOS is based on a grade scale from A to F with A being excellent and F being failure. A Level of Service C is desirable, and D is acceptable in an urban setting.

LOS	Intersection Delay (Seconds per Vehicle)	
	Signalized	Unsignalized
A	<=10	<=10
B	>10 and <=20	>10 and <=15
C	>20 and <=35	>15 and <=25
D	>35 and <=55	>25 and <=35
E	>55 and <=80	>35 and <=50
F	>80	>50

Table 8 LOS Criteria for Intersections

2012 Delay and LOS

The Highway Capacity Software (HCS) was used to determine delay and Level of Service for Rudy Lane, West Ramps, East Ramps, and Old Brownsboro Road intersections.

The LOS for all intersections is below the accepted value in the AM and PM Peak with the exception of Rudy Lane during the AM. Each intersection exceeds capacity, and

results in undesirable delay times for drivers in 2012. The Project Team discussed this situation and due to the proximity of adjacent interchanges on I-264 and right of way and utility impacts for flyover movements, alternatives that would achieve LOS D were not deemed feasible at this location.

2030 Delay and Level of Service

To determine the 2030 Delay and LOS for the intersections, HCS was used for the 2030 AM and PM Peak hour volumes.

The US 42/Rudy Lane intersection does not change delay and LOS depending on the interchange alternative selected. The intersection remains LOS D in the AM and LOS E in the PM for each of the alternatives.

The US 42/I-264 West Ramps operate at LOS F in the AM and PM peak hour for Alternatives 1 and 2 due to the heavy left turn volumes. Alternative 3 improves to LOS C in the AM and D in the PM due to the two-phase signal and left turns being free flow.

The US 42/I-264 East Ramps operate at LOS F in the AM and PM peak hour for Alternatives 1, 2, and 3 due to the heavy turn volumes. The ramp split improves Alternative 2 to LOS D in the AM and E in the PM due to the reduced volume that travels to the US 42 intersection.

The Old Brownsboro Road intersection operates at LOS F with all alternatives due to the heavy volumes turning left from Old Brownsboro Road.

2030 Travel Times

To determine the benefits of each alternative on the entire study area, travel time analysis was chosen for the same critical routes described in Table 5.

VISSIM models of the three intermediate alternatives were computed with and without the Ramp Split option. Two additional models were created to include the impacts of the RIRO option with and without the Ramp Split option with Alternative 1.

The study showed that the PM peak hour was the critical time period for all movements. During the AM peak hour, Alternative 1 and 1S resulted in a shorter travel time for the critical movement (US 42 WB to I-264 WB) when compared to other alternatives. During the PM Peak, the heavy volumes are traveling eastbound on US 42 from I-264. Alternative 3 results in shorter travel time durations for the I-264 WB to US 42 EB movement, and Alternative 3S has the shortest travel time for I-264 EB to US 42 EB when compared to other alternatives.

The Ramp Split option improves the travel times of each alternative significantly by eliminating the conflicts along US 42. The RIRO Option with and without the Ramp Split significantly reduced the PM travel times for both directions of I-264 to US 42 EB with Alternative 1.

2012 Queue Lengths

A concern identified early by local officials and KYTC personnel was the safety impact from vehicles queuing onto I-264 at both off ramps. To evaluate queue lengths, VISSIM was used to determine the maximum queue lengths for each of the Alternatives. Queue length measures the distance in which vehicles are waiting to be served by the system.

Four locations were identified by the project team as having critical queue lengths.

- Eastbound I-264 Exit Ramp
- Westbound I-264 Exit Ramp
- Westbound US 42 to Westbound I-264 Entrance Ramp
- Old Brownsboro Road to Westbound US 42

From 2012 analysis, the I-264 Eastbound exit ramp experiences significant delays in the PM peak, which results in vehicles queuing on I-264. During the AM Peak, the Westbound US 42 left-turn movement onto the I-264 WB On-Ramp experiences significant queues due to the high volume. Additionally, the left turns from Old Brownsboro Road to US 42 WB experience long queues during both the AM and PM peaks due to the demand along US 42.

2030 Queue Length

The maximum queue length represents the greatest length vehicles are backed up at any point during the one-hour simulation. This analysis determines if vehicles would queue onto I-264 during the design year. Each alternative experienced long maximum queues during the design hour due to the heavy turn volumes and congestion along US 42.

During the AM Peak, the queuing occurs along US 42 due to the heavy left-turn volumes from US 42 WB to the I-264 WB On-Ramp. The PM Peak queues are on the I-264 EB Off-Ramp to US 42 EB and I-264 WB Off-Ramp to US 42 EB. The Ramp Split option eliminates the I-264 EB Off-Ramp queue by providing a free flow movement to vehicles with a destination along Old Brownsboro Road.

		No Build	ALT 1	ALT 1S	ALT 2	ALT 2S	ALT 3	ALT 3S	AM 12D	AM 12DS
		No Build	SPUI	SPUI w/Ramp Split	Compressed Diamond	Compressed Diamond w/ Ramp Split	Diverging Diamond	Diverging Diamond w/ Ramp Split	Old Brownsboro Rt-In/Rt-Out	Old Brownsboro Rt-In/Rt-Out w/ Ramp Split
Right of Way										
Additional Acres	Acres	0	0.2	1.3	0.2	1.3	0	1.1	0	0
Business Relocations	No.	0	0	0	0	0	0	0	0	0
Residential Relocations	No.	0	0	0	0	0	0	0	0	0
Construction										
Maintenance of Traffic	H/M/L	NA	High	High	Low	Low	High	High	Low	Low
Use Existing Bridge	Y/N	Yes	No	No	Yes	Yes	Yes	Yes	NA	NA
New/Add Bridge lanes	No.	0	1	1	3	3	0	0	0	0
New/Add Signals	No.	0	-1	-1	0	0	0	0	-1	-1
Utility Impacts	H/M/L	NA	High	High	Med	Med	Low	Low	Low	Low
Interim Const. Potential	H/M/L	NA	Low	Low	High	High	Low	Low	High	High
Level of Service (2030) HCS		(2012)AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM
Rudy Lane	LOS	C/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E	D/E
West Ramps	LOS	F/F	F/F	F/F	F/F	F/F	C/D	C/D	F/F	F/F
East Ramps	LOS	F/F			F/F	D/E	F/F	F/F		
Old Brownsboro Road	LOS	F/F	F/F	F/F	F/F	F/F	F/F	F/F	-	-
Intersection Delay (2030) HCS		(2012)AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM
Rudy Lane	Sec.	28/70	42/75	42/75	42/75	42/75	42/75	42/75	42/75	42/75
West Ramps	Sec.	209/236	161/193	161/190	167/235	167/236	35/49	35/49	161/193	161/190
East Ramps	Sec.	188/238			121/114	54/55	130/300	130/300		
Old Brownsboro Road	Sec.	300/300	410/300	410/300	410/300	410/300	410/300	410/300	-	-
Travel Time (2030) VISSIM		(2012)AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM w/Alt 1	AM/PM w/Alt 1
US 42 WB to I-264 WB	Min.	7.3/4.5	4.0/4.8	4.0/4.5	6.7/6.7	7.5/7.9	7.4/8.4	7.3/7.7	4.9/5.0	4.8/5.0
I-264 WB to US 42 EB	Min.	3.5/5.0	4.4/8.0	3.9/5.5	4.9/6.0	3.5/8.0	3.7/5.2	4.3/5.8	4.8/4.7	4.9/4.0
I-264 EB to US 42 EB	Min.	2.8/8.3	3.4/11.5	2.9/4.5	4.5/10.5	3.5/5.0	3.8/11.8	2.7/3.4	2.5/4.9	2.4/3.5
Max. Queue Length (2030) VISSIM		(2012)AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM
I-264 WB Off-Ramp	Feet	300/650	1500/3600	500/3500	3050/3060	550/3600	420/530	480/408	3500/1030	1270/1060
I-264 EB Off-Ramp	Feet	250/4000	800/4000	140/300	3050/4060	2900/1100	3200/4000	857/40	490/4050	150/65
US 42 WB Left Turns	Feet	4000/3800	1620/1500	1640/850	3020/4000	3020/4000	-	-	3850/3890	1690/700
Old Brownsboro Road Lt Turns	Feet	2800/1800	3450/3500	3500/4000	3040/4060	3050/3800	4050/4040	4050/4050	30/20	50/60
Cost										
Construction Cost	$	$ -	$ 15,400,000	$ 15,800,000	$ 10,500,000	$ 10,900,000	$ 9,000,000	$ 9,400,000	$ 100,000	$ 500,000
Other										
Environmental Impacts	H/M/L	NA	Low	Low	Low	Low	Low	Low	Low	Low
Bicycle/Pedestrian Access	H/M/L	NA	Low	Low	High	High	High	High	Med	Med
Driver Expectancy	H/M/L	High	Med	Med	High	High	Low	Low	Low	Low

Table 9 FHWA Evaluation Decision Matrix

Results

The FHWA recommended elimination of Alternative 3 (DDI) based on the low level of driver familiarity and driver expectancy of the interchange type. The FHWA also recommended that the RIRO option become an integral part of the two remaining alternatives because it showed a significant improvement on both exit ramps during the PM peak hour.

The three options at Glenview, Glen Eagle, and existing Lime Kiln Lane to redirect full access between Old Brownsboro Road and US 42 were advanced.

The FHWA had concerns over design speed and signing for the Ramp Split Option. These concerns were addressed by showing that spacing was adequate to provide appropriate deceleration to the 35 mph ramp to Old Brownsboro Road. A Preliminary Signing Plan (Figure 31) was also developed to provide a concept demonstrating how signing could be accomplished with the ramp split. Based on these discussions, the FHWA agreed to advance the Ramp Split Option to the IJS stage. These issues will need to be further explored in the Interchange Justification Study.

Access Management Options 4, 6, 7, and 8 were eliminated due to the RIRO implementation in the remaining Alternatives. The US 42 U-Turn in Option 7 was also eliminated. AM Options 1, 2, 3, 9, and 10 were advanced to the Public Meeting.

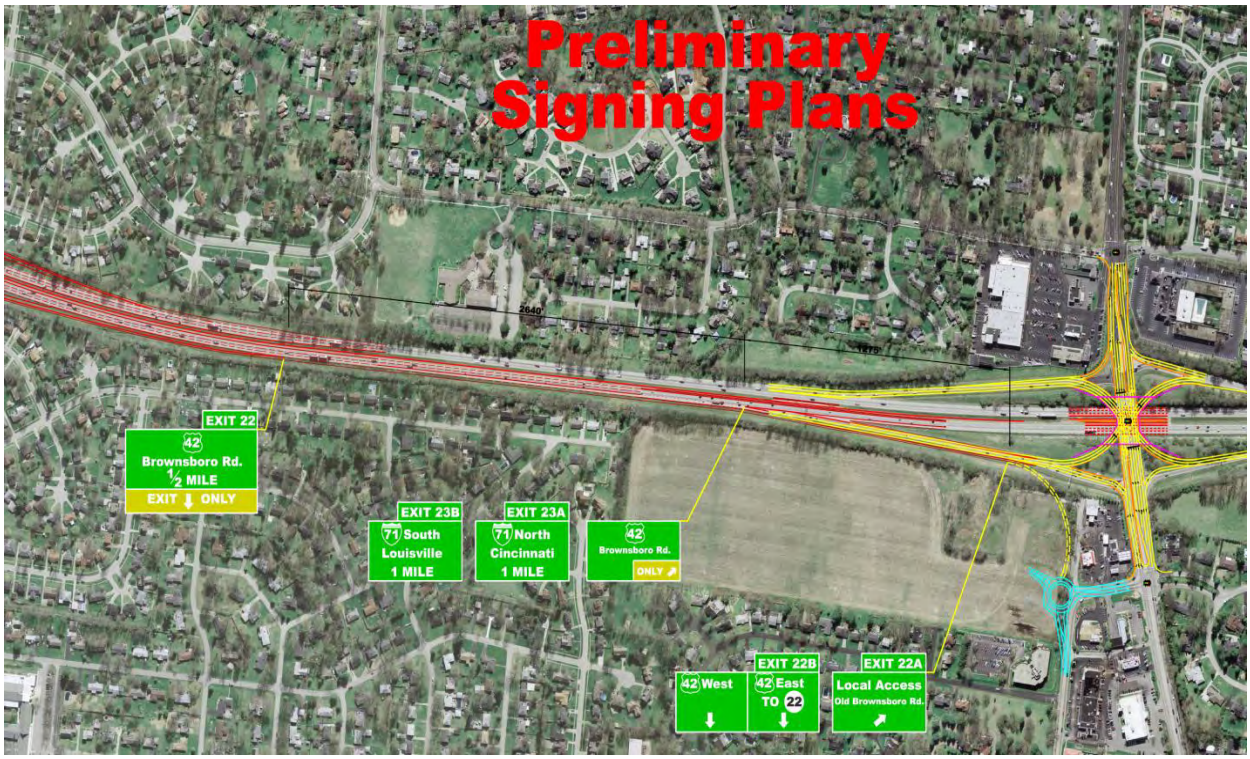

Figure 31 Preliminary Signing Plan for Ramp Split

Chapter 8

8.0 Public Involvement

A Public Meeting was held at Christ Church United Methodist on October 13, 2009, to provide an opportunity for the public to voice their opinion on the final alternatives. The meeting included a PowerPoint presentation of the project history and the methodology of the study. The final alternatives were displayed and discussed in an open house format. Attendees' questions were addressed in a one-on-one interaction.

After the meeting, KYTC learned that a number of interested parties either did not receive notification of the meeting or were unable to attend. In order to accommodate those parties, a second (continuation) meeting was held at KYTC District 5 offices on October 30, 2009. The second meeting included representatives from the Midland development and elected officials from Northfield.

8.1 Final Interchange Alternatives

The final interchange alternatives presented at the Public Meeting(s) were:

- Alternative 1-SPUI with RIRO
- Alternative 1S-SPUI with RIRO and RS
- Alternative 2-CDI with RIRO
- Alternative 2S-CDI with RIRO and RS

*RIRO is the Right In / Right Out at Old Brownsboro Road.
*RS is the Ramp Split Option to Old Brownsboro Road.

The FHWA recommendation to include the RIRO as an integral part of the final interchange alternatives also required that one of the three options to restore the movements between US 42 and Old Brownsboro Road be included. The three options to restore the movements were:

- Glenview Avenue Option
- Lime Kiln Realignment Option (at Glen Eagle)
- Existing Lime Kiln Lane Option

The Glenview option, (modified from AM 12A and AM 12B) was a new route to reconnect Old Brownsboro Road and US 42 at Glenview Avenue. Glenview Avenue is an existing entrance to Northfield subdivision between the RIRO at the Northfield Drive / Old Brownsboro Road / US 42 intersection and the entrance to Holiday Manor. A new traffic signal would be installed to replace the signal removed at the RIRO.

The Lime Kiln realignment Option (AM 12C) was a realignment of Lime Kiln Lane and Glen Eagle Drive to reconnect access between US 42 and Old Brownsboro Road east of Holiday Manor at Glen Eagle Drive. A new traffic signal would be installed at the US 42 / Glen Eagle Drive intersection. The Existing Lime Kiln Lane Option (AM 12D) was a re-routing of traffic form Old Brownsboro Road via existing Lime Kiln Lane to its severely skewed intersection with US 42 east of Glen Eagle Drive.

The final interchange alternatives, with RS Option and RIRO relocation options presented are shown in Figures 32 and 33.

The roundabout shown with the interchange alternatives is not a part of this project. It was presented to reflect the current plans of the Midlands development. The RIRO may lead the Midlands to modify those plans. A final decision on the roundabout has not been made by the developer.

8.2 Final Access Management Options

The final Access Management Options 1, 2, 3, 9, and 10 presented are shown in figures 34 thru 37.

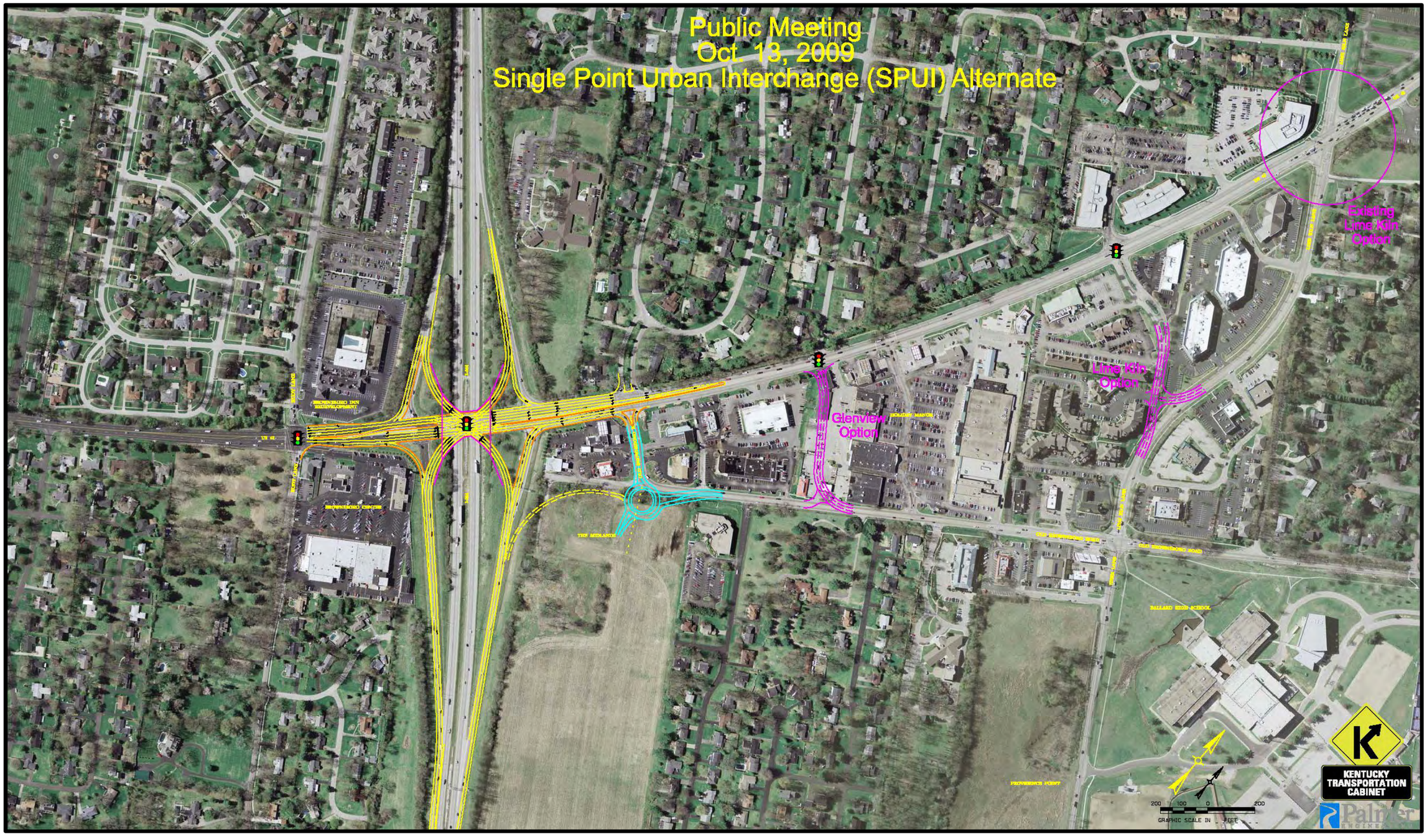

Figure 32 Final Alternative 1--SPUI w/ RIRO

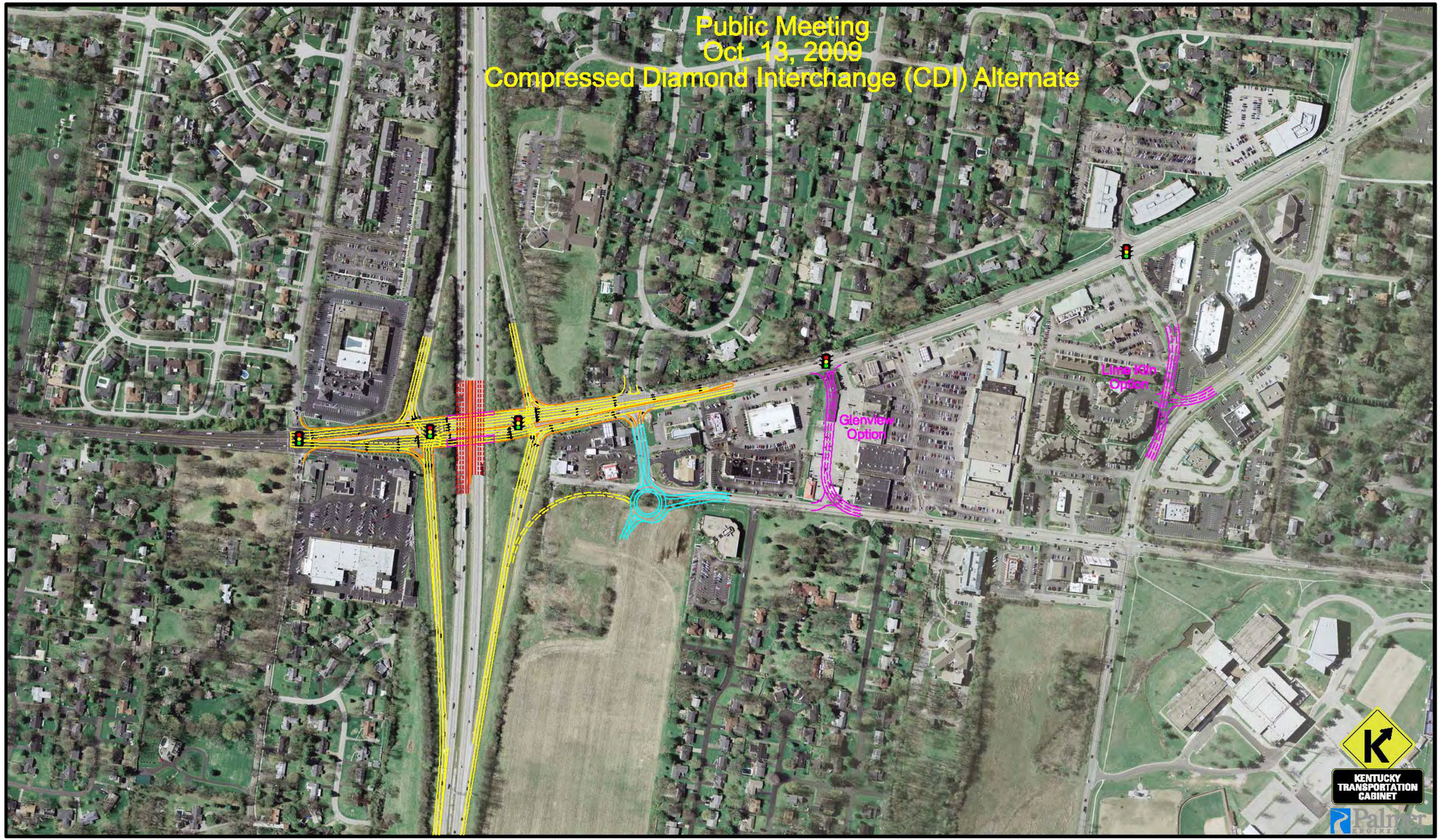

Figure 33 Final Alternative 2--CDI w/ RIRO

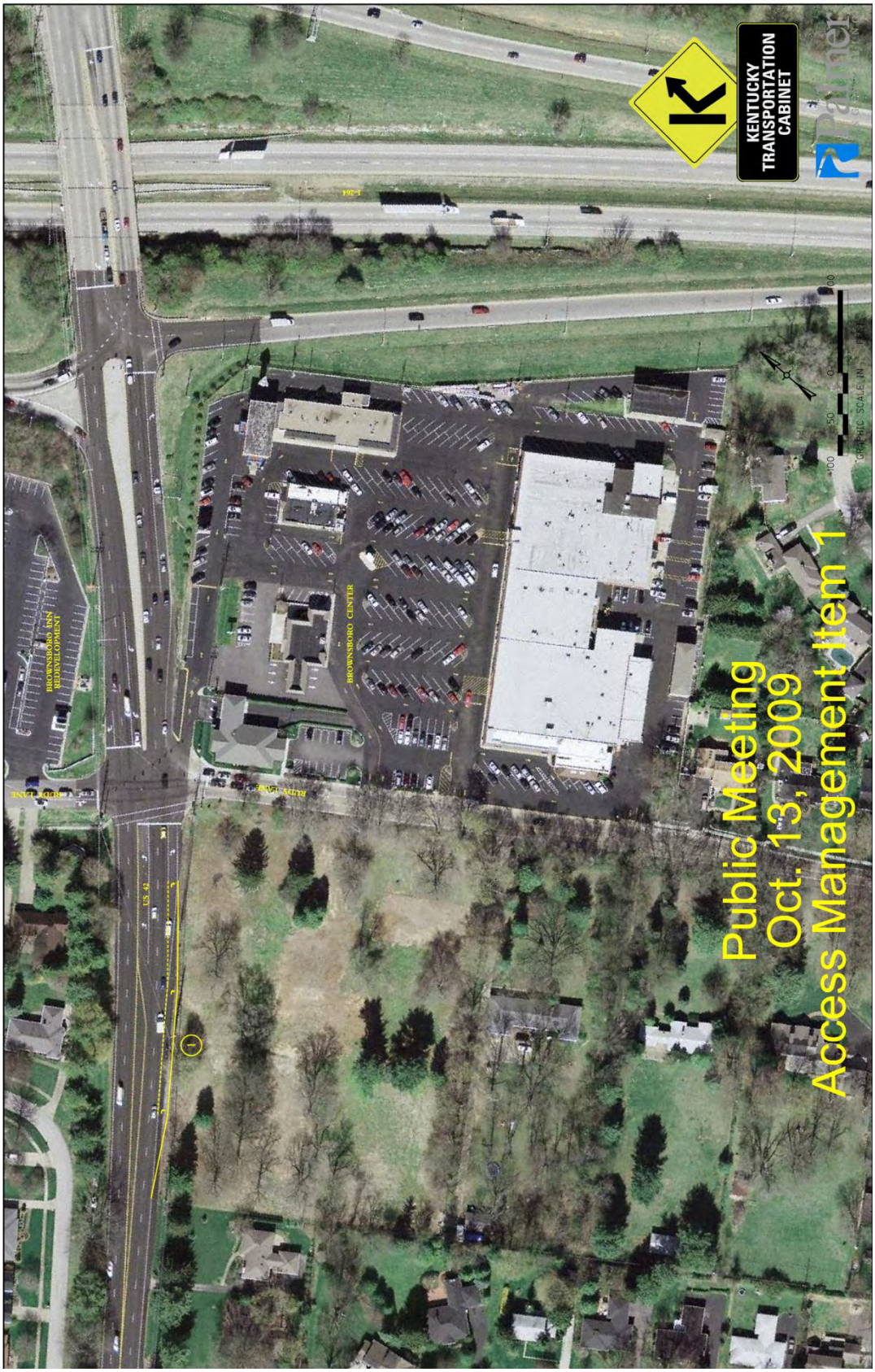

Figure 34 Final Access Management Option 1

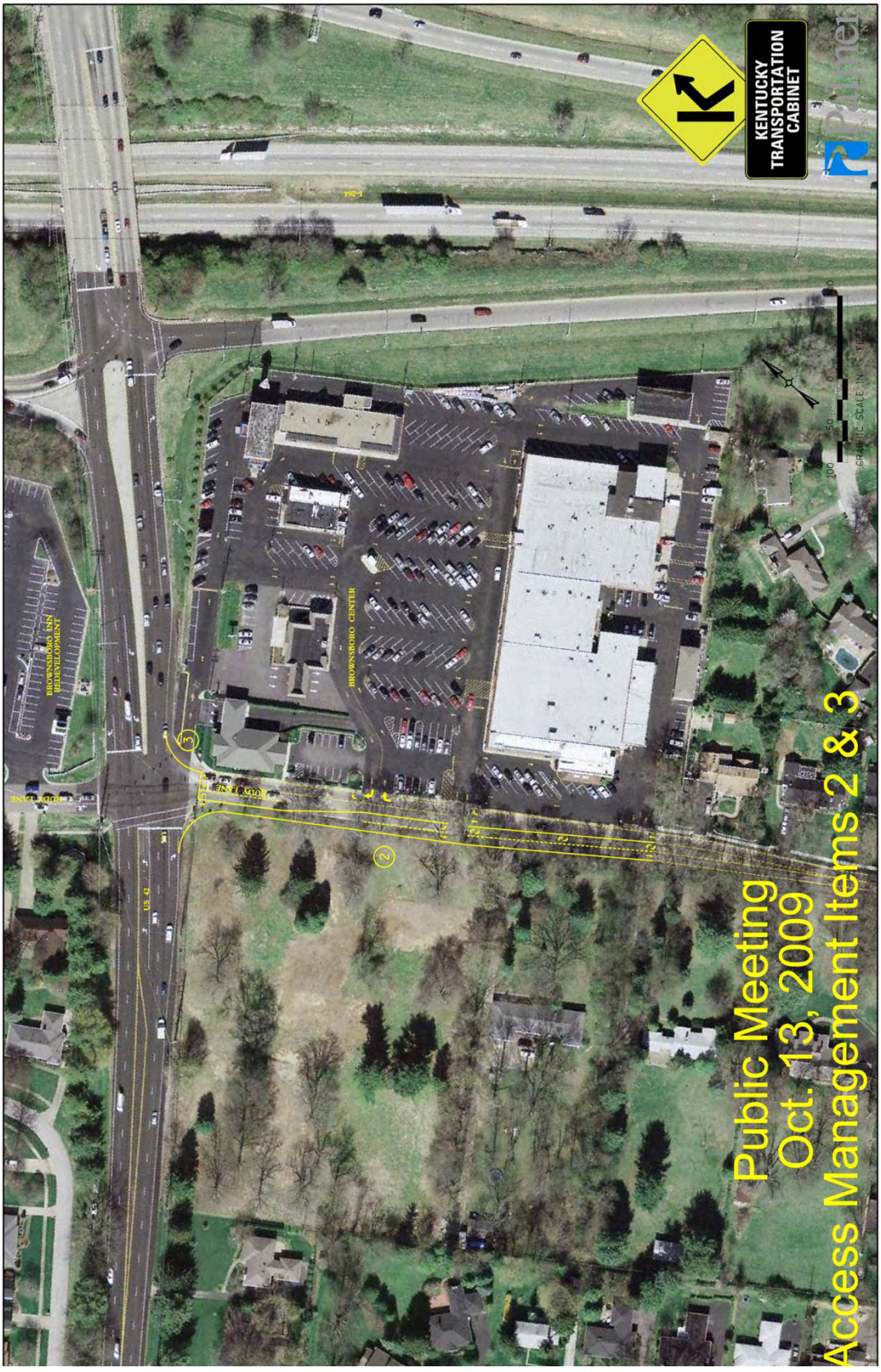

Figure 35 Final Access Management Option 2 and Option 3

Figure 36 Final Access Management Option 9

Figure 37 Final Access Management Option 10

8.3 Public Input

To assist in the collection and tabulation of public input, a questionnaire was provided to attendees of both meetings. At the second meeting, the Mayor of Northfield was provided multiple questionnaires to distribute to his constituents.

A total of 56 questionnaires were returned. In addition to the questionnaires, 40 letters were received. If two people were named on a questionnaire or letter, the responses were counted twice. A total of 113 people responded by questionnaires and/or letters. If any questionnaire questions were clearly answered in the letters, they were counted. If a significant number of comments from the questionnaires or letters provided a response that was not shown on the questionnaire, those comments were also tabulated. The questionnaire responses are shown in Table 10.

Most of the people who responded were local residents who travel the corridor multiple times daily.

Alternative 1 SPUI was preferred by 53 of the 56 people who indicated a preference of the two Final Interchange Alternatives presented. However, 41 people commented that nothing should be done with the interchange until the new Westport Road Interchange was open long enough to show how the US 42 traffic volumes would be affected. A total of 14 comments (including 10 of the 39 who preferred waiting for the impact of Westport Road) indicated a preference for other possible interchange options such as a new interchange at I-71 and US 42.

The Ramp Split Option was preferred by 59 of the 66 responses. Most comments were in favor of the Ramp Split, while a few had concerns that the rate of traffic that would be put onto Old Brownsboro Road would be too high.

The Glenview Option for the RIRO access connector was preferred by 44 people. Of the 44, 10 comments indicated that additional improvements and a traffic signal would be required on existing Glenview to handle the additional traffic into and out of Northfield. However, another 10 of the 44 who indicated a preference for the Glenview Option commented that they thought that Glenview was the *best option*, but they would prefer that the RIRO not be implemented. In total, 37 people opposed the RIRO. Of the 37 who stated opposition to the RIRO, 24 cited safety concerns regarding emergency vehicle access to Northfield and the travel time to the Glenview Manor nursing home as primary concerns.

The Lime Kiln realignment to Glen Eagle and the existing Lime Kiln Lane Options were each preferred by 10 people. Comments from 11 people stated that they were against the realignment of Lime Kiln because it would have a negative impact on the businesses located there.

Of the 61 people who ranked the benefits of the proposed options, 26 indicated the Ramp Split, and 25 indicated the Interchange Improvements provided the most benefit. The Access Management Options ranked third with nine.

In addition to the written responses, informal comments were taken from attendees at the October 13, 2009, Public Meeting regarding the five Access Management options shown. All of those polled supported the improvements at Rudy Lane shown in AM Options 1, 2, and 3. There was a general indifference, but no one was opposed to the

entrance consolidations along US 42 shown in AM Options 9 and 10. One person recommended expanding AM Option 10 to include additional entrance consolidation measures along Old Brownsboro Road.

	Are you a Business or Residential Owner in the project area?
13	Business
90	Residential
4	Other: Work in area
	How often do you travel this portion of the US 42 corridor?
53+	Multiple times daily (+ only 9 people of the 39 local resident letters specifically stated travel freqency)
9	Once a day
1	Once a week
1	Rarely
	Which interchange configuration do you prefer?
53	Single Point Urban Interchange (SPUI)
3	Compressed Diamond Interchange (CDI)
41	Comment: None - Do nothing until effect of Westport Road Interchange has been determined
14	Comment: None - Study other options, new interchange at I-71 and US 42
	What is your preference for the Ramp Split to Old Brownsboro Road option?
59	Like
7	Dislike
	With Old Brownsboro Road converted to a right in/right out access which connector option do you prefer?
44	Glenview option
10	Lime Kiln option
10	Existing Lime Kiln
37	Comment: Do Nothing - Don't convert to right in / right out.
24	Comment: RIRO is saftey concern because it impedes emergency vehicles to Northfield
11	Comment: Do not realign Lime Kiln Lane
10	Comment: Glenview will need traffic signal and other improvements
	Which of the proposed options would you rank as being the most beneficial?
25	Interchange improvements
26	Old Brownsboro Road Ramp Split
9	Access management
1	Other: Add Left turn lane into Northfield

Table 10 Public Meeting Questionnaire Responses

Chapter 9

9.0 Interdisciplinary Team Meeting

The Final Evaluation occurred at the Interdisciplinary Team (IDT) Meeting held at KYTC District 5 offices on July 6, 2010.

The Measures of Effectiveness for the Final Evaluation again included Level of Service (LOS), Intersection Delay, Travel Time (2030), and Queue Length.

9.1 Interchange Alternatives

2030 Delay and Level of Service

HCS analysis showed that even though the LOS remained F, the actual delay on both exit ramps decreased when the RIRO was added to Alternatives 1 and 2. Alternates 1S and 2S (Ramp Split Option) further improved both exit ramps in the PM peak hour. Alternative 1 and 1S had slightly lower total delays.

2030 Travel Times

VISSIM 2030 models of Alternatives 1 and 2 with the RIRO at Old Brownsboro Road were developed. Two additional models, 1S and 2S, were created to include the impacts of the Ramp Split Option with each. Alternatives 1 and 1S (SPUI) outperformed Alternatives 2 and 2S (CDI) in travel time for all three critical movements.

2030 Queue Length

Alternatives 1 & 2 had similar queue lengths during the AM and PM peaks for both exit ramps, and westbound US 42 to westbound I-264. When the Ramp Split Option was added, Alternative 1S (SPUI) showed the most significant improvement.

		No Build	ALT 1	ALT 1S	ALT 2	ALT 2S	RIRO relocation			AM 1	AM 2	AM 3	AM 9
		No Build	SPUI w/ RIRO	SPUI w/ RIRO w/ Ramp Split	CDI w/ RIRO	CDI w/ RIRO w/ Ramp Split	at Glenview	at Glen Eagle	at Existing Lime Kiln	Right Turn for Rudy Lane	Add Lane on Rudy Lane	Close Entrance at Rudy Lane	Close cut thru at KFC
Right of Way													
Additional Acres	Acres	0	0.2	1.3	0.2	1.3	0.9	1.2	0	0.04	0.12	0	0
Business Relocations	No.	0	0	0	0	0	3	0	0	0	0	0	0
Residential Relocations	No.	0	0	0	0	0	0	0	0	0	0	0	0
Construction													
Maintenance of Traffic	H/M/L	NA	High	High	Low	Low	Med	Med	Low	Low	Low	Low	Low
Use Existing Bridge	Y/N	Yes	No	No	Yes	Yes	-	-	-	-	-	-	-
New/Add Bridge lanes	No.	0	1	1	3	3	-	-	-	-	-	-	-
New/Add Signals	No.	0	-1	-1	0	0	0	0	-1	0	0	0	0
Utility Impacts	H/M/L	NA	High	High	Med	Med	Med	Med	Low	High	Med	Low	Low
Interim Const. Potential	H/M/L	NA	Low	Low	High	High	-	-	-	-	-	-	-
Level of Service (2030) HCS		*(2012)AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	-	-	-	-	-	-	-
Rudy Lane	LOS	C/E	D/E	D/E	D/E	D/E	-	-	-	-	-	-	-
West Ramps	LOS	F/F	F/F	F/F	F/F	F/F	-	-	-	-	-	-	-
East Ramps	LOS	F/F			B/F	B/C	-	-	-	-	-	-	-
Old Brownsboro Road	LOS	F/F	- / -	- / -	- / -	- / -	-	-	-	-	-	-	-
Intersection Delay (2030) HCS		*(2012)AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	-	-	-	-	-	-	-
Rudy Lane	Sec.	28/70	42/75	42/75	42/75	42/75	-	-	-	-	-	-	-
West Ramps	Sec.	209/236	107/147	116/124	116/137	116/137	-	-	-	-	-	-	-
East Ramps	Sec.	188/238			20/96	13/26	-	-	-	-	-	-	-
Old Brownsboro Road	Sec.	300/300	- / -	- / -	- / -	- / -	-	-	-	-	-	-	-
Travel Time (2030) VISSIM		*(2012)AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	-	-	-	-
US 42 WB to I-264 WB	Min.	7.3/4.5	4.8/7.4	4.8/7.4	6.7/10.4	6.7/10.4	-	-	-	-	-	-	-
I-264 WB to US 42 EB	Min.	3.5/5.0	5.2/8.5	6.0/7.3	3.4/5.0	3.4/5.0	-	-	-	-	-	-	-
I-264 EB to US 42 EB	Min.	2.8/8.3	2.5/6.0	2.5/2.5	3.2/8.4	4.3/3.9	-	-	-	-	-	-	-
Herr Lane to Rudy Lane	Min.	-	-	-	-	-	10.8/11.8	7.1/8.3	-	-	-	-	-
Max. Queue Length (2030) VISSIM		*(2012)AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	*AM/PM*	-	-	-	-	-	-	-
I-264 WB Off-Ramp	Feet	300/650	580/1800	480/3500	450/1850	550/2300	-	-	-	-	-	-	-
I-264 EB Off-Ramp	Feet	250/4000	400/6500	100/100	450/6550	600/1600	-	-	-	-	-	-	-
US 42 WB Left Turns	Feet	4000/3800	3850/3800	3800/3800	3750/3800	4100/4100	-	-	-	-	-	-	-
Old Brownsboro Road Lt Turns	Feet	2800/1800	-	-	-	-	-	-	-	-	-	-	-
Cost													
Construction Cost	$	$ -	$ 15,400,000	$ 15,800,000	$ 13,600,000	$ 14,000,000	$ 1,600,000	$ 1,600,000	$ 100,000	$ 160,000	$ 900,000	$ 30,000	$ 30,000
Other													
Environmental Impacts	H/M/L	NA	Low	Low	Low	Low	Med	Med	Low	Low	Low	Low	Low
Bicycle/Pedestrian Access	H/M/L	NA	Low	Low	High	High	High	High	Med	-	-	-	-
Driver Expectancy	H/M/L	High	Med	Med	High	High	Med	Med	Low	High	High	Med	Med
Neighborhood Impacts	H/M/L									Low	Low	Low	Low

Table 11 Final Evaluation Decision Matrix

9.2 Interim Solutions

The four Interim Solutions identified for this project were intended to be interim construction projects that would improve the interchange performance and remain in place with ultimate construction of either final alternative.

To determine the traffic benefits of making Interim Solutions, VISSIM simulations or HCS+ analysis were developed for each of the scenarios. It is anticipated that these improvements would only be temporary and would have to be followed by other improvements in the future; thus, 2012 and 2020 traffic volumes were evaluated.

The four interim solutions identified and evaluated were:

IS 1: Convert the Old Brownsboro Road Intersection at US 42 to Right-In / Right-Out.

The RIRO at Old Brownsboro Road has the most positive impact on congestion of all of the proposed improvements. Elimination of the traffic signal 450' east of the interchange reduces the congestion by shifting the Old Brownsboro Road traffic away from the interchange and creating better spacing between signals. The RIRO would also require the implementation of one of the RIRO relocation options to reestablish the full access between Old Brownsboro Road and US 42. Based on public input, the Glenview connection is included in Table 12.

IS 2: Provide Ramp Split to Old Brownsboro Road.

The Ramp Split Option was supported at the Public Meeting and was ranked by the attendees as the most beneficial of the proposed improvements. The Ramp Split would keep a high percentage of westbound I-264 exiting traffic off the US 42 corridor. This option would reduce congestion on US 42, shorten the queues on the eastbound exit ramp, and reduce the possibility of the queue backing up onto I-264. The FHWA has indicated that the Ramp Split Option would not be approved without implementing the RIRO at Old Brownsboro Road.

IS 2A: Alternative Ramp Split to Old Brownsboro Road.

A variation of the Ramp Split Option would be to provide a dedicated lane that is separated by a raised median adjacent to the ramp. The dedicated lane would tie to the existing Old Brownsboro Road near the US 42 intersection. As with the other Ramp Split option a high percentage of eastbound I-264 exiting traffic would be removed from the US 42 corridor resulting in reduced congestion, shorter queues on the eastbound exit ramp, and the reduction of queues onto I-264. The traffic operations, summarized in Table 12, indicate that the LOS of the intersection are acceptable but the queue lengths are substantially higher due to the weave condition and combining of US 42 with a destination along Old Brownsboro. The weave could be eliminated by providing two lanes along Old Brownsboro in this direction but would increase the right of way and utility impacts. This option would require the right of way acquisition of the Marathon Gas Station, Dairy Queen, and Goodwill due to loss of access.

IS 3: Close the US 42 entrance to Brownsboro Center, and construct the channelized turn lane to westbound I-264.

Closing the US 42 entrance to the Brownsboro Center was evaluated as

Access Management Option AM 3. Closing this entrance allows for the maximum length channelized turn lane to westbound I-264. This option would separate the turning movement from US 42 traffic and, thus, reduce congestion.

IS 4: Construct the second lane of the westbound I-264 entrance ramp.

Constructing the second entrance lane onto westbound I-264 would eliminate the congestion where the existing ramp tapers to one lane just prior to the gore. In order to add the second lane, the construction would have to also include adding the third lane on westbound I-264 to the new third lane added by the Westport Road interchange construction. This 1800' lane would impact approximately 500' of the newly constructed noise walls.

		2012 No Build *AM/PM*	**2012** *AM/PM*	**2020** *AM/PM*	**Construction Cost**
Interim Solution #1	Herr to Rudy Travel time (min)	25.2/14.4	14.1/9.5	14.5/9.8	$ 1,675,000
Interim Solution #2	I-264 EB to Herr Travel time (min)	10.5/9.5	6.1/7.5	8.2/9.1	$ 600,000
Interim Solution #2A	I-264 EB to Herr Travel time (min)	10.5/9.5	6.8/8.5	8.9/9.9	$ 800,000
Interim Solution #3	Rudy/US 42	LOS D/C	LOS D/C	LOS D/C	$ 40,000
Interim Solution #4	I-264 WB merge	LOS D/F	LOS C/C	LOS C/D	$ 2,000,000

		2012		**2020**		**2030**	
		AM/PM	**Max Queue (ft)**	***AM/PM***	**Max Queue (ft)**	***AM/PM***	**Max Queue (ft)**
Interim Solution #2	I-264 EB Ramp	B/C	225/675	B/C	225/675	B/C	250/750
Interim Solution #2A	I-264 EB Ramp	A/C	300/1375	A/C	425/1750	A/C	450/2000

Table 12 Interim Solutions Additional Analysis

9.3 Low-Cost Options

The three Low-Cost Options identified for this project were intended to be options that could be constructed with the existing interchange configuration, improve the interchange performance, and not necessarily remain in place with ultimate construction of either final alternative.

To determine the traffic benefits of the Low-Cost Options, VISSIM simulations or HCS+ analysis were developed for each of the scenarios (See Table 13 for results). It is anticipated that these improvements would only be a temporary fix and would have to be followed by other improvements in the future; thus, only 2012 and 2020 traffic volumes were evaluated. The three Low-Cost Options identified and studied were:

LC 1 Construct a full length dual left-turn lane for Westbound US 42 to I-264.

The existing structure over I-264 would be widened on the north side. The westbound lanes would be shifted out, and a second full-length turn lane across the structure would be added. The second turn lane would allow for more storage.

LC 2 Construct a second left-turn lane on the Eastbound I-264 exit ramp.

The existing eastbound exit ramp has two right-turn lanes and one left-turn lane. The added left-turn lane could allow left-turning traffic to avoid the queue formed by the large number of vehicles turning right--resulting in a shorter queue and reducing the possibility of traffic backing up onto I-264.

LC 3 Construct a second exit lane on the Westbound I-264 exit ramp.

The existing westbound exit is a single-lane exit that often backs up onto I-264. Cars often use the shoulder to avoid using the driving lane during the PM peak hour. Adding the second lane would increase the ramp storage and decrease the number of cars in the I-264 driving lanes.

		2012 No Build *AM/PM*	**2012** *AM/PM*	**2020** *AM/PM*	**Construction Cost**
Low-Cost Option #1	Lime Kiln to I-264 WB	18.1/13.2 Travel Time (min.)	6.9/6.6 Travel Time (min.)	7.2/7.7 Travel Time (min.)	$ 950,000
Low-Cost Option #2	East Ramp	LOS F/F	LOS E/D	LOS E/E	$ 325,000
Low-Cost Option #3	West Ramp	LOS C/E	LOS A/B	LOS A/B	$ 1,700,000

Table 13 Low-Cost Options Analysis

Chapter 10

10.0 Conclusion and Recommendations

Based on the final evaluations at the Interdisciplinary Team Meeting and public input, the project team makes the following recommendations.

10.1 Preferred Alternative

The project team recommends Alternate 1 SPUI with RIRO at Old Brownsboro Road as the preferred alternative.

The Lime Kiln realignment Option (AM 12C) that reconnects access between US 42 and Old Brownsboro Road is recommended in the preferred alternative based on traffic operations and traffic signal spacing.

Access Management Option 1 (extending the right turn lane on US 42 EB to Rudy Lane) and Option 3 (closing the entrance at Brownsboro Center at US 42 and Rudy Lane) are also recommended by the project team, with possible funding for AM 1 by the Highway Safety Improvement Program to reduce rear-end crashes.

Additionally, the project team recommends that lower cost options be studied in Phase 1 for AM 2 on Rudy Lane, which may include minimal additional pavement and/or restriping. Additional study of AM 9 and AM 10 is also recommended in Phase 1.

The Ramp Split option was recommended by the project team. Evaluation of the FHWA's policy for new or modified access points on the Interstate System has been included in this study as Chapter 11. Additional analysis to demonstrate that a signalized intersection will improve queuing for the Ramp Split option at Old Brownsboro Road is also included.

The project team recommends that KYTC maintain control of the signal and evaluate retaking ownership of the remaining portion of Old Brownsboro Road corridor to Herr Lane during the next phase.

The project team recommends replacing the existing bridge over I-264 with the preferred alternative and the interim solutions due to its condition and restrictive clearance. The team recommended an evaluation of rehabilitation improvements be considered under the low cost options scenario.

10.2 Interim Solutions

The project team recommends all four interim solutions (RIRO at Old Brownsboro, Ramp Split, channelized turn to WB I-264, and second lane at WB I-264 entrance ramp).

At project team meetings, the FHWA stated that if IS #1 (RIRO at Old Brownsboro) is broken out as a separate project, it could not be funded by Interstate Maintenance (IM) funding.

Additionally, the FHWA reiterated that IS #2 (Ramp Split) could only be considered with or after construction of IS #1 and with KYTC control of traffic control devices along Old Brownsboro Road to Herr Lane.

IS #2 would require an approved IMS before construction, while IS #'s 1, 3, and 4 would not require such approval. Chapter 11 of this study as well as the analysis provided throughout the study will serve as the Draft IMS for IS #2. Alternative IS#2 is preferred over IS #2A because of the improved traffic operations and not requiring the acquisition of the businesses between the I-264 Ramp and Old Brownsboro Road.

10.3 Low-Cost Options

The project team recommends that all three low-cost options (full-length dual left-turn lane for WB US 42 to WB I-264; second left-turn lane on EB I-264 exit ramp; second exit lane on WB I-264 exit ramp) be carried forward and studied in Phase 1 once traffic patterns stabilize from the new Westport Road Interchange. Additionally, LC #3 is also being studied as part of the adjacent I-71/I-264 interchange project.

10.4 Additional Information

Maintenance of Traffic (MOT)

The preferred Alternative 1 SPUI will have a significant impact on existing traffic. The existing structure will have to be completely replaced. The new structure will likely have deeper beams and may require a small grade change on US 42 to maintain clearance over I-264. The realignment of ramps will add to the complexity. The tight right of way will limit construction of diversions. Detours like re-routing to Westport Road and/or lane closures may be required during bridge construction. A detailed MOT plan and public information plan will be required

Bicycle and Pedestrian Access

Bicycle and Pedestrian access is not provided in the existing interchange. No plans are currently being developed by Louisville Metro to provide bicycle and/or pedestrian access through the existing interchange. However, several sidewalk projects have been constructed within the study area. Sidewalks are available along US 42 in front of Northfield, were recently added along Rudy Lane, and are provided for by the new development projects.

Rudy Lane has no existing bicycle lanes and there are currently no plans to add any even though it carries a large number of recreational, weekend cyclists. The final design for this project should explore bicycle and pedestrian considerations.

Public Transportation Access

Public transportation access will need to be a consideration of final design along US 42 and Old Brownsboro Road. The Transit Authority of River City (TARC) has four routes through the area. TARC routes 15, 49X, 62, and 68 provide access to shopping and Ballard High School. In addition to the TARC routes, numerous Jefferson County Public School (JCPS) buses travel through the area to Ballard High School, Kammerer Middle School, and Wilder Elementary School.

10.5 Interchange Modification Study

An Interchange Modification Study (IMS) will be required during the initial and ultimate phases for the recommended interchange improvements. Based on discussions with FHWA, the IMS for this project would not need to include the adjacent Interchanges during the initial/low cost modifications but would need to include all adjacent interchanges for the ultimate phase.

10.6 Next Steps

This scoping study was the first step in providing much needed improvements to the I-264 / US 42 interchange. The next step must be to secure funding for Phase 1 and Environmental Services, Phase 2 Design, Right of Way and Utilities, and Construction.

Given the level of public interest shown by both the community of Northfield and other neighborhoods, enhanced public involvement should be utilized in future phases of the project development.

APPENDIX A

MEETING SUMMARIES

MEETING DOCUMENTATION

Project: 5-390.00 I-264/US 42 Interchange Scoping Study

Location: KYTC D5 Conference Room

Meeting Date: March 23, 2009 at 9:00 a.m.

Subject: Project Status update and Pre-Meeting for Local Elected Officials Meeting

Attendees:

Carl Jenkins	KYTC D5 Design (PM)	carl.jenkins@ky.gov
Tala Quinio	KYTC D5 Design	tala.quinie@ky.gov
Robert Farley	KYTC CO Design	Bob.Farley@ky.gov
Andrea Clifford	KYTC D5 PIO	andrea.clifford@ky.gov
Tom Hall	KYTC D5 Planning	tom.hall@ky.gov
Matt Bullock	KYTC D5 Chief Dist. Engr.	matt.bullock@ky.gov
Brian Meade	KYTC D5 Traffic	brian.meade@ky.gov
David Lindeman	PEC	dlindeman@palmernet.com
Chuck Wood	PEC	cwood@palmernet.com
Stephen Sewell	PEC	ssewell@palmernet.com
Karl Sawyer	PEC	ksawyer@palmernet.com
Bob Kennedy	PEC	bkennedy@palmernet.com

MEETING MINUTES

KYTC Project Manager, Carl Jenkins made a brief statement concerning the purpose of the meeting which is to prepare for the upcoming Local Elected Officials Meeting to be held on April 7th at 3:00 PM in the District Office.

Traffic Forecasts

The methodology utilized to develop traffic forecasts was to use traffic counts from URS and counts taken by Palmer Engineering as a basis for establishing a base year level of traffic volumes. Existing condition 2012 volumes and future year forecasts were created for 2020 and 2030 based upon ADTs produced by the KIPDA travel demand forecasting model. To these were added the site generated traffic from traffic impact studies for The Midlands, Providence Point, the Fresh Market, and the Seminary Condominium development which are all scheduled to be constructed prior to 2012. It was noted that the KIPDA model assumes a future six-lane section on US 42 east of the interchange which affects the volumes forecasted on US 42. This will be explained to the local officials. The consultant will submit four copies and pdf files of the forecasting to be sent to KYTC Division of Planning and the FHWA for review. Traffic forecasts will be separated by intersection rather than year.

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Crash Analysis
The crash analysis for the study was briefly discussed revealing nothing unexpected. Two locations stand out for having crashes in excess of the critical crash rate. These occur at the Rudy Lane intersection and also on the northbound interchange off-ramp where there are a significant number of rear end collisions. This correlates with the traffic counts, local experience, and the 2012 simulation showing back ups on the ramp.

VISSIM Simulation
Steve Sewell presented the 2012 existing condition simulation showing a large number of turns (1,900) from US 42 onto the southbound interchange ramp. There was some discussion concerning the accuracy of this turning movement. The general consensus was that this is one of the critical movements of the interchange as it is today and that high volumes are to be expected. Another movement of the interchange that drew attention was the northbound off-ramp from I-264 where the ramp was backed up. It appeared that the back up is occurring due to the left turns but it should be due more to the number of right turns.

- Slip Ramp – There was some discussion concerning whether or not left turns would be allowed at the slip ramp terminus at Old Brownsboro Road. A round-about would allow this movement as proposed in the Midlands study, but the turning movement would be relatively small if the movement were to be made possible. The slip ramp speed is 35 MPH based on previous FHWA guidance but the developer of the Midlands wants it to be held to 25 MPH to reduce the amount of right-of-way required for the higher speed facility. There is concern as to whether the proposed slip ramp can be adequately signed so as to allow traffic the opportunity to merge into the desired lanes adequately. In addition, there is concern as to what signing and lane configuration changes are needed in order to safely accommodate the slip ramp. The statement was made that the slip ramp has to be shown to improve traffic conditions on I-264 to be considered seriously by FHWA. There was some discussion concerning whether or not the slip ramp should be proposed as an option to the public officials given that there is some doubt that it could be shown to improve traffic conditions on I-264. There was also discussion about how soon we might know whether the slip ramp is a viable feature or if it won't work. The slip ramps will be shown with dashed lines so that it can be emphasized that it is still just a concept that will require considerable additional study to determine its feasibility.

- Trucks – There was discussion concerning the percentage of trucks. 5% was assumed to be the truck percentage but an opinion was expressed that the truck percentage needs to be much smaller, especially in the PM. School buses were also mentioned as being included as part of the truck count.

- Traffic Congestion – there was concern about how much traffic congestion the FHWA would accept even with improvements and still approve the use of federal funds. They usually want level-of-service C or D but may accept a lower service level. With the forecasted amount of traffic there aren't many things that can be done without a major overhaul of the interchange and considerable right of way acquisition. Preservation of the interstate will be their primary issue. Steve Sewell said that following field

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observations, adjustments might be made which could improve the traffic conditions of the simulation. The issue of whether or not the study area could absorb any more traffic and whether or not it was realistic to forecast growth was discussed. Traffic volumes were expanded at about 1% per year to arrive at the forecasts. There was a certain amount of sentiment expressed that the area already has as much traffic as it can handle. One suggestion was to determine the maximum capacity in the corridor and work backwards from that figure rather than forecast traffic higher than the corridor can handle. If the model used to provide the growth factors is showing too much growth, should we assume zero growth? The model is the best tool we have for showing the impact of all proposed road projects in the area which we could not otherwise anticipate.

Interchange Design Options

Karl Sawyer presented three initial options, the tight diamond, SPUI and the Diverging Diamond designs. Concern was expressed that we would not want to provide a complete blank slate for the public meetings. Concepts need to be given to the public for them to react to.

- The tight diamond would operate much as the existing diamond operates currently with added turn lanes.

- Diverging Diamond - The diverging diamond appears to work fairly well from a geometric standpoint. There was a concern for the traffic movements in the interchange if required to operate above a level-of-service E. It was acknowledged that it is likely that some of the movements could be operating at level-of-service E or worse. Other concerns expressed were concerning what to do if the diverging diamond works the best, and which interchange works the best with unbalanced interchange turns.

- SPUI – It was stated that tighter radii are needed on the drawing. The drawing was shown with 300' radii but it was meant to be only a conceptual drawing to generate comment.

Local Elected Officials Meeting

The Local Elected Officials Meeting will be held on April 7, 2009 at 3:00 PM in the District 5 Offices in conference room I & J. There is a need to include bicycle and pedestrian accommodations to the issues discussed during the meeting. It was thought that the public officials will immediately focus on the slip ramp.

The scoping study is supposed to have interim and low cost solutions. Carl Jenkins stated we will need the following:

- Cheap Quick Fixes
- Intermediate Solutions
- Ultimate Solutions

There will be 11"x17" map sets for the public officials with larger maps in rolls that can be referenced if needed.

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MEETING DOCUMENTATION

Project: 5-390.00 I-264/US 42 Interchange Design Study

Location: KYTC D5 Design Conference Room

Meeting Date: April 7, 2009

Subject: Local Elected Officials Meeting

Attendees:

Sharon Berger	City of Northfield
Scott Brinkman	Kentucky Legislature House District 32
Matt Bullock	KYTC D5 Chief District Engineer
Jeff Burnett	City of Thornhill
Debbie Carroll	Louisville Metro Council District 16
Randy Chappell	City of Northfield
Andrea Clifford	KYTC D5 Public Information Officer (PIO)
David Davis	City of Northfield
Gilberto De Leon	FHWA
Bob DeWeese	Kentucky Legislature House District 48
Kelly Downard	Louisville Metro Council District 16
Ken Fleming	Louisville Metro Council District 7
Bill Hanson	FHWA
Jim Ising	City of Windy Hills
Carl Jenkins	KYTC D5 Project Manager
Brian Meade	KYTC D5 Design
Mike Onachilla	City of Northfield
Phyllis Onachilla	City of Northfield
Jennifer Osborne	Louisville Metro Council District 7
Lou Phillips	City of Windy Hills
Ted Pullen	Louisville Metro Public Works
Tala Quinio	KYTC D5 Design
Bob Rosenbaum, Jr.	City of Windy Hills
Jeff Schaefer	KYTC D5 Environmental
Scott Wolf	FHWA
David Lindeman	Palmer Engineering (PEC)
Karl Sawyer	PEC
Stephen Sewell	PEC
Chuck Wood	PEC

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MEETING MINUTES

A Local Elected Officials (LEO) meeting for the referenced project was held at 3:00 PM on April 7, 2009 in the Kentucky Transportation Cabinet (KYTC) District 5 Design conference room. The purpose of the meeting was to give an overview of the project and to get input on interchange types and other project concerns from the local elected officials. Items were discussed per the following agenda. LEO comments from the meeting are numbered (x) for future reference and listed per corresponding agenda item.

Introductions
Carl Jenkins began the meeting with introductions of attendees.

Project Overview
David Lindeman gave an overview of the project. The project was described as an interchange scoping study. The project limits were described as being along I-264 (Watterson Expressway) within the limits of the entrance and exit ramps, along US 42 from Rudy Lane to the Holiday Manor Shopping Center entrance, and along Old Brownsboro Road (formerly KY22) from US42 to Lime Kiln Lane / Herr Lane. David Lindeman briefly discussed the project schedule and gave a copy of project schedule to attendees.

(1) The US 42 limits should be expanded west to Blankenbaker Road to include the substantial congestion west of Rudy Lane.

(2) The study should include the impact of traffic between US 42 and Westport Road via Rudy Lane and Ambridge Drive.

Traffic Forecasting
David Lindeman described the methodology used for the traffic forecasts. New and existing counts were used to establish base year traffic volumes. The Kentuckiana Regional Planning and Development Agency (KIPDA) travel demand forecasting model was used to produce 2012, 2020, and 2030 volumes. Site generated traffic from traffic impact studies of four current area developments (Fresh Market, The Midlands, Providence Point, and Seminary Condominium) were added to the forecasts.

(3) Kelly Downard requested a copy of the traffic forecast volumes after KYTC approval.

(4) Questions were asked concerning the traffic forecast for the slip ramp after the Westport Road Intersection is open.

Simulation of Existing Conditions
Stephen Sewell displayed VISSIM model simulations of existing and 2012 AM and PM peak hours.

(5) Several attendees commented that the existing conditions seemed more congested than shown in the model.

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Typical Interchange Improvements and Access Management Solutions
David Lindeman discussed typical interchange configurations. Three typical configurations were shown for interchange type considerations only, none of the configurations have been studied in detail to determine performance at this point. A handout of the three configurations discussed and traffic diagrams of 2012 AM and PM forecast peak hour volumes were given to attendees.

Tight Urban Diamond Interchange (TUDI): The TUDI is a diamond interchange with closely spaced intersections at the ramp termini. This interchange type is similar to the existing interchange. Construction would likely include some geometric improvements, lane additions, and existing bridge widening or replacement. An important element of this design is the timing and coordination of the traffic signals of the closely spaced intersections.

Single Point Urban Interchange (SPUI): The SPUI interchange is a form of diamond interchange with a single intersection at the ramp termini. This interchange is similar to I-264 (Watterson Expressway) @ Popular Level Road. Construction would include geometric reconfiguration of the ramps and bridge replacement. An important element of this design is that it allows opposing left turns to operate simultaneously allowing more efficient use of signal green times.

Diverging Diamond Interchange (DDI): The DDI is an interchange that uses intersections near the ramp termini to switch traffic from the right side to the left side between the ramps making both right and left turns free flow conditions. A video simulation of the DDI was shown. There is currently no similar interchange in the United States, however several states have construction planned, and preliminary planning is under way for one in northern Kentucky. Construction would include some geometric reconfiguration and may or may not include existing bridge widening or replacement. An important element of this design is that the two intersections would have two phase signals with much more efficient green times than the other configurations.

(6) Several attendees indicated a preference for the SPUI to increase the spacing between the interchange intersection and the US 42 intersections at Rudy Lane and Old Brownsboro Road.

(7) Several attendees were concerned about the potential of driver confusion in the DDI.

Brainstorming Session
The LEO's were divided into two groups. Blank maps of the study area were given to each group to markup with their own concepts, comments, or areas of concern. The comments are listed below by topic: Interchange Configurations, Access Control, Pedestrian and Bicycle Mobility, General Comments and/or Concerns.

<u>Interchange configurations:</u>

(8) Add new interchange at US 42 and I-71.

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(9) Construct viaduct (2nd level) on I-264 East Bound for US 42 entrance ramp to I-71 to separate traffic from I-264 (Watterson Expressway) to I-71 traffic (eliminate weave).

(10) Consider 11' vs 12' Lanes on US 42.
(11) If Slip Ramp to Old Brownsboro Road is provided, consider separating it from US 42 ramp as early as possible.

Access Control:

(12) Many businesses along US 42 have multiple entrances, consider reducing to one per business, and/or have some businesses use combined entrances.

(13) Add left turn lane in median barrier on US 42 at Northfield.

(14) Improve right turn lane into Northfield on US 42 at Old Brownsboro Road.

(15) Add signal at Glenview Avenue to improve access to Northfield.

(16) Consider closing and/or cul-de-sac short section of Old Brownsboro Road at US 42 and route traffic to Lime Kiln.

(17) Close off through street (US 42 to Old Brownsboro Road) by fast food restaurants (by KFC).

(18) Steep "Subway Entrance" off Old Brownsboro Road is big problem, but also serves as truck access for Krogers.

(19) Concerns about access to Goodwill Store and Dairy Queen with roundabout (proposed by The Midlands) and possible slip ramp to Old Brownsboro Road.

(20) Close off entrance to Brownsboro Center at US 42 / Rudy Lane Intersection.

(21) Provide additional lane on Rudy Lane for left turn into Brownsboro Center.

Pedestrian and Bicycle Mobility:

(22) Provisions should be added for pedestrians and bicycle traffic.

(23) Sidewalks should be connected on Old Brownsboro Road from "AAA" to Lime Kiln.

(24) Concern about pedestrian access to/from Northfield to Bus Stops on Old Brownsboro Road.

(25) Concern of pedestrian safety at Old Brownsboro Road and Herr Lane (Ballard High School).

(26) Northfield wants to protect the sidewalk and landscaping north of US 42.

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(27) Pedestrian cross walk signals are not currently operating at Glenview Avenue and US 42.

General Comments and/or Concerns:

(28) Concern about speed limit / signage on US 42 between Old Brownsboro and Lime Kiln. (35 vs 45 mph)

(29) Northfield needs noise walls along I-264 (Watterson Expressway) in area of nursing home.

(30) Concern about left turn traffic from Old Brownsboro Road blocking intersection at US 42.

(31) Widen Old Brownsboro Road between Lime Kiln / Herr Lane and KY 22.

(32) Repave Lime Kiln from Old Brownsboro Road to US 42.

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MEETING DOCUMENTATION

Project: 5-390.00 I-264/US 42 Interchange Design Study

Location: KYTC D5 Design Conference Room

Meeting Date: July 20, 2009

Subject: Alignment Review Meeting

Attendees:

Mohamad Abdol (KYTC D5 Engineering Support)
Robert Farley (KYTC CO Design)
Tom Hall (KYTC D5 Planning)
J.R. Ham (KYTC CO Planning)
Carl Jenkins (KYTC D5 Project Manager)
David Lindeman (Palmer Engineering (PEC))
Brian Meade (KYTC D5 Design)
Tala Quinio (KYTC D5 Design)
Karl Sawyer (PEC)
Stephen Sewell (PEC)

MEETING SUMMARY

An Alignment Review meeting for the referenced project was held at 1:00 PM on July 20, 2009 in the Kentucky Transportation Cabinet (KYTC) District 5 Design conference room. The purpose of the meeting was to review the five preliminary interchange alternatives, to select three alternatives to advance, and to review and select access management alternatives to advance to a public meeting.

Preliminary Alternatives

The five Preliminary Alternatives discussed were:

1) Single Point Urban Interchange (SPUI)
2) Compressed Diamond Interchange (CDI)
3) Diverging Diamond Interchange (DDI)
4) Split Diamond Interchange (SDI)
5) Tight Urban Diamond Interchange (TUDI)

Each of the Alternates was shown in plan with and without a possible slip ramp to Old Brownsboro Road. The slip ramp will require FHWA approval. Signing and deceleration lengths are specific areas of concern and require additional study. There is approximately 2200' from the Westport Road entrance ramp to the current exit ramp, and an additional 1300' from the exit ramp to the proposed slip ramp.

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Alternative Comparisons

Plans for the five preliminary interchange alternatives were presented and a traffic simulation of each was shown to evaluate the traffic impacts of the alternate. A decision Matrix was provided to aid in the alternative selections.

Traffic Simulations

Each of the alternatives was simulated using 2030 volumes with Vissim. The simulations included a future six lane section on I-264 and US 42 east of the interchange alternates. There are no current plans by KYTC for the widening of US 42, so there was some debate as to whether the six lane section should be shown in the simulations. It was then noted that the six lane section was included in the Kentuckiana Regional Planning and Development Agency (KIPDA) travel demand forecasting model. The KIPDA model was used as a basis for the 2030 volumes in part because of its inclusion of the effect the new Westport Road Interchange (under construction) will have on the traffic demand of the US 42 Interchange. The project team decided to keep the six lane sections of US 42 in the simulations.

In addition to the five interchange alternatives, two interchange modifications were considered that could be implemented for each alternative. The first was a slip ramp from the I-264 Exit Ramp to Old Brownsboro Road as shown in the alternative plans. The second was to convert the Old Brownsboro Road Intersection at US 42 to Right-In/Right-Out only. This alternative was originally an access management alternative (AM12D), but its impact to the interchange operation was significant enough to merit a separate traffic simulation.

In order minimize the number of Vissim permutations with the two interchange modifications, only Alternative 5 (TUDI) was simulated with and without each of the modifications. It was noted that similar traffic impacts would be experienced with the other interchange alternatives.

Interchange Decision Matrix

The Decision Matrix for the Interchange Alternatives was developed to aid in the selection of the three alternatives to move forward. The matrix evaluated six alternatives (no build and alternates 1 thru 5) and the two modifications on five main categories.

Right of Way Impacts included additional Right of Way required (ac) as well as business and residential relocations.

Construction Impacts included the relative impact of Maintenance of Traffic (H/M/L), use of the existing bridge, new/additional bridge lanes and traffic signals, relative impacts to utilities, and the potential for interim construction.

Travel Time (2030) was the average simulated travel time (min) experienced for the three critical movements: US 42 WB from Lime Kiln Lane to I-264 SB (toward Westport Road); I-264 SB from I-71 to US 42 EB at Lime Kiln Lane; and I-264 NB (from Westport Road) to US 42 EB at Lime Kiln Lane.

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Cost ($) was the planning level construction costs associated with the interchange proper, ramp to ramp, and does not include any additional I-264 or US 42 widening outside the ramps.

Other impacts evaluated were the relative Environmental Impacts, the relative ease of providing Pedestrian/Bicycle facilities, and the driver expectancy within the interchange.

Future interchange decision matrix evaluations will include: (2030) Level of Service (LOS) and Intersection Delay for Rudy Lane, West Ramps, East Ramps, and Old Brownsboro Road; and Maximum Queue Lengths (95^{th} percentile) for I-264 Exit Ramps, US 42 WB Left Turns, and Old Brownsboro Road Left Turns.

Interchange Selections

Based on the plans, simulations and interchange decision matrix, the project team elected to move forward with Alternates 1 (SPUI), 2 (CDI), and 3 (DDI). Each of the alternatives will be further evaluated with and without the slip ramp. The Old Brownsboro Road Right-In/Right-Out Modification will be evaluated with alternate 1 (SPUI) for relative impacts with and without the slip ramp.

Access Management - Brownsboro Road Right-In/Right-Out Options

Three options to accommodate the Right-In/Right-Out Intersection for Old Brownsboro Road at US 42 were shown and discussed.

Option AM12D required no additional construction and forced Old Brownsboro Road left turns to use the existing route at Lime Kiln Lane. Concerns about AM12D include: 1) the increased left turns at the extremely skewed intersection at Lime Kiln Lane and US 42; 2) that a large number drivers might continue on Old Brownsboro and be forced to turn right and then U-turn on US 42; and 3) that others might use unintended cut-throughs like the Holiday Manor parking lot.

Option AM12B realigned Old Brownsboro Road to intersect US 42 at Glenview.

Option AM12C modified Glen Eagle Drive to re-route traffic from existing Herr/Lime Kiln Lane to a perpendicular intersection with US 42.

A separate decision Matrix was provided for these options. The project team elected to take all of these options to a public meeting if the Right-In/Right-Out modification is advanced.

Access Management – Other Options

Eight additional Access Management Options were brought forward from previous project team meetings. A separate decision Matrix was also provided for these options. Unless otherwise indicated, the project team elected to take all of these options to a public meeting.

AM1 was the extension of the US 42 EB Right Turn Lane to Rudy Lane.

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AM2 was a combined version of previous AM2 – The addition of a center turn lane on Rudy Lane, and AM3 – closure of the one way entrance into Brownsboro Center at the US 42 at Rudy Lane intersection. The project team decided to re-split the two options as AM2 & AM3.

AM4 was the addition of a US 42 EB Left Turn pocket into Northfield.

AM6 was the extension of the US42 WB left turn lane through the Old Brownsboro Road Intersection.

AM7 was the extension of the median barrier to eliminate US 42 Left Turns into Northfield and to make Northfield Right-In/Right-Out only.

AM8 was the closure of the Northfield entrance and forcing access at Glenview Avenue. The project team eliminated AM8.

AM9 was the closure of access points to eliminate through access from US 42 to Old Brownsboro Road between KFC and AAA.

AM10 was the closure of miscellaneous US 42 access points. The project team modified AM10 by adding additional closure options to take to a public meeting.

Schedule

Continue with the Environmental Overview

Mid August: Meeting with FHWA to discuss interchange alternatives, slip ramp, and access management options.

Mid September: Team Meeting (Pre-Public Meeting)

Mid October: Public Meeting

Mid November: Interdisciplinary Team Meeting

Mid December: Submit Draft Report

Mid February: Submit Final Report

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Jefferson County 5-390.00
Interchange Alternatives
7/20/2009

		No Build	ALT 1	ALT 2	ALT 3	ALT 4	ALT 5		AM 12D
		No Build	SPUI	Compressed Diamond	Diverging Diamond	Split Diamond	Tight Diamond	Slip Ramp	Old Brownsboro Rt-In/Rt-Out
Right of Way									
Additional Acres	Acres	0	0.2	0.2	0	0.6	0.2	1.1	0
Business Relocations	No.	0	0	0	0	0	0	0	0
Residential Relocations	No.	0	0	0	0	0	0	0	0
Construction									
Maintenance of Traffic	H/M/L	NA	High	Low	High	Med	Low	Low	Low
Use Existing Bridge	Y/N	Yes	No	Yes	Yes	Yes	Yes	NA	NA
New/Add Bridge lanes	No.	0	1	3	-1	1	3	0	0
New/Add Signals	No.	0	-1	0	0	1	0	0	-1
Utility Impacts	H/M/L	NA	High	Med	Low	Med	Med	Low	Low
Interim Const. Potential	H/M/L	NA	Low	High	Low	Med	Med	High	High
Travel Time (2030)		AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM	AM/PM
US 42 WB to I-264 SB	Min.	7.3/4.5	4.0/4.8	6.7/6.7	7.1/7.5	9.3/6.2	5.0/8.2	6.7/4.5	7.0/5.8
I-264 SB to US 42 EB	Min.	3.5/5.0	4.4/6.0	4.9/6.0	9.6/7.0	9.0/8.1	3.7/6.9	3.3/6.7	3.3/4.8
I-264 NB to US 42 EB	Min.	2.8/8.3	3.4/8.6	4.5/10.5	3.3/9.0	4.7/8.2	3.8/10.6	3.7/4.0	3.1/6.8
								w/ ALT 5	*w/ ALT 5*
Cost									
Construction Cost	$	$ -	$ 15,400,000	$ 10,500,000	$ 8,600,000	$ 10,800,000	$ 12,300,000	$ 400,000	$ 100,000
Other									
Environmental Impacts	H/M/L	NA	Low	Low	Low	Low	Low	Low	Low
Bicycle/Pedestrian Access	H/M/L	NA	Low	High	High	Med	High	NA	Med
Driver Expectancy	H/M/L	High	Med	High	Low	Low	High	Med	Low

Jefferson County 5-390.00
Relocate Old Brownsboro Road Options
7/20/2009

		AM 12B	AM 12C	AM 12D
		at Glenview	at Glen Eagle	Existing at Lime Kiln
Right of Way				
Additional Acres	Acres	0.9	1.2	0
Business Relocations	No.	3	0	0
Residential Relocations	No.	0	0	0
Construction				
Maintenance of Traffic	H/M/L	Med	Med	Low
New/Add Signals	No.	0	0	-1
Utility Impacts	H/M/L	Med	Med	Low
Travel Time (2030)		AM/PM	AM/PM	AM/PM
Herr Lane to Rudy Lane	Min.	10.8/11.8	7.1/8.3	-
		w/ ALT 3	*w/ALT 3*	
Cost				
Construction Cost	$	$ 1,600,000	$ 1,600,000	$ 100,000
Other				
Environmental Impacts	H/M/L	Med	Low	Low
Bicycle/Pedestrian Access	H/M/L	High	High	Med
Driver Expectancy	H/M/L	Med	Low	Low

Jefferson County 5-390.00
Access Management Options
7/20/2009

		AM1	AM2	AM4	AM6	AM7	AM8	AM9	AM10
		Rudy Rt	Rudy Add. Lane	Northfield Lt Turn	Extend WB Left	No 42 Lt & Northfield Rt-In/Rt-Out	Close Northfield Access	Close KFC Cut thru	Close Misc. US 42 Access
Right of Way									
Additional Acres	Acres	0.04	0.12	0	0	0	0	0	0
Business Relocations	No.	0	0	0	0	0	0	0	0
Residential Relocations	No.	0	0	0	0	0	0	0	0
Construction									
Maintenance of Traffic	H/M/L	Low	Low	Low	Low	Low	Low	Low	Low
New/Add Signals	No.	0	0	0	0	0	Maybe	0	0
Utility Impacts	H/M/L	Low	Med	NA	NA	NA	Low	Low	Low
Cost									
Construction Cost	$	$ 160,000	$ 900,000	$ 30,000	$ 50,000	$ 70,000	$ 150,000	$ 30,000	$ 150,000
Other									
Environmental Impacts	H/M/L	Low	Low	Low	Low	Low	Low	Low	Low
Neighborhood Impacts	H/M/L	Low	Low	Low	Low	Med	High	Low	Low
Driver Expectancy	H/M/L	High	High	High	Med	Low	Low	Med	Med

MEETING DOCUMENTATION

Project: 5-390.00 I-264/US 42 Interchange Design Study

Location: KYTC D5 Design Conference Room

Meeting Date: August 17, 2009

Subject: FHWA Coordination Meeting

Attendees:

Mohamad Abdol (KYTC D5 Engineering Support)
Matt Bullock (KYTC D5)
Andrea Clifford (KYTC D5)
Robert Farley (KYTC CO Design)
Tom Hall (KYTC D5 Planning)
J.R. Ham (KYTC CO Planning)
Bill Hanson (FHWA)
Carl Jenkins (KYTC D5 Project Manager)
Brian Meade (KYTC D5 Design)
Tala Quinio (KYTC D5 Design)
Jeff Schaefer (KYTC D5)
David Lindeman (Palmer Engineering) (PEC)
Karl Sawyer (PEC)
Stephen Sewell (PEC)
Chuck Wood (PEC)

MEETING SUMMARY

An FHWA Coordination meeting for the referenced project was held at 10:00 AM on August 17, 2009 in the Kentucky Transportation Cabinet (KYTC) District 5 Design conference room. The purpose of the meeting was for FHWA review of the three preliminary interchange alternatives selected at the previous team meeting, and to further discuss the feasibility of two access management options to determine if they should be presented at the project public meeting.

Study Philosophy

The meeting opened with a review of the project area, history, and scope. The land surrounding the existing I-264 / US 42 interchange is nearly fully developed. Plans are well under way for development of the few unimproved tracts. A new interchange is under construction less than a mile west at Westport Road. The Kentuckiana Regional Planning and Development Agency (KIPDA) travel demand forecasting model was used as the basis of the traffic forecast in order to capture the effect of the new interchange on the existing demand. New and existing traffic counts and existing Traffic Impact Studies were used to adjust the forecast.

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Because of this existing and proposed development, the project team was charged in the initial scope with remaining within or nearly within the existing interchange footprint to minimize right of way impacts. No multilevel interchanges or flyover ramps were part of the initial study alternatives. Traffic volumes would necessitate more sophisticated and costly interchange configurations to reach goal levels of service of D for each intersection.

The study philosophy is to provide Ultimate 2030 Solutions, Interim Solutions to the preferred alternate, and Low Cost Options all within or nearly within the existing interchange footprint.

Preliminary Alternatives & Simulations

The three Preliminary Alternatives advanced to this meeting were:

1) Single Point Urban Interchange (SPUI)
2) Compressed Diamond Interchange (CDI)
3) Diverging Diamond Interchange (DDI)

Plans for the three preliminary interchange alternatives were presented with an optional slip ramp to Old Brownsboro Road. A preliminary signing plan (with the current construction at the Westport Road interchange included) was presented to help determine if signing for the optional slip ramp to Old Brownsboro Road was feasible.

A second option for each of the interchanges was the modification of the US 42 / Old Brownsboro Road intersection to Right In / Right Out (RIRO). The RIRO option was presented in previous team meetings as Access Management option 12A (AM12A). A plan showing three options to accommodate the high volume of left turning traffic from Old Brownsboro Road was shown and discussed.

Option AM12D requires no additional construction and forces Old Brownsboro Road left turns to use the existing route at Lime Kiln Lane. Concerns about AM12D include: 1) the increased left turns at the extremely skewed intersection at Lime Kiln Lane and US 42; 2) that a large number drivers might continue on Old Brownsboro and be compelled to turn right and then U-turn on US 42; and 3) that others might use unintended cut-throughs like the Holiday Manor parking lot.

Option AM12B realigns Old Brownsboro Road to intersect US 42 at Glenview.

Option AM12C modifies Glen Eagle Drive to re-route traffic from existing Herr / Lime Kiln Lane to a perpendicular intersection with US 42.

VISSIM traffic simulations of each interchange alternative were shown with and without the slip ramp option.

There was discussion regarding the need to provide adequate pedestrian crossings on US 42 where a new intersection is located in options AM12B and AM12C.

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Alternative Comparisons

An “Interchange Alternatives” decision matrix was presented to aid in the evaluation of the three interchange alternatives. The matrix evaluated seven alternatives, no build (2012) and alternates 1 thru 3 with and without the slip ramp. The RIRO option and a combination of RIRO and the slip ramp were shown with Alternative 1 only, but similar improvements would be experienced with the other alternatives.

A separate “Relocate Old Brownsboro Road Options” decision matrix was provided to evaluate the three options for implementing the RIRO interchange option.

Eight additional Access Management Options were brought forward from previous project team meetings. A separate decision Matrix was also provided for these options described as follows:

AM1 was the extension of the US 42 EB Right Turn Lane to Rudy Lane.

AM2 was the addition of a center turn lane on Rudy Lane, and the closure of the one way entrance into Brownsboro Center at the US 42 at Rudy Lane intersection.

AM3 was only the closure of the one way entrance into Brownsboro Center at the US 42 at Rudy Lane intersection.

AM4 was the addition of a US 42 EB Left Turn pocket into Northfield.

AM6 was the extension of the US42 WB left turn lane through the Old Brownsboro Road Intersection.

AM7 was the extension of the median barrier to eliminate US 42 Left Turns into Northfield and to make Northfield Right-In/Right-Out only.

AM8 eliminates access to Northfield via Northfield Drive.

AM9 was the closure of access points to eliminate through access from US 42 to Old Brownsboro Road between KFC and AAA.

AM10 was the closure of miscellaneous US 42 access points.

Team Decisions

The project team made the following decisions at the meeting:

Bridge cost estimates should include replacing the superstructure in all alternatives that widen the existing bridge. The deck and joints are in need of replacement.

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The need for adding noise wall costs to the interchange comparisons was discussed, but it was determined that noise walls built for the Westport interchange would most likely cover this interchange on the south side and the configuration of ramps from the I-264/I-71 interchange study would control the north side. Noise walls would likely not be feasible along US 42. The team decided that based on the planning level data gathered, the estimates should not include noise walls at this time. The need for noise walls will be determined in the environmental phase.

Interchange Alternatives

Based on the number of lanes required and the public unfamiliarity of the interchange type, Alternate 3 (DDI) the Diverging Diamond Interchange was eliminated from consideration and will not be presented at the public meeting.

Alternates 1 (SPUI) and 2 (CDI) will be presented at the public meeting with the following modification:

> The RIRO at Old Brownsboro Road option will no longer be an optional element. It will be shown as part of both Alternates 1 (SPUI) & 2 (CDI).

The slip ramp option will remain optional on both alternates and will be presented at the public meeting.

The roundabout proposed at the Midlands development on Old Brownsboro Road will be shown as "by others" on the maps for the public meeting. It was discussed that with the RIRO added to both alternatives that the developer may not have a need for the roundabout with the left-turn volume decreasing.

Concerns were raised that the roundabout could back traffic up on the slip ramp due to back-ups through the roundabout from the left-turn movements. It was also pointed out that the slip ramp provides two alternative routes to turn right onto Old Brownsboro Road and avoid ramp back-ups in the event that one of those routes has an accident or back-up. An option of utilizing a parallel but dedicated slip ramp closer to US 42 was also discussed but discarded since it would likely result in acquisition of the gas station and Dairy Queen at the corner.

It was determined that an option to U-turn on US 42 would be eliminated to discourage that movement since the movement is mostly for Northfield residents that can still access the subdivision via Glenview Avenue.

The FHWA would like to see a simplified cost/benefit analysis for each interchange option both with and without the slip ramp. A timeline showing where the intersections break down between the opening year 2012 and 2030 would also be helpful.

Access Management Options

Access Management Options AM4, AM6, AM7 & AM8 were eliminated due to the addition of the RIRO to all options and will not be presented at the public meeting.

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Access Management Options AM1, AM2, AM3, AM9, & AM10 will be presented at the public meeting.

Public Meeting

The Public Meeting will be held sometime between late September and mid October from 5:30 PM to 7:30 PM. The location is still to be determined. A brief five minute PowerPoint presentation will be prepared to describe the meeting purpose, handouts, and describe the room set-up. No detailed description of alternatives will be provided in the presentation.

A Local Public Officials Meeting will be held from 3:00 to 4:00 on the day of the Public Meeting at the District 5 Office.

Three stations will be provided at the Public Meeting with displays for Interchange Alternates and Access Management Options at each station.

A team meeting will be held to preview displays prior to the Public Meeting.

Meeting Adjourned

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MEETING DOCUMENTATION

Project: 5-390.00 I-264/US 42 Interchange Design Study

Location: KYTC D5 Design Conference Room

Meeting Date: October 13, 2009

Subject: Local Elected Officials Meeting

Attendees:

Matt Bullock (KYTC D5 Chief District Engineer)
Debbie Carroll (Louisville Metro Council District 16)
Bob DeWeese (Kentucky Legislature House District 48)
Kelly Downard (Louisville Metro Council District 16)
Ken Fleming (Louisville Metro Council District 7)
Libby Gray (City of Crossgate)
Lou Phillips (City of Windy Hills)
Carl Jenkins (KYTC D5 Project Manager)
Brian Meade (KYTC D5 Design)
Tala Quinio (KYTC D5 Design)
Karl Sawyer (PEC)
Stephen Sewell (PEC)
Chuck Wood (PEC)
David Lanham (PEC)
David Lindeman (PEC)

MEETING MINUTES

A Local Elected Officials (LEO) meeting for the referenced project was held at 3:00 PM on October 13, 2009 in the Kentucky Transportation Cabinet (KYTC) District 5 Design conference room. The purpose of the meeting was to provide detailed explanations of alternatives considered and to give a preview of the Public Meeting presentation to be held subsequent to this meeting.

Introductions
Carl Jenkins began the meeting with introductions of attendees.

Project Overview
David Lindeman delivered the PowerPoint presentation to be used at the Public Meeting. Key points of discussion from the presentation are listed below:

- Limits of the project study area

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- Project history
- Recommended Alternatives: The list of alternatives has been narrowed down to two, a single point urban interchange (SPUI) and a compressed diamond interchange. Both alternatives can be designed with or without a slip ramp to Old Brownsboro Road. The end of the slip ramp can tie into Old Brownsboro Road with or without the roundabout, which is proposed by others.
    - Mr. Lindeman clarified the definition of Level of Service (LOS), the parameters used to define LOS, and how the LOS was used to compare the operation of the interchange alternatives.
    - Mr. Lindeman also discussed the lane assignments, signalization requirements, and general operational characteristics of the interchange alternatives.
    - A comment was made that the travel time for the slip ramp should be highlighted during the Public Meeting, to make sure the public understands the benefits of including it in the project.
- Old Brownsboro Road Connectors: Adding a raised median to US 42 at the intersection with Old Brownsboro Road and the Northfield entrance yielded the single greatest improvement to the operation of the interchange. This would eliminate left turns at the intersection, changing Old Brownsboro Road and the Northfield entrance to right-in/right-out only at US 42. Alternate connectors between Old Brownsboro Road and US 42 were presented and discussed. The city of Northfield has a second entrance which could provide the necessary left turn movements into and out of the neighborhood, and it could be signalized.
- The Public Meeting handout and questionnaire were presented for review.
- Stephen Sewell showed a traffic simulation for the SPUI alternative.
- Interim/Low Cost Options: Improvements were discussed that could be achieved sooner and at a lower cost than a full reconstruction of the interchange.
    - Lane additions/Turn Lanes
    - Ramp Improvements
    - Auxiliary Lanes
    - Access Management
        - Funding for the Rudy Lane Access Management Items (AM1, AM2, & AM3) were discussed. Rudy Lane is a city street, and it is unlikely to be viewed as necessary to the interchange improvement from FHWA's viewpoint. Ken Fleming suggested that the City look into funding possibilities for these items.
- Project Schedule
    - Submit Draft Report – January 2010
    - Submit Final Report – February 2010

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Following the PowerPoint presentation, the attendees briefly brainstormed potential questions and concerns that may be raised at the Public Meeting.

Meeting Adjourned at 4:15 pm.

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MEETING DOCUMENTATION

Project: 5-390.00 I-264/US 42 Interchange Design Study

Location: KYTC D5 Design Conference Room

Meeting Date: July 6, 2010

Subject: Interdisciplinary Team (IDT) Meeting

Attendees:

Mohamad Abdol (KYTC D5 Engineering Support)
Kevin Bailey (KYTC D5 Section Supervisior)
Dane Blackburn (KYTC D5 Planning)
Robert Farley (KYTC CO Design)
J.R. Ham (KYTC CO Planning)
Tony Harrod (KYTC D5 Maintenance)
Gilberto De Leon (FHWA)
Carl Jenkins (KYTC D5 Project Manager)
Brian Meade (KYTC D5 Project Development)
Tala Quinio (KYTC D5 Design)
Jeff Schaefer (KYTC D5 Environmental)
Wayne Simpson (KYTC D5 Maintenance)
Travis Thompson (KYTC D5 Design)
Mike Neely (ClassSickle Inc.)
Chuck Wood (Palmer Engineering - PEC)
Stephen Sewell (PEC)
Karl Sawyer (PEC)
David Lindeman (PEC)

MEETING SUMMARY

An Interdisciplanary Team (IDT) meeting for the referenced project was held at 9:00 AM on July 6, 2010 in the Kentucky Transportation Cabinet (KYTC) District 5 Design conference room. The purpose of the meeting was to review the Draft Scoping Study Report, to make final evaluations of study alternatives, and to make final team recommendations.

Review of Draft Scoping Study
David Lindeman led the review of the Draft Scoping Study Report. A Power Point presentation was used to guide the team through the chapter by chapter review. The comments are listed below by chapter:

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Executive Summary

- The Executive Summary was intintionaly left out of the draft report pending final recommendations. Palmer will include an Executive Summary with the final report which will include final recommendations from this meeting.

1.0 Introduction

No comments

2.0 Purpose and Need

No comments

3.0 Study Area

- Revise Figure 4 to make more legible (red text in particular is hard to read).
- Expand Section 3.4 Existing Structure to include more information from previous bridge inspection report.
- Team recommends replacement on all alternatives except possible low cost options

4.0 Environmental Overview

No comments on this abbreviated section of the Scoping Study, however final comments have been submitted to be included in the final Environmental Overview. This section will be modified as required to reflect those final comments.

5.0 Traffic Forecasting

- Revise Figure 9 to make more legible (red text in particular is hard to read).

6.0 Alternative Development

- Revise Figures 15 through 30 to indivivdual sheets and increase scale.

7.0 Alternative Evaluation Process

No comments

8.0 Public Involvement

- Revise Figures 32 & 33 to increase size and ledgibility of traffic volumes.

9.0 Interdisciplinary Team Meeting

- Revise Table 11 to add cost to replace existing structure in Alternative 2 & 2S.
- Revise Table 12 Interim Solution # 4 from "I-264 EB merge LOS" to "I-264 WB merge LOS"

10.0 Conclusions and Recommendations

- The conclusions and recommendations section will be completed based on the recommendations of the IDT.
- Revise section 10.5 from "FHWA recommended that the IMS …" to "FHWA required that the IMS …"
- Revise section 10.6 Next Steps to include Phase 1 & Environmental.

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IDT Recommendations

Preferred Alternative

The IDT decided that one alternative should be carried forward as the preferred altenative. Based on the criteria in the Final Evaluation Decision Matrix (Table 11) and public support the IDT selected Alternative 1 SPUI as the preferred alternative.

The RIRO relocation options at Glenview and Gleneagle to Lime Kiln were initially advanced by the IDT. Upon further post meeting discussions, the Cabinet proposed that the Glenview option be eliminated, and that the Glen Eagle option be advanced as the preferred option based on better traffic operations, and better traffic signal spacing.

The Phase 1 & Envirionmental alternatives will include, No Build, Alternative 1 SPUI, and Alternative 1S SPUI with Slip Ramp.

The Slip Ramp will requre additional analysis during Phase 1 to determine if a signalized intersection rather than the currently approved roundabout at Old Brownsboro Road would better control queueing on the Slip Ramp. Also, KYTC will need to maintain control of the intersection as well as other traffic signals and/or other traffic control devices along Old Brownsboro Road to Herr Lane in order to control queues on the Slip Ramp.

FHWA stated that an Interchange Modification Study (IMS) would be required for the project and that it should include the I-71/I-264 Interchange.

Access Management

The IDT recommended Access Management options AM 1 and AM 3, and to study lower cost options for AM2 on Rudy Lane which may include minimal additional pavement and/or restripping in Phase 1. The team also recommended additional study of AM 9, and AM 10 in Phase 1. AM 1 could potetially be funded by (HSIP) to reduce rear end crashes.

Interim Solutions

Four Interim Solutions (IS) were identified.

- IS 1: Convert the Old Brownsboro Road Intersection at US 42 to Right In Right Out (RIRO).
- IS 2: Provide Slip Ramp to Old Brownsboro Road. (See discussion on the Slip Ramp in Preferred Alternative).
- IS 3: Close the US 42 entrance to Browsboro Center and construct channelized turn lane to WB I-264.
- IS 4: Construct the second lane of WB I-264 Entrance Ramp.

The IDT recommended all four Interim Solution options.

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FHWA stated that IS 1 (RIRO at Old Brownsboro) if broken out as separate project could not be funded by Interstate Maintenance (IM) funding.

FHWA reiterated that IS 2 (Slip Ramp) could only be considered with or after construction of IS 1 (RIRO) and with KYTC control of traffic control devices along Old Brownsboro Road to Herr Lane. The FHWA also stated that IS 2 (Slip Ramp) would require the approved IMS before construction.

IS 1, IS 3, and IS 4 would not require the approved IMS.

Low Cost Options

Three Low Cost (LC) Options were identified.

- LC 1: Construct a full length dual left turn lane for WB US 42 to WB I-264.
- LC 2: Construct a second left turn lane on the EB I-264 Exit Ramp.
- LC 3: Construct a second exit lane on the WB I-264 Exit Ramp.

The IDT recommended that all three options should be carried forward and studied in Phase 1 once the traffic patterns stablize from the new Westport Road Interchange. This study should note that LC 3 is also being studied as part of the adjacent I-71/I-264 interchange project.

Meeting Adjourned

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Palmer ENGINEERING

MEETING DOCUMENTATION

Project: 5-390.00 I-264/US 42 Interchange Design Study

Location: KYTC Central Office Design Conference Room

Meeting Date: September 13, 2010

Subject: Interchange Modification Study Meeting

Attendees:

Robert Farley (KYTC CO Design)
Tala Quinio (KYTC D5 Design)
Travis Thompson (KYTC D5 Design)
Brad Bottoms (KYTC D5)
David Lindeman (Palmer Engineering (PEC))
Karl Sawyer (PEC)
Stephen Sewell (PEC)

MEETING SUMMARY

A Project Team Meeting for the referenced project was held at 1:00 PM on September 13, 2010 in the Kentucky Transportation Cabinet (KYTC) Central Office conference room. The purpose of the meeting was to discuss an Interchange Modification Study (IMS) for the proposed Ramp Split.

Palmer Engineering was updated on a recent meeting KYTC had with FHWA concerning the project. FHWA originally had stated that adjacent interchanges would need to be addressed in the IMS but modified their decision. An IMS would be required for the Ramp Split option but could be completed without addressing the adjacent interchanges. The ultimate interchange will require an additional IMS along with the analysis of the adjacent interchanges.

As part of this scoping study an additional chapter will be included that addresses the FHWA Interchange Access Policy. This chapter will support the 8 policy points and provide traffic analysis to support the benefits of the Ramp Split.

Prior to adjourning KYTC requested PEC to submit a contract modification for incorporating an IMS in the scoping study.

Meeting Adjourned

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U.S. Department
of Transportation
Federal Highway Administration

Kentucky Division Office
José M. Sepúlveda, Division Administrator

330 West Broadway
Frankfort, KY 40601
PH. (502) 223-6720
FAX (502) 223-6735

August 3, 2010

Mr. Michael W. Hancock, PE
Acting Secretary
Kentucky Transportation Cabinet
200 Mero Street, Room 613
Frankfort, Kentucky 40622

Dear Mr. Hancock:

We recently met with Mr. Steve Waddle and Kentucky Transportation Cabinet (KYTC) staff regarding the proposed addition of a slip ramp from I-264 eastbound to Old Brownsboro Road, SYP 5-390; I-264 and US-42. We discussed two options for advancing the construction of the slip ramp. Include the slip ramp in the previously proposed Interchange Reconstruction Project, and use phased construction to advance the ramp, or create a new independent project for the slip ramp and advance the slip ramp construction independently of the previously proposed Interchange Reconstruction Project.

To advance the ramp construction as an independent project; it must shown that addition of the slip ramp will not preclude options under consideration for the previously proposed Interchange Reconstruction Project. Also, a new independent project would have to be added to the TIP and STIP.

In order to move forward with the evaluation of either option, an Interchange Modification Study (IMS) is required. Currently, this slip ramp is not provided as a part of the existing interchange and it constitutes the creation of a new access point. Please refer to http://www.fhwa.dot.gov/legsregs/directives/fapg/access.htm for detailed information on the eight policy points that need to be addressed for "Findings of Engineering and Operational Acceptability" for the IMS.

As part of addressing the eight policy points, the IMS must satisfactorily detail the existing access and the local street network cannot be upgraded to provide acceptable access without the addition of the proposed slip ramp. Several improvements to the local street network are detailed in Section 8.2 of the scoping study. The IMS would need to evaluate the construction of the proposed local improvements without the addition of the ramp to clearly demonstrate the existing access and the local street network cannot be upgraded to provide acceptable access without the addition of the proposed slip ramp.

Please contact Mr. Gilberto DeLeon at (502) 223-6757 if you have any questions regarding this issue.

Sincerely,

Steve R. Mills
Assistant Division Administrator

cc: Steve Waddle, KYTC

APPENDIX B

TRAFFIC FORECASTING

Traffic Forecast Business Report
Jefferson County Traffic Forecast
I-264/US 42 Interchange Scoping Study
Item Number: 5-390.00

Prepared for:

Kentucky Transportation Cabinet (KYTC)

Prepared by:

Palmer Engineering

June 2009

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Appendices

1. Introduction

The purpose of this document is to summarize the steps taken by Palmer Engineering to prepare the traffic forecast for the US 42 and I-264 Interchange area in Jefferson County, Kentucky for the Kentucky Transportation Cabinet (KYTC). The study area begins on US 42 at Rudy Lane (west of I-264 Interchange) and extends to Lime Kiln along US 42. Also included in the study area is Old Brownsboro Rd from US 42 to Herr Lane/Lime Kiln. **Figure 1** shows the study area.

The attached report uses a variety of data sources to arrive at traffic forecasts for the study area. This report uses the KIPDA travel model output as a guide for developing traffic growth rate factors which is preferable to merely applying growth factors derived from past trends. Fueling this is the realization that there are several roadway projects that will impact traffic flow patterns and volumes in the near future, not the least of which is the construction of the Westport Road Interchange. Urban Travel Demand Forecasting Models, while inherently inaccurate at the micro level of analysis, do provide a window into general travel pattern changes. Therefore, determining growth rates from the model and applying them to actual traffic counts should yield reasonably accurate traffic forecasts.

This report includes the following traffic forecast:

- Average Daily Traffic (ADT) forecast for the base year 2012, intermediate year 2020, and future year 2030.
- ADT and Design Hourly Volumes (DHV) forecast for intersections within the study area for each scenario.

2. Segment Traffic Volumes

The turning movement volumes used for this project include counts provided by KYTC as well as counts performed by Palmer Engineering. The turning movement counts provided by KYTC were part of a signal timing study conducted by URS in May 2008 and included the following intersections:

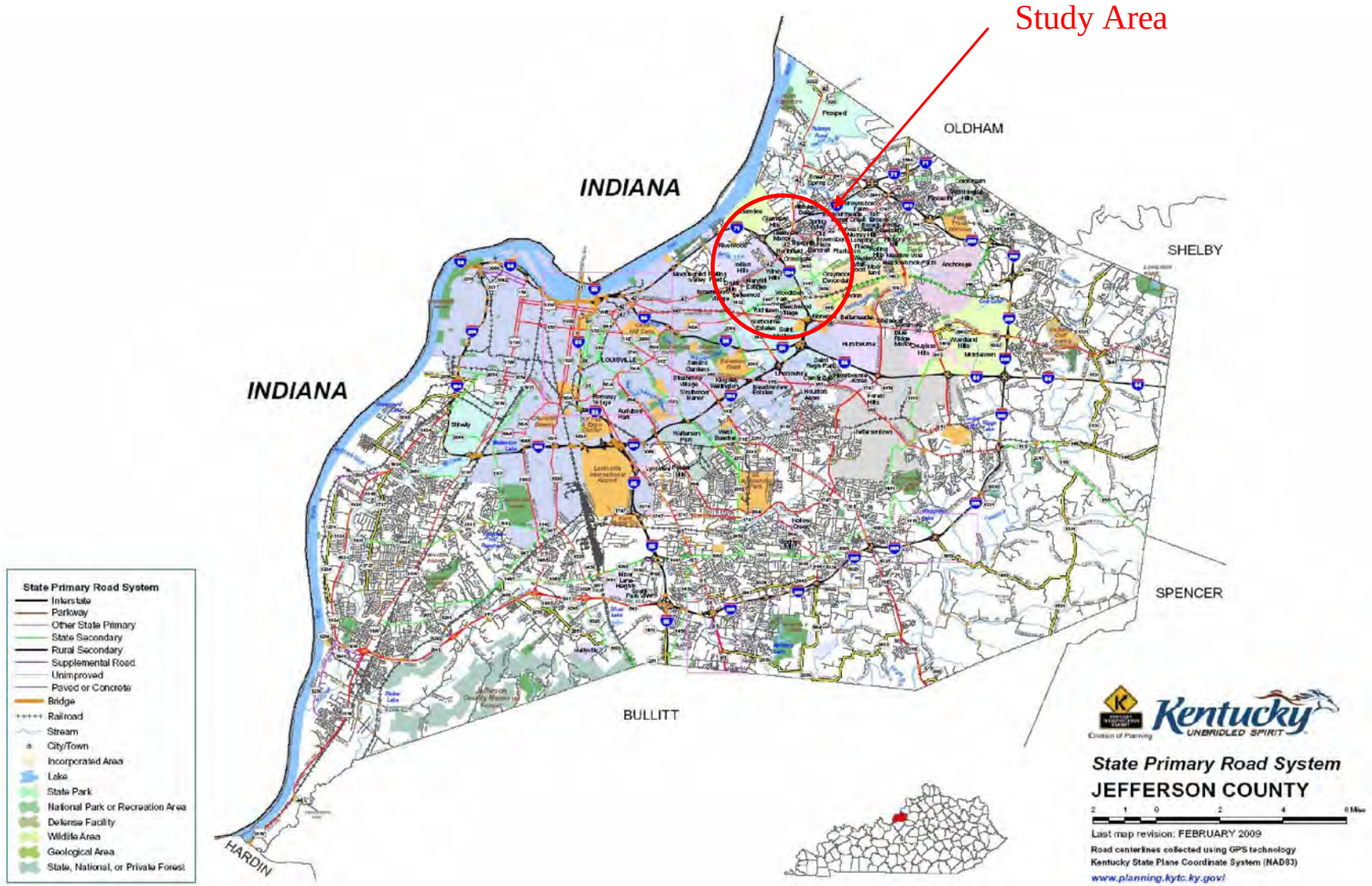
- US 42-Rudy Lane
- US 42-I264 SB Ramps
- US 42-I264 NB Ramps
- US 42-Old Brownsboro Rd

In addition, Palmer Engineering conducted AM and PM turning movement counts at the following intersections:

- US 42-Holiday Manor
- Old Brownsboro Rd-Holiday Manor
- Old Brownsboro Rd-Herr Lane/Lime Kiln

The counts were conducted in 15-minute intervals to obtain peak hour factors. While conducting turning movement counts, truck volumes were also counted.

Figure 1. Study Area



3. Intersection Turning Movement Volumes

Meetings held with District 5 Department of Highways staff revealed that base year 2012 traffic should be based upon May 2008 traffic counts taken by URS (on US 42) and supplemented with three counts to be taken by Palmer Engineering. Palmer Engineering performed these turning movement counts in January 2009 during the AM peak period (6:00 AM - 8:00 AM) and the PM peak period (2:00 PM – 6:00 PM) for the following intersections:

- US 42/Holiday Manor
- Old Brownsboro Rd/Lime Kiln
- Old Brownsboro Rd/Holiday Manor

4. Growth Rates

Traffic count data was expanded to 2012 using growth factors for each intersection approach from the KIPDA provided link data and then smoothed and balanced. The primary objective was to preserve and expand on the turning movements that were found in the traffic counts as opposed to model produced turning movements which usually prove to be unreliable. Given that future year forecasts are inherently less accurate over a long period of time, average growth factors were established based on the KIPDA model output for the US 42 corridor as well as Old Brownsboro Road, and Lime Kiln Road for 2020 and 2030. The growth factors for US 42, Old Brownsboro Road, and Lime Kiln were applied to the 2012 forecasts to arrive at 2020 and 2030 forecasts.

The 2012 volumes along US 42 were expanded from 2012 to 2020 by applying a growth factor of approximately 10% (1.3% per year) and from 2012 to 2030 by applying a growth factor of approximately 20% (0.8% per year). Volumes along Old Brownsboro Road were expanded from 2012 to 2020 by applying a growth factor of approximately 2.5% (0.3% per year) and from 2012 to 2030 there was no additional growth. Volumes on Lime Kiln were forecasted to remain essentially the same as 2012 for 2020 and 2030.

5. Trip Generation/Trip Distribution

The area surrounding the I-264/US 42 interchange is undergoing several changes that make this scoping study relatively complex. Several developments within and adjacent to the study area are scheduled to be completed by 2012. The travel model did not take the proposed developments into account, requiring the volumes generated and distributed by these developments to be added into the forecasts for 2012, 2020, and 2030. There were four developments identified that would generate traffic, thus needing to be included in the traffic forecasts. These developments include:

1. The Midlands
2. Providence Point
3. Seminary Condominium Complex
4. Fresh Market

District 5 and Louisville Metro provided information concerning The Midlands, Providence Point, Seminary Condominium Complex, and the Fresh Market. A supplemental report has also been published which adds Providence Point and the Seminary Condominium complex to The Midlands development traffic. Louisville Metro provided the Fresh Market traffic impact study as well as some additional information concerning the Seminary Condominium complex.

The Midlands supplemental report incrementally included each additional development but did not separate background traffic from site generated traffic in every case. Therefore, in order to separate site generated traffic from background traffic these studies had to be reverse engineered to determine the trips from each. After determining the site generated traffic for each proposed development, these new traffic numbers were added to the 2012 forecasts and also to 2020 and 2030 in order to analyze the combined traffic in the study area.

While the use of the KIPDA model as a basis for the forecasts has some inherent risk due to the probable error that is considered acceptable with regional travel models, a decision was made to use this information source because of its ability to take into account all of the impending road network changes. Several of the roadway projects that will impact traffic flow patterns and volumes in the future, not the least of which is the construction of the Westport Road Interchange, will be completed this year and the widening of US 42 from I-264 to I-71 is scheduled for 2015.

Another important part of the analysis is the proposed slip ramp. The general public and local officials have expressed an interest in constructing a slip ramp from the interchange northbound off ramp (from the south) directly to Old Brownsboro Road. The intersection of the slip ramp with Old Brownsboro Road would be at the sharp 90 degree turn where Old Brownsboro Road turns from a north-south orientation to an east-west alignment. The purpose of the slip ramp is to remove a significant amount of traffic from the right turn movement that currently uses the ramp, turning right onto US 42, and then turning right again at Old Brownsboro Road. The analysis for each future year includes both with slip ramp and without slip ramp conditions.

6. K Factor

K Factors were calculated based on the turning movement counts conducted by Palmer Engineering and URS. The K Factors were compared to the statewide average for each functional classification and a K Factor of 10% to 12% was used.

7. PHF

Peak Hour Factor (PHF) was calculated from turning movement counts conducted by Palmer Engineering and counts conducted by URS (previous study). The PHF for each intersection varied by approach and movement. A default of 0.90 was used for movements which data was not able to be gathered in the field.

Table 1. US 42 & Old Brownsboro Rd Traffic Forecast ADT & DHV

Seg	Route	Beginning Intersection	Ending Intersection	Historical Growth Rate	KIPDA Model ADT (Base)	2008 Truck % ADT	2008 Truck % DHV	KIPDA Model ADT (2012)	Growth Rate	KIPDA Model ADT (2020)	Growth Rate	KIPDA Model ADT (2030)	2030 Truck % ADT	2030 Truck % DHV
A	42	Rudy Lane	I-264 Ramp	0.6%	32,200	1.3%	1.0%	36,600	-1.40%	32,700	1.60%	37,100	2.0%	1.5%
B	42	I-264 Ramp	I-264 Ramp	7.2%	43,600	2.0%	1.5%	37,000	1.10%	40,400	0.50%	42,100	3.1%	2.3%
C	42	I-264 Ramp	Old Brownsboro Rd	7.2%	61,300	2.0%	1.5%	62,400	2.40%	75,500	0.75%	80,000	3.1%	2.3%
D	42	Old Brownsboro Rd	Holiday Manor	4.5%	37,800	2.0%	1.5%	38,200	3.25%	49,300	1.00%	53,400	3.1%	2.3%
E	42	Holiday Manor	Lime Kiln	4.5%	34,200	2.0%	1.5%	34,300	3.35%	44,600	1.05%	48,500	3.1%	2.3%
F	Old Brownsboro Rd	US 42	Proposed Midlands Ent	0.6%	23,500	2.2%	1.7%	22,800	0.45%	23,600	0.05%	23,700	3.4%	2.6%
G	Old Brownsboro Rd	Proposed Midlands Ent	Holiday Manor	0.6%	23,500	2.2%	1.7%	22,800	0.45%	23,600	0.05%	23,700	3.4%	2.6%
H	Old Brownsboro Rd	Holiday Manor	Herr Ln/Lime Kiln	0.6%	18,100	2.2%	1.7%	18,600	0.35%	19,100	-0.07%	19,000	3.4%	2.6%

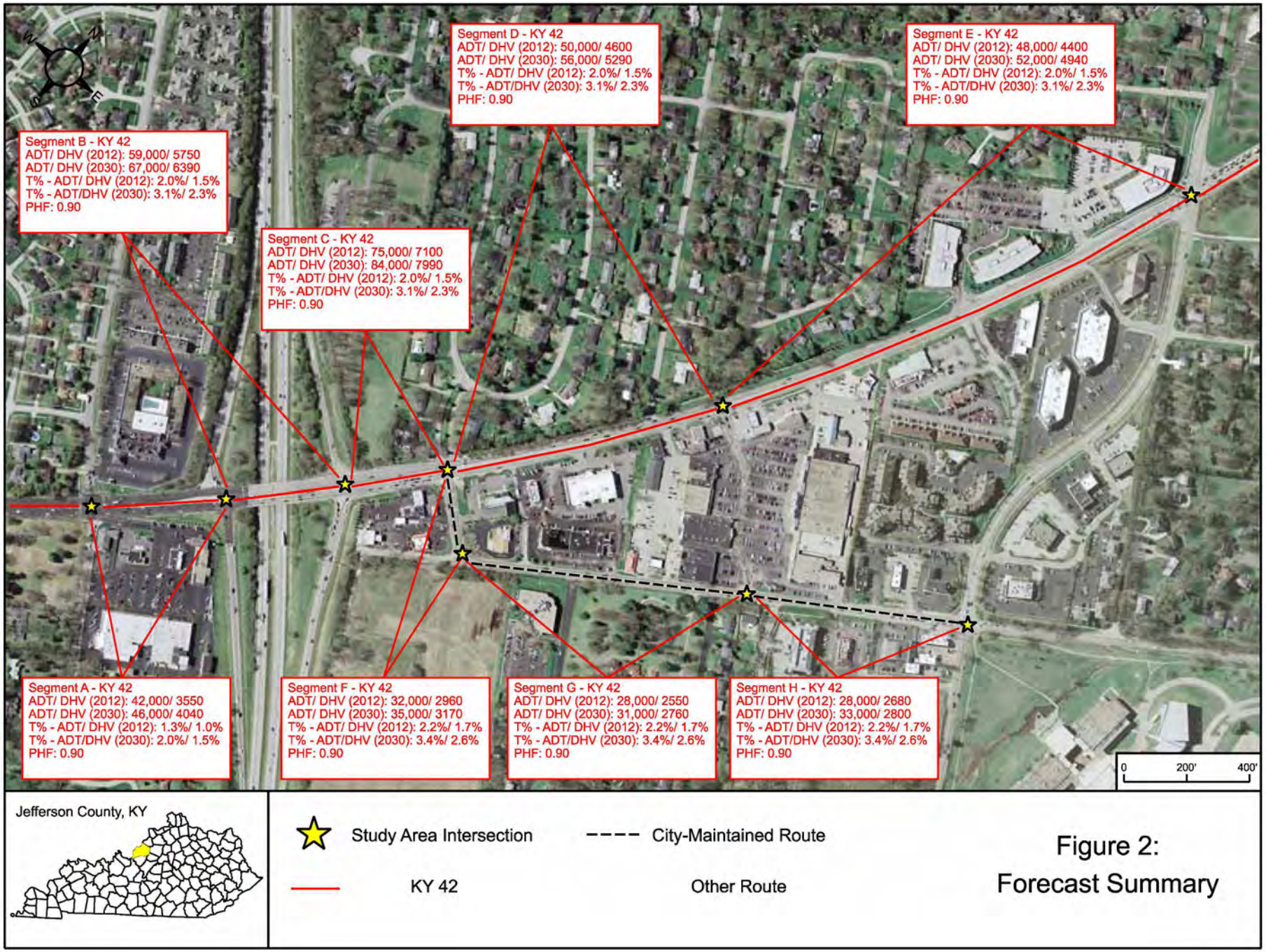


Figure 2:
Forecast Summary

8. Truck Percentages

Truck Percentages were obtained from two sources: KYTC's count station 056-004 and 056-238 along with counts made during the am and pm peak hour by Palmer Engineering. The truck percentages varied from 1.3% to 2.1% so a decision was made to use a truck percentage of 2.0% for the entire project area. The truck percentages were grown by 0.5% due to the area already being developed and a small truck percentage of truck existing on the system presently.

9. ESAL Calculations

ESAL forecasts were not requested by the project team for this study since there was no intent to use the study for pavement design purposes.

10. Population

A traffic forecast for an adjacent project provided the following data which were attained from the Kentucky State Data Center. Historical population growth can be found in Table 2 while projected population growth can be found in Table 3.

Table 2: Historical Population Growth

	1970	1980	1990	2000	% Growth (1990-2000)
Kentucky	3,220,711	3,660,334	3,686,892	4,041,769	9.6%
Jefferson County	695,055	684,684	665,123	693,604	4.3%

Table 3: Projected Population Growth

	2000	2010	2020	2030	% Growth (2000-2030)
Kentucky	4,041,769	4,326,490	4,660,703	4,912,621	22.0%
Jefferson County	693,604	710,120	738,732	763,393	10.0%

Jefferson County population increased 4.3% from 1990 to 2000 while Kentucky's population increased 9.6% in the same timeframe. Population projections indicate that Jefferson County's population will increase 10.0% between 2000 and 2030 at a rate of 0.32% per year as compared to Kentucky's expected increase of 22.0% at a rate of 0.65% per year.

APPENDIX A

2012 Turning Movement

Traffic Forecast

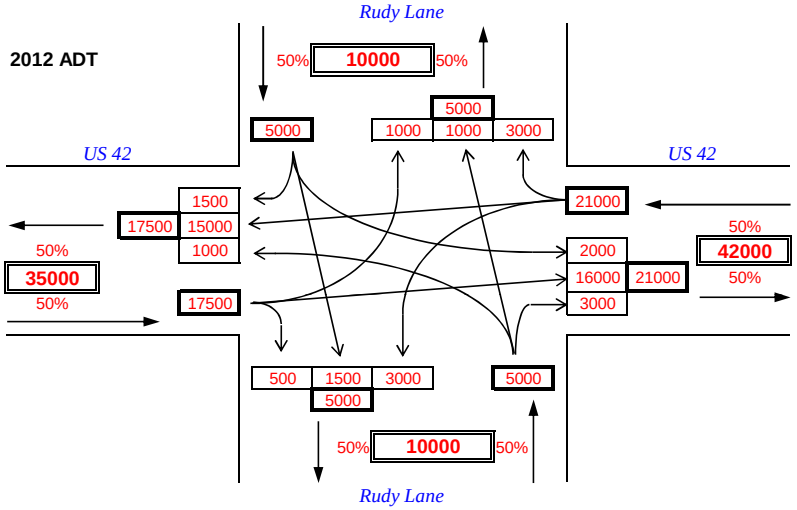
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (Without Slipramp)

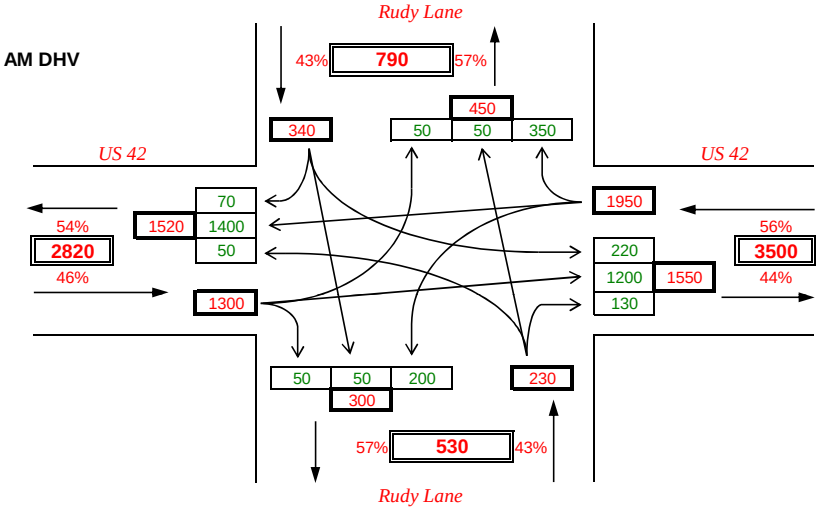
INTERSECTION: Int #1 (US 42 @ Rudy Lane)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.48	0.60	0.37	0.45	0.60	0.57	0.68	0.59
NB	0.75	0.91	0.45	0.86	0.77	0.83	0.63	0.82
WB	0.90	0.90	0.96	0.94	0.66	0.76	0.86	0.86
EB	0.92	0.93	0.88	0.94	0.63	0.71	0.69	0.54

2012 ADT

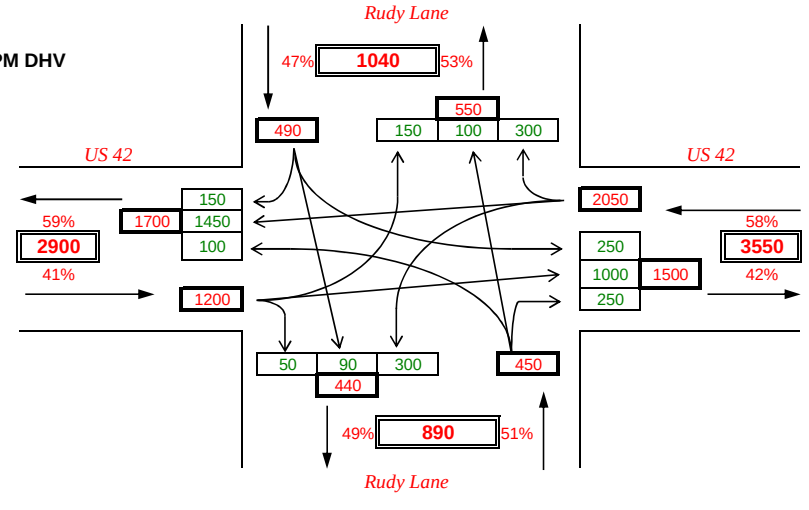


2012 AM DHV



Location Map

2012 PM DHV



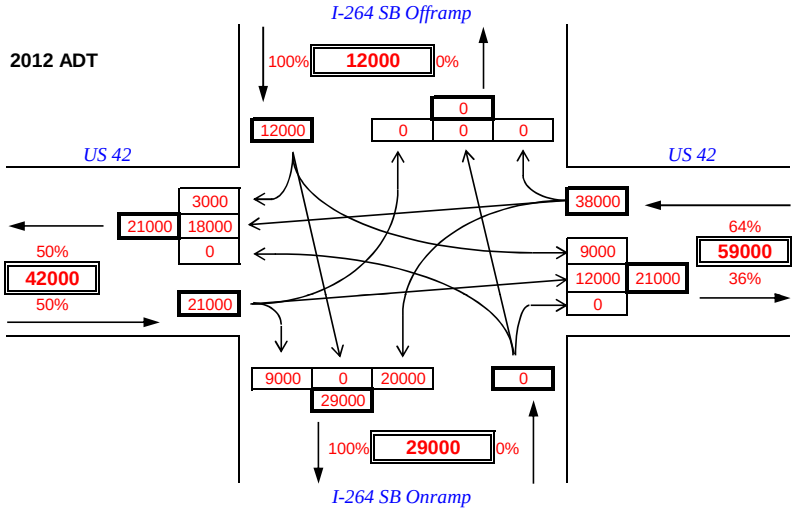
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (Without Slipramp)

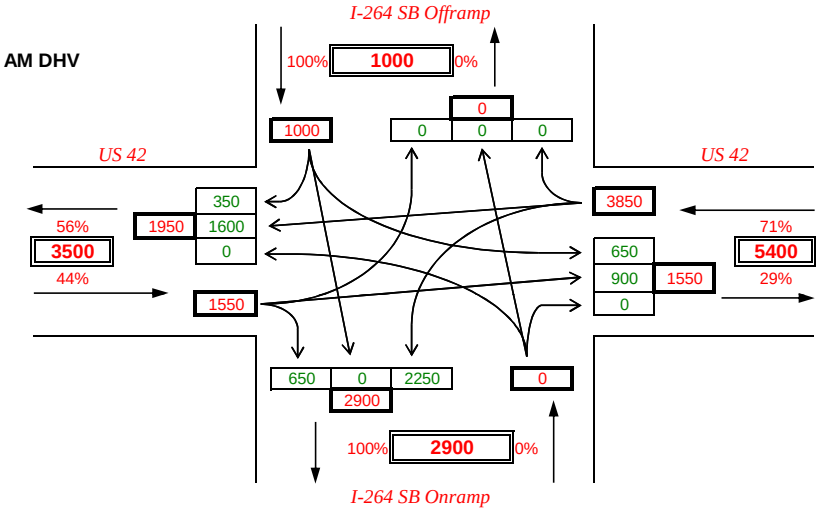
INTERSECTION: Int #2 (US 42 @ I-264 SB Ramps)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.80	0.87	-	-	0.69	0.81	0.87	0.87
NB	-	-	-	-	-	-	-	-
WB	0.96	0.92	0.92	0.87	-	-	0.98	0.88
EB	0.90	0.83	0.88	0.80	0.95	0.86	-	-

2012 ADT

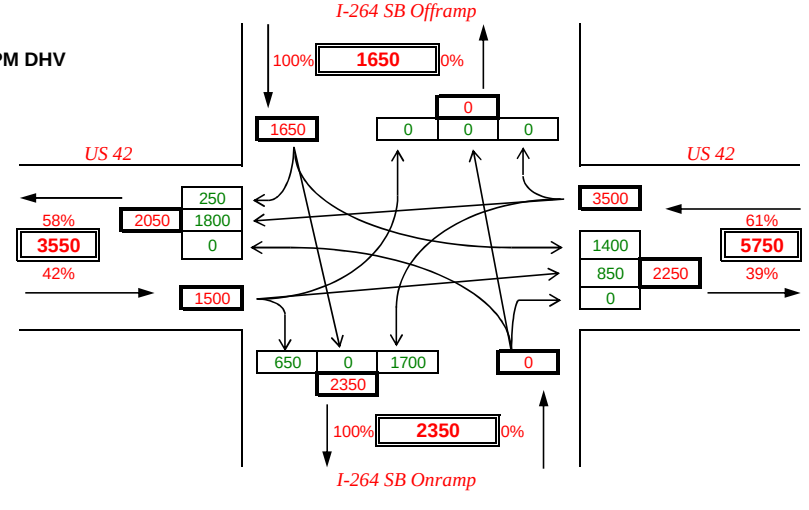


2012 AM DHV



Location Map

2012 PM DHV



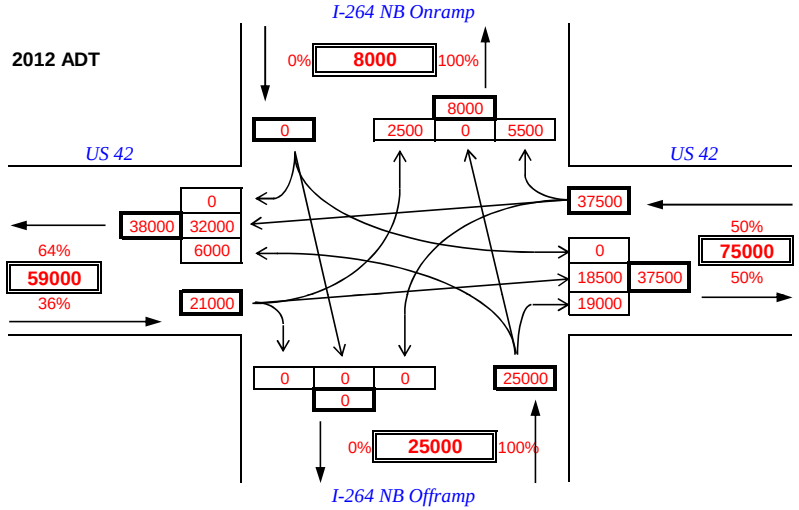
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (Without Slipramp)

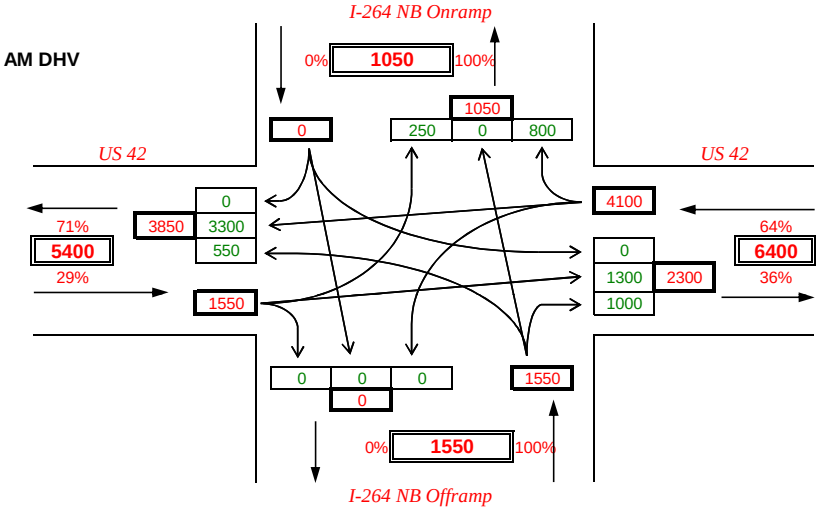
INTERSECTION: Int #3 (US 42 @ I-264 NB Ramps)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	-	-	-	-	-	-	-	-
NB	0.90	0.93	-	-	0.85	0.98	0.94	0.78
WB	0.97	0.91	0.93	0.92	0.80	0.82	-	-
EB	0.87	0.93	0.87	0.63	-	-	0.87	0.91

2012 ADT

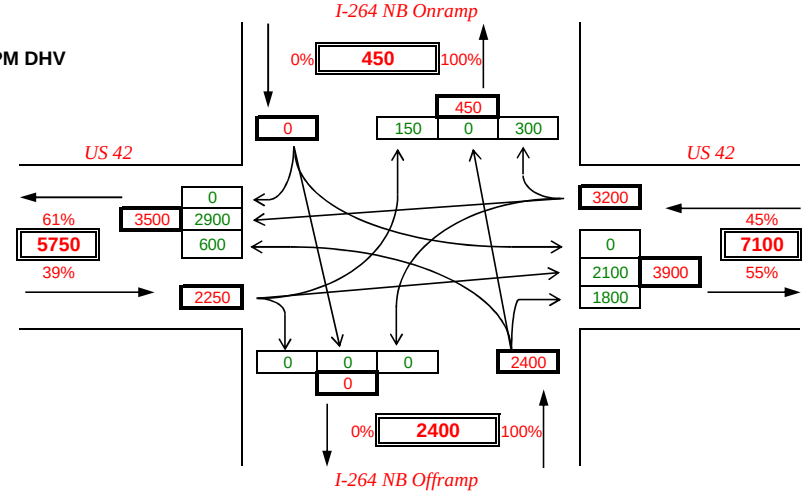


2012 AM DHV



Location Map

2012 PM DHV



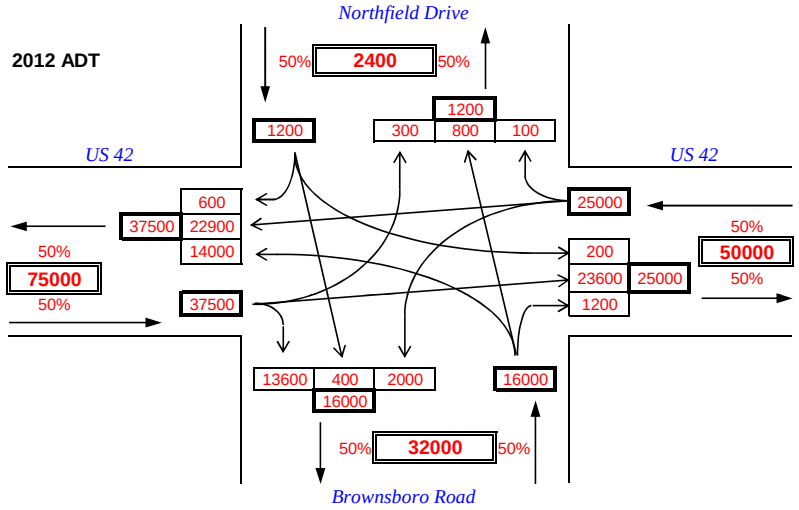
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (Without Slipramp)

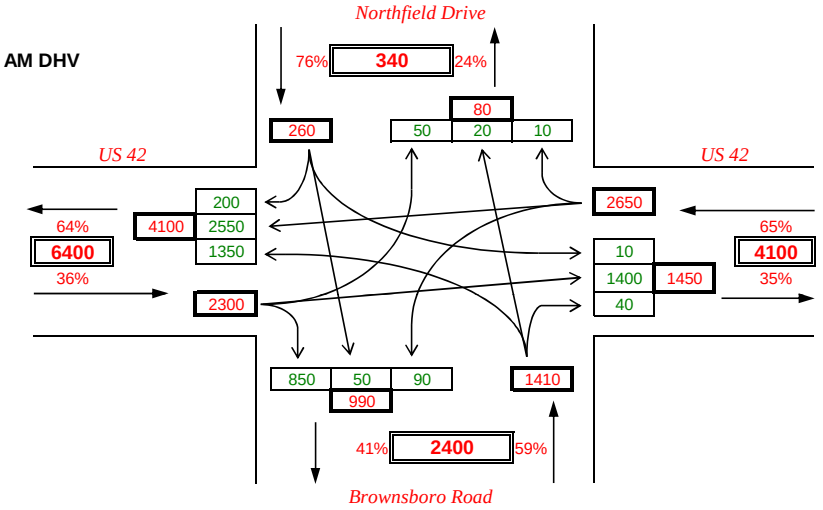
INTERSECTION: Int #4 (US 42 @ Brownsboro Road)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.79	0.70	0.60	0.50	0.80	0.50	0.50	0.69
NB	0.98	0.91	0.50	0.60	1.00	0.58	0.98	0.90
WB	0.97	0.92	0.97	0.91	0.42	0.68	0.63	0.54
EB	0.92	0.96	0.92	0.96	0.91	0.96	0.80	0.75

2012 ADT

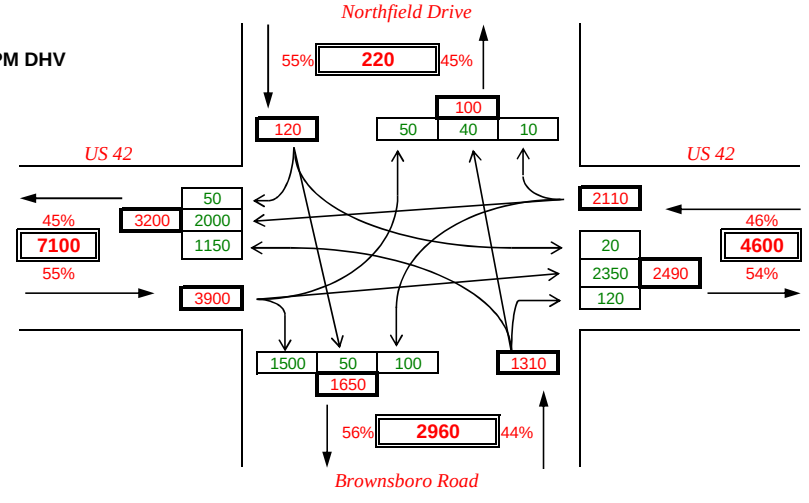


2012 AM DHV



Location Map

2012 PM DHV



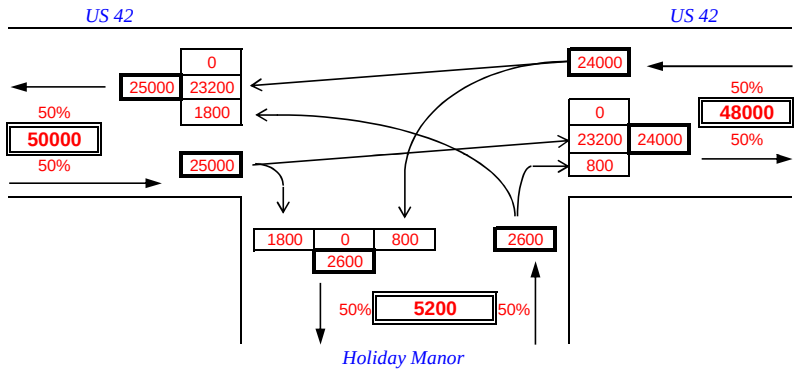
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (Without Slipramp)

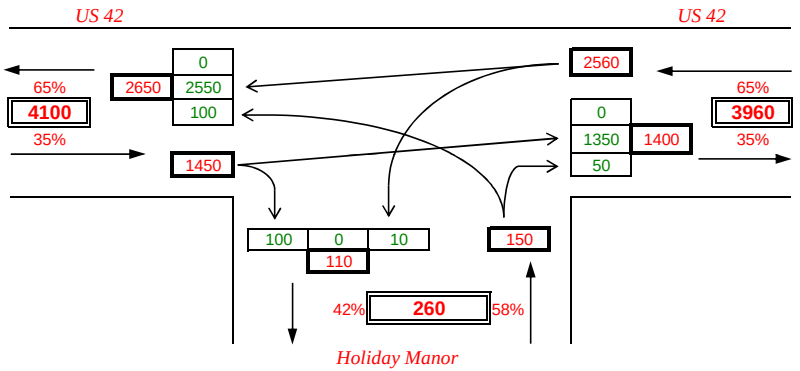
INTERSECTION: Int #5 (US 42 @ Holiday Manor)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	-	-	-	-	-	-	-	-
NB	0.82	0.89	-	-	0.73	0.60	0.90	0.75
WB	0.92	0.91	0.92	0.91	-	-	0.42	0.83
EB	0.77	0.94	0.77	0.93	0.60	0.92	-	-

2012 ADT

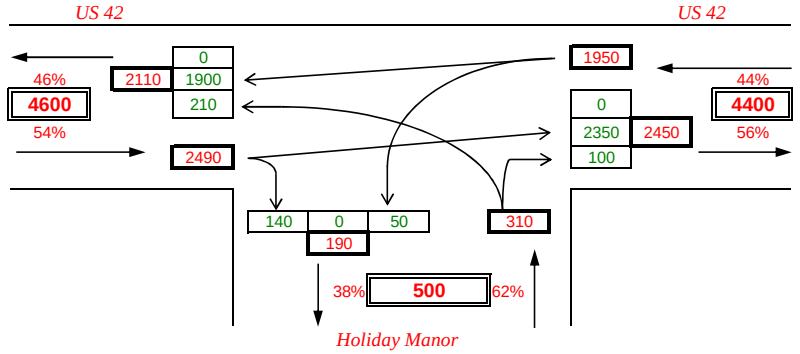


2012 AM DHV



Location Map

2012 PM DHV



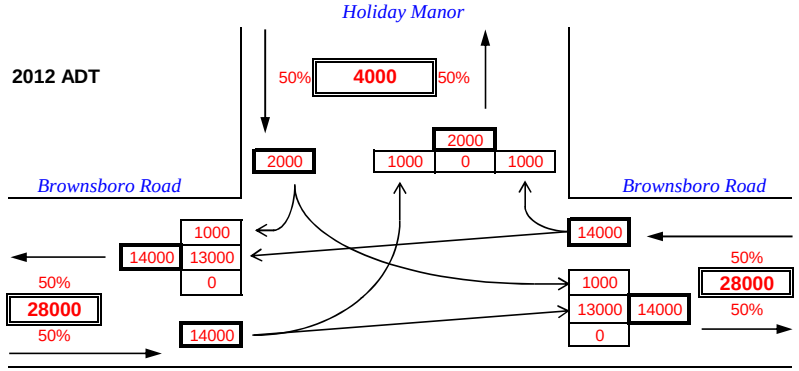
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (Without Slipramp)

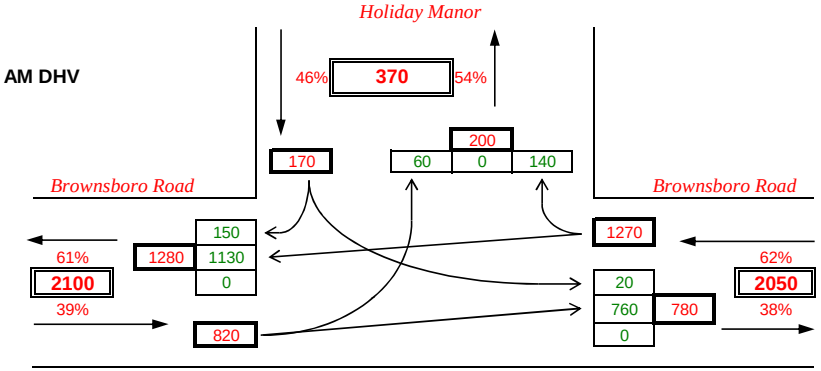
INTERSECTION: Int #6 (Brownsboro Road @ Holiday Manor)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.61	0.94	-	-	0.75	0.64	0.54	0.91
NB	-	-	-	-	-	-	-	-
WB	0.83	0.92	0.85	0.96	0.62	0.82	-	-
EB	0.69	0.92	0.68	0.91	-	-	0.85	0.91

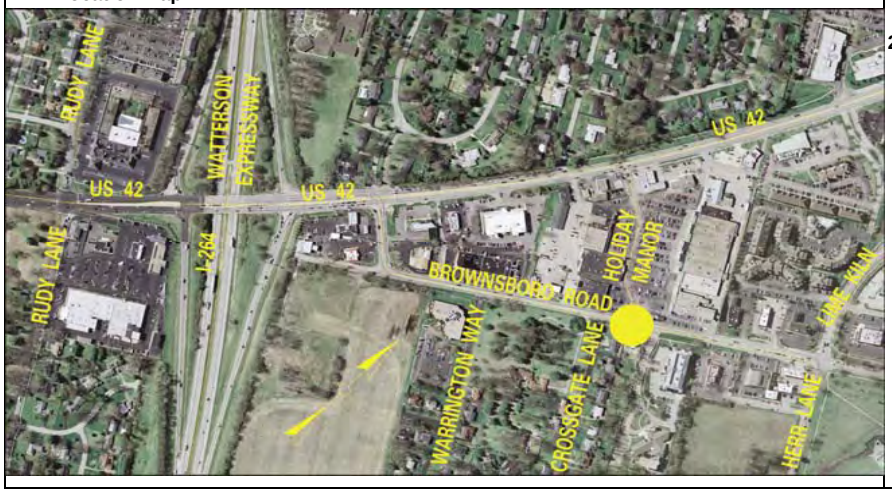
2012 ADT



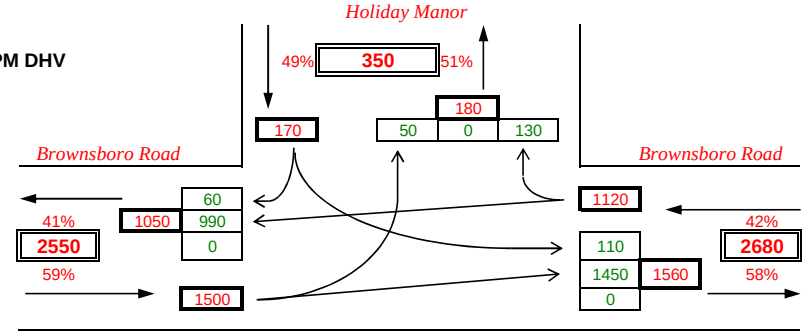
2012 AM DHV



Location Map



2012 PM DHV



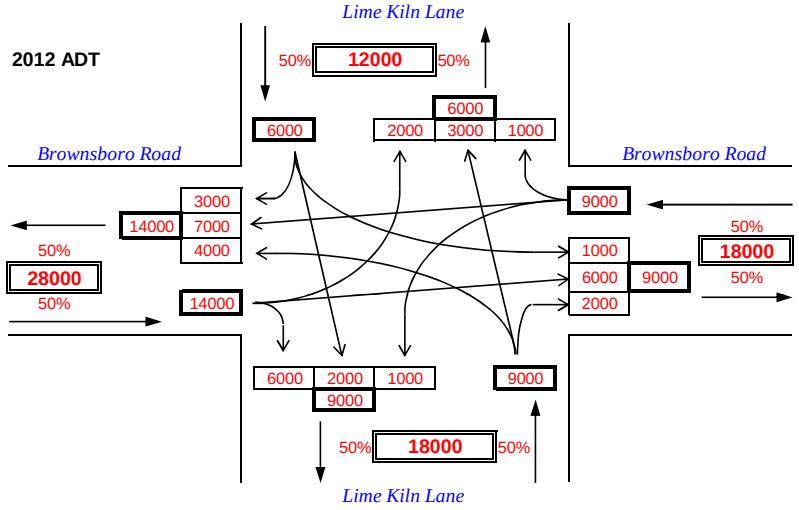
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (Without Slipramp)

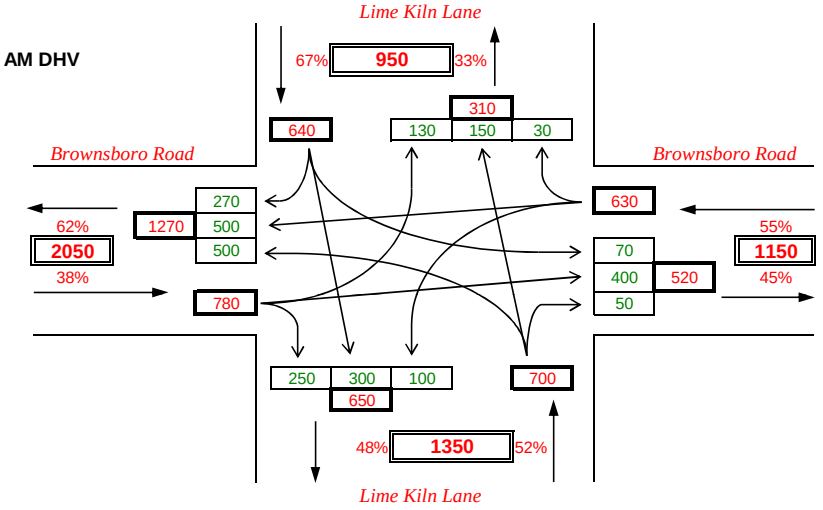
INTERSECTION: Int #7 (Brownsboro Road @ Lime Kiln Lane)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.86	0.88	0.94	0.93	0.65	0.69	0.84	0.81
NB	0.9	0.86	0.79	0.78	0.65	0.81	0.93	0.95
WB	0.89	0.85	0.88	0.85	0.69	0.64	0.88	0.91
EB	0.65	0.96	0.55	0.94	0.71	0.82	0.75	0.91

2012 ADT

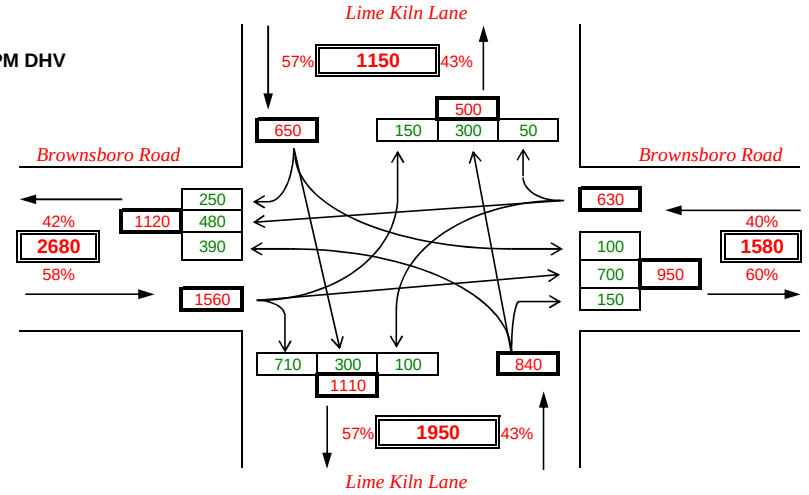


2012 AM DHV



Location Map

2012 PM DHV



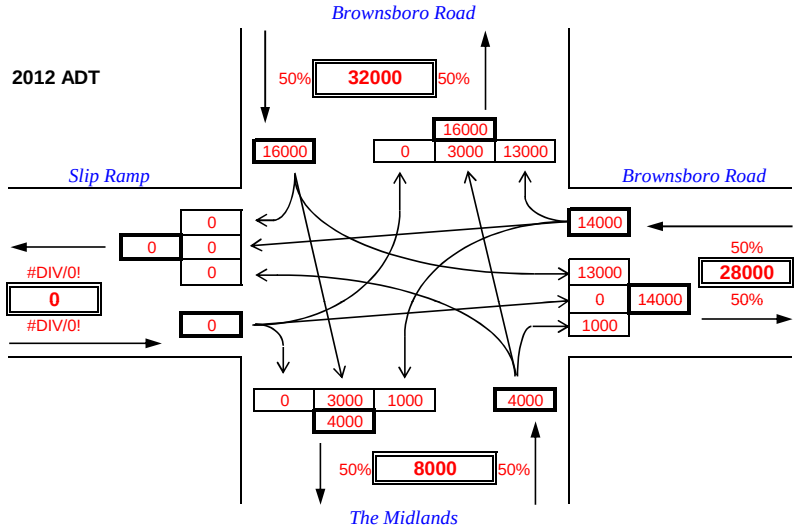
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (Without Slipramp)

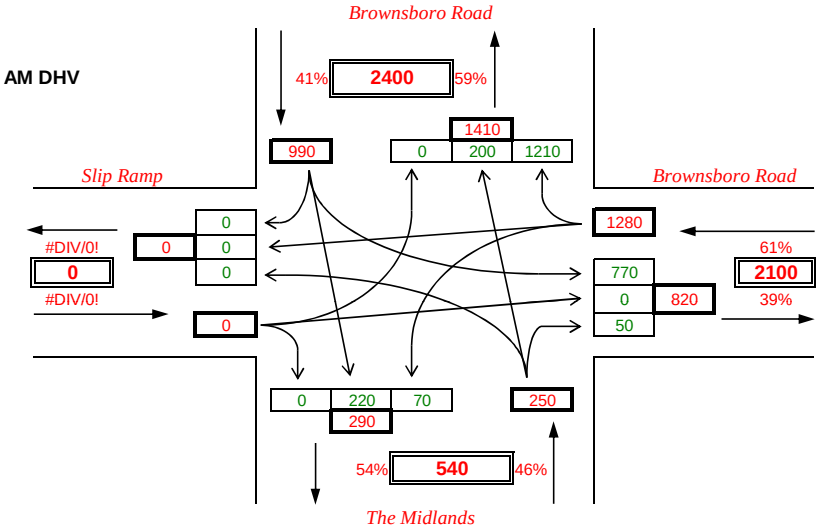
INTERSECTION: Int #8 (Brownsboro Road @ The Midlands)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.69	0.92	-	-	-	-	0.69	0.92
NB	-	-	-	-	-	-	-	-
WB	0.85	0.96	-	-	0.85	0.96	-	-
EB	-	-	-	-	-	-	-	-

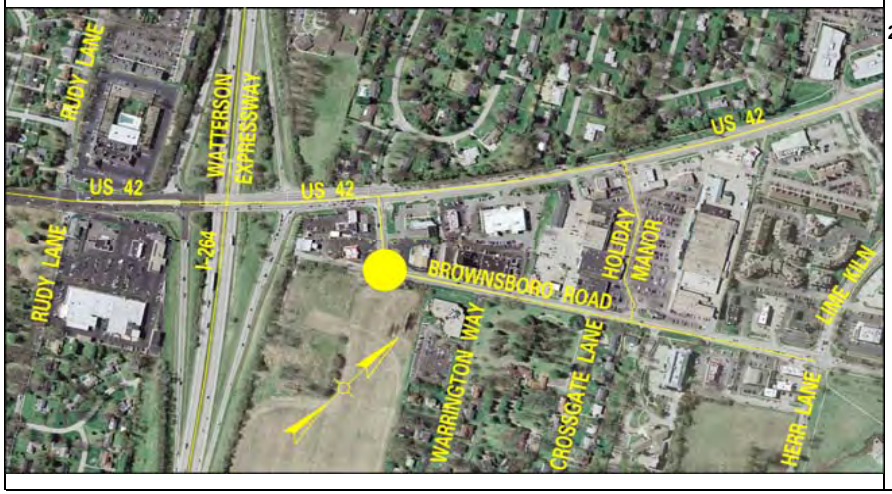
2012 ADT



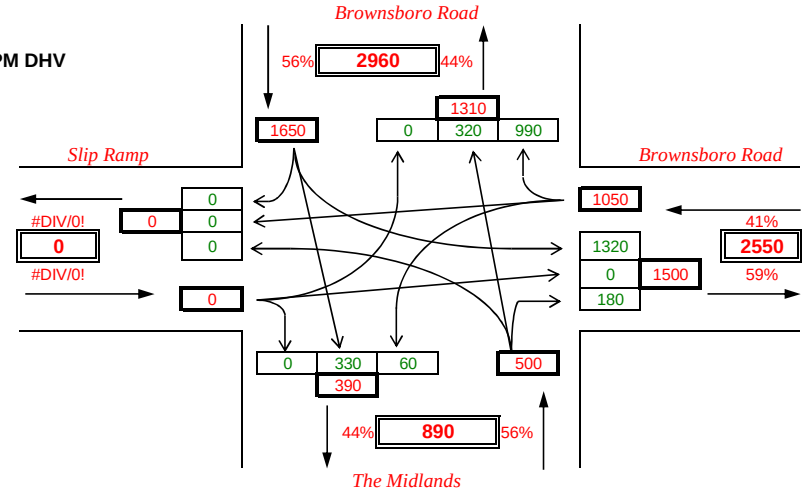
2012 AM DHV



Location Map



2012 PM DHV



2012 Turning Movement

Traffic Forecast

SLIP RAMP OPTION

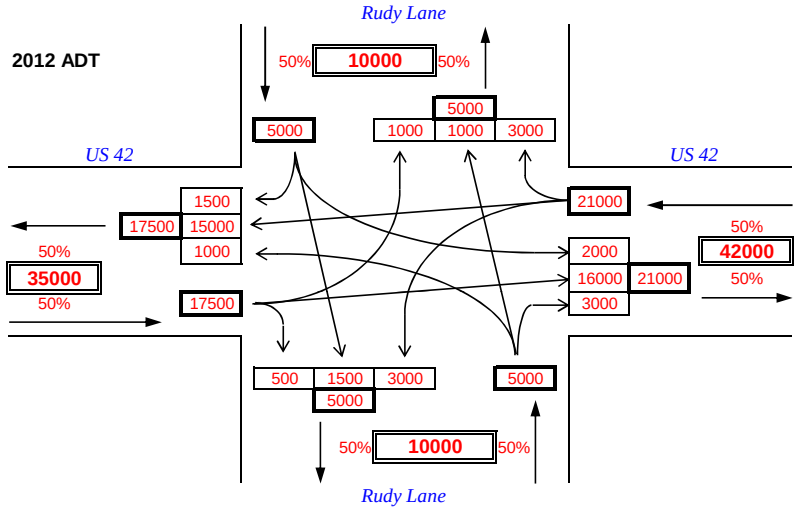
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (With Slipramp)

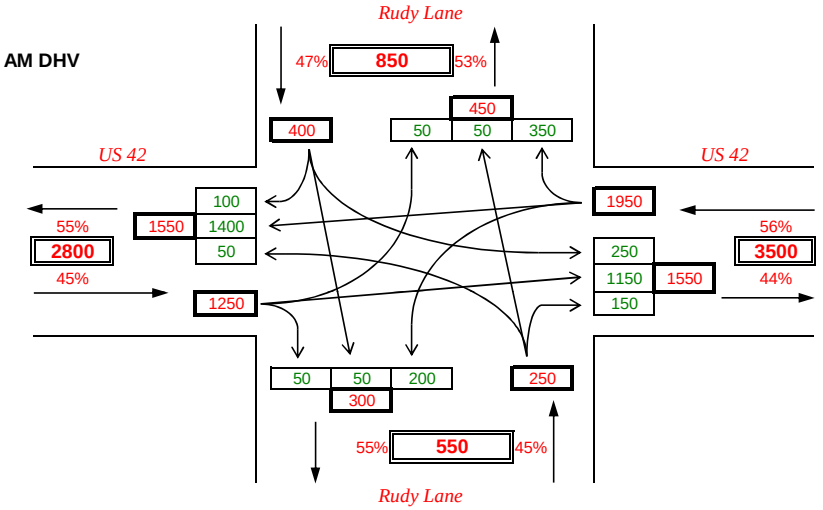
INTERSECTION: Int #1 (US 42 @ Rudy Lane)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.48	0.60	0.37	0.45	0.60	0.57	0.68	0.59
NB	0.75	0.91	0.45	0.86	0.77	0.83	0.63	0.82
WB	0.90	0.90	0.96	0.94	0.66	0.76	0.86	0.86
EB	0.92	0.93	0.88	0.94	0.63	0.71	0.69	0.54

2012 ADT

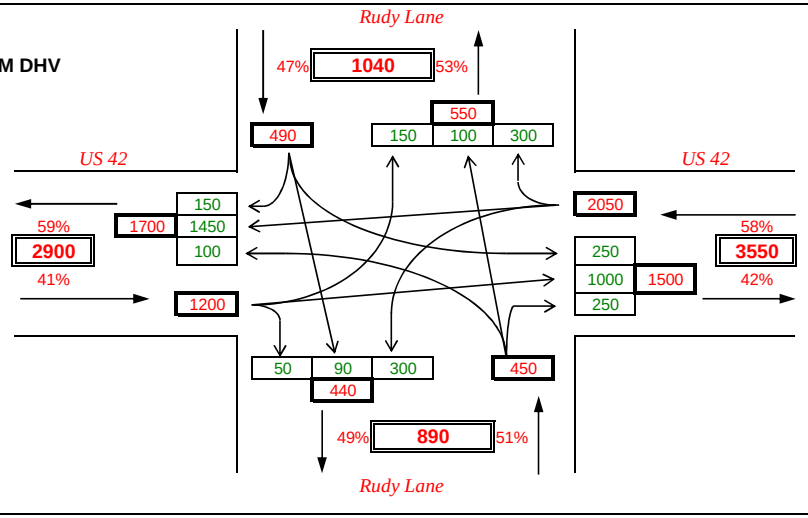


2012 AM DHV



Location Map

2012 PM DHV



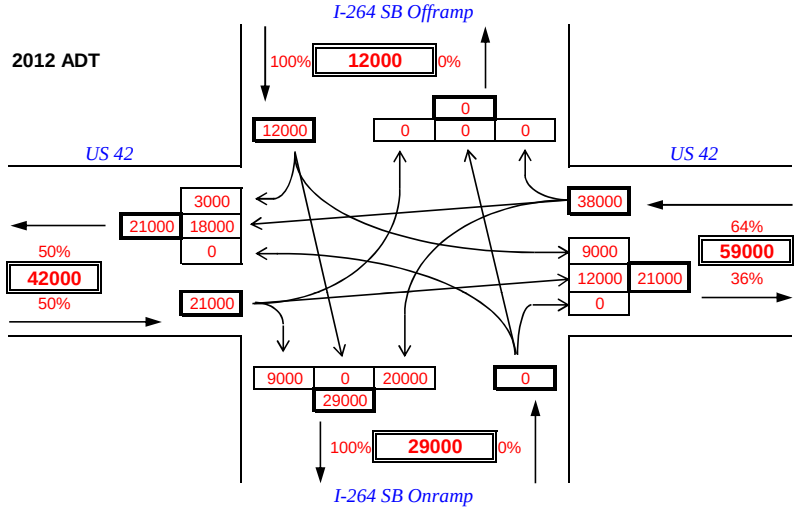
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (With Slipramp)

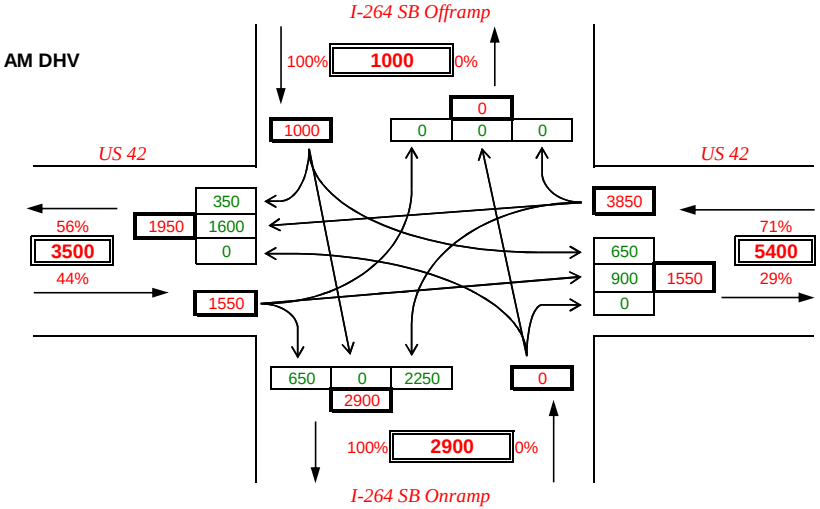
INTERSECTION: Int #2 (US 42 @ I-264 SB Ramps)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.80	0.87	-	-	0.69	0.81	0.87	0.87
NB	-	-	-	-	-	-	-	-
WB	0.96	0.92	0.92	0.87	-	-	0.98	0.88
EB	0.90	0.83	0.88	0.80	0.95	0.86	-	-

2012 ADT

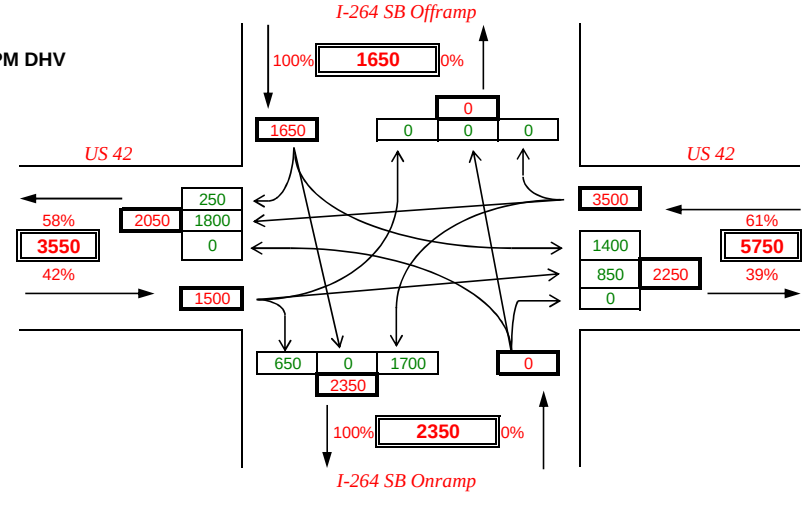


2012 AM DHV



Location Map

2012 PM DHV



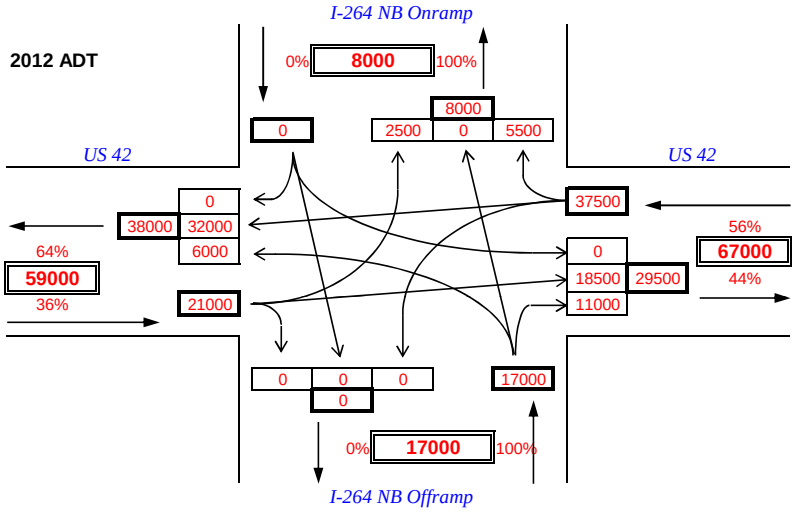
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (With Slipramp)

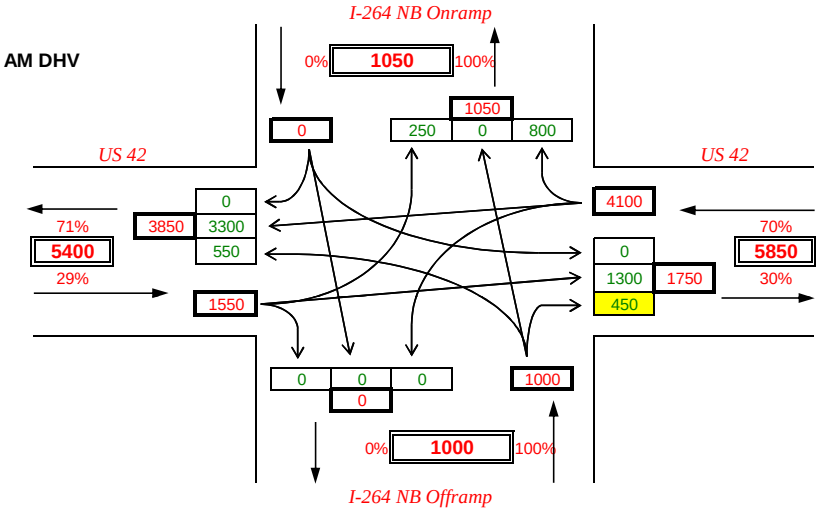
INTERSECTION: Int #3 (US 42 @ I-264 NB Ramps)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	-	-	-	-	-	-	-	-
NB	0.90	0.93	-	-	0.85	0.98	0.94	0.78
WB	0.97	0.91	0.93	0.92	0.80	0.82	-	-
EB	0.87	0.93	0.87	0.63	-	-	0.87	0.91

2012 ADT

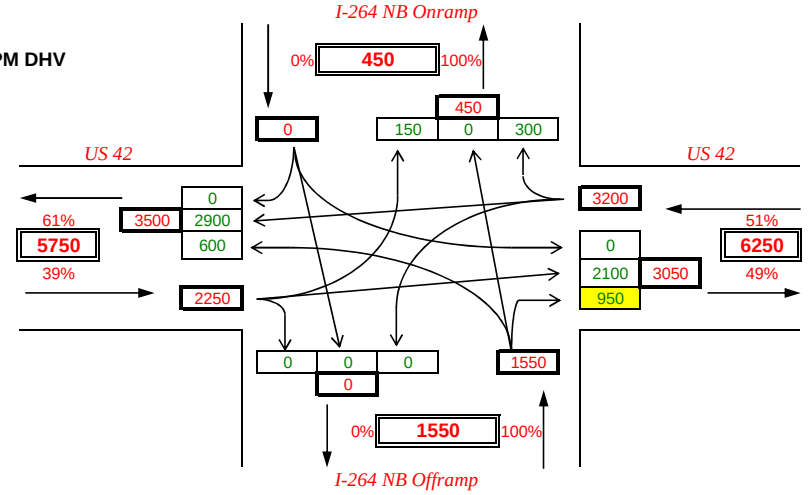


2012 AM DHV



Location Map

2012 PM DHV



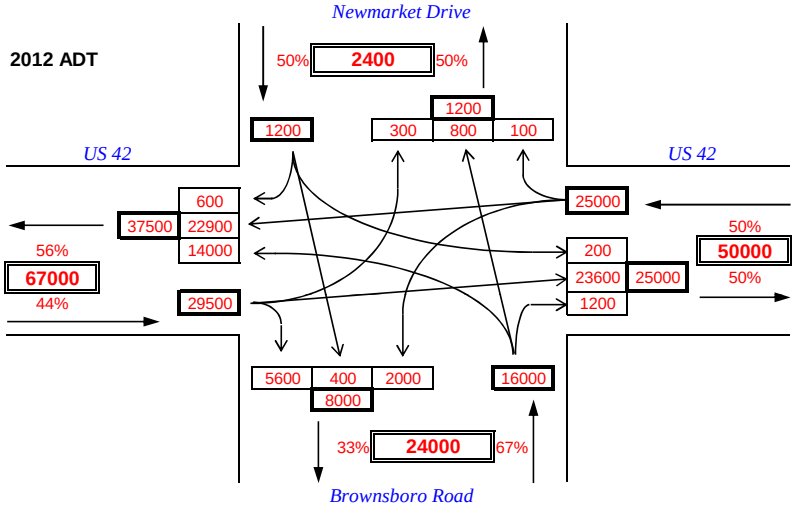
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (With Slipramp)

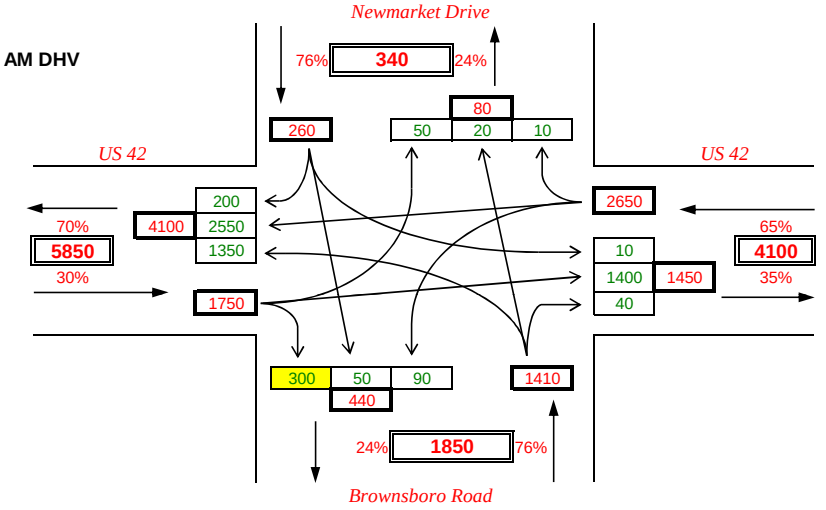
INTERSECTION: Int #4 (US 42 @ Brownsboro Road)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.79	0.70	0.60	0.50	0.80	0.50	0.50	0.69
NB	0.98	0.91	0.50	0.60	1.00	0.58	0.98	0.90
WB	0.97	0.92	0.97	0.91	0.42	0.68	0.63	0.54
EB	0.92	0.96	0.92	0.96	0.91	0.96	0.80	0.75

2012 ADT

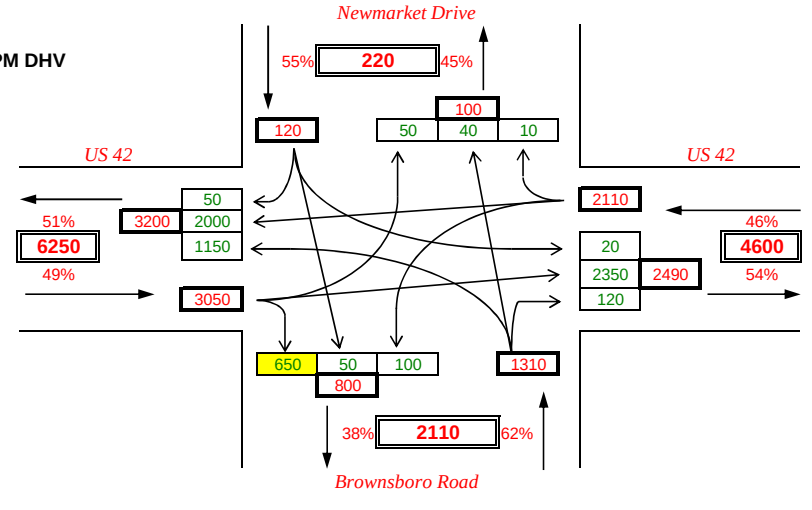


2012 AM DHV



Location Map

2012 PM DHV



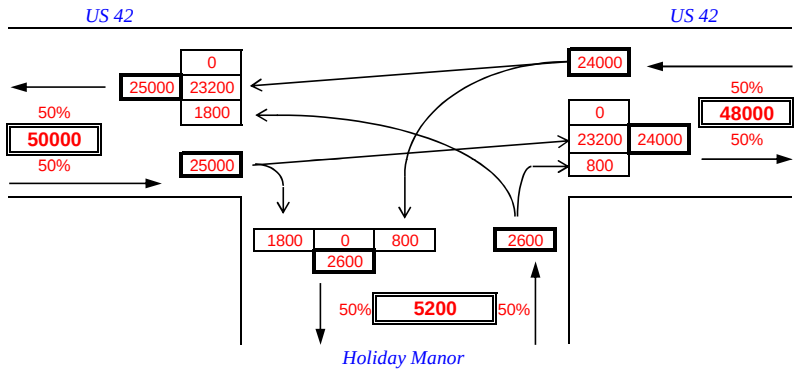
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (With Slipramp)

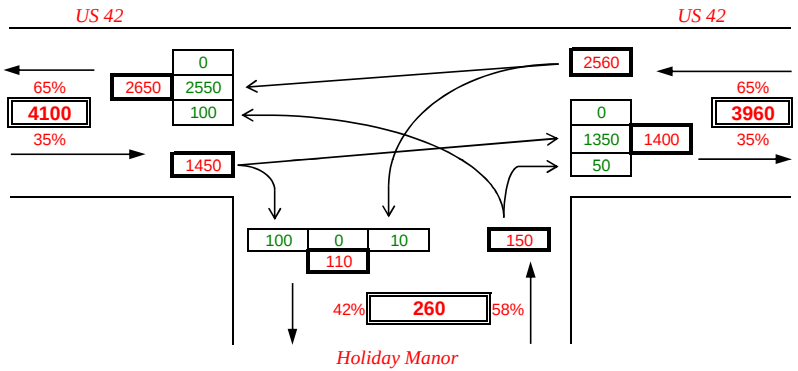
INTERSECTION: Int #5 (US 42 @ Holiday Manor)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	-	-	-	-	-	-	-	-
NB	0.82	0.89	-	-	0.73	0.60	0.90	0.75
WB	0.92	0.91	0.92	0.91	-	-	0.42	0.83
EB	0.77	0.94	0.77	0.93	0.60	0.92	-	-

2012 ADT

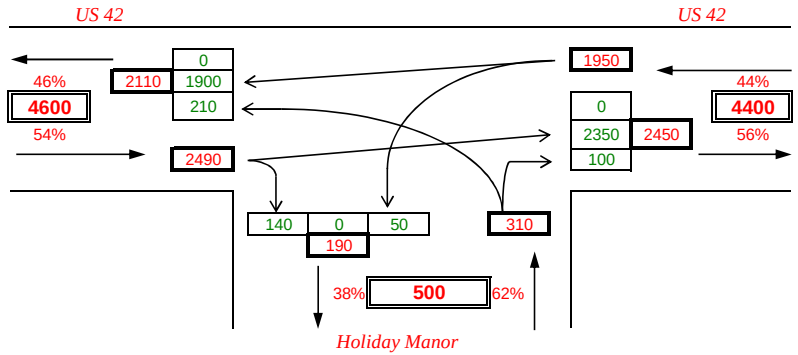


2012 AM DHV



Location Map

2012 PM DHV



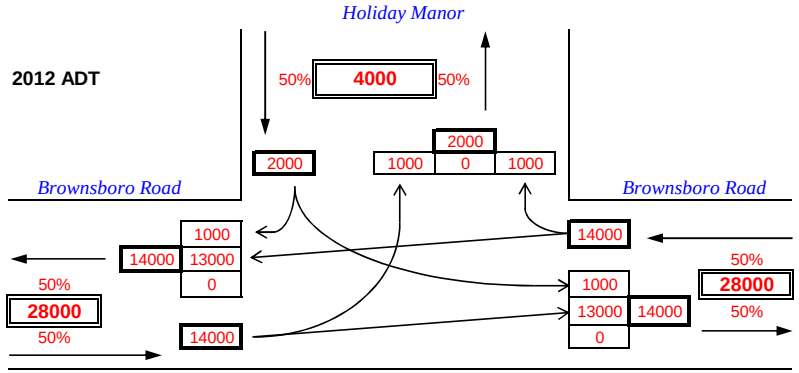
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (With Slipramp)

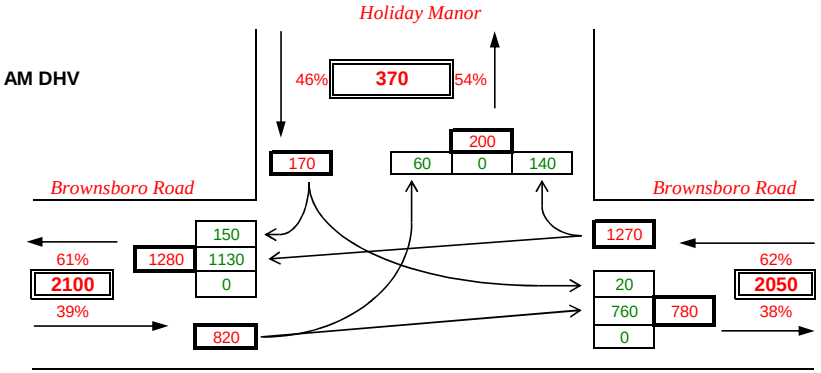
INTERSECTION: Int #6 (Brownsboro Road @ Holiday Manor)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.61	0.94	-	-	0.75	0.64	0.54	0.91
NB	-	-	-	-	-	-	-	-
WB	0.83	0.92	0.85	0.96	0.62	0.82	-	-
EB	0.69	0.92	0.68	0.91	-	-	0.85	0.91

2012 ADT

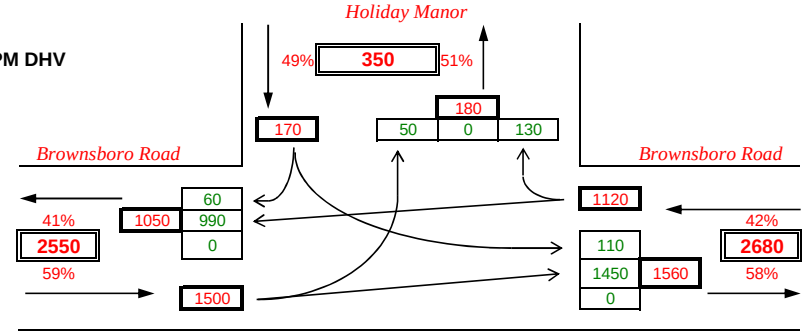


2012 AM DHV



Location Map

2012 PM DHV



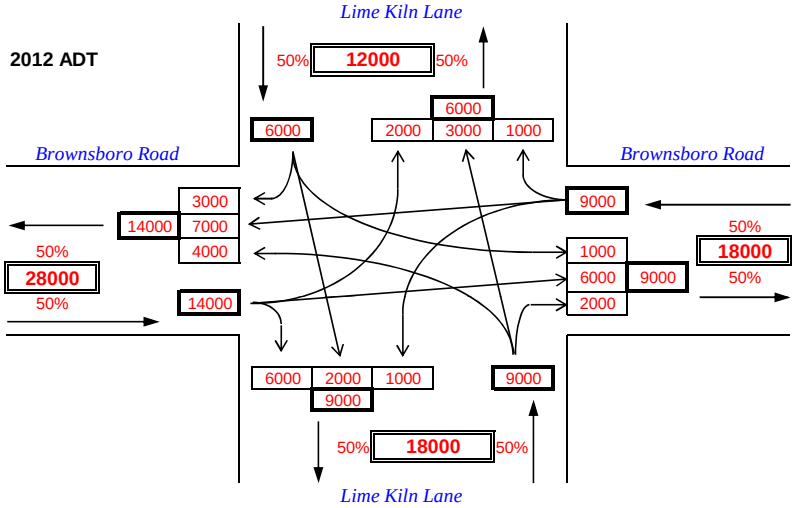
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (With Slipramp)

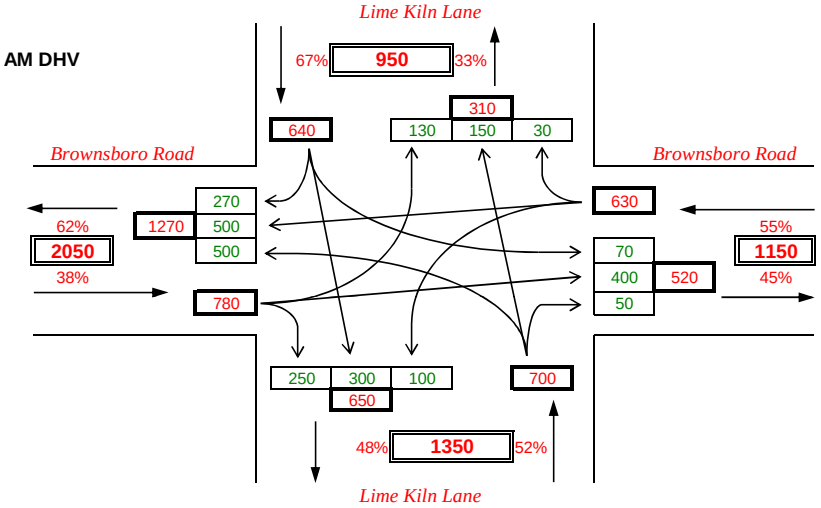
INTERSECTION: Int #7 (Brownsboro Road @ Lime Kiln Lane)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.86	0.88	0.94	0.93	0.65	0.69	0.84	0.81
NB	0.9	0.86	0.79	0.78	0.65	0.81	0.93	0.95
WB	0.89	0.85	0.88	0.85	0.69	0.64	0.88	0.91
EB	0.65	0.96	0.55	0.94	0.71	0.82	0.75	0.91

2012 ADT

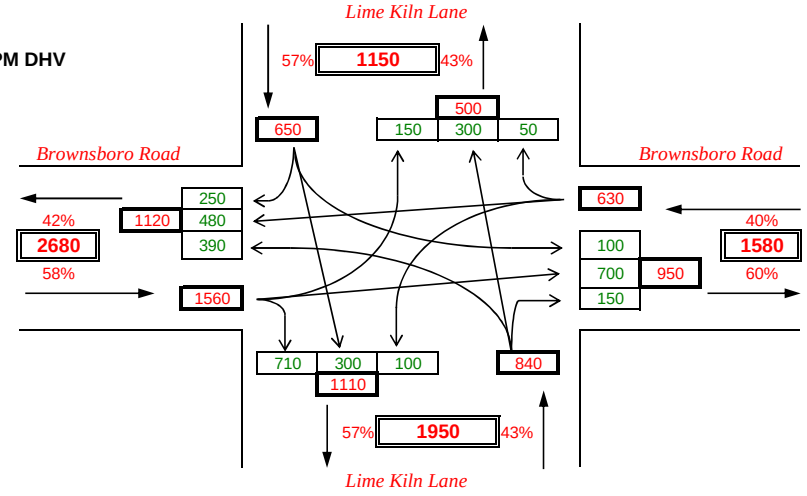


2012 AM DHV



Location Map

2012 PM DHV



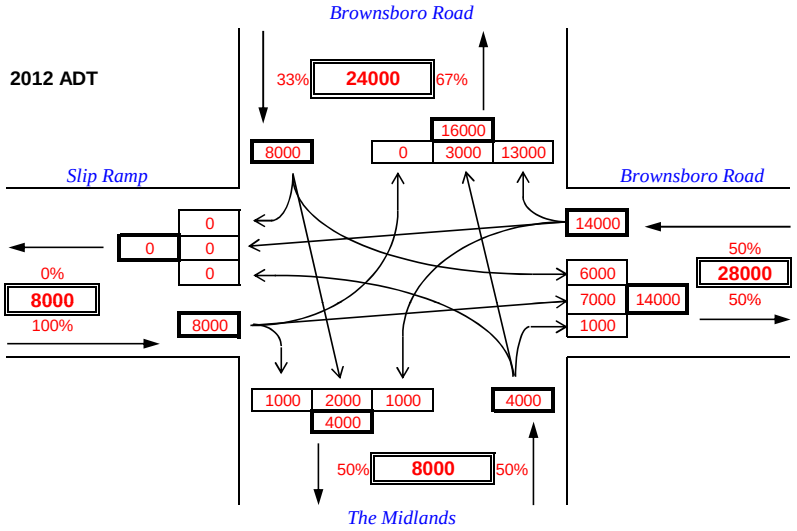
PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

SCENARIO: 2012 ADT and Design Hour Volumes (With Slipramp)

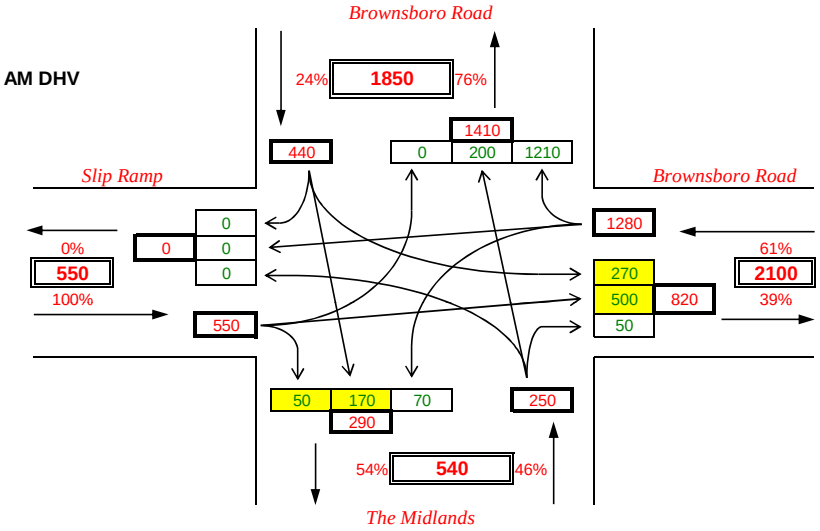
INTERSECTION: Int #8 (Brownsboro Road @ The Midlands)

	AM	PM	Thru AM	Thru PM	Right AM	Right PM	Left AM	Left PM
SB	0.69	0.92	-	-	-	-	0.69	0.92
NB	-	-	-	-	-	-	-	-
WB	0.85	0.96	-	-	0.85	0.96	-	-
EB	-	-	-	-	-	-	-	-

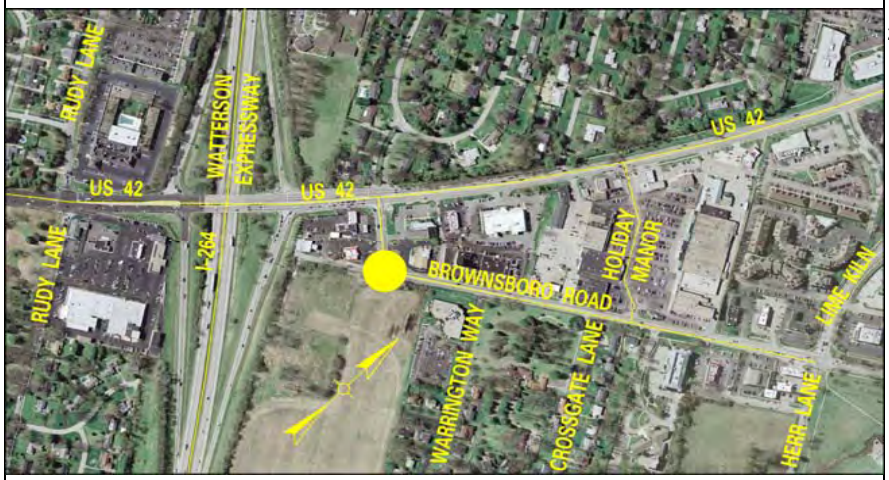
2012 ADT



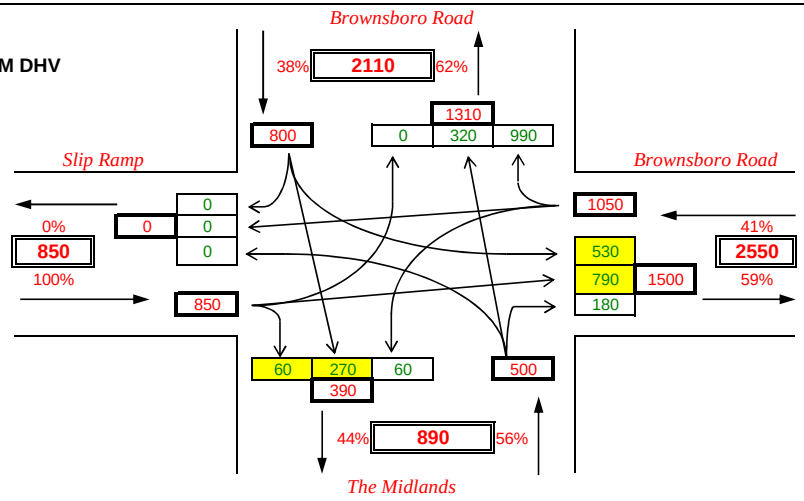
2012 AM DHV



Location Map



2012 PM DHV



APPENDIX B

2020 Turning Movement

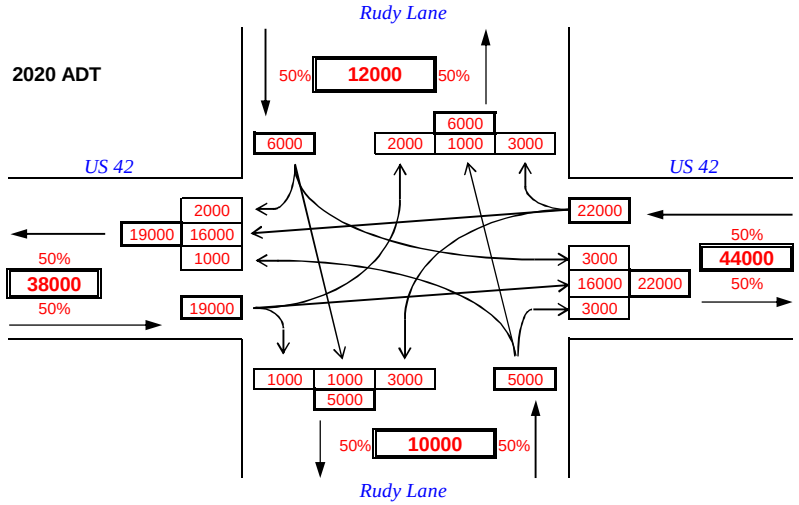
Traffic Forecast

PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

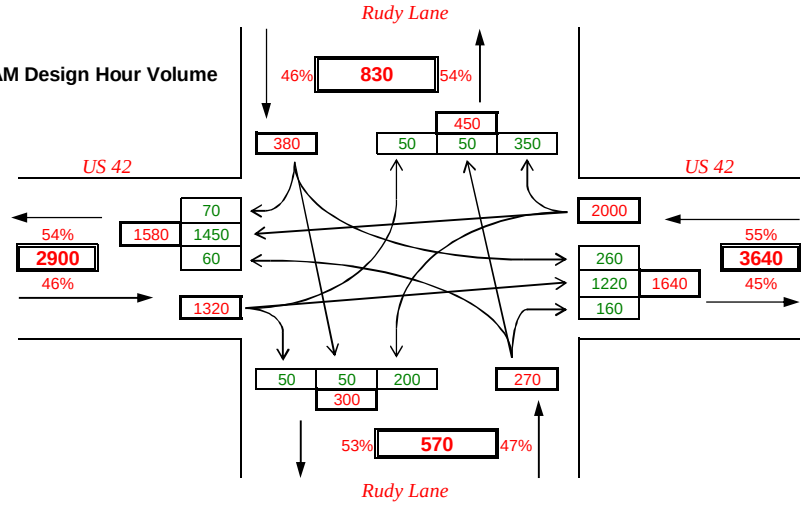
SCENARIO: 2020 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #1 (US 42 @ Rudy Lane)

2020 ADT

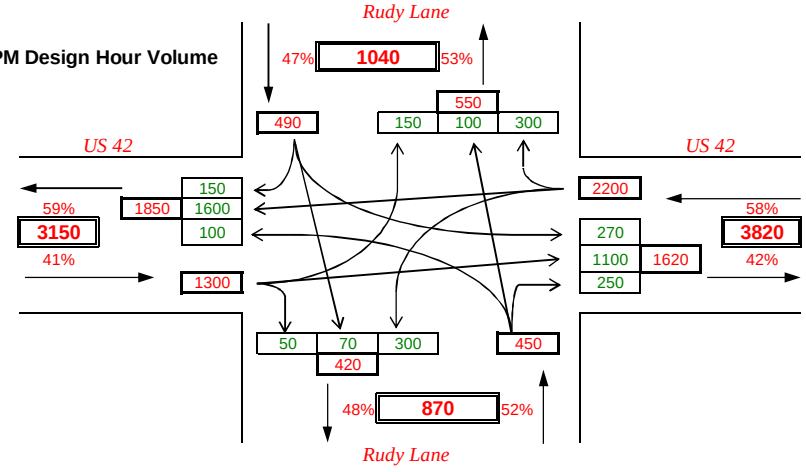


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

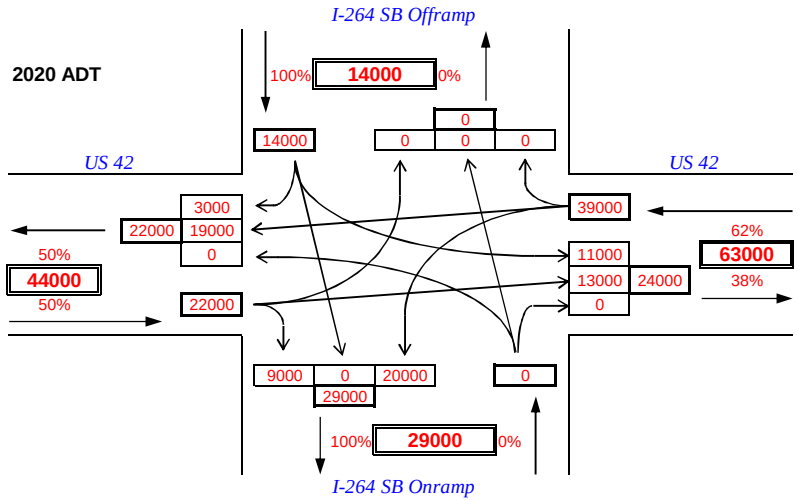


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

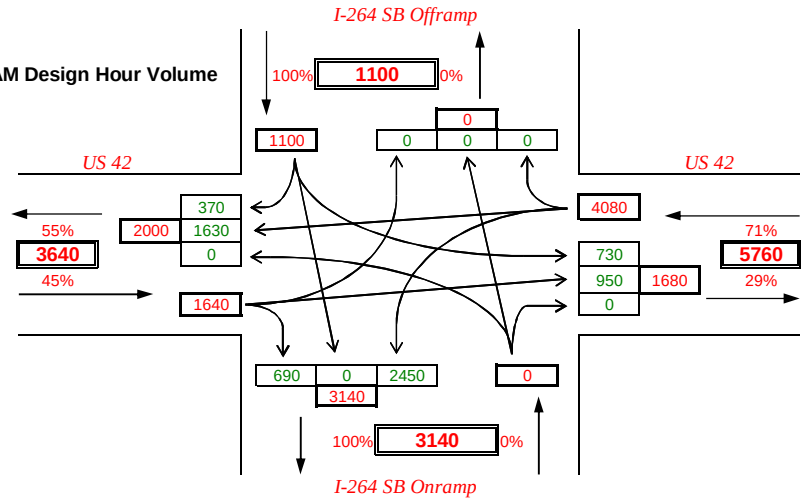
SCENARIO: 2020 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #2 (US 42 @ I-264 SB Ramps)

2020 ADT

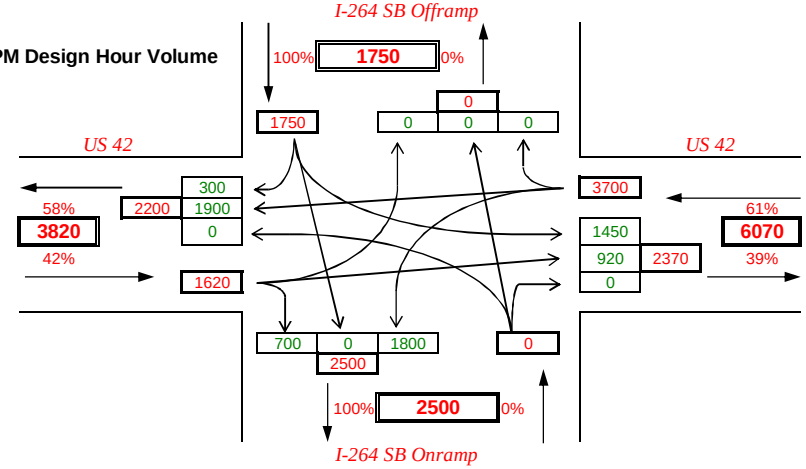


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

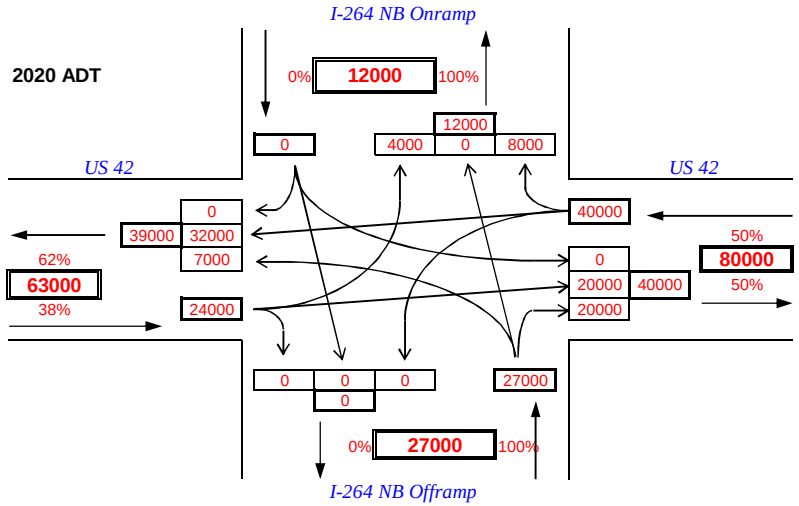


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

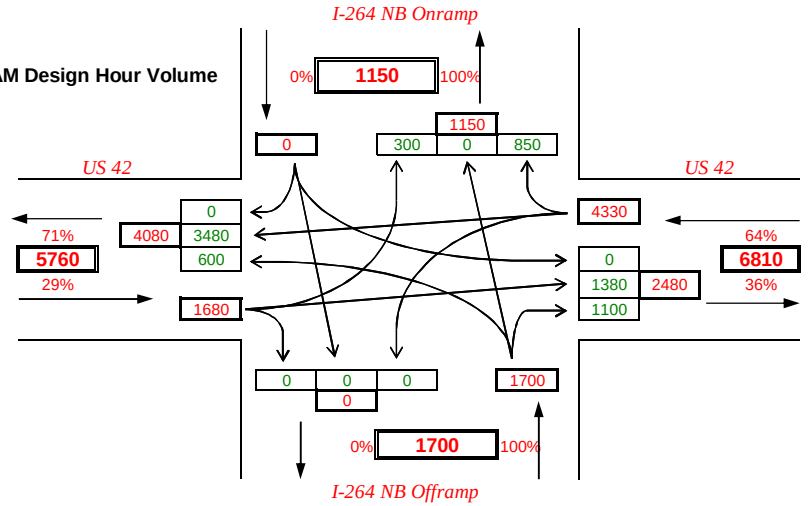
SCENARIO: 2020 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #3 (US 42 @ I-264 NB Ramps)

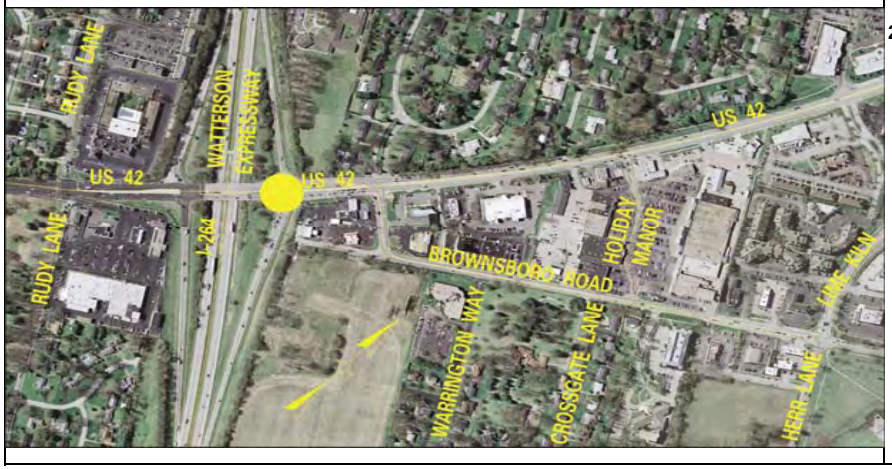
2020 ADT



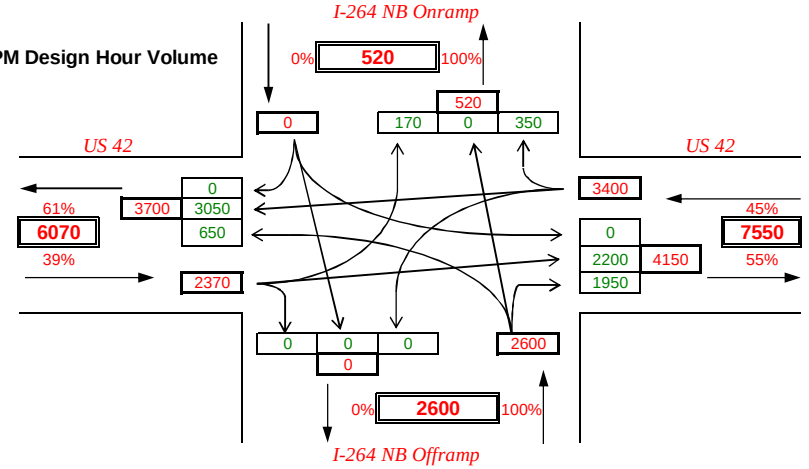
2020 AM Design Hour Volume



Location Map



2020 PM Design Hour Volume

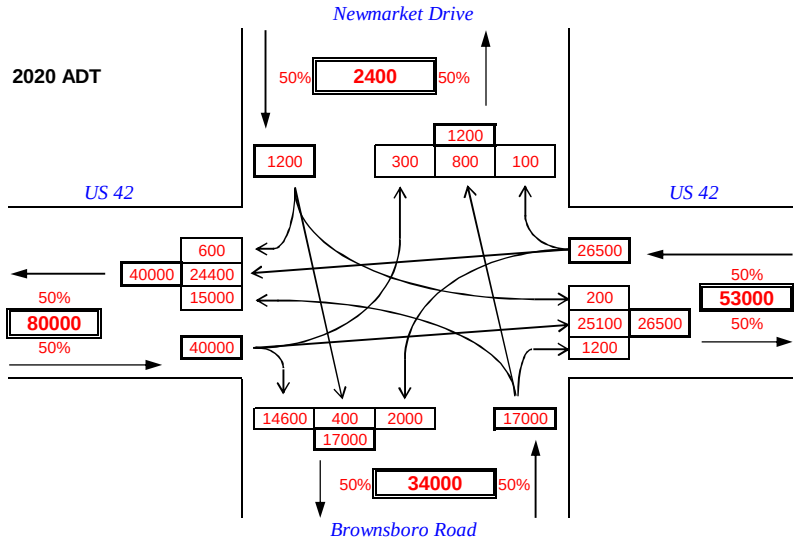


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

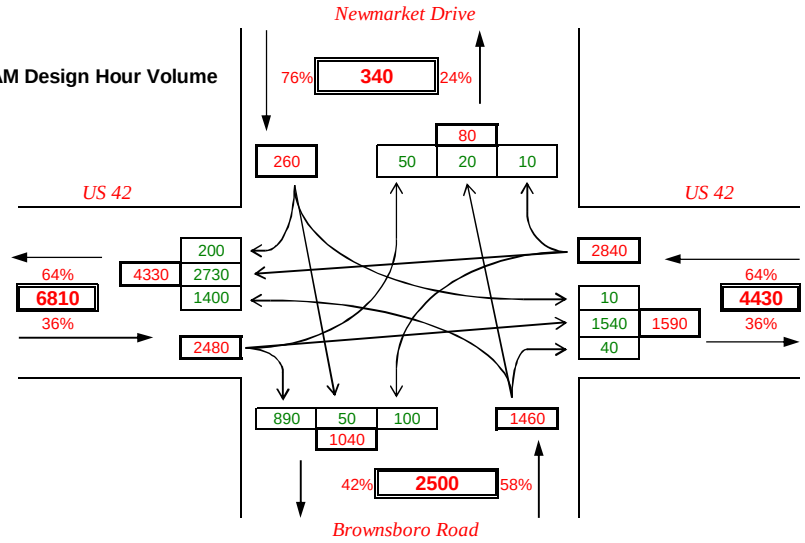
SCENARIO: 2020 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #4 (US 42 @ Brownsboro Road)

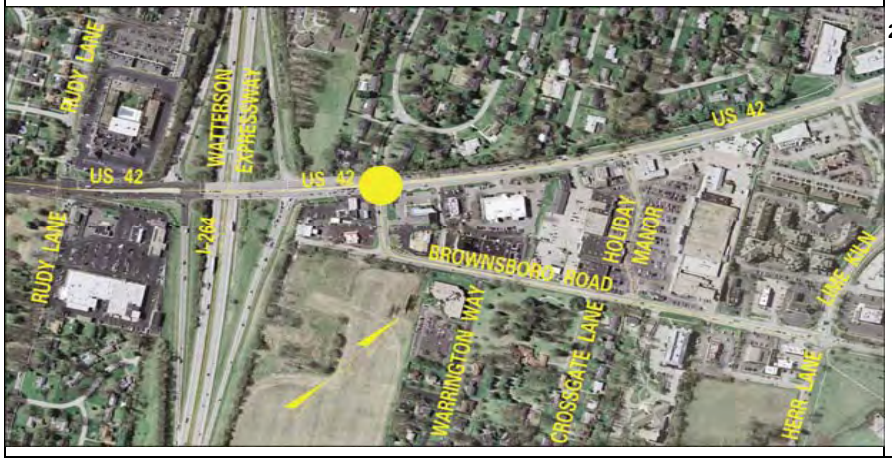
2020 ADT



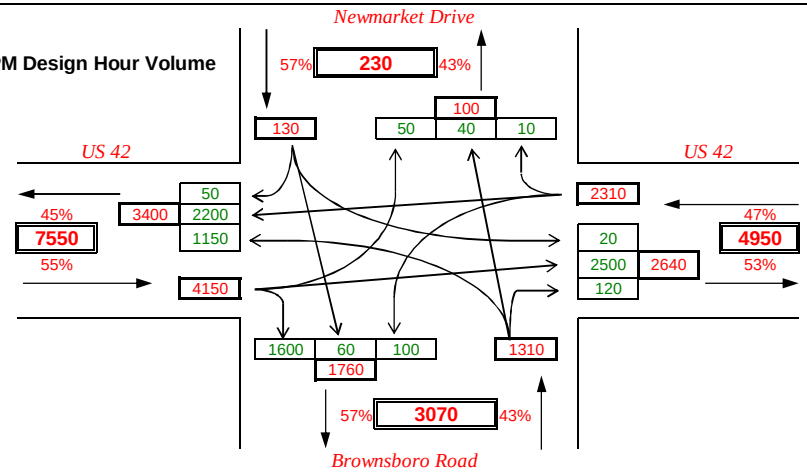
2020 AM Design Hour Volume



Location Map



2020 PM Design Hour Volume

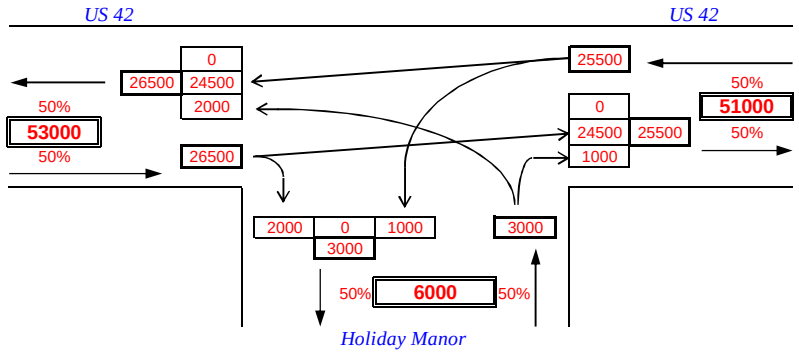


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

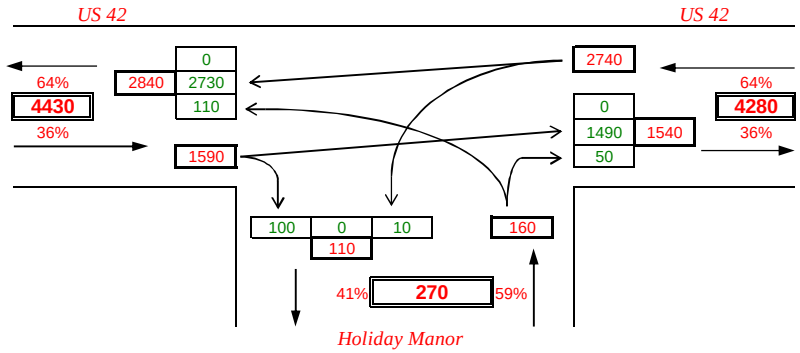
SCENARIO: 2020 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #5 (US 42 @ Holiday Manor)

2020 ADT

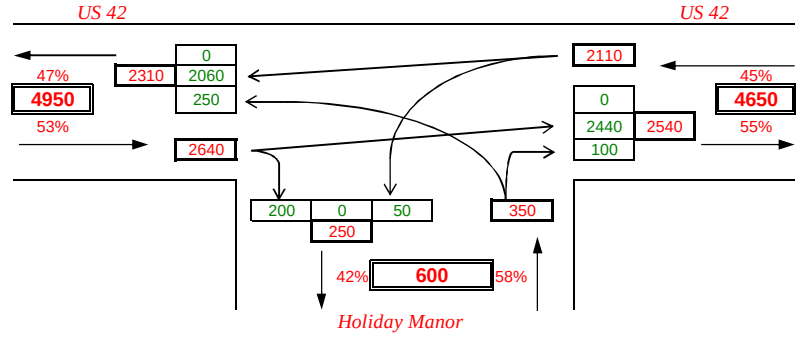


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

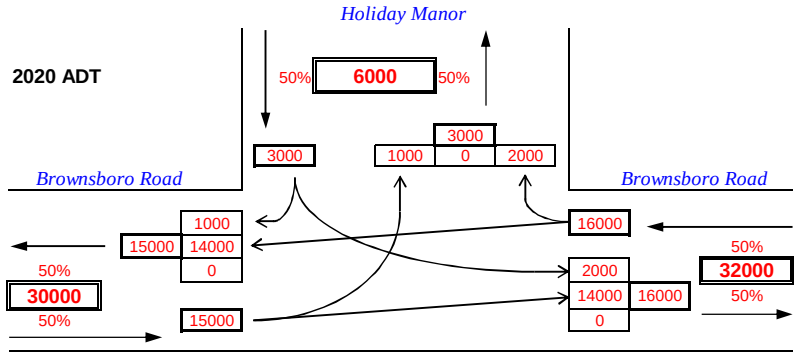


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

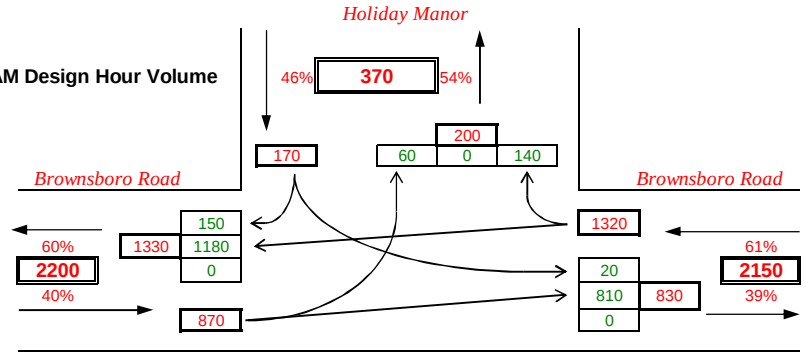
SCENARIO: 2020 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #6 (Brownsboro Road @ Holiday Manor)

2020 ADT

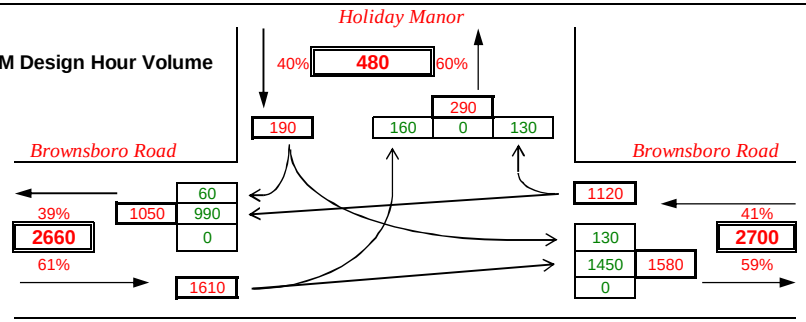


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

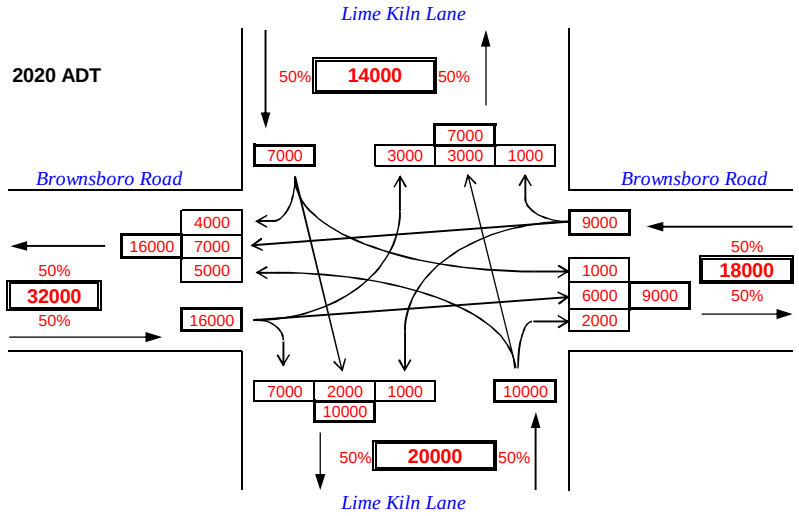


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

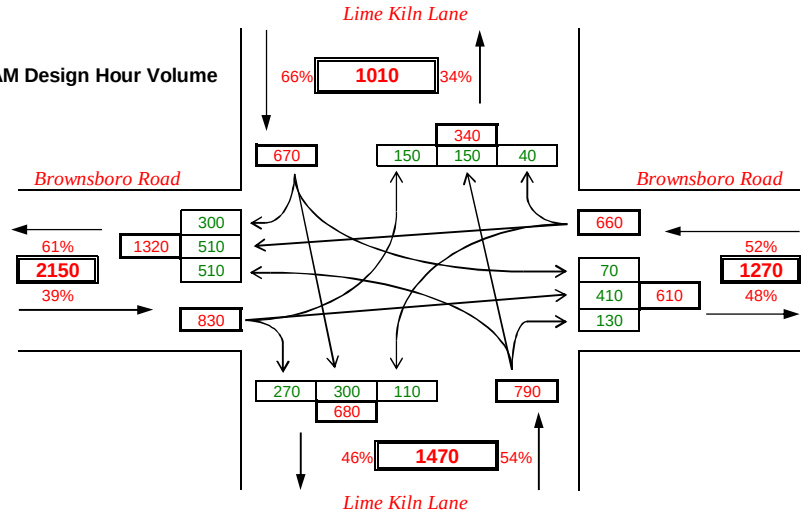
SCENARIO: 2020 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #7 (Brownsboro Road @ Lime Kiln Lane)

2020 ADT

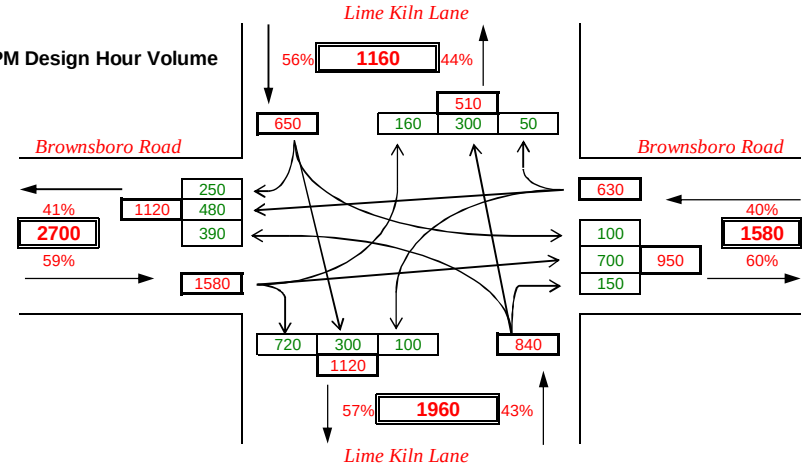


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

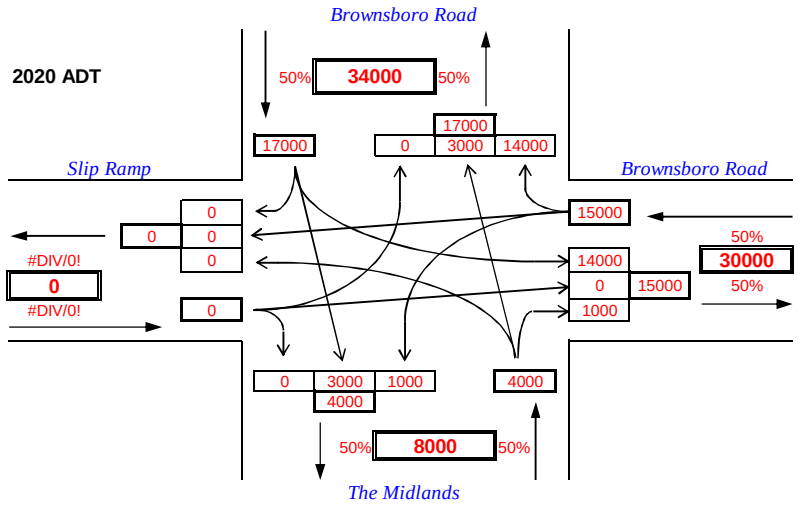


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

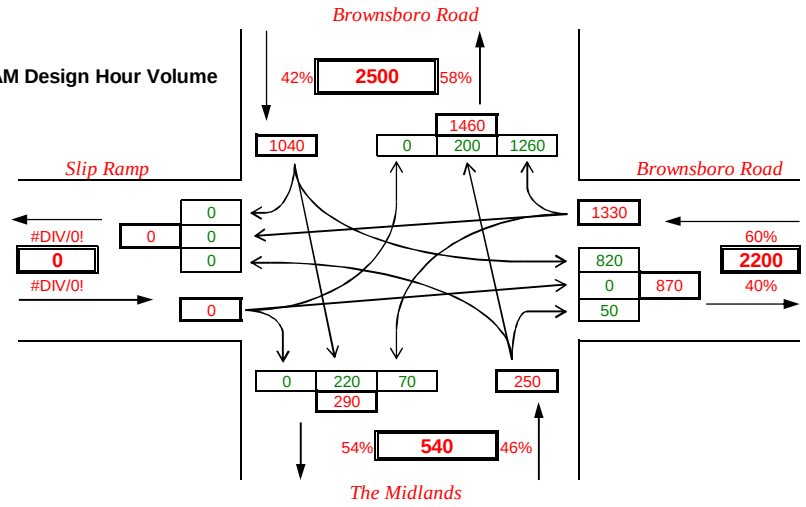
SCENARIO: 2020 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #8 (Brownsboro Road @ The Midlands)

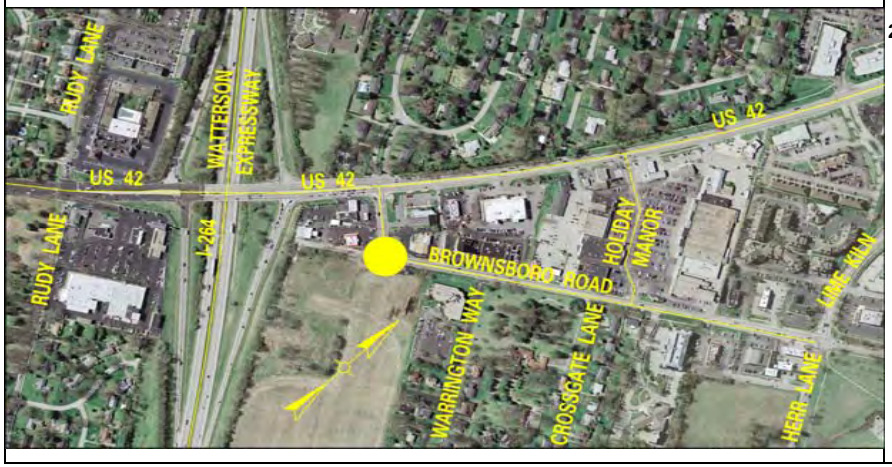
2020 ADT



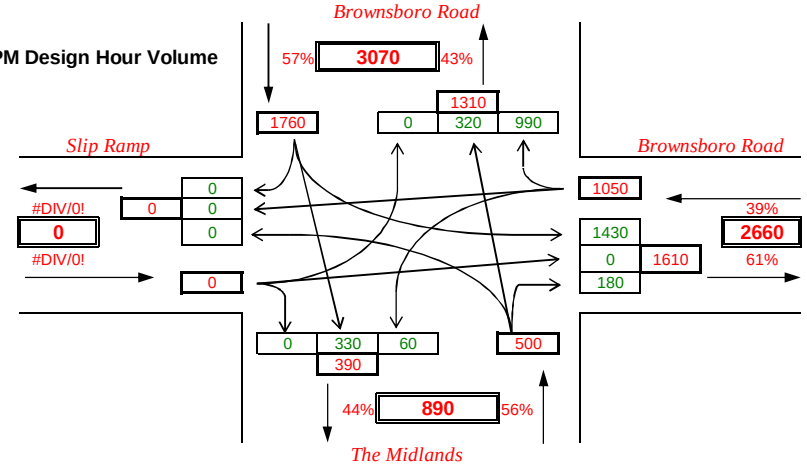
2020 AM Design Hour Volume



Location Map



2020 PM Design Hour Volume



2020 Turning Movement

Traffic Forecast

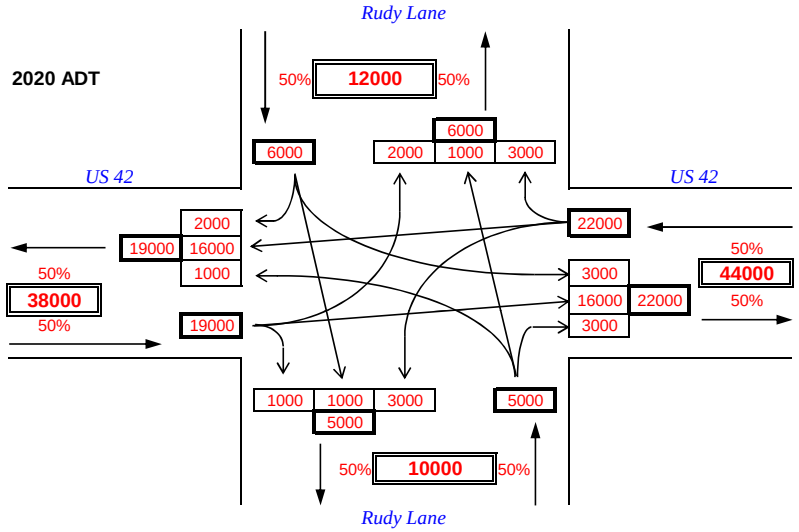
SLIP RAMP OPTION

PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

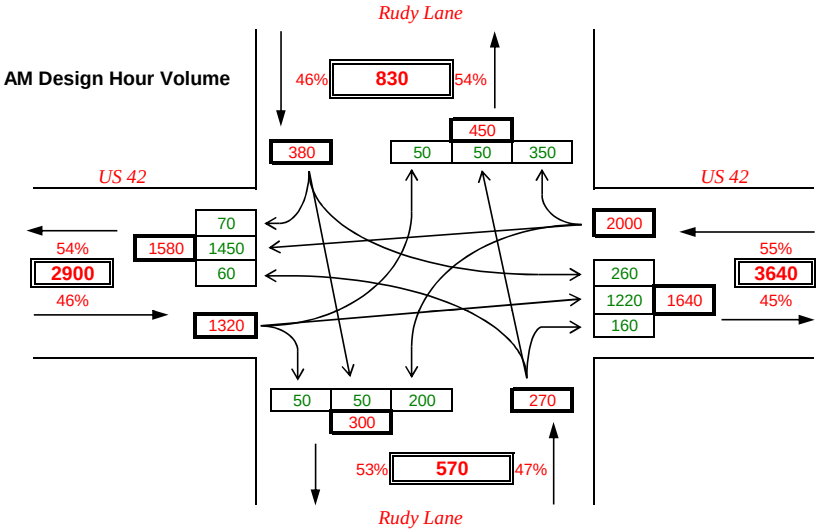
SCENARIO: 2020 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #1 (US 42 @ Rudy Lane)

2020 ADT

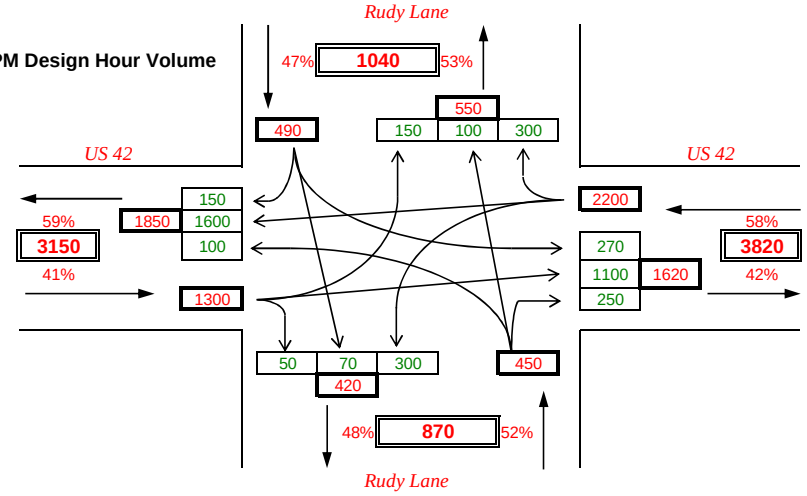


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

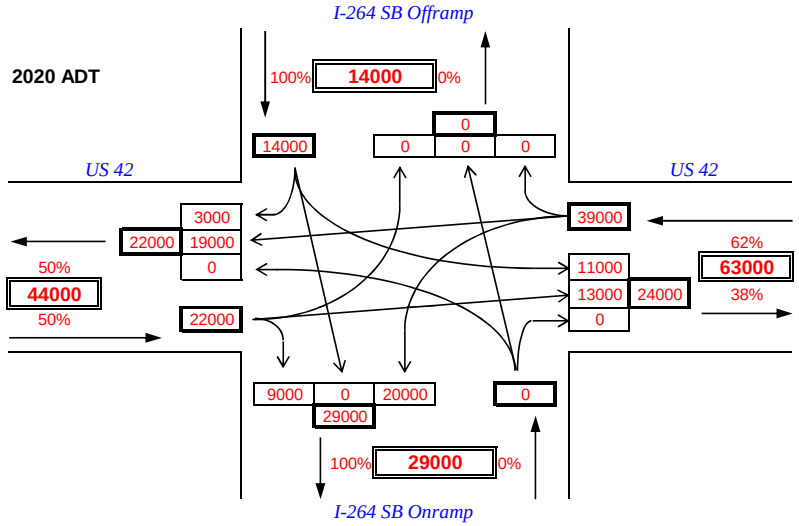


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

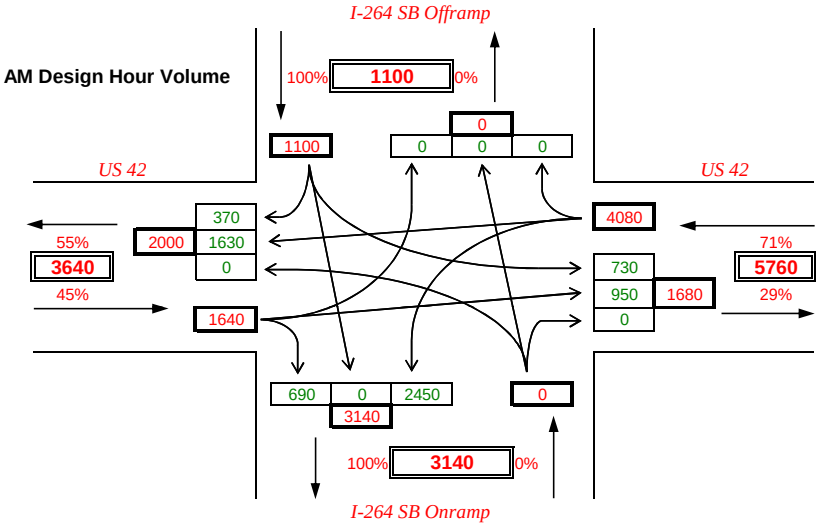
SCENARIO: 2020 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #2 (US 42 @ I-264 SB Ramps)

2020 ADT

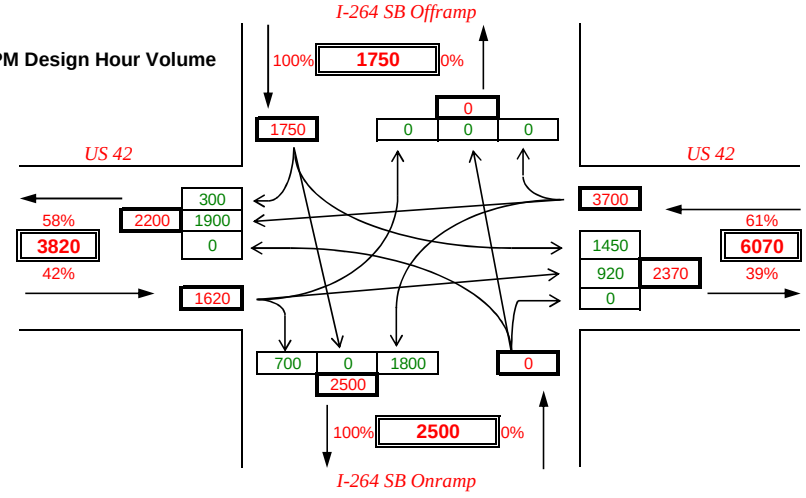


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

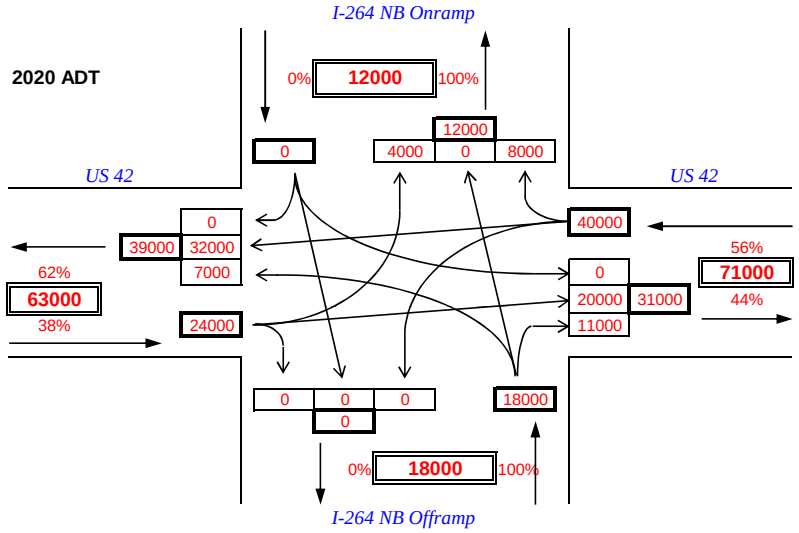


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

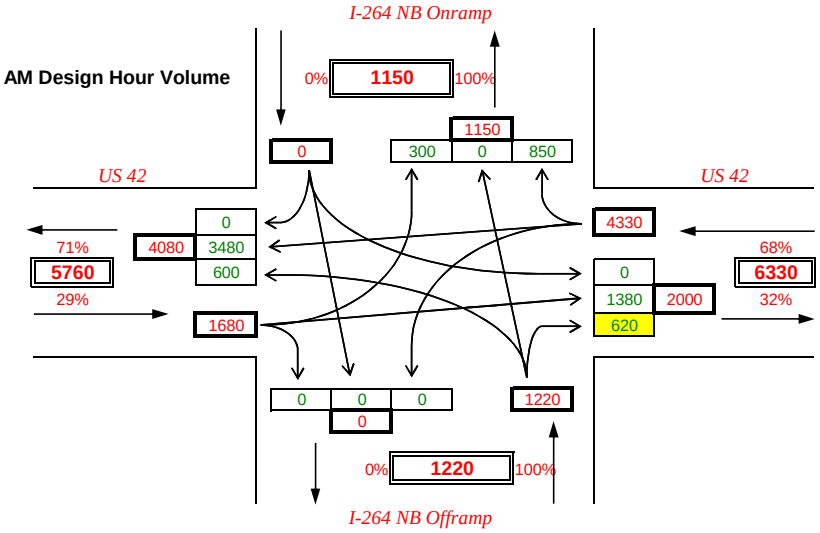
SCENARIO: 2020 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #3 (US 42 @ I-264 NB Ramps)

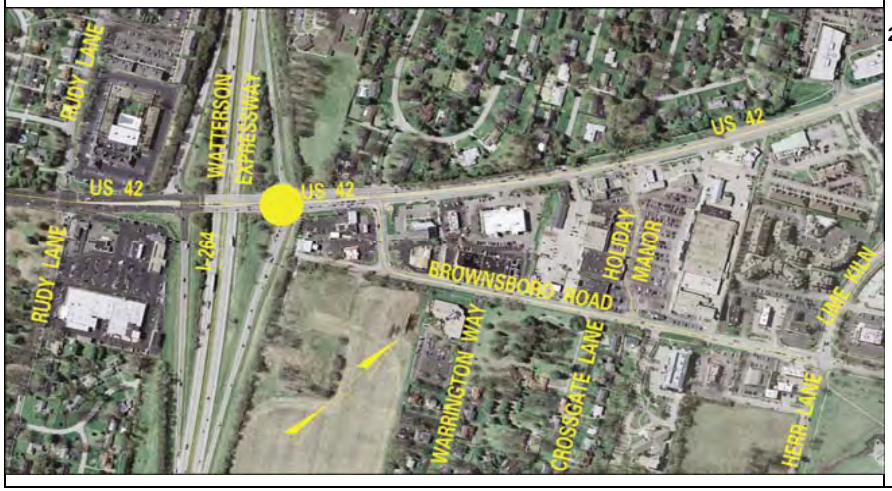
2020 ADT



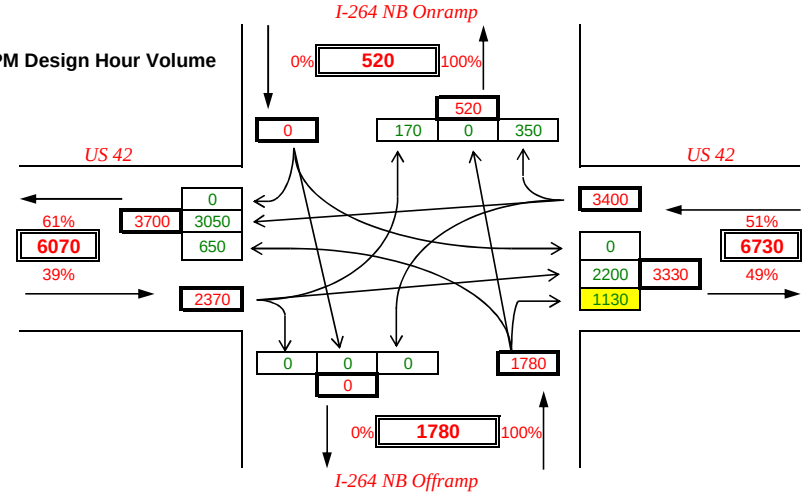
2020 AM Design Hour Volume



Location Map



2020 PM Design Hour Volume

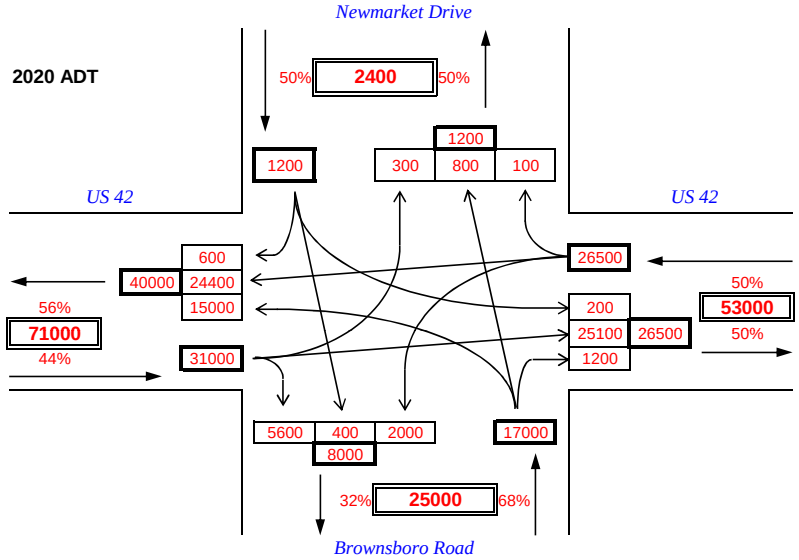


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

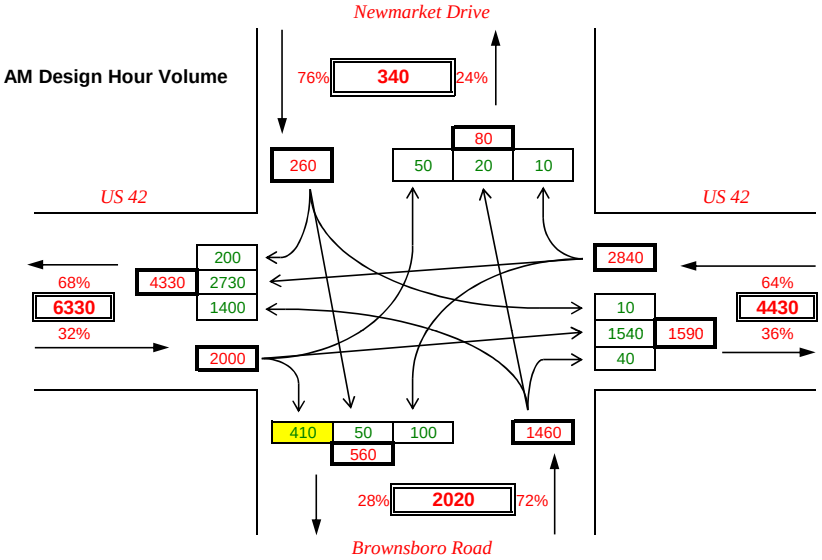
SCENARIO: 2020 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #4 (US 42 @ Brownsboro Road)

2020 ADT

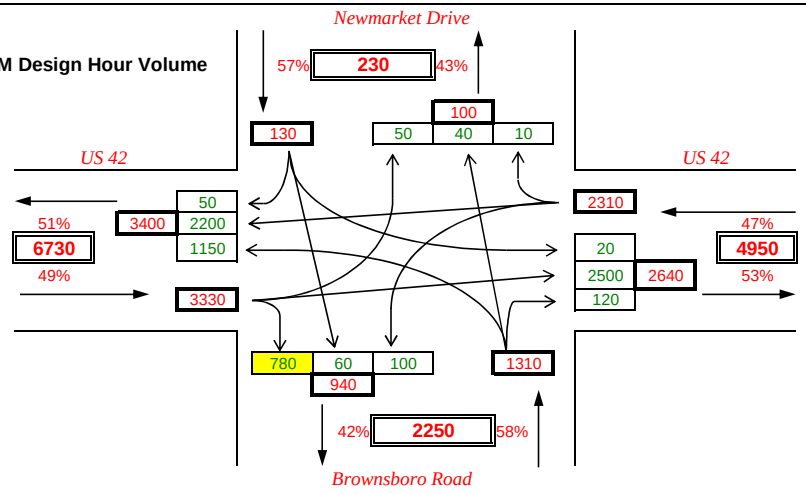


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

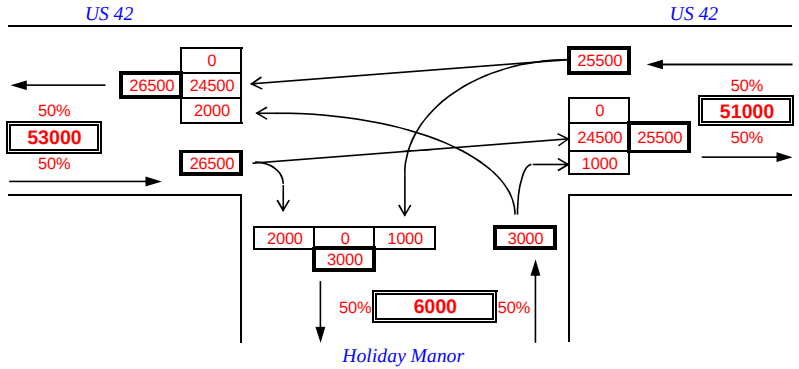


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

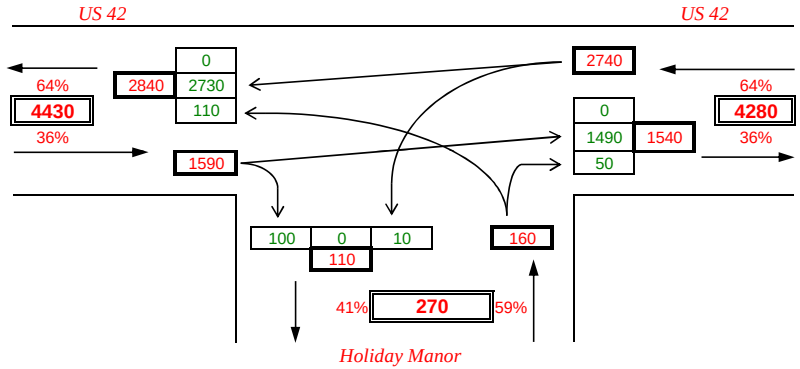
SCENARIO: 2020 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #5 (US 42 @ Holiday Manor)

2020 ADT

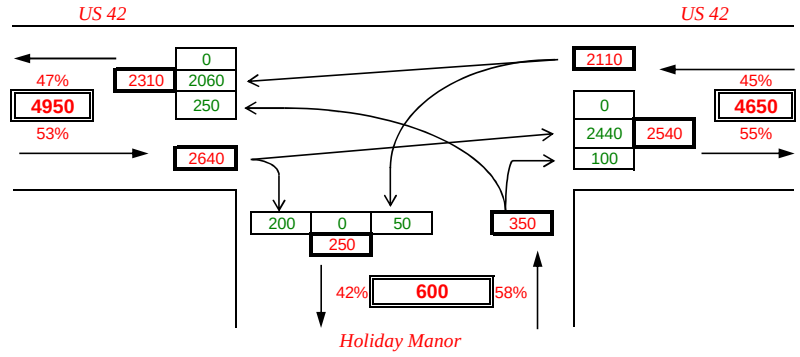


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

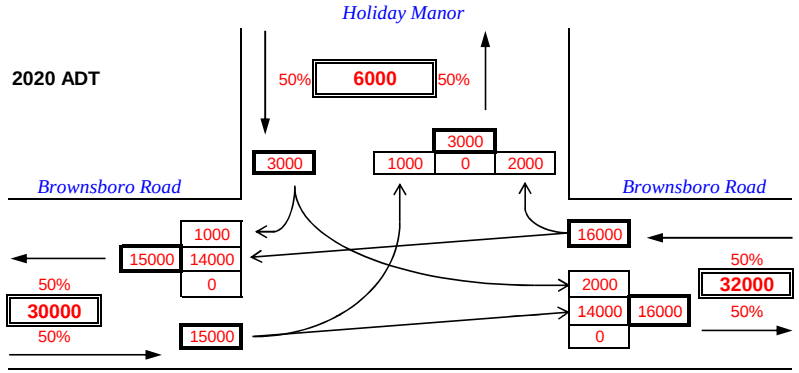


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

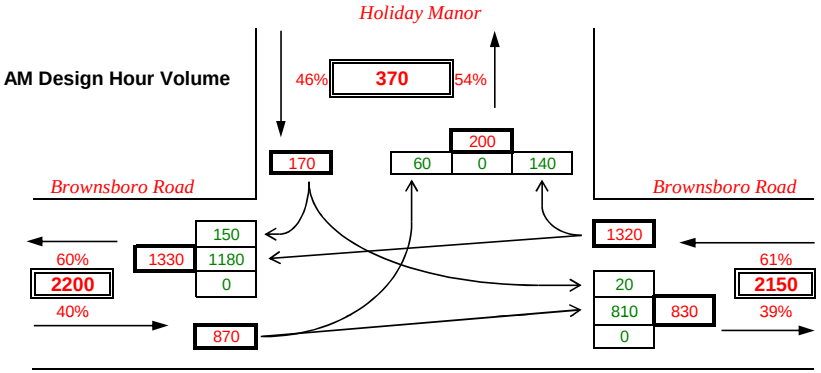
SCENARIO: 2020 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #6 (Brownsboro Road @ Holiday Manor)

2020 ADT

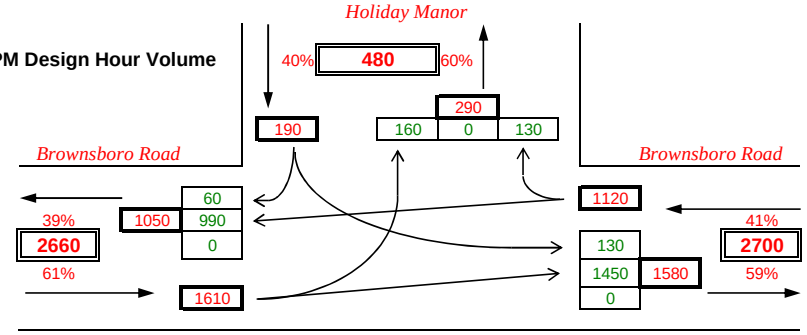


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

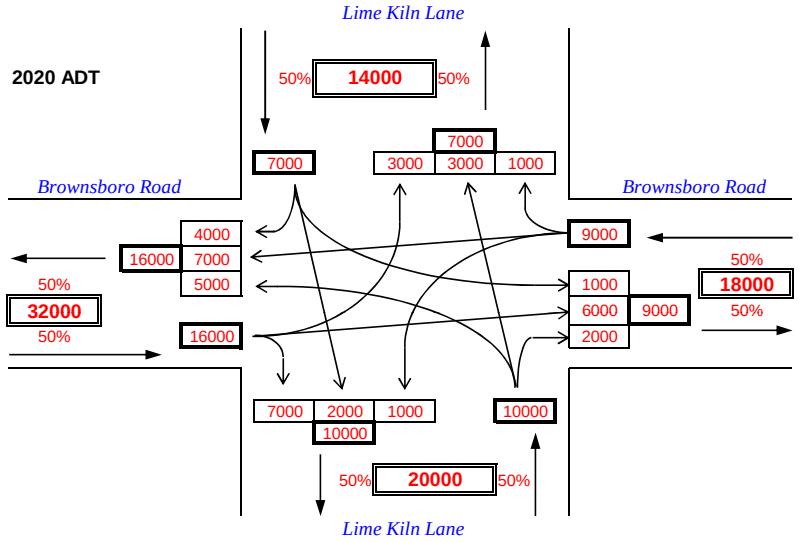


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

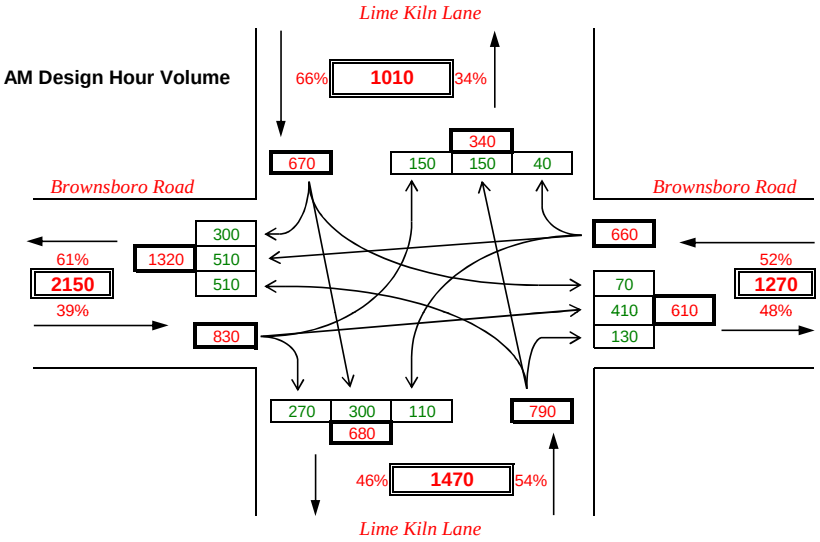
SCENARIO: 2020 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #7 (Brownsboro Road @ Lime Kiln Lane)

2020 ADT

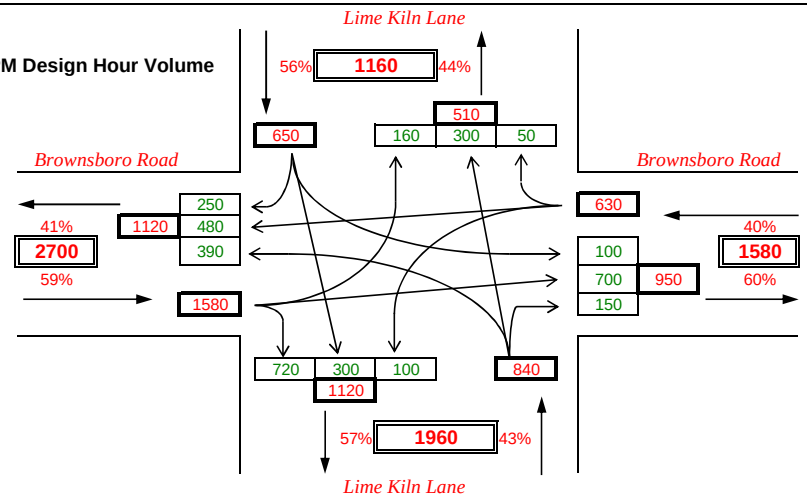


2020 AM Design Hour Volume



Location Map

2020 PM Design Hour Volume

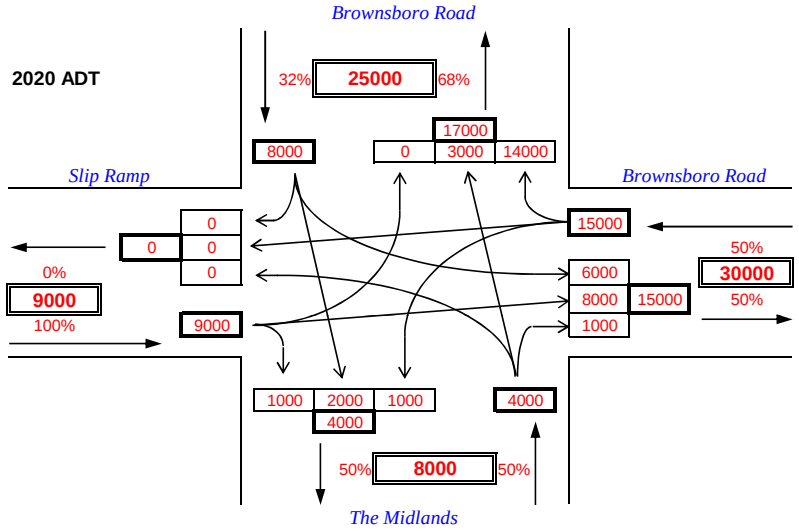


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

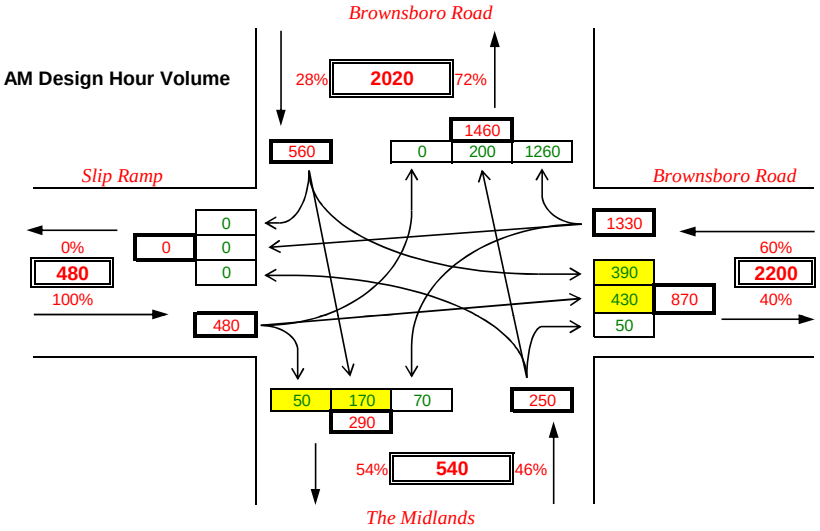
SCENARIO: 2020 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #8 (Brownsboro Road @ The Midlands)

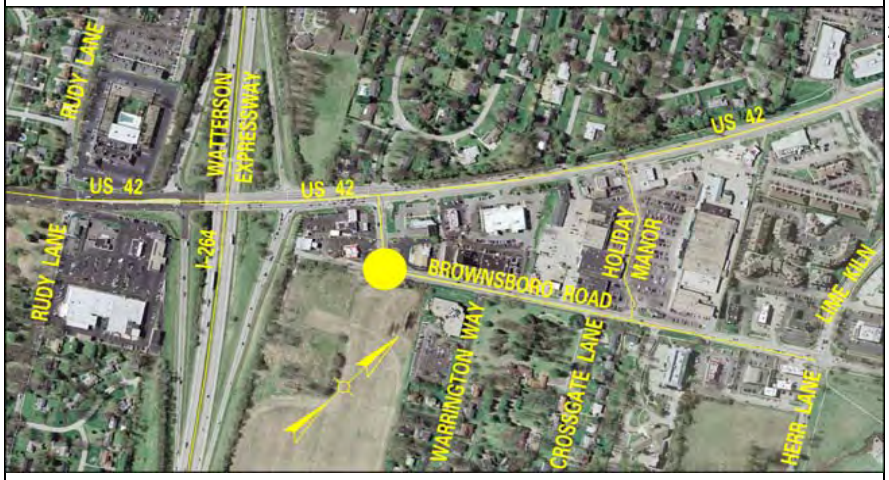
2020 ADT



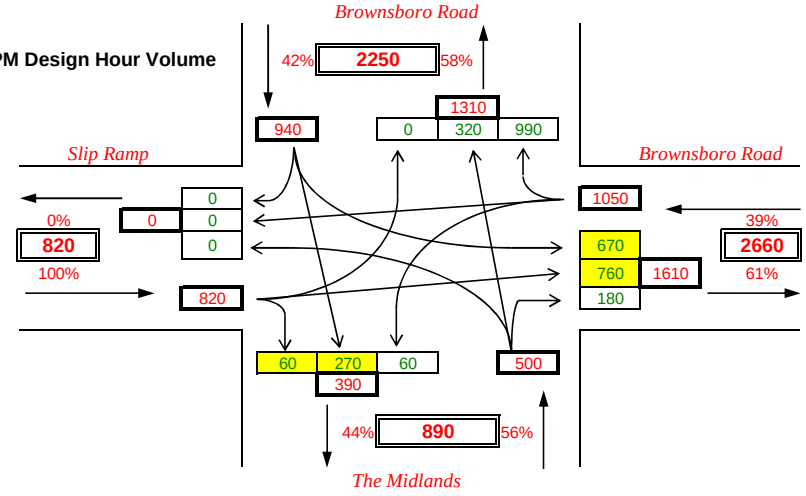
2020 AM Design Hour Volume



Location Map



2020 PM Design Hour Volume



APPENDIX C

2030 Turning Movement

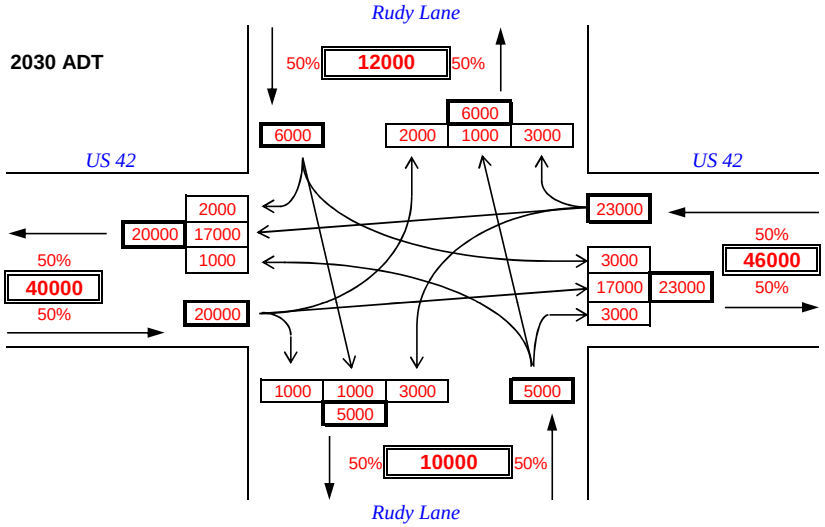
Traffic Forecast

PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

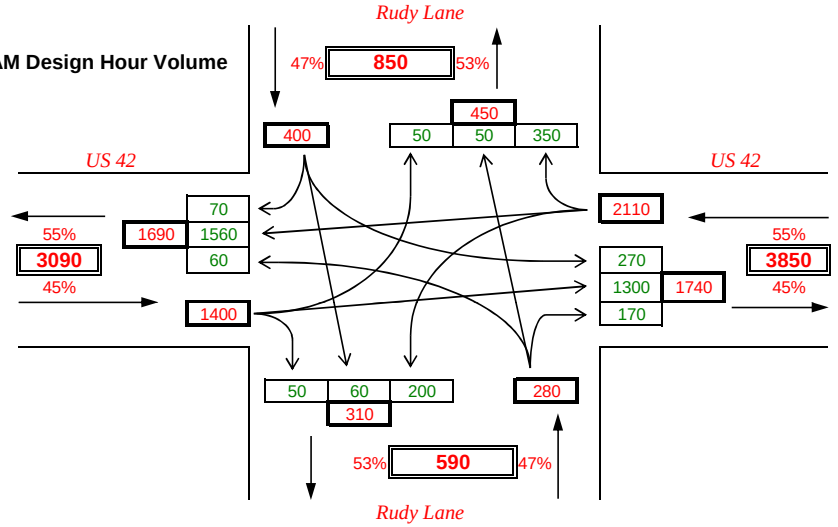
SCENARIO: 2030 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #1 (US 42 @ Rudy Lane)

2030 ADT

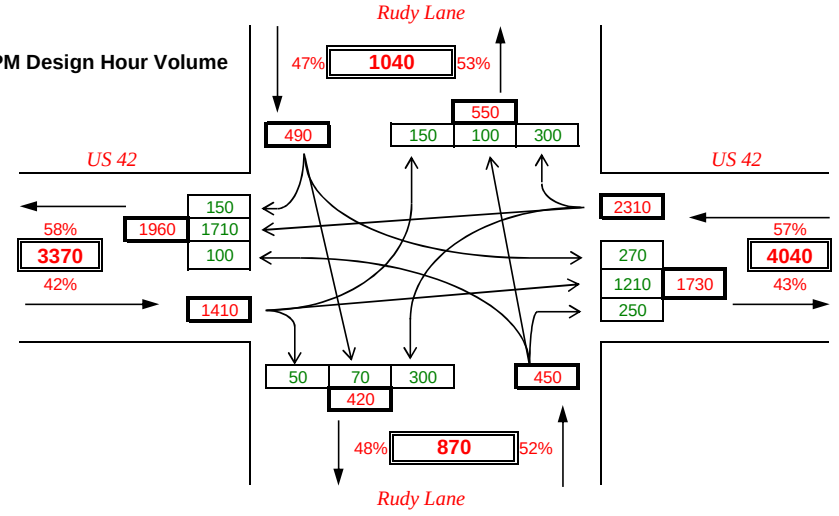


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

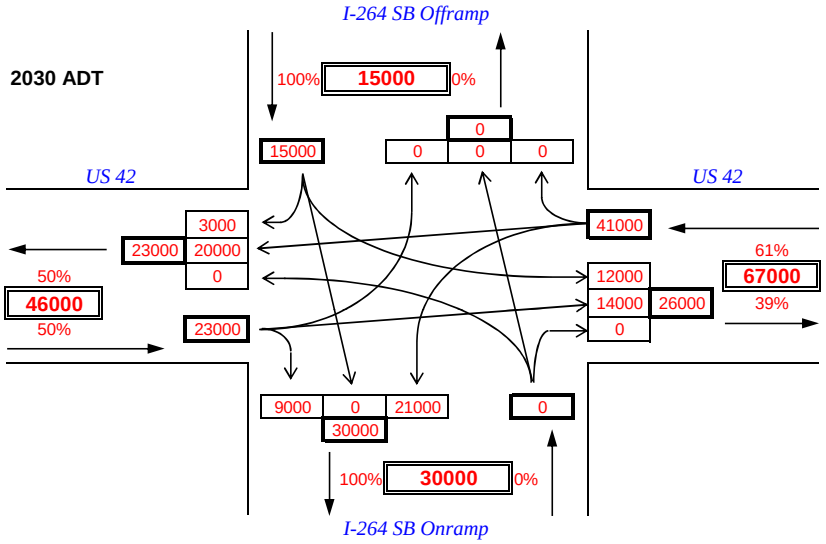


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

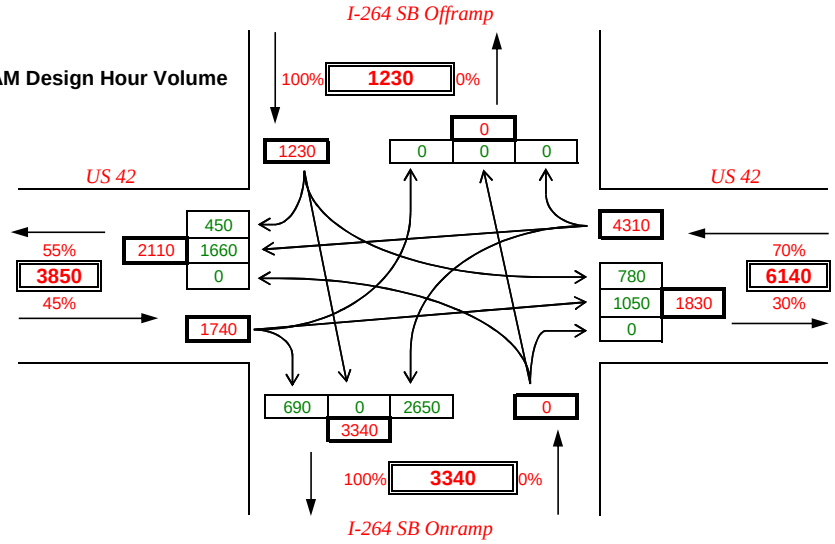
SCENARIO: 2030 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #2 (US 42 @ I-264 SB Ramps)

2030 ADT

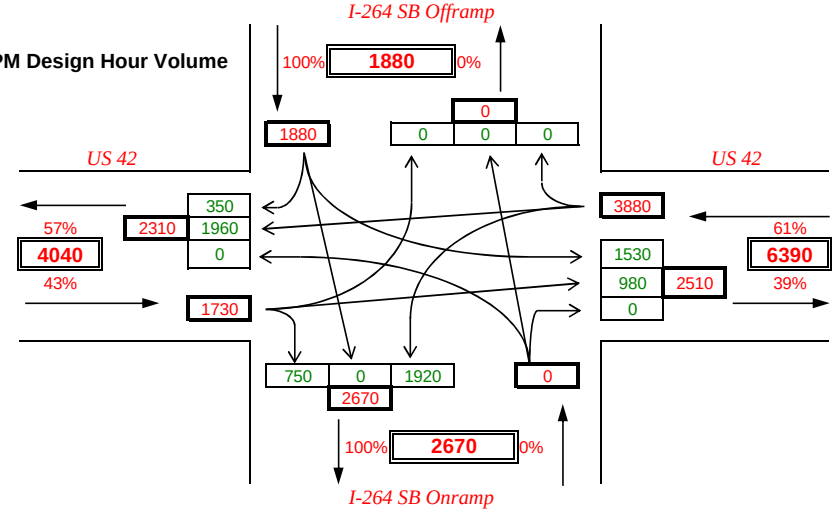


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

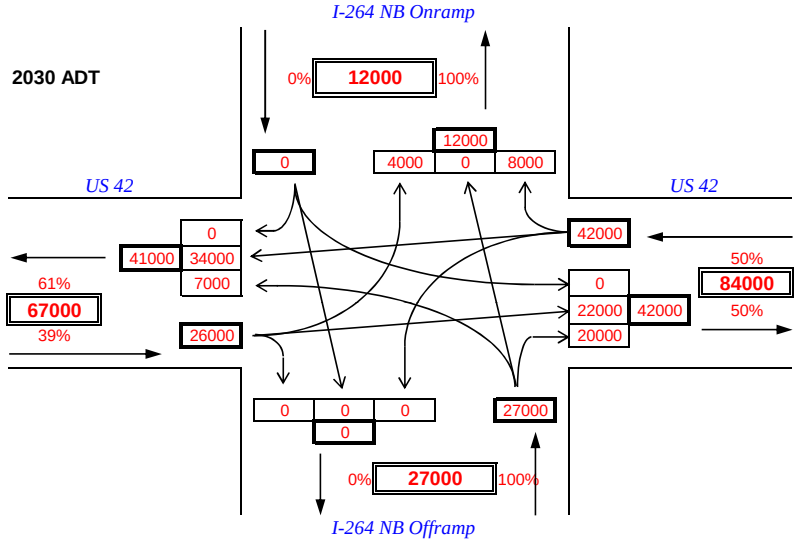


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

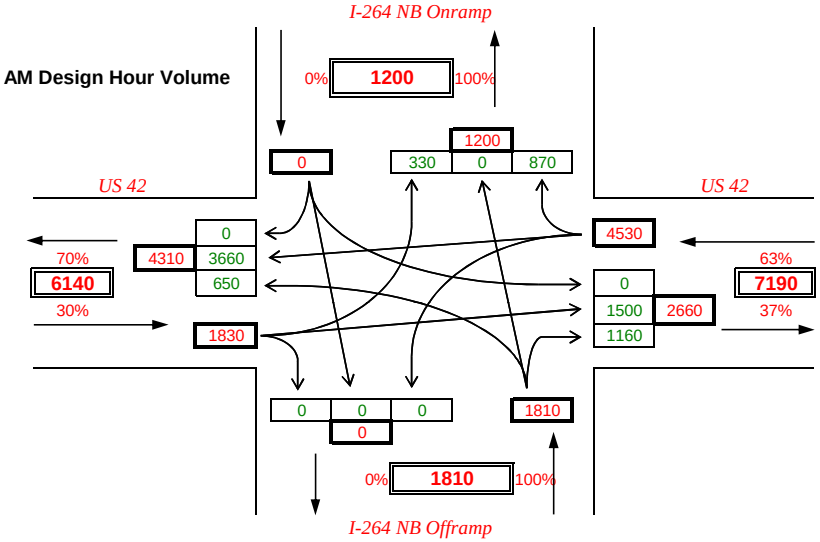
SCENARIO: 2030 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #3 (US 42 @ I-264 NB Ramps)

2030 ADT

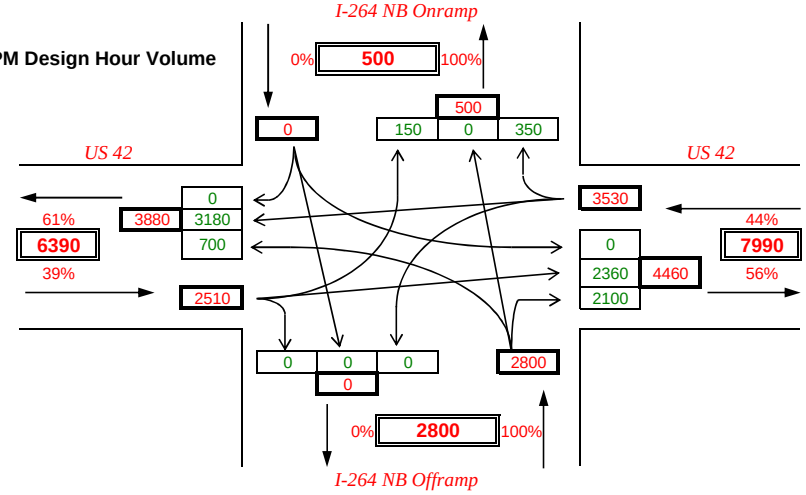


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

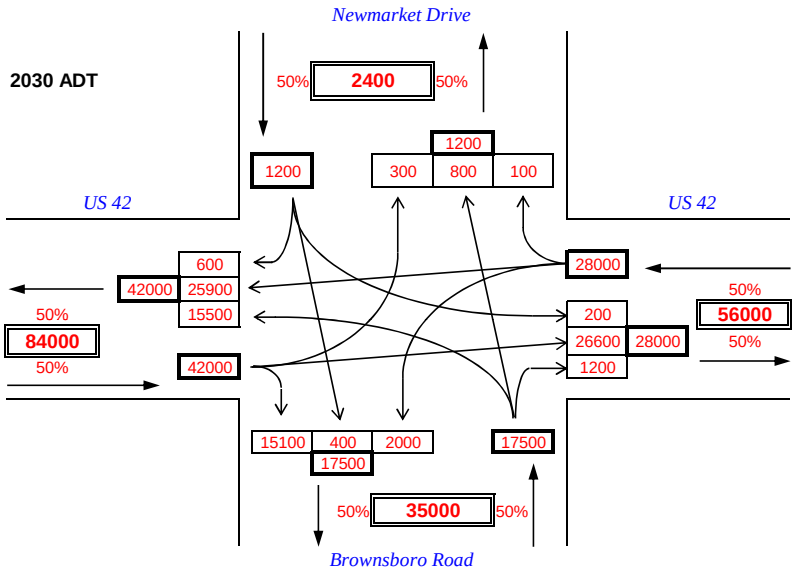


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

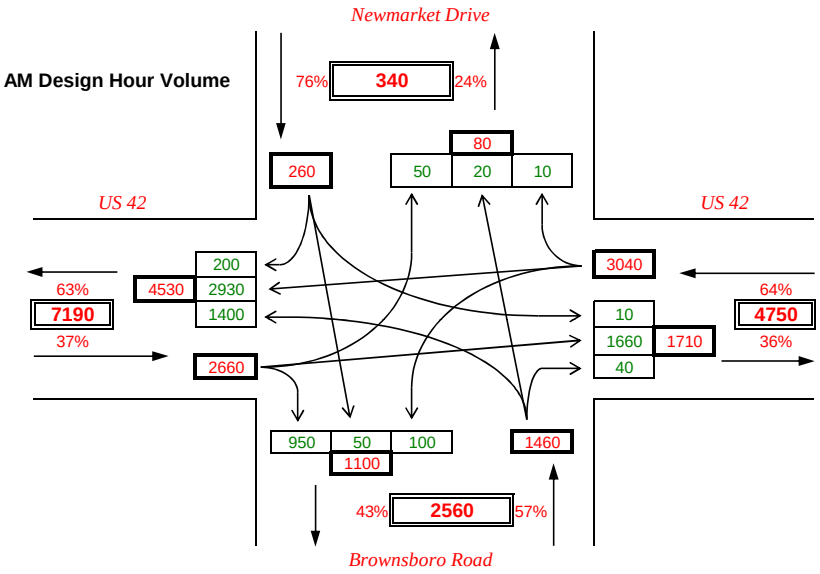
SCENARIO: 2030 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #4 (US 42 @ Brownsboro Road)

2030 ADT

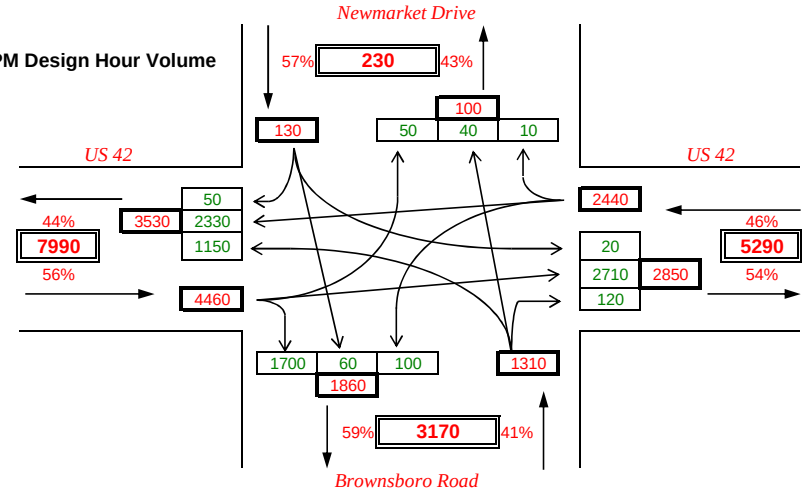


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

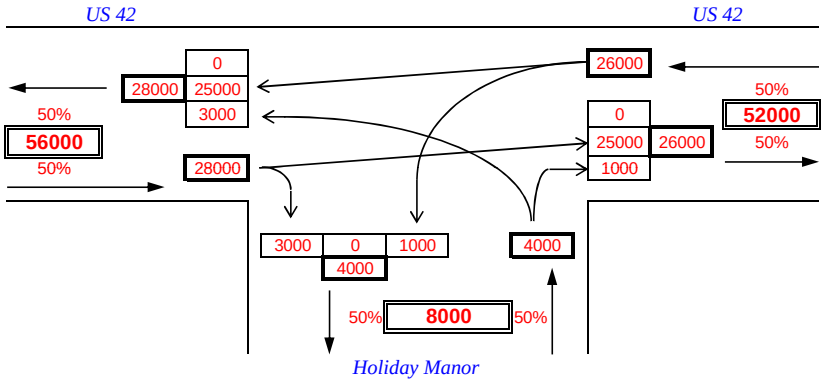


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

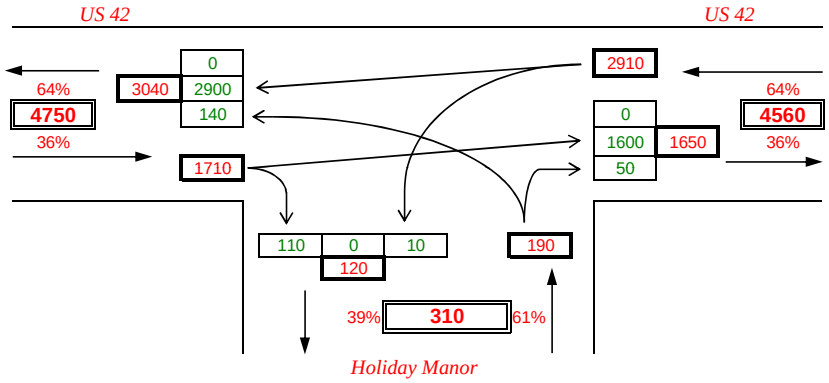
SCENARIO: 2030 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #5 (US 42 @ Holiday Manor)

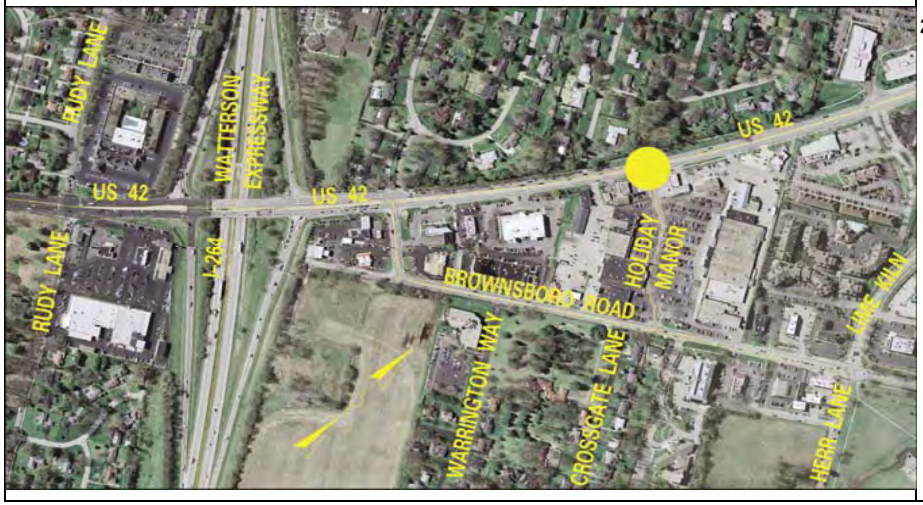
2030 ADT



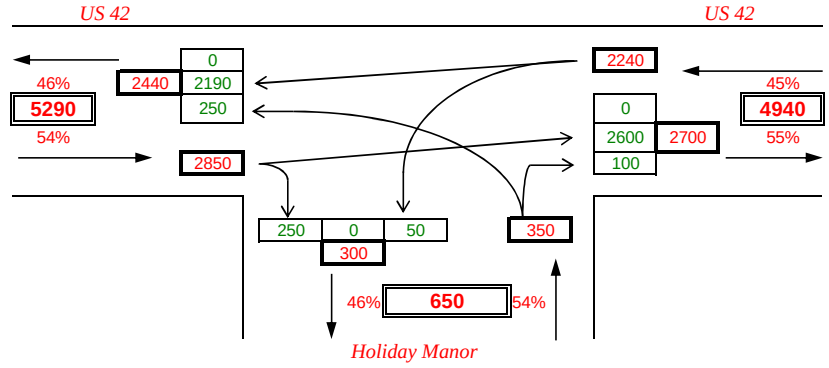
2030 AM Design Hour Volume



Location Map



2030 PM Design Hour Volume

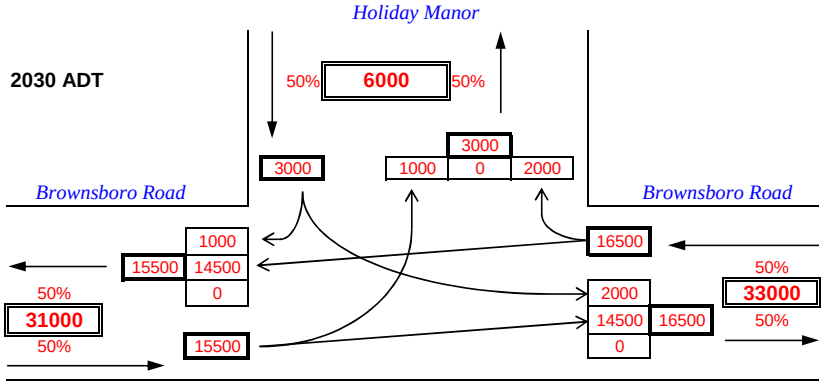


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

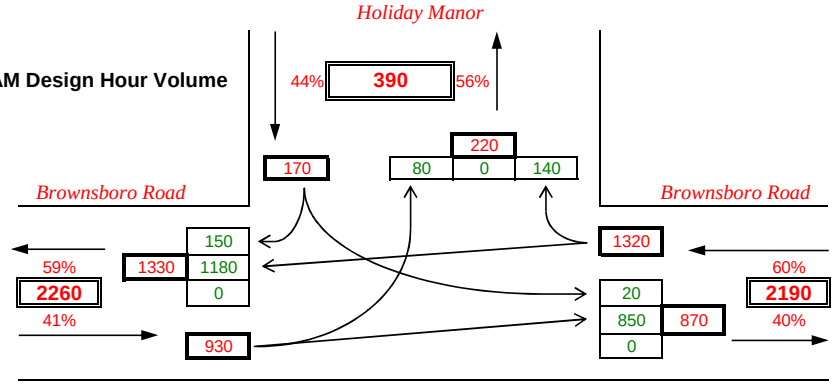
SCENARIO: 2030 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #6 (Brownsboro Road @ Holiday Manor)

2030 ADT

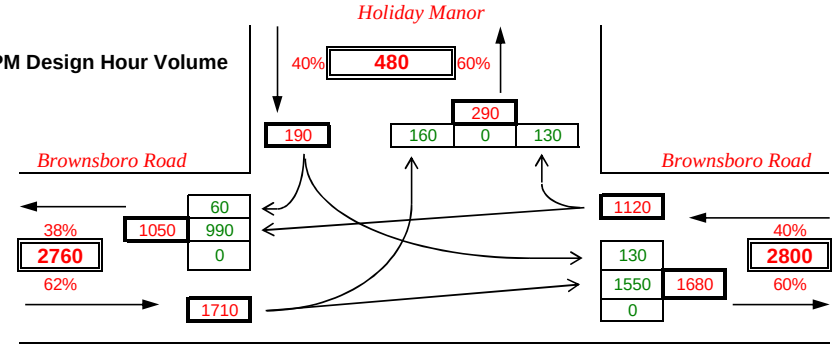


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

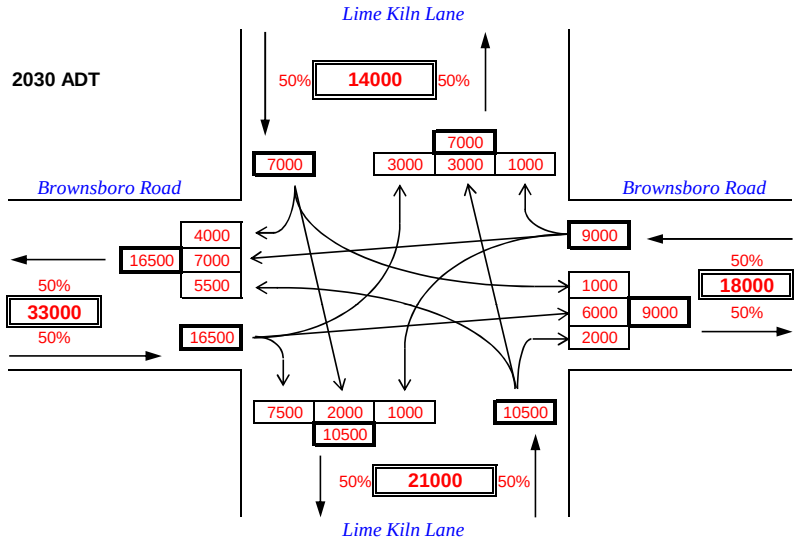


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

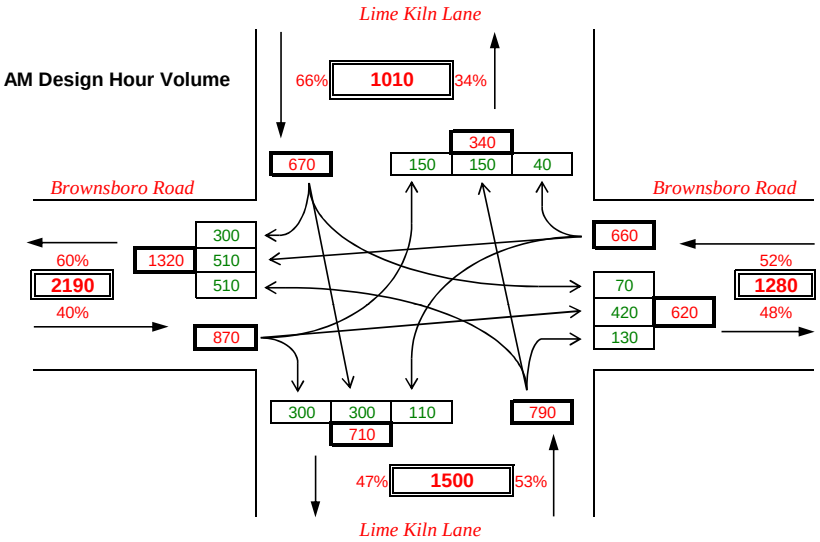
SCENARIO: 2030 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #7 (Brownsboro Road @ Lime Kiln Lane)

2030 ADT

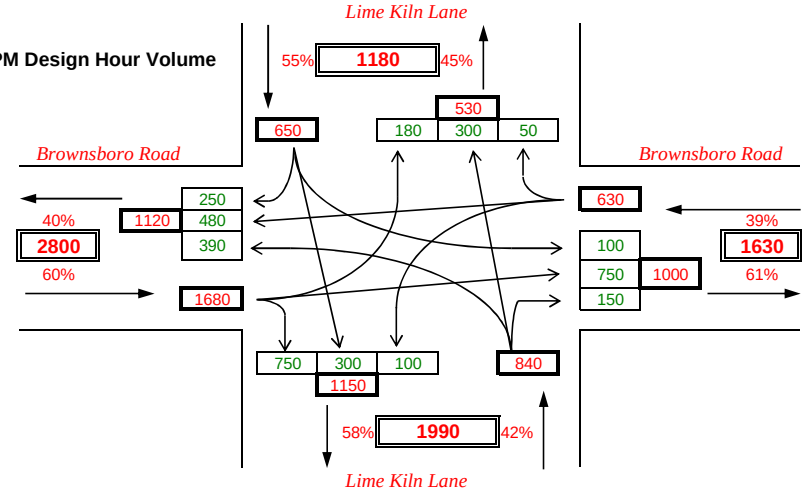


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

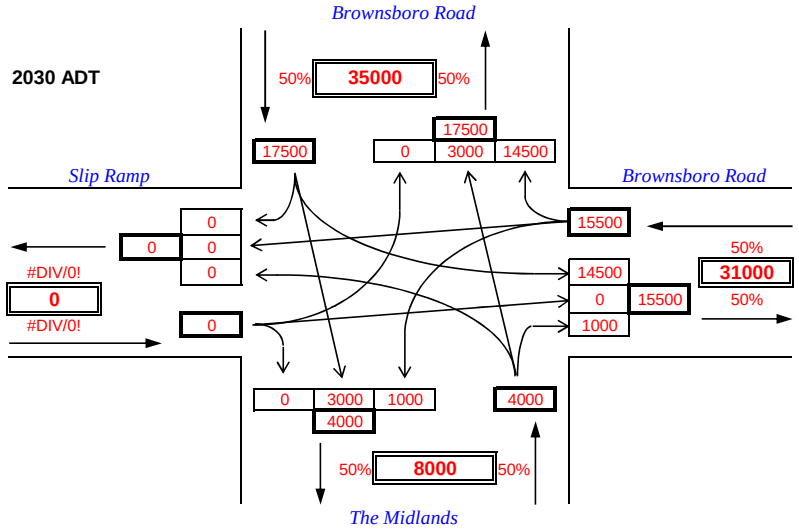


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

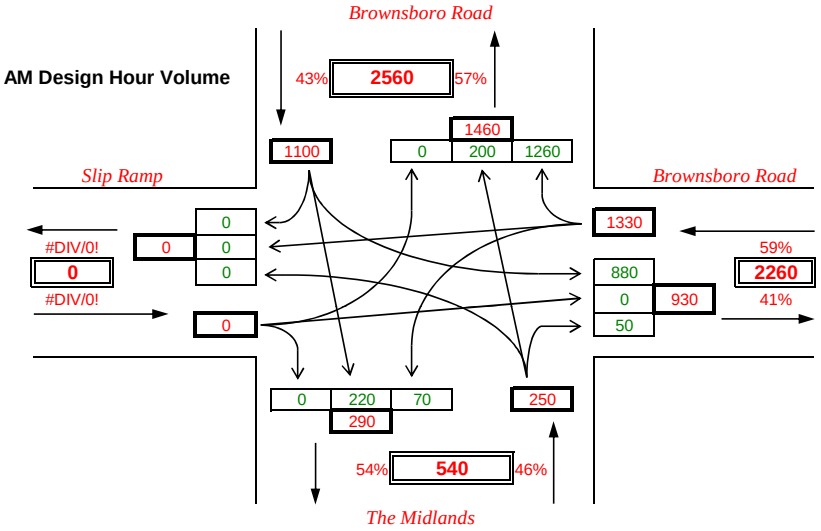
SCENARIO: 2030 ADT and Design Hour Volumes (Without Slipramp)

INTERSECTION: Int #8 (Brownsboro Road @ The Midlands)

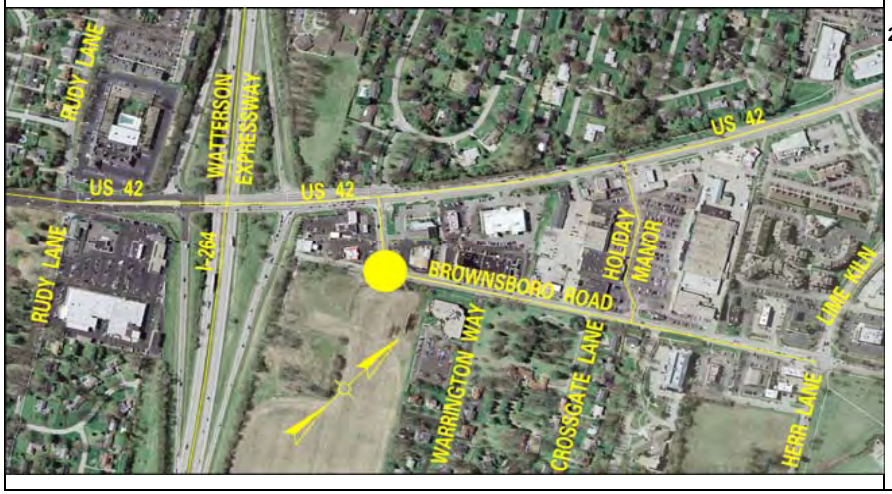
2030 ADT



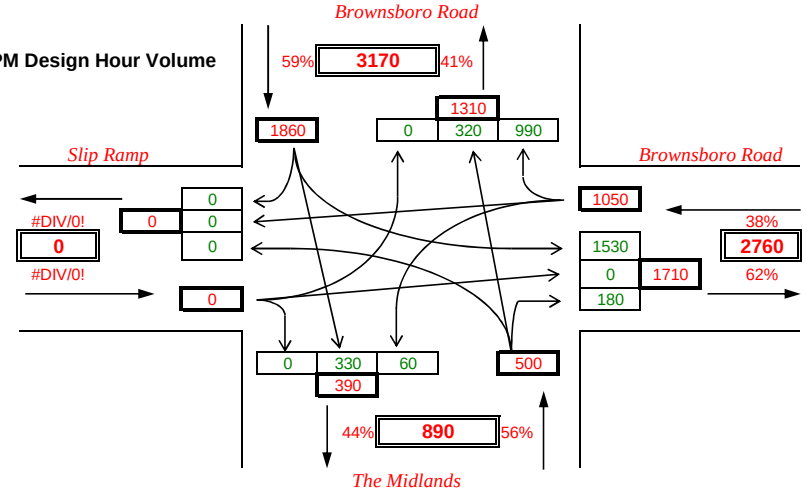
2030 AM Design Hour Volume



Location Map



2030 PM Design Hour Volume



2030 Turning Movement

Traffic Forecast

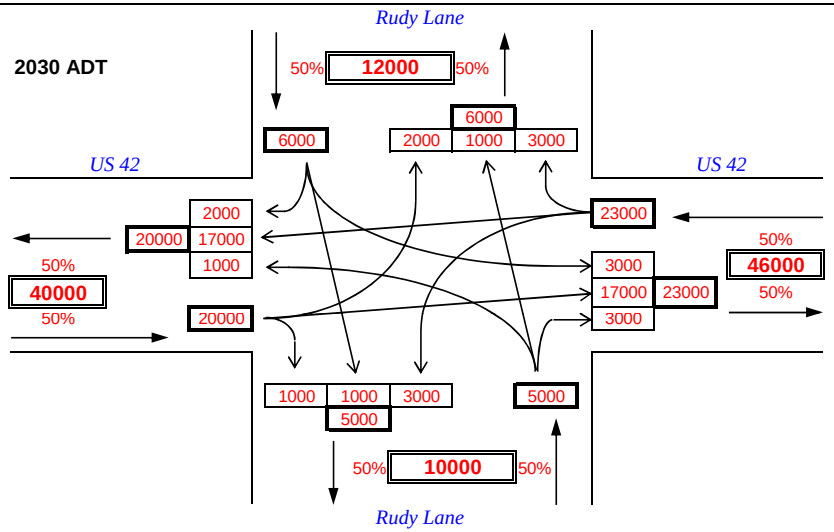
SLIP RAMP OPTION

PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

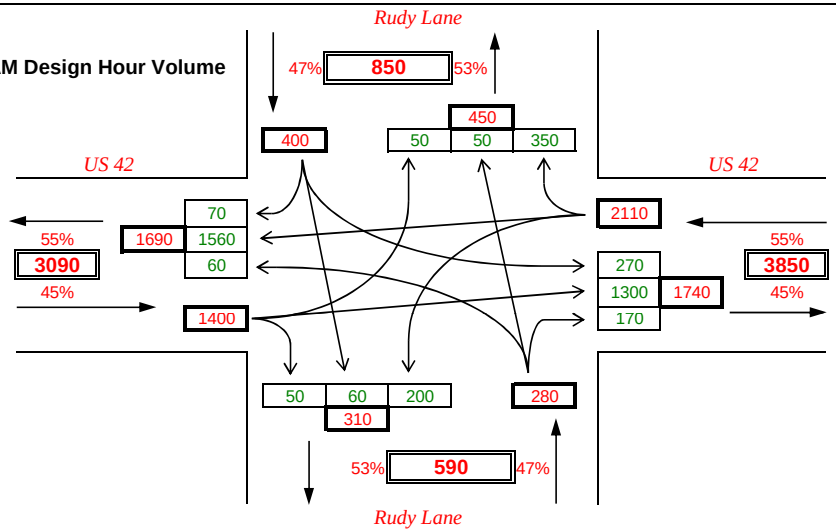
SCENARIO: 2030 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #1 (US 42 @ Rudy Lane)

2030 ADT

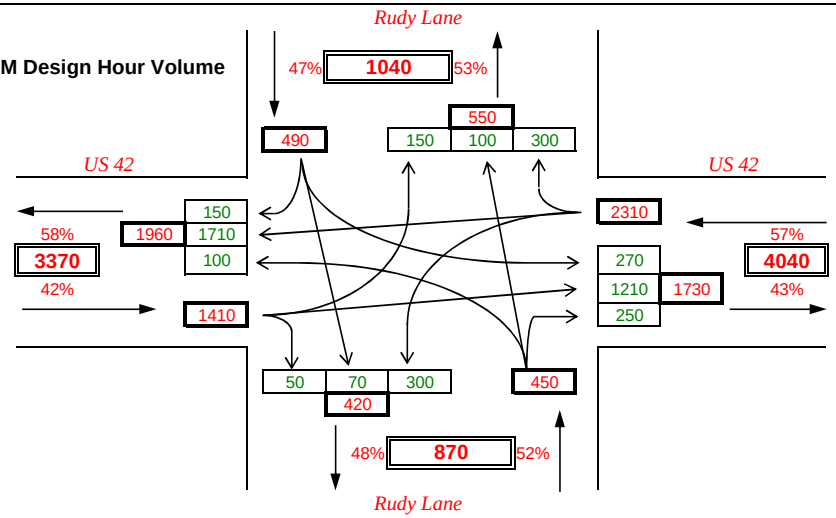


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

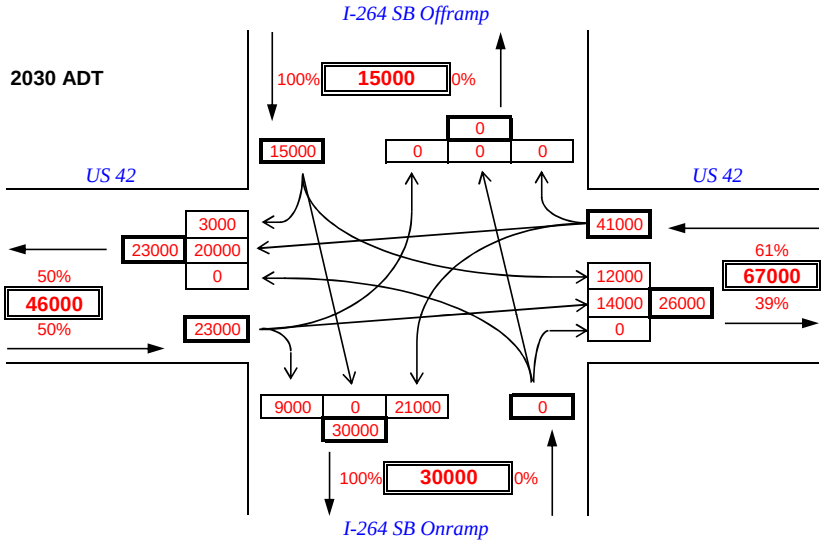


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

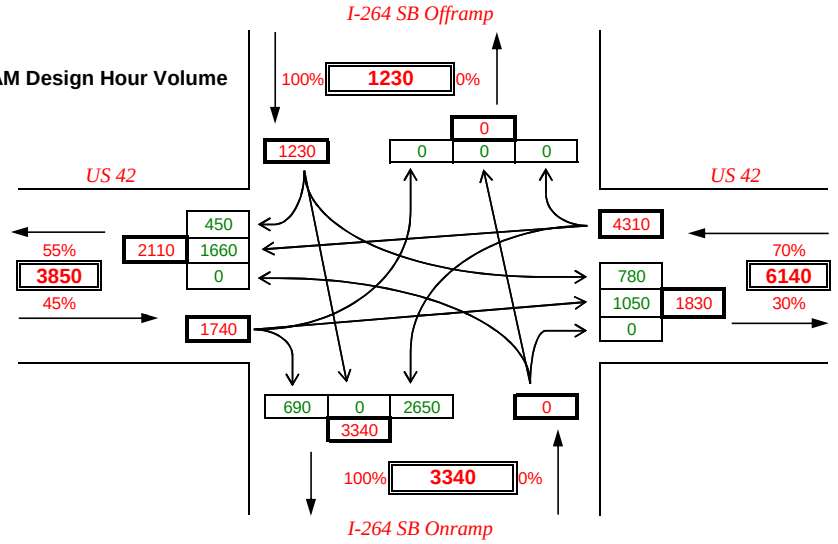
SCENARIO: 2030 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #2 (US 42 @ I-264 SB Ramps)

2030 ADT

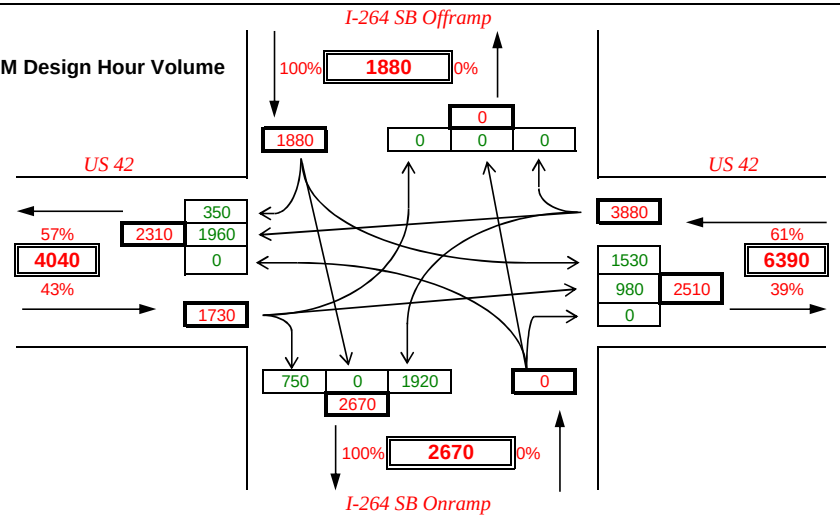


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

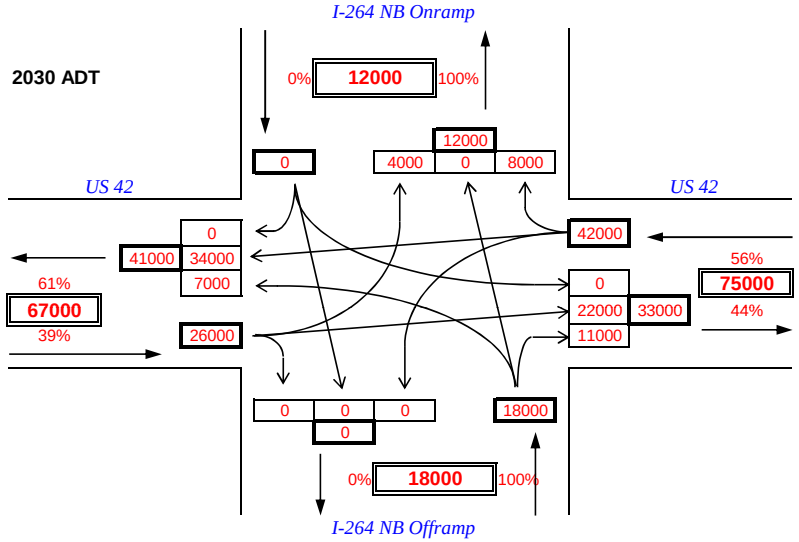


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

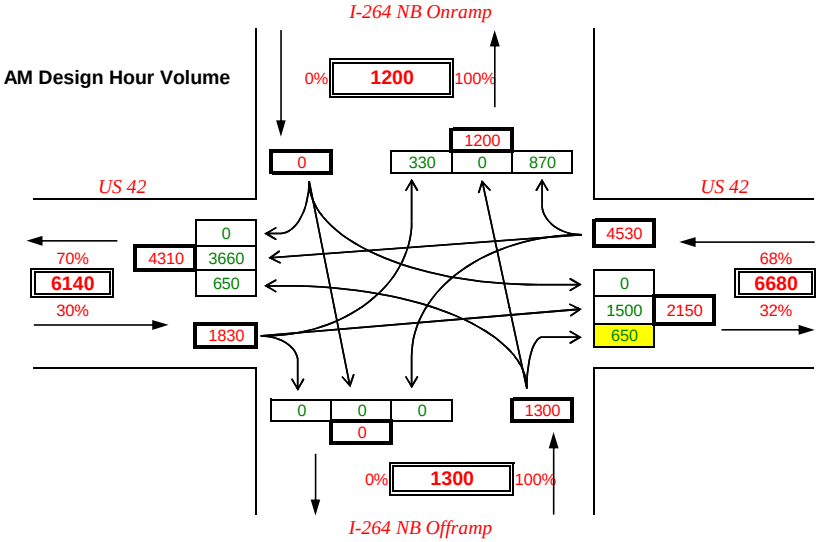
SCENARIO: 2030 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #3 (US 42 @ I-264 NB Ramps)

2030 ADT

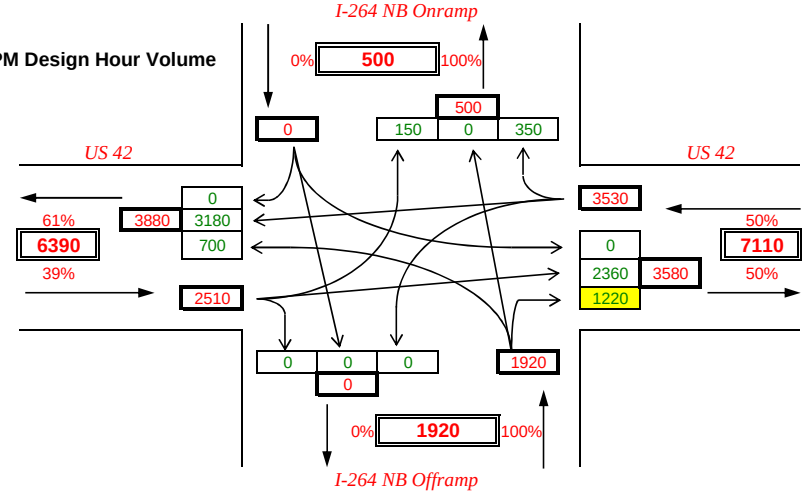


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

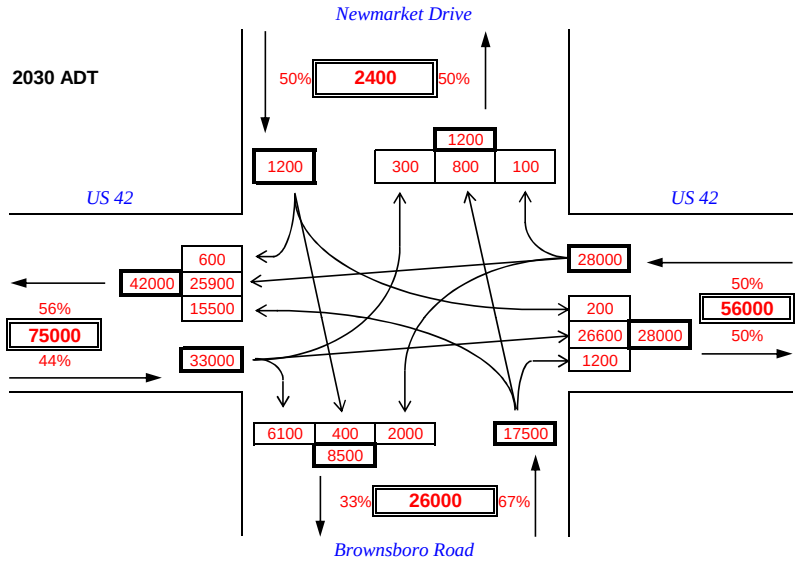


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

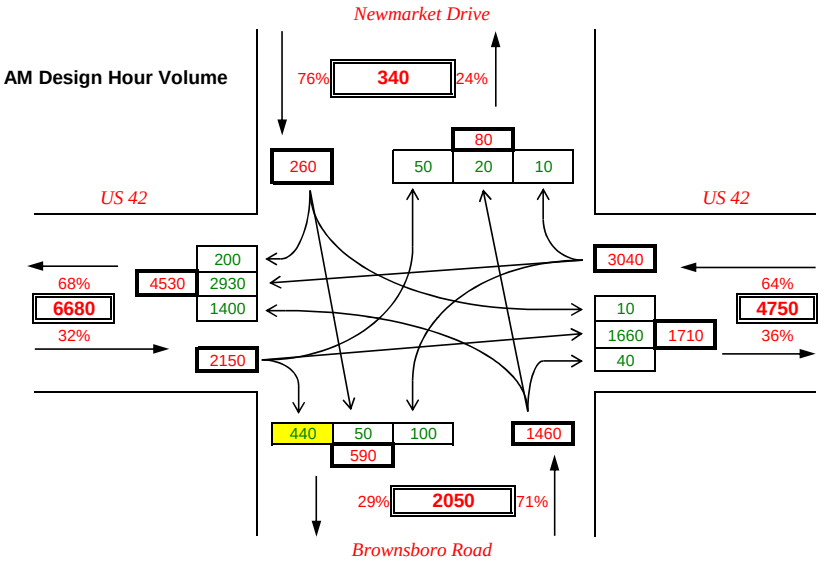
SCENARIO: 2030 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #4 (US 42 @ Brownsboro Road)

2030 ADT

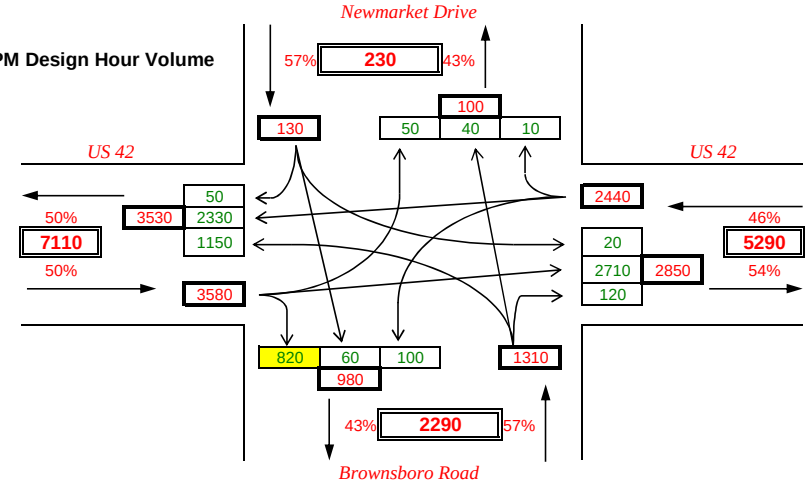


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

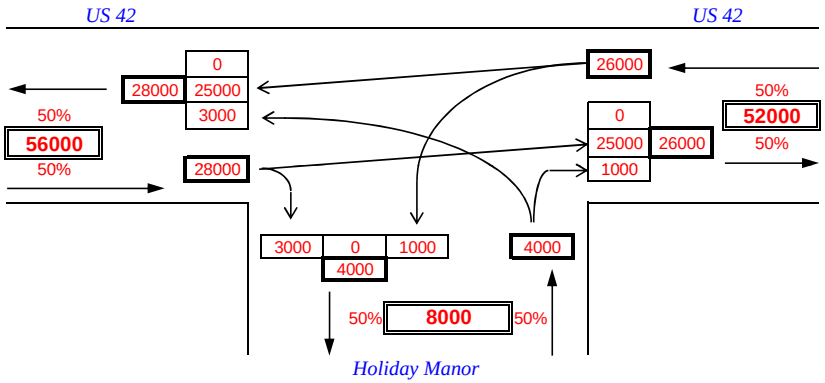


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

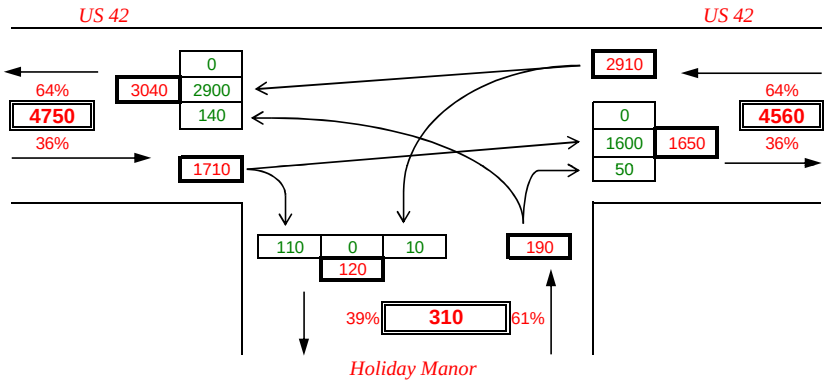
SCENARIO: 2030 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #5 (US 42 @ Holiday Manor)

2030 ADT

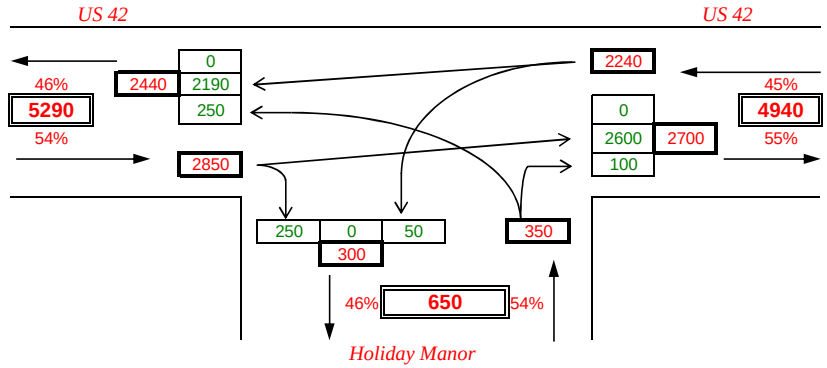


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

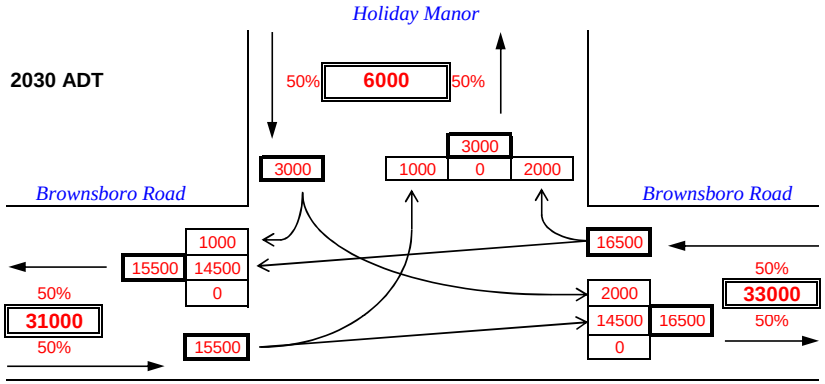


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

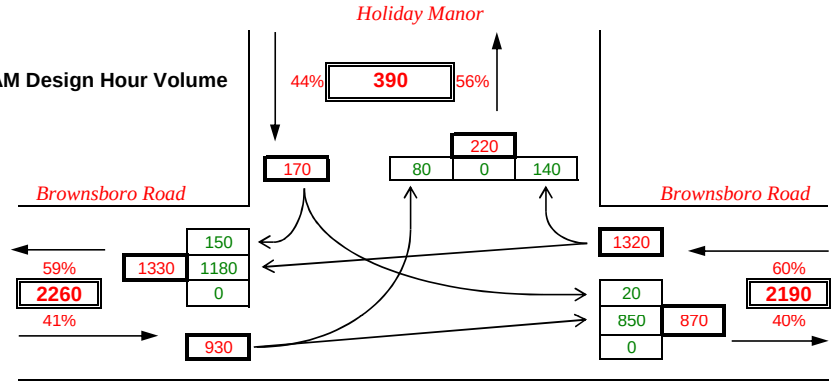
SCENARIO: 2030 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #6 (Brownsboro Road @ Holiday Manor)

2030 ADT

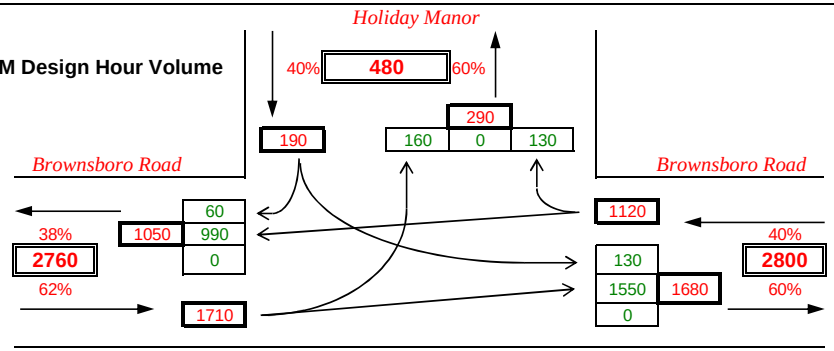


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

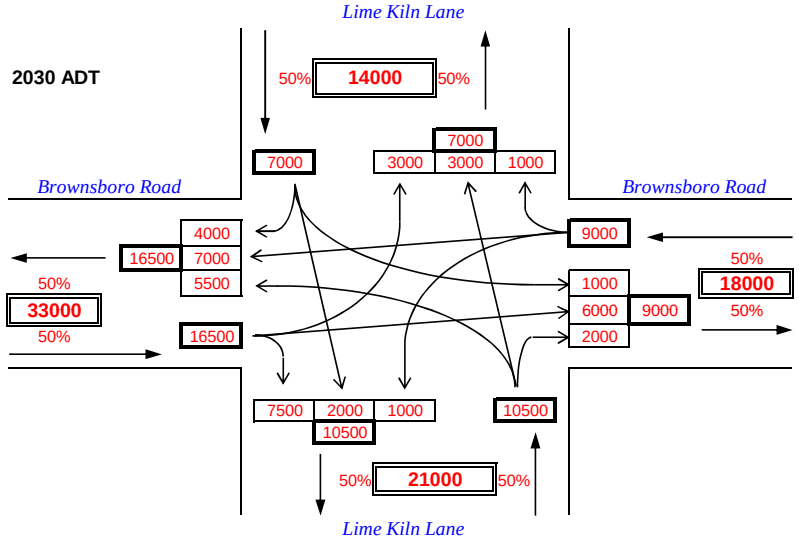


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

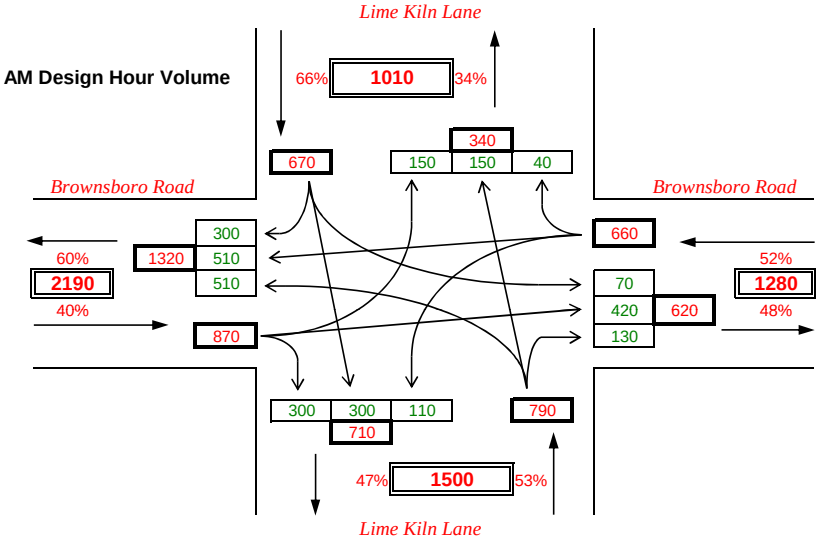
SCENARIO: 2030 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #7 (Brownsboro Road @ Lime Kiln Lane)

2030 ADT

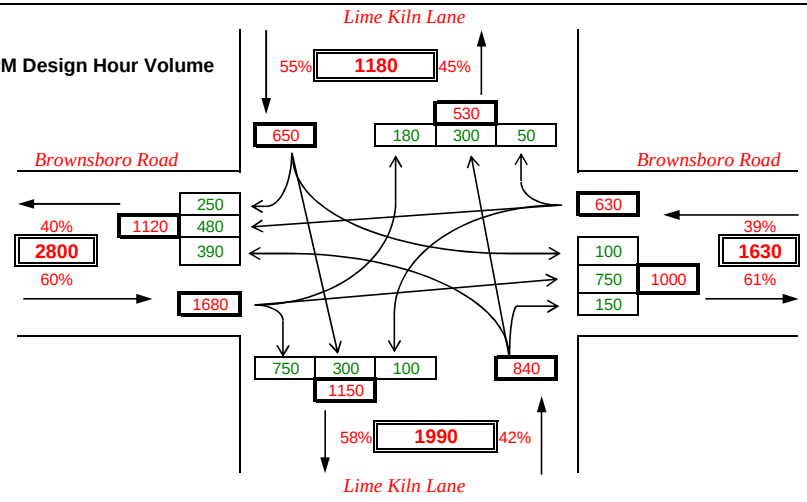


2030 AM Design Hour Volume



Location Map

2030 PM Design Hour Volume

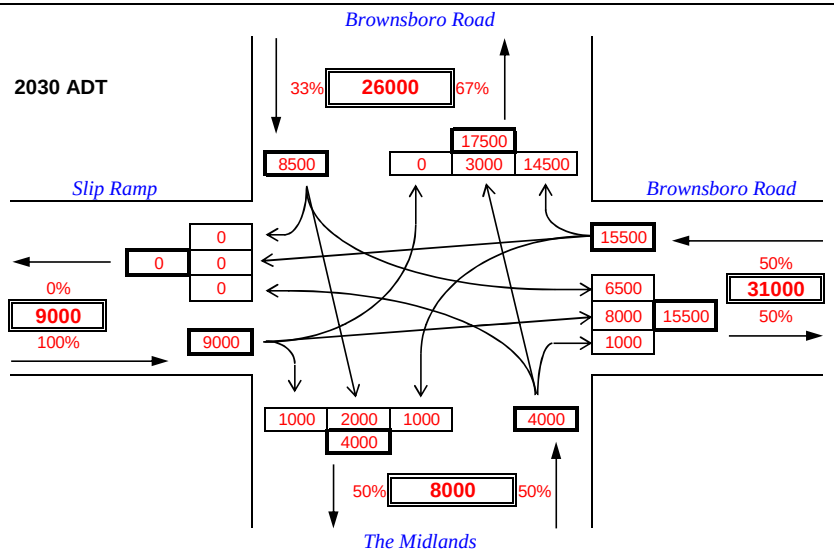


PROJECT: Interstate 264/US 42
ITEM NUMBER:
ACCOUNT NUMBER:
REQUEST DATE:
ANALYST: Bob Kennedy

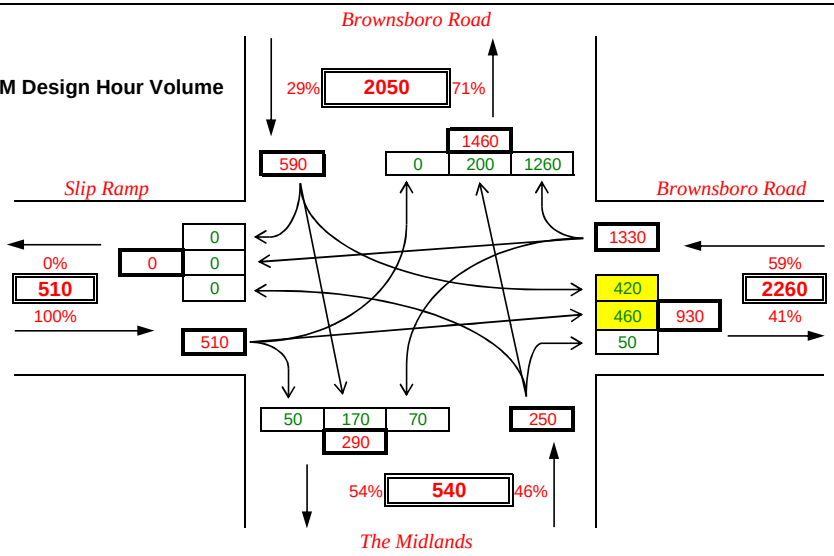
SCENARIO: 2030 ADT and Design Hour Volumes (With Slipramp)

INTERSECTION: Int #8 (Brownsboro Road @ The Midlands)

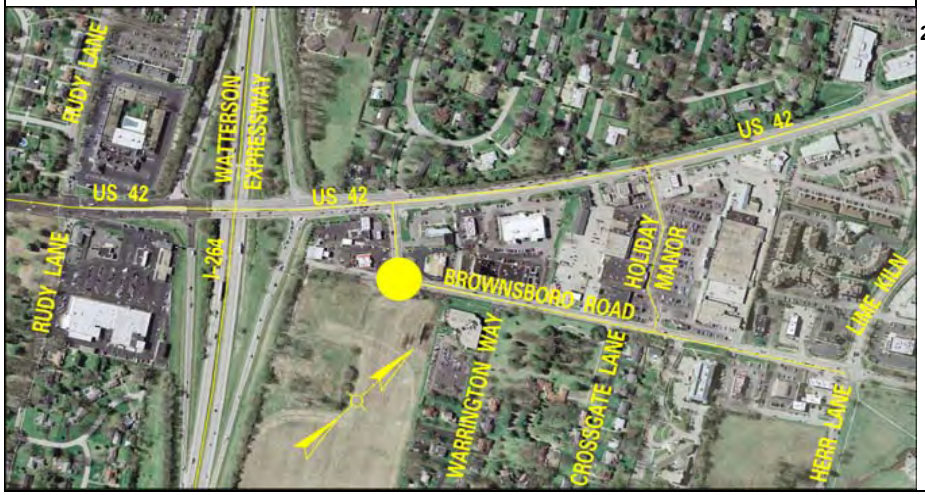
2030 ADT



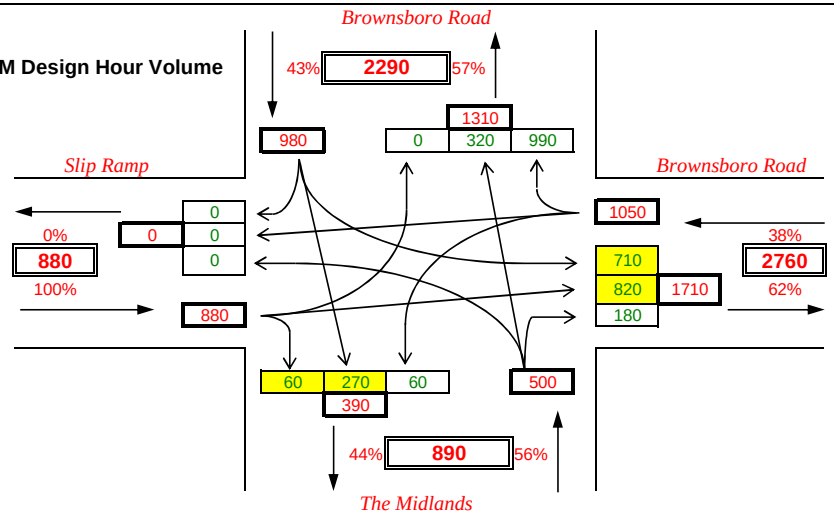
2030 AM Design Hour Volume



Location Map



2030 PM Design Hour Volume



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