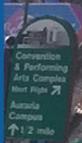


Appendix C:
**PEER INTERVIEW
MEMORANDUM**



MEMORANDUM

Date: March 9, 2018
To: Phil Greenwald, City of Longmont
From: Charles Alexander & Carly Sieff, Fehr & Peers
Subject: **Enhanced Multi-use Corridors – Peer Community Practices**

DN17-0559

The purpose of this technical memorandum is to summarize peer communities' practices regarding several of the bikeway types or devices proposed in the Enhanced Multi-use Corridor Plan. Although each bikeway type and device is the subject of a variety of design guidelines and standards, many jurisdictions have their own practices for implementing bikeways within the flexibility allowed by these guidelines and standards. In general, the most pertinent design guidelines and standards to these bikeways and devices are:

- The *Manual on Uniform Traffic Control Devices*, or MUTCD (FHWA, 2009), as well as various interim approvals issued since 2009
- The *Guide for the Development of Bicycle Facilities*, Fourth Edition, or AASHTO Bike Guide (AASHTO, 2012)
- The *Urban Bikeway Design Guide* (NACTO, 2014)
- The *Separated Bike Lane Planning and Design Guide* (FHWA, 2015)

This memorandum is intended to cover specific bikeway types or devices relevant to the Enhanced Multi-use Corridor Plan, not every bikeway type or device described in these guidelines and standards.

In general, most of the information in this technical memorandum is the result of discussions with staff in Denver, Boulder and Fort Collins, although information from additional jurisdictions is mentioned where appropriate.



GREEN COLORED PAVEMENT FOR BIKE LANES

Green colored pavement for bike lanes was approved for use by FHWA in April 2011 (Interim Approval IA-14). This interim approval is broad and generally allows green colored pavement anywhere within marked bike lanes or extensions of bike lanes through intersections and traffic conflict areas.

Whereas many early adopters of green colored pavement for bike lanes would color entire bike lane segments green, many jurisdictions, including Denver, Boulder and Fort Collins, have moved towards an approach where green colored pavement is used more sparingly. This more tactical approach recognizes that green colored pavement is expensive to maintain, especially in winter climates, and that the overuse of any traffic control device will decrease its efficacy. This approach generally includes green colored pavement for bike lanes in traffic conflict areas or through intersections and underneath the bike lane and arrow pavement legends to make them more visible.

Practices regarding green colored pavement for bike lanes in traffic conflict areas and through intersections vary by city. In general, most cities are generally focusing green colored pavement on conflict areas or through intersections with a high level of vehicle-bicyclist conflict rather than all possible conflict areas. However, in addition to traffic conflict areas with a high level of conflict, Denver generally marks any conflict area along a protected bike lane.

Cities are also generally using green colored pavement underneath bike lane and arrow pavement legends to make them more visible. Note that many jurisdictions, including Denver, Boulder and Fort Collins, area also using green colored pavement underneath shared-lane markings (sharrows) although this application is subject to experimentation through the MUTCD.

BUFFERED BIKE LANES

The *Urban Bikeway Design Guide* recommends a buffer width of at least 18-inches and that the buffer feature diagonal cross hatching or chevron markings of 3-feet or wider in width. Although the practices for buffered bike lanes vary by city and by project, some practices are worth pointing out:

- On 5th Street in Davis, California, the city did not have enough space for an 18-inch buffer and instead implemented a 12-inch solid white line. Although different in width from the



- specifications of the MUTCD, FHWA did not suggest an experiment for this application and rather interpreted that this was allowable.
- In Denver, recent practices in designs for Martin Luther King Jr. Blvd. and 31st Street have been to include diagonal cross-hatching when the buffer is 2-feet or wider in width, recognizing that it is difficult to implement cross-hatching in narrower buffers.

PROTECTED BIKE LANES (OR CYCLE TRACKS)

Applications of protected bike lanes have increased significantly throughout the United States in recent years, including in Denver, Boulder and Fort Collins. Examples include (not an exhaustive list):

- 15th Street, Lawrence Street, Arapahoe Street and Stout Street in Denver
- Folsom Street in Boulder
- Laurel Street in Fort Collins

Two practices regarding protected bike lanes are worth pointing out for Longmont's consideration. First, the City and County of Denver has acquired special equipment to clear bike lanes of snow and debris. Denver uses a 7-foot minimum between the face of curb and any vertical element, such as bollards, so that this equipment can maneuver within the protected bike lanes. Second, as protected bike lanes require special equipment and maintenance protocols for snow clearance, Denver has generally aimed to keep expansion of protected bike lanes relatively contiguous to the downtown area to minimize deadhead time for maintenance crews.

BIKE BOXES/TWO-STAGE TURN QUEUE BOXES

Bike boxes were approved for use by FHWA in October 2016 (Interim Approval IA-18) and two-stage turn queue boxes were approved for use by FHWA in July 2017 (Interim Approval IA-20).

Examples of both of these devices exist within Denver, Boulder and Fort Collins. A general practice from these cities, as well as other cities in the United States, is to consider their application on a case-by-case basis. Case-by-case decision making is usually based on existing or anticipated bicyclist volumes, as well as a recognized or anticipated need for the device (such as to reduced right-hook conflicts at the startup of green for bike boxes, or to facilitate bicyclist left-turns from protected bike lanes for two-stage turn queue boxes).



BICYCLE OR PEDESTRIAN TRAFFIC SIGNALS

Denver, Boulder and Fort Collins have all used pedestrian signals or Pedestrian Hybrid Beacons as treatments for previously-uncontrolled pedestrian crossings. Denver and Fort Collins have also used these devices for bike boulevard crossings of major streets. A commonly identified issue to implementing either device is meeting warrants or application guidance from the MUTCD. Practices in Denver, Boulder and Fort Collins vary in regards to how warrants or application guidance is generally applied.

In Denver, staff generally aim to demonstrate that a location already meets or will meet warrants or application guidance. In some cases, the Roadway Network warrant (Warrant 8) has been interpreted in such a way as to qualify bike boulevards for traffic signals.

In Boulder, staff generally aim to demonstrate that a location already meets or will meet warrants or application guidance. Additionally, staff indicated that they use the thresholds from the *Pedestrian Crossing Treatment Installation Guidelines* as justification for such devices. Staff indicated that an existing baseline of volume is an especially important consideration.

In Fort Collins, staff indicated that their Bicycle Master Plan helps guide decision-making regarding traffic signals or pedestrian hybrid beacons at bicycle boulevard crossings. Although these locations may not meet warrants or application guidance in their existing condition, staff recognize the importance of adequately improving crossings to achieve the vision of the Bicycle Master Plan.