

BICYCLE TRANSPORTATION PLAN UPDATE

City of Lincoln, California

May, 2018

Prepared for:

Prepared by:

Kimley»Horn

555 Capitol Mall, Suite 300
Sacramento, California 95814
Phone: 916.858.5800

Kimley»Horn



This page left intentionally blank.



TABLE OF CONTENTS

INTRODUCTION 1
Purpose 1
Study Area 1
Consistency with Other Plans 7
Community Participation 7

GOALS, OBJECTIVES, AND POLICIES 9
Overall System 9
Land Development 10
Commuting 10
Safety Education 11
Environmental Considerations 11
Funding 12

EXISTING CONDITIONS 13
Past Expenditures on Bicycle Facilities 13
Existing Bicycle Facilities 13
Regional Connections 15
Multi-modal Connections 15
Support Facilities 17
Bicycle Safety 17

ANALYSIS OF BICYCLE DEMAND 21
Existing Major Activity Centers 21
Population and Employment Trends 21
Bicycle Ridership Levels 22
Future Land Use and Development 22
Future Population and Employment 23

BICYCLE CONNECTIVITY 25
Level of Stress Criteria 25
Existing Roadway Network Level of Traffic Stress 26
Existing Network Connectivity 28
Existing Network Undue Detour 31

COMMUNITY PARTICIPATION 33
Online Engagement 34
Summary of Public Input 34

PROPOSED SYSTEM 37
Planned Bikeway Projects 37
Proposed System of Bikeways 39
Top 10 Bikeway Improvements 42
Proposed System Low-Stress Connectivity Comparison 46
Future Bicycle Ridership 47

COST AND FUNDING ANALYSIS 49
Cost Estimates 49
Grade Crossing Constraints 49
Monetizing The Societal Benefit of Bicycling 49
Federal Funding Sources 52
Statewide Funding Sources 53
Local and Regional Funding Sources 54
Non-Traditional Funding Sources 54

IMPLEMENTATION 55
Bikeway System Phasing 56

APPENDICES
Design Guidelines ..... Appendix A
Public Survey ..... Appendix B
Public Comments ..... Appendix C
Future Development ..... Appendix D
Planned Bikeway Improvements ..... Appendix E
Top 10 Cost Estimates ..... Appendix F
Top 10 Ridership Estimates ..... Appendix G
2012 BTP CIP Projects ..... Appendix H

LIST OF FIGURES
Figure 1 - Study Area 2
Figure 2 - Existing Bikeways 14
Figure 3 - Transit Services 16
Figure 4 - Bicycle Collisions 19
Figure 5 - Existing Level of Traffic Stress 27
Figure 6 - Barriers and Gaps 29
Figure 7 - Network Connectivity 30
Figure 8 - Public Comments 35
Figure 9 - Existing and Planned Bicycle Facilities 41
Figure 10 - Top 10 Projects 43



This page left intentionally blank.



INTRODUCTION

PURPOSE

The purpose of the City of Lincoln's 2018 Bicycle Transportation Plan (BTP) is to update the City's proposed future bicycle network, including the City's bicycle capital improvement list, with the goal of providing a safe, enjoyable, and connected bicycle network for all users within the City of Lincoln. As a dual purpose, this plan demonstrates compliance with the California Bicycle Transportation Act and provides the City of Lincoln a resource document for pursuing discretionary and competitive funding for bicycle infrastructure improvements.

Specifically, the 2018 Bicycle Transportation Plan accomplishes the following:

- updates all required information elements of the California Bicycle Transportation Act;
- updates the City's existing bicycle network to include street and bicycle improvements completed since the previous update in 2012;
- updates the City's bicycle facility design guidelines to reflect the latest national/regional guidance;
- determines the efficacy of the 2012 bicycle capital improvement program and revises these recommendations based on input from the public combined with a comprehensive assessment of bicycle connectivity relative to existing and future development patterns;
- establishes a future bicycle network that connects all areas of significance in the city with facilities and routes that are more in line with the majority of potential bicyclist's comfort levels;
- establishes bicycle demand, mode shift and planning level cost opinions to inform bicycle capital improvement cost-effectiveness for funding prioritization; and,
- establishes a one-stop data source to facilitate the development of future state/federal grant funding applications for bicycle improvements by the City of Lincoln.

As stated above, the 2018 ***Bicycle Transportation Plan*** addresses all element required under the California Bicycle Transportation Act (BTA). These requirements are shown in **Table 1**.

STUDY AREA

The City of Lincoln, California, is located in Placer County, approximately 10 miles north of the City of Roseville and 25 miles north of the City of Sacramento. State Route 65 and State Route 193 bisect the city north and south, and east and west, respectively. The City is approximately 19 square miles in area; however, this plan includes the City limits and its "sphere of influence", including Village 1 and Village 7 and other Special Use Districts in the City's General Plan. This plan will provide a blueprint for developing a bikeway system that includes both on-street and off-street facilities as well as support facilities and programs in line with both current and future mobility needs.

The City of Lincoln study area is presented on **Figure 1**.

Figure 1 – Study Area

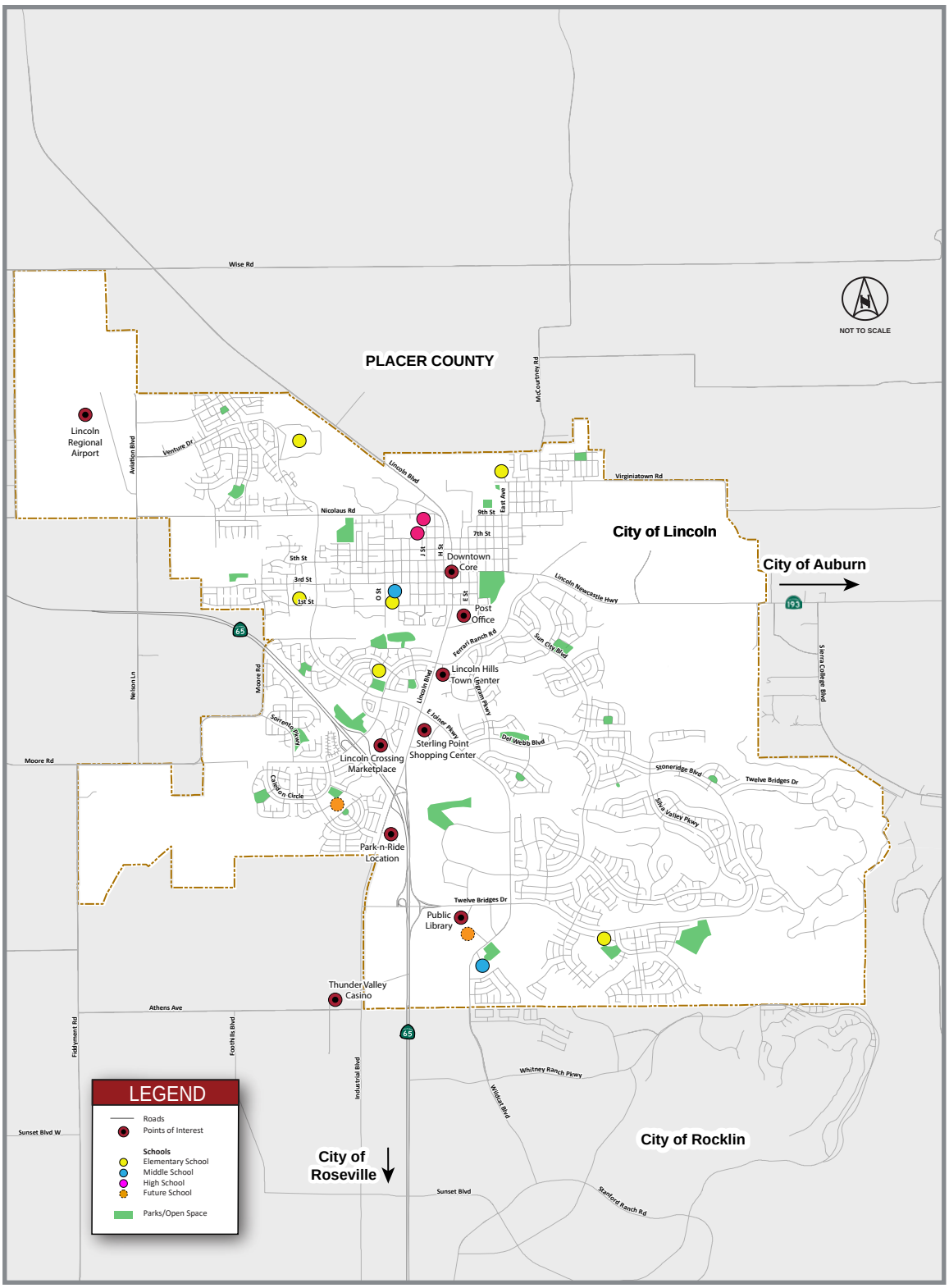




Table 1 – *California Streets and Highways Code Section 891.2 Required Elements*

REQUIRED BICYCLE TRANSPORTATION PLAN ELEMENT		REPORT REFERENCE PAGE
A.	Estimated number of existing and future bicycle commuters	22-23
B.	Map and description of land use and development patterns	22-23; Appendix D
C.	Map and description of existing and proposed bikeways	13-14; 37; Appendix E
D.	Description of bicycle parking facilities	13-14; 17
E.	Map of transit routes and multi-modal connections	16
F.	Description of facilities for changing and storing clothes and equipment	17
G.	Description of bicycle safety and education programs	17
H.	Description of citizen and community participation	33-35
I.	Description of consistency with transportation, air quality, and energy conservation plan	7
J.	Cost summary of proposed bicycle projects for Class I, II, and III priorities	50
K.	Description of past expenditures and future financial needs for bicycle facilities	13; 49-50

PLANNING AND DESIGN STANDARDS

Bikeway planning and design in California rely on the guidelines and design standards established by the California Department of Transportation (Caltrans) and supporting guides as documented in:

- Chapter 1000; *Bicycle Transportation Design*, contained in the Highway Design Manual, 6th Edition (California Department of Transportation, 2017) with supporting Chapters 200, 300, and 400.
- California Manual on Uniform Traffic Control Devices, 2014 Edition, Revision 2
- Caltrans, Design Information Bulletin Number 89, *Class IV Bikeway Guidance*
- Federal Highway Administration (FHWA), *Separated Bike Lane Planning and Design Guide*, 2015
- American Association of State Highway and Transportation Officials (AASHTO), *Guide for the Development of Bicycle Facilities*, 2012, Fourth Edition
- National Association of City Transportation Officials (NACTO), *Urban Bikeway Design Guide*, 2014
- Massachusetts Department of Transportation (MDOT), *Separated Bike Lane Planning and Design Guide*, 2015

Where possible, it may be desirable to exceed the minimum standards. These guidelines cover basic concepts. The HDM Chapter 1000 contains more detailed standards and guidance and should be followed. The City may also reference the AASHTO Guide, and the NACTO Urban Bikeway Design Guide. Caltrans has supported the NACTO from a memorandum dated August 20, 2013 for Bicycle and Pedestrian Facility Design Flexibility. The NACTO addresses more recently developed bicycle design treatments and techniques. It provides options that can help create "complete streets" that better accommodate bicyclists. Many treatments in the NACTO guide are compatible with Caltrans HDM policies and demonstrate new and innovative solutions for the varied urban settings across the country. The vast majority of treatments illustrated in the NACTO guide are either allowed or not precluded from the CA-MUTCD. In addition, non-compliant traffic control devices may be piloted through the CA-MUTCD experimentation process.



This section also references the uniform standards and specifications for traffic control devices under the 2014 California Manual on Uniform Traffic Control Devices (CA-MUTCD). Given that they are not currently adopted by the FHWA MUTCD or CA MUTCD, a number of recommended devices currently being implemented in California are considered experimental.

Recommended devices that are currently not adopted by the MUTCD or Caltrans appear to be promising improvements in bicycle and pedestrian access and safety as they have been widely used in Europe and experimented within the US. Any jurisdiction wishing to use these treatments should follow the appropriate experimental procedures. Some of the more commonly used devises, such as colored bike lanes, have been given blanket interim approval for use in California. For these, the City only needs to notify Caltrans that it will use these. Bike boxes and colored treatments of shared lane markings are approved for experimentation by the Federal Highway Administration (FHWA). To conduct these experiments, the City would need to follow the guidelines set forth by the FHWA here: https://mutcd.fhwa.dot.gov/condexper.htm and to the California Traffic Control Device Committee following their guidelines set forth in Section 1A.10 of the CA MUTCD.

Appendix A provides the *Bicycle Facilities Recommended Class Types and Policies* memorandum prepared for the *2018 Bicycle Transportation Plan*. The following highlights design recommendations specific to the plan update, including the following bicycle facilities:

- **Class I Bike Path:** Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross-flow minimized. Caltrans standards call for Class I bikeways to have a minimum of 8 feet of pavement (10 feet preferred) with 2 food graded shoulders on either side. These bikeways must also be at least 5 feet from the edge of a paved roadway.
- **Class II Bike Lane:** Provides a restricted right-of-way designated for the exclusive or semi-exclusive use of bicycles with through travel by pedestrians and motorists permitted. Caltrans' standards require a six-inch striped lane with a 4-5-foot paved shoulder for one-way bike travel on a street or highway.
- **Class III Bike Route:** Provides for shared use with pedestrians and/or motor vehicle traffic within the same right-of-way and is designated with signs only indicating "Bike Route". Class III bike routes are appropriate where restricted right-of-way would make a Class II facility infeasible.
- **Class IV Bike Lanes:** Provides a separated bike lane, or "protected bike lane", with a physical barrier between the bike lane and the adjacent travel lanes, parking lanes, and sidewalks. Class IV bike lanes may be one-way or two-way. Separated bike lanes can be separated from motor vehicle traffic by raised medians, concrete curbs, landscaping, on-street parking, bollards, flexible delineator posts, or by a change in elevation between the bike lane and travel lane.

The following facilities or treatments were considered due to the potential for increasing bicyclist visibility, safety, and comfort along bicycle facilities:

- **Buffered Bike Lanes (Without On-Street Parking):** Provides additional protection and can be considered a Class IV facility, referred to in this plan as a "Class IV-Lite" facility. Painted buffers at least 2-feet in width can be used to narrow travel lanes, which slows traffic, and are most appropriate on wide, busy streets, where physically separating the bike lanes with protected vertical separation is undesirable for cost, operations, or maintenance reasons. Class IV-Lite facilities are useful in providing additional separation between cyclists and motor vehicles where traditional Class IV facilities are not feasible, and where Class II facilities are not adequate.
- **Buffered Bike Lanes (With On-Street Parking):** Provides a painted divider between the bike lane and the adjacent travel lane. Buffers at least 3-feet in width can be used to narrow travel lanes, which slows traffic, and are most appropriate on wide, busy streets, where physically separating the bike lanes with protected vertical separation is undesirable for cost, operations, or maintenance reasons. Double buffered bike lanes provide a painted divider on both the travel lane and the parking lane.



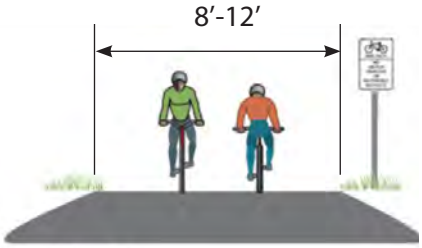
» **Colored Bike Lanes:** Provides increased visibility for cyclists through the use of green paint on the width of the bike lane. Colored bike lanes can be implemented at intersections to enhanced bicycle visibility at points of conflict with vehicles, or can be used as a continuous treatment spanning the extended length of a bike lane corridor.

The following bicycles facilities were considered due to the potential for increasing bicyclist visibility, safety, and comfort at intersections.

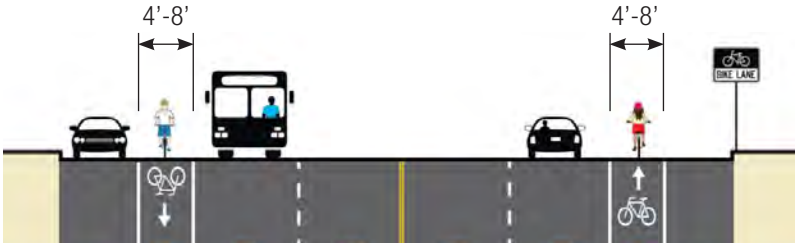
» **Bikeway Markings:** Continuing marked bicycle facilities at intersections (up to the crosswalk) ensures that separation, guidance on proper positioning, and awareness by motorists are maintained through these potential conflict areas. Colored bike lanes can be implemented at intersections to enhanced bicycle visibility at points of conflict with vehicles.

» **Bike Pockets and Boxes:** Provides bicyclists with a safe and visible way to get ahead of queuing traffic during the red signal phase.

Cross-sections for bicycle facilities Class I, II, III, and IV-Lite, as referred to in this plan, are provided below, with recommended lane widths.



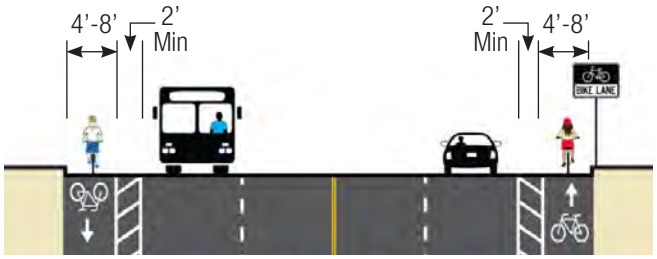
Class I – Bike Path



Class II – Bike Lane



Class III – Shared Bike Route



Class IV-Lite – Buffered Bike Lane without On-Street Parking



CONSISTENCY WITH OTHER PLANS

This Plan ensures consistency with the following planning documents:

- 2012 City of Lincoln Bicycle Transportation Plan
- 2017 PCTPA Regional Bikeway Plan/Network
- Sacramento County Bicycle Master Plan
- SACOG 2016 Metropolitan Transportation Plan and Sustainable Community Strategy for 2035
- City of Lincoln General Plan
- Village 1 Specific Plan
- Village 7 Specific Plan
- Placer County Sunset Industrial Area + Placer Ranch Development Draft Study and DEIR
- Placer County Bikeway Master Plan
- Revised Twelve Bridges Specific Plan
- Twelve Bridges Golf Cart Circulation Plan
- The City of Lincoln Neighborhood Electric Vehicle (NEV) Transportation Plan
- Lincoln Crossing Specific Plan
- General Development Plan and Golf Cart Transportation Plan for Del Webb – Lincoln Hills
- Gladding Parkway EIR

COMMUNITY PARTICIPATION

Community participation is a vital component of this plan for obtaining input on existing bicycling facilities, potential roadways for improvement to accommodate bicycles, and the type of support facilities or programs needed to improve bicycling within the City of Lincoln. The development of the plan was based on an advocacy planning approach between City staff, interested organizations, and citizens. The public outreach approach of this plan includes the following:

- A thorough review of existing plans and studies to determine what exists today.
- Direct input from the City staff about what development is planned for the future and what will be needed to accommodate that growth.
- A public presentation and workshop to incorporate citizen and community input.
- A refinement process that takes into account the following bikeway planning criteria
  - **Safety –** The system should provide the highest level of safety feasible.
  - **Coverage –** The system should provide balanced access from the City's activity centers for commuting and recreation purposes.
  - **Connectivity –** The system should provide bikeway connections to major activity centers, multi-modal transfer locations, regional connections, and should integrate with golf cart and NEV facilities as appropriate.
  - **Use –** The proposed system should reflect use levels that are commensurate with the intended level of investment
  - **Standards –** The system should reflect the appropriate Class of bicycle facility consistent with Caltrans' design standards.

A Public Workshop was held on Thursday, December 7, 2018 at the City of Lincoln. A second Public Workshop was held on Thursday, April 19, 2018, to share results of the plan. Community participation is discussed in more detail in a following "Community Participation" section.



This page left intentionally blank.



GOALS, OBJECTIVES, AND POLICIES

The inclusion of goals, objectives, and policies for this plan are intended to provide specific direction on the necessary actions involved in planning, designing, funding, and constructing bicycle facilities in the City of Lincoln. The following information relies on an understanding of the relationship between the proposed bikeway system, key issues facing implementation of specific routes, and the requirements of local, state, and federal funding programs. The goals and policies are organized by topic areas that relate to specific implementation issues. The topic areas include:

- Overall System;
- Land Development;
- Commuting;
- Safety Education;
- Environmental Considerations
- Funding.

The purpose of organizing this section by topic area is to provide City staff, decision makers, and citizens with clear and concise policy direction and guidance on how to implement the bicycle facilities proposed in this plan. Each topic area addressed below includes an overall goal, measurable objective, and policies with specific action statements related to the development of specific facilities or programs within the City of Lincoln.

OVERALL SYSTEM

The following goal and policy statements express the philosophy behind this plan and the proposed system of bikeways. The statements stem from the City's desire to provide residents and visitors with a connected bikeway/path system that can accommodate both commute and recreational trips throughout the City.

GOAL 1: Provide a well-connected bikeway system within the City of Lincoln to improve the quality of life for all residents and visitors.

Objective: *Construct priority bikeways identified in the proposed system map and provide for the maintenance of both existing and new facilities.*

Policies

1.1 Prepare and maintain a Bikeway Master Plan that identifies existing and future needs, and provides specific recommendations for facilities and programs including adequate provisions for bicycle and pedestrian use, golf carts, and neighborhood electric vehicles (NEVs) to, within, and from the City of Lincoln.

1.2 Require all bikeways to conform to design standards contained in the latest version of the Highway Design Manual, Chapter 1000: Bikeway Planning and Design, Caltrans, unless otherwise established by the City.

1.3 Consider a proposed route's importance in providing access and connectivity to adjacent bicycle facilities and destinations when recommending bike routes for implementation.

1.4 Coordinate with Placer County, City of Rocklin, and City of Roseville regarding the implementation of the proposed system of bikeways.

1.5 Provide bicycle connections that allow for regional bike travel to and from the City of Lincoln.

1.6 Integrate bicycle planning with other community planning, including land use and transportation planning.

1.7 Ensure proposed Class II bike lanes are consistent with the City of Lincoln NEV Transportation Plan.

1.8 As funding allows, implement the proposed bikeway system in this Bikeway Master Plan in a cost effective manner.



LAND DEVELOPMENT

As shown in the population and employment growth expectations, the City of Lincoln has significant planned development over the next 20 years. Proposed development projects should adhere to the policy statements below regarding access, mobility, and support facilities for bicyclists and pedestrians.

GOAL 2: Include bicycle facilities in all appropriate development projects to facilitate on-site circulation for bicycle and pedestrian travel, on-site bicycle parking, and connections to the proposed system of golf cart and NEV facilities.

Objective: *Maximize the number of daily trips made by bicycling to and from new development projects within the City of Lincoln.*

Policies

2.1 Require new development projects to reserve the right-of-way for multi-use trails shown in the proposed system of bikeways.

2.2 Meet the requirements of the Americans with Disabilities Act when constructing facilities contained in the proposed system, where applicable.

2.3 Provide pedestrian/bicycle crossings at appropriate intervals along new roadways that will adequately serve new large-scale commercial office, industrial development, and residential development.

2.4 Provide one mile of pedestrian/bicycle trails per 2,500 population (Amended Public Facilities Element 2008).

2.5 Adhere to specific policies contained within adopted plans and specific plans relating to the design, implementation, and function of bikeways and pedestrian facilities within the City of Lincoln.

2.6 Encourage new commercial development to provide bicycle and pedestrian access to surrounding residential areas.

2.7 Encourage new commercial development to place required bike racks near entrances for employees and customers.

COMMUTING

Commuters that bicycle to the City can represent a larger percentage of total commute trips if a comprehensive network of interconnected bicycle facilities is developed. This plan proposes to implement such a system as defined by the following goal and policy statements.

GOAL 3: Increase bicycle trips to work to reduce vehicle congestion, improve air quality, conserve energy use, and improve individual physical fitness.

Objective: *Develop a system of bikeways that provides direct routes between residential areas and to major employment centers.*

Policies

3.1 Provide connections to the proposed system from all existing and future transit facilities and transferpoints.

3.2 Encourage employers to install and/or maintain support facilities such as bicycle racks, personal lockers, and showers at appropriate locations to promote bicycle use.

3.3 Employers should encourage employees to consider bicycling as an alternative mode for commuting to and from employment centers.

3.4 Employers should be actively involved in implementing Ordinance No. 604B relating to the City's Ridesharing Program. The provisions of Ordinance 604B provide for the following:



- Identifies a "Major project controller" as an employer or common work location with 100 or more employees working at a single site for at least 20 hours per week.
- Identifies a "Transportation Control Measure (TCM) Coordinators" as an individual assigned by the Placer County Transportation Commission to assist member jurisdictions in complying with the provisions of trip reduction ordinances.
- Requires an annual commute survey as part of the annual reporting requirement on ridesharing.
- Identifies a "new project" as a project which would allow a use or number of uses that, individually or collectively, would employ 100 or more employees at one common work location.
- Identifies a "project expansion" as an existing project which would allow a use or uses that, individually or collectively, after expansion, may both (1) generate employment for 100 or more employees and (2) increase the total number of employees at the common work location by twenty percent or more from the applicant's baseline employment.
- States that assistance in transportation plan preparation will be provided by the City through the TCM Coordinator who will be provided to the City by the Placer County Transportation Commission.
- Identifies that the Rideshare Coordinator will be responsible for conducting an annual commute survey as part of the employer's annual reporting requirements.

SAFETY EDUCATION

Safety education is an important aspect of increasing bicycle use. If bicyclists or potential bicyclists perceive that the bikeway system is unsafe, they will be discouraged from using it. Therefore, the following goal and policy statements are intended to improve the user's knowledge of how to use the bikeway system safely.

GOAL 4: Educate all residents of the City of Lincoln about how to use bikeway and trail facilities safely.

Objective: *Improve bicycle safety in the City of Lincoln by providing a system of connected routes that minimize conflicts with autos, golf carts, NEVs and pedestrians.*

Policies

4.1 Play an active role in educating residents about bicycle and pedestrian safety in conjunction with public and private schools and civic organizations.

4.1 Use available collision data to monitor bicycle collisions and locations and target education programs and/or improvements in those locations.

ENVIRONMENTAL CONSIDERATIONS

Bicycle facilities are generally considered to benefit the environment because their use reduces demand for motorized travel and promotes beneficial lifestyle changes. Nevertheless, the construction of specific bikeway improvements may adversely affect the physical environment. The following goal and policy statements have been developed to avoid and minimize potential impacts to the environment.

GOAL 5: Avoid adverse environmental impacts associated with the implementation of the proposed system.

Objective: *Mitigate potentially significant impacts to a level of less than significant.*



Policies

5.1 Conduct site-specific environmental review consistent with the California Environmental Quality Act for individual bicycle projects as they advance to the implementation stage of development.

5.2 Solicit and consider community input in the design and location of bicycle facilities that connect to neighborhoods.

5.3 Consider the effect on other transportation facilities such as travel lane widths, turn lanes, on-street parking, and on-site circulation when planning and designing on-street bikeways.

FUNDING

To obtain the funding required to implement the proposed system, the City of Lincoln must take advantage of funding sources at the state and federal level. It will also require a commitment of local funding.

GOAL 6: Acquire sufficient funding to construct the proposed system within the next 20 years.

Objective: *Maximize the amount of local, state, and federal funding sources for bicycle facilities that can be used by the City of Lincoln for the implementation of the proposed system.*

Policies

6.1 Periodically update current information regarding regional, state, and federal funding programs for bicycle facilities along with specific funding requirements and deadlines.

6.2 Where feasible, consider joint grant applications with other agencies, such as the City of Roseville, City of Rocklin, and/or Placer County, for state and federal funds.



EXISTING CONDITIONS

This section of the Plan documents existing bicycle infrastructure and facilities in the City of Lincoln to determine the availability and status of safe and connected bicycle travel for City residents. Information concerning existing bicycle infrastructure and facilities was collected from the 2012 BTP, the City of Lincoln, the Public Workshop (December 7, 2017), and a site-visit conducted in November 2017.

PAST EXPENDITURES ON BICYCLE FACILITIES

Since the adoption of the 2012 BTP, the following bikeway improvements have been implemented:

- Bicycle racks installed on Lincoln Blvd in the downtown area
- Class II lanes on 3rd Street from the western terminus to D Street
- Class II lanes on O Street from 1st Street to 9th Street/Nicolaus Road
- Class II lanes on Sorrento Parkway from Ferrari Ranch Road to Moore Road
- Class II lane (East side only) on Moore Road from Sorrento Parkway to dead end at the Lincoln Bypass
- Removed Class II lanes on Eastridge Drive from Twelve Bridges Drive to Dinis Cottage (to allow for on street parking)

EXISTING BICYCLE FACILITIES

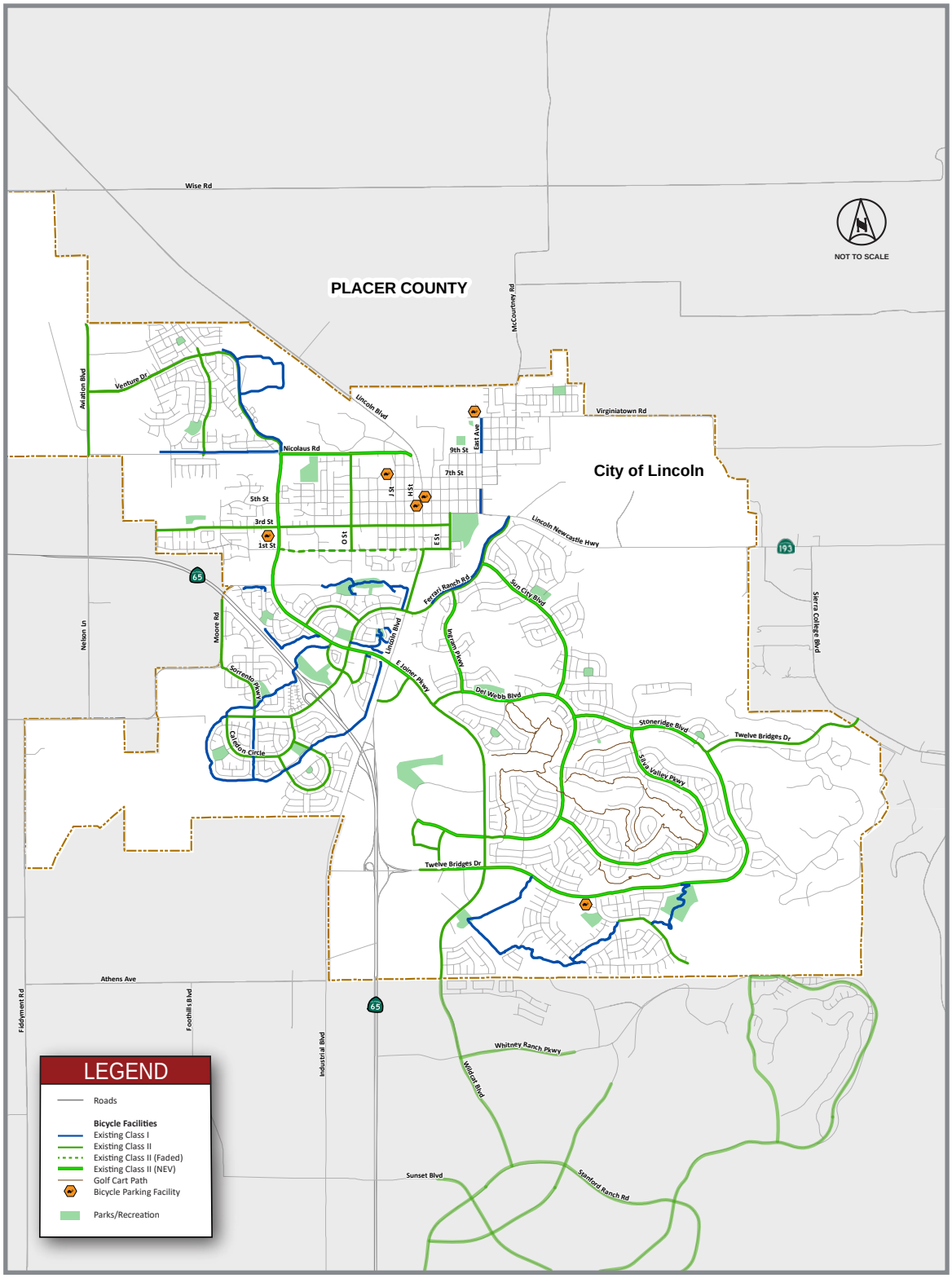
The existing roadway network in the City of Lincoln consists of 50.54 centerline miles of City owned roadways and approximately 5 miles of state owned facilities that traverse the City. Inclusive of the recent improvements described above, of the City's existing roadway centerline miles, 19% provides Class II bike lanes. A significant portion of these roadways are local residential streets with posted speeds of 25 miles per hour. In addition, a significant portion of Class II facilities have parallel neighborhood electric vehicle (NEV) lanes approximately 8-feet in width. The 19% of Class II network translates to approximately 198,415 linear feet (37.5 miles) of roadway providing bi-directional Class II facilities within the City of Lincoln.

There are currently 127,310 linear feet (or 24 miles) of Class I bicycle facilities within the City of Lincoln. Approximately 42% of Class I facilities are located in the Del Webb community area, and 31% are located along or parallel to Joiner Parkway and Ferrari Ranch Road, including the Class I trail along the Auburn Ravine. Other disjointed Class I facilities are located in north Lincoln along Joiner Parkway/Venture Drive and south Lincoln near Twelve Bridges Drive. Additionally, there is a disconnected Class I facility along East Avenue between 12th Street and McBean Park Drive.

Although 1st Street east of Joiner Parkway has Class II bicycle lanes, the lane striping (white paint) is difficult to observe for both motorist and cyclists, and is therefore not considered to provide adequate Class II connectivity. For several roadways without bi-directional bike lanes, such as Ferrari Ranch Road east of Lincoln Boulevard, and Joiner Parkway/ Venture Drive north of Nicolaus Road/9th Street, Class I facilities are provided. Additionally, several roadways are designated as Class III bicycle routes due to the presence of "share the road" signs, such as along East Avenue between the existing Class I facility.

The City of Lincoln's existing bikeway network is shown on **Figure 2.** Existing bicycle parking facilities are located at key downtown locations, as shown on **Figure 1**.

Figure 2 – Existing Bikeways





REGIONAL CONNECTIONS

The City of Lincoln is bordered by unincorporated Placer County. The City of Roseville and the City of Rocklin are located to the south with primary access from Highway 65, Industrial Boulevard, and Joiner Parkway. The Town of Loomis and the City of Auburn are located short distances east of Lincoln with primary access from Highway 193. Designated bikeways providing regional connections to surrounding communities do not currently exist. New proposed connections that have potential as regional connections include Industrial Boulevard, Nicolaus Road, and SR 193. Proposed system connections are discussed in subsequent sections of this plan.

The Town of Loomis recently completed its 2010 Bicycle and Trails Master Plan. Except for sidewalks located in the downtown area of Loomis, a trail system within the Town does not currently exist. The Town of Loomis currently has no Class I bike paths, 6.5 miles of Class II bike lanes, and no designated Class III routes. The Town of Loomis, through its Bicycle Transportation and Trails Plan, is committed to creating a more bicycle-friendly community with connections to adjacent jurisdictions. The 2008 City of Roseville Bicycle Master Plan provides for bicycle connections to Sierra College Boulevard with connections to Twelve Bridges Drive and ultimately SR 193.

MULTI-MODAL CONNECTIONS

Multi-modal connections in the City of Lincoln and South Placer County are especially important due to Lincoln's distance from other communities and barriers to bicycle travel such as the lack of existing continuous bicycle facilities and high-speed roadways. A transit center currently exists at Third and F Streets serviced by Lincoln Transit and Placer County Transit. The various transit services that serve South Placer County are described below. Maps of the various service areas and key transfer points within the City of Lincoln are provided n **Figure 3.**

Lincoln Transit

Lincoln Transit currently operates two fixed routes known as the downtown Circulator and Lincoln Loop. Both routes operate on one-hour headways (at each stop, buses arrive every hour). Each bus is equipped with two bike racks. The Downtown Circulator operates in Historic Downtown Lincoln and along Highway 65 with stops near City Hall (6th Street), downtown retail centers, Safeway Center, Twelve Bridges Library, Twelve Bridges Medical Center, and Kaiser Permanente. The service begins each morning at the Lincoln Transfer Point at Third and F Streets. The Circulator connects daily with the Lincoln Loop and the Placer County Transit's Lincoln/Rocklin/Sierra College route.

The Lincoln Loop operates throughout the city with stops at several schools, parks, community centers, and major activity centers. The route beings daily at the southwest corner of Venture and lakeside Drives. It continues to the Lincoln Transfer Point at Third and F Streets and then to destinations throughout the city.

Lincoln Transit Dial-A-Ride (DAR) is a complimentary curb-to-curb Para-transit service for the general public. DAR operates in the city limits of Lincoln on a reservation basis.

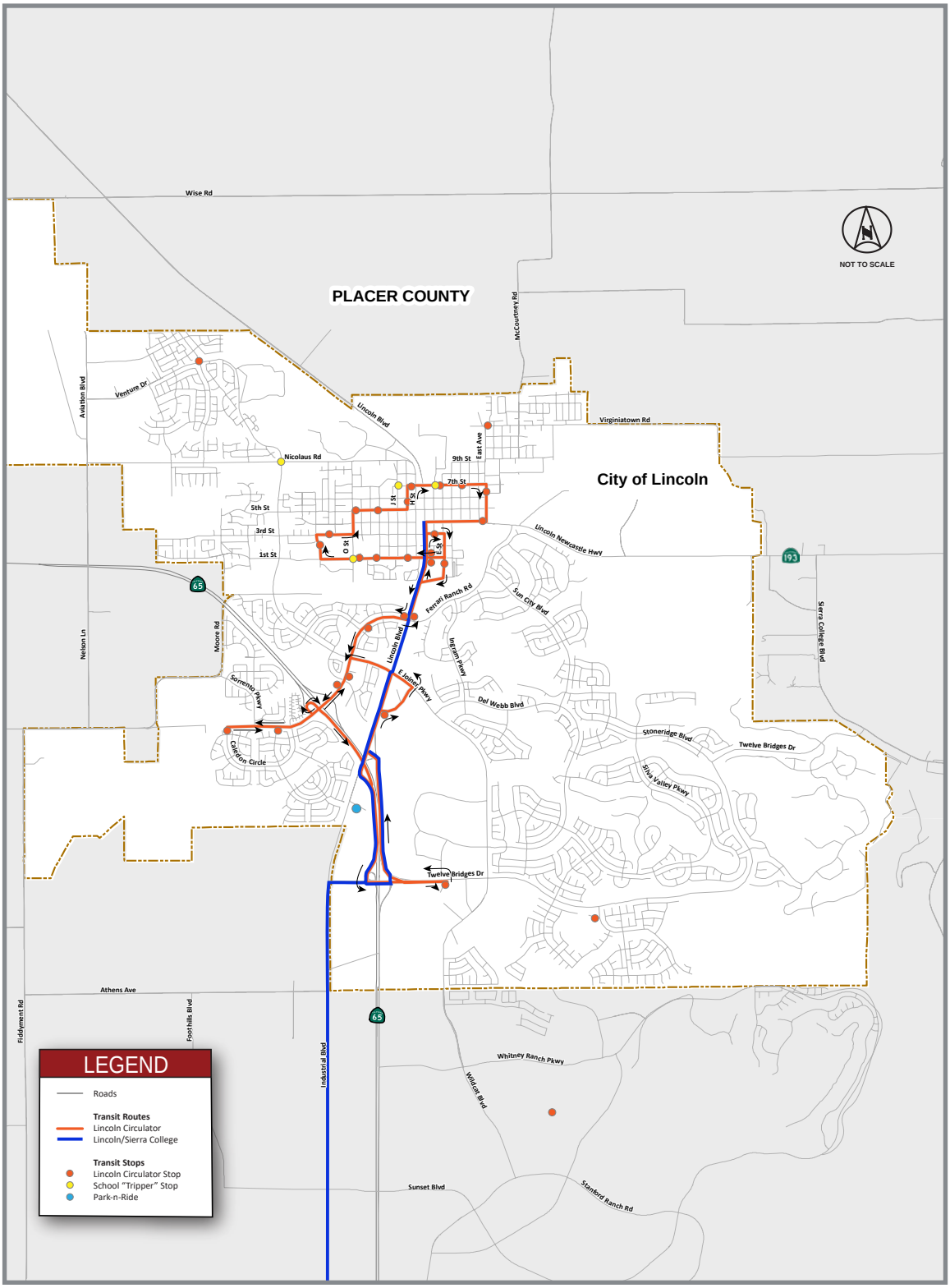
Placer County Transit (PCT)

Transit riders in Placer County can make a connection to Lincoln's Historic Downtown and points in between at the Twelve Bridges Transfer Point via the Lincoln Transit Downtown Circulator. Transfers are free. The Taylor Road Shuttle operated by PCT stops at the Penryn Park and Ride near King Road and the Loomis Park and Ride located at I-80 and Horseshoe Bar Road. Additional information is located at *www.placer.ca.gov/transit.*

Roseville Transit

Roseville Transit offers local fixed-route service throughout Roseville but does not serve the City of Lincoln. Riders can transfer to PCT at Thunder Valley to reach destinations within the City of Lincoln. Additional information is located at *www.roseville.ca.us/transit.*

Figure 3 – Transit Services





SUPPORT FACILITIES

Bikeway support facilities include physical infrastructure designed to accommodate or promote the use of bicycles. Examples include bicycle racks, bicycle lockers, restrooms, and shower facilities. A windshield survey of major shopping centers, schools, parks, and employment centers found bike racks located at most major commercial centers in the City. The Lincoln Transit District provides a rack that holds two bikes on the front of all buses. The City of Lincoln provides bike parking at City Hall, 600 Sixth Street. In addition, all recent shopping centers have bike racks as a condition of their approval. Several newer projects in the downtown core have street tree grates with tree guards that qualify as informal bike racks for bicyclists. Support facilities are important because potential riders can be discouraged from riding if they think that their bicycle may be stolen, vandalized or if sufficient facilities are not provided to make bicycling convenient, particularly for commute purposes.

In many cities and counties, the installation of secure bicycle parking is required as part of local transportation system management plans or the zoning code. For example, Yuba City, CA requires the provision of bicycle racks as part of their zoning code while similar requirements apply in the City of Roseville as part of their transportation systems management program. The City of Lincoln, as part of their rideshare program, requires that bicycle parking facilities be made available at the request of any tenant or employee participating in the program whose primary mode of commuting is by bicycle. Parking facilities are not currently required as part of the City of Lincoln zoning code.

BICYCLE SAFETY

Collision data was provided by the California Highway Patrol Statewide Integrated Traffic Records System (SWITRS) statistics, and by the City of Lincoln, for the five-year period between 2012 and 2016. According to these two datasets, approximately 25 collisions involving a bicyclist occurred in the City of Lincoln during that five-year period. **Figure 4** presents the location of bicycle collisions during this five-year period. **Table 2** presents bicycle collision severity by year. **Table 3** presents bicycle collisions by severity type.

No bicyclist fatalities were reported between 2012 and 2016; however, as shown in **Table 2** and **Table 3**, 23 of the 25 collisions resulted in bicyclist injury. Additionally, the roadways with the highest number of collisions were Lincoln Boulevard (4 collisions), McBean Park Drive (3 collisions), and Ferrari Ranch Road (3 collisions), and approximately half of all bicycle collisions occurred at intersections.

Bicycle Safety Programs

A summary of safety programs that have been implemented within the City is described below:

- Bicycle Rodeos - are designed to teach the rules of the road and safe riding practices to school age bicyclists.
- Bicycle Helmet Enforcement Program - is conducted by the Lincoln Police Department and focuses on issuing warnings to students who do not ride with a bicycle safety helmet. A warning card that includes discounts for purchasing bicycle helmets is given to violators.
- Bicycle Helmet Distribution Program - Approximately 250 helmets are given away annually to local students.
- Bicycle Safety Instruction - Lincoln Police Department conducts bicycle safety instruction at local elementary schools at the beginning of the school year.
- Helmet Safety Program – Sponsored by UC Davis Trauma Center Outreach Program., this program provides instruction on helmet safety.



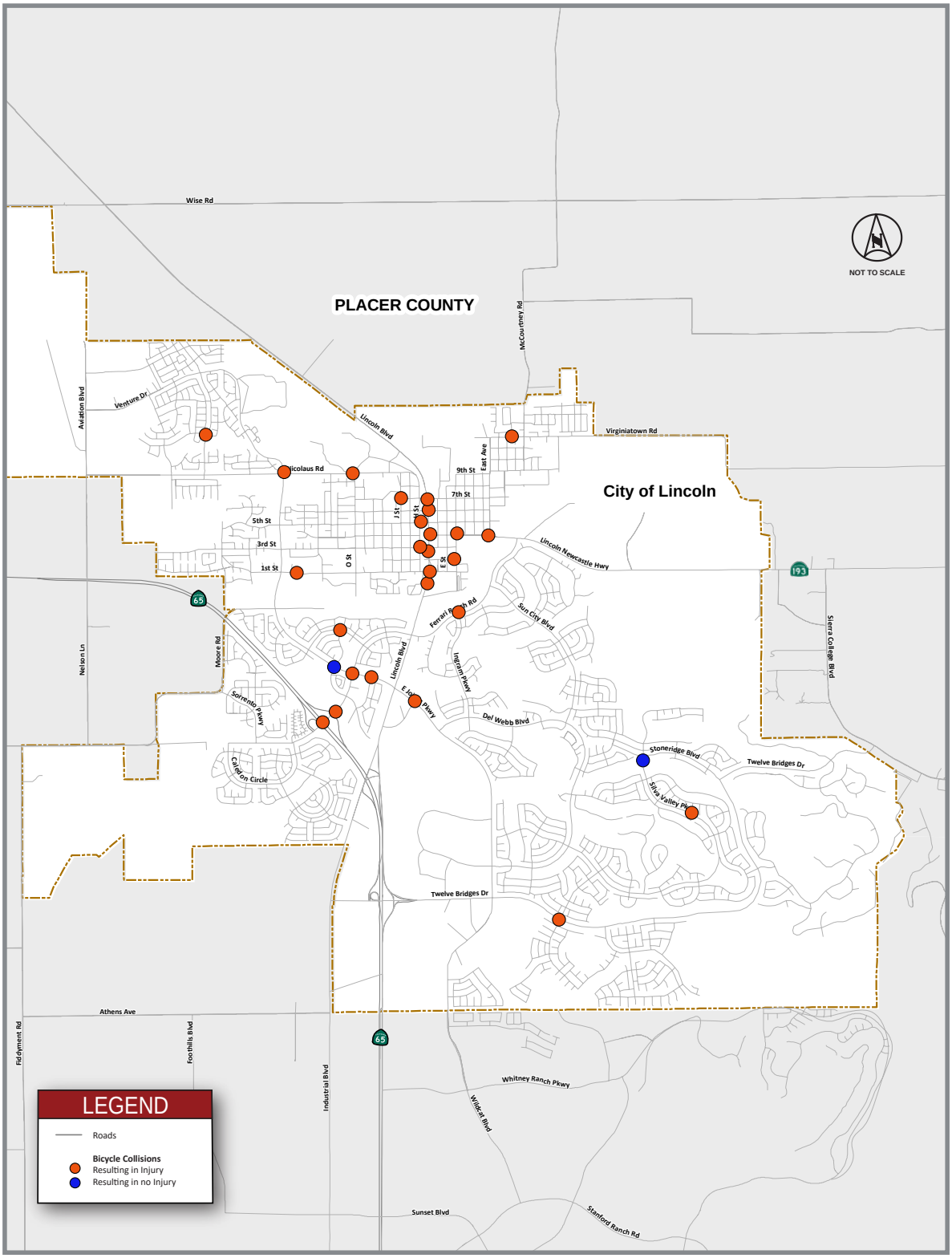
Table 2 – *Bicycle Collision Severity by Year*

YEAR	INJURY (COMPLAINT OF PAIN)	INJURY (OTHER VISIBLE)	PROPERTY DAMAGE ONLY	GRAND TOTAL
2012	1	2		3
2013	4		1	5
2014	2	3		5
2015	4	4		8
2016	1	2	1	4
TOTAL	**12**	**11**	**2**	**25**

Table 3 – *Bicycle Collision Frequency by Location*

INTERSECTION	PRIMARY ROAD	SECONDARY ROAD	INJURY (COMPLAINT OF PAIN)	INJURY (OTHER VISIBLE)	PROPERTY DAMAGE ONLY	GRAND TOTAL
No	1st Street	Joiner Parkway		1		1
	2nd Street	D Street	1			1
	5th Street	H Street		1		1
	12th Street	Buckboard Lane		1		1
	Lincoln Boulevard	6th Street		1		1
		7th Street	1			1
		Lincoln Boulevard 96		1		1
		Lincoln Boulevard 270		1		1
	McBean Park Drive	A Street		1		1
		Lincoln Boulevard		1		1
	Nicolaus Road	Joiner Parkway	1			1
	Spring Valley Parkway	Blue Heron Loop	1			1
	Stoneridge Boulevard	Spring Valley Parkway			1	1
Yes	1st Street	Lincoln Boulevard	1			1
	3rd Street	H Street		1		1
	7th Street	J Street	1			1
	Danbury Drive	Groveland Lane	1			1
	Danbury Drive	Ingram Parkway	1			1
		Joiner Parkway	1			1
		Route 65			1	1
	Groveland Lane	Joiner Parkway	1			1
	Joiner Parkway	Stanmark Drive	1			1
	Lakeside Drive	Floradale Way		1		1
	McBean Park Drive	D Street		1		1
		Danbury Drive	1			1
TOTAL			**12**	**11**	**2**	**25**

Figure 4 – Bicycle Collisions





This page left intentionally blank.



ANALYSIS OF BICYCLE DEMAND

The objective of analyzing bicycle demand is to identify existing bicycle ridership levels and travel patterns, along with projected future use and possible methods for stimulating additional ridership. This section provides information about City of Lincoln projections for population and employment and their influence on bicycle travel demand.

EXISTING MAJOR ACTIVITY CENTERS

One purpose of a BTP is to provide facilities that connect residential areas to employment, commercial, educational, and recreational centers. These facilities support bicycle travel demand for both commuter and recreational trip purposes. Major activity centers in the City of Lincoln include regional commercial areas such as Sterling Pointe Shopping Center, Lincoln Hills Town Center, Lincoln Crossing Marketplace, Joiner Parkway Corridor, and the downtown core. In addition, employment centers, schools, parks, the Thunder Valley Casino and Lincoln Regional Airport serve as potential destinations for bicyclists. Major activity center locations are identified in **Figure 1**.

POPULATION AND EMPLOYMENT TRENDS

The following discussion contains estimates of existing and future projections of population and employment levels to determine trends and how they affect demand for bicycle facilities.

Existing Population

In 2011, the City of Lincoln had an estimated total population of 43,144 persons. This number rose to 43,572 by 2012, increasing to 45,675 in 2016. **Table 4** shows a comparison of population estimates for the City of Lincoln and several surrounding cities and Placer County.

Table 4 – *Population Estimates and Comparisons (2015 to 2016)*

JURISDICTION	2015	2016	% CHANGE
City of Lincoln	45,038	45,675	1.4%
Auburn	13,785	13,858	0.5%
Loomis	6,648	6,690	0.6%
Rocklin	59,727	60,509	1.3%
Roseville	126,327	128,276	1.5%
Placer County	366,280	370,571	1.2%

Source: US Census, 2012-2016 ACS Data

Existing Employment

The City of Lincoln has a labor force of approximately 36,048 persons and employment of approximately 17,203 persons over 16 years of age. The current unemployment rate for the City of Lincoln is 7.0%, compared with Loomis Town (7.6%), Auburn (7.6%), Rocklin (7.3%), and Roseville (6.5%) (Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates).



BICYCLE RIDERSHIP LEVELS

Bicycle ridership levels are not easily measured or projected for an entire City without extensive data collection efforts. Bicycle ridership varies widely among different jurisdictions. For jurisdictions with similar populations, land use density, and bicycle system quality, bicycled mode split typically varies from one to three percent. The City of Lincoln General Plan provides for increased land use densities in many areas and villages that will contribute the attractiveness of non-auto modes of travel such as bicycling. The transition to a denser land use pattern could increase the City's bike mode split from 0.7 percent to between one and three percent.

Existing Ridership Levels

A common term used in describing demand for bicycle facilities is "mode split." Mode split describes the percentage of people selecting a certain means of transportation within a jurisdiction. Mode split is often used in evaluating commuter alternatives such as bicycling, where the objective is to increase the "split" or percentage of people selecting an alternative means of transportation. From the 2012-2016 Census data, mode split information is available for home-to-work trips for the City of Lincoln. City of Roseville, and City of Rocklin. This information is presented in **Table 5**.

Table 5 – *Mode Split for Home-to-Work Trips*

Mode	Lincoln	Rocklin	Roseville
Drove alone	78.6%	81.6%	79.5%
Carpooled	10.5%	7.1%	8.8%
Public transportation (no taxicab)	1.0%	1.1%	1.1%
Walked	0.6%	1.0%	1.9%
Bicycle	0.7%	0.6%	0.8%
Taxicab, motorcycle, or other means	1.5%	1.2%	1.0%
Worked at home	7.0%	7.5%	7.0%

Source: US Census, 2012-2016 ACS Data

As shown in **Table 5**, less than one percent of home-to-work trips for the cities of Lincoln, Rocklin, and Roseville are made by bicycle.

FUTURE LAND USE AND DEVELOPMENT

The City of Lincoln future development map and approved development list is presented in **Appendix D**. The City of Lincoln development includes the following approved residential projects:

1. Twelve Bridges Villages 1, 2, 10, 11, 12, Education Foundation
2. Lakeside 6: Phase 2, 7 & 8
3. Senior Living at Lincoln in Twelve Bridges
4. Meadowlands
5. Magnolia Village
6. Independence



7. Village 1
    a. Epick 1, 2 & 3
    b. La Bella Rosa
    c. Walkup Ranch
    d. Turkey Creek Estates
    e. Hidden Hills
    f. Enclave
8. Fullerton Ranch
9. Cypress Meadows/Cresleigh Grove
10. E. 10th Street
11. Riverwalk Villas
12. Crocker Knoll
13. Village 7
14. Joiner Ranch
15. Summerset Assisted Living Facility – Downtown
16. Lincoln Crossing Village 11

The City of Lincoln development includes the following approved commercial projects.

1. Quick Quack Car Wash
2. America's Tire
3. Les Schwab Tires
4. tarbucks
5. Hotel in Parkway Pointe
6. Property north of Fire Station on Joiner Parkway
7. Northeast corner of Lincoln Boulevard and Ferrari Ranch Road
8. Twelve Bridges Commercial
9. Twelve Bridges Employment-Center
10. Village 1 – southeast corner of Highway 193 and Oak Tree Lane
11. Village 7 Commercial



FUTURE POPULATION AND EMPLOYMENT

Future population and employment 20-year forecasts have been developed for both the City of Lincoln and the City's Sphere of Influence. Future forecasts assume the development of the seven villages in the Sphere of Influence (Village 1 through 7 were annexed in 2017). The City of Lincoln anticipates a future population of approximately 55,857 persons and approximately 16,461 employees, as presented in **Table 6**.

Table 6 – *Future Population and Employment Forecasts*

BOUNDARY/AREA	FUTURE POPULATION	FUTURE EMPLOYMENT
Lincoln	55,857	16,461
Lincoln SOI	26,414	7,760
Total City and SOI	**82,271**	**24,221**
Village 1	*5,823*	*155*
Village 2	*348*	-
Village 3	*391*	-
Village 4	*67*	-
Village 5	*3,394*	*966*
Village 6	*3,245*	*377*
Village 7	*8,081*	*1,003*
Total Village	***21,349***	***2,501***

As shown, the City's population is expected to almost double within the next 20 years. The City's employment is expected to increase by approximately 7,000 persons within the next 20 years. It is anticipated that bicycle ridership levels will increase accordingly.



BICYCLE CONNECTIVITY

The City of Lincoln has a significant amount of existing bicycle infrastructure, with Class II bicycle lanes on approximately 19% of existing local roadway infrastructure, and an additional 12 miles of Class I bicycle facilities within the City limits. However, due to high vehicular speeds on major roadways, incomplete or discontinuous bicycle infrastructure, and a lack of adequate bicycle protection at some intersections, many existing bicycle routes may not be suitable for all user-types, nor do they necessarily provide complete connections to key destinations throughout the City.

In addition, the City of Lincoln is characterized by many residential areas that are served by low-speed (< 25 mph) local streets. However, many of these residential areas are encircled by high speed, major roadways – some of which provide no bicycle infrastructure. High vehicular speeds and discontinuous bicycle routes can create stressful conditions for a majority of potential bicycle users. These conditions can preclude "true" city-wide bicycle connectivity which in turn discourages bicycling as a viable mode option relative to the automobile. As such, the level of stress experienced by a cyclist becomes the determining factor of bicycle infrastructure connectivity, rather than the presence of the infrastructure itself.

Level of traffic stress, as defined by the Mineta Transportation Institute's ***Low-Stress Bicycling and Network Connectivity*** report (2012), provides thresholds of cyclist tolerance for on-street bicycle facilities as determined by the roadway conditions of the shared route. A "level of traffic stress" (LTS) score between 1 and 4 is then assigned to the roadway, where 1 represents a level of stress that the majority of the cycling public, including children, can tolerate, and 4 represents a level of stress tolerated only by those characterized as "strong and fearless" cyclists. For purposes of this study, roadways classified as LTS 1 or 2 reflect low-stress facilities for which the vast majority of the City's population would feel comfortable bicycling on. Conversely, a roadway with an LTS score of 3 or 4 reflects medium to high-stress conditions that only a small percentage of accomplished cyclists would feel at ease using.

The ultimate goal is to improve the overall connectivity of the low-stress bicycle network. The greater the access to the low-stress network and the greater number of origin and destination pairs it serves, the more attractive bicycling becomes as a modal option for a larger segment of the population.

LEVEL OF STRESS CRITERIA

Criteria used to determine the LTS score for roadways include the following:

- Road width (number of through travel lanes)
- Vehicular traffic speed limit
- The presence and width of a parking lane (diagonal or parallel)
- The presence and width of a bicycle lane

Criteria used to determine the LTS score for intersections include the following:

- Right-turn vehicular channelization (right-turn pocket length or shared through/right-turn lane)
- The presence and location of a bicycle lane pocket at the intersection
- Signalized traffic control or side-street stop-control

Table 7 presents the LTS category summaries as defined by the Mineta Transportation Institute.



Table 7 – *Level of Traffic Stress Categories*

LEVEL OF TRAFFIC STRESS (LTS)	DESCRIPTION
LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which the car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links (roadway segments), cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a right-turn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS 3.

EXISTING ROADWAY NETWORK LEVEL OF TRAFFIC STRESS

Using the criteria described in the above section, a level of traffic stress (LTS) value was assigned to every segment of the City of Lincoln's existing roadway network. Segments were generally defined as sections of roadway that are between controlled intersections or changes in roadway characteristics (such as the transition from two to three lanes, or changes in speed limits). Segments vary by length depending on the roadway function and characteristic. Additionally, intersection approaches were treated as distinct segments for analysis due.

The City of Lincoln's existing roadway network level of traffic stress is presented on **Figure 5**. There is a large proportion of low-stress facilities within the city due to the fact that the majority of the city's road-miles are residential streets with speed limits of 25 miles per hour or less. While these streets generally do not have bicycle facilities, they are considered low stress routes due to the low vehicular speed and low volumes.