



CHAPTER 4:

PROPOSED NETWORK & RECOMMENDATIONS

DEVELOPING THE PROPOSED BICYCLE NETWORK

While creating the proposed bicycle network was not one linear step-by-step methodology, the following three steps made up the bulk of the process:

1. Utilizing Existing Routes

To maintain consistency with past planning efforts while still acknowledging changes in community priorities and regional trends, the project team revisited recommendations from the 2018 Bicycle System Master Plan to determine which of them to carry forward into the updated Plan. In addition to carrying forward those existing recommendations, the project team aligned the proposed network with other highly-utilized existing routes where feasible, especially local streets. These routes were gathered primarily from the knowledge of the project team and working groups, data on bicycle volumes from city-conducted bike counts, comparative volume heat maps from Strava Metro, and feedback received during public outreach.

2. Analyzing Connectivity

With a preliminary network of existing recommendations and popular bike routes in place, the project team overlaid the initial proposed routes against community destinations as well as the proposed and existing bicycle networks of neighboring municipalities to ensure the network connects bicyclists to their destinations both within Lakewood and throughout the region.

3. Determining Facility Type

Once the placement of potential routes was drafted, the most appropriate type of facility for each corridor needed to be determined. The project team started with a chart developed by the American Association of State Highway and Transportation Officials (AASHTO) that recommends bikeway types based on vehicle volumes and speeds (Figure 17). While other national guidance exists with different parameters, AASHTO's guidance was chosen both because of its simplicity and because the recommended thresholds are closely aligned with those in the Jefferson County Bicycle Plan (2022) and the Denver Bikeway Design Manual (2024), therefore ensuring consistency with two of Lakewood's neighboring agencies.

Once AASHTO-recommended facility types were determined, the project team made adjustments based on the unique character and context of each proposed route as well as feedback received during public engagement.

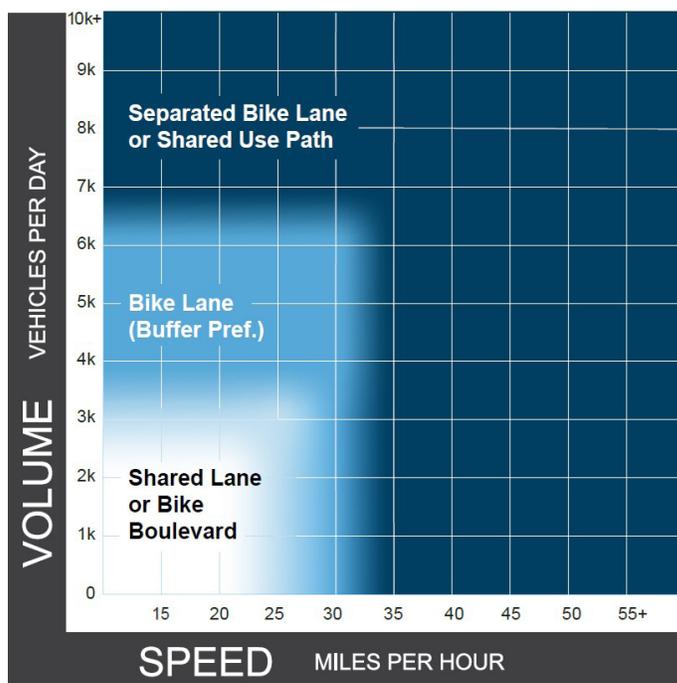


Figure 17: Preferred bikeway type for suburban contexts based on roadway volume and speed, AASHTO Guide for the Development of Bicycle Facilities (2024).

PROPOSED FACILITY TOOLBOX

The proposed network includes seven recommended bike facility types, short descriptions and photo examples of which can be found below. For more detailed design recommendations, refer to Appendices A and E.

Neighborhood Bikeway

Street with low vehicle volumes and low speeds that is suitable for comfortable bicycle travel, typically designated as a bicycle facility with a combination of signage and markings. Also known as a bike boulevard.

Photo example: Cedar Ave near Hoyt St in Lakewood, Fall 2024



Bike Lane / Buffered Bike Lane

On-street lane exclusive to bicycle travel that is delineated by a painted single (standard) or double (buffered) white line. All future bike lanes will be buffered with a double white line as space allows or will otherwise be standard with a single white line.

Photo example: Garrison St near Addenbrooke Park in Lakewood, Spring 2024

Separated Bike Lane

On-street lane exclusive to bicycle travel that is delineated by a painted double white line and some combination of plastic posts and plastic, rubber, or concrete curbing to provide additional separation from motorists. Also known as a protected bike lane.

Photo example: Garrison St near Green Gables Park in Lakewood, Fall 2024



Barrier Protected Bike Lane

On-street lane exclusive to bicycle travel that is delineated by a painted double white line and continuous or semi-continuous curbing made of concrete or another durable material that provides physical protection from motorists.

Photo example: Baseline Rd near 35th St in Boulder, Fall 2023

Side Path

Paved off-street path shared by bicycles, pedestrians, and other non-motorized forms of travel that runs adjacent to a roadway, is a minimum of 8 feet wide, and is mostly or entirely detached from the roadway by a strip of landscaping or other contrasting material.

Photo example: Wadsworth Blvd near Virginia Ave in Lakewood, Spring 2024



Shared Use Trail

Paved off-street path shared by bicycles, pedestrians, and other non-motorized forms of travel that runs through an open space or is otherwise not directly adjacent to a roadway and is a minimum of 8 feet wide.

Photo example: Bear Creek Trail near Stone House in Lakewood, Spring 2024

Overpass / Underpass

Grade-separated crossing over or underneath a freeway or other barrier, shared by bicycles, pedestrians, and other non-motorized forms of travel.

Photo example: 6th Ave pedestrian bridge near Jefferson County Government Center in Golden



PROPOSED BICYCLE NETWORK

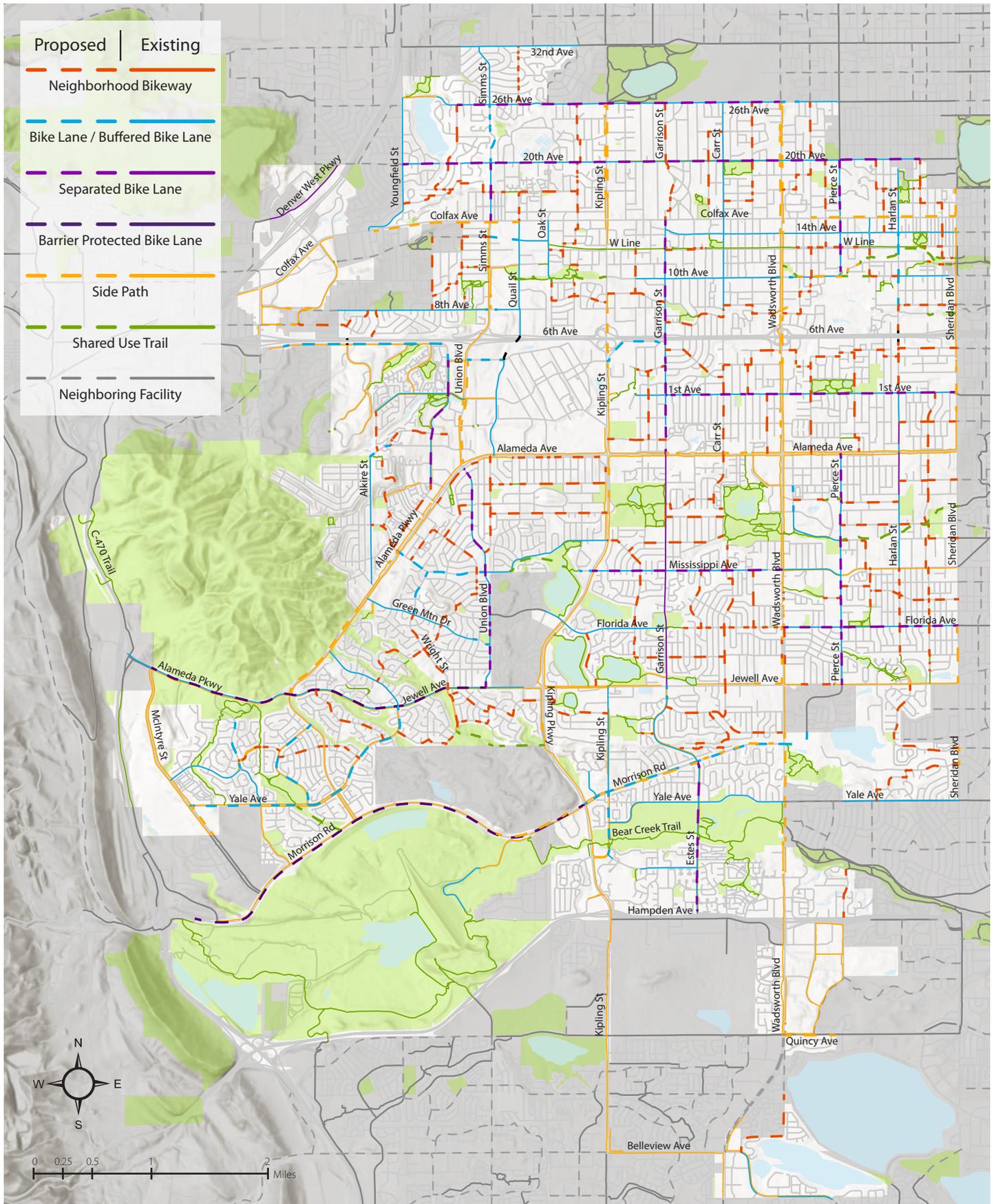


Figure 18: Map of existing and proposed bike facilities in Lakewood. See Appendix A for a larger map with project numbers and a detailed project list.

Proposed Network Overview

As an upgrade or in addition to the existing bicycle facilities on page 20, Lakewood’s proposed bicycle network recommends:

- **68 miles of neighborhood bikeways,**
- **25 lane miles of bike lanes (buffer preferred),**
- **44 lane miles of separated bike lanes,**
- **14 lane miles of barrier protected bike lanes,**
- **16 miles of side paths,**
- **6 miles of shared use trails, and**
- **3 shared use overpasses/underpasses.**

A variety of proposed facility types are intended to provide a safe, convenient, and accessible network for bicyclists of all ages and abilities, regardless of which facility types they favor.

Increasing Separation

One of the major themes of this proposed network compared to previous Bicycle Plans is upgrading bike facilities that already exist in order to increase the separation between travel modes, thereby making the facilities more appealing to a wider range of people. 84% of Spring 2024 Bike Plan survey respondents indicated they feel comfortable riding in a separated bike lane, compared to 51% of respondents feeling comfortable in a standard bike lane (see Appendix B for full survey results). This suggests that existing bike lane utilization could increase by as much as 64% if the bike lanes were separated from vehicle traffic.

“[Mississippi Ave] feels too dangerous for our family to ride as is, but we would definitely use it regularly if separated.”
- Interactive Feedback Map Comment

Keeping Crossings In Mind

As discussed on page 22, this Plan recognizes that gaps and unsafe crossings can decrease the overall usability of a bike route. To ensure this is not overlooked during implementation, the project list in Appendix A identifies any intersections that could benefit from crossing improvements. Examples include extending bike lanes through intersections where shared conditions currently exist, delineating intersection approaches for separated bike lanes, and installing crossing enhancements at unsignalized intersections along neighborhood bikeways. Several crossing treatment design examples are provided in Appendix E for guidance, and designs will be determined based on the context of each intersection.

“I’ve gone way out of my way to avoid crossing Jewell [at Carr St]. I’m very confident in traffic but find this crossing prohibitively terrifying.”
- Interactive Feedback Map Comment

Increasing Route Coverage

To make Lakewood’s bicycle network more convenient and accessible for a greater number of people, routes are proposed at a higher density than past Bicycle Plans. This reduces the need for bicyclists to travel more than 1/2 mile out of their way for a designated bike route, a distance that over 80% of Fall 2024 Bike Plan survey respondents indicated is acceptable (Figure 19). Neighborhood bikeways in particular are spaced to provide greater coverage of designated routes throughout the network.

What is the furthest you are willing to travel out of your way for a more comfortable route?

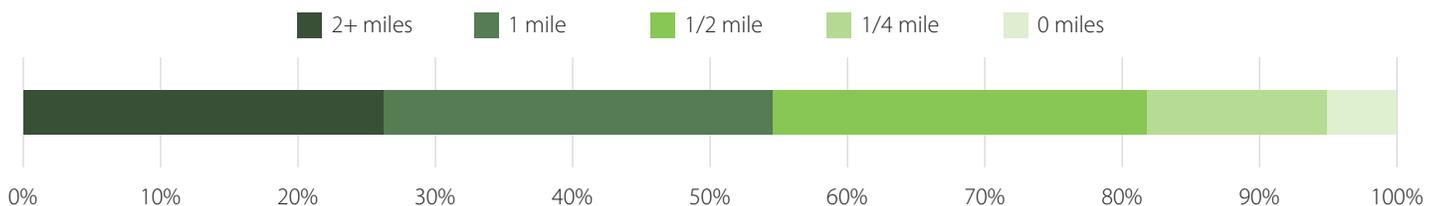


Figure 19: Survey result showing the longest distance respondents are willing to travel for a more comfortable bike route, by percentage of 194 respondents. See Appendix B for full survey results.

ADDITIONAL RECOMMENDATIONS

The installation of comfortable bike facilities does not alone make a successful bicycle network. Those facilities must be well-maintained for year-round bicycle travel, the routes should be intuitive and easy to find, and bicyclists should have a secure place to leave their bikes when they arrive at their destination.

Maintenance

In order for bicycling to truly be a viable alternative to driving, Lakewood residents must be able to ride a bike in any drivable weather conditions to meet their transportation needs year-round. This means bike facilities must be plowed and swept as needed to keep them safe and accessible. Because resources are limited, City transportation staff analyzes the bicycle network each year to determine priority routes to be kept clear, much the same way that snow removal on roads is prioritized. As the Bicycle Plan is implemented and the network shifts over time, these priority plowing routes will continue to be evaluated at the beginning of each snow season. Implementation of the Plan will also greatly increase the current miles of facilities that must be plowed



Figure 20: Scaled-down plowing equipment clears a separated bike lane.

and swept separately from the roadway, such as separated bike lanes and paths. Public Works has acquired specialized equipment to sweep and plow these facilities, but over time as more separated facilities are constructed, resources will need to be reallocated or increased as part of a future operating plan to most efficiently keep the lanes clear of snow and debris.

Wayfinding

When riding a bike for transportation, it is often necessary to research the route beforehand to ensure it meets the bicyclist's preference for safety and comfort and to avoid any unwanted surprises,

since it is not uncommon for bike facilities to end suddenly, jog over to another street, or otherwise be disconnected from the overall network. An accessible and convenient bike network would remove the necessity for such research by providing sufficient signage and wayfinding throughout the network, so that even if a route ends or picks up one street over, a bicyclist is never left stranded wondering where the nearest bike facility is or whether they have strayed from the route they were on. In addition to clearly marking facilities with bike route signage, wayfinding to common destinations and regional bike facilities should be considered where advantageous.

"It says something that I get lost every time I try to ride this route between Denver and Golden."

- Interactive Feedback Map Comment

Bike Parking

No matter how safe, comfortable, and accessible a bike network is, bicycling is not a viable alternative

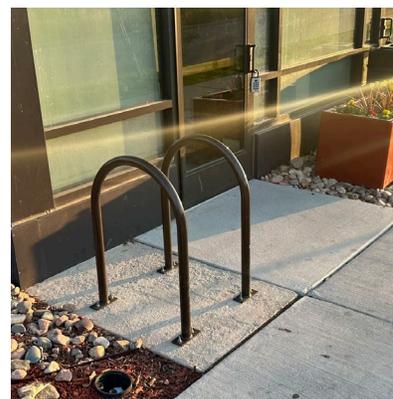


Figure 21: Inverted U style bike racks by a business entrance.

to driving if there is no way for bicyclists to safely store their bikes upon arrival at their destination. Because the majority of bike racks in Lakewood are on private property, a system should be

developed to ensure there is consistent and high-quality bike parking to compliment the proposed network. More detail on existing bike parking in Lakewood and recommendations for placement and design can be found in Appendix D.