

Existing and Future Conditions Report

Boston Road/I-71 Interchange No-Build Alternatives Study

Prepared for:
Cuyahoga County Engineer's Office
Medina County Engineer's Office

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November, 2008

Existing and Future Conditions Report Boston Road /I-71 Interchange No-Build Alternatives Study Cuyahoga and Medina Counties, Ohio

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1.0 Introduction

The Boston Road/I-71 Interchange No-Build Alternatives Analysis study is being conducted to determine transportation investments required to improve the safety and efficiency within the study area. For future traffic projections, this study assumes that a new interchange at I-71 and Boston Road will not be constructed.

2.0 Study Area

The study area includes portions of Cuyahoga and Medina Counties. It is bound by Royalton Road (SR 82) to the north; Center Road (SR 303) to the south; W. 130th Street to the east; and Pearl Road to the west (**see Figure 1, Appendix A**). Interstate 71 traverses the study area in a north-south direction with full interchanges located at SR 82 in Strongsville and SR 303 in Brunswick. The interchanges are approximately five miles apart and primarily serve the suburban communities of Brunswick, Hinckley, North Royalton and Strongsville. Land use within the study area varies with commercial developments adjacent to both interchanges and continuing along SR 82, SR 303 and Pearl Road. A large tract of land in the northeast quadrant of the study area is park land operated by the Cleveland Metroparks while the remaining land use is primarily residential in nature. Within the study area north-south access is provided primarily along W. 130th Street, Howe Road, Carpenter Road, Hadcock Road, and Pearl Road. East-west access is provided primarily along SR 82, Shurmer Road, Drake Road, Boston Road, Grafton Road, and SR 303. **Table 1** below summarizes the characteristics of these roadways.

Table 1: Existing Roadway Characteristics

Road Name	Functional Classification	Speed Limit	2006 Average Daily Traffic (Range along Corridor)	Number of Lanes
SR 82	Principal Arterial	35	29,740 - 44,050	4-8
Shurmer Road	Collector	25	4,840	2-3
Drake Road	Collector	35	4,730 - 10,190	2-3
Boston Road	Collector	35	7,790 - 9,305	2
Grafton Road	Collector	35	5,990 - 8,290	2
SR 303	Minor Arterial	35	14,920 - 33,593	4-5
W. 130 th Street	Minor Arterial	35	9,340 - 11,690	2-5
Howe Road	Collector	35	7,100 - 17,550	2-6
Carpenter Road	Collector	35	6,150- 8,020	2
Hadcock Road	Collector	35	7,030	2-3
Pearl Road	Principal Arterial	25-35	14,900 - 23,450	2-6

There are several sites within the study area with potential growth. The key sites are illustrated in **Figure 2** in **Appendix A**. Both the Cities of Strongsville and Brunswick provided a list of key economic development projects and include:

- City of Strongsville
 - Westfield Southpark Mall Expansion
 - Retail development - NW quadrant of I-71/SR 82 interchange across from Howe Road, Costco possible tenant

- City of Brunswick
 - 90 acres commercial development at the SE quadrant of I-71/SR 303 interchange
 - 20 acres commercial development at the NW and SW quadrants of the I-71/SR 303 interchange, college-level satellite campus possible tenant
 - Residential development, Waite Farm, east of I-71, 190 units
 - Residential development, Rosewood, east of I-71 fronting Grafton, 300 units
 - Southwest General Hospital office facility next to Brunswick City Hall

2.1 Roadway Geometric Conditions

2.1.1 Existing Conditions

Geometric characteristics of the primary roadways within the study area vary. Field observations were performed to document the physical attributes of the roadways and to identify roadways with geometric features that appear substandard by current design standards. **Table 2** below identifies the roadways that appear to have deficient design standards based on field observation.

Table 2: Apparent Geometric Deficiencies

Road Name	Section	Apparent Deficiency	Roadway Improvement Planned
SR 82	At W. 130 th St.	Intersection Geometry	Yes
Drake Road		Lane Width	No
Boston Road	W. 130 th St. to Pearl	Vertical Alignment; Lane Width	Yes
W. 130 th Street	Boston Rd. to SR 303	Lane Width	No
Howe Road		Lane Width	No
Carpenter Road		Vertical Alignment; Lane Width	Yes
Pearl Road		Horizontal Alignment; Lane Width	Yes

2.1.2 Future Conditions

Although deficiencies were identified on several routes throughout the study area, there are already projects under various stages of development to address some of the current issues. It is anticipated that by the design year (2030), the improvements listed below will be in place.

- SR 82/W. 130th Street Intersection
 - Added one thru lane both eastbound and westbound
 - Added northbound right turn lane
 - Currently in design phase
- Pearl Road Improvement (Shurmer Road to Drake Road and Drake Road to Boston Road)
 - Pavement replacement and widening to two thru lanes in each direction
 - Sidewalk additions
 - Signal upgrades
 - Shurmer Road to Drake Road - currently in design phase
 - Drake Road to Boston Road - currently in planning phase
- Howe/Drake Intersection

- Pavement replacement with curbing
- Added southbound right turn lane, westbound right turn lane
- Lengthen left turn lanes on each approach
- Under construction, to be completed 2008
- Boston Road/Howe Road Intersection
 - Added southbound left turn lane
 - Added traffic signal with interconnect along Boston Road
 - Completed in 2008
- North Carpenter Road/SR 303 intersection
 - Turn lane additions
 - Completed in 2008
- Boston Road (Pearl Road to W. 130th Street)
 - Pavement replacement/re-profiling
 - Sidewalk addition
 - Turn lane additions and signal upgrades
 - Currently in design phase
- North Carpenter Road (SR 303 to Boston Road)
 - Pavement replacement/re-profiling
 - Sidewalk addition
 - Turn lane additions and signal upgrades
 - Final design currently on hold
- Brunswick Citywide Signal System Project
 - Upgraded traffic signals
 - New signal at Grafton Road and North Carpenter Road
 - Anticipated construction, summer 2009

2.2 Roadway Pavement Conditions

2.2.1 Existing Conditions

Roadway pavement conditions vary throughout the study area. Some roadways have undergone significant rehabilitation and/or reconstruction to extend their useful life, while others are in need of repair. Listed below are sections of roadways where field observations indicate the need for improvements to the pavement surface/structure.

- SR 82 at W.130th Street*
- Shurmer Road
- Pearl Road (Shurmer to Drake)*
- Boston Road*
- Grafton Road
- N. Carpenter Road*
- Hadcock Road

NOACA maintains a pavement management system for their region which ranks major roadways based on Pavement Condition Ratings (PCRs). NOACA categorizes PCRs from very good, scores of 91 to 100, through very poor, scores from 0 to 40. The most recent map published is the 2006

ratings. **Table 3** below lists the major roadways in the study area with their assigned rating. If the roadway is not shown, it was not included in NOACA's ratings.

Table 3: 2006 NOACA Pavement Condition Ratings

Road Name	NOACA Listing
SR 82	Good / Very Good
Boston Road	Fair to Poor
Grafton Road	Poor
SR 303	Good
W. 130 th Street	Fair to Poor (Cuyahoga County) / Good (Medina County)
Howe Road	Good (at SR 82) / Fair
N. Carpenter Road	Good
Hadcock Road	Poor
Pearl Road	Fair

2.2.2 Future Conditions

Although deficiencies were identified on several routes throughout the study area, as mentioned in Section 2.1.2 and indicated by "*" in the list in Section 2.2.1, there are already projects under various stages of development to restore the pavement condition. It is anticipated that by the design year (2030), the improvements listed will be in place.

2.3 Pedestrian Facilities

2.3.1 Existing Conditions

Sidewalks are present to a varying degree throughout the study area. Some roadways feature continuous sidewalk on both sides, some have it along one side while others do not have any walk. Many of the roadways have sidewalk present intermittently on a block by block and even parcel to parcel basis. It appears that sidewalk is being added as parcels redevelop or in conjunction with roadway improvement projects. **Table 4** below lists the roadways with various levels of sidewalk deficiency within the study area.

Table 4: Sidewalk Deficiencies

Roadway	Location	Deficiency
W. 130 th Street	Full study area	Most of roadway lacks walk; intermittent locations with walk on one side
Howe Road	Drake to Boston	No walk present or only present on one side of roadway
Carpenter Road	Full study area	Walk is intermittent; generally on one side of the roadway
Pearl Road	Shurmer to south of Grafton	Intermittent walk, one side or no walk at all
Drake Road	Howe to W. 130 th Street	Generally no walk present
SR 82	At W. 130 th Street	No walk present
Boston Road	Full study area	Generally on one side of the roadway
SR 303	S.Carpenter to W. 130 th Street	Generally not present or on one side only

2.3.2 Future Conditions

It appears that sidewalk is being added as part of the roadway improvement projects, including those described in Section 2.1.2. It is recommended that sidewalk improvements continue to be included with roadway upgrade projects throughout the study area in order to build a more complete pedestrian environment.

2.4 Bicycle Facilities

2.4.1 Existing Conditions

NOACA's Regional Bicycle Transportation Plan, updated March 2008, illustrates all existing bikeways in their five county region. According to the Cuyahoga and Medina County maps, there are no existing bike paths, lanes or routes along roadways studied within the project study area. There is an existing all purpose trail which runs through the Metroparks in the northeastern corner of the project study area. NOACA also publishes county bicycle maps which indicate streets suitable for riders with basic, intermediate, or expert skills. **Table 5** below lists streets in the project study area which are shown on NOACA's county bicycle maps with their associated skill level.

Table 5: NOACA County Bicycle Map Roadway Listing

Road Name	NOACA Listing
SR 82	Not suitable for bicyclists
Shurmer Road	Suitable for bicyclists having intermediate skills
Drake Road	Suitable for bicyclists having intermediate skills
Boston Road	Suitable only for experienced bicyclists
Grafton Road	Suitable for bicyclists having intermediate skills
SR 303	Not suitable for bicyclists
W. 130 th Street	Suitable for bicyclists having intermediate skills (Cuyahoga County)/ Not suitable for bicyclists (Medina County)
Howe Road	Suitable only for experienced bicyclists / Not suitable for bicyclists
N. Carpenter Road	Suitable only for experienced bicyclists
Hadcock Road	Suitable for bicyclists having intermediate skills
Pearl Road	Suitable for bicyclists having intermediate skills (Cuyahoga County)/ Not suitable for bicyclists (Medina County)

2.4.2 Future Conditions

NOACA's Regional Bicycle Transportation Plan, updated March 2008, also illustrates all planned bikeways in their five county region. According to the Cuyahoga County map, there is a proposed bike path, lane or route along I-71 from the SR 82 interchange to the county line. According to the Medina County map, there are planned bike routes along Grafton Road, Hadcock Road and I-71 within the study area.

In addition, NOACA has adopted a bicycle facility priority plan which identifies the bikeway priority system within the five county region. Within the study area, SR 82, Pearl Road, W.130th Street, Boston Road, Grafton Road, SR 303, and Hadcock Road are all listed as part of the priority system. It is recommended that future roadway upgrade projects along routes identified with planned bike routes and along the priority system throughout the study area coordinate project needs with NOACA's bicycle advisory committee.

2.5 Public Transportation

2.5.1 Existing Conditions

Public transportation within the study area is provided by the Greater Cleveland Regional Transit Authority (GCRTA) as well as the Brunswick Transit Authority (BTA). GCRTA operates three bus routes within the study area in the City of Strongsville. The routes are 51F, 51X and 451. Routes 51F and 51X provide loop service to the commercial development, west of I-71, along Pearl Road, SR 82 and Howe Road. The routes interface with the Kiss-N-Ride facility located at the Howe/Drake intersection. The service also interfaces with the Strongsville Park-N-Ride facility located north of the study area. Route 451 services Medina County patrons originating at Laurel Square. No separate bus routes are provided by GCRTA east of I-71. Patrons east of I-71 are required to utilize either the Park-N-Ride or Kiss-N-Ride facilities noted above.

BTA operates two community circulators within the Medina county portion of the study area. These are the BTA North Route and the BTA South Route. The commercial area north of SR 303, between I-71 and W. 130th Street, is the only portion of the Medina County study area not covered by these routes. **Figure 3, Appendix A** displays the existing bus routes within the study area for both transit agencies.

The portion of the study area located east of I-71, south of Drake Road appears to be underserved by transit operations. There are numerous residential neighborhoods that could utilize public transportation if it was readily available, W. 130th Street, Benbow Road, and Drake Road have sidewalk deficiencies which would make it difficult to walk from home to a bus stop. Also, the commercial area east of I-71 along SR 303 is not served by transit routes.

2.5.2 Future Conditions

GCRTA has no current plans to expand service within the study area. However, the Strongsville Park-N-Ride facility often reaches capacity and may be expanded in the future. If service was expanded to the area east of I-71, sidewalk improvements should also be made to make it easier for pedestrians to walk from home to the bus stop and back. As the commercial developments advance near the I-71/SR 303 interchange, BTA may want to examine expansion of their circulator routes near the facilities.

2.6 Traffic Flow

2.6.1 Existing Conditions

Existing traffic count data for the study area intersections listed in **Table 6** was provided by the Cuyahoga County and Medina County Engineer's offices. Intersection traffic data was analyzed with Highway Capacity Software (HCS) using existing lane assignments and optimized signal timing. Intersection Level of Service (LOS) was calculated for each intersection. It is noted that this analysis used optimized timing for isolated intersections. System timing through corridor analysis could result in LOS calculations which vary from these results. A summary of intersection LOS is contained in **Table 6** below. Typically, LOS D or better is deemed acceptable in urban areas, such as this study area. Based on the analysis, only one intersection during either peak hours operates at an unacceptable LOS, SR 303/N. Carpenter Road/Brunswick Town Center Drive which operates at LOS F during the PM peak hour based on lane usage prior to the 2008 improvements. The intersection was modeled in the pre-improvement condition to allow for correlation between field observations, crash analysis and capacity analysis. The 2008 improvements are contained within the future conditional analysis in Section 2.6.2. There are several intersections that currently operate at LOS D, although this is acceptable, some movements within the intersection may be operating at LOS E or F. These intersections are indicated with a "*" in the table below.

Table 6: Existing (2006) Intersection Level of Service

Location	Intersection LOS	
	AM	PM
SR 82 & Pearl Road	D	D
SR 82 & Howe Road	C	C
SR 82 & Webster Road	B	B
SR 82 & W. 130 th Street	B	D*
Shurmer Road & Pearl Road	B	B
Shurmer Road & Howe Road	D	C
Drake Road & Pearl Road	C	C
Drake Road & Howe Road	C	C
Drake Road & W. 130 th Street	B	B
Boston Road & Pearl Road	B	C
Boston Road & Howe Road	B	B
Boston Road & N. Carpenter Road	B	C
Boston Road & Benbow Road	A	B
Boston Road & W. 130 th Street	C	C
Grafton Road & Pearl Road	B	B
Grafton Road & Hadcock Road	B	C
Grafton Road & N. Carpenter Road	C	D
Grafton Road & W. 130 th Street	B	B
SR 303 & Pearl Road	C	C
SR 303 & Hadcock /Maxwell	C	D*
SR 303 & N. Carpenter Road/Brunswick Town Center	D	F*
SR 303 & S. Carpenter Road	C	B
SR 303 & Industrial Pkwy	B	B
SR 303 & W. 130 th Street	B	B
Pearl Road & Lunn Road	C	C
Benbow Road & Hunt Road	B	B
Drake Road & Hunt Road/Greenbriar Drive	B	C
Unsignalized		

Since intersections were evaluated in HCS as single intersections, not corridors, some appear to operate better than observed in the field. This is especially the case near the interchanges, both SR 82 and SR 303. The sections of roadway in between Howe Road and the I-71/SR 82 ramps and South Carpenter Road and the I-71/SR 303 interchange ramps experience heavy congestion in the weave section where vehicle are exiting the interstate and trying to reach either Howe Road or South Carpenter Road.

2.6.2 Future Conditions

Future traffic volumes, design year 2030, were provided by NOACA and are included in **Appendix B**. NOACA was only able to provide projections for roadways that are included in their regional model. Therefore, some of the intersections that were evaluated under existing conditions were not able to be analyzed under future conditions. Similar to the existing traffic analysis, intersection traffic data was analyzed with HCS using either existing lane assignments or the upgraded lane assignments if the intersection is one of the planned improvements listed in Section 2.1.2 and optimized signal timing. Intersection LOS was calculated for each intersection. It is noted that this analysis used optimized timing for isolated intersections. System timing through corridor analysis could result in LOS calculations which vary from these results. A summary of intersection LOS is

contained in **Table 7** below. Based on the analysis, with the planned improvements, only one intersection during the either peak hours operates at an unacceptable LOS, SR 82/Pearl Road which operates at LOS E during the PM peak hour. There are several intersections that currently operate at LOS D, although this is acceptable, some movements within the intersection may be operating at LOS E or F. These intersections are indicated with a "*" in the table below.

Table 7: Future (2030) Intersection Level of Service

Location	Intersection LOS	
	AM	PM
SR 82 & Pearl Road	D	E*
SR 82 & Howe Road	B	C
SR 82 & W. 130 th Street	C	D
Shurmer Road & Pearl Road	B	B
Shurmer Road & Howe Road	C	C
Drake Road & Pearl Road	D	D*
Drake Road & Howe Road	B	B
Drake Road & W. 130 th Street	B	D*
Boston Road & Pearl Road	B	D*
Boston Road & Howe Road	B	B
Boston Road & N. Carpenter Road	B	B
Boston Road & W. 130 th Street	C	C
Grafton Road & Pearl Road	B	D*
Grafton Road & Hadcock Road	B	C
Grafton Road & N. Carpenter Road	B	B
Grafton Road & W. 130 th Street	B	B
SR 303 & Pearl Road	C	C
SR 303 & Hadcock /Maxwell	C	C
SR 303 & N. Carpenter Road/Brunswick Town Center	C	D*
SR 303 & S. Carpenter Road	B	C
SR 303 & W. 130 th Street	B	B

Unsignalized

2.7 Safety

2.7.1 Existing Conditions

Three years (2004-2006) of crash data was obtained for the study area from the Cuyahoga County Engineer's Office. Crash data was supplied in spreadsheet format, without crash reports. Crash data was then separated into study area intersections and corridors in between intersections. Study area intersections are limited to those contained in **Table 6** on **Page 7**.

Total crashes for the study area intersections are illustrated by type in **Figure 4** in **Appendix A**. In general rear-end and angle crashes combined for majority of the crashes at the intersections. These crash types typically indicate congestion and/or lack of gaps for turning vehicles.

Since intersections within the study area each experience different volumes of traffic, in order to normalize the crash data, intersection crash rates were computed in crashes per million entering vehicles. In addition, a standard deviation was calculated and any intersection with a crash rate above one standard deviation was considered high. The intersections listed in the **Table 8** on **Page 9** are included in that list.

Table 8: Intersection Crash Rates above one Standard Deviation

Intersection	Crash Rate
SR 303 and W. 130 th Street	1.83
Howe Road and Drake Road	1.69
Howe Road and SR 82	1.66
Pearl Road and SR 82	1.46

At the intersection of SR 303 and W. 130th Street, fixed object crashes were a high percentage of the total crashes. For this intersection, crash reports were obtained and the fixed object crashes appear to have occurred on the uncurbed, east leg of the intersection where vehicles ran off the road into the ditch and then hit another object, such as a pole or mailbox.

The intersection of Howe Road and Drake Road experiences congestion during peak hours. In addition, the left turn lane lengths are not sufficient to meet the existing traffic demands. This intersection is currently being upgraded with the addition of a southbound and westbound right turn lane and lengthening of the left turn lanes. It is anticipated that the improvements increase the safety at this location.

The intersections of Howe Road/SR 82 and Pearl Road/SR 82 both see high volumes of traffic during much of the weekday and on weekends due to Southpark Mall. Howe Road/SR 82 is located just west of the I-71 interchange. The close spacing of the intersection to the ramp intersections often causes drivers to be maneuvering between lanes as they approach Howe Road, causing crashes. The intersection of Pearl Road and SR 82 has multiple legs with dual left turn lanes and right turn lanes. The intersection is built out to handle the high traffic volumes; however the expansive pavement has led to crashes. Due to the long cycle length, vehicles may become aggressive in turning and running red lights. In addition, sideswipe crashes have occurred within the dual left turn lanes.

Total corridor crashes for corridors in between study area intersections were also computed and are illustrated by type in **Figure 5** in **Appendix A**. Rear-end crashes were predominate within the corridors indicating congestion may be a factor. Fixed object crashes appeared in higher percentages along uncurbed roadways, specifically W. 130th Street. The corridors with the highest crash totals were SR 82 and SR 303 surrounding the I-71 interchanges. Since the study area intersections do not include the ramp intersections, the corridor crashes appear inflated at those locations.

In order to more accurately determine where corridor crashes may be a problem, all intersection crashes were removed to find the crashes that truly occurred within the roadway sections between intersections. These crashes are listed in **Table 9** on **Page 10** by type. Areas shaded within the table indicate high values or areas to note. Segments with high angle crashes appear to occur along segments of roadway with high volumes of access points where vehicles crash while turning into and out of drives. Segments with high fixed object crashes were the uncurbed roadway segments. This indicates where curbs are not provided, vehicles more often crash into ditches, poles, and mailboxes. Rear-end collisions tend to indicate congestion problems within a corridor; this is apparent along SR 303, Pearl Road, and SR 82.

Table 9: Corridor Crashes

CORRIDOR	LENGTH (MILES)	ANGLE	FIXED OBJECT	REAR END	SIDESWIPE MEETING	SIDESWIPE PASSING	OTHER	Grand Total
BENBOW - HUNT TO BOSTON	0.95	1	2	0	0	0	1	4
BOSTON - PEARL TO HOWE	1.30	1	3	2	0	0	0	6
BOSTON - HOWE TO N. CARPENTER	0.15	0	0	1	0	0	0	1
BOSTON - N. CARPENTER TO BENBOW	0.15	3	3	0	1	0	1	8
SR 303 - PEARL TO HADCOCK	0.91	1	0	1	0	0	0	2
SR 303 - HADCOCK TO N. CARPENTER	0.80	17	2	57	0	7	7	90
SR 303 - N. CARPENTER TO S. CARPENTER	0.34	13	1	41	0	6	0	61
SR 303 - S. CARPENTER TO INDUSTRIAL PKWY	0.39	2	2	5	0	0	1	10
SR 303 - INDUSTRIAL PKWY TO W 130 TH	0.45	0	0	1	0	0	0	1
DRAKE - PEARL TO HOWE	1.25	2	1	10	0	1	3	17
DRAKE - HOWE TO HUNT	0.30	0	5	9	0	0	1	15
DRAKE - HUNT TO W 130 TH	1.00	0	2	1	0	0	2	5
GRAFTON - PEARL TO HADCOCK	0.90	0	2	3	0	1	4	10
GRAFTON - HADCOCK TO N. CARPENTER	0.82	0	1	5	0	0	0	6
GRAFTON - N. CARPENTER TO W 130 TH	1.19	0	3	3	0	0	0	6
HADCOCK - GRAFTON TO SR 303	1.57	2	1	7	0	1	2	13
HOWE - SR 82 TO SHURMER	0.85	0	2	7	0	0	2	11
HOWE - SHURMER TO DRAKE	0.75	3	6	19	0	1	4	33
HOWE - DRAKE TO BOSTON	1.00	1	8	3	0	0	3	15
HUNT - W130 TH TO DRAKE	1.40	0	3	0	0	1	2	6
N. CARPENTER - BOSTON TO GRAFTON	1.03	0	1	1	0	0	0	2
N. CARPENTER - GRAFTON TO SR 303	1.56	1	5	8	0	0	2	16
PEARL - SR 82 TO SHURMER	0.69	54	4	54	0	4	7	123
PEARL - SHURMER TO DRAKE	0.95	15	3	86	1	1	7	113
PEARL - DRAKE TO BOSTON	1.02	3	7	19	0	0	2	31
PEARL - BOSTON TO GRAFTON	1.07	9	1	3	0	0	4	17
PEARL - GRAFTON TO SR 303	1.57	21	4	48	3	9	8	93
SR 82 - PEARL TO HOWE	0.99	27	6	75	0	8	5	121
SR 82 - HOWE TO WEBSTER	1.30	13	7	83	1	5	6	115
SR 82 - WEBSTER TO W130 TH	0.29	1	0	5	0	1	0	7
W 130 TH - SR 82 TO DRAKE	1.55	0	7	7	0	0	5	19
W 130 TH - DRAKE TO HUNT	0.89	2	2	6	0	0	2	12
W 130 TH - BOSTON TO GRAFTON	1.04	1	1	1	0	0	0	3
W 130 TH - GRAFTON TO SR 303	1.57	0	3	1	1	0	0	5
TOTAL CRASHES		193	98	572	7	46	81	997

2.7.2 Future Conditions

Although future conditions of safety are unknown, it is anticipated that as traffic volumes increase, the crashes may increase as well. This is especially true of the areas near planned growth, if they are not improved. This would include the SR 82 corridor from Howe Road through the I-71 interchange and the SR 303 corridor from N. Carpenter Road to W. 130th Street. These corridors include two of the intersections with high crash rates: Howe Road/SR 82 and SR 303/W. 130th Street.

2.8 Access Management

2.8.1 Existing Conditions

As described in Section 2.0, SR 82, SR 303 and Pearl Road are fronted by commercial development within the study area. The development is primarily retail in nature and varies in scale. Development includes a regional mall, multiple strip plazas and numerous individual small scale developed parcels. Good access management has been incorporated at the larger developments, however where development occurred on a parcel by parcel basis there are locations of poor access management. This was also evident when examining corridors with high concentrations of angle crashes.

In addition to drive spacing, closely spaced intersections are also an issue in the study area, specifically surrounding the interchanges. ODOT's recommended limited access protection is not provided at either interchange in the study area. These closely spaced intersections have led to crashes and operational issues as drivers often maneuver between lanes, positioning themselves for their next turn. If backups exist at the adjacent intersection, vehicles could back up through the interchange area. This leads to sideswipe and rear-end crashes. In addition, the operational efficiency of the intersections is degraded since vehicles are often blocking lanes of traffic.

2.8.2 Future Conditions

As additional development occurs, close attention should be paid to access management techniques for both drives and signalized intersections. Also as roadway projects are developed, access management should be considered to reduce and consolidate existing drives as much as possible.

3.0 Summary and Recommendations

Many items were examined throughout the study area as part of this study including: roadway geometric conditions, roadway pavement conditions, pedestrian facilities, public transportation, traffic flow, safety, and access management. These items were examined with respect to both existing conditions as well as upon completion of planned improvements. When analyzed with planned improvements in place, operation within the study area is generally acceptable, although specific issues exist. The issues are identified in the Existing and Future Conditions report and generally summarized in the following paragraphs. The local municipality will be responsible for further evaluating these issues.

Several roadways within the study area have lane width, vertical alignment, and/or horizontal alignment deficiencies. Nearly half of the identified deficiencies are part of current projects to correct the problems. Pavement conditions are also poor on several roadways within the study area. All except for Shurmer Road, Grafton Road, and Hadcock Road have projects underway to restore pavement conditions.

Generally within the study area, sidewalk is intermittent. It appears that as development and redevelopment occurs, new sidewalk facilities are being introduced, however they are still not complete. The study area is served by public transit by GCRTA and BTA. Generally, the east side of

I-71 is not served as well as the other portions of the study area. The lacking sidewalk in some areas may prohibit increased bus ridership.

In general, traffic operations are currently acceptable during the peak hours. The PM peak hour typically experiences heavier traffic volumes due to the retail developments within the study area. At the time of analysis, the intersection of SR 303/N.Carpenter Road/Brunswick Town Center is the only failing intersection during the PM peak hour, although several other intersections have movements operating at unacceptable LOS. With the planned improvements in place, it is projected only the intersection of SR 82 and Pearl Road will be operating at unacceptable LOS in the future. Again, several other intersections have movements projected to fall under the acceptable levels. The traffic projections used for this analysis are planning level and should be reevaluated as specific development sites are proposed.

There are several high crash locations within the study area. The intersections with the highest crash rates include: SR 303/W. 130th Street, Howe Road/Drake Road, Howe Road/SR 82, and Pearl Road/SR 82. Improvements to the Howe Road/Drake Road intersection have been implemented which should result in a reduction of crashes. Rear end and angle crashes were prominent along the corridors with heavy traffic and a high number of access points, while fixed object crashes were higher along the uncurbed roadway segments. At many of the high crash locations, both intersections and corridors, safety is expected to degrade as new development comes on line if improvements are not made. The local municipality should further study the intersections of SR 82/Pearl Road and SR 303/W. 130th Street by performing a Safety Study at each location.

Lack of access management occurs primarily where the older development occurred on a parcel by parcel basis. This has led to angle crashes along the corridors. In addition, the limited access is not protected beyond the ramp intersections at both interchanges on I-71 in the study area, therefore, intersections have been placed closer to the ramp intersections than recommended. These closely spaced intersections have led to congestion, driver confusion, and crashes along the SR 82 and SR 303 corridors near the interstate. It is recommended that local municipalities evaluate the SR 82 and SR 303 corridors by performing a Safety Study, Traffic Impact Study, and evaluating the corridor signal timing.

Recommendations for the local municipalities to consider are as follows:

- Planned roadway improvement projects identified in Existing and Future Conditions report should continue
- Sidewalk improvements should be incorporated into future projects
- Transit should be coordinated with pedestrian improvements
- Pavement conditions should be improved on Shurmer, Grafton, Hadcock Roads
- Substandard lane/shoulder widths should be improved on Howe, Drake, W.130th (Medina County section)
- Safety Studies at SR 82/Pearl Road and SR 303/W. 130th Street Intersections
- Safety Study, Traffic Impact Study, and evaluate the corridor signal timing for corridor segments on SR 82 from Howe Road through the I-71 interchange and SR 303 from Hadcock Road through the I-71 interchange

Appendix A

Figures

FIGURE 1: STUDY AREA

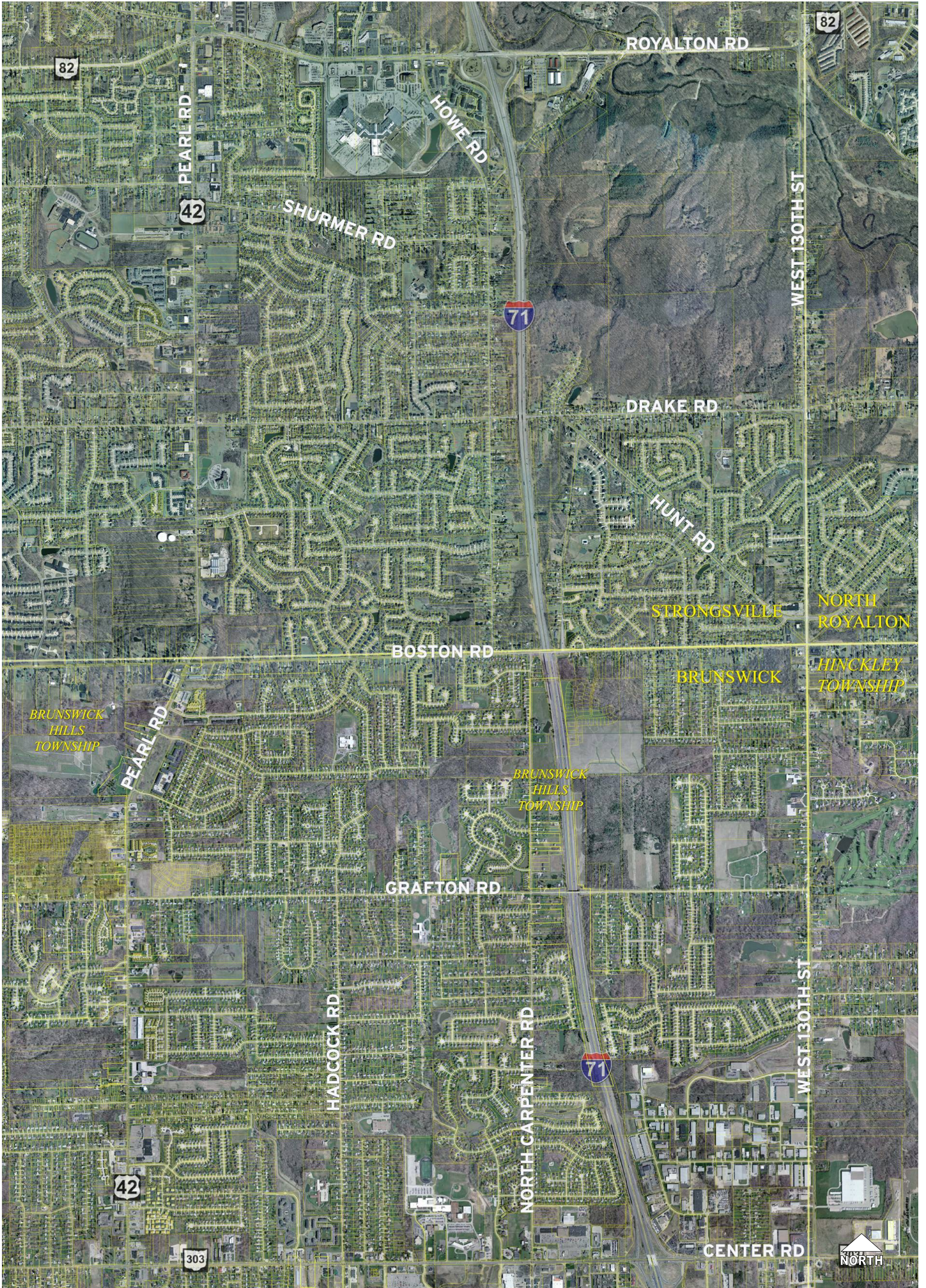
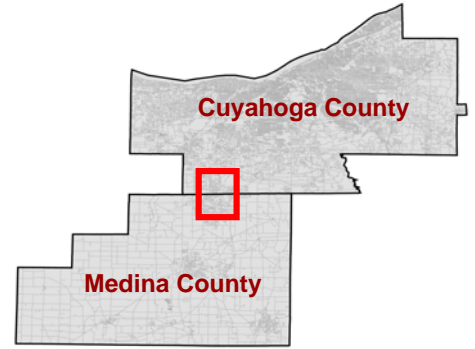
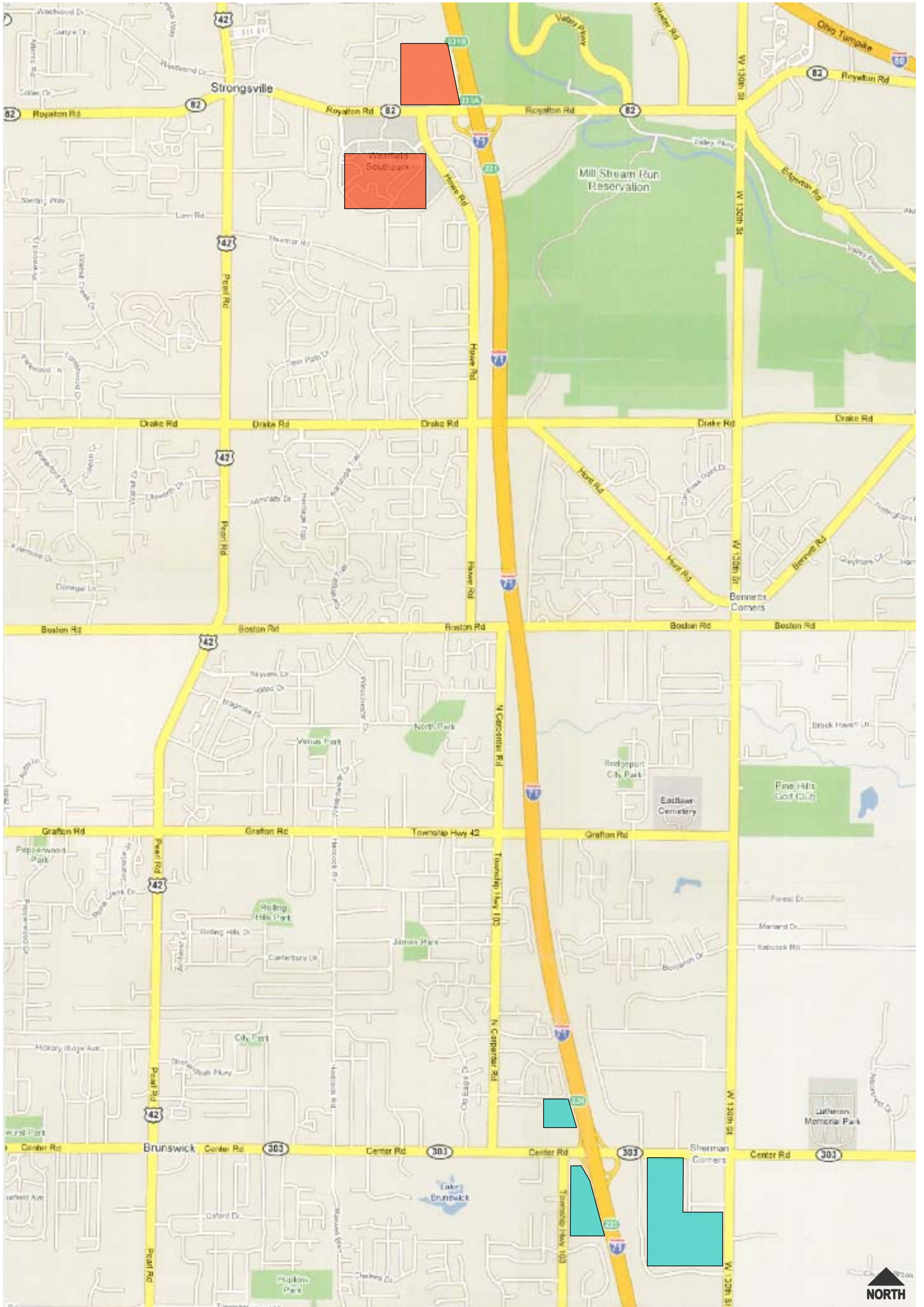


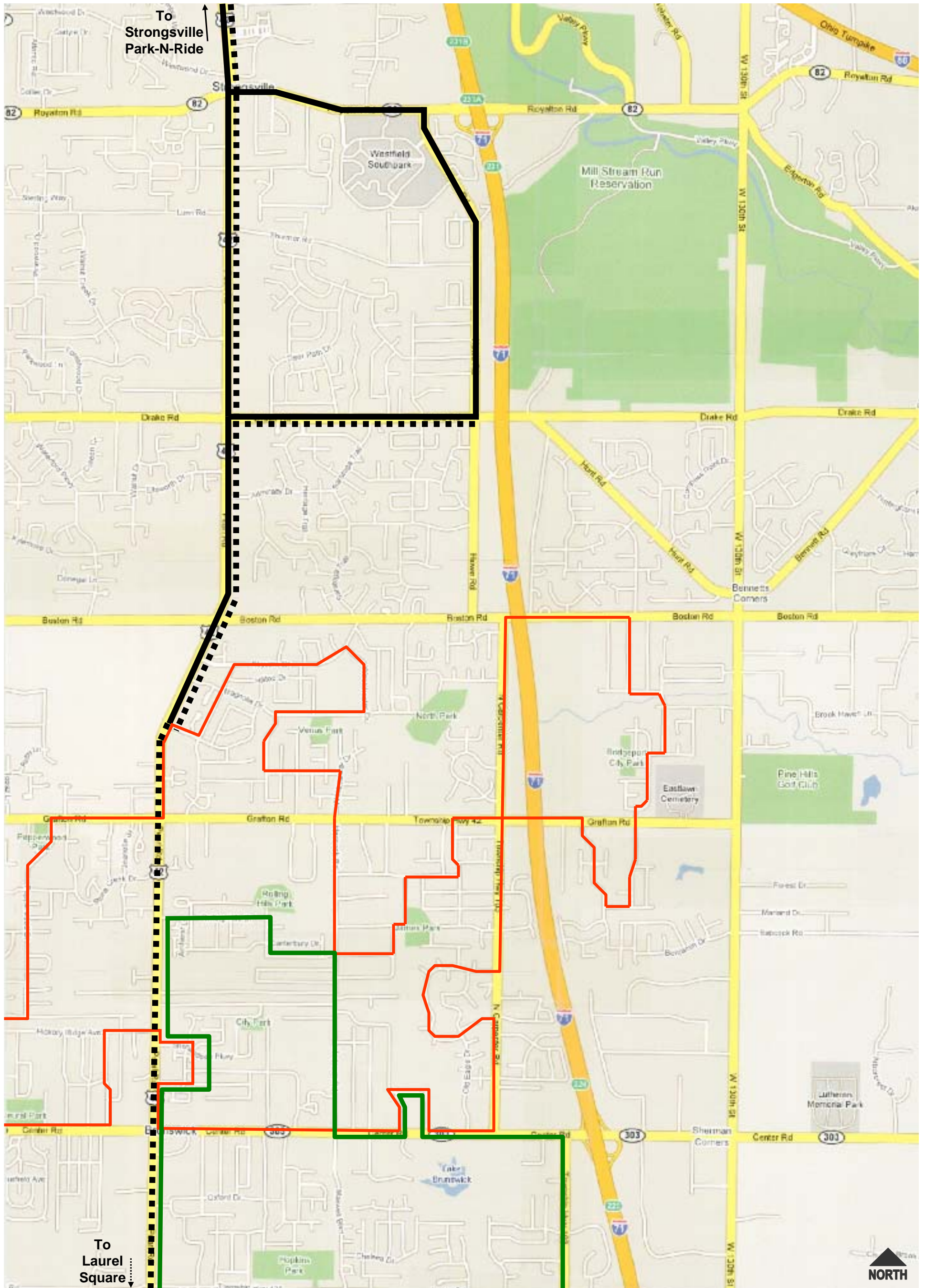
FIGURE 2: PROPOSED ECONOMIC DEVELOPMENT



City of Strongsville Planned Development

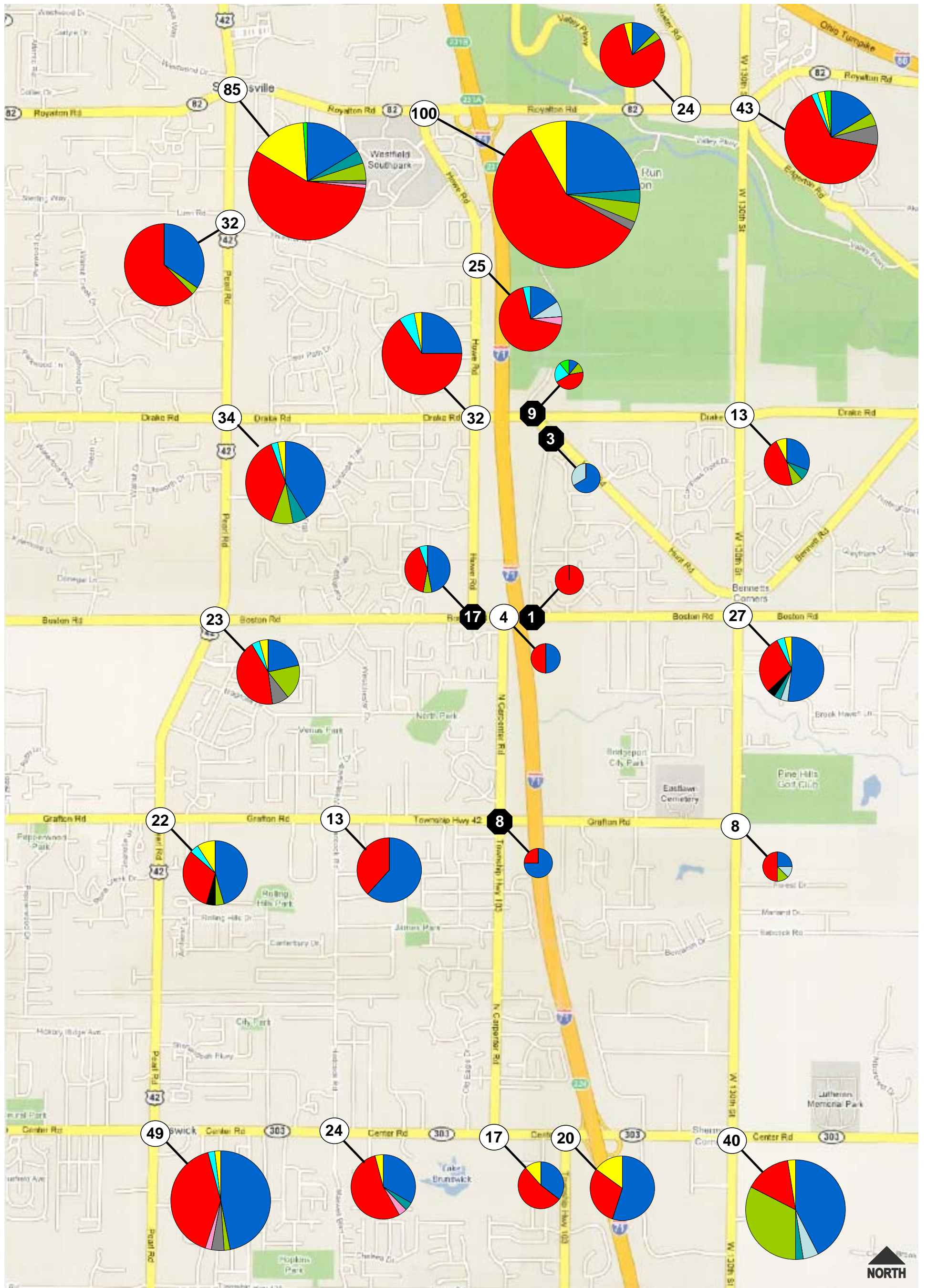
City of Brunswick Planned Development

FIGURE 3: EXISTING BUS ROUTES



- BTA NORTH ROUTE
- BTA SOUTH ROUTE
- GCRTA ROUTE 51X, 51F
- - - GCRTA ROUTE 451, MCPT

FIGURE 4: TOTAL INTERSECTION CRASHES (2004-2006)



XX Signalized Intersection
 XX Unsignalized Intersection
 XX Number of Crashes

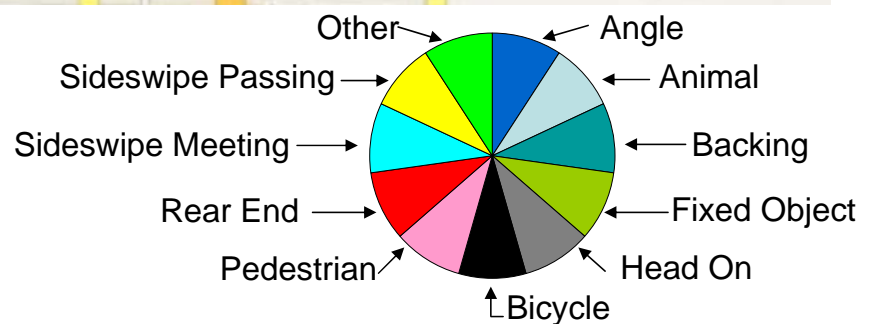
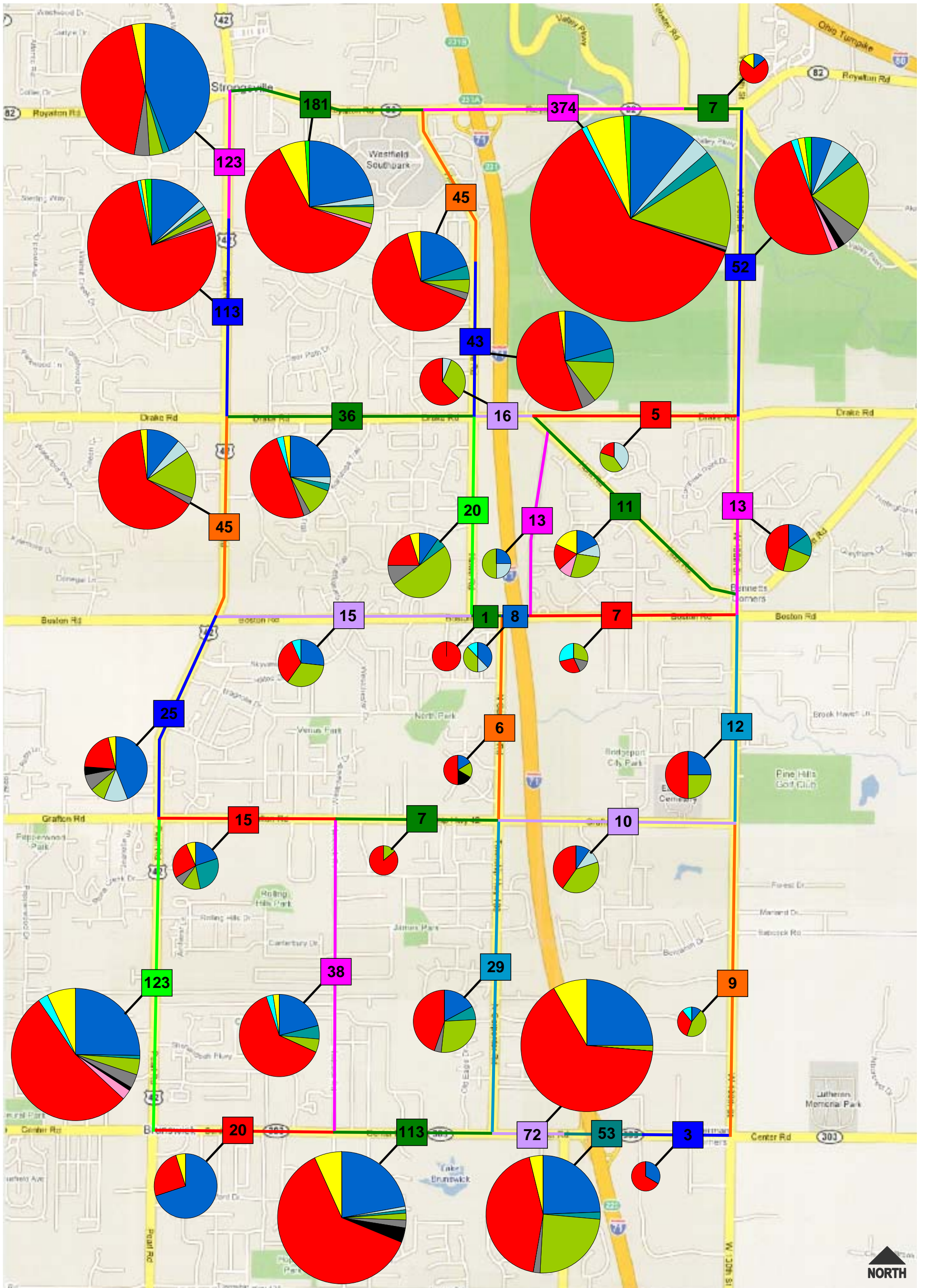
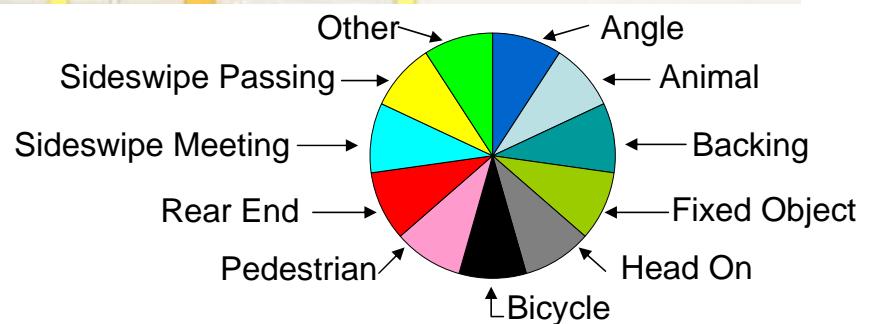


FIGURE 5: TOTAL CORRIDOR CRASHES (2004-2006)



XX Number of Crashes

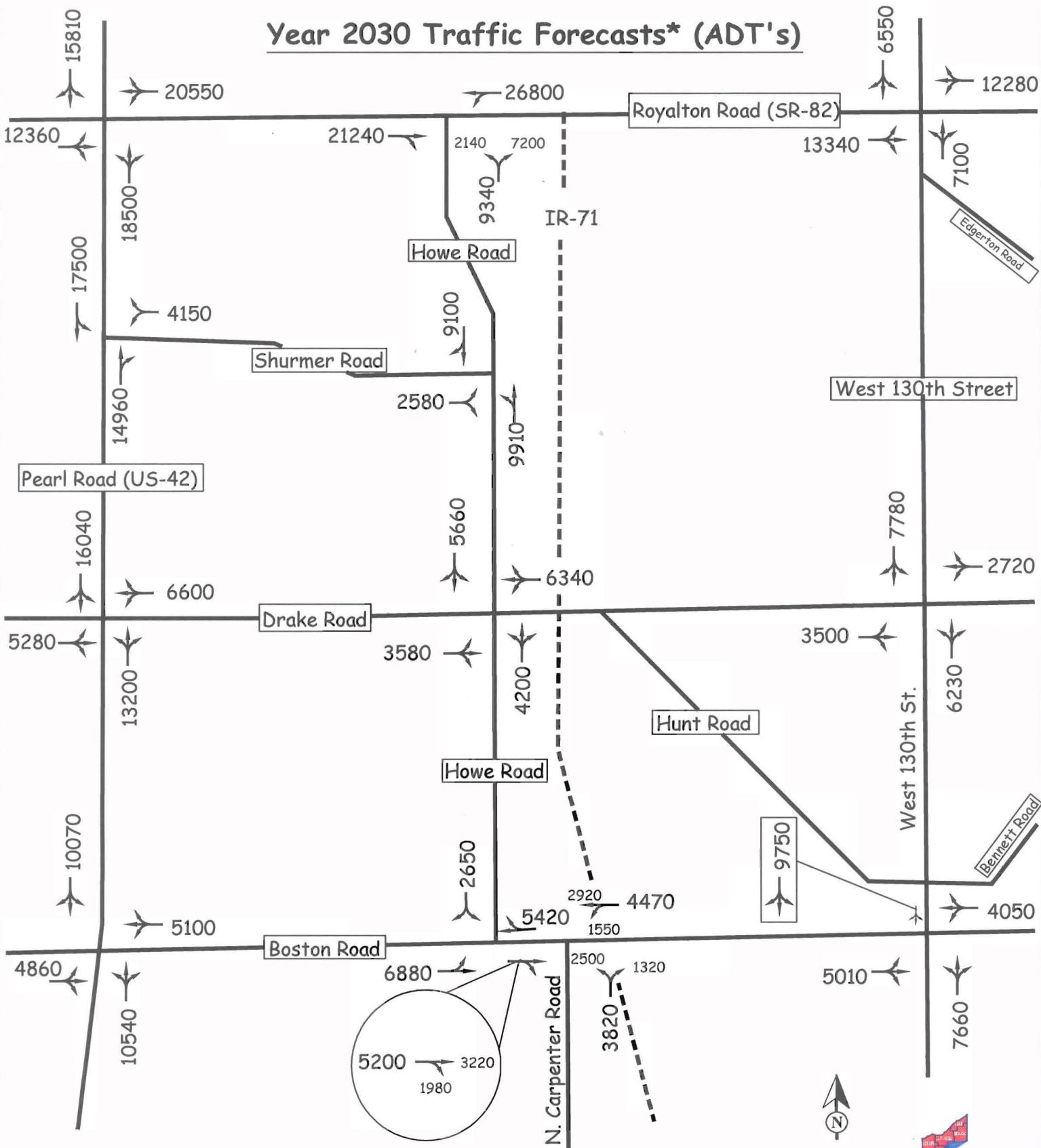


Appendix B

Traffic Volumes

Boston Road/I-71 No-Build Alternative TLCI project 2030 Traffic Forecast

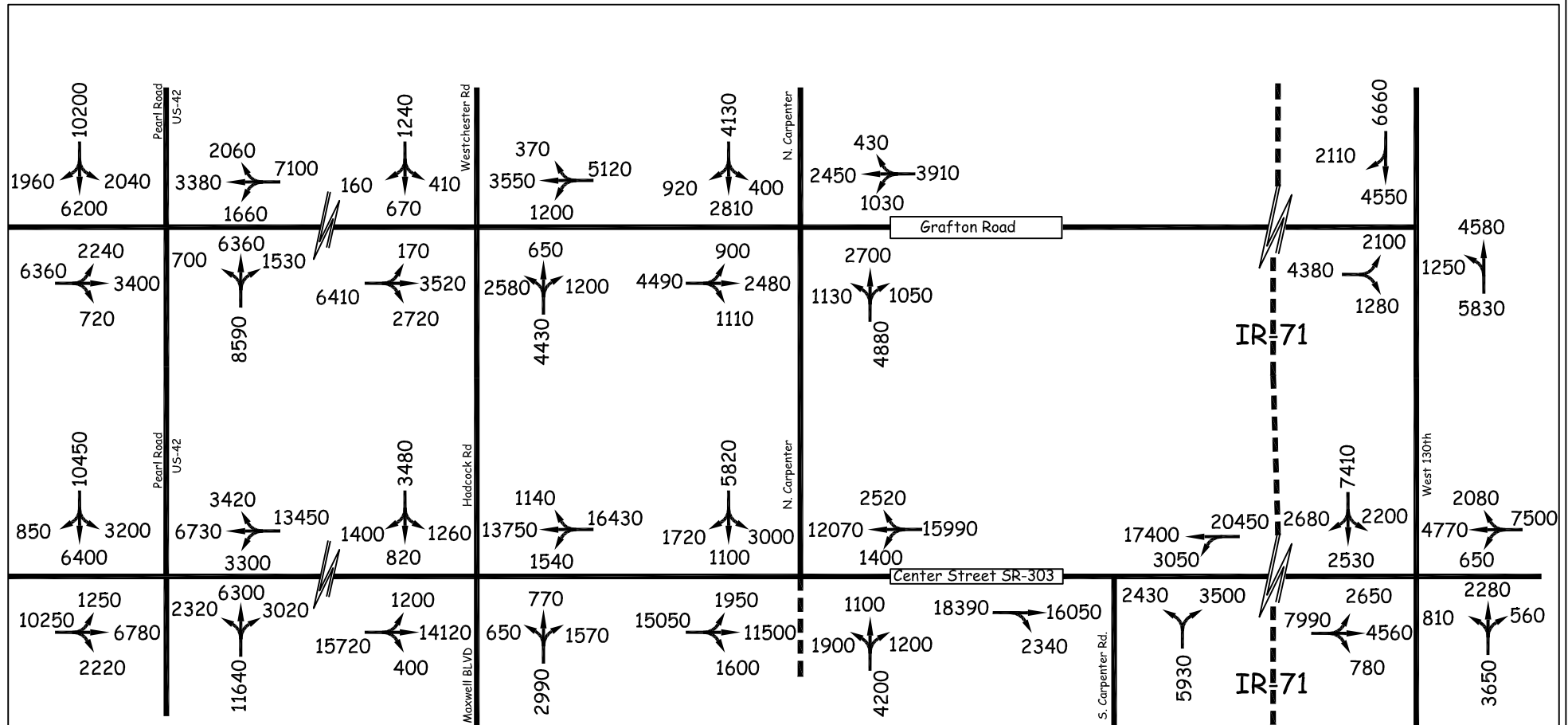
Year 2030 Traffic Forecasts* (ADT's)



* The forecasts are based on the NOACA regional Model inputs and the 2006 actual traffic counts provided. The forecasts can be used as base line (background) forecast, if a major development is known to be coming to this area the trips generated by the development can be added to this forecast following the Trip Generation Manual's procedures.

Boston Road/I-71 No-Build Alternative TLCI project 2030 Traffic Forecast

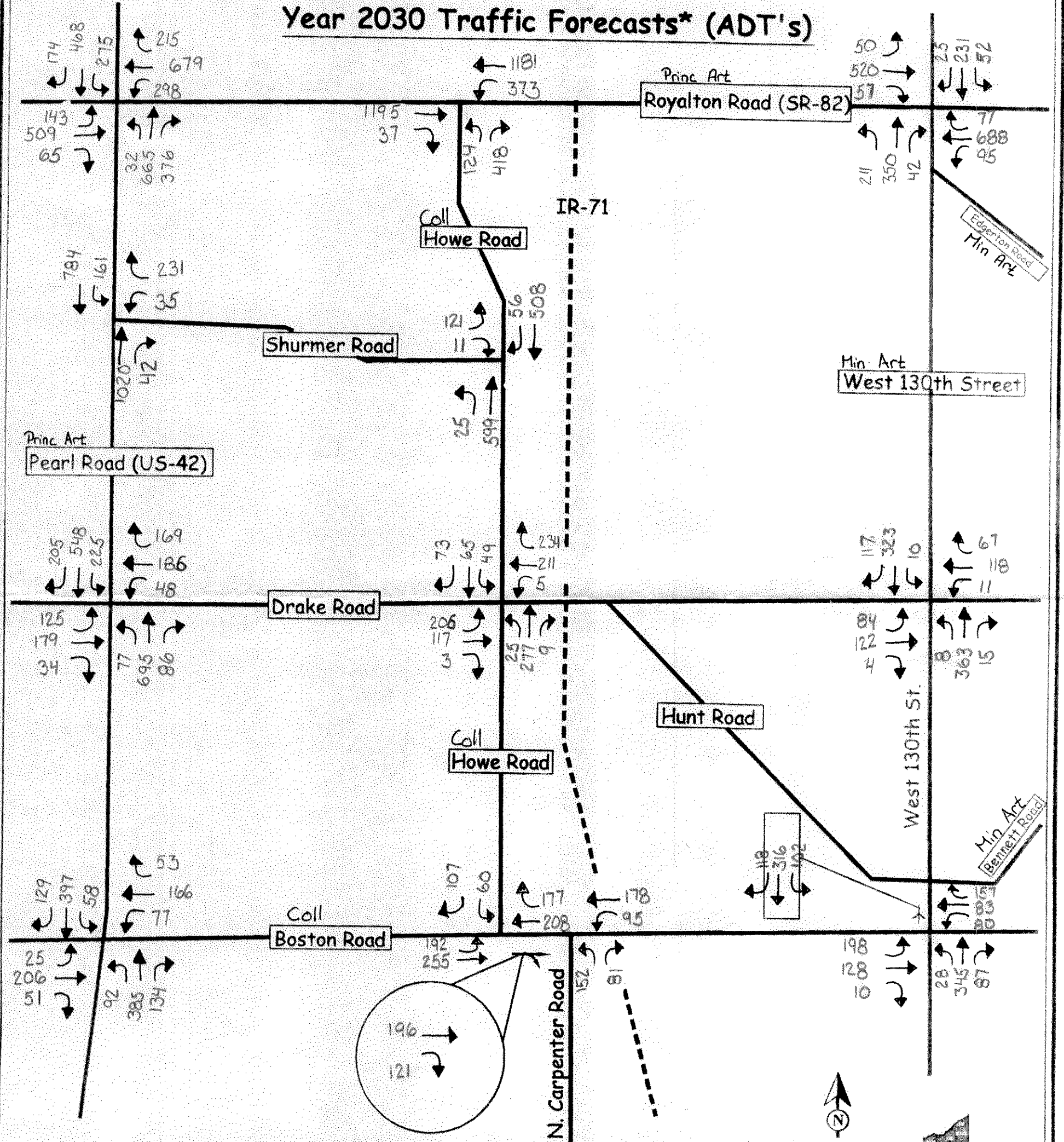
Year 2030 Traffic Forecasts* (ADT's)



* The forecasts are based on the NOACA regional Model inputs and the 2006 actual traffic counts provided. The forecasts can be used as base line (background) forecast, if a major development is known to be coming to this area the trips generated by the development can be added to this forecast following the Trip Generation Manual's procedures.

**Boston Road/I-71 No-Build Alternative TLCI project
2030 Traffic Forecast**

Year 2030 Traffic Forecasts* (ADT's)

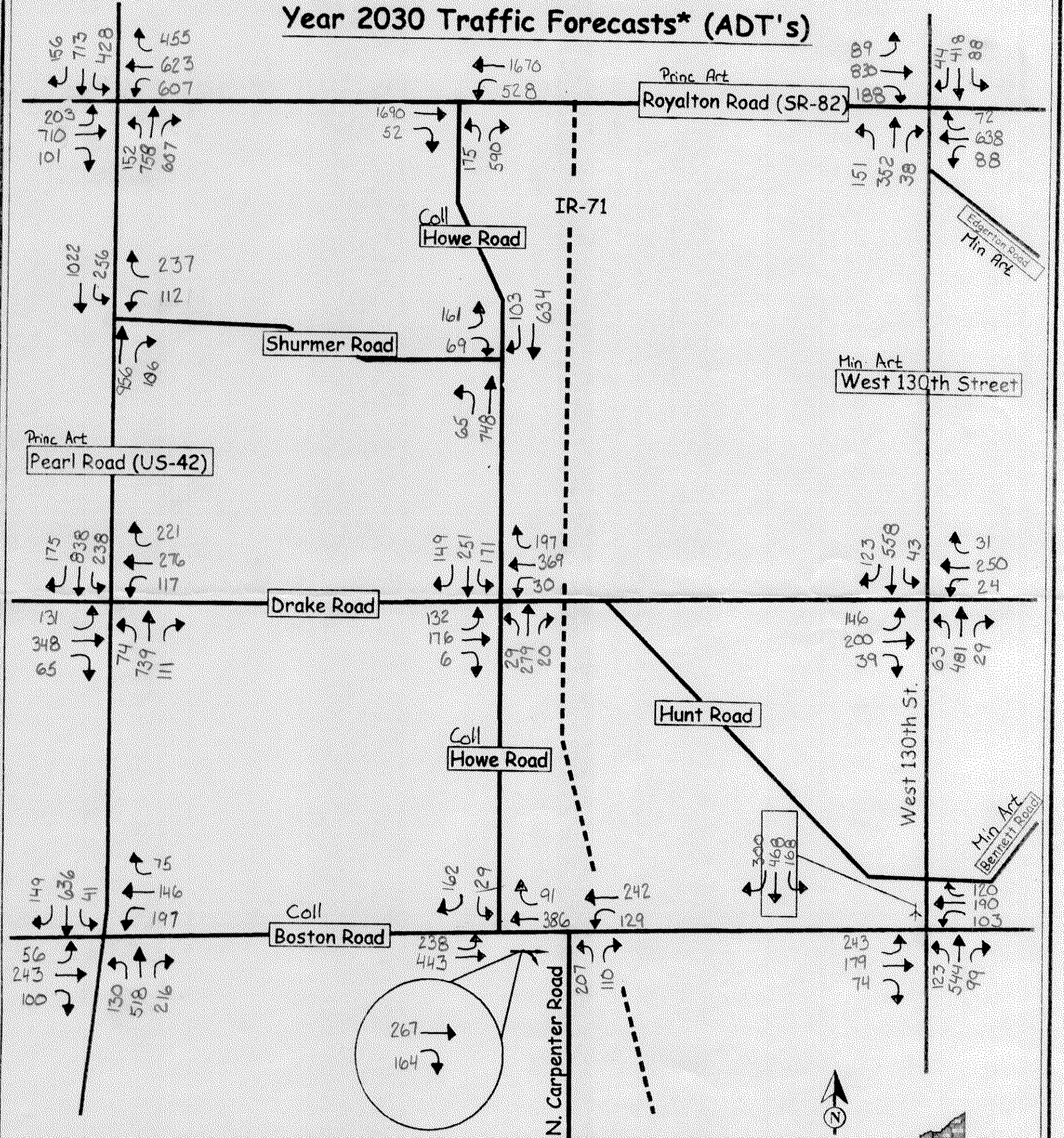


* The forecasts are based on the NOACA regional Model inputs and the 2006 actual traffic counts provided. The forecasts can be used as base line (background) forecast, if a major development is known to be coming to this area the trips generated by the development can be added to this forecast following the Trip Generation Manual's procedures.



**Boston Road/I-71 No-Build Alternative TLCI project
2030 Traffic Forecast**

Year 2030 Traffic Forecasts* (ADT's)



* The forecasts are based on the NOACA regional Model inputs and the 2006 actual traffic counts provided. The forecasts can be used as base line (background) forecast, if a major development is known to be coming to this area the trips generated by the development can be added to this forecast following the Trip Generation Manual's procedures.