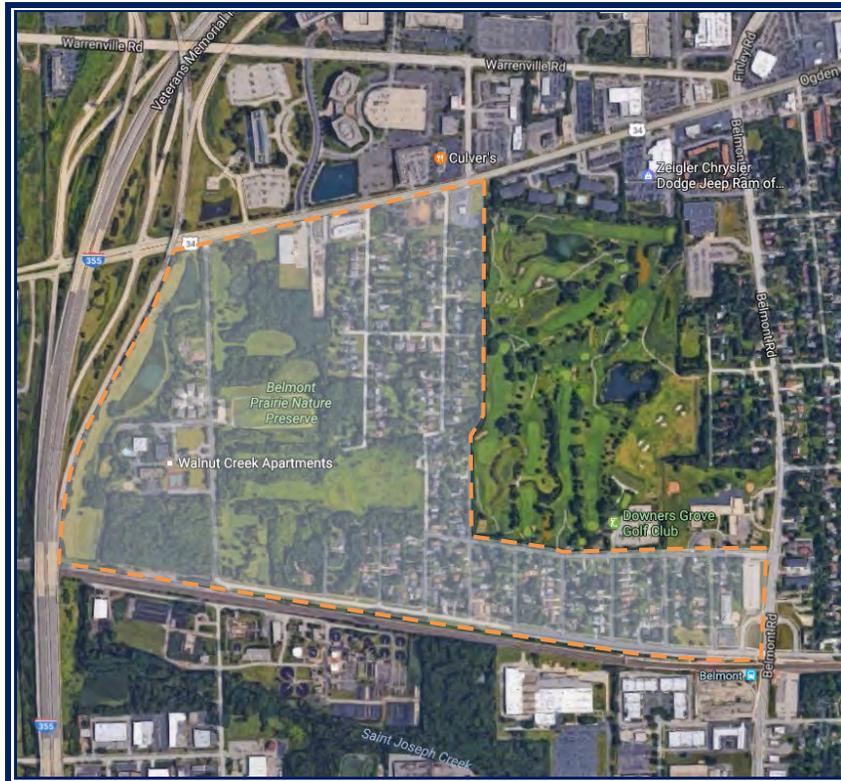


Neighborhood Traffic Study Area Number 5

Downers Grove, Illinois



Prepared for:



Village of Downers Grove

Submitted by:



Kenig, Lindgren, O'Hara, Aboona, Inc.

April 2017

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Rosemont, Illinois

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1.

Introduction

The Village of Downers Grove has retained Kenig, Lindgren, O’Hara, Aboona, Inc. (KLOA, Inc.) to conduct the neighborhood traffic study in Area Number 5. Overall, the objective of the study was to thoroughly examine the existing operations within the neighborhood, identify operational deficiencies, and recommend modifications and/or improvements to enhance both vehicular and pedestrian operations. In addition, this included addressing the primary traffic concerns within a neighborhood, vehicular volume, vehicular speed, and overall vehicular and pedestrian safety.

Located on the western border of the Village, the neighborhood is generally bounded by Ogden Avenue, Henry Puffer Elementary School, and the Downers Grove Golf Club on the north, Belmont Road and the Downers Grove Golf Club on the east, Burlington Avenue on the south, and Walnut Avenue on the west. The neighborhood has 10 north-south roads and five east-west roads. Primarily consisting of single-family homes, the neighborhood also contains Henry Puffer Elementary School, Downers Grove Golf Club, Belmont Prairie Natural Preserve, and several parks. In addition, the Belmont Metra train station is located in the southeast quadrant of the neighborhood and commercial uses are located along the north end of the neighborhood. **Figure 1** shows the location of the neighborhood (all of the figures for this study are provided in the Appendix).

2. Existing Neighborhood Conditions

Transportation conditions were inventoried to obtain a database for evaluating the existing operations within the neighborhood and along the roadways bordering the neighborhood. The components of existing conditions that were inventoried within the neighborhood included the following:

- Existing land uses
- Physical and operating characteristics of the roadways (i.e., number of lanes, speed limits, traffic control, etc.)
- Existing traffic control devices
- Existing pedestrian and bicycle facilities
- Existing daily traffic volumes and vehicle speeds
- Existing morning and evening peak hour volumes

Study Area and Existing Land Uses

The neighborhood is generally bounded by Ogden Avenue, Henry Puffer Elementary School, and the Downers Grove Golf Club on the north, Belmont Road and the Downers Grove Golf Club on the east, Burlington Avenue on the south, and Walnut Avenue on the west. Located along the western boundary of the Village, single-family homes are the predominant land use within the neighborhood with some commercial and office land uses located along Ogden Avenue. The neighborhood contains Henry Puffer Elementary School, which is located in the northwest quadrant of the Belmont Road/Haddow Avenue intersection, and the Belmont Prairie Nature Preserve and Walnut Park, which are located in the western portion of the neighborhood. In addition, the Belmont Metra train station and a parking lot for the train station are located in the southeast portion of the neighborhood. Finally, the Downers Grove Golf Club is located adjacent to the neighborhood with access provided via Haddow Avenue.

Existing Roadway System

The two external roadways that border the neighborhood are described below.

Ogden Avenue (U.S. Route 34) is a northeast-to-southwest road that is under the jurisdiction of the Illinois Department of Transportation (IDOT). It has a five-lane cross section with a posted speed limit that varies from 35 mph to 40 mph. Traffic signal control is provided at its intersections with Belmont Road, Cross Street, and the I-355 ramps. IDOT classifies Ogden Avenue as a major arterial.

Belmont Road is a north-south roadway that is under the jurisdiction of the DuPage County Division of Transportation (DuDOT). In general, Belmont Road has a four-lane cross section and a posted speed limit of 35 mph. Separate left-turn lanes are provided on Belmont Road at its signalized intersections with Ogden Avenue, Prairie Avenue, and Haddow Avenue. Belmont Road has a grade-separated intersection with Burlington Avenue. IDOT classifies Belmont Road as a minor arterial.

Internal Neighborhood Roadways

Excluding Ogden Avenue and Belmont Road, the following summarizes the physical and operating characteristics of the neighborhood roadways.

- All of the neighborhood roads provide one lane in each direction.
- All of the roadways within the neighborhood are classified as local roads except Walnut Avenue and Burlington Avenue, which are classified as collector roads.
- Parking is generally provided on one or both sides of the roadways except Rose Avenue, Western Avenue, and the western section of Burlington Avenue. However, parking restrictions are provided on many of the roadways. In addition, perpendicular commuter parking is provided along the south side of the eastern section of Burlington Avenue.
- The posted speed limit within the neighborhood is 25 miles per hour with 20 mph school and park zone speed limits except Walnut Avenue and Burlington Avenue, which have a posted speed limit of 30 mph.

Figure 2 illustrates the number of lanes and posted speed limits on each of the roadways and the geometrics at the primary intersections. **Figure 3** shows the parking restrictions in the neighborhood.

Pedestrian and Bicycle Facilities and Traffic Control Devices

The neighborhood contains Henry Puffer Elementary School, Downers Grove Golf Club, Belmont Prairie Nature Preserve, Walnut Park, and the Belmont Metra train station. In order to accommodate the neighborhood pedestrian and bicycle activity, a number of facilities and traffic control devices are provided in the neighborhood. These are illustrated in **Figure 4** and highlighted below:

- Burlington Avenue between Belmont Road and Cross Street and Cross Street are designated bike routes.
- Dedicated school crossings are provided at the intersections of Belmont Road with Prairie Avenue and Haddow Avenue with Puffer Road.
- School zones with warning signs and reduced speed limits are located along Belmont Road and Haddow Avenue within proximity to Henry Puffer Elementary School.
- School crossing guards are stationed at the Belmont Road with Prairie Avenue intersection.
- A dedicated pedestrian crossing is provided at the intersection of Haddow Avenue with Edward Avenue and the Downers Grove Golf Club access drive.
- All of the traffic signals provide pedestrian signals.
- Sidewalks are provided on at least one side of all the following roadways:
 - Burlington Avenue
 - Haddow Avenue
 - Puffer Road
 - Chase Avenue
 - Edward Avenue

In order to determine the pedestrian activity around the school, pedestrian counts were conducted at the intersection of Belmont Road with Haddow Avenue. The counts were conducted in November 2016 from 7:00 A.M. to 9:00 A.M. and from 2:00 P.M. to 4:00 P.M. Figure 4 also illustrates the results of the pedestrian traffic counts.

Existing Intersection Traffic Control

Figure 5 shows the existing intersection traffic control within the neighborhood and the following provides a summary of the existing traffic control at the 28 intersections within the neighborhood:

- One intersection is under traffic signal control
- Two intersections are under all-way stop sign control
- Nine intersections are under two-way or one-way stop sign control
- One intersection has two of the three legs under stop sign control
- Fifteen intersections have no intersection traffic control

Existing Daily Traffic Volumes and Speed Surveys

In order to determine the existing traffic volumes and speeds along the neighborhood roadways, KLOA, Inc. conducted daily machine traffic counts and speed surveys at 20 locations. Of the total traffic counts and speed surveys, 12 were conducted along the north-south roadways and eight were conducted along the east-west roadways. The KLOA, Inc. traffic counts and speed surveys were conducted during October 2016. All of the traffic counts and speed surveys were conducted for a minimum of two days and were broken down by direction and by hour.

Figure 6 shows the two-way daily traffic volumes and **Figure 7** shows the average and 85th percentile speeds observed on the roadways. The average speed is the sum of the observed speeds of all the vehicles divided by the total vehicles on that segment of the road. Average speeds are used to determine the speeds at which motorists are typically traversing a roadway section, whereas the 85th percentile speed represents the speed at or below which 85 percent of vehicles on a roadway section travel under free flow conditions. The 85th percentile speed is commonly used to establish the posted speed limits along roadways.

Existing Morning and Evening Peak Period Traffic Volumes

In addition to the daily traffic counts and speed surveys, KLOA, Inc. conducted manual peak period traffic counts at the following intersections within the study area:

- Cross Street with Ogden Avenue
- Cross Street with Haddow Avenue
- Haddow Avenue with Belmont Road
- Haddow Avenue with Puffer Road and the Henry Puffer Elementary School access drive

The traffic counts were conducted in November 2016 during the morning (6:00 A.M. to 9:00 A.M.) and evening (3:00 P.M. to 6:00 P.M.) peak periods. **Figure 8** illustrates the existing morning and evening peak hour traffic volumes.

3.

Evaluation of Existing Conditions

To determine how the roadway system is currently functioning, KLOA, Inc. examined the existing operating characteristics within the neighborhood. The purpose of this evaluation was to identify and quantify the current operations and ascertain how the neighborhood's infrastructure and land uses contribute to the existing conditions. This was accomplished by reviewing and analyzing the existing traffic volumes and the speed surveys as well as the physical characteristics of the neighborhood and its transportation system. This evaluation provides the basis to thoroughly analyze and develop recommendations pertaining to the operation and design of the internal roadways.

Daily Traffic Volumes

From **Figure 6**, it can be seen that the collector roads (Walnut Avenue and Burlington Avenue) carry the highest volume of traffic. This is expected given that collector roads link the local neighborhood roads and land uses to the external or arterial roadway system. Further, the collector roads generally extend the length of the neighborhood and serve many homes and other land uses within the neighborhood. In addition, the eastern section of Haddow Avenue carries a higher volume of traffic which is due in part to the fact that it provides access to Henry Puffer Elementary School, the Downers Grove Golf Club, and the commuter parking lot.

Residential Streets, Third Edition^a indicates that local residential roads have a daily volume between 400 and 1,500 vehicles while residential collector roads have a daily volume exceeding 1,500 vehicles. Therefore, even with the characteristics outlined above, the traffic volumes within the neighborhood are generally within the established standards for residential roads. Overall, given the various non-residential land uses in the neighborhood, the traffic volumes are relatively low.

^a *Residential Streets*, Third Edition was developed by the National Association of Home Builders (NAHB), the American Society of Civil Engineers (ASCE), the Institute of Transportation Engineers (ITE), and the Urban Land Institute (ULI).

A review of the existing traffic volumes as well as the roadway system's physical and operating conditions indicates that the neighborhood is likely experiencing some limited cut-through traffic along Walnut Avenue, Burlington Avenue, and to a lesser extent along Haddow Avenue and Cross Street. The cut-through traffic can be attributed to the congestion along Ogden Avenue and its intersection with Belmont Road. However, as indicated previously, the traffic volumes in the neighborhood are low and well within the established standards for residential roads.

Travel Speed Surveys

The main factors affecting travel speeds are the roadway's physical and operating characteristics including width of road, number of travel lanes, hills, curves, roadway surface, and length of free-flow conditions. Many of these attributes are fixed within the neighborhood's infrastructure and are generally difficult and/or costly to change.

Excluding Walnut Avenue and Burlington Avenue which have 30 mph posted speed limits, the internal neighborhood roads had an observed average speed of approximately 20 mph and an observed 85th percentile speed of approximately 26 mph. As shown in **Figure 7**, the average speeds on the roads with a posted 25 mph speed limit were generally between 14 and 29 mph. A number of the surveyed road sections did experience 85th percentile speeds that exceeded the posted speed limit by five mph and were primarily observed along the collector roads and those roadway sections that had longer lengths of free-flow conditions. The speed surveys show that the following roadways had 85th percentile speeds that exceeded the posted speed limit by five mph:

- Walnut Avenue
- Burlington Avenue
- Haddow Avenue
- Dressel Road

4.

Detailed Evaluation and Recommendations

This section of the study provides the detailed evaluation of the internal roadways, pedestrian and bicycle facilities, and traffic control devices within the neighborhood and included a thorough analysis of traffic operations, vehicular and pedestrian/bicycle circulation, and overall safety along the internal neighborhood roadways. Recommendations were developed for the following components of the neighborhood transportation system:

- Intersection Traffic Control Devices
- Pedestrian and Bicycle Facilities

In addition, a number of traffic calming measures and/or tools were identified that can be used to effectively reduce the operating speeds and traffic volumes in the neighborhood.

The recommendations developed in this section were based primarily on accepted engineering practices, conformity with the 2009 *Manual on Uniform Traffic Control Devices* (MUTCD), existing Village criteria, and the input from Village staff. The MUTCD defines the standards used to install and maintain traffic control devices, including all signs, signals, markings, and other devices used to regulate, warn, or guide traffic on all public streets, highways, bikeways, and private roads open to public traffic. While the MUTCD provides guidelines with specific benchmarks, many of the criteria are subjective and are left to engineering judgment and practices.

Intersection Traffic Control

Development of the intersection traffic control plan involves a comprehensive evaluation of each intersection along with the existing overall operating conditions of the neighborhood (see Chapter 3). Any intersection traffic control plan must consider typical neighborhood issues, such as functional classifications, cut-through traffic, speeding, traffic calming, neighborhood circulation, and land-use impacts. As such, a systematic approach was employed that examined the neighborhood from the inside (each individual intersection) and outside (the overall neighborhood). It is important to note that to increase the level of standardization and consistency of the neighborhood traffic control, the Village has requested that traffic signal control or some form of stop sign control generally be provided at all of the neighborhood intersections.

The first step consisted of evaluating the physical and operating conditions of each intersection to determine if they meet any of the MUTCD warrants/requirements that control the installation of all-way stop sign control. The second step was to determine which road of the one-way and two-way controlled intersections is to be under stop sign control. **Figure 9** illustrates the proposed traffic control plan which is presented below.

All-Way Stop Sign Controlled Intersections

The following points summarize the all-way stop sign control warrants/requirements as outlined in the MUTCD:

1. Meets the minimum traffic and pedestrian volume
2. Meets the minimum number of intersection crashes
3. Required to control left-turn conflicts
4. Required to control vehicle/pedestrian conflicts
5. Required due to poor intersection sight distance
6. Required to improve traffic operational characteristics of the intersection of two collector roads with similar design and operating characteristics

The characteristics of each intersection were evaluated to verify whether the existing operations met any of the warrants and/or requirements that control the installation of an all-way stop sign control. It has been determined that the following intersections should be under all-way stop sign control:

- *Warren Avenue with the Belmont Road West Ramp.* This intersection should continue to operate under all-way stop sign control as it is the intersection of a collector roadway and the ramp from an arterial road.
- *Warren Avenue with the Belmont Road East Ramp.* This intersection should be converted to all-way stop sign control, given that it is an intersection of a collector roadway and the ramp from an arterial road.

- *Haddow Avenue with Cross Street.* This intersection should continue to operate under all-way stop sign control to maintain this established location and to reduce the uninterrupted flow along Cross Street.
- *Haddow Avenue with Edward Avenue and the Downers Grove Golf Club Access Drive.* This intersection should be converted to all-way stop sign control, given the uninterrupted flow along Haddow Avenue as well as the pedestrian activity in proximity to the intersection.

Two-Way/One-Way Stop Sign Controlled Intersections

Once the all-way stop sign control intersections were identified, it was assumed that all of the other intersections were to be controlled via one-way (T-intersections) or two-way (four-legged intersections) stop sign control. The criteria used in determining which road of an intersection should be under stop sign control were based on the following:

1. The guidelines provided in the MUTCD.
2. Minimizing the uninterrupted flow along the local road by providing, if possible, a stop sign at every other cross road along the local roads.
3. If possible, maintaining which road is currently under traffic control (via either yield sign or stop sign) at each intersection in order to minimize the change in the flow of traffic through the neighborhood.

New Two-Way Stop Sign Controlled Intersections

New two-way stop sign control should be provided at the following intersections:

- *Cross Street with Indianapolis Avenue and Drendel Road with Indianapolis Avenue.* Both of these intersections currently operate with no intersection traffic control. The Indianapolis Avenue approaches should be under stop sign control at both intersections.
- *Francisco Avenue with Haddow Avenue.* This intersection currently operates with no intersection traffic control. The Francisco Avenue approaches should be under stop sign control at this intersection.

Proposed One-Way Stop Sign Controlled Intersections

The following T-intersections currently have no control and should be converted so the minor approaches are under stop sign control:

- *Rose Avenue with Haddow Avenue and Rose Avenue with Burlington Avenue.* The Rose Avenue approaches should be under stop sign control at both intersections.
- *Western Avenue with Haddow Avenue and Western Avenue with Burlington Avenue.* The Western Avenue approaches should be under stop sign control at both intersections.
- *Chase Avenue with Haddow Avenue and Chase Avenue with Burlington Avenue.* The Chase Avenue approaches should be under stop sign control at both intersections.
- *Edward Avenue with Burlington Avenue.* The Edward Avenue approach should be under stop sign control at this intersection.
- *Francisco Avenue with Burlington Avenue.* The Francisco Avenue approach should be under stop sign control at this intersection.
- *Cross Street with Burlington Avenue.* The Cross Street approach should be under stop sign control at this intersection.
- *Drendel Road with Burlington Avenue.* The Drendel Road approach should be under stop sign control at this intersection.
- *Granville Avenue with Burlington Avenue.* The Granville Avenue approach should be under stop sign control at this intersection.
- *Walnut Avenue with Provence Court.* The Provence Court approach should be under stop sign control at this intersection.

Finally, Cross Street currently has an S-curve in its alignment that has limited sight distance and a narrow cross section. As such, to provide for a safer and more orderly flow of traffic through the S-curve, stop signs should be installed along both legs of the S-curve.

Summary of Recommended Intersection Traffic Control Plan

Table 1 provides a summary of the intersection traffic control modifications and **Table 2** provides a comparison of the existing and recommended traffic control within the neighborhood. Under the recommended plan, 28 of the 28 intersections will be under either traffic signal control or some form of stop sign control. This is an improvement over existing conditions where 15 intersections have no intersection traffic control.

Table 1

RECOMMENDED INTERSECTION TRAFFIC CONTROL MODIFICATIONS

Modifications	Intersections
Convert two-way stop sign control to all-way stop sign control	<ul style="list-style-type: none"> Haddow Avenue at Edward Avenue and Downers Grove Golf Club Access Drive
Convert intersection with two of three legs under stop sign control to all-way stop sign control	<ul style="list-style-type: none"> Burlington Avenue with Belmont Road East Ramp
Add two-way stop sign control at intersections with no intersection traffic control	<ul style="list-style-type: none"> Drendel Road at Indianapolis Avenue (Stop sign control on Indianapolis Ave.) Cross Street at Indianapolis Avenue (Stop sign control on Indianapolis Ave.) Haddow Avenue at Francisco Avenue (Stop sign control on Francisco Avenue)
Add one-way stop sign control at intersections with no intersection traffic control	<ul style="list-style-type: none"> Burlington Avenue at Chase Avenue Burlington Avenue at Edward Avenue Burlington Avenue at Western Avenue Burlington Avenue at Rose Avenue Burlington Avenue at Francisco Avenue Burlington Avenue at Cross Street Burlington Avenue at Drendel Road Burlington Avenue at Granville Avenue Haddow Avenue at Chase Avenue Haddow Avenue at Western Avenue Haddow Avenue at Rose Avenue Walnut Avenue at Provence Court
Add stop sign control along roadway	<ul style="list-style-type: none"> Cross Street S-Curve

Table 2
EXISTING AND RECOMMENDED INTERSECTION TRAFFIC CONTROL

	Existing Intersection Traffic Control	Recommended Intersection Traffic Control
Traffic Signal Control	1	1
All-Way Stop Sign Control	2	4
Two-Way/One-Way Stop Sign Control	9	23
Two of Three Legs Under Stop Sign Control	1	0
No Intersection Traffic Control	<u>15</u>	<u>0</u>
Total	28	28

Pedestrian and Bicycle Facilities and Traffic Control Devices

As discussed previously, the neighborhood contains several pedestrian- and bicycle-generating land uses, including the Belmont Metra train station, Henry Puffer Elementary School, Downers Grove Golf Club, Walnut Park, and Belmont Prairie Nature Preserve. In addition, the Downers Grove Park District is proposing a soccer complex in the northwest section of the neighborhood. As such, the neighborhood has a number of existing and proposed land uses that generate higher pedestrian and bicycle activity.

In addition to the standard pedestrian and bicycle facilities (i.e., sidewalks, crosswalks and bike routes), the neighborhood contains various traffic control devices associated with the non-residential land uses. The neighborhood has several dedicated school and pedestrian crossings and school zones, which include appropriate warning signs and reduced speed limits. In addition, the traffic signals at the intersections of Belmont Road with Haddow Avenue and Belmont Road with Prairie Avenue have countdown pedestrian signals. Overall, these traffic control devices are generally well distributed and located appropriately.

However, recommendations have been developed to further enhance the pedestrian and bicycle circulation and to ensure that the traffic control devices comply with the MUTCD. The proposed recommendations are illustrated in **Figure 10** and summarized below and in **Table 3**:

- Sidewalks are currently provided on one side of the following roads in the neighborhood:
 - North side and a portion of the south side of Burlington Avenue
 - North side of Haddow Avenue
 - West side of Edward Avenue
 - West side of Chase Avenue
 - East side of Puffer Avenue

To accommodate the neighborhood pedestrian activity, the Village should strive to install sidewalks or multi-use paths on at least one side of all the roads in the neighborhood. This is particularly critical given the narrow widths of many of the roads. To further enhance pedestrian and bicycle access to and from and circulation around the neighborhood as well as the nature preserve and the proposed soccer complex, the Village should explore whether sidewalks/multi-use paths can be provided through undeveloped Village right-of-ways and/or the nature preserve property.

- High visibility ladder style crosswalks should be installed at all of the existing and future pedestrian crossings within the neighborhood.
- An Advanced School Crossing Assembly should be installed along the eastbound direction of Haddow Avenue in advance of the existing school crossing at the intersection of Haddow Avenue with Puffer Road.
- Consideration should be given to installing sharrow markings along the two designated bike routes (Cross Street and Burlington Avenue between Belmont Road and Cross Street) in the neighborhood. Sharrow markings reinforce the shared-lane environment of posted bicycle routes where the road width cannot support dedicated bicycle lanes and/or where it is undesirable to eliminate on-street parking. Additionally, they alert road users of the lateral position that bicyclists are likely to occupy within the road to keep them out of the “door zone” of parked cars and in lanes that are too narrow for a motor vehicle and a bicycle to travel side-by-side within the same traffic lane. Further, they may reduce the number of bicyclists on the sidewalks and the additional guidance may reduce the number of bicyclists riding on the wrong side of the road.

- Consideration should be given to installing the following pedestrian enhancements at the Belmont Metra train station (see **Figure 11**) to improve pedestrian safety and increase the number of pedestrian crossings:
 - *Burlington Avenue with Belmont Road West Ramp.* A curb/sidewalk extension should be considered on the south side of the pedestrian crossing along the west leg of the intersection. The curb/sidewalk extension should extend the length of the perpendicular parking provided along the south side of Burlington Avenue. In addition, a high visibility ladder style crosswalk should be installed on the north leg of the intersection.
 - *Burlington Avenue with Belmont Road East Ramp.* Given that this intersection is proposed to operate under all-way stop sign control, consideration should be given to installing a pedestrian crossing on the west leg of the intersection. If installed, the pedestrian crossing should include a high visibility ladder style crosswalk and a curb/sidewalk extension on the south side of the crossing. The curb/sidewalk extension should extend the length of the perpendicular parking provided along the south side of Burlington Avenue. In addition, a high visibility ladder style crosswalk should be installed on the north leg of the intersection.

However, further studies should be conducted to determine any impacts the enhancements will have on the Belmont Metra train station and the feasibility of installing the enhancements.

- Consideration should be given to installing a pedestrian refuge island in the Belmont Road median serving the crosswalk along the south leg of the Belmont Road with Prairie Avenue intersection (see **Figure 12**). However, in order to accommodate the turning maneuver of a semi-trailer, the crosswalk and sidewalk ramps on the south leg of the intersection and the northbound stop bar would need to be relocated approximately 15 feet south of their current location. As such, a comprehensive study needs to be performed in order to determine the impacts and feasibility of installing the pedestrian refuge island and the other require intersection modifications. Further, any improvements will require the review and approval of DuDOT as they have jurisdiction over Belmont Road.

Table 3
 RECOMMENDED PEDESTRIAN AND BICYCLE FACILITIES AND TRAFFIC CONTROL
 ENHANCEMENTS

Enhancement	Location
Install sidewalks/multi-use path on at least one side of the neighborhood roads	<ul style="list-style-type: none"> • All of the neighborhood roads without sidewalks
Install ladder style crosswalks	<ul style="list-style-type: none"> • Burlington Avenue at Belmont Road West Ramp • Burlington Avenue at Belmont Road East Ramp • Burlington Avenue at Puffer Road • Burlington Avenue at Chase Avenue • Burlington Avenue at Edward Avenue • Burlington Avenue at Western Avenue • Burlington Avenue at Rose Avenue • Burlington Avenue at Francisco Avenue • Burlington Avenue at Cross Street • Burlington Avenue at Drendel Road • Burlington Avenue at Granville Avenue • Haddow Avenue at Puffer Elementary School Access Drive • Haddow Avenue at Downers Grove Golf Club Access Drive
Install Advanced School Crossing Assembly	<ul style="list-style-type: none"> • Haddow Avenue at Puffer Road
Install sharrow markings on designated bike routes	<ul style="list-style-type: none"> • Burlington Avenue between Belmont Road and Cross Street • Cross Street
Install curb/sidewalk extension (Only after comprehensive study is performed to determine impacts/feasibility)	<ul style="list-style-type: none"> • Burlington Avenue at Belmont Road West Ramp • Burlington Avenue at Belmont Road East Ramp
Install pedestrian refuge island (Only after comprehensive study is performed to determine impacts/feasibility)	<ul style="list-style-type: none"> • South leg of Belmont Road with Prairie Avenue intersection

Traffic Calming Measures

Speeding and cut-through traffic are generally two of the major concerns expressed by residents in any neighborhood. As discussed previously, the traffic volumes within the neighborhood are generally within an acceptable range for residential roads and consistent with traffic patterns on other neighborhood roads within the Village. Furthermore, the internal neighborhood roads generally had observed average speeds within one to two mph of the posted speed limit and observed 85th percentile speeds within five mph of the posted speed limit. Several of the roads did experience 85th percentile speeds that exceeded the speed limit by five mph or more. The higher 85th percentile speeds were primarily observed along those roadway sections that had longer lengths of free-flow conditions. As such, a review of the existing traffic volumes and speed surveys as well as the roadway system's physical and operating conditions indicates that the neighborhood is experiencing some higher travel speeds and cut-through traffic.

The recommended traffic control and striping modifications should help to mitigate the speeds and cut-through traffic in the neighborhood. If these measures are not completely successful, other measures and/or tools that can effectively reduce vehicle speeds and cut-through traffic include the following traffic calming measures:

- Enhanced speed limit signs that increase motorists' awareness
- Increased police enforcement
- Portable or permanent speed awareness systems such as electronic speed radar signs
- Pavement markings, edge lines, parking lanes, and bike lanes/sharrows that reduce the width of roadways
- Horizontal or vertical deflections (e.g. curb extensions and/or medians at intersections and midblock locations, traffic circles, raised crosswalks, chokers, neck-downs, and chicanes)

Table 4 provides a summary of these measures/devices and also shows how they can be implemented incrementally from measures/devices with lower costs and reduced design, coordination, and implementation efforts to measures/devices with higher costs and greater design, coordination, and implementation efforts.

Table 4
INCREMENTAL TRAFFIC CALMING MEASURES

Options	Examples
Level 1	
Regulatory Modifications	Speed Limit Reductions
Increased Police Presence/Enforcement	
Level 2	
Advisory Signing	Portable Speed Radar Signs, Enhanced Speed Limit Signs
Pavement Markings	Parking Lanes, Bike Lanes/Sharrows, Crosswalks, Edgelines
Level 3	
Horizontal Deflections	Curb Extensions, Medians, Traffic Circles, Chicanes, Chokers/Neck-Downs
Vertical Deflections	Raised Crosswalks, Speed Humps, Speed Tables, Speed Cushions

In addition, KLOA, Inc. examined locations that would be appropriate for traffic calming measures and developed traffic calming recommendations for the Village to consider. The review was only preliminary in nature and based on the existing traffic volumes, speed surveys, and roadway characteristics. Before any horizontal deflection measures are implemented, a thorough evaluation will need to be conducted to examine the impact of the measures/devices including emergency vehicle access and response times, diversion of traffic to other neighborhood roads, drainage impacts, costs, and long-term maintenance. The following outlines traffic calming measures that could be implemented along several of the neighborhood roads.

Burlington Avenue

Burlington Avenue is an east-west collector road that extends along the south end of the study area and has a grade-separated interchange with Belmont Road and serves the Belmont Metra train station. The road has one lane in each direction with perpendicular parking for the Belmont Metra train station provided on the south side of the road between Pershing Avenue and Rose Avenue. It is under all-way stop sign control at its intersection with the Belmont Road west ramp and is proposed to be under all-way stop sign control at its intersection with the Belmont Road east ramp. According to the daily traffic counts/speed surveys, Burlington Avenue had a daily traffic volume of 1,305 to 1,787 vehicles and 85th percentile speed of 34 to 39 mph. The following traffic calming measures should be considered along Burlington Avenue:

- *Center Line.* Refresh the existing center line and extend to Walnut Avenue to delineate the travel lanes and to give motorists the perception of a narrower roadway.

- *Speed Limit Signage/Markings.* Add additional speed limits signs, install yellow-framed speed limit signs, and/or install speed limit pavement markings to further reinforce the posted speed limit.
- *Speed Monitors and Police Enforcement.* Utilize portable electronic speed monitors and/or install permanent speed monitors to further reinforce the posted speed limit. In addition, enhance targeted police enforcement, particularly during the weekday morning (7:00-9:00 A.M.) and evening (4:00-7:00 P.M.) peak commuting hours.
- *Sharrow Markings.* Install sharrow markings along both directions of the road between Belmont Road and Cross Street to reinforce the shared-lane environment of the posted bicycle route.
- *Median Islands.* Install a median island along the sections with no on-street parking to give motorists the perception of a narrower roadway that will reduce travel speeds.

Walnut Avenue

Walnut Avenue is a north-south collector road that extends along the west end of the study area from Ogden Avenue to Burlington Avenue and serves Walnut Park and Belmont Prairie Nature Preserve. The road has one lane in each direction with parking permitted on both sides of the road. It is under stop sign control at its intersection with Ogden Avenue. According to the daily traffic counts/speed surveys, Walnut Avenue had a daily traffic volume of 1,298 to 1,747 vehicles and 85th percentile speed of 35 to 41 mph. The following traffic calming measures should be considered along Walnut Avenue:

- *Speed Limit Signage/Markings.* Add additional speed limits signs, install yellow-framed speed limit signs, and/or install speed limit pavement markings to further reinforce the posted speed limit.
- *Speed Monitors and Police Enforcement.* Utilize portable electronic speed monitors and/or install permanent speed monitors to further reinforce the posted speed limit. In addition, enhance targeted police enforcement, particularly during the weekday morning (7:00-9:00 A.M.) and evening (4:00-7:00 P.M.) peak commuting hours.
- *Median Islands.* Install one or more median islands to give motorists the perception of a narrower roadway that will reduce travel speeds. This would require the elimination of on-street parking within proximity to the median islands.

Haddow Avenue

Haddow Avenue is an east-west local road that extends between Belmont Road and Cross Street and provides access to Henry Puffer Elementary School and Downers Grove Golf Club. The road has one lane in each direction with parking generally permitted on both sides of the road. It is under traffic signal control at its intersection with Belmont Road and all-way stop sign control at its intersection with Cross Street. In addition, the road is recommended to be under all-way stop sign control at its intersection with Edward Avenue and the Downers Grove Golf Club access drive. According to the daily traffic counts/speed surveys, Haddow Avenue had a daily traffic volume of 491 to 1,503 vehicles and 85th percentile speed of 26-36 mph. The following traffic calming measures should be considered along Haddow Avenue:

- *Speed Limit Signage/Markings.* Add additional speed limits signs, install yellow-framed speed limit signs, and/or install speed limit pavement markings to further reinforce the posted speed limit.
- *Speed Monitors and Police Enforcement.* Utilize portable electronic speed monitors and/or install permanent speed monitors to further reinforce the posted speed limit. In addition, enhance targeted police enforcement, particularly during the weekday morning (7:00-9:00 A.M.) and evening (4:00-7:00 P.M.) peak commuting hours.
- *Median Islands.* Install a median island at the intersection with Edward Avenue and the Downers Grove Golf Club access drive to enhance pedestrian circulation and safety and give motorists the perception of a narrower roadway that will reduce travel speeds.

5. Conclusion

This study summarizes the results and findings of the neighborhood traffic study for Area Number 5. The neighborhood is generally bounded by Ogden Avenue, Henry Puffer Elementary School, and the Downers Grove Golf Club on the north, Belmont Road and the Downers Grove Golf Club on the east, Burlington Avenue on the south, and Walnut Avenue on the west. Overall, the objective of the study was to thoroughly examine the existing traffic operations within the neighborhood, identify operational deficiencies, and recommend modifications and/or improvements to enhance both vehicular and pedestrian operations. The study addressed the primary traffic concerns within any neighborhood: vehicular volume, vehicular speed, and overall vehicular and pedestrian safety. The recommendations developed in the study were based primarily on accepted engineering practices, conformity with the 2009 MUTCD, existing Village criteria, and the input from Village staff and residents.

Tables 5, 6, and 7 summarize the short-term, mid-term, and long-term recommendations of the neighborhood traffic study. Short-term improvements generally have lower costs, are easier to implement, and/or are needed to address immediate concerns. Long-term improvements are generally more costly, require additional planning/engineering, can be implemented with other improvement projects, or may only be required depending on the effectiveness of previous efforts.

Table 5
SHORT-TERM (0 TO 6 MONTHS) RECOMMENDATIONS

Recommendations	Location
Intersection Traffic Control Modifications	
Convert two-way stop sign control to all-way stop sign control	<ul style="list-style-type: none"> • Haddow Avenue at Edward Avenue and Downers Grove Golf Club Drive
Convert intersection with two of three legs under stop sign control to all-way stop sign control	<ul style="list-style-type: none"> • Burlington Avenue with Belmont Road East Ramp
Add two-way stop sign control at intersections with no intersection traffic control	<ul style="list-style-type: none"> • Drendel Road at Indianapolis Avenue (Stop sign control on Indianapolis Ave.) • Cross Street at Indianapolis Avenue (Stop sign control on Indianapolis Ave.) • Haddow Avenue at Francisco Avenue (Stop sign control on Francisco Avenue)
Add one-way stop sign control at intersections with no intersection traffic control	<ul style="list-style-type: none"> • Burlington Avenue at Chase Avenue • Burlington Avenue at Edward Avenue • Burlington Avenue at Western Avenue • Burlington Avenue at Rose Avenue • Burlington Avenue at Francisco Avenue • Burlington Avenue at Cross Street • Burlington Avenue at Drendel Road • Burlington Avenue at Granville Avenue • Haddow Avenue at Chase Avenue • Haddow Avenue at Western Avenue • Haddow Avenue at Rose Avenue • Walnut Avenue at Provence Court
Add stop sign control along roadway	<ul style="list-style-type: none"> • Cross Street S-Curve

Table 5, Continued
 SHORT-TERM (0 TO 6 MONTHS) RECOMMENDATIONS

Recommendations	Location
Pedestrian and Bicycle Enhancements	
Install ladder style crosswalks	<ul style="list-style-type: none"> • Burlington Avenue at Belmont Road West Ramp • Burlington Avenue at Belmont Road East Ramp • Burlington Avenue at Puffer Road • Burlington Avenue at Chase Avenue • Burlington Avenue at Edward Avenue • Burlington Avenue at Western Avenue • Burlington Avenue at Rose Avenue • Burlington Avenue at Francisco Avenue • Burlington Avenue at Cross Street • Burlington Avenue at Drendel Road • Burlington Avenue at Granville Avenue • Haddow Avenue at Puffer Elementary School Access Drive • Haddow Avenue at Downers Grove Golf Club Access Drive
Install Advanced School Crossing Assembly	<ul style="list-style-type: none"> • Haddow Avenue at Puffer Road
Traffic Calming Measures	
Increase police awareness/enforcement	<ul style="list-style-type: none"> • Throughout the neighborhood
Refresh the existing center line and extend to Walnut Avenue	<ul style="list-style-type: none"> • Burlington Avenue
Install additional speed limits signs, install yellow-framed speed limit signs, and/or install speed limit pavement markings	<ul style="list-style-type: none"> • Burlington Avenue • Walnut Avenue • Haddow Avenue

Table 6
MID-TERM (6 TO 18 MONTHS) RECOMMENDATIONS

Recommendations	Location
Pedestrian and Bicycle Enhancements	
Install sharrow markings	<ul style="list-style-type: none"> • Burlington Avenue between Belmont Road and Cross Street • Cross Street
Traffic Calming Measure	
Install portable/permanent speed radar signs (Only implement if objectives of other measures are not sufficiently met.)	Key areas in the neighborhood, including <ul style="list-style-type: none"> • Burlington Avenue • Walnut Avenue • Haddow Avenue

Table 7
LONG-TERM (18 TO 36 MONTHS) RECOMMENDATIONS

Recommendations	Location
Pedestrian and Bicycle Enhancements	
Install curb/sidewalk extension (Only after comprehensive study is performed to determine impacts/feasibility)	<ul style="list-style-type: none"> • Burlington Avenue at Belmont Road East Ramp • Burlington Avenue at Belmont Road West Ramp
Install pedestrian refuge island (Only after comprehensive study is performed to determine impacts/feasibility)	<ul style="list-style-type: none"> • South leg of Belmont Road with Prairie Avenue intersection
Traffic Calming Measure	
Install median islands (Implement only if objectives of other measures are not sufficiently met and a thorough evaluation of the impact of the measures/devices are performed.)	Possible locations for consideration include: <ul style="list-style-type: none"> • Burlington Avenue • Walnut Avenue • Haddow Avenue

Appendix

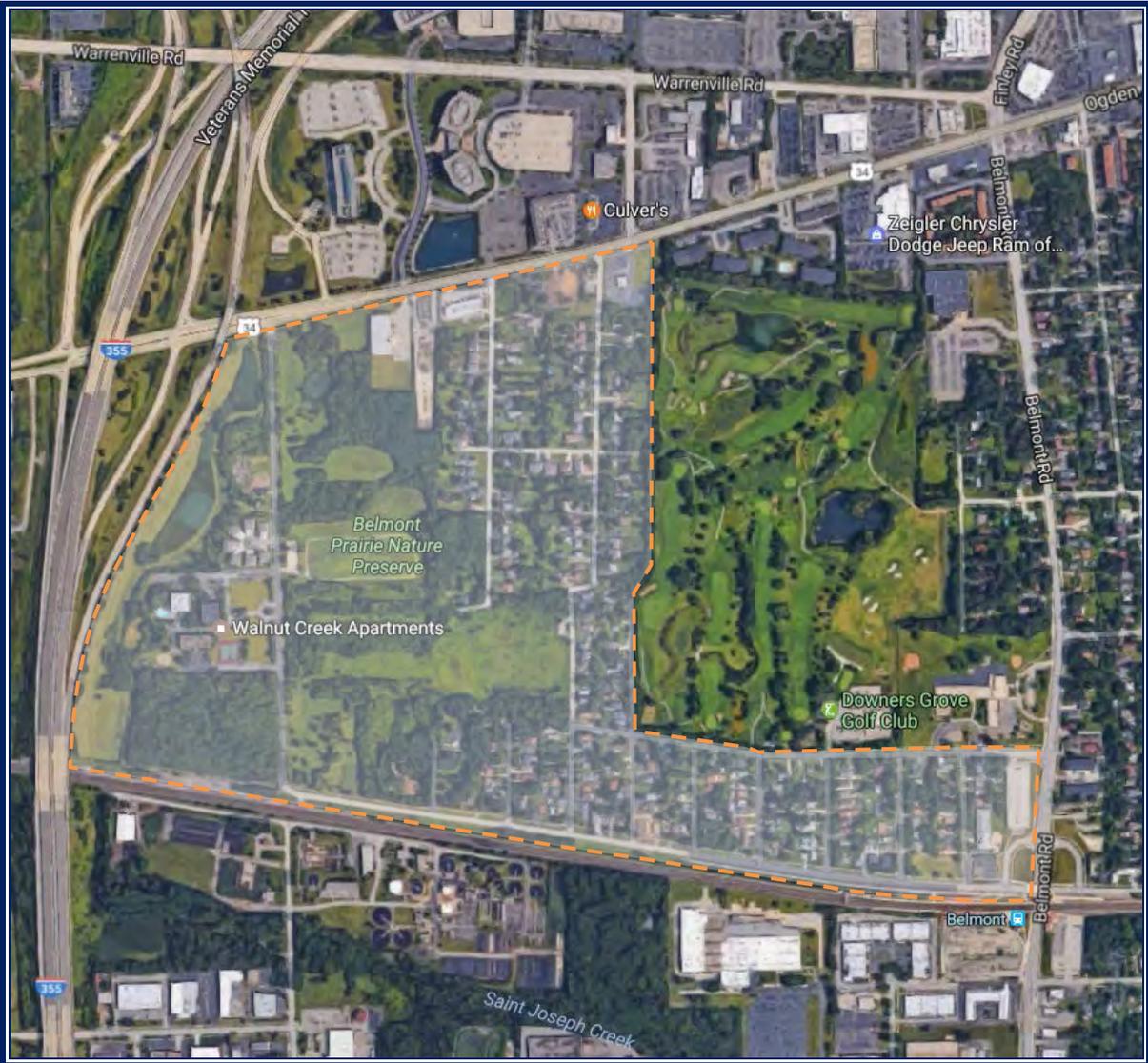


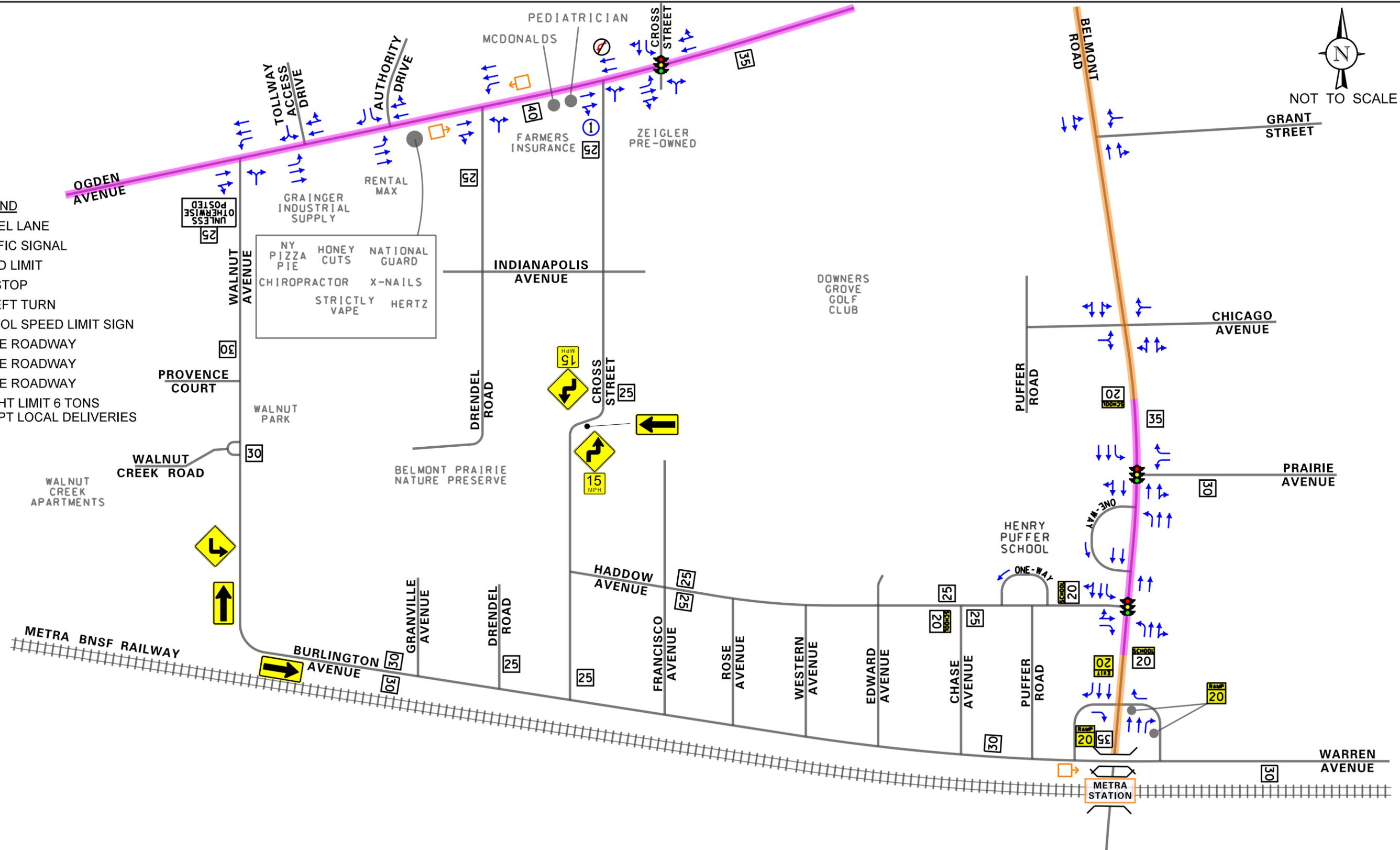
Figure 1

Aerial View of Study Area



NOT TO SCALE

- LEGEND**
- TRAVEL LANE
 - TRAFFIC SIGNAL
 - SPEED LIMIT
 - BUS STOP
 - NO LEFT TURN
 - SCHOOL SPEED LIMIT SIGN
 - 4 LANE ROADWAY
 - 5 LANE ROADWAY
 - 2 LANE ROADWAY
 - WEIGHT LIMIT 6 TONS EXCEPT LOCAL DELIVERIES



PROJECT:
Traffic Study Neighborhood 5
Downers Grove, Illinois

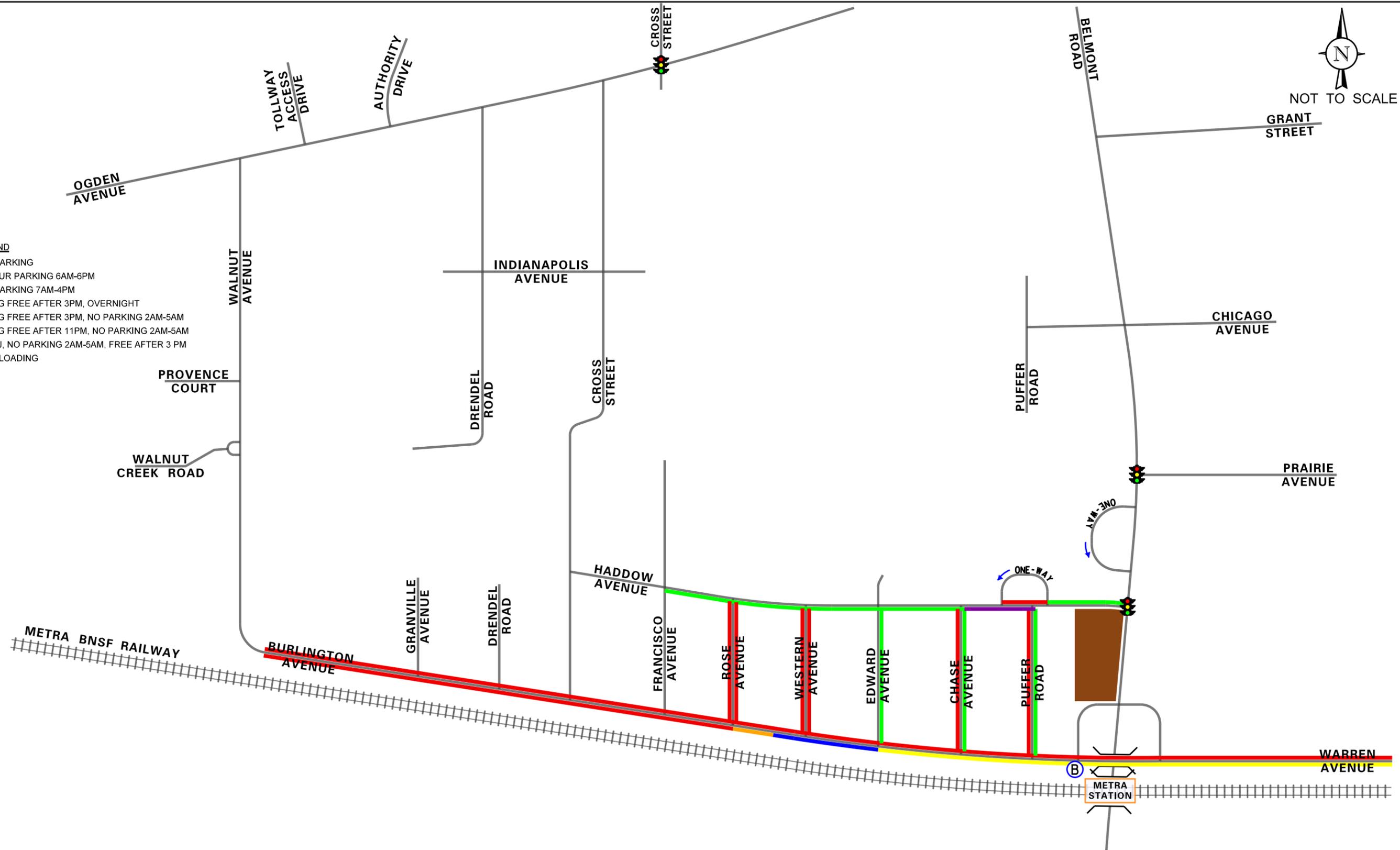
TITLE:
EXISTING ROADWAY CONDITIONS

KLOA
Job No: 16-225
Figure: 2



NOT TO SCALE

- LEGEND**
- █ - NO PARKING
 - █ - 4 HOUR PARKING 6AM-6PM
 - █ - NO PARKING 7AM-4PM
 - █ - LOT G FREE AFTER 3PM, OVERNIGHT
 - █ - LOT G FREE AFTER 3PM, NO PARKING 2AM-5AM
 - █ - LOT G FREE AFTER 11PM, NO PARKING 2AM-5AM
 - █ - LOT J, NO PARKING 2AM-5AM, FREE AFTER 3 PM
 - B - BUS LOADING



PROJECT:
Traffic Study Neighborhood 5
Downers Grove, Illinois

TITLE:
EXISTING PARKING RESTRICTIONS

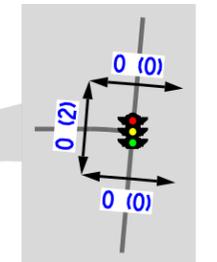
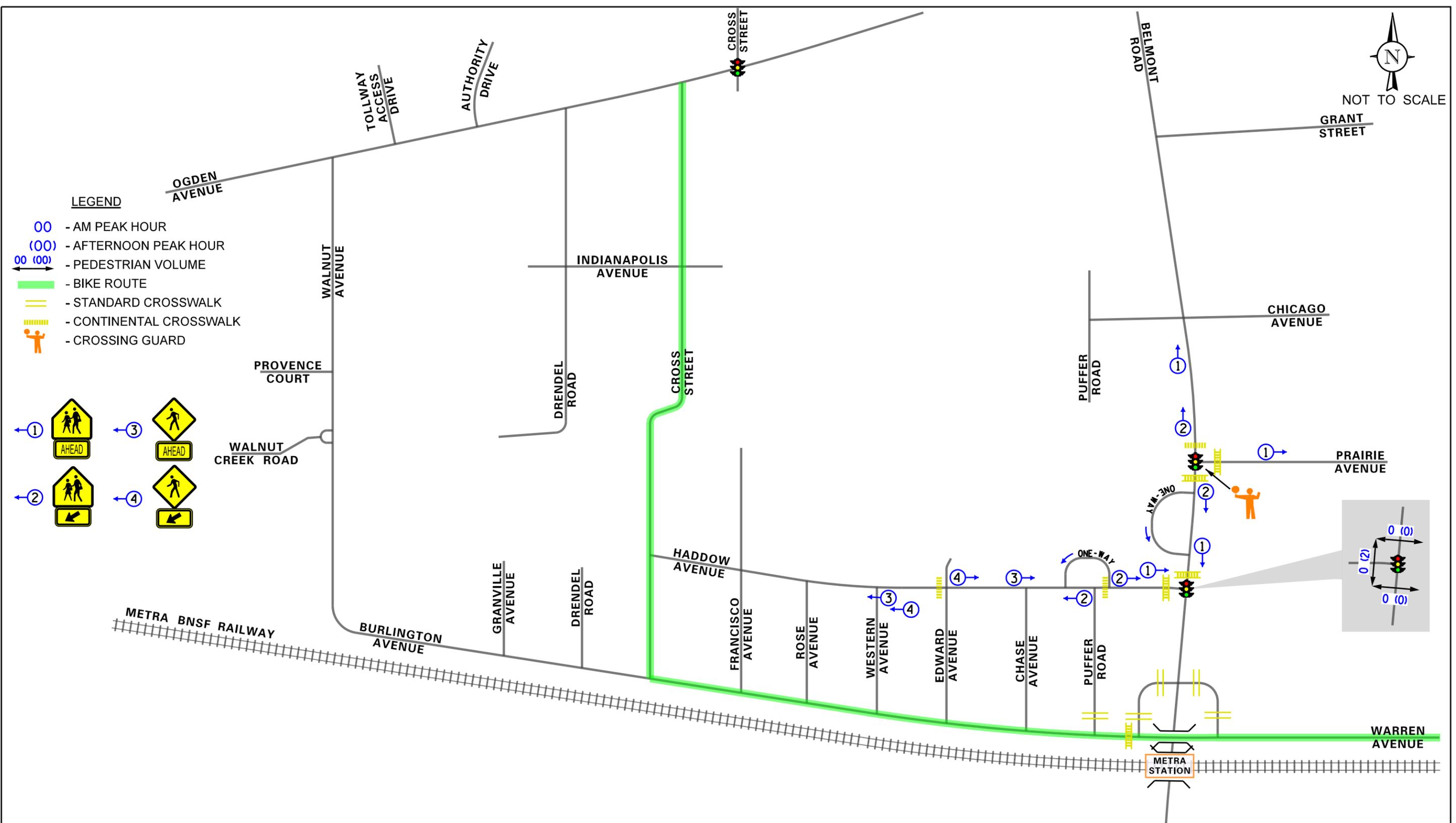
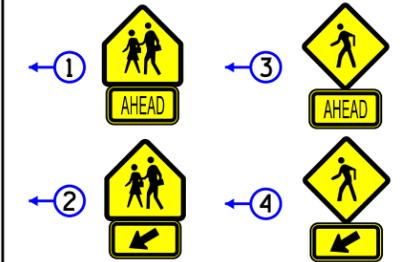




NOT TO SCALE

LEGEND

- 00 - AM PEAK HOUR
- (00) - AFTERNOON PEAK HOUR
- 00 (00) - PEDESTRIAN VOLUME
- BIKE ROUTE
- STANDARD CROSSWALK
- CONTINENTAL CROSSWALK
- CROSSING GUARD



PROJECT:
Traffic Study Neighborhood 5
Downers Grove, Illinois

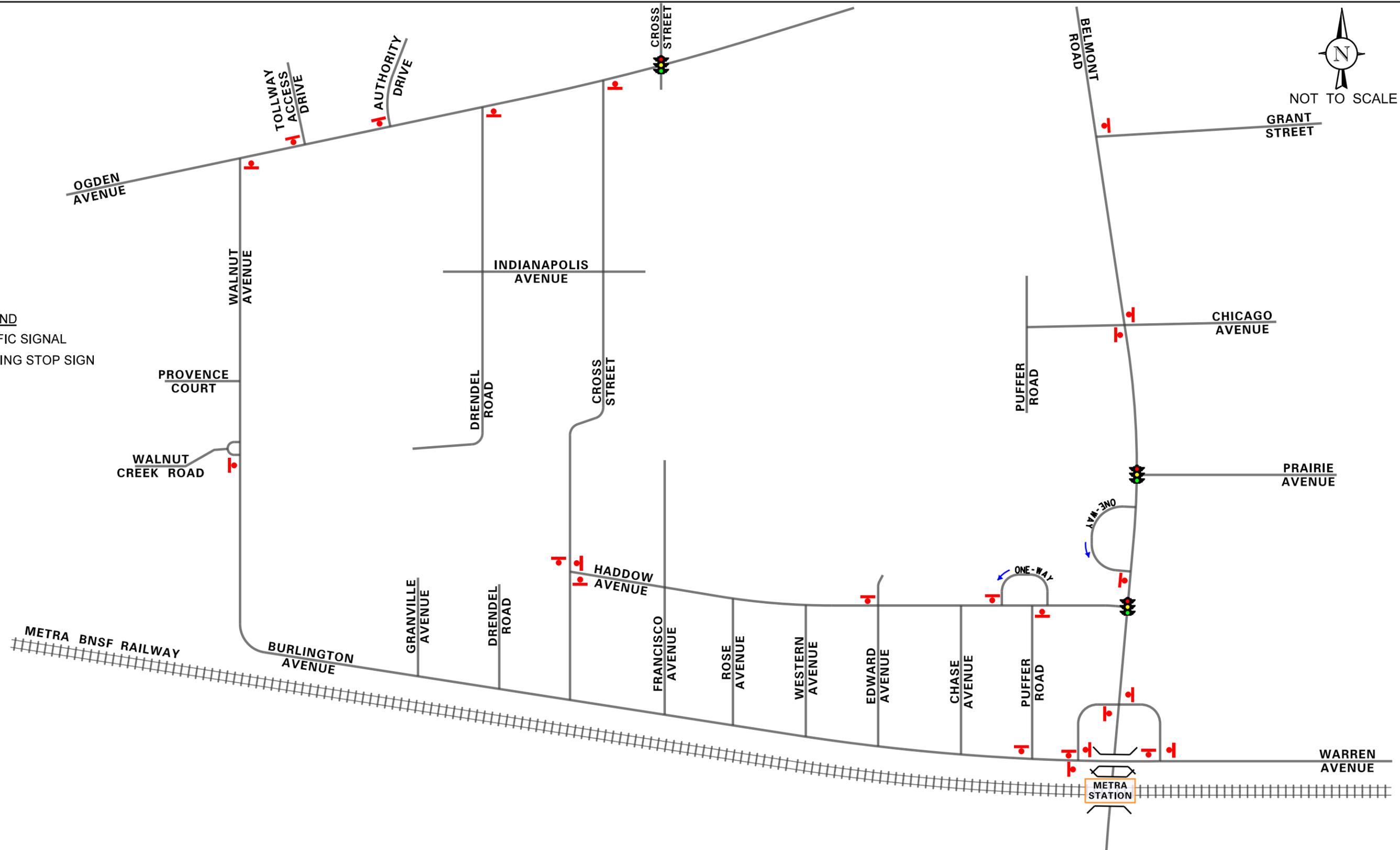
TITLE:
EXISTING PEDESTRIAN AND BICYCLE FACILITIES
AND TRAFFIC CONTROL DEVICES

KLOA
Job No: 16-225
Figure: 4



NOT TO SCALE

- LEGEND**
-  - TRAFFIC SIGNAL
 -  - EXISTING STOP SIGN



PROJECT:
 Traffic Study Neighborhood 5
 Downers Grove, Illinois

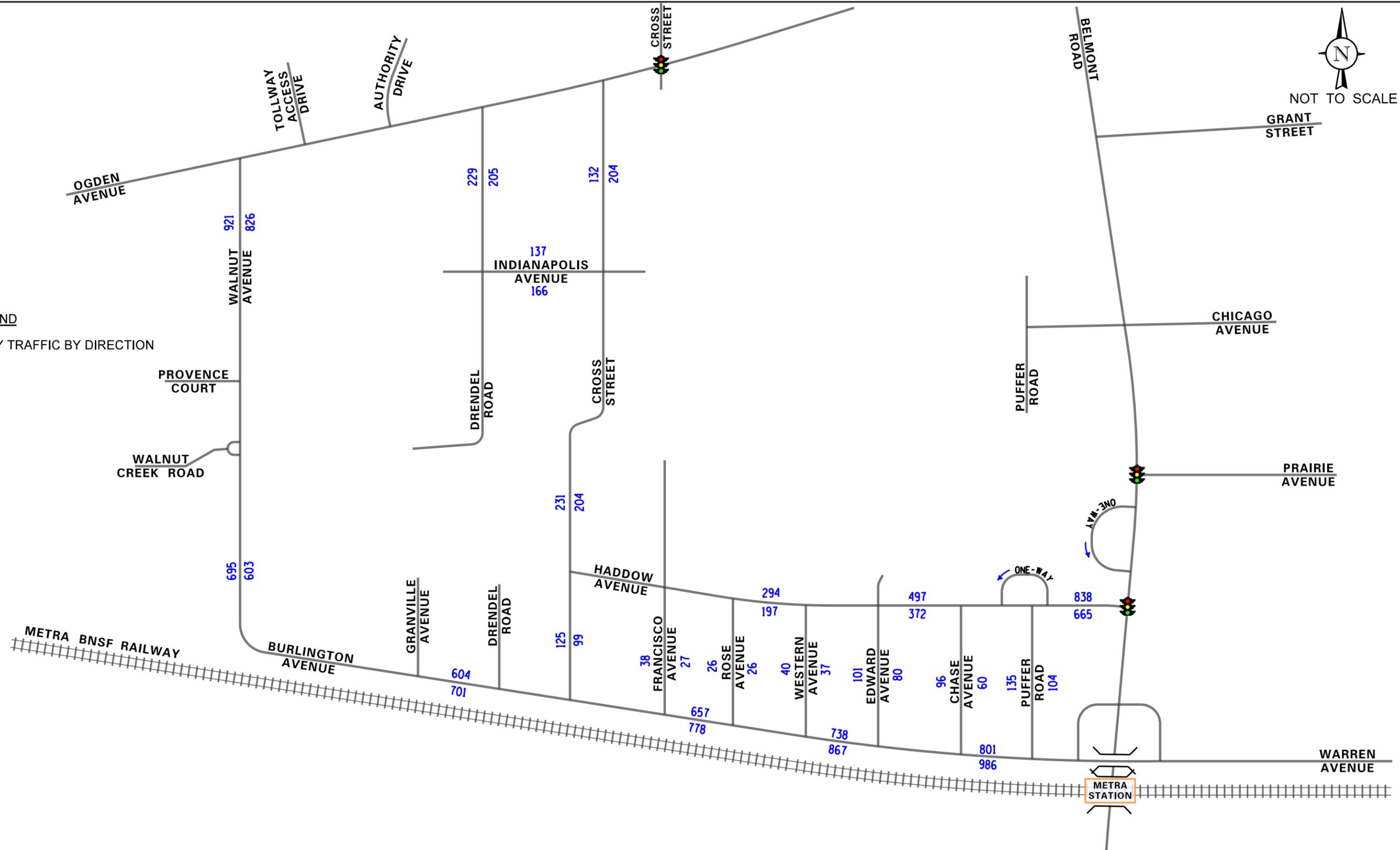
TITLE:
 EXISTING INTERSECTION TRAFFIC CONTROL

KLOA
 Job No: 16-225
 Figure: 5



NOT TO SCALE

LEGEND
OO - DAILY TRAFFIC BY DIRECTION



PROJECT:
Traffic Study Neighborhood 5
Downers Grove, Illinois

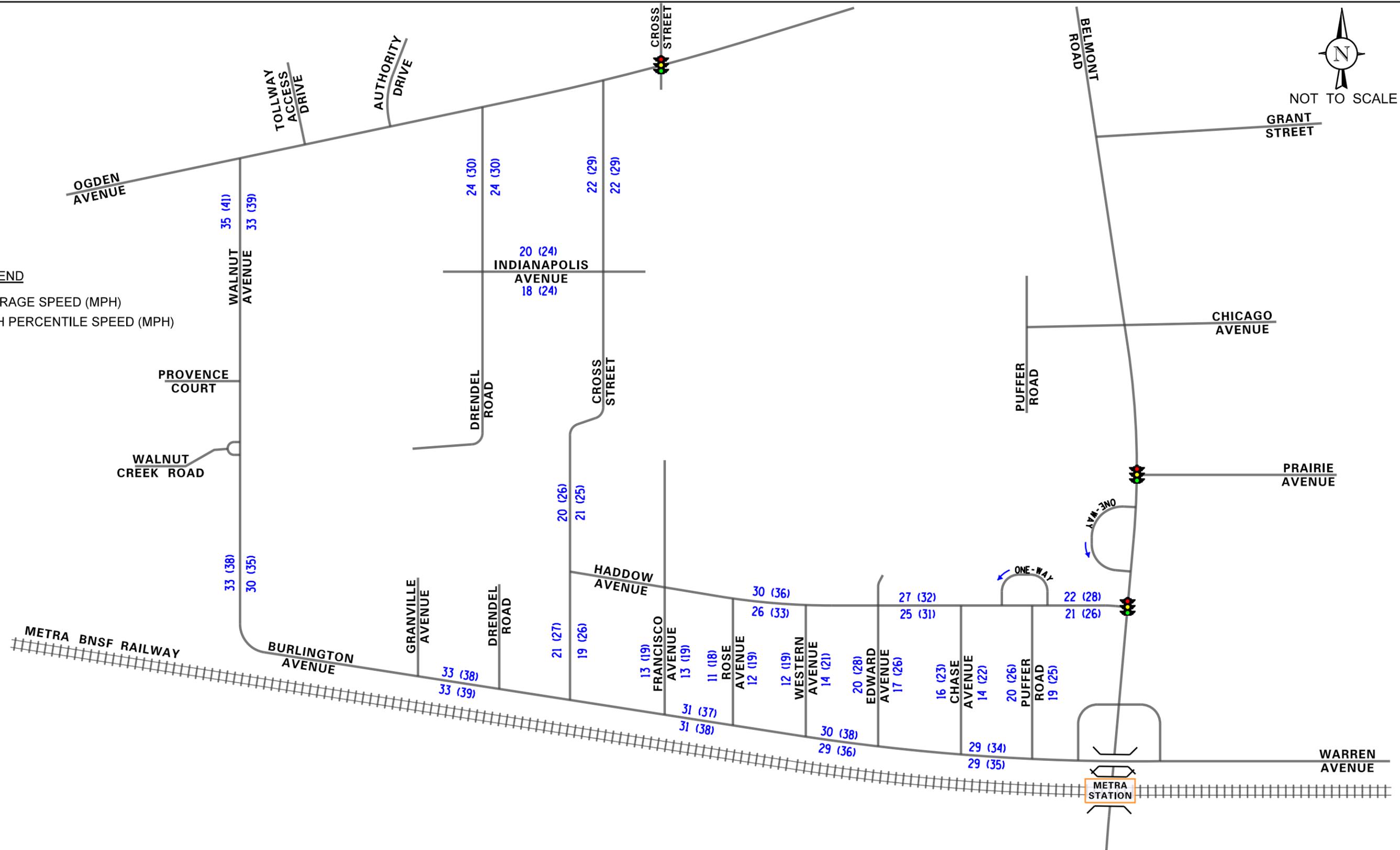
TITLE:
EXISTING DAILY TRAFFIC VOLUMES





NOT TO SCALE

LEGEND
 OO - AVERAGE SPEED (MPH)
 (OO) - 85TH PERCENTILE SPEED (MPH)



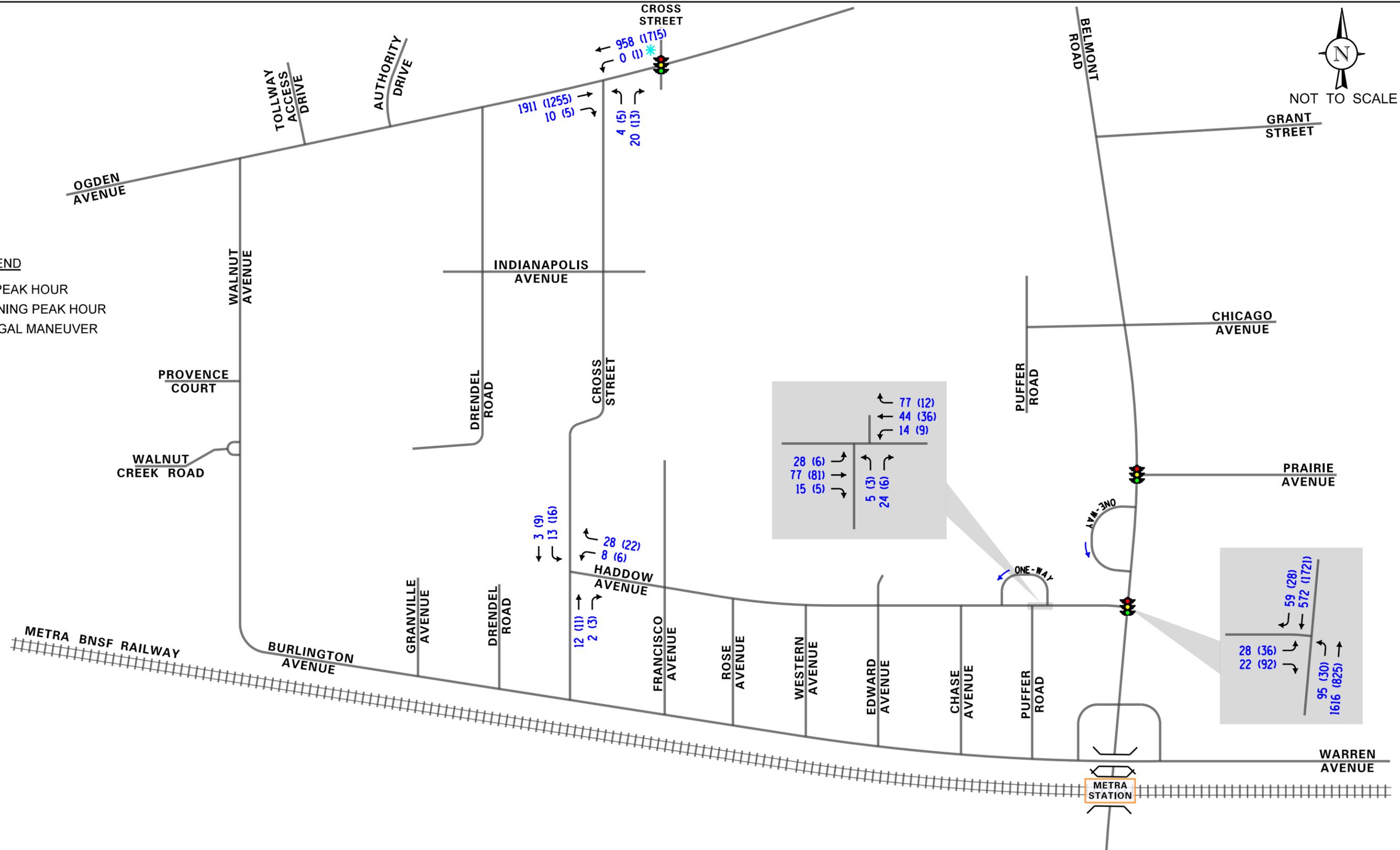
PROJECT: Traffic Study Neighborhood 5
Downers Grove, Illinois

TITLE: EXISTING TRAVEL SPEED



NOT TO SCALE

- LEGEND**
- 00 - AM PEAK HOUR
 - (00) - EVENING PEAK HOUR
 - * - ILLEGAL MANEUVER



PROJECT: Traffic Study Neighborhood 5
Downers Grove, Illinois

TITLE: EXISTING INTERSECTION PEAK HOUR VOLUMES

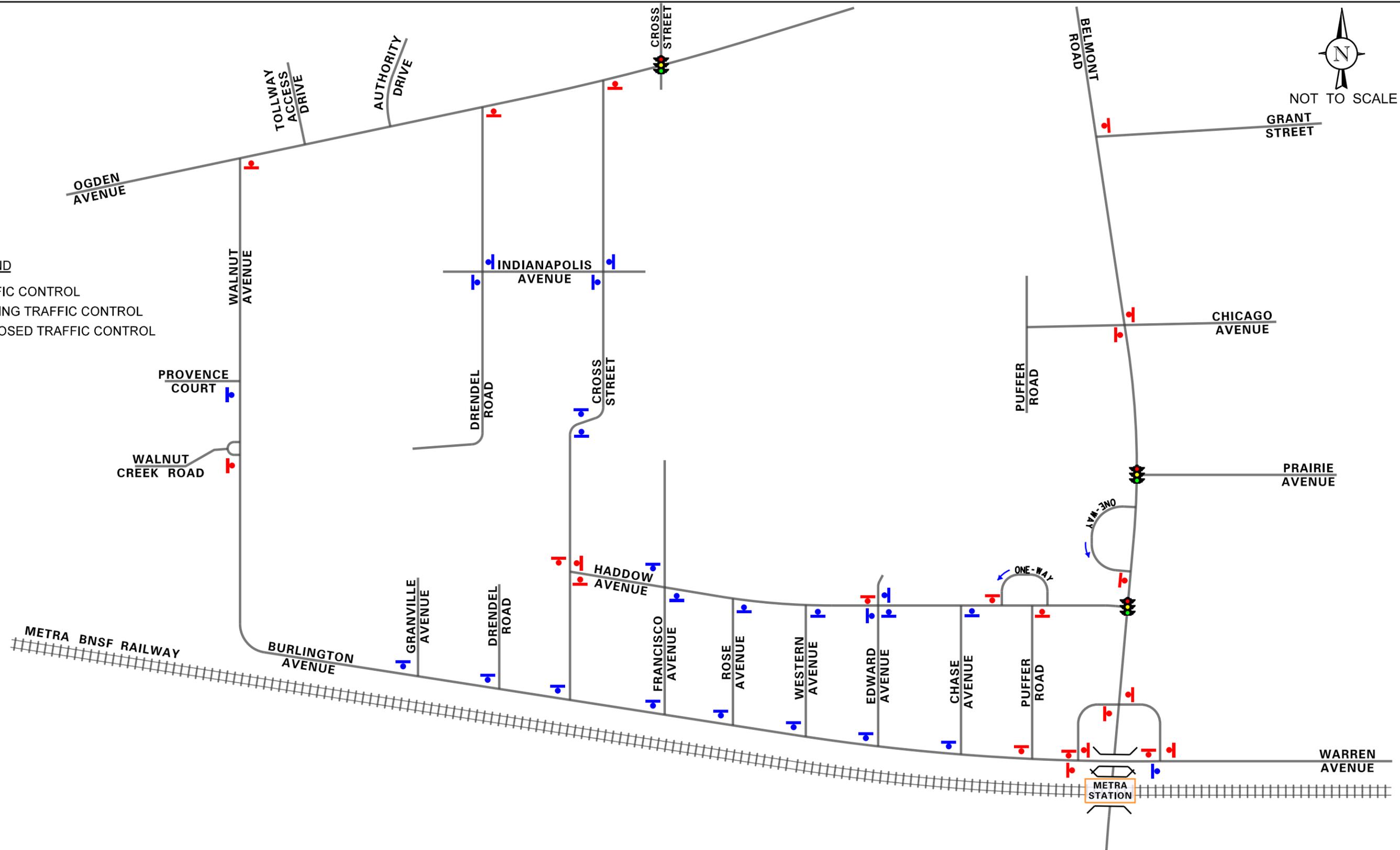
KLOA
Job No: 16-225
Figure: 8



NOT TO SCALE

LEGEND

-  - TRAFFIC CONTROL
-  - EXISTING TRAFFIC CONTROL
-  - PROPOSED TRAFFIC CONTROL



PROJECT:
 Traffic Study Neighborhood 5
 Downers Grove, Illinois

TITLE:
 PROPOSED INTERSECTION TRAFFIC CONTROL

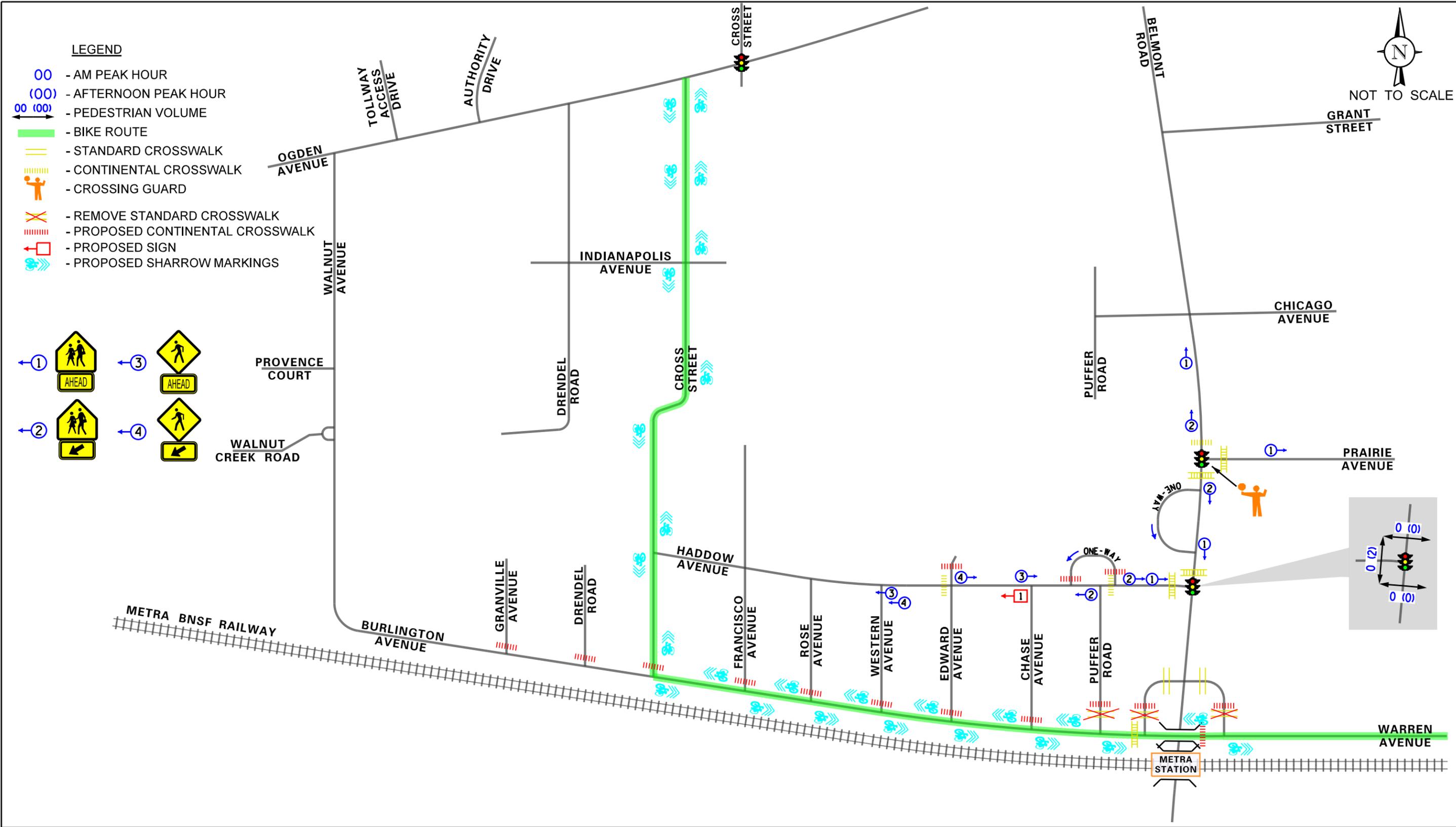
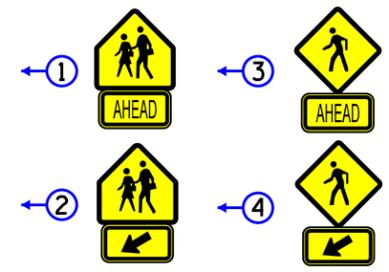
KLOA
 Job No: 16-225
 Figure: 9



NOT TO SCALE

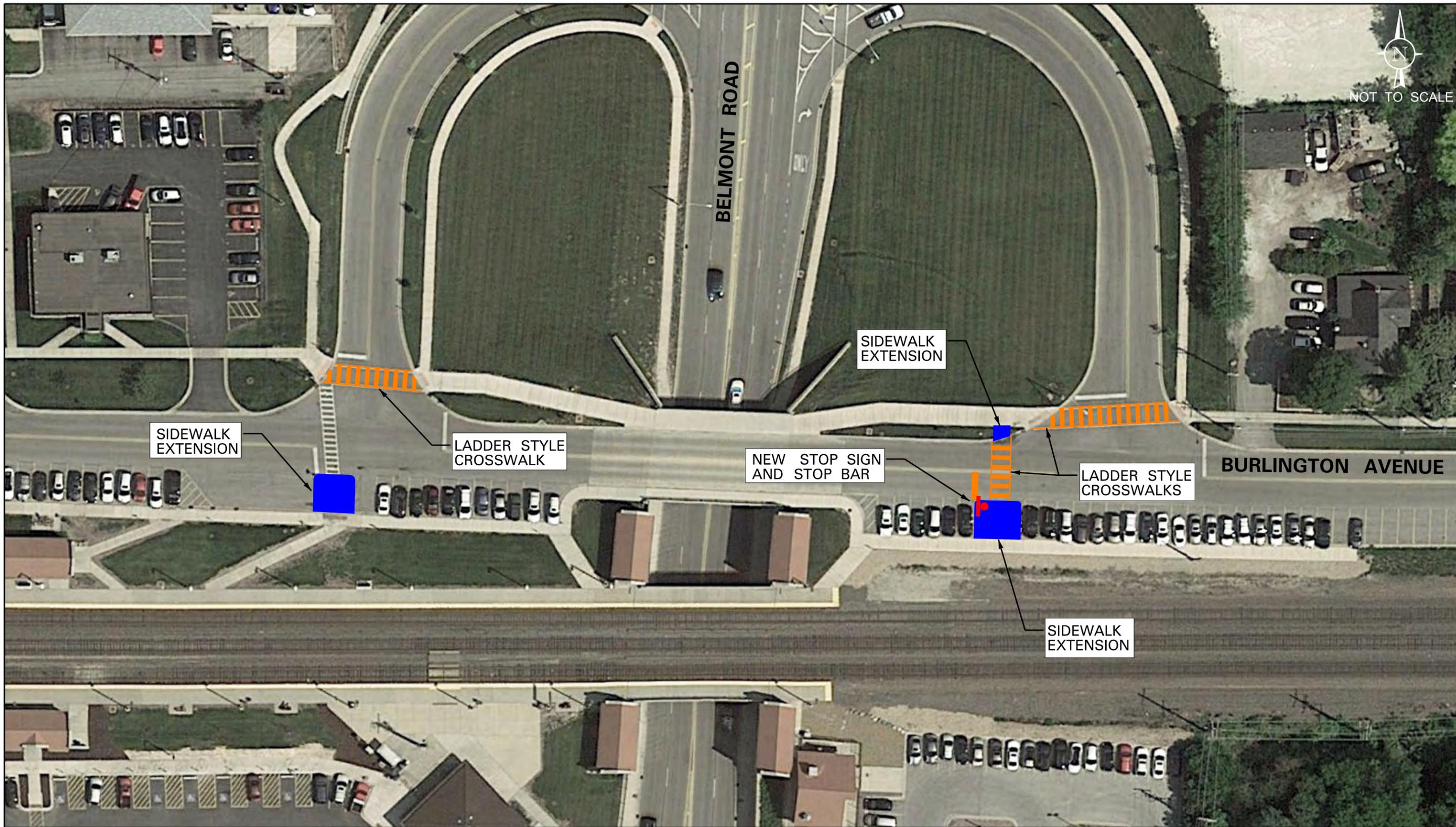
LEGEND

- 00 - AM PEAK HOUR
- (00) - AFTERNOON PEAK HOUR
- ↔ (00) ↔ - PEDESTRIAN VOLUME
- - BIKE ROUTE
- — - STANDARD CROSSWALK
- ||||| - CONTINENTAL CROSSWALK
- 👤 - CROSSING GUARD
- ✂ - REMOVE STANDARD CROSSWALK
- ||||| - PROPOSED CONTINENTAL CROSSWALK
- 🚦 - PROPOSED SIGN
- 🚲 - PROPOSED SHARROW MARKINGS



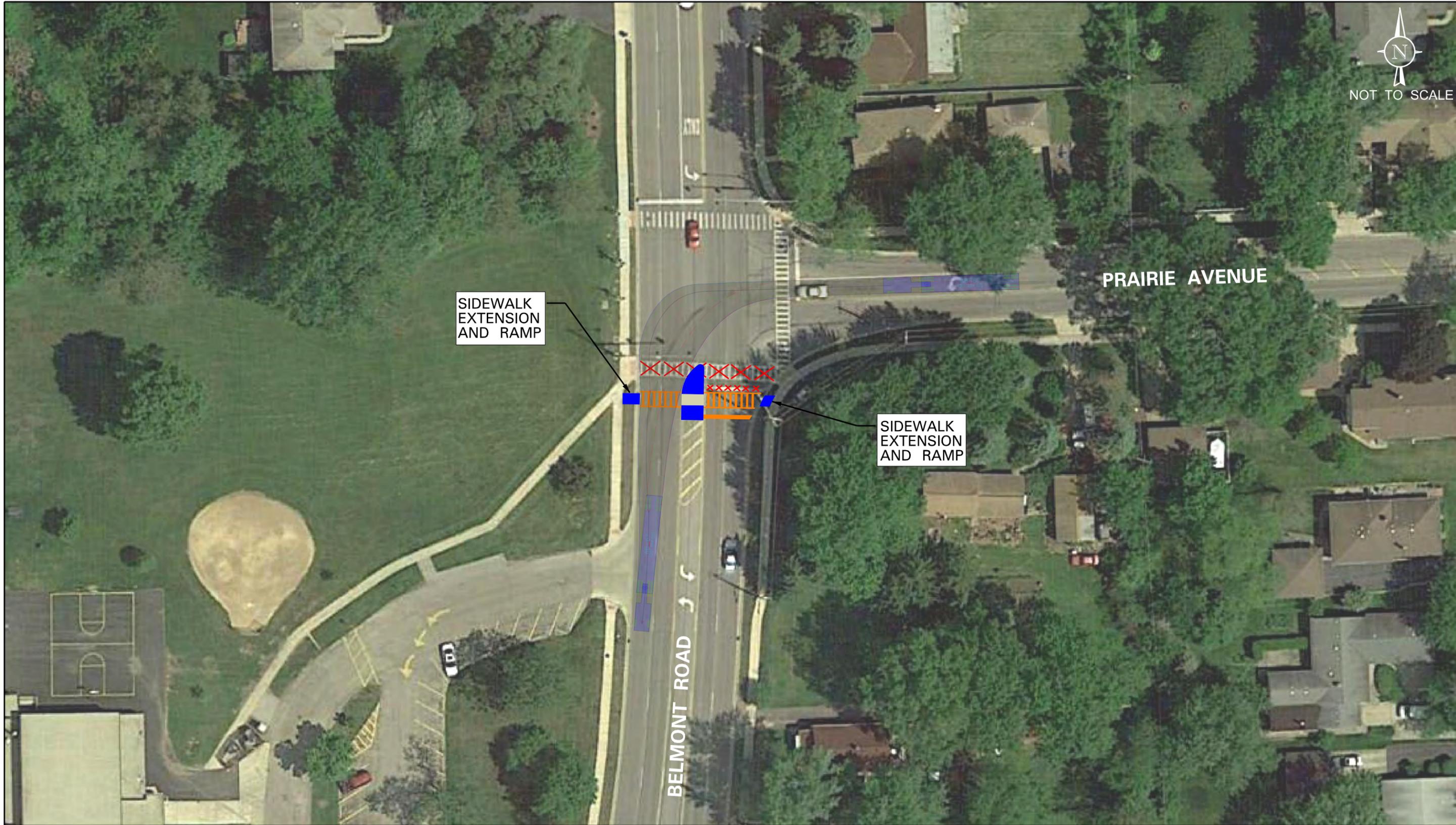
PROJECT:
 Traffic Study Neighborhood 5
 Downers Grove, Illinois

TITLE:
 PROPOSED MODIFICATIONS TO THE PEDESTRIAN AND BICYCLE FACILITIES
 AND TRAFFIC CONTROL DEVICES



PROJECT:
Traffic Study Neighborhood 5
Downers Grove, Illinois

TITLE:
BURLINGTON STREET AT BELMONT AVENUE RAMPS
CONCEPTUAL PEDESTRIAN ENHANCEMENTS



PROJECT:
Traffic Study Neighborhood 5
Downers Grove, Illinois

TITLE:
BELMONT ROAD WITH PRAIRIE AVENUE INTERSECTION
CONCEPTUAL PEDESTRIAN REFUGE ISLAND