

Revised Draft Village of Glen Ellyn Central Business District Traffic Study



Prepared for:
Village of Glen Ellyn

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Introduction

The Village of Glen Ellyn retained Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) and Walker Parking Consultants (Walker Parking) to examine the operation of the one-way roads in and near the Village's Central Business District (CBD) and determine the feasibility of converting them to two-way traffic. Of equal importance to improving traffic flow was to minimize any loss of on-street parking. Furthermore, a key objective was to examine the impact on pedestrian and bicycle access and safety.

The limits of the study area were Hawthorne Street on the north, Park Boulevard on the east, Hill Avenue on the south and Prospect Avenue/Western Avenue on the west as shown in **Figure 1**, encompassing most of the one-way roads in the Village. (All of the Figures and Tables are located within the Appendix). Given the different physical and operating characteristics of the one-way roads and the areas they serve, the study area was broken down into the following sections and sub-sections:

- The *Central Business District* which traditionally developed along its Main Street and the Union Pacific (UP) railroad that bisects the CBD in an east-west direction. The CBD contains the properties zoned C5A (CBD Retail Core) and C5B (CBD Service). This section was the principal study area for the project.
- The *Commercial Block* which is located in the CBD Retail Core just north of the UP railroad tracks and is bordered by Pennsylvania Avenue on the north, Forest Avenue on the east, Crescent Boulevard on the south and Main Street on the west. All four roads bordering this block are currently designated one-way, providing counter-clockwise travel around the block.
- The *Residential Areas* which are located generally between Anthony Street and Hawthorne Street north of the UP railroad tracks and between Hillside Avenue and Hill Avenue south of the UP railroad tracks. This area consists of primarily single family homes and is zoned R2, Single Family Residential. The one-way roads within these areas typically serve or are associated with one of the six area churches, many of which provide preschools and one elementary/junior high school. Many of the residential streets - being very narrow - are not designed according to width standards utilized today by most transportation agencies.

Currently sections of nine roads are permanently restricted to one-way traffic and the portions of three other roads are restricted to one-way traffic on Sundays. The one-way roadways within the study area are also shown on Figure 1.

As the study documents, the existing one-way roadway system is generally operating well with minimal delay and queuing along the system. This is due to the fact that the CBD traffic volumes are not excessive and do not exceed the capacity of the roadway system. Similar to other CBD's, the three at-grade railroad crossings within the CBD and the pedestrian activity as well as the on-street parking result in some limited congestion in the CBD. The one-way system provides a number of benefits including the following.

- Improving traffic flow by maximizing roadway capacity and minimizing vehicle conflicts
- Enhancing pedestrian access and circulation by minimizing the number of pedestrian/vehicle conflicts
- Maximizing on-street parking

Similar to the one-way system, a two-way roadway system can also be designed to operate well with limited delay and queuing. The two-way system would also experience limited congestion due to the at-grade railroad crossings, the pedestrian activity and the on-street parking. The two-way system provides a number of benefits including.

- Improving access to the CBD, businesses and the parking facilities
- Enhancing circulation through the CBD and to/from the businesses and parking facilities, particularly when the gates are down at the at-grade railroad crossings
- A simplified and less confusing system to navigate

One of the key initiatives/projects identified in the 2009 Village of Glen Ellyn Downtown Strategic Plan was "Analyzing the Downtown Traffic Circulation System." As stated in the Master Plan: *"The purpose of the two-way traffic conversion is not to increase traffic counts, but to eliminate the one-way Crescent/Forest/Pennsylvania/Main route, and make it easier to find parking and navigate through the Downtown."*

To assist Village officials, the businesses community and residents in evaluating the merits of the one-way system versus the two-way system, the matrix below highlights the transportation benefits of each. The matrix provides a list of components/features pertaining to the CBD's transportation system and identifies which system is better designed to address each. It is important to note that the matrix presents only transportation components/features to consider and does not include other factors pertinent to the viability of the CBD. In addition to the matrix, the study thoroughly addresses the operation of a two-way system, the impact on the transportation components/features and includes a list of the advantages and disadvantages of a two-way system. In order to provide the basis for determining the most appropriate roadway system for the Glen Ellyn CBD, all of the factors would need to be thoroughly vetted and the merits of each prioritized.

Transportation Components/Features	One-Way Roadway System	Two-Way Roadway System
Maximizing access to/from the CBD, businesses and parking facilities		X
Maximizing circulation through the CBD and to/from businesses and parking facilities		X
Maximizing the capacity of the roadway system	X	
Minimizing the distance required to travel through the CBD		X
Maximizing flexibility to avoid railroad delays		X
Minimizing vehicle conflicts	X	
Minimizing vehicle/pedestrian conflicts along Main Street	X	
Minimizing vehicle/pedestrian conflicts along Pennsylvania Avenue, Forest Avenue and Crescent Boulevard	X	X
Maximizing potential improvements to pedestrian facilities	X	X
Maximizing the on-street parking	X	
Maximizing traffic flow (visibility) along Main Street		X
Maximizing traffic flow (visibility) along Pennsylvania Avenue, Forest Avenue and Crescent Boulevard	X	
Simplifying and providing a less confusing system to navigate		X
Minimizing the implementation costs	X	

Existing Conditions

Transportation conditions were inventoried to obtain a database for evaluating the existing operating conditions within the study area. The components of existing conditions that were inventoried in the study area included the following.

- Existing land uses
- Physical and operating characteristics of the road system
- Existing pedestrian and bicycle facilities
- Existing railroad and bus operations
- Existing vehicular and pedestrian volumes
- Existing parking conditions

Study Area and Existing Land Uses

The study area is bounded by Hawthorne Street on the north, Park Boulevard on the east, Hill Avenue on the south and Prospect Avenue and Western Avenue on the west and includes the following permanent and temporary one-way roads.

Permanent One-Way Roads

- Main Street (southbound) between Pennsylvania Avenue and Crescent Boulevard
- Forest Avenue (southbound) between the railroad tracks and Hill Avenue
- Forest Avenue (northbound) between Crescent Boulevard and Hawthorne Street
- Pleasant Avenue (southbound) between Cottage Avenue and Anthony Street
- Pennsylvania Avenue (westbound) between Forest Avenue and Main Street
- Crescent Boulevard (eastbound) between Main Street and Forest Avenue
- Hillside Avenue (westbound) between Park Boulevard and Prospect Avenue
- Cottage Avenue (westbound) between Main Street and Pleasant Avenue
- Anthony Street (eastbound) between Main Street and Park Boulevard

Temporary One-Way Roads - Sunday Only

- Glenwood Avenue (northbound) between Hill Avenue and Duane Street
- Anthony Street (eastbound) between Pleasant Avenue and Main Street
- Phillips Avenue (eastbound) between Main Street and Park Boulevard

Figure 1 depicts the boundary of the study area and the one-way roads within the study area.

The UP railroad tracks generally bisect the study area in an east-west direction and have at-grade crossings with Prospect Avenue, Main Street and Park Boulevard. The Glen Ellyn Metra station is located on the north side of the tracks between Main Street and Park Boulevard. The CBD portion of the study area is generally bounded by Anthony Street on the north, Park Boulevard on the east, Hillside Avenue on the south and Prospect Avenue/Western Avenue on the north. The north and south portion of the study area generally consist of single family homes. Glenbard West High School is located just east of the study area. Lastly, several churches, many of which provide preschools and one elementary/junior-high school, are located in the study area, including.

- First Presbyterian Church of Glen Ellyn
- First Congregational Church of Glen Ellyn
- First United Methodist Church of Glen Ellyn
- Glen Ellyn Bible Church
- Saint Mark's Episcopal Church
- Saint Petronille Catholic Church

Existing Roadway System

Figure 2 illustrates and the following describes the physical and operating characteristics of the one-way roads in the study area.

Main Street is a north-south road that has an at-grade crossing with the UP railroad tracks. It provides one moving lane in each direction except the section between Pennsylvania Avenue and Crescent Boulevard which is restricted to one-way southbound traffic. Parking is prohibited on both sides of the road except between Anthony Street and Hillside Avenue where it is generally permitted on both sides of the road.

Forest Avenue is a north-south road that is restricted to one-way northbound traffic between Crescent Boulevard and Hawthorne Street and one-way southbound traffic between the UP railroad tracks and Hill Avenue. It provides one moving lane with parking generally permitted on one side of the road except between Crescent Boulevard and Pennsylvania Avenue where it is permitted on both sides of the road.

Glenwood Avenue is a north-south road that provides one moving lane in each direction with parking permitted on one side of the road. Between Hill Avenue and Duane Street, traffic is restricted to one-way northbound traffic on Sundays from 6:00 A.M. to 6:00 P.M.

Pleasant Avenue is a north-south road that provides one moving lane in each direction except the section between Cottage Avenue and Anthony Street which is restricted to one-way southbound traffic. Parking is generally permitted on one side of the road.

Pennsylvania Avenue is an east-west road that provides one moving lane in each direction except the section between Forest Avenue and Main Street which is restricted to one-way westbound traffic. Within the study area, parking is generally permitted on both sides of the road.

Crescent Boulevard is an east-west road that provides one moving lane in each direction except the section between Main Street and Forest Avenue which is restricted to one-way eastbound traffic. Within the study area, parking is generally permitted on both sides of the road.

Hillside Avenue is a one-way westbound road between Park Boulevard and Prospect Avenue. It provides one moving lane with parking generally provided on one side of the road.

Phillips Avenue is an east-west road that provides one moving lane in each direction. Parking is generally provided on both sides of the road east of Main Street and one side of the road west of Main Street. Between Main Street and Park Boulevard, traffic is restricted to one-way eastbound traffic on Sundays from 8:00 A.M. to 1:00 P.M.

Anthony Street is an east-west road that provides one moving lane in each direction except between Main Street and Park Boulevard which is restricted to one-way eastbound traffic. Parking is generally provided on one side of the road. Between Pleasant Avenue and Main Street, traffic is restricted to one-way eastbound traffic on Sundays from 8:00 A.M. to 1:00 P.M.

Cottage Avenue is an east-west road that provides one moving lane in each direction except between Main Street and Pleasant Avenue which is restricted to one-way westbound traffic. Parking is generally provided on one side of the road within the study area.

Federal Aid Urban Routes

Several roads within the study area are classified as Federal Aid Urban (FAU) routes, making them part of the National Highway System (NHU) and eligible for federal-aid funds for resurfacing, reconstruction, traffic management, bicycle/pedestrian enhancements and operational improvement projects. Figure 1 highlights the FAU routes within the study area. It is important to note that future federal-funding on these routes may be dependent on meeting federal and state design criteria.

Pedestrian and Bicycle Facilities

Within the study area, sidewalks are generally provided along both sides of the roads and crosswalks are provided at all of the primary intersections. In addition, pedestrian warning signs and gates are provided at the Main Street at-grade crossings with the UP railroad tracks. Adding to the pedestrian traffic is the location of the train station on the north side of the tracks. The Illinois Prairie Path, a 61-mile trail extending between Forest Park and Elgin, traverses through the CBD along the south side of the UP railroad tracks.

Existing Railroad and Pace Bus Operations

The UP railroad tracks bisect the study area in an east-west direction with at-grade crossings provided at Prospect Avenue, Main Street and Park Boulevard. According to Village officials approximately 120 to 130 Metra Union Pacific/West Line trains and freight trains use the tracks per day. Metra currently operates 29 eastbound weekday trains of which 25 stop at the Glen Ellyn train station and 30 westbound weekday trains of which 24 stop at the Glen Ellyn train station. Field observations that are summarized in the Appendix show that Main Street crossing is closed for an average of 75 seconds when eastbound Metra trains are stopped at the train station and approximately 130 seconds when westbound Metra trains are stopped at the station.

One Pace Suburban route (714) currently serves the study area and only operates on weekdays. The route extends along Park Boulevard south of the tracks and Main Street north of the tracks and uses Pennsylvania Avenue (westbound) and Crescent Boulevard (eastbound) to traverse between the two north-south roads.

Existing Vehicle and Pedestrian Counts

In order to determine the existing vehicle and pedestrian traffic volumes in the study area, KLOA, Inc. conducted daily vehicle counts and vehicle and pedestrian counts during the weekday morning and evening peak periods. The location and time of the counts was determined based at a kick-off meeting with Village staff.

Daily Vehicle Counts

Daily vehicle counts were conducted along ten roads in the study area for two consecutive days in October 2010. In addition, 2008 daily traffic counts were obtained from the Illinois Department of Transportation (IDOT) for three other road sections. **Figure 3** illustrates the 2008 and 2010 daily traffic volumes.

Morning and Evening Peak Hour Counts

Weekday morning and evening vehicle traffic counts were conducted at ten intersections in the study area. In addition, pedestrian counts were performed at four intersections around the commercial block. The intersection counts were conducted on Wednesday and Thursday, October 6 and 7, 2010 during the morning (7:00 A.M. to 9:00 A.M.) and the evening (2:00 P.M. to 6:00 P.M.) peak periods. The results of the traffic counts showed that the weekday morning peak hour of traffic occurs from 7:00 A.M. to 8:00 A.M. and the weekday evening peak hour of traffic occurs from 5:00 P.M. to 6:00 P.M. **Figure 4** illustrates the existing peak hour vehicle volumes and **Figure 5** illustrates the peak hour pedestrian volumes.

When the traffic counts were conducted, Riford Road was closed to through traffic between St. Charles Road and Crescent Boulevard due to construction. The posted detour route around the construction project included Main Street north of the tracks and Pennsylvania Avenue (westbound) and Crescent Boulevard (eastbound) between Main Street and Park Boulevard. As such, the traffic counts in the study area, particularly the north side of the CBD, were higher than normal as they included the detour traffic. However, in order to provide a worst case analysis, the traffic volumes were not reduced in order to reflect normal or typical conditions.

Existing CBD Parking Conditions

As part of the 2009 Village of Glen Ellyn Downtown Strategic Plan, limited parking surveys were conducted in the CBD. Both inventory and occupancy surveys were performed of all on-street parking spaces and those provided in the private and public parking lots. The Downtown Strategic Plan divided the CBD into six sections as shown in **Figure 6**. For the purpose of this study only the following four sections were considered.

- *Northwest Section of the CBD* which is bounded by Anthony Street on the north, Main Street on the east, the UP railroad tracks on the south and Western Avenue on the west. This section did not include the parking along Western Avenue or Anthony Street.
- *Northeast Section of the CBD* which is bounded by Anthony Street on the north, Park Boulevard on the east, the UP railroad tracks on the south and Main Street on the west. This section includes the parking along Main Street, but did not include the parking along Anthony Street or Forest Avenue north of Pennsylvania Avenue.
- *Southeast Section of the CBD* which is bounded by UP railroad tracks on the north, Park Boulevard on the east, Hillside Avenue on the south and Main Street on the west. This section included the parking along Main Street, but did not include the parking along Hillside Avenue east of Forest Avenue.
- *Southwest Section of the CBD* which is bounded by the UP railroad tracks on the north, Main Street on the east, Hillside Avenue on the south and Prospect Avenue on the west.

The 2009 Downtown Strategic Plan surveys were performed during one weekday in April/March 2008 and on a Friday, Saturday and Sunday evening in June 2008. In addition, Walker Parking performed updated parking surveys on Thursday, October 7, 2010 during the midday and Thursday, November 17, 2011 at several times throughout the day. **Table 1A and Table 1B** show the results of the parking surveys of only the public parking lots and the on-street parking.

Many of the public parking lots include permit and leased parking. Permit parking is currently provided for commuters and merchants. The commuter parking is generally available to non-permit holders after 11:00 A.M. with the majority of the other permit parking available after 6:00 P.M. However, the leased parking provides exclusive rights to the lessee for use with no time restrictions. The 2008 occupancy surveys of the public parking lots provide only the total of all the parking and did not separate which parking spaces (non-permit, permit or leased) were occupied. The following summarizes the results of the parking surveys of the public lots and the on-street parking spaces and focuses on the north side of the tracks and the northeast section of the CBD as these are the areas that would be impacted the most from a two-way roadway system.

CBD

- The four sections had a total of approximately 1,143 public parking spaces with 402 on-street spaces and 741 permit and non-permit spaces provided in the public parking lots.
- The four sections of the CBD had a peak parking demand within the public parking facilities of 802 vehicles (70 percent occupancy) on a weekday and 655 vehicles (57 percent occupancy) on a weekend evening.

North Section of the CBD (north of the railroad tracks)

- The north section had a total of approximately 606 public parking spaces with 266 on-street spaces and 340 permit and non-permit spaces provided in the public parking lots.
- The north section's public parking facilities had a peak parking demand of 458 vehicles (75 percent occupancy) on a weekday and 318 vehicles (53 percent occupancy) on a weekend evening.
- The on-street parking had a peak demand of 204 vehicles (77 percent occupancy) on a weekday and 183 vehicles (69 percent occupancy) on a weekend evening.
- The public parking lots had a peak demand of 266 vehicles (78 percent occupancy) on a weekday and 135 vehicles (40 percent occupancy) on a weekend evening. The majority of the available parking spaces during the weekday were in the Pennsylvania/Main parking lot which is mainly reserved for permit and leased parking which is not available to the general public during weekdays (permit) or at all (leased).

Northeast Section of the CBD

- The northeast section had a total of approximately 232 public parking spaces with 166 on-street spaces and 66 permit and non-permit spaces provided in the public parking lots.
- The northeast section's public parking facilities had a peak parking demand of 210 vehicles (90 percent occupancy) on a weekday and 170 vehicles (73 percent occupancy) on a weekend evening.
- The on-street parking had a peak demand of 144 vehicles (87 percent occupancy) on a weekday and 125 vehicles (75 percent occupancy) on a weekend evening.
- The public parking lots had a peak demand of 66 vehicles (100 percent occupancy) on a weekday and 55 vehicles (83 percent occupancy) on a weekend evening.

In addition to the public parking facilities, the CBD has many private parking lots that serve various commercial buildings.

In general, the results of the parking surveys show that the peak parking demand occurs on a weekday given the high commuter parking in the CBD. During weekday evenings and weekends all the commuter parking and a majority of the other permit parking is available to the general public. Overall, the parking surveys show that the CBD parking supply and the parking provided along the north section of the CBD is sufficient to accommodate the observed peak parking demand. The northeast section had the highest occupancy at approximately 90 percent on a weekday. It should be noted that the preferred parking within the front of the businesses, particularly around the commercial block, are usually the first to be occupied. During the peak times, the available parking is generally not in front of the businesses but within proximity to or within reasonable walking distance.

Lastly, it appears that the Pennsylvania/Main parking lot, which is conveniently located just west of the commercial block and provides 147 spaces, is under utilized as it had an observed maximum occupancy of 67 percent. However, it is important to note that this lot provides a combination of non-permit parking (12 three-hour metered spaces and one handicapped space), permit parking (53 commuter permit spaces and 41 employee permit spaces) and leased/reserved parking (25 general leased spaces, 10 employee leased spaces and 5 spaces reserved for the fire department).

Evaluation of CBD Commercial Block

This section examined the feasibility of converting the one-way roads around the commercial block to two-way traffic. The commercial block is bordered by Pennsylvania Avenue, Forest Avenue, Crescent Boulevard and Main Street. All four roads bordering this block provide one-way traffic in a counter-clockwise direction. The tasks completed were to (1) examine alternative two-way roadway systems, (2) further develop a two-way roadway system, (3) evaluate the operation of the two-way roadway system and (4) summarize the advantages and disadvantages. In addition, Walker Parking examined the other CBD roads to determine if more efficient on-street parking can be achieved which would yield an increase in the on-street parking.

Two-Way Roadway System

Based on the existing physical and operating characteristics of the roadway system, KLOA, Inc. and Walker Parking developed and evaluated alternative two-way roadway systems. The overall goal of the evaluation was to maximize the capacity of the roadway system, enhance the accessibility to and from and circulation through the CBD, minimize the loss of on-street parking and was sensitive to the pedestrian nature of the CBD. The alternative roadway systems were vetted with Village staff, including representatives from public works, engineering, planning and the police and fire departments, and its consultant James J. Benes and Associates, Inc. **Figure 7** and the following presents the two-way roadway system that was evaluated.

Roadway Cross Sections

All four roads surrounding the block would provide two-way traffic with one moving lane in each direction with on-street parking on both sides of the roads. **Figure 8A and 8B** and the following summarize the two-way roadway cross sections which are based on the existing roadway widths and assumed no substantial modifications to the existing cross sections.

- *Main Street between Pennsylvania Avenue and Crescent Boulevard* would provide one 14-foot lane in each direction with parallel parking on both sides of the road. The angle parking currently provided on the east side of the road would be replaced with parallel parking.
- *Crescent Boulevard between Main Street and Forest Avenue.* The section west of Forest Avenue would provide one 14-foot lane in each direction with parallel parking on both sides of the road. The section east of Main Street would provide a 12-foot westbound lane and a 14-foot (minimum) eastbound lane with parallel parking on the north side of the road and angle parking on the south side of the road. The angle parking currently provided on the north side of the road would be replaced with parallel parking and the parallel parking provided on the south side of the road would be replaced with parallel and angle parking.

- *Forest Avenue between Pennsylvania Avenue and Crescent Boulevard* would provide a 11-foot southbound lane and a 12-foot northbound lane with angle parking on the east side of the road and parallel parking on the west side of the road.
- *Pennsylvania Avenue between Main Street and Forest Avenue* would provide one 12-foot westbound lane and one 11-foot eastbound lane with angle parking on the north side of the road and parallel parking on the south side of the road. The angle parking currently provided on the south side of the road would be replaced with parallel parking and the parallel parking provided along the eastern portion of the north side of the road would be replaced with angle parking. It is important to note that this section of Pennsylvania Avenue is classified as a FAU route and that the angle parking design does not meet IDOT criteria. As such, the angle parking design could impact the ability to obtain future federal funding along this section of Pennsylvania Avenue.

Intersection Geometrics and Traffic Control

The following outlines the modifications that would be required at the four intersections.

Main Street with Pennsylvania Avenue

- The *southbound approach* would continue to provide a three-lane cross section with two southbound lanes and one northbound lane. The southbound lanes would be restriped to provide a shared left-turn/through lane and a separate right-turn lane.
- The *westbound approach* would be restriped to provide a three-lane cross section with two westbound lanes and one eastbound lane. The westbound lanes would be striped to provide a shared left-turn/through lane and a separate right-turn lane.
- The *northbound approach* would be restriped to provide a two-lane cross section with one northbound lane and one southbound lane. The northbound lane would be striped to provide a shared left-turn/through/right-turn lane.
- The *eastbound approach* would continue to provide a three-lane cross section with two eastbound lanes and one westbound lane. The eastbound lanes would be restriped to provide a shared left-turn/through lane and a separate right-turn lane.

This intersection would continue to operate under all-way stop sign control. In addition, the median in this intersection would need to be removed.

Main Street with Crescent Boulevard

- The *southbound approach* would be restriped to provide a three-lane cross section with two southbound lanes and one northbound lane. The southbound lanes would be striped to provide a separate left-turn lane and a shared through/right-turn lane.

- The *westbound approach* would be restriped to provide a two-lane cross section with one westbound lane and one eastbound lane. The westbound lane would be striped to provide a shared left-turn/through/right-turn lane.
- The *northbound approach* would be restriped to provide a three-lane cross section with two northbound lanes and one southbound lane. The northbound lanes would be striped to provide a shared left-turn/through lane and a separate right-turn lane.
- The *eastbound approach* would continue to provide a three-lane cross section with two eastbound lanes and one westbound lane. The eastbound lanes would be restriped to provide a shared left-turn/through lane and a separate right-turn lane.

Given the proximity of the railroad tracks, this intersection would continue to operate with the southbound, eastbound and westbound approaches under stop sign control and the northbound approach under free flow operation. In addition, the horse trough and median in the center of the intersection would be removed.

Forest Avenue with Crescent Boulevard

- The *southbound approach* would be restriped to provide a two-lane cross section with one southbound lane and one northbound lane. The southbound lane would be striped to provide a shared left-turn/right-turn lane.
- The *westbound approach* would continue to provide a two-lane cross section with one westbound lane and one eastbound lane. The westbound lane would be restriped to provide a shared through/right-turn lane.
- The *eastbound approach* would be restriped to provide a two-lane cross section with one eastbound lane and one westbound lane. The eastbound lane would be striped to provide a shared left-turn/through lane.

This intersection would operate under all-way stop sign control. In addition, the median in the intersection would be removed.

Forest Avenue with Pennsylvania Avenue

- Forest Avenue north of Pennsylvania Avenue would continue to operate as a one-way northbound road.
- The *westbound approach* would continue to provide a two lane cross-section with one westbound lane and one eastbound lane. The westbound lane would be restriped to provide a shared left-turn/through/right-turn lane.

- The *northbound approach* would be restriped to provide a three-lane cross section with two northbound lanes and one southbound lane. The northbound lanes would be striped to provide a shared left-turn/through lane and a separate right-turn lane.
- The *eastbound approach* would be restriped to provide a two-lane cross section with one eastbound lane and one westbound lane. The eastbound lane would be striped to provide a shared left-turn/through/right-turn lane.

This intersection would continue to operate under all-way stop sign control.

Analysis of Vehicle Operations

Given that the two-way roadway system would only impact the four roadway segments and four intersections surrounding the commercial block, only these roadway segments and intersections were evaluated. The operations at the other CBD intersections are projected to remain the same as no improvements would be provided at these intersections and the traffic volumes are generally expected to remain the same.

Projected Traffic Volumes

Based on the two roadway systems and the existing traffic patterns, the existing traffic volumes around the commercial block were redistributed to represent existing traffic volumes with the two-way roadway system. **Figure 9** illustrates the existing redistributed peak hour traffic volumes. In addition, this study also examined the impact of the two-way roadway system assuming additional growth in the CBD. Based on discussion with Village staff and its consultant, an ambient growth factor of 0.5 percent per year was assumed for twenty years. As such, the existing redistributed peak hour volumes were increased by ten percent to obtain Year 2030 redistributed peak hour volumes which are illustrated in **Figure 10**. It should be noted that the existing and Year 2030 redistributed traffic volumes are conservative (worst case) as they include the detour traffic around the Riford Road construction project.

Table 2 shows the change in the traffic volumes along the four roadways bordering the block. It is estimated that the traffic volumes along Crescent Boulevard, Forest Avenue and Pennsylvania Avenue would decrease by approximately 140 to 275 vehicles during the morning and evening peak hours. The traffic volumes along Main Street are projected to increase by approximately 65 to 130 vehicles during the morning and evening peak hours. Given that northbound traffic would no longer have to traverse around the commercial block, the two-way system may result in the redistribution of northbound traffic from other north-south roads to Main Street. As such, the northbound Main Street traffic could increase even further.

Intersection Capacity Analyses

In order to determine the operation of the external roadway system, capacity analyses were conducted at the critical intersections and simulation models were developed of the study area.

The capacity analyses were performed based on the existing and projected traffic volumes and the intersection's geometrics. Synchro/Sim Traffic 7.0 computer software was used to evaluate and model the operation of the intersections.

The ability of an intersection to accommodate traffic flow is expressed in terms of level of service, which is assigned a letter grade from A to F based on the average control delay experienced by vehicles passing through the intersection. Control delay is that portion of the total delay attributed to the traffic signal or stop sign control operation and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Level of Service A is the highest grade (best traffic flow and least delay), Level of Service E represents saturated or at-capacity conditions, and Level of Service F is the lowest grade (oversaturated conditions, extensive delays).

Table 3 presents the results of the intersection capacity analyses for existing conditions. **Table 4** presents the results of the capacity for the existing and Year 2030 redistributed traffic volumes assuming the two-way roadway system

Existing Road Conditions

The results of the capacity analyses, simulation models and field observations have shown that the existing intersections are generally operating well with minimal delay and queuing. This is primarily due to the fact that the CBD traffic volumes are not excessive and do not exceed the capacity of the roadways. Similar to other CBDs, the following characteristics result in some limited congestion. However, any additional queuing and delay typically dissipates quickly.

- The three at-grade railroad crossings in the CBD (Prospect Avenue, Main Street and Park Boulevard) contribute to the congestion experienced in the area. Queues from the railroad crossings at times extend to and through upstream intersections, particularly during the morning and evening peak periods and when longer freight trains are traversing through the CBD. In addition, a surge in traffic occurs when the crossings are open to vehicle traffic which can impact the operations of the downstream intersections. However, the additional congestion resulting from the at-grade railroad crossings typically dissipates in several minutes once the crossings are open.
- The on-street parking and the pedestrian activity also contribute to the congestion in the area. Motorists must yield to other motorists accessing the on-street parking spaces and pedestrians crossing the intersections. Adding to the pedestrian activity is the location of the train station and the peaking of pedestrian traffic that occurs when a train stops at the station.

While the intersections operate well overall, the southbound approach of Main Street at Pennsylvania Avenue does experience some queuing and delay. This is due to the higher volume of southbound traffic and the fact that the intersection is under all-way stop sign control. Field observations have shown that queuing along this approach can extend to and beyond Anthony Street during the peak hours and/or when the gates are down at the Main Street at-grade crossing.

Projected Traffic Conditions

The results of the capacity analyses and the simulation models show that all of the intersections are projected to operate at a good level of service assuming the existing and Year 2030 redistributed traffic volumes and the two-way roadway system. Further, all of the particular movements are projected to generally operate at a good level of service. Overall, the two-way roadway system would have sufficient capacity to accommodate the existing and Year 2030 traffic volumes.

As is the case under existing conditions, it is expected that some congestion would occur due to the at-grade railroad crossings, the on-street parking and the pedestrian activity. However, the additional queuing and delay would typically dissipate quickly. Further, the additional flexibility provided by the two-way roadway system would provide the following benefits which would only enhance the traffic operations.

- It would improve the accessibility to the northern portion of the CBD, the various businesses and the parking located west of Main Street.
- It would enhance circulation around the northern portion of the CBD, particularly when the gates are down at the railroad crossings.
- It would better distribute the traffic through the northern portion of the CBD.
- It would reduce the travel through the northern portion of the CBD.

If the year 2030 traffic volumes are realized, which are very conservative (worst case), the southbound Main Street left-turn/through movement at the Pennsylvania Avenue intersection is projected to operate at a poor level of service during the weekday evening peak hour. As was indicated previously, the southbound approach currently experiences some queuing and delay. In addition, the two-way roadway system would introduce five additional vehicle movements at this intersection which would reduce the southbound Main Street capacity. However, this approach is likely to operate better than projected as the all-way stop sign control at the Main Street/Hawthorne Street intersection meters the southbound traffic along southbound Main Street and reduces the surging of traffic at this intersection.

Although the two-way roadway system would have many positive impacts it would result in a reduction in capacity for southbound Main Street traffic at its intersections with Pennsylvania Avenue and Crescent Boulevard. This is due to the additional vehicle movements that would be introduced at these two intersections with the two-way roadway system. As the capacity analyses have shown, this would result in some additional delay and queuing for southbound Main Street traffic as it traverses through the northern portion of the CBD.

Analysis of Pedestrian Operations

The two-way roadway system would provide the following enhancements as it relates to pedestrian operations.

- The pedestrian operations at the Forest Avenue/Crescent Boulevard intersection would be improved as the intersection is assumed to operate under all-way stop sign control and a crosswalk would be added to the west leg of the intersection. This is a critical pedestrian intersection given its proximity to the train station.
- Given the decrease in travel around the commercial block, the two-way roadway system would reduce the vehicle and pedestrian conflicts, particularly at the Forest Avenue/Crescent Boulevard and Forest Avenue/Pennsylvania Avenue intersections.

The plan was developed assuming the existing roadway cross sections. However, the plan can accommodate the following additional pedestrian enhancements with modifications to the existing cross sections and sidewalks.

- *Increased Sidewalk Widths.* The cross sections of several roads under the two-way roadway system can be reduced allowing for the increase in the width of the adjacent sidewalks. Main Street can be reduced by approximately eight feet. Forest Avenue and Pennsylvania Avenue can be reduced by eight feet if the angle parking is replaced with parallel parking.
- *Intersection Bump-Outs.* Intersection bump-outs are an extension of the sidewalk at the corners of intersections in order to reduce the distance that pedestrians must traverse when crossing a road. Typically bump-outs extend within the parking lanes and may result in the loss of parking. Bump-outs can be accommodated along many intersection legs in the CBD.

The two-way roadway system would add additional movements that pedestrians would have to navigate at the four intersections in the study area. However, the additional movements encountered at the intersections are no greater than those found at most intersections.

Parking Analysis

Walker Parking examined the roads within the CBD to determine if more efficient on-street parking can be achieved which would yield an increase in the on-street parking. The analysis has shown that Duane Street between Forest Avenue and Main Street is wide enough to provide angle parking on the south side of the road and maintain the existing parallel parking on the north side of the road (see **Figure 11**). The restriping of Duane Street would result in a net increase of approximately thirteen on-street parking spaces and can be implemented with or without modifications to the roadway system around the commercial block.

Table 5 and the following summarize the change in the on-street parking associated with the two-way roadway system and the restriping of Duane Street.

- Duane Street would have a net gain of approximately thirteen parking spaces.
- Pennsylvania Avenue would have a net gain of two parking spaces.
- Forest Avenue would have a net gain of two parking spaces.
- Main Street would have a net loss of approximately eight parking spaces north of the railroad tracks.
- Crescent Boulevard would have net loss of approximately nine parking spaces.

From Table 5 it can be seen that the number of on-street parking spaces within the CBD would not change with the two-way roadway system and the restriping of Duane Street.

The two-way roadway system would result in a net loss of approximately thirteen on-street parking spaces around the commercial block and in the northeast section of the CBD. This represents a loss of approximately eight percent of the on-street parking spaces in the northeast section and approximately five percent in the northeast and northwest sections. The parking surveys show that the northeast section is not currently operating at full capacity and that some parking is available. Depending on the time of day, the 2011 weekday parking surveys show that between 22 and 68 on-street parking spaces are available in the northeast section of the CBD. Further, the following summarizes additional parking that is provided and/or available within proximity to or within walking distance of the commercial block.

- The 2011 weekday parking surveys show that parking is available on weekday evenings and weekends (62 to 80 spaces) in the public parking lots located in the northeast section.
- Additional on-street parking is provided along Forest Avenue north of Pennsylvania Avenue which was not included in the parking surveys
- The parking surveys show that parking is available west of Main Street in the northwest section of the CBD. These spaces are generally within walking distance of the commercial block. Further, as indicated previously, the two-way roadway system would enhance the accessibility to these parking spaces.
- The parking surveys show that parking is available on weekday afternoon/evenings and weekends in the commuter parking lot located south of the railroad tracks and east of Main Street.
- Thirteen additional spaces can be provided along Duane Street between Main Street and Forest Avenue which is within walking distance of the commercial block. It is important to note that these additional spaces can be implemented with or without modifications to the roadway system around the commercial block.

Lastly, the Pennsylvania/Main parking lot appears to be under utilized as it had a maximum occupancy of 67 percent. This lot is located just west of the commercial block and the accessibility to the lot would be enhanced with the two-way roadway system. It should be noted that the majority of the parking spaces in this lot are reserved for either (1) permit parking during the weekday business day or (2) leased parking which is reserved 24-hours a day, seven days a week. As such, the Village should consider reevaluating the mix of non-permit, permit and leased parking in this lot to determine if additional general parking can be provided.

Advantages and Disadvantages of the Two-Way Roadway System

The following summarizes the transportation and parking advantages/disadvantages of the two-way roadway system.

Advantages

- Improved access to the northern portion of the CBD, the various businesses and the parking west of Main Street.
- Enhanced circulation around the northern portion of the CBD, particularly when the gates are down at the at-grade railroad crossings, and better distribution of traffic within the northern portion of the CBD.
- Reduced travel through the northern portion of the CBD, particularly northbound Main Street traffic, and reduced traffic on several of the roads.
- Simplified and less confusing roadway system to navigate.
- Decreased pedestrian and vehicle conflicts particularly at the Forest Avenue/Crescent Boulevard and Forest Avenue/Pennsylvania Avenue intersections as a result of the reduction in traffic volumes at these intersections.
- Improved pedestrian facilities at the Forest Avenue/Crescent Boulevard intersection as the intersection is assumed to operate under all-way stop sign control and a crosswalk would be added to the west leg of the intersection.
- Increased on-street parking (thirteen spaces) can be accommodated with the restriping of Duane Street between Main Street and Forest Avenue. It is important to note that these additional spaces can be implemented with or without modifications to the roadway system around the commercial block.

Disadvantages

- Reduced capacity for southbound Main Street traffic traversing through the CBD which would result in some additional intersection delay and queuing.
- Added locations where queuing can occur (northbound Main Street at Pennsylvania Avenue, westbound Crescent Boulevard at Main Street and eastbound Pennsylvania Avenue at Forest Avenue) which at times may block access to on-street parking.
- Increased number of vehicle movements at the four intersections in the study area which pedestrians would have to navigate. However, the additional movements encountered at the intersections are no greater than those found at most intersections.
- Decreased on-street parking (thirteen spaces) around the commercial block and within the northeast section of the CBD. It should be noted that with the restriping of Duane Street within the southeast section of the CBD the total on-street parking in the CBD would remain the same.

Evaluation of other CBD One-Way Roads

This section examined the feasibility of converting the other one-way roadways within the CBD to two-way traffic.

Analyses of Permanent One-Way Roads

The following characteristics of the road segments was identified and evaluated as to the feasibility of converting them to two-way traffic.

- Roadway classification and if the roadway is classified as a CBD road
- Roadway traffic volume, if available
- Roadway width (back of curb to back of curb)
- Provision of on-street parking
- Land uses that the roadway serves

Table 6 summarizes the characteristics of the permanent roads. Based on these characteristics, the roads were evaluated as to the feasibility of converting them to a two-way operation. In addition, any operational and/or physical modifications required to accommodate the two-way operation was identified.

Hillside Avenue between Park Boulevard and Prospect Avenue

Hillside Avenue is classified as a neighborhood collector road and is also classified as a CBD road. It serves the southern portion of the CBD providing access to two churches and to the main public parking lot south of the tracks. Further, it carries a relatively high volume of traffic. Therefore, given the higher roadway classification, the importance of the road in providing access to/from and circulation around the CBD and the road's higher traffic volumes, it is recommended that two lanes of traffic clear of any parking be maintained if the road is converted to a two-way operation.

Hillside Avenue has a cross section (back of curb to back of curb) that varies between 20 and 28 feet. (It should be noted that a short portion of the road east of Main Street widens to 34 feet.) As such, to maintain two lanes of traffic on Hillside Avenue between Park Boulevard and Main Street, either (1) on-street parking would have to be prohibited on both sides of the road or (2) the road would need to be widened to accommodate on-street parking. The short section that provides a 34-foot cross section and the section between Main Street and Glenwood Avenue are wide enough to maintain two lanes of traffic if the current angle parking is replaced with parallel parking. Lastly, if on-street parking is eliminated and parking is still desired for the churches, the road would need to be signed for temporary one-way traffic with on-street parking permitted on one side of the road on Sundays.

***Forest Avenue between Duane Street and Hillside Avenue and
Forest Avenue between Pennsylvania Avenue and Anthony Street***

Both roadway sections provide an alternative means for exiting the CBD with direct access provided (1) from the train station to the northern section of Forest Avenue and (2) from the parking lots directly south of the railroad tracks to the southern section of Forest Avenue. Further, both roadway sections provide access to the various churches in the area and the southern section provides access to Hillside Avenue which is also classified as a CBD road. Consequently, both roads carry a higher volume of traffic. Therefore, given that both roadway sections are CBD roads, the importance of them in providing access from and circulation around the CBD and the higher traffic volume on the two roads, it is recommended that two lanes of traffic clear of any parking be maintained if the road sections are converted to two-way operations.

The two sections of Forest Avenue have width that varies generally between 20 and 24 feet (back of curb to back of curb). As such, to maintain two lanes of traffic on these two roadway sections, either (1) on-street parking would have to be prohibited on both sides of the road or (2) the roads would need to be widened to accommodate on-street parking. Lastly, if on-street parking is eliminated and parking is still desired for the churches, the sections of the two roads would need to be signed for temporary one-way traffic with on-street parking permitted on one side of the road on Sundays.

Evaluation of One-Way Roads in the Residential Areas

This section examined the feasibility of converting the one-way roadways within the residential areas to two-way traffic. All of the roads within this area generally provide residential access and serve many of the churches.

Analyses of Permanent One-Way Roads

The following characteristics of the road segments was identified and evaluated as to the feasibility of converting them to two-way traffic.

- Roadway classification and if the roadway is classified as a CBD road
- Roadway traffic volume, if available
- Roadway width (back of curb to back of curb)
- Provision of on-street parking
- Land uses that the roadway serves

Table 6 summarizes the characteristics of the permanent roads. Based on these characteristics, the roads were evaluated as to the feasibility of converting them to a two-way operation. In addition, any operational and/or physical modifications required to accommodate the two-way operation was identified.

Forest Avenue between Anthony Street and Hawthorne Street

While this section of Forest Avenue is classified as local road and is not classified as CBD road, it does carry a high volume of daily traffic for a residential road. This portion of Forest Avenue provides an alternative means for exiting the CBD with direct access provided from the train station to Hawthorne Street. In addition, the roadway provides access to the various churches in the area. Therefore, given the road's current traffic volume, it is recommended that two lanes of traffic clear of any parking be maintained if the roadway section is converted to a two-way operation.

This section of Forest Avenue has a cross section (back of curb to back of curb) of 20 feet. As such, to maintain two lanes of traffic either (1) on-street parking would have to be prohibited on both sides of the road or (2) the road would need to be widened. Lastly, if on-street parking is eliminated and parking is still desired for the churches, the road would need to be signed for temporary one-way traffic with on-street parking permitted on one side of the road on Sundays.

If the two-way roadway system is implemented around the commercial block, it may be prudent to first evaluate the impact it has on traffic along this section of Forest Avenue before a final recommendation is made. It may be possible to provide two-way traffic with parking on one side of the road without any widening if the traffic volumes are reduced. However, given the volume of traffic and parking generated by the churches, the road would likely need to be signed for temporary one-way traffic with on-street parking permitted on one side of the road on Sundays.

Forest Avenue between Hillside Avenue and Hill Avenue

This section of Forest Avenue is classified as a local road and is not classified as a CBD road. Further, it primarily serves a residential neighborhood and carries a relatively low volume of traffic. Therefore, the road does not need to provide two lanes of traffic clear of any parking. With a 20-foot cross section (back of curb to back of curb) parking can be provided on one side of the road with a two-way operation. However, since only one through lane would be provided around parked vehicles, motorists would have to yield to allow opposing vehicles the right-of-way around the parked vehicles. This is common in many residential neighborhoods, including the Glen Ellyn CBD.

Anthony Street between Main Street and Park Boulevard

This section of Forest Avenue is classified as local road and is not classified as CBD road. Further, it primarily serves a residential neighborhood with a church, but does provide an alternative route around the CBD. As part of this study, only peak hour traffic counts were conducted along Anthony Street. While it appears that the traffic volumes are appropriate to allow two-way operation with parking on one side, daily traffic counts should be performed and evaluated before a final recommendation is made. Further, if the two-way roadway system is implemented around the commercial block, it may be prudent to evaluate the impact it has on traffic along Anthony Street.

Cottage Avenue between Main Street and Pleasant Avenue Pleasant Avenue between Cottage Avenue and Anthony Street

The sections of Cottage Avenue and Pleasant Street are classified as local roads and are not classified as CBD roads. Further, they primarily serve the residential neighborhood and also the First Presbyterian Church of Glen Ellyn. However, no traffic counts were obtained along either road as part of the study. It appears that the traffic volumes on the road are appropriate to allow two-way operation with parking on one side. However, it is recommended that (1) daily traffic counts be performed and evaluated and (2) discussions be held with church officials regarding its operations and the potential impacts, particularly the preschool drop off/pick up operation, before any final recommendations are made.

Analyses of Temporary One-Way Roads

Given the additional traffic and parking generated by the area churches, the following three roads are signed for one-way traffic flows on Sunday.

- Glenwood Avenue (northbound) between Hill Avenue and Duane Street from 6:00 A.M. to 6:00 P.M. on Sundays.
- Anthony Street (eastbound) between Pleasant Avenue and Main Street from 8:00 A.M. to 1:00 P.M. on Sundays.
- Phillips Avenue (eastbound) between Main Street and Park Boulevard from 8:00 A.M. to 1:00 P.M. on Sundays.

All three roads have narrow cross section that range from 20 to 24 feet (back of curb to back of curb) and generally provide one lane in each direction with parking permitted on one side. Field observations have revealed that the parking along these roads is typically fully occupied during the Sunday services. The drop off and pick up activity as well as the traffic peaking characteristics of churches adds to the congestion along these narrow roads. Lastly, the impact of the one-way restrictions are minimized as (1) they are on local residential roads with lower traffic volumes and generally do not impact circulation around the CBD and (2) typically occur on Sunday mornings when traffic volumes are much lower and most of the businesses are closed.

Therefore, it is recommended that the one-way restrictions be maintained along these three roadways. However, the Village should work with the churches to see if the time limits for the one-way traffic restrictions can be reduced, particularly along Glenwood Avenue which is restricted from 6:00 A.M. to 6:00 P.M.

Other Future CBD Projects

Per the request of the Village, KLOA, Inc. and Walker Parking examined the impact/feasibility of two key initiatives/projects identified in the 2009 Downtown Strategic Plan.

Redevelopment of the Parking Lots Immediately North of the UP Railroad Tracks (North Downtown Greenway)

One of the key initiatives/projects is to redevelop the two existing parking lots located on the south side of Crescent Boulevard between Main Street and Park Boulevard into passive green space. KLOA, Inc. and Walker Parking examined how the redevelopment of the two parking lots can be implemented into the two-way roadway system. **Figure 12** illustrates the two-way roadway system with the redevelopment of the two parking lots.

In general, the two-way roadway system would remain the same. However, the elimination of the parking lots would allow the opportunity to widen Crescent Boulevard along the two parking lots and allow for angle parking as opposed to parallel parking on the south side of Crescent Boulevard between Main Street and Park Boulevard. The remaining portions of the parking lots could be redeveloped into passive green space.

Overall, the elimination of the railroad parking lots would have limited impact on the operation of Crescent Boulevard and the two-way roadway system. While it would eliminate four access drives along the south side of Crescent Boulevard, it would increase the number of angle parking spaces along Crescent Boulevard. It should be noted that the elimination of the parking lots would enhance pedestrian operations as it would eliminate all the access drives along the south side of Crescent Boulevard between Main Street and Park Boulevard. Lastly, the elimination of the parking provided in the lots and the reconfiguration of the on-street parking along the south side of Crescent Boulevard would result in a net loss of approximately fourteen additional parking spaces in the CBD.

Mixed-Use Forest Avenue North Parking Structure

A second key initiative/project is to develop a multilevel parking structure located in the southwest quadrant of the Pennsylvania Avenue/Forest Avenue intersection. The 2009 Downtown Strategic Plan contemplates the vacation of Forest Avenue to accommodate a portion of the parking structure and to create a pedestrian plaza between the parking structure and the train station. KLOA, Inc. examined on a preliminary basis the impacts of the parking structure and the vacation of Forest Avenue on the transportation system.

- Forest Avenue is a critical link in the existing one-way roadway system, particularly for northbound Main Street traffic, and circulation around the commercial block. As such, the vacation of Forest Avenue would have a significant impact on the existing roadway system. Some form of a two-way roadway system would need to be implemented in order to mitigate the impact of the vacation of Forest Avenue.

- Given the additional flexibility of the two-way roadway system, the impact of the vacation of Forest Avenue would be minimized as motorist would have increased options for traversing through and around the north portion of the CBD.
- Even with the two-way roadway system, the vacation of Forest Avenue would result in additional travel when circulating around the CBD. Motorists would be redistributed to either Main Street or Park Boulevard if they desire to circulate between Crescent Boulevard and Pennsylvania Avenue. However, with the two-way system the importance of Forest Avenue is greatly reduced and, consequently, the volume of traffic along Forest Avenue is projected to decrease significantly.
- With the vacation of the Forest Avenue, the north portion of the CBD would lose one of its two north-south roads that do not have an at-grade crossing with the UP railroad tracks. Therefore, more motorists would have to contend with the at-grade crossings and the additional congestion that occurs along Main Street and Park Boulevard when circulating through the CBD.
- To minimize the impact of the vacation of Forest Avenue, consideration should be given to providing inbound and outbound access between the parking structure and both Pennsylvania Avenue and Crescent Boulevard. Providing full access to both roads would greatly increase the flexibility of the access system to the parking structure which would better distribute the traffic along the roadway system.

Conclusion

KLOA, Inc. and Walker Parking were retained to examine the operations of the one-way roads in the study area and determine the feasibility of converting them to two-way traffic. Given the different physical and operating characteristics of the one-way roads and the areas they serve, the study area was broken down into the following sections and sub-sections.

- The *Central Business District* traditionally developed along its Main Street and the Union Pacific (UP) railroad that bisects the CBD in an east-west direction. The CBD contains the properties zoned C5A (CBD Retail Core) and C5B (CBD Service). This section was the principal study area for the project.
- The *Commercial Block* is located in the CBD Retail Core just north of the UP railroad tracks and is bordered by Pennsylvania Avenue on the north, Forest Avenue on the east, Crescent Boulevard on the south and Main Street on the west. All four roads bordering this block are currently designated one-way, providing counter-clockwise travel around the block.
- The *Residential Areas* are located generally between Anthony Street and Hawthorne Street north of the UP railroad tracks and between Hillside Avenue and Hill Avenue south of the UP railroad tracks. This area consists of primarily single family homes and is zoned R2, Single Family Residential. The one-way roads within these areas typically serve or are associated with one of the six area churches, many of which provide preschools and one elementary/junior high school. Many of the residential streets - being very narrow - are not designed according to width standards utilized today by most transportation agencies.

Evaluation of the Commercial Block

Working with the Village and its consultant, a two-way roadway system was developed for the commercial block which is illustrated in Figure 7. Under the plan, all four roads around the block would provide two-way traffic with one moving lane in each direction on-street parking provided on both sides of the roads. Further all turning movements would be permitted at the four intersections surrounding the block.

The results of the capacity analyses and the simulation models show that all of the intersections are projected to operate at a good level of service assuming the existing and Year 2030 redistributed traffic volumes assuming the two-way roadway system. Further, all of the particular movements are projected to generally operate at a good level of service except the southbound Main Street approach at Pennsylvania Avenue. If the year 2030 traffic volumes are realized, which are very conservative (worst case), the southbound Main Street left-turn/through movement is projected to operate at a poor level of service during the weekday evening peak hour. Overall, the two-way roadway system would have sufficient capacity to accommodate the existing and Year 2030 traffic volumes.

The following summarizes the transportation and parking advantages/disadvantages of the two-way roadway system.

Advantages

- Improved access to the northern portion of the CBD, the various businesses and the parking west of Main Street.
- Enhanced circulation around the northern portion of the CBD, particularly when the gates are down at the at-grade railroad crossings, and better distribution of traffic within the northern portion of the CBD.
- Reduced travel through the northern portion of the CBD, particularly northbound Main Street traffic, and reduced traffic on several of the roads.
- Simplified and less confusing roadway system to navigate.
- Decreased pedestrian and vehicle conflicts particularly at the Forest Avenue/Crescent Boulevard and Forest Avenue/Pennsylvania Avenue intersections as a result of the reduction in traffic volumes at these intersections.
- Improved pedestrian facilities at the Forest Avenue/Crescent Boulevard intersection as the intersection is assumed to operate under all-way stop sign control and a crosswalk would be added to the west leg of the intersection.
- Increased on-street parking (thirteen spaces) can be accommodated with the restriping of Duane Street between Main Street and Forest Avenue. It is important to note that these additional spaces can be implemented with or without modifications to the roadway system around the commercial block.

Disadvantages

- Reduced capacity for southbound Main Street traffic traversing through the CBD which would result in some additional intersection delay and queuing.
- Added locations where queuing can occur (northbound Main Street at Pennsylvania Avenue, westbound Crescent Boulevard at Main Street and eastbound Pennsylvania Avenue at Forest Avenue) which at times may block access to on-street parking.
- Increased number of vehicle movements at the four intersections in the study area which pedestrians would have to navigate. However, the additional movements encountered at the intersections are no greater than those found at most intersections.

- Decreased on-street parking (thirteen spaces) around the commercial block and within the northeast section of the CBD. It should be noted that with the restriping of Duane Street within the southeast section of the CBD the total on-street parking in the CBD would remain the same.

Evaluation of the Other CBD One-Way Roads

Given the importance of the following roads in providing access from and circulation around the CBD and/or the higher traffic volume on these roads, it is recommended that two lanes of traffic clear of any parking be maintained on the roads if they are converted to two-way operations. As such, to maintain two lanes of traffic on the roads, either (1) on-street parking would have to be prohibited on both sides of the road or modified from angle to parallel parking or (2) the road would need to be widened to accommodate on-street parking. Lastly, if on-street parking is eliminated and parking is still desired for the churches, the roads would need to be signed for temporary one-way traffic with on-street parking permitted on one side of the road on Sundays.

- Hillside Avenue (westbound) between Park Boulevard and Glenwood Avenue
- Forest Avenue (southbound) between the railroad tracks and Hillside Avenue
- Forest Avenue (northbound) between Crescent Boulevard and Anthony Street

Evaluation of the One-Way Roads in the Residential Areas

Forest Avenue (northbound) between Anthony Street and Hawthorne Street. Similar to the analysis for the one-way roads within the CBD, it is recommended that two lanes of traffic clear of any parking be maintained on this section of Forest Avenue if it is converted to a two way operation. As such, to maintain two lanes of traffic on the road, either (1) on-street parking would have to be prohibited on both sides of the road or (2) the road would need to be widened to accommodate on-street parking. Lastly, if on-street parking is eliminated and parking is still desired for the area churches, the road would need to be signed for temporary one-way traffic with on-street parking permitted on one side of the road on Sundays.

Given that the following roads are local residential roads and that they have lower traffic volumes, it appears that the roads do not need to provide two lanes of traffic clear of any parking. However, it is recommended that additional data be collected and evaluated before any final recommendations are made regarding several of the roads. It should be noted that since only one through lane would be provided around parked vehicles, motorists would have to yield to allow opposing vehicles the right-of-way around the parked vehicles. This is common in many residential neighborhoods, including the Glen Ellyn CBD.

- Forest Avenue (southbound) between the Hillside Avenue and Hill Avenue
- Anthony Street (eastbound) between Main Street and Park Boulevard
- Pleasant Avenue (southbound) between Cottage Avenue and Anthony Street
- Cottage Avenue (westbound) between Main Street and Pleasant Avenue

Lastly, it is recommended that temporary Sunday one-way restrictions be maintained along the following three roads. However, the Village should work with the churches to see if the time limits for the one-way traffic restrictions can be reduced, particularly along Glenwood Avenue which is restricted from 6:00 A.M. to 6:00 P.M.

- Glenwood Avenue (northbound) between Hill Avenue and Duane Street
- Anthony Street (eastbound) between Pleasant Avenue and Main Street
- Phillips Avenue (eastbound) between Main Street and Park Boulevard

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Appendix

Table 1A
PUBLIC PARKING SUPPLY AND DEMAND - CBD

	Inventory	2009 Downtown Strategic Plan				
		Weekday	Friday	Saturday	Sunday	Thursday
		April/March 2008 Mid-Day	June 2008 5:30 - 7:00 P.M.	June 2008 6:00 - 7:00 P.M.	June 2008 6:00 - 7:00 P.M.	October 7, 2010 Mid-Day
Northeast Quadrant						
On-Street Parking	166	132	125	109	111	110
Public Parking Lots	<u>66</u>	<u>57</u>	<u>45</u>	<u>39</u>	<u>55</u>	<u>60</u>
Subtotal	232	189	170	148	166	170
Northwest Quadrant						
On-Street Parking	100	65	58	65	60	33
Public Parking Lots	<u>274</u>	<u>158</u>	<u>90</u>	<u>51</u>	<u>33</u>	<u>177</u>
Subtotal	374	223	148	116	93	210
Southeast Quadrant						
On-Street Parking	84	79	44	53	42	51
Public Parking Lots	<u>276</u>	<u>214</u>	<u>162</u>	<u>104</u>	<u>138</u>	<u>204</u>
Subtotal	360	293	206	157	180	255
Southwest Quadrant						
On-Street Parking	58	34	25	44	45	47
Public Parking Lots	<u>126</u>	<u>63</u>	<u>106</u>	<u>126</u>	<u>126</u>	<u>61</u>
Subtotal	184	97	131	170	171	108
Total						
On-Street Parking	408	310	252	271	258	241
Public Parking Lots	<u>742</u>	<u>492</u>	<u>403</u>	<u>320</u>	<u>352</u>	<u>502</u>
Total	1,150	802	655	591	610	743

Table 1B
PUBLIC PARKING SUPPLY AND DEMAND - NORTH SECTION OF THE CBD

	Inventory	Thursday, November 17, 2011				
		10:00 A.M.	12:00 P.M.	2:00 P.M.	4:00 P.M.	6:00 P.M.
Northeast Quadrant						
On-Street Parking	166	106	144	131	116	128
Public Parking Lots	<u>66</u>	<u>58</u>	<u>66</u>	<u>66</u>	<u>66</u>	<u>45</u>
Subtotal	232	164	210	197	182	173
Northwest Quadrant						
On-Street Parking	100	55	60	61	55	74
Public Parking Lots	<u>274</u>	<u>198</u>	<u>184</u>	<u>200</u>	<u>181</u>	<u>124</u>
Subtotal	374	253	244	261	236	198
Total						
On-Street Parking	266	161	204	192	171	202
Public Parking Lots	<u>340</u>	<u>256</u>	<u>250</u>	<u>266</u>	<u>247</u>	<u>169</u>
Total	606	417	454	458	418	371

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Table 2

CHANGE IN TRAFFIC VOLUMES WITH TWO-WAY ROADWAY SYSTEM

Roadway Segment	Morning Peak Hour			Evening Peak Hour		
	Existing Traffic Volume	Projected Traffic Volume	Change	Existing Traffic Volume	Projected Traffic Volume	Change
Pennsylvania Avenue	460	310	-150	640	365	-275
Forest Avenue	291	130	-161	408	150	-258
Crescent Boulevard	501	320	-181	528	385	-143
Main Street	520	585	+65	578	705	+127

Table 3

CAPACITY ANALYSIS - EXISTING TRAFFIC CONDITIONS

Intersection	Morning Peak Hour		Evening Peak Hour	
	Level of Service	Delay (seconds)	Level of Service	Delay (seconds)
Main Street/Pennsylvania Avenue ^{1,2}	C	15.5	C	19.6
Main Street/Crescent Boulevard ³	A	n.a.	A	n.a.
Main Street/Duane Street ³	A	n.a.	B	n.a.
Main Street/Hillside Avenue ¹	A	9.9	B	12.5
Main Street/Phillips Avenue ⁴	B	13.1	B	14.7
Forest Avenue/Anthony Street ¹	A	7.4	A	7.7
Forest Avenue/Pennsylvania Avenue ^{1,2}	B	10.1	B	13.5
Forest Avenue/Crescent Boulevard ⁵	A	7.8	A	8.1
Forest Avenue/Hillside Avenue ⁴	A	9.4	A	9.6

¹All-way stop controlled intersection. Represents operations of intersection as a whole.

²All-way stop sign controlled intersections can only be evaluated with two-lane approaches. As such, the three-lane approaches at these intersections were assumed to have two lanes.

³Given that three of the four legs are under stop sign control, the estimated delay at this intersection cannot be determined. The operation of the intersection is based on a volume to capacity (V/C) evaluation.

⁴Two-way stop controlled intersection. Represents operation of east-west movements under stop control.

⁵Represents operation of eastbound free flow left-turn movement.

Table 4
 CAPACITY ANALYSIS - FUTURE TRAFFIC CONDITIONS

Intersection	Morning Peak Hour		Evening Peak Hour	
	Level of Service	Delay (seconds)	Level of Service	Delay (seconds)
Redistributed Existing Traffic Volumes and Road Modifications				
Main Street/Pennsylvania Avenue ¹	C	15.4	C	19.4
Main Street/Crescent Boulevard ²	A	n.a.	B	n.a.
Forest Avenue/Pennsylvania Avenue ¹	A	8.3	A	8.9
Forest Avenue/Crescent Boulevard ¹	A	8.3	A	8.5
Redistributed Year 2030 Traffic Volumes and Road Modifications				
Main Street/Pennsylvania Avenue ¹	C	22.1	D	30.2
Main Street/Crescent Boulevard ²	A	n.a.	C	n.a.
Forest Avenue/Pennsylvania Avenue ¹	A	8.7	A	9.4
Forest Avenue/Crescent Boulevard ¹	A	8.6	A	8.9

¹All-way stop controlled intersection. Represents operations of intersection as a whole.

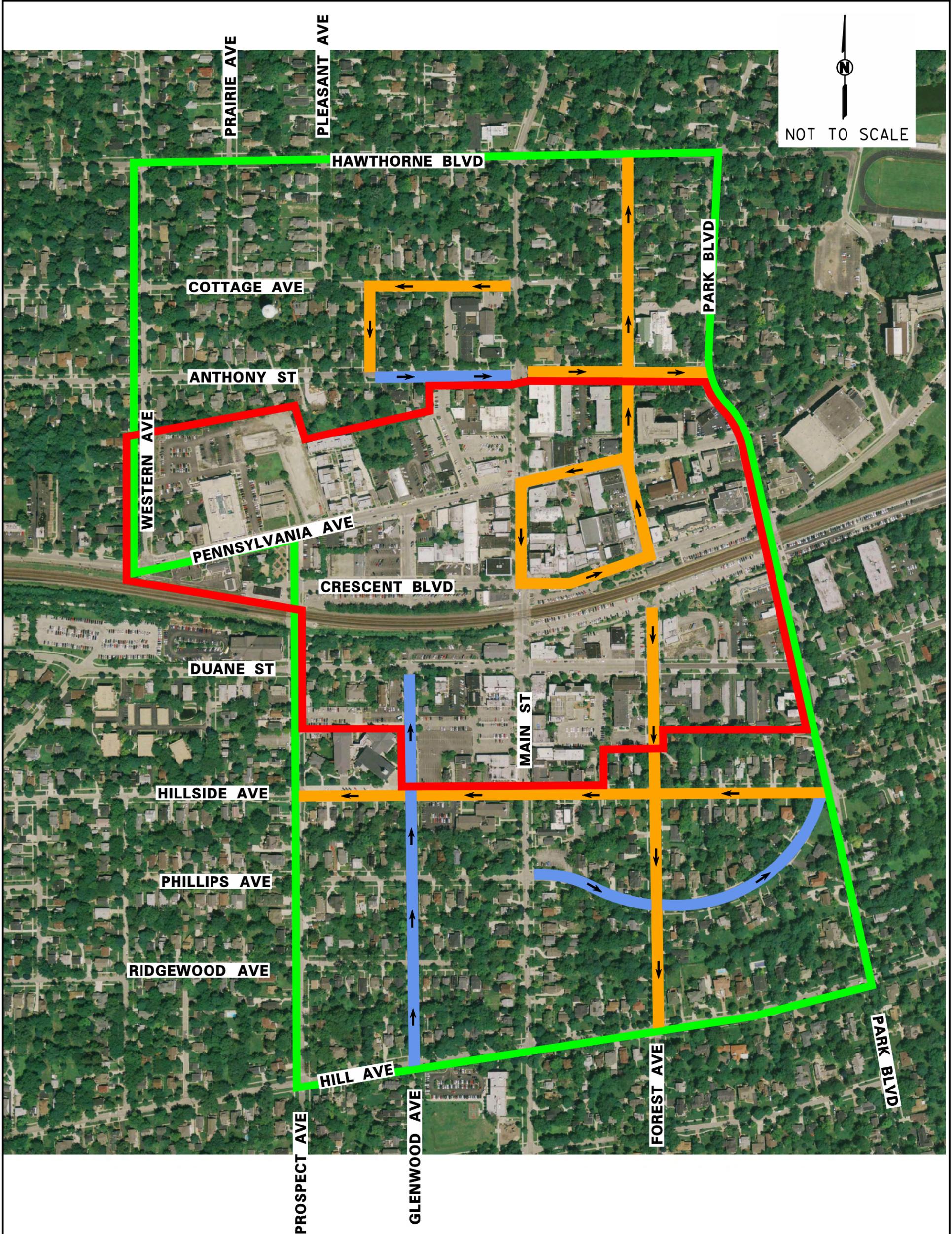
²Given that three of the four legs at this intersection are under stop sign control, the estimated delay at this intersection cannot be determined. The operation of the intersection is based on a volume to capacity (V/C) ratio.

Table 5
 CHANGES IN THE NUMBER OF ON-STREET PARKING SPACES

Street Section	Existing On-Street Parking Spaces	Proposed On-Street Parking Spaces	Increase or Decrease
Main Street between Pennsylvania Avenue and Crescent Boulevard	26	18	-8
Forest Avenue between Pennsylvania Avenue and Crescent Boulevard	14	16	+2
Pennsylvania Avenue between Main Street and Forest Avenue	17	19	+2
Crescent Boulevard between Main Street and Forest Avenue	<u>43</u>	<u>34</u>	<u>-9</u>
Sub-Total	100	87	-13
Duane Street between Main Street and Forest Avenue	<u>29</u>	<u>42</u>	<u>+13</u>
Total	129	129	0

Table 6
CHARACTERISTICS OF PERMANENT ONE-WAY ROADS

Road	Road Classification	CBD Road	Traffic Volume	Road Width	On-Street Parking	Land-Uses
Hillside between Park and Prospect	Neighborhood Collector Road	Yes	1,010 and 1,520	20 to 28 feet	One Side	Commercial Residential Institutional
Forest between Duane and Hillside	Local Road	Yes	450	20 feet	One-side	Commercial Institutional
Forest between Hillside and Hill	Local Road	No	450	20 feet	One-side	Residential
Forest between Pennsylvania and Anthony	Local Road	Yes	1,180	24 feet	One-side	Commercial Residential
Forest between Anthony and Hawthorne	Local Road	No	1,180	20 feet	One-side	Residential
Anthony between Main and Park	Local Road	No	n.a.	24 feet	One Side	Residential Institution
Cottage between Main and Pleasant	Local Road	No	n.a.	20 feet	One Side	Residential Institution
Pleasant between Cottage and Anthony	Local Road	No	n.a.	20 feet	One Side	Residential



LEGEND

- ONE-WAY STREET
- ONE-WAY STREET (SUNDAY ONLY)
- STUDY AREA BOUNDARY
- CENTRAL BUSINESS DISTRICT (WITHIN STUDY AREA)

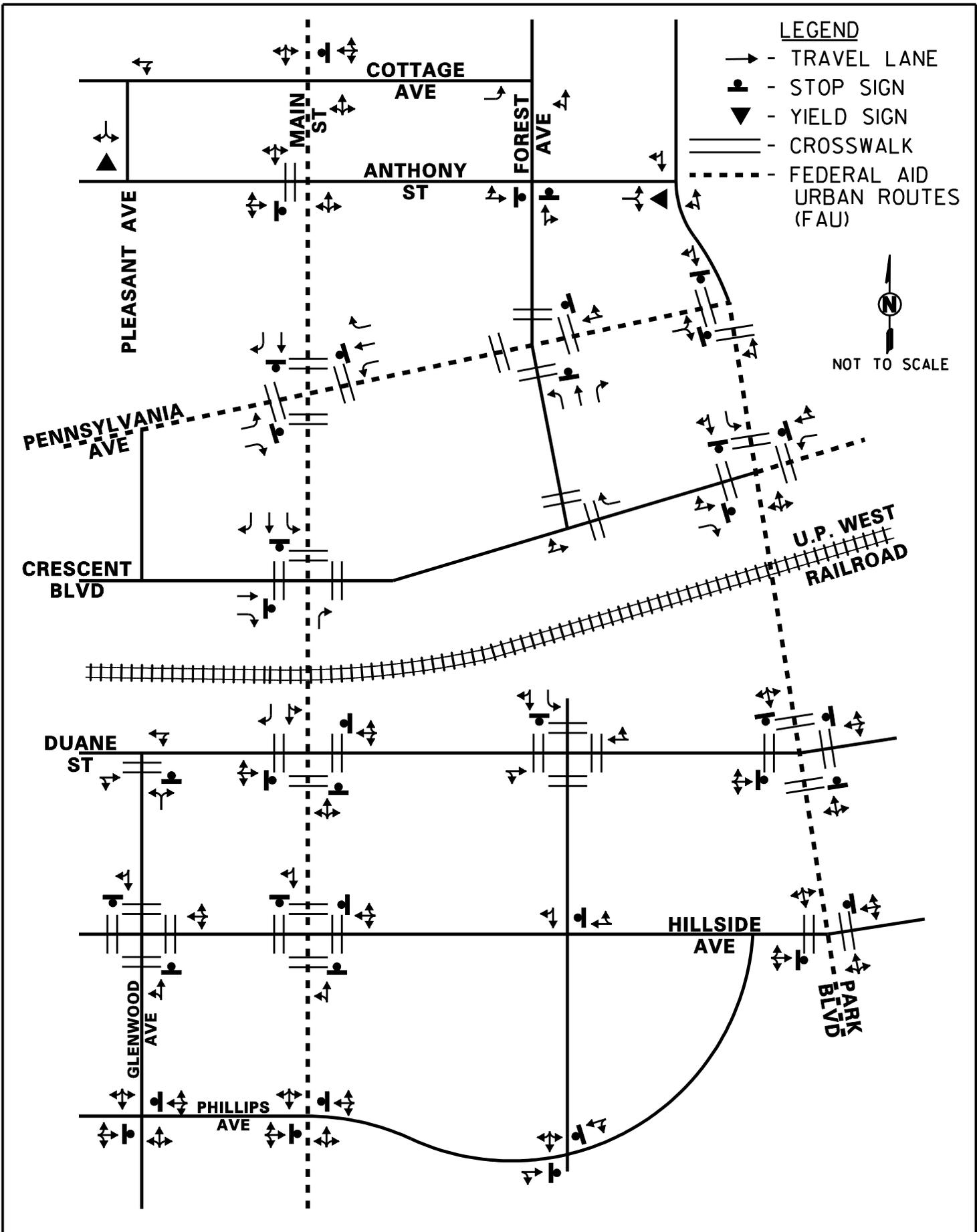
PROJECT: CENTRAL BUSINESS DISTRICT TRAFFIC STUDY GLEN ELLYN, ILLINOIS

TITLE: STUDY AREA AND ONE-WAY STREETS

PROJECT NO: 10-125



FIGURE NO: 1



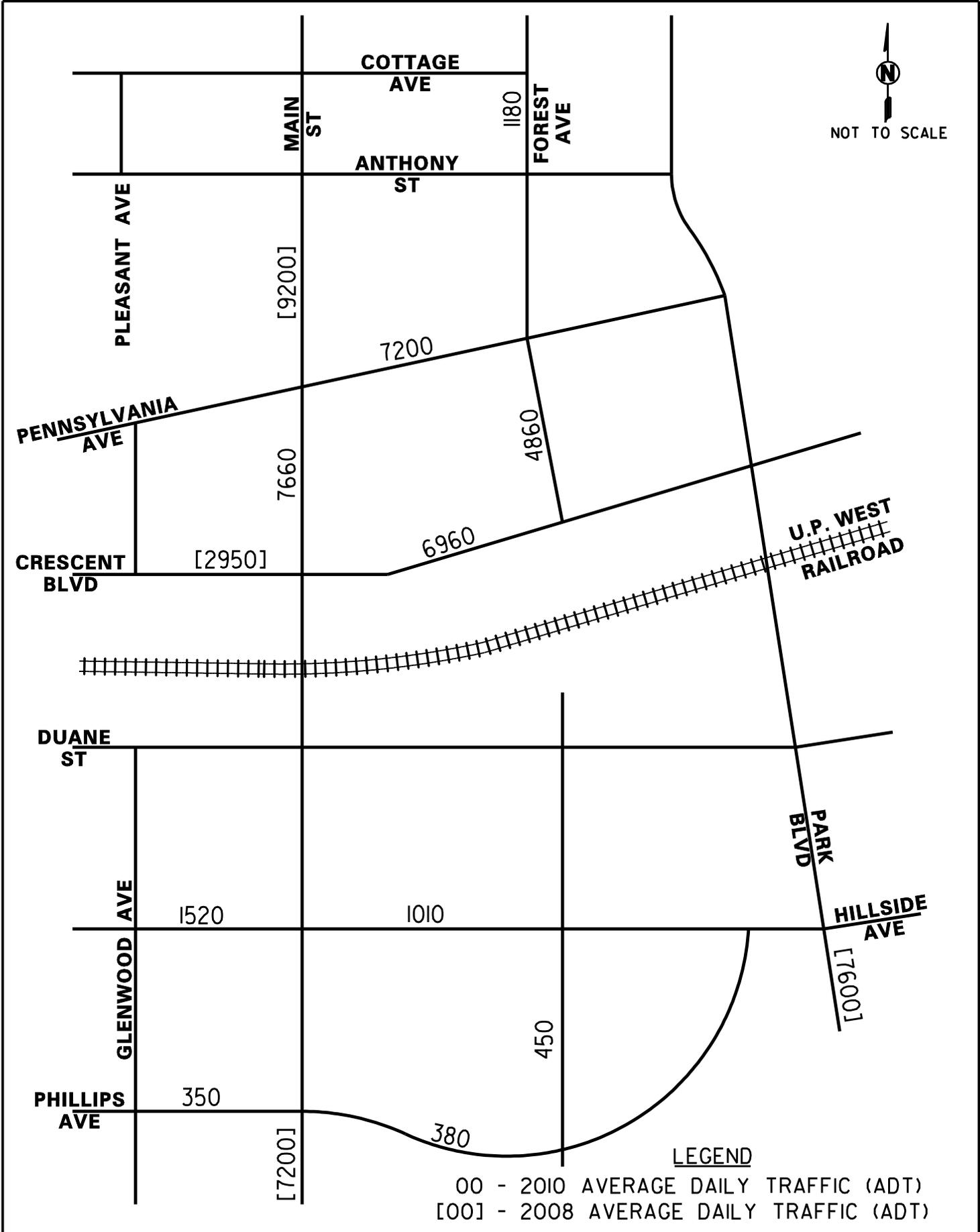
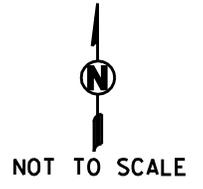
PROJECT:
 CENTRAL BUSINESS DISTRICT
 TRAFFIC STUDY
 GLEN ELLYN, ILLINOIS

TITLE:
 EXISTING ROADWAY CONDITIONS

PROJECT NO: 10-125

KLOA **WALKER**
 PARKING CONSULTANTS

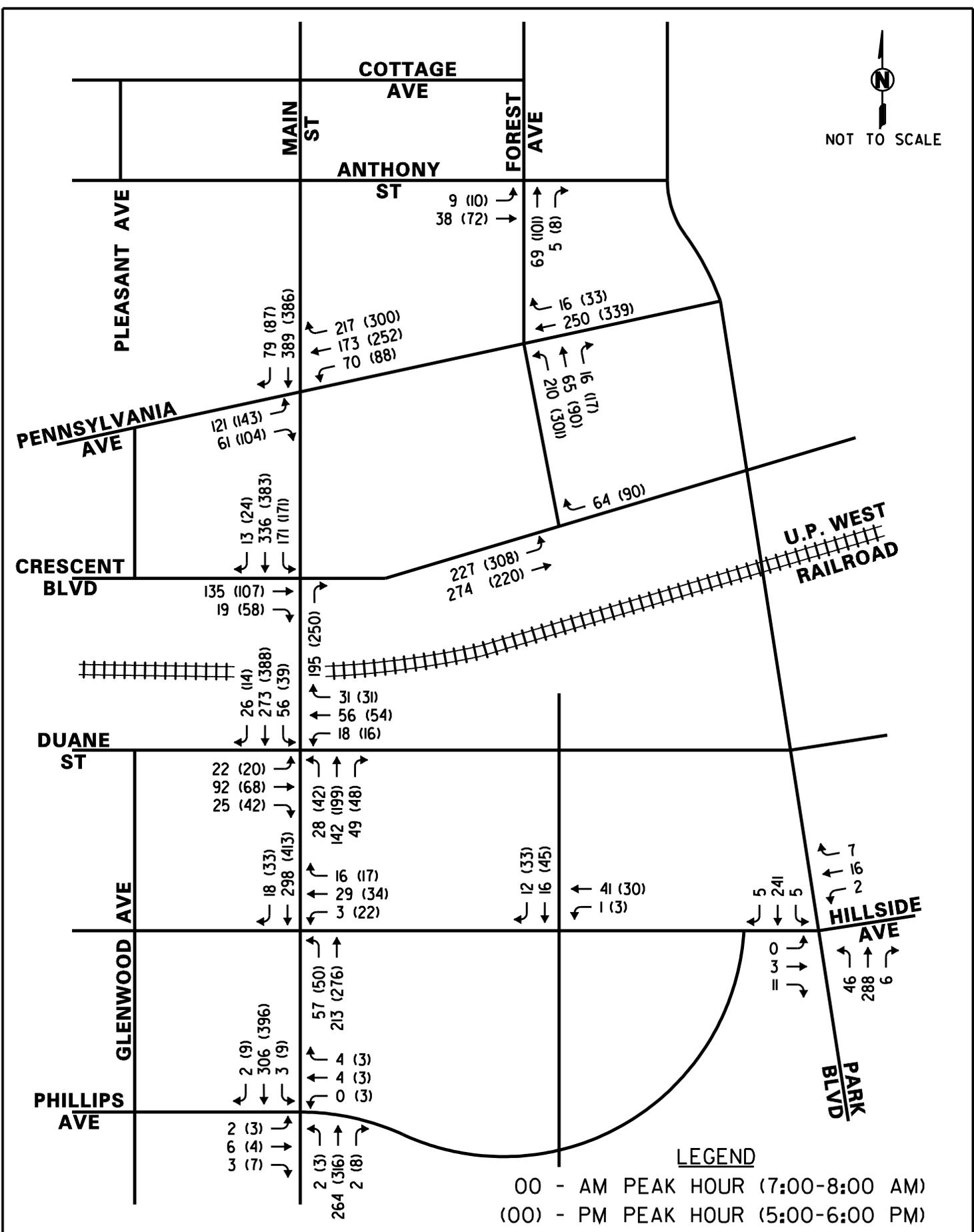
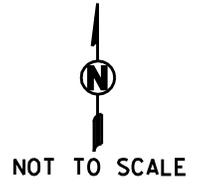
FIGURE NO: 2



PROJECT:
 CENTRAL BUSINESS DISTRICT
 TRAFFIC STUDY
 GLEN ELLYN, ILLINOIS

TITLE:
 EXISTING DAILY TRAFFIC
 VOLUMES

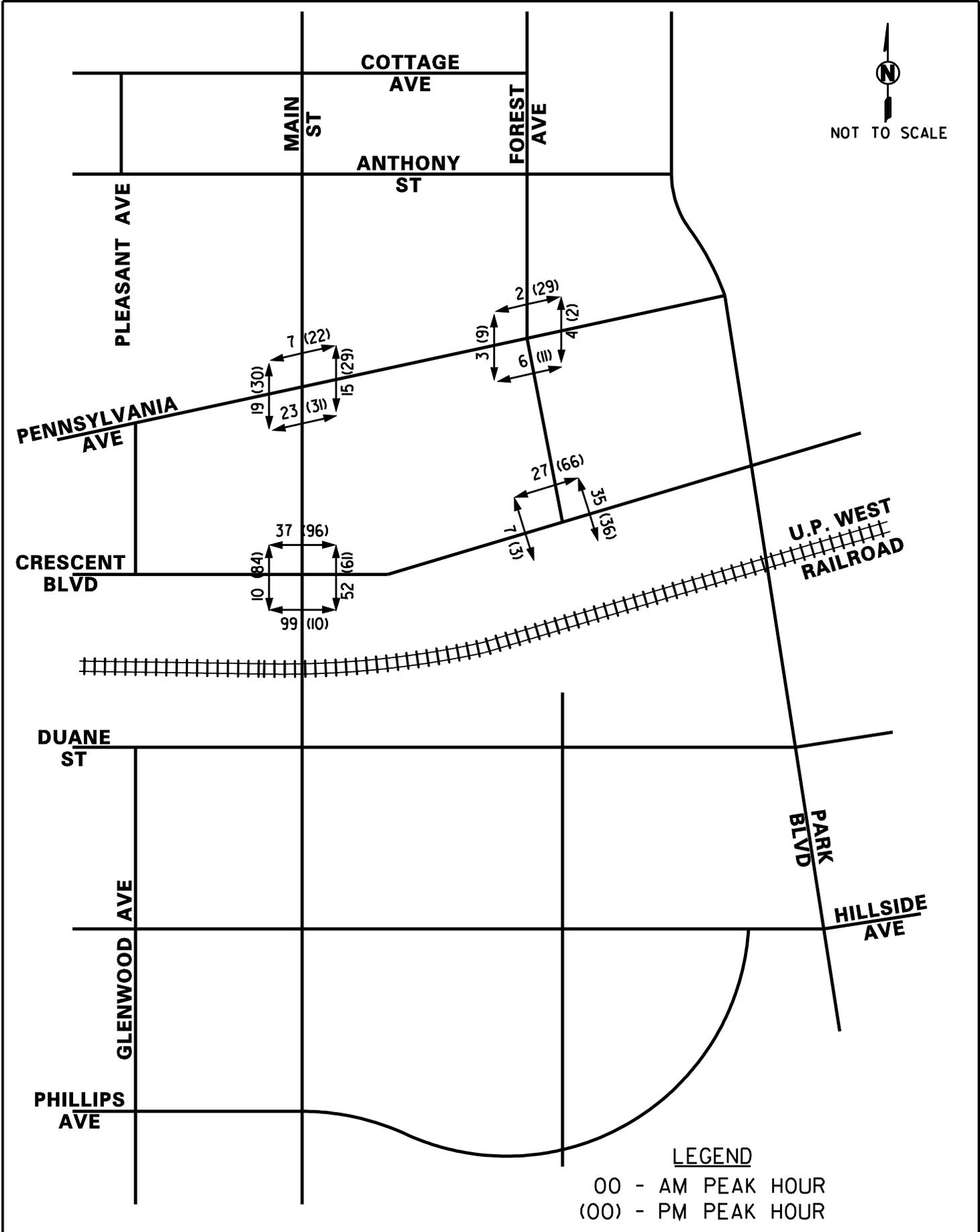
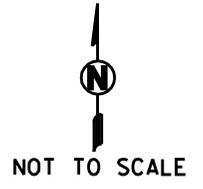
PROJECT NO: 10-125
FIGURE NO: 3



PROJECT:
 CENTRAL BUSINESS DISTRICT
 TRAFFIC STUDY
 GLEN ELLYN, ILLINOIS

TITLE:
 EXISTING PEAK HOUR
 TRAFFIC VOLUMES

PROJECT NO: 10-125
WALKER
 PARTNERSHIP CONSULTANTS
FIGURE NO: 4

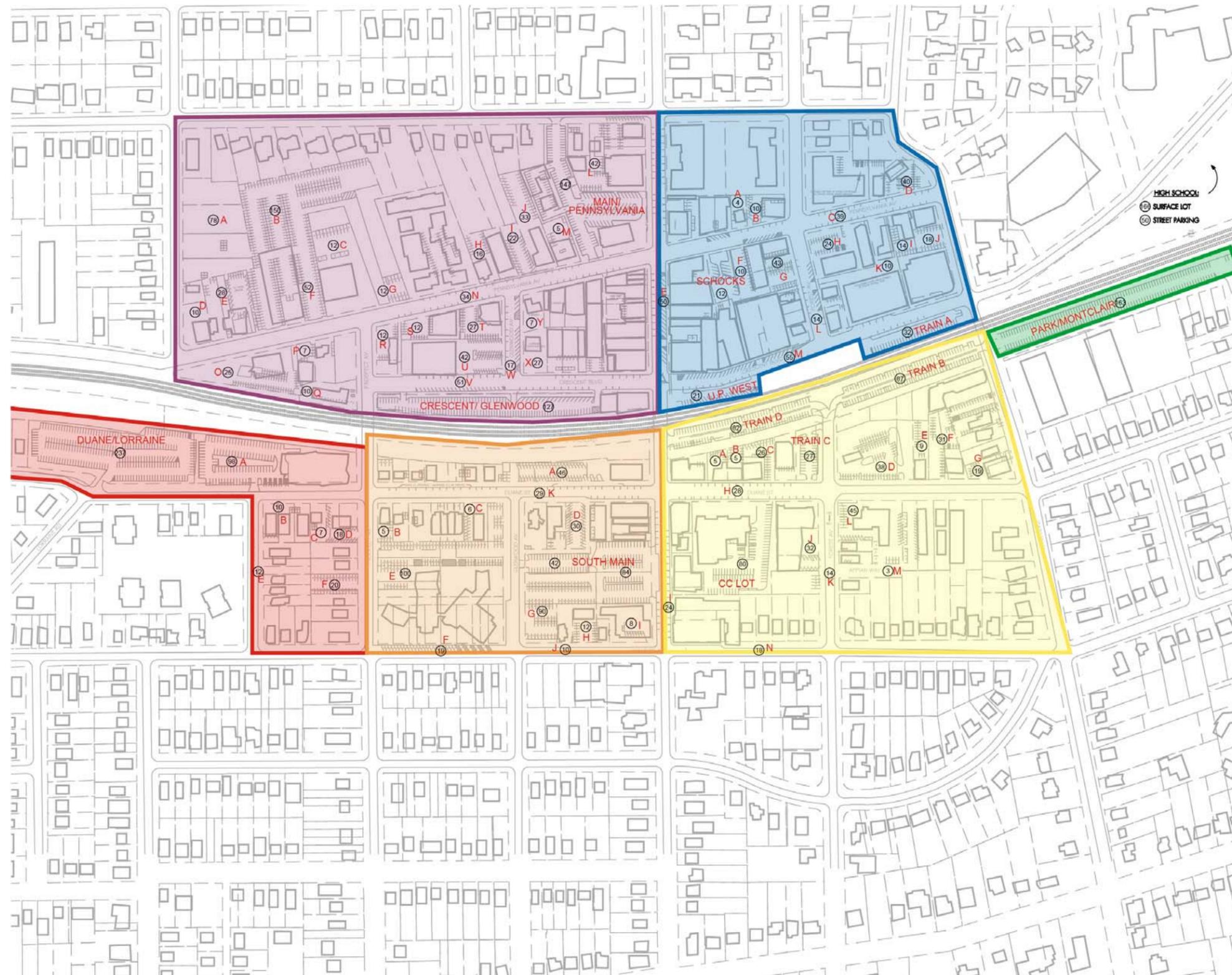


LEGEND

00 - AM PEAK HOUR
 (00) - PM PEAK HOUR

<p>PROJECT: CENTRAL BUSINESS DISTRICT TRAFFIC STUDY GLEN ELLYN, ILLINOIS</p>	<p>TITLE: EXISTING PEDESTRIAN VOLUMES</p>	<p>PROJECT NO: 10-125</p> <p>KLOAN  WALKER TRAFFIC CONSULTANTS</p> <p>FIGURE NO: 5</p>
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Parking Inventory



OVERALL SITE

PUBLIC SPACES =	1,099
BUSINESS SPACES =	1,723
STREET SPACES =	414
TOTAL SPACES =	3,236

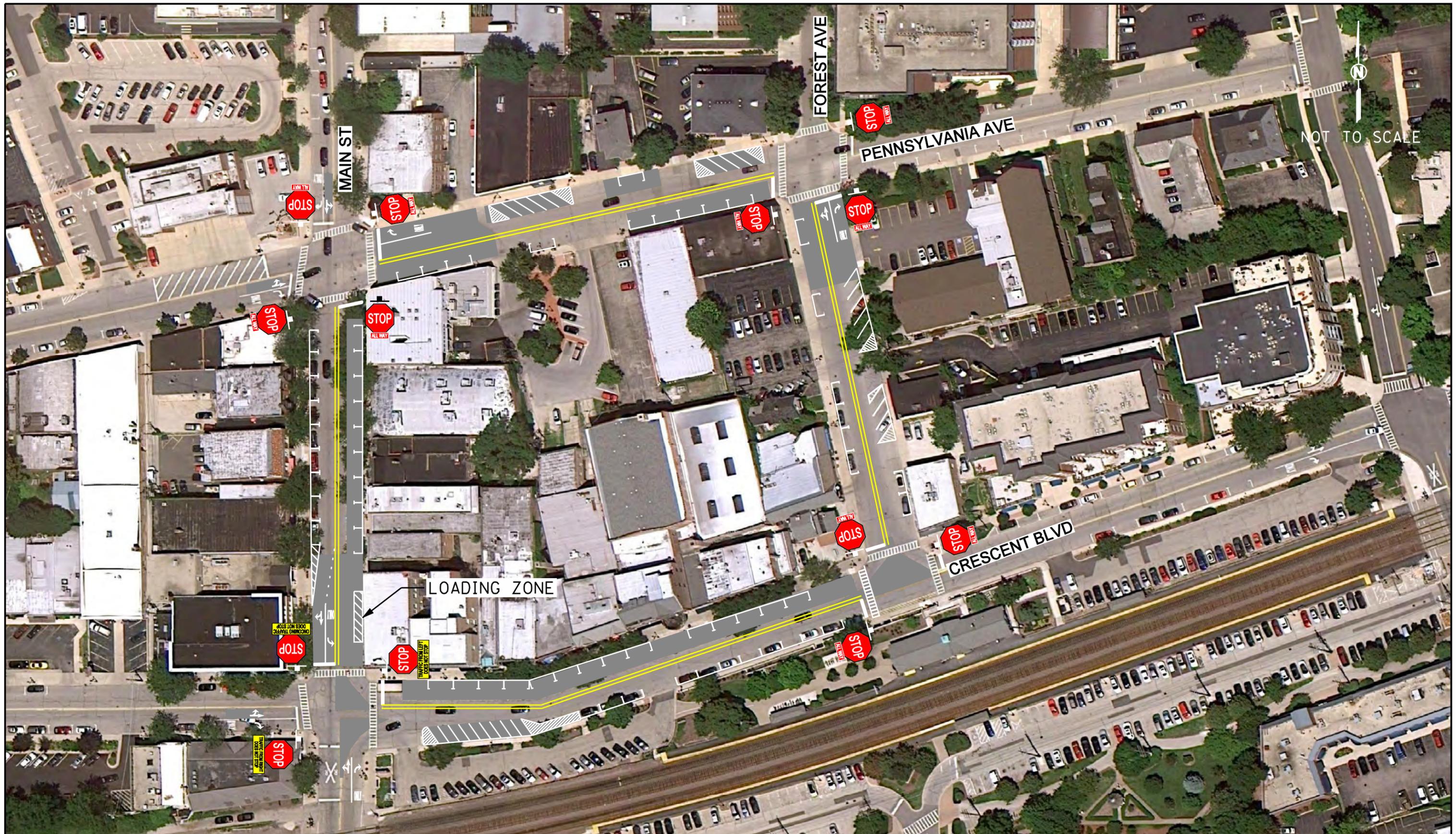


Village of Glen Ellyn
Downtown Strategic
Plan

April 6, 2008



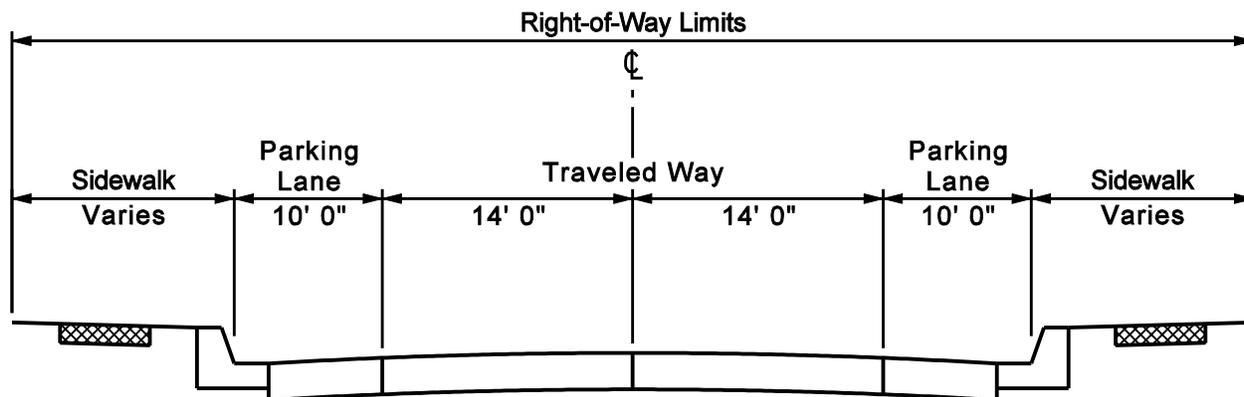
FIGURE 6



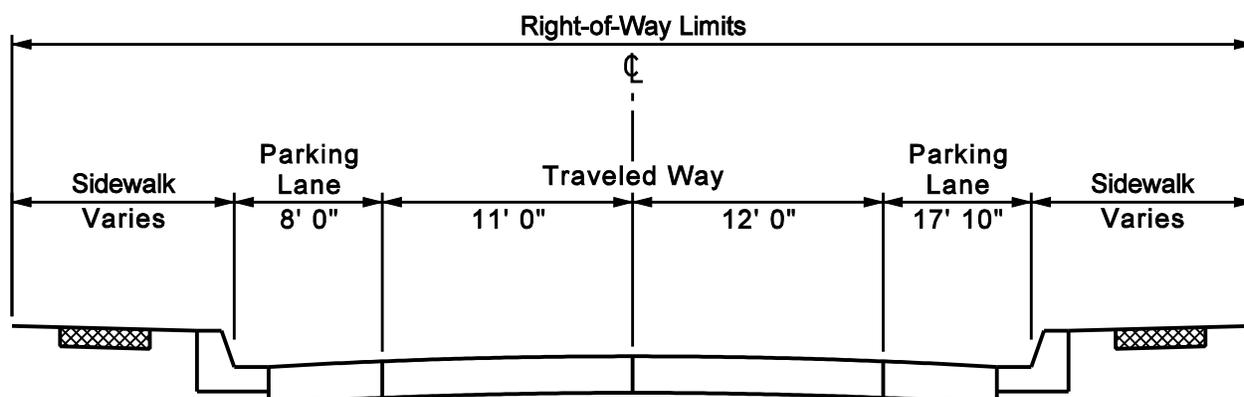
PROJECT:
 CENTRAL BUSINESS DISTRICT
 TRAFFIC STUDY
 GLEN ELLYN, ILLINOIS

TITLE:
 TWO-WAY ROADWAY SYSTEM

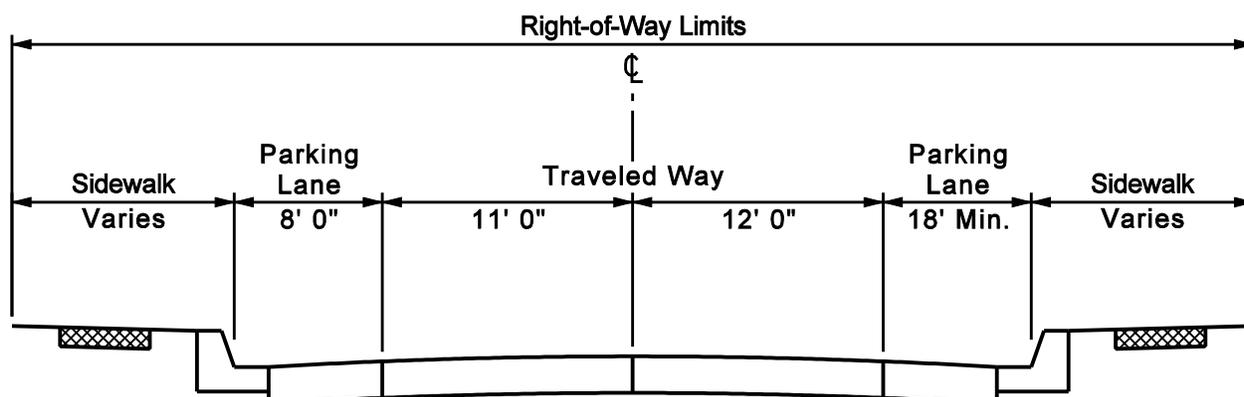
PROJECT NO: 10-125
 
 FIGURE NO: 7



**Main Street Cross Section
Pennsylvania Avenue to Crescent Boulevard**



**Forest Avenue Cross Section
Pennsylvania Avenue to Crescent Boulevard**



**Pennsylvania Avenue Cross Section
Forest Avenue to Main Street**

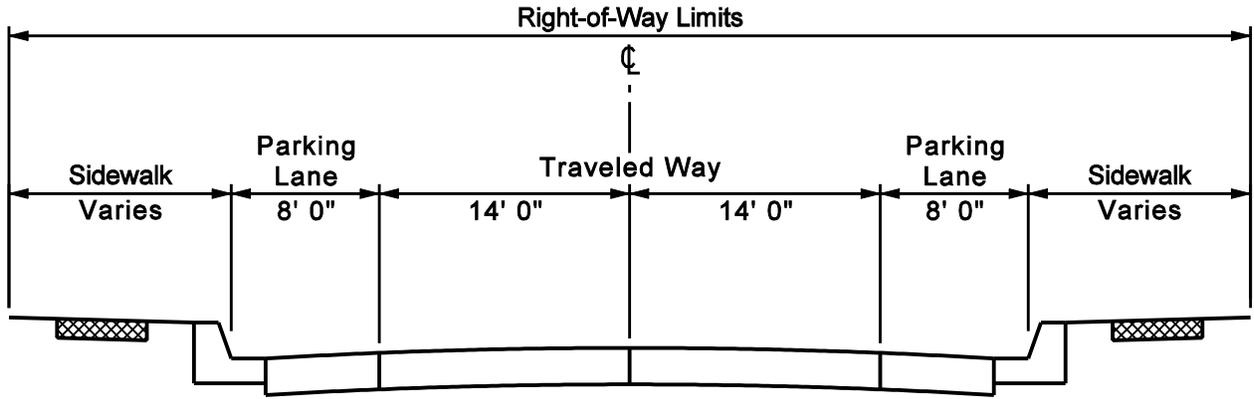
PROJECT:
CENTRAL BUSINESS DISTRICT
TRAFFIC STUDY
GLEN ELLYN, ILLINOIS

TITLE:
TWO-WAY ROADWAY
SYSTEM CROSS SECTIONS

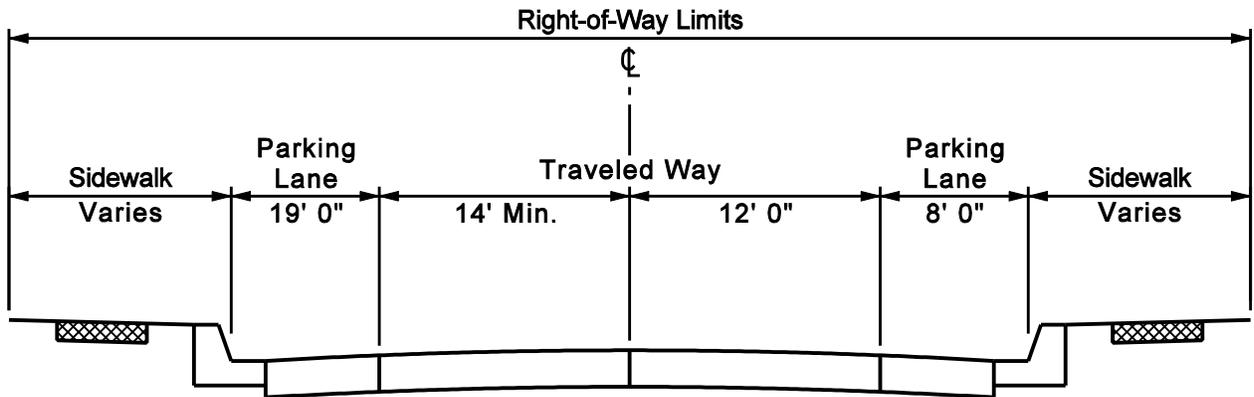
PROJECT NO: 10-125



FIGURE NO: 8A



**Crescent Boulevard Cross Section
West of Forest Avenue**



**Crescent Boulevard Cross Section
East of Main Street**

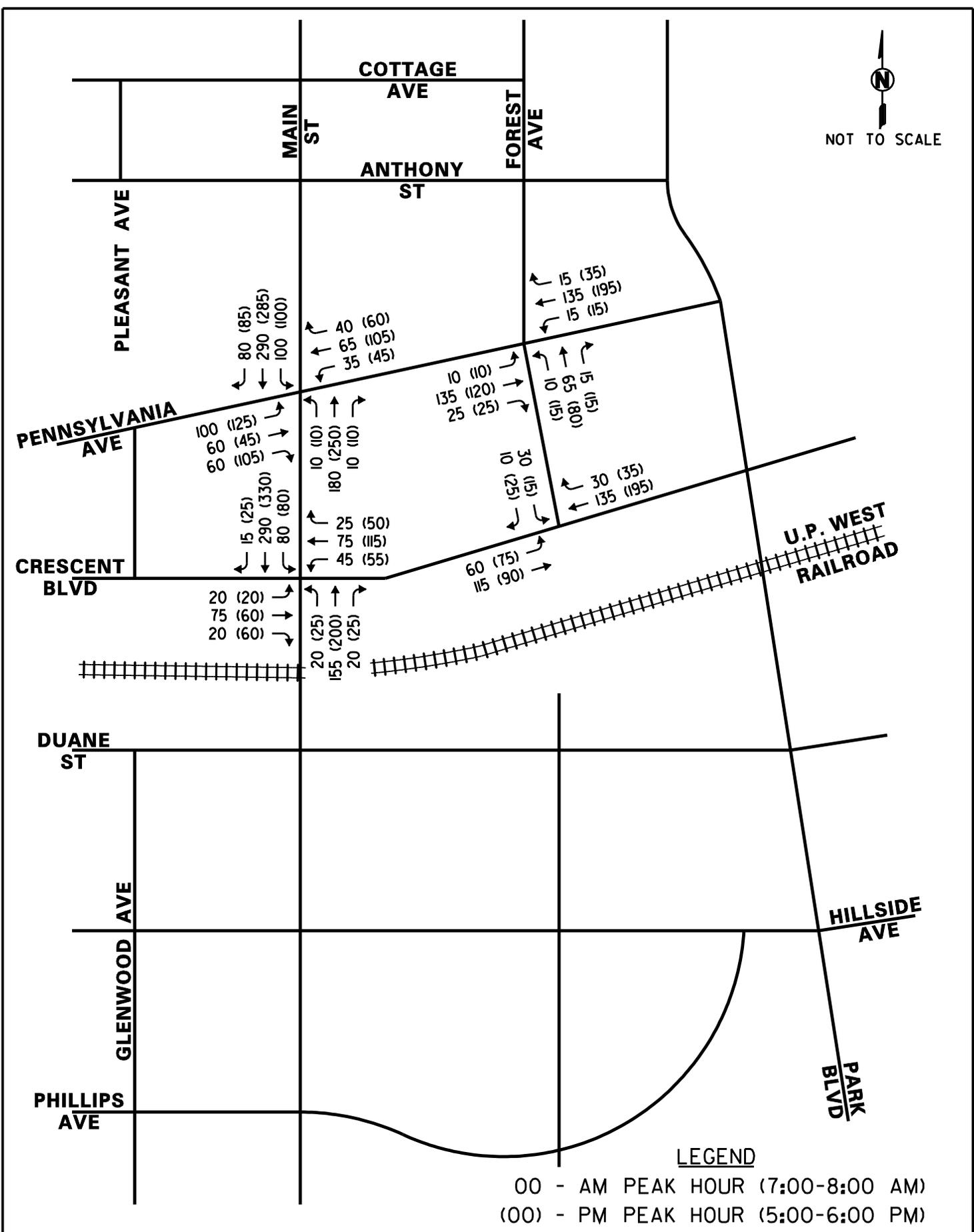
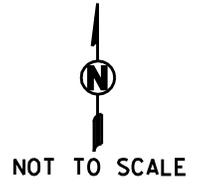
PROJECT:
CENTRAL BUSINESS DISTRICT
TRAFFIC STUDY
GLEN ELLYN, ILLINOIS

TITLE:
TWO-WAY ROADWAY
SYSTEM CROSS SECTIONS

PROJECT NO: 10-125



FIGURE NO: 8B

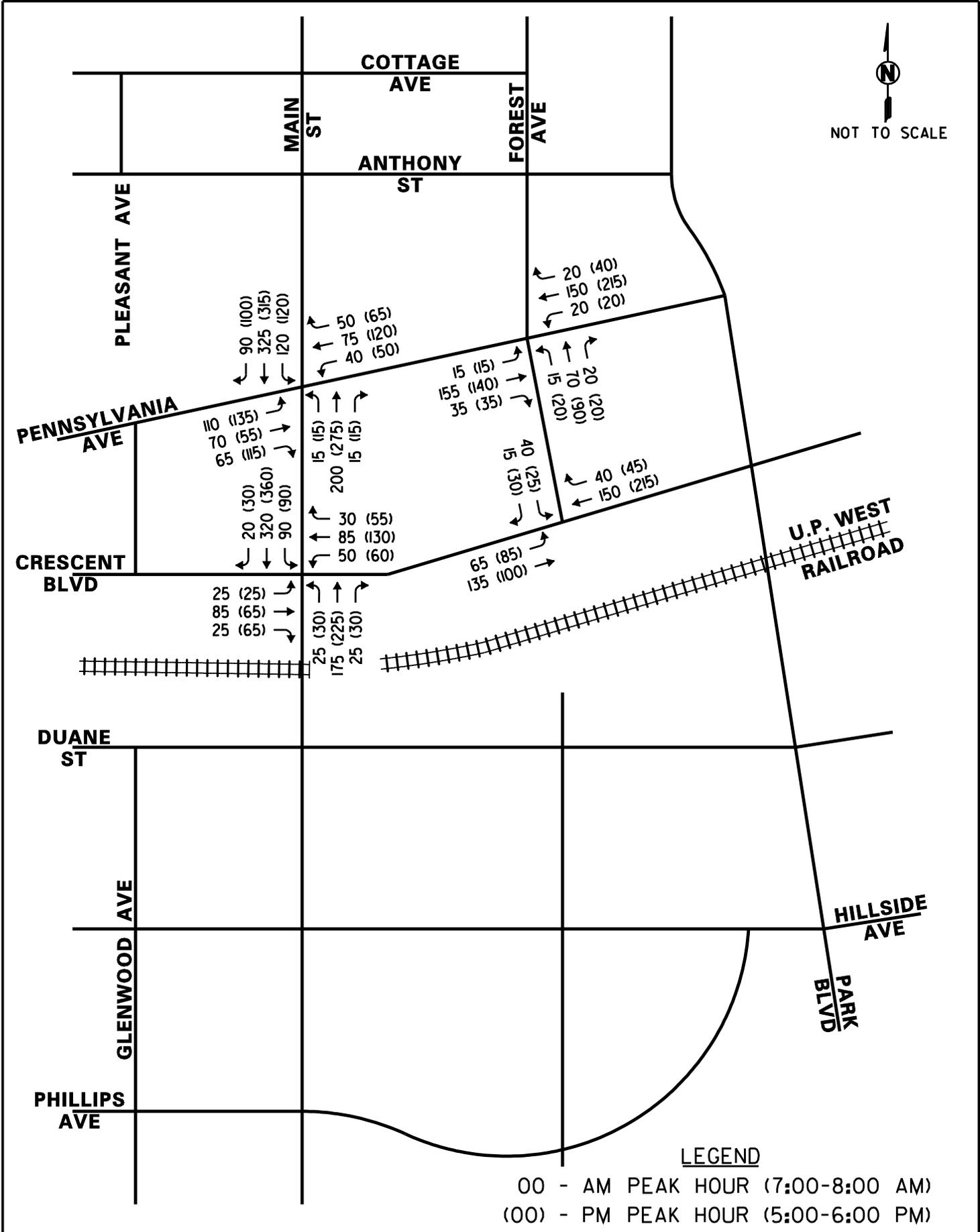
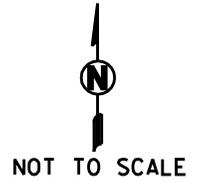


PROJECT:
 CENTRAL BUSINESS DISTRICT
 TRAFFIC STUDY
 GLEN ELLYN, ILLINOIS

TITLE:
 REDISTRIBUTED
 EXISTING PEAK HOUR
 TRAFFIC VOLUMES

PROJECT NO: 10-125

FIGURE NO: 9



LEGEND

00 - AM PEAK HOUR (7:00-8:00 AM)
 (00) - PM PEAK HOUR (5:00-6:00 PM)

<p>PROJECT: CENTRAL BUSINESS DISTRICT TRAFFIC STUDY GLEN ELLYN, ILLINOIS</p>	<p>TITLE: REDISTRIBUTED YEAR 2030 PEAK HOUR TRAFFIC VOLUMES</p>	<p>PROJECT NO: 10-125</p> <p>FIGURE NO: 10</p> 
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DUANE ST

MAIN ST

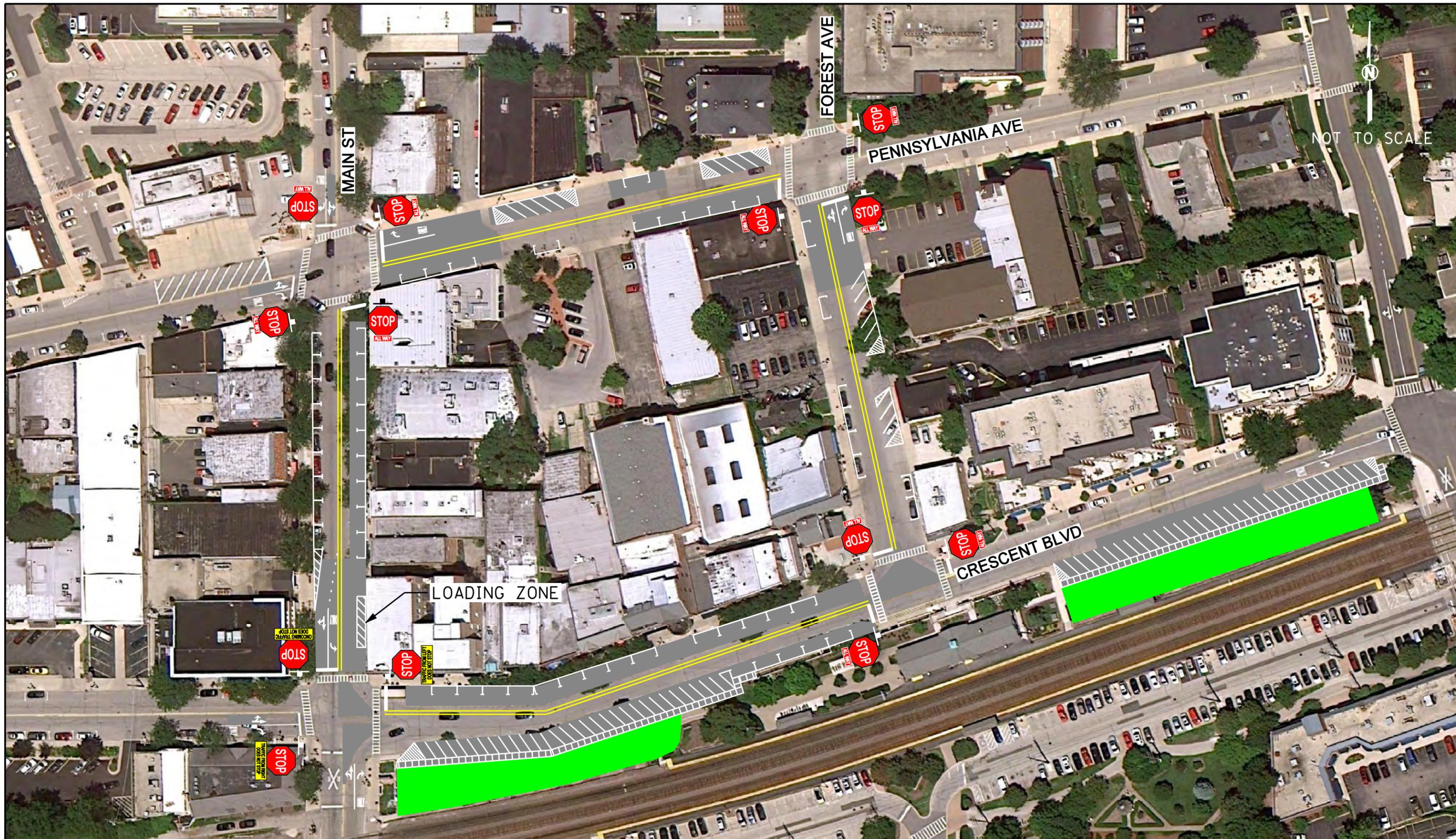
FOREST AVE

NOT TO SCALE

PROJECT:
CENTRAL BUSINESS DISTRICT
TRAFFIC STUDY
GLEN ELLYN, ILLINOIS

TITLE:
DUANE STREET MODIFIED ON-STREET PARKING PLAN

PROJECT NO: 10-125
KLOA **WALKER**
PARKING CONSULTANTS
FIGURE NO: II



PROJECT:
CENTRAL BUSINESS DISTRICT
TRAFFIC STUDY
GLEN ELLYN, ILLINOIS

TITLE:
TWO-WAY ROADWAY SYSTEM
(WITH REDEVELOPMENT OF PARKING LOTS
ADJACENT TO RAILROAD TRACKS)

PROJECT NO: 10-125


 FIGURE NO: 12