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Introduction

Denver Moves is the City and County of Denver’s Bicycle and Walking Action Plan. Denver Moves identified the Garfield Street corridor between City Park and the Cherry Creek Trail as an ideal candidate to become a neighborhood bikeway (formerly known as bicycle boulevard). The Garfield Street Neighborhood Bikeway was envisioned with new design features that would enhance bicycling and walking for a wide range of people. It would support motor vehicle traffic traveling at speeds that are consistent with the posted limits of 25 MPH. It would not rely on traditional bike lanes. The Garfield Street Neighborhood Bikeway would utilize a collection of treatments including traffic calming, signing, marking, and intersection improvements. The treatments would be specific to each location and evolve as travel patterns adjust over time.

The information from Denver Moves was combined with stakeholder input and national design guidebooks to prepare a plan for the Garfield Street Neighborhood Bikeway. The City’s project team collected information over a nine-month process that included flyers distributed to every household along corridor, two neighborhood workshops, and meeting with registered neighborhood organizations (RNOs). This document summarizes the stakeholder input process, evaluation of the proposed treatments and concept design for the Garfield Street Neighborhood Bikeway.

Input from the process highlighted Garfield Street as an important north-south bicycling and walking route that connects neighborhoods, business districts, parks, and the Cherry Creek Trail system. When implemented this plan will link key business destinations to neighborhoods, provide active living opportunities to families, strengthen neighborhood character, and work toward the City’s vision zero crash goals. The recommendations in this plan were presented to stakeholders at workshops and were available on the project website for a 2 month comment period. The input obtained during that process was critical in preparing this plan and serves as the basis for the recommendations and overall project implementation.

The Garfield Street Neighborhood Bikeway Plan is based on neighborhood input at two public workshops and fieldwork conducted between December 2014 and September 2015.
Existing Conditions

An inventory of existing conditions was conducted along Garfield Street. The full data collection results can be found in Appendix A: Data Collection. Generally, data about land use, current traffic, street characteristics and measurements, parking utilization, and crashes were collected and analyzed to understand the existing conditions in the corridor. During data collection, the project team conducted a full day corridor evaluation. Riding bikes and walking in the corridor during the field evaluations allowed the project team to experience current conditions and interact with neighborhood residents. Some of the key findings from the existing conditions data collection include:

- Existing traffic volume ranges from 500-1,400 vehicles per day
- Posted speed limit is 25 miles per hour
- Parking is heavily used
- Pavement conditions are generally good
- Sidewalks are provided
- Crosswalks are provided
- 1/8 mile stop sign spacing (recommended best practice is 1/4 mile)
- No transit service in the corridor
- Teller Elementary is the only school in the corridor - located at 12th Avenue and Garfield Street
- Limited redevelopment potential except along southern portion of the corridor within Cherry Creek
- Colfax Avenue, 1st Avenue, and the area bounded by Alameda Avenue, Cherry Creek Drive North, and Colorado Boulevard are noted as Areas of Change in Blueprint Denver.

The following summarizes specific data and observations of the existing conditions at major intersections in the corridor.

17th Avenue
- Important connection at the northern extent of the Garfield Street Neighborhood Bikeway
- Provides access to and from City Park
- The intersection is currently stop controlled on Garfield Street and difficult to cross
- 24,600 vehicles per day on 17th Avenue in 2011

Colfax Avenue
- Complex intersection due to Garfield Street’s north and south legs being offset by approximately 70 feet. This offset geometry creates uncertainty for people bicycling across the intersection, particularly regarding where they should position themselves
- High traffic volumes on Colfax Avenue
- Bus routes run along Colfax Avenue
- Lots of active commercial uses near the intersection
- 31,000 AADT on Colfax Avenue in 2014 according to CDOT

48% of people arrive at Colfax Avenue on foot or bicycle between Colorado Boulevard and Saint Paul Street.
- Bluebird Colfax BID
6th Avenue
- 6th Avenue is a busy one-way, three-lane thoroughfare (especially during the AM/PM peak hours) that is uncontrolled at the crossing with Garfield Street
- Gaps in traffic are few and brief at this intersection especially during the peak hours, making it difficult for people walking or on bicycles to cross
- Garfield Street shifts alignment roughly 65 feet at the intersection
- Bicycle and vehicle movements northbound on Garfield Street are limited to right turns
- Vehicles traveling eastbound on 6th Avenue often queue up all the way back to this intersection from the signal at Colorado Boulevard, inhibiting crossing 6th Avenue on foot or on bicycle
- Northbound vehicles traveling on Garfield are not permitted to turn left. However, violations were observed
- 17,014 vehicles in a 24 hour period on 6th Avenue in 2012

1st Avenue
- No passive signal activation for bicycles
- 5,168 ADT on 1st Avenue in 2011

Bayaud Avenue
- Junction of two bicycle facilities. Bayaud Avenue with bike lanes and Garfield Street with the Neighborhood Bikeway

Alameda Avenue
- 12,746 vehicles in a 24 hour period on Alameda Avenue on 7/28/2015
- Alameda has a 6.5 foot wide median with narrow openings
- Pedestrian and bicyclist crossings are difficult due to limited gaps in traffic especially during the peak hours

Cherry Creek North Drive
- The intersection with Cherry Creek North Drive is a critical connection to the Cherry Creek Multi-Use Trail at the south end of the Garfield Street Neighborhood Bikeway
- Cherry Creek North Drive has two lanes in each direction and poses significant crossing challenges for people bicycling and walking
- 9,739 vehicles in a 24 hour period on Cherry Creek North Drive on 7/28/2015
Community Outreach

Community Workshop #1
Working with the neighborhood residents along Garfield Street was a critical part of this project. The first of two community meetings was hosted on March 25, 2015 from 7AM to 7PM. People were invited to drop in and learn about neighborhood bikeways as well as provide comments about the corridor through the Neighborhood Bikeway Game; a map based tool for facilitating conversation about the Garfield corridor existing conditions as well as the future vision for the corridor.

To proactively reach all members of the neighborhood who are not accustomed to attending workshops, flyers were sent to each of the registered neighborhood organizations (RNOs) that surround Garfield Street. Additionally, flyers were sent out with the e-newsletter at Teller Elementary School. Finally, flyers with information about the community meeting were delivered to every home and business along Garfield Street between City Park and the Cherry Creek Trail.

This outreach strategy resulted in over 70 people who live in the corridor participating in the process. This included students from the local elementary school. They provided information about drainage issues and unsafe crossing location along the route of their walking school bus. The elementary students and their parents that attended the workshop stressed the need to enhance crossings at major intersections along the proposed Garfield Street Neighborhood Bikeway. Local neighborhood residents also attended the workshop. They provided information about current conditions on Garfield Street.

During the workshop, several alternative routes were proposed for the neighborhood bikeway. The alternatives proposed included:

- Using Steele Street and the existing access to City Park
- Using Madison Street instead of Garfield Street for the entirety of the route
- Using Madison Street for a portion of the route and jogging back to Garfield Street

Each of these were evaluated and it was confirmed that the Garfield Street route is the most appropriate route for the neighborhood bikeway. Garfield Street provides access to the local neighborhood elementary school. Enhancing access to the school with safety improvement can encourage more students to walk and bike to school. Additionally, Garfield Street provides controlled access across busy arterial corridors at Colfax Avenue, 14th Avenue, 8th Avenue, and 1st Avenue.

The following pages show the boards that were used to explain neighborhood bikeways. A summary presentation from the community workshop can be found in Appendix B: Community Outreach.

Over 70 meeting attendees played the Neighborhood Bikeway Game and shared ideas and concerns about Garfield. They provided 450 comments.
Community Workshop

The City and County of Denver is implementing Denver Moves neighborhood bikeway recommendations. Please join us to discuss the exciting opportunities for the 12th Avenue and Garfield Street corridors.

**12th Avenue** between Garfield Street and Yosemite Street  
**Garfield Street** between City Park and the Cherry Creek Trail

Drop in at any time between 7AM and 7PM to provide feedback about the project.

**March 25, 2015**  
7:00AM - 7:00PM

*bike parking available in front

Learn more and watch a short video about neighborhood bikeways at [www.denvergov.org/neighborhoodbikeways](http://www.denvergov.org/neighborhoodbikeways)

1,500 flyers were distributed to publicize the first community meeting. Flyers were delivered to every home and business along Garfield Street. They were also sent home with every student at Teller Elementary.
What is a Neighborhood Bikeway?

A neighborhood bikeway is designed for people walking, bicycling, and driving. The design is flexible to fit with a neighborhood’s unique character and safety needs. Safety for all people riding bikes is communicated through the roadway design, signage, and traffic calming measures.

Learn more and watch a short video about neighborhood bikeways at www.denvergov.org/neighborhoodbikeways
Elements of a Neighborhood Bikeway

Neighborhood bikeways improve awareness for all people sharing the road. The following design treatments are commonly found on neighborhood bikeways.

**Bicycle Pavement Markings**

**Wayfinding Signs to Destinations**

**Modify Stop Signs to Prioritize People on Bikes**

**Safety Improvements at Large Intersections**

**Neighborhood Bikeway Signs**

**Traffic Calming to Limit Traffic and Speed**
Community Workshop #2
The second community workshop took place at Montclair Civic Center on August 31, 2015 from 5PM to 7PM. Capitol Hill United Neighbors (CHUN) coordinated with all of its members as well as overlapping RNO memberships to encourage meeting attendance. The evening open house was attended by 25 people. A presentation given at the open house outlined the process of developing the concept plan for the Garfield corridor as well the recommendations for the corridor. The open house detailed concept recommendations and provided the opportunity for discussion to better understand the recommendations.

The community provided feedback and their preferred implementation strategy for each corridor. Each meeting participant was given a series of dots, which they placed on the recommended intersection concept plans they prefer to have implemented in the Garfield corridor. Attendees were also given dots to provide input on the implementation strategy for corridor recommendations.
The feedback from meeting participants based on the comment forms and a dot exercise was supportive of the Garfield Street Neighborhood Bikeway. Over the two hour session many neighborhood residents provided detailed comments on design features in and near their property. Those comments were reviewed by the project team and cross-checked with national guidelines for implementing neighborhood bikeways. Most of those comments have been incorporated in the design plans and will be included in the final design phase as possible. Concept plan details are found in the next section.
Concept Plan

Using the information gathered during data collection and the first phase of community outreach, the project team developed a concept plan for Garfield Street. The following pages detail crossing enhancements in locations where community members expressed concern or where the data evaluated identified locations that necessitate change. The conceptual plan shows intersections from north to south. Additional details along with a complete corridor aerial identifying the location for proposed traffic calming, stop sign reorientation, sharrow placement, and wayfinding signage can be found in Appendix C: Concept Plan.

Corridor Recommendations
The concept plan for Garfield recommends some consistent changes throughout the entire neighborhood bikeway. All locations with sidewalk ramps will need to be upgraded to ADA (Americans with Disabilities Act) compliant ramps when work is performed at the individual intersections. The following changes are recommended along the entire corridor to designate a neighborhood bikeway.

Install signing and striping to identify the corridor as a neighborhood bikeway
Reorient stop signs to minimize unnecessary stops for people riding bicycles

Install and evaluate neighborhood traffic circles to encourage slower travel speeds
**Garfield Street and 17th Avenue**

Based on the polling and comment cards, the proposed changes at Garfield Street and 17th Avenue were strongly supported by both City Staff and the community. Neighborhood residents and school teachers, students, and parents repeatedly requested an access point into City Park with a safe crossing. The concept plan for the intersection includes the following changes:

- Signalize intersection with pedestrian signals
- Add center pedestrian and bicycle refuge median
- Create paved connection to the existing City Park roadway
- Install passive bicycle detection
- Add bicycle-specific wayfinding pavement markings
- Install curb extensions
- Stripe intersection pavement markings
- Restrict left turns into or out of Garfield Street
- Stripe “do not block the box” pavement marking

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**City Park, the Denver Zoo, and the Denver Museum of Nature and Science** are walking and bicycling destinations for residents living along Garfield Street. The proposed crossing at 17th Avenue provides a direct connection from the Garfield Street Neighborhood Bikeway to these destinations in City Park.
Garfield Street and Colfax Avenue
Community residents provided input to the redesign of the Garfield Street and Colfax Avenue intersection for all modes of travel. The concept plan for the intersection includes the following changes:

- Install passive bicycle detection
- Add bicycle signal heads
- Add bicycle-specific wayfinding pavement markings
- Retime the signals to include a leading pedestrian and bicycle interval
- Install pedestrian and bicycle warning signing
- Install dedicated bicycle lanes and bike boxes
- Install NO TURN ON RED signs

The proposed Leading Pedestrian Interval at this intersection provides people bicycling and walking with a few second head start prior to drivers being given the green indication. This makes people walking and bicycling more visible to those turning right.
Garfield Street and 6th Avenue
The offset nature of the north and south legs of Garfield Street creates challenges for moving all travel modes through the intersection. To help facilitate safe crossing of 6th Avenue the following changes are proposed:

- Signalize intersection with bicycle detection and bicycle and pedestrian signals
- Re-purpose north side 12-foot sidewalk as two-way multi-use path for bicyclists and pedestrians
- Add bicycle specific wayfinding pavement markings
- Install pedestrian and bicycle warning signage
- Install curb extensions

During morning and afternoon peak traffic times, crossing 6th Avenue can be difficult as very few of the gaps in traffic provide adequate time to cross the street. Providing a full traffic signal at Garfield and 6th Avenue allows people walking and riding bicycles a chance to cross 6th Avenue.
Garfield Street and 1st Avenue
While 1st Avenue is currently signalized, there is not detection for a person on a bicycle waiting at the intersection to activate the signal. The recommended improvements to the Garfield Street and 1st Avenue intersection include the following:

• Install updated signal mast arms on all approaches with bicycle and pedestrian signal heads
• Reorient loading zones to reduce conflicts between bicycles and delivery vehicles
• Install bike boxes and passive bicycle signal detection
• Adjust traffic signal timing and phasing to include a leading pedestrian and bicycle interval

Passive activation via video detection will help the intersection operate more effectively for people using bicycles. The added bike lane and bike box will allow people on bicycles to be more visible and help reduce right turning conflicts between people driving and people bicycling.
Garfield Street and Bayaud Avenue
Bayaud was recently restriped to provide one vehicle lane and one bike lane in each direction. The concept plan recommends curb extensions to narrow the intersection. This will reduce the crossing distance and provide a visual reminder to vehicles to look for pedestrians. It will also provide direct access for people in wheelchairs and pushing strollers. The recommended improvements to the Garfield Street and Bayaud Avenue intersection include the following:

- Install curb bulb-outs
- Install ADA access ramps
- Design intersection drainage as needed

The concept plan recommends curb extensions to narrow the intersection. This will reduce the crossing distance and provide a visual reminder to vehicles to look for pedestrians.
Garfield Street and Alameda Avenue
There is presently a raised 6.5 foot wide refuge island along Alameda Avenue that restricts Garfield Street to right-in-right-out as well as providing a location for people bicycling and walking to stand while waiting for gaps in traffic. Due to the narrow width of the median and limited gaps in traffic during the typical peak hours, additional improvements are necessary. The recommended improvements to the Garfield Street and Alameda Avenue intersection include the following:

- Install signalized intersection with bicycle detection, bicycle and pedestrian signals, and pedestrian push buttons
- Improve raised center pedestrian and bicycle refuge median
- Install Curb bulb-outs
- Install bike boxes and passive bicycle signal detection
- Add bicycle-specific wayfinding pavement markings

The recommended improvements to the Garfield Street and Alameda Avenue intersection will improve predictability and visibility for all modes of travel.
Garfield Street and Dakota Avenue

The existing geometry on Dakota Avenue, as well as the four lane cross section, vehicle travel speed, and limited gaps on Cherry Creek North Drive create challenges for people walking and bicycling across the intersection. However, the southern terminus of the Garfield Street Neighborhood Bikeway provides an opportunity to connect the on-street bicycle network with the off-street trail network. The concept plan recommendations include the following changes:

- Reconfigure Dakota Avenue approach to have one defined connection with Cherry Creek North Drive (rather than two approaches separated by a raised island)
- Install a two-way cycle track on the south side of Dakota Avenue
- Install a raised center pedestrian and bicycle refuge median on Cherry Creek North Drive in conjunction with a traffic control device
- Convert Cherry Creek Drive from four vehicle lanes to three; add a center left turn lane and on-street parking on the north side of Cherry Creek Drive
- Pave a pedestrian and bicycle connection to the existing Cherry Creek trail
- Install a curb extension on the south side of Dakota Avenue near Garfield Street

*The City is evaluating the appropriate enhanced bicycle/pedestrian crossing treatment at this location including traffic control devices such as Rectangular Rapid Flashing Beacons, Pedestrian Hybrid Beacons (HAWK) and Traffic Signals. Selection of the preferred treatment method will be made during the subsequent design phase of the project.

Additional traffic operations analysis for all modes of travel will be completed prior to implementation. This will provide additional information on travel time impacts and safety benefits.
Planning Costs

Planning level costs were prepared for each of the treatments along the Garfield Street Neighborhood Bikeway. The cost estimates use preliminary planning costs based on estimates from similar construction projects. For instance, ADA ramps at all four corners of an intersection cost approximately $28,000 while new curb and gutter costs $60/linear foot. More information about cost estimate assumptions can be found in Appendix D: Planning Costs.

The following are the planning level costs for each project.

**Corridor Signing and Striping**  
17th Avenue  
Colfax Avenue  
6th Avenue  
1st Avenue  
Bayaud Avenue  
Alameda Avenue  
Dakota Avenue/Cherry Creek Drive

- $183,300
- $829,100
- $142,100
- $613,400
- $928,800
- $333,700
- $1,052,600
- $341,500
Project Priority

This planning effort establishes the priorities for implementing the Garfield Street Neighborhood Bikeway. The City does not currently have funding to construct the Garfield Street Neighborhood Bikeway. However, the information obtained from neighborhood residents and stakeholders will be used to prioritize funding when it becomes available. The following provides a summary of the input received on project priorities.

Project Priority

High
- Dakota Avenue/Cherry Creek Drive
- Alameda Avenue
- 17th Avenue
- 1st Avenue
- 6th Avenue
- Colfax Avenue
- Bayaud Avenue
- Corridor Signing and Striping

Dakota Avenue received the highest priority ranking from community residents and stakeholders.
Implementation

The projects needed to develop the Garfield Street neighborhood bikeway can be considered in three implementation tiers.

**Signing & Striping**
These projects are low cost and would take approximately 3-6 months to design. Examples include bicycle pavement markings (sharrow), wayfinding signage, and street sign installation. Garfield Street Neighborhood Bikeway projects that fall into this category include:

- Corridor Signing and Striping
- 12th Avenue

**Signal & Intersection Upgrades**
These projects are moderate cost and would take approximately 6 months to two years to design and implement. Examples include modification or addition of a new signal, ADA curb ramps, signage and striping, and coordination with other departments (such as Parks & Recreation). Garfield Street Neighborhood Bikeway projects that fall into this category include:

- 17th Avenue
- Colfax Avenue
- 6th Avenue
- 1st Avenue
- Bayaud Avenue
- Alameda Avenue

**Significant Intersection Reconstruction**
These projects are high cost and would take approximately 2-3 years to design and implement. Examples include right-of-way purchases, new signals, access reconfiguration, parking restrictions, signage, curb modifications, significant drainage improvements, and coordination with other agencies (such as the Colorado Department of Transportation). Garfield Street Neighborhood Bikeways projects that fall into this category include:

- Dakota/Cherry Creek Drive

Community polling at workshop #2 revealed that signal & intersection upgrades are the preferred implementation priority.
Additional projects to develop the Garfield Street neighborhood bikeway include traffic calming and stop sign reorientation.

**Candidate Traffic Circles**

Traffic circles are recommended for a number of intersections on the Garfield Street Neighborhood Bikeway corridor. Traffic circles slow vehicular traffic while posing little or no interruption to bicyclists and pedestrians. The recommended candidate traffic circle design will consider emergency vehicle clearance and produce optimal traffic calming effects. In most cases, traffic circles require an 18 foot clearance between the outer edge of the circle and intersection corners, and a 6-inch high, two-foot wide mountable curb apron. These standards vary depending on the existing intersection geometry. Traffic circles do not need stop signs to control traffic, however, the project team has recommended keeping or re-orienting stop signs at some locations where candidate traffic circles are proposed. The project team also proposes that space within the traffic circle be xeriscaped and maintained by local residents.

Several locations are recommended for re-orientation of stop signs either to prioritize movements on the neighborhood bikeway corridor, or in conjunction with the installation of a candidate traffic circle. On the Garfield Street Neighborhood Bikeway this generally means re-orienting the stop signs from the north and south approaches to the east and west approaches to control east and westbound traffic while reducing stops for north and southbound traffic traveling on the bikeway. In some cases stop sign re-orientation involves converting a 4-way stop to a 2-way stop.

Locations on Garfield Street where traffic circles and/or stop sign reorientation are recommended include:

- 16th Avenue - install traffic circle, convert 4-way stop to 2-way east/west stop
- 10th Avenue - install traffic circle
- 9th Avenue - install traffic circle, re-orient 2-way north/south stop to 2-way east/west stop
- 5th Avenue - install traffic circle
- 4th Avenue - install traffic circle, re-orient 2-way stop from north/south to east/west
- 2nd Avenue - install traffic circle, convert 4-way stop to 2-way east/west stop
- Ellsworth Avenue - install traffic circle, convert 4-way stop to 2-way east/west stop

The City does not currently have a policy for traffic calming installation. As such, to implement the candidate traffic circles and stop sign reorientation, the City will embark on a traffic calming trial. They will conduct additional analysis and data collection and then design and implement temporary traffic circles and stop sign reorientation. These changes will be monitored to evaluate the candidate traffic circles and stop sign reorientation. The City plans to conduct these evaluations in 2016.
Appendix

This document has electronic appendices that include the following:

Appendix A: Data Collection
Appendix B: Community Outreach
Appendix C: Concept Plan
Appendix D: Planning Costs

The files can be found on the project website
www.denvergov.org/neighborhood bikeways