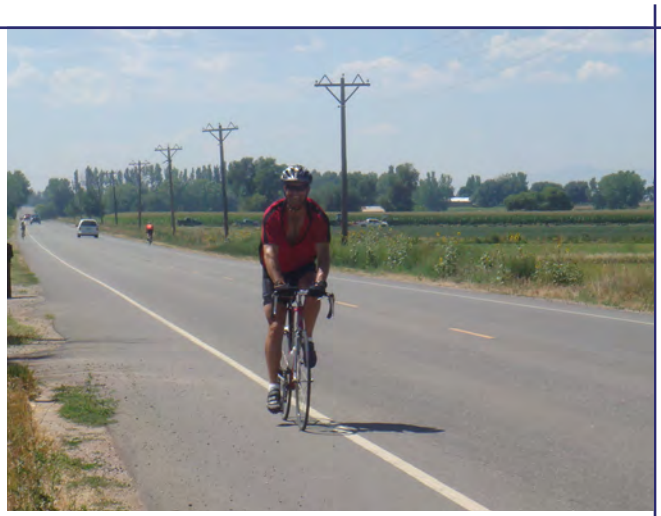
Brighton

TRANSPORTATION MASTER PLAN

ADOPTED BY CITY COUNCIL
MARCH 1, 2016



Acknowledgments

THIS PLAN WAS PREPARED FOR:

The City of Brighton, Colorado

REGIONAL TECHNICAL ADVISORY COMMITTEE:

Jacob Riger, DRCOG Transportation Planning
Nataly Erving, RTD North Team Service Planning
Danny Herman, CDOT Region 1
Karen Schneiders, CDOT Region 4
Jim Brady, E-470 Highway Authority
Jeane Shreve, Adams County Transportation Coordinator
Steve Timms, Commerce City Planning Manager
Steve Stamey, Lochbuie Town Manager

CITY STAFF ADVISORY COMMITTEE:

Joe Smith, Streets and Fleet
Kimberly Dall, Streets and Fleet
Aja Tibbs, Community Development
Casey Ballard, Community Development
Mark Heidt, Parks and Recreation
Roy Gallea, Utilities

THIS PLAN WAS PREPARED BY:

Charlier Associates, Inc.

IN ASSOCIATION WITH:

DBC
Drexel, Barrell & Co.

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Chapter 1

PLAN OVERVIEW

The City of Brighton's Transportation Master Plan (TMP) is a 25-year blueprint for development and expansion of the local and regional multimodal transportation networks. Because the city is expected to grow significantly in coming decades, the TMP incorporates a transportation growth management system to ensure that progress toward completion of the Build-Out Transportation System is timed to match the pace of residential and commercial development. This will be accomplished through a strategic transportation capital investment program that is map-based and tied directly to performance monitoring and reporting.

A COORDINATED VISION

Land use and transportation are inherently linked, and to develop a plan for one without considering the other would be a pointless endeavor. Thus, the goals and key elements of this TMP were developed as part of a coordinated effort with *2016 Be Brighton Comprehensive Plan* Update. The City's land use objectives provided guidance for planning the future transportation system. Similarly, the TMP explicitly addresses the role of transportation in future land use development patterns.

The TMP will serve as the transportation component of the *Be Brighton Comprehensive Plan* and is designed so that elements of both the TMP and *Be Brighton Comprehensive Plan* will compliment and support each other. The coordinated planning effort sets the stage for unified implementation of the two plans, which will ultimately help the City reach both its land use and transportation goals.

PLAN DEVELOPMENT

Development of this plan was guided by technical analysis and community, stakeholder and City Council input. A more detailed summary of the public engagement process and technical analysis can be found in Appendix B (Meeting Log) and Appendix C (Transportation Data Book) respectively.

- **Public Engagement** – Public outreach included two public meetings attended by over 75 people and an active web presence. The first event in August, 2015 was a visioning event combined with the Brighton Comprehensive Plan. The second in late October gave the public an opportunity to weigh in on draft elements of the TMP. Public outreach was also achieved through an actively updated project webpage on the City's website and coordination with the City's existing online Community Voice. This feature allowed the public to comment online and share ideas about existing and future transportation in Brighton.
- **Stakeholder Committees** – The planning process was guided by two sets of stakeholder committees. The first was a regional technical advisory committee (TAC) which met three times over the course of developing the plan. The TAC was made up of representatives from Brighton staff, Adams and Weld County, RTD, CDOT, E-470 and neighboring jurisdictions. The second stakeholder committee met regularly during the planning process and was made up of different departments within the City, including Streets and Fleet, Community Development, Parks and Open Space and Utilities. The stakeholder process facilitated collaboration between regional agencies, nearby jurisdictions and City departments giving robust local and regional backing to the goals and elements of the TMP.
- **Structured Interviews** – A series of structured interviews were conducted early in the planning process to provide guidance on the main issues, aspirations and considerations to incorporate in the TMP. Interviewees included representatives of various agencies internal and external to the City with a stake in the TMP.
- **Council Consideration** – Presentations to City Council were made during development of the TMP on May 26 and November 10, 2015. A Council study session addressed the TMP on January 26, 2016. The Plan was adopted by Council on March 1, 2016.

TRANSPORTATION GOALS

The Brighton Transportation Master Plan is driven by local goals that are based on community character, economic opportunity and public safety (see Figure 1.1). These goals will be achieved through completion of a Build-Out Transportation System identified in later chapters of this Plan. The goals were developed through the community and stakeholder engagement process. Progress toward achieving these goals will be tracked on a dashboard of indicators as described in the Performance Monitoring and Reporting section of Chapter 6.

FIGURE 1.1 TRANSPORTATION GOALS

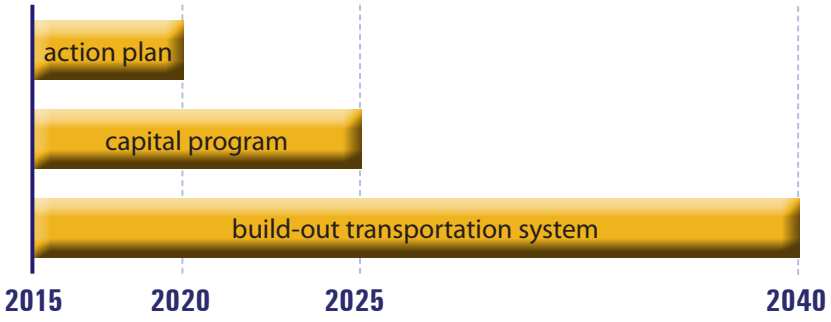
1. Brighton will prioritize safety in transportation planning and design
2. Brighton will be well-connected to regional multimodal transportation networks
3. Brighton's streets will accommodate all modes (pedestrian, bicycle, vehicle, transit)
4. Brighton will be served by a well-connected streets and highways network
5. Brighton's land development will occur in walkable, complete neighborhoods
6 Brighton's transportation system will expand concurrently with development

PLAN HORIZONS

Brighton's TMP employs three planning horizons to guide strategic investment.

- **Action Plan** – Projects and actions to be completed by 2020. The Action Plan for each program is described at the end of each chapter in the TMP.
- **Capital Program** - The Capital Program encompasses a 10-year timeframe to allow adequate time for careful project development and budgeting. These programs are identified as immediate and near-term projects in the Integrated Capital Project List (see Appendix A).
- **Build-Out Transportation System** - Finally, the TMP is designed to complete the Build-Out Transportation System by the year 2040.

FIGURE 1.2 PLAN HORIZONS



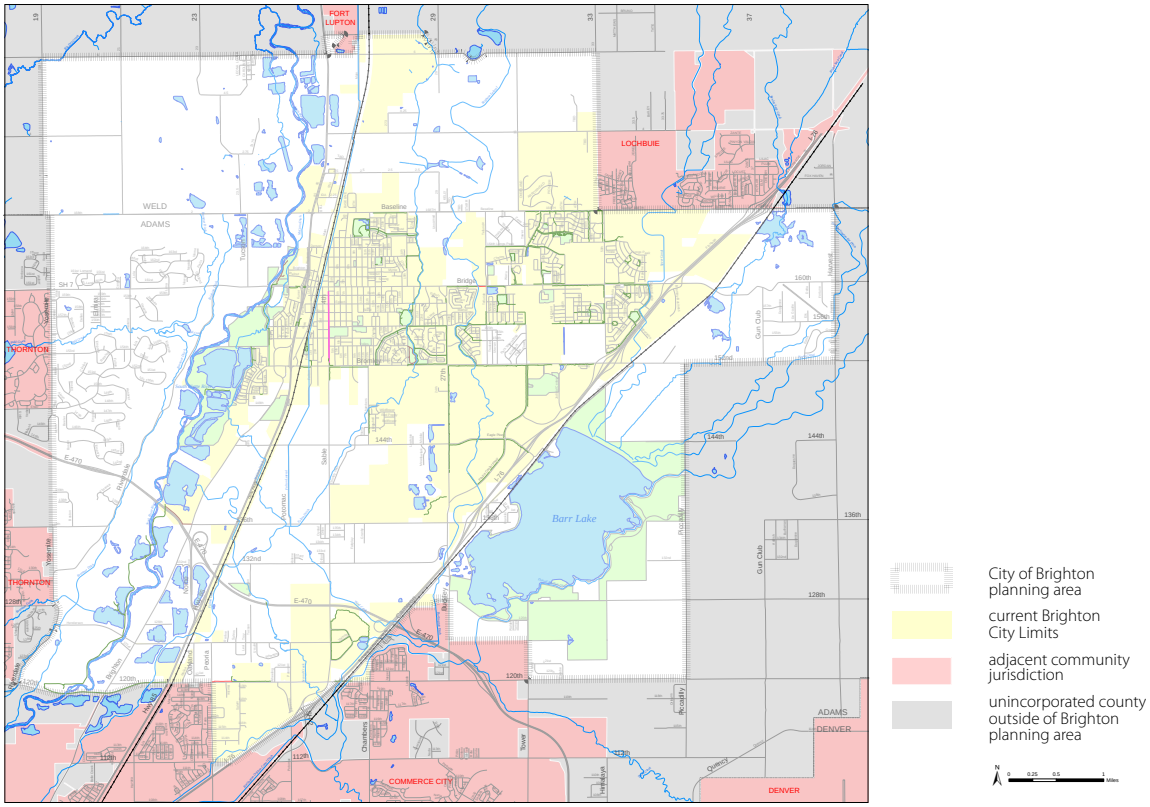
PLANNING AREA

This TMP addresses the future transportation network within the planning area boundary mapped in Figure 1.3. The planning area corresponds with the *Comprehensive Plan* area and includes the existing city limits, Barr Lake State Park, and unincorporated areas of Adams and Weld County, some of which may become incorporated into the City of Brighton at future dates. The southern, western and northern boundary of the planning area align with IGA (intergovernmental agreement) boundaries of adjacent communities.

The City of Brighton will coordinate planning and project implementation with Adams and Weld County for the unincorporated areas within the planning area; with neighboring communities for corridors along the planning area boundaries; and with counties and regional agencies (CDOT, RTD, DRCOG and E-470) to address regional networks that extend beyond the planning area. This includes planning and design of regional highways, greenways and transit corridors.

Areas outside the planning area are not specifically addressed in the TMP. However, the existing and proposed regional street, bike and transit network surrounding Brighton were accounted for in this TMP (through coordination and review of existing regional and neighboring jurisdictions' plans).

FIGURE 1.3 BRIGHTON TMP PLANNING AREA MAP



ONGOING UPDATES

The Brighton Transportation Master Plan is designed to be a living document that responds to economic, social and transportation system trends. While DRCOG population and traffic forecasts provided a framework to this TMP, prioritization of future projects will be based on trends and actual needs, as oppose to forecasts. Monitoring and reporting of key indicators and benchmarks will provide information about when specific projects should be implemented (see Chapter 6). In addition, the Integrated Capital Project List (see Appendix A) is designed so that projects can be modified or added over time based on population growth and the changing dynamics of the City and region. The Integrated Capital Project List will be updated annually as needed. Metrics in the Transportation Databook (forecasts, traffic counts, transit ridership, etc.) will be updated in 2020. The next full update of the Transportation Master Plan will occur in 2025.

Chapter 2

CAPITAL PROJECT DEVELOPMENT

The City of Brighton's approach to capital planning and programming will employ investment principles widely used by progressive private and public sector entities. The underlying idea is that capital investment should be strategic – designed to achieve goals, in this case the City's transportation goals, as shown on page 3.

STRATEGIC PRIORITIES

Six strategic priorities will be used to evaluate potential transportation infrastructure investments to meet the City's goals. These are:

- **Safety First** – Safety of all travelers will be Brighton's highest priority in planning and design of facilities serving all modes.
- **Network Approach** – Complete, well-connected multimodal networks will ensure Brighton's transportation system is efficient and resilient.
- **Modal Balance** – Brighton will balance the modes of travel (walk, bike, transit, motor vehicle) to improve quality of life and ensure the City continues to be an attractive place to live and work.
- **Growth Management** – Transportation facilities needed to support development will be built at a rate matching the pace of growth.
- **Technology** – The City will use emerging technologies to improve operational efficiencies and to monitor program effectiveness.
- **Major Capital Projects** – The City will employ a project chartering process for projects over $500,000 in construction cost to set project objectives and streamline project development.

GROWTH MANAGEMENT

This Plan anticipates significant increases in demand for travel by all modes in and around Brighton between now and 2040. Transit ridership demand, which has been growing rapidly in Brighton since at least 2000 (see Chapter 4), will continue to grow as cultural and economic changes influence household decision-making. Demand for safe and convenient bicycling and walking facilities is also growing rapidly and represents a key opportunity for Brighton (see Chapter 3). Motor vehicle traffic will also grow, resulting from continued increases in auto-based commuting as well as increases in local and regional truck freight traffic. However, because all of the modes – not just traffic – rely on the City's street network for access and circulation, the City's Thoroughfare Plan (Chapter 5) is inherently multimodal in nature.

This Plan also relies on the concept of a "build-out network" to guide methodical development of an efficient traffic circulation system, a complete and convenient bicycle circulation system and a future transit system that is well-integrated with land uses. These modal build-out networks are described in Chapters 3, 4 and 5. By establishing up front what the ultimate facilities networks will look like, the City can help developers anticipate infrastructure requirements and can systematically work on the timing and phasing of public sector capital investments based on the underlying build-out maps.

Strategy 2.1

Develop new and expanded multimodal facilities at a rate that keeps pace with population and economic growth within Brighton's planning area.

The City will utilize a strategic "concurrency" approach to transportation system development. This will involve monitoring ongoing trends in Brighton and the region (population, employment, transit ridership, traffic, accident rates, etc.) relative to the goals and indicators established by this Plan and using that information to guide investment. The timing and scale of multimodal capital investments will be adjusted to shape and support continued population and employment growth in Brighton consistent with the City's goals.

BENCHMARKS

Brighton will pursue a balanced, multimodal capital program to keep pace with these demand trends. Investment decisions will be guided by a set of benchmarking criteria that utilize a variety of metrics. These benchmarks, described following, guided development of the Integrated Capital Project List shown in Appendix A, which will be updated over time as trends unfold.

Thoroughfare Network Completion
Development of the build-out thoroughfare network will occur concurrently with the City's growth. Two metrics will be used to pace public and private sector investments in the City's streets. Details on these metrics, along with maps and tables, are shown in Appendix D: Concurrency Management.

1. Extensions and expansions of **arterial and collector streets** will be guided by a level of service criterion (LOS D) applied at a district level across the thoroughfare network (Chapter 5). The rate of growth in population and employment within each of eight LOS districts, and the resulting growth in vehicle miles of travel, will determine the number of lane miles that should be added to the network within that district. Based on current trends it appears that virtually all of the new lane miles required between now and 2040 can and should be met by developing new streets to close gaps in the build-out network. There will be little or no need to widen existing streets. If a given street approaches the minimum LOS D benchmark, potential investments in parallel corridors in the network will be given priority over widening of that street. A map and tables showing details of this analysis are shown in Appendix D.

Reasons to prioritize street connections over street widening include:

- Wide streets encourage higher speeds, reducing safety
- Wide streets create pedestrian crossing barriers, discouraging walking
- Incomplete, poorly-connected street networks have less capacity, even with wider streets
- A well-connected street network is consistent with Brighton's historic character

2. Development and expansion of the **local street network** – much of which will be undertaken by the private sector in conjunction with development projects – will be guided by a network completion benchmark: number of intersections per square mile. The City will use a benchmark of a minimum 140 intersections per square mile to ensure that emergency service access, efficient traffic circulation, neighborhood walkability, and traffic safety are not compromised by an incomplete, poorly-connected street network. A map and data relating to this benchmark can be found in Appendix D.

Bicycle Network Completion
Development of the build-out bicycle network shown in Chapter 3 will proceed steadily over the 25 years to 2040. However, the City is prioritizing completion of a core area bicycle network, including on-street lanes and off-street multi-use trails in the heart of the existing city. This network is shown in the Core Area Bicycle Connectivity Plan map in Chapter 3 (Figure 3.3).

1. The bicycle network benchmark will be **completion of the core network by 2025**. In a couple of instances, completion of specific segments may have to wait for completion of an associated street project, but the fundamental objective will be to complete as much of core area bicycle network as possible by 2025.

2. This Plan establishes a minimum benchmark for **annual investment in discretionary bicycle network projects** of $75,000 annually. These generally will not be the major capital projects required for Bicycle Network Completion (above) but rather will be a range of smaller discretionary projects needed to address spot improvements and resolve site-specific safety issues or opportunities.

Complete Streets
Brighton's streets will be designed and operated to enable safe circulation and access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. Street design will prompt motorists to operate at speeds that reflect the City's quality of life values and are compatible with neighborhood settings and high levels of pedestrian activity. Crossing streets, walking to shops, bicycling to work, and accessing bus stops will be convenient, comfortable, and safe throughout the community.

By adopting new street design standards (see Chapter 5), the City of Brighton will ensure that each transportation project makes the street network safer for all modes. This does not mean that every street will

be designed to the same standards. Each project will require consideration of the network needs of all modes and the character of the adjacent neighborhoods to determine appropriate design elements and maintenance solutions.

1. The benchmark for Complete Streets will be use of the **street design standards** contained in Chapter 5 on all new streets, and all major reconstructions, including streets built both by the City and by private sector developers.
2. This Plan also establishes a minimum benchmark for **annual investment in pedestrian network spot improvements and missing links** projects of $75,000 annually. This will provide funding for a range of small discretionary projects needed to address and resolve site-specific safety issues or opportunities for improved walkability, such as short sidewalk gaps, improved crosswalks, last-mile transit access, universal design/ADA (Americans with Disabilities Act) retrofits, and so forth.

Public Transit Service

This Plan establishes a transit benchmark (see Chapter 4). In the future, per capita transit ridership (annual transit trips per resident to, from and within Brighton) will not drop below today's level. While the City intends to work with its partners – RTD, Adams County, etc. – to improve transit service resulting in increased transit ridership, the exact nature of these improvements and service increases has not been determined. However, this benchmark will serve to guide the City's efforts to ensure that service level enhancements are sufficient to keep up with Brighton's growth and development.

1. The minimum benchmark for transit will be **no reduction in per capita ridership**. By achieving this minimum, the City will be ensuring that ridership (and service levels) grow at least as fast as the growth in population.

INTEGRATED CAPITAL PROJECT LIST

The initial transportation capital project list developed according to provisions of this chapter is contained in Appendix A. The City will update this list annually, taking into account the strategic priorities and benchmarks, as well as financial realities and funding limitations.

Strategy 2.2

Annually update the list of projects and implementation details contained within the Integrated Capital Project List.

The list in Appendix A is multimodal and is based on a corridor-by-corridor evaluation of the projects required to complete the build-out networks shown in the modal chapters. It represents a coordinated approach to project planning that integrates multiple City departments, including street and active transportation projects with street rights-of-way, as well and components of the City of Brighton Trails and Open Space Plan.

Successful completion of transportation capital projects requires that the entire project development cycle be planned and funded, from project concept planning, through project design, right of way acquisition, bid letting and construction management. The list provides estimates for each of these phases in project development, not just the actual construction phase. This approach to planning and budgeting will ensure a logical and systematic progression of project development activities based on a multi-year capital plan.

MAJOR PROJECT CHARTERS

A Transportation Capital Project Charter is a document that describes a project and, once approved by City Council, guides project development. Project charters should not be lengthy documents, and shall be updated at three points in project development:

- **Start Up Phase** – Initial preparation and adoption.
- **Concept Design Phase** – At completion of concept design.
- **Final Design Phase** – At completion of final design.

Strategy 2.3

Employ a project chartering process for projects over $500K to streamline project development.

Qualifying Projects

A charter is required for capital projects that are specifically named in the *2015 Transportation Master Plan* or that have an estimated capital cost over $500,000. Charters may be used for groups of projects that are interrelated parts of a network. A project charter may be used by the City to guide local involvement in Colorado DOT projects. Charters are not required for smaller capital projects, for programs, or for ongoing maintenance and operations.

Project Initiation

A project charter may be initiated at the direction of the City Council or the staff department with responsibility for capital project development. The project charter must be approved by the respective elected body before major expenditures are made for qualifying projects.

Purpose, Need and Objectives

The charter shall identify why the project qualifies for, or requires, a charter. The transportation purpose and need of the project – access, circulation, mobility, etc. – shall be stated in terms that reconcile the project with policies and strategies in the *Transportation Master Plan*.

The charter shall identify project objectives. These may include quantitative and qualitative objectives. Quantitative objectives shall include indicator metrics for a baseline condition and the corresponding intended future indicator values at five and ten years following completion.

Project Location, Extents and Elements

The charter shall include a map showing the project location. The extents, or physical limits, of the project shall be described. The charter shall include a preliminary list of project elements.

Roles and Responsibilities

The charter shall identify agencies, entities, positions or individuals who will share responsibility for project development and shall describe their respective roles, including the following:

- **Project Sponsor** – The lead department or agency with direct authority and responsibility.
- **Project Manager** – The staff individual (or position) who will serve as project manager.
- **Project Team** – The charter may identify other individuals (or positions) who will work on project development.
- **Elected Bodies** – The charter shall identify how the City Council will be involved in the project and at what points they will review project status and/or make decisions. The charter itself shall be presented to the City Council for review and approval and is not in effect until approved.
- **Stakeholder Oversight** – The charter shall identify individuals (or organizations) who will be appointed by the City Council to serve on the stakeholder oversight committee for the specific project(s) covered by the charter. Stakeholder committees shall not have formal approval authority, shall not make decisions by voting and shall not have elected officers. Their function is

to provide a sounding board for the project team and to provide advice and comment at various stages in project development. The charter shall identify the anticipated number and timing of stakeholder committee meetings. Notes from stakeholder committee meetings shall become part of the project record.

- Public Engagement – The charter shall identify the public engagement process to be used for project development, including a schedule of planned public events and any plans for a project website.

Required Resources

Project charters shall provide an estimate of the resources required to develop, build and open the project to service in the following categories. Resource estimates shall be updated periodically during project development.

- Project Cost Estimate – A cost estimate for the project shall be included in the project charter and shall be revised at each update phase. Estimated costs shall be provided for each of the major components of project development, including: planning and concept design; final design, right of way acquisition, construction and construction engineering. A contingency amount shall be included in the cost estimate for each component.
- Staff Resources – An estimate of staff resources required to manage the project shall be developed. This estimate need not be overly precise in hours but can be general in nature, e.g., "0.5 FTE for 6 months."
- Professional Services – Any contracts or work orders for consulting and other contract services required to complete various project components shall be described along with the planned approach to procurement. A cost estimate for these services shall be included in the project cost estimate for each project component.
- Funding Sources – The charter shall identify the source of funds for each project component, based on the cost estimate for that component. If a portion of the funding is speculative (e.g., federal TIGER grant), that fact shall be noted.

Risk Assessment

Project charters shall include a discussion of project risks. These may be qualitative, but should be as specific as possible.

- Outcomes Risk – This is the risk that the project will fail to achieve the Project Objectives (see above) along with the risk of unintended consequences. Potential mitigation measures for specific risks shall be described.
- Business Risk – This shall include the risk that the project costs will exceed the cost estimate and the risk that adequate funding will not be available and other potential events or occurrences that could affect the project development process or the ability to deliver the project on schedule. Potential mitigation measures for specific risks shall be described.

Transparency

Project charters, including each phase update, shall be made available on the respective City website for general public access.

Chapter 3

ACTIVE TRANSPORTATION

The "active transportation" modes of bicycling and walking will become increasingly important activities that impact both individual and community health and quality of life. Active living is a way of life that integrates physical activity into daily routines. Individuals may achieve this through activities such as walking and bicycling for transportation, exercise, and pleasure. Brighton will be a community that implements policies and creates environments that remove barriers and increase easy access to opportunities for active transportation and active play.

Research shows a direct relationship between active living and several health indicators. Levels of diabetes, high blood pressure, and obesity are all lower in cities with higher shares of commuters bicycling or walking to work. Likewise, in communities where people bike and walk, more of the population is meeting the recommended amount of weekly physical activity. Safety, too, has a close relationship with bicycling and walking levels. In cities where a higher percent of commuters walk or bicycle, corresponding fatality rates are generally lower. This statistic is in direct contrast to concern of increasing crash rates if more bicyclists and pedestrians are using streets and roadways.

The City of Brighton will therefore focus on providing opportunities for Brighton residents to safely and enjoyably use non-motorized modes for running errands, traveling to work or school, completing the last-mile of transit trips, and expanding recreation opportunities for all demographics of the community. This approach to creating multimodal transportation system will directly further the Brighton Sustainable movement to promote sustainable livability, encourage sustainable transportation modes, and create a sustainable community that will be sought out as a place to live and work for generations to come.

NETWORK PLANNING

The City of Brighton desires to expand its past focus on trail planning into a more comprehensive approach to creating a citywide bicycle system. Increasing connectivity between existing facilities to provide cross-town travel options for bicyclists was the top overall comment received through the Transportation Master Plan public input process.

To date, the Brighton Parks and Recreation Department has developed 27 miles of off-road, multi-use trails as part of its Park and Open Space system. These trails follow segments of waterways that generally run north/south. In addition, segments of multi-use trail have been constructed within the rights-of-way of arterial streets to begin to provide east/west bicycle travel options. However, the existing trail segments do not provide desired connections between neighborhoods and destinations. The TMP Build-Out Bicycle Network, depicted in Figure 3.1, addresses this problem by focusing on missing links and fully integrating the off-street facilities with a system of on-street bicycle lanes. The goal is to create continuous corridors that are at least 2.5 miles long (the national average bicycle trip length) that connect to community activity centers, with seamless integration between bike routes on trails and on streets.

Understanding the Users

This planning approach recognizes that people use trails and bicycle facilities for different purposes and have varying comfort levels and expectations for their riding experiences. The plan follows the nationally recognized "design bicyclist" concept in which the planning and design of facilities considers the needs of three distinct classifications of users:

Type A: Advanced Bicyclists

These are experienced riders who can operate under most traffic conditions. They include road cyclists comfortable riding in traffic, who will ride with or without bicycle facilities present, often ride long distances, and prefer direct, safe routes for utilitarian trips and/or long-distance loops for recreational outings. Type A bicyclists comprise the majority of the current users of collector and arterial streets and are best served by the following:

- Direct access to destinations usually via the existing street and highway system.
- The opportunity to operate at maximum speed with minimum delays.
- Sufficient space on the roadway to reduce the need for a bicycle or motor vehicle to change position when passing.

Type B: Basic Bicyclists

These are casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. They are intimidated by motor vehicles, tend to make short trips close to home, and prefer designated bicycle facilities. Some will develop greater skills and progress to the advanced level, but there will always be many millions of basic bicyclists. They prefer:

- Comfortable access to destinations, preferably by a direct route, using either streets with slow speeds and low traffic volumes and/or designated bicycle facilities.
- Well-defined separation from motor vehicles by providing bicycle lanes or separate bike paths.

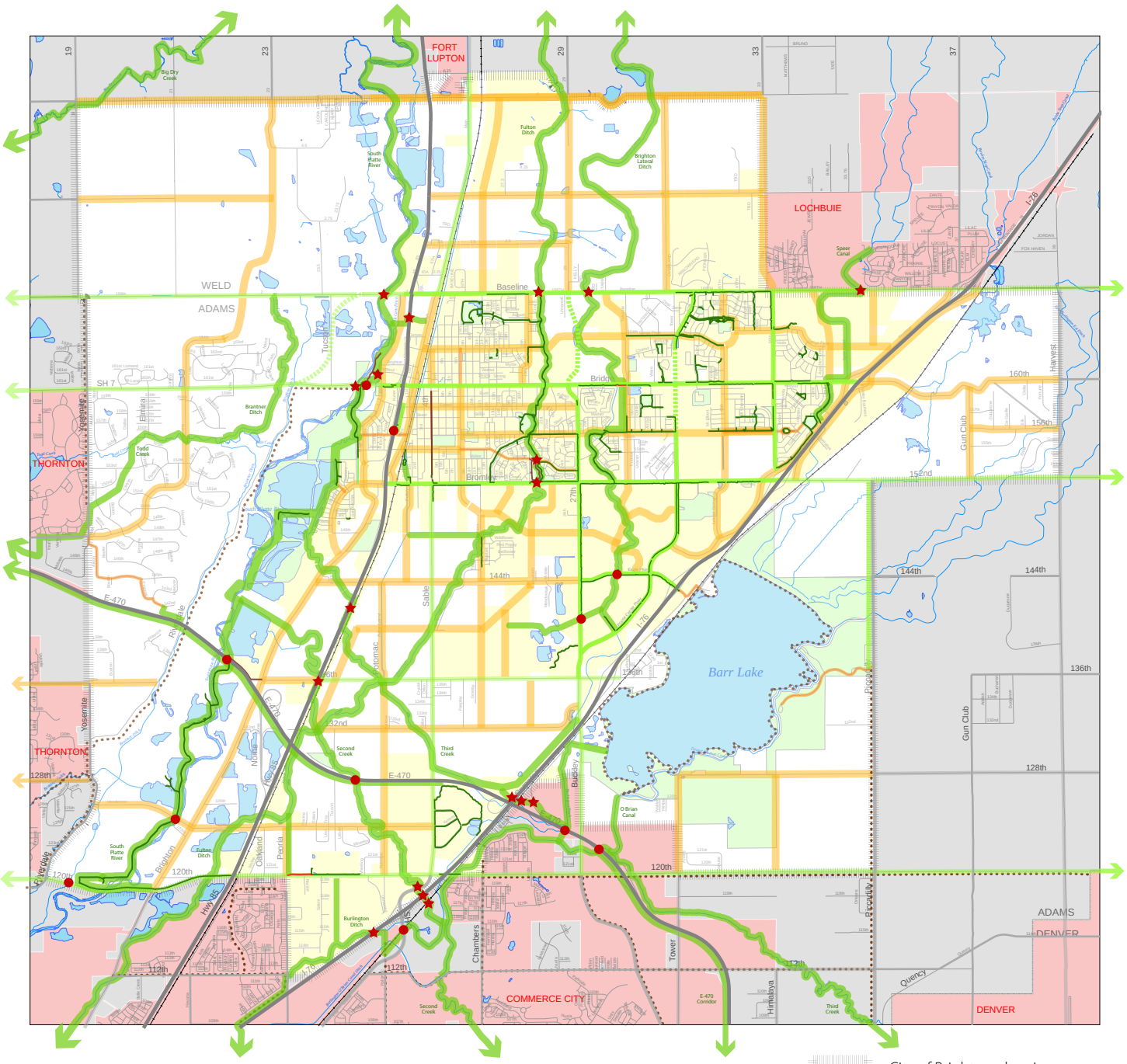
Type C: Child Bicyclists

These are pre-teen riders whose roadway use is initially monitored by parents. Eventually they are accorded independent access to the bicycle system and will begin to ride farther from home. They and their parents prefer the following:

- Access to key destinations surrounding residential areas (schools, recreation facilities, shopping, etc.).
- Residential streets with low motor vehicle speed limits and volumes.
- Well-defined separation from motor vehicles on bicycle lanes or paths.

The City of Brighton's bikeway and trail planning initiatives will combine Type B/C riders into a single user group that prefers access to off-road paths, a network of lightly traveled neighborhood streets, and bicycle lanes on streets with moderate traffic volumes and speeds. In contrast, Type A cyclists will be served by designing all streets and roadways to accommodate shared use by bicycles and motor vehicles, with select corridors enhanced with paved shoulders, striped bicycle lanes, and/or multi-use paths designed to bicycle facility standards.

FIGURE 3.1 BUILD-OUT ACTIVE TRANSPORTATION PLAN



Off-Road Trail System

- regional greenway corridors
  existing multi-use trail
- proposed trail, adjacent jurisdiction
- arterial streets w/ proposed parallel trail
  existing multi-use trail

Special Features:

- regional connections
- existing trail overpass/underpass
- new/retrofit trail overpass/underpass

On-Street System

- existing striped bicycle lanes
- collector streets w/ proposed bicycle lanes
  signed and striped lanes
- local streets w/ shared lanes
  sharrow pavement markings to indicate key links in bicycle network
- undesignated shared streets

- City of Brighton planning area
- current Brighton City Limits
- parks and open space
- adjacent community jurisdiction
- unincorporated county outside of Brighton planning area

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by Charlier Associates, Inc.

Bicycle Facility Typology

Accomplishing the community vision to create a more bicycle-friendly and walkable Brighton will require several actions to address investment in active transportation modes as a routine part of growth and development within the community, including specific measures to be undertaken by various City departments to retrofit existing street corridors within the core area of the city. Strategies to implement this vision are presented in the section following, with a photo menu of recommended bicycle facility types presented below.

FIGURE 3.2 BICYCLE FACILITY TYPOLOGY


Traditional Bike Lanes - designated and striped bicycling space on streets


Sharrows - shared streets identified as part of a designated bicycle network


Colored and Buffered Bike Lanes - special treatments for higher visibility and buffering from traffic


Cycle Tracks - protected bicycle-only facilities, separate from both street and sidewalk


Paved Shoulders - extra pavement width on rural roadways to accommodate bicycles


Multi-Use Trails - greenway corridors, safe-routes-to-school, trails within street right-of-ways

Recommended Design Standards

The following national guidance manuals shall be used to implement Active Transportation projects:

- ***Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities***, 2006, Institute of Transportation Engineers (ITE). Design solutions for arterial and collector roadways that are consistent with physical setting and community values.
- ***Guide for the Development of Bicycle Facilities***, American Association of State Highway Transportation Officials (AASHTO), Fourth Edition, 2012. Addresses design of on-road facilities and shared use paths.
- ***Manual on Uniform Traffic Control Devices*** (MUTCD), Federal Highway Administration (FHWA), 2009 Edition. Standards for traffic control devices on public streets, highways and bikeways.
- ***Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way*** (PROWAG), Federal Highway Administration (FHWA), 2011 draft. Forthcoming detailed guidance on how to apply the provisions of the Americans with Disabilities Act (ADA) to pedestrian facilities in the public right-of-way.
- ***Urban Bikeway Design Guide, National Association of City Transportation Officials*** (NACTO), Second Edition, 2012. Innovative infrastructure treatments to help create complete streets that are safe and enjoyable for bicyclists.

Strategy 3.1

Routinely incorporate bicycle and pedestrian facilities into the design of all new streets and major capital reconstruction projects.

Bicycle accommodation with street right-of-ways will be implemented within the City of Brighton based upon a combination of functional street classification (see Chapter 5: Thoroughfare Plan) and the context of the street as it relates to adjacent land use and development patterns. Key design criteria for various street types include the following:

ARTERIAL STREETS

The primary function of arterial streets is to provide cross-town mobility. Design treatments for accommodating bicycles will be similar on both major and minor arterial streets within Brighton, as illustrated in the street cross-sections on pages 47 and 49 and described following.

Arterial corridors will carry the highest volumes of traffic through Brighton, and will often be multi-lane streets. Experienced bicyclists often ride on arterials for the combination of speed, connectivity and directness of route offered by these streets. However, less experienced cyclists are usually intimidated by the volume and speed of vehicles on multi-lane arterials. Design recommendations therefore include:

Shared Roadways

Type A cyclists who are comfortable and experienced operating in traffic may share travel lanes with motor vehicles. No bicycle designation (signage or sharrow pavement markings) shall be used for shared lanes on arterial streets.

Off-Street Bike Paths

Type B/C cyclists will be provided with a continuous multi-use trail within the street right-of-way.

- A 10' wide regional trail, developed to AASHTO bike standards, will be provided on one side of all arterial streets.
  - South of Bridge Street, the 10' trail shall be developed on the south side of the street.
  - North of Bridge Street, the 10' trail shall be developed on the north side of the street.
  - An 8' wide sidewalk/local trail shall be provided on the opposite side of the street.
- Where multi-use trails intended to accommodate bicycles are implemented parallel to streets, special design attention will be paid to all intersections. Mid-block, the bike trail may meander slightly and/or be located at edge of right-way, but the trail will shift laterally into the intersection envelope at approaches to all street and driveway crossings. NACTO guidance for cycle track intersection approaches and intersection crossing treatments will be followed to minimize conflicts between bicycles and motor vehicles.
- Once construction of a parallel 10' multi-use trail is continuous for >2.5 miles in length and connects with another facility in the bicycle network, NACTO green pavement marking treatments may be used on crosswalks to increase visibility of the parallel path as a bicycle facility offering connectivity for cross-town travel.

On-Street Bike Lanes

Interim design of minor arterials may include on-street bicycle lanes in addition to a parallel trail.

- Minor arterials constructed with a center median must maintain a min. 20' clear pavement width to meet fire code. As an interim design, minor arterials with traffic volumes below the thresholds of a four-lane street may be striped with an on-street bicycle lane and one through lane of vehicular travel in each direction.
- Ultimate build-out of minor arterials will be up to two travel lanes in each direction, based upon actual traffic demand. (See cross-sections on page 49.)

COLLECTOR STREETS

The primary function of collector streets is to provide circulation between neighborhoods. Within the overall street network, collectors offer continuity and directness of routes, balanced with lighter traffic volumes and slower vehicular design speeds than arterials. Collector streets are therefore often the backbone of bicycling systems in most communities.

In Brighton, all future collector streets – whether new street construction, pave and grade projects, or street widening projects – will include on-street bicycle lanes. Collector street cross-sections presented on pages 51-52 provide options for implementing various street designs based upon the adjacent land use context. Bicycle and pedestrian considerations are summarized as follows:

On-Street Bike Lanes

Designated roadway space shall be provided to serve the joint needs of both Type A and Type B/C bicyclists. Bicycle lanes will be:

- One-way facilities located on either side of a street; typically 5' min. width, excluding street gutter pan. Includes a lane stripe separating the bicycle travelway from adjacent motor vehicle lanes, combined with bike lane pavement stencils and signage.
- May be implemented in conjunction with on-street parking.
- May be in the form of paved shoulders on rural street cross-sections without curb-and-gutter.

Shared Roadways

If a collector street is desired to be designated for connectivity as part of Brighton's bicycle network before the street can be upgraded to collector standards, yellow MUTCD Share-the-Road warning signs may be posted as an interim measure.

Off-Street Bike Paths

Type B/C bicyclists routinely use and prefer bicycle lanes on collector streets. Construction of parallel bike paths separated from traffic is thus not warranted within most collector street corridors.

Multi-use paths meeting AASHTO standards may be provided in addition to bike lanes in specific locations where additional separation is desired for Safe-Routes-to-School or to provide an off-road link between regional open space trails.

Sidewalks

Continuous detached 6' sidewalks will be provided on both sides of collector streets for pedestrian use.

LOCAL STREETS

Local neighborhood streets are designed to have low volumes of traffic traveling at slow speeds, which creates environments where bicycles and cars can safely share roadway space. Contrary to common belief, bicyclists who ride on streets are actually at less risk of being hit by a motor vehicle that than those who bike on sidewalks, especially at intersections, due to motorist attention paid to the vehicular travelway.

No special bicycle accommodation or designation will be required on local streets, unless a street segment is identified as a key connection in the overall Brighton bicycle network. (See Figure 3.1 on page 13.)

Shared Roadways

Bicycles are legal users of all street and roadways, unless specifically prohibited. Segments of neighborhood connectors and local streets may be identified as part of the Brighton bicycle network by adding shared lane pavement markings, often called "sharrows," and posting bicycle route signage.

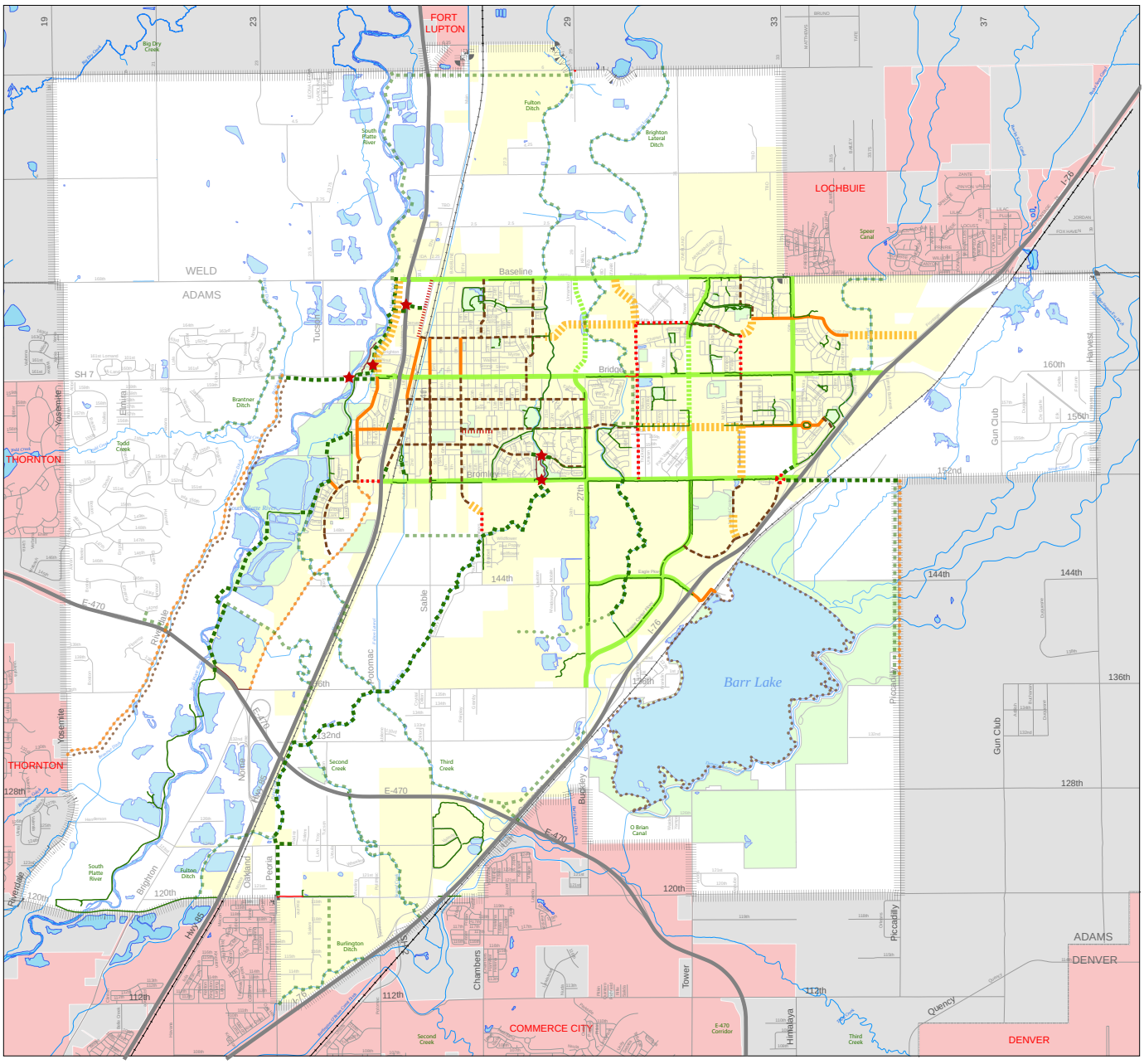
Sidewalks

Continuous detached 6' sidewalks shall be provided on both sides of local streets for pedestrian use.

CORE AREA CONNECTIVITY

Establishing a basic bicycling grid throughout Brighton's core is a high priority, which will be accomplished through wayfinding, restriping wide streets, and completing strategic missing links in the core system depicted below.

FIGURE 3.3 CORE AREA BICYCLE CONNECTIVITY PLAN



Core Area Bicycle Connectivity Plan

Arterial Streets w/ Multi-Use Trails:
- continuous parallel trail

Collector Streets w/ Bicycle Lanes:
- street restriping
- street retrofit
- new street construction

Local Streets w/ Shared Lanes:
- sharrow pavement markings
- interim share-the-road signing
- undesignated shared streets

Trails & Open Space System

Regional Greenway Corridors:
- existing multi-use trail
- immediate/near-term project (by 2025)
- long-term project (beyond 2025)

Special Features:
- proposed segment of cycle track
- existing trail overpass/underpass
- new/retrofit trail overpass/underpass

- City of Brighton planning area
- current Brighton City Limits
- parks and open space
- adjacent community jurisdiction
- unincorporated county outside of Brighton planning area

N 0 0.25 0.5 1 Miles

2.11.16
by Charlier Associates, Inc.

Strategy 3.2

Retrofit existing streets within the core area of Brighton to include bicycle accommodation.

Public comments received in the preparation of this plan stressed the need to complete missing links in Brighton's existing infrastructure to make it easier and safer to bicycle and walk to local destinations. Cyclists desire continuous paths of travel, and do not mind transitioning from one bicycle facility type to another.

The City of Brighton will focus on implementing a retrofit plan to add bicycle accommodations within the core area of the city. The map on page 17 highlights missing links within the city's core area that create obstacles to travel by active transportation modes, and presents an implementable connectivity plan that includes a variety of design recommendations. It is important to note that most recommendations for street corridors follow the functional classification approach outlined under Strategy 3.1, but adjustments have been made within select corridors based upon existing conditions – i.e. some wide local streets within the proposed bicycle network are recommended to be striped with bike lanes, and select segments of collector streets may have a parallel trail or cycle track constructed based upon site-specific needs.

See also Appendix A: Integrated Capital Project List for a line-item summary of each recommended improvement depicted as part of the Active Transportation Plan. The more detailed guidance found on the following pages shall be used to implement the various design treatments.

SHARROWS

Lightly traveled neighborhood connectors and local streets may be designated as bike routes and marked with a pavement symbol called a "sharrow" to provide a higher level of guidance to bicyclists and motorists. Sharrows will serve a wayfinding function, identifying key shared-street connections that will complete the Brighton network.

Key Design Elements

- Select shared use roadways may be designated as bicycle routes to identify key connections within a community's overall bicycle system.
- Appropriate for use on non-arterial streets with low traffic volumes and speed limits less than 35mph.
- Designation includes sharrow pavement markings and bike route signing with supplemental directional arrow plaques.
- Sharrows shall be placed on the pavement to indicate correct bicyclist roadway positioning. Preferred location is in the center of the shared travel lane, but markings shall be located no closer than 4' min. from curb face, or 11' min. where on-street parking is present.
- Spacing of sharrow markings may be infrequent, but will indicate change in bike route direction to assist in wayfinding.

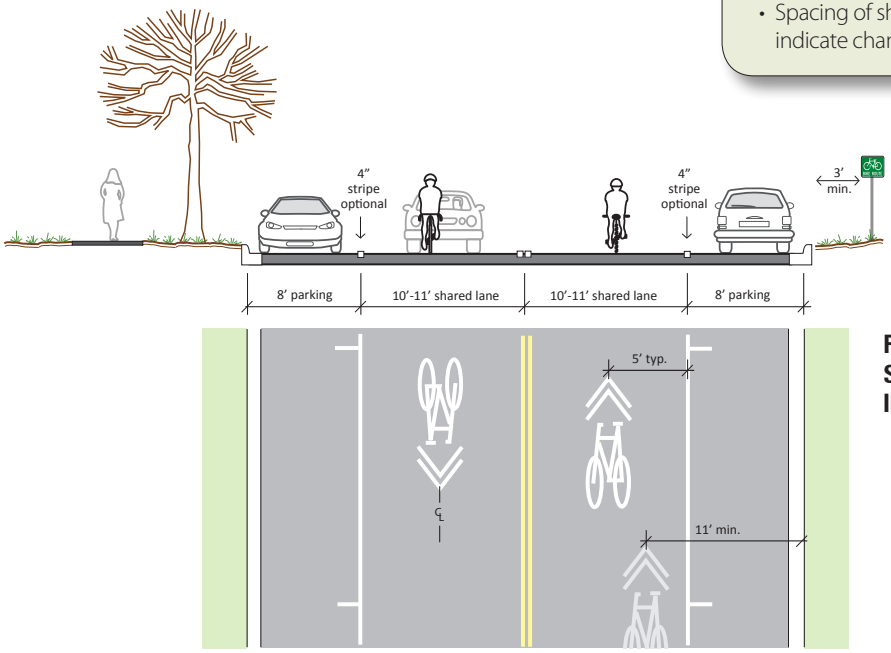


FIGURE 3.4
SHARROW IMPLEMENTATION DETAILS

BICYCLE LANES

Signing and marking shared roadways as bicycle routes does not create designated space for bicyclist use. Thus, on-street bicycle lanes will be used throughout Brighton to create longer distance cross-town bicycling corridors that will benefit both Type A and Type B/C riders. Brighton will join communities nationwide that are implementing bicycle lane systems on collector and minor arterial streets, which provide convenient and direct routes of travel and are where additional bicycle operating space is most needed to enhance cyclist safety and comfort levels.

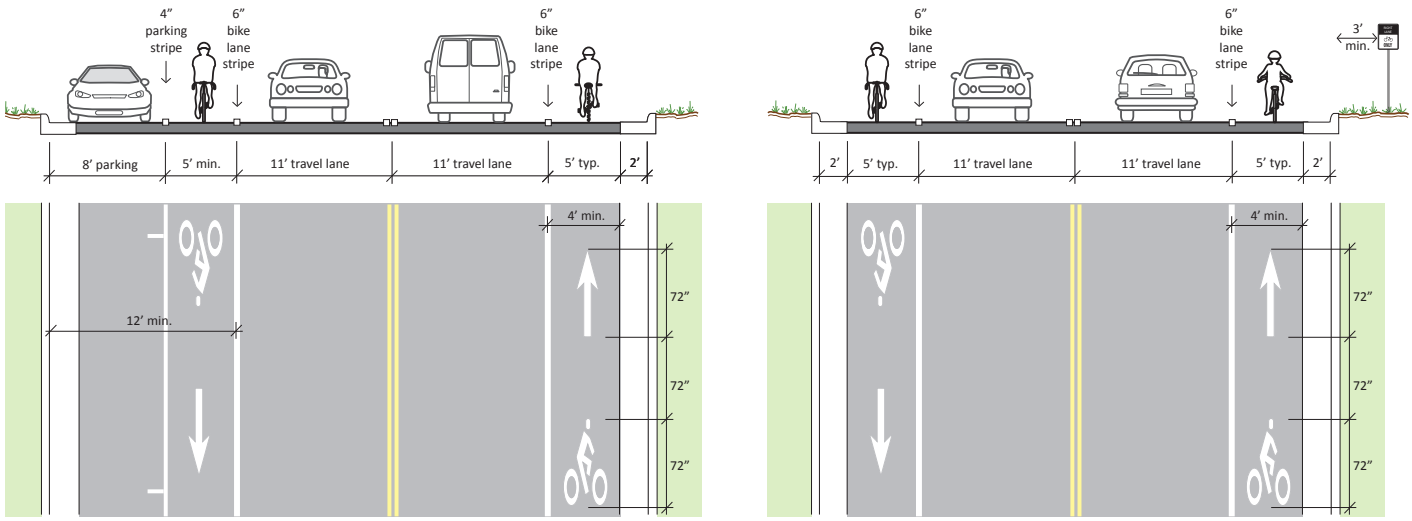


FIGURE 3.5 BICYCLE LANE IMPLEMENTATION DETAILS

Key Design Elements

- Used to delineate available roadway space for preferential use by bicyclists, place cyclists in motorist's field of vision, and discourage wrong-way riding.
- Appropriate for use on streets with moderate to high levels of vehicular traffic, where designated lanes are desired to provide separation from motor vehicles.
  - Bike lanes shall be one-way facilities located on either side of a street; typically 5' min. width, excluding street gutter pan.
  - May be implemented in conjunction with on-street parking, placed between parking and travel lane, unless designed as a cycle track. Combined bicycle/parking lane shall be 12' min. width, 13' preferred.
  - May be in the form of paved shoulders on rural cross-sections without curb-and-gutter
    - 5' min. paved shoulder width, without rumble strips
    - Consider increasing shoulder widths on roadway segments with motor vehicle speeds >50 mph, heavy truck traffic, and/or heavy bicycle traffic.
  - In retrofit conditions on extra wide streets, a NACTO buffered bike lane treatment may be considered. Stripe an 18" - 36" buffer area with interior diagonal cross hatching to separate bikes from cars and differentiate an overly wide bicycle lane from an on-street parking lane.
- Special attention shall be paid to bike lane positioning at intersections to minimize potential conflicts with turning vehicular movements. Design guidance for bike lane placement within a variety of intersection configurations is provided in the AASHTO and MUTCD guides. Key considerations include:
  - When bicycle lanes approach intersections, bicycle lane striping shall shift laterally to minimize conflicts between bicycles and turning motor vehicles, always placing through bicycle lanes to the left of right-turning vehicular lanes.
  - Dashed bicycle lane striping and/or green pavements shall be used to increase visibility through vehicular lane merging areas, following AASHTO and NACTO design guidance.
  - In retrofit conditions where space is limited, a combined bike lane/turn lane may be implemented. A sharrow stencil may be placed within the combined lane. Bike lane striping shall resume on the far side of the intersection, immediately past the pedestrian crosswalk.

Bike Lane Elements, cont.

- Bicycle accommodation may be implemented on streets with or without on-street parking. On streets with moderate to few parked vehicles, on-street parking may be limited to one side of the street to create space for striping bicycle lanes. Working with adjacent property owners to assess parking demand will be necessary for successful roadway reconfiguration.
  - Both bicycle lanes and sharrow bike route treatments may be implemented in corridors with on-street parking.
  - Bicycle lanes must always be striped between the parking and travel lanes. 6' wide bike lanes are preferred adjacent to parked cars, with 13' min. required for the combined bike/parking lane.
  - A pavement stripe should be used between bike lane and parking lane to discourage encroachment of parked cars into the bicycle travelway.
  - At intersection approaches where the on-street parking lane transitions into a right-turn lane, the bicycle lane shall continue through the intersection to the left of the right-turn lane.
  - On streets that are too narrow to accommodate both bicycle lanes and on-street parking, sharrow pavement markings may be used. Preferred placement is in the center of the shared travel lane to avoid the "door zone" adjacent to parked cars, with the center of the sharrow placed at least 11' from the curb face.
- Use of green pavements within bike lanes will be encouraged in locations where higher visibility is desired through potential conflict areas. This includes difficult arterial street crossings and site-specific locations through school zones where collector streets provide both bicycle lanes and on-street parking to serve school drop-off and pick-up needs.

TRAILS WITHIN STREET CORRIDORS

Paved multi-use trails may be developed parallel to higher volume roadways when adequate separation can be provided between the path and roadway, and intersections are designed to minimize conflicts between cars and bikes.

Application

The City of Brighton will implement this approach to bicycle accommodation along all major and minor arterial corridors, with a regional multi-use trail to be provided on at least one side of all arterial streets.

Select segments of other streets (Riverdale, County Road 6, Peoria) may also have a parallel trail constructed where off-road connections are desired for trail system continuity.

Key Design Elements

- All multi-use bike trails to be constructed within arterial street rights-of-way shall follow national *AASHTO Bike Guide* standards.
- Retrofitting arterial corridors to complete missing links in existing trails shall receive highest priority for completion to avoid cyclists from unexpectedly merging into the vehicular travel lane and/or riding wrong-way into traffic to navigate the gap in the trail system.
- Intersections shall be designed and retrofitted where needed to provide access to the regional 10' trail from all approaches. This may need to include crosswalk striping, signal timing adjustments, and addition/replacement of curb cuts to meet bicycle and ADA standards.

CYCLE TRACKS AND PROTECTED BICYCLE LANES

Creativity is sometimes necessary when retrofitting urban corridors to accommodate bicycle travel. The *NACTO Urban Bikeway Design Guide* was developed to address this need, and offers options for development of special facilities for special situations.

Cycle tracks (at sidewalk grade) and protected bike lanes (at street grade) are unique treatments that combine the user experience of a separated path with the on-street infrastructure of a conventional bike lane. Both are physically separated from motor vehicle traffic and also distinct from the sidewalk. Since they represent innovative ways to retrofit urban conditions to provide greater levels of bicycle accommodation, designs can be complicated and numerous site-specific details need to be addressed.

Application
Segments of cycle track will be developed within Brighton as special solutions within two corridors.

A raised one-way, eastbound cycle track will be built along Southern Street, adjacent to the ball fields where on-street parking is desired to remain on both sides of the street (westbound travel will be accommodated within a traditional on-street bicycle lane).

A raised, two-way cycle track is proposed on the west side of N. Main, from Baseline Road south to Denver Street. The bicycle facility will then transition to a two-way, on-street protected bike lane for one block between Denver and Longs Peak streets.

Key Design Elements

- Cycle tracks may be one-way or two-way facilities, and may be at street level, at sidewalk level, or at an intermediate level.
- Called a protected bike lane when located at street level, they may be physically separated from passing traffic by raised medians, on-street parking, bollards and/or painted buffer striping.
- Special design details need to be considered at intersections to minimize conflicts with both motor vehicles and pedestrians.
- A minimum 5'-7' width is desired for one-way facilities; 12' min. width for a two-way facility.
- The *NACTO Urban Bikeway Guide* shall be followed for designing all cycle track and protected bike lane facilities.

Strategy 3.3

Complete Brighton's multi-use trail system and ensure seamless transitions between on-road and off-road facilities.

TRAILS WITHIN OPEN SPACE CORRIDORS

Off-road trails are desired by Type B/C bicyclists to offer alternative routes removed from traffic. Trail segments also offer opportunity to make connections in areas where the street system is not continuous due to challenging terrain and other travel barriers. Expansion of the Brighton trails system will thus serve both utilitarian and recreational bicycling needs, if appropriate segments are designed to national standards for multi-use bike paths.

Multi-use paths may be paved (typical in urban settings) or soft-surface (appropriate in rural contexts), but should be developed to widths that will allow bicyclists to meet and pass other cyclists, pedestrians, and other users of the trail system.

Pedestrians tend to use paths in groups and may walk side-by-side and/or meander laterally. Pets on leashes and in-line skaters will take up additional lateral space on a multi-use facility. Joggers and equestrians prefer to travel on soft-surface path shoulders. Design and maintenance of trails within open space corridors will therefore consider the trail tread, trail shoulders, appropriate clear zones, and transitions to on-street bicycle facilities.

Key Design Elements

- Multi-use paths are an appropriate facility type to be developed in linear open spaces, or parallel to higher volume roadways when adequate separation can be provided between multi-use path and road.
- Design to accommodate activity levels by a variety of non-motorized users including pedestrians, bicyclists, in-line skaters, joggers, etc.
- The *AASHTO Bike Guide* shall be followed for designing all multi-use paths.
- The trail tread may be soft surface (crusher fines) or paved (asphalt or concrete). Trail width is 10' min. with a 5% grade. However, a 12' width is preferred on trails of regional significance that are anticipated to experience higher levels of multiple use.
- Within open space corridors, Parks and Recreation desires a 6' recovery zone be provided on each side of the trail, to be maintained free of vegetation and other obstructions.
- Standard MUTCD signage and pavement markings, including ladder-style crosswalks, shall be installed at all street crossings. Curb cuts shall span the full width of the approaching trail. Green pavements may be used at trail crossings for added visibility.

Strategy 3.4

Adopt elements of the Northern Colorado bikeway signage program for application within Brighton.

Brighton is one of several cities in Northern Colorado that desires to implement a consistent wayfinding signage program to promote the community as a hub along the developing Colorado Front Range Trail (CFRT).

Signage

A custom wayfinding signage system will be developed, based upon the recently approved Fort Collins prototype, which includes the following elements:

- Confirmation signs, for community identification along the CFRT
- Decision signs, stating time and distance to major local destinations
- Supplemental plaques, as necessary to convey additional information.

Strategy 3.5

Implement programs of the Bike Brighton Subcommittee to attain recognition as a Bicycle Friendly Community.

The City of Brighton desires entrance into the League of American Bicyclists program to become nationally recognized as a Bicycle Friendly Community – one that welcomes and provides safe accommodations for bicycling and encourages people to bike for transportation and recreation. Making bicycling safe and convenient are viewed by the League as keys to improving public health, reducing traffic congestion, improving air quality, and enhancing quality of life.

BFC Designation

The first step in becoming certified as a Bicycle Friendly Community is to achieve Bronze status, then working through successful levels to Platinum. To achieve this goal, the City of Brighton will continue to work on implementing a combination of the following "5-E" action items:

- **Engineering** – creating safe and convenient places to ride and park
- **Education** – giving people of all ages and abilities the skills and confidence to ride
- **Encouragement** – creating a strong bike culture that welcomes and celebrates bicycling
- **Enforcement** – ensuring safe roads for all users
- **Evaluation and Planning** – planning for bicycling as a safe and viable transportation option

The Bike Brighton Subcommittee will continue to take the lead in applying for this national award program and promoting opportunities to make Brighton a vibrant bicycling destination for residents and visitors.

PEDESTRIAN NEEDS

Sidewalks are a network of facilities that provide for pedestrian access and mobility throughout a community. Sidewalks are not considered to be bicycle facilities, but multi-use paths may substitute for sidewalks within arterial street right-of-ways.

The City of Brighton will employ a concept of **"universal design"** to provide sidewalks that meet the mobility needs of all pedestrians – this includes addressing physical access challenges for users young and old, as well as those with vision impairments and those using crutches, walkers, wheelchairs, etc.

New sidewalks and curb ramps will be designed to meet the basic requirements of a continuous and unobstructed Pedestrian Access Route (PAR) for walkway width and ramp slope as defined by requirements of the 1990 Americans with Disabilities Act (ADA). However, good pedestrian design practice will consider the full pedestrian realm (the space located between the back-of-curb and the edge of the public right-of-way) and will exceed the minimum ADA PAR requirements.

Within Brighton's core area, where existing conditions exist substandard to the ADA guidelines, the City will develop an ADA Transition Plan to inventory problem areas and develop a phased approach for retrofitting sidewalks and street corners to bring them into compliance.

Strategy 3.6

Construct all new streets and retrofit existing street corridors within Brighton to include pedestrian accommodation and meet the accessibility needs of the 1990 Americans with Disabilities Act (ADA).

DETACHED SIDEWALKS

Locating the sidewalk away from the street edge provides many benefits, including creating a more safe and comfortable pedestrian experience.

Street cross-sections on pages 47-54 illustrate and dimension sidewalk design elements, including the relationship of the pedestrian realm to the street, based upon the context of various street corridors.

ATTACHED SIDEWALKS

When a sidewalk is constructed immediately at the back-of-curb, it is called an attached sidewalk. Attached sidewalks should be discouraged because they do not buffer pedestrians from adjacent vehicular traffic, nor provide space for the sidewalk furnishing zone. Attached sidewalks shall not be built adjacent to any arterial or collector street due to the high speeds of adjacent motor vehicle travel.

Key Design Elements

- All new sidewalks within Brighton will be detached from back-of-curb by a 6'-8' furnishing zone that accommodates utility placement, snow storage, street signs, tree planting, etc.
- All sidewalks will exceed the minimum ADA PAR clear width requirement (4'), with Brighton walkway widths ranging from 6'-8' depending on street corridor context.
- Sidewalks will be constructed of stable, firm and slip resistant materials with smooth and continuous surfaces.
- Cross slopes will be 2% max. and shall be maintained across all driveways.
- In select, limited locations where there is inadequate right-of-way or other constraints to construct detached sidewalks, attached sidewalks shall be a minimum 6' wide, with a 7' width encouraged to provide additional buffer from street edge.
- In locations where a furnishing zone is not provided, obstacles may not be placed on or protrude into the attached sidewalk. All utility poles, fire hydrants, signs, trash collection dumpsters, mail boxes, etc. must be located to ensure a minimum 4' clear PAR walkway width will be maintained in all locations.
- Driveway crossings of attached sidewalks shall not create steep cross slopes that cause difficulties for pedestrians using wheelchairs and walkers. Driveway crossings shall be level (<2% cross slope) and not force sidewalk users to repeatedly travel over flared sides of driveway ramps.

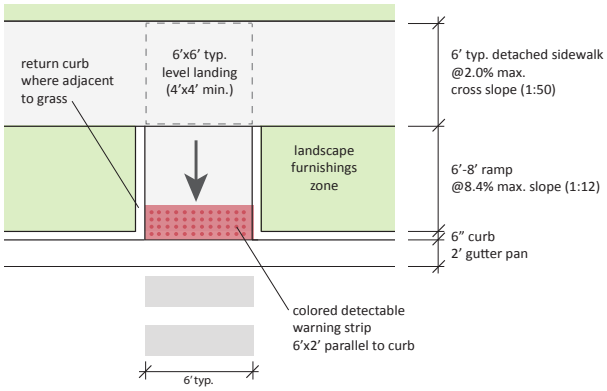
INTERSECTIONS

Sidewalks will provide continuous routes of travel for pedestrians by addressing mobility needs both **along and across streets**. Design treatments at intersections will vary depending on sidewalk location and motor vehicle lane configuration, but all intersections will consider the needs of pedestrian travelers in the design of corners, crosswalks, and signals.

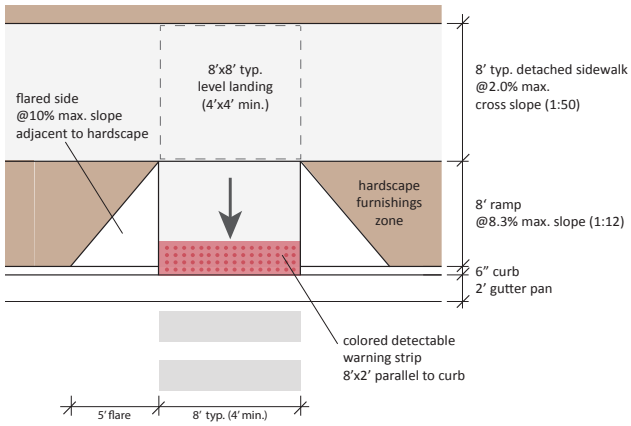
Key Design Elements

- All curb ramps shall be constructed to the width of the approaching sidewalk. A min. 4'x4' level landing shall be provided at top of perpendicular and diagonal ramps, and at the bottom of parallel ramps.
- Ramp grades shall have a 1:12 (8.3%) max. slope; blended transitions shall have a1:20 (5%) max. slope.
- Curb ramp sides shall be flared when adjacent to walkable hard surfaces (i.e. within mixed-use contexts), but return curbs may be used when adjacent to turf or other landscaped surfaces where pedestrians are unlikely to walk (i.e. within a residential context). The maximum slope for ramp flares shall be 1:10 (10% max.)
- All corner treatments must include a 2' colored detectable warning strip at the bottom of the ramps to signal transition into the vehicular travelway a the point of street crossing.
- Crosswalk markings shall extend across the full width of street pavement; 6' min. width or the same width as the approaching sidewalk or trail.
- Ladder style crosswalks are encouraged in locations where added visibility is desired.
- Ladder lines shall be 12' - 24" wide and separated by gaps of 12' - 60".
- The design of the lines and gaps should avoid vehicular wheel paths if possible to minimize maintenance needs for restriping crosswalks.

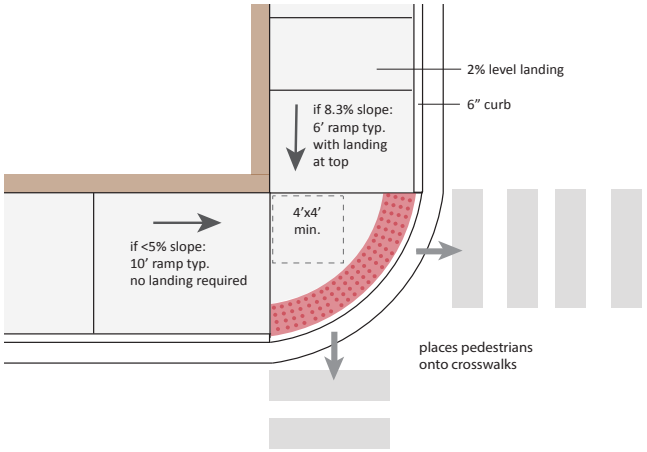
FIGURE 3.6 CURB RAMP IMPLEMENTATION DETAILS



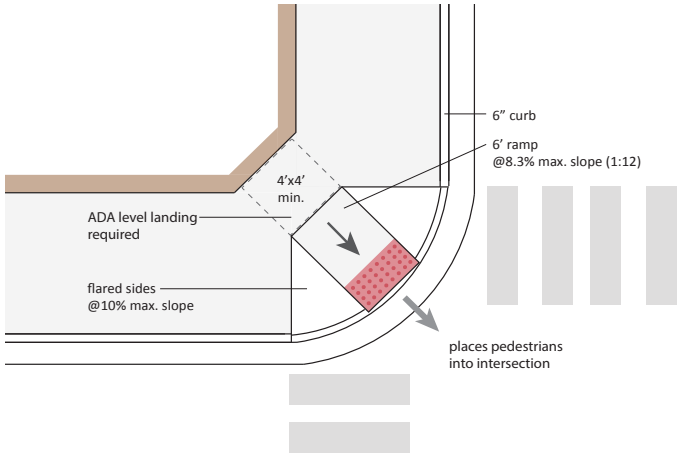
Perpendicular Curb Ramps - residential context



Perpendicular Curb Ramps - mixed-use context



Blended Transitions - preferred design



Diagonal Curb Ramps - not recommended

Corners

Curb ramps and blended transitions are critical components of the pedestrian realm that provide access between the sidewalk and street for people using wheelchairs or walkers, pushing baby strollers, etc. All curb ramps will be constructed according to the latest ADA PROWAG guidance and shall lead directly into crosswalk locations. See Figure 3.6.

- Curb ramps may be parallel, perpendicular, or a combination of both. Single diagonal curb ramps that place pedestrians into the center of the intersection, rather than the crosswalk, shall be avoided.
- Blended transitions (depressed corners) provide a more gentle grade connection to street. Designs do not require level landings at top of ramp, but must address storm drainage at bottom to minimize ponding water within the pedestrian travelway.

Crosswalks

Provide designated crosswalks in the following locations:

- At signalized intersections.
- At key crossings along designated school walking routes.
- At certain types of uncontrolled crossings to indicate a preferred pedestrian crossing location.
- To alert drivers to an often-used pedestrian crossing.
- In midblock locations where a multi-use trail crosses streets at-grade.

Designated crosswalks are not appropriate in the following locations unless located at a signal:

- On roadways where the speed limit is >40 mph.
- On streets with four or more travel lanes carrying >12,000 ADT without a raised median or refuge island.
- On streets with four or more travel lanes carrying >15,000 ADT with a raised median or refuge island.

Signals

Ensure signal pedestrian-actuated push buttons are positioned laterally and vertically to be accessible to persons with disabilities.

- The push button shall be 1.5 feet to 10 feet from the back of curb.
- Vertical height shall be 42"

Adjust signal timing to allow adequate time for pedestrians to cross the width of the street.

- Calculate pedestrian clearance intervals for traffic signals using 4.0 feet/second avg walking speed.
- Use a slower walking speed of 3.5 feet/second in areas with high use by less-capable older pedestrians, wheelchairs users, and families with young children.

Strategy 3.7

Develop walkable, complete neighborhoods that incorporate small blocks, mixed uses, continuous sidewalk networks, and traffic-calmed streets.

Providing ADA accessible sidewalks, by itself, will not encourage increased levels of walking. Land use, urban design and transportation planning combine to create various environments of differing levels of pedestrian friendliness. Trip length, level of personal safety and comfort, interest along the route, and human-scale details all influence the successful development of pedestrian-supportive corridors and neighborhoods.

The City of Brighton desires to shift away from typical suburban development patterns found in much of the Northeast Metro area, instead focusing on how urban form, intensity and design character will combine to make frequent walking (and transit) use attractive and efficient choices for many people. Development of this *2016 Transportation Master Plan* is being coordinated with the *2016 Be Brighton Comprehensive Plan* update to collectively develop a community vision and implement a focused implementation plan for the next 20 years.

A SUSTAINABLE + COMPLETE COMMUNITY

The *Be Brighton* vision includes prioritizing the development of mixed-use neighborhoods with multiple transportation options to reduce singe-use sprawl, infrastructure extensions, and vehicle miles traveled. This includes providing bike lanes, sidewalks, trails and complete streetscapes to make walking and bicycling convenient and viable for all types of trips and for all ages, abilities, and income levels. It also includes supporting Downtown reinvestment and infill with streetscape improvements and residential development, as well as embracing changes that strengthen Brighton's quality of life by encouraging new, high-quality urban development that responds to the unique character of Brighton.

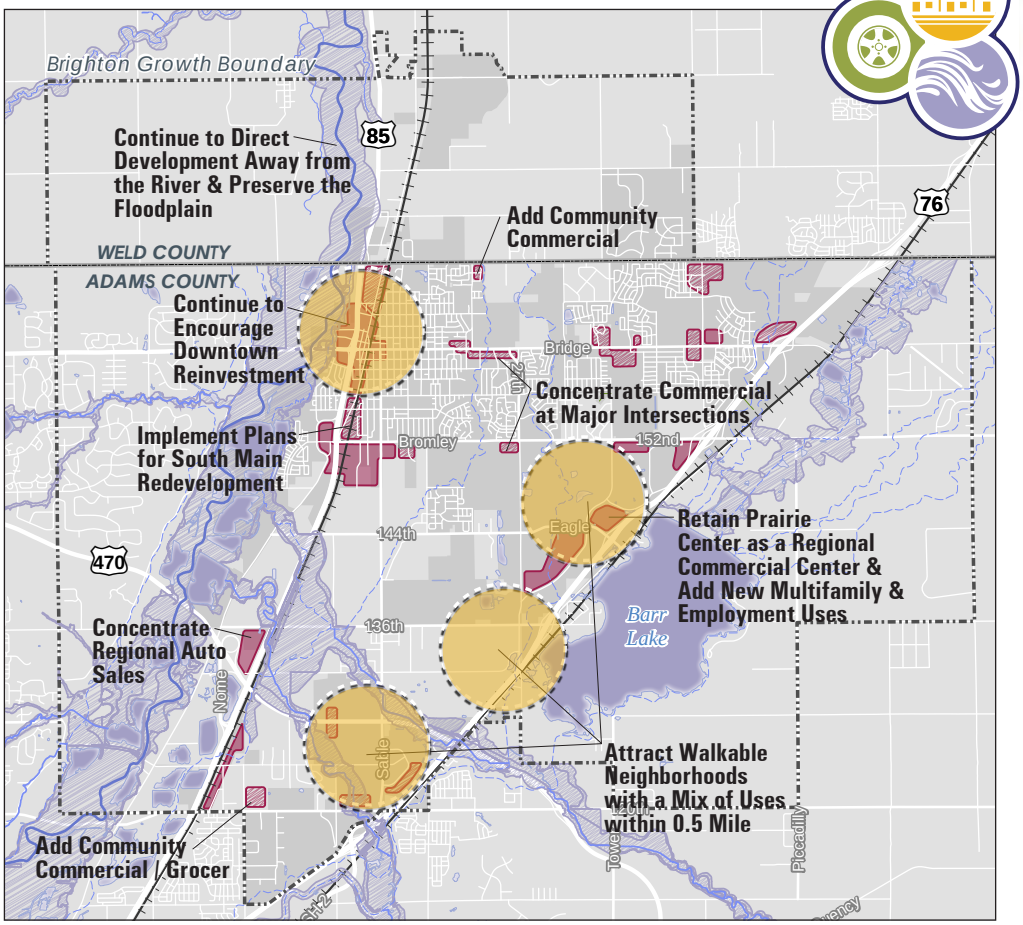


FIGURE 3.7
WALKABLE URBAN NEIGHBORHOODS
as proposed in the draft 2016 Be Brighton Comprehensive Plan

BE BRIGHTON

BE UNIQUE. BE INCLUSIVE. BE SUSTAINABLE.

2015 City Council Priorities

- A values-based future.
- High quality of life.
- Focus on the triple bottom line of social, economic, and environmental sustainability.

Motto:

WHAT WE VALUE TODAY IS WHAT WE BECOME TOMORROW

Key to realizing these goals will be addressing the link between land use and transportation. The City of Brighton will incorporate recommendations of the adopted *2016 Transportation Master Plan* into the subsequent *2016 Comprehensive Plan Update*, as well as future revisions to the *City of Brighton Land Use and Development Code* that will be needed to enforce implementation of key principles for creating walkable neighborhoods.

These concepts are appropriate within most of the core area of the City of Brighton, and will be prioritized within the community's four proposed Urban Centers, as depicted in Figure 3.7:

- Downtown
- Bromley Park
- Prairie Center
- Adams Crossing

Urban Centers

Areas designated for a higher intensity mix of uses that support a range of housing, job and mobility options amid high-quality urban design; eligible for special funding from the Denver Regional Council of Governments.

WALKABILITY COMPONENTS

Key principles to address in strengthening these areas as complete, walkable communities include the following. Several of these actions will be achieved within public street rights-of-way by implementing the recommendations of this *Transportation Master Plan*; others will depend on the actions of private developers as part of coordinated community design, development, and decision-making processes.

Small Blocks

Walkable places will have ideal block sizes ranging from 330'-350' in length, similar to the historical layout of Downtown Brighton. Small blocks arranged on an interconnected street grid enable multiple route options and short trip lengths between destinations that can be made by walking. The City of Brighton will follow LEED ND guidance for street connectivity, which reflects block size and walkability criteria. (See Chapter 6 and Appendix D.)

Site Layouts

Lot frontages will not be dominated by driveways and parking lots. Instead buildings will face and embrace the street, located at build-to lines or small setbacks. Building frontages and the semi-public/private space in between building and street will have human-scale architectural details and streetscape elements that add interest and user comfort to the pedestrian realm. Parking will be internal to blocks, structured, or otherwise managed to accommodate vehicular access to destinations without compromising the character of the place. Site layouts will ensure pedestrian access and connectivity from front door of building to the sidewalks within the public right-of-way.

Mix of Land Uses

Planned Unit Developments (PUDs) targeted as Urban Centers will encourage a high intensity mix of uses that offer balanced housing choices, diversified job and education opportunities, and recreational activities to create an inclusive community. As Brighton's employment base continues to grow and diversify, the option to both live and work within a small geographic area will reduce commutes, encourage active transportation, enhance social networks, and improve air quality.

To truly become a walkable neighborhood, Urban Centers will need to focus on developing synergy within a half-mile walking radius of the core pedestrian activity area. Surrounding this central pedestrian place will be a mix of multifamily, apartments, senior housing, office and lodging uses, transitioning to lower intensity single-family detached residential land use.

Continuous Sidewalk Networks

Sidewalks within the half-mile Urban Center walk sheds will be developed to a higher standard than the rest of the community, allowing two pair of pedestrians to meet and pass, window shop, stroll, linger, etc. (See commercial/mixed-use street cross-sections and design elements on page 52.) Sidewalk frontage and furnishings zones will offer visual interest and create unique identity through the use of colored and textured pavements, lighting and signage, pedestrian amenities, and other urban design treatments. Pedestrian

crossing opportunities will be frequent and accommodate users of all ages and abilities. Sidewalk networks and crossings will link to transit stops and provide last-mile multimodal commuting opportunities.

Traffic-Calmed Streets
Traffic will move at a slow, human-scaled pace through Urban Centers. By design, street corridors and intersections will not encourage motor vehicle speeds over 25mph within the Urban Centers. Travel lanes will be narrow, with on-street parking allowed. People on foot will have priority over cars.

Placemaking
Areas with the highest levels of pedestrian accommodation will become pedestrian place destinations – districts of limited extent, with mixed-use land development, moderate to high densities, good transit service, great streets, and extensive pedestrian accommodation in the form of sidewalks, crosswalks, and other facilities. Here people will stroll and linger past store fronts and urban landscape features, walking for both utilitarian and recreational purposes.

The acid test for qualifying a place as a pedestrian destination is the actual ongoing presence of significant numbers of people. Pedestrian places will have people moving about between multiple activities -- typically at least three highly identifiable areas such as sidewalk cafes, a water feature, kids' play area, outdoor seating, food trucks, pedestrian-oriented shopping, etc. Pedestrian places will be park-once districts, where people will want to get out of their vehicles and enjoy the ambiance that has been created through good urban design.

Strengthening and creating authentic places within the proposed Urban Centers mapped on page 25 will mean being **people focused**.

Whether creating a new place, or adding to the sense of place found in the historical Downtown and surrounding neighborhoods, the City of Brighton will need to empower, educate and grow in a manner consistent with the community vision to provide Brighton and its residents with the best of all places.

This will need to be accomplished through coordinated implementation of this *Transportation Master Plan* and the *Be Brighton Comprehensive Plan* by addressing the layout of land uses, the design of buildings, and the allocation of space within public street right-of-ways.

Active Transportation Action Plan
To Be Completed by 2020

NETWORK PLANNING

Strategy 3.1 – Routinely incorporate bicycle and pedestrian facilities into the design of all new streets and major capital reconstruction projects.

- ❑ Retrofit/construct (4) street improvement projects. . . . **Longs Peak, Southern, 45th, 40th/Tower**
- ❑ Complete a corridor retrofit study to reclaim Bridge Street for multimodal use.
- ❑ Ensure multimodal accommodation through the new interchange at Bridge/I-76.

BICYCLE CORE AREA CONNECTIVITY

Strategy 3.2 – Retrofit existing streets within the core area of Brighton to include bicycle accommodation.

- ❑ Add sharrows and signage to identify (7) segments of local streets intended as connections in the bicycle network. . . . **Longs Peak, E. Southern, W. Southern, Miller, Main, 8th**
- ❑ Add lane striping and signage to (10) existing streets to provide bicycle lanes throughout the Core Area. . . **Longs Peak, Egbert, E. Southern, Jessup, Platte River Blvd, Main, 11th, 8th, 18th/19th, Medical Center Drive**
- ❑ Complete priority missing links in parallel trails within (3) street rights-of-way. . . . **Bridge, Peoria, I-76 West Frontage Road**
- ❑ Construct (1) segment of cycle track. . . . **E. Southern**

Strategy 3.3 – Complete Brighton's multi-use trail system and ensure seamless transitions between on-road and off-road facilities.

- ❑ Construct (2) new trail segments as part of the City of Brighton Trails and Open Space System. . . . **Colorado Front Range Trail along the S. Platter River and McCann Ditch**

Strategies 3.4 & 3.5 – Bikeway Signage Program/Bike Brighton Subcommittee

- ❑ Continue annual discretionary funding for trail missing link needs.
- ❑ Establish annual discretionary funding for on-street bikeway missing link needs.
- ❑ Establish annual discretionary funding for bicycle encouragement and education programs.
- ❑ Post Share-the Road signing along (1) rural route. . . . **Brighton Road**
- ❑ Compete (1) spot improvement to provide connectivity. . . . **S. Main Street**

PEDESTRIAN NEEDS

Strategy 3.6 – Construct all new streets and retrofit existing corridors to meet accessibility needs for all pedestrians.

- ❑ Complete an ADA transition plan to inventory universal design and access needs.
- ❑ Establish annual discretionary funding for pedestrian infrastructure missing link needs.

Strategy 3.7 – Develop walkable, complete neighborhoods that incorporate small blocks, mixed uses, continuous sidewalk networks, and traffic-calmed streets.

- ❑ Incorporate TMP recommendations into the *2016 Be Brighton Comprehensive Plan* update and subsequent revisions to the *City of Brighton Land Use and Development Code* that will be needed to create walkable neighborhoods.

Chapter 4
TRANSIT PLAN

The Transit Plan describes the vision for a future transit network in Brighton and a strategy for achieving that vision. Implementation of this transit plan will be important to meeting the transportation goals identified by the community, in particular Goal #2 and Goal #6 (see Chapter 1). The Transit Plan includes three major elements:

- Regional High-Capacity Transit
- Local Transit
- Supporting Capital Investments

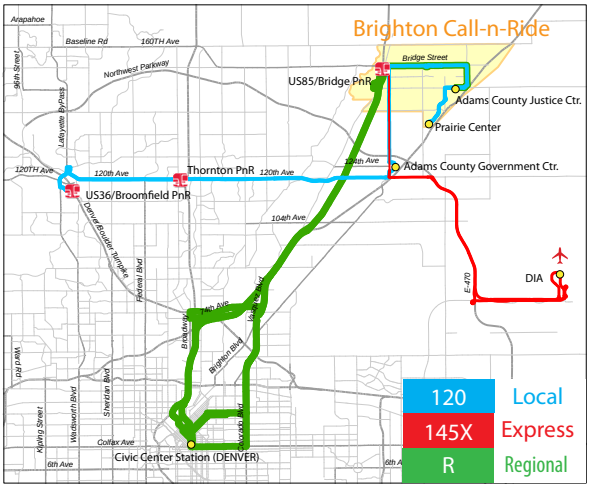


FIGURE 4.1 EXISTING BRIGHTON TRANSIT SERVICE

NEED FOR TRANSIT IN BRIGHTON

Public transit in Brighton is provided by RTD (Regional Transportation District). Existing service includes three fixed-routes and a call-n-ride, with limited frequency and no evening or weekend service (see figure 4.1 & 4.2). Transit service levels to and within Brighton have not changed significantly in the last 15 years despite the fact that Brighton's population has grown by over 70% since 2000. As a result few Brighton residents and (even fewer) Brighton employees use transit as a means of transportation in Brighton (see figure 4.3). Existing transit primarily serves a small segment of the transit-dependent population and some commuters working in downtown Denver and DIA. In addition, Brighton will not be served by any of the future rail or BRT (Bus Rapid Transit) lines being built as part of FasTracks. Despite the limited service, demand for transit is growing in Brighton. Transit ridership on routes serving Brighton has grown by 24% since 2010, about 4 times the ridership growth of the Denver Region (see figure 4.4).

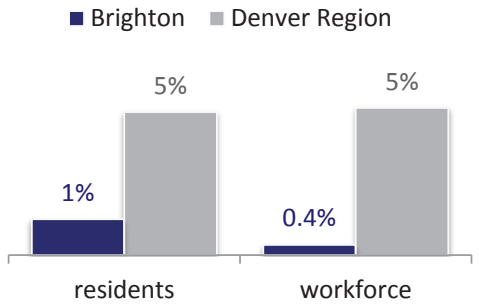
FIGURE 4.2 TRANSIT SERVICE LEVELS & RIDERSHIP

routes	weekday roundtrips	weekend roundtrips	weekday ridership*
120	16	0	329
145X	2	0	32
R	9	0	282
Call-n Ride	5:30AM-7PM	no service	53

source: RTD, Jan 2015

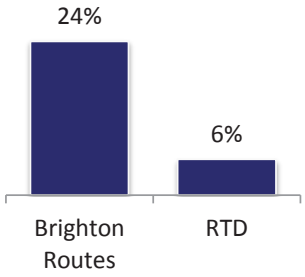
*riders that alighted or boarded in the Brighton Planning Area

FIGURE 4.3 TRANSIT COMMUTE MODE SHARE



source: 2009-2013 American Community Survey

FIGURE 4.4 2010-2013 TRANSIT RIDERSHIP GROWTH



source: RTD

RTD Service Buy-Ups

A number of communities throughout the Denver Region have used grant money or other funding sources to pay RTD to initiate or increase transit service on particular route above what RTD would typically provide based on their predetermined service standards. Service buy-ups are a great means of testing ridership potential. As a recent example, in 2013 Commerce City received a 2-year grant through DRCOG to pay for 80% of operating costs to start the route 104x, which operates along 104th Avenue to Denver. Since it was implemented ridership on the 104x has grown to the point that RTD will take-over the service costs in 2016.

Brighton is a small community within the Denver Region (with a population of about 37,000 in 2015) but is growing quickly. The population within the Brighton planning areas is expected to more than double by 2040. When combined with increasing demand for transit, significant future increases in transit service will be warranted. In order to meet existing and future demand, transit service levels over the next 25 years will need to grow at a faster rate than population growth (see transit benchmark on page 8).

BRIGHTON'S ROLE IN PROVIDING TRANSIT

RTD is the primary service provider of transit. However, the City of Brighton and other agencies besides RTD will have a role in planning for, providing and improving transit to Brighton, including DRCOG and CDOT. Multi-jurisdictional collaboration will be important to implementing future transit service improvements. The City of Brighton, in collaboration with Adams County and surrounding jurisdictions, will support transit in the following ways:

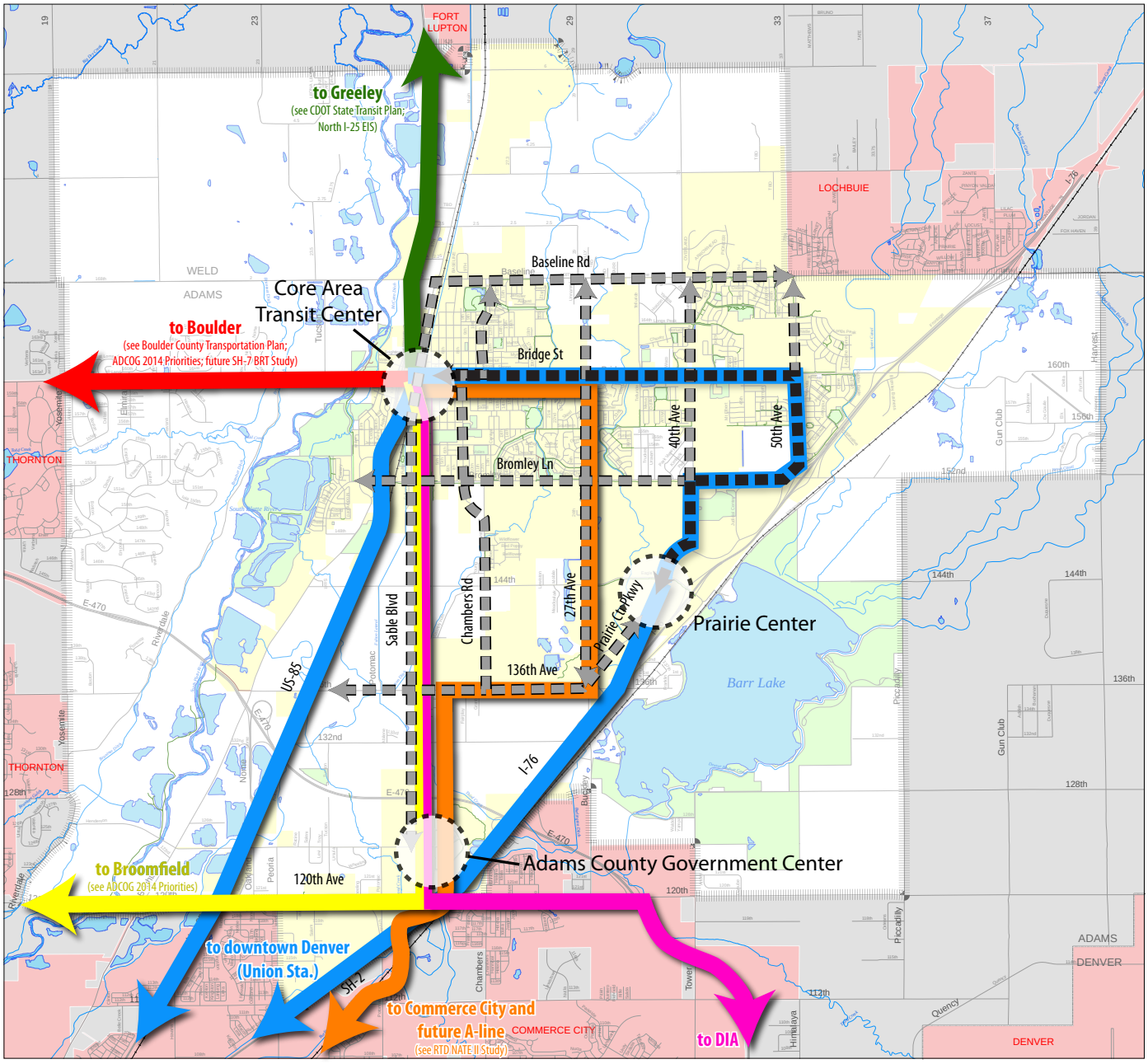
- **Planning** – Provide direction to RTD, DRCOG and CDOT on the planned locations and corridors for transit service.
- **Capital Infrastructure** - Invest in infrastructure that will support transit, such as a well-connected road network, bicycle/pedestrian facilities, improved bus stops, park-n-rides, transit centers and dedicated (on-street or off-street) bus layover facilities.
- **Service Buy-Ups** – Seek grants and partnerships to fund new or increased service on RTD routes beyond the minimum service standards (see sidebar). If the service increases are successful, RTD may take over costs of the additional service.
- **Ridership Incentives** – encourage and support provision of Eco-Passes to residents and employees (see TDM section in Chapter 6).

ROLE OF PUBLIC TRANSIT IN BRIGHTON

Future public transit, as described in this chapter, will play an important role in the transportation network in Brighton by 2040, including providing the following:

- **Connecting people to jobs and services** - Future transit will enable Brighton residents to access jobs and services within Brighton and throughout the Denver region, as well as allow residents of neighboring communities to access employment and other services within Brighton.
- **Connecting Brighton to Denver Region** - Future transit service will connect Brighton with the major destinations and transit corridors in the Denver region.
- **Supporting a healthy economy** - Future transit will contribute to Brighton's economy by encouraging transit-oriented development, supporting job growth and making Brighton a more desirable place for residents and businesses to locate.
- **Providing a viable means of transportation for all residents** - Future transit in Brighton will provide a viable means of transportation to all riders including "choice riders" and transit-dependent riders, such as the elderly, disabled, children and low-income populations.
- **Mitigating future traffic demand** - Future transit will reduce per capita VMT (vehicle miles traveled) within Brighton, thus reducing the demand for expensive future roadway widening projects.

FIGURE 4.5 TRANSIT VISION MAP



Future Regional Transit (express bus/ BRT)

- downtown Denver
- SH-7
- Commerce City/A-line
- DIA
- 120th Ave
- Greeley

Future Local Transit

- high priority corridor
- future corridors
- major transit node

- City of Brighton planning area
- current Brighton City Limits
- adjacent community jurisdiction
- unincorporated county outside of Brighton planning area
- parks & open space

updated 2.11.16

REGIONAL TRANSIT

Express/Bus Rapid Transit (BRT) will provide frequent connections from Brighton directly to regional employment centers, including Downtown Denver, the US-36 corridor and Denver International Airport, as well as employment centers in Brighton. As regional express bus routes reach their practical maximum capacity Commuter Rail will support the continued employment growth in Brighton and throughout the region.

Location, Location, Location

Brighton's geographic location within the Denver region (at the crossroads of several major highways and rail corridors and within close proximity to downtown Denver, DIA and other north Metro communities) presents an opportunity for the City to become a node of a future regional high-capacity transit network. Implementation of such a transit network (as described in this chapter) with connecting routes intersecting in Brighton would enhance the City's regional appeal as a location for business and commercial activity as well as its livability.

Strategy 4.1

Work closely with state and regional agencies and with neighboring jurisdictions on planning for regional high-capacity transit.

FUTURE BRT/ EXPRESS BUS CORRIDORS

The City of Brighton and other jurisdictions and agencies identified several high-capacity regional transit corridors that would serve Brighton in the future (see Figure 4.5). In most cases these routes will be initiated as enhanced regional bus routes and, as ridership warrants, upgraded to BRT and eventually (where feasible) rail corridors. Future routes Brighton will plan for and encourage include:

- Downtown Denver - Service will connect downtown Brighton with Union Station in Downtown Denver following the fastest and most direct route (either US-85 to I-76 to I-25 or I-76 to I-25). This corridor was consistently identified by the public and stakeholders in Brighton as the highest priority for future high-capacity regional transit. RTD's route R provides the only service to downtown Denver today, including nine round-trips on weekdays, mostly during peak hours in the peak direction to/from Civic Center station. Future commuter rail could use the existing Union Pacific rail corridor between downtown Brighton and downtown Denver.
- SH-7 - Future service will connect downtown Brighton with Lafayette and Boulder via SH-7. This route will connect Brighton into the planned regional high-capacity transit network including along the US-85 corridor, RTD's North Metro Commuter line (N-line), the I-25 corridor, the US-287 corridor, the US-36 corridor and the SH-119 corridor. A future BRT route in the western portion of the SH-7 corridor was identified in RTD's 2014 Northwest Area Mobility Study (NAMS). BRT to Brighton was identified in both the 2012 Boulder County Transportation Plan and the 2014 Adams County Council of Governments (ADCOG) priorities. Future bus service was also included as part of the SH-7 PEL by CDOT in 2014. In 2016 Boulder County and Adams County will be conducting a SH-7 BRT Study. Currently no transit service operates along the SH-7 corridor to Brighton.
- Commerce City/A-line - Future service will connect downtown Brighton with Commerce City and the future RTD A-line commuter rail (planned to open in 2016). This corridor was identified in preliminary drafts of RTD's NATE (Northeast Area Transit Evaluation) II Study (final report to be released in 2016). Service would operate from downtown Brighton and follow Bridge Street, 27th Avenue and 136th Avenue in Brighton to the Adams County Government Center, continuing on SH-2 through Commerce City, with a southern terminus at either the Colorado Station or Central Park Station of the future A-line. No transit service currently operates along this corridor.
- Denver International Airport - Future service will connect downtown Brighton with DIA. E-470 is the most direct route, but other corridors including Tower Road and Piccadilly Road could be evaluated based on ridership potential. RTD's route 145X provides two round-trips via Sable Boulevard and E-470 today. A potential interim measure to increase service to DIA would be to connect Brighton to the future Pena Blvd station of the A-line.

What is BRT?

BRT stands for Bus Rapid Transit. BRT is an enhanced bus service with some qualities similar to rail:

- frequent service
- limited stops
- utilizes exclusive or express lanes
- off-board fare payment

Advantages of BRT vs rail?

- lower cost to build and operate
- more route options
- can operate on local streets downtown

- 120th Ave - Future service will connect downtown Brighton and the Adams County Government Center with Thornton, Broomfield and the US-36 corridor via 120th Avenue. Similar to SH-7, this route would provide connections to several planned future high-capacity bus or rail corridors including the US-85 corridor, RTD's North Metro Commuter line (K line), the I-25 corridor, the US-287 corridor and the US-36 corridor. A future BRT route along 120th Avenue is identified in the Adams County Council of Government 2014 Regional Priorities. The 120 local route provides the only service along this route today.
- Greeley - Future service will connect downtown Brighton with Greeley via the US-85 corridor. A regional bus between Denver and Greeley along the US-85 corridor (including a stop in Brighton) was identified as a high priority corridor in the Colorado Statewide Transit Plan (2015) and the North I-25 EIS, both published by CDOT. Since this corridor is outside of RTD's district, service may be provided through the expansion of CDOT's Bustang program (which began operating three intercity bus routes along the I-25 and I-70 corridors in 2015). Brighton will work with CDOT on the provision of future regional bus service between Brighton and Greeley.

FIGURE 4.6 POTENTIAL BRIGHTON RIDERSHIP DEMAND ALONG PROPOSED BRT CORRIDORS

Route/ Destination	percent of daily work trips to/from Brighton (2015)		Existing Transit Service	Route referenced by others?
	to Brighton	from Brighton		
Downtown Denver	2%	7%	RTD route R	none
SH-7	3%	3%	none	ADCOG 2014 Regional Priorities; Boulder County Transportation Plan; RTD Northwest Area Mobility Study (NAMS)
Commerce City/ A-line	2%	2%	none	RTD NATE II Study
DIA	0%	4%	RTD route 145X	none
120th Avenue	5%	5%	RTD route 120	ADCOG 2014 Regional Priorities
Greeley	2%*	1%*	none	CDOT Statewide Transit Plan (2015); North I-25 EIS
Total Work Trips	15,978	19,194		

source: DRCOG Focus Model (2014 cycle); includes all work trips between TAZ's in the Brighton Planning Area and TAZ's within a 1/2 mile of the proposed BRT corridor (see Appendix C for more data)
*Work trips between Brighton and Greeley are based on the 2006-2010 CTPP as these trips are not included in the DRCOG Focus Model

RAIL PASSENGER SERVICE

Future regional transit to Brighton will be provided through express bus and BRT routes. However, as ridership builds along these future BRT corridors and reaches their practical maximum capacity, commuter rail will be evaluated and potentially implemented. The corridors with the most potential to one day host future passenger rail service to Brighton are along the existing Union Pacific rail line between Denver, Brighton and Greeley and the E-470 corridor to DIA and US-36. Provisions for future commuter rail between Brighton and Denver will be included as part of RTD's NATE II Study (final report to be released in 2016).

Connect to RTD North Metro Line

The RTD North Metro Commuter Rail Line (N Line) is planned as part of FasTracks and will provide commuter rail service between Denver Union Station and Thornton. The line is currently under construction and when it opens will be the closest commuter rail line to Brighton. The line is being built in two phases. Phase 1 is currently under construction and will open in 2018. It includes the first 13 miles (of 18.5 miles total) with a northern terminus at the Eastlake-124th Avenue Station. The second phase is currently unfunded and will extend the line north to SH-7 (see Figure 4.7).

Brighton will work with RTD to provide frequent express bus service between downtown Brighton and the Eastlake-124th Avenue Station when the N-line opens in 2018. A convenient transit connection to the station will take advantage of the frequent express rail service the new line will provide to Thornton, Commerce City and Downtown Denver. When the N-line is extended north to SH-7 at a later date, express bus service will be provided between Brighton and the future SH-7 station (potentially via the future SH-7 BRT).

FIGURE 4.7 RTD NORTH METRO LINE MAP

graphic courtesy of www.RTD-Denver.com

LOCAL TRANSIT

Local bus service in Brighton will improve as the City's population and employment grow. New routes will circulate within the city connecting major destinations, including downtown, the Prairie Center mall, and commercial corridors, and will serve transit hubs, providing convenient connections to other local and regional transit routes. Local transit routes will operate along the arterial and collector road network (see Chapter 5) with frequents stops. Routes will initially be spaced about 1-mile apart and as density increases spacing of corridors will be decreased to 1/2-mile apart (see Figure 4.5).

Strategy 4.2

Work with RTD and Adams County to establish a local fixed-route transit network in Brighton.

FUTURE CORRIDORS

The most successful local transit routes are those that connect major community destinations with frequent service along a direct route with few deviations.

Bridge Street

Given the types of local routes most likely to succeed, the highest priority corridor for local transit service in Brighton today is a route along Bridge Street that connects downtown Brighton and the Prairie Center Shopping Mall. The existing 120 bus provides service along this corridor. Future service along this corridor will be improved to provide more frequent and reliable service at more times of day.

Other Corridors

As Brighton's population grows and demand increases additional local routes will be added along other corridors (see Figure 4.5). Priority will be given to routes that provide direct connections to commercial activity centers, major employment centers and schools in Brighton (see sidebar below). Future routes will be planned to provide convenient connections between other local and regional routes.

Future Local Transit Corridors

- Bridge Street (highest priority)
- Bromley Lane
- Baseline Road
- 136th Avenue
- 27th Avenue
- 4th Avenue/Sable Blvd
- Chambers Road/11th Avenue
- 50th Avenue
- Prairie Center Parkway

Major Destinations in Brighton

- Downtown (Main Street/Pavilions)
- Prairie Center
- Adams County Government Center
- Adams County Justice Center
- Bridge Street Commercial Corridor
- City Hall
- Bridge Street/50th Avenue
- Bromley Lane/US-85
- Brighton Recreation Center
- Public Schools

SUPPORTING CAPITAL INVESTMENTS

Supporting capital investments and strategic planning will play an important role in improving transit within Brighton. The four most critical capital elements that Brighton will implement to support transit service include:

- Bicycle/Pedestrian Infrastructure – to provide access to the bus stops
- Well-Connected Street Network – to provide efficient bus circulation along collectors and arterials within the community and convenient access by foot, bicycle and personal vehicle to/from transit stops
- Strategic Land Use Planning – to provide activity nodes with sufficient density at strategic locations to support transit service
- Bus Stops and Amenities – to provide access to transit and in some locations dedicated space for layover facilities, bicycle and vehicle parking and connections between routes

Capital improvements to the first two elements listed above (bicycle and pedestrian infrastructure and the road network) are described in Chapter's 3 and 5 respectively. This section will focus on actions Brighton will take to support the latter two elements, land use planning and bus stop improvements.

Strategy 4.3

Encourage and support new development as well as infill development in identified mixed-use centers that will serve as destinations and service nodes for local and regional transit routes.

LAND USE

Transit works best when routes connect major activity centers along commercial corridors. Brighton will encourage and support development of identified mixed-use urban centers (see the *2016 Be Brighton Comprehensive Plan* - also highlighted in Figure 3.6 in Chapter 3), which will enable transit to more effectively serve the transportation needs of Brighton residents and employees. The locations of the urban centers identified in the Comprehensive Plan (see Figure 3.6) are the same locations identified as nodes for future local and regional transit in Figure 4.5.

Strategy 4.4

Improve existing bus stops and develop new transit facilities to support "first and last-mile" transit needs and efficient bus service operations.

TRANSIT FACILITIES

Improvements to transit facilities in Brighton (as described below) will be designed to support two specific objectives:

- First and Last Mile Access - Completing the first or last mile of a transit trip (between the local bus stop and front door of a residence or place of employment) can be a barrier to using transit, particularly for people wishing to bike or walk to access transit stops. Addressing the last-mile needs of public transportation is thus a major requirement for increasing transit ridership.
- Efficient Transit Operations - Strategic location and design of bus stops, transit centers, park-n-rides and bus layover areas will be important to developing an efficient transit network in Brighton that provides timely connections between transit routes, frequent service, and access by other modes (walking, biking and driving).

Bus Stop Improvements

In order to improve the quality of service, provide better active transportation access, and raise the transit system's visibility, Brighton will work with RTD and developers, as well as leverage voluntary support from adjacent landowners, improvement districts and neighborhood associations to make improvements to existing and future bus stops within the City. Capital improvements will include the addition of shelters, lighting, bike parking, posted bus information (such as schedules and maps) and trash receptacles. Prioritization of bus stop improvements will be based on average number of daily boardings and future transfer locations, with a lower priority assigned to stops that are temporary or may move locations.

Detailed design considerations and criteria for improving existing bus stops and developing new stops are described on page 38 and 39. Additional improvements beyond the immediate station area that will support first and last mile access, such as crosswalks, sidewalks, and bike lanes, are discussed in Chapter 3.

Core Area Transit Center

The US-85 and Bridge Street park-n-ride will serve as the de-facto transit center in Brighton in the near future. However, as transit service in Brighton grows the City will work with RTD to establish a long-term transit center in the core area of the City (in the same or a new location). The primary purpose of the transit center will be to provide a central transfer point between converging local and regional routes and a terminus/bus layover location. The transit center can be on-street or off-street as long pull-offs are provided for multiple regional and local buses. Parking is not necessary, but if included will be integrated with the surrounding land uses. Consideration will be given to existing and planned transit routes and local land uses when identifying a location and designing a future transit center.

Park-n-Rides

The only existing park-n-ride in Brighton is at the US-85 and Bridge Street location in downtown. To serve the growing population on the east side of town, Brighton will work with RTD and landowners to establish one or more park-n-rides on the east side. Park-n-rides would be served by existing and future regional bus routes.

Bus Layover Facilities

Provision of a layover area at the end of a bus line is necessary to prevent delays and give bus drivers periodic breaks between runs. Brighton will work with RTD and local landowners to provide a dedicated space for buses to layover at or near the end of their route. The layover location could be provided at a park-n-ride, transit center or on-street bus stop (as long as there is a pull-off area outside of travel lanes and a nearby restroom for drivers). Prairie Center will be a major transit node within Brighton, and will serve as a terminus for future local and potentially regional routes. Therefore it will be important to identify a location for layover of existing and future bus routes in or near the Prairie Center shopping mall. Depending on the location, an east-side park-n-ride could double as the Prairie Center layover facility in the future.

Bus Stop Design Considerations

Bus stops shall be designed to consider efficient transit service, accessibility by users of all abilities, and comfort for patrons waiting to board a bus (see design drawing of a typical bus stop below).

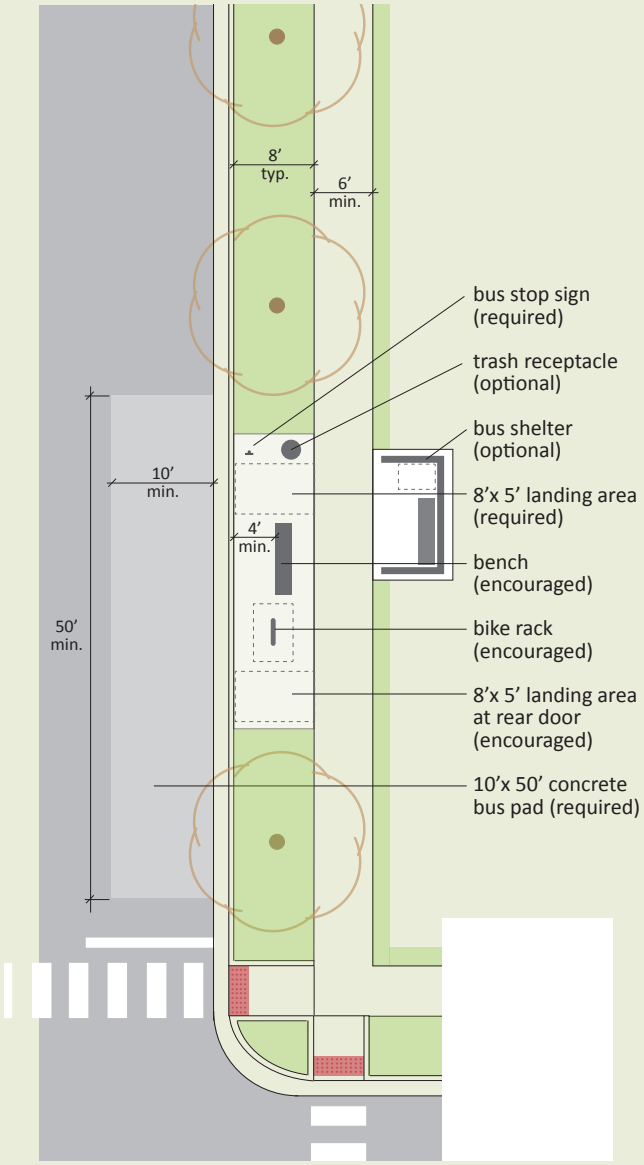
Transit Service Operation

- Concrete bus pads shall be provided within the curb-side travel lane to improve durability and maintenance of a street in locations where heavy transit vehicles regularly start and stop.
  - A full-pavement depth, reinforced concrete pad 10'x 50' in size is required.
- Farside stops are the preferred design treatment to allow a bus to pass through the intersection before stopping.
- Bus turnouts may be provided within corridors built to interim street cross-sections (one less travel lane than at ultimate build-out).
  - Bus turnouts are dedicated stopping areas where buses leave higher speed travel lanes to stop and safely load and unload passengers.
  - Tapers a minimum of 25' in length shall be provided to permit buses to enter and exit the traffic stream.
  - A 10'x 50' concrete bus pad shall be provided within the turnout space.

ADA Accessibility

- The Americans with Disabilities Act (ADA) requires providing a continuous pedestrian access route (PAR) leading to a paved landing area at all bus stops.
  - A 4' min. PAR must be maintained free of obstacles and protruding objects. This includes a 4' min. space in front of shelters, benches and other waiting amenities.
  - Paved landing areas shall be provided to facilitate the boarding and alighting of wheelchair passengers on transit vehicles using lifts or ramps.
  - Landing areas shall be 5' wide and 8' in depth, measured from back-of-curb.

BUS STOP IMPLEMENTATION DETAILS



Bus Stop Design Considerations continued . . .

Bicycle and Pedestrian Amenities

- Bus stop signs shall be installed in all locations to identify the bus stop.
- Benches are encouraged at all stops.
  - Shall be oriented either toward the street or the direction of the approaching bus.
  - Designs shall meet ADA specifications for bench accessibility.
  - All benches shall be installed on a concrete pad, typically 9'x 3' in size.
- Trash receptacles are optional and shall be located at stops with high ridership, a demonstrated need, and a commitment to trash collection.
- Bicycle parking racks are encouraged at all bus stops.
  - Style of bicycle rack shall be an inverted-U.
  - At least 1 rack shall be installed in the center of a 4'x 6' concrete pad to provide space to secure two bicycles.
  - Must be located outside of the PAR and passenger landing area.
- Shelters are encouraged, but not required, at stops within residential neighborhoods. Bus shelters shall be required within mixed-use corridors and at transit stops serving major activity generators.
  - Location may not compromise pedestrian accessibility by partially blocking the sidewalk or extending into the passenger landing area.
  - Design shall be pedestrian accessible and include the following:
    - an opening of at least 36" for wheelchair access
    - a min. 30"x 48" of clear floor space located entirely within the shelter
    - an accessible route connecting the shelter to an 8'x 5' concrete passenger landing area
    - 3' min. clearance maintained around the shelter, with 4' min. clearance between the shelter and back-of-curb
  - Bus shelters may vary in size and style.
    - A typical transit shelter dimension is 6'x11' installed on an 8'x13' concrete pad
    - Transparent sides are encouraged for greater visibility
    - Seating shall be incorporated within the shelter whenever possible

Transit Action Plan
To be completed by 2020

REGIONAL TRANSIT

Strategy 4.1 Work closely with state and regional agencies and with neighboring jurisdictions on planning for Regional High Capacity Transit.

- ❑ Work with RTD to provide a new frequent express bus connection between downtown Brighton and the future North Metro commuter rail line at the Eastlake/124th Avenue station when it opens in 2018 (service would include stops at the Adams County Government Center and Prairie View Middle/High Schools).
- ❑ Work with RTD to increase regional bus service to downtown Denver (potential avenues include utilizing service buy-ups in partnership with Adams County and Commerce City).
- ❑ Work with RTD and Adams County to increase regional bus service to DIA (potential avenues include utilizing service buy-ups and connection to future A-line at the Pena Blvd station).
- ❑ Work with CDOT, RTD, DRCOG and neighboring jurisdictions to study and support development of regional express bus and BRT corridors to Brighton.

LOCAL TRANSIT

Strategy 4.2 Work with RTD and Adams County to establish a local fixed-route transit network in Brighton.

- ❑ Seek a grant in partnership with Adams County to expand the Brighton call-n-ride to provide weekend service in order to test the demand for fixed-route weekend transit service (estimated cost: $180,000 for 2-years).
- ❑ Establish a new frequent local circulator route along Bridge Street between downtown and the Prairie Center shopping mall.

SUPPORTING FACILITIES

Strategy 4.3 Encourage and support new development as well as infill development in identified mixed-use centers that will serve as destinations and service nodes for local and regional transit routes.

- ❑ Complete and begin implementation of the *2016 Be Brighton Comprehensive Plan.*

Strategy 4.4 Improve existing bus stops and develop new transit facilities to support "first and last-mile" transit needs and efficient bus service operations.

- ❑ Work with RTD and the community to identify high-priority bus stops for improvements and begin an annual program of upgrades.
- ❑ Work with local land-owners and RTD to establish a bus layover facility in or near Prairie Center for existing and future local and regional routes.
- ❑ Work with RTD and landowners to study and identify one or more locations for a future park-n-ride on the east side of Brighton.

Chapter 5
THOROUGHFARE PLAN

This Thoroughfare Plan describes the "build-out" street network the City will develop in the future. Because it is not possible to accurately predict the future, the Thoroughfare Plan is based on transportation needs currently forecast for the year 2040. The land area covered by the Thoroughfare Plan is the City's Planning Area as of the date of adoption of this *Transportation Master Plan*. Within this Planning Area, the build-out network includes every major street corridor that will be required to serve that land area.

Network Approach

Brighton's Thoroughfare Plan emphasizes a network approach rather than focusing on specific facilities or corridors in isolation. Complete networks of small, well-connected streets provide more capacity, improve safety and operate more efficiently per lane mile than poorly-connected networks of wide streets. The City's Thoroughfare Plan will be implemented through benchmark criteria that will be used to guide capital investment. (See Chapter 2.) Both street widening and improved connectivity projects will be needed, but connectivity generally will be have higher priority than widening.

The "functional classification" of each of the streets in the build-out network has been identified to guide planning and design. (The functional classification system and the street design standards are provided in this chapter.) Because the Thoroughfare Plan is designed to provide a complete, connected network, most corridors in the plan will not need to be immediately widened to the ultimate width for that classification of street. Accordingly, interim designs are included that will be used for the years between initial establishment of the corridor and full build-out of the width of the street. By identifying the ultimate

build-out cross section (number of lanes, etc.), the City can establish adequate right-of-way width for each street without unnecessary, premature construction of the ultimate build-out cross section.

Safety is Our Highest Priority
This Thoroughfare Plan places the highest priority on the safety of people as they move about in the City's neighborhoods and commercial areas. Brighton will rely on directness of travel and reduced concentration of turning movements at intersections to manage congestion. This will avoid the safety issues other Front Range cities have faced as they have attempted to manage congestion by widening streets in poorly-connected networks. Brighton's complete, connected network will keep travel speeds low while providing more traffic capacity than would be achievable with a poorly connected network of wide, high-speed roads. The safety benefits in reduced accident severity and fewer personal injuries and fatalities will be significant.

Technology
Brighton's street planning and design will take advantage of technology-enabled systems and services. This includes means of monitoring and measuring system performance as well as means of operating systems to achieve maximum efficiency and benefit.

NETWORK PLANNING

Completing missing links in the proposed thoroughfare street system and the supporting local street system will provide several benefits for the greater Brighton community (delivery of services, emergency access, etc.) and to individuals who seek enhanced travel options (both by route and by mode). The proposed street network approach will promote sustainable transportation, enhance local quality of life, and help preserve the City's identity as a freestanding community visually and physically separated from the greater metropolitan region.

Strategy 5.1

Prioritize completing "missing link" connectivity projects over street widening projects.

The benefits of network connectivity can be summarized by comparing the suburban style street layouts found in surrounding communities and unincorporated areas vs. the City of Brighton's proposed network approach mapped in Figure 5.1.

Suburban Street Layout

A system of widely spaced, large arterials fed by smaller roadways that rarely connect with each other:

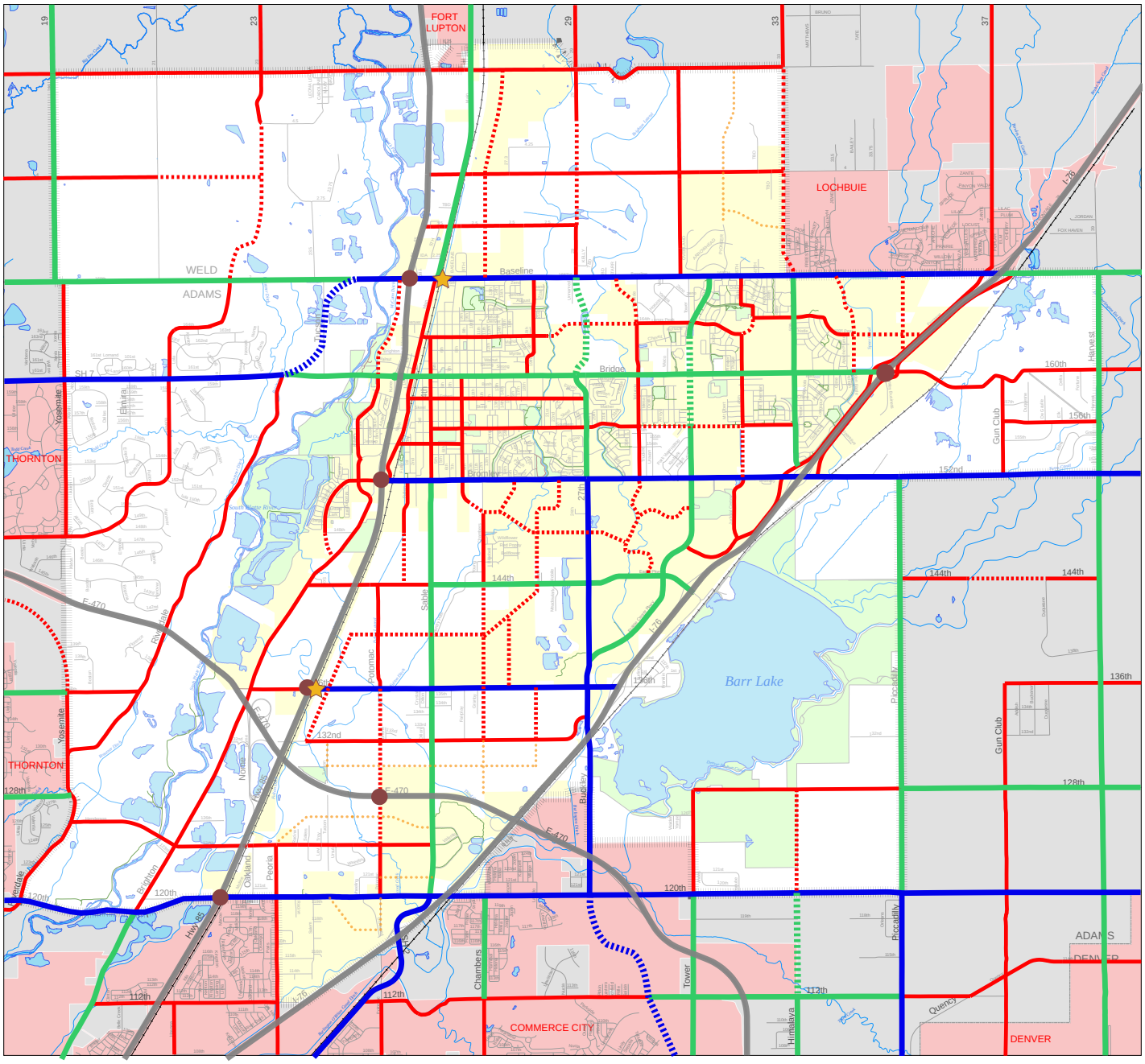
- Concentrates motorized traffic on a limited number of large roads.
- Causes longer, indirect trips.
- Limits opportunities for alternate routes.
- Creates trip distances typically too long to be made on foot or by bike, and discourages biking and walking on streets not designed for active transportation safety or comfort.
- Creates isolated neighborhoods that cannot easily be served by public transportation.

Connected Street Network

A system of well designed, complete streets on a connected grid of relatively short blocks:

- Increases street connectivity in order to give people choices when traveling between home, medical offices, schools, shops, and work places.
- Makes travel more efficient.
- Reduces traffic congestion by dispersing traffic and offering travel options.
- Provides choice not only in travel modes, but also in routes.
- Improves safety with fewer fatal or severe crashes.
- Includes various street types and scales – some may emphasize vehicles and trucks, others may place priority on pedestrians and public transportation.

FIGURE 5.1 BUILD-OUT THOROUGHFARE PLAN



Build-Out Thoroughfare Plan
- Major Arterials
- Minor Arterials
- Collector Streets
- Future Railroad Overpass
- Future Freeway Interchange

Missing Links in Network
- Major Arterials
- Minor Arterials
- Collector Streets
- Neighborhood Connectors (conceptual)

- City of Brighton planning area
- current Brighton City Limits
- parks and open space
- adjacent community jurisdiction
- unincorporated county outside of Brighton planning area

N 0 0.25 0.5 1 Miles

2.11.16
by Charlier Associates, Inc.

Specific final roadway alignment to be established by the developer, working in conjunction with the City of Brighton Community Development and Streets and Fleet Departments.

FUNCTIONAL CLASSIFICATION

Functional classification is the process by which streets and roadways are grouped into classes, or systems, according to character of the traffic (i.e., local or long distance) and the degree of access that they allow. Each class of street (arterial, collector, local) has a specific purpose related to traffic mobility and land access. Many jurisdictions, Brighton included, relate street design criteria directly to roadway functional classification.

Strategy 5.2

Assign functional classification to create a network of streets that are of various sizes and functions to serve a variety of multimodal travel, circulation, and access needs within Brighton.

Brighton will apply a modern approach to functional classification of streets and highways to determine the role of each facility in the network as well as to accurately reflect its scale and land use context within neighborhoods and commercial districts.

Primary criteria of street function, spacing, and continuity have been used to establish the city's existing street network and expansion into future growth areas, as mapped in Figure 5.1 on page 43. (This map is an update of Figure 6 from the *2009 Brighton Comprehensive Plan*.)

In summary, this TMP update to the Brighton Thoroughfare Plan includes the following modifications to address the City's desired approaches to network connectivity, growth management, and development of "complete streets" that will serve multiple modes of travel:

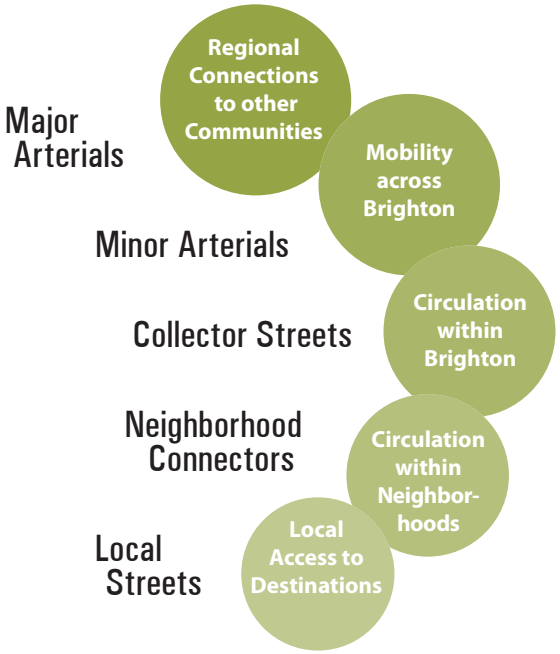


FIGURE 5.2 FUNCTION OF VARIOUS STREET TYPES

- Major and Minor Arterial Streets – Roadway classification as a major or minor arterial will not determine number of motor vehicle travel lanes to be constructed. Instead, the City shall build new streets and widen existing roadways to arterial standards based upon network development needs, which shall be concurrent with growth within the community.
- Collector Streets – Right-of-way alignments from platted subdivisions have been added to the Thoroughfare Plan map. All new collector streets shall include on-street bicycle lanes, or paved shoulders on rural roads without curb-and-gutter. (See proposed Bicycle Network in Chapter 3.) Midblock segments of collector streets will be encouraged to be constructed to alternative cross-sections designed to enhance multimodal use and neighborhood livability characteristics.
- Neighborhood Connectors and Local Streets – These are neighborhood streets that will be laid out, designed, and constructed as part of established land development processes. Local streets are included in the vision for the community's street network approach, but are not depicted on the Thoroughfare Plan. However, key local streets that will be needed to provide network connectivity through geographic areas lacking collector streets are shown in concept as "neighborhood connectors," with final roadway alignment to be established by the developer, working in conjunction with the City of Brighton Community Development Department.

FIGURE 5.3 SCALE & CONTEXT OF VARIOUS STREET TYPES

arterial scale / retail services context

collector scale / main street context

collector scale / rural context

local scale / residential context

STREET DESIGN STANDARDS

Brighton will use street design standards to integrate the design of facilities built by the City with those built by developers and to maximize network performance, cost effectiveness and improve safety. These design standards will ensure that the City establishes the minimum rights-of-way needed for the Build-Out Transportation System, while at the same time allowing for gradual development of increased capacity as growth occurs. The design standards will also preserve the ability of agricultural entities to operate efficiently and safely.

Cross-sections for each street classification presented following are based upon the interim *City of Brighton Public Works Streets Standards,* dated 12/16/2014, and reflect planning and design based upon targeted posted speed limits. For each street type, modifications to the City's existing standards include options for interim designs that will be used for the years between initial establishment of the corridor and full build-out of the street width; provisions for detached sidewalks and tree-planted furnishing zones; and a series of options for context-sensitive implementation based upon characteristics of the adjacent land use.

MAJOR ARTERIALS

- **Function:** provide regional mobility, connecting to and continuing through adjacent jurisdictions
- **Spacing:** every 2 miles
- **Continuity:** continuous across community

Major arterial corridors are streets and roadways that connect Brighton to the greater Denver metro area and communities located north and east in Adams and Weld Counties. These include CDOT freeways (Highway 85, E-470, I-75) and regional arterials (State Highway 7, 152nd, 120th, Buckley) which shall be designed and expanded in coordination with adjacent jurisdictions.

Build-Out Design
Within Brighton, major arterials are proposed to be six-lane streets at build-out, as depicted in the first two cross-sections in Figure 5.4.

Interim Design
Past City policies have been to acquire and develop half of the intended build-out roadway cross-section (resulting in the construction of three lanes within one side of the right-of-way).

Modified policy recommendations are to initially construct a four-lane street with medians, sidewalks, multi-use paths, and an interim wide furnishing zone planted with street trees. If/when traffic volumes and concurrency thresholds are met in the future (see Appendix D) one additional vehicular lane may then be added in each direction.

Of Special Note
Rural roadways that run along the Brighton Planning Area Boundary (CR 19, Yosemite, Picadilly, Harvest, 152nd, 120th) are depicted in Figure 5.1 according to the future functional classification of abutting jurisdictions. The adjacent communities and/or counties plan to upgrade these streets (which currently function as collectors) to four-lane or six-lane arterials as their communities grow, thus different design standards may apply.

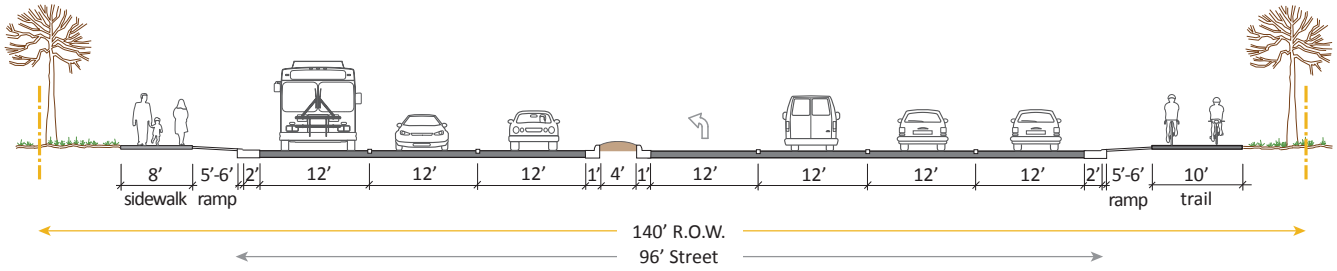
Key Design Elements

- Acquire 140' right-of-way for all major arterials to allow for incremental street expansion
  - Includes pedestrian realm within the R.O.W.
- 35mph posted speeds
- Interim design shall include two lanes of travel in each direction
  - A third lane can be added at build-out conditions, based upon traffic thresholds
  - Median islands, travel lanes, utilities, sidewalks, and street trees shall be placed in build-out locations
  - Outside curb and gutter will need to be relocated upon eventual street widening at build-out
- Provide 16' width for all arterial median islands
  - Allows for a 12' turning lane, plus 4' raised median for enhanced safety at intersections
- Midblock, provide a furnishing zone/tree planting space
  - Minimum 8' width to aid in street maintenance and provide snow storage capacity removed from street and sidewalk in winter
- At intersections, shift trail position to align with crosswalks located within intersection sight triangles
  - Where trails are setback further from street, the trail/bike crossing may be located a distance 20' from curbline or remain at the intersection
- A context-sensitive rural option with 8' wide stabilized shoulders may be implemented to minimize farm equipment/suburban traffic conflicts in areas with active food production operations
  - A multi-use trail shall be provided in the build-out location at edge of right-of-way, but may be constructed of compacted crusher fines as appropriate to the rural setting

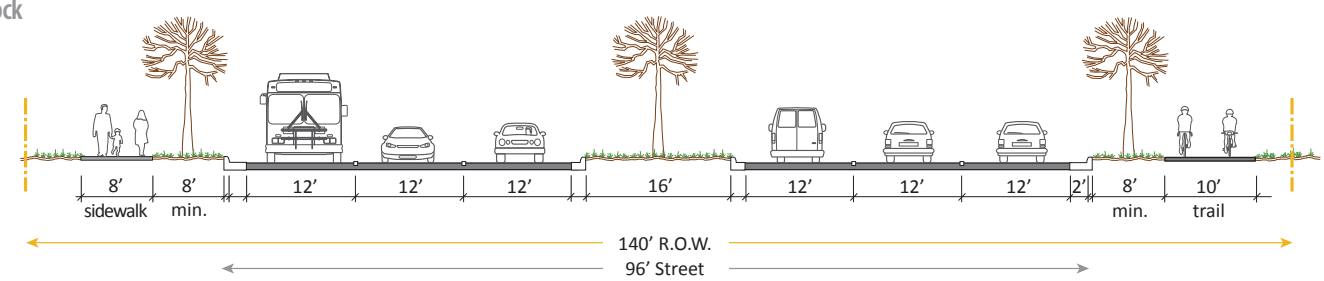
MAJOR ARTERIALS

FIGURE 5.4

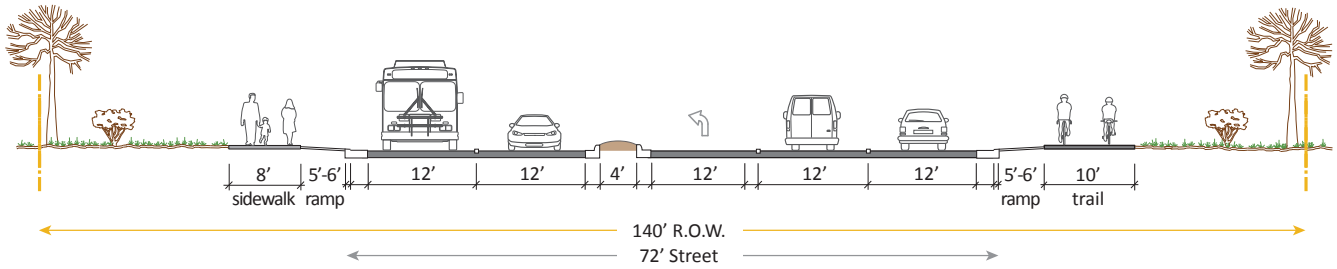
Option 1 - Build-Out Intersection



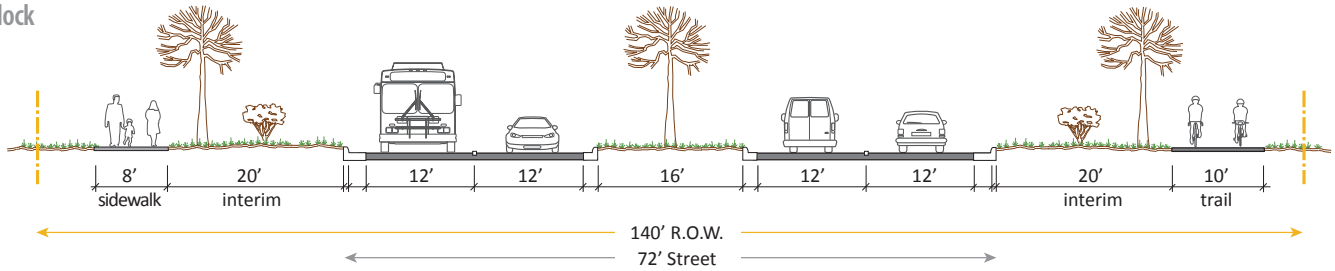
Option 2 - Build-Out Midblock



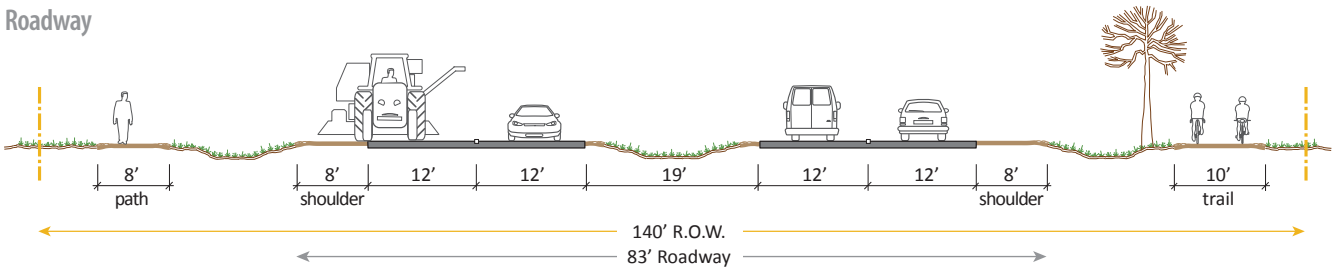
Option 3 - Interim Intersection



Option 4 - Interim Midblock



Option 5 - Interim Rural Roadway



MINOR ARTERIALS

- **Function:** primary function is to provide mobility across the community, with access secondary
- **Spacing:** combined 1-mile corridor spacing (major and minor arterials), with minor arterials alternating between major arterial corridors
- **Continuity:** continuous across community

Minor arterial corridors in Brighton are streets and roadways that provide connectivity between the major regional arterials. Minor arterials include Bridge, Eagle Parkway, Sable, the northern section of 27th, Tower Road, Prairie Center Parkway, and 50th.

Build-Out Design

Within Brighton, minor arterials are proposed to be four-lane streets at build-out, as depicted in the first two cross-sections in Figure 5.5.

Interim Design

Initial acquisition of the full 110' right-of-way for minor arterials will allow for incremental street expansion. Where traffic demand does not warrant full minor arterial build-out, a two-lane street may be constructed. Medians, sidewalks, multi-use paths, and an interim wide furnishing zone planted with street trees shall be included. Then, if/when concurrency thresholds are met in the future, one additional vehicular lane can be added in each direction. (See Appendix D.)

Of Special Note

Streets within Brighton's mixed-use retail and services district (Prairie Center Parkway, Eagle Parkway) are classified as minor arterials by function, but were initially constructed to a six-lane standard in anticipation of serving high levels of commercial traffic.

All other minor arterials depicted on the Thoroughfare Plan on page 43 shall be constructed with two travel lanes (interim design) or four lanes (build-out condition).

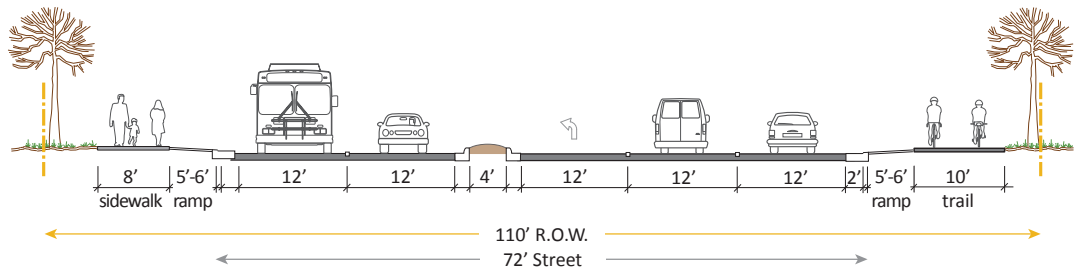
Key Design Elements

- Acquire 110' right-of-way for all minor arterials
  - Includes pedestrian realm within the R.O.W.
- 35mph posted speeds
- Interim design may include one lane of travel in each direction
  - The second travel lane shall be added at build-out when traffic volumes warrant
  - Interim design shall include striping on-street bicycle lanes to provide a 20' clear paved width to meet Fire Code
- Median islands, travel lanes, utilities, sidewalks, and street trees shall be placed in build-out locations
  - Outside curb and gutter will need to be relocated and reconstructed upon eventual street widening at build-out
- Provide 16' width for all arterial median islands
  - Allows for a 12' turning lane, plus 4' raised median for enhanced safety at intersections
- Midblock, provide a furnishing zone/tree planting space
  - Minimum 8' width to aid in street maintenance and provide snow storage capacity removed from street and sidewalk in winter
- At intersections, shift trail position to align with crosswalks located within intersection sight triangles
  - Where trails are setback further from street, the trail/bike crossing may be located a distance 20' from curbline or remain at the intersection
- A context-sensitive rural option with 8' wide stabilized shoulders may be implemented to minimize farm equipment/suburban traffic conflicts in areas with active food production operations
  - A multi-use trail shall be provided in the build-out location at edge of right-of-way, but may be constructed of compacted crusher fines as appropriate to the rural setting

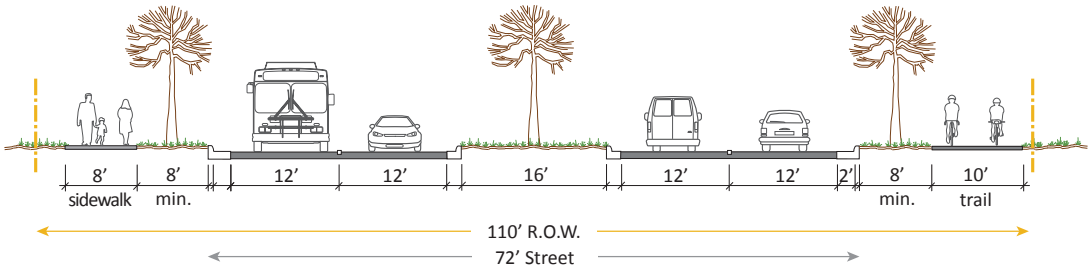
MINOR ARTERIALS

FIGURE 5.5

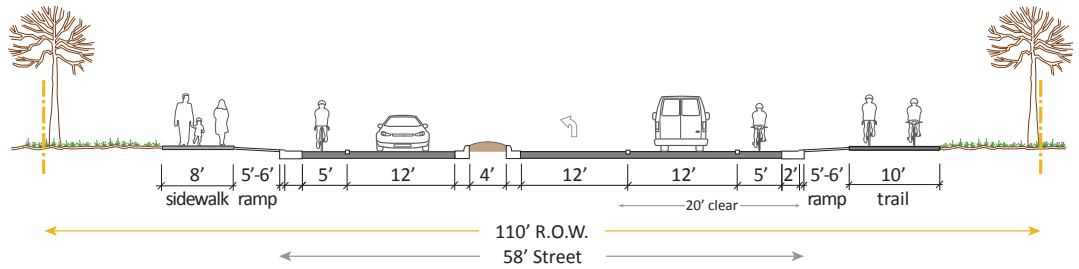
Option 1 - Build-Out Intersection



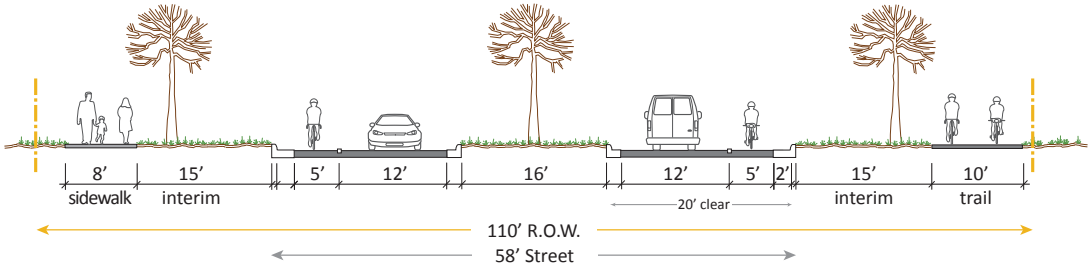
Option 2 - Build-Out Midblock



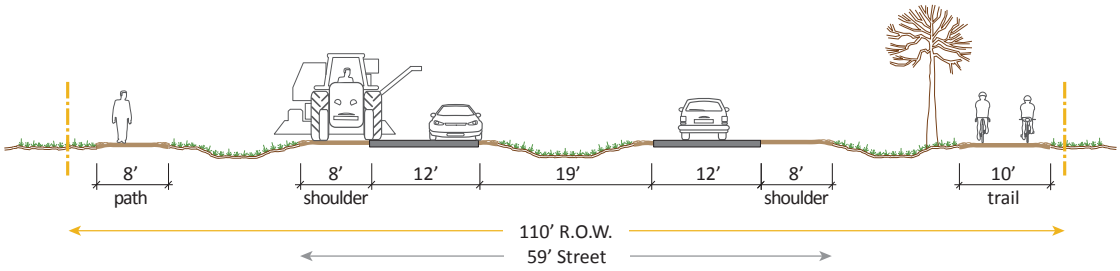
Option 3 - Interim Intersection



Option 4 - Interim Midblock



Option 5 - Interim Rural Roadway



COLLECTOR STREETS

- **Function:** primary circulation within community, with mobility and access secondary
- **Spacing:** combined 1/4-mile corridor spacing (collector and/or neighborhood connector)
- **Continuity:** ≥2 miles; continuous through and between neighborhoods

Most of the streets identified on the Brighton Thoroughfare Plan will be collector streets, creating a functional circulation grid that provides multiple travel options between neighborhoods and community destinations.

Build-Out Design

By design, collectors shall be 2-lane streets, with a center turn lane provided at intersections and where required for adjacent land use access. In addition, all collector streets shall provide bicycle accommodation in the form of paved shoulders or on-street bicycle lanes.

Transitional Design

To avoid construction of long stretches of 3-lane streets where left turns are either not allowed or needed by adjacent properties, the TMP includes a series of alternative midblock designs to transition into areas that will require 3-lane construction. Special street design will also be incorporated into corridors that traverse unique areas of Brighton that are more rural and/or urban in character than the rest of the community. (See Figures 5.6A and 5.6B)

Rural Design

Brighton values its strong agricultural heritage and the separation farmlands provide from the Denver metro area. Within the local food district and agricultural zoning areas, special transitional roadway designs will be built to minimize conflicts between farming operations and suburban commuters.

Key Design Elements

- Acquire 50' right-of-way for all collector streets
  - Requires additional 16' pedestrian easements outside of R.O.W.
- 30mph posted speeds
- Provide 11' travel lanes and 5' min. bike lanes
- Include center turn lanes at intersections
- Midblock where turn lanes are not needed, provide either a center median island or narrower travelway
  - Plant island with approved landscape materials (medium sized shrubs, ornamental grasses, etc.) for ease of maintenance
  - Maintain a 20' clear zone on either side of island to meet Fire Code
- In rural contexts, provide paved shoulders 5' min. width for bicycle accommodation.
  - Within the local food district and agricultural zoning areas, provide additional unpaved, stabilized shoulder width to accommodate large farm equipment
  - Interim design for context-appropriate sidewalks in rural areas may be constructed of compacted, crusher-fines

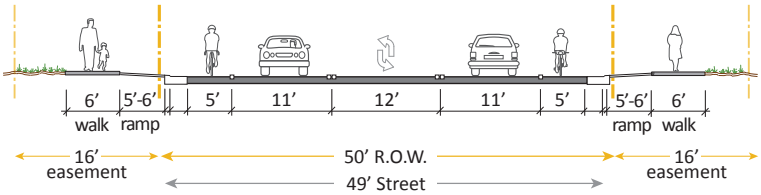
Shoulders will be provided on roadways that traverse rural areas to provide a number of important functions, including:

- Providing space for emergency storage of disabled vehicles
- Providing space for enforcement activities
- Providing space for maintenance activities, including winter snow storage that has been cleared from the roadway travel lanes
- Increasing safety by providing an area for drivers to maneuver to avoid crashes
- Improving stopping sight distance at horizontal curves by providing an offset to objects such as barrier and bridge piers
- On bicycle routes, shoulders improve bicycle accommodation and reduce risky passing maneuvers by drivers
- On farm-to-market roads, shoulders increase safety by providing extra roadway width to accommodate over-sized, slow-moving vehicles

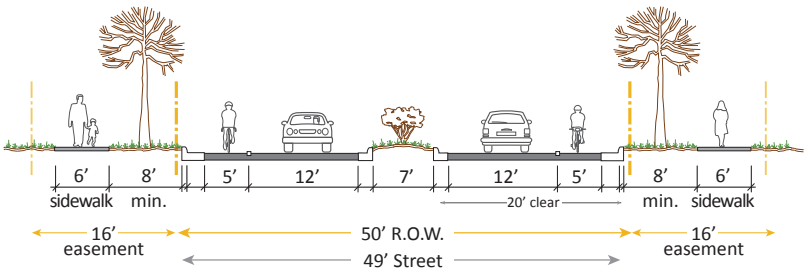
COLLECTORS

FIGURE 5.6A

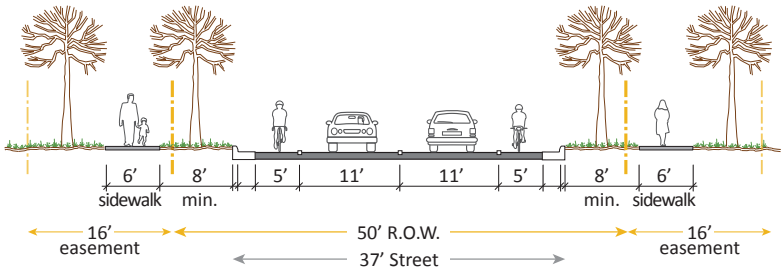
Option 1
Intersection



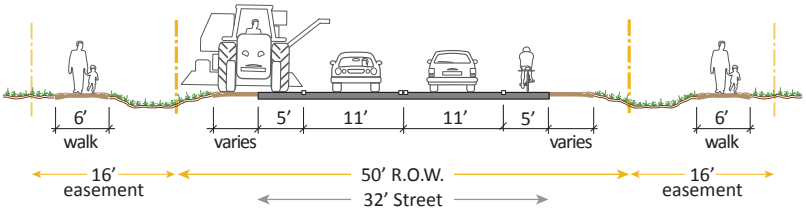
Option 2
Midblock



Option 3
Midblock



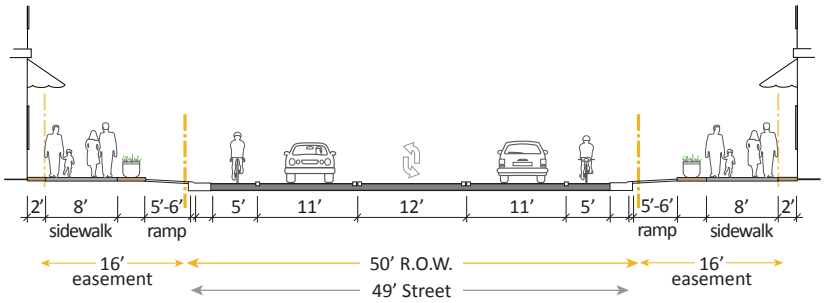
Option 4
Rural Roadway



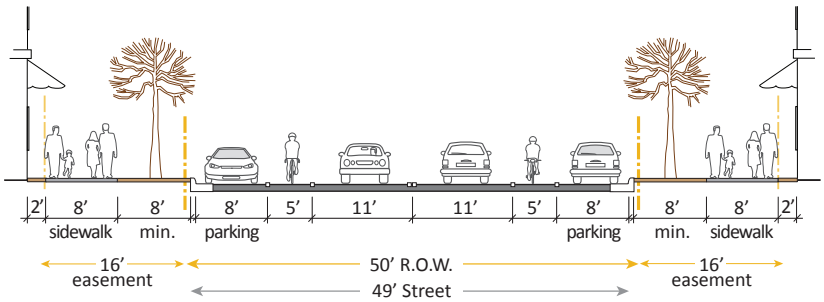
COLLECTORS

FIGURE 5.6B

Option 5 Mixed-Use Intersection



Option 6 Mixed-Use Midblock



Commercial/Mixed-Use Design

The street design recommendations of this TMP are designed to work in tandem with land use recommendations coming out of the *2016 Be Brighton Comprehensive Plan*. Modified street designs will be used within collector corridors targeted for a "main street" style of mixed-use development that will have ground-floor retail and commercial uses.

The allocation of space within the street right-of-way will reflect the more urban context where buildings face and embrace the street and a high-quality pedestrian environment is desired. Special treatments for these special places shall include the following:

- On-street parking to support main-street style retail, restaurants and mixed-use
- Wide sidewalks that include, in addition to the through walkway, a paved furnishing zone located at back-of-curb and a paved shy zone located along the building frontage
- Street trees planted within tree wells
- Bicycle parking, benches and other pedestrian amenities provided within the public right-of-way (typically within the frontage zones)
- Extra sidewalk width where feasible to support development of outdoor dining areas
- Frequent and transparent windows, interesting building facades, and awnings or other structures to provide shade and help define a human-scale pedestrian place.

Key Design Elements for Main Street-Commercial Corridors

- Acquire 50' right-of-way as per all collector streets
  - Requires additional 16' pedestrian easements outside of R.O.W.
- 25 mph posted speeds
- Provide 11' travel lanes and 5' min. bike lanes
- Include 12' center turn lanes at intersections and 8' parking lanes midblock
- Create a high-quality pedestrian environment by addressing three distinct sidewalk zones within the pedestrian realm:
  - Maintain an 8' min. width furnishing zone/ tree planting space at back of curb – shall be hardscape as part of the wider sidewalk space
  - Maintain an 8' min. through, unobstructed walkway to allow two pair of pedestrians to meet and pass each other
  - Provide an additional 2' min. frontage zone (building shy zone, located on private property) to accommodate opening doors, signs, planters, benches, sidewalk merchandise displays, etc.

NEIGHBORHOOD CONNECTOR STREETS

- **Function:** internal circulation and access
- **Spacing:** combined 1/4-mile corridor spacing (collector and/or neighborhood connector)
- **Continuity:** ≤2 miles; continuous through neighborhood

Developers will provide neighborhood connectors as needed within subdivisions for internal connectivity. Like local streets, these corridors will be laid out, designed, and constructed by the developer, working in conjunction with the City of Brighton Community Development Department.

Purpose

This street type was formerly called "neighborhood collector." While the streets function to provide continuity similar to a collector street, they are actually local streets (built to a slightly higher design standard) that provide access and on-street parking.

Proposed neighborhood connectors are identified in conceptual alignment on the Thoroughfare Plan map on page 43 within geographic areas that lack collector streets. Final routing will be determined by developers, but the streets must make through connections to the thoroughfare network.

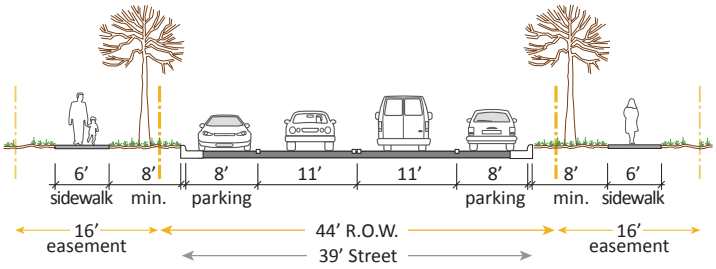
Key Design Elements

- Acquire 44' right-of-way for neighborhood connectors
  - Requires additional 16' pedestrian easements outside of R.O.W.
- 25 mph posted speeds
- Provide on-street parking
  - Within rural contexts, provide stabilized shoulders to accommodate parking
- Provide 11' travel lanes to accommodate occasional use by emergency vehicles, school buses, and other large vehicles
- *Optional*: May limit parking to one-side of street where desired to stripe on-street bicycle lanes

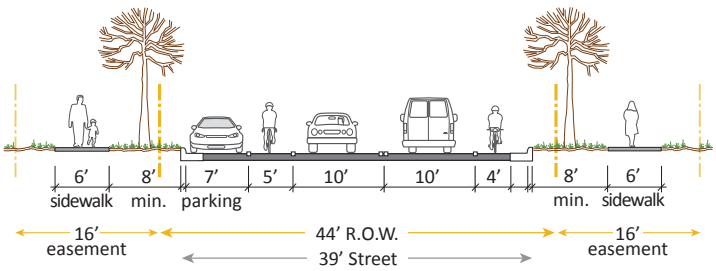
NEIGHBORHOOD CONNECTORS

FIGURE 5.7

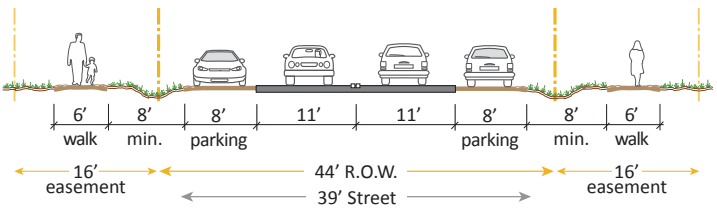
Option 1
Typical



Option 2
Bicycle Lanes



Option 3
Rural



LOCAL STREETS

- **Function:** local residential access
- **Spacing:** provide throughout development
- **Continuity:** n/a

Local streets are critical components of quality of life within residential neighborhoods. By design, they shall encourage slow speeds of motor vehicle travel and create pedestrian-friendly environments.

Developers will provide local streets as needed within subdivisions for internal connectivity and access to individual lots. A fine-grain network of small blocks and interconnected streets shall be encouraged over suburban development patterns that lay out streets as a series of disconnected loops and lollipops.

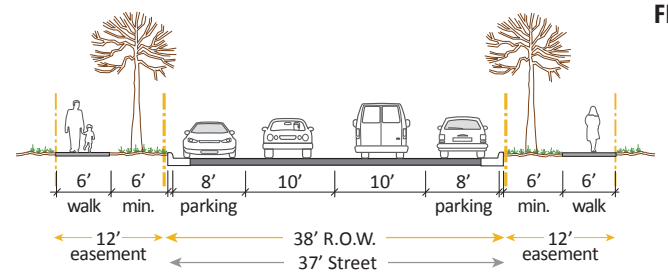
Key Design Elements

- Acquire 38' of right-of-way for local streets
  - Requires additional 12' pedestrian easements outside of R.O.W.
- 25 mph posted speeds
- Provide on-street parking
  - Within rural contexts, provide stabilized shoulders to accommodate parking
- Context-sensitive design for lower intensity residential land uses include 6' sidewalks and 10' travel lanes

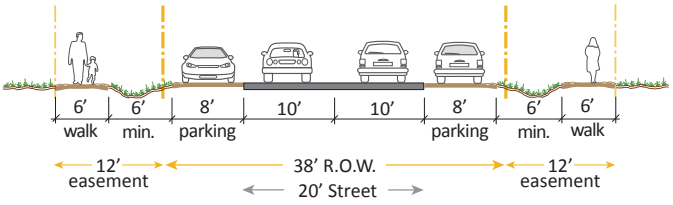
LOCAL STREETS

FIGURE 5.8

Option 1
Typical



Option 2
Rural



MAJOR CAPITAL INVESTMENTS

Ideas for several new and previously discussed infrastructure projects generated significant discussion by the public, staff, and stakeholders during the TMP planning process. The following major infrastructure investments are included in the Thoroughfare Plan and will require on-going study and planning for project implementation.

Strategy 5.3

Further assess the feasibility and need for special projects and major capital investments that may be needed by 2040.

New Highway Interchanges

- **I-76 and Bridge Street** – A future interchange is desired to relieve congestion at the Bromley interchange and enhance access onto I-76 from new residential subdivisions in the northeast portion of the community. The project's Environmental Impact Statement (EIS) is completed and City of Brighton is pursuing implementation.
- **US 85 Planning and Environmental Linkages (PEL)** – The long-term plan by the Colorado Department of Transportation (CDOT) is to turn Highway 85 into a freeway, whereby existing at-grade intersections within Brighton (**Baseline, Bromley, 136th, 120th**) will become grade-separated interchanges.
- **Potomac at E-470** – Potomac Street will be a collector, with a future two-lane bridge over E-470 to provide street connectivity. Adams County has requested the reservation of right-of-way for a potential future interchange, which would be implemented in conjunction with the E-470 Highway Authority. The interchange would be at Potomac Street and not Sable Boulevard due to the proximity of the existing interchange at I-76.

Grade-Separated Railroad Crossings

Traffic backups at at-grade railroad crossings was a common comment received through TMP public input. Due to the proximity of the Union Pacific tracks to Highway 85, the potential to construct a grade-separated railroad crossing to relieve congestion caused by train travel will be most feasible if constructed in conjunction with proposed US 85 PEL interchanges.

- **136th** – Proximity of the Union Pacific tracks to Highway 85 will necessitate an integrated design for ramps and structures across both corridors at 136th.
- Baseline – Further removed from the Highway 85 corridor, the railroad crossing at Baseline will need to involve multiple structures to accommodate grade clearances of the various transportation corridors.

Realigning Highway 7 & Reclaiming Bridge Street

These two projects, realignment of SH-7 and reclaiming of Bridge Street, are interrelated and would address the public and stakeholders desire to relieve traffic congestion, improve multimodal connections, and beautify Bridge Street through Downtown.

- Rerouting State Highway 7 onto Baseline/County Road 2 through Brighton is mentioned in the SH-7 PEL. This project will provide through regional capacity to the existing interchange at I-76 and will relieve traffic congestion on Bridge Street within the heart of Brighton. A proposed new arterial street segment will need to be constructed beginning around Riverdale, heading northeast along the existing alignment of Tucson Street to connect to Baseline Road near the Platte River.
- Bridge Street is considered by many to be Brighton's "Main Street." The realignment of Highway 7 to the north will allow the City of Brighton to re-envision what this corridor may become when through traffic is rerouted onto Baseline. Land uses would continue to support the Main Street character along with improvements to the multimodal travel options through the corridor. Assessment of pavement widths, number of needed travel lanes, transit service options, bicycle accommodation, on-street parking, and desired elements of an enhanced pedestrian realm will be considered in reinventing Bridge Street as a local travel corridor instead of a State Highway.

Thoroughfare Action Plan
To Be Completed by 2020

NETWORK PLANNING

Strategy 5.1 – Prioritize completing "missing link" connectivity projects over street widening projects.

❑ Construct (4) segments of streets to complete missing links in the transportation network within the core area of Brighton. . . . **Longs Peak, Southern, 45th, 40th/Tower**

FUNCTIONAL CLASSIFICATION & STREET DESIGN STANDARDS

Strategy 5.2 – Assign functional classification to create a network of streets that are of various sizes and functions to serve a variety of multimodal travel, circulation, and access needs within Brighton.

❑ Adopt the function classification system mapped in the Thoroughfare Plan (Figure 5.1) as part of the *2016 Be Brighton Comprehensive Plan*.

❑ Adopt recommended street cross-sections (Figures 5.4 - 5.8) as part of the *City of Brighton Public Works Streets Standards*.

❑ Construct all new roadways and street retrofit projects to the new standards – this includes City Capital Improvement Projects within arterial rights-of-way, and the design and construction of collector and local streets by developers.

MAJOR CAPITAL INVESTMENTS

Strategy 5.3 – Further assess the feasibility and need for special projects and major capital investments that may be needed by 2040.

❑ Ensure multimodal accommodation through the new interchange to be constructed at Bridge/I-76.

❑ Complete a corridor retrofit study addressing how to reclaim Bridge Street for community reinvestment **and** multimodal use.

❑ Work with CDOT on collaborative planning to reroute Highway 7 off of Bridge Street, onto Baseline.

❑ Work with CDOT on design of the US 85 PEL recommendations for grade-separated interchanges at Baseline, Bromely, 136th, 120th.

❑ Work with CDOT and Union Pacific on collaborative planning for grade-separated railroad crossings at 136th and at Baseline.

❑ Coordinate with Adams County and the E-470 Highway Authority on their long-term plans for future realignment of Highway 2 onto Potomac.

Chapter 6

TRANSPORTATION SYSTEM MANAGEMENT

This Chapter outlines strategies and actions the City of Brighton will take to manage the build-out of the future transportation system. Transportation System Management (TSM) will include four general elements:

- **Transportation Metrics** – The City will maintain and update a transportation data book every five years.
- **Performance Monitoring and Reporting** – The City will maintain a dashboard of key metrics to track progress toward reaching the City's transportation goals.
- **Travel Demand Management (TDM)** – Following implementation of the 5-year modal Action Plans the City will establish a TDM program to compliment development of the modal networks.
- **Development Review** – The City will use development review to implement certain aspects of the TMP.

TRANSPORTATION METRICS

As part of developing the Brighton Transportation Master Plan, relevant data on existing conditions, trends and forecasts within the Brighton Planning Area were compiled into a spreadsheet-based Transportation Data Book (a PDF version of the Transportation Data Book is available in Appendix C - see Chapter 1, Figure 1.3 for a map of and descirption of the Brighton Planning Area). Data was collected from the U.S. Census Bureau, the Denver Regional Council of Governments (DRCOG), the Regional Transportation District (RTD) and the City of Brighton. DRCOG provided all forecast data used in this Plan, which extends out to 2040.

Transportation Data Book

Available in Appendix C, the data book includes data, trends and forecasts on the following topics within the Brighton Planning Area:

- Population & Demographics
- Commuting & Mode Share
- Transit
- VMT & Traffic
- Vehicle Crashes

Strategy 6.1

Maintain and regularly update a database of transportation metrics and a dashboard of key indicators within the Brighton Planning Area to monitor performance and trends over time.

As part of implementing this Plan, metrics gathered in the Transportation Data Book will be updated by the City every five years beginning in 2020.

Compilation of the transportation data book was an important part of the planning process. Transportation metrics provided a basis for identification and discussion of transportation issues and opportunities within Brighton, including the key elements addressed throughout the TMP. In addition, many aspects of implementing this TMP will rely on the City to maintain a current set of transportation data in the years ahead (see the section on Growth Management in Chapter 2 and Performance Monitoring and Reporting later in this Chapter).

PERFORMANCE MONITORING AND REPORTING

To ensure accountability and credibility of Brighton's transportation program, the City will monitor and report system performance through a transportation indicators dashboard on the Transportation Master Plan website. The dashboard will monitor ten key indicators that will be used to evaluate how effectively the City is reaching the TMP goals identified in Chapter 1 (see Figure 6.1 for a list of the key indicators, data sources and corresponding goals that eash indicator will measure). The dashboard will be updated annually.

TRAFFIC COUNTS

The City will also monitor annual average daily traffic (AADT) on arterial and collector streets within the city limits. This data will be used to track traffic patterns and determine whether traffic on a given corridor is approaching the LOS (level of service) D benchmark identified as the threshold for the maximum acceptable level of traffic congestion within the City (see Chapter 2 – Benchmarks). If traffic levels of a given corridor are approaching LOS D this would trigger either investment in a parallel street or, if all parallel streets exist, widening of that street. Criterion for LOS D AADT thresholds of a given street are identified in Appendix D. The City will utilize permanent traffic counters that will be gradually added to the system as part of signal modernization (see Appendix A Integrated Capital Project List).

FIGURE 6.1 TRANSPORTATION DASHBOARD INDICATORS AND DATA SOURCES

GOAL	INDICATOR	DATA SOURCE
Goal 1. Safety First	• Fatal Crashes Per Capita • Injury Crashes Per Capita	DRCOG annual crash data, US Census Bureau
Goal 2. Regional Connections	• Build-Out System Map	Implemented projects (modal plans)
Goal 3. Accommodate All Modes	• Resident Commute Mode Share • Employee Commute Mode Share	American Community Survey
Goal 4. Local Connectivity	• Citywide Intersection Density	GIS database, LEED-ND standards
Goal 5. Walkable, Mixed-Use Neighborhoods	• Citywide WalkScore	www.walkscore.com
Goal 6. Concurrency Management	• Lane Miles of Arterial & Collector Streets • Miles of Bike Facilities • Per Capita Transit Ridership	GIS database, RTD

TRAVEL DEMAND MANAGEMENT

The main purpose of travel demand management (TDM) programs are to mitigate future traffic demand. TDM programs provide residents, employers and employees with information, resources and incentives to encourage travel by means other than single-occupant-vehicle (SOV), including transit, walking, biking or carpooling. TDM programs can be administered by public agencies, private entities - such as business associations - or separate public/private Transportation Management Associations/Organizations (TMAs or TMOs).

Strategy 6.2

Establish a citywide travel demand management program to support efficient utilization of the multimodal transportation network.

Through 2020, the City's highest transportation priorities will be to implement the modal action plans outlined at the end of Chapter 3, 4 and 5. Beyond 2020 - as transit service levels within the City increase, the core area bike and pedestrian networks are built-out and as traffic levels increase on the major corridors - Brighton will establish a travel demand management program. Establishment of the TDM program will be an important aspect of achieving Brighton's transportation goals (see Chapter 1). The three main areas likely to be the focus of a future TDM program in Brighton include: employees, residents and new development. Example strategies to consider as part of the future TDM program are highlighted below and organized by the three focus areas.

TDM Program Example Strategies

Employees

- Transit Passes (RTD EcoPass Program - http://www.rtd-denver.com/EcoPass.shtml)
- Qualified Fringe Benefits (tax free commuting)
- Secure bike parking and showers
- Flexible work schedules
- Carpooling/vanpooling assistance
- Regional ride-matching
- Technical assistance to employers
- Online resources (maps, program information, events, trip planner)

Residents

- Safe Routes to School assistance and activities
- Ciclovia events (temporarily close a street(s) to motorized traffic to celebrate walking and biking)
- Car-free days
- Organized bike rides
- Bike safety clinics
- Distribution of bike maps
- Transit Passes (RTD Neighborhood EcoPass Program - http://www.rtd-denver.com/Neco.shtml)
- Online resources (maps, program information, events, trip planner)

New Development

- Submit TDM Plan as part of development review
- Report on key metrics every 2 years
- Require participation in TDM program
- Participation in a minimum number of electives (secure bike parking, transit passes, etc.)

DEVELOPMENT REVIEW

The Transportation Master Plan prescribes certain actions and criteria that must be applied to the development review process. As a result certain aspects of this TMP will be implemented through development review.

Strategy 6.3

Utilize development review to implement elements of the Transportation Master Plan.

Provisions of the TMP that will be included in development review include:

- **Street Design Criteria** – Chapter 5 of the TMP includes a single set of street design standards that will be used by both developers and the City. The City will work with developers during the development review process to ensure that all new streets to be built as part of a development meet the required design standards based on the street classification type (arterial, collector, local, etc.) and land-use context (see Chapter 5 for more detail on the design standards and the future arterial/collector network map).

- **Connectivity Requirements** – To meet the connectivity benchmark for local streets (see Chapter 2), all future developments will be required to meet the LEED-ND (Neighborhood Development) standard of 140 intersections per square mile. The City will refer to the most current version of the LEED-ND standards for calculating the intersections per square mile of proposed developments. For example, some intersections (such as alleys and non-motorized trails) count toward the intersection total, while others (such as to cul-de-sacs and gated streets) do not count, and some land areas should be excluded from the total calculations (such as public parks and public facility campuses). See Appendix D for a map and data of existing conditions related to intersection density and further detail on existing LEED-ND intersection density standards.
- **Arterial/Collector Street Network** – The City will work with developers to ensure that future developments will not restrict and (in most cases) will contribute to the build-out of the future arterial/collector road network (as mapped in Figure 5.1 of Chapter 5). It should be noted that Figure 5.1 shows the rough alignment of future arterial/collector missing links. Developers will have some leeway into the exact alignments of future arterial and collector streets that cross their property as long as network connectivity is preserved. The City will be tasked with ensuring that new development preserve or contribute to the arterial collector network and that streets are designed to the appropriate street classification standards.

- **Active Transportation Network** - The City will work with developers to ensure that future developments will not restrict and (in most cases) will contribute to the build-out of the future active transportation network (as mapped in Figure 3.1 of Chapter 3). Since much of the active transportation network would be included as part of the arterial/collector network, this action will primarily include provision of (and connections to) the existing and planned regional greenways that cross new development.

In addition to those listed above, the following provisions of the TMP may also be included as part of the development review process when appropriate to meet the goals of the TMP:

- **Transit Facilities** – The City will work with developers to ensure new developments do not preclude planned transit operations (identified as part of the future transit network - see Chapter 4) that are within or adjacent to proposed developments. In some cases the City will require developers to provide new or upgraded bus stops and/or associated transit facilities as part of a new development (see Bus Stop Design Considerations on pages 38-39 of Chapter 4). Given that the transit plan will be implemented as part of the long-term build-out of the transportation network (by 2040) not all the details of the planned future transit service (such as exact route alignments and stop locations of all routes) are known. However, as these details become clearer in future years, they will be incorporated into the development review process.

- **TDM Program** – Development review will be a part of implementing a future citywide travel demand management (TDM) program. When the TDM program is established, developer requirements may include submitting a TDM plan, monitoring key metrics over time, providing bike parking, participating in a transit pass program, or other actions (see the TDM section on pages 59-60).

TSM Action Plan
To be completed by 2020

TRANSPORTATION METRICS

Strategy 6.1 Maintain and regularly update a database of transportation metrics and key indicators within the Brighton Planning Area to track performance and trends.

- ❑ Update the Transportation Data Book in 2020.

PERFORMANCE MONITORING & REPORTING

(also Strategy 6.1 – see above)

- ❑ Implement and regularly update an online transportation indicators dashboard.
- ❑ Record daily traffic on arterial and collector streets into a new database (locations would be added as traffic signals are modernized with new permanent traffic counters).

TDM

Strategy 6.2 Establish a citywide travel demand management program to support efficient utilization of the multimodal transportation network.

- ❑ Implement the modal Action Plans (see the end of Chapters 3, 4 and 5).

DEVELOPMENT REVIEW

Strategy 6.3 Utilize development review to implement elements of the Transportation Master Plan.

- ❑ Incorporate street designs standards into development review.
- ❑ Incorporate local street connectivity requirements into development review.
- ❑ Incorporate the build-out arterial/collector street network into development review.
- ❑ Incorporate the build-out active transportation network into development review.