STUDY OF A NORTH SOUTH BICYCLE – FRIENDLY CORRIDOR

March 10, 2016

Prepared for: ELMIRA-CHEMUNG TRANSPORTATION COUNCIL

Prepared by: LABELLA Associates, D.P.C.

TABLE OF CONTENTS

APPENDICIES

EXECUTIVE SUMMARY

This *Study of a North South Bicycle Friendly Corridor* has been developed to analyze the feasibility of three potential north-south bicycle corridors between Downtown Elmira and a commercial area in the Town of Big Flats, Chemung County, New York. The three identified north-south routes are as follows:

- Route #1 - Downtown Elmira to Big Flats via Miracle Mile (Park Place, College Ave, Corning Rd)
- Route #2 - Downtown Elmira to Big Flats via Madison Ave, Lake St, Main St
- Route #3 - Downtown Elmira to Big Flats via Davis St, Oakwood Ave, Grand Central Ave

This study analyzes the existing conditions, including bicycle compatibility and safety, and identifies recommended improvements to achieve minimum bicycle standards throughout each corridor. A preferred route is selected, and conceptual cost estimates and prioritization of improvements are discussed.

Data collected for the analysis includes existing street characteristics, traffic volumes, percentage of heavy vehicles, and on-street parking utilization. Other factors such as bicyclist comfort / perception, drainage structures, major intersections, directness, and amenities along each route were considered. Each route was broken into segments based on the street characteristics and data described above. The *Bicycle Level of Service Model* was used to measure the bicycle compatibility of each segment, and an overall Bicycle Level of Service (BLOS results are reported in letters from "A" to "F") was assigned to each route.

Route 1 – "Miracle Mile" is the most direct route between the two nodes, but it was determined to have the worst overall Bicycle Level of Service. This is largely attributed to the "Miracle Mile" segments along Corning Road where there are high traffic and truck volumes, higher vehicle speeds, and little to no bicycle space along the multi-lane highway. There were several other segments of Route 1 within the City of Elmira with poor BLOS that would require improvements.

Route 2 – Madison Ave / Lake St / Main Street Horseheads had the best overall Bicycle Level of Service and the segments along Madison Ave and Lake St / Lake Rd were found to be quite suitable for bicycle travel. In fact, this portion of the route is already designated as State Bicycle Route 14. However, it does have some challenging intersections for bicyclists to navigate, and because of its alignment on the far east side of the study area does not connect the nodes or serve origins/destinations as well as the other routes.

Route 3 – Davis St / Oakwood Ave / Grand Central Ave was determined to have the second-best overall BLOS but the lowest percentage of the route that would require upgrades to meet minimum bicycle standards. It is the only route to directly serve the City of Elmira, Villages of Elmira Heights and Horseheads, and Town of Big Flats as well as many points of interest and origins/destinations along the route. It also had, by far, the fewest number of bicycle-related accidents.

Route 3 was selected as the preferred North/South Bicycle-Friendly Corridor. Recommendations to improve the corridor as a designated bicycle route include improving the railroad crossing in Elmira Heights (either modifying the tunnel or improving nearby streets), replacing and widening a culvert on Upper Oakwood Avenue, widening Grand Central Avenue near I-86, and widening shoulders along Sing Sing Road, Colonial Drive and Arnot Road. The total construction cost of the recommended improvements is approximately $800,000.

Designating a bicycle route would also involve installing new signage along the route (regulatory, warning and way-finding) as well as educating and informing the public. It is expected that not all of the recommended improvements will be made right away. An approach has been developed with immediate, short-term and medium-term goals to realize the vision of a designated north/south bicycle friendly corridor.

1.0 INTRODUCTION

1.1 Purpose

In March 2015, the Elmira Chemung Transportation Council (ECTC) completed the *Elmira-Chemung Bicycle Pedestrian Trail 2035 Plan* with the intent to promote a network of bike-able and pedestrian friendly routes which connect communities and provide safer routes for non-vehicular modes of traffic. As part of this planning process, the community voiced the desire to create a safer north-south bicycle corridor serving Elmira and its surrounding communities (Horseheads, Big Flats, and Elmira Heights). The plan noted that, based on surveys, seven percent of respondents walk or bicycle to work, and therefore providing a safe north-south bicycle corridor would greatly serve this need.

In 2015 the ECTC received federal Unified Planning Work Program funds to study alternatives for a north-south bicycle corridor. This *North-South Bicycle Corridor Study* has been developed, utilizing those funds, to analyze the feasibility of three potential north-south bicycle corridors between Elmira and Big Flats. The routes under consideration have been selected by ECTC and are described as follows:

- Route #1 - Downtown Elmira to Big Flats via Miracle Mile (Park Place, College Ave, Corning Rd)
- Route #2 - Downtown Elmira to Big Flats via Madison Ave, Lake St, Main St
- Route #3 - Downtown Elmira to Big Flats via Davis St, Oakwood Ave, Grand Central Ave

The purpose of the study is to select a north-south corridor from among the three candidates such that the selected route can be officially designated as bicycle route. It is recognized that some street improvements may be required to provide a greater level of consistency, comfort level and safety for the average rider. Therefore, this study identifies, defines and prioritizes recommendations for achieving minimum bicycle standards throughout the selected corridor.

1.2 Objectives

The objectives of this study are to: analyze each of the three corridors based on current bicycle standards for roadways; document the attributes of each; provide a rationale for selecting a preferred route; and, provide recommendations for street improvements consistent with standard practice for bicycles. Of particular interest is the evaluation of each roadway from a perspective of feasibility and cost to upgrade, with the selection of a preferred route based on a comparison of anticipated benefits including improved bicycle level of service, safety and compliance with established standards. This report presents detailed analysis of the three selected routes based on data collected from various sources and field investigations including traffic volumes, street geometrics, parking studies, truck traffic, accident data, and neighborhood context. Specifically, the objectives are:

1. Examine, document and evaluate existing corridor conditions (street characteristics) within the study area for each of the three selected ECTC routes.
2. Conduct a Bicycle Level of Service (BLOS) analysis for the three selected routes to identify segments of each route which do not provide acceptable BLOS (refer to Chapter 3).
3. Where appropriate, identify the types of street improvements needed to provide an acceptable BLOS for each alternative such that each route would be equally compatible for an “average”, AASHTO Type B bicyclist (refer to Chapter 3).

4. Evaluate contributing factors (such as major intersections, grades, length, aesthetics, users served, accessibility) which will assist in the selection of a preferred alternative.
5. Develop order of magnitude costs for recommended improvements along each route.
6. Make a recommendation for the preferred north-south bicycle route to provide better non-motorized options for recreational and commuter riders alike.
7. Develop a prioritized list of recommended improvements (immediate, short term and long term) that can reasonably accomplish a consistent BLOS throughout the corridor.
8. Identify potential follow-on studies required to verify the feasibility of preferred alternative and/or further refine the recommendations.

1.3 References

Numerous design guidelines, standards and documents were utilized to assist in developing this study as noted below:

- ECTC's *Elmira-Chemung Bicycle Pedestrian Trail 2035 Plan, March 2015*
- AASHTO's *Guide for Development of Bicycle Facilities, 2012 Fourth Edition*
- NACTO's *Urban Bikeway Design Guide, Second Edition*
- *Bicycle Level of Service Model* (developed by Sprinkle Consulting) based on the Transportation Research Board of National Academy of Sciences *Transportation Research Record 1587*
- League of Illinois Bicyclist's (Ride Illinois), *Bicycle Level of Service Calculator*
- AASHTO's *The Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual*

2.0 PROJECT STUDY AREA, EXISTING CONDITIONS ASSESSMENT

2.1 Existing Bicycle Network and Facilities and Routes Analyzed

There are two designated bike routes traversing Chemung County. They are:

- New York State Bicycle Route 14 is a signed on-street north/south bicycle route generally following NY Route 14 from the Pennsylvania State Line to Sodus Point at Lake Ontario. Within the study area, Bicycle Route 14 deviates from NY Route 14, following Madison Avenue, Lake Street / Lake Road, and South Main Street through the Village of Horseheads (these streets are the north/south portion of Route 3 analyzed in this report).

- New York State Bicycle Route 17 is a signed on-street east/west bicycle route generally following the alignment of NY Route 17 between Westfield and Beacon. Within the City of Elmira, Bicycle Route 17 follows both Church Street and Water St and crosses the Chemung River at Madison Avenue. Water Street is the southern terminus of all three bicycle routes analyzed in this study.

Additionally, there is a multi-use trail (Lackawanna Rail Trail) within the study limits. This trail system is a paved multi-use trail primarily within the City of Elmira. The trail extends between East Water St near Newtown Creek and the East Thurston St & Clemens Center Pkwy intersection, and follows a former railroad alignment. The trail was recently extended on the south end across Newtown Creek, and a future project (currently in design) will continue the trail along a NYSDOT-owned utility corridor south to Lowman Crossover. The Lackawanna Rail Trail crosses over Madison Avenue (part of Route 2 analyzed in this report), and can also connect to College Avenue (part of Route 1) via Eldridge Park Road. A separate east/west segment of the Lackawanna Trail extends along Diven Creek between Lake St and Eldridge Park.

2.2 Routes Analyzed

As noted in Chapter 1, the routes studied in this report were selected by the ECTC. The routes have a north-south component as well as an east-west component. The north-south roads traverse several municipalities and zoning districts as identified in Section 2.3, page 5 and Section 2.4, page 6. The east-west component is similar for each alternative and utilizes West Broad Street, Sing Sing Road, Colonial Drive and Arnot Road. The northern terminus of each corridor is in the vicinity of the Arnot Mall.

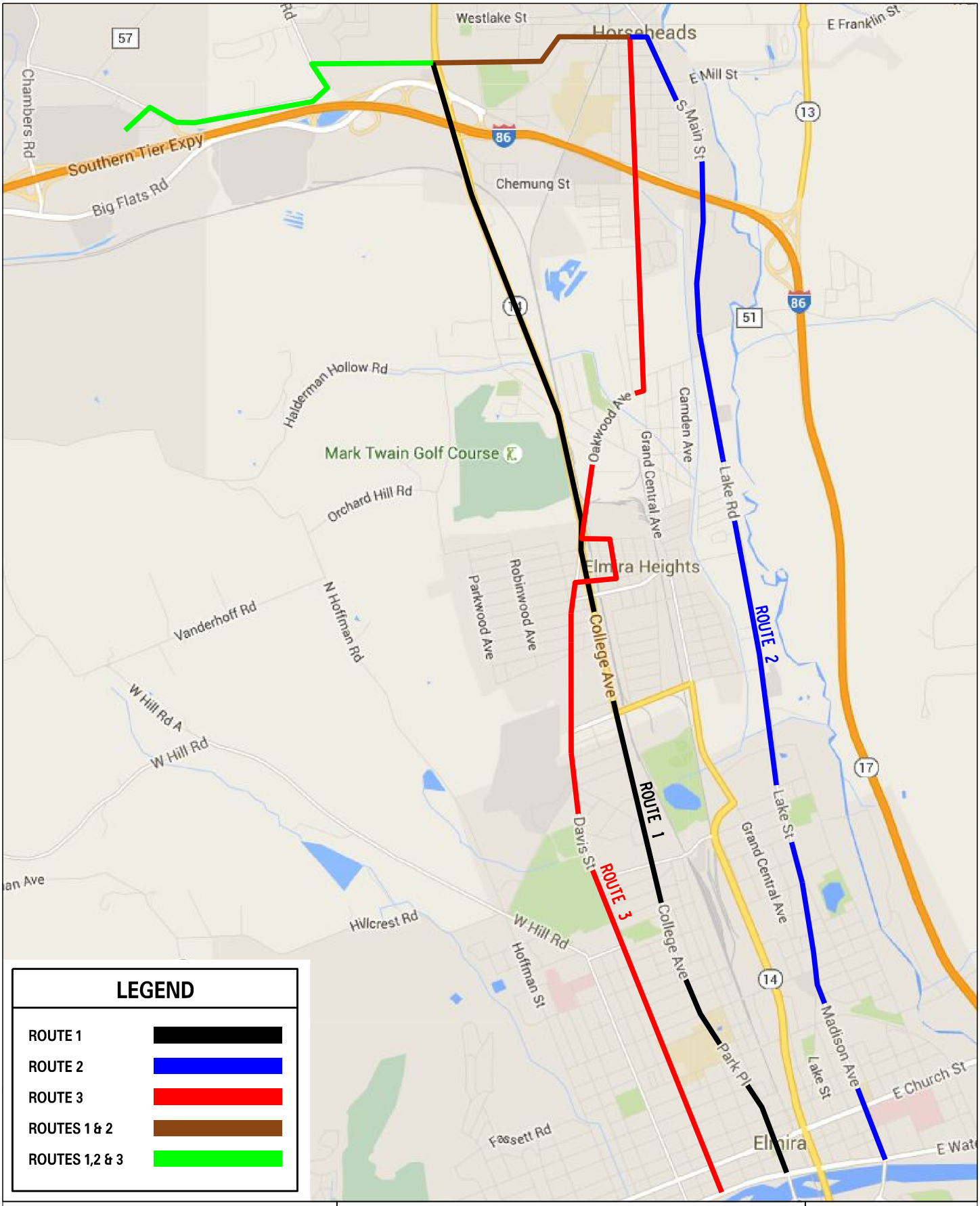
The three routes are described (from south to north) as follows:

- Route 1 – This route begins in the City of Elmira at West Water St and traverses north along North Main St, Park Pl, College Ave, Corning Rd (NY State Route 14), West Broad St, Sing Sing Rd, Colonial Dr and Arnot Rd.

- Route 2 - This route begins in the City of Elmira at East Water St and traverses north along Madison Ave, Lake St, Lake Rd, South Main St (Horseheads), West Broad St, Sing Sing Rd, Colonial Dr and Arnot Rd.

- Route 3 - This route begins in the City of Elmira at West Water St and traverses north along Davis St, Oakwood Ave, 14th St, North Park Ln, Birchwood Ave, East 18th St, Upper Oakwood Ave, Grand Central Ave, West Broad St, Sing Sing Rd, Colonial Dr and Arnot Rd.

The routes are depicted in Figure 1 on the following page.



LABELLA Associates, D.P.C.
300 State Street
Rochester, NY 14614
585.454.6110

FIGURE 1
BICYCLE ROUTE MAP

STUDY OF A NORTH SOUTH
BICYCLE-FRIENDLY CORRIDOR

N

SCALE: N.T.S.

...\Maps\2151430_bike route.dgn
ROUTE MAP

2.3 Jurisdictions / Municipalities Involved

The three routes studied traverse many municipalities within Chemung County, including: Town and City of Elmira, Village of Elmira Heights, Town and Village of Horseheads and the Town of Big Flats.

Municipalities and ownership jurisdiction of the roadways utilized for each of the three routes is defined in Tables 2-1 through 2-3, below.

Table 2-1: Route 1 Municipalities and Ownership Jurisdiction

Roadway	Municipality	Jurisdiction
Main St, Park Pl, College Ave	City of Elmira	City of Elmira
College Ave	Town of Elmira	Town of Elmira
College Ave (NY 14)	Village of Elmira Heights	NYSDOT
Corning Rd (NY 14)	Town of Horseheads	NYSDOT
Corning Rd (NY 14)	Village of Horseheads	NYSDOT
W. Broad St	Village of Horseheads	Village of Horseheads
Sing Sing Rd (CR 17)	Town of Horseheads	Chemung County
Colonial Drive (CR 74)	Town of Horseheads	Chemung County
Colonial Drive (CR 74)	Town of Big Flats	Chemung County
Arnot Road (CR 75)	Town of Big Flats	Chemung County

Table 2-2: Route 2 Municipalities and Ownership Jurisdiction

Roadway	Municipality	Jurisdiction
Madison Ave, Lake St	City of Elmira	City of Elmira
Lake Rd (CR 65)	Town of Elmira	Chemung County
Lake Rd (CR 65)	Town of Horseheads	Chemung County
S. Main St, W. Broad St	Village of Horseheads	Village of Horseheads
Sing Sing Rd (CR 17)	Town of Horseheads	Chemung County
Colonial Drive (CR 74)	Town of Horseheads	Chemung County
Colonial Drive (CR 74)	Town of Big Flats	Chemung County
Arnot Road (CR 75)	Town of Big Flats	Chemung County

Table 2-3: Route 3 Municipalities and Ownership Jurisdiction

Roadway	Municipality	Jurisdiction
Davis St	City of Elmira	City of Elmira
Oakwood Ave	Town of Elmira	Town of Elmira
Oakwood Ave, 14th St, Park Ln, Birchwood Ave, Upper Oakwood Ave	Village of Elmira Heights	Village of Elmira Heights
Upper Oakwood Ave (CR 58)	Town of Horseheads	Chemung County
Grand Central Ave (CR 66)	Village of Horseheads	Chemung County
Grand Central Ave, W. Broad St	Village of Horseheads	Village of Horseheads
Sing Sing Rd (CR 17)	Town of Horseheads	Chemung County
Colonial Drive (CR 74)	Town of Horseheads	Chemung County
Colonial Drive (CR 74)	Town of Big Flats	Chemung County
Arnot Road (CR 75)	Town of Big Flats	Chemung County

Coordination with municipalities and agencies with jurisdiction over the roadways is critical to the development of a regional bicycle corridor. Appropriate planning and community input across all municipalities involved is necessary for the success of this type of project.

2.4 Land Use and Zoning

Zoning maps for the City and Town of Elmira, Town and Village of Horseheads and Town of Big Flats are provided in Appendix A. The three routes (depicted on each zoning map) traverse through many different zoning districts within each municipality. Table 2-4 summarizes the zoning districts traversed by each route.

Table 2-4: Zoning Districts Traversed

Municipality	Route 1	Route 2	Route 3
City of Elmira	Central Business, Conservation, Multi-Family, Higher Education, Family, Neighborhood Commercial, General Commercial	Central Business, Hospital, Gateway Commercial, Light Industrial, General Commercial, 1-2 Family, Neighborhood Commercial, Conservation	1-2 Family, Historic Commercial, 1-4 Family, Higher Education, Neighborhood Commercial, Family, Conservation, Multi-Family
Town of Elmira	Neighborhood Business	Manufacturing, General Business	Residential A
Village of Elmira Heights	Medium Density Residential, Business District, High Density Residential, Limited Industrial, General Industrial	Route 2 does not traverse through Elmira Heights. Route 2 bypasses Elmira Heights to the east.	Medium Density Residential, Business District, High Density Residential, General Industrial
Town of Horseheads	Business, Residential A, Residential B, PUD, Residential AA	Manufacturing, Residential B, PUD, Business, Residential AA	Business, Residential B, PUD, Residential AA
Village of Horseheads	Industrial, Highway Commercial, One Family Residential, Single Family Residential, Planned Development	Neighborhood Commercial, One Family Residential, Highway Commercial, Multi- Family Residential, Hanover District, Two-Family Residential, Planned Development, Single Family Residential	Neighborhood Commercial, Multi- Family Residential, Planned Development, Highway Commercial, One Family Residential, Hanover District, Two-Family Residential, Single Family Residential
Town of Big Flats	Business Regional	Business Regional	Business Regional

2.5 Roadway Functional Classification

The functional classification of a roadway is established according to the character of traffic service that the road is intended to provide. There are three main highway functional classifications: arterial, collector, and local roads. Sub categories of classification include: minor and principle, and urban and rural. All streets and highways can be grouped into one of these classifications, depending on the character of the traffic and the degree of access that they allow. The functional classifications of the roadways for each route are shown in Table 2-5, on the following page.

Table 2-5 Roadway Functional Classifications		
Route	**Roadway**	**Classification**
Route 1	Main St, Park Pl, College Ave (to Woodlawn)	Minor Arterial
	College Ave (Woodlawn north), Corning Rd	Principal Arterial
	W. Broad St, Sing Sing Rd, Colonial Dr, Arnot Rd	Local Road
Route 2	Madison Ave, Lake St/Rd, S. Main St, W. Broad St (Gardner to Westinghouse)	Minor Arterial
	W. Broad St (Main to Gardner) W. Broad St (Westinghouse to Sing Sing) Sing Sing Rd, Colonial Dr, Arnot Rd	Local Road
Route 3	Davis St (north of Roe), Oakwood Ave, Grand Central Ave, W. Broad St (Gardner to Westinghouse)	Minor Arterial
	Davis St (Water to Roe), 14th St, Park Ln, Birchwood Ave, Upper Oakwood Ave, W. Broad St (Grand Central to Gardner) W. Broad St (Westinghouse to Sing Sing) Sing Sing Rd, Colonial Dr, Arnot Rd	Local Road

Local roads (typically neighborhood streets) function well as "shared use" roadways with no special provisions for bicyclists as they typically have lower vehicular volumes at lower speeds. Local roads, however, can be less efficient if they are circuitous or discontinuous. Collector and arterial roads (which distribute and deliver traffic) are typically more direct routes and can function well with marked shared lanes, paved shoulders or designated bicycle lanes. However, arterials are often multi-lane roads that include busy intersections with traffic signals and turn lanes, heavy traffic volumes, higher percentages of heavy vehicles, and higher speeds. Arterials with these characteristics would require dedicated bicycle space (either paved shoulders of adequate width or bicycle lanes) in order for most cyclists to feel comfortable while riding.

2.6 Street Characteristics

Roadway characteristics can vary immensely. Roadway classification (as noted above) typically dictates the makeup of a roadway section (lane and shoulder width, curb offset, curvature, grade, etc.). Surface material can vary widely as well; concrete, asphalt, gravel, and dirt. Understanding roadway characteristics

is a key component in the evaluation of a bicycle corridor. The calculation of a Bicycle Level of Service (BLOS) is highly dependent upon numerous street parameters (refer to Chapter 3, Section 3.1 for a detailed discussion of BLOS).

Field observations were conducted to obtain information for each of the three routes evaluated in this study. Field observations / determinations included the following:

- Roadway lane geometry including number and width of travel lanes and turn lanes
- Shoulder width (vs curb offset)
- Posted speed limit
- Percent use of designated parking lanes
- Pavement and shoulder condition
- Roadway features such as grades, drainage systems, width restrictions, travel patterns (one way, etc.), lighting

In addition to field observations, various sources / documents were used to obtain additional roadway information, such as:

- Average daily traffic volumes
- Percent of heavy vehicles operating on each roadway

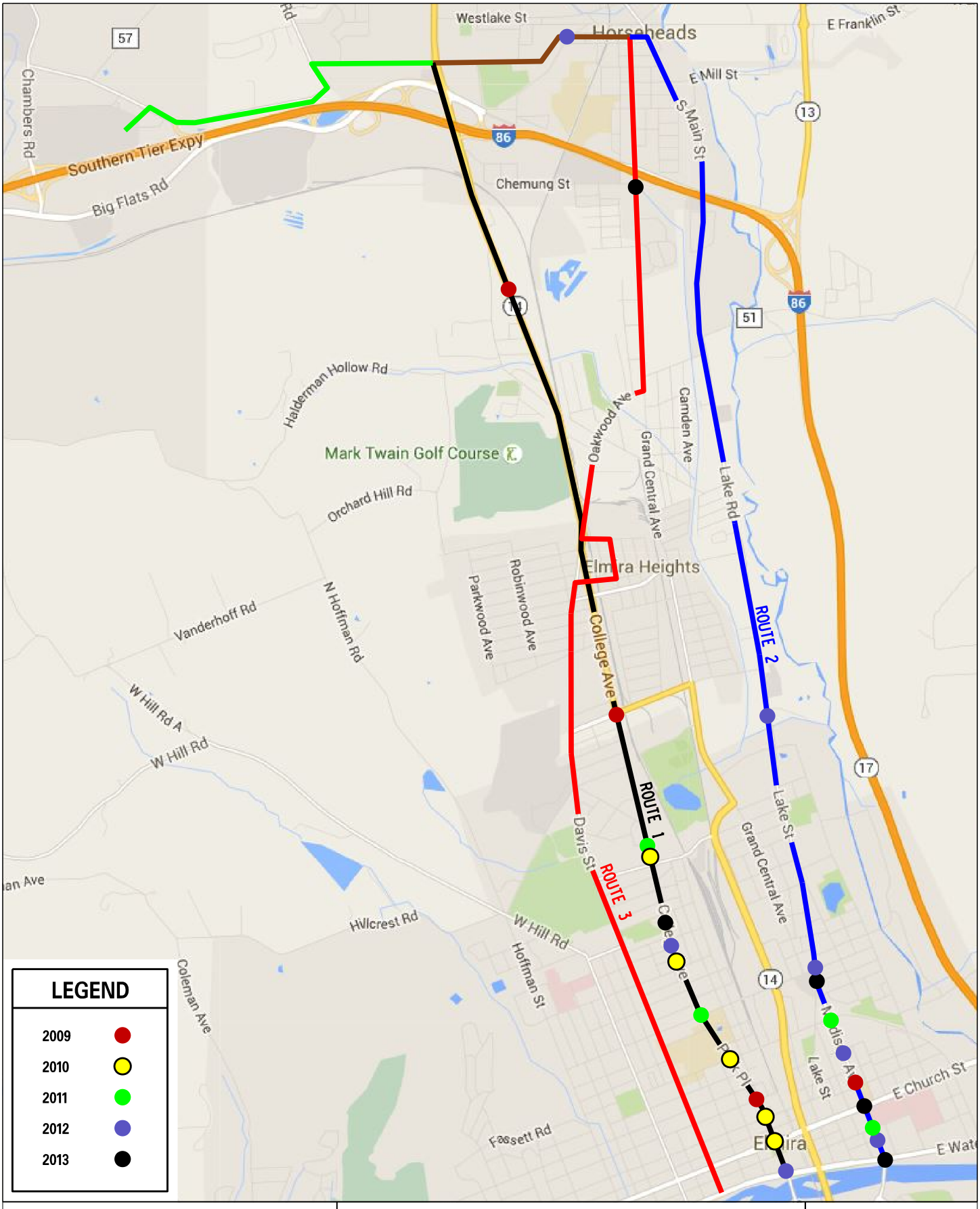
2.7 Safety / Accident Information

Analysis of crash trends is critical in selecting and designing bicycle corridors. ECTC's *Elmira-Chemung Bicycle Pedestrian Trail 2035 Plan* included the analysis of vehicle and bicycle / pedestrian accidents throughout Chemung County for the period between 2009 and 2013. The plan notes that 145 vehicle / bicycle crashes were recorded during this timeframe. A review of the information provided shows the following:

- Route 1 - a total of twelve vehicle / bicycle accidents occurred (two in 2013, two in 2012, two in 2011, four in 2010, and two in 2009).
- Route 2 - a total of eleven vehicle / bicycle accidents occurred (three in 2013, five in 2012, two in 2011, and one in 2009).
- Route 3 - a total of two vehicle / bicycle accidents occurred (one in 2013 and one in 2012).

The plan also notes the following five year averages for vehicle / bicycle crashes: 65% occur at intersections, 80% involved injury (11% serious injury), and 2% involved a fatality.

A diagram depicting the locations of the accidents is provided on the following page. The majority (72%) of the accidents which occurred on the routes being studied occurred within City of Elmira limits. An updated crash study is recommended for the route selected to determine if there are changes in the occurrences of accidents and to identify contributing factors which could be corrected through the implementation of specific improvements, especially at major intersections.



LABELLA Associates, D.P.C.

300 State Street
Rochester, NY 14614
585.454.6110

FIGURE 2
BICYCLE CRASH MAP

STUDY OF A NORTH SOUTH
BICYCLE-FRIENDLY CORRIDOR

N

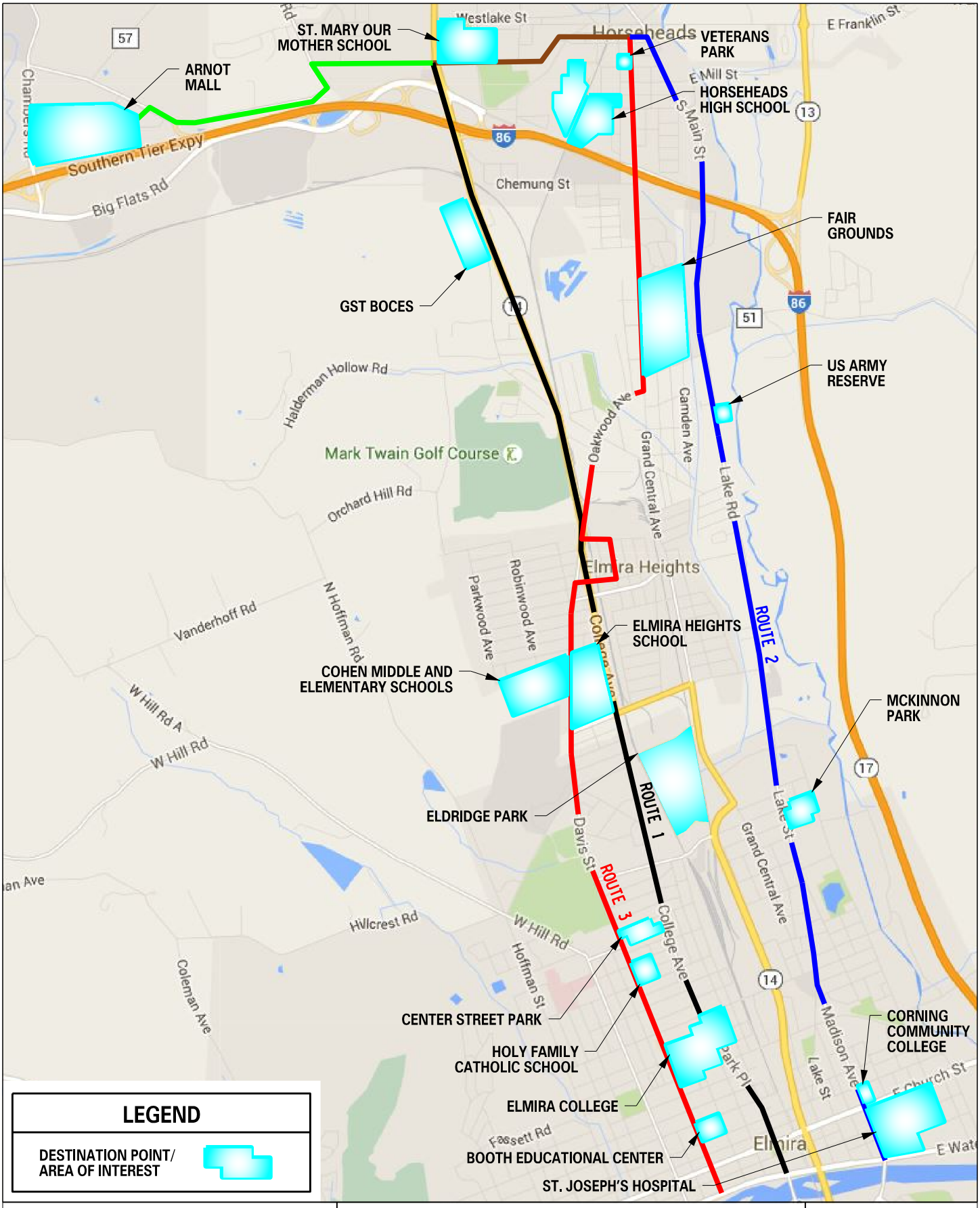
SCALE: N.T.S.

...\Maps\2151430_bike route.dgn
CRASH MAP

2.8 Origins and Destinations

In order to determine the best location for a bicycle corridor, consideration must be given to where bicyclists originate and where are they headed. Selection of a north / south bicycle corridor should consider connection of source districts to specific destinations such as public services, schools, parks, recreational multi-use trails and other points of interest. Residential neighborhoods as well as higher education districts are the source of most casual riders. As can be seen from Table 2-4, page 6 and the Zoning Maps in Appendix A, the routes evaluated in this study traverse through numerous residential neighborhoods.

The map, on the following page, provides information on key destinations which may attract bicyclists including schools, parks, and public services which should be directly or in close proximity to the recommended bicycle corridor.



LABELLA Associates, D.P.C.

300 State Street
Rochester, NY 14614
585.454.6110

FIGURE 3
AREAS OF INTEREST

STUDY OF A NORTH SOUTH
BICYCLE-FRIENDLY CORRIDOR

N

SCALE: N.T.S.

...\Maps\2151430_bike route.dgn
building

3.0 ANALYSIS METHODOLOGY

3.1 Data Collection

A wealth of data has been collected for the bicycle route analysis including traffic volumes, heavy vehicle percentages, roadway characteristics, pavement condition, and parking usage. This data was obtained from ECTC, other online resources such as the NYSDOT website, aerial photography, and field observations. A Class "B" cyclist from LaBella Associates rode each of the three routes while taking video footage on Wednesday, November 11, 2015. Traffic volume and heavy vehicle data was estimated for certain segments using available data from adjoining segments and engineering judgment (estimated data is noted on the tables). Parking utilization was estimated using the video footage and additional field observations.

3.2 Bicycle Level of Service

A primary factor in the evaluation of bicycle routes is Bicycle Level of Service (BLOS). BLOS is a measure of the bicycle compatibility of a street based on factors such as travel lane and shoulder width, traffic volumes, speed, and pavement surface condition. The *Bicycle Level of Service Model* is a mathematical equation developed from research published by the Transportation Research Board based on the evaluation of more than 100,000 miles of urban, suburban and rural roadways across North America. The model has become an industry-standard method to evaluate bicycle conditions and is utilized by local and state transportation agencies throughout the United States, including the New York State Department of Transportation. The BLOS equation yields a numerical value that corresponds to a Level of Service (LOS) ranging from "A" to "F". Level of Service "A" indicates an extremely high compatibility of a roadway segment for bicyclists, while LOS "F" indicates extremely poor compatibility. The range of scores and corresponding BLOS grades is as follows:

BLOS "A": Score ≤ 1.5 (scores may be negative)
BLOS "B": Score > 1.5 and ≤ 2.5
BLOS "C": Score > 2.5 and ≤ 3.5
BLOS "D": Score > 3.5 and ≤ 4.5
BLOS "E": Score > 4.5 and ≤ 5.5
BLOS "F": Score > 5.5

The Bicycle Level of Service equation is as follows:

$$BLOS = a_1 \ln(Vol_{15}/L_n) + a_2 SP_t(1+10.38HV)^2 + a_3(1/PR_5)^2 + a_4(W_e)^2 + C$$

$a_1 = 0.507$ $a_2 = 0.199$ $C = 0.760$
$a_3 = 7.066$ $a_4 = -0.005$

Vol_{15} = Volume of directional traffic in 15 minute time period
= $(ADT \times D \times K_d) / (4 \times PHF)$
where: ADT = Average Daily Traffic volume
D = Directional Factor
K_d = Peak to Daily Factor
PHF = Peak Hour Factor

L_n = Number of directional through lanes
SP_t = Effective speed limit
= $1.1199\ln(SP_p - 20) + 0.8103$
where: SP_p = Posted Speed Limit
HV = Percentage of Heavy Vehicles
PR_5 = Pavement surface condition rating (FHWA rating from 1 to 5)
W_e = Average effective width of outside through lane
where: $W_e = W_v - (10ft \times \%OSPA)$ and $W_l = 0$
$W_e = W_v + W_l(1\text{-}2 \times \%OSPA)$ and $W_l > 0$ & $W_{ps} = 0$
$W_e = W_v + W_l - 2(10 \times \%OSPA)$ and $W_l > 0$ & $W_{ps} > 0$ and bike lane exists
where: W_t = total width of outside lane and shoulder pavement
OSPA = percentage of occupied on-street parking
W_l = width of pavement between the outside lane stripe and edge of pavement
W_{ps} = width of pavement striped for on-street parking
W_v = effective width as a function of traffic volume
$W_v = W_t$ if ADT > 4,000
$W_v = W_t(2 - 0.00025 \times ADT)$ if ADT < 4,000 and street is undivided and unstriped

This analysis uses a slightly simplified version of the *Bicycle Level of Service Model* developed by the League of Illinois Bicyclists (LIB). The LIB version calculates a Bicycle Level of Service based on inputs including number of lanes, lane width, shoulder width, average daily traffic volume, posted speed limit, percentage of heavy vehicles, pavement condition rating, and percentage of occupied on-street parking. While this report presents BLOS for each segment using the LIB version of the *Bicycle Level of Service Model*, certain segments along each bicycle route were spot-checked by LaBella Associates using the full *Bicycle Level of Service Model* presented above. In each case, BLOS results calculated using the full model were nearly identical to the results calculated using the LIB model.

Bicycle Level of Service data and calculations for each route are included in Appendix B.

3.3 Bicycle Level of Service and the "Average Rider"

The evaluations and recommendations of this study are based on an "average bicyclist", which is an AASHTO Type B bicyclist. AASHTO defines a Type B bicyclist as a basic or less confident adult or teenage rider who may also be using their bicycles for transportation purposes (e.g., going to the store or visiting friends) but prefers to avoid roads with fast and busy motor vehicle traffic, unless there is ample roadway width to allow easy overtaking by the faster motor vehicles. Thus, basic riders are comfortable riding on neighborhood streets and shared-use paths, and prefer designated facilities such as bicycle lanes or wide shoulder lanes on busier streets.

To correlate between the BLOS calculated for each route and the AASHTO Type B bicyclist, the Bicycle Compatibility Index (BCI) has been utilized. The BCI ranges were developed based on an average adult bicyclist. Table 3-1 (from AASHTO's *The Bicycle Compatibility Index: A Level of Service Concept, Implementation Manual*) provides the correlation between BLOS, BCI and a roadway's compatibility level (comfort level) for the average adult bicyclist.

Table 3-1: BLOS / BCI Correlation		
BLOS	**BCI**	**Compatibility Level**
A	≤ 1.50	Extremely High
B	1.51 - 2.30	Very High
C	2.31 - 3.40	Moderately High
D	3.41 - 4.40	Moderately Low
E	4.41 - 5.30	Very Low
F	> 5.30	Extremely Low

Using the distribution of BCI values, a BLOS C correlates to a roadway which provides a moderately high compatibility level or a moderately high comfort level for the average adult bicyclist. Therefore, for the purposes of this evaluation, a BLOS "C" or better is considered adequate, while Level of Service "A" or "B" is desirable.

3.4 Route Segments and Analysis

Each bicycle route follows roadways with a variety of characteristics related to travel lane and shoulder width, speed limit, traffic volumes and on-street parking. In order to accurately provide Bicycle Level of Service calculations along the routes, each route was split into approximately 20 segments. Segment boundaries are generally at intersections and reflect changes in pavement section, speed limit, traffic volumes and/or parking utilization. The segments vary in length but the vast majority of the segments are less than one mile.

For each segment, data including lane and shoulder widths, speed limit, traffic volumes, heavy vehicles, and parking utilization was compiled (refer to Tables 3.2 through 3.4, pages 13-15) in order to perform the Bicycle Level of Service calculation. A BLOS score and grade was assigned to each segment. A weighted average for each overall bicycle route was calculated, excluding the northern five segments that are common to each route.

3.5 Major Intersection Analysis

Another important factor in the evaluation of bicycle routes is the presence of major intersections along the route. Although most typical side street intersections would not pose a significant challenge to bicyclists, larger intersections can negatively affect a bicyclist's comfort level and safety due to the presence of turn lanes, traffic signals, higher traffic volumes and narrower travel lanes and shoulders. Intersections where bicyclists need to make a left turn to follow the route are of particular concern, as a bicyclist would need to ride out in the middle of the road with traffic to complete the turn, unless other facilities such as "bike boxes" are provided.

Although this study does not include a detailed evaluation of every intersection along each route, it does identify the number of major signalized intersections and any unusual or significant challenges present at major intersections along each route, as well as possible intersection improvements (both general and at specific locations) that would benefit bicycle safety and mobility. Refer to Section 4.1 for a discussion of major intersections along the analyzed bicycle routes.

Table 3-2

Bicycle Route #1: Downtown Elmira to Big Flats via Miracle Mile (Park Pl, College Ave, Corning Rd)

Segment ID	Road Name	From	To	Length (Miles)	Direction (N or S)	Lanes		Traffic		Posted Speed	Width of Pavement				Occupied Parking %	Pavement Condition		Bicycle LOS	
						Thru #	Config	ADT	HV %		Centerline to Edge	Outside Lane Width	Lane Stripe to Edge	Parking W/Bike		Centerline to Edge	Lane Stripe to Edge	Score	Grade
1-1	N. Main St	W. Water St	1st St	0.20	NB	1	U	12,910	4.0	30	20'	12'	8'	N/A	67	3.5	3.5	3.79	D
1-2	N. Main St	1st St	Park Pl	0.15	NB	1	U	11,554	4.0	30	22'	14'	N/A	N/A	0	3.0	3.0	1.51	B
1-3	Park Pl	N. Main St	6th St	0.30	NB	1	U	10,451	4.0	30	18'	10'	8'	N/A	5	3.0	3.0	2.21	B
1-4	Park Pl	6th St	Washington Ave	0.20	NB	1	U	10,451	4.0	30	14'	14'	N/A	N/A	0	3.5	3.5	4.19	D
1-5	College Ave	Washington Ave	Woodlawn Ave	0.75	NB	1	U	8,062	4.0	30	18'	10'	8'	N/A	0	3.5	3.5	1.66	B
1-6	College Ave	Woodlawn Ave	Thurston St	0.20	NB	1	U	11,407	4.0	30	26'	13'	13'	N/A	0	3.5	3.5	-2.39	A
1-7	College Ave	Thurston St	McCanns Blvd	0.55	NB	1	U	11,407	4.0	30	14'	14'	N/A	N/A	0	4.0	4.0	4.10	D
1-8	College Ave	McCanns Blvd	Oakwood Ave	0.80	NB	1	U	10,061	6.7	30	22'	12'	10'	N/A	5	4.0	4.0	0.80	A
1-9	Corning Rd	College Ave	Lenox Ave	0.70	NB	2	U	22,160	5.7	40	13'	11'	2'	N/A	0	4.0	4.0	4.69	E
1-10	Corning Rd	Lenox Ave	Philo Rd	1.05	NB	2	U	22,160	5.7	40	13'	11'	2'	N/A	0	4.0	4.0	4.69	E
1-11	Corning Rd	Philo Rd	Chemung St	0.30	NB	2	D	22,160	5.7	40	13'	11'	2'	N/A	0	4.0	4.0	4.69	E
1-12	Corning Rd	Chemung St	W. Broad St	0.40	NB	2	U	28,348	11.3	40	12'	11'	1'	N/A	0	4.0	4.0	6.91	F
1-13	W. Broad St	Westinghouse	Sing Sing Rd	0.60	WB	1	U	2,000	2.0	30	22'	12'	10'	N/A	0	3.5	3.5	-1.15	A
1-14	Sing Sing Rd	W. Broad St	Colonial Dr	0.10	SB	1	U	4,642	2.0	30	12'	11'	1'	N/A	0	3.0	3.0	3.76	D
1-15	Colonial Dr	Sing Sing Rd	Roemmelt Dr	0.35	WB	1	U	5,749	2.0	30	13'	11'	2'	N/A	0	3.0	3.0	3.59	D
1-16	Colonial Dr	Roemmelt Dr	Arnot Rd	0.70	WB	1	U	6,041	4.0	35	13'	11'	2'	N/A	0	4.0	4.0	3.81	D
1-17	Arnot Rd	Colonial Dr	Chambers Rd	0.45	WB	1	U	3,386	4.0	35	12'	11'	1'	N/A	0	2.5	2.5	4.49	D

Estimated Data

Table 3-3

Bicycle Route #2: Downtown Elmira to Big Flats via Madison Ave / Lake St / Main St

Segment ID	Road Name	From	To	Length (Miles)	Direction (N or S)	Lanes		Traffic		Posted Speed	Width of Pavement				Occupied Parking %	Pavement Condition		Bicycle LOS	
						Thru #	Config	ADT	HV %		Centerline to Edge	Outside Lane Width	Lane Stripe to Edge	Parking W/Bike		Centerline to Edge	Lane Stripe to Edge	Score	Grade
2-1	Madison Ave	E. Water St	Lake St	0.90	NB	1	U	11,541	3.2	30	24'	14'	10'	N/A	2	3.5	3.5	-0.58	A
2-2	Lake St	Madison Ave	Clemens Ctr Ext	1.15	NB	1	U	7,553	3.2	30	20'	12'	8'	N/A	2	4.0	4.0	0.89	A
2-3	Lake St	Clemens Ctr Ext	Elmira City Line	0.10	NB	1	U	9,184	4.0	30	14'	14'	N/A	N/A	0	3.5	3.5	4.13	D
2-4	Lake Rd	Elmira City Line	McCann's Blvd	0.30	NB	1	U	9,184	4.0	40	16'	12'	4'	N/A	0	3.5	3.5	3.42	C
2-5	Lake Rd	McCann's Blvd	Fairview Rd	1.55	NB	1	U	9,184	4.0	40	20'	12'	8'	N/A	0	3.5	3.5	1.50	A
2-6	S. Main St	Fairview Rd	Lattabrook Rd	0.10	NB	1	U	8,723	4.0	40	14'	12'	2'	N/A	0	3.5	3.5	4.11	D
2-7	S. Main St	Lattabrook Rd	Orchard Pl	0.40	NB	1	U	8,013	4.0	30	22'	12'	10'	N/A	0	4.0	4.0	-0.22	A
2-8	S. Main St	Orchard Pl	Canal St	0.15	NB	1	U	8,013	5.0	30	12'	12'	N/A	N/A	0	3.5	3.5	4.52	E
2-9	S. Main St	Canal St	Sayre St	0.40	NB	1	U	7,944	5.0	30	16'	16'	N/A	N/A	0	3.5	3.5	3.96	D
2-10	S. Main St	Sayre St	Mill St	0.10	NB	1	U	9,882	5.1	30	20'	12'	8'	N/A	10	3.5	3.5	1.86	B
2-11	S. Main St	Mill St	Broad St	0.20	NB	1	U	9,882	5.1	30	20'	12'	8'	N/A	0	3.5	3.5	1.45	A
2-12	W. Broad St	S. Main St	Thorne St	0.40	WB	1	U	2,962	2.0	30	18'	10'	8'	N/A	0	3.5	3.5	0.79	A
2-13	W. Broad St	Thorne St	Westinghouse Rd	0.70	WB	1	U	4,559	2.0	30	13'	13'	N/A	N/A	0	3.0	3.0	3.75	D
2-14	W. Broad St	Westinghouse Rd	Sing Sing Rd	0.60	WB	1	U	2,000	2.0	30	22'	12'	10'	N/A	0	3.5	3.5	-1.15	A
2-15	Sing Sing Rd	W. Broad St	Colonial Dr	0.10	SB	1	U	4,642	2.0	30	12'	11'	1'	N/A	0	3.0	3.0	3.76	D
2-16	Colonial Dr	Sing Sing Rd	Roemmelt Dr	0.35	WB	1	U	5,749	2.0	30	13'	11'	2'	N/A	0	3.0	3.0	3.59	D
2-17	Colonial Dr	Roemmelt Dr	Arnot Rd	0.70	WB	1	U	6,041	4.0	35	13'	11'	2'	N/A	0	4.0	4.0	3.81	D
2-18	Arnot Rd	Colonial Dr	Chambers Rd	0.45	WB	1	U	3,386	4.0	35	12'	11'	1'	N/A	0	2.5	2.5	4.49	D
	Estimated Data																		

Table 3-4

Bicycle Route #3: Downtown Elmira to Big Flats via Davis St, Oakwood Ave, Grand Central Ave

Segment ID	Road Name	From	To	Length (Miles)	Direction (N or S)	Lanes		Traffic		Posted Speed	Width of Pavement				Occupied Parking %	Pavement Condition		Bicycle LOS	
						Thru #	Config	ADT	HV %		Centerline to Edge	Outside Lane Width	Lane Stripe to Edge	Parking W/Bike		Centerline to Edge	Lane Stripe to Edge	Score	Grade
3-1	Davis St	W. Water St	1st St	0.20	NB	1	OW	1,908	0.5	30	16'	16'	N/A	N/A	0	4.5	4.5	2.20	B
3-2	Davis St	1st St	Thurston St	1.90	NB	1	U	6,262	4.0	30	18'	10'	8'	N/A	15	3.0	3.0	2.34	B
3-3	Oakwood Ave	Thurston St	13th St	0.90	NB	1	U	11,951	4.0	30	18'	10'	8'	N/A	0	3.5	3.5	1.86	B
3-4	Oakwood Ave	13th St	14th St	0.05	NB	1	U	11,786	9.1	30	37'	12'	5'	N/A	5	3.0	3.0	4.33	D
3-5	14th St	Oakwood Ave	Railroad	0.10	EB	1	U	1,000	5.0	30	32'	14'	0'	N/A	40	3.0	3.0	3.90	D
3-6	Park Ln	14th St	Birchwood Ave	0.10	NB	1	OW	2,000	2.0	30	30'	20'	10'	N/A	15	3.0	3.0	-2.67	A
3-7	Birchwood Ave	Park Ln	18th St	0.15	NB	1	OW	1,000	0.5	30	22'	12'	10'	N/A	20	5.0	5.0	-0.84	A
3-8	18th / Oakwood	Birchwood Ave	Lenox Ave	0.60	NB	1	U	1,000	5.0	30	12'	12'	N/A	N/A	0	3.5	3.5	3.47	C
3-9	Oakwood Ave	Lenox Ave	Grand Central	0.30	NB	1	U	1,479	5.0	30	16'	12'	4'	N/A	0	3.5	3.5	2.39	B
3-10	Grand Central	Oakwood Ave	Roosevelt Ave	0.80	NB	1	U	10,904	4.0	30	20'	12'	8'	N/A	0	3.5	3.5	1.27	A
3-11	Grand Central	Roosevelt Ave	Chemung St	0.15	NB	1	S	11,288	4.0	30	16'	12'	4'	N/A	0	3.0	3.0	3.42	C
3-12	Grand Central	Chemung St	Brickyard Ln	0.10	NB	2	U	11,288	5.0	30	14'	12'	2'	N/A	0	3.5	3.5	3.79	D
3-13	Grand Central	Brickyard Ln	W. Broad St	0.60	NB	1	D	5,066	3.5	30	18'	18'	N/A	N/A	0	4.0	4.0	2.95	C
3-14	W. Broad St	Grand Central	Thorne St	0.30	WB	1	U	2,962	2.0	30	18'	10'	8'	N/A	0	3.5	3.5	0.79	A
3-15	W. Broad St	Thorne St	Westinghouse	0.70	WB	1	U	4,559	2.0	30	13'	13'	N/A	N/A	0	3.0	3.0	3.75	D
3-16	W. Broad St	Westinghouse Rd	Sing Sing Rd	0.60	WB	1	U	2,000	2.0	30	22'	12'	10'	N/A	0	3.5	3.5	-1.15	A
3-17	Sing Sing Rd	W. Broad St	Colonial Dr	0.10	SB	1	U	4,642	2.0	30	12'	11'	1'	N/A	0	3.0	3.0	3.76	D
3-18	Colonial Dr	Sing Sing Rd	Roemmelt Dr	0.35	WB	1	U	5,749	2.0	30	13'	11'	2'	N/A	0	3.0	3.0	3.59	D
3-19	Colonial Dr	Roemmelt Dr	Arnot Rd	0.70	WB	1	U	6,041	4.0	35	13'	11'	2'	N/A	0	4.0	4.0	3.81	D
3-20	Arnot Rd	Colonial Dr	Chambers Rd	0.45	WB	1	U	3,386	4.0	35	12'	11'	1'	N/A	0	2.5	2.5	4.49	D

Estimated Data

3.6 Other Factors Considered

Many factors contribute to the selection of a bicycle corridor. Besides the statistical calculation of a BLOS, factors such as experience, engineering judgement, budget constraints, barriers, connections to focal points, directness of route, aesthetics, intersection frequency and safety, and security should all be considered in the selection of a bicycle corridor. Additional considerations in the analysis of the three bicycle routes are described below:

Route Aesthetics / Perception: The surrounding land uses and environment have an impact on a bicyclist's perception of safety and comfort while riding along a route. For example, a cyclist is likely to feel more comfortable riding down a tree-lined residential street than a roadway with large commercial / industrial parcels. Tree lined streets provide shade making cooler riding conditions during summer months. Trees also provide a windbreak.

Drainage Structures: Drainage inlets are often located along the curb in the space where a bicyclist would typically be riding. The open grates of a drainage structure can pose a significant hazard to cyclists, particularly those riding road bikes with narrow tires. Drainage structures and other utility infrastructure (manholes, valves) can also settle over time which causes an unexpected disruption in the riding surface and poses a safety concern. Field observations have identified areas along the three analyzed routes where there are concerns with drainage and utility structures.

Isolated Constrictions: There may be isolated locations where constrictions or other roadway factors can negatively affect a route's bicycle compatibility. Examples include narrower pavement at bridge / culvert crossings, narrowed shoulders due to turn lanes, tunnels, railroad crossings and steep grades.

Directness of Route: The length and directness of a bicycle route is likely to impact the level of ridership. Bicyclists are more likely to utilize a route between nodes that is logical and direct than a route that is circuitous or requires a lot of turns and deviations.

4.0 ROUTE EVALUATION, ISSUES AND NEEDS

4.1 Route Evaluations

4.1.1 Route 1: Miracle Mile

Bicycle Level of Service: Route 1 was calculated to have the worst Bicycle Level of Service of the three analyzed routes, with an overall score of 3.3 and BLOS "C" (overall scores do not include segments at the northern end that are common to all three routes). Of the total 7.8 miles along the route, 2.55 miles are BLOS "D", 2.05 miles are BLOS "E", and 0.4 miles are BLOS "F", which adds up to 5.0 miles or 64% of the route with BLOS "D" or worse.

Segments along Route 1 with the highest score and worst BLOS were on Corning Rd between College Ave and W. Broad St (the "Miracle Mile" section). The poor BLOS is attributed to high traffic volumes, high percentage of trucks, higher vehicular speeds, and narrow shoulders. Because of these factors, most "average" users would feel uncomfortable riding this section of roadway.

The "Miracle Mile" section of Route 1

Other segments with poor BLOS include N. Main St between W. Water St and 1st St (attributed to high parking utilization), Park Pl between 6th St and Washington Ave (no shoulders), College Ave between Thurston St and McCann's Blvd (high traffic volumes and no shoulders), and the northern segments along Sing Sing Rd, Colonial Drive, and Arnot Rd which are common to all three routes (poor LOS is primarily attributed to narrow shoulders).

Major Intersections: There are a total of 17 signalized intersections along Route 1. There are several intersections along the "Miracle Mile" portion that can be particularly challenging for bicyclists to navigate. The intersection of College Ave and Oakwood Ave requires southbound cyclists to be out in traffic in the left lane to stay on College Ave. At Corning Rd and Chemung St, there is a long southbound right turn lane where cyclists may be conflicting with right turning traffic. The intersection of Corning Rd and CR 64 is particularly busy with many lanes, slip ramps and narrow shoulders. At the Westinghouse Rd and W. Broad St intersection, northbound cyclists have to make a left turn at this busy intersection.

Other Factors: Route 1 is the shortest in length and most direct of the three routes analyzed. It is generally aesthetically pleasing and comfortable within the City of Elmira as it travels through the Central Business District, Elmira College and residential / commercial neighborhoods along College Ave. The "Miracle Mile" segment of Route 1 would likely be uncomfortable for most cyclists due to the heavy traffic volumes, trucks, higher vehicular speeds, narrow shoulders, and

busy intersections near I-86. There are also steep grades along this section as Corning Rd travels over the railroad tracks near I-86.

Additional isolated locations with factors influencing BLOS include sunken drainage inlets along W. Broad St, a difficult uphill start on W. Broad St (westbound) after stopping at Thorne St, shoulder drop-offs along some parts of Colonial Dr, and a challenging left turn from Colonial Dr to Arnot Rd due to narrow lanes and high traffic volumes. These concerns are along segments that are common to all three routes analyzed and therefore apply to each of the three routes.

4.1.2 Route 2: Madison Ave / Lake Rd / S. Main St

Typical section along Lake Road

Bicycle Level of Service: Route 2 was calculated to have the best Bicycle Level of Service of the three analyzed routes, with an overall score of 1.6 and BLOS "B". Of the total 8.65 miles along the route, 2.9 miles are BLOS "D", 0.15 miles are BLOS "E", and there are no segments with BLOS "F". A total of 3.05 miles or 35% of the route was calculated to operate at BLOS "D" or worse.

The only segment calculated at BLOS "E" is S. Main St between Orchard Pl and Canal St, which is where S. Main St intersects I-86 ramps and several commercial driveways. The poor BLOS is attributed to high traffic volumes and narrow shoulders. There is a striped shoulder under the I-86 Bridge, but the I-86 intersection approaches have narrow lanes and no shoulders. Segments with BLOS "D" include Lake St between Clemens Center Pkwy Ext and the Elmira City Line (attributed to narrow lanes and high traffic volumes), S. Main St between Fairview Rd and Lattabrook Rd (narrow shoulders), S. Main St between Canal St and Sayre St (narrow lanes), W. Broad St between Thorne St and Westinghouse Rd (narrow lanes) and the northwestern segments along Sing Sing Rd, Colonial Drive, and Arnot Rd which are primarily attributed to narrow shoulders.

Major Intersections: There are a total of 12 signalized intersections along Route 2, and several were noted to be challenging for bicyclists. The intersection of Madison Ave and Washington Ave has narrow lanes, a northbound right turn lane, and a slip ramp that may cause conflicts between bicycle and vehicular traffic. Along Lake St / Lake Rd, the intersections with McCanns Blvd, 14th St and Fairview Rd have narrower shoulders and turn lanes. The S. Main St intersections at Lattabrook Rd and I-86 also have narrow lanes and shoulders.

Other Factors: Route 2 is not the longest route between the two points (that distinction goes to Route 3), but it does travel the furthest east and potentially out of the way between the nodes in Elmira and Big Flats. It is generally aesthetically pleasing and comfortable within the City of Elmira as it travels through the Central Business District and residential / commercial neighborhoods along Madison Ave and Lake Street. Similar characteristics exist within the Village of Horseheads. The segment of Lake Rd between the Elmira City Line and Lattabrook Rd may not be as appealing for bicyclists as it contains a lot of commercial / industrial properties, expansive driveways and parking lots, and higher vehicular speeds. Although each route intersects I-86 ramps and access roads which have busy intersections that can be challenging to navigate, the Route 2 interaction with I-86 is arguably the best, as the S. Main St intersections are smaller and have lower traffic volumes than the I-86 intersections along Routes 1 and 3.

4.1.3 Route 3: Davis St / Oakwood Ave / Grand Central Ave

Davis Street in the City of Elmira

Bicycle Level of Service: Route 3 was calculated to have the second-best Bicycle Level of Service of the three analyzed routes, with an overall score of 2.3 and BLOS "B" (overall scores do not include segments at the northern end that are common to all three routes). Of the total 9.15 miles along the route, 2.55 miles or 28% of the route are BLOS "D", and no segments were calculated to have BLOS "E" or "F".

Segments along Route 3 with the highest score and worst BLOS were in the Village of Elmira Heights, on Oakwood Ave between 13th St and 14th St and along 14th St between Oakwood Ave and the railroad. The poor BLOS is attributed to high traffic volumes, high percentage of trucks, and high utilization of on-street parking. Other segments with poor BLOS include Grand Central Ave between Chemung St and Brickyard Ln (attributed to high traffic volumes and narrow shoulders), W. Broad St between Thorne St and Westinghouse Rd (narrow lanes), and the northwestern segments along Sing Sing Rd, Colonial Drive, and Arnot Rd which are primarily attributed to narrow shoulders.

Major Intersections: There are a total of 10 signalized intersections along Route 3, and several intersections were noted to be challenging for bicyclists. The Oakwood Ave intersections at 13th and 14th Streets have turn lanes and adjacent on-street diagonal parking that can cause conflicts between vehicles and bicycles. In the southbound direction, the route requires a left turn from 14th St to Oakwood Ave. The intersection of 14th St and College Ave is un-signalized and can be difficult for a bicyclist to cross. At the Upper Oakwood Ave intersection with Grand Central Ave, a left turn is required for northbound bicyclists. The intersections on Grand Central Ave at Fairport Ln and Brickyard Ln (I-86 ramps / access roads) are also busy and have narrow shoulders.

Other Factors: Route 3 is the longest in length – 1.35 miles longer than Route 1 – and rather circuitous and awkward within the Village of Elmira Heights. It is generally aesthetically pleasing and comfortable within the City of Elmira as it travels through the residential neighborhoods along Davis St and Oakwood Ave, and similar characteristics exist along Grand Central Ave and through the Village of Horseheads. Upper Oakwood Ave between 18th St and Lenox Ave would likely not be as appealing for most cyclists due to the industrial setting.

This route travels along several one-way streets including Davis St (W. Water St to W. Church St), and Park Lane and Birchwood Ave in Elmira Heights. These streets would likely require changes in regulations to either allow contra-flow bicycle travel or convert the streets to two-way traffic. Even with contra-flow bicycle travel allowed, these segments may be difficult or confusing for bicyclists to navigate.

Additional isolated locations with factors influencing BLOS include a narrow culvert crossing on Upper Oakwood Ave near California Ave, and the tunnel under the railroad between 14th St and Park Lane, which is a narrow space shared with pedestrians and requires bicyclists to use sidewalks at the tunnel approaches.

4.2 Issues and Needs

4.2.1 Route 1: Miracle Mile

"Miracle Mile" Segments: The majority of the Corning Rd "Miracle Mile" portion of Route 1 is a four or five-lane roadway with 11 ft wide travel lanes and a 2 ft shoulder with curb. The narrow shoulder combined with high traffic and truck volumes and a 40 mph speed limit results in a calculated Bicycle Level of Service of "E" (College Ave to Chemung St) and "F" (Chemung St to W. Broad St). If Route 1 were to be a designated bicycle route, improvements would be needed along these segments to better accommodate bicyclists.

Because Corning Rd is a State highway with over 22,000 vehicles per day (6 % truck traffic), it is not feasible to re-stripe the existing pavement with narrower lanes and wider shoulders, or to reduce the number of travel lanes and use the extra space for bicycle lanes. Therefore, pavement widening would be required to improve the BLOS to C or better.

Corning Rd between I-86 and CR 64

Between College Ave and Chemung St, widening each side of the roadway by 4 feet would improve the BLOS from "E" to "C". However, this is a highly developed commercial corridor and widening would be difficult and costly to accomplish. Therefore, widening is not considered feasible due to right-of-way constraints, impacts to properties and structures, and modifications required to the bridge over the railroad.

The segment of Corning Rd between Chemung St and W. Broad St currently operates at BLOS "F" due to traffic volumes of over 28,000 vehicles per day (11% truck traffic) and narrow shoulders. Even significant widening (5 ft – 6 ft on each side of the roadway) would only improve the BLOS to "D".

Park Place: The segment of Park Pl between 6th St and Washington Ave was calculated to operate at BLOS "D" due to the lack of shoulders and high traffic volumes. One foot of widening on each side of the roadway, striped with either 10 ft travel lanes and 5 ft bike lanes or 11 ft travel lanes and 4 ft shoulders, would improve the BLOS to "C". Widening appears to be feasible along this relatively short section of roadway.

College Ave: The segment of College Ave between Thurston St and McCanns Blvd was calculated to operate at BLOS "D" due to the lack of shoulders and high traffic volumes. Re-striping the existing pavement with 10 ft travel lanes and 4 ft shoulders would improve the BLOS to "C".

College Avenue near Thurston Street

Sing Sing Rd: The short segment of Sing Sing Rd between W. Broad St and Colonial Dr was calculated to operate at BLOS "D" because of the narrow shoulders. Widening each shoulder by 2 ft would improve the BLOS to "C", and widening each shoulder by 4 ft would improve the BLOS to "B".

Colonial Dr: The calculated BLOS for Colonial Dr is "D" due to the narrow shoulders. Widening each shoulder by 2 ft would improve the BLOS to "C".

Arnot Rd: Arnot Rd was also calculated to operate at BLOS "D" due to the narrow shoulders. Widening each shoulder by 3 ft would improve the BLOS to "C", while widening by 4 ft would improve the BLOS to "B".

Drainage Inlets: Sunken drainage inlets along W. Broad St pose a safety hazard to bicyclists and should be raised to grade. Bicycle-safe grates should be used at all drainage inlets along the route.

4.2.2 Route 2: Madison Ave / Lake Rd / S. Main St

S. Main St: The segment of S. Main St between Orchard Pl and Canal St was calculated to operate at BLOS "E" due to narrow lanes and no shoulder in some areas. There are striped shoulders under the I-86 Bridge, but a consistent bicycle space should be provided through this segment. Widening the road by 4 ft on each side would provide for a shoulder at the intersection approaches and would improve the BLOS to "C".

S. Main Street near Interstate 86

Lake St: The short segment of Lake St between Clemens Center Pkwy Ext and the Elmira City Line operates at BLOS "D". Providing a 4 ft shoulder along each side would improve the BLOS to "C". This would likely involve minor widening along a portion of the segment.

S. Main St: The segment of S. Main St between Fairview Rd and Lattabrook Rd operates at BLOS "D" due to the narrow shoulders. Minor widening of 2 ft – 4 ft on each side would improve the BLOS to "C". In the northbound direction, a bicycle space should be striped between the thru lane and right turn lane.

The segment of S. Main St between Canal St and Sayre St in the Village of Horseheads operates at BLOS "D". Providing a 5 ft striped shoulder would improve the BLOS to "C". It is believed that there is sufficient pavement width to stripe the road with 11 ft travel lanes and 5 ft shoulders.

S. Main Street between Fairview Road and Lattabrook Road

W. Broad St: W. Broad St between Thorne St and Westinghouse Rd operates at BLOS "D" due to the narrow lanes and no shoulders. Re-striping the road with 10 ft travel lanes and 3 ft shoulders would improve the BLOS to "C", while widening the road by 2 ft on each side would improve the BLOS to "B".

Sing Sing Rd: The short segment of Sing Sing Rd between W. Broad St and Colonial Dr was calculated to operate at BLOS "D" because of the narrow shoulders. Widening each shoulder by 2 ft would improve the BLOS to "C", and widening each shoulder by 4 ft would improve the BLOS to "B".

Colonial Drive near Sing Sing Road

Arnot Road

Colonial Dr: The calculated BLOS for Colonial Dr is "D" due to the narrow shoulders. Widening each shoulder by 2 ft would improve the BLOS to "C".

Arnot Rd: Arnot Rd was also calculated to operate at BLOS "D" due to the narrow shoulders. Widening each shoulder by 3 ft would improve the BLOS to "C", while widening by 4 ft would improve the BLOS to "B".

Drainage Inlets: Sunken drainage inlets along W. Broad St pose a safety hazard to bicyclists and should be raised to grade. Bicycle-safe grates should be used at all drainage inlets along the route.

4.2.3 Route 3: Davis St / Oakwood Ave / Grand Central Ave

Village of Elmira Heights: Segments along Route 3 with the poorest BLOS were located along Oakwood Ave and 14th St in the Village of Elmira Heights. The tunnel under the railroad is another issue in this area, as the east tunnel approach lacks a ramp to the street and the tunnel itself is narrow, has a railing down the middle, and is shared with pedestrians. Improvements to the tunnel (relocate railings) and approaches (new ramps) should be considered. However, there is limited opportunity to improve BLOS along Oakwood Ave and 14th Street. Widening Oakwood Ave and 14th St would not be feasible due to adjacent structures, and providing bicycle space within the existing pavement would likely result in the loss of parking within this commercial district.

14th Street in Elmira Heights

Eastern approach to tunnel between 14th St and Park Lane in Elmira Heights

A possible solution would be to use 13th Street as the designated bicycle route between Oakwood Ave and Birchwood Ave. Although 13th St is a fairly busy road with an AADT of around 7,500 vehicles per day, the roadway is approximately 50 feet wide and appears to be a candidate for a road diet that would provide one travel lane in each direction, turn lanes at intersections, and bicycle lanes. 13th St would be a more direct route between Oakwood Ave and Birchwood Ave and the railroad crossing is better for bicyclists than the 14th St tunnel.

13th Street – possible alternate route through Elmira Heights

Grand Central Ave: The short segment of Grand Central Ave between Chemung St and Brickyard Ln was calculated to operate at BLOS "D" due to high traffic volumes and narrow / no shoulders. Providing a 3 ft shoulder on each side, which could involve re-striping or minor pavement widening, would improve the BLOS to "C".

W. Broad Street between Thorne Street and Westinghouse Road

W. Broad St: W. Broad St between Thorne St and Westinghouse Rd operates at BLOS "D" due to the narrow lanes and no shoulders. Re-striping the road with 10 ft travel lanes and 3 ft shoulders would improve the BLOS to "C", while widening the road by 2 ft on each side would improve the BLOS to "B".

Sing Sing Rd: The short segment of Sing Sing Rd between W. Broad St and Colonial Dr was calculated to operate at BLOS "D" because of the narrow shoulders. Widening each shoulder by 2 ft would improve the BLOS to "C", and widening each shoulder by 4 ft would improve the BLOS to "B".

Colonial Dr: The calculated BLOS for Colonial Dr is "D" due to the narrow shoulders. Widening each shoulder by 2 ft would improve the BLOS to "C".

Arnot Rd: Arnot Rd was also calculated to operate at BLOS "D" due to the narrow shoulders. Widening each shoulder by 3 ft would improve the BLOS to "C", while widening by 4 ft would improve the BLOS to "B".

Drainage Inlets: Sunken drainage inlets along W. Broad St pose a safety hazard to bicyclists and should be raised to grade. Bicycle-safe grates should be used at all drainage inlets along the route.

4.3 Order of Magnitude Costs

Conceptual cost estimates have been developed for the recommended improvements along each route and segment in order to achieve Bicycle Level of Service "C" or better, as described above in Section 4.2. Locations of recommended improvements are depicted in the attached foldout. Costs are estimated construction costs (design and inspection costs are not included) and were calculated using average NYSDOT bid prices. A summary of the order of magnitude costs for each route is provided in Tables 4-1, 4-2 and 4-3. Figure 4 depicts the areas of concern for each route.

Table 4-1: Route 1 Order of Magnitude Construction Costs 2015 Dollars		
Segment	**Recommended Improvement**	**Order of Magnitude Cost**
Corning Road (Miracle Mile): College to W. Broad	Provide 3 ft widening each side including new curb, inlet relocation, grading, widen three culverts, remove RR bridge raised median, sidewalk, restripe road with bike lane or 4 ft shoulder	$3,486,000*
Park Place: 6th St to Washington Ave	Provide 1 ft widening each side (including new curb, inlet relocation and decorative ped crossing) and restripe road with bike lane or 4 ft shoulder	$150,000
College Ave: Thurston St to McCanns Blvd	Restripe with 10 ft lanes and 4 ft shoulders	$15,000
Sing Sing Rd: W. Broad St to Colonial Dr	Provide 2 ft shoulder widening each side and restripe	$25,000
Colonial Dr: Sing Sing Rd to Arnot Rd	Provide 2 ft shoulder widening each side and restripe	$265,000
Arnot Rd: Colonial Dr to Chambers Rd	Provide 3 ft shoulder widening each side, reset guiderail and restripe	$175,000
Total		**$4,116,000**

***Cost includes $500,000 for right-of-way (assuming $5 per square foot) and an average of $6,000 per entrance for improvements made due to widening the road (reestablishing driveways, signing, landscaping, etc.). Cost does not include impacts to utilities.

Corning Road over Railroad

Corning Road Businesses

Corning Road Culvert

Table 4-2: Route 2 Order of Magnitude Construction Costs 2015 Dollars		
Segment	**Recommended Improvement**	**Order of Magnitude Cost**
South Main St: Orchard Pl to Canal St	Provide 4 ft widening each side (including new curb, gutter, inlet relocation, and sidewalk) and restripe road with 4 ft shoulder	$130,000
Lake Street: Clemens Center to City Line	Provide 2 ft widening each side (including new curb, inlet relocation, sidewalk, guiderail) restripe road with 4 ft shoulder	$150,000
South Main St: Fairview Rd to Lattabrook Rd	Provide 4 ft widening each side (including new curb) and restripe road with 4 ft shoulder	$75,000
South Main St: Canal St to Sayre St	Restripe with 11 ft lanes and 5 ft shoulders	$11,000
West Broad St: Thorne St to Westinghouse Rd	Restripe with 10 ft lanes and 3 ft shoulders	$18,000
Sing Sing Rd: W. Broad St to Colonial Dr	Provide 2 ft shoulder widening each side and restripe	$25,000
Colonial Dr: Sing Sing Rd to Arnot Rd	Provide 2 ft shoulder widening each side and restripe	$265,000
Arnot Rd: Colonial Dr to Chambers Rd	Provide 3 ft shoulder widening each side, guiderail, restripe	$175,000
Total		**$849,000**

Table 4-3: Route 3 Order of Magnitude Costs		
Segment	**Recommended Improvement**	**Order of Magnitude Cost**
14th St: Oakwood to Park	Mill and overlay, relocate railing and new ramp at tunnel	$45,000
Upper Oakwood Ave: West of Grand Central	Widening to replace existing culvert	$165,000
Grand Central Ave: Chemung St to Brickyard Ln	Provide 3 ft widening each side as needed (including new curb and sidewalk) and restripe road with 3 ft shoulder	$100,000
West Broad Street: Thorne St to Westinghouse Rd	Restripe with 10 ft lanes and 3 ft shoulders	$18,000
Sing Sing Rd: W. Broad St to Colonial Dr	Provide 2 ft shoulder widening each side and restripe	$25,000
Colonial Dr: Sing Sing Rd to Arnot Rd	Provide 2 ft shoulder widening each side and restripe	$265,000
Arnot Rd: Colonial Dr to Chambers Rd	Provide 3 ft shoulder widening each side, reset guiderail, restripe	$175,000
Total		**$793,000**

...\Maps\2151430_bike route.dgn
layout

SING SING RD
W. BROAD ST TO COLONIAL DR
PROVIDE 2 FT SHOULDER WIDENING EACH SIDE
$25,000

COLONIAL DR

W BROAD ST

WEST BROAD ST
THORNE ST TO WESTINGHOUSE RD
RESTRIPE EXISTING LANES
$18,000

S MAIN ST

SOUTH MAIN ST
CANAL ST TO SAYRE ST
RESTRIPE EXISTING LANES
$11,000

ARNOT
COLONIAL DR TO CHAMBERS RD
PROVIDE 3 FT SHOULDER WIDENING EACH SIDE
$175,000

COLONIAL DR
SING SING RD TO ARNOT RD
PROVIDE 2 FT SHOULDER WIDENING EACH SIDE
$265,000

SOUTH MAIN ST
ORCHARD PL TO CANAL ST
PROVIDE 4 FT WIDENING EACH SIDE
$130,000

GRAND CENTRAL AVE
CHEMUNG ST TO WESTINGHOUSE RD
RESTRIPE EXISTING LANES
$100,000

GRAND CENTRAL AVE

CORNING ROAD (MIRACLE MILE)
COLLEGE TO W. BROAD
PROVIDE 3 FT WIDENING EACH SIDE
$3,486,000

CORNING RD

SOUTH MAIN ST
FAIRVIEW RD TO LATTABROOK RD
PROVIDE 4 FT WIDENING EACH SIDE
$75,000

UPPER OAKWOOD AVE
WEST OF GRAND CENTRAL
WIDENING TO REPLACE EXISTING CULVERT
$165,000

UPPER OAKWOOD AVE

LAKE RD

14TH ST
OAKWOOD TO PARK
MILL AND OVERLAY
$45,000

COLLEGE AVE
THURSTON ST TO MCCANNS BLVD
RESTRIPE EXISTING LANES
$15,000

LAKE STREET
CLEMENS CENTER TO CITY LINE
PROVIDE 2 FT WIDENING EACH SIDE
$150,000

COLLEGE AVE

OAKWOOD AVE

LAKE ST

PARK PLACE
6TH ST TO WASHINGTON AVE
PROVIDE 1 FT WIDENING EACH SIDE
$150,000

MADISON AVE

PARK PL

DAVIS ST

LEGEND

- ROUTE 1
- ROUTE 2
- ROUTE 3
- ROUTES 1 & 2
- ROUTES 1,2 & 3

LABELLA Associates, D.P.C.

300 State Street
Rochester, NY 14614
585.454.6110

FIGURE 4
ROUTE MAP AREAS OF CONCERN

STUDY OF A NORTH SOUTH BICYCLE-FRIENDLY CORRIDOR

N

N.T.S.

5.0 PREFERRED BICYCLE ROUTE

5.1 Recommended Route

Analysis of the three bicycle routes took into account factors such as Bicycle Level of Service, major intersections, directness of route, destinations served, and costs to improve the routes to be suitable for an AASHTO Class B cyclist. Based on all of these factors, Route 3: Davis St / Oakwood Ave / Grand Central Ave was determined to be the most suitable north/south bicycle corridor between the City of Elmira and Big Flats.

5.2 Basis For Selection

The primary reasons for selecting Route 3 as the preferred north/south bicycle corridor are explained below:

- Bicycle Level of Service: The overall BLOS for Route 3 under existing conditions was determined to be "B", which is considered a very high compatibility level for the analyzed AASHTO Class B cyclist. Although Route 3 did not have the best overall BLOS, the analysis indicated no segments with BLOS "E" or "F", and Route 3 had the shortest length of street segments requiring improvements to obtain BLOS "C" or better.

- Directness of Route and Destinations Served: Route 3 is the only route that directly serves the City of Elmira, Village of Elmira Heights and Village of Horseheads (Route 1 bypasses Horseheads and Route 2 bypasses Elmira Heights). It does not directly serve the Central Business District of Elmira as well as Route 1, but the south end does connect to State Bicycle Route 17 which travels through Downtown Elmira. Route 3 travels directly by or in close proximity to schools, parks, Elmira College, the County Fairgrounds and the Arnot Ogden Medical Center, among others. Route 3, which runs along the western side of Elmira, also complements the existing State Bicycle Route 14 which runs along the eastern side of Elmira.

- Major Intersections: Route 3 has the lowest number of signalized intersections as well as the lowest number of intersections requiring difficult crossings or turning movements of the three routes.

- Safety: Route 3 had, by a significant margin, the lowest number of bicycle-related accidents.

- Feasibility for Implementation: The total estimated construction cost was determined to be the lowest of the three routes. The areas along Route 3 with recommended improvements are short segments of roadway or isolated locations (such as the culvert on Upper Oakwood Ave) – not long segments of streets requiring widening. The improvements do not appear to be complex projects requiring significant right-of-way or multi-jurisdictional coordination.

5.3 Recommended Improvements Along Route

Recommended improvements along Bicycle Route 3 are discussed in detail in Section 4.2.3 and Table 4-3. Improvements are located at the railroad crossing in Elmira Heights (either by improving the tunnel or using 13th Street as an alternate route), the culvert on Upper Oakwood Avenue, Grand Central Avenue

near I-86, and the northwestern segments along W. Broad Street, Sing Sing Road, Colonial Drive and Arnot Road (which are similar to all three routes).

In addition to the recommended street improvements, additional signage and pavement markings should be installed along the entire route (exact locations would be determined during project design phases). Signage would include route designation and way-finding signage, as well as signs designating bicycle lanes or in-lane shared use. Pavement markings could include bicycle lane designations, "sharrows" or special striping to designate vehicle/bicycle conflict areas.

5.4 Order of Magnitude Costs

The total order of magnitude construction cost (in 2015 dollars) to obtain a Bicycle Level of Service "C" or better along Route 3 is approximately $800,000 (refer to Section 4.3 and Table 4-3). The estimated costs are for construction only, and do not include design, inspection or the aforementioned signage and pavement markings along the entire route to provide way-finding and designate bicycle facilities.

5.5 Plan Going Forward

Immediate Goals ($50,000)

- Designate route as a bicycle corridor and install initial signage and pavement markings (wayfinding signage, bicycle warning signs, and sharrows).
- Educate the public.
- Develop project list for phasing of proposed improvements identified in the short term and midterm goals.

Short Term Goals (< $100,000)

- Address lower cost areas of concern identified in Section 4.2.3 and Table 4-3.
  - Elmira Heights: 14th Street or 13th Street
  - West Broad Street: Thorne to Westinghouse
  - Sing Sing Road: West Broad to Colonial
- Evaluate and improve major intersections.
- Evaluate and install pavement marking in areas of acceptable BLOS.

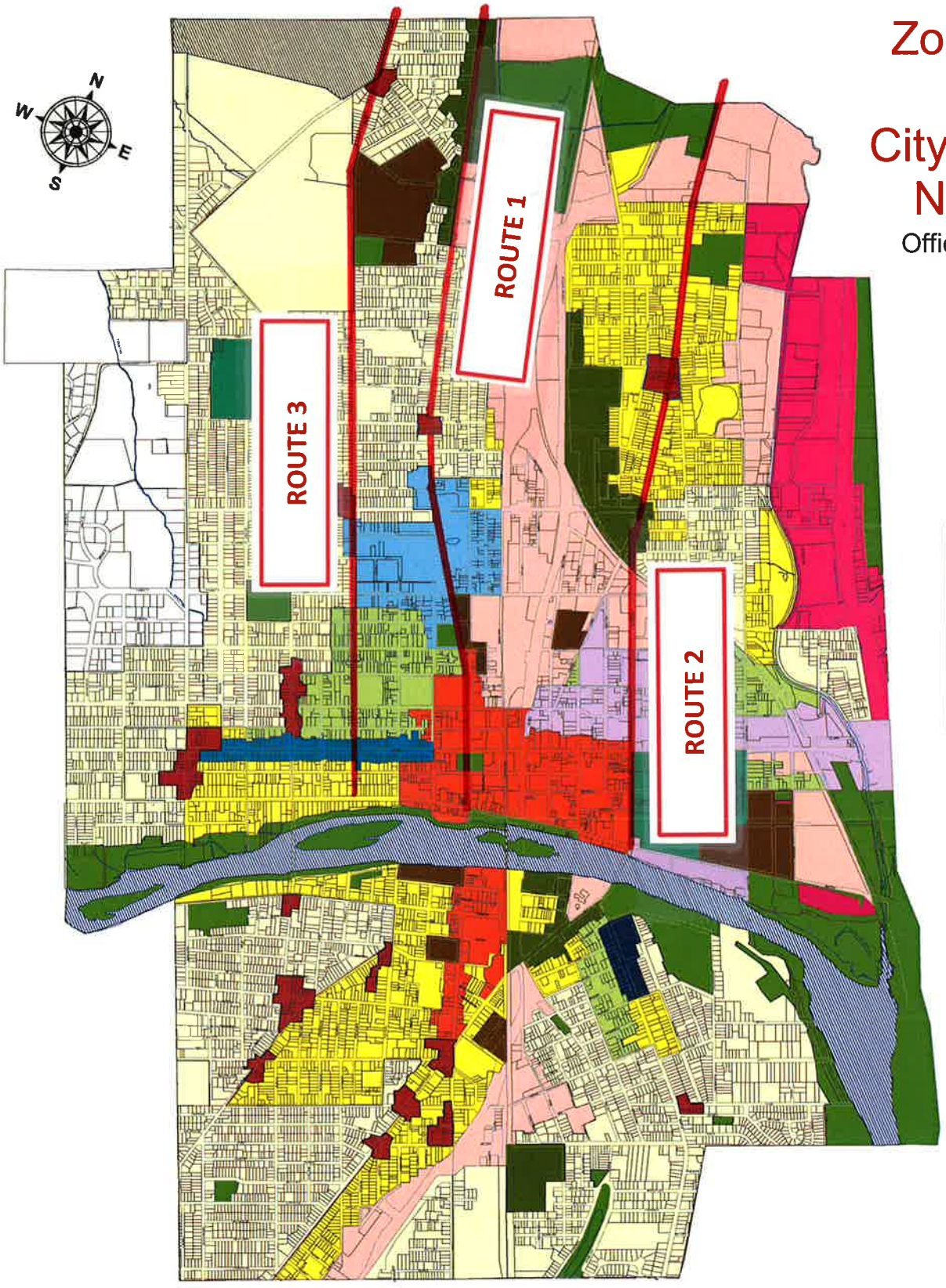
Midterm Goals (> $100,000)

- Address higher cost areas of concern identified in Section 4.2.3 and Table 4-3.
  - Grand Central Avenue: Chemung to Brickyard
  - Colonial Drive: Sing Sing to Arnot
  - Upper Oakwood Avenue Culvert
  - Arnot Road: Colonial to Chambers

APPENDIX A
ZONING MAPS

Zoning Map of the City of Elmira, New York

Official Zoning Map



Adopted December 21, 1998
Resolution No.98-516
Map Printed 2/15/2006
Map Printed 1/16/2007

REVISIONS		
Date/Revised by	Date/Revised by	Date/Revised by
6/16/1999 by APA 7/05/2000 by APA 2/14/2002 by APA 3/11/2002 by APA 9/09/2002 by APA 9/23/2002 by APA 10/7/2002 by APA 12/2/2002 by APA 6/11/2003 by APA 2/23/2004 by APA 1/5/2004 by RCV		

KEY

- RB - 1 to 2 Family
- RA - 1 Family
- RAA - 1 Family Large Lot
- RC - 1 to 4 Family
- RD - Multi-Family
- BA - Neighborhood Commercial
- BA1 - Neighborhood Commercial I
- BB - Central Business District
- BC - Specialized Commericial
- BD - Historic Commercial
- BE - General Commercial
- BG - Gateway Commercial
- IA - Light Industrial
- IB - General Industrial
- HED - Higher Education
- HA - Hospital
- CONS - Conservation
- River (Unzoned)
- Reformatory (Unzoned)

THE ZONING ORDINANCE OF THE CITY OF ELMIRA

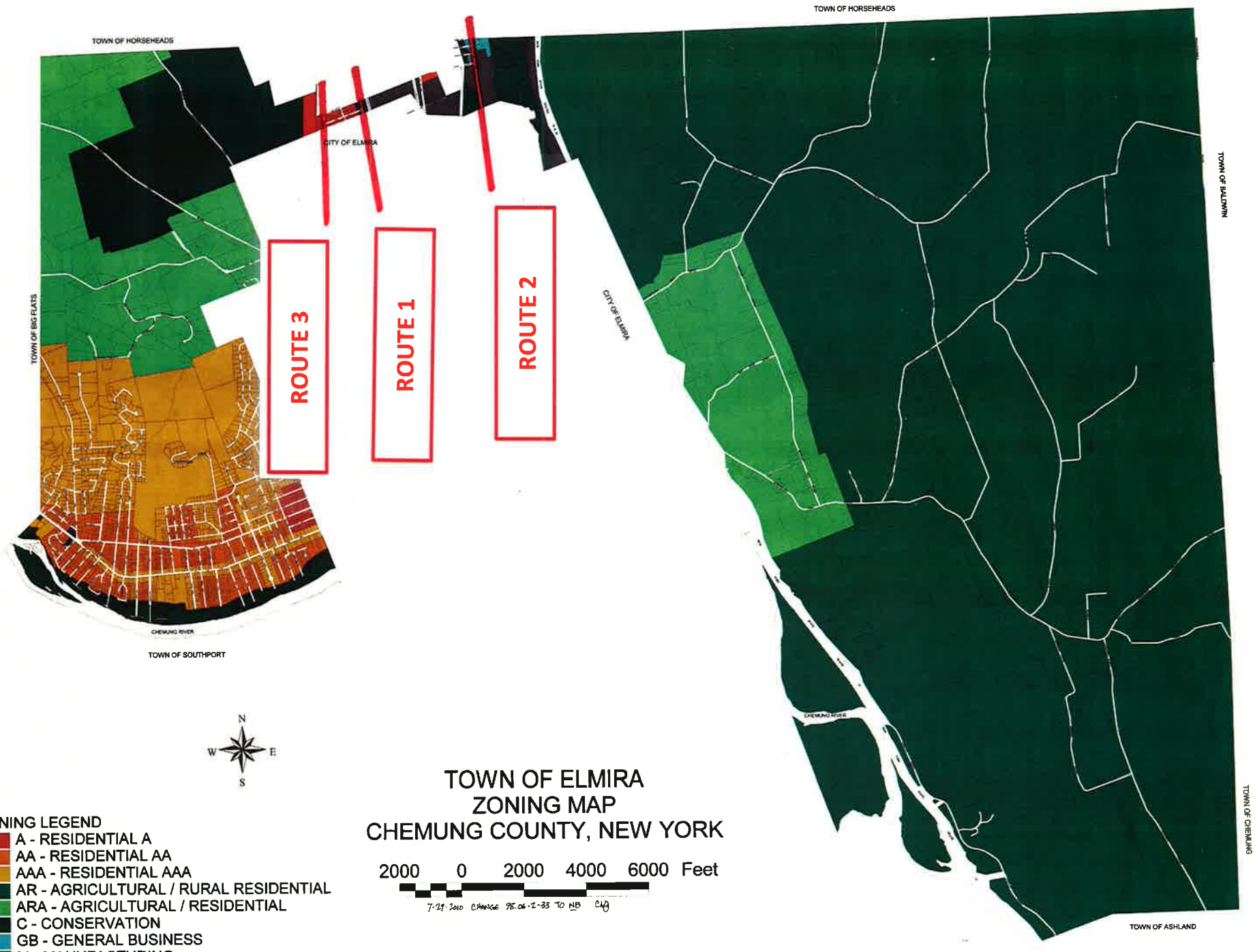
"This is to certify that this is the official Zoning Map of the City of Elmira."

ATTEST — CITY OF ELMIRA

City Clerk, Angela Williams — Mayor, John S. Tonello

Map prepared by the Department of Public Works Engineering Division

1,200 600 0 1,200 2,400 3,600 4,800 Feet


TOWN OF HORSEHEADS
TOWN OF HORSEHEADS
CITY OF ELMIRA
ROUTE 3
ROUTE 1
ROUTE 2
CITY OF ELMIRA
TOWN OF BIG FLATS
TOWN OF BALDWIN
CHEMUNG RIVER
TOWN OF SOUTHPORT
CHEMUNG RIVER
TOWN OF CHEMUNG
TOWN OF ASHLAND
N
W
E
S
ZONING LEGEND
A - RESIDENTIAL A
AA - RESIDENTIAL AA
AAA - RESIDENTIAL AAA
AR - AGRICULTURAL / RURAL RESIDENTIAL
ARA - AGRICULTURAL / RESIDENTIAL
C - CONSERVATION
GB - GENERAL BUSINESS
M - MANUFACTURING
NB - NEIGHBORHOOD BUSINESS
TOWN OF ELMIRA
ZONING MAP
CHEMUNG COUNTY, NEW YORK
2000 0 2000 4000 6000 Feet
7-29-2010 CHANGE 98.06-2-33 TO NB CAO

ZONING MAP

LEGEND

R-1 LOW DENSITY RESIDENTIAL
R-2 MEDIUM DENSITY RESIDENTIAL
R-3 HIGH DENSITY RESIDENTIAL
C-1 BUSINESS DISTRICT
C-2 GENERAL COMMERCIAL
I-1 LIMITED INDUSTRIAL (buffer)
I-2 GENERAL INDUSTRIAL

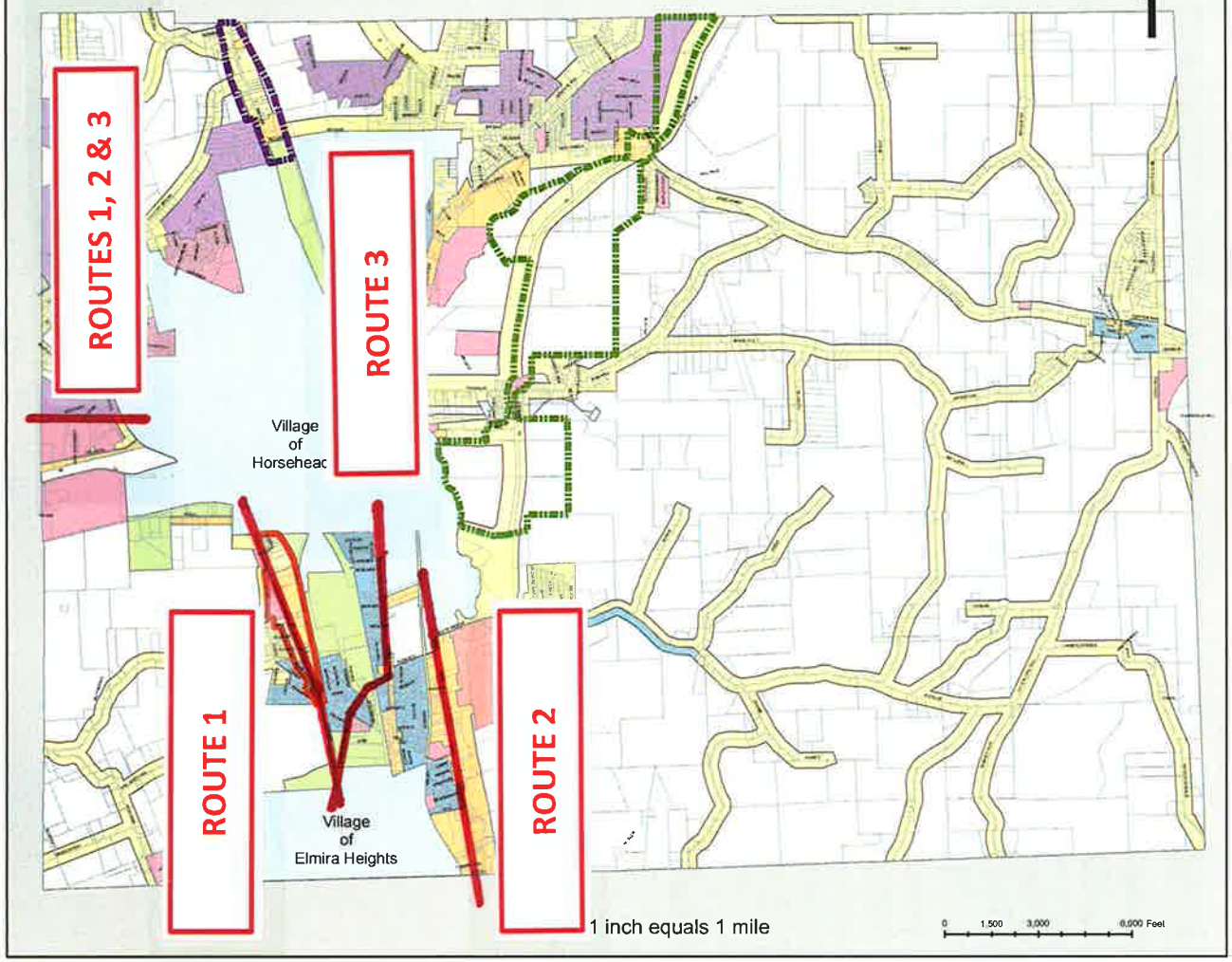
JUNE, 1972
ADOPTED JULY 25, 1972

SCALE IN FEET

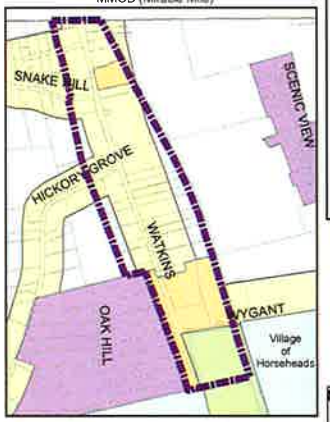
ELMIRA HEIGHTS, CHEMUNG COUNTY

ROUTE 2 – Does not traverse through Elmira Heights. ROUTE 2 bypasses Elmira Heights to the east.

Town of Horseheads
Chemung County
New York



MMOD (Miracle Mile)



WROD (Watkins Road NYS Rte. 14)

NYS13OD (NYS Rte 13 Overlay District)

Town of Horseheads Zoning

Designation

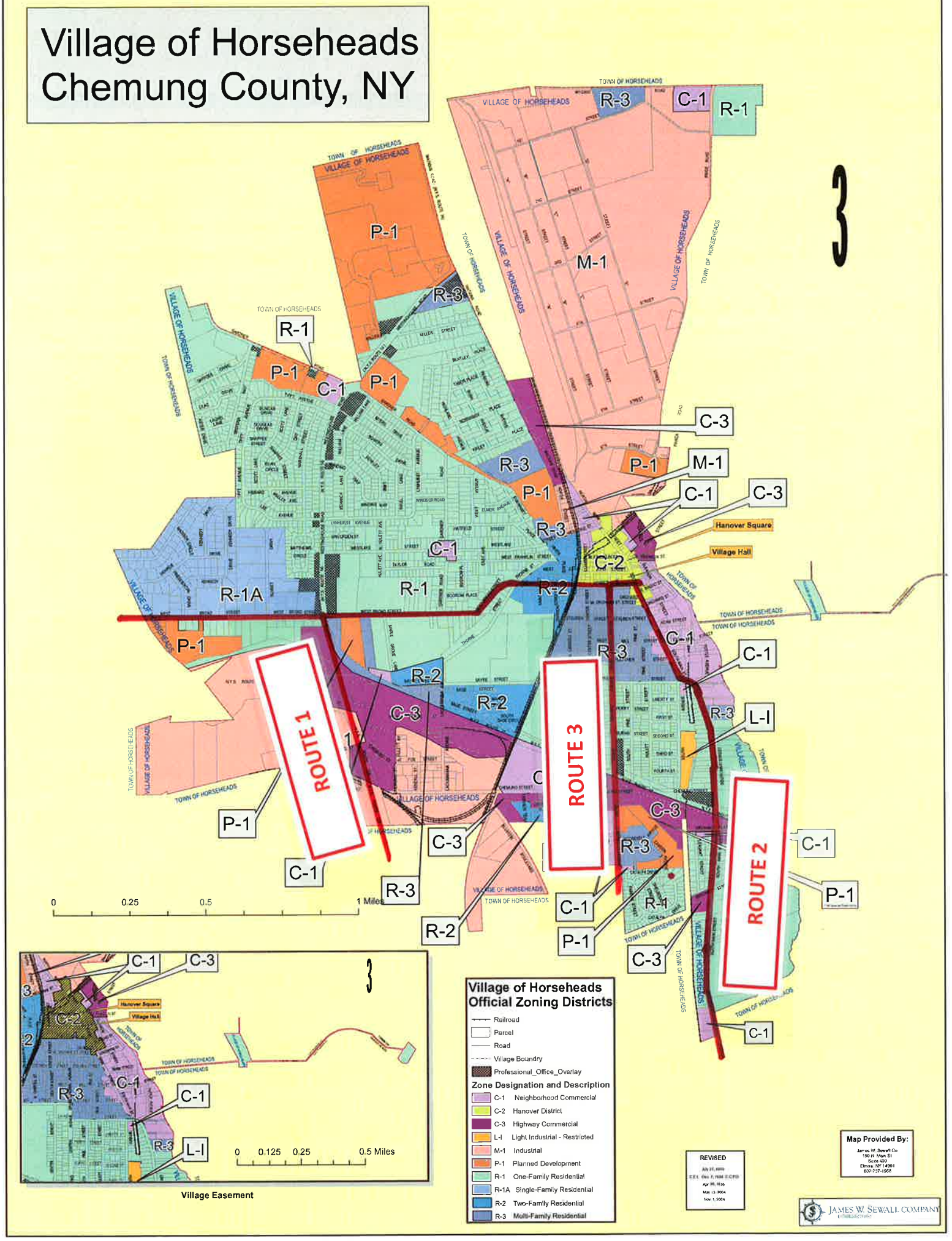
- AG
- BUSINESS
- INDUSTRIAL PARK
- MANUFACTURING
- PUD
- RES-A
- RES-AA
- RES-B
- VILLAGE OF ELMIRA HEIGHTS
- VILLAGE OF HORSEHEADS
- Parcel
- NYS13OD
- WROD
- MMOD

Neighborhood Service Area Zones

455 Old Ithaca Road	49.05-4-59
456 Upper Oakwood Ave	69.10-2-72
18 Ridge Road	49.03-2-9

Map Provided by:
James W. Sewall Co.
150 N. Main St.
Elmira, NY 14901

Village of Horseheads
Chemung County, NY



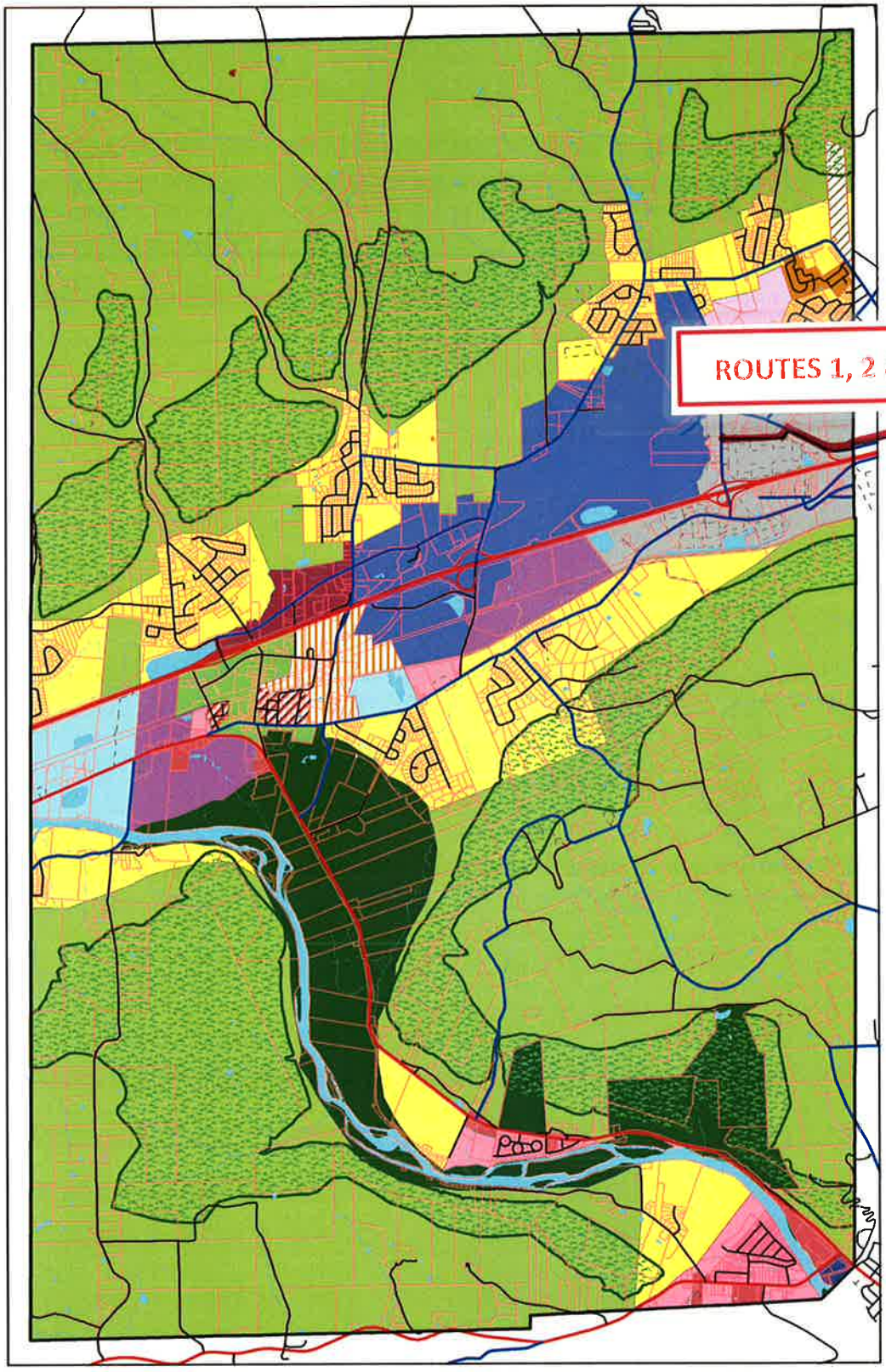
Town of Big Flats Zoning Map

Town of Big Flats
Department of Planning

Last Amended on:
December 9th, 2009

Map produced on:
December 9th, 2009

Schedule A



Legend:

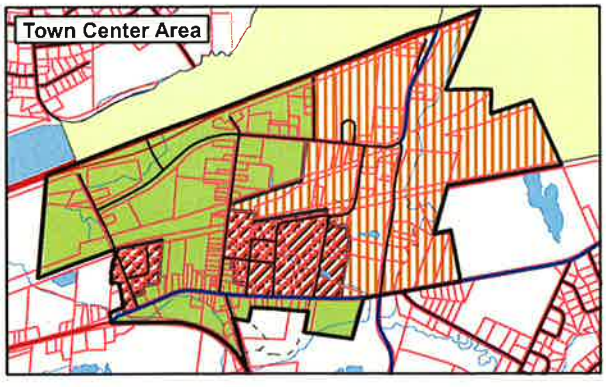
Roads
- Local
- County
- State
- Ramp
- Private

Lakes, Ponds, & Streams

Parcels - 2009

Zoning Districts
- Airport Business Development
- Business Neighborhood
- Business Neighborhood #2
- Business Non-Retail
- Business Regional
- Commercial Light Industrial
- Industrial
- Planned Multi-Res.
- Town Center
- Town Center 2
- Town Center Residential
- Residential 1
- Residential 2
- Senior Planned Multi-Res.
- Rural
- Conservation
- Recreation Conservation

Ridgeline Overlay District
- RLO Area



2

0 5,000 10,000 Feet

APPENDIX B
LEVEL OF SERVICE CALCULATIONS

BICYCLE LEVEL OF SERVICE (BLOS)

ROUTE 1: MIRACLE MILE

Study of a North South Bicycle-Friendly Corridor

Bicycle Route #1: Downtown Elmira to Big Flats via Miracle Mile

Segment ID	Road Name	From	To	Length (Miles)	Bicycle LOS		Weighted Score
					Score	Grade	
1-1	N. Main St	W. Water St	1st St	0.20	3.79	D	0.135
1-2	N. Main St	1st St	Park Pl	0.15	1.51	B	0.040
1-3	Park Pl	N. Main St	6th St	0.30	2.21	B	0.118
1-4	Park Pl	6th St	Washington Ave	0.20	4.19	D	0.150
1-5	College Ave	Washington Ave	Woodlawn Ave	0.75	1.66	B	0.222
1-6	College Ave	Woodlawn Ave	Thurston St	0.20	-2.39	A	-0.085
1-7	College Ave	Thurston St	McCanns Blvd	0.55	4.10	D	0.403
1-8	College Ave	McCanns Blvd	Oakwood Ave	0.80	0.80	A	0.114
1-9	Corning Rd	College Ave	Lenox Ave	0.70	4.69	E	0.586
1-10	Corning Rd	Lenox Ave	Philo Rd	1.05	4.69	E	0.879
1-11	Corning Rd	Philo Rd	Chemung St	0.30	4.69	E	0.251
1-12	Corning Rd	Chemung St	W. Broad St	0.40	6.91	F	0.494
1-13	W. Broad St	Westinghouse	Sing Sing Rd	0.60	-1.15	A	
1-14	Sing Sing Rd	W. Broad St	Colonial Dr	0.10	3.76	D	
1-15	Colonial Dr	Sing Sing Rd	Roemmelt Dr	0.35	3.59	D	
1-16	Colonial Dr	Roemmelt Dr	Arnot Rd	0.70	3.81	D	
1-17	Arnot Rd	Colonial Dr	Chambers Rd	0.45	4.49	D	
		Total Segments 1 through 12		**5.60**		**C**	**3.308**
Excluded from Weighted Score (segments are common to all three routes)							

Segment 1-1

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	12910 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	67%

	Score	Level-of-service	Compatibility Level
BLOS:	3.79	D (3.51-4.50)	Moderately Low

Segment 1-2

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	11554 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	1.51	B (1.51-2.50)	Very High

Segment 1-3

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	10 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	10451 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	5%

	Score	Level-of-service	Compatibility Level
BLOS:	2.21	B (1.51-2.50)	Very High

Bicycle Level of Service for this road segment

Segment 1-4

Lanes per direction:	1
Outside lane width:	14 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	10451 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.19	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 1-5

Lanes per direction:	1
Outside lane width:	10 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	8062 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	1.66	B (1.51-2.50)	Very High

Segment 1-6

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	13 ft
Paved shoulder/bikelane width:	13 ft
Bidirectional ADT traffic volume:	11407 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	-2.39	A (below 1.50)	Extremely High

Segment 1-7

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	14 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	11407 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.1	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 1-8

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	10 ft
Bidirectional ADT traffic volume:	10061 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	6.7%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	5%

	Score	Level-of-service	Compatibility Level
BLOS:	0.8	A (below 1.50)	Extremely High

Segment 1-9

Bicycle Level of Service for this road segment

Lanes per direction:	2
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	22160 (veh/day)
Posted speed limit:	40 mph
Heavy vehicle percentage:	5.7%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.69	E (4.51-5.50)	Very Low

Segment 1-10

Bicycle Level of Service for this road segment

Lanes per direction:	2
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	22160 (veh/day)
Posted speed limit:	40 mph
Heavy vehicle percentage:	5.7%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.69	E (4.51-5.50)	Very Low

Segment 1-11

Bicycle Level of Service for this road segment

Lanes per direction:	2
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	22160 (veh/day)
Posted speed limit:	40 mph
Heavy vehicle percentage:	5.7%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.69	E (4.51-5.50)	Very Low

Bicycle Level of Service for this road segment

Segment 1-12

Lanes per direction:	2
Outside lane width:	11 ft
Paved shoulder/bikelane width:	1 ft
Bidirectional ADT traffic volume:	28348 (veh/day)
Posted speed limit:	40 mph
Heavy vehicle percentage:	11.3%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	6.91	F (above 5.50)	Extremely Low

Bicycle Level of Service for this road segment

Segment 1-13

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	10 ft
Bidirectional ADT traffic volume:	2000 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	-1.15	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 1-14

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	1 ft
Bidirectional ADT traffic volume:	4642 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.76	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 1-15

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	5749 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.59	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 1-16

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	6041 (veh/day)
Posted speed limit:	35 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.81	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 1-17

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	1 ft
Bidirectional ADT traffic volume:	3386 (veh/day)
Posted speed limit:	35 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	2.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.49	D (3.51-4.50)	Moderately Low

BICYCLE LEVEL OF SERVICE (BLOS)

ROUTE 2: MADISON AVE / LAKE RD / S. MAIN ST

Study of a North South Bicycle-Friendly Corridor

Bicycle Route #2: Downtown Elmira to Big Flats via Madison / Lake / Main

Segment ID	Road Name	From	To	Length (Miles)	Bicycle LOS		Weighted Score
					Score	Grade	
2-1	Madison Ave	E. Water St	Lake St	0.90	-0.58	A	-0.081
2-2	Lake St	Madison Ave	Clemens Ctr Ext	1.15	0.89	A	0.159
2-3	Lake St	Clemens Ctr Ext	Elmira City Line	0.10	4.13	D	0.064
2-4	Lake Rd	Elmira City Line	McCann's Blvd	0.30	3.42	C	0.159
2-5	Lake Rd	McCann's Blvd	Fairview Rd	1.55	1.50	A	0.360
2-6	S. Main St	Fairview Rd	Lattabrook Rd	0.10	4.11	D	0.064
2-7	S. Main St	Lattabrook Rd	Orchard Pl	0.40	-0.22	A	-0.014
2-8	S. Main St	Orchard Pl	Canal St	0.15	4.52	E	0.105
2-9	S. Main St	Canal St	Sayre St	0.40	3.96	D	0.246
2-10	S. Main St	Sayre St	Mill St	0.10	1.86	B	0.029
2-11	S. Main St	Mill St	Broad St	0.20	1.45	A	0.045
2-12	W. Broad St	S. Main St	Thorne St	0.40	0.79	A	0.049
2-13	W. Broad St	Thorne St	Westinghouse Rd	0.70	3.75	D	0.407
2-14	W. Broad St	Westinghouse Rd	Sing Sing Rd	0.60	-1.15	A	
2-15	Sing Sing Rd	W. Broad St	Colonial Dr	0.10	3.76	D	
2-16	Colonial Dr	Sing Sing Rd	Roemmelt Dr	0.35	3.59	D	
2-17	Colonial Dr	Roemmelt Dr	Arnot Rd	0.70	3.81	D	
2-18	Arnot Rd	Colonial Dr	Chambers Rd	0.45	4.49	D	
		Total Segments 1 through 13		**6.45**		**B**	**1.592**
Excluded from Weighted Score (segments are common to all three routes)							

Bicycle Level of Service for this road segment

Segment 2-1

Lanes per direction:	1
Outside lane width:	14 ft
Paved shoulder/bikelane width:	10 ft
Bidirectional ADT traffic volume:	11541 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	3.2%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	2%

	Score	Level-of-service	Compatibility Level
BLOS:	-0.58	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 2-2

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	7553 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	3.2%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	2%

	Score	Level-of-service	Compatibility Level
BLOS:	0.89	A (below 1.50)	Extremely High

Segment 2-3

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	14 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	9184 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.13	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 2-4

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	4 ft
Bidirectional ADT traffic volume:	9184 (veh/day)
Posted speed limit:	40 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.42	C (2.51-3.50)	Moderately High

Bicycle Level of Service for this road segment

Segment 2-5

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	9184 (veh/day)
Posted speed limit:	40 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	1.5	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 2-6

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	8723 (veh/day)
Posted speed limit:	40 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.11	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 2-7

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	10 ft
Bidirectional ADT traffic volume:	8013 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	-0.22	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 2-8

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	8013 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	5%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.52	E (4.51-5.50)	Very Low

Bicycle Level of Service for this road segment

Segment 2-9

Lanes per direction:	1
Outside lane width:	16 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	7944 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	5%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.96	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 2-10

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	9882 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	5%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	10%

	Score	Level-of-service	Compatibility Level
BLOS:	1.86	B (1.51-2.50)	Very High

Bicycle Level of Service for this road segment

Segment 2-11

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	9882 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	5.1%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	1.45	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 2-12

Lanes per direction:	1
Outside lane width:	10 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	2962 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	0.79	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 2-13

Lanes per direction:	1
Outside lane width:	13 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	4559 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.75	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 2-14

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	10 ft
Bidirectional ADT traffic volume:	2000 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	-1.15	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 2-15

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	1 ft
Bidirectional ADT traffic volume:	4642 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.76	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 2-16

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	5749 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.59	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 2-17

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	6041 (veh/day)
Posted speed limit:	35 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.81	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 2-18

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	1 ft
Bidirectional ADT traffic volume:	3386 (veh/day)
Posted speed limit:	35 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	2.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.49	D (3.51-4.50)	Moderately Low

BICYCLE LEVEL OF SERVICE (BLOS)

ROUTE 3: DAVIS ST / OAKWOOD AVE / GRAND CENTRAL AVE

Study of a North South Bicycle-Friendly Corridor

Bicycle Route #3: Downtown Elmira to Big Flats via Davis / Oakwood / Grand Central

Segment ID	Road Name	From	To	Length (Miles)	Bicycle LOS		Weighted Score
					Score	Grade	
3-1	Davis St	W. Water St	1st St	0.20	2.20	B	0.063
3-2	Davis St	1st St	Thurston St	1.90	2.34	B	0.640
3-3	Oakwood Ave	Thurston St	13th St	0.90	1.86	B	0.241
3-4	Oakwood Ave	13th St	14th St	0.05	4.33	D	0.031
3-5	14th St	Oakwood Ave	Railroad	0.10	3.90	D	0.056
3-6	Park Ln	14th St	Birchwood Ave	0.10	-2.67	A	-0.038
3-7	Birchwood Ave	Park Ln	18th St	0.15	-0.84	A	-0.018
3-8	18th / Oakwood	Birchwood Ave	Lenox Ave	0.60	3.47	C	0.300
3-9	Oakwood Ave	Lenox Ave	Grand Central	0.30	2.39	B	0.103
3-10	Grand Central	Oakwood Ave	Roosevelt Ave	0.80	1.27	A	0.146
3-11	Grand Central	Roosevelt Ave	Chemung St	0.15	3.42	C	0.074
3-12	Grand Central	Chemung St	Brickyard Ln	0.10	3.79	D	0.055
3-13	Grand Central	Brickyard Ln	W. Broad St	0.60	2.95	C	0.255
3-14	W. Broad St	Grand Central	Thorne St	0.30	0.79	A	0.034
3-15	W. Broad St	Thorne St	Westinghouse Rd	0.70	3.75	D	0.378
3-16	W. Broad St	Westinghouse Rd	Sing Sing Rd	0.60	-1.15	A	
3-17	Sing Sing Rd	W. Broad St	Colonial Dr	0.10	3.76	D	
3-18	Colonial Dr	Sing Sing Rd	Roemmelt Dr	0.35	3.59	D	
3-19	Colonial Dr	Roemmelt Dr	Arnot Rd	0.70	3.81	D	
3-20	Arnot Rd	Colonial Dr	Chambers Rd	0.45	4.49	D	
		Total Segments 1 through 15		**6.95**		**B**	**2.318**
Excluded from Weighted Score (segments are common to all three routes)							

Segment 3-1

Bicycle Level of Service for this road segment

Lanes per direction:	1
Outside lane width:	16 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	1908 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	0.5%
FHWA's pavement condition rating:	4.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	2.2	B (1.51-2.50)	Very High

Bicycle Level of Service for this road segment

Segment 3-2

Lanes per direction:	1
Outside lane width:	10 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	6262 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	15%

	Score	Level-of-service	Compatibility Level
BLOS:	2.34	B (1.51-2.50)	Very High

Bicycle Level of Service for this road segment

Segment 3-3

Lanes per direction:	1
Outside lane width:	10 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	11951 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	1.86	B (1.51-2.50)	Very High

Bicycle Level of Service for this road segment

Segment 3-4

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	5 ft
Bidirectional ADT traffic volume:	11786 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	9.1%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	5%

	Score	Level-of-service	Compatibility Level
BLOS:	4.33	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 3-5

Lanes per direction:	1
Outside lane width:	14 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	1000 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	5%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	40%

	Score	Level-of-service	Compatibility Level
BLOS:	3.9	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 3-6

Lanes per direction:	1
Outside lane width:	20 ft
Paved shoulder/bikelane width:	10 ft
Bidirectional ADT traffic volume:	2000 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	15%

	Score	Level-of-service	Compatibility Level
BLOS:	-2.67	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 3-7

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	10 ft
Bidirectional ADT traffic volume:	1000 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	0.5%
FHWA's pavement condition rating:	5
% of segment with occupied on-street parking:	20%

	Score	Level-of-service	Compatibility Level
BLOS:	-0.84	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 3-8

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	1000 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	5%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.47	C (2.51-3.50)	Moderately High

Bicycle Level of Service for this road segment

Segment 3-9

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	4 ft
Bidirectional ADT traffic volume:	1479 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	5%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	2.39	B (1.51-2.50)	Very High

Bicycle Level of Service for this road segment

Segment 3-10

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	10904 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	1.27	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 3-11

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	4 ft
Bidirectional ADT traffic volume:	11288 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.42	C (2.51-3.50)	Moderately High

Bicycle Level of Service for this road segment

Segment 3-12

Lanes per direction:	2
Outside lane width:	12 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	11288 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	5%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.79	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 3-13

Lanes per direction:	1
Outside lane width:	18 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	5066 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	3.5%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	2.95	C (2.51-3.50)	Moderately High

Bicycle Level of Service for this road segment

Segment 3-14

Lanes per direction:	1
Outside lane width:	10 ft
Paved shoulder/bikelane width:	8 ft
Bidirectional ADT traffic volume:	2962 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	0.79	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 3-15

Lanes per direction:	1
Outside lane width:	13 ft
Paved shoulder/bikelane width:	0 ft
Bidirectional ADT traffic volume:	4559 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.75	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 3-16

Lanes per direction:	1
Outside lane width:	12 ft
Paved shoulder/bikelane width:	10 ft
Bidirectional ADT traffic volume:	2000 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	-1.15	A (below 1.50)	Extremely High

Bicycle Level of Service for this road segment

Segment 3-17

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	1 ft
Bidirectional ADT traffic volume:	4642 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.76	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 3-18

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	5749 (veh/day)
Posted speed limit:	30 mph
Heavy vehicle percentage:	2%
FHWA's pavement condition rating:	3
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.59	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 3-19

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	2 ft
Bidirectional ADT traffic volume:	6041 (veh/day)
Posted speed limit:	35 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	4
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	3.81	D (3.51-4.50)	Moderately Low

Bicycle Level of Service for this road segment

Segment 3-20

Lanes per direction:	1
Outside lane width:	11 ft
Paved shoulder/bikelane width:	1 ft
Bidirectional ADT traffic volume:	3386 (veh/day)
Posted speed limit:	35 mph
Heavy vehicle percentage:	4%
FHWA's pavement condition rating:	2.5
% of segment with occupied on-street parking:	0%

	Score	Level-of-service	Compatibility Level
BLOS:	4.49	D (3.51-4.50)	Moderately Low