BARRINGTON ROAD INTERCHANGE FEASIBILITY STUDY

INTERSTATE 90 (NORTHWEST TOLLWAY)

AT

BARRINGTON ROAD

VILLAGE OF HOFFMAN ESTATES
COOK COUNTY, ILLINOIS

May 2004

PREPARED FOR:

VILLAGE OF HOFFMAN ESTATES

PREPARED BY:

TRANSYSTEMS CORPORATION

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1. EXECUTIVE SUMMARY

The purpose of this study is to assess the feasibility of several interchange development scenarios along Interstate 90 (Northwest Tollway) at Barrington Road, Higgins Road, and Roselle Road in northwest Cook County, Illinois. The corridor limits extend from Illinois Route 59 to Illinois Route 53 (see Exhibit 1, Project Location Map in Appendix A). The study has been initiated by the Village of Hoffman Estates to address the transportation needs of the region. This study involves system-level analysis of traffic and operational characteristics, identification of geometric improvements, determination of right-of-way impacts, assessment of environmental and economic impacts, and an estimate of construction and right-of-way acquisition costs for the potential improvements within the study area. The study includes assessment of interchange scenarios on the arterial operations of Barrington Road and Roselle Road. The findings of this interchange feasibility study will serve as a planning tool for involved stakeholders in assessing and establishing interchange improvement priorities within the Northwest Tollway corridor.

Projected traffic volume data

The existing average daily traffic (ADT) volumes along Interstate 90 range from 110,000 to 150,000. Traffic is anticipated to grow by 40 to 50 percent within the corridor by the design year 2020. This will result in an increase in traffic volumes ranging from 160,000 to 230,000 vehicles per day along the Tollway, as provided by the Chicago Area Transportation Study (CATS).

The existing traffic volume along Barrington Road and Roselle Road in the vicinity of Interstate 90 is 45,000 ADT and 29,000 ADT, respectively. Traffic is anticipated to grow by 30 percent on Barrington Road and 60 percent on Roselle Road over the 2020 design period, resulting in projected ADT volumes of 59,000 on Barrington Road and 48,000 on Roselle Road.

Capacity Analysis

The projected increase in traffic volumes will place higher demands on the corridor. Under existing conditions, Interstate 90 consists of three through lanes in each direction. A capacity analysis of the No-Build Scenario for Interstate 90 indicated failure and congestion (Level-of-Service F). Improvements are needed along Interstate 90 even if no new interchange ramps are added within the corridor. Interstate 90 would require either a fourth lane be added in each direction and/or a transit mode (such as the STAR Line) be introduced to reduce vehicular demand. The capacity analysis of adding a fourth through lane in each direction results in acceptable operations and flow of traffic along Interstate 90. Therefore, it was considered as the Baseline Condition for each interchange scenario studied.

Interchange Location Scenarios

For the study, six interchange scenarios were analyzed. All scenarios assume the construction of a fourth lane in each direction along Interstate 90 to accommodate the anticipated design year demand:

Scenario A: Baseline Condition. Scenario A represents the existing interchange conditions and the baseline condition to compare all interchange scenarios.

Scenario B: Full Interchange at Barrington Road only. Scenario B includes construction of new ramps at Barrington Road to accommodate traffic to and from the west. It would enhance the attractiveness of the Barrington Road corridor. The capacity analysis indicates that a full access interchange at Barrington Road would result in acceptable operations along Barrington Road with some roadway improvements.

Scenario C: Full Interchange at Roselle Road only. Scenario C includes construction of new ramps at Roselle Road to accommodate traffic to and from the west. It would provide a full access interchange at Roselle Road and would enhance the attractiveness of the Roselle Road corridor. The capacity analysis indicates that Roselle Road would experience an increase in delays, but with improvements at the intersections of Roselle Road with Central Road and Hillcrest Boulevard, a full access interchange at Roselle Road would result in acceptable operations. The needed improvements along Roselle Road are anticipated to have some environmental impacts.

Scenario D: Full Interchange at Barrington Road and Roselle Road. Scenario D combines Scenarios B and C resulting in full interchanges at both Barrington Road and Roselle Road. Full access interchanges at both locations would result in better operations along Barrington Road and Roselle Road, yet it is not necessary to construct both interchanges to receive benefits within the corridor.

Scenario E: Adding only an eastbound exit ramp at Barrington Road. Scenario E provides only an eastbound exit ramp in the southwest quadrant of the Interstate 90 interchange at Barrington Road. Providing access to only three of the four directions violates driver expectations and puts stress on the local network as motorists are forced to back track on the arterial system to access westbound Interstate 90.

Scenario F: Split Interchange at Higgins Road. Scenario F includes construction of new ramps at Higgins Road to minimize impacts to the area surrounding the existing Barrington Road interchange. However, it would not meet the ISTHA interchange spacing requirement of 2 miles in suburban areas. The severe skew angle of Higgins Road and the close proximity to the Forest Preserve combine to make this location undesirable.

Comparison of Alternative Interchange Designs at Barrington Road

Four interchange configurations were studied for the Barrington Road interchange: 1) Partial Cloverleaf Interchange (PARCLO), 2) Conventional Diamond, 3) Single Point Urban Interchange, and 4) Modified Diamond Interchange.

Capacity analysis was performed for each of the interchange configurations. Based on the capacity analysis, the PARCLO interchange provides acceptable operations during both A.M. and P.M. peak periods. The Conventional Diamond Interchange does not provide acceptable

operations as the westbound left turn from the westbound exit ramp operates poorly during the P.M. peak period. The Single Point Urban Interchange was eliminated as it did not provide acceptable operations. The Modified Diamond Interchange provides a combination of the PARCLO and Diamond interchange. The interchange provides acceptable operations during both peak periods.

The existing weave on Barrington Road between the loop ramps is undesirable. The weave condition will be maintained in the PARCLO option. The weave condition is eliminated with the Modified Diamond Interchange as the eastbound entrance loop ramp is eliminated and the westbound exit loop ramp is operated through a signalized intersection on Barrington Road. The Modified Diamond Interchange provides acceptable operations without significant economic impacts.

Recommendation

It is recommended that the Modified Diamond Interchange at Barrington Road be studied in further detail and that preliminary engineering studies be conducted. The overall operations along Barrington Road are not anticipated to be affected adversely by the additional traffic demand created by the interchange. Depending on the interchange type, economic and environmental impacts are anticipated in the vicinity. In general, the interchange would reduce travel time and alleviate congestion along the arterial system without significantly affecting the operations along Interstate 90.

2. PURPOSE AND NEED FOR IMPROVEMENT

2.1 PURPOSE

The purpose of the study is to identify potential improvements at existing interchange locations that will enhance accessibility without severely impacting operations, capacity and safety. This will be accomplished by analysis of traffic and operational characteristics and assessment of environmental, economic, and operational impacts. New interchange ramps will provide access to and from the west along Interstate 90. The improvements will increase the attractiveness of the corridor and provide additional access to the vast employment and commercial centers in the Village of Hoffman Estates and its neighboring communities, leading to continuous economic growth of the corridor.

Interstate 90 is a fully access controlled facility that serves local, regional, and interstate traffic. It provides a vital link between the Northwest suburbs and the Chicago Metropolitan Area. Interstate 90 is also a part of the Primary National Defense Network and the National Highway System (NHS), which is a network of Interstate and other major routes. The purpose of these designations is to have a network of roadways that can be used in times of national crisis or need. With its various designations, Interstate 90 is a vital link in the transportation network for the area and the region providing mobility for local and regional traffic. The adjacent land use within the corridors is a mix of commercial, office, residential, educational, forest preserve, and recreational development.

Illinois Route 53 located to the east is a major north-south Interstate in the region. Barrington Road, Higgins Road (Illinois Route 72), Roselle Road, and Algonquin Road (Illinois Route 62) are Strategic Regional Arterials (SRA) within the corridor limits. SRA routes, as designated by the Illinois Department of Transportation, were identified to supplement the regions' expressway and Interstate system and provide an essential connection in the regional transportation network. Barrington Road and Roselle Road provide access to Interstate 90 for travel in the eastbound direction, but not the westbound direction. Illinois Route 59 and Illinois Route 53 provide access to Interstate 90 for travel in the eastbound and westbound directions. Illinois Route 59 is approximately 2.5 miles to the west and Illinois Route 53 is approximately 6.0 miles to the east of Barrington Road.

2.2 NEED FOR THE PROPOSED ACTION

Interstate 90 links the Chicago central business district with the communities in the northwest suburbs like Hoffman Estates and Schaumburg (See Exhibit 2, Municipality Boundaries Map in Appendix A). Barrington Road and Roselle Road are north-south arterials. In the study area, there are several major traffic generators. The Villages of Hoffman Estates and Schaumburg are home to multiple commercial establishments and office complexes. The Villages also provide several recreational and educational facilities.

The northwest suburbs are experiencing growth in population and commercial development resulting in increased traffic volumes. Based on Northeastern Illinois Planning Commission

(NIPC) information, the population in the area is likely to grow 10 to 20 percent by year 2020. From the year 1990 to the year 2020, the population of Hoffman Estates is projected to grow from 47,000 to approximately 56,000 and Schaumburg from 69,000 to 84,000. During the same period the employment in Hoffman Estates is projected to grow from 15,000 to approximately 44,000 and Schaumburg from 63,000 to 134,000. This projected growth in population and employment, especially to the west and northwest of the study area, will intensify travel demand.

According to the Chicago Area Transportation Study (CATS), the traffic volumes within the area are anticipated to increase on an average between 20 and 40 percent by the year 2020. Traffic growth is expected to continue due to the anticipated growth in population and increase in employment opportunities within the corridor, especially to the west and northwest. Considering the anticipated growth in population and employment in the region, the interchange improvements are needed to provide efficient full access to the corridor. An improved interchange will address the present and future transportation needs of the region. The improvements would also reduce travel time and relieve traffic along the local roadway system.

3. DESCRIPTION OF EXISTING FACILITY

3.1 EXISTING INTERSTATE 90

Interstate 90 is part of the Interstate highway system and extends from coast to coast. Within the study area, full interchanges exist at Illinois Route 59 and Illinois Route 53 and half interchanges (to and from the east only) at Barrington Road and Roselle Road.

The interchange at Illinois Route 59 is a partial cloverleaf service interchange. All quadrants have directional ramps and the northeast and the southwest quadrant have loop ramps. A toll collection facility consisting of a three lane unattended toll plaza exists on the eastbound and the westbound directional exit ramps. Interstate 90 between Illinois Route 53 and Illinois Route 59 has three through lanes in each direction with auxiliary lanes at ramp junctions (See Exhibit 3, Existing Lane Configuration Map in Appendix A). Within the study limits, Interstate 90 is under the maintenance and jurisdiction of the Illinois State Toll Highway Authority (ISTHA).

The interchange at Barrington Road is a partial cloverleaf service interchange with collector-distributor (C-D) roads. In the westbound direction, the exit leads to the C-D road that has a toll collection facility consisting of a three lane unattended toll plaza. From the C-D road, a directional ramp leads to northbound Barrington Road and a loop ramp leads to southbound Barrington Road. A loop ramp from southbound Barrington Road and a directional ramp from northbound Barrington Road provide entrance via a C-D road to Interstate 90 in the eastbound direction.

The interchange at Roselle Road is a partial diamond service interchange. Ramps exist in the northeast and the southeast quadrants providing exit from the westbound direction and entrance to the eastbound direction of Interstate 90. A toll collection facility consisting of a three lane unattended toll plaza exists on the westbound exit ramp.

The Interstate 90 interchange at Illinois Route 53 is a full cloverleaf system interchange with C-D roads providing free-flow access to and from Illinois Route 53 in all directions. A toll collection facility consisting of a three lane unattended toll plaza exists on the eastbound exit ramp from Interstate 90 to northbound Illinois Route 53 and a four lane unattended toll plaza exists on the eastbound exit ramp to southbound Illinois Route 53. The interchange provides an important connection between the east-west and the north-south Interstate system.

3.2 EXISTING ARTERIALS

Barrington Road

The study includes analysis of the Barrington Road and Roselle Road corridors. Barrington Road is a north-south principal arterial. Hassell Road and Central Road are east-west collectors that intersect Barrington Road within the project limits. Barrington Road is under contract (L.A. Section No. 00-0069-00- WR) for improvement and anticipated to be completed in late 2004.

The improvements currently being constructed are considered as existing conditions for this feasibility study. Barrington Road will provide three through lanes in each direction between Old Higgins Road and the Interstate 90 northbound entrance ramp/southbound exit ramp. North of Interstate 90, Barrington Road will consist of two through lanes in each direction. At the intersection of Barrington Road and Higgins Road, Barrington Road will provide an exclusive left and right turn lane in the northbound direction and dual left turn lanes and a single right turn lane in the southbound direction. At the intersection of Barrington Road and Hassell Road, Barrington Road will provide dual left turn lanes and a right turn lane in the southbound direction and a left turn lane and a right turn lane in the northbound direction. Hassell Road will have a through lane and separate left and right turn lanes in the eastbound and westbound directions. At the intersection of Barrington Road and Central Road, Barrington Road has dual left turn lanes and a right turn lane in both directions. Central Road has dual left turn lanes and a shared through-right turn lane in the westbound direction, and dual left turn lanes, a shared through-right turn lane, and an exclusive right turn lane in the eastbound direction. Barrington Road is under the maintenance and jurisdiction of the Illinois Department of Transportation (IDOT). Central Road is under the maintenance and jurisdiction of the Cook County Highway Department. Hassell Road is under the maintenance and jurisdiction of the Village of Hoffman Estates.

The Interstate 90 interchange with Barrington Road provides free-flow access to and from the east along Interstate 90. The ramp intersections with Barrington Road are unsignalized. All ramps have one lane (See Exhibit 3, Existing Lane Configuration Map in Appendix A).

Higgins Road

Higgins Road is an east-west principal arterial. Higgins Road is also being improved as part of the Barrington Road project (L.A. Section No. 00-00069-00-WR). Upon completion of construction in late 2004, Higgins Road will consist of three lanes in each direction east of Shoe Factory Road. At the intersection with Barrington Road, Higgins Road will have dual left and dual right turn lanes in the westbound direction and dual left turn lanes and a single right turn lane in the eastbound direction. At the intersection of Higgins Road and Shoe Factory Road, Higgins Road will have left and right turn lanes in the westbound direction and a left turn lane and a shared through-right turn lane in the eastbound direction. West of Shoe Factory Road, Higgins provides two lanes in each direction. Shoe Factory Road will have a single through lane and separate left and right turn lanes in the northbound direction. Greenspoint Parkway will have a shared through-right turn lane and exclusive left turn lane in the southbound direction. Higgins Road is under the maintenance and jurisdiction of IDOT. Shoe Factory Road is under the maintenance and jurisdiction of Cook County Highway Department and Greenspoint Parkway are under the maintenance and jurisdiction of the Village of Hoffman Estates (See Exhibit 3, Existing Lane Configuration Map in Appendix A).

Roselle Road

Roselle Road is a north-south principal arterial. Hillcrest Boulevard and Central Road are east-west collectors that intersect Roselle Road within the project limits. Within the study area,

Roselle Road is fully developed with three through lanes in each direction to Central Road. At the signalized intersection of Hillcrest Boulevard/Chatham Centre Entrance, Roselle Road has an exclusive left turn lane and a right turn lane in both northbound and southbound direction. Hillcrest Boulevard/Chatham Centre Entrance has an exclusive left turn lane, a right turn lane and a through lane in each direction. At the signalized intersection of the Interstate 90 entrance ramp, Roselle Road has dual right turn lanes in the northbound direction and an exclusive left turn lane in the southbound direction. The entrance ramp has two lanes. At the signalized intersection of the Interstate 90 and westbound exit ramp, the ramp provides dual left turn lanes and a right turn lane. At the signalized intersection of Central Road, Roselle Road has an exclusive left turn lane in both directions, three through lanes with a shared right lane in the northbound direction and two through lanes with a shared right lane in the southbound direction. The west approach of Central Road has an exclusive left turn and right turn lane and a shared through left turn lane. The east approach of Central Road has an exclusive left turn and a shared through right turn lane. Central Road provides two through lanes in each direction east of Ela Road and one through lane in each direction west of Ela Road (See Exhibit 3, Existing Lane Configuration Map in Appendix A). Roselle Road and Central Road are under the maintenance and jurisdiction of Cook County Highway Department and Hillcrest Boulevard is under the maintenance and jurisdiction of the Village of Hoffman Estates.

3.3 LAND USE

The adjacent land use within the corridor is a mix of commercial, office, residential, educational, forest preserve, and recreational development. The Villages of Hoffman Estates and Schaumburg provide extensive employment and business opportunities facilitating a healthy economy in the region (See Exhibit 4, Land Use Map in Appendix A).

The Barrington Road interchange with Interstate 90 is located in the Village of Hoffman Estates, however the northwest quadrant is located in the Village of South Barrington. The land use in the immediate vicinity mainly consists of office complexes and commercial properties. The Siemens Medical Center, SBC campus, Claire's Accessories office complex and AMC 30 theatre complex are located north of the interchange along Central Road. Greenspoint Office Park and the Barrington Point subdivision are located in the southwest quadrant of the interchange. Several hotels/motels including Amerisuites, LaQunita, Red Roof Inn and Hilton are located around the interchange. The St. Alexius Hospital is located approximately one-half mile south of Higgins Road along Barrington Road. The Barrington Road interchange provides access to the extensive business and residential communities in the area.

The Roselle Road interchange with Interstate 90 is located in the Village of Schaumburg. The land use in the immediate vicinity mainly consists of office complexes and residential communities. The Illinois Department of Transportation (IDOT) District 1 office is located on Central Road just west of Roselle Road. The Medieval Times entertainment complex is located in the northeast quadrant of the interchange. Harper Community College with a student population of over 30,000 is located to the north along Algonquin Road. Residential communities and single family homes exist south of Interstate 90 west of Roselle Road. Several

restaurants and hotels/motels are located south of the interchange as well. The Chatham Centre office complex is located in the southeast quadrant of the interchange.

3.4 ENVIRONMENTAL RESOURCES

A macro level analysis of the environmental resources has been developed to assess the environmental impacts of the improvements. The environmental resources were identified using available resource databases. The analysis did not involve any field reviews. The environmental resources discussed in this section include Forest Preserves, Wetlands and Floodplains/Floodways.

Forest Preserves

There are two forest preserve areas in the vicinity of the corridor. The Poplar Creek Forest Preserve is located south of Interstate 90 and Higgins Road and west of Barrington Road. The boundaries of the preserve extend west of Illinois Route 59 and south of Golf Road. This property is primarily used for picnicking, hiking, biking, and other passive recreational activities. Existing amenities include parking lots, picnic shelters, bicycle path and restroom facilities. The forest preserve can be accessed from Shoe Factory Road and Golf Road.

The Paul Douglas Forest Preserve is bounded by Central Road, Ela Road, Algonquin Road (Illinois Route 62), and Freeman Road. This 1,400-acre property is primarily used for picnicking, hiking, biking, and other passive recreational activities. Existing amenities include parking lots, picnic shelters, golf course, and restroom facilities. The forest preserve can be accessed from Ela Road and Central Road.

Both forest preserves are under the jurisdiction of the Forest Preserve District of Cook County (FPDCC), Illinois. The FPDCC does not have current information available on the usage/visitor attendance for the forest preserves (See Exhibit 5, Environmental Resources Map in Appendix A).

Wetlands

The wetland information was obtained from the National Wetland Inventory (NWI) Maps prepared by the United States Department of Interior. A 16-acre wetland exists in the northwest quadrant of the Barrington Road interchange. The wetland is in close proximity of the westbound Interstate 90 exit loop ramp.

No wetlands exist near the Roselle Road interchange. A wetland is located north of Central Road and near the intersection of Roselle Road and Hillcrest Boulevard south of the interchange (See Exhibit 5, Environmental Resources Map in Appendix A).

Floodplains / Floodway

Flood Insurance Rate Maps (FIRM), developed by the Federal Emergency Management Agency (FEMA) and the Flood Insurance Administration, were reviewed to identify base floodplains that are in the vicinity of the study area. They show special flood hazard areas associated with Salt Creek, Poplar Creek and their associated tributaries.

Poplar Creek Tributary A flows south longitudinally along Barrington Road through the wetland located in the northwest quadrant of the interchange and crosses Interstate 90 on the west side of Barrington Road. Salt Creek Tributary D originates within the Paul Douglas Forest Preserve and crosses Central Road approximately 1,000 feet west of Roselle Road. Tributary D then flows along the south side of Central Road, crosses Roselle Road, and continues east (See Exhibit 5, Environmental Resources Map in Appendix A).

3.5 PUBLIC TRANSIT

The corridor is served by commuter rail provided by METRA and bus transit provided by PACE. The Metra/Union Pacific Northwest Line (UP-NW) is located north of the corridor and the Metra/Milwaukee District West Line (MD-W) is located south of the corridor. The Palatine Station and the Barrington Station on the UP-NW line are approximately 4 and 6 miles north of Interstate 90, respectively. The Roselle, Schaumburg, and Hanover Park stations on the MD-W line are approximately 5 miles south of Interstate 90.

PACE provides five bus routes within the Hoffman Estates, Schaumburg, and South Barrington corridor: Route 557 – "The Hot Line" Barrington Road corridor, Route 696 – Woodfield-Arlington Heights-Randhurst, Route 699 – Palatine-Woodfield-Elk Grove, Route 767 – Congress/Douglas-Prairie Stone connection, and Route 610 – River Road-Prairie Stone Express. The bus service provides access to various commercial, educational and employment centers. The bus routes serve Woodfield Mall, Harper College, Roosevelt University, SBC, Sears Headquarters, the Prairie Stone Business Park, and several other destinations within the corridor. The routes also provide access to the METRA train stations along the UP-NW line and MD-W line and transfer service to other bus routes within the corridor.

The Northwest Municipal Conference, which includes the Villages of Hoffman Estates and Schaumburg, conducted a study of transit options for the Northwest Tollway Corridor to identify potential mobility improvements of their residents and businesses. On June 5, 2003, the Regional Transportation Authority (RTA) selected Metra's Suburban Transit Access Route (STAR) line as the locally preferred option for the Northwest Transit Corridor, which is centered on Interstate 90 from O'Hare Airport to northwestern Cook County. The STAR line is a proposed commuter rail line that would travel along Interstate 90 from O'Hare Airport to the Elgin Joliet & Eastern (EJ&E) Railway, west of Illinois Route 59 in Hoffman Estates, where it would then provide outer circumferential rail transit service to Joliet. The Metra STAR line has proposed stations near the Roselle Road and Barrington Road interchanges and at the Prairie Stone Business Park just west of Illinois Route 59.

A well established bike path network in the Villages of Hoffman Estates and Schaumburg connects the residential areas and forest preserves. The bike path network is being continuously developed to address regional needs.

3.6 OTHER CONSTRAINTS

In addition to the environmental constraints mentioned above, other features that need to be considered include existing utilities, overhead electric lines, buildings, and access roads located in the vicinity of the study area.

In addition to the water, sanitary sewer, and storm sewer lines, several other utilities typically serve the area including gas, electric, telephone, and cable lines. The location and impacts to the utility services would be identified during preliminary engineering studies. At the Barrington Road interchange, a high voltage overhead electric transmission line exists along the south side of Interstate 90. Interchange improvements may have potential conflicts with the overhead lines. A Commonwealth Edison station is located in the southeast quadrant of the Barrington Road interchange.

At the Barrington Road interchange, two office parks, Barrington Point Subdivision and Greenspoint Office Park, exist in the southwest quadrant. Greenspoint Parkway is an access road that loops around the Greenspoint Office Park and is in close proximity to the Interstate 90 loop ramp on the southwest quadrant.

At the Roselle Road interchange, the IDOT materials testing laboratory is located in the northwest quadrant. An Extended Stay America motel is located in the southwest quadrant and Medieval Times is adjacent to the northeast quadrant.

4. TRAFFIC VOLUME DISTRIBUTION AND ANALYSIS

4.1 EXISTING TRAFFIC VOLUME DATA

The study involves system wide traffic analysis for the existing and proposed geometric conditions. The traffic analysis was conducted for the year 2020 traffic volumes. The traffic projection process included the following steps:

1. Obtaining existing Average Daily Traffic (ADT) volumes and Design Hourly Volumes (DHV)
2. Obtaining projected year 2020 ADT from CATS for the base scenario (existing interchange configurations)
3. Developing year 2020 traffic volume distributions for each proposed scenario

Existing traffic volume data, ADT's and DHV's, were obtained from several agencies including the Illinois Department of Transportation (IDOT), Chicago Area Transportation Study (CATS), and Illinois State Toll Highway Authority (ISTHA). The existing ADT's for the arterial system were obtained from IDOT's Traffic Statistics ADT map. The existing ADT's for Interstate 90 were obtained from the CATS Northeastern Illinois Expressway and Tollway Systems VMT database. ISTHA also provided A.M. and P.M. DHV's for the Interstate 90 system, mainline, and ramps. All existing data is for the year 2001 (See Exhibit 6, Existing and Projected Average Daily Traffic Map in Appendix A).

In addition to the data available from the various agencies, supplemental turning movement counts were also performed at select intersections to verify the existing base volumes. Turning movement counts were performed at the intersections of Illinois Route 59 and Higgins Road, Illinois Route 59 and Shoe Factory Road, Higgins Road and Shoe Factory Road, Barrington Road and the Interstate 90 ramps, Barrington Road and Central Road, Roselle Road and Central Road, and Roselle Road and the Interstate 90 ramps.

4.2 PROJECTED TRAFFIC VOLUMES FOR INTERCHANGE SCENARIOS

CATS is the local Metropolitan Planning Organization (MPO) for the northeastern Illinois region that is responsible for carrying out the urban transportation planning process and performs traffic projections for the area. All traffic projections have been developed for the year 2020, the current time horizon defined by CATS. ISTHA had developed projected DHV's for Scenarios B, C, and D for the Interstate 90 ramps and mainline. These traffic projections for Interstate 90 were developed using traffic networks and trip tables developed by CATS, as part of the 2020 Regional Transportation Plan (RTP). The projections were based on the existing plus committed network and trip tables assuming expansion at O'Hare and Midway Airports.

CATS provided the projected ADT's for Interstate 90 and the arterial system for the baseline condition, Scenario A (See CATS Memo in Appendix B). The traffic growth factor for Interstate 90 ranges from 1.2 to 1.8. The traffic growth factor for the arterial system ranges from 1.1 to 1.9 (See Exhibit 6, Existing and Projected Average Daily Traffic Map in Appendix A).

The projected DHV's for the Barrington Road intersections with Higgins Road and Hassell Road were based on the approved traffic projections for the Barrington Road Improvements (L.A. Section No. 00-00069-00-WR), Higgins Road to Interstate 90.

For the study, six interchange placement scenarios have been analyzed. Traffic volumes were distributed based on the impact of adding new ramps at the various locations. The following is a brief discussion of each scenario and the results of the traffic distribution:

Scenario A: Baseline Condition

Scenario A represents the existing interchange configurations. Design Hourly Volumes (DHV's) for Scenario A were developed by making logical modifications to the DHV's available from ISTHA and the Project Development Report for the Barrington Road improvements. The projected ADT's and the traffic counts taken at select intersections were utilized in redistributing available DHV's. The developed DHV's were balanced throughout the Barrington Road and Roselle Road corridors as well as the Interstate 90 system. Scenario A serves as the baseline condition for the traffic redistribution process for other interchange improvement scenarios. DHV's for the other scenarios were developed by redistributing the DHV's developed under Scenario A (See Exhibit 7, Design Hourly Volume Map, Scenario A in Appendix A).

Scenario B: Full Interchange at Barrington Road only

Scenario B includes new ramps to accommodate traffic to and from the west along Interstate 90. The full interchange will redistribute traffic along Interstate 90 and the arterial system. Traffic currently exiting at Illinois Route 59 having destinations within the Barrington Road and Roselle Road corridor may prefer to stay on Interstate 90 and exit at Barrington Road. This will increase traffic volumes on the Interstate 90 segment between Illinois Route 59 and Barrington Road. Traffic volumes will decrease along Higgins Road west of Barrington Road, and increase along Barrington Road south of Interstate 90 as traffic makes use of the new ramps and Barrington Road to reach their destinations. Central Road may be utilized as an access route to the Roselle Road corridor thereby increasing the traffic volumes at the Central Road intersections with Barrington Road and Roselle Road (See Exhibit 8, Design Hourly Volume Map, Scenario B in Appendix A).

Scenario C: Full Interchange at Roselle Road only

Scenario C includes new ramps to accommodate traffic to and from the west along Interstate 90. Similar to Scenario B, the full interchange will redistribute traffic along Interstate 90 and the arterial system. Traffic volumes along Interstate 90 west of Roselle Road and the arterial system along Roselle Road will increase. Higgins Road will experience a reduction in traffic volumes. Traffic volumes along Central Road may not be affected (See Exhibit 9, Design Hourly Volume Map, Scenario C in Appendix A).

Scenario D: Full Interchange at Barrington Road and Roselle Road

Scenario D combines Scenarios B and C providing new ramps to accommodate traffic to and from the west along Interstate 90. The new ramps will provide an entrance to westbound Interstate 90 and an exit from eastbound Interstate 90 at both the interchanges. Traffic along Interstate 90 west of Roselle Road and the arterial system along Barrington Road and Roselle Road will increase. Higgins Road will experience a reduction in traffic volumes. Traffic volumes along Central Road will not be affected (See Exhibit 10, Design Hourly Volume Map, Scenario D in Appendix A).

Scenario E: Adding only eastbound exit ramp at Barrington Road

Scenario E only provides an eastbound exit ramp in the southwest quadrant of the Interstate 90 interchange at Barrington Road providing exit in the eastbound direction from Interstate 90. Traffic along westbound Interstate 90 west of Barrington Road and along southbound Barrington Road south of Interstate 90 will increase. Higgins Road will experience a reduction in traffic volumes. Traffic volumes along Central Road may not be affected (See Exhibit 11, Design Hourly Volume Map, Scenario E in Appendix A).

Scenario F: Split Interchange, ramps to westbound and from eastbound Interstate 90 at Higgins Road

Scenario F includes an eastbound exit ramp and westbound entrance ramp at Higgins Road. The configuration essentially provides a "Split Interchange" in combination with the existing interchange at Barrington Road. Traffic along Interstate 90 west of Higgins Road will increase. The traffic volumes along the arterial system along Barrington Road and Roselle Road may not be affected under this scenario (See Exhibit 12, Design Hourly Volume Map, Scenario F in Appendix A).

4.3 CAPACITY ANALYSIS OF MODIFIED GEOMETRY WITH PROJECTED TRAFFIC

The study involves traffic analysis of the existing geometric conditions using the projected year 2020 traffic volumes. The capacity analysis was divided into two sections: Interstate 90 and Arterials. The Interstate 90 elements were analyzed using the Highway Capacity Software (HCS 2000). The Interstate 90 elements included all Basic Freeway Segments and Ramp Junctions upstream and downstream of the Roselle Road and Barrington Road interchanges. The Weave formed between the loop ramps on Barrington Road was also studied.

The capacity of the Interstate 90 elements is evaluated by the measured density in terms of passenger cars per mile per lane. In turn the density can be quantified and graded on a letter scale of A to F. LOS A describes free-flow operations where vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. LOS F describes breakdowns in vehicular traffic with no room for vehicles to maneuver within the traffic stream. The grading

for the Basic Segments, Weaves, and Ramp Junctions is different for each case. According to ISTHA Roadway Design Criteria, a LOS D is desirable for Interstate 90 elements.

The signalized intersections along the arterials were analyzed using the SYNCHRO software. The Arterial study included capacity analysis at the intersections of Higgins Road with Shoe Factory Road; Barrington Road intersections with Higgins Road, Hassell Road, the Interstate 90 ramps, and Central Road; and Roselle Road intersections with Hillcrest Boulevard, the Interstate 90 ramps and Central Road.

The capacity of an arterial roadway is measured by the average stopped delay a motorist experiences at the signalized intersections along the route. In turn, this stopped delay time can be quantified and graded on a letter scale of A to F, called the Level-of-Service (LOS). LOS A condition is when the average delay at a signalized intersection is 10 seconds or less per vehicle. Conversely, LOS F condition is when the average delay exceeds 80 seconds and usually results in traffic waiting through two cycles of red and green at the traffic signal before continuing. According to ISTHA Roadway Design Criteria, a LOS C is desirable for signalized ramp intersections with arterials with minimum LOS of D for any traffic movement or lane group. According to the FAPLHI manual, a LOS C is desirable for local streets such as Central Road. According to IDOT criteria, LOS D is desirable for intersections along state routes and principal arterials such as Barrington Road, Roselle Road, and Higgins Road.

Interstate 90

Under existing geometric conditions, Interstate 90 consists of three through lanes in each direction. In the A.M. peak hour, traffic in the eastbound direction is heavier than traffic in the westbound direction. The traffic flow pattern reverses in the P.M. peak hour. Capacity analysis using projected traffic volumes indicates that the mainline will operate at an unacceptable LOS, E and F in the eastbound direction during the A.M. peak hour and in the westbound direction during the P.M. peak hour, respectively. The eastbound segment of Interstate 90 east of Roselle Road also operates at a LOS E during the P.M. peak hour (See Exhibit 13, Interstate 90 Capacity Analysis Summary in Appendix A).

The mainline traffic flow patterns during the peak hours also influence the operations of the ramp junctions. During the A.M. peak hour, the eastbound entrance ramp junctions at Barrington Road and Roselle Road will operate at LOS E. During the P.M. peak hour, the westbound exit ramp junctions at Barrington Road and Roselle Road will operate at LOS F.

The weave segment on southbound Barrington Road will operate at a LOS F during the P.M. peak hour (See Exhibit 13, Interstate 90 Capacity Analysis Summary in Appendix A).

Arterials

Under existing geometric conditions and projected traffic volumes, all signalized intersections are projected to operate at an acceptable LOS with the following exceptions: The intersection of Barrington Road with Higgins Road will operate at a LOS E during the P.M. peak hours. The

Roselle Road intersection with Hillcrest Boulevard will operate at a LOS E during both the A.M. and P.M. peak hours. The Roselle Road intersection with Central Road will operate at a LOS E during both the A.M. and P.M. peak hours (See Exhibit 14, Arterial Capacity Analysis Summary in Appendix A).

4.4 CAPACITY ANALYSIS OF MODIFIED GEOMETRY WITH PROJECTED TRAFFIC (SCENARIO A)

The results of the traffic analysis performed for the existing geometric conditions identified improvements required due to the general increase in traffic demand over the design period. As described in Section 4.3 above, the projected traffic conditions during the peak hours cause the Interstate 90 mainline to be oversaturated in both directions even without any improvements at the interchanges. A fourth lane in each direction along Interstate 90 will be required to efficiently manage the traffic flow within the corridor. This improves the LOS from E and F to D and E (See Exhibit 13, Interstate 90 Capacity Analysis Summary in Appendix A).

In addition, the results of the traffic analysis also indicates that the Roselle Road intersections with Central Road is oversaturated and will operate at an unacceptable LOS. Dual left turn lanes will be required in the northbound direction and an additional through lane will be required in the southbound direction in order for the intersection to operate at an acceptable LOS, with or without any new interchange ramps. This will improve the LOS from E to C (See Exhibit 14, Arterial Capacity Analysis Summary in Appendix A).

These improvements are required due to the increase in demand over the design period. They are considered the Baseline Condition and described in this study as Scenario A. The existing and proposed lane configurations are shown in Exhibit 15 located in Appendix A.

5. INTERSTATE 90 AND ARTERIAL IMPROVEMENTS DUE TO INTERCHANGE IMPROVEMENTS

5.1 CAPACITY ANALYSIS OF SCENARIOS WITH PROPOSED IMPROVEMENTS

The capacity analysis for each interchange scenario includes all the base improvements along Interstate 90 and the arterials required for the increase in design year traffic, as described in Section 4.4. Each scenario also has some required proposed improvements to provide additional capacity along Barrington Road and Roselle Road to efficiently manage the increase in traffic demand due to the proposed interchange improvements. With the proposed improvements, the delay within the arterial networks was reduced.

The capacity analysis for Interstate 90 elements due to each interchange scenario is summarized in Exhibit 13 in Appendix A. The capacity analysis for Arterial elements due to each interchange scenario is summarized in Exhibit 14 in Appendix A.

The capacity analysis was conducted first without any lane additions to the arterial network, followed by an analysis with recommended lane additions. The capacity analysis results are based on the recommended improvements to the arterial roadways. The improvements required to the arterial roadways as a result of adding interchange ramps under each scenario are depicted in green arrows on Exhibits 15 thru 20, Existing and Proposed Lane Configuration Maps in Appendix A.

Scenario Comparison

Scenario A: Baseline Condition

Scenario A represents the existing interchange conditions. It incorporates improvements which are required due to the increase in traffic demand over the design period. Under the Baseline Condition, the Interstate 90 mainline provides four through lanes in each direction. The Baseline Condition also includes additional lanes required at the intersection of Roselle Road and Central Road, as described in Section 4.4 (See Exhibit 15, Existing and Proposed Lane Configurations, Scenario A in Appendix A).

Scenario B: Full Interchange at Barrington Road only

Scenario B includes a full interchange at Barrington Road only. The Partial Cloverleaf Interchange was used for comparison (See Exhibit 16, Existing and Proposed Lane Configurations, Scenario B in Appendix A).

Interstate 90

The operational characteristics along Interstate 90 under this scenario do not change significantly in comparison to the Baseline Scenario. Westbound Interstate 90 west of Barrington Road

would decrease from LOS C to D in the P.M. peak hour. Eastbound Interstate 90 west of Barrington Road would decrease from LOS B to C.

Arterials

Under Scenario B, the arterial level of service does not change significantly in comparison to the Baseline Scenario. The intersection of Barrington Road and Higgins Road would improve from LOS E to D in the P.M. peak hour. The intersection of Barrington Road and Hassell Road would decrease from LOS B to C in the A.M. peak hour, but improve from LOS C to B in the P.M. peak hour. Similar one letter LOS changes would occur at Central Road and Shoe Factory Road. The overall delay along Barrington Road, as calculated by SYNCHRO, improves from 35.0 to 20.0 in the P.M. peak hour. This indicates that the addition of new ramps can be accommodated by Barrington Road.

Scenario C: Full Interchange at Roselle Road only

Scenario C includes a full interchange at Roselle Road only (See Exhibit 17, Existing and Proposed Lane Configurations, Scenario C in Appendix A).

Interstate 90

The level of service under this scenario would worsen from the Baseline Scenario for westbound Interstate 90 between Roselle Road and Barrington Road from LOS B to C in the A.M. peak hour and D to E in the P.M. peak hour. Westbound and eastbound Interstate 90 west of Barrington Road would worsen by one LOS letter. Eastbound Interstate 90 between Barrington Road and Roselle Road would worsen from LOS E to F.

Arterials

Under Scenario C, the arterial level of service does not change significantly in comparison to the Baseline Scenario. The intersection of Roselle Road and Hillcrest Boulevard decreases from LOS E to F in the P.M. peak hour. The Roselle Road and Central Road intersection would worsen from LOS C to D in the P.M. peak hour. The overall delay along Roselle Road, as calculated by SYNCHRO, worsens from 31.0 to 46.0 in the P.M. peak hour. This indicates that the addition of new ramps will have more of an impact to operations along Roselle Road compared to Scenario B.

Scenario D: Full Interchange at Barrington Road and Roselle Road

Scenario D includes a full interchange at Barrington Road and Roselle Road (See Exhibit 18, Existing and Proposed Lane Configurations, Scenario D in Appendix A).

Interstate 90

The operational characteristics along Interstate 90 under this scenario do not change significantly in comparison to Scenario C. The segments west of Roselle Road would experience higher congestion than under the Baseline Scenario. The segment between Barrington Road and Roselle Road would worsen from LOS E to F in the eastbound direction during the A.M. peak period.

Arterials

Under Scenario D, the arterial level of service does not change significantly in comparison to the Baseline Scenario. It generates the same improvements to Barrington Road as Scenario B with slightly better performance. It also generates the same negative operations to Roselle Road as Scenario C with slightly better performance. From the capacity analysis conducted, it appears that an interchange at both Barrington Road and Roselle Road would help the level of service especially along Roselle Road.

Scenario E: Adding only eastbound exit ramp at Barrington Road

Scenario E includes an eastbound exit ramp at Barrington Road (See Exhibit 19, Existing and Proposed Lane Configurations, Scenario E in Appendix A).

Interstate 90

The addition of an eastbound exit ramp has little effect to the operations along Interstate 90 compared to the Baseline Scenario. The segment of eastbound Interstate 90 west of Barrington Road would decrease from LOS B to C in the P.M. peak hour.

Arterials

Under Scenario E, the arterial level of service does not change significantly in comparison to the Baseline Scenario. The intersection of Barrington Road and Hassell Road would decrease from LOS C to D in the P.M. peak hour.

Scenario F: Split Interchange, ramps to westbound and from eastbound Interstate 90 at Higgins Road

Scenario F includes an eastbound exit ramp and a westbound entrance ramp at Higgins Road (See Exhibit 20, Existing and Proposed Lane Configurations, Scenario F in Appendix A). The interchange would have insignificant impacts along Barrington Road and Roselle Road and the Interstate 90 elements studied. The operations would be similar to the Baseline Scenario.

5.2 PROPOSED IMPROVEMENTS

The improvements required to the roadway network as a result of adding interchange ramps under each scenario are depicted in green arrows shown on Exhibits 15 thru 20, Existing and Proposed Lane Configuration Maps in Appendix A.

Interstate 90 – All Scenarios
The proposed interchange improvements are not expected to significantly influence the operations along Interstate 90 above the needs identified in the Baseline Scenario (Scenario A). Additional lanes would not be required along the mainline exclusively due to the proposed interchange improvements.

Arterials

Scenario B
A third through lane is needed in each direction along Barrington Road from Interstate 90 to Central Road, where the northbound through lane becomes a mandatory right turn lane to eastbound Central Road. The proposed ramp junctions at Barrington Road would be signalized. No improvements are recommended at the intersection of Higgins Road and Shoe Factory Road or at the Barrington Road intersections with Higgins Road, Hassell Road, and Central Road. Depending on the interchange configuration, dual left turn lanes would be required in the northbound and the southbound direction along Barrington Road at the interchange intersections.

Scenario C
Dual left turn lanes are required along Roselle Road at the Interstate 90 interchange. The vehicle storage distance between the intersections is not adequate using the existing median space. To accommodate the required parallel dual left turn lanes, the bridge over Interstate 90 would require widening. The widening is proposed on the west side of the bridge to minimize any improvements to the existing interchange ramps on the east.

Scenario D
Same as Scenarios B and C above.

Scenario E
No improvements are needed above the Baseline Scenario. However, providing access to only three of the four directions violates driver expectations and puts stress on the local network as motorists are forced to back track on the arterial system to access westbound Interstate 90.

Scenario F
No improvements are needed above the Baseline Scenario. However, the interchange at Higgins Road would not meet the ISTHA interchange spacing requirement of 2 miles in suburban areas. The severe skew angle of Higgins Road and the close proximity to the Forest Preserve also make this location undesirable.

6. CONCEPTUAL INTERCHANGE DESIGNS

6.1 DESIGN GUIDELINES

Interstate 90 within the study area is under the jurisdiction of ISTHA, Barrington Road is under the jurisdiction of IDOT, and Roselle Road is under the jurisdiction of Cook County Highway Department. Considering the three jurisdictional authorities, the guidelines defined in the following standards are applicable:

Interstate 90 – ISTHA

Roadway Design Criteria, August 2002
AASHTO, A Policy on Geometric Design of Highways and Streets, 2001
AASHTO, Roadside Design Guide
Construction Section Engineer's Manual
Standard Drawings
Bridge Design Criteria
Standard Specifications
Drainage Design Criteria

Barrington Road – IDOT

Bureau of Design and Environment Manual, 2002
Bureau of Bridges and Structures Bridge Manual
Manual on Uniform Traffic Control Devices
Drainage Manual, 2003
Standard Specifications

Roselle Road – Cook County Highway Department

Federal Aid Procedures for Local Highways Improvements (FAPHLI) Manual
Bureau of Design and Environment Manual, 2002

The posted speed and the design speed for different elements are as follows:

Table 1: Posted and Design Speeds

Roadway	Posted Speed	Design Speed
Interstate 90 Mainline	55 mph	70 mph
Interstate 90 Outer Ramp	30 mph	40 mph
Interstate 90 Loop Ramp	30 mph	30 mph
Interstate 90 Directional Ramp	30 mph	50 mph
Barrington Road	40 mph	45 mph
Roselle Road	45 mph	45 mph

6.2 ALTERNATE INTERCHANGE CONFIGURATIONS

Four interchange configurations were studied for the Barrington Road interchange; Partial Cloverleaf Interchange; Conventional Diamond Interchange; Single Point Urban Interchange; and Modified Diamond Interchange. Based on the existing interchange configuration at Roselle Road, only a full Tight Urban Diamond Interchange was evaluated.

Capacity analysis was performed at the interchange locations and included the proposed Interstate 90 and arterial improvements. Based on the capacity analysis, the Single Point Urban Interchange was eliminated as it did not provide acceptable operations (See Exhibit 21, Barrington Road Interchange Alternatives Capacity Analysis Comparison in Appendix A).

The environmental impacts include impacts to forest preserves, wetlands, floodways and floodplains, and threatened and endangered species. Other impacts include utility impacts, right-of-way impacts, and infrastructure impacts. The exact location and extent of impacts would be determined during the preliminary engineering phase.

Historic sites and hazardous sites have not been identified at this stage. Biological resources, threatened and endangered species have not been identified at this stage. During the preliminary engineering phase, additional studies would be required to evaluate the impacts to noise and air quality.

Cost estimates were prepared for all feasible interchange alternatives at Barrington Road and Roselle Road. The estimates also include proposed improvements along Barrington Road and Roselle Road as needed for the interchange implementation. Estimated construction quantities were developed from the concept drawings prepared for each alternate. All estimates are preliminary and detailed estimates would be prepared during the Phase I Engineering stage of the project. The cost estimates do not include costs for mitigation of environmental and economic impacts.

Barrington Road Interchange: Partial Cloverleaf Interchange (PARCLO)

Under this alternative, the existing directional ramps and the loop ramps would be maintained. The proposed westbound entrance ramp and the eastbound exit ramp would be constructed around the loop ramps and aligned with the existing westbound exit and eastbound entrance ramps. The intersections of the proposed ramps with Barrington Road would be signalized. The loop ramps will remain free-flow as under the existing condition. The existing collector-distributor system for the westbound exit ramp and eastbound entrance ramp will also be maintained.

The westbound entrance ramp would be a two lane ramp that would taper to one lane before merging on to Interstate 90. The eastbound exit ramp would be a standard one lane exit ramp that would widen to accommodate a three lane toll collection facility. At the ramp intersection with Barrington Road, the eastbound exit ramp would provide dual left and dual right turn lanes. The improvements at the interchange intersections with Barrington Road vary depending on the

interchange configuration. The PARCLO interchange would require dual left turn lanes on Barrington Road at the north interchange intersection (See Exhibit 22, Partial Cloverleaf Interchange in Appendix A). The PARCLO interchange maintains the loop ramps facilitating free-flow movements. During both peak periods, the interchange intersections are anticipated to operate at an acceptable LOS (See Exhibit 21, Barrington Road Interchange Alternatives Capacity Analysis Comparison in Appendix A).

The improvements at the interchange and along Barrington Road are not anticipated to have any impacts to the forest preserves within the area. A wetland, a floodplain, and a floodway of the Poplar Creek Tributary A exist in the northwest quadrant at the Barrington Road Interchange. Under the PARCLO interchange option, these environmental resources will have significant impacts. The impacts could be minimized by constructing retaining walls along the outer ramp. The impacts to the floodplain and the floodway could be mitigated using compensatory storage.

At the Barrington Road interchange, it is anticipated that right-of-way (ROW) acquisition would be required at all four quadrants of the interchange. The Hilton Garden Hotel in the northeast quadrant, Commonwealth Edison in the southeast quadrant, Village of South Barrington in the northwest quadrant, and Greenspoint Office Park and Barrington Point Subdivision in the southwest quadrant would be impacted. Under the PARCLO option, approximately 11.0 acres of additional ROW could be required for the construction of the proposed ramps.

Other infrastructure impacts include loss of parking and realignment of local streets. Under the PARCLO option, the eastbound exit ramp is anticipated to have significant impacts to the parking lots for the Greenspoint Office Park and Barrington Point Subdivision that are located in the southwest quadrant of the interchange. The Greenspoint Office Park will loose approximately 180 parking spaces and Barrington Point Subdivision is likely to loose 80 parking spaces. Also, Greenspoint Parkway, the loop road, would be impacted and would require realignment. The proposed eastbound exit ramp may also require the relocation of the electric pole in the southwest quadrant that carries the high voltage electric lines.

The PARLCO interchange requires the construction of retaining walls for the outer ramps to minimize impacts to adjacent resources. Also, the ROW acquisition costs and costs for mitigation of economic and environmental impacts are significantly higher. The proposed improvements at the interchange and along Barrington Road are anticipated to cost between $20 to $25 million (See Exhibit 27, Preliminary Estimate of Cost in Appendix A).

Barrington Road Interchange: Conventional Diamond Interchange

Under this alternative, the existing directional ramps would be maintained but the existing loop ramps would be eliminated to accommodate the proposed westbound entrance ramp and the eastbound exit ramp. The collector-distributor system on Interstate 90 will also be eliminated. The westbound exit and eastbound entrance directional ramps would be aligned with the proposed ramps and the intersections with Barrington Road would be signalized.

The westbound entrance ramp would be a two lane ramp that would taper to one lane before it merges with Interstate 90. The eastbound exit ramp would be a standard one lane exit ramp that would widen to accommodate a three lane toll collection facility. At the ramp intersection with Barrington Road, the eastbound exit ramp would provide dual left and dual right turn lanes. The eastbound entrance ramp to Interstate 90 would be widened to a two lane ramp that would taper back to the existing single lane cross-section. The westbound exit ramp from Interstate 90 would be widened to a three lane cross-section at the intersection with Barrington Road providing dual left turn lanes and a single right turn lane. Dual left turn lanes would be required along Barrington Road at both signalized interchange intersections (See Exhibit 23, Conventional Diamond Interchange in Appendix A). With the Conventional Diamond Interchange option, the south interchange intersection would operate at a LOS B during the A.M. peak period and LOS B during the P.M peak period. The north interchange intersection would operate at a LOS B during the A.M. peak period and LOS E during the P.M peak period. Also, the westbound left turn movement from Interstate 90 to southbound Barrington Road, at the north interchange would operate at a LOS F during the P.M peak period (See Exhibit 21, Barrington Road Interchange Alternatives Performance Comparison in Appendix A).

The improvements at the interchange and along Barrington Road are not anticipated to have any impacts to the forest preserves within the area. The interchange may have minor impacts to the wetland, the floodplain, and the floodway in the northwest quadrant.

At the interchange, it is anticipated that ROW acquisition would be required at all four quadrants of the interchange. Under this interchange option, approximately 4.5 acres of additional ROW would be required for the construction of the proposed ramps.

Under the Conventional Diamond Interchange option the Greenspoint Office Park is likely to loose 30 parking spaces and the Barrington Point Subdivision is not anticipated to have any impacts. Greenspoint Parkway would be impacted and would require realignment. The proposed eastbound exit ramp may also require the relocation of the electric tower in the southwest quadrant that carries the high voltage electric lines.

The proposed ramps could be constructed on embankments with minimal retaining walls. The additional ROW costs and environmental and economic impacts are also minimal. The proposed improvements at the interchange and along Barrington Road are anticipated to cost between $15 to $20 million (See Exhibit 28, Preliminary Estimate of Cost in Appendix A).

Barrington Road Interchange: Single Point Urban Interchange (SPUI)

Under this alternative, the entire existing interchange including the bridge over the Interstate 90 would be reconstructed. All the through traffic along Barrington Road and turning traffic movements exiting from and entering Interstate 90 would converge into a single point signalized intersection. Capacity analysis of this conceptual interchange indicated that this configuration is not capable of providing an acceptable level-of-service and hence was eliminated from further consideration.

Barrington Road Interchange: Modified Diamond Interchange

Under this alternative, the existing directional ramps and the westbound exit loop ramp would be maintained. The proposed westbound entrance ramp would be constructed around the existing loop ramp. The existing eastbound entrance loop ramp would be removed to accommodate the proposed eastbound exit ramp from Interstate 90. The existing westbound exit and eastbound entrance ramps would be aligned with the proposed ramps. The intersections of the proposed ramps, as well as, the existing westbound exit loop ramp with Barrington Road would be signalized. The westbound collector-distributor system on the Interstate will be maintained.

The westbound entrance ramp would be a two lane ramp that would taper to one lane before it merges with Interstate 90. The eastbound exit ramp would be a standard one lane exit ramp that would widen to accommodate a three lane toll collection facility. At the eastbound exit ramp intersection with Barrington Road, the ramp would provide dual left and dual right turn lanes. The eastbound entrance ramp to Interstate 90 would be widened to a two lane ramp that would taper back to existing single lane cross-section. Dual left turn lanes would be required along Barrington Road at both signalized interchange intersections (See Exhibit 24, Modified Diamond Interchange in Appendix A). The Modified Diamond would operate with slightly higher delays than the PARLCO interchange as all movements travel through signalized intersections. The south interchange intersection would operate at a LOS C during the A.M. peak period and LOS B during the P.M peak period. The north interchange intersection would operate at a LOS B during the A.M. and LOS C during the P.M peak period. (See Exhibit 21, Barrington Road Interchange Alternatives Performance Comparison in Appendix A).

The improvements at the interchange and along Barrington Road are not anticipated to have any impacts to the forest preserves within the area. Under this interchange option, the wetland, the floodplain, and the floodway will have significant impacts. The impacts could be minimized by constructing retaining walls along the outer ramp. The impacts to the floodplain and the floodway could be mitigated using compensatory storage.

At the Barrington Road interchange, it is anticipated that ROW acquisition would be required at all four quadrants of the interchange. The construction of the proposed ramps could require approximately 7.0 acres of additional ROW.

Under the Modified Diamond Interchange option the Greenspoint Office Park is likely to loose 30 parking spaces and the Barrington Point Subdivision is not anticipated to have any impacts. Also, Greenspoint Parkway would be impacted and would require realignment. The proposed eastbound exit ramp may also require the relocation of the electric tower in the southwest quadrant that carries the high voltage electric lines.

The interchange requires the construction of retaining walls for the outer ramps to minimize impacts to adjacent resources. Also, the ROW acquisition costs and costs for mitigation of economic and environmental impacts are significantly higher. The proposed improvements at the interchange and along Barrington Road are anticipated to cost between $20 to $25 million (See Exhibit 29, Preliminary Estimate of Cost in Appendix A).

Roselle Road Interchange: Tight Urban Diamond Interchange

Under this alternative, the existing directional ramps that form a partial Diamond interchange would be maintained. The proposed westbound entrance and eastbound exit directional ramps would be constructed to align with the existing ramps forming a complete Diamond interchange. Other interchange options, providing free-flow movements using loop ramps, were not feasible due to the close proximity of other structures to the interchange. The ramp intersections with Roselle Road would remain signalized. The proposed interchange would be a Tight Diamond Interchange as the ramps termini are located close to the abutments of the structure over Interstate 90. Also, the left turn lanes between the ramp termini are overlapped to provide sufficient storage and efficient operations at the ramp intersections.

The westbound entrance ramp would be a two lane ramp that would taper to one lane before it merges with Interstate 90. The eastbound exit ramp would be a standard one lane exit ramp that would widen to accommodate a three lane toll collection facility. At the ramp intersection with Roselle Road, the eastbound exit ramp would provide dual left and right turn lanes. Dual left turn lanes would be required along Roselle Road at both signalized interchange intersections (See Exhibit 25, Tight Urban Diamond Interchange in Appendix A).

The proposed improvements along Roselle Road at the intersection with Central Road would have impacts to the Paul Douglas Forest Preserve in the northwest corner. The proposed widening to the west of Roselle Road would require ROW acquisition from the forest preserve. The impacts are not anticipated to affect any facilities or recreational activities at the forest preserve. There are no wetlands in the vicinity of the improvements along Roselle Road. The improvements along Roselle Road north of Central Road are anticipated to impact both the floodplain and the floodway of the Salt Creek Tributary D.

At the Roselle Road interchange, ROW acquisition would be required from the FPDCC. For the proposed improvements at the interchange and along Roselle Road, approximately 4.5 acres of additional ROW would be required. Detailed estimates for ROW and easements would be performed during the preliminary engineering process. At the interchange, no impacts are anticipated to adjacent properties.

The Tight Urban Diamond Interchange at Roselle Road would also involve extensive construction of retaining walls to minimize impacts. The interchange also involves ROW acquisition. The proposed improvements at the interchange and along Roselle Road are anticipated to cost between $10 to $15 million (See Exhibit 30, Preliminary Estimate of Cost in Appendix A).

7. CONCLUSIONS AND RECOMMENDATIONS

This section discusses the feasibility of the various scenarios and evaluates the different interchange options. Considering the anticipated growth in population and employment in the region, the proposed interchange improvements are needed to provide efficient full access to the corridor. The proposed interchange will address the transportation needs, present and future, of the region. The proposed improvements would also reduce travel time and relieve traffic along the local roadway system. New ramps could be constructed at Barrington Road, Roselle Road, or both locations. With minor improvements Barrington Road appears to be better suited to handle the additional traffic demands compared to the Roselle Road corridor. Therefore it is recommended that a Modified Diamond Interchange at Barrington Road be pursued.

Scenario Comparison

Scenario B, C and D are feasible options and would address the travel needs of the corridors. In summary, new ramps could be constructed at Barrington Road, Roselle Road, or both locations. A summary of all Scenarios is provided below:

Each of the scenarios has different operational, environmental, and economic impacts. Scenario A is the no build alternative and would not fully address the transportation needs of the corridor.

Scenario B, the full interchange at Barrington Road, would provide the necessary access to and from Interstate 90 and would enhance the attractiveness of the corridor. The capacity analysis indicates that an interchange at Barrington Road would provide acceptable operations with proposed improvements along Barrington Road. Also, the overall operations along Barrington Road are not anticipated to be affected adversely by the additional traffic demand created by the interchange. The PARLCO and the Modified Diamond Interchange configurations would provide the most efficient operations. Depending on the interchange type, economic and environmental impacts are anticipated in the vicinity. In general, the interchange would reduce travel time and alleviate congestion along the arterial system without significantly affecting the operations along Interstate 90.

Scenario C provides a full diamond interchange at Roselle Road. The capacity analysis indicates that the corridor would experience an increase in delay. The proposed improvements along Roselle Road are anticipated to have some environmental impacts, including right of way acquisition from the Paul Douglas Forest Preserve.

Scenario D combines the benefits of Scenario B and Scenario C. While improving both locations would be desirable, construction costs and environmental impacts may be prohibitive at this time.

Scenario E provides only an eastbound exit ramp at Barrington Road. With this interchange configuration, access would not be possible to westbound Interstate 90. An eastbound exit slip ramp from Interstate 90 that would connect to Greenspoint Parkway would not be a feasible option because it would not meet design standards and would provide access to the local

business properties instead of the arterial system. Providing access to only three of the four directions is not recommended. The motorists' inability to enter the interstate from the point where they left it can lead to driver confusion, unsafe maneuvers, and adverse travel. This would also add stress to the arterial system as motorists navigate the local network in order to access westbound Interstate 90. Scenario E would not address the present and future transportation needs of the corridor and should not receive further consideration.

Under Scenario F, the interchange at Higgins Road would not provide any significant improvement to the corridor. The interchange would not meet the ISTHA interchange spacing standard of 2 miles in suburban areas. The interchange is not feasible from a geometric standpoint because of the unacceptable skew angle at the intersection of the interstate and Higgins Road. The interchange at Higgins Road would not address the transportation needs of the corridor and would not meet ISTHA criteria. Scenario F is not feasible and should be dropped from further consideration.

Comparison of Alternative Interchange Designs at Barrington Road

The Partial Cloverleaf, Conventional Diamond, and the Modified Diamond interchanges were compared against several critical measures (See Exhibit 26 in Appendix A). The SPUI configuration was eliminated as it would not provide acceptable operations (See Exhibit 21 in Appendix A).

The PARCLO interchange provides acceptable operations during both peak periods. The Conventional Diamond Interchange fails to provide acceptable operations as the westbound left turn operates at a LOS F during the P.M. peak period. The Modified Diamond Interchange, which provides a combination of the PARCLO and Diamond interchange, provides acceptable operations during both peak periods. At the system-level, the operations do not differ significantly.

The weave on Barrington Road between the loop ramps is undesirable on an arterial roadway. Under the PARCLO option the loop ramps are maintained, therefore the weave condition will remain. The PARCLO interchange has an unconventional configuration as it is partially a cloverleaf interchange with the west side of the interchange operating as a Conventional Diamond Interchange. The Conventional Diamond Interchange provides a more common configuration and also eliminates the weave condition. The Modified Diamond Interchange eliminates the weave condition as the eastbound entrance loop ramp is eliminated and the westbound exit loop ramp is operated through a signalized intersection on Barrington Road.

The PARCLO interchange is anticipated to have the highest construction cost and impact mitigation costs while the Diamond interchange is anticipated to have the lowest costs. The environmental impacts caused by the PARCLO and the Modified Diamond Interchange are similar in nature. The Conventional Diamond interchange is anticipated to have minimal environmental impacts. Under the PARCLO option, the parking lots for Greenspoint Office Park and Barrington Point Subdivision are anticipated to have significant impacts. Under the Conventional and Modified Diamond interchange options, Greenspoint Office Park and

Barrington Point Subdivision are anticipated to have minor impacts. The PARCLO interchange is anticipated to require the most right of way acquisition in both the northwest and the southwest quadrants. The right-of-way acquisition required under the Modified Diamond Interchange is mainly in the northwest quadrant of the interchange. The Conventional Diamond Interchange is anticipated to require the least amount of right-of-way acquisition.

The Modified Diamond Interchange provides acceptable operations without significant economic impacts. The ROW acquisition is less than required for the PARCLO interchange and the weave section on Barrington road is eliminated.

Recommendations

It is recommended that the Modified Diamond Interchange at Barrington Road be studied in further detail and that preliminary engineering studies be conducted. The project would involve coordination with multiple agencies including the Villages of Hoffman Estates, South Barrington and Schaumburg; ISTHA; IDOT; Cook County; FPDCC; ComEd; local business; and utility companies.

APPENDIX A
EXHIBITS

LOCATION AND LAND USE MAPS

1. Project Location Map
2. Municipality Boundaries Map
3. Existing Lane Configuration Map
4. Land Use Map
5. Environmental Resources Map

TRAFFIC VOLUMES

6. Existing and Projected Average Daily Traffic Map
7. Design Hourly Volume Map, Scenario A
8. Design Hourly Volume Map, Scenario B
9. Design Hourly Volume Map, Scenario C
10. Design Hourly Volume Map, Scenario D
11. Design Hourly Volume Map, Scenario E
12. Design Hourly Volume Map, Scenario F

TRAFFIC CAPACITY ANALYSIS

13. Interstate 90 Capacity Analysis Summary
14. Arterial Capacity Analysis Summary

EXISTING AND PROPOSED LANE CONFIGURATIONS

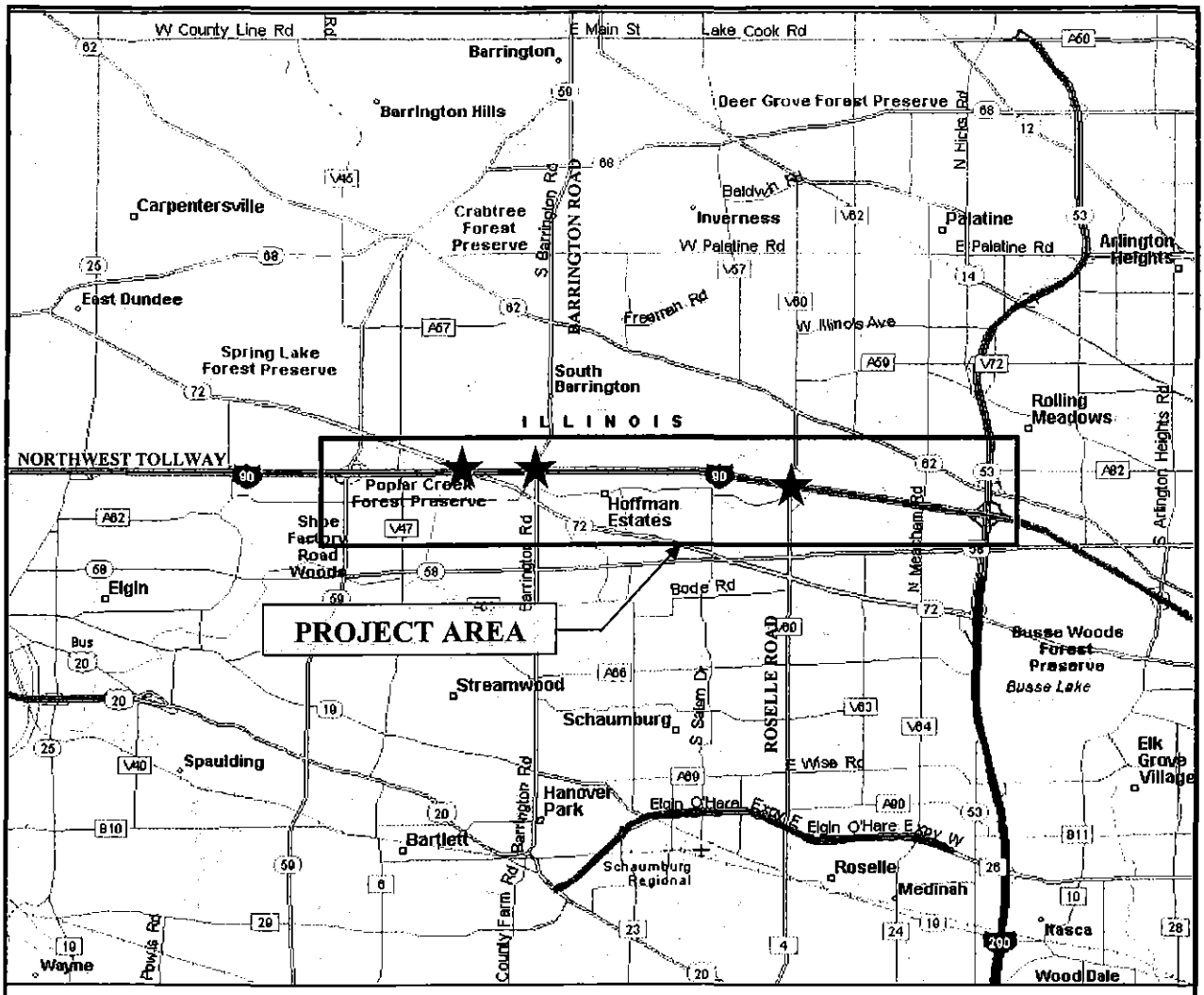
15. Scenario A
16. Scenario B
17. Scenario C
18. Scenario D
19. Scenario E
20. Scenario F

ALTERNATE INTERCHANGE CONFIGURATIONS AND ANALYSIS

21. Barrington Road Interchange Alternatives Capacity Analysis Comparison
22. Partial Cloverleaf Interchange, Barrington Road
23. Conventional Diamond Interchange, Barrington Road
24. Modified Diamond Interchange, Barrington Road
25. Tight Urban Diamond Interchange, Roselle Road
26. Comparison of Alternative Interchange Designs at Barrington Road

COST ESTIMATES

27. Partial Cloverleaf Interchange, Barrington Road
28. Conventional Diamond Interchange, Barrington Road
29. Modified Diamond Interchange, Barrington Road
30. Tight Urban Diamond Interchange, Roselle Road



★ **STUDY LOCATIONS**

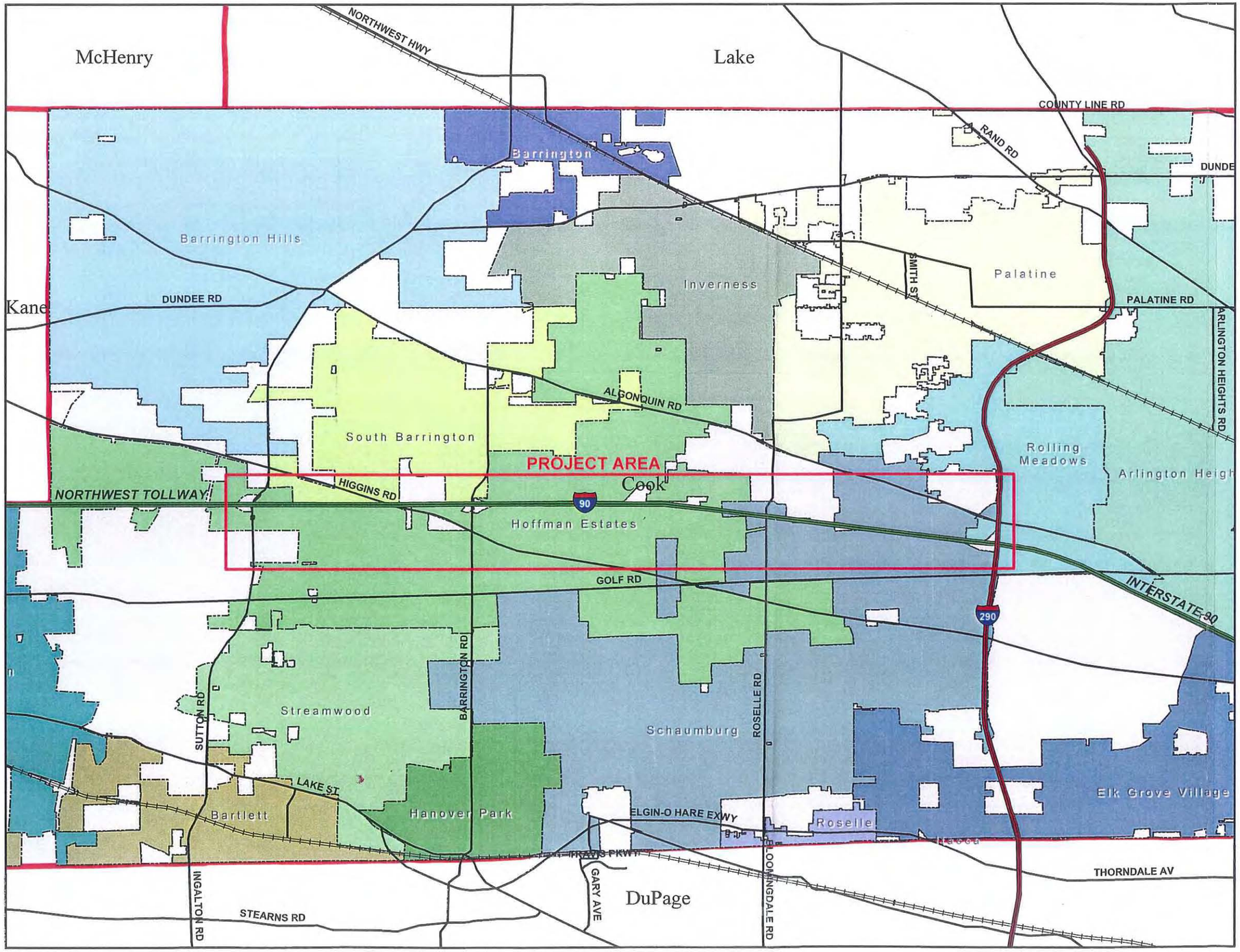
VILLAGE OF HOFFMAN ESTATES

BARRINGTON ROAD INTERCHANGE
FEASIBILITY STUDY

PROJECT LOCATION MAP

NOT TO SCALE DATE: 5/13/2004

EXHIBIT 1



Legend

Municipalities

- Arlington Heights
- Barrington
- Barrington Hills
- Bartlett
- Elgin
- Elk Grove Village
- Hanover Park
- Hoffman Estates
- Inverness
- Palatine
- Rolling Meadows
- Roselle
- Schaumburg
- South Barrington
- Streamwood
- Un-Incorporated

N

0 0.5 1 2 3 4 Miles

1:100,000

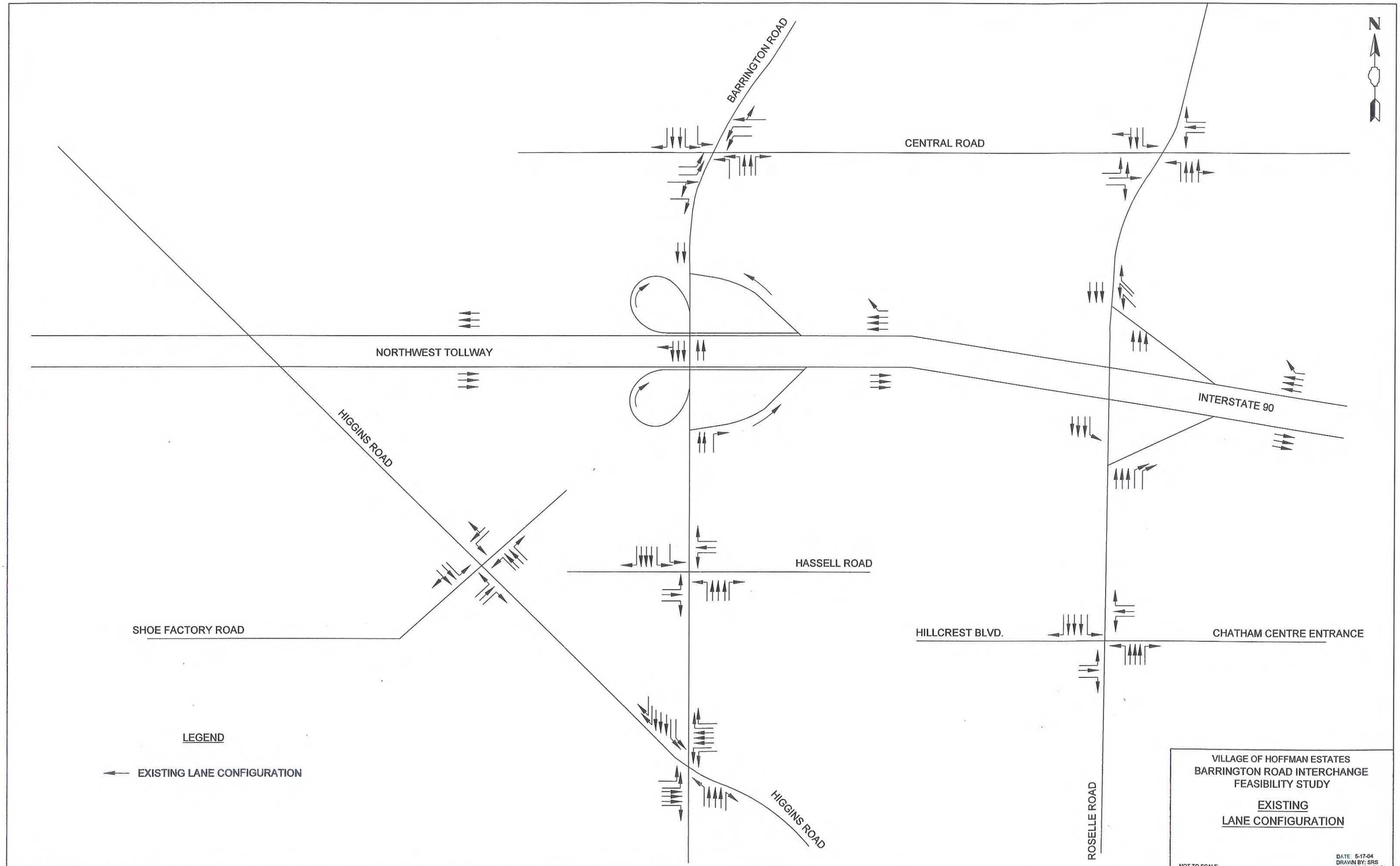
VILLAGE OF HOFFMAN ESTATES

BARRINGTON ROAD INTERCHANGE FEASIBILITY STUDY

MUNICIPALITY BOUNDARIES

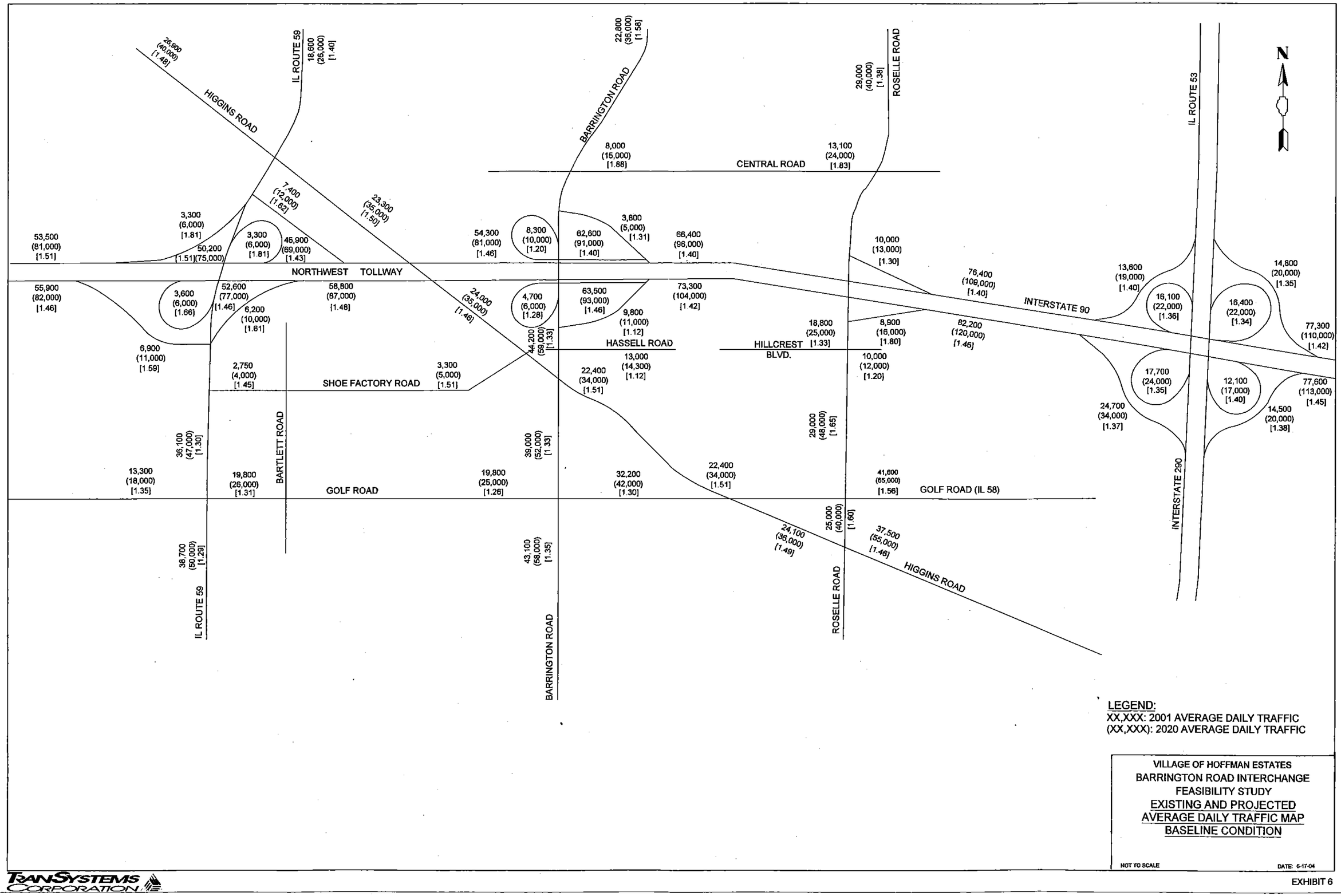
DATE: 05-17-04

EXHIBIT 2



TRANSYSTEMS CORPORATION

EXHIBIT 3



LEGEND:
XX,XXX: 2001 AVERAGE DAILY TRAFFIC
(XX,XXX): 2020 AVERAGE DAILY TRAFFIC

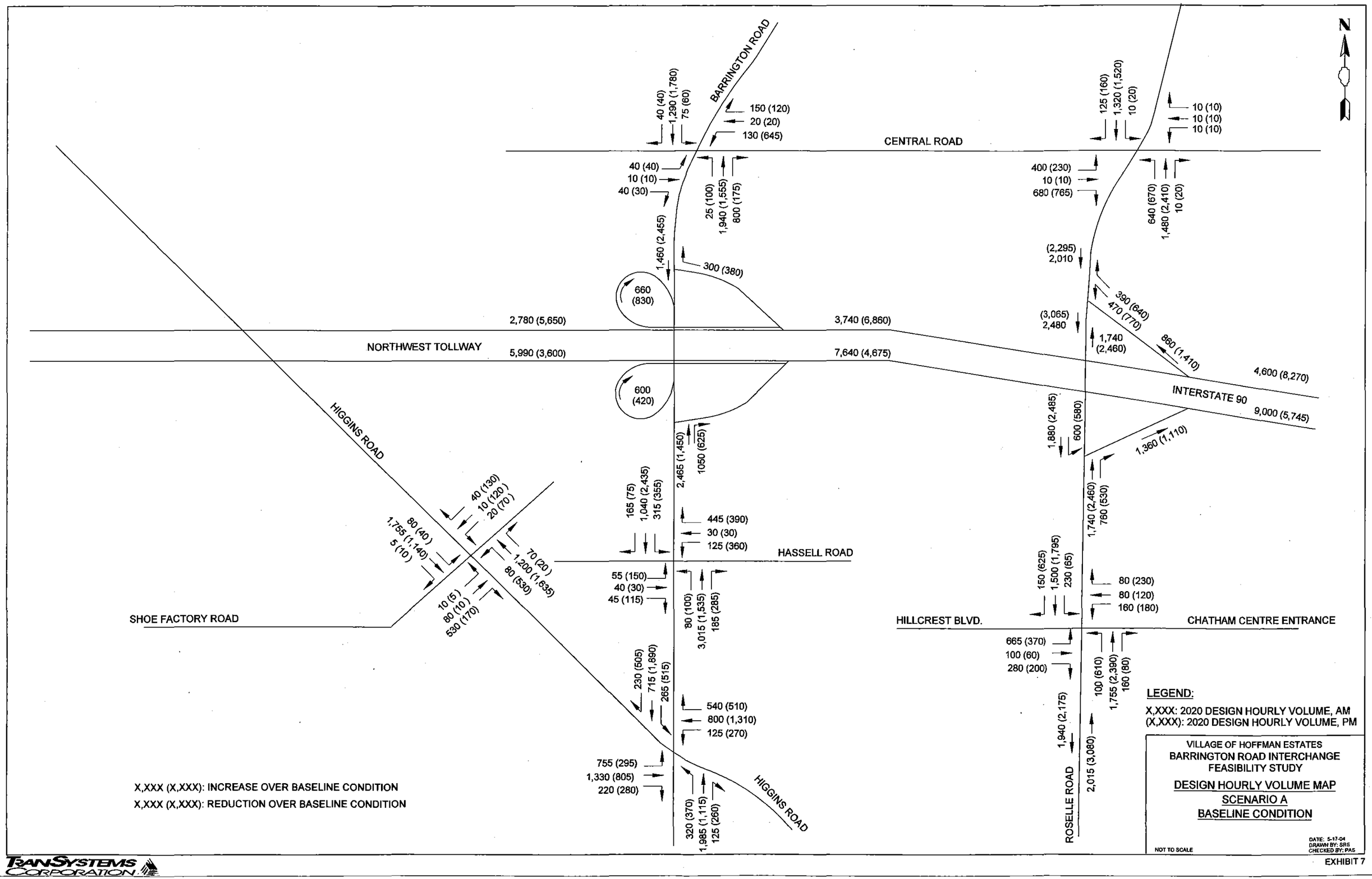
VILLAGE OF HOFFMAN ESTATES
BARRINGTON ROAD INTERCHANGE
FEASIBILITY STUDY
EXISTING AND PROJECTED
AVERAGE DAILY TRAFFIC MAP
BASELINE CONDITION

NOT TO SCALE

DATE: 5-17-04

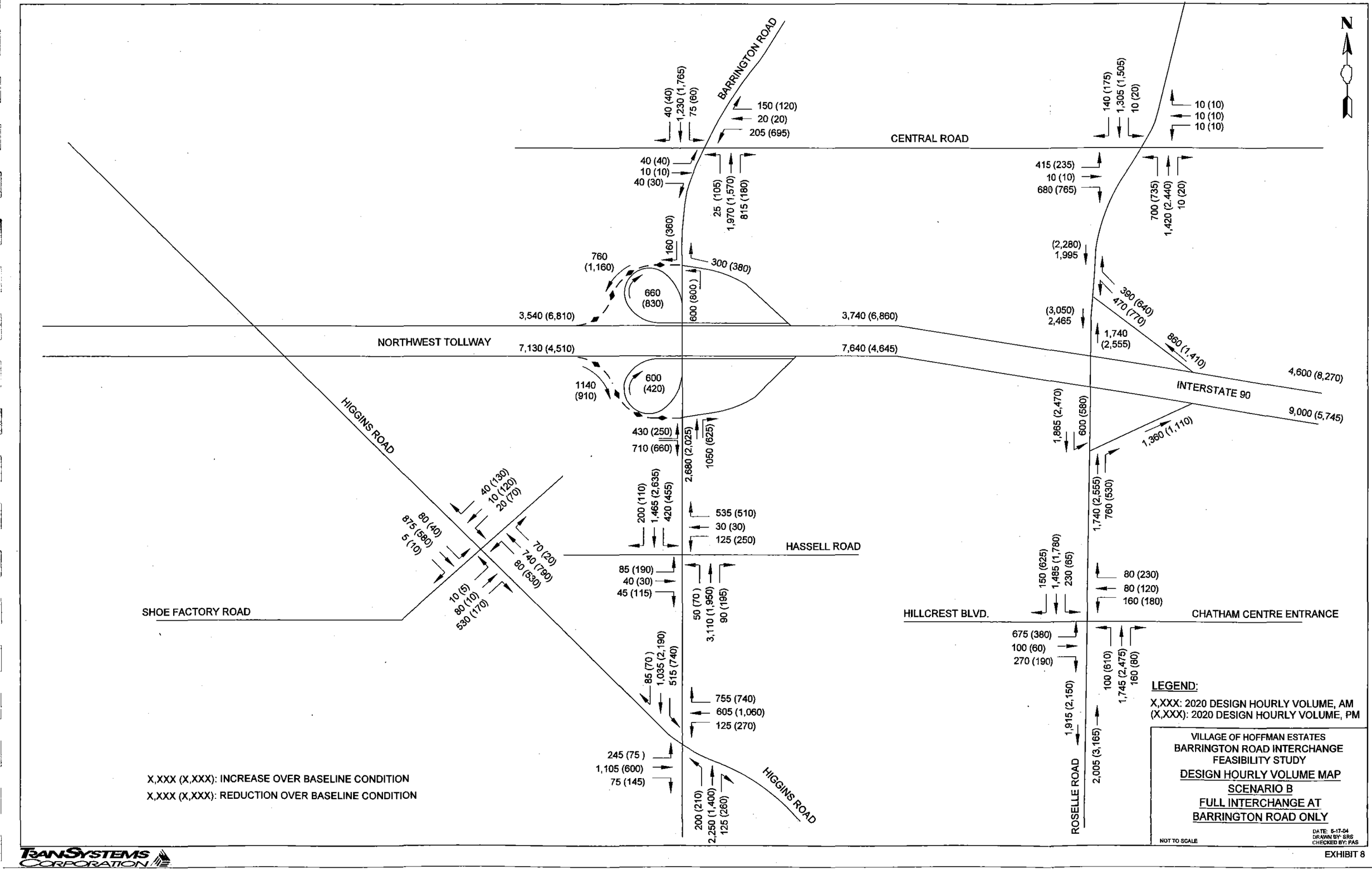
TRANSYSTEMS CORPORATION

EXHIBIT 6



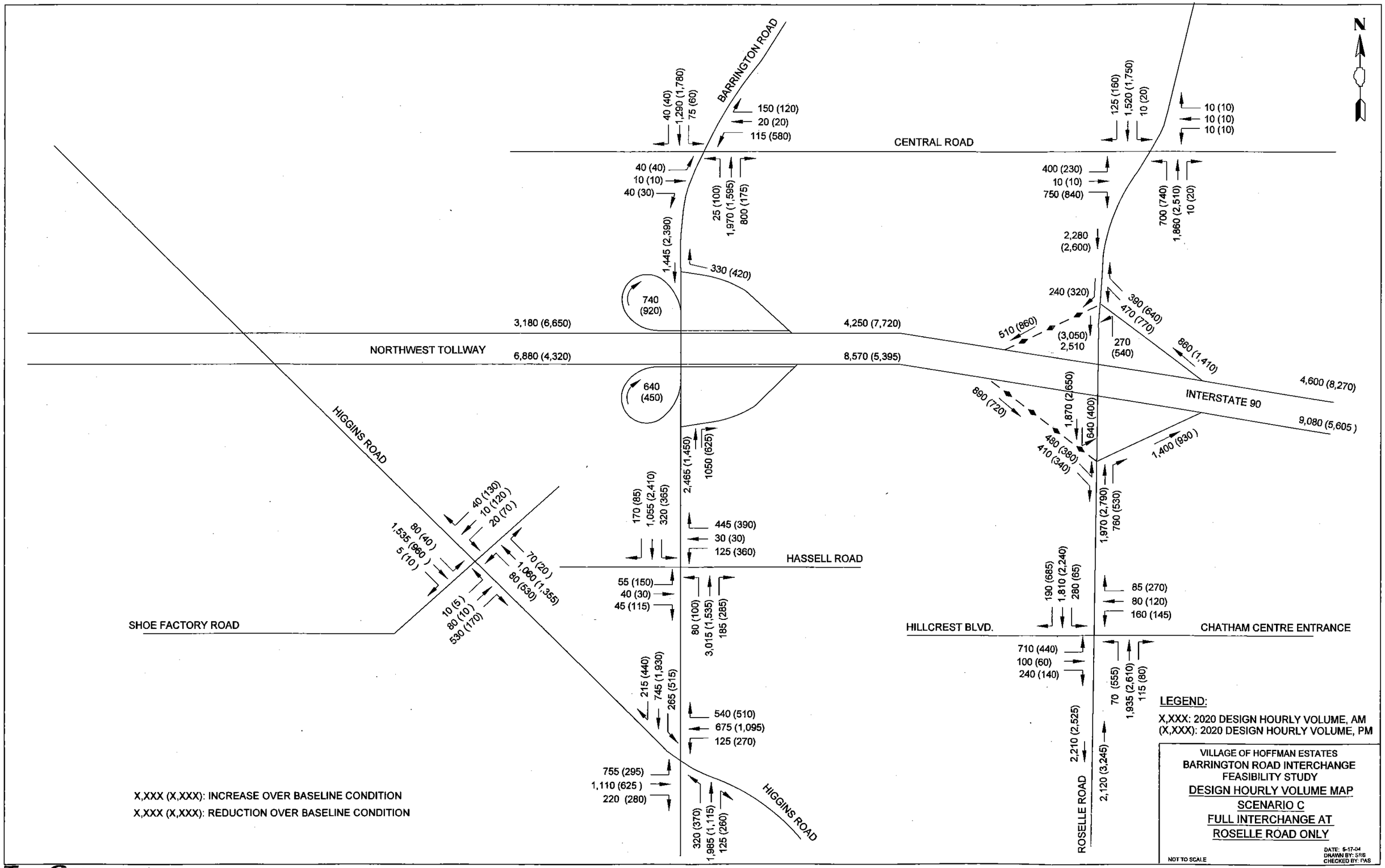
TRANSYSTEMS CORPORATION

EXHIBIT 7



TRANSYSTEMS CORPORATION

EXHIBIT 8



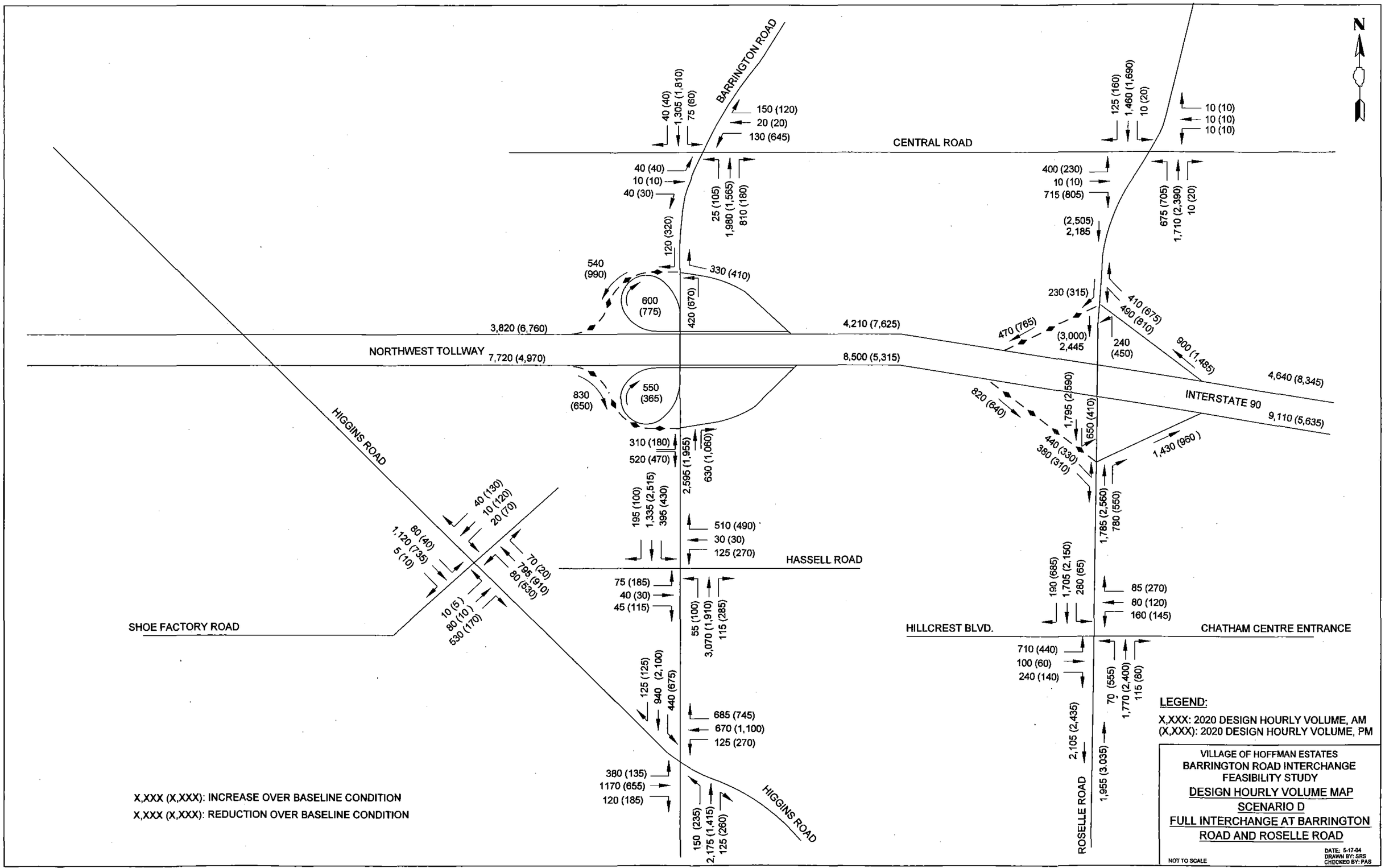
VILLAGE OF HOFFMAN ESTATES
BARRINGTON ROAD INTERCHANGE
FEASIBILITY STUDY
DESIGN HOURLY VOLUME MAP
SCENARIO C
FULL INTERCHANGE AT
ROSELLE ROAD ONLY

NOT TO SCALE

DATE: 5-17-04
DRAWN BY: SRS
CHECKED BY: PAS

TRANSYSTEMS CORPORATION

EXHIBIT 9



X,XXX (X,XXX): INCREASE OVER BASELINE CONDITION

X,XXX (X,XXX): REDUCTION OVER BASELINE CONDITION

LEGEND:

X,XXX: 2020 DESIGN HOURLY VOLUME, AM
(X,XXX): 2020 DESIGN HOURLY VOLUME, PM

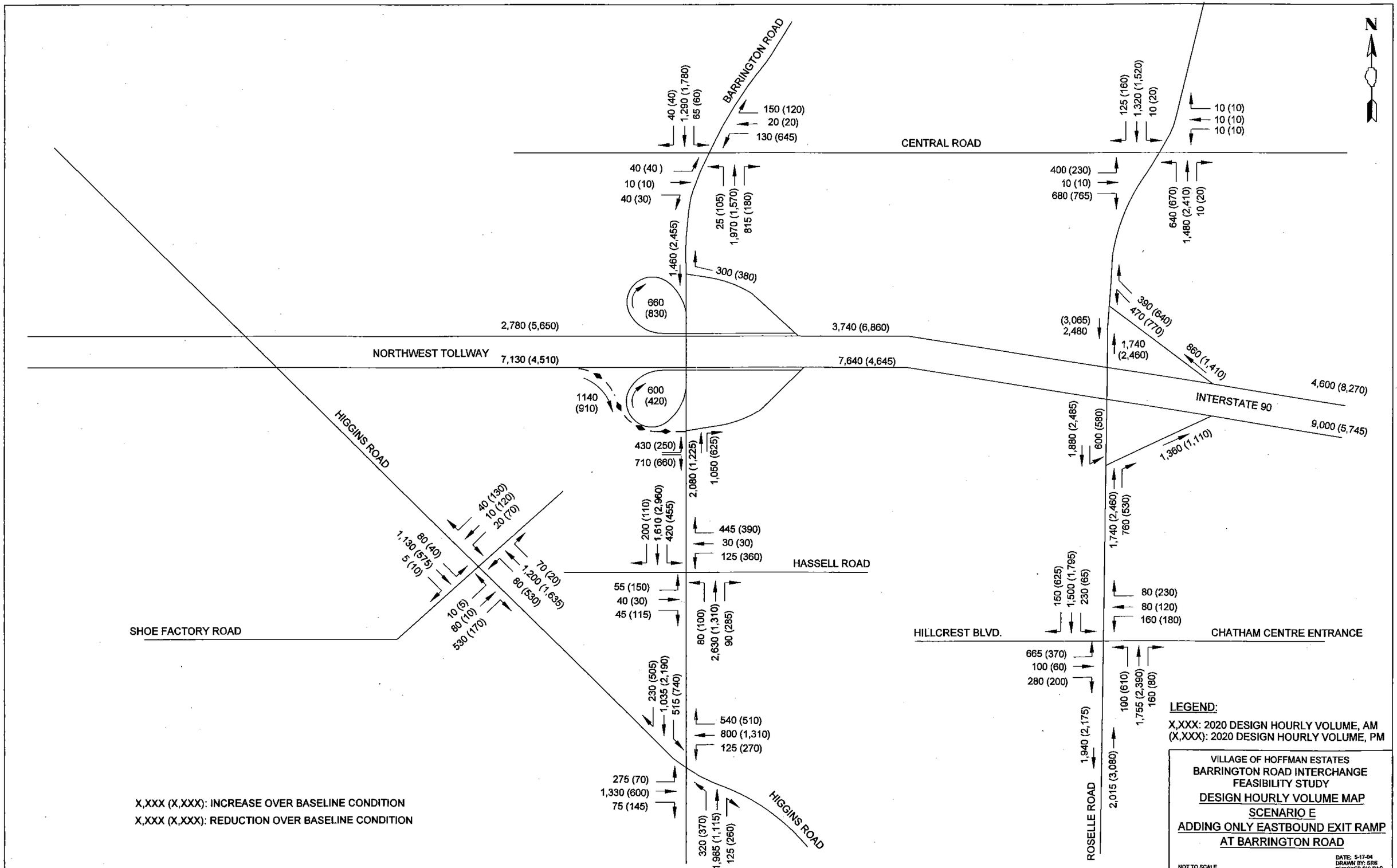
VILLAGE OF HOFFMAN ESTATES
BARRINGTON ROAD INTERCHANGE
FEASIBILITY STUDY
DESIGN HOURLY VOLUME MAP
SCENARIO D
FULL INTERCHANGE AT BARRINGTON ROAD AND ROSELLE ROAD

NOT TO SCALE

DATE: 5-17-04
DRAWN BY: SRS
CHECKED BY: PAS

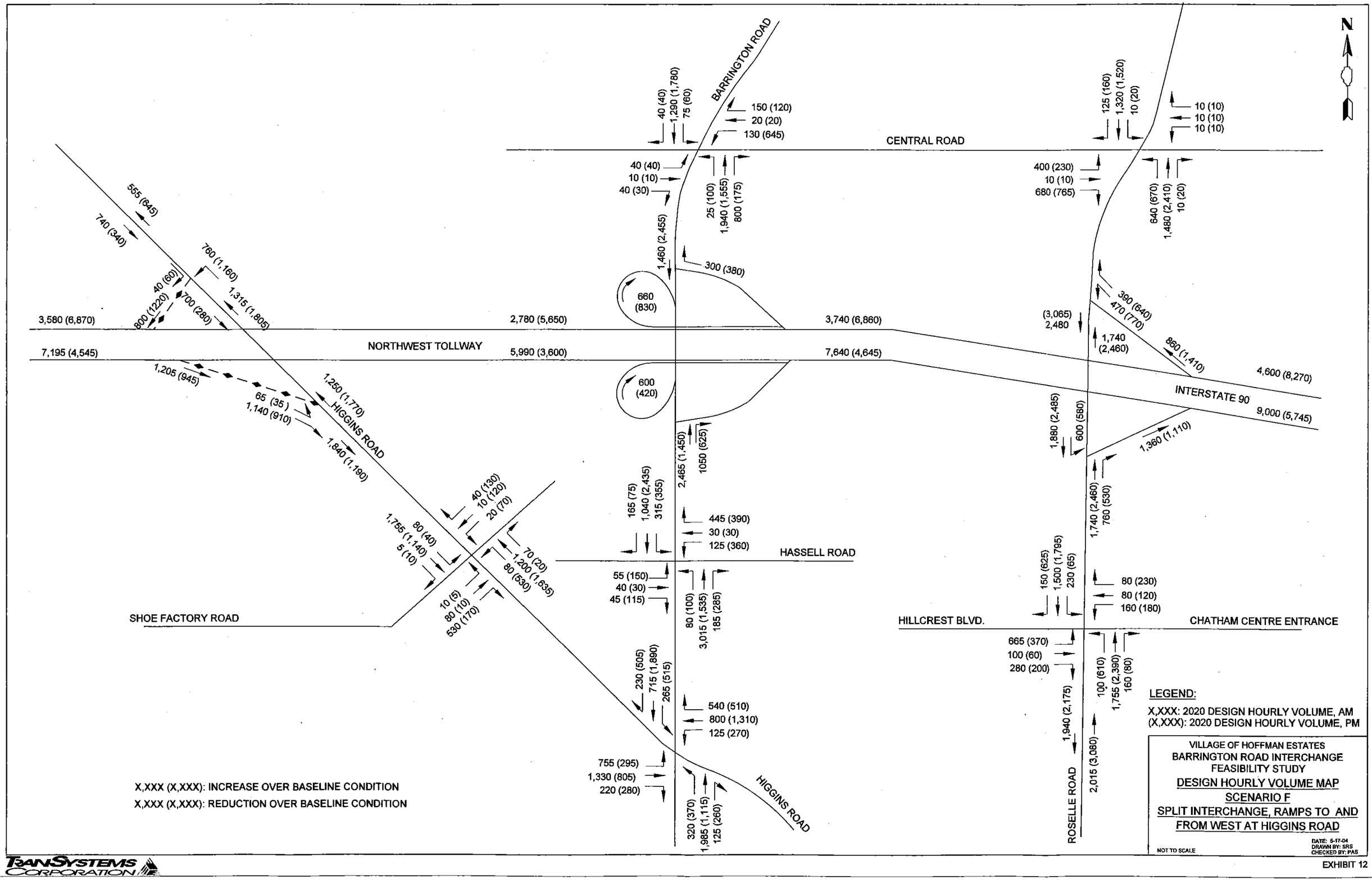
TRANSYSTEMS CORPORATION

EXHIBIT 10



TRANSYSTEMS CORPORATION

EXHIBIT 11



TRANSYSTEMS CORPORATION

EXHIBIT 12

Barrington Road Interchange Feasibility Study
Village of Hoffman Estates
Cook County

TRANSYSTEMS CORPORATION

INTERSTATE 90 CAPACITY ANALYSIS SUMMARY

(Year 2020 Design Hourly Volumes, Existing and Proposed Geometry)

TOLLWAY ELEMENT	EX GEOMETRY		PROPOSED GEOMETRY											
			SCENARIO A		SCENARIO B		SCENARIO C		SCENARIO D		SCENARIO E		SCENARIO F	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
	Density / LOS		Density / LOS		Density / LOS		Density / LOS		Density / LOS		Density / LOS		Density / LOS	
SEGMENTS														
WB I-90 EAST OF ROSELLE ROAD	27.3 D	X F	19.9 C	42.1 E	19.9 C	42.1 E	19.9 C	42.1 E	20.1 C	43.1 E	19.9 C	42.1 E	19.9 C	42.1 E
WB I-90 BETWEEN ROSELLE ROAD AND ROAD BARRINGTON	22.2 C	X F	16.3 B	30.7 D	16.3 B	30.7 D	18.5 **C**	36.9 **E**	18.3 **C**	36.1 **E**	16.3 B	30.7 D	16.3 B	30.7 D
WB I-90 WEST OF BARRINGTON ROAD	16.7 B	36.5 E	12.2 B	24.8 C	15.5 B	30.8 **D**	14.0 **B**	29.8 **D**	16.8 B	30.5 **D**	12.2 B	24.8 C	12.2 B	24.8 C
EB I-90 WEST OF BARRINGTON ROAD	40.9 E	21.6 C	26.4 D	15.8 B	32.8 D	19.8 **C**	31.2 D	19.0 **C**	37.5 **E**	21.8 **C**	32.8 D	19.8 **C**	26.4 D	15.8 B
EB I-90 BETWEEN BARRINGTON ROAD AND ROSELLE ROAD	X F	27.7 D	36.2 E	20.2 C	36.2 E	20.2 C	X **F**	23.5 C	X **F**	23.1 C	36.2 E	20.2 C	36.2 E	20.2 C
EB I-90 EAST OF ROSELLE ROAD	X F	36.7 E	X F	24.9 C	X F	24.9 C	X F	24.3 C	X F	24.4 C	X F	24.9 C	X F	24.9 C
RAMP JUNCTIONS														
WB I-90 EXIT TO ROSELLE ROAD	-7.6 A	X (10.9) F (B) *	-14.3 A	-1.3 A	-14.3 A	-1.3 A	-14.3 A	-1.3 A	-13.9 A	-1.2 A	-14.3 A	-1.3 A	-14.3 A	-1.3 A
ROSELLE ROAD ENTRANCE TO WB I-90 (Proposed)	N/A		N/A		N/A		16.9 B	25.2 C	16.8 B	25.2 C	N/A		N/A	
WB I-90 EXIT TO BARRINGTON ROAD	-1.7 A	X (13.0) F (B) *	-6.6 A	2.8 A	-6.6 A	2.8 A	-4.6 A	5.9 A	-5.7 A	4.6 A	-6.6 A	2.8 A	-6.6 A	2.8 A
BARRINGTON ROAD ENTRANCE TO WB I-90 (Proposed)	N/A		N/A		16.1 B	24.9 C	N/A		18.3 B	27.6 C	N/A		N/A	
HIGGINS ROAD ENTRANCE TO WB I-90 (Proposed)	N/A		N/A		N/A		N/A		N/A		N/A		16.2 B	24.9 C

SCENARIO A: Baseline Conditions
SCENARIO B: Full Interchange at Barrington Road only (PARCLO)
SCENARIO C: Full Interchange at Roselle Road only (DIAMOND)
SCENARIO D: Full Interchange at Barrington Road and Roselle Road
SCENARIO E: EB Exit Ramp at Barrington Road only
SCENARIO F: WB Entrance and EB Exit Ramps at Higgins Road

Analysis Software: Highway Capacity Software (HCS) Version 4.1c
Density: Measured in passenger cars / mile / lane
LOS: Level of Service, based on HCM LOS criteria (HCM Exhibit 23-2, 24-2, 25-4)
N/A: Not Applicable, Ramp not proposed in the alternative
X: Density not provided, Demand greater than Capacity
*: Ramp Junction w/ mainline influence = LOS F
Ramp Junction w/ auxillary lanes only = LOS A, B, C, D, E
Improvement in LOS over Baseline Condition (Scenario A)
Decrease in LOS from Baseline Condition (Scenario A)

EXHIBIT 13

TRANSYSTEMS CORPORATION

INTERSTATE 90 CAPACITY ANALYSIS SUMMARY

(Year 2020 Design Hourly Volumes, Existing and Proposed Geometry)

TOLLWAY ELEMENT	EX GEOMETRY		PROPOSED GEOMETRY											
			SCENARIO A		SCENARIO B		SCENARIO C		SCENARIO D		SCENARIO E		SCENARIO F	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
	Density / LOS		Density / LOS		Density / LOS		Density / LOS		Density / LOS		Density / LOS		Density / LOS	
RAMP JUNCTIONS, CONTINUED														
EB I-90 EXIT TO HIGGINS ROAD (Proposed)	N/A		N/A		N/A		N/A		N/A		N/A		22.6 C	15.9 B
EB I-90 EXIT TO BARRINGTON ROAD (Proposed)	N/A		N/A		36.3 E	24.1 C	N/A		37.1 E	24.6 C	36.3 E	24.1 C	N/A	
BARRINGTON ROAD ENTRANCE TO EB I-90	X (35.5) F (E) *	7.9 A	17.4 B	-3.1 A	17.4 B	-3.1 A	X (19.4) F (B) *	-1.6 A	15.2 B	1.2 A	17.4 B	-3.2 A	17.4 B	-3.1 A
EB I-90 EXIT TO ROSELLE ROAD (Proposed)	N/A		N/A		N/A		X (39.2) F (E) *	25.1 C	X (38.5) F (E) *	24.4 C	N/A		N/A	
ROSELLE ROAD ENTRANCE TO EB I-90	X (40.1) F (E) *	23.7 C	X (17.3) F (B) *	9.8 A	X (17.3) F (B) *	9.8 A	X (17.6) F (B) *	8.4 A	X (17.9) F (B) *	8.6 A	40.1 E	23.7 C	X (17.3) F (B) *	9.8 A
WEAVE														
SB BARRINGTON ROAD - BETWEEN LOOP RAMPS	24.9 C	36.2 E	21.1 B	27.0 C	21.2 B	30.1 C	22.6 B	31.2 C	18.9 B	26.2 C	21.1 B	27.0 C	21.1 B	27.0 C

SCENARIO A: Baseline Conditions
SCENARIO B: Full Interchange at Barrington Road only (PARCLO)
SCENARIO C: Full Interchange at Roselle Road only (DIAMOND)
SCENARIO D: Full Interchange at Barrington Road and Roselle Road
SCENARIO E: EB Exit Ramp at Barrington Road only
SCENARIO F: WB Entrance and EB Exit Ramps at Higgins Road

Analysis Software: Highway Capacity Software (HCS) Version 4.1c
Density: Measured in pc/mi/ln (passenger cars / mile / lane)
LOS: Level of Service, based on HCM LOS criteria (HCM Exhibit 23-2, 24-2, 25-4)
N/A: Not Applicable, Ramp not proposed in the alternative
X: Density not provided, Demand greater than Capacity
***:** Ramp Junction w/ mainline influence = LOS F
Ramp Junction w/ auxillary lanes only = LOS A, B, C, D, E
Improvement in LOS over Baseline Condition (Scenario A)
Decrease in LOS from Baseline Condition (Scenario A)

Barrington Road Interchange Feasibility Study
Village of Hoffman Estates
Cook County

TRANSYSTEMS CORPORATION

ARTERIAL CAPACITY ANALYSIS SUMMARY

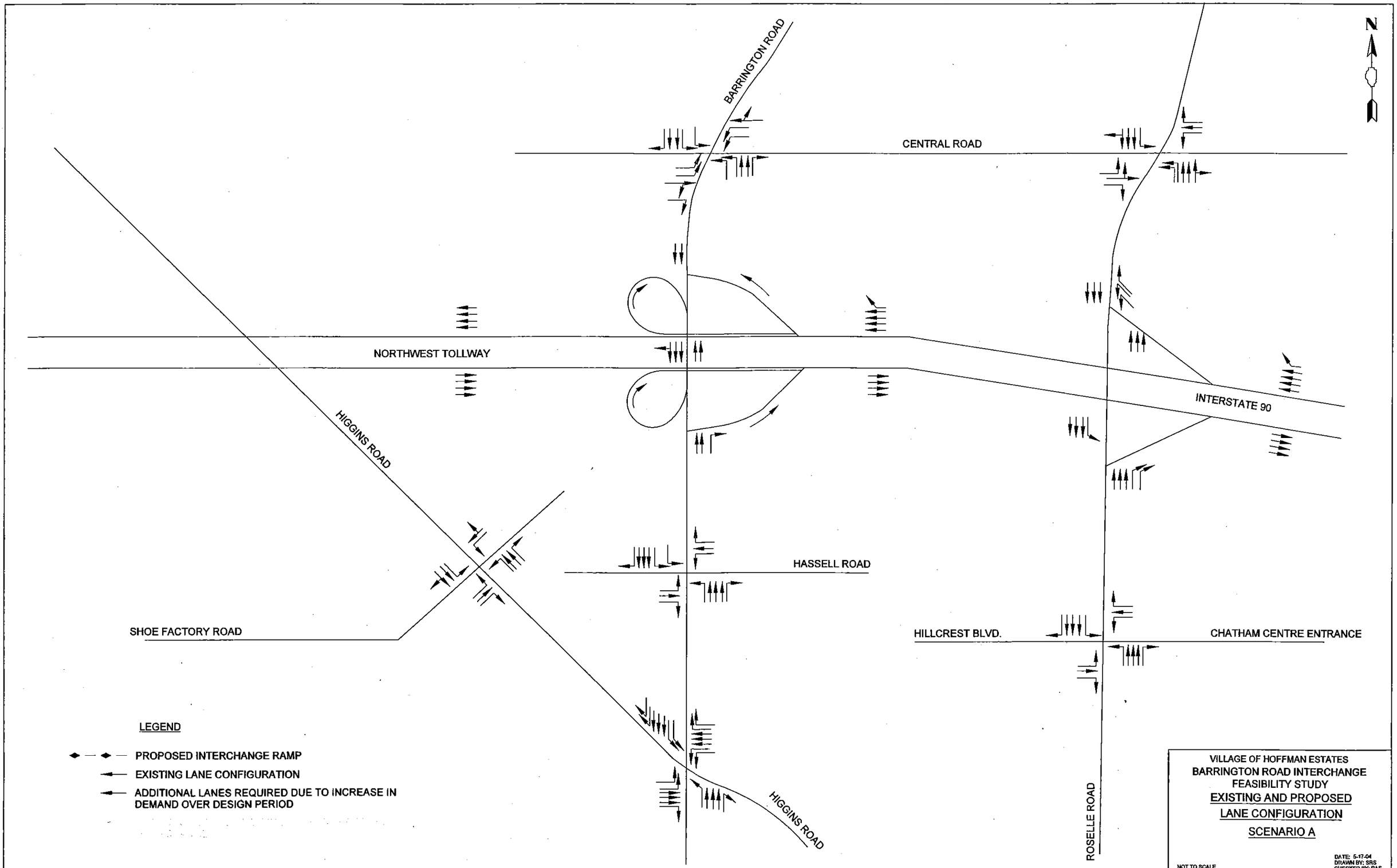
(Year 2020 Design Hourly Volumes, Existing and Proposed Geometry)

SIGNALIZED INTERSECTIONS	EX GEOMETRY		PROPOSED GEOMETRY											
			SCENARIO A		SCENARIO B		SCENARIO C		SCENARIO D		SCENARIO E		SCENARIO F	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
	Control Delay / LOS		Control Delay / LOS		Control Delay / LOS		Control Delay / LOS		Control Delay / LOS		Control Delay / LOS		Control Delay / LOS	
BARRINGTON ROAD AT HIGGINS ROAD	44.0 D	67.1 E	44.0 D	67.1 E	49.1 D	38.7 **D**	41.4 D	51.3 **D**	44.5 D	36.2 **D**	46.8 D	56.0 E	46.6 D	56.6 E
BARRINGTON ROAD AT HASSELL ROAD	16.4 B	25.7 C	16.4 B	25.7 C	25.7 **C**	19.4 **B**	16.9 B	26.7 C	16.0 B	18.5 **B**	15.2 **B**	44.4 **D**	12.5 B	28.2 C
BARRINGTON ROAD AT EB ENT RAMP	N/A		N/A		9.9 A	8.6 A	N/A		12.3 B	9.3 A	15.2 B	25.3 C	N/A	
BARRINGTON ROAD AT WB EXIT RAMP	N/A		N/A		11.9 B	20.2 C	N/A		15.1 B	19.0 B	N/A		N/A	
BARRRINGTON ROAD AT CENTRAL ROAD	8.0 A	40.3 D	8.0 A	40.3 D	11.0 **B**	33.0 C	8.1 A	23.3 C	10.7 **B**	33.6 C	19.7 **B**	32.4 C	8.5 A	17.9 **B**
HIGGINS ROAD AT SHOE FACTORY ROAD	31.7 C	22.7 C	31.7 C	22.7 C	16.1 **B**	16.8 **B**	22.7 C	22.2 C	19.1 **B**	20.7 C	21.5 C	17.2 **B**	39.4 **D**	21.0 C
HIGGINS ROAD AT EB EXIT RAMP	N/A		N/A		N/A		N/A		N/A		N/A		20.8 C	29.7 C
HIGGINS ROAD AT WB ENT RAMP	N/A		N/A		N/A		N/A		N/A		N/A		15.1 B	11.5 B
BARRINGTON ROAD CORRIDOR SUMMARY	27.0	43.0	27.0	43.0	23.0	**21.0**	24.0	34.0	25.0	29.0	28.0	42.0	26.0	33.0
ROSELLE ROAD AT HILLCREST BOULEVARD	60.1 E	62.1 E	57.3 E	60.4 E	60.5 E	62.2 E	69.2 E	92.1 **F**	64.9 E	85.2 **F**	57.3 E	60.4 E	57.3 E	60.4 E
ROSELLE ROAD AT EB ENT RAMP	8.8 A	9.2 A	8.1 A	9.1 A	8.2 A	6.8 A	19.1 **B**	19.8 **B**	17.6 **B**	18.5 **B**	8.1 A	9.1 A	8.1 A	9.1 A
ROSELLE ROAD AT WB EXIT RAMP	22.3 C	21.8 C	12.4 B	20.4 C	12.0 **B**	31.2 C	14.7 **B**	27.7 C	13.8 **B**	30.8 C	12.4 B	20.4 C	12.4 B	20.4 C
ROSELLE ROAD AT CENTRAL ROAD	55.6 E	56.6 E	24.4 C	30.6 C	22.2 C	22.7 C	28.0 C	41.5 **D**	24.8 C	31.4 C	24.4 C	30.6 C	24.4 C	30.6 C
ROSELLE ROAD CORRIDOR SUMMARY	37.0	38.0	26.0	31.0	26.0	33.0	33.0	**46.0**	30.0	**42.0**	26.0	31.0	26.0	31.0

SCENARIO A: Baseline Conditions
SCENARIO B: Full Interchange at Barrington Road only (PARCLO)
SCENARIO C: Full Interchange at Roselle Road only (DIAMOND)
SCENARIO D: Full Interchange at Barrington Road and Roselle Road
SCENARIO E: EB Exit Ramp at Barrington Road only
SCENARIO F: WB Entrance and EB Exit Ramps at Higgins Road

Analysis Software: Synchro Version 5.0
Control Delay: Calculated using Synchro Percentile Delay Method (seconds/vehicle)
LOS: Level of Service, based on HCM LOS criteria (HCM Exhibit 16-2)
N/A: Not Applicable, Unsignalized Intersection
Improvement in LOS over Baseline Condition (Scenario A)
Decrease in LOS from Baseline Condition (Scenario A)

EXHIBIT 14



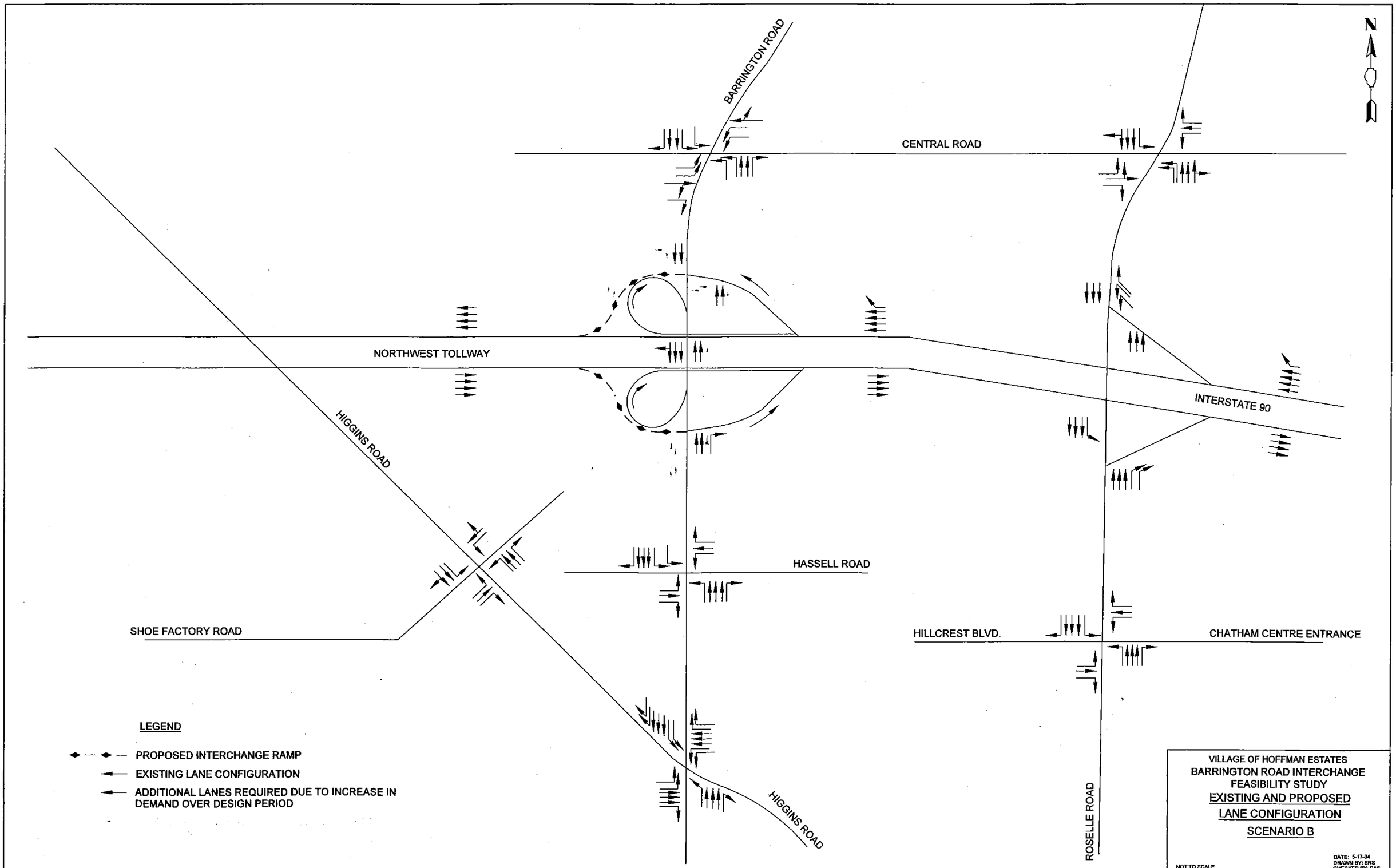
VILLAGE OF HOFFMAN ESTATES
BARRINGTON ROAD INTERCHANGE
FEASIBILITY STUDY
EXISTING AND PROPOSED
LANE CONFIGURATION
SCENARIO A

NOT TO SCALE

DATE: 5-17-04
DRAWN BY: SRS
CHECKED BY: PAS

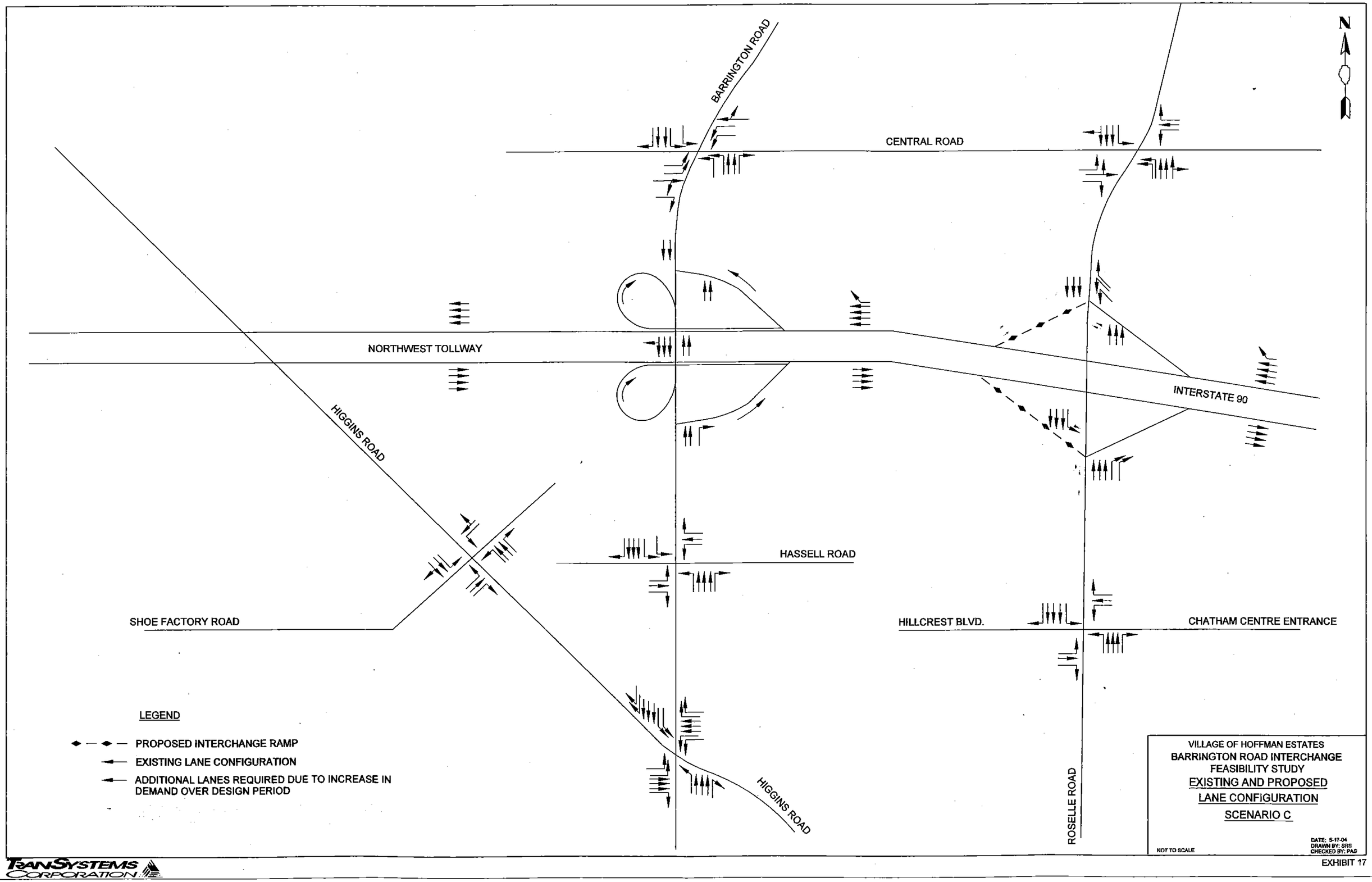
TRANSYSTEMS CORPORATION

EXHIBIT 15



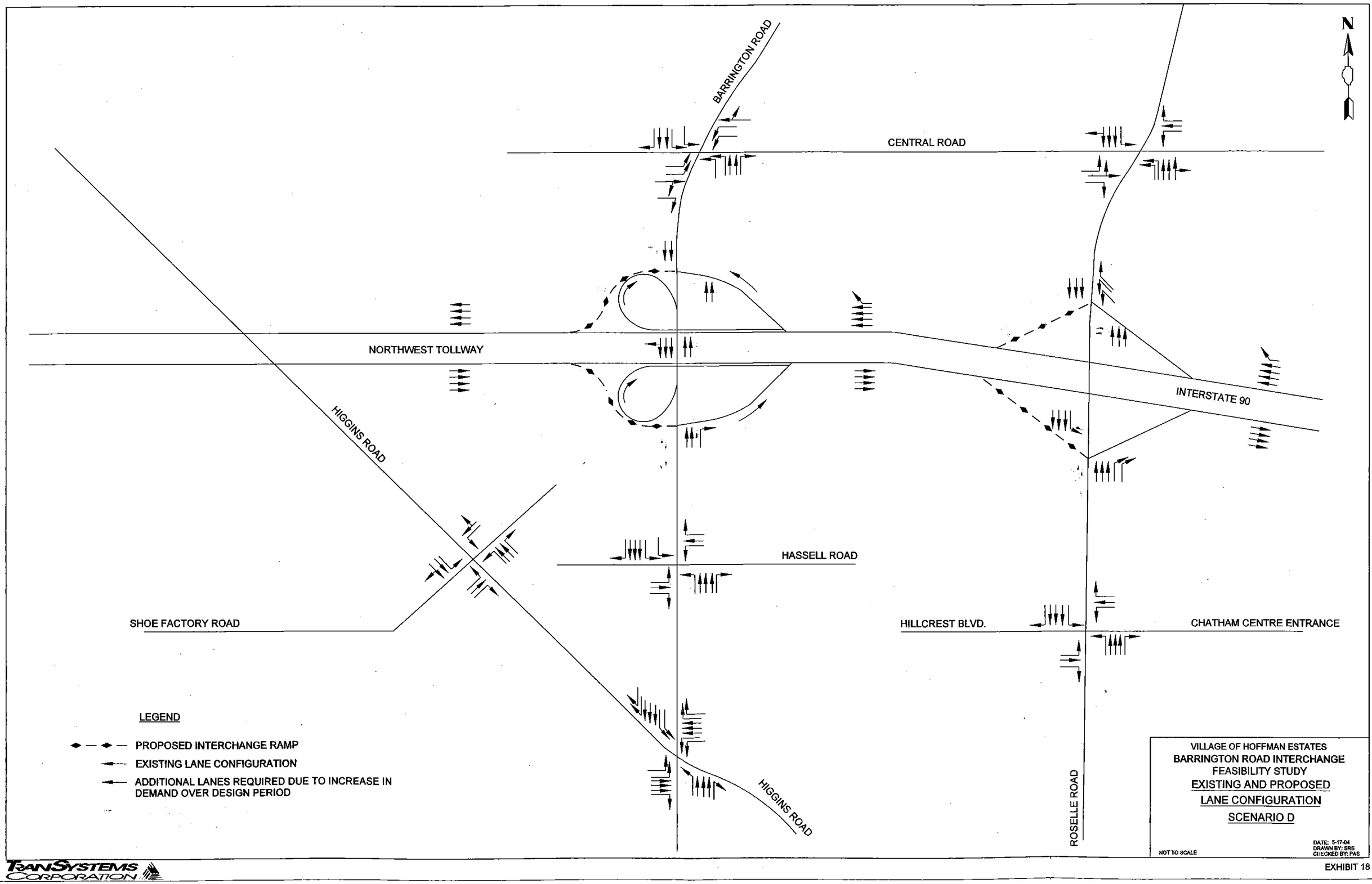
TRANSYSTEMS CORPORATION

EXHIBIT 16



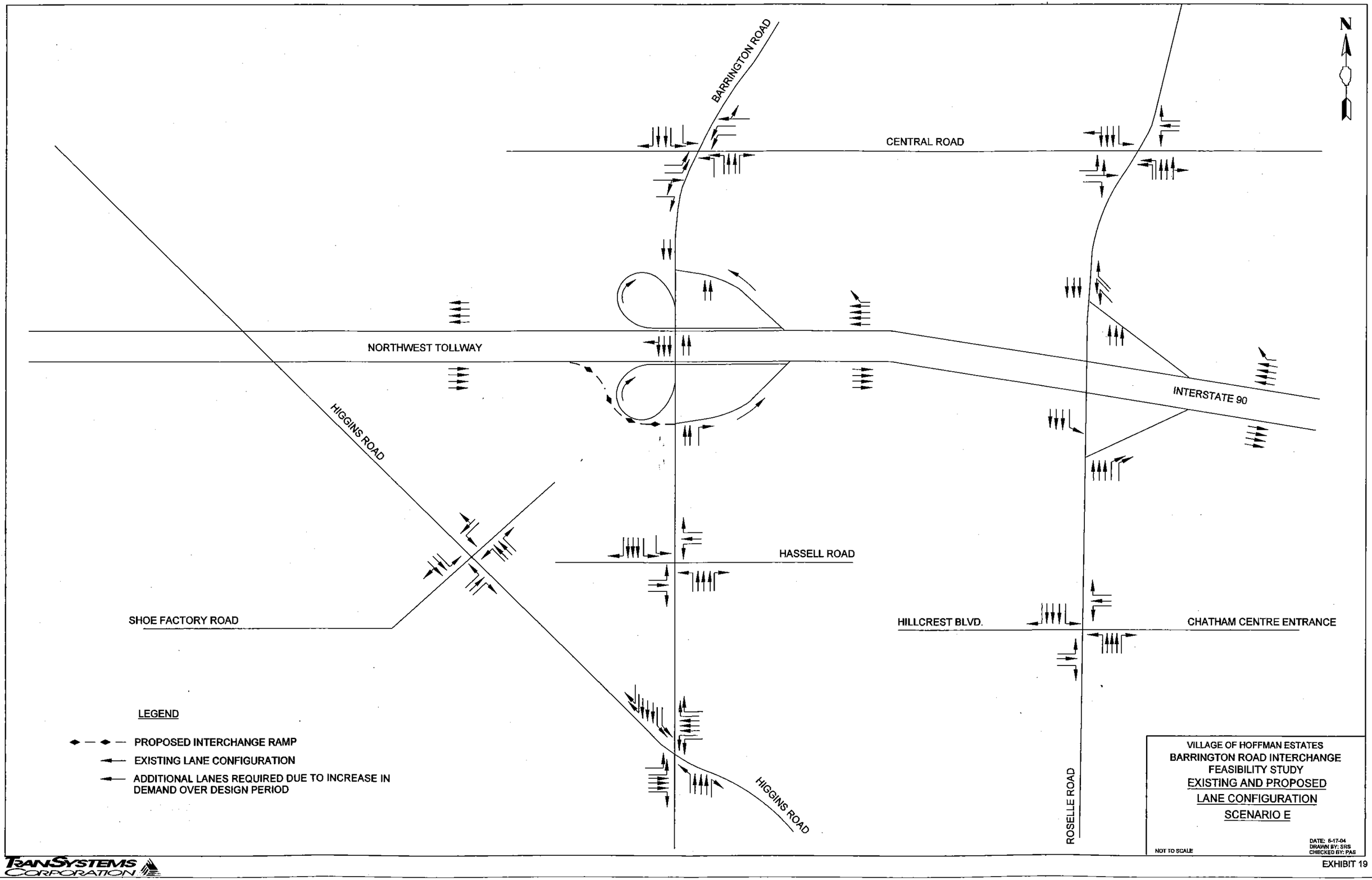
TRANSYSTEMS CORPORATION

EXHIBIT 17



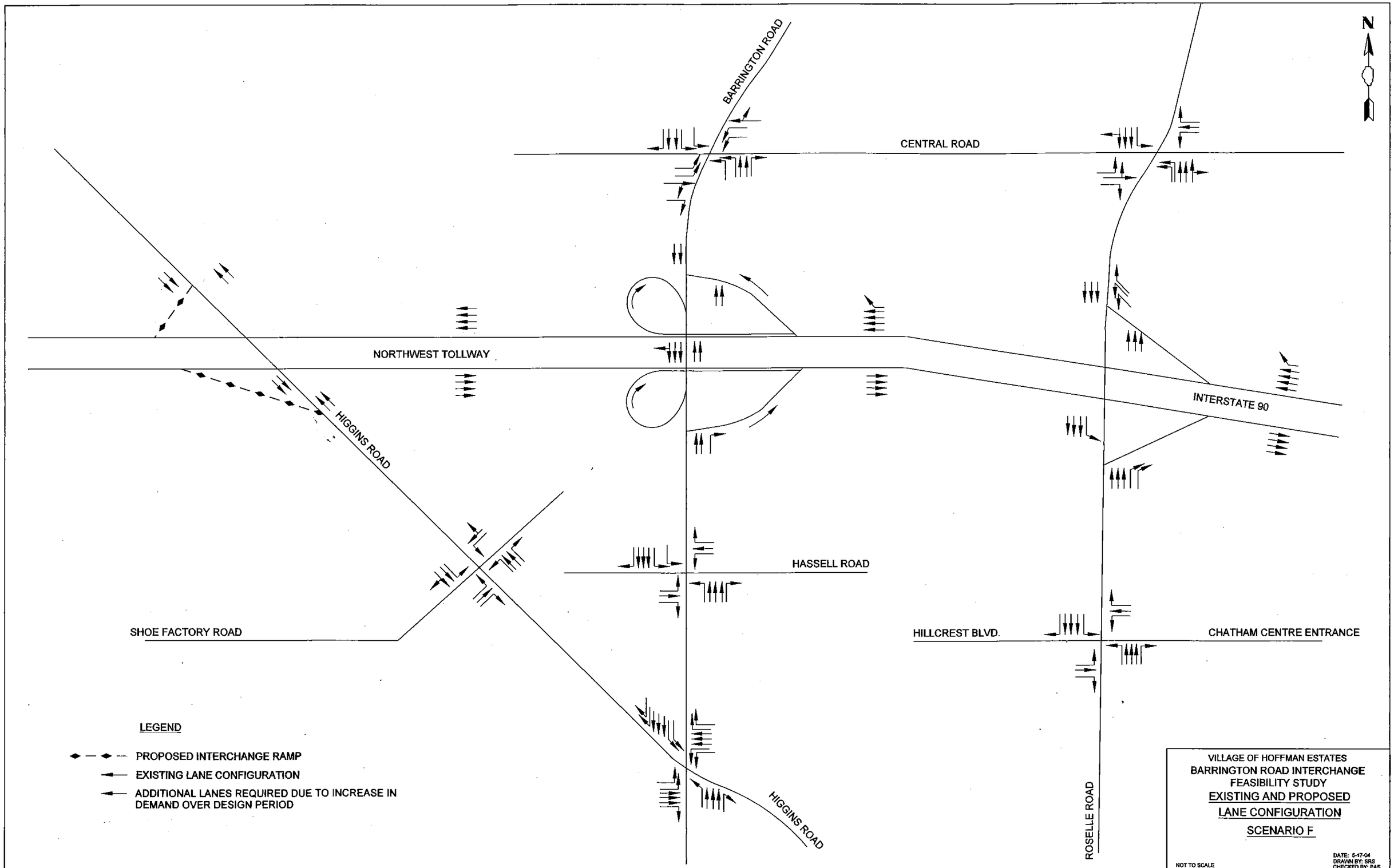
TRANSYSTEMS CORPORATION

EXHIBIT 18



TRANSYSTEMS CORPORATION

EXHIBIT 19



VILLAGE OF HOFFMAN ESTATES
BARRINGTON ROAD INTERCHANGE
FEASIBILITY STUDY
EXISTING AND PROPOSED
LANE CONFIGURATION
SCENARIO F

NOT TO SCALE

DATE: 5-17-04
DRAWN BY: SRS
CHECKED BY: PAS

TRANSYSTEMS CORPORATION

EXHIBIT 20

TRANSYSTEMS CORPORATION

BARRINGTON ROAD INTERCHANGE ALTERNATIVES CAPACITY ANALYSIS COMPARISON (Year 2020 Design Hourly Volumes, Proposed Geometry)

SIGNALIZED INTERSECTIONS	PARTIAL CLOVERLEAF		CONV DIAMOND		MODIFIED DIAMOND		SPUI		COMMENTS
	AM	PM	AM	PM	AM	PM	AM	PM	
	Control Delay / LOS		Control Delay / LOS		Control Delay / LOS		Control Delay / LOS		
BARRINGTON ROAD AT HIGGINS ROAD	49.1 D	38.7 D	52.9 D	39.3 D	50.2 D	41.2 D	46.8 D	41.2 D	
BARRINGTON ROAD AT HASSELL ROAD	25.7 C	19.4 B	28.8 C	17.1 B	26.8 C	19.3 B	26.0 C	19.1 B	
BARRINGTON ROAD AT EB ENT RAMP	9.9 A	8.6 A	18.7 **B**	12.2 **B**	21.7 **C**	11.3 **B**	68.6 **E**	91.9 **F**	
BARRINGTON ROAD AT WB EXIT RAMP	11.9 B	20.2 C	19.6 B	60.9* **E**	14.7 B	23.6 **C**			
BARRRINGTON ROAD AT CENTRAL ROAD	11.0 B	33.0 C	10.5 B	24.0 C	11.4 B	23.5 C	10.6 B	26.8 C	
HIGGINS ROAD AT SHOE FACTORY ROAD	16.1 B	16.8 B	17.5 B	16.8 B	17.2 B	16.9 B	16.2 B	17.0 B	
HIGGINS ROAD AT EB EXIT RAMP	N/A		N/A		N/A		N/A		
HIGGINS ROAD AT WB ENT RAMP	N/A		N/A		N/A		N/A		
BARRINGTON ROAD CORRIDOR SUMMARY	23.0	21.0	27.0	30.0	26.0	24.0	40.0	47.0	
ROSELLE ROAD AT HILLCREST BOULEVARD	60.5 E	62.2 E	60.5 E	62.2 E	60.5 E	62.2 E	60.5 E	62.2 E	
ROSELLE ROAD AT EB ENT RAMP	8.2 A	6.8 A	8.2 A	6.8 A	8.2 A	6.8 A	8.2 A	6.8 A	
ROSELLE ROAD AT WB EXIT RAMP	12.0 B	31.2 C	12.0 B	31.2 C	12.0 B	31.2 C	12.0 B	31.2 C	
ROSELLE ROAD AT CENTRAL ROAD	22.2 C	22.7 C	22.2 C	22.7 C	22.2 C	22.7 C	22.2 C	22.7 C	
ROSELLE ROAD CORRIDOR SUMMARY	26.0	33.0	26.0	33.0	26.0	33.0	26.0	33.0	

PARTIAL CLOVERLEAF: Existing interchange with EB exit ramp and WB entrance ramp
CONV DIAMOND: Conventional Diamond
MODIFIED DIAMOND: Combination Partial Cloverleaf (NW quadrant) / Diamond interchange
SPUI: Single Point Urban Interchange
*: LOS F - WB Exit Ramp (LOS F WB LT)

Analysis Software: Synchro Version 5.0
Control Delay: Calculated using Synchro Percentile Delay Method (seconds/vehicle)
LOS: Level of Service, based on HCM LOS criteria (HCM Exhibit 16-2)
N/A: Not Applicable, Unsignalized Intersection
Improvement in LOS over Partial Cloverleaf Interchange
Decrease in LOS from Partial Cloverleaf Interchange

EXHIBIT 21

TRANSYSTEMS CORPORATION

COMPARISON OF ALTERNATIVE INTERCHANGE DESIGNS

MEASURES	PARTIAL CLOVERLEAF (PARCLO)	CONVENTIONAL DIAMOND	MODIFIED DIAMOND	COMMENTS
INTERSECTION LEVEL OF SERVICE (LOS)	EB Ramps - A (A)* WB Ramps - B (C)*	EB Ramps - B (B)* WB Ramps - B (E)* ^	EB Ramps - C (B)* WB Ramps - B (C)*	SPUI eliminated due to unacceptable LOS
BARRINGTON ROAD CORRIDOR DELAY (sec/veh)	23.0 (21.0)*	27.0 (30.0)*	26.0 (24.0)*	
OPERATIONAL FACTORS	Weave on Barrington Road maintained Unconventional Interchange Design	Weave on Barrington Road eliminated Conventional Interchange Design	Weave on Barrington Road eliminated Unconventional Interchange Design	Weave on Barrington Road undesirable
COST ESTIMATE	$22,500,000	$16,000,000	$22,200,000	High costs for retaining walls for PARCLO and Modified Diamond
ENVIRONMENTAL IMPACTS	Wetlands - 1.3 acres Floodplain - 2.0 acres	Wetland - 0.02 acres Floodplain - 0.2 acres	Wetlands - 1.3 acres Floodplain - 2.0 acres	Additional Wetland Mitigation for PARCLO and Modified Diamond
PARKING IMPACTS (parking spaces lost)	260	30	30	Greenspoint Office Park - 180 (30) Barrington Point Subdivision - 80 (0)
NEW ROW ACQUISITION (acres)	8.5	3.0	5.0	Additional ROW cost for PARCLO Interchange

* Measure: xx (xx) - AM (PM) peak period
^ LOS F, WB exit ramp
Single Point Urban Interchange (SPUI): LOS E (AM), LOS F - PM (ELIMINATED)
Note: Cost Estimate, Environmental Impacts, Parking Impacts and ROW acquisition values are approximate. Exact values to be determined in Phase I

EXHIBIT 26