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1.0 Introduction

The Town of Westlock has a population of just under 5,000 persons. Located in central Alberta at the junction of Highways 18 and 44, Westlock has a number of economic bases including agriculture, retail, oil, lumber, gas and coal. Canadian National Railways also operates a rail line through Westlock.

The Town expects to grow. Recently the Town annexed six quarter sections of land on its eastern boundary. Four of these quarters are for commercial uses while the remaining two are for residential uses. The Town is also processing residential development proposals within its southern boundary.

To plan its orderly growth, the Town needs a Transportation Master Plan (TMP). The plan will identify new roads and sidewalks in the long term, as well as within the next 5 years. It will also identify access points to Highways 18 and 44, both operated by Alberta Transportation.

2.0 Methodology

The following discussion describes the methodology used to conduct the Westlock TMP. During the course of the Westlock TMP project, four meetings were held with the Town to share progress and comments on work completed.

2.1 Gather Background Information

Gathering background information included obtaining electronic base plans of the Town and recently annexed lands, as well as all relevant land use plans including the Land Use Bylaw, the Municipal Development Plan, Area Structure Plans and Outline Plans (see Appendix A). In addition, four traffic counts were obtained from Alberta Transportation's website (Hwy 18/100 Ave, Hwy 18/Hwy 44, Hwy 18/113 Ave and Hwy 44/107St), 17 counts along Highways 18 and 44 were provided by Associated Engineering (shown in Exhibit 2.2) and ISL conducted one traffic count on Highway 18 at 108 Avenue to confirm accuracy and determine growth. Finally, draft functional plans of Highway 18 and Highway 44 were obtained from Associated Engineering, who are conducting a Functional Planning Study of these Highways through Westlock on behalf of Alberta Transportation.

2.2 Conduct Network Inventory

Westlock's existing road and sidewalk networks were mapped based on plan and air photo information. Draft road and sidewalk inventory plans were created and shared with the Town. Comments from the Town were then incorporated into these drafts. For each road segment the road inventory identified the number of travel lanes, the availability of parking and the surface treatment (paved or gravel). For each sidewalk segment the sidewalk inventory identified the type of sidewalk (sidewalk, trail or Rotary Trail), and included sufficient detail to show sidewalks on one or both sides of any road.

2.3 Forecast and Analyze Traffic Volumes

Future traffic volumes were forecasted based on expected population growth and emerging development patterns. The forecast was to a 20 year time frame at major intersections. The resulting traffic volumes were analyzed to identify any deficiencies and to recommend mitigating measures.

2.4 Define Future Road Hierarchy

Using the road network inventory and the snow clearing priority a road hierarchy of future arterial, collector and local roads was created. A draft of the hierarchy was shared with the Town. Comments were incorporated to update the network.

2.5 Define Future Pedestrian Network

Using the sidewalk network inventory a future sidewalk network was defined. A draft of this network was shared with the Town and comments received were incorporated to update the network.

2.6 Define Five Year Capital Plan

Using the future road hierarchy and the future pedestrian network, as well as pavement and sidewalk assessments from other studies, a five year capital plan was defined for the Town. It identifies new road and sidewalk needs as well as rehabilitation of existing roads and sidewalks.

2.7 Draft and Final Reports

The above tasks were incorporated into a draft report. It was shared with the Town and comments received were incorporated into the final report.

3.0 Network Inventory

This section describes the roadway and pedestrian network inventories created for Westlock's TMP.

3.1 Roadway Network Inventory

3.1.1 Background

Using air photo and plan information, a draft roadway network was created. It was shared with the Town, who provided comments for updates.

The roadway network is an important part of the Town's transportation system. It allows motor vehicles and bicycles to travel between various properties in the Town, and to connect to regions beyond the Town via the Provincial Highways. The roadways move people in passenger vehicles as well as goods and services in vans, trucks and semi-trailers. In this sense the roadways allow trade and connection to a very wide region that can include world wide markets.

The network inventory included the number of lanes (including rear lanes), the availability of parking, and the road surface treatment (paved or gravel).

3.1.2 Existing Roadways

Exhibit 2.1 shows the Roadway Network Inventory. Highways 18 and 44 are included in the inventory, but are the responsibility of Alberta Transportation. Some private roads exist for condominium or trailer park developments. All other roads are the Town's responsibility.

The most common road types are "2 lane with Parking" and "Back Lane". They prevail in all residential areas as well as the downtown. "2 lane with Single Parking" is common on several service roads along the Highways, as well as 108 Street paralleling the rail corridor.

In the industrial area gravel roads prevail, although there are also some in commercial areas.

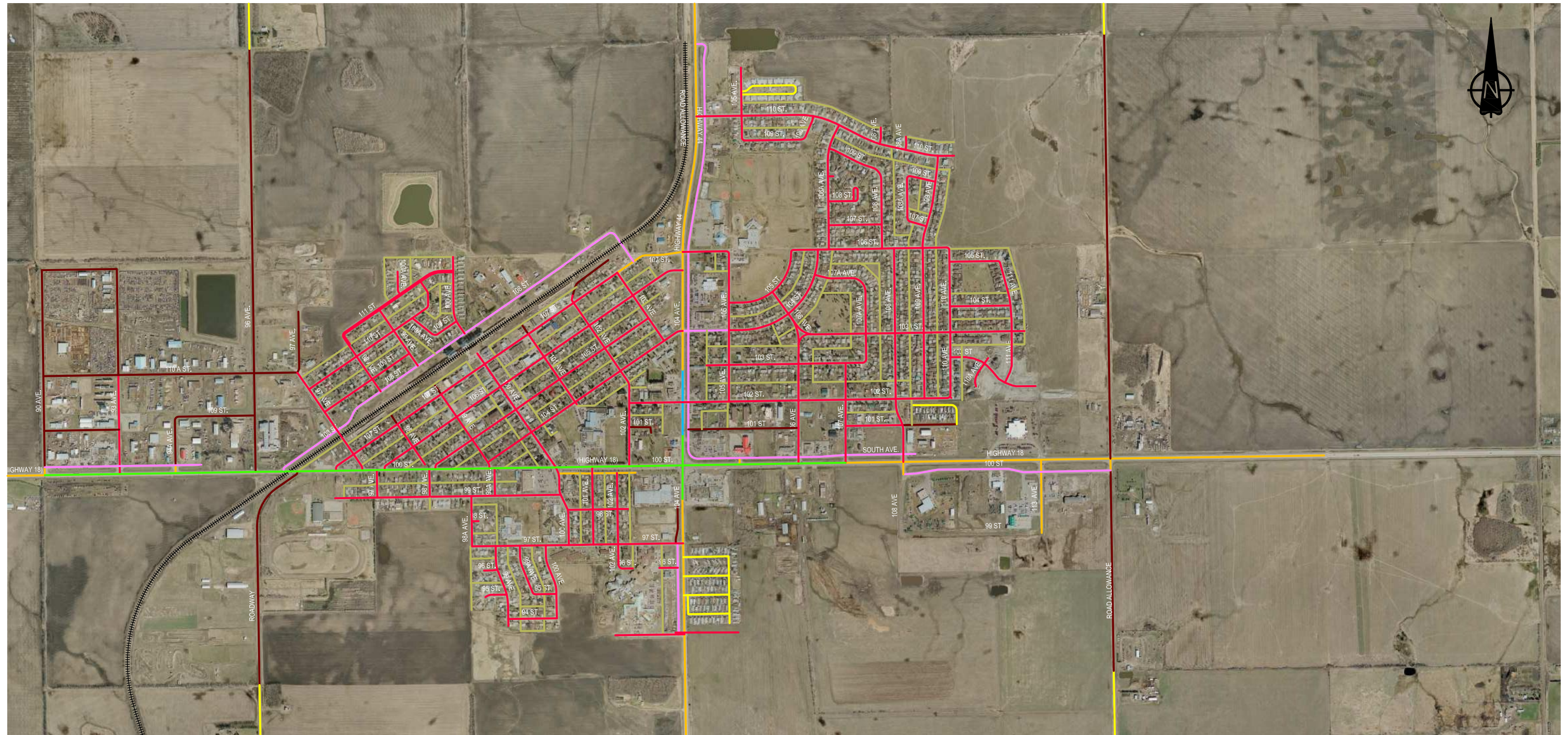
The Town currently does not have any roads with more than two travel lanes in its inventory, excluding those maintained by the Province of Alberta.

Traffic counts from AT and Associated Engineering are shown in Exhibit 2.2. The counts were conducted from 2006 to 2008 and all factored to 2008 based on growth observed at Automatic Traffic Recorders on the highways outside of the town boundary.









3.2 Pedestrian Network Inventory

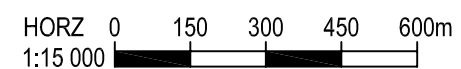
3.2.1 Background

Air photo and plan information was used to create a draft pedestrian network. The Town provided comment on the network and the draft was updated.



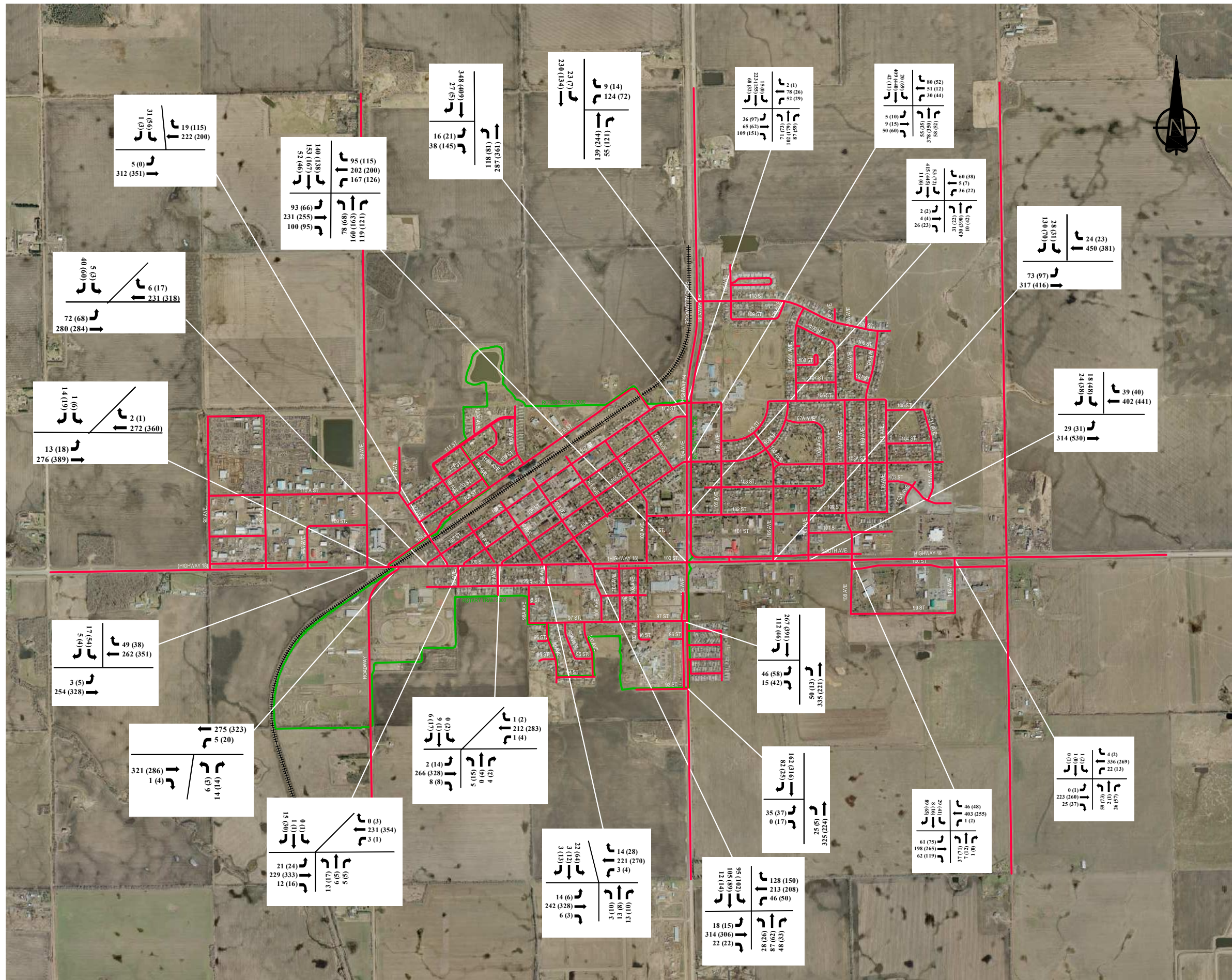
ROAD LEGEND

- | | |
|---|----------------------------|
|  | 2 Lane |
|  | Gravel |
|  | 2 Lane with Parking |
|  | 2 Lane with Single Parking |
|  | 4 Lane |
|  | Private or External |
|  | 3 Lane NB |
|  | Back Lane |



TOWN OF WESTLOCK TRAFFIC MASTER PLAN EXISTING ROADWAY NETWORK





TRAFFIC VOLUMES
AM (PM) PEAKS

HORZ 0 200 400 600 800m
1:20 000

TOWN OF WESTLOCK
TRAFFIC MASTER PLAN

2008 TRAFFIC VOLUMES



The pedestrian network is an important part of the Town's local transportation system. Westlock is a community whose size and character allow walking. Walking access is realistic for many activities that people in Westlock do, such as working, education and social and recreational trips.

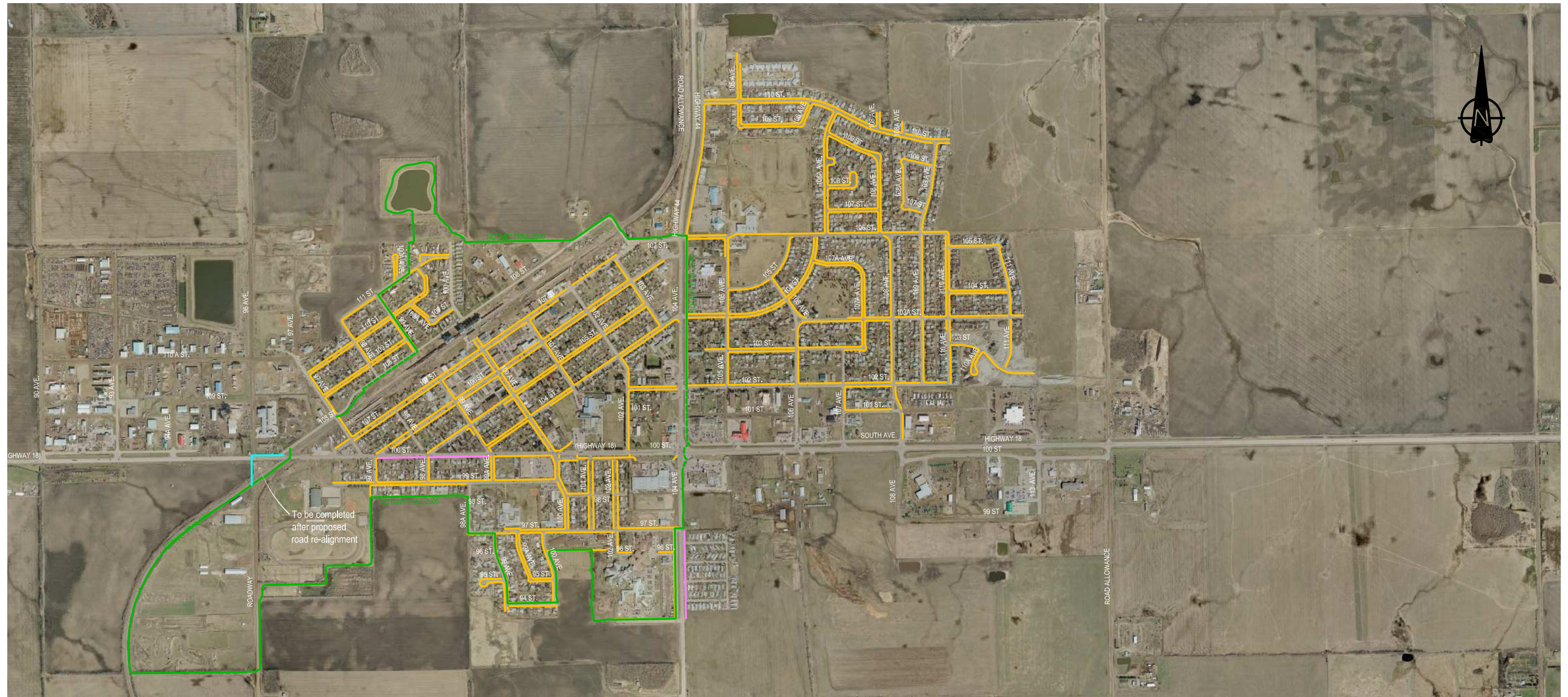
The inventory included a description of the type of sidewalk, defined as follows:

- Sidewalk – concrete material paralleling a road
- Paved trail – asphalt material about 1.0m to 1.5m wide
- Rotary trail – a signed circular trail system mainly for recreational use, sometimes using existing sidewalks or trails
- Designated Trails – portions of the Rotary Trail where no pedestrian facilities exist.

3.2.2 Existing Pedestrian Network



Exhibit 2.3 shows the existing pedestrian network inventory. Sidewalks make up the bulk of the inventory. In the downtown, sidewalks are on both sides of most Streets and some Avenues. In residential areas a sidewalk are usually on one side of the street and in some cases both sides of the streets. In outlying industrial and commercial areas there are no sidewalks.

There is a small portion of paved trail on the south side of Highway 18 between 97 and 99A Avenues. The Rotary Trail provides a significant amount of access for pedestrians, even for non-recreational trip purposes.



SIDEWALK LEGEND

Existing Sidewalks

- Sidewalk
 Paved Trail
 Rotary Trail
 Designated Trail
 Future Rotary Trail

HORZ 0 150 300 450 600m
1:15 000

TOWN OF WESTLOCK TRAFFIC MASTER PLAN EXISTING SIDEWALK NETWORK



4.0 Future Conditions

4.1 Future Roadways

Exhibit 3.1 shows the future roadway hierarchy for the Town.

Highways 18 and 44 form regional connections and function as arterial roads within the Town. Additional arterial roads are shown on the north/south alignments at about one mile spacing. The spacing is greater in the west end of the Town due to the proximity of the rail crossing. Truck route collector roads are used in industrial areas to collect and distribute commercial and industrial traffic.

Future roads are shown in outlying areas of the Town. These alignments are subject to change at the time of development, but indicate required connectivity within the Town and to the County if required.

In the newly annexed lands to the east, connections to Highway 18 are shown as well as connection to the surrounding arterial grid. The spacing of these connections is generous to minimize the number of intersections that Highway and arterial traffic must face. In the north east, connections are shown between the future residential and commercial lands. These connections should accommodate pedestrians at the least, and could accommodate vehicular traffic if desired. The pedestrian connection is required to promote walk-ability and sustainability.

4.2 Future Pedestrian Network

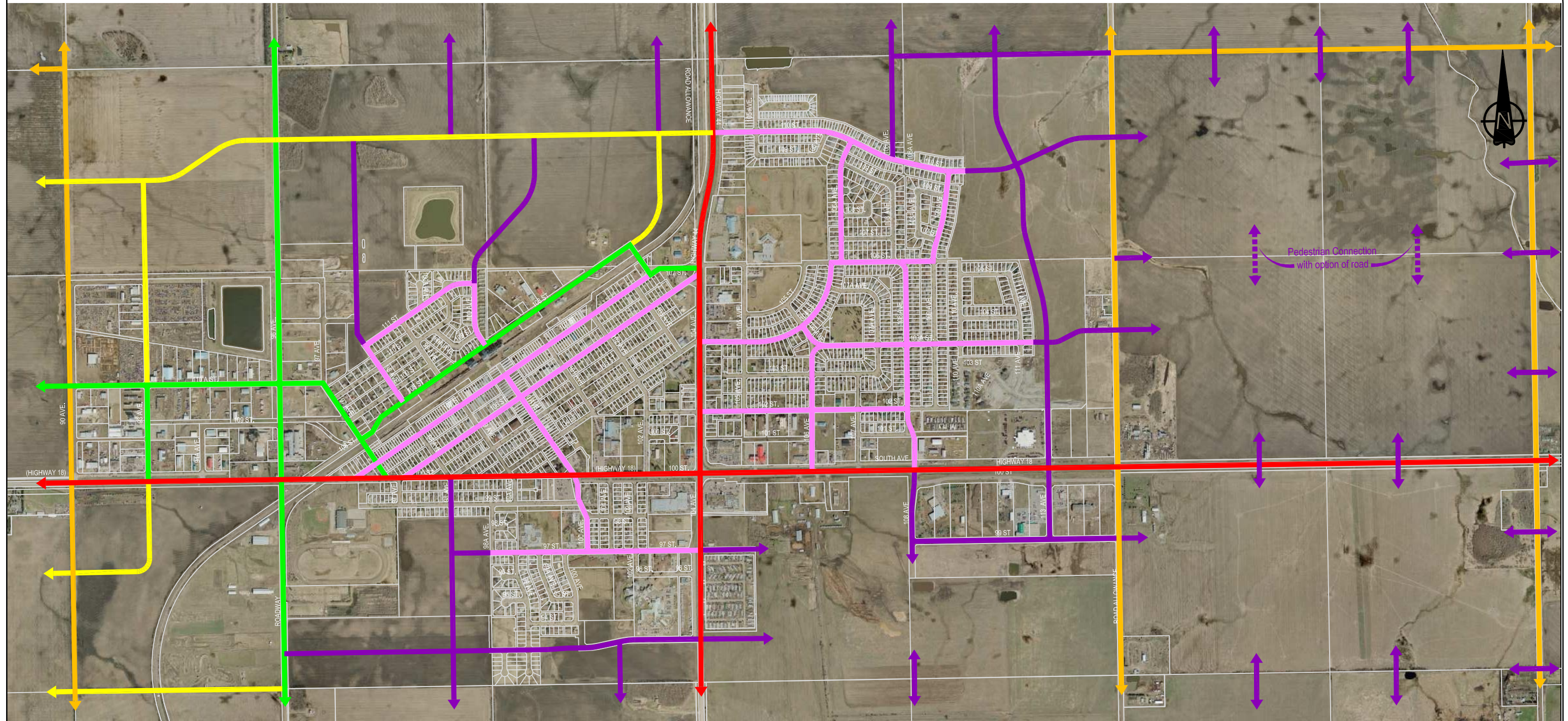
Exhibit 3.2 shows the existing sidewalk network as well as future sidewalks. The new walks fill in some gaps in the downtown and in outlying commercial and industrial areas, as well as complete the sidewalk network where it is only available on one side of a street.

Highway priority sidewalks are in the downtown, on school routes and connecting to the commercial areas in the east end of the Town. Pedestrian trips are more likely in these areas and given the absence of sidewalks, these areas were judged to require higher priority for new sidewalks.

In some cases it may be difficult to install a traditional sidewalk due to rural cross sections (ditches) or other obstacles. Some alternative methods should be considered, including:

- Locating the walk on private property, through negotiation of an easement with the owner. There is usually room for a sidewalk on the required front yard of the property.
- Banning parking on one side of a service road and painting a shoulder for pedestrians. Rumble strips could also be used to delineate the pedestrian space from the roadway space.

It is also recommended that for future development, sidewalks should be included on both sides of a road. This is an important element in keeping Westlock walkable and sustainable.



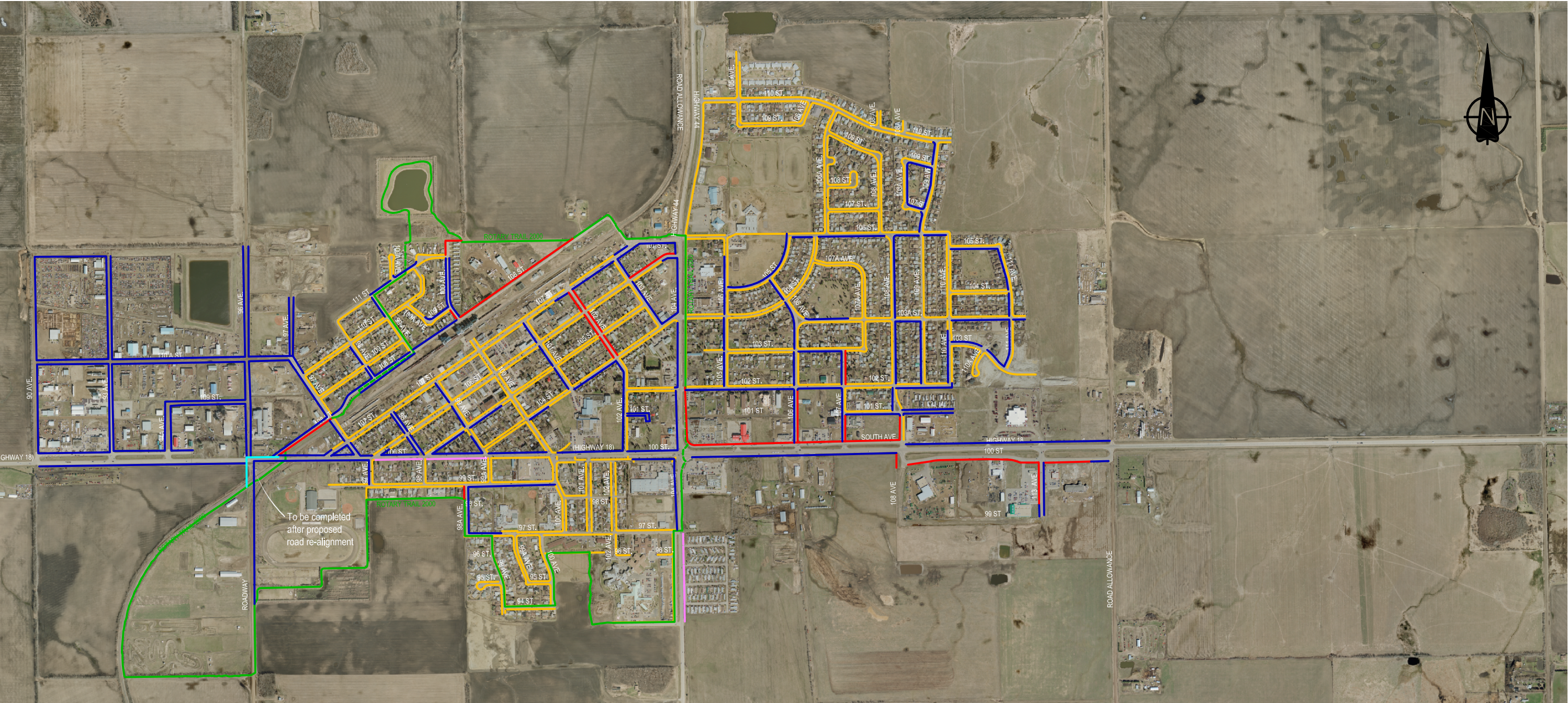
ROAD LEGEND

- Highway Arterial
- Arterial
- Collector
- Future Collector
- Truck Route Collector
- Future Truck Route Collector

HORZ 0 150 300 450 600m
1:15 000

TOWN OF WESTLOCK
TRAFFIC MASTER PLAN
FUTURE ROADWAY HIERARCHY





SIDEWALK LEGEND

Existing Sidewalks

- Sidewalk
- Paved Trail
- Rotary Trail
- Designated Trail
- Future Rotary Trail

Future Sidewalks

- Short Term Development
- Long Term Development

HORZ 0 150 300 450 600m
1:15 000

TOWN OF WESTLOCK
TRAFFIC MASTER PLAN
FUTURE SIDEWALK NETWORK



4.3 Traffic Forecast and Analysis

The goal of the traffic forecast and analysis was to identify possible roadway needs for a 20 year time frame. Traffic forecasts to this time frame rely heavily on a number of key assumptions regarding the amount, location, and nature of the Town's growth. This can never be forecasted with a high degree of certainty. Therefore the traffic forecast must be viewed as "guidance" for future growth, and judgment must be applied to the forecast and subsequent analysis.

The following steps were needed to create the 20 year forecast:

- Estimate a reasonable population growth scenario for Westlock
- Identify a corresponding amount of commercial growth for the population growth
- Identify the areas where the population, residential and commercial growth is likely to occur,
- Calculate the amount of traffic generated by the growth and estimate the routes used in the roadway network
- Add this development traffic to existing traffic.

Each of these steps is described in the following sections.

4.3.1 Population Growth Scenario

Population growth for Westlock was estimate using past growth patterns. Exhibit 3.3 shows historical population growth for the Town. In recent years (1982 to 2006) the Town's growth is about 0.5% per year (non-compound) (see Appendix B).

Three growth options were considered to forecast the population, an 8000 (2.72%), a 6400 (1.25%) and a 5600 (0.54%) twenty year (2028) population horizon. The 8000 horizon reflected the highest growth rate experienced in Westlock (between 1956 and 1982). The three, forty and ninety years rate yielded the 6400 horizon option. The last horizon, 5600, represents the approximate growth rate of Westlock in all the years excluding the high rate growth period between 1956 and 1982.

For a TMP exercise, it is strategic choice uses a growth rate slightly higher than the historical growth. This allows for flexibility in the plan should growth occur higher than historical trends. The 8000 population horizon requires a sustained sharp upturn in the population growth and was deemed too aggressive. Therefore the 6400 population horizon with a growth rate of about 1.25% was assumed.

4.3.2 Commercial Growth

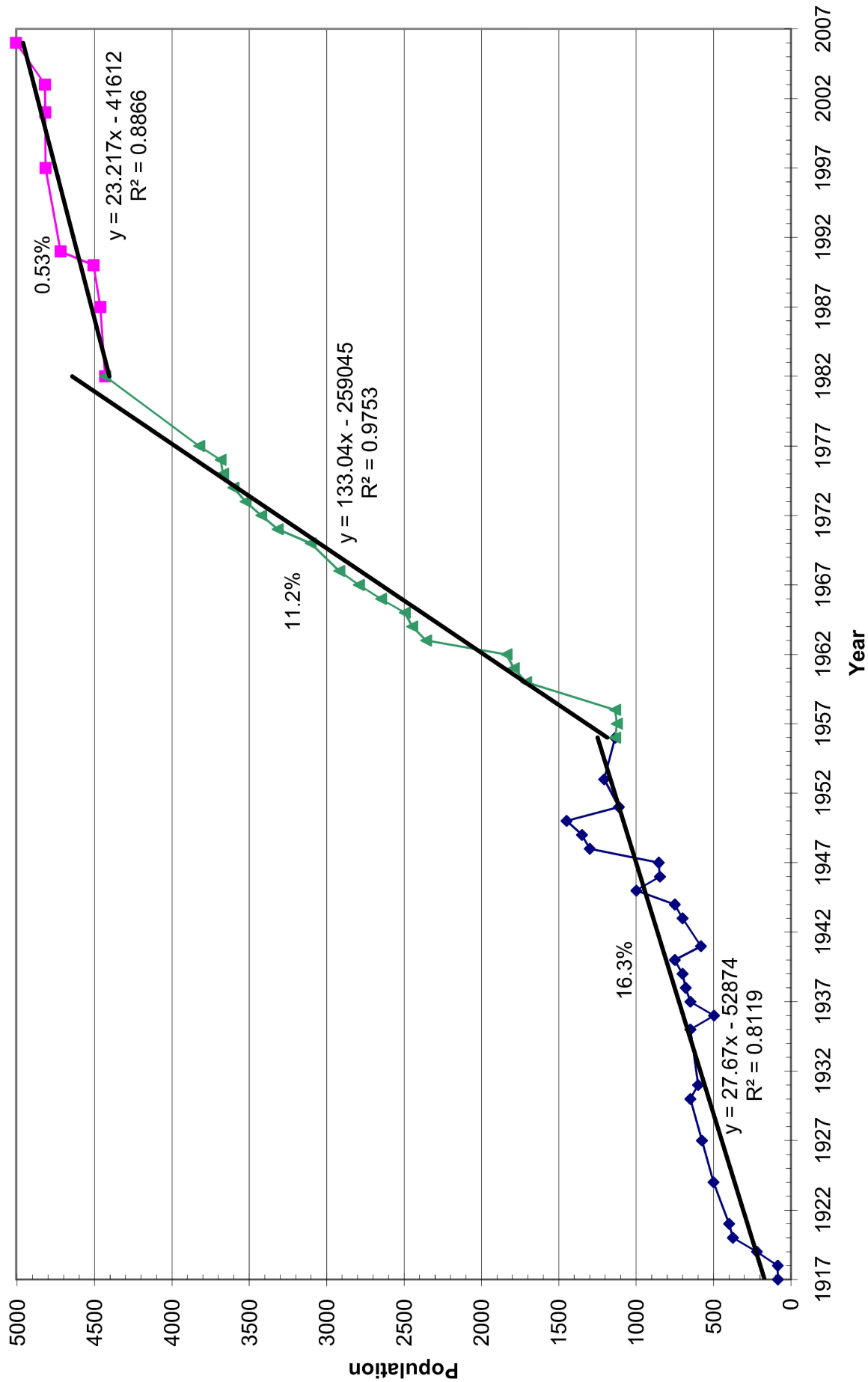
Given the population growth of 1.25% over the 20 year forecast period, the same growth was assumed for commercial lands. Using existing land areas and zoning information, the commercial areas are forecast to grow by 62 gross hectares (152 acres).

4.3.3 Location of Growth

Two main areas of the Town were assumed to absorb the forecasted population growth. These are Aspendale in the Northeast and the lands accessed via 93 Avenue west of Highway 44. Both areas are subject of active development proposals and are therefore more likely to absorb a substantial portion of the forecasted population growth.

Exhibit 3.3

Town of Westlock Population
Source: Government of Alberta Municipality Affairs



For the commercial and industrial growth, the newly annexed lands on the east side of Westlock were assumed to absorb most of this growth. This area was selected as some of the newer commercial and industrial growth in the Town as at the eastern edges of the pre-annexation Town boundary.

4.3.4 Traffic Calculation

The traffic calculation involved an iterative process. Trip generation for AM and PM peak hours for the commercial and population growth was estimated using the Institute of Transportation Engineers “Trip Generation Manual” (7th Edition). It was found that the commercial trips greatly outnumbered the residential trips. While some commercial trips were assumed to originate from outside of Westlock, the overall number of commercial trips was reduced to provide better balance between the trips numbers.

4.3.5 Traffic Volumes and Analysis

Exhibit 2.2 shows 2008 traffic volumes at most highway intersections within the Town. Several of these were identified as higher volume intersections and are: 96 Ave, 100 St, 106 Ave and 108 Ave along Hwy 18, 107 St, 104 St, 97 St and 93 St along Hwy 44 and the intersection of Highways 18 and 44. The main parameter analyzed was Intersection Capacity Utilization (ICU). This measures the remaining capacity, regardless of control type or signal timing, in the critical, opposing movements and it is preferred to be below around 80%. Although ICU is independent of control, signalization may be required to utilize the available time more efficiently.

Through the analysis of the higher volume intersection in both the AM and PM peak hours, it was determined that they will have sufficient capacity in the 20 year time period (see Appendix C). The intersections with the highest ICU are 104 St/Hwy44 and 108 Ave/Hwy18 with AM and PM values ranging from 65% to 75%. These intersections are more likely to require signalization in the 20 year time period.

It was found that the existing roads will perform satisfactorily in the 20 year time frame. Although road widening is not foreseen, there also may be the need to add traffic signals at some locations due to development. These locations will be near developing areas and will be on the Provincial Highway network. Likely locations are:

- Highway 18 – 108 Avenue
- Highway 44 – 93 Street – if development along 93 Street proceeds, signals should be installed as recommended in the developer’s TIA.
- Highway 44 – 97 Street if development along 97 Street proceeds, signals should be installed as recommended in the developer’s TIA.

5.0 Five Year Capital Plan

Table 4.1 shows the proposed Westlock Street and Sidewalk Improvement Program. The plan includes a number of road rehabilitation projects, as well as a number of new sidewalks as identified in Exhibit 3.2 (see Appendix D).

The plan estimates expenditures of about \$3M per year until 2013, when only \$130,000 of projects have been identified. They include sidewalks only, as the street improvement program has not been forecasted to 2013 at this point.

Table 4.1: Westlock Street and Sidewalk Improvement Program – Short Term

	Location			Job Type	Cost
	On	From	To		
2009	105 Ave	109 St	110 St	Rehab	\$ 432,699
	109 St	105 Ave	106 Ave	Rehab	\$ 908,172
	106 Ave	109 St	110 St	Rehab	\$ 505,698
	103A St	W / 108 Ave	107 Ave	Rehab	\$ 336,148
	103 A St	107 Ave	L/W 107 Ave	Rehab	\$ 521,088
	107 Ave	103A St	S / 107 Ave	Rehab	\$ 148,435
				Total	\$ 2,852,240
2010	105 Ave	109 St	110 St	Rehab	\$ 29,915
	109 St	105 Ave	106 Ave	Rehab	\$ 70,317
	106 Ave	109 St	110 St	Rehab	\$ 28,373
	98 St	L/E 101 Ave	102 Ave	Rehab	\$ 123,288
	101 Ave	97 St	N / 100 St	Rehab	\$ 750,819
	105 St	100 Ave	101 Ave	Rehab	\$ 662,285
	100 Ave	100 St	104 St	Rehab	\$ 678,394
	100 Ave	104 St	105 St	Rehab	\$ 519,166
	100 Ave	108 St	109 St	New Sidewalk	\$ 5,280
	108 St	100 Ave	N Sidewalk	New Sidewalk	\$ 68,640
	108 St	100 St	97 Ave	New Trail	\$ 63,000
	106 St	103 Ave	104 Ave	New Sidewalk	\$ 26,400
				Total	\$ 3,025,877
2011	97 St	98 A Ave	99 A Ave	Rehab	\$ 627,542
	97 St	99 A Ave	100 Ave	Rehab	\$ 568,088
	99 Ave	104 St	105 St	Rehab	\$ 476,649
	99 Ave	106 St	107 St	Rehab	\$ 76,649
	107 St	100 Ave	101 Ave	Rehab	\$ 995,830
	108 Ave	100 St	101 St	New Sidewalk	\$ 11,880
	108 Ave	S Service Rd	100 St	New Sidewalk	\$ 7,260
	Service Rd S of 100 St	108 Ave	E of Hotel	New Trail	\$ 165,060
	113 Ave	S Extra Food Access	Service Rd S of 100 St	New Sidewalk	\$ 23,760
				Total	\$ 2,952,718
2012	106 St	102 Ave	103 Ave	Rehab	\$ 1,133,360
	103 Ave	104 St	106 St	Rehab	\$ 410,390
	103 Ave	106 St	107 St	Rehab	\$ 558,956
	106 St	103 Ave	104 Ave	Rehab	\$ 992,395
	104 St	104 Ave	103 Ave	Rehab	\$ 105,382

	Location				
	On	From	To	Job Type	Cost
	102 Ave	104 St	107 St	New Sidewalk	\$ 71,280
	Service Rd E of 104 Ave	100 St	102 St	New Sidewalk	\$ 26,400
	Service Rd N of 100 St	104 Ave	106 Ave	New Sidewalk	\$ 52,800
				Total	\$ 3,350,963
2013*	106 Ave	100 St	102 St	New Sidewalk	\$ 26,400
	Service Rd N of 100 St	106 Ave	108 Ave	New Sidewalk	\$ 52,800
	107 Ave	100 St	101 St	New Sidewalk	\$ 11,880
	107 Ave	102 St	103 St	New Sidewalk	\$ 16,500
	98A Ave	Rotary Trail	99 St	New Sidewalk	\$ 6,600
	100 Ave	111 St	Rotary Trail	New Sidewalk	\$ 15,048
				Total*	\$ 129,228
				Grand Total	\$ 12,311,026
* Street improvement program was not available for 2013					

6.0 Conclusions and Recommendations

6.1 Conclusions

- C1: Some sidewalk deficiencies are present, especially in the downtown, along school routes and in outlying commercial and industrial areas.
- C2: Roadway network will have sufficient capacity in terms of number of lanes to operate satisfactory for 20 years. However, some intersections may require traffic signals in that time.
- C3: Road widening may be required if development is concentrated in specific areas of town

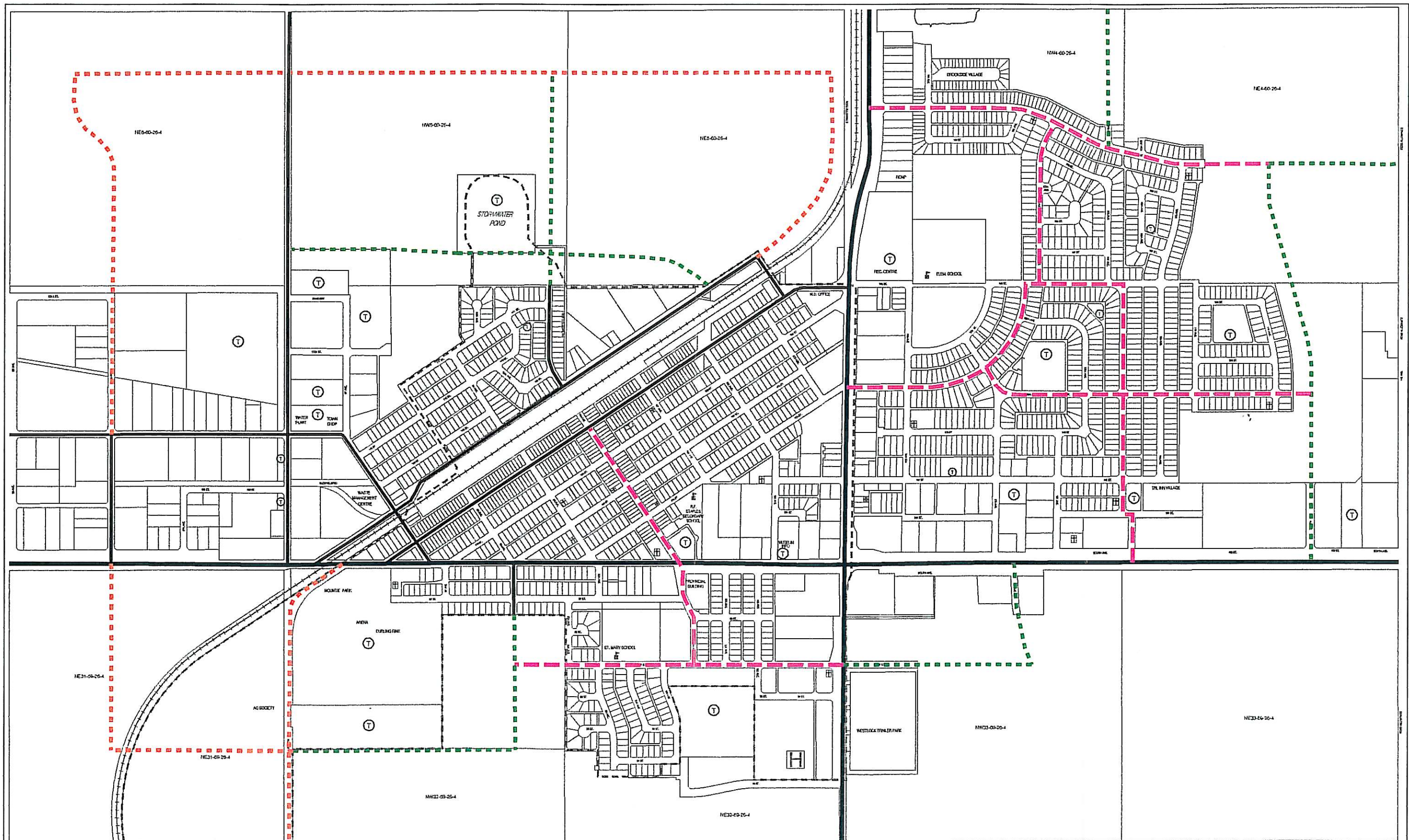
6.2 Recommendations

- R1: Rectify sidewalk deficiencies by construction new sidewalks in priority areas of the downtown, school routes and outlying commercial areas.
- R2: For future developments require construction of sidewalks on each side of a road where development is proposed.
- R3: Continue communications with A.T. regarding ongoing highway operations and the need for traffic signals
- R4: Require a pedestrian connection at a minimum between the residential and commercial areas in the east annex lands and other developed lands.
- R5: Use future roadway hierarchy (Exhibit 3.1) as a guideline for future development and road connectivity.
- R6: Use the proposed Westlock Street and Sidewalk Improvement Program (Table 4.1) as a guideline for road rehabilitation and sidewalk construction.

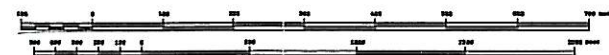
Appendix A

Land Use Plans

Land Use Bylaw, Municipal Development Plan and ASPs
Outline Plans and Snow Clearing Priority Maps



Town of Westlock



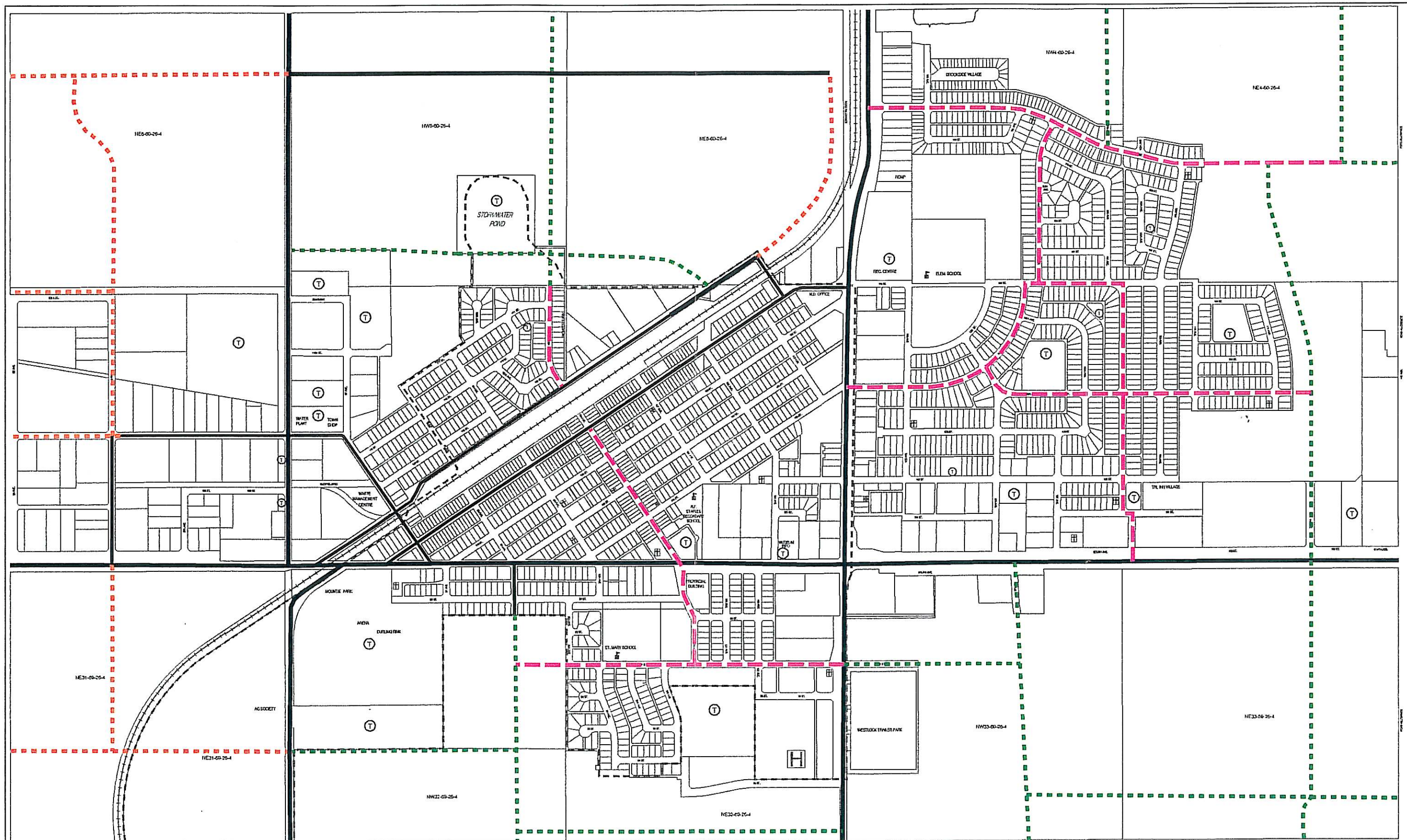
Map 2.1
TRANSPORTATION
(SHORT TERM)

Note: Short term is up to 5 years

- Arterial
- - - Collector
- - - Truck Collector
- - - Proposed Collector
- - - Proposed Truck Collector

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Town of Westlock



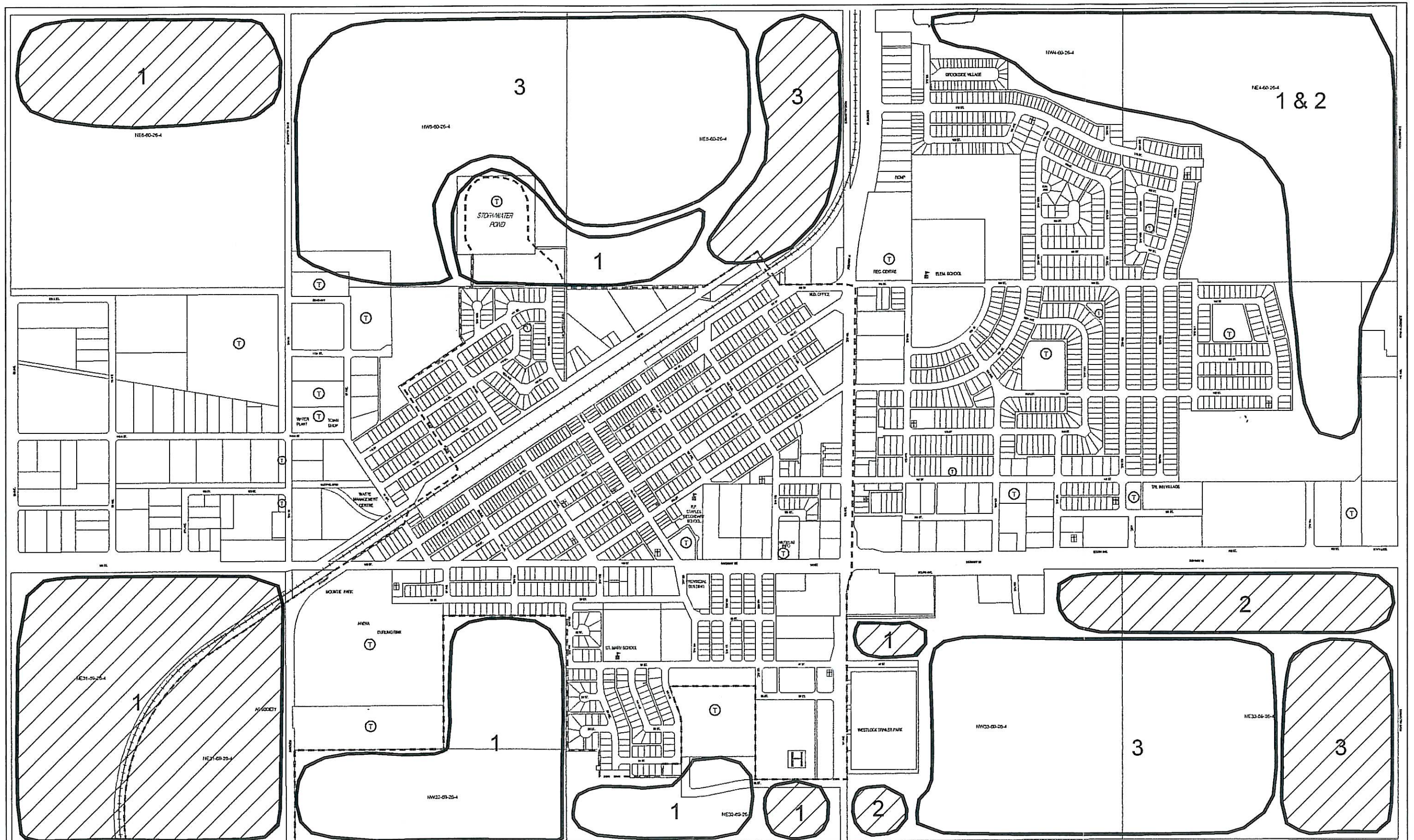
Map 2.2
TRANSPORTATION
(LONG TERM)

Note: Long term is from 5 to 20 years

- Arterial
- Collector
- Truck Collector
- Proposed Collector
- Proposed Truck Collector

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Town of Westlock



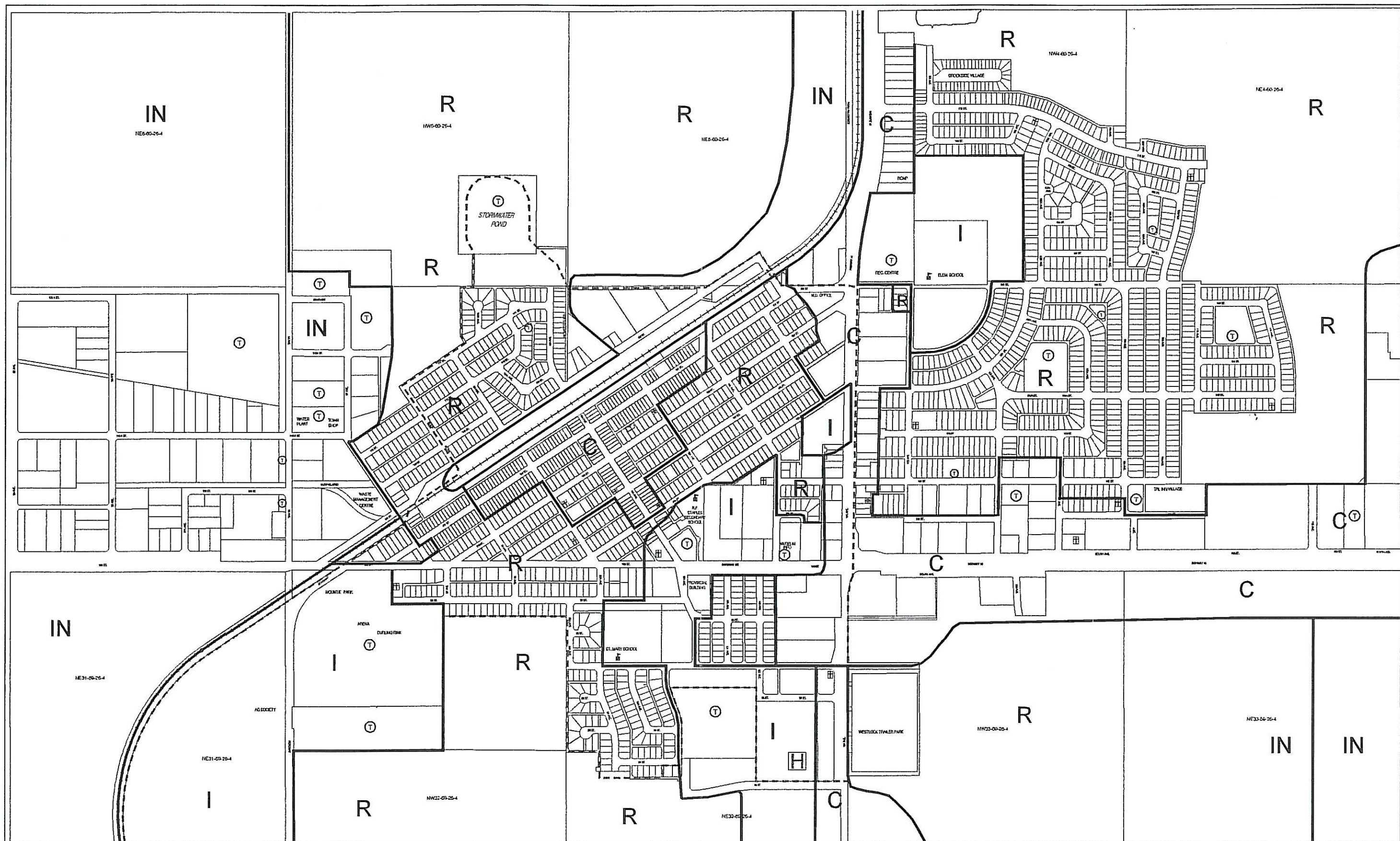
Map 3.1
DEVELOPMENT
STAGING &
RESIDENTIAL
CAPACITY

Staging Priority 1, 2, 3
Size of Parcel 64.7 ha (160 ac)
Non-residential Use



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Town of Westlock

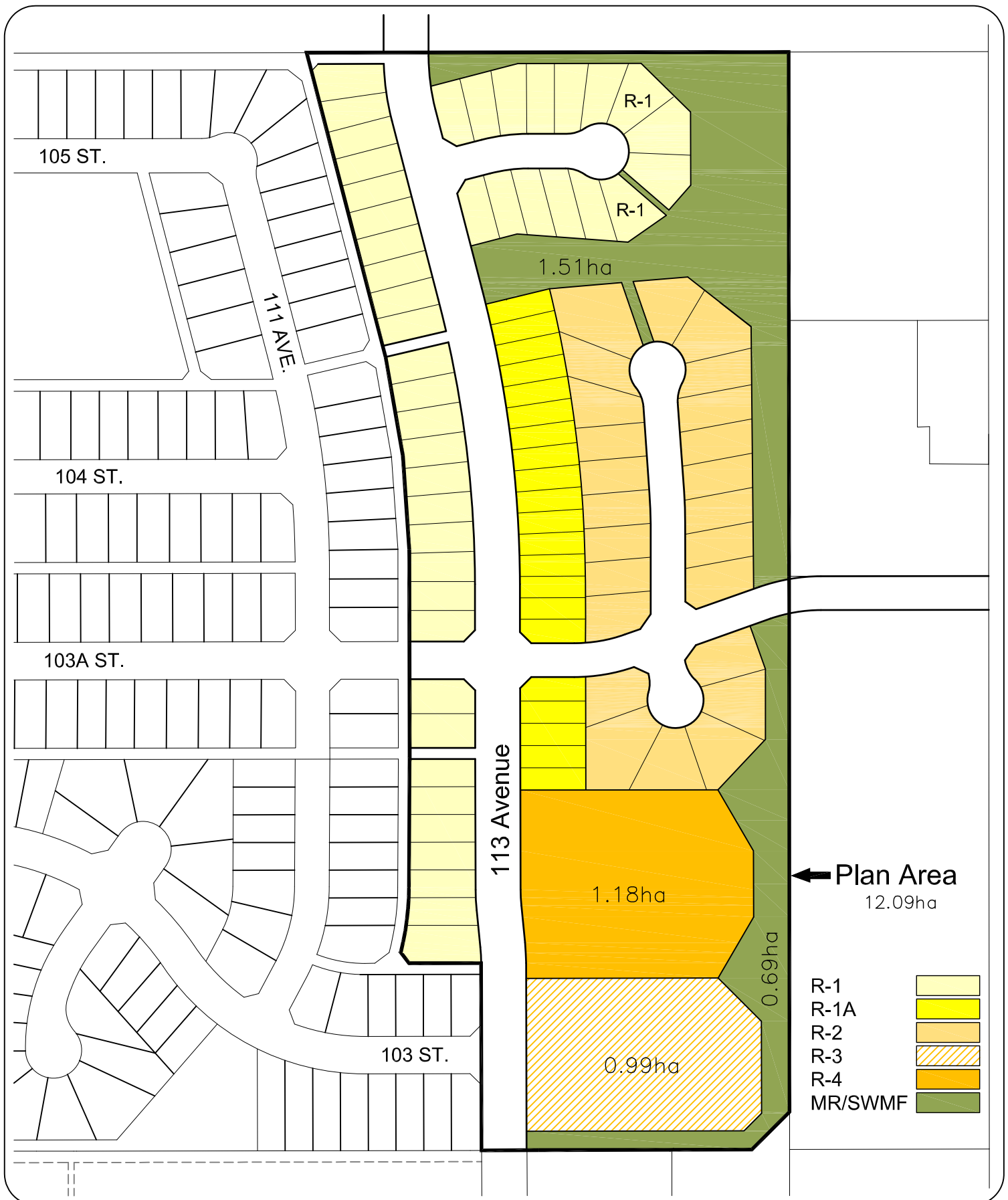


Map 3.2
FUTURE LAND USE

IN Industrial
R Residential
C Commercial
I Institutional

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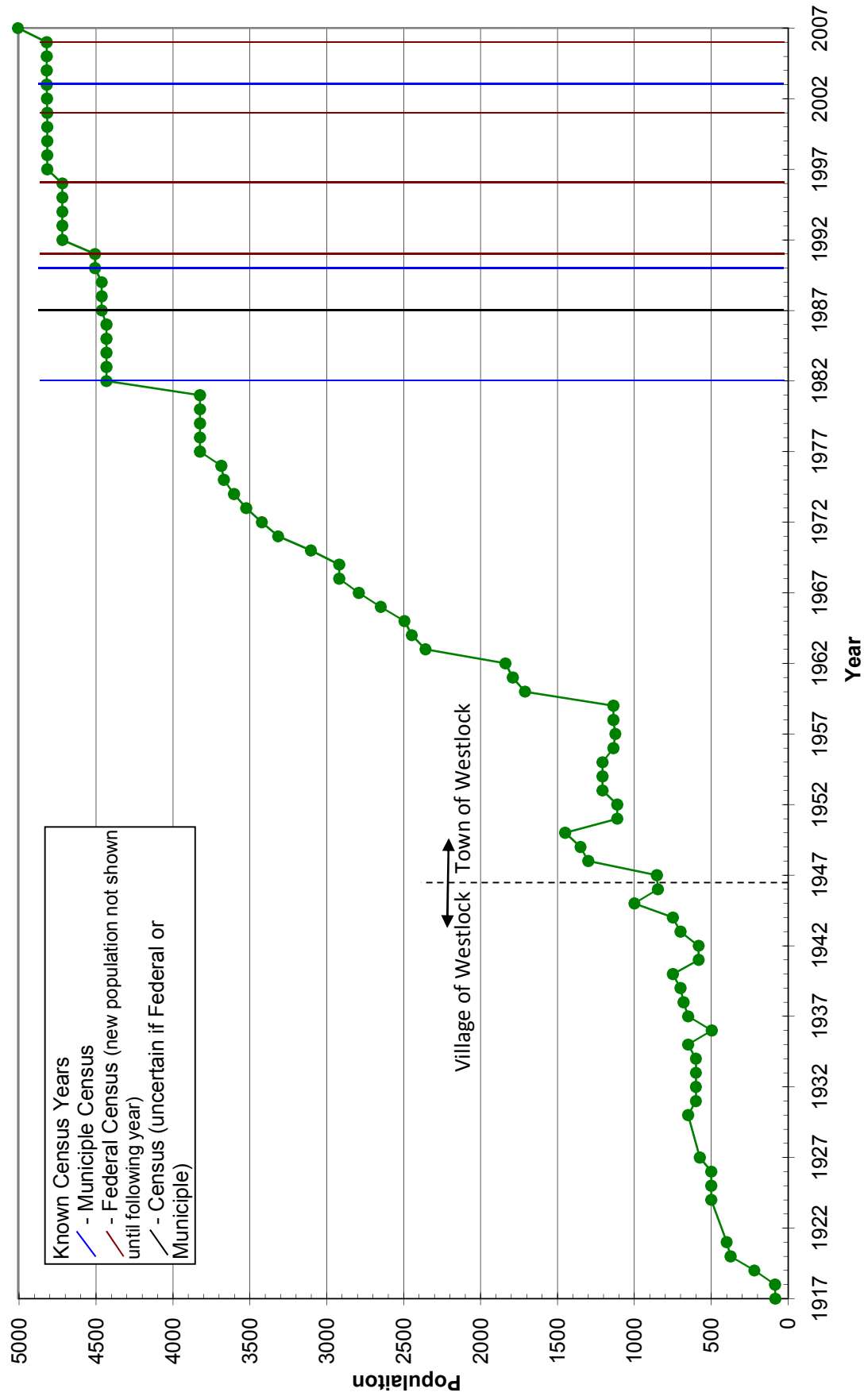




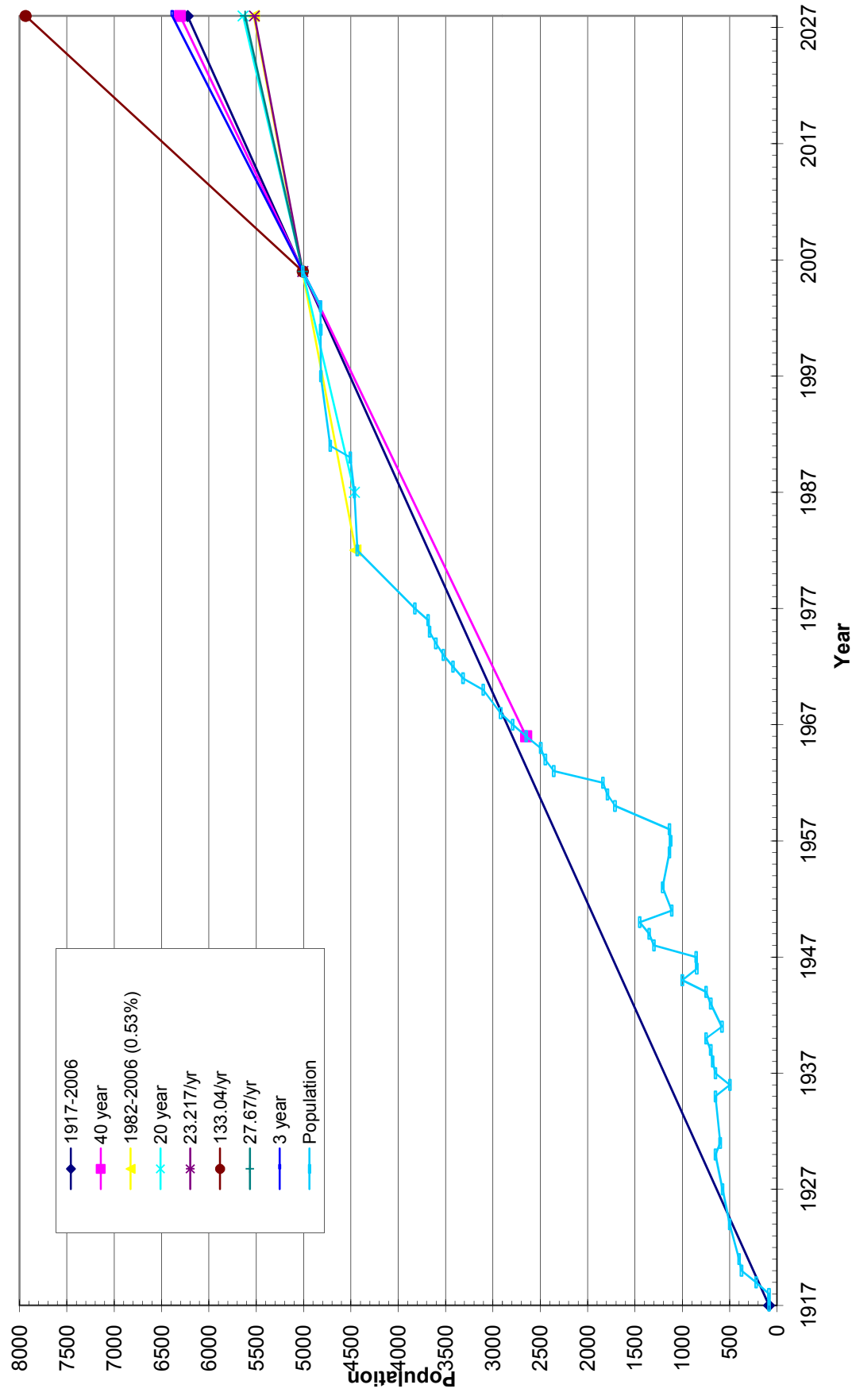
Appendix B

Historic Population and Population Forecast

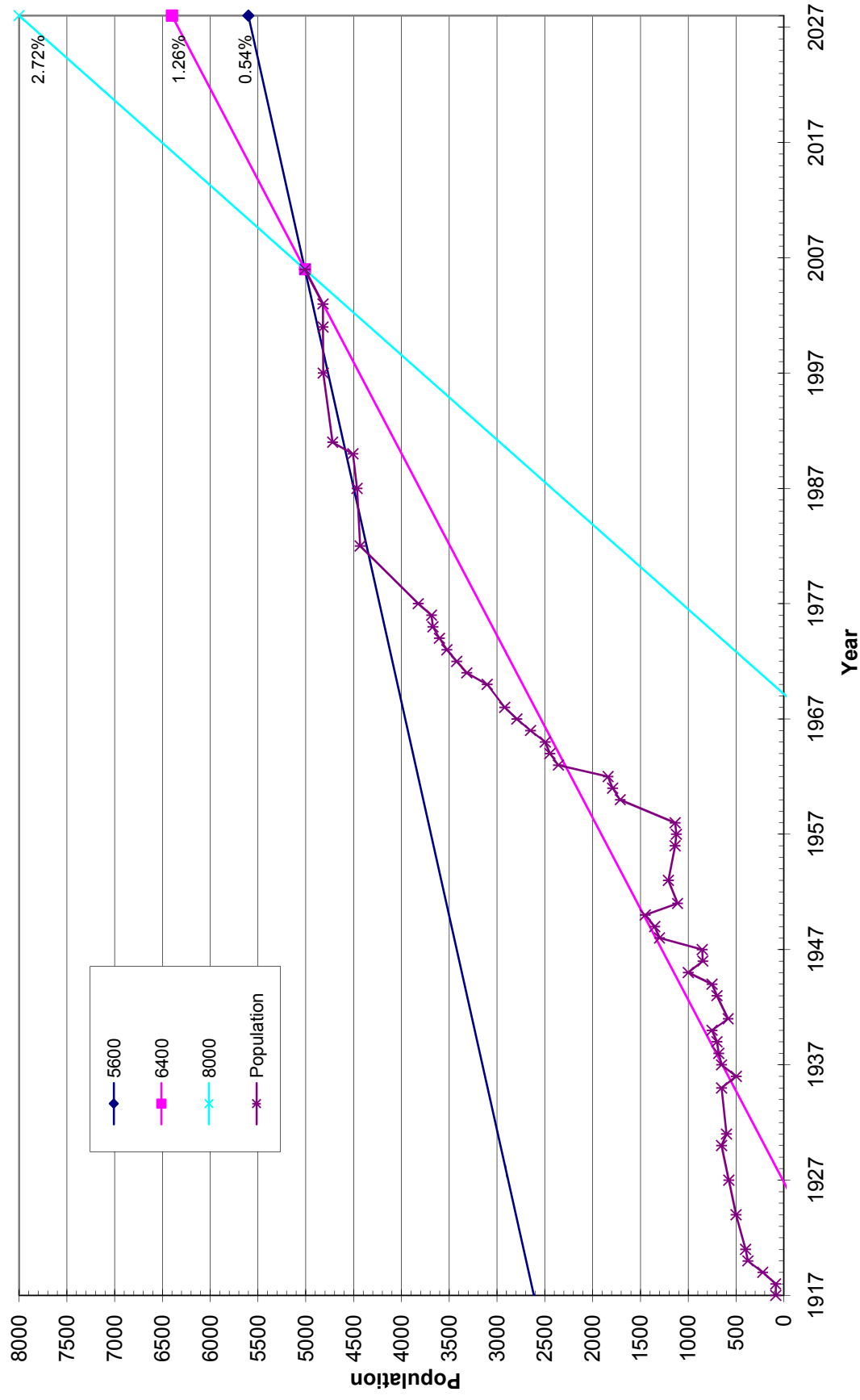
Town of Westlock Population
 Source: Government of Alberta Municipality Affairs



Westlock Population Forecast

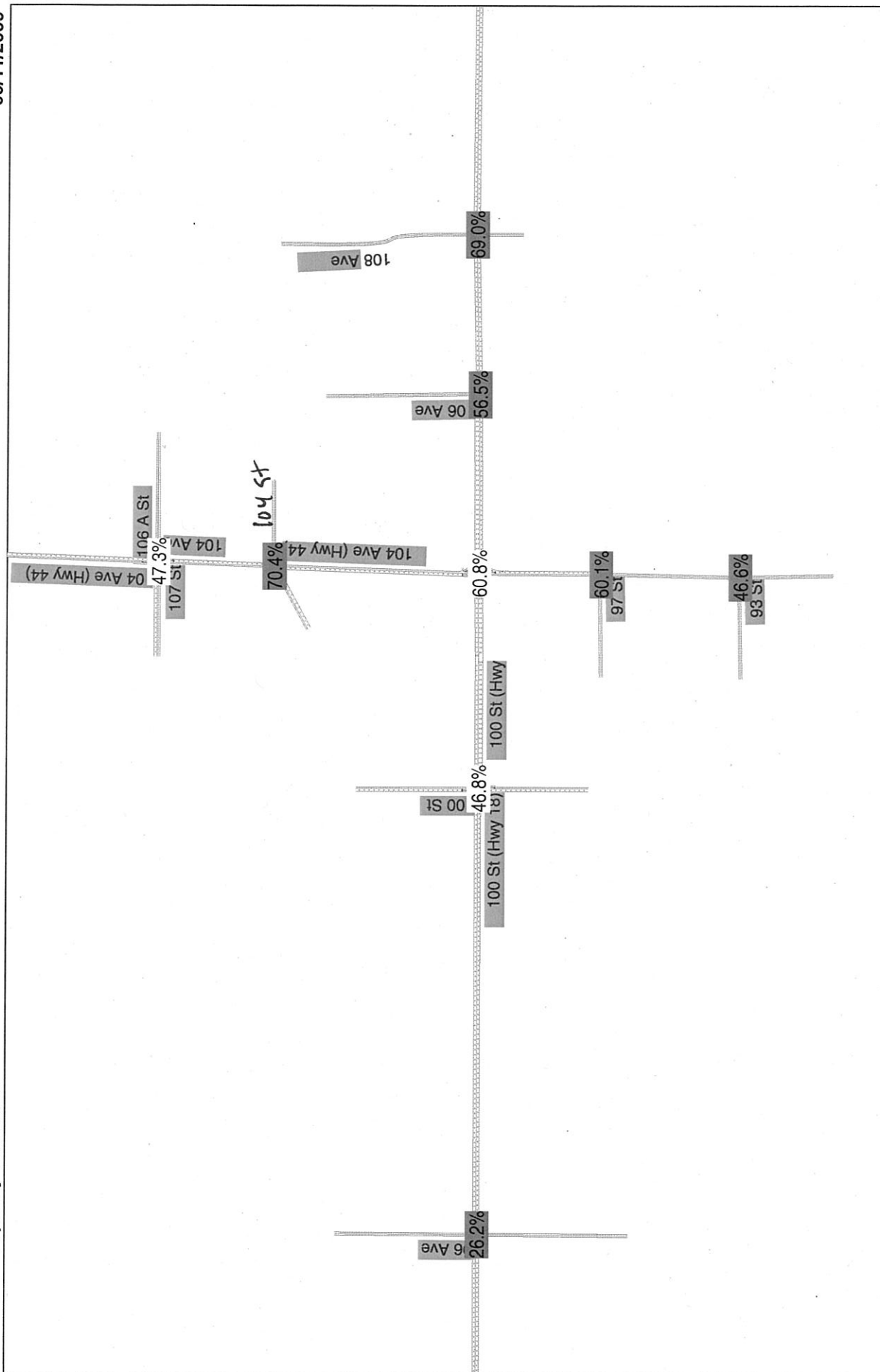


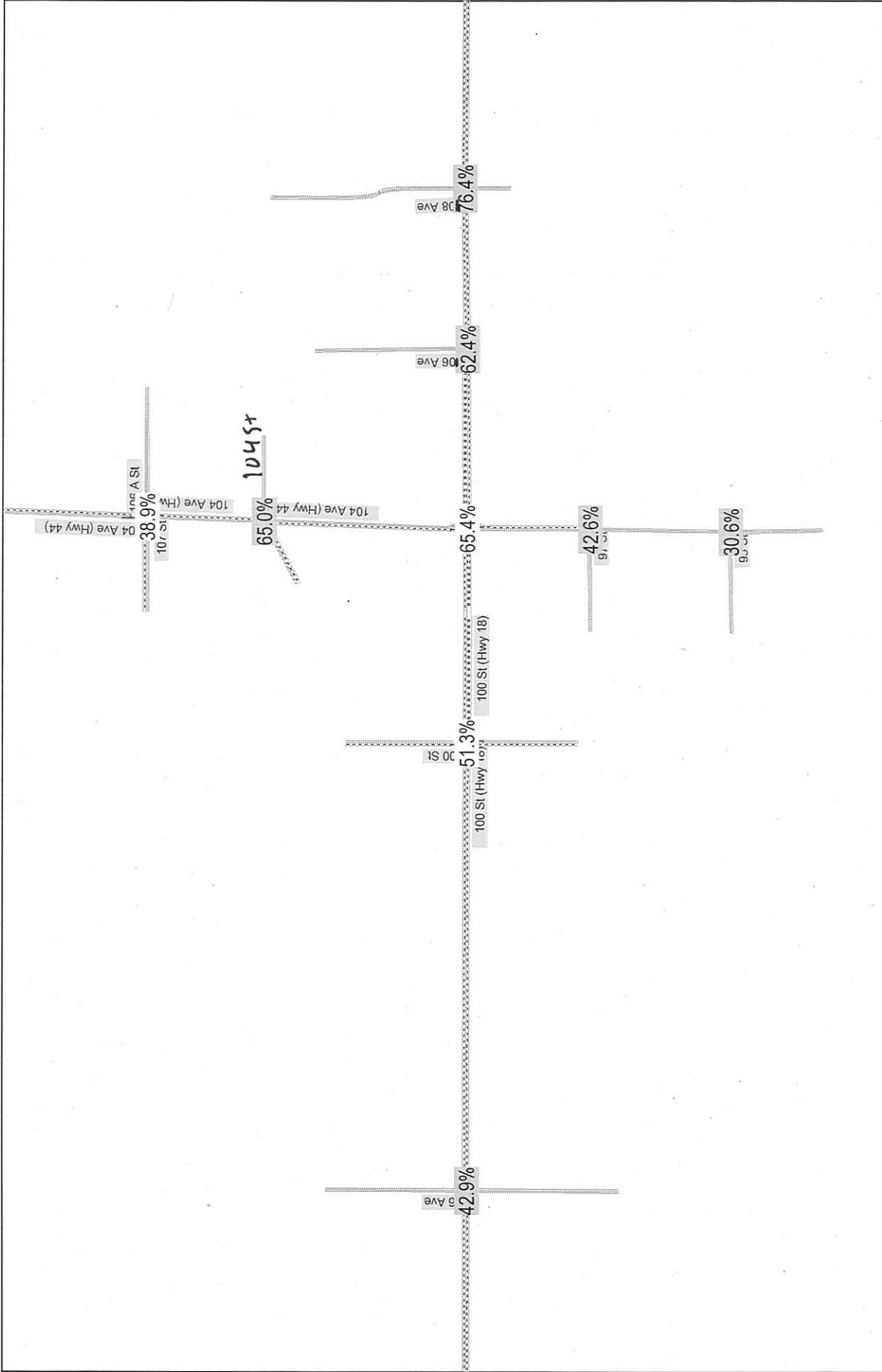
Four Options for Forecast



Appendix C

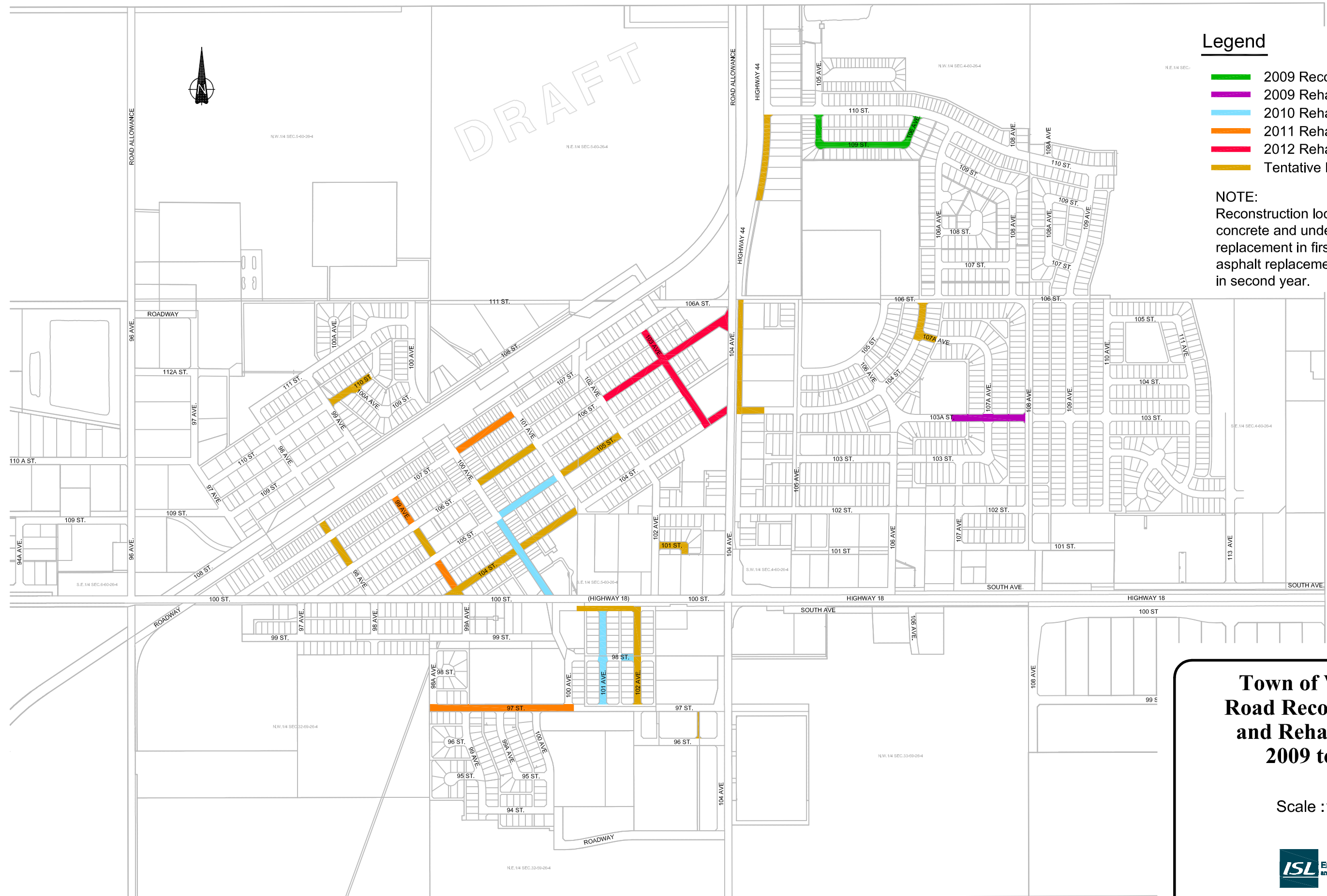
Intersection Capacity Utilization





Appendix D

Street Improvement Program



Legend

- 2009 Reconstruction
- 2009 Rehabilitation
- 2010 Rehabilitation
- 2011 Rehabilitation
- 2012 Rehabilitation
- Tentative Project Locations

NOTE:
Reconstruction locations include concrete and underground replacement in first year, asphalt replacement in second year.

Town of Westlock
Road Reconstruction
and Rehabilitation
2009 to 2013

Scale :10,000

