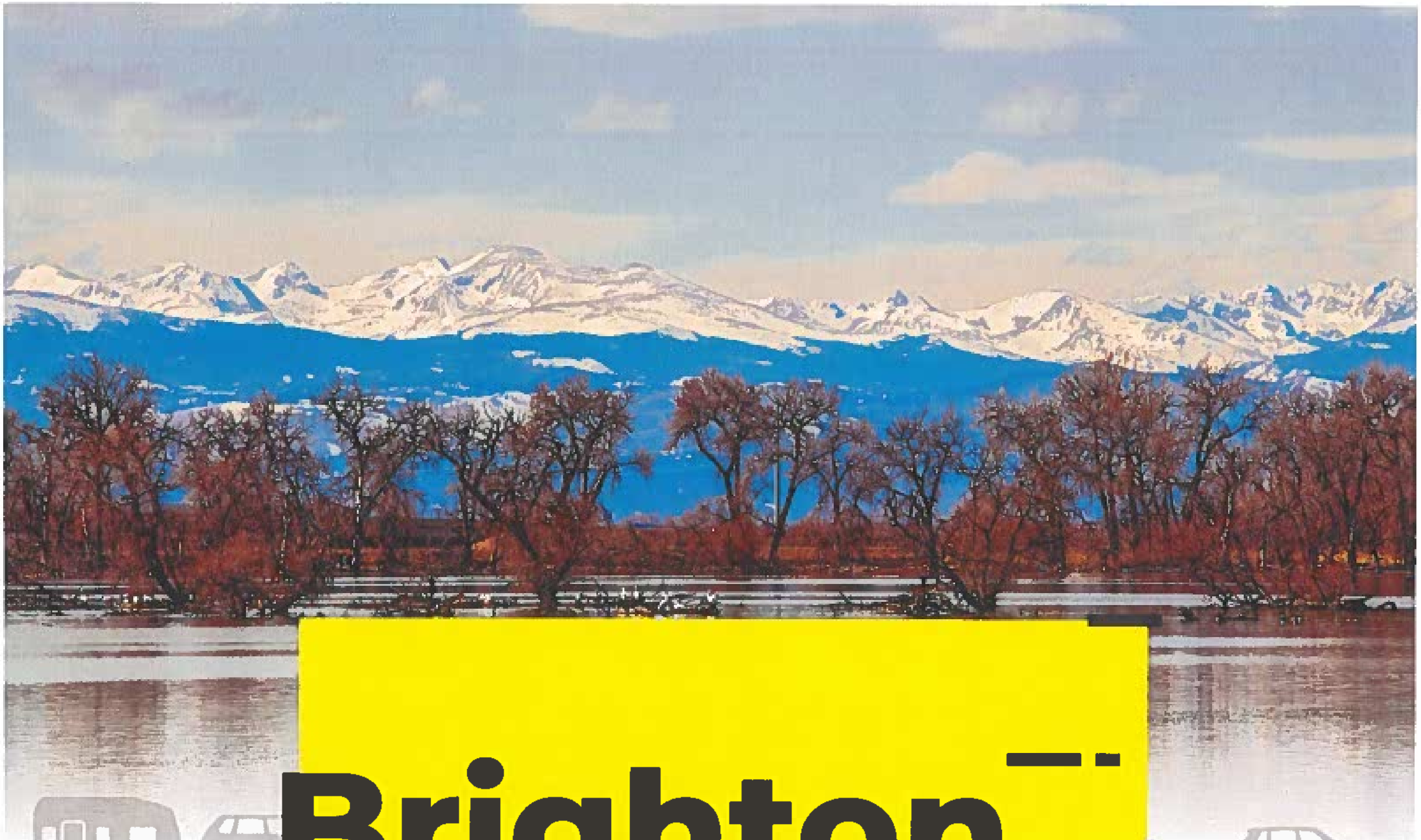

Brighton

Transportation Master Plan 2026

Prepared for
The City of Brighton
Prepared By
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Brighton

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Brighton Transportation Master Plan 2026

Brighton Bohannan Huston

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FIGURES

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.

Brighton has experienced significant growth since the adoption of previous TMP in 2016 and has successfully completed a number of previously identified goals. These goals were accomplished through a strategic transportation capital investment program that is map-based and tied directly to performance monitoring and reporting. As the City of Brighton looks to the future, these goals have been reevaluated based on current social and economic regional trends to ensure that Brighton's TMP stays consistent and relevant to current and anticipated growth.

A Coordinated Vision

Land use and transportation are inherently linked, so it's crucial when developing a master plan to consider how elements of these systems overlay and interact with each other. Thus, the original goals and key elements of this plan were developed as a part of a coordinated effort with the 2016 Be Brighton Comprehensive Plan Update. This 2026 TMP provides updates to goals and key elements based on past implementation efforts, changes in anticipated growth and development, as well as community and staff feedback. Connections between the City's Comprehensive Plan land use objectives and the *Transportation Master Plan* are strengthened within this update. The TMP continues to explicitly address the role of transportation in future land use development patterns.

This TMP continues to serve as the transportation component of the Be Brighton Comprehensive Plan and is designed so that elements of both will complement and support each other. The coordinated planning effort sets the stage for continued unified implementation of the two plans. Each will ultimately support the City in efforts to reach its land use and transportation goals.

Plan Update Development

The initial *Brighton Transportation Master Plan* was adopted by Council on March 1, 2016. Over the course of the last 9 years, the City has made substantial progress in implementing the original actions outlined in the plan. Thus, City staff felt it necessary, and helpful, to update the plan to reflect changes in the growth and development of the City and updated implementation needs. Updates to the original TMP were developed through a combined effort incorporating key stakeholder input and utilizing two key engagement opportunities implemented over the course of the update process (detailed below). Prior to initiating the plan update, Brighton staff invited key internal staff and regional stakeholders to provide comment on the original plan. Comprehensive comments were received by the following:

City of Brighton Departments

- Community Development
- Public Works
- Parks and Recreation

Regional Stakeholders

- Regional Transportation District (RTD)
- Adams County
- City of Fort Lupton
- Town of Lochbuie

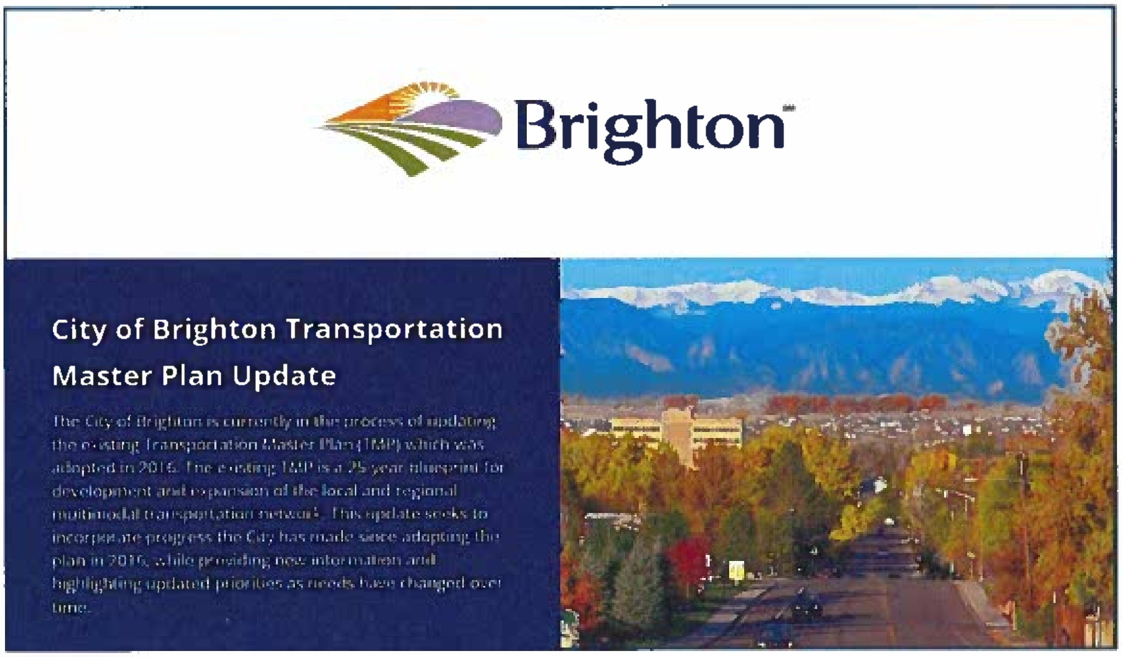


Figure 1: Project Website

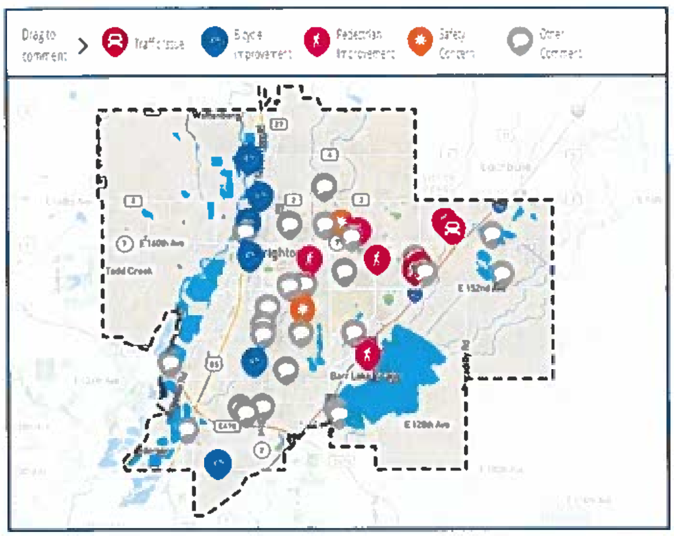


Figure 2: Interactive Website

Figure 3: Interactive Website Comment Word Cloud

Interactive Map and Project Website

As part of the Plan Update the consultant team developed an interactive map in conjunction with a project website where residents could make comments and share their feedback on transportation in Brighton. The Interactive map collected 41 comments with bicycle Improvements being the largest comment type group follow by pedestrian improvements, traffic issues, and lastly safety concerns.

Public Meeting

As part of the public engagement plan for Brighton's Transportation Master Plan update, the City of Brighton held a public meeting on August 17th, 2022 from 3 PM - 6 PM at the Armory Performing Arts Center. The goal of this meeting was to engage with the public and collect comments\ feedback about updates to the Transportation Master Plan. Four maps were created and presented on boards that the people could review and ask questions from city staff and the consultant teams. The four maps represented Brighton's existing transit service, existing roadway network, planning boundaries, and future major transportation projects. Residents were encouraged to leave comments on a board that asked what ideas they have to help the city meet the previously established goals from the existing Brighton Master Transportation Plan. Brighton residents were also encouraged to share feedback and comment on the interactive map.

Twenty eight (28) individual comments were received during the public meeting with the majority of comments expressing a need for more bike lanes, increased multi-modal connectivity, and increased pedestrian and bicycle safety. The remaining comments that were not related to multi-modal corridor connections and safety improvement exposed specific vehicle traffic and safety concerns within Brighton.

Transportation Goals

Driven by local goals originally developed in 2016, this TMP update includes goals that continue to be based on community character, economic opportunity, and public safety. While progress has been made in achieving these goals since 2016, the original intent behind them continues. This update includes only minor changes to the language originally used to outline the City's transportation goals.

Transportation Goals

1. *Brighton will prioritize safety in transportation planning and design*

2. *Brighton's transportation system will be well-connected and accommodate all modes.*

3. *Brighton's land development will contribute to a walkable, complete neighborhoods*

4. *Brighton's transportation system will expand concurrently with growth and/or demand*

Plan Horizons

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

Action Plan – Projects and actions to be completed by 2028. 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 time frame 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 reflect the full Build-Out Transportation System to ensure adequate right-of-way is obtained for final configuration of each roadway.

Planning Area

This TMP addresses the future transportation network within the planning area boundary mapped in Figure 5. The planning area corresponds with the Comprehensive Plan area and includes the existing city limits, Barr Lake State Park, and the 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, WCCOG, 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 and multimodal network surrounding Brighton were accounted for in this TMP (through coordination and review or existing regional and neighboring jurisdictions' plans).

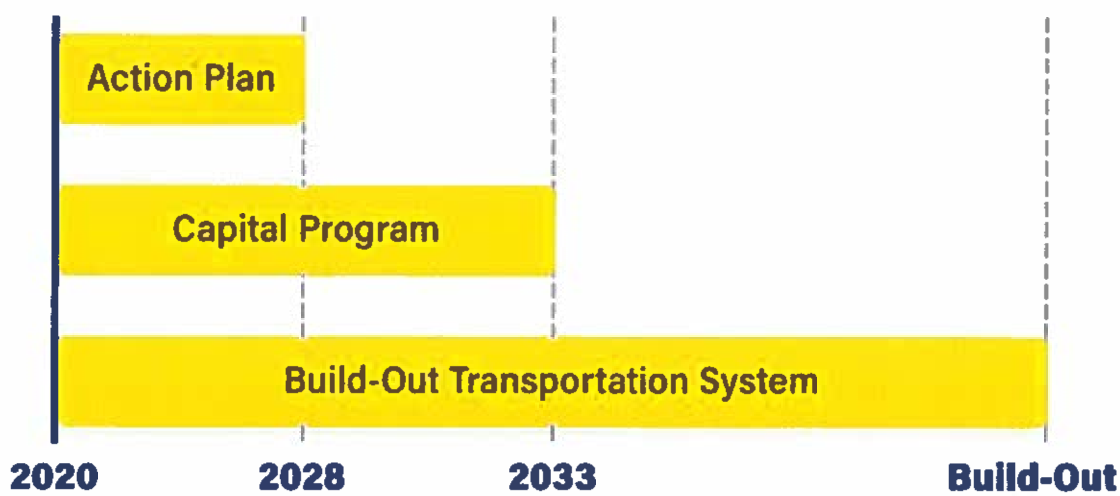


Figure 4: Planning Horizons

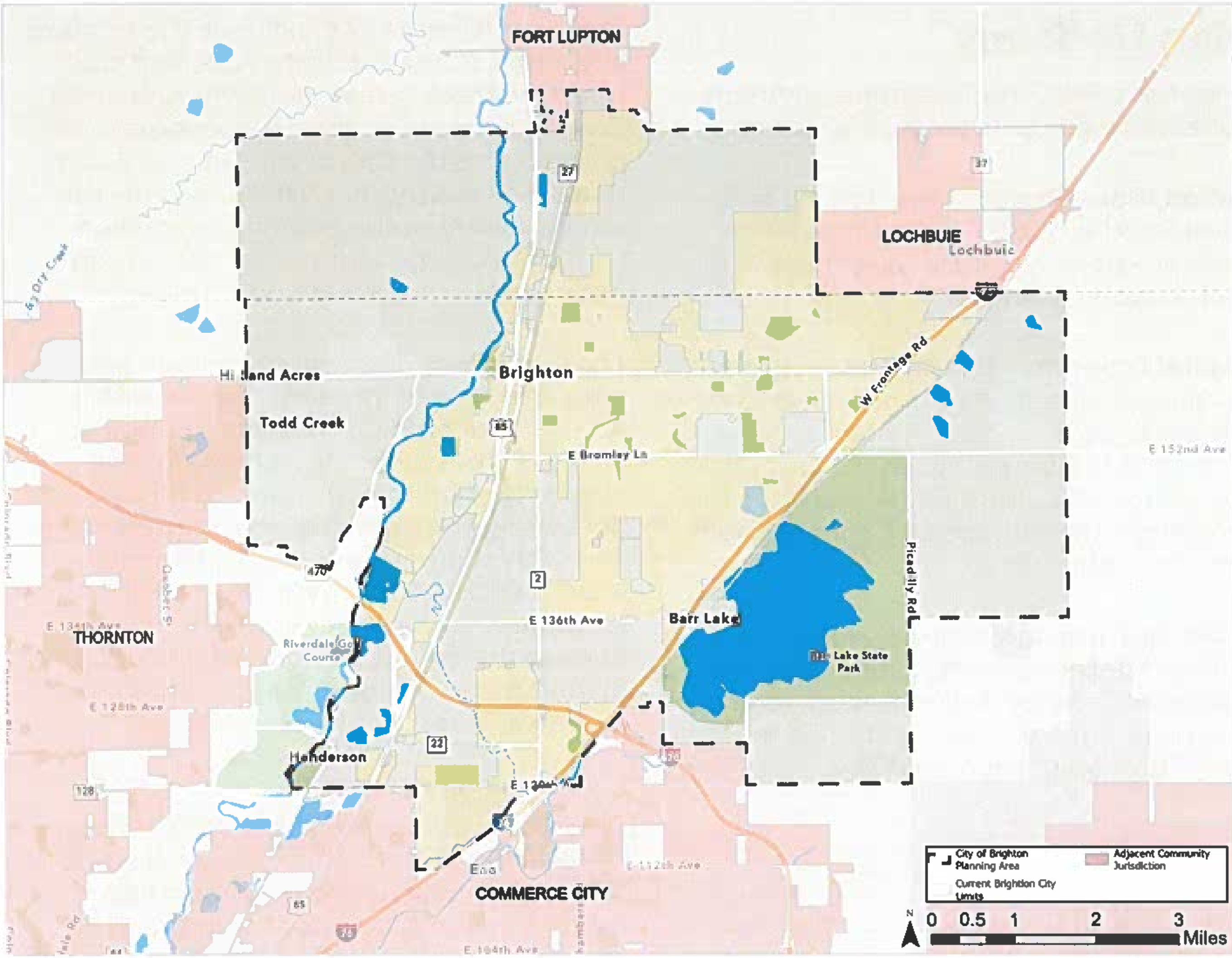


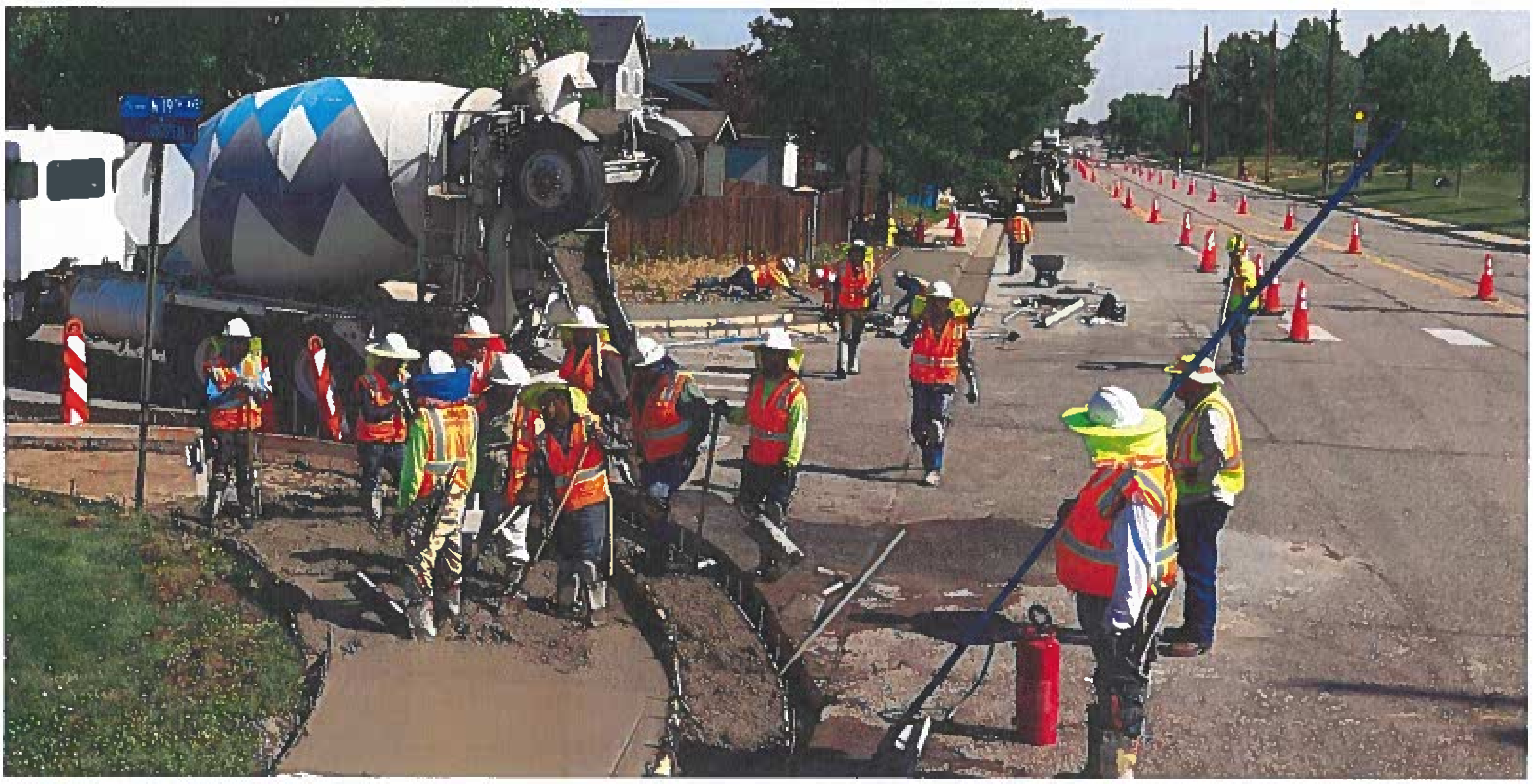
Figure 5: Brighton TMP Planning Area Map

Ongoing Updates

The Brighton Transportation Master Plan is designed to be a living document that responds to economic, social and transportation system trends. While Denver Regional Council of Governments (DRCOG) population and traffic forecasts provided a framework for the original TMP, prioritization of future projects will be based on trends and actual needs, as opposed 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 reviewed annually. Metrics in the Transportation Databook (forecasts, traffic counts, transit ridership, etc) have been updated to the extent possible in alignment with this overall TMP update.

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 10.



Strategic Priorities

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

Strategic Objectives

1. ***Safety First*** *– Through the Vision Zero Action Plan, address safety of the transportation system.*

    Strategy *-Use traffic calming techniques outlined in Appendix B.*

    Strategy *- Incorporate specific safety recommendations in the Bicycle, Pedestrian, and Multi-Modal Plan*

2. ***Network Approach*** *– Complete, well-connected multimodal networks will ensure Brighton's transportation system is efficient and resilient.*

3. ***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.*

4. ***Growth Management*** *– Ensure new development builds infrastructure supporting all modes while maintaining capacity for future population needs.*

5. ***Technology*** *– The City will use emerging technologies to improve operational efficiencies and to monitor program effectiveness.*

6. ***Major Capital Projects*** *– The City will continue to balance capital project implementation within annual budgetary constraints and prioritized need within the City*

Growth Management

This Plan anticipates significant increases in demand for travel by all modes around Brighton for the next 20 years. Demand for safe and convenient local/regional 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 vehicles – 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.

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.

Benefits to Prioritizing Street Connections 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.

Bicycle Network Completion

Development of the build-out bicycle network shown in Chapter 3 will proceed steadily over the next 15 years . 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 10).

1. The bicycle network benchmark will be completion of the core network in the next 15 years. In a couple of instances, completion of specific segments may have to wait for completion of an associated street project. The City is currently on track to meet this goal.

2. This Plan establishes a minimum benchmark for annual investment in discretionary bicycle network projects. 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.

NOTE: The Bicycle, Pedestrian, and Multi-Modal Plan will make recommendations for the broader city

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. 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 will be determined by RTD service standards (see Chapter 4). However, this benchmark will serve to guide the City's efforts to ensure that service level enhancements are discussed with RTD and coordinated in a way that is sufficient to keep up with Brighton's growth, development, and RTD service standards.

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.

Capital Improvement Project Prioritization Strategy

The City will identify and prioritize projects by evaluating those submitted through the annual budget process against established strategic priorities, performance benchmarks, financial constraints, and available funding. This review will determine which capital projects are necessary to include in the five-year plan.

Figure 6:

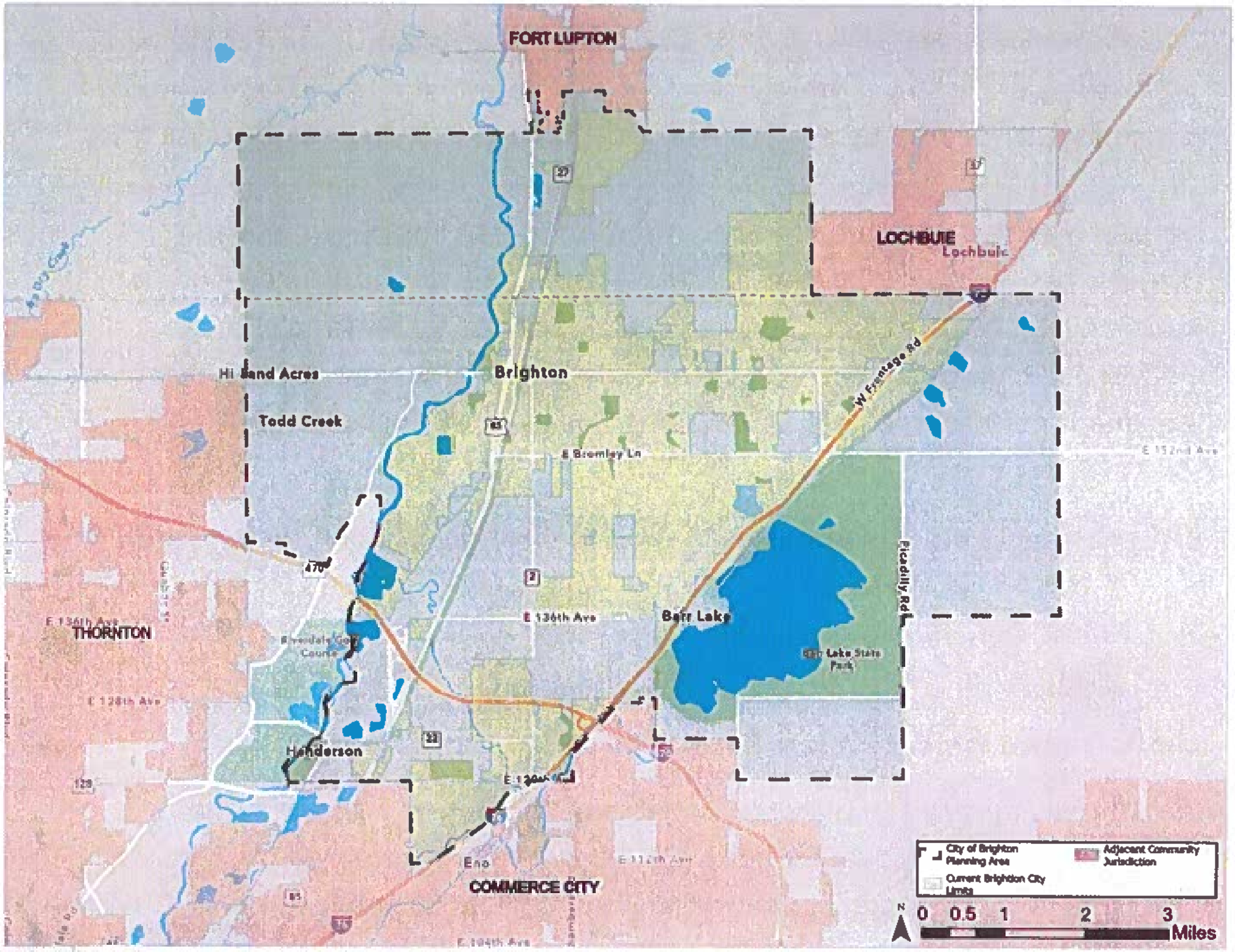


Figure 7: Brighton TMP Planning Area Map

Strategy 2.2

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

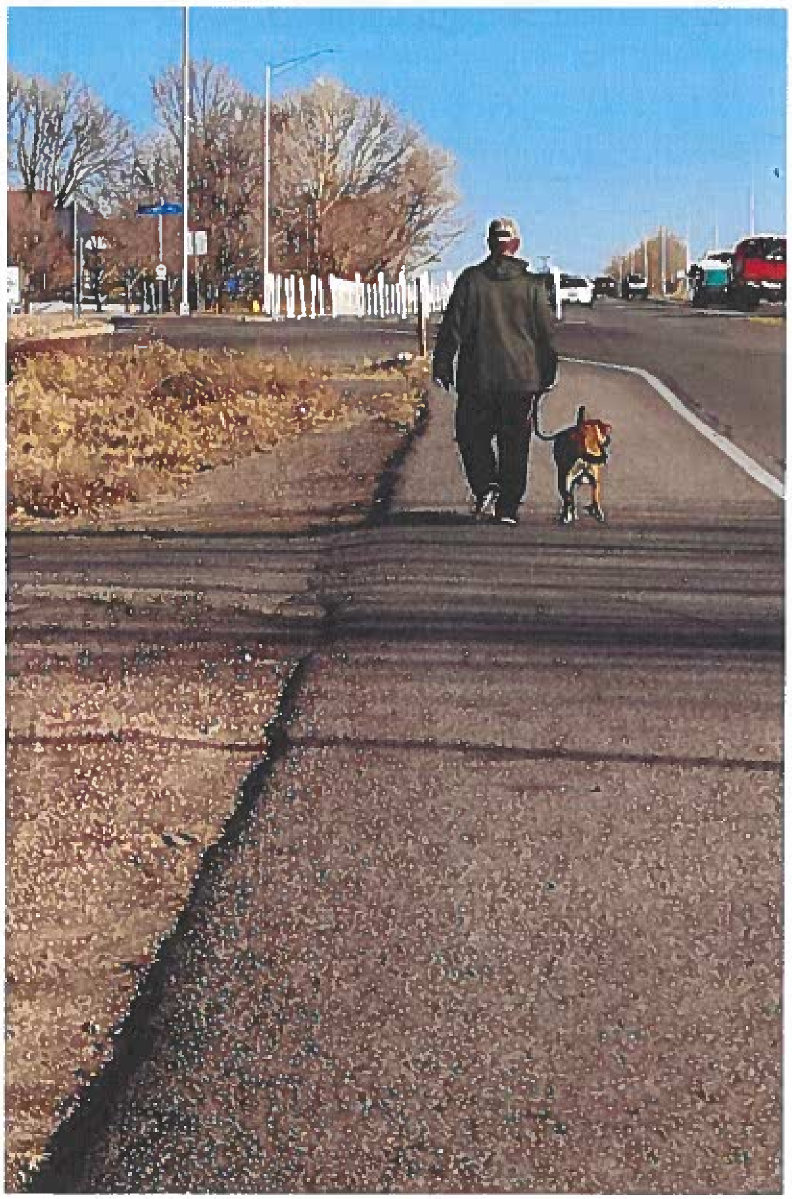
The integrated project list is multimodal and is based on a corridor-by-corridor evaluation of the projects required to complete the build-out networks shown in the modal chapters. It represents a coordinated approach to project planning that integrates multiple City departments, including street and active transportation projects with street rights-of-way, as well and components of the City of Brighton Trails and Open Space Plan. Once complete, it will be important for projects identified in the Pedestrian and Bicycle Master Plan to be included in this Integrated Project List moving forward.

Successful completion of transportation 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. This approach to planning and budgeting will ensure a logical and systematic progression of project development activities based on a multi-year capital plan.

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 when coupled with infrastructure improvements to support these modes of travel. 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 first- and last-mile of transit trips, and expanding recreation opportunities for all demographics of the community. Coordination between this plan and the Parks Department's bicycle and pedestrian master plan is key to ensure consistent implementation of a connected network throughout the City. This approach to creating a multimodal transportation system will directly support Brighton's Sustainability Action Plan by promoting livability, transportation modes, and community in a sustainable manner for generations to come.

City of Brighton Vision Zero Action Plan

The Brighton Vision Zero Action Plan 2018 was adopted with the goal to eliminate all traffic fatalities and severe injuries on the streets of Brighton while improving safe and equitable mobility. A Technical Advisory Committee provided technical guidance and oversight to the plan while a separate Working Group composed of City leaders and agencies provided policy guidance. The plan is data-driven and informed by an analysis of all crashes that occurred on the streets of Brighton from 2011 to 2017 (it excludes highway crashes). In addition to crash data, the plan looked at existing roadway traits, traffic volumes, the context of land use, and responses from residents to a survey.

The plan identifies ways in which the City will prioritize safety when making decisions about transportation and a suggests a framework for implementation to achieve the Vision Zero goal. In addition to citywide recommendations, the plan includes separate analysis and recommendations for streets in school zones.

The plan identified a High Injury Network, or the corridors with the highest levels of crashes, and will use this information to prioritize project and focus resources. A community survey turned up several key findings, including that the top traffic safety concerns in the community are 1) speeding and 2) drivers not yielding to pedestrians. The plan also identified the top five crash profiles (representing crash types that resulted in death or severe injuries); the top crash profile is Distracted or Inattentive Driving.

Four priority project locations were identified for the City to prioritize safety improvements:

1. Bridge Street and Main Street

2. Bridge Street – 18th Ave to 27th Ave

3. Brighton Road – 136th Ave to 148th Ave

4. Bromley Lane – Prairie Center Parkway to Medical Center Drive

The plans sets forth a series of recommendations in the Action Plan, organized into five action areas: 1) Vision Zero Program, 2)Priority Project Locations, 3) Targeted Engineering, 4) Targeted Enforcement, and 5) Education.

Network Planning

The City of Brighton continues to expand its past focus on trail planning into a more comprehensive approach to creating a citywide bicycle system. 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 8, addresses this problem by focusing on missing links and fully integrating the off-street facilities with a system of on-street bicycle lanes. The continued goal is to create or connect 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, which are described on the following page.

Type A

Advanced Cyclist

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 cyclists 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 speeds 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 Cyclist

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 cyclists. They prefer:

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

Type C

Child Cyclist

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.

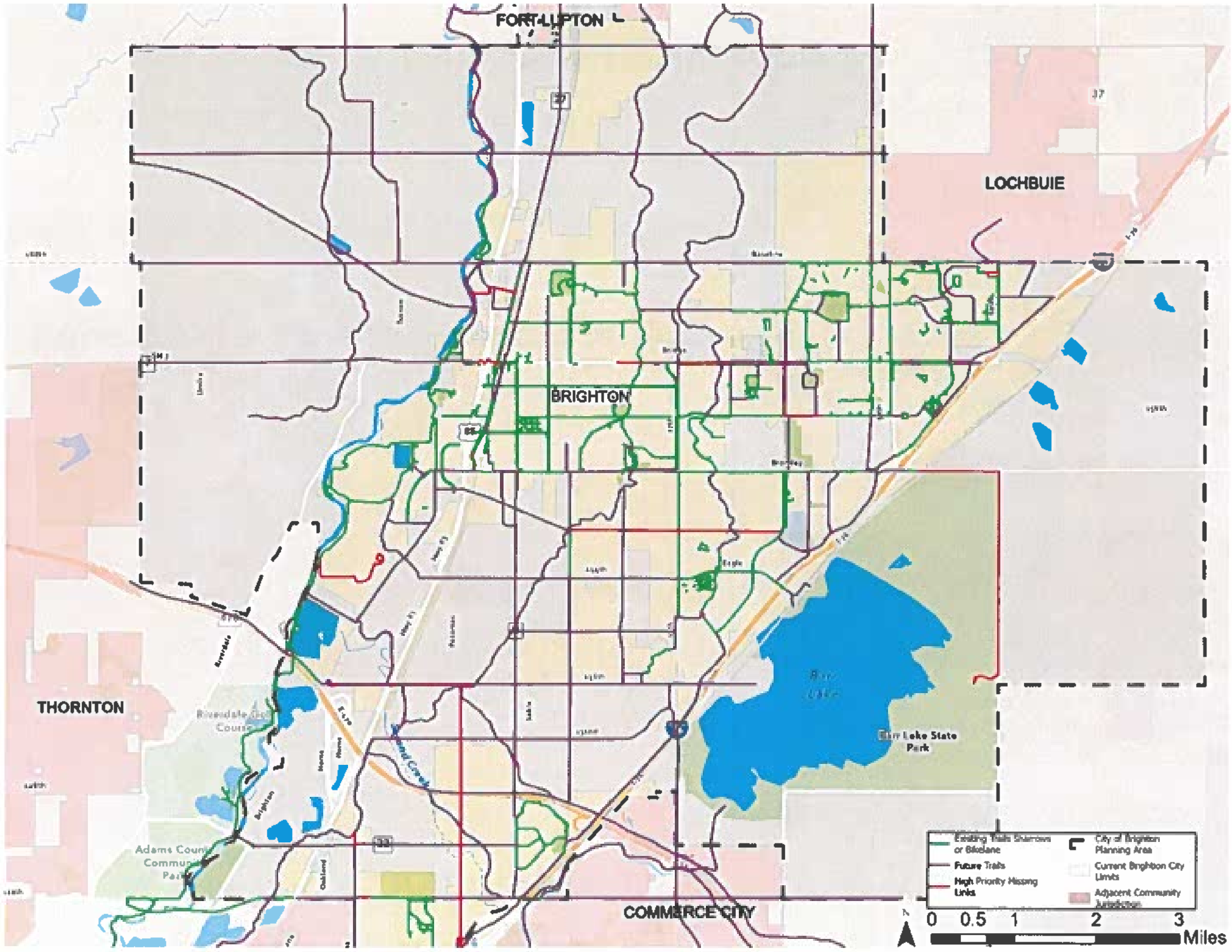


Figure 8: Active Transportation Plan – Existing and Proposed

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 on the following page.

Traditional Bike Lanes

Designated and striped bicycle 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 streets and sidewalks

Paved Shoulders

Extra pavement width on rural roadways to accommodate cyclists.

Multi-Use Trails

Greenway corridors, safe-routes-to-school, trails within street right-of-way.

Recommended Design Standards

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

- ***Designing Walkable Urban Thoroughfares: A Context Sensitive Approach,*** Latest Edition, 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), Latest Edition. Addresses design of on-road facilities and shared use paths.
- ***Manual on Uniform Traffic Control Devices (MUTCD)***, Federal Highway Administration (FHWA), Latest 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), Latest Edition. 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), Latest Edition. Innovative infrastructure treatments to help create complete streets that are safe and enjoyable for bicyclists.
- ***Bikeway Selection Guide,*** Latest Edition, FHWA. Highlights linkages between the bikeway selection process and the transportation planning process.

Strategy 3.1

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

Bicycle accommodation with street rights-of-way 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 76-81 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.

Planning for this integration will require consideration of potential safety conflicts between buses and bicycle through traffic, specifically at bus stop locations.

Far-Side In-Lane Stop With Shared Bus-Bike Lane

When ROW prevents dedicated bike and transit facilities from being provided separately

- *Mark advisory bike lane to the left of the bus stop.*
- *Place the seam of the concrete bus pad to either side of the advisory lane.*
    - ◊ *Seams and cracks pose a hazard to bicycle wheels.*

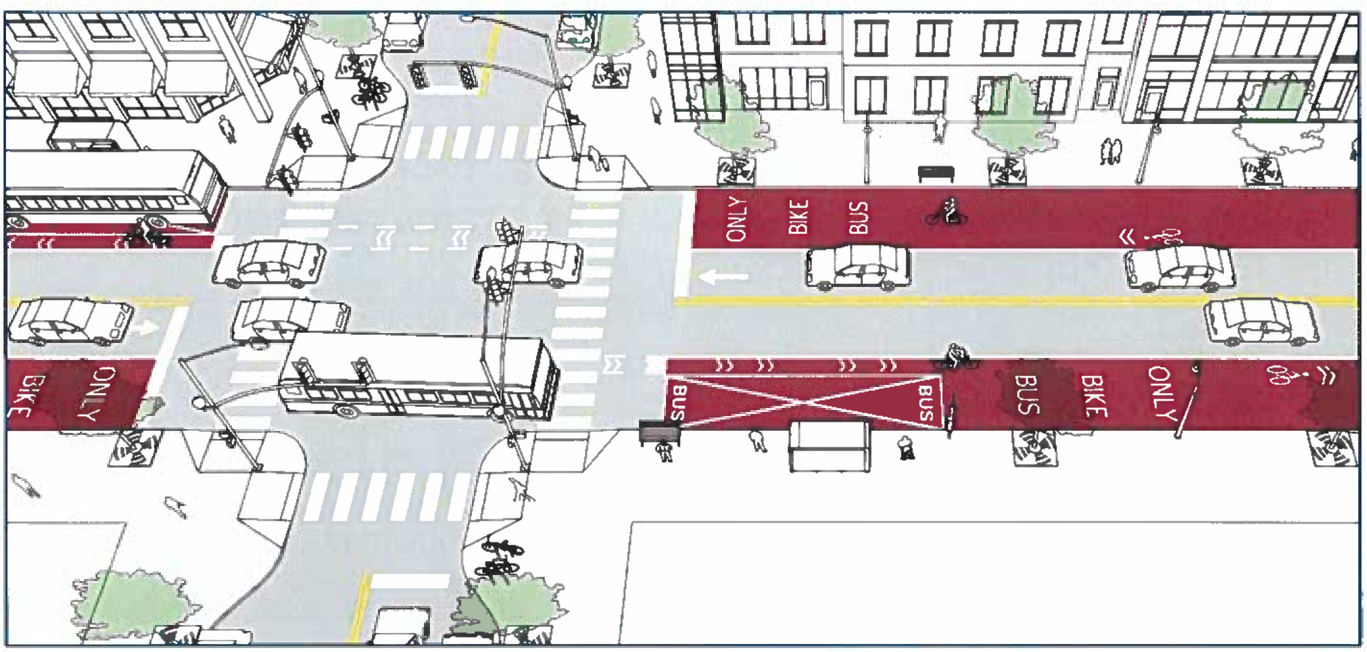


Figure 9: Far-Side In-Lane Stop With Shared Bus-Bike LaneLane *Source: NACTO*

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.
    - ◊ *Note: In general, and where right of way allows, an 8' wide sidewalk/local trail shall be provided on the opposite side of the street*
- Implementation on arterial streets throughout the City shall be designed on a case-by-case basis to ensure a context sensitive approach that considers continued regional connections, right of way constraints, and general origins and destinations in the network.
- 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 79-81.)

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 80-85 provide options for implementing various street designs based upon the adjacent land use context. Bicycle and pedestrian considerations are summarized as follows:

From Vision Zero:

3.2 Incorporate Vision Zero safety principles in street design efforts, including:

- *Street retrofits (street design guidelines, reduce operating speed, address top five crash profiles)*
- *New streets (street design guidelines, design speed, address top five crash profiles)*
- *Design review process*

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 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 8 on page 27.)

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, re-striping wide streets, and completing strategic missing links in the core system depicted below.

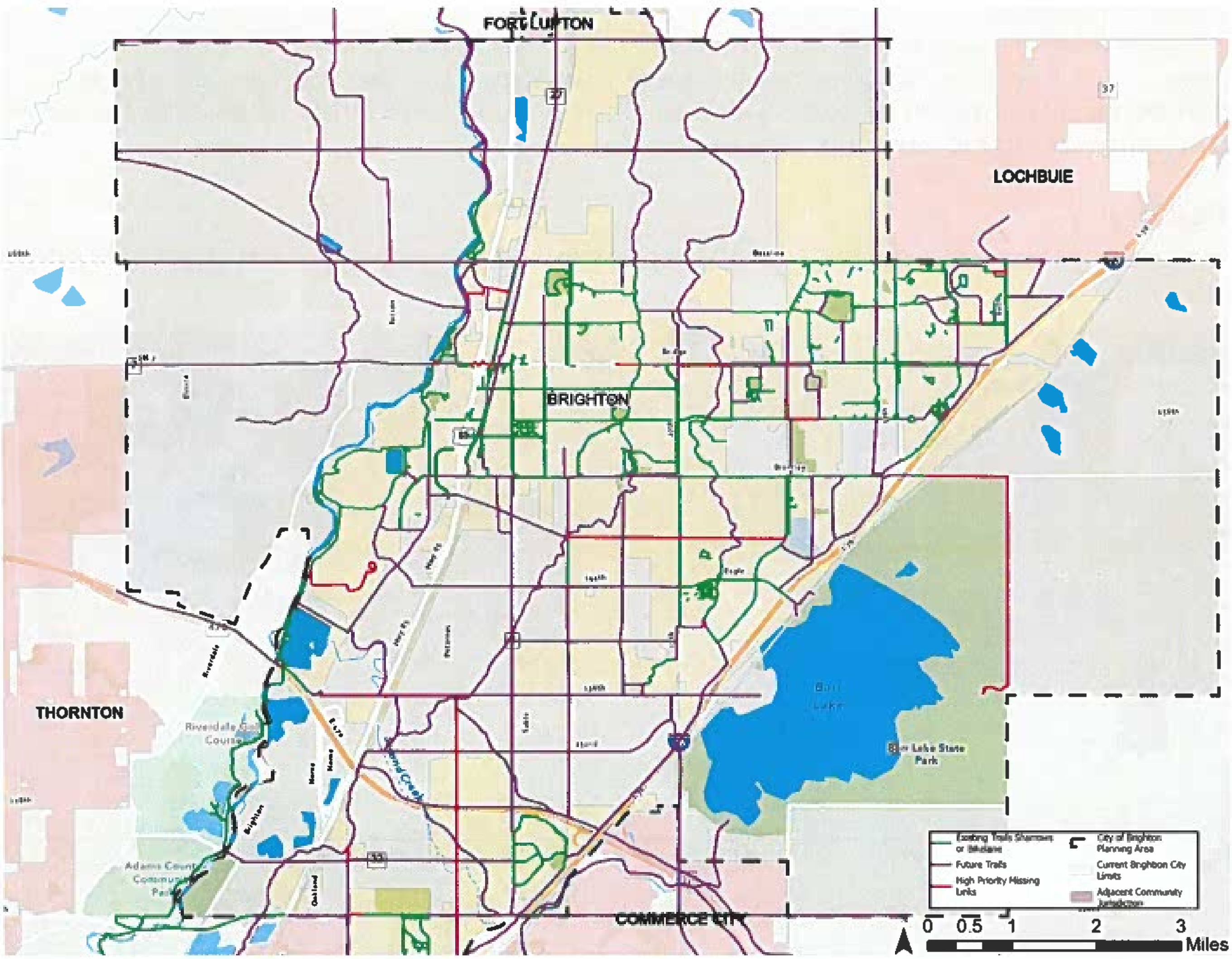


Figure 10: Core Area Bicycle Connectivity Plan

See also Appendix A: Integrated 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.

Strategy 3.2

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

Public comments received in the preparation, and update 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 34 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.

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 Brighton's overall bicycle system.
- Appropriate for use on non-arterial streets with low traffic volumes and speed limits less than 35 mph.
- Designation includes sharrow pavement markings and bike route signing with supplemental direction 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 the 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.

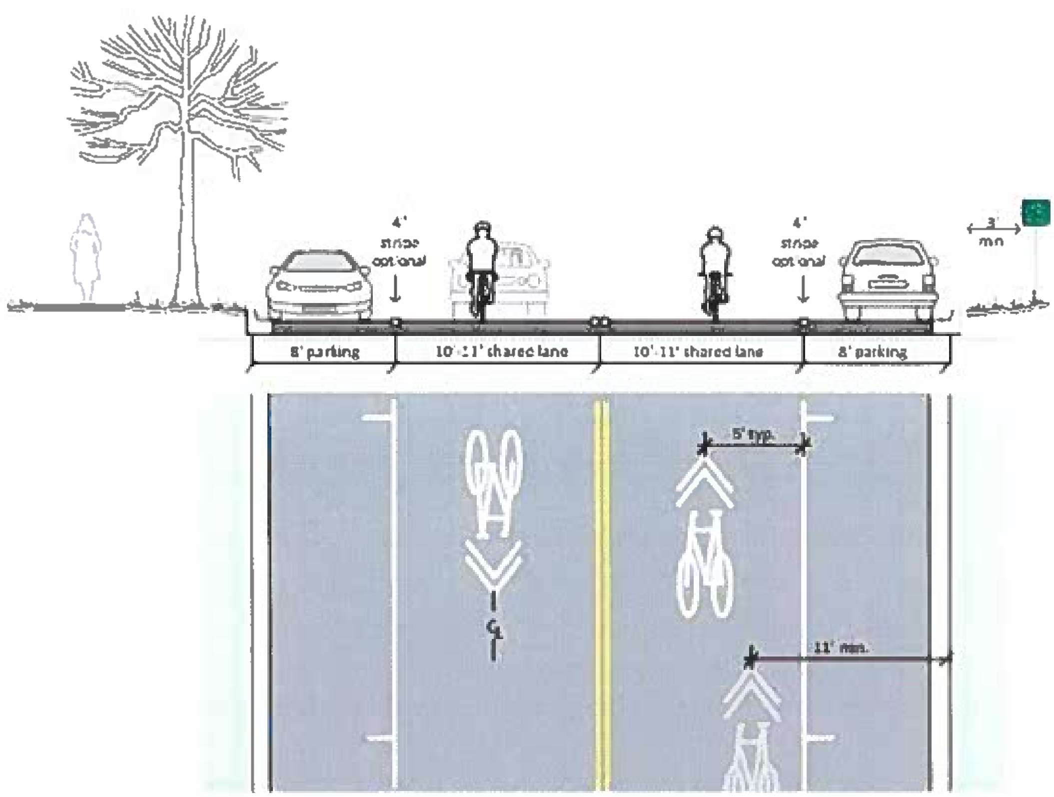


Figure 11: Sharrow Implementation Details

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.

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.

Key Design Elements (cont.)

- ◊ 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.

- 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.

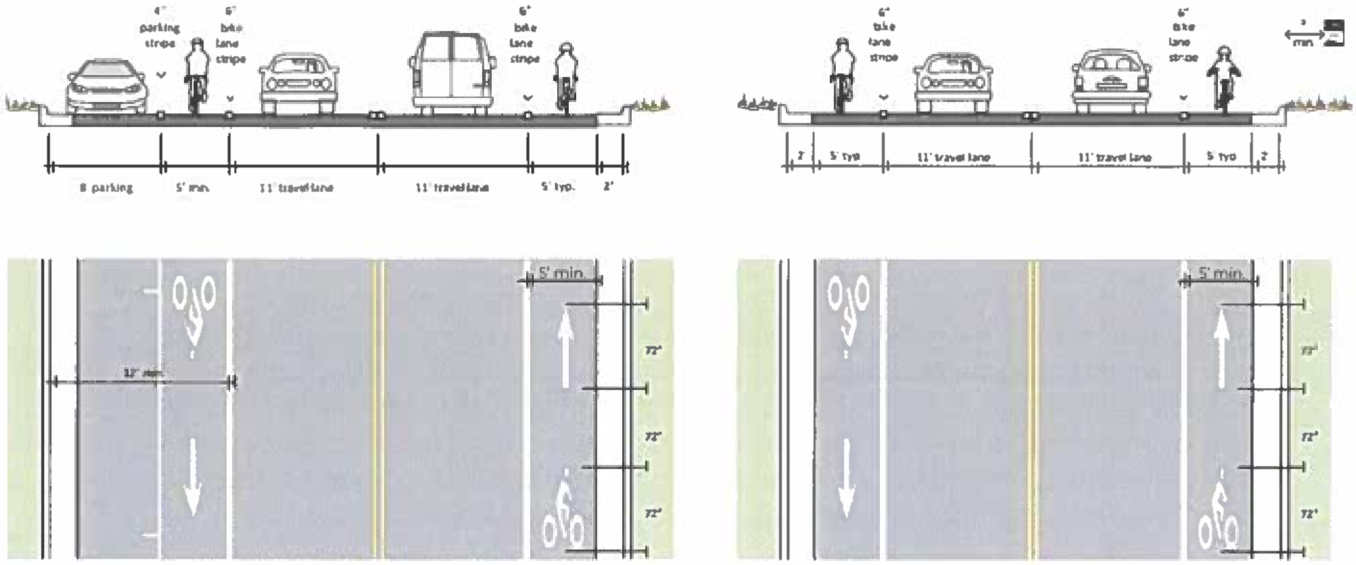


Figure 12: Bicycle Lane Implementation Details

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.

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 designated 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

Paved multi-use trails may be developed parallel to higher volume road 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.

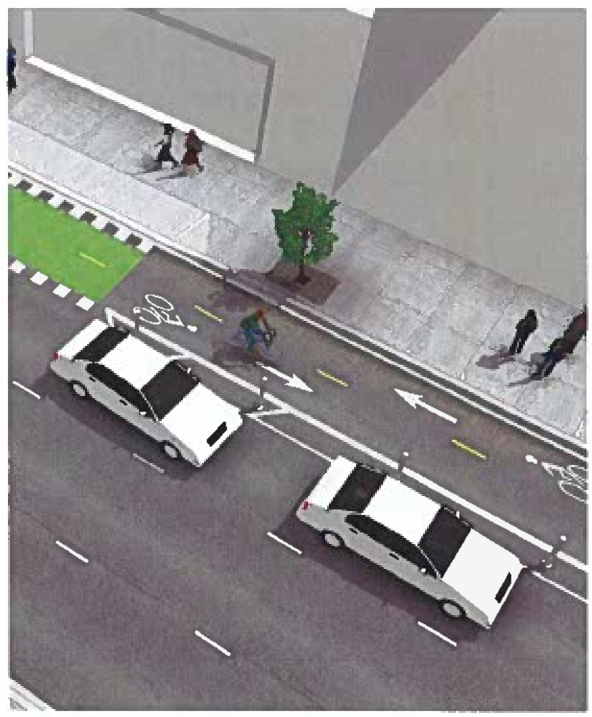
Cycle tracks and protected bike lanes (at street grade) are unique treatments that combine the user experience of a separated path with the on-street infrastructure of a conventional bike lane. Both are physically separated from motor vehicle traffic and distinct from the sidewalk. Since they represent 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 tracks will be considered among corridors with high multi-modal interest.

Key Design Elements

- Cycle tracks may be one-way or two-way facilities, and may be at street 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.



Two-Way Cycle Track Source: NACTO

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 (crushed fines) or paved (asphalt or concrete). Trail width is 10 min. with a 5% grade. However, 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.

Bicycle Friendly Community 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 rights-of-way.

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 76-92 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 shall 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 (5'), with Brighton walkway widths ranging from 6' to 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 locations where a furnishing 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 will be maintained in all locations.

Key Design Elements (cont.)

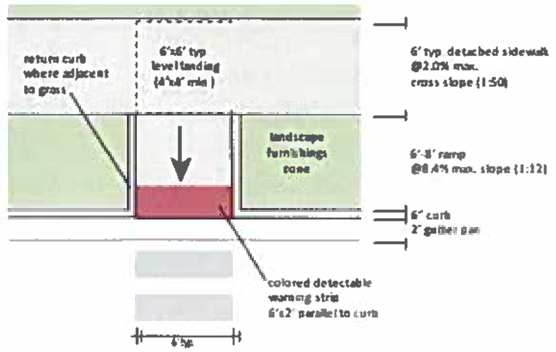
- Attached sidewalks are only allowed where needed to connect to existing attached sidewalks on adjacent properties. Driveway crossings of attached sidewalks shall not create steep cross slopes that cause difficulties for pedestrians using wheelchairs and walkers. Driveway crossings shall be level (<2% cross slope) and not force sidewalk users to repeatedly travel over flared sides of driveway ramps.

Intersections

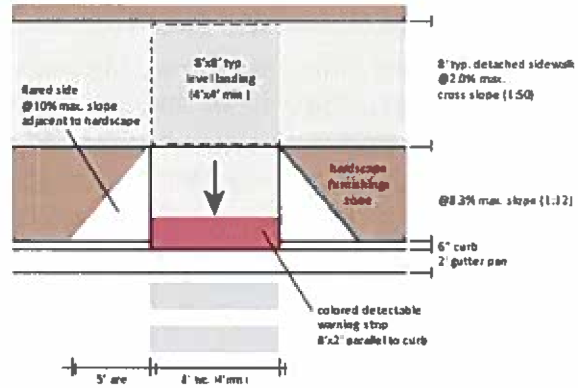
Sidewalks will provide continuous routes of travel for pedestrians by addressing mobility needs both along and across streets. Design treatments at intersections will vary depending on sidewalk location and motor vehicle lane configuration, but all intersections will consider the needs of pedestrian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

Key Design Elements

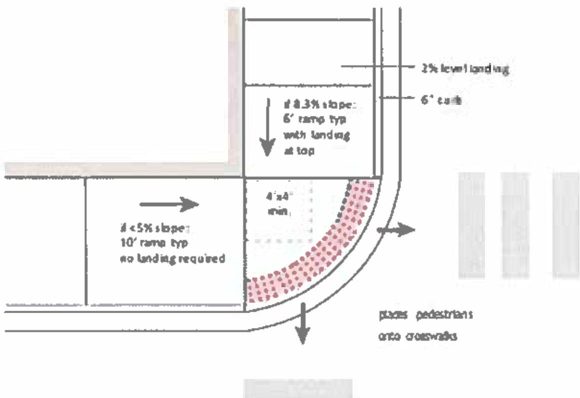
- All curb ramps shall be constructed to the width of the approaching sidewalk. A min. 4'x4' level landing shall be provided at top of perpendicular and diagonal ramps, and at the bottom of parallel ramps.
- Ramp grades shall have a 1:12 (8.3%) max. slope; blended transitions shall have a 1:20 (5%) max. 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 at 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 gaps of 12" - 60".
- The design of the lines and gaps should avoid vehicular wheel paths if possible to minimize maintenance needs for re-striping crosswalks.



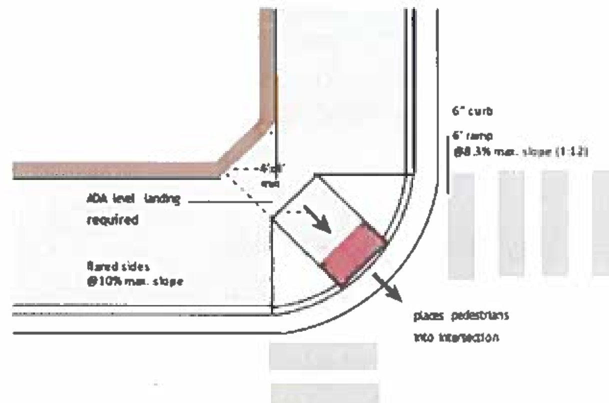
Perpendicular Curb Ramps - residential context



Perpendicular Curb Ramps - mixed-use context



Blended Transitions - preferred design



Diagonal Curb Ramps - not recommended

Figure 13: Curb Ramp Implementation Details

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 13.

- 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 travel way.

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.

A Sustainable + Complete Community

The Be Brighton (2015) vision includes prioritizing the development of mixed-use neighborhoods with multiple transportation options to reduce single-use sprawl, infrastructure extensions, and vehicle miles traveled. This includes providing bike lanes, sidewalks, trails, transit options , 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.

Key to realizing these goals will be addressing the link between land use and transportation. The City of Brighton will need to coordinate the recommendations of the adopted 2016 *Transportation Master Plan* and the 2026 update with the latest 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.

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 Master Transportation 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 Leadership in Energy and Environmental Design for Neighborhood Development (LEED ND) guidance for street connectivity, which reflects block size and walkability criteria. (See Chapter 6.)

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

New development in Urban Centers designated by DRCOG 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 86.) 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

As Brighton continues to grow, there will be an increased need for managing the vehicle speeds and traffic that comes with additional amounts of drivers on the city's roadway network. To achieve this task, the City of Brighton will need to be strategic in its implementation of traffic calming in key locations throughout the City. According to the FHWA and ITE, the primary purpose of traffic calming is to "support the livability and vitality of residential and commercial areas through improvements in non-motorist safety, mobility, and comfort. These objectives are typically achieved by reducing vehicle speeds or volumes on a single street or a street network."

To achieve traffic calming, four main techniques are utilized: vertical treatments, horizontal shifts, and roadway narrowing are intended to reduce vehicle speeds and enhance the street environment for non-motorists, while roadway closures are intended to reduce cut-through traffic by preventing vehicular travel in one or more directions. It is important to note that any of the traffic calming techniques described within this section may be used in combination with other treatments to achieve greater speed and traffic reductions.

In deciding the most-appropriate traffic calming technique for a given situation, the cost of a specific treatment must also be considered, especially when deciding between an infrastructure-based or paint-based treatment. Infrastructure improvements are typically more expensive to install, but they last longer and require less maintenance than paint-based techniques. Conversely, paint-based treatments are cheaper to install than additional infrastructure, but they require regular reapplication of paint to maintain their effectiveness. Please see the Appendix for a list of treatments that may be supportive of the City's efforts in calming traffic.

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 four major elements:

- **Regional High-Capacity Transit**
- **Local Transit**
- **Supporting Capital Investments**
- **Mobility on Demand**

Need for Transit in Brighton

Public transit in Brighton is provided by the Regional Transportation District (RTD). Existing service includes four fixed-routes (145X, 520, 120L and RX), FlexRide, and the N line (see figure 14 & 15). Despite Brighton's population increasing by 30% since 2010, ridership within Brighton has not increased largely due to overall changes in travel patterns of those who live and work within the city. Commuting to and from work is a crucial aspect of transit service in Brighton. According to the U.S. Census Bureau's On the Map data, a slight majority of residents living in Brighton travel to work outside of the City (15,956). Comparatively, almost the same amount of people live outside of the City and commute in for their employment (roughly 1,700 less). With this almost even split in commute, further support for future BRT corridors and commuter lines is a must.

Figure 14: Regional Transit Service

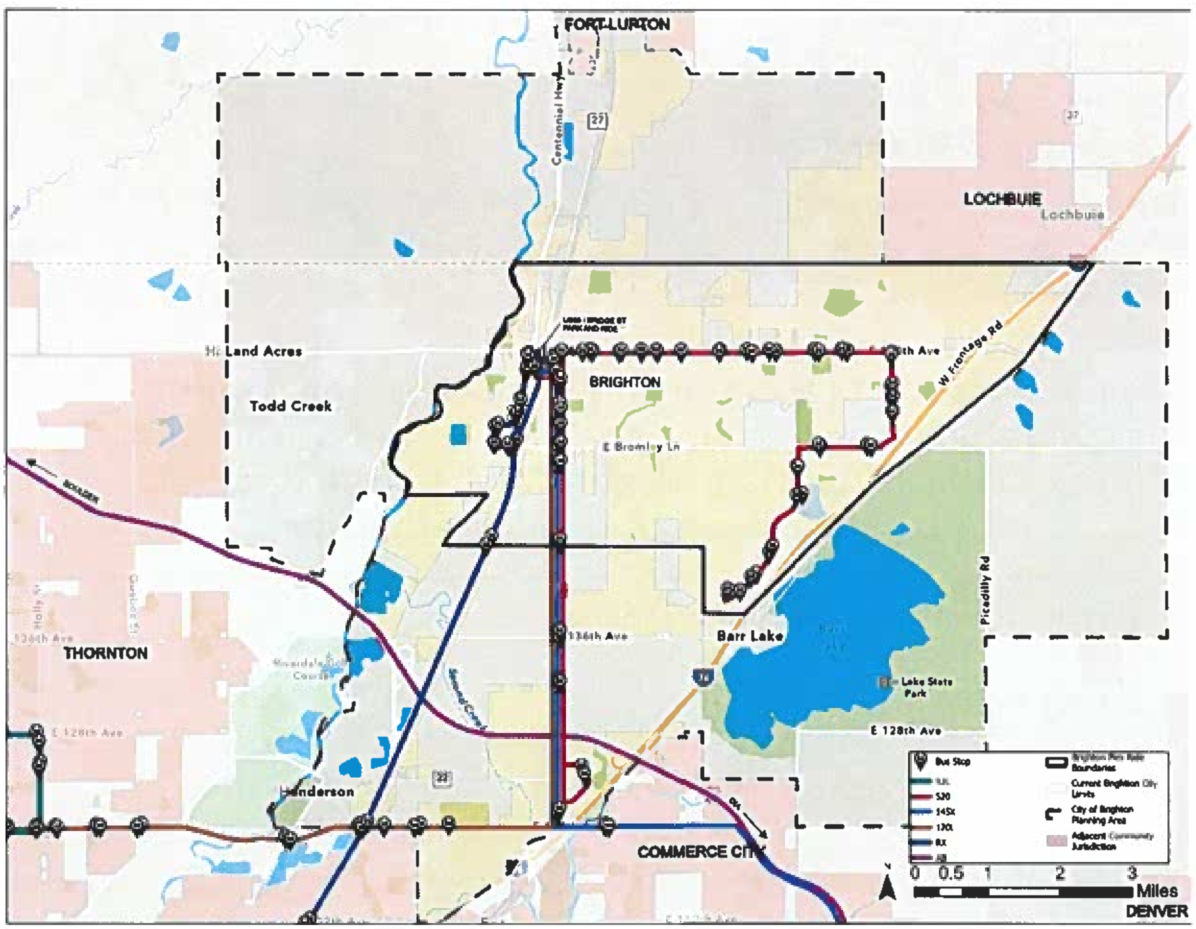


Figure 15: Existing Brighton Transit Service

Currently, the growth that has occurred in transit ridership is relative and has not resulted in an increase in transportation demand that would, per RTD's district-wide service standards, warrant additional service levels in addition to what is already being provided via the N Line Bus Operations Plan. Despite this, four of RTD's planned Bus Rapid Transit (BRT) routes would serve Brighton (State Highway 2, North E-470, 120th Avenue, and North I-25) working to further connect Brighton with surrounding communities and the core of the metro area.

Brighton is a small community within the Denver region (with a population of about 40,083 in 2020) with growth settling between 2% and 5% each year. Continued steady growth is anticipated in Brighton due to the availability of land and proximity to Denver and the Denver Metropolitan Area. 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 coordinated with RTD to ensure proper service levels (see transit benchmark on page 19).

Routes	Weekday Roundtrips	Weekend Roundtrips	Weekday Ridership (Board)	% Total
FlexRide	5:30AM - 7PM	No Service	25	4%
145X	4	4	35	6%
520	30	30	92	15%
120L	36	36	169	27%
RX	14	No Service	307	49%
Grand Total	**84**	**70**	**628**	**100%**

Figure 16: Transit Service Levels & Ridership

Means of Transportation	Brighton	Denver
Drive Alone	79%	66%
Carpool	11%	7%
Work from Home	6%	12%
Public Transportation	2%	6%
Other Means	1%	1%
Walk	1%	5%
Bicycle	0%	2%
Grand Total	**100%**	**100%**

Figure 17: Means of Transition to Work

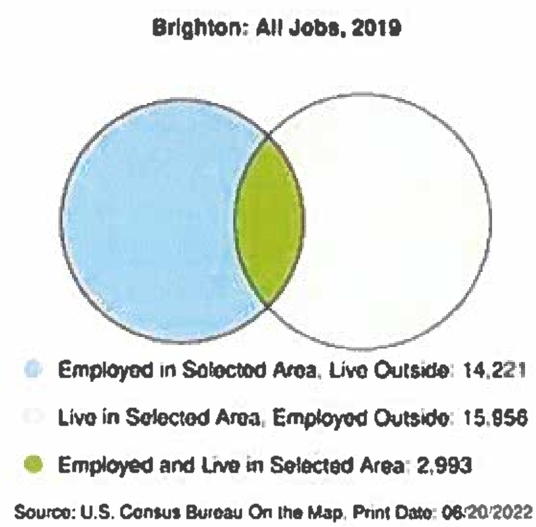


Figure 18: Brighton Workforce Inflow/Outflow

Brighton's Role in Providing Transit

RTD is the primary service provider of transit throughout the Denver metro area. However, the City of Brighton and other agencies 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** – collaborate with RTD, DRCOG and CDOT on locations and corridors for transit service identified through planning processes.

- **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.

- **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, including providing the following:

- **Connecting people to jobs and services** - Future transit investment and enhancements 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 continue to, and become increasingly efficient in connecting Brighton's workforce and residents to major destinations throughout the Metro Denver region.

- **Supporting a healthy economy** - Future transit will contribute to Brighton's economy by supporting transit-oriented development, supporting job growth and making Brighton a more desirable place for residents and businesses to locate.

- **Providing a viable alternative means of transportation for all residents** - Future transit in Brighton will provide a viable alternative 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, paired with other transportation demand management strategies, will help reduce per capita VMT (vehicle miles traveled) within Brighton, reducing the demand for expensive future roadway widening projects.

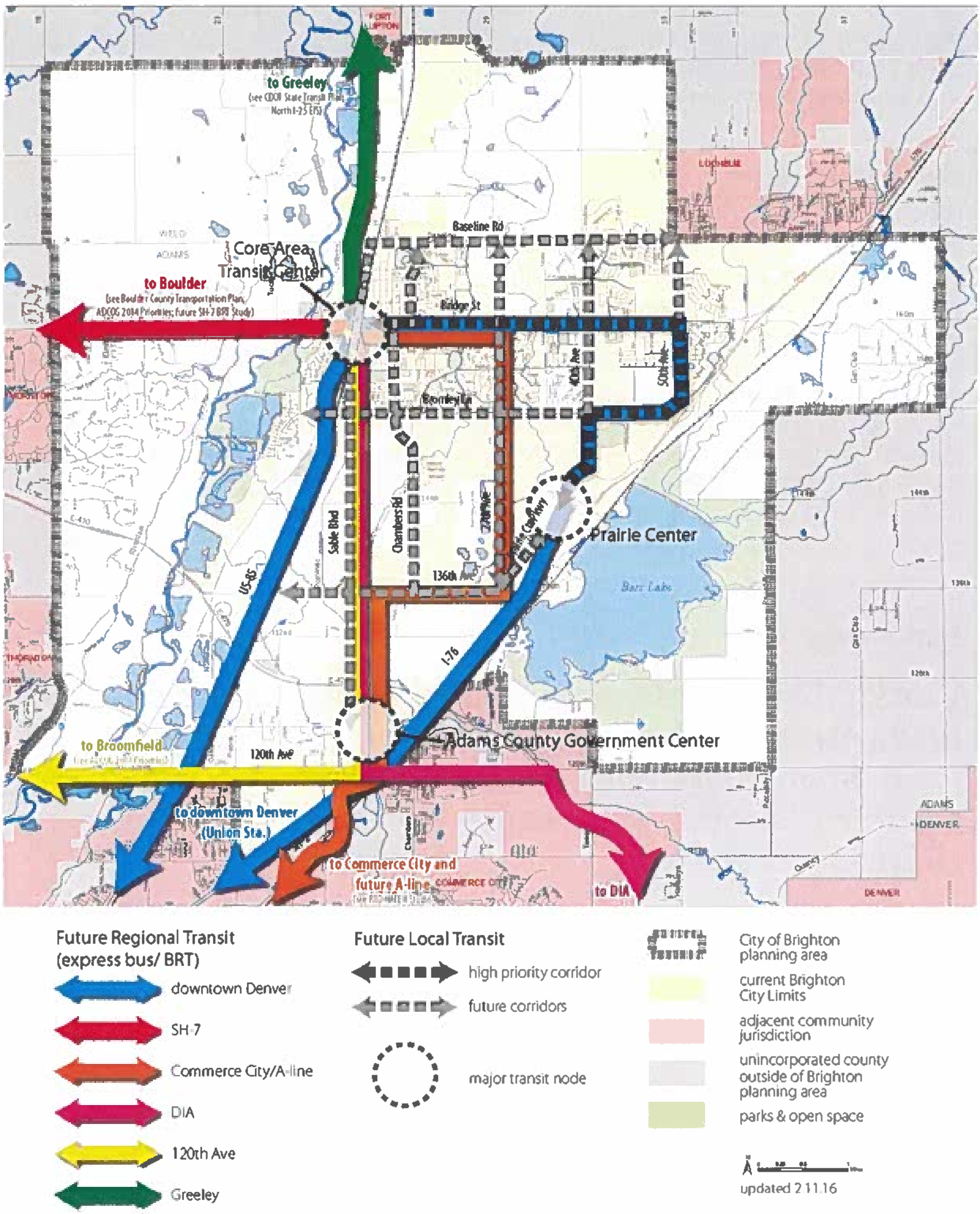


Figure 19: Transit Vision Map

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 be come a node of a future regional high-capacity transit network. Implementation of such a transit network (as described in this chapter) coupled with increasing density and demand to more efficiently connect Brighton to the metro area would enhance the City's regional appeal as a location for business and commercial activity as well as its livability. By supporting the density necessary and incentivizing strategic connections to origins and destinations, the City could leverage transit as a successful part of the overall strategy increase connectivity.

Strategy 4.1

Work closely with state and regional agencies and with neighboring jurisdictions on planning for transit. Work with RTD and Adams County to establish a local fixed-route transit network in Brighton.

What is BRT?

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

- Frequent service
- Limited stops
- Utilizes exclusive 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

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 19). 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.

In January of 2020, RTD released its Regional BRT Network Feasibility Study which aimed to understand increases in regional travel demand, assess the viability of pursuing Small Starts funding to support the region's transportation demands, identify opportunities to leverage existing investments, and identify BRT investments that complement local and regional planning goals. The Regional BRT Network Feasibility Study identified the most promising BRT projects though a 4-tier evaluation process. Evaluation ranking is outlined as the following:

Tier 1 – Identify High Demand Travel Corridors

- Tasks – Evaluate candidate corridors
- Results – Identify top 20 – 30 corridors for advancement to tier 2 evaluation

Tier 2 – Identify Congestion and/or Delay

- Tasks – evaluate top 20 – 30 corridors retained in tier 1
- Results – identify top 10 – 20 corridors/segments for advancement to tier 3 evaluation

Tier 3 – Identify Viability of Capital Investments

- Tasks – evaluate top 10 – 20 corridors/ segments retained in tier 2
- Results – identify top 5 – 10 corridors/corridor segments for advancement to their 4 evaluation

Tier 4 – Conduct Final Evaluation

The City will plan for and encourage the following future routes included in the regional BRT study:

- **North I-25 (Downtown Denver) Tier 4** - 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 RX 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 Tier 2** - 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 conducted a SH-7 BRT Study and determined that BRT is a feasible option along SH-7 and funding is being explored. 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.

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.

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.

Connect to RTD North Metro Line

The RTD North Metro Commuter Rail Line (N Line) was completed and has been providing commuter rail service between Denver Union Station and Northglenn since September 2020. Currently, the 120L route provides service between Brighton and the northern N line terminus at the Eastlake-124th Avenue Station. Once extended, express bus service is anticipated to be provided between Brighton and the future SH-7 station (potentially via the future SH-7 BRT).

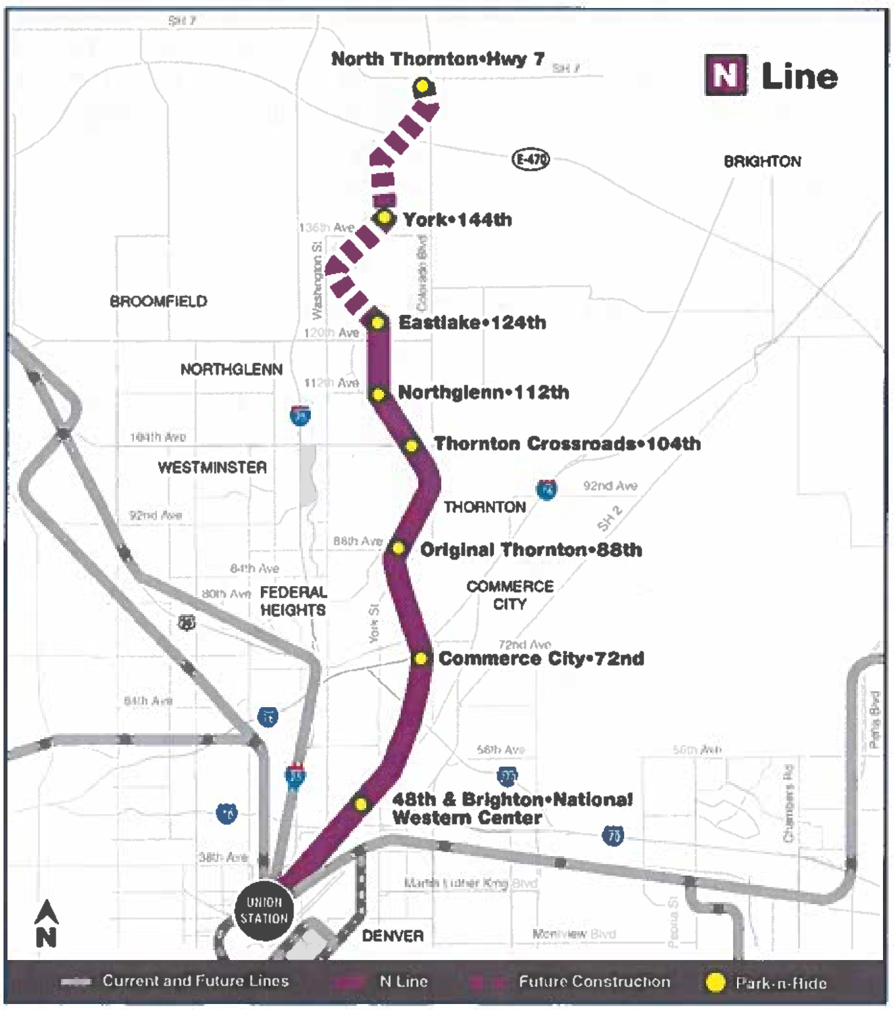


Figure 20: North Metro Rail Line (N Line)

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. Per RTD guidelines, spacing of routings will be based on what is warranted per density and demand.

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 520 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.

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
- **Transit Hubs, Transfer Centers, and Transit Stops** – 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 4.2

Work with RTD and other mobility providers to include transit and mobility access in designated Urban Centers.

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 19.

Strategy 4.3

Assess existing and proposed bus stops and transfer locations for suitability for service as mobility hubs to provide first and last mile connections and improve transit ridership.

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 by providing options that complement fixed route transit 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 64 to 66. 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 Figure 21).

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.
- Far side 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.

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

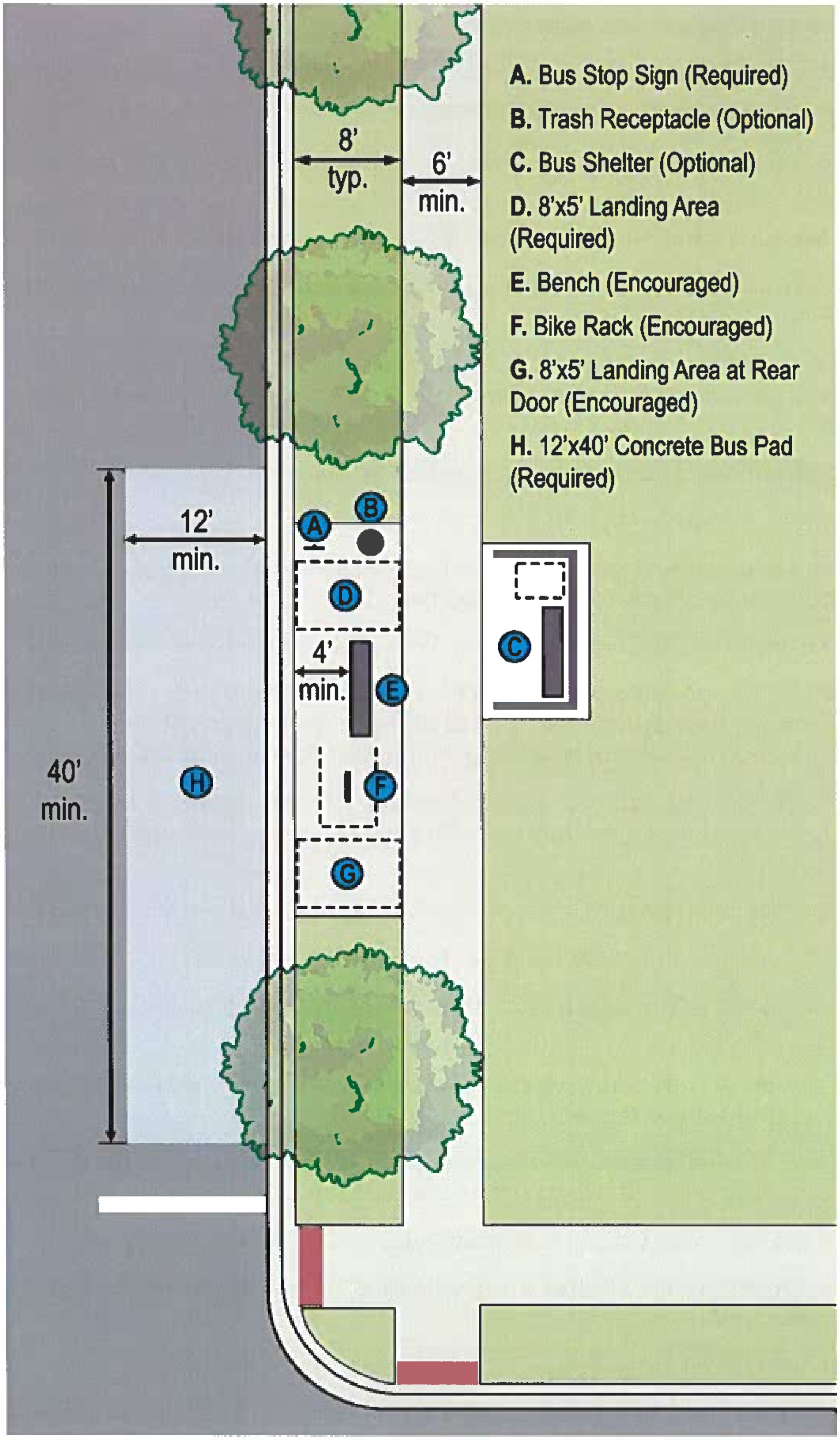
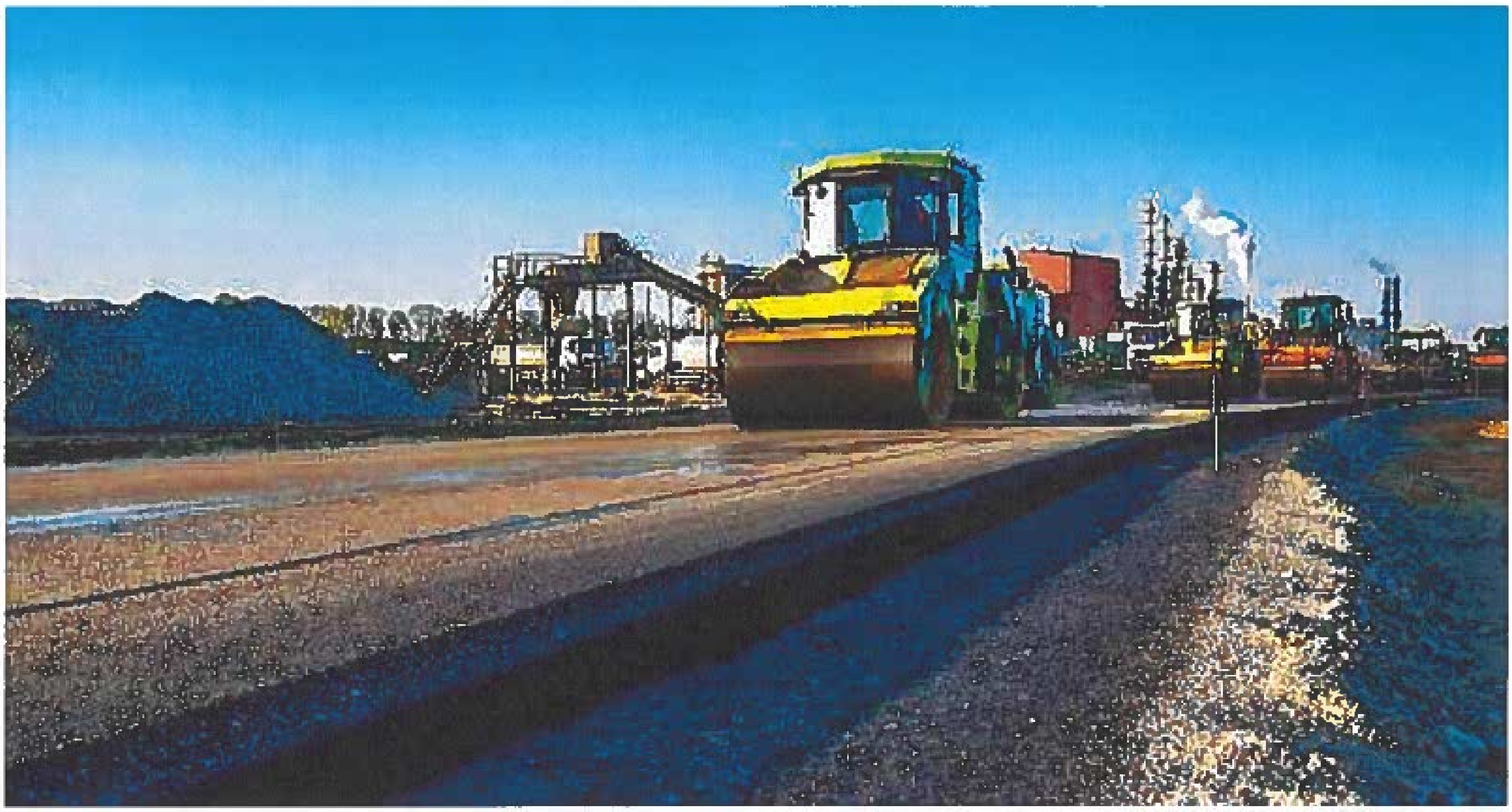


Figure 21: Bus Stop Elements

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 through buildout. 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 have higher priority than widening.

The "functional classification" (ie. major and minor arterials and collectors) of each of the streets in the build-out network has been identified to guide planning and design. 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. 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.

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 22.

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

Strategy 5.1

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

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 Layout

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 other 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.

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.

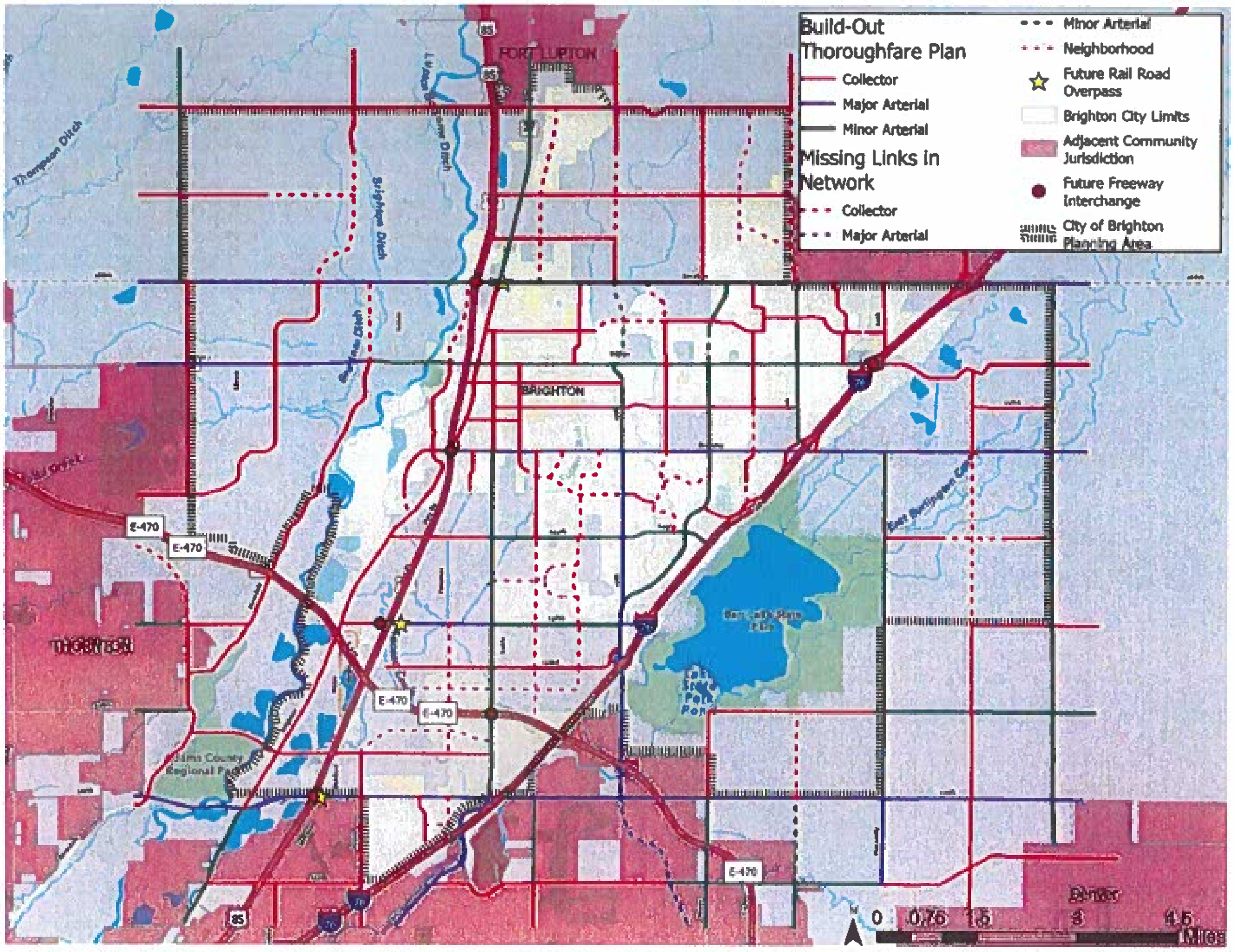


Figure 22: Build-Out Thoroughfare Plan

Strategy 5.2

Require new development to construct roadways to the classification in the Thoroughfare Plan.

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 20 on page 59.

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 21: 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.

arterial scale / retail services context

collector scale / main street context

collector scale / rural context

local scale / residential context

Figure 23: Scale & Context of Various Street Types

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.

Roundabouts and Signalized Intersections

When conditions allow, the City of Brighton has a preference for the utilization of roundabouts, as opposed to signalized intersections, when expanding the roadway network.

Cross Sections

Cross-sections for each street classification presented below are a direct reference to the Street Design Standards included in the Land Use update as of February 25, 2021, and reflect planning and design based upon targeted posted speed limits. For each street type 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. For complete design details, including planning & urban design considerations and description and context for each roadway type, please see the City of Brighton Land Use and Development Code, Article 3.-Subdivision Standards, 3.03 – Blocks and Lots.

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-76) and regional arterials (State Highway 7, Bromley Lane, 120th, 27th Avenue) 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 arterial cross-sections provided below.

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 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 below 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 ROW
- 35 mph 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 crushed fines as appropriate to the rural setting.

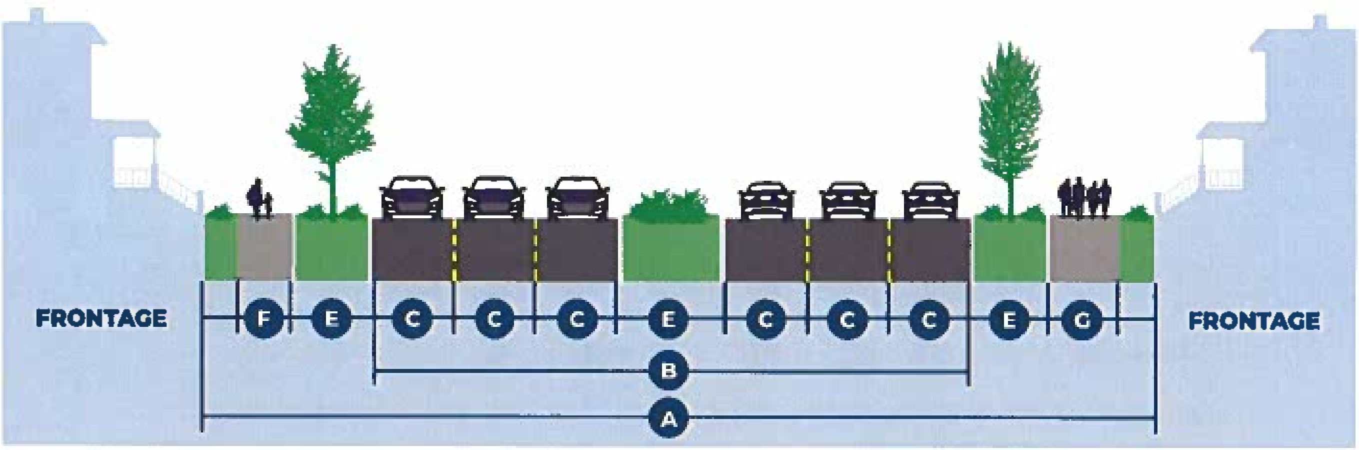


Figure 24: Standard Arterial (Minor Arterial or Major Arterial)

Street Design – Standard Arterial (Major Arterial)		
A	ROW Width	140'
B	Street Width (curb-to-curb)	88' including median
C	Lanes (#/width)	Up to 6 @ 12'
	On-street Parking	N/A
F	Sidewalks	8'; 10' trail
E	Planting/Amenity Area	12' on each side / 16' median
G	Bicycle Facilities	10' trail on one side
	Turn Lanes	Limited distances within median

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 two cross-sections in Figure 26 and 27.

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.

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 70 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 ROW
- 35 mph posted speeds
- Interim design may include one lane of travel in each direction
  - ◊ A 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 crushed fines as appropriate to the rural setting.

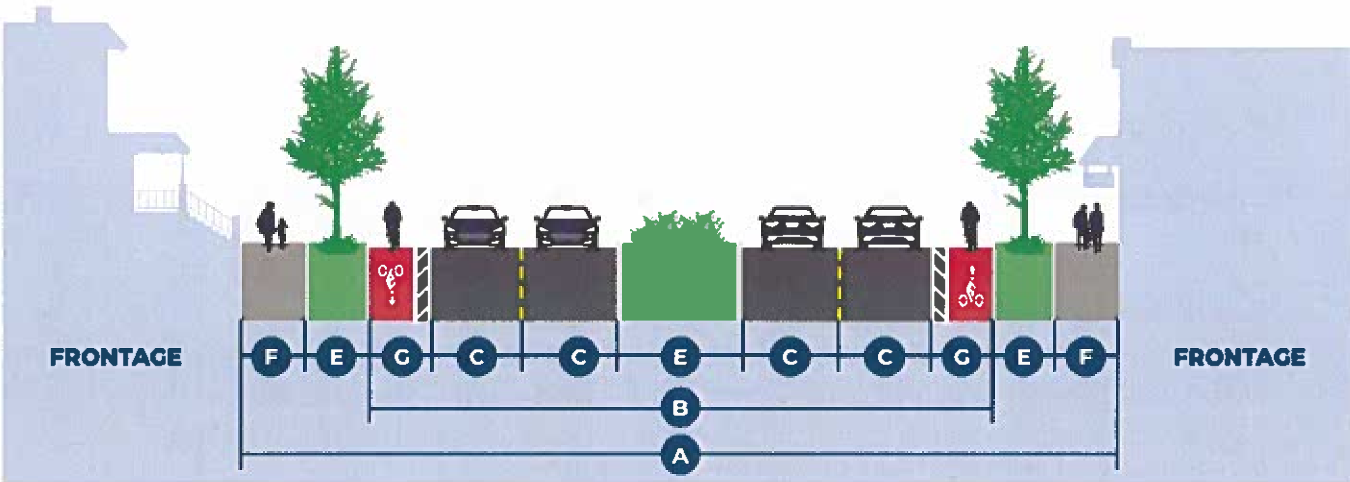


Figure 27: Standard Arterial (Minor Arterial Arterial)

Street Design – Standard Arterial (Minor Arterial)		
A	ROW Width	110'
B	Street Width (curb-to-curb)	76' including median
C	Lanes (#/width)	4 @ 12'
D	On-street Parking	N/A
E	Planting/Amenity Area	8' on each side / 16' median
F	Sidewalks	8'
G	Bicycle Facilities	6' buffered bike lane on each side
	Turn Lanes	Distances within median

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 28 - 32)

Rural Design

Brighton values its strong agricultural heritage and the separation farmlands provided 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.

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

Key Design Elements

- Acquire 70'-92' right-of-way for all collector streets.
  - ◊ Includes pedestrian realm within ROW
- 30 mph 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

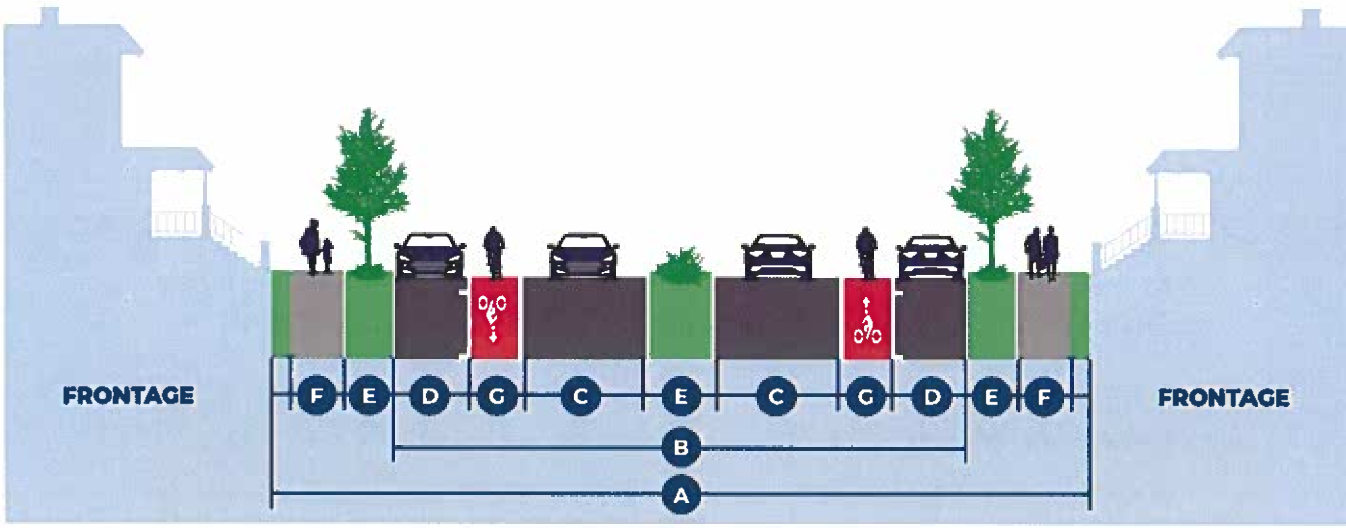


Figure 28: Neighborhood Parkway (Collector)

Street Design – Neighborhood Parkway (Collector)		
A	ROW Width	92'
B	Street Width (curb-to-curb)	64'
C	Lanes (#/width)	2 @ 14'
D	On-street Parking	8' on each side
E	Planting/Amenity Area	6' on each side / 8' median
F	Sidewalks	6' on each side
G	Bicycle Facilities	6' lanes
	Turn Lanes	N/A, or within median

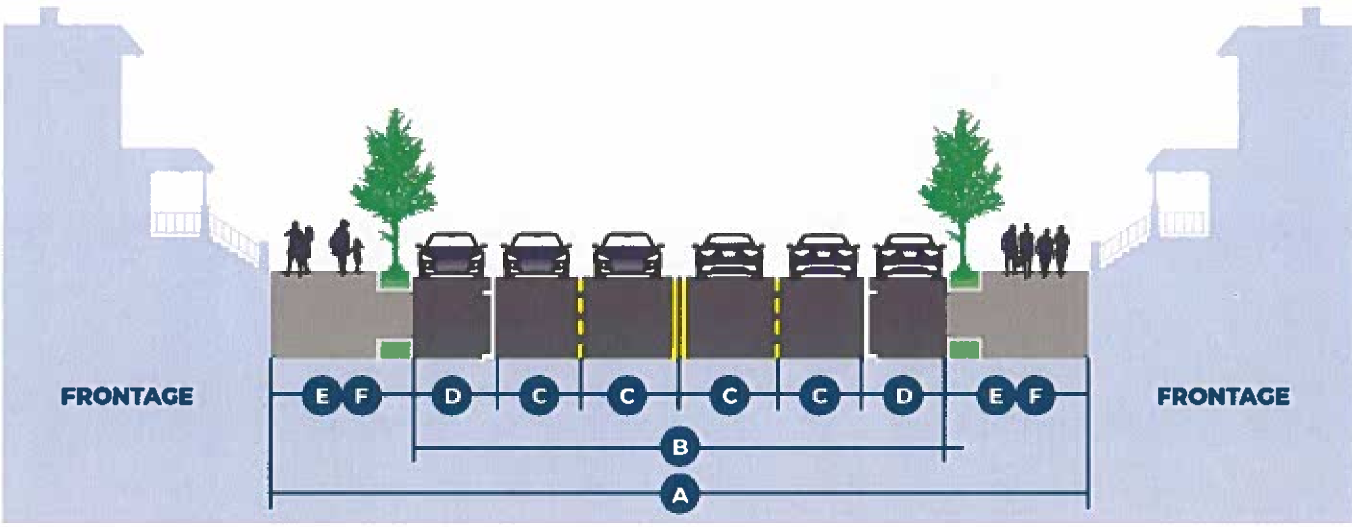


Figure 29: Avenue (Collector)

Street Design – Avenue (Collector)		
A	ROW Width	92'
B	Street Width (curb-to-curb)	60'
C	Lanes (#/width)	4 @ 11'
D	On-street Parking	8' on each side
E	Planting/Amenity Area	4' x 8' (min) tree wells within sidewalk
F	Sidewalks	16' on each side
G	Bicycle Facilities	N/A
	Turn Lanes	Avoid due to connected network OR limit within reconfigured street space

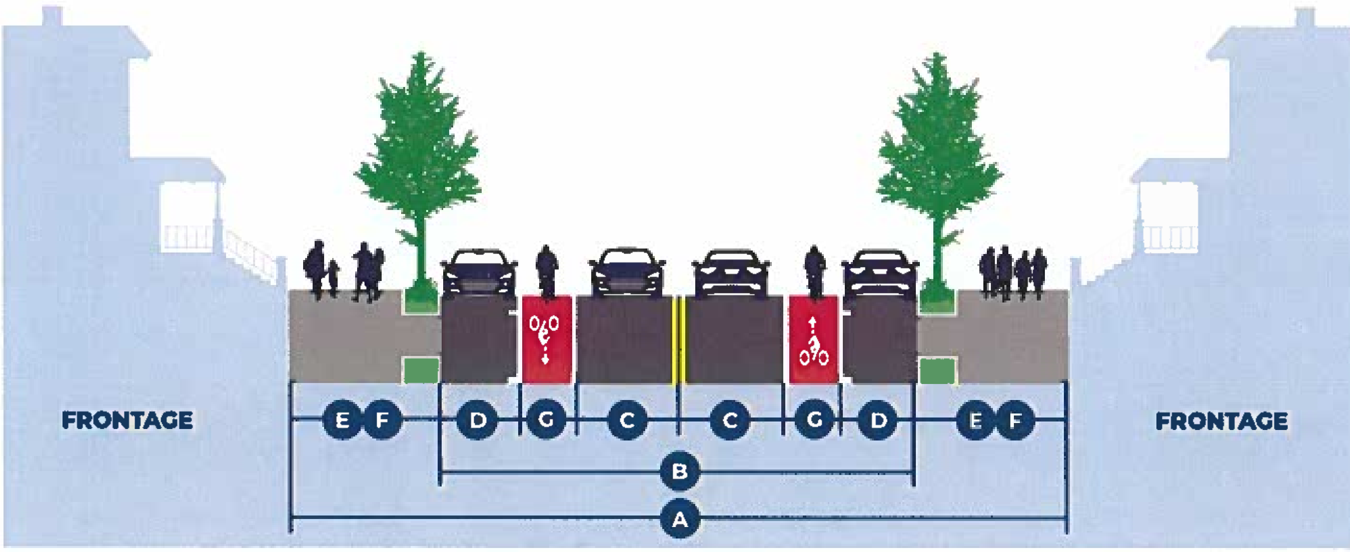


Figure 30: Boulevard (Collector)

Street Design – Boulevard (Collector)		
A	ROW Width	82'
B	Street Width (curb-to-curb)	50'
C	Lanes (#/width)	2 @ 11'
D	On-street Parking	8' on each side
E	Planting/Amenity Area	4' x 8' (min) tree wells within sidewalk
F	Sidewalks	16' on each side
G	Bicycle Facilities	6' bicycle lane on each side
	Turn Lanes	Avoid due to connected network

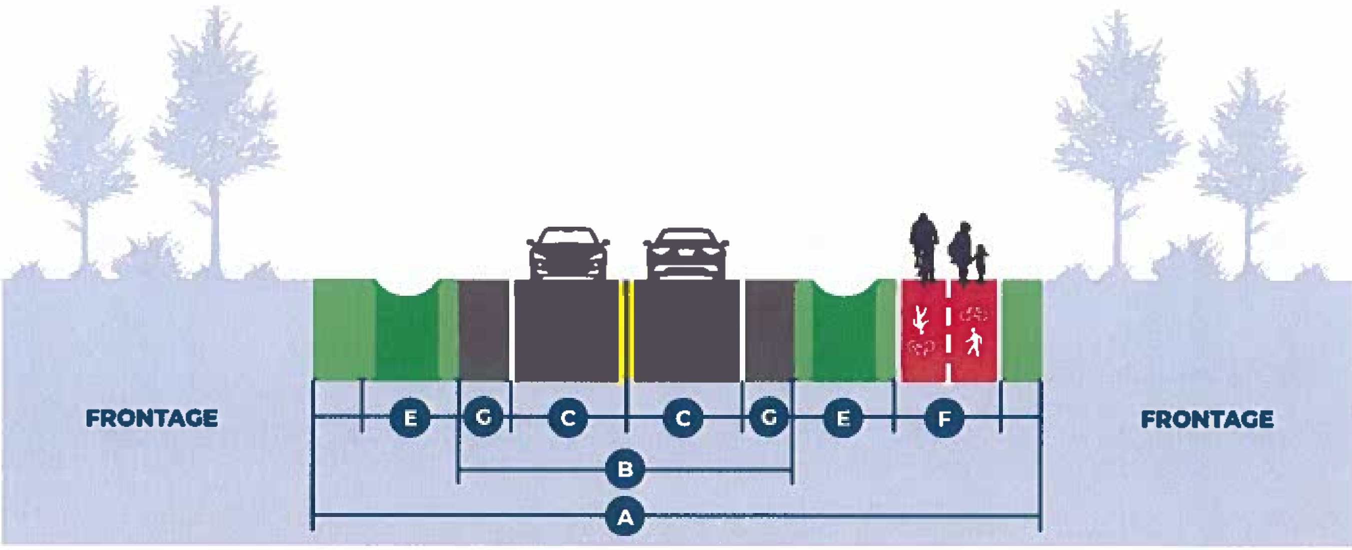


Figure 31: Rural Connector (Collector)

Street Design – Rural Connector (Collector)		
A	ROW Width	70’
B	Street Width (edge of pavement to edge of pavement)	30’
C	Lanes (#/width)	2 @ 11’ lanes w/ paved shoulder
D	On-street Parking	N/A
E	Planting/Amenity Area	10’ drainage swale
F	Sidewalks	5’ path or 10’ multi-use path, 1 side
G	Bicycle Facilities	5’ paved shoulder
	Turn Lanes	10’ – 12’ based on engineering review where needed

Commercial/Mixed-Use Design

The street design recommendations of this TMP are designed to work in tandem with the Land Use and Development Code. 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 82'-92' right-of-way as per all collector streets.
- 25 mph posted speeds
- Provide 11' travel lanes and 5' min. bike lanes
- 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 pairs 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 70 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 78' right-of-way for neighborhood connectors
- 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

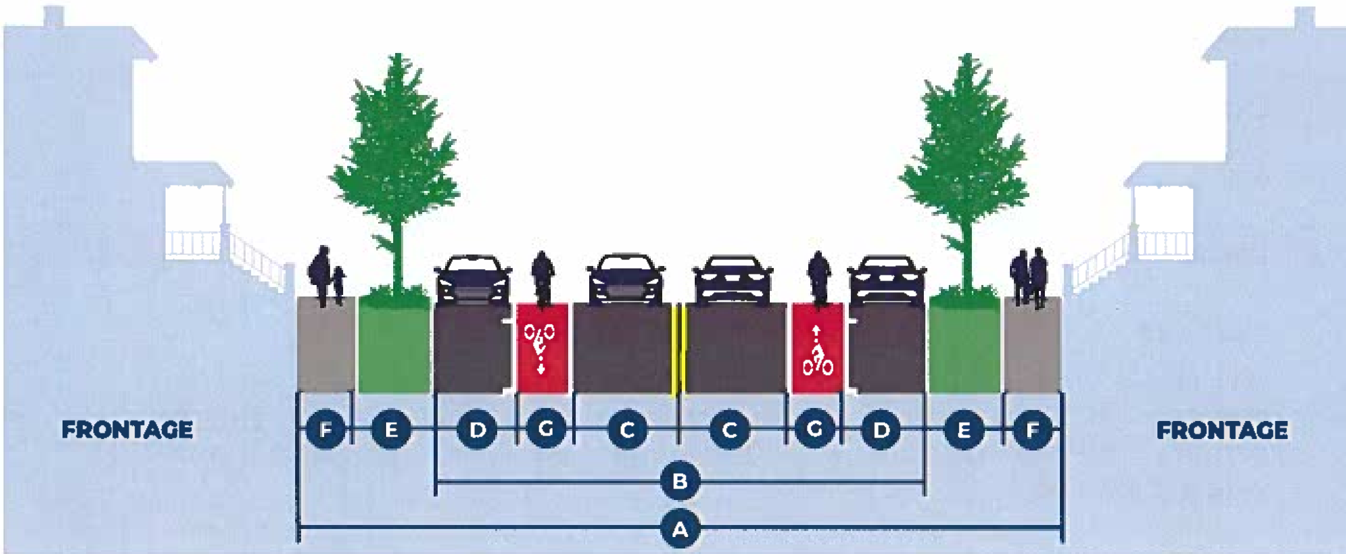


Figure 32: Neighborhood Connector (Collector)

Street Design – Neighborhood Connector (Collector)		
A	ROW Width	78'
B	Street Width (curb-to-curb)	50'
C	Lanes (#/width)	2 @ 11'
D	On-street Parking	8' on each side
E	Planting/Amenity Area	8'
F	Sidewalks	6' on each side
G	Bicycle Facilities	6' bike lane on each side
	Turn Lanes	N/A unless dictated by traffic study

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 62' right-of-way for local streets
- 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

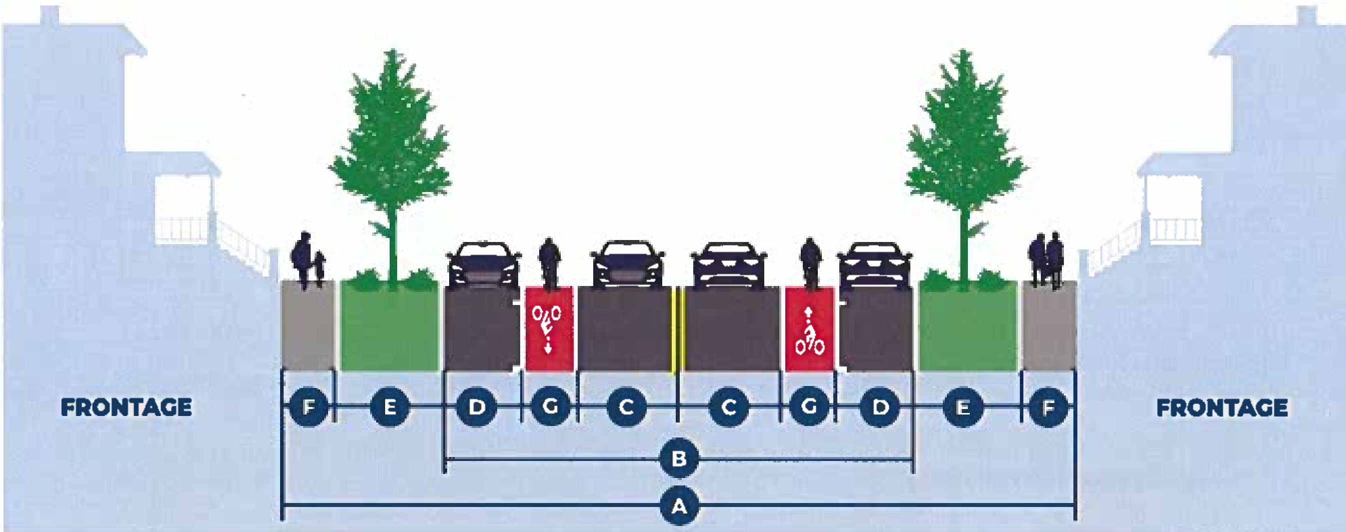


Figure 33: Standard Street (Local or Collector)

Street Design – Standard Street (Local or Collector)		
A	ROW Width	74' - 86'
B	Street Width (curb-to-curb)	50'
C	Lanes (#/width)	2 @ 11'
D	On-street Parking	8'
E	Planting/Amenity Area	6' – 12'
F	Sidewalks	6'
G	Bicycle Facilities	6' bike lane
	Turn Lanes	Avoid due to connected network OR locate within reconfigured street width

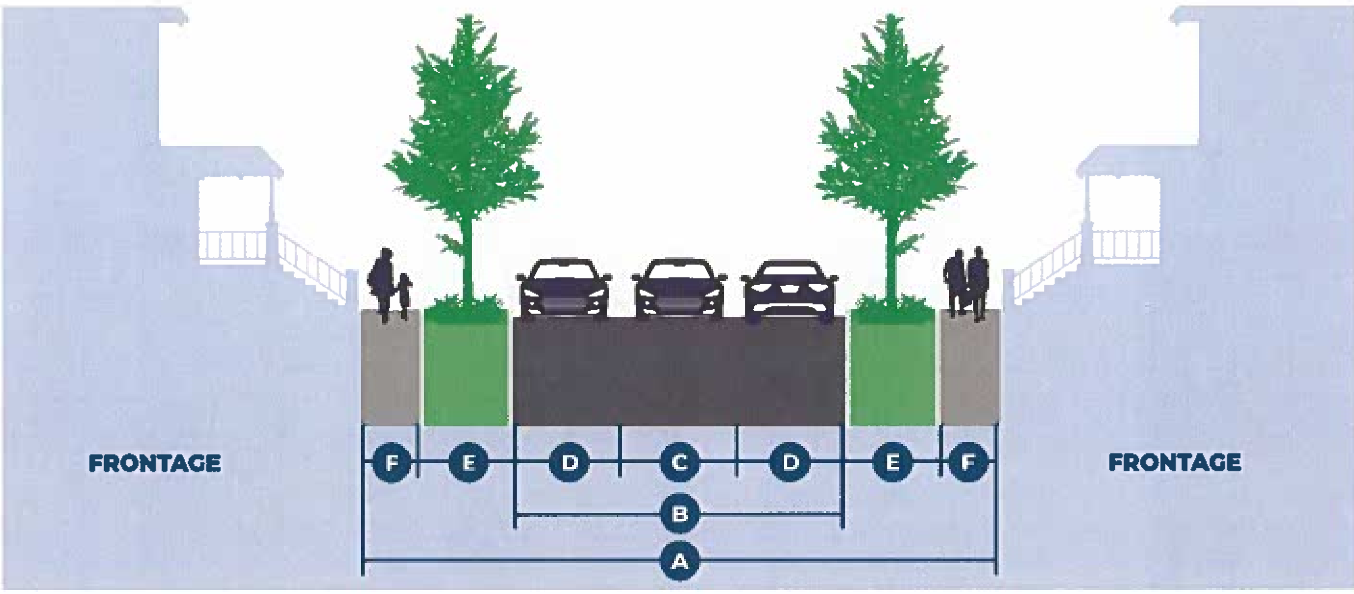


Figure 34: Neighborhood Street (Local)

Street Design – Neighborhood Street (Local)		
A	ROW Width	54'
B	Street Width (curb-to-curb)	28'
C	Lanes (#/width)	N/A - two way slow speeds
D	On-street Parking	Both sides; non-designated
E	Planting/Amenity Area	8'
F	Sidewalks	5'
G	Bicycle Facilities	N/A
	Maximum Street Length	Maximum length of 200' between other local roadways

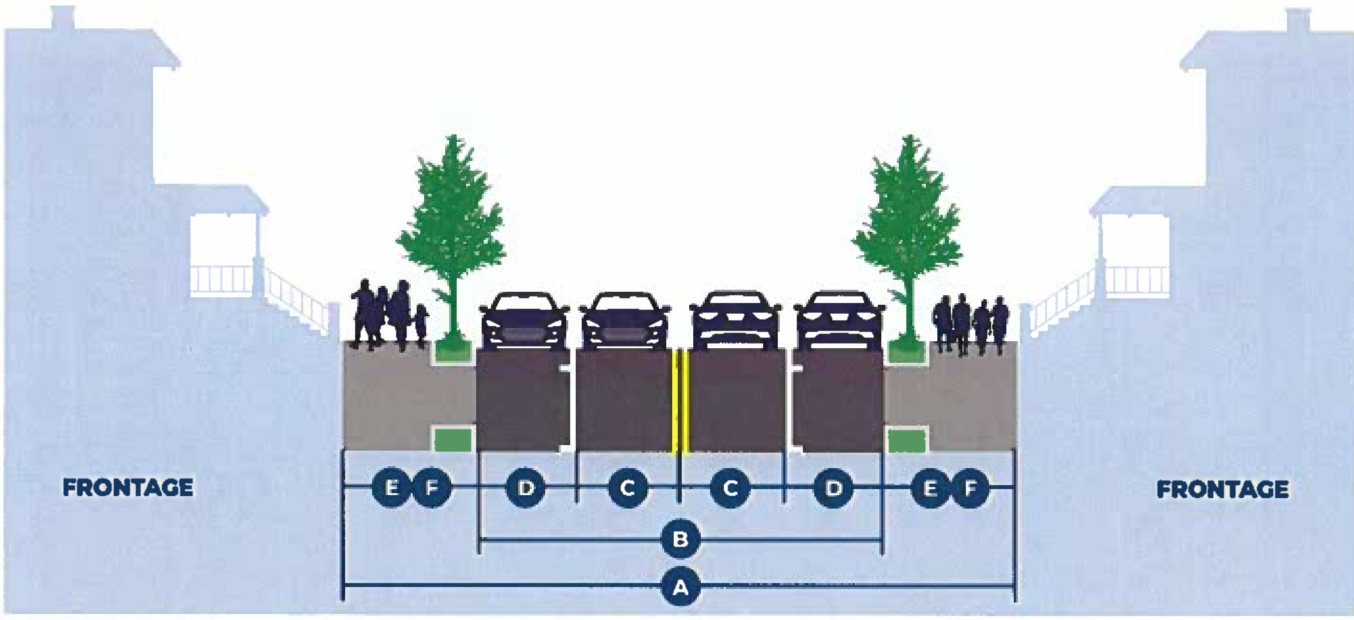


Figure 35: Pedestrian/Mixed Use (Local)

Street Design – Pedestrian/Mixed Use (Local)		
A	ROW Width	60'
B	Street Width (curb-to-curb)	36'
C	Lanes (#/width)	2 @ 10'
D	On-street Parking	8'
E	Planting/Amenity Area	4' x 6' (min) tree wells within sidewalk
F	Sidewalks	12'
G	Bicycle Facilities	N/A
	Turn Lanes	Avoid due to connected network OR limit within reconfigured street space

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

Be flexible with major capital investments to accommodate special projects that are identified or opportunities arise to better connect or improve the safety of the transportation system.

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.
- **Sable and E-470 Interchange** – Sable is planned to become a major arterial after full build out and will be a full diamond interchange. Adams County, City of Brighton, and the E-470 Highway Authority are cooperating for the construction of the interchange.

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.

- **120th and 136th** – Proximity of the Union Pacific tracks to Highway 85 will necessitate an integrated design for ramps and structures across both corridors at 120th and 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.

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 three general elements:

- **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.

Performance Monitoring and Reporting

To ensure accountability and credibility of Brighton's transportation program, the City will monitor and report system performance as necessary. This reporting 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 34 for a list of the key indicators, data sources and corresponding goals that each indicator will measure). The report will be updated as necessary to support City efforts.

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. 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).

Strategy 6.2

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

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).

GOAL	INDICATOR	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*

Figure 36: Transportation Dashboard Indicators and Data Sources

The City has made progress on developing bicycle and pedestrian networks in the core area. At the time of this TMP update, a bicycle, pedestrian, and multi-modal plan is also being developed. As more modal infrastructure is installed, Brighton will establish a travel demand management program.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 - https://www.rtd-denver.com/fares-passes/ecopass)
- 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 streets 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)
- 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).

- **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 22 of Chapter 5). It should be noted that Figure 22 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 8 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:

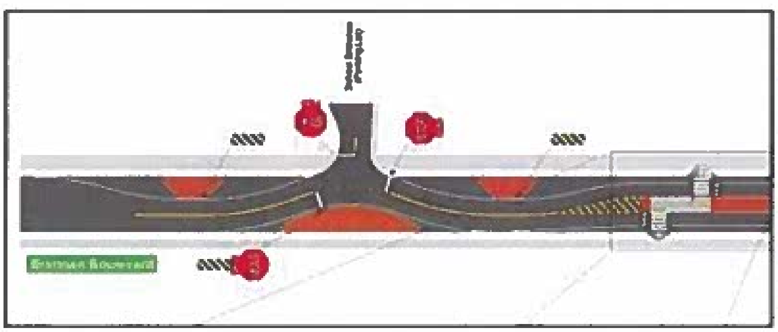
- **Transit Facilities** – The City will work with developers to ensure new developments do not preclude planned transit operations (identified as part of the future transit network - see Chapter 4) that are within or adjacent to proposed developments. In some cases, the City will require developers 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 66 of Chapter 4). Given that the transit plan will be implemented as part of the long-term build-out of the transportation network 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).

APPENDIX A -
TRAFFIC CALMING TREATMENTS

The following treatments will be described within this section according to ITE and FHWA best practices:

- Chicane
- Choker
- Closure
- Curb Extensions/Bulb-Out
- Lateral Shift
- Median Island
- Mini Roundabout
- On-Street Parking
- Road Diet
- Roundabout
- Speed Cushions
- Speed Tables/Raised Crosswalks
- Traffic Circle



Chicane

Description

A chicane is a series of alternating curves or lane shifts that force a motorist to steer back and forth instead of traveling a straight path. The curvilinear path is intended to reduce the speed at which a motorist is comfortable traveling through the chicane, and the lower speed can in turn result in a traffic volume reduction. A chicane-like effect can also be achieved through curved striping, or by alternating on-street parking from one side of the street to the other. This method is also called deviations, serpentines, reversing curves, or twist.

Applications

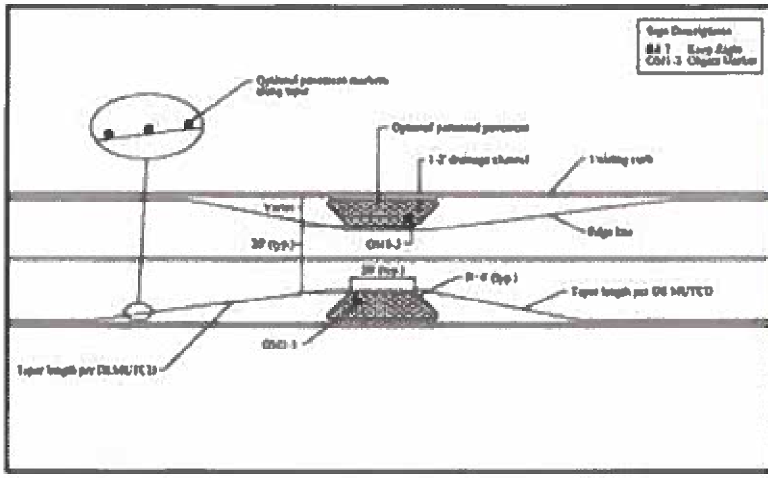
- Appropriate for mid-block locations but can be an entire block if it is relatively short
- Most effective with equivalent low volumes on both approaches
- Appropriate speed limit is typically 35 mph or less
- Typically, a series of at least three landscaped curb extensions
- Can use alternating on-street parking from one side of a street to the other
- Applicable on one-lane one-way and two-lane two-way roadways
- Can be used with either open or closed (i.e. curb and gutter) cross-section
- Can be used with or without a bicycle facility

Implementation

- Chicanes may still permit speeding by drivers cutting straight paths across the center line
- Minimize relocation of drainage features
- May force bicyclists to share travel lanes with motor vehicles
- Maintain sufficient width for ease of emergency vehicles and truck throughout

Potential Impacts

- No effect on access, although heavy trucks may experience challenges when negotiating
- Limited data available on impacts to speed and crash risk
- Street sweeping may need to be done manually
- Minimal anticipated volume diversion from street
- May require removal of some on-street parking
- Provides opportunity for landscaping
- Unlikely to require utility relocation
- Special attention should be paid to avoid the need to relocate drainage features such as catch basins, concrete channels, valley gutters, inlets, and trench drains
- Not a preferred crosswalk location
- Bus passengers may experience discomfort due to quick successive lateral movement

Choker

Description

A choker is a horizontal, midblock extension of the curb into the street which results in a narrower roadway section. The placement of chokers results in a narrower travel lane and encourages reduced travel speeds as drivers perceive a reduced margin of error to operate within. Chokers can also provide opportunity for landscaping, which results in increased attractiveness and visibility for motorists.

Applications

- Can be located at any spacing desired
- May be suitable for a mid-block crosswalk
- Appropriate for arterials, collectors, or local streets with a speed limit of 40 mph or less

Implementation

- Only applicable for mid-block locations
- Can be used on a one-lane one-way and two-lane two-way street
- Most easily installed on a closed-section road (i.e. curb and gutter)
- Applicable with or without dedicated bicycle facilities
- Compatible with on-street parking and can be used to protect on-street parking
- Appropriate for any speed limit
- Appropriate along bus routes
- Typical width of 6 to 8 feet; offset from through traffic by approxi-mately 1.5 feet
- Locations near streetlights are preferable
- Length of choker island should be at least 20 feet

Potential Impacts

- Encourages lower speeds by funneling it through the pinch point
- Can result in shorter pedestrian crossing distances if a mid-block crossing is provided
- May force bicyclists and motor vehicles to share the travel lane
- May require some parking removal
- May require relocation of drainage features and utilities
- Retains sufficient width for ease of use for emergency vehicles

Closure

Description

Closures refer to the prevention of travel on a street in one of two ways. Half closures are barriers that block travel in only one direction (creates a one-way street) for a short distance on otherwise two-way streets and are sometimes referred to as partial closures or one-way closures. Full-street closures are barriers placed across a street to completely close the street to through traffic, while usually leaving open space for pedestrians and bicyclists.

Applications

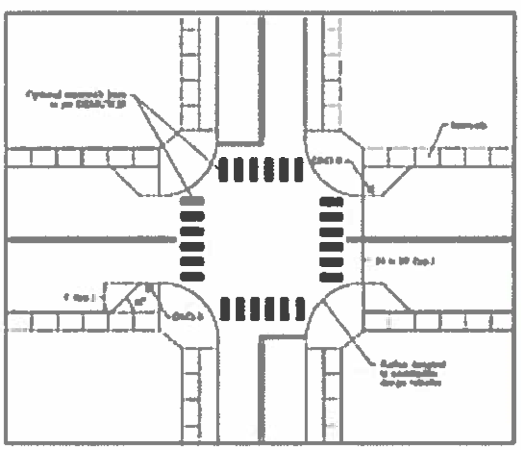
- Appropriate for local streets (half and full), at intersection (half and full), or mid-block (full closure only)
- Typically applied only after other cut-through traffic reduction measures have failed or are deemed inappropriate or ineffective
- Typically found on roadways with curb and gutter
- Can be applied with and without dedicated bicycle facilities and on roads with on-street parking
- Often used in sets to make travel through neighborhoods more circuitous
- Not appropriate along bus transit routes
- Can be used to assist crime prevention

Implementation

- Barriers may consist of landscaped islands, mountable facilities, walls, gates, side-by-side bollards, or any other obstruction that leave an opening smaller than the width of a passenger car
- Appropriate signing needed at entrances to full-closure street blocks
- May require modifications to maintain surface drainage capacity
- Should consider traffic diversion patterns and associated impacts
- Possible to make diverters passable for pedestrians and bicyclists

Potential Impacts

- May negatively impact street network connectivity and capacity
- May unintentionally result in traffic diverting to other local streets
- No significant impact on vehicle speeds beyond the closed block
- Can improve pedestrian crossing safety
- Less accessibility for businesses or emergency access
- Can be placed mid-block or on the approach to an intersection
- Typically installed on a closed-section roadway (i.e. curb and gutter)
- Full or half closures can increase response times and should not be used on roads/streets that provide access to hospitals or emergency medical services; half closures allow for a higher degree of emergen-cy vehicle access than full closures
- Both closure types can be designed to allow emergency vehicle ac-cess with removable, or breakaway delineators or bollards, gates, mountable curbs, etc



Curb Extensions/Bulb Out

Description

Curb extensions, or bump-outs/bulb-outs, are horizontal extensions of the sidewalk into the street, resulting in a narrower roadway section. If located at a mid-block location, it is typically called a choker.

Applications

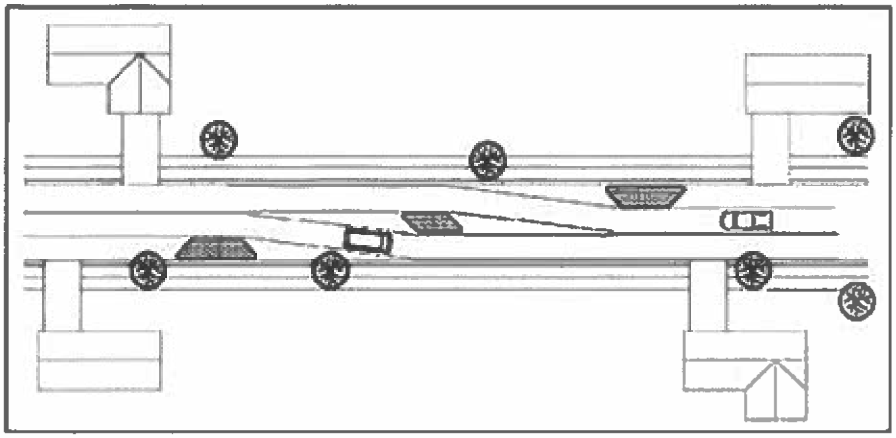
- When combined with on-street parking, a corner extension can create protected parking bays
- Effective method for narrowing pedestrian crossing distances and increase pedestrian visibility
- Appropriate for arterials, collectors, or local streets
- Can be used on one-way and two-way streets
- Installed only on closed-section roads (i.e. curb and gutter)
- Appropriate for any speed, provided an adequate shy distance is provided between the extension and the travel lane
- Adequate turning radii must be provided to use on bus route

Implementation

- Effects on vehicle speeds are limited due to lack of deflection
- Must check drainage due to possible gutter realignment
- Major utility relocation may be required, especially drainage inlets
- Typical width between 6 and 8 feet
- Typical offset from travel lane at least 1.5 feet
- Should not extend into bicycle lane

Potential Impacts

- Effects on vehicle speeds are limited due to lack of deflection
- Can achieve greater speed reduction if combined with vertical deflection
- Smaller curb radii can slow turning vehicles
- Shorter pedestrian crossing distances can improve pedestrian safety
- More pedestrian waiting areas may become available
- May require some parking removal adjacent to intersections



Lateral Shift

Description

Similar to a chicane, a Lateral Shift is the realignment of an otherwise straight street that causes travel lanes to shift in at least one direction. A typical lateral shift separates opposing traffic through the shift with the aid of a median island. Without this island, motorists can cross the centerline in order to drive the straightest path possible, thereby reducing the speed reduction effectiveness of the lateral shift. Additionally, a median island reduces the likelihood a motorist will veer into the path of opposing traffic, further improving the safety of the roadway for motorists.

Applications

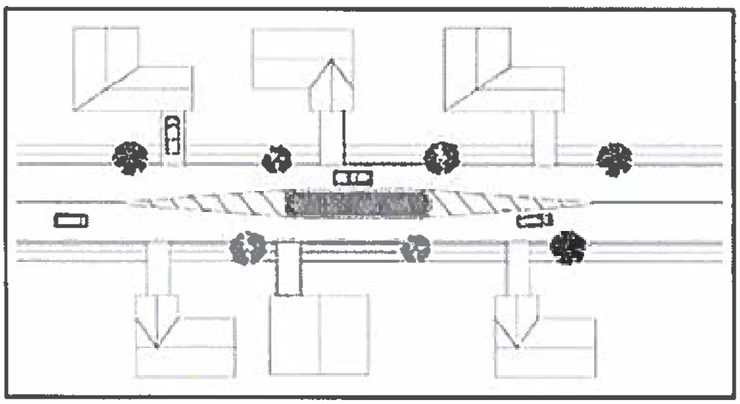
- Appropriate for local, collector, or arterial roadways
- Appropriate for one-lane one-way and two-lane two-way streets
- Appropriate on roads with or without dedicated bicycle facilities
- Maximum appropriate speed limit is typically 35 mph
- Appropriate along bus transit routes

Implementation

- Typically separates opposing traffic through the shift with the aid of a raised median
- Applicable only to mid-block locations
- Can be installed on either open- or closed-section (i.e. curb and gutter) roads
- Location near streetlights preferred
- May require drainage feature relocation
- Should not require utility relocation

Potential Impacts

- Without islands, motorists could cross the centerline to drive the straightest path possible
- No impact on access
- May require removal of some on-street parking
- Limited data available on impacts on speed, volume diversions, and crash risk
- Provides opportunities for landscaping
- Can provide locations for pedestrian crosswalk
- Appropriate along primary emergency vehicle routes or on a street that provides access to a hospital or emergency medical services, as low narrow medians can be straddled by emergency vehicles, if needed



Median Islands

Description

Median Islands are raised islands located along the street centerline that narrows the travel lanes at that location, and has the option to implement a pedestrian crosswalk and refuge within the island. The separation of travel lanes also allows pedestrians to focus on one lane at a time when crossing the street. Where there is an existing midblock crosswalk, it is desirable to locate the median island at the crosswalk. While medians are generally located at mid-block, they can also serve as a gateway to a community. This traffic calming method is also called a median diverter, intersection barrier, intersection diverter, and island diverter.

Applications

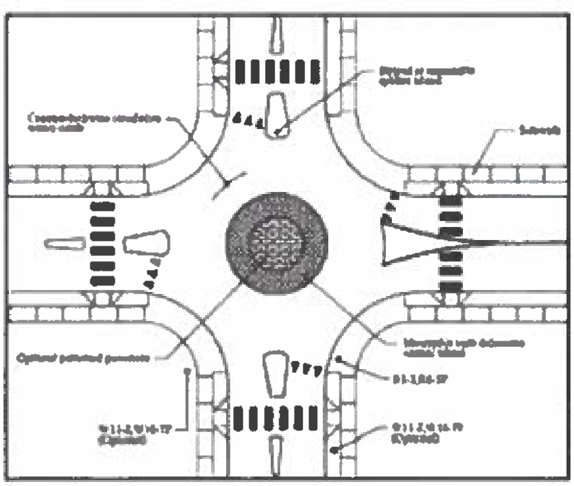
- For use on arterial, collector, or local roads with a speed of 45 mph or less
- Can often double as a pedestrian/bicycle refuge islands if a cut in the island is provided along a marked crosswalk, bike facility, or shared-use trail crossing
- If placed through an intersection, considered a median barrier

Implementation

- Can be applied on roads with or without sidewalks and/or dedicated bicycle facilities
- Typically not appropriate near sites that attract large combination trucks

Potential Impacts

- May impact access to properties adjacent to islands
- No significant impact on vehicle speeds beyond the island
- Little impact on traffic volume diversion
- Safety can be improved without substantially increasing delay
- Shortens pedestrian crossing distances
- Bicyclists may have to share vehicular travel lanes near the island
- May require removal of some on-street parking
- May require relocation of drainage features and utilities
- May complicate snow plowing efforts



Mini Roundabouts

Description

Mini roundabouts consist of raised islands, placed in unsignalized intersections, around which traffic circulates where motorists must yield to motorists already in the intersection. These roundabouts require drivers to slow to a speed that allows them to comfortably maneuver around them. The center island of a mini roundabout is fully traversable, and splitter islands may be fully traversable as well.

Applications

- Intersections of local and/or collector streets
- One lane each direction entering intersection
- Not typically used at intersections with high volume of large trucks/ buses turning left
- Appropriate for low-speed settings

Implementation

- Typically circular in shape, but may be an oval shape
- Controlled by YIELD signs on all approaches with pedestrian crosswalks, if included one car-length upstream of YIELD bar
- Preferable for roadway to have urban cross section (i.e., curb and gutter)
- Can be applied to road with on-street parking
- Can be applied to roads both with and without a bicycle facility. Bicycle facilities, if provided, must be separated from the circulatory roadway with physical barriers; cyclists using the circulatory roadway must merge with vehicles. Bicycle facilities are prohibited in the circulatory roadway to prevent right-hook crashes
- Key design features are the fastest paths and path alignment

Potential Impacts

- Slight speed reduction
- Little diversion of traffic
- Bicycle and motorist will share lanes at intersections because of narrowed roadway
- Large vehicles/buses usually drive over the center island for left turns

On-Street Parking

Description

By allocated paved space to parking, parked cars encourage reduced travel speeds as drivers perceive a reduced margin of error to operate within. Parking can be utilized on one or both sides of roadway, and can be either parallel or angled. However, parallel generally results in maximized speed reduction.

Application

- Angled parking is preferred, and should follow the latest AASHTO design guidelines
- More appropriate in urban or suburban settings
- Can apply alternating sides of street for chicane effect
- Can combine with curb extensions for protected parking, which can also include landscaping or other beautification treatments
- Can apply using time-of-day restrictions to maximize throughput during peak periods
- Can be used on one-way or two-way streets
- Preferable on roads with curb and gutter
- Appropriate along bus transit routes

Implementation

- Appropriate distance needed between travel lanes and parking lanes
- Impact is directly affected by demand, and parked vehicles must be present to be effective
- If used for chicane effect, must verify parking demand to ensure that majority of spaces are occupied when effect is desired most during the day

- Should not be considered near traffic circles nor roundabouts
- Should not be applied along median island curbs
- For lower-demand locations, can counteract negligible impact with curb extensions or other road narrowing features

Potential Impacts

- Can be blocked in by snow during plowing operations
- May limit road user visibility and sight distance at driveways/alleys/intersections
- Can put bicyclists at risk of colliding with car doors if road features bike lanes
- May be impacted if other traffic calming measures are considered or implemented
- Requires consideration of design of parking lanes near hydrants and other emergency features


Road Diet

Description

Road diets refer to the revision of lane use or widths to result in one travel lane per direction with minimum practical width, with the overall goal of reducing cross-section. Common road diets involve conversion of a four-lane road to a three-lane road featuring two through lanes and center two-way left-turn lane. Road diets can also involve narrowing of existing travel lanes, and converting travel lanes to dedicated bicycle facilities, left-turn lanes, on-street parking, raised medians, pedestrian refuge islands, sidewalks, etc.

Application

- Applicable for nearly all roadway functional classifications
- Can be applied in urban, suburban, or rural settings
- Appropriate for most common urban speed limits

- Can be applied at/near intersections or along road segments
- Appropriate along bus routes
- Must consider transitions from adjacent roadway sections and through intersections

Potential Impacts

- Impacts demand that can be accommodated by the roadway
- Reduction of through lanes tends to reduce speeds
- Can improve pedestrian crossing ease and safety
- Can improve bicycle accessibility if travel lanes can be used for shoulders/bike lanes instead
- Potential impact to snow plowing operations

Roundabout

Description

A roundabout is a circular intersection, without traffic signals or stop signs, where drivers travel counterclockwise around a center island. Drivers must yield at entry to traffic already in the roundabout, then enter the intersection and exit at their desired street. By reducing the number and severity of conflict points, and because of the lower speeds of vehicles moving through the intersection, roundabouts are a significantly safer type of intersection than compared to typical intersections.

Application

- Suitable for intersections of arterial and/or collector streets with one or more entering lanes
- Can be used at intersections with high volumes of large trucks and buses, depending on design

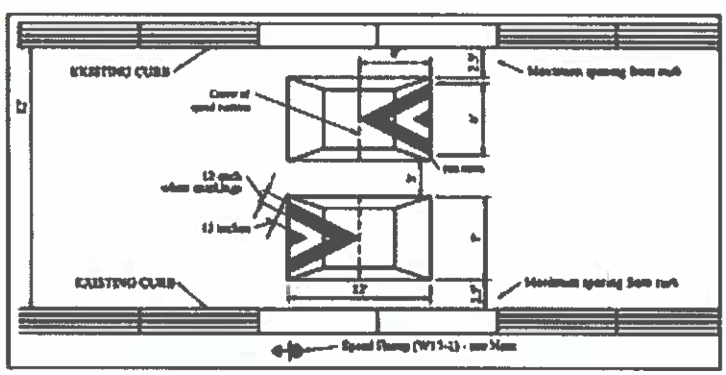
Implementation

- See NCHRP Report 672 for design details

- Design vehicle is determined specifically for each site
- Typically circular in shape but may be an oval shape
- Key physical elements are center islands, truck aprons, and splitter islands
- Controlled by YIELD signs on all approaches with pedestrian crosswalks, if included, one car length upstream of YIELD bar
- Key design features include: fastest paths, swept paths, and path alignment
- Large vehicles circulating around the center island for all movements may traverse the apron
- Landscaping needs to be designed to allow adequate sight distance per NCHRP 672
- Preferable on roads with curb and gutter
- Bicycle facilities, if provided, must be separate from the circulatory roadway with physical barriers; cyclists using the circulatory roadway must merge with vehicles. Bicycle facilities are prohibited in the circulatory roadway to prevent right-hook crashes.

Potential Impacts

- Limited impact on access, except for access points immediately adjacent to intersection
- Limited impact on roadways with on-street parking
- May draw additional traffic but with reduced delays and queues
- Appropriate for emergency vehicle routes or streets that provide access to hospitals
- Emergency vehicles may traverse the apron



Speed Cushion

Description

Speed cushions are modular units that are either pre-manufactured or constructed with asphalt. They are applied to a road surface and designed to be uncomfortable for motorists to negotiate at high operating speeds. The height and length of the raised areas are comparable to the dimensions of a speed hump. However, a speed cushion has gaps (often referred to as "cutouts") between the raised areas to enable a vehicle with a wide track (e.g., emergency vehicles, trucks, buses, etc.) to pass though the feature without any vertical deflection. Speed cushions are effective but generally achieve lower levels of speed reduction than speed tables.

Application

- Appropriate on local and collector streets
- Appropriate at mid-block locations only
- Appropriate for collectors and local residential streets of 30 mph or less
- Not appropriate on grades greater than 8 percent

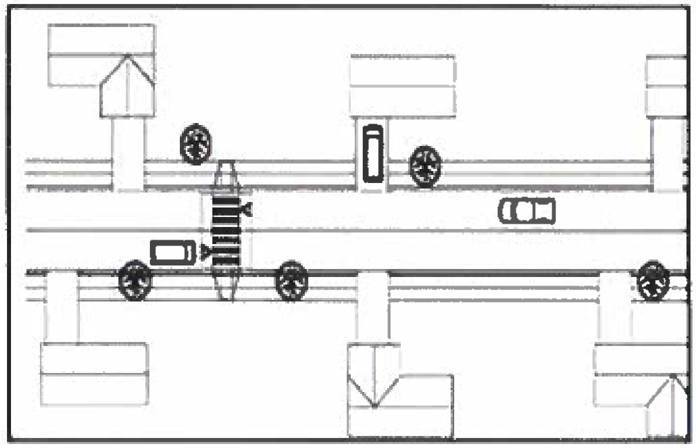
Implementation

- Two or more cushions required at each location
- Typically 12 to 14 feet in length and 7 feet in width
- Cushion heights range between 3 and 4 inches, with trend toward 3 - 3 ½ inches maximum
- Speed cushion shapes include parabolic, circular, and sinusoidal
- Material can be asphalt or rubber
- Often have associated signing (advance-warning sign before first cushion at each cushion)
- Typically have pavement markings (zigzag, shark's tooth, chevron, zebra)
- Some have speed advisories

Potential Impacts

- Limited-to-no impact on non-emergency access
- Speeds determined by height and spacing; speed reductions between cushions have been observed averaging 20 and 25 percent
- Speeds typically increase by 0.5 mph midway between cushions for each 100 feet of separation
- Studies indicate that average traffic volumes have reduced by 20 percent depending on alternative routes available

- Average collision rates have been reduced by 13 percent on treated streets
- Speed cushions have minimal impact on emergency response times, with less than a 1 second delay experienced by most emergency vehicles



Speed Table/Raised Crosswalks

Description

Speed tables are flat-topped speed humps that cover the entire width of a roadway to raise the wheelbase of a vehicle in order to reduce its travel speed. When outfitted with crosswalk markings and signage, the speed table can become a raised crosswalk. If placed only in one direction on a road, it is called an offset speed table.

Application

- Appropriate for local and collector streets; mid-block or at intersections, with/without crosswalks
- Can be used on a one-lane one-way or two-lane two-way street
- Not appropriate for roads with speeds of 45 mph or more
- Typically long enough for the entire wheelbase of a passenger car to rest on top or within limits of ramps
- Work well in combination with textured crosswalks, curb extensions, and curb radius reductions
- Can be applied both with and without sidewalks or dedicated bicycle facilities
- Typically installed along roads with curb and gutter, but are feasible on roads without C&G

Implementation

- ITE recommended practice – "Guidelines for the Design and Application of Speed Humps"

- Most common height is between 3 and 4 inches (reported as high as 6 inches)
- Ramps are typically 6 feet long (reported up to 10 feet long) and are either parabolic or linear
- Careful design is needed for drainage

Potential Impacts

- No impact on non-emergency access
- Speeds reductions typically less than for speed humps
- Speeds typically decline approximately 0.5 to 1 mph midway between tables for each 100 feet beyond the 200-foot approach and exit points of consecutive speed tables
- Average traffic volumes diversions of 20 percent when a series of speed tables are implemented
- Average crash rate reduction of 45 percent on treated streets
- Increase pedestrian visibility and likelihood of driver yield compliance
- Generally not appropriate for BRT bus routes
- Typically preferred by fire departments over speed humps, but not appropriate for primary emergency vehicle routes; typically less than 3 seconds of delay per table for fire trucks

Traffic Circle

Description

A traffic circle is a raised island, placed within an unsignalized intersection, around which traffic circulates. Traffic circles force motorists to reduce their speeds regardless of whether the vehicle is traveling straight through the intersection or making a turn. A traffic circle can take the place of an existing 4-way stop, and can operate exclusively with yield signs. Semi-permanent barriers can also be utilized to create traffic circles.

Application

- Appropriate at intersections of local streets with one lane each direction entering the intersection
- Not typically used at intersections with high volumes of large trucks or buses turning left
- Appropriate for both one-way and two-way streets in urban and suburban settings

Implementation

- Typically circular in shape but may be an oval shape
- Frequently have landscaped center islands
- Recommend YIELD signs on all approaches
- Preferable for roadways with curb and gutter
- Can be applied to roads with on-street parking
- Can be applied to roads both with and without dedicated bicycle facilities
- Key design features include: offset distance (distance between projection of street curb and center island), lane width of circulatory roadway, circle diameter, and height of mountable apron for large vehicles

Potential Impacts

- Minimal anticipated traffic diversion
- Bicyclist and motorists will share lanes at intersections because of narrowed roadway
- Large vehicles/buses are usually not able to circulate around center island for left turns
- Landscaping needs to be designed to allow adequate sight distance, per AASHTO
- Minimize routing of vehicles through unmarked crosswalks on side-streets
- May require additional street lighting
- Emergency vehicles maneuver intersections at slow speeds
- Constrained turning radii typically necessitates a left turn in front of the circle for large vehicles

Complimentary Traffic Calming Elements

The following elements can be used in conjunction with the aforementioned traffic calming techniques to increase the effect of the individual technique(s) utilized at a given location.

Speed Feedback Signs

Speed feedback signs consist of a static "Your Speed" sign and an electronic display of the approaching vehicle speed measured by radar. Speeding vehicles can trigger a warning message such as "Too Fast" or "Slow Down." Signs can be paired with software to capture data on driver speeds and document the times of day that speeding occurs. This data can be used to coordinate with police for increased enforcement during peak speeding times, which has been shown to increase effectiveness.

Speed Feedback Trailers

Portable speed display trailers can be used as a temporary treatment in areas where speeding problems arise. As with speed feedback signs, speed feedback trailers consist of a speed limit sign, a static "Your Speed" sign, and an electronic display of the approaching vehicle speed measured by radar. Speeding vehicles can trigger a warning message such as "Too Fast" or "Slow Down." Some trailers can be paired with software to capture data on driver speeds and document the time of day that speeding occurs for increased enforcement. Due to their mobility, speed feedback trailers can be used dynamically to respond to speeding throughout the city. Coordination with police is necessary for deployment and enforcement and may be limited by police resources.

Transverse Markings

Transverse markings are a series of white bars, either flat or raised, which are painted across the center of the lane and spaced progressively closer together to create the illusion that driver speed is increasing. Transverse markings by themselves have proven to be only moderately effective but adding "speed bars" to both sides of the transverse marking provides additional visual contrast for drivers and encourages drivers to place their vehicles between the bars. Transverse bars can also be placed so that the bars become closer together and thinner to create the perception that the driver is traveling faster than they are.

Pavement Marking Messages

Pavement markings provide messaging to remind drivers of lawful speeds utilizing messages like "SLOW" and "SPEED LIMIT 25 MPH." Pavement marking messages have been shown to be ineffective in isolation, and other traffic calming measures must be used in combination with messages to achieve any significant reduction in travel speeds. One of the most effective methods is based on European entrance treatments in which a large red rectangle (9.5 ft by 12 ft) is used to frame on-pavement speed limit markings.

Converging Chevrons

A series of converging chevron markings are placed in advance of, and terminated at, a speed limit sign which establishes the speed within a given area. The distance between chevrons gradually decreases, which gives the perception of increasing speed. This technique has been shown to be especially effective when applied to curves in a roadway. A pavement marking legend “xx MPH” can also be installed at the end of a chevron series to further reinforce the posted roadway speed.

Rumble Strips

Rumble strips are patterned sections of rough pavement or topical applications of raised material, which when driven over cause vibration and noise in a vehicle. This treatment is intended to direct the attention of the motorist back to the roadway. Rumble strips may be used to heighten motorists’ awareness of certain conditions like a stop sign, curve, or speed limit change.

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 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 Master Transportation 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 rights-of-way.