

Denver Street Design Summit

Final Report

Workshopping Denver's draft Complete Streets guidelines
January 24th, 2020



Table of Contents:

Overview of Street Design Summit	3
Event Attendees	4
Previous Complete Streets Guiding Principles	5
Best Practices	5
Visual Preference Survey Data	8
Case Studies Overview and Applications to Street Design Guidelines	9
Federal Boulevard	10
Relevant Street Types from Blueprint Denver	11
Additional Blueprint Denver Designations	11
Currently Reflected in Draft Design Guidelines (Mixed Use Arterial)	11
Suggested Changes to Draft Design Guidelines (Mixed Use Arterial)	11
Other Ideas	12
303 ArtWay Heritage Trail (35th Avenue)	13
Relevant Street Types from Blueprint Denver	14
Additional Blueprint Denver Designations	14
Currently Reflected in Draft Design Guidelines (Local Street)	15
Suggested Changes to Draft Design Guidelines (Local Street)	15
Other Ideas	15
River Mile	16
Relevant Street Types from Blueprint Denver	17
Additional Relevant Blueprint Denver Designations	17
Currently Reflected in Draft Design Guidelines (Main Streets)	18
Suggested Changes to Draft Design Guidelines (Main Streets)	18
Other Ideas	19
Overall Comments on Draft Design Guidelines	19
Well-Stated Commitments in the Draft Guidelines	19
Suggestions for Changes to the Draft Guidelines	19
Bike Rack for Further Study beyond the Street Design Guidelines	21
Appendix A: Complete Streets Goals, Vision, and Strategies	23
Appendix B: Visual Preference Survey Data	24
Appendix C: Annotated Draft Design Guidelines	25

Overview of Street Design Summit

As a leading Vision Zero City, Denver has committed to eliminating traffic fatalities and serious injuries by 2030. Blueprint Denver establishes people walking and wheelchair rolling as the top priority on every street, followed closely by people using transit, bikes, and other “micro mobility” devices. The Denver Moves suite of plans lays out the vision for complete walk, bike, and transit networks that will allow Denver to achieve at least 50% non-SOV commuting mode share by 2030. A key factor holding our City back in achieving these goals is outdated street design standards that prioritize the movement of cars over the health and well-being of people. Denver is therefore developing new “Complete Streets” Guidelines that will inform a comprehensive update to the City’s street design standards.

The update of Denver’s street design standards is an important opportunity to bring together a diverse set of stakeholders to discuss community priorities for the use of street space, and to identify how new guidelines/standards can best support these priorities while mitigating conflict among competing demands on our street space. The Denver Streets Partnership and the Denver Department of Transportation and Infrastructure therefore hosted a Street Design Summit on January 24, 2020, that brought together stakeholders to workshop three projects as case studies for the draft Complete Street Design Guidelines.

Goals of the Street Design Summit included the following:

- Reaffirm overarching values and principles, such as Denveright and Vision Zero
- Focus in on key topic areas that present particular challenges for street design
- Review best practices from other cities
- Use case studies from Denver to “test drive” the draft complete street design guidelines, explore challenges, and discuss creative strategies for addressing these challenges



Pedestrian Priority: Complete multimodal networks prioritize the most efficient modes first. People walking and rolling are the heart of the transportation system as everyone is a pedestrian at some point during their trip.

Event Attendees

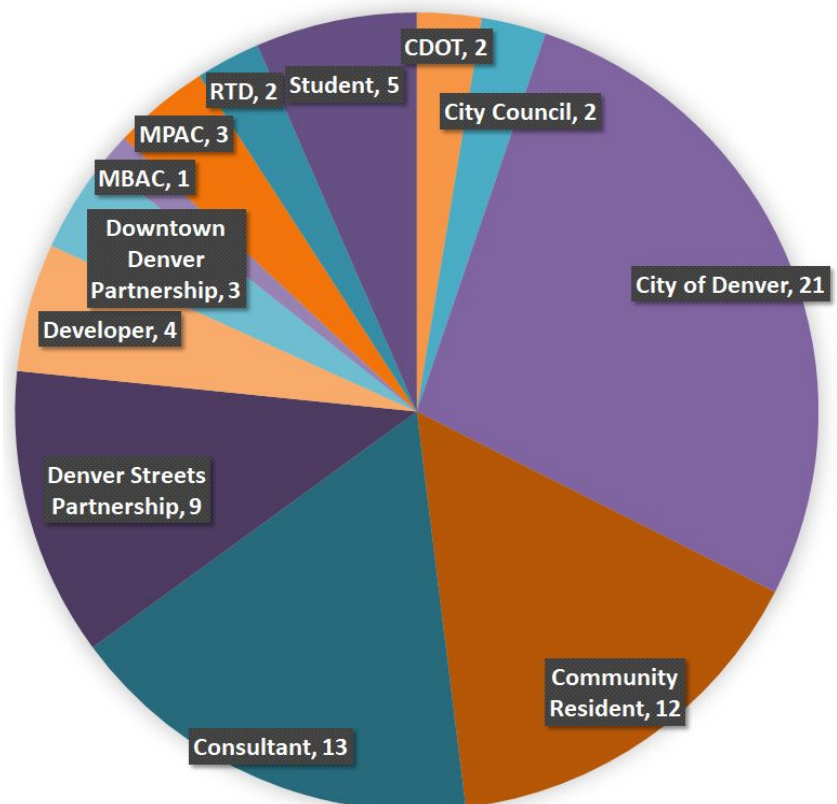


Attendees of the Street Design Summit listen to a presentation from DOTI's Riley LaMie.

The Summit was attended by 77 people representing various Denver agencies, RTD, CDOT, community members, and private sector experts. Community Resident representatives included residents of the 303 Artway case study area and the Montbello neighborhood. Denver Streets Partnership representatives included representatives from Colorado Cross Disability Coalition, American Heart Association, CoPIRG, Bicycle Colorado, and others. City of Denver staff included representatives from Community Planning & Development (CPD), Denver Fire Department (DFD), Department of Transportation & Infrastructure (DOTI), and Denver Parks & Recreation (DPR). DOTI representatives included staff from green infrastructure, operations, transportation planning, and office of community and business engagement. See the below charts for a further breakdown.

Affiliation	# Attendees
CDOT	2
City Council	2
City of Denver	21
CPD - 2	
DFD - 1	
DOTI - 15	
DPR - 3	
Community Resident	12
Consultant	13
Denver Streets Partnership	9
Developer	4
Downtown Denver Partnership	3
MBAC	1
MPAC	3
RTD	2
Student	5
Grand Total	77

Attendees of Street Design Summit by Affiliation
Total Attendees: 77



Previous Complete Streets Guiding Principles

Denver Streets Partnership, the Mayor’s Pedestrian Advisory Committee, and Mayor’s Bicycle Advisory Committee were selected as a community stakeholder group for the City of Denver’s Complete Streets design guidelines. Collectively, these groups worked alongside partners to create a guiding document entitled “Complete Streets Goals, Vision, and Strategies.” This document, which can be found [here](#) or in Appendix A, outlines high level goals of what a Complete Streets policy should contain, sets a high standard for a vision of our future complete streets in Denver, and outlines a number of potential strategies that can be used to meet this vision.

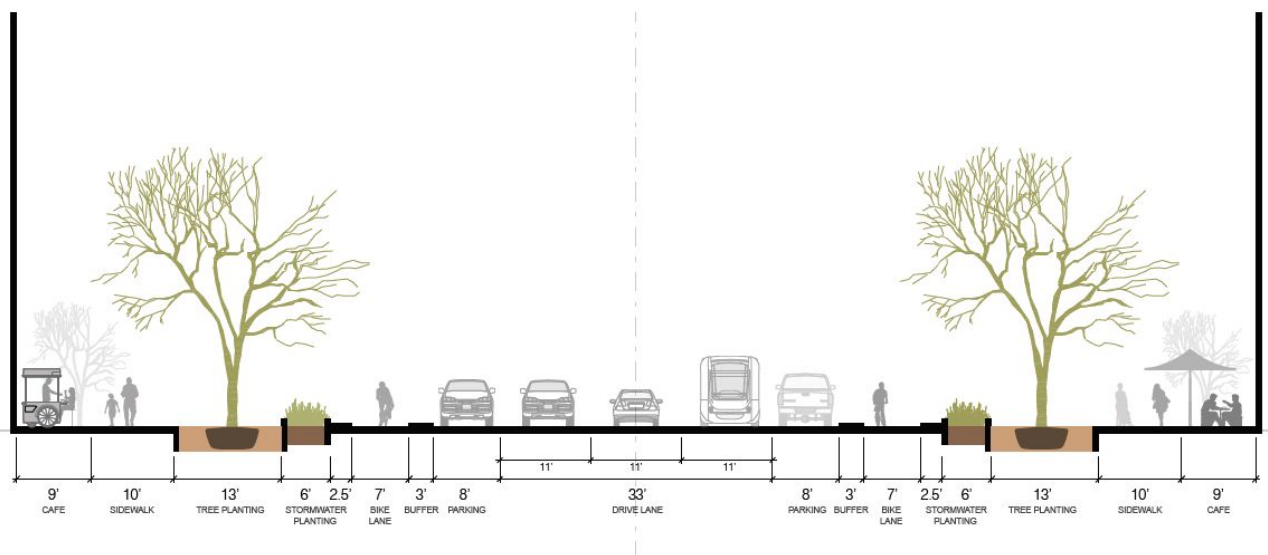
Best Practices

At the beginning of the Summit, attendees heard from a variety of local experts on best practices that relate to Street Design Standards. Key takeaways from these presentations included the following:

First and foremost, we should set our goals high and strive for a visionary future. When it comes to street design standards, these will shape our city for a century or more to come. We have to set the bar high. And because streets account for 80% of open space in urban areas, it’s important for street design standards to support placemaking in addition to mobility.

“When it comes to street design standards, these will shape our city for a century or more to come. We have to set the bar high.”

Street design has traditionally started by first focusing on vehicular travel lanes, and then incrementally adding elements such as on-street parking, bike lanes, green infrastructure and tree lawns, sidewalks, and outdoor cafe seating space. When all these elements are added together, the required street cross section becomes extremely wide, up to 150 feet. Each of these individual uses don’t always require as much space as we think they do. A better approach would first focus on highest priority uses, such as pedestrian space, and creatively accommodate other uses such as parking without excessively widening the street.



An “ideal” complete street cross-section that is 150’ wide.

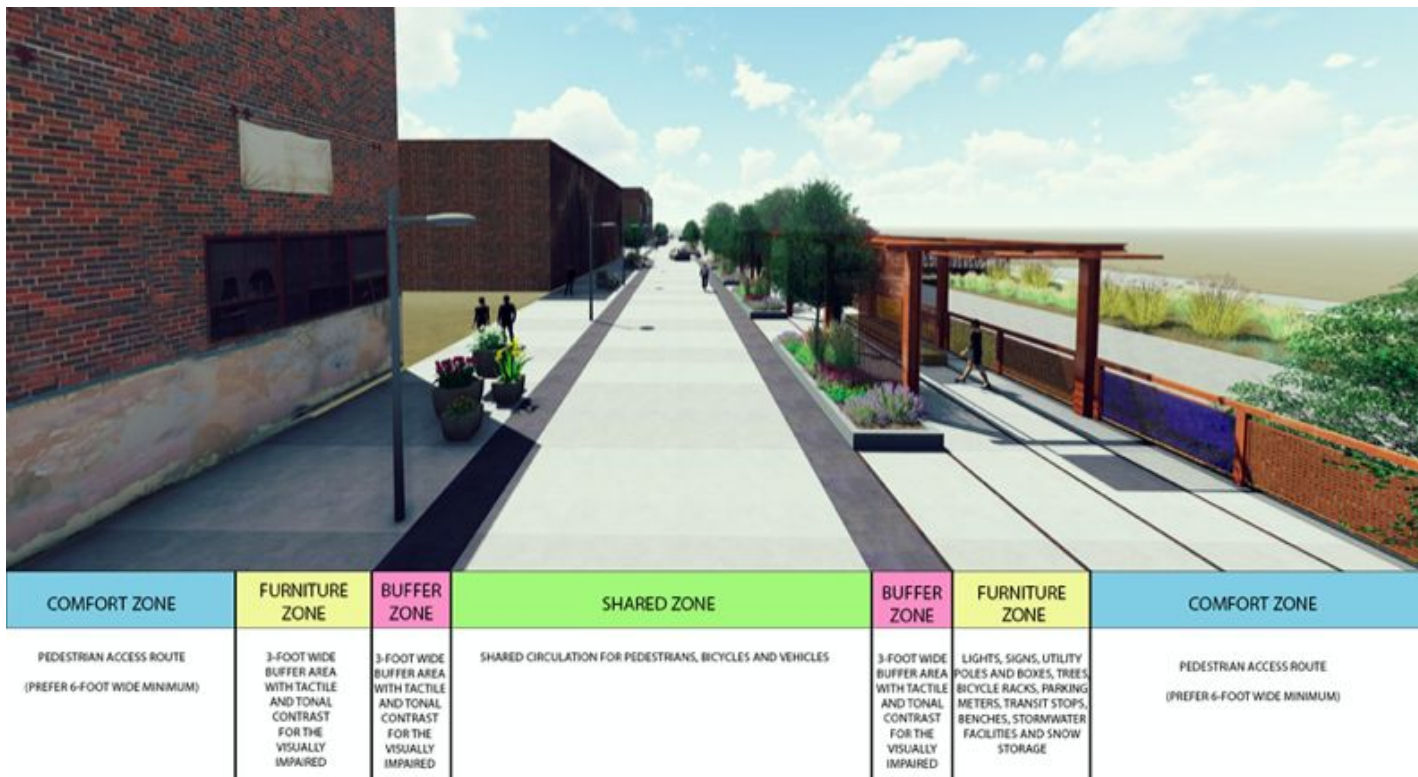
For many years, the City of Boulder has used several vertical deflection treatments to reinforce safe speeds, such as raised crosswalks, speed humps, and speed cushions. Their experience demonstrates how these treatments do not conflict with snow removal or emergency vehicles. Key to mitigating these conflicts was the creation of emergency response routes in the 1990s.

The City of Boulder successfully uses vertical deflection treatments, with little to no impact on both snow removal and emergency vehicles.



Examples of vertical deflection traffic calming treatments in Boulder.

The 39th Avenue Greenway will be Denver’s first truly shared street. Project designers drew upon best practices from across the country. The space is divided into shared zones, buffer zones, furniture zones, and comfort zones, demarcated with tactile and tonal contrast for the visually impaired.



Different zones of the shared street currently under construction along 39th Avenue in Denver.

Complete streets have a positive impact on public health. Because Complete streets make it more desirable and safe to walk, bike, or just hang out on the street, they are often associated with more physical activity which improves health outcomes and reduces risks of chronic disease. Reducing vehicle miles traveled also improves air quality on these streets. Of course, Complete Street designs also tend to be safer and result in less serious injuries and deaths from motor vehicle crashes. In addition to physical health impacts, Complete streets are also known to provide community gathering spaces and promote social cohesion, leading to increased social and mental health outcomes for communities as a whole.

Complete street designs on commercial streets leads to increased retail sales and fewer vacancies, and the shops there also tend to do well because people traveling by foot or by bike spend as much or more than people who travel by car, even if they buy smaller amounts at a time. Complete streets increase access to economic opportunity, particularly for traditionally disadvantaged communities. The cost of traffic fatalities resulting from unsafe street design is high. USDOT research suggests that the general public is willing to invest \$9.6 million to prevent just one fatality.

Visual Preference Survey Data

Beyond the technical aspects of street design, an important consideration is how people experience being on the street, particularly when they are not inside a vehicle. To help Summit participants consider this aspect of street design, participants viewed pictures of different streets in Denver and used a polling app on their smartphones to indicate how each picture made them feel on a scale from 1 (sad) to 5 (love). The chart below highlights the greater number of votes for each street.. A full document of the pictures and responses can be found [here](#) or in Appendix B.

Photo Location & Brief Description	5 - love	4	3	2	1 - sad
6th & Bannock @ Denver Health large intersection, pavement in poor condition	0	0	8	21	22
16th Street Mall Wide sidewalk, mom with a stroller, cafe seating, trees and shade	22	22	5	0	1
17th Ave at Sloan's Lake Park Bus stop with a bench. No continuous sidewalk. Desire path in sight. Striped bike lane on street.	0	7	23	20	2
Brown International School Wider sidewalk, big public art, two people walking together.	1	8	24	17	1
Cherry Creek Drive off trail Bike/ped crossing across a street with faded crosswalk and median island.	0	8	28	8	0
North Federal Boulevard A man using a cane, crossing midblock, amidst car traffic.	0	0	1	4	38
Decatur-Federal Station Wide sidewalk, wide street, turn lane, many people waiting at bus stop.	0	0	6	14	29
Morrison Road in Westwood Median islands, 2-3 story development, freshly installed curb ramps.	0	36	11	1	0
Montbello School Zone School intersection with street parking, crosswalks, and 4-way stop.	0	10	19	6	1



Case Studies Overview and Applications to Street Design Guidelines

Following the best practices presentations and the visual preference survey, Summit participants broke into three breakout groups that focused on case studies of specific Denver streets. The case studies were selected to be representative of different street types throughout Denver. Breakout groups discussed the challenges related to competing priorities for street space, and brainstormed creative strategies for mitigating these conflicts through street design. The discussions sequentially addressed three different “zones” for each street: above the curb, at the curb, and between the curbs. Below is a summary of each case study and the challenges and opportunities that emerged from the discussion, as well as suggested changes to the draft Complete Streets Guidelines that would help support the community’s priorities for that type of street.



Attendees at the summit discuss the Federal Boulevard study area.

Federal Boulevard



A cross section of Federal Boulevard and 14th Avenue. Decatur/Federal Light Rail station is on the left side of this picture, a major transit hub.

Federal Boulevard is a vital north-south arterial corridor that runs through the west neighborhoods of the City and County of Denver. It is also an important regional transportation artery and State of Colorado Highway (US-287). Federal Boulevard winds through some of the most culturally and economically diverse communities in Denver, carrying an average of 47,000 daily trips between 17th and Alameda Avenues alone.

The case study session focused on a segment of the corridor between 12th Avenue and Colfax. This area is currently part of Denver Community Planning and Development's Neighborhood Planning Initiative - West Area Plan and between two neighborhoods with recent major master planning efforts. The segment also contains important bus transit stops and transfer points, the Decatur/Federal light rail station, access to the Colorado Department of Transportation headquarters, Lakewood Gulch trail connections, Rude Recreation Center, Denver Human Services, Denver Health Westside Clinic, Paco Sanchez Park, and exit/entrance points to West Colfax Avenue.

The corridor is also on Denver's High Injury Network, the five percent of streets where 50% of traffic fatalities occur. Traffic safety is a top concern identified by residents along the corridor.

Existing conditions at the curb are bus pull outs for passenger pick up and drop off. These are often mixed with turn lanes, particularly at Decatur-Federal station, creating safety hazards because of conflicts between buses stopping, going straight, cars turning, and pedestrians/cyclists crossing the street. Future conditions support more priority to transit and pedestrians. Existing conditions between the curb are high speeds and several wide traffic lanes. Speeding and traffic crashes are frequent in this area. Future conditions support traffic calming and dedicated bus travel lanes. Existing conditions above the curb include sidewalks, transit stops, and access to adjacent trails/parks. Future conditions support higher and more active adjacent land uses, which will in turn lead to even more pedestrian activity in the corridor. Future conditions should therefore support wider sidewalks, more amenities, pedestrian scale lighting, and green infrastructure such as shade trees or structures, plantings, and bioretention treatments.

“Future conditions support more priority to transit and pedestrians.”

Relevant Street Types from Blueprint Denver

- Mixed Use Arterial

Additional Blueprint Denver Designations

- Pedestrian Enhanced
- Transit Capital Investment Corridor
- High-Capacity Transit Corridor
- Designated Parkway
- Ultra-Urban Green Street

Currently Reflected in Draft Design Guidelines (Mixed Use Arterial)

- Federal Blvd is a major transit corridor with a high number of people walking and a high density of people who live in the area. This verifies that items such as Transit Signal Priority, Pedestrian Lighting, and Transit Stops and Shelters, already listed as most appropriate, are on track.
- Relative priority chart lists pedestrians, transit, and amenity zone as top priorities, which is line with comments from participants.
- Given Federal’s designation as a Ultra-Urban Green Street, green infrastructure elements are appropriate.
- The Federal-Colfax Cloverleaf is a severe limiter on economic activity and pedestrian/bike connectivity in the area. Draft Guidelines do not seem to support future designs like this interchange.

Suggested Changes to Draft Design Guidelines (Mixed Use Arterial)

- Many participants noted conflicts between bicyclists and pedestrians, since there is no dedicated space for bicycles along Federal. This may merit changing priority levels for “Designated Bicycle Lanes” on Mixed Use Arterials to a higher priority.
- Although Federal is designated for high-capacity transit and dedicated bus lanes, the draft guidelines do not list anything regarding transit-only lanes in the design details or in the preferred widths chart. Additionally, participants noted the need for design elements that reduce conflict between turning vehicles and buses.
- Given Federal’s designation as an ultra-urban green street, street trees and plantings should be given higher priority.
- Many participants noted the need for artistic elements to bring placemaking to the corridor. Artistic elements could also provide dual support of traffic calming or protection from elements, such as artistic bus stops, sculptures in the medians, or intersection art. Artistic elements are not currently listed in design elements.

- Given conflicts between pedestrians crossing and cars turning, perhaps raised crossings could be appropriate on side streets of arterial crossings. Similarly, limiting right turn on red and restricting left turns could also have drastic improvements in safety.
- The draft Guidelines do not address turning radii or setbacks, but participants suggested moving back stop bars to keep cars from stopping in the crosswalk.
- Allocate curb space for active uses such as food trucks and stands/carts.
- The draft Guidelines did not designate the number of lanes that would be appropriate for Mixed-Use Arterial. Many participants recommended removing or narrowing travel lanes to give more spaces to pedestrians, bicyclists, and transit users.
- The draft Guidelines do not include wayfinding elements, or cultural elements, which were also recommended by many participants.

Participants suggested additional elements such as public art, wayfinding, and cultural elements.

Other Ideas

- Traffic calming on adjacent/intersection streets, such as Howard Place
- Future land use changes could increase activity even more in this area



Attendees at the summit discuss Federal Boulevard existing conditions.

303 ArtWay Heritage Trail (35th Avenue)



Stakeholders participating in a PhotoVoices project on 35th Avenue.

303 ArtWay is a future four-mile bike and pedestrian loop connecting the 40th & Colorado Transit Station and Holly Square in Northeast Park Hill. 303 ArtWay was conceived by Urban Land Conservancy (ULC), a nonprofit that owns community beneficial real estate near both properties. Today, 303 ArtWay has two primary goals: improve safety through increased connectivity and mobility as well as highlight the historically unique and diverse neighborhood that is Northeast Park Hill.

In 2019, ULC partnered with Radian – a nonprofit architecture and urban design firm – to create a Schematic Corridor Plan to guide future development of the trail (e.g., ADA compliant sidewalks, increased lighting, traffic calming improvements, and more). Through neighborhood walk audits, design workshops and regular community meetings, 303 ArtWay has identified critical areas in need of infrastructure improvements along the proposed path.

“303 Artway has two primary goals: improve safety through increased connectivity and mobility, as well as highlight the historically unique and diverse neighborhood.”

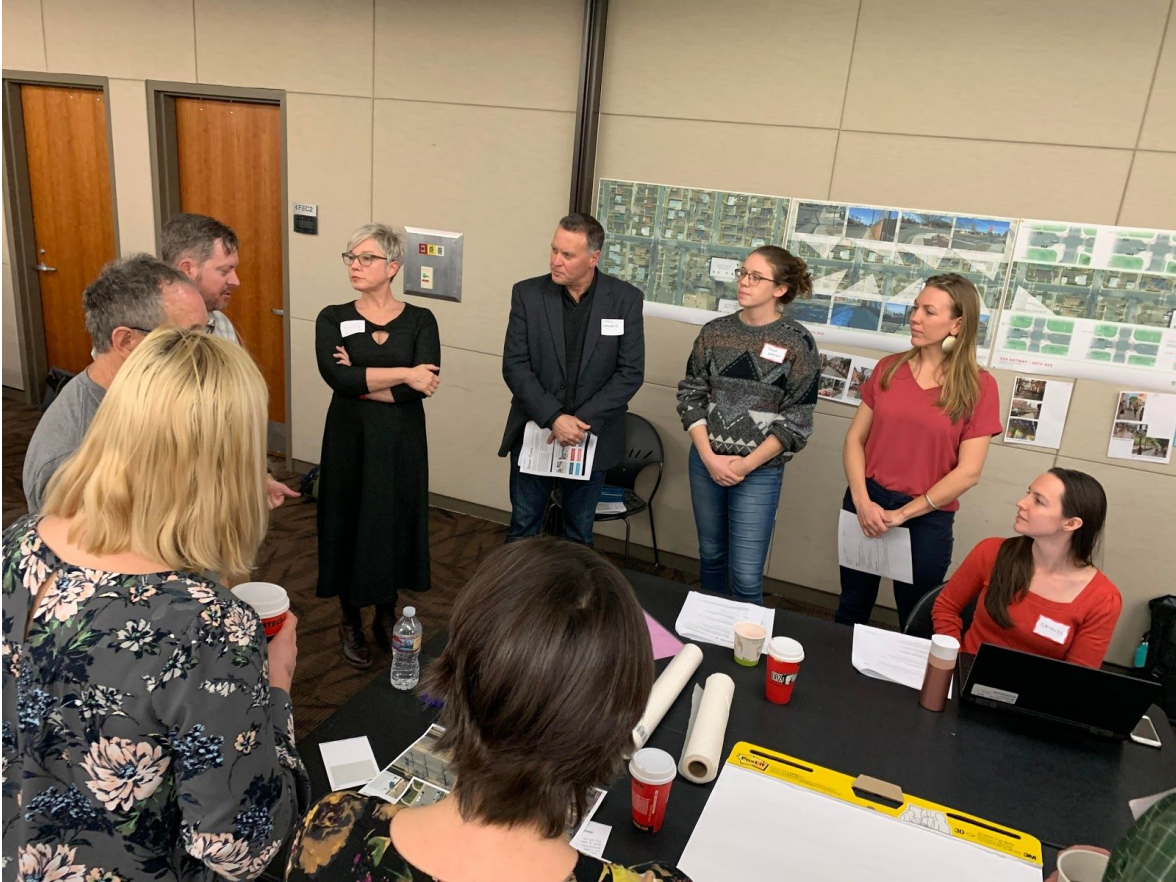
The case study session focused on the section of the trail along the 35th Avenue corridor between Holly and Glencoe. This is one of many routes along the trail identified by the community as an area in need of wider sidewalks, multi-modal street alternatives, curb bump outs and increased street lighting. The community has also voiced their concern over north/south cross traffic, and the need for reduced speeds. The 303 ArtWay team hopes to work with the City to re-classify 35th Avenue as a “local” street (currently a collector), to help achieve this goal. Summit participants agreed that 35th Avenue would be more appropriately classified as a local street, and so comments on the draft guidelines below focus on this street type.

Relevant Street Types from Blueprint Denver

- Residential Collector
- Local
- Shared Street

Additional Blueprint Denver Designations

- Pedestrian Enhanced Area
- Bicycle Priority



Attendees discuss the 303 Artway project area.

Currently Reflected in Draft Design Guidelines (Local Street)

- Participants agreed with a high prioritization of sidewalks and curbside uses, and deprioritizing medians
- Participants also agreed with medium prioritization of bicycle lanes - this is not an immediate priority for the area, but should be maintained as a possibility in the future
- Strong agreement that 20 mph is the appropriate design speed for local streets
- No turn on red was identified as an important strategy for prioritizing pedestrians on local streets.

Participants strongly agreed that 20 mph is the appropriate design speed for local streets.

Suggested Changes to Draft Design Guidelines (Local Street)

- Primary curbside uses should be expanded beyond parking to also include parklets, green infrastructure (planters), chicanes, and pinch points. Participants were supportive of limiting parking to just one side of the street to allow more space for pedestrians and to keep the overall width of the street more narrow - this could be explicitly noted as an option in the street design guidelines.
- Participants preferred a low driveway frequency, noting that frequent curb cuts create challenges for people with disabilities.
- Trees should be bolded as a highly desired element of the pedestrian realm on local streets.
- Pedestrian lighting is also a highly desired element that should be added, particularly to create a safe and welcoming environment for families with children.
- Chicanes and pinch points, neighborhood traffic circles, raised crossings/intersections, speed humps and tables should all be bolded as highly desired safe and accessible features. Participants expressed that traffic should move smoothly, but slowly along local streets.
- Participants noted that both trees and pedestrian lighting could be accommodated within chicanes/pinch points, so as to maximize pedestrian space on the sidewalks.
- 6' should be allowed as a minimum for the curbside zone, to allow more flexibility in retrofitting existing streets. The additional one or two feet can make a big difference when trying to increase pedestrian space on streets that currently have very narrow sidewalks.
- The draft guidelines do not address turning radii, but participants recommended tight radii for local streets. Related to this issue, the draft guidelines do identify SU-30 as the design vehicle for local streets, whereas NACTO recommends the smaller DL-23 for neighborhood and residential streets.
- The draft guidelines do not include wayfinding, which participants identified as a high priority for this context.

Vertical speed deflection such as speed humps and chicanes are highly desired safety and accessibility features on local streets.

Other Ideas

- The preferred design speeds of 20 mph in the street design guidelines should be used to move forward citywide speed limit reductions.
- The city should develop an equitable funding mechanism for pedestrian lighting. The current practice of funding street lighting but not pedestrian lighting is inconsistent with the city's stated policy of making people walking and rolling the top priority on all streets.

River Mile



A rendering of a potential street in the new proposed River Mile Development.

This case study focused on two streets that will be constructed as part of the new River Mile development, planned for the area near downtown Denver currently occupied by Elitch Gardens Theme & Water Park. Providing safe pedestrian and bicycle circulation and an attractive streetscape is a high priority of the River Mile development. The neighborhood includes two existing light rail stations, as well as a planned new circulator service from the site to downtown, primarily Union Station.

Though highly connected to the surrounding areas, with Little Raven, Elitch Circle, a new 7th street bridge to Auraria Parkway, and a new Walnut Street connection, the site plan does not prioritize vehicular through-traffic that would diminish the walkable nature of the site. All streets within the River Mile are two-way, most are one lane in each direction, with frequent stop signs and intersections to naturally create a slow traffic pattern and a safer pedestrian and cycling environment.

Elitch Street is the primary street into the River Mile from Speer Boulevard. The proposed development along Elitch Street will include office and residential uses. Elitch Street places a high priority on growing healthy street trees, while providing safe sidewalks and bike lanes. Elitch Street dedicates a travel lane for a shuttle “loop” that can also be shared with low speed vehicles such as scooters and electric bikes. Elitch Street also provides dedicated space for curbside loading. Elitch Street has varying widths along its length; the case study focused on the section of Elitch Street with 100’ ROW and 4 travel lanes total (inclusive of 1 dedicated shuttle lane). Elitch Street will also include bi-directional, off-street bike lanes.

Little Raven Street will be the primary “main” street within the development. The 85’ ROW will include café-lined sidewalks, narrow travel lanes, and on-street parking. Little Raven Street will include a dedicated westbound shuttle service lane as part of the shuttle loop. The plan envisions Little Raven to be a slowly traveled street where travel lanes are shared with bicyclists.

Relevant Street Types from Blueprint Denver

- Elitch Street - Downtown Collector (with mixed-uses)
- Little Raven Street - Downtown Local (Main Street)

Additional Relevant Blueprint Denver Designations

- Pedestrian Enhanced Area
- Bicycle Priority
- Transit Priority
- Designated Parkway
- Ultra-Urban Green Street

Participants noted that the vision for streets in River Mile does not fit well within the street types described in the draft design guidelines, underscoring the need for flexibility within the guidelines. The discussion focused primarily on the draft guidelines for Main Streets.

River Mile underscored the need for flexibility within the guidelines to allow more people-centered streets in dense urban areas.



Attendees of the summit discuss the River Mile project area.

Currently Reflected in Draft Design Guidelines (Main Streets)

- Participants agreed the frontage zone, sidewalk, and amenity zone are the highest priorities on these streets
- Participants also agreed that pedestrian lighting, street furniture, street trees, bike and dockless mobility parking are all high priority elements of the pedestrian realm
- Raised crossings/intersections or other vertical deflection elements were identified as desirable to reinforce slow speeds on these streets.
- No turn on red was identified as an important strategy for prioritizing pedestrians on main streets.

Vertical deflection elements such as raised crossings and chicanes were identified as highly desirable to reinforce slow speeds.

Suggested Changes to Draft Design Guidelines (Main Streets)

- Frontage zones and amenity zones should be a high priority, and drive lanes a low priority, for both arterials and collectors. These elements are critical for main streets intended to prioritize pedestrians, even when a lot of traffic is expected - the design must clearly convey that cars are a lower priority. If it is difficult to drive, people will use other modes.
- Loading and parking are not envisioned as high priority curbside uses in the River Mile context - both will be primarily handled off street. Parking traditionally has provided traffic calming on main streets, but there are other ways to do this without prioritizing car storage. While River Mile streets will be newly constructed, existing main streets could evolve in this direction as well.
- Participants had a robust discussion regarding the best way to accommodate bikes in the River Mile context, with some arguing that the streets should be designed to be slow enough to allow bikes to mix with traffic while others preferred a designated bike facility, potentially even raised or separated from both the sidewalk and travel lane with a double curb system, as is common in Copenhagen. All participants agreed that bikes should be welcome, suggesting that designated bicycle lanes should be medium, rather than low priority, for main streets.
- Parking for bikes and dockless mobility is envisioned as a potential curbside use in River Mile - the guidelines should differentiate this from car parking.
- Participants questioned whether 25 mph was too high of a speed to be truly comfortable and welcoming to all street users in a main street context.
- Participants discussed the need for adequate space to support healthy tree growth in a main street context, suggesting that 1.5' is too low a minimum for the amenity zone.
- Participants agreed that the overall width of the ROW was key to achieving the vision for main streets, and therefore the street design guidelines should allow for and encourage narrow widths.
- Allowing for flexibility of use over time - both in the short term (e.g., different times of day) and long term (as development continues to evolve) is key for accommodating a range of uses without oversizing the street.
- Participants recommended considering shared street designs as a mechanism for accommodating emergency vehicles while still allowing for narrow street widths in dense contexts. Curbless design was highlighted as a design typology that could help maximize flexibility of street design over time.
- Participants noted that design guidelines did not contain elements such as wayfinding or artistic elements.

“Participants agreed that the overall width of the ROW was key to achieving the vision for main streets, therefore the guidelines should allow for and encourage narrow widths.”

Other Ideas

- The city should consider how street designs can provide “soft spaces” for dogs while protecting trees and other plantings.
- The city should pursue legislative (liquor permitting) changes required to allow for “borderless” sidewalk cafes, so that these do not excessively impede pedestrian access.

Overall Comments on Draft Design Guidelines

Well-Stated Commitments in the Draft Guidelines

The draft design guidelines do a great job demonstrating several important and needed paradigm shifts in how the city approaches street design:

- **Prioritization of modes based on vulnerable users**, with relative priority listing for every street type that puts pedestrians always at the top of the list
- A clear statement that **“When prioritizing right-of-way space, the street planner or designer should first provide space for those at the top of the hierarchy before maximizing motor vehicle travel lanes.”**
- **A commitment to reducing speeds across all street types**, by listing design speeds only up to 30 MPH
- **A directive to design a street according to the target speed**—the speed at which you want a person to drive.

Also, the draft includes clear guiding principles well aligned with goals of Blueprint Denver, Vision Zero, and the Denver Moves suite of plans.

Suggestions for Changes to the Draft Guidelines

- Add transit-only lanes and bicycle lanes to Key Design Details and Preferred Design Widths for all typologies.
- Page 6 lists four categories under Street Design Details, but the fourth, Utilities, is left off in the Design Parameters. Is this intentional? How do utilities fit into Street Design Details?
- Transition Key Design Details into more chart-like format rather than appropriate or most appropriate. Suggested categories: Required/Strongly Recommended, Applicable, or Not Appropriate.
- Specify minimum widths for crosswalks depending on crossing distance, number of lanes, and speeds
- Under design parameters, provide more detailed and diverse descriptions of “primary curbside uses” including bike/microbility parking vs car parking, freight loading vs passenger pick-up/drop-off, green infrastructure and placemaking elements such as planters or parklets, as well as traffic calming features such as chicanes or pinch points, which can also accommodate trees, green infrastructure and pedestrian lighting.
- Tie the priority list to the design widths chart.
 - I.e., designated transit lanes in high priority means lane of X width
 - I.e., drive lanes low priority means no more than 1 travel lane
- Refine the description of “travel volume” - volumes can be high but if mainly transit, don’t require as much travel lane capacity
- Include preferred overall ROW widths for each street type, and encourage narrower widths through flexible use of space

- Revise the design vehicles for each street type to be more consistent with NACTO recommendations¹. For example:
 - The draft guidelines identify WB-50 as the design vehicle for downtown and main street, mixed use, and commercial arterials, whereas NACTO recommends SU-30 for downtown and commercial streets
 - The draft guidelines identify WB-67 as one of the design vehicles for industrial streets, whereas NACTO recommends WB-50 for designated truck routes
 - The draft guidelines identify SU-30 as the design vehicle for local streets, whereas NACTO recommends DL-23 for neighborhood and residential streets.
- Consistent with NACTO, on narrow commercial streets that require frequent loading and unloading, consider the application of a shared street design to avoid large turning radii or freight vehicles parking on sidewalks. Similarly, shared street designs should be considered as mechanism for accommodating emergency vehicles in high density residential and mixed use areas.
- Allow and prioritize both horizontal traffic calming treatments (chicanes and pinch points) and vertical treatments (speed humps, raised crossings, and raised intersections) on a broader range of street types. For example the current draft design guidelines limit raised crossings to collector streets downtown, whereas the vast majority of streets downtown are classified as arterials. The 16th Street Mall is an ideal example of where raised crossings or intersections would be appropriate for the context. These treatments are also particularly important on parkways, residential streets, and local streets.
- Identify amenity zones as a higher priority on arterials streets. An adequate buffer between the sidewalk and the street is even more essential on streets that accommodate a higher volume of traffic. Minimum widths for amenity zones should be sufficient so that this space can truly act as a buffer (e.g., greater than 1.5’).
- There should be flexibility in the specified widths for frontage, sidewalk and amenity zones based on adjacent uses (e.g., frontage zones should be wider where sidewalk cafes are desired), pedestrian densities (in most cases, 6’ is an adequate width) and desired amenities and buffering (the amenity zone may need to be wider on high vehicle volume streets to buffer sidewalk users, or may need to be wider to accommodate robust planting areas for street trees.)
- Identify bike lanes as at least a medium priority on main streets and mixed use streets. These streets are where the destinations are that people are trying to get to by bike (along with every other mode), and with higher/volume speed of traffic separated facilities for bicyclists are particularly important (as opposed to expecting bikes to mix with cars in the travel lanes, or to ride on the sidewalk in conflict with pedestrians).
- Designate lower driveway frequencies on main streets, local streets, and parkways, as these significantly detract from the pedestrian environment, particularly for people with disabilities. Prioritize driveway crossings (i.e., continuous sidewalks across driveways) on streets with higher driveway frequencies, including downtown, commercial, and industrial streets.
- Include pedestrian lighting as a key element on commercial, residential, and local streets.
- Reduce the target speed to 20 mph for residential streets and parkways.
- Add street trees as a key element on residential streets.
- Add frequent pedestrian crossings located near transit stops and bus queue jump lanes to the description of Transit Capital Investment Corridors.
- Add green infrastructure within the curb zone (e.g., planters and parklets) to the description of Ultra Urban Green Streets.
- All of the groups noted that the design guidelines did not contain wayfinding, artistic, or cultural elements in the key design details. We suggest adding these where possible, and considering where these elements might be combined with vertical separation (such as concrete planters) or other safety or accessibility features (such as intersection murals).

¹ See <https://nacto.org/publication/urban-street-design-guide/design-controls/design-vehicle/>
Streets for People Summit - January 2020 - Final Report

Bike Rack for Further Study beyond the Street Design Guidelines

- Designate priority freight, emergency, and bus routes throughout the city, to minimize the number of streets that must be designed to accommodate these larger vehicles.
 - I.e., the city shouldn't design ALL downtown streets to be freight-accessible
- Revise city funding and maintenance policies to be more consistent with the modal priorities reflected in the street design guidelines. For example, the city's current practice of funding and maintaining street lights that primarily illuminate travel lanes, but not pedestrian lights, is inconsistent with the city's stated intention to prioritize people walking and rolling first on all city streets.
- Include signal timing (e.g. leading pedestrian intervals, elimination of right-on-red signal, and "green wave" timing) as an operational feature to be considered on streets with priority pedestrian and bicycle uses.
- See appendix C for an annotated copy of the Street Design Guidelines.

Thank you!

Thank you to the speakers, attendees, and volunteers for the Denver Street Design Summit. This wouldn't have been possible without you.

Thank you to DOTI's Planning team who is leading the Design Guidelines project. We greatly appreciate this opportunity to provide impactful input into the future of Denver's streets.



Appendix A: Complete Streets Goals, Vision, and Strategies

Appendix B: Visual Preference Survey Data

Appendix C: Annotated Draft Design Guidelines

Complete Streets Goals, Vision, and Strategies

As a leading Vision Zero City, Denver committed to eliminating traffic fatalities and serious injuries by 2030. Blueprint Denver establishes people walking and wheelchair rolling as the top priority on every street, followed closely by people using transit, bikes, and other micromobility devices. The Denver Moves suite of plans lays out the vision for complete walk, bike, and transit networks that will allow Denver to achieve at least 50% non-SOV commuting mode share by 2030. A key factor holding our City back from achieving these goals is outdated street design standards that prioritize the movement of cars over the health and well-being of people. Denver is therefore in developing new complete streets guidelines that will inform a comprehensive update to the City's street design standards.

The Denver Streets Partnership, Mayor's Pedestrian Advisory Committee, and Mayor's Bicycle Advisory Committee offer the following recommendations for the Complete Streets guidelines and street design standards.

Goals

The City and County of Denver's expansion of its complete streets policy should reflect people-centric goals:

- Access to streets and safe transportation for residents of all ages and abilities
- Denver's Vision Zero commitment to ending traffic deaths by 2030 through systems-level approaches above influencing individual behavior
- Denver's Comprehensive Plan goal to reduce the percent of commuters who drive to work in single-occupancy vehicles to 50% by 2030
- The prioritization of modes of travel as expressed in Blueprint Denver:
 1. People walking/rolling (top priority)
 2. People on transit, bikes, and other "micromobility" devices
 3. Movement of goods, including freight and deliveries
 4. Personal vehicles (lowest priority)

Vision

Based on these goals, this policy should establish the following vision for streets in Denver:

- Any and every user of the transportation system arrives safely and efficiently at their destination
- A consistent and complete network for residents who walk/roll, bike, or use transit
- A network that helps the City achieve climate and public health goals by encouraging residents to walk/roll, bike, or use transit
- A network designed to promote safe speeds by all vehicles
- Aesthetically pleasing streets that can accommodate placemaking and uses other than travel, such as recreation, public gatherings, trees and greenery, water quality, festivals, art, culturally appropriate elements, etc.
- Design standards appropriately matched to the street typologies identified in Blueprint Denver, including shared streets

Strategies

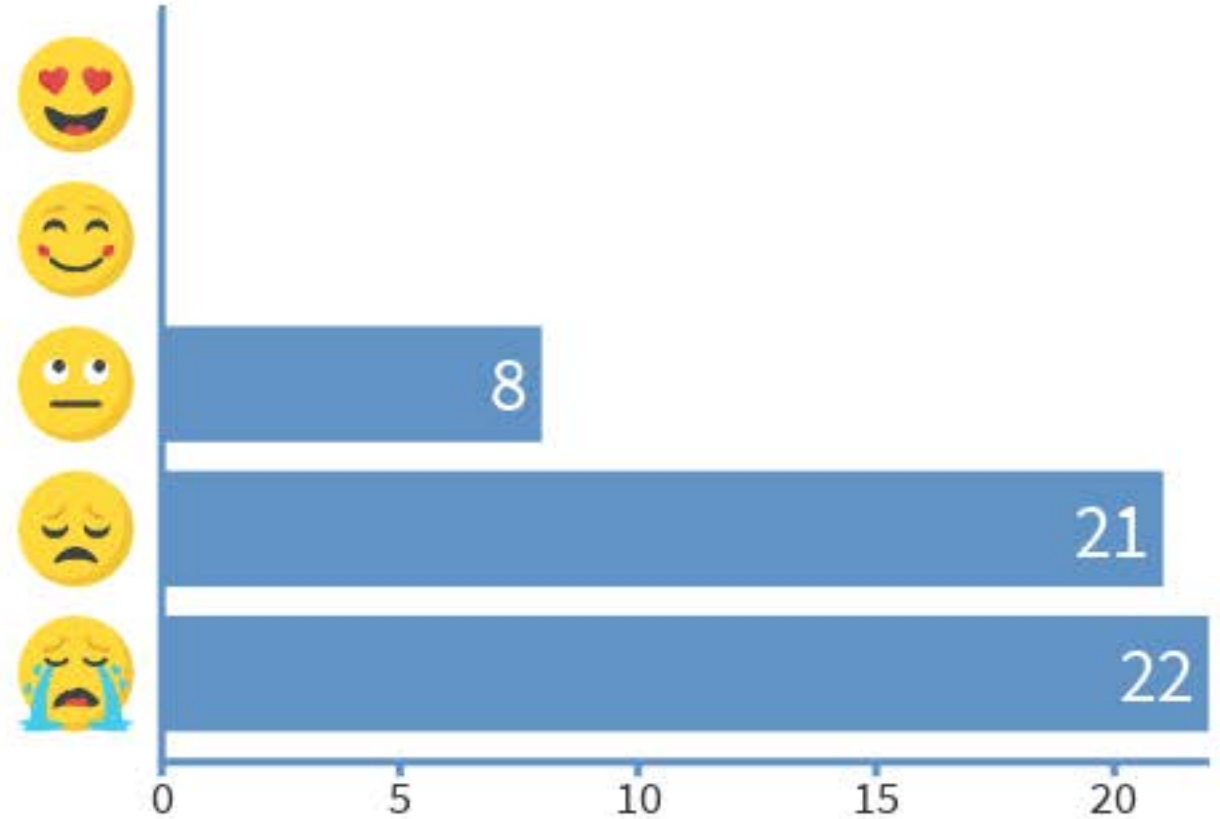
Numerous strategies will be required to meet this vision, including, but not limited to:

- Proactively install pedestrian and bicycle safety features
- Restructure the warrant process (i.e. requirements to do a study or demonstrate a specific threshold has been reached before implementing an improvement) to facilitate and prioritize walk/roll, bicycle, transit, and street safety improvements, consistent with the goals stated above. This includes:
 - Create a list of safety projects that do not require warrants
 - Raise the threshold requirements for increasing vehicular capacity
- Develop a toolbox of affordable strategies that can be rapidly and iteratively deployed to improve the public right-of-way and test and evaluate new designs
- Develop a clear process to move from quick interventions to permanent and consistent networks in a timely manner
- Proactively use regular maintenance (e.g. paving) to elevate existing streets to the new standards
- Ensure construction detour policies are consistent with street design standards and modal prioritization
- Designate priority routes for larger vehicles such as emergency vehicles, commercial vehicles, and transit
- Implement a long term plan for capital and fleet investments that match our desired street network
- Establish consistent guidelines that promote the health and longevity of street trees to increase the urban tree canopy
- Develop policies that support the highest and best use of curb space based on context and what benefits the most people, while minimizing conflict
- Ensure transparency in how the street design standards are applied and provide clear justification when complete street principles cannot be applied

When poll is active, respond at PollEv.com/kaylagilbert998

Text **KAYLAGILBERT998** to **22333** once to join

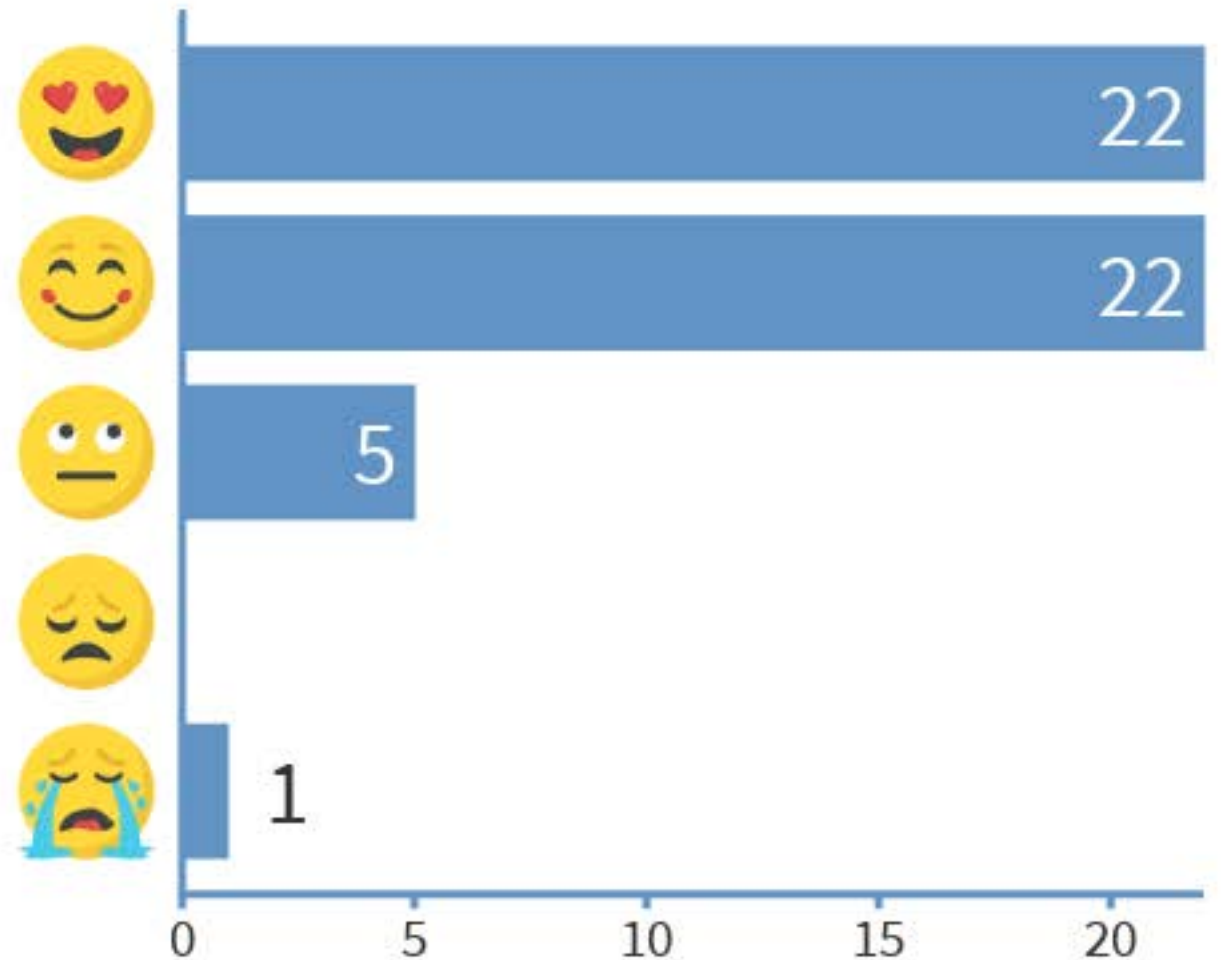
How does this street make you feel? (6th/Bannock, Denver Health)



🗨️ When poll is active, respond at PollEv.com/kaylagilbert998

📱 Text **KAYLAGILBERT998** to **22333** once to join

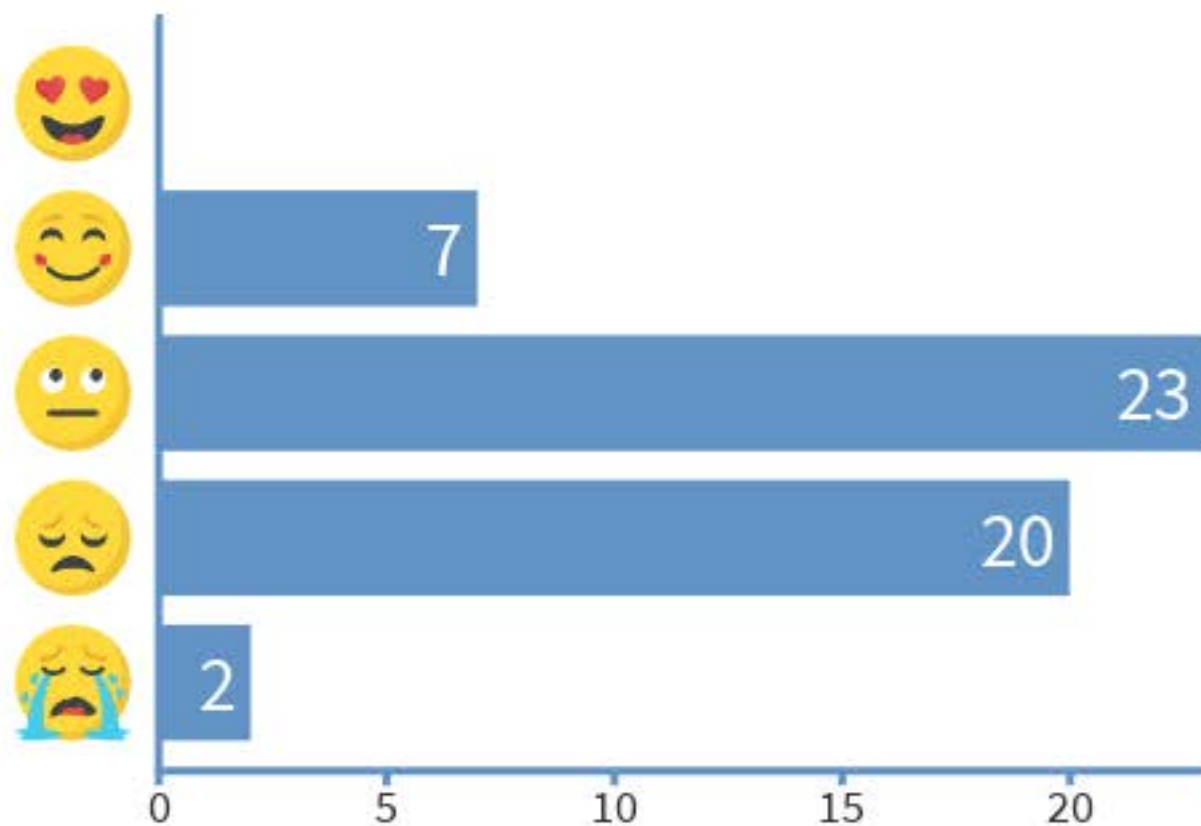
How does this street make you feel? (16th St Mall)



🗨️ When poll is active, respond at PollEv.com/kaylagilbert998

📱 Text **KAYLAGILBERT998** to **22333** once to join

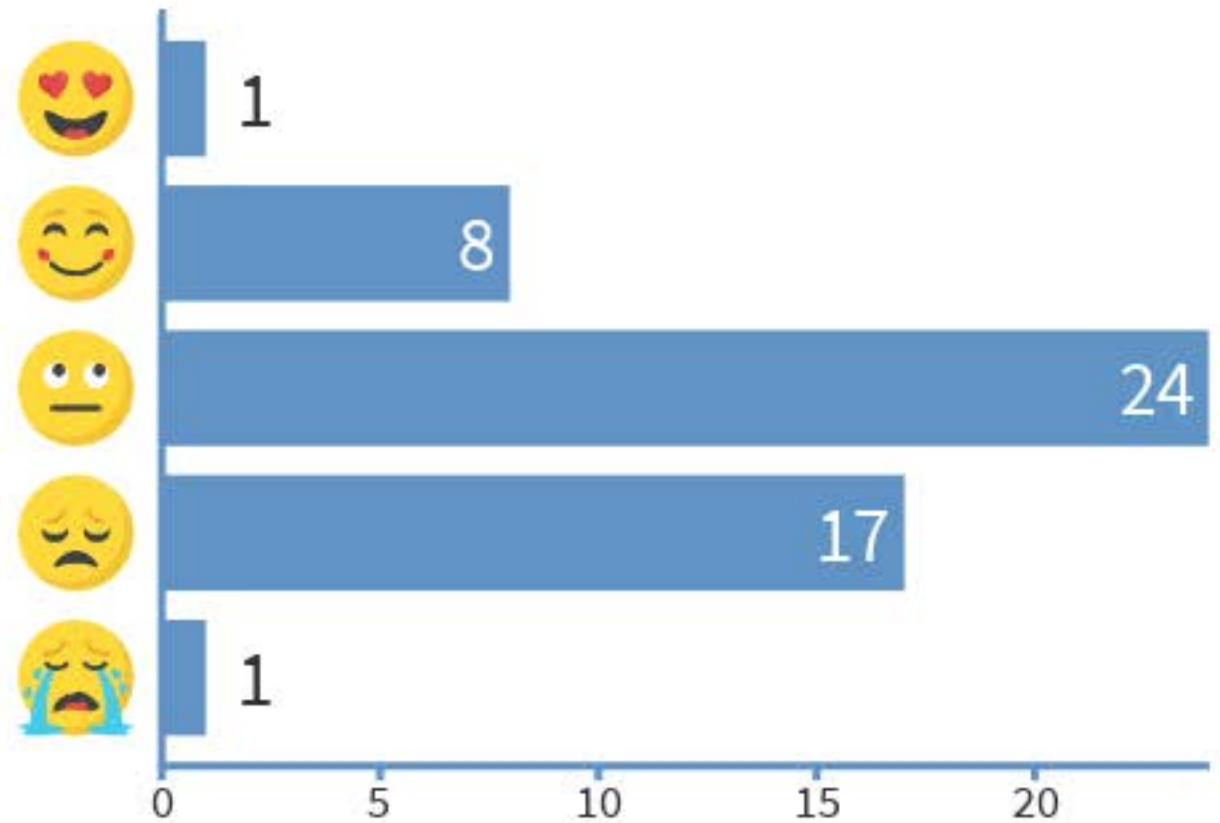
How does this street make you feel? (17th Ave, Sloan's Lake park)



When poll is active, respond at PollEv.com/kaylagilbert998

Text **KAYLAGILBERT998** to **22333** once to join

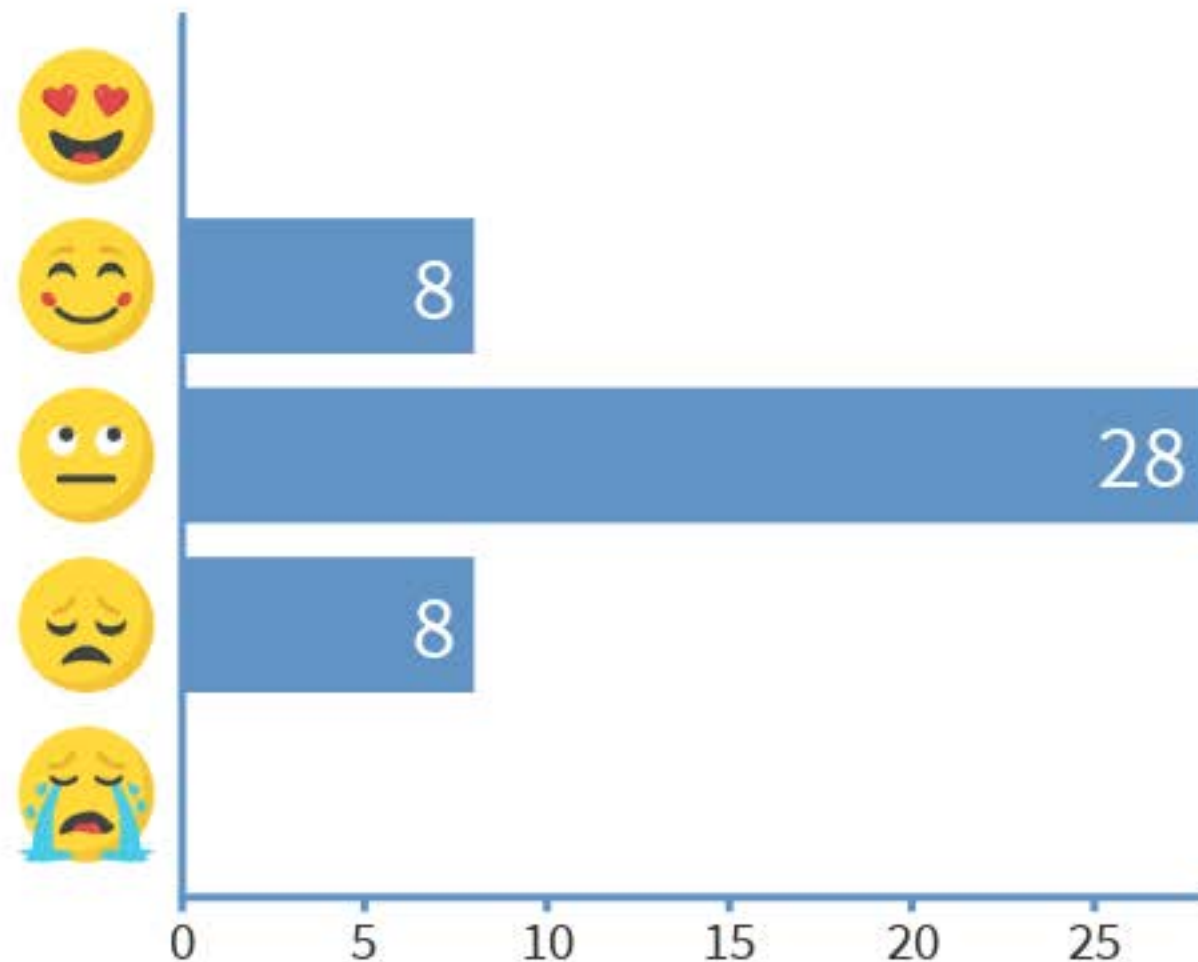
How does this street make you feel? (Brown Intl. School)



When poll is active, respond at PollEv.com/kaylagilbert998

Text **KAYLAGILBERT998** to **22333** once to join

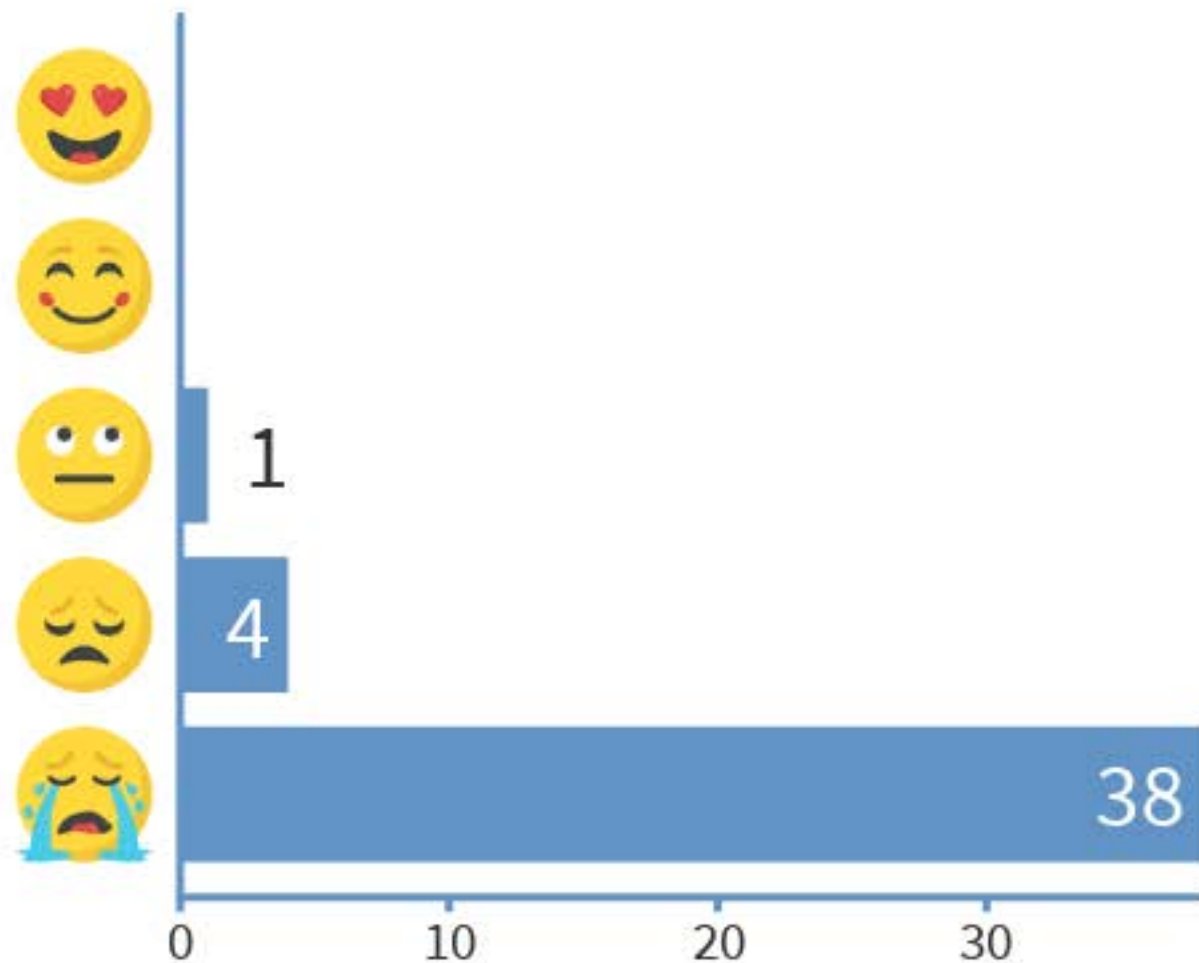
How does this street make you feel? (Cherry Creek Trail)



When poll is active, respond at PollEv.com/kaylagilbert998

Text **KAYLAGILBERT998** to **22333** once to join

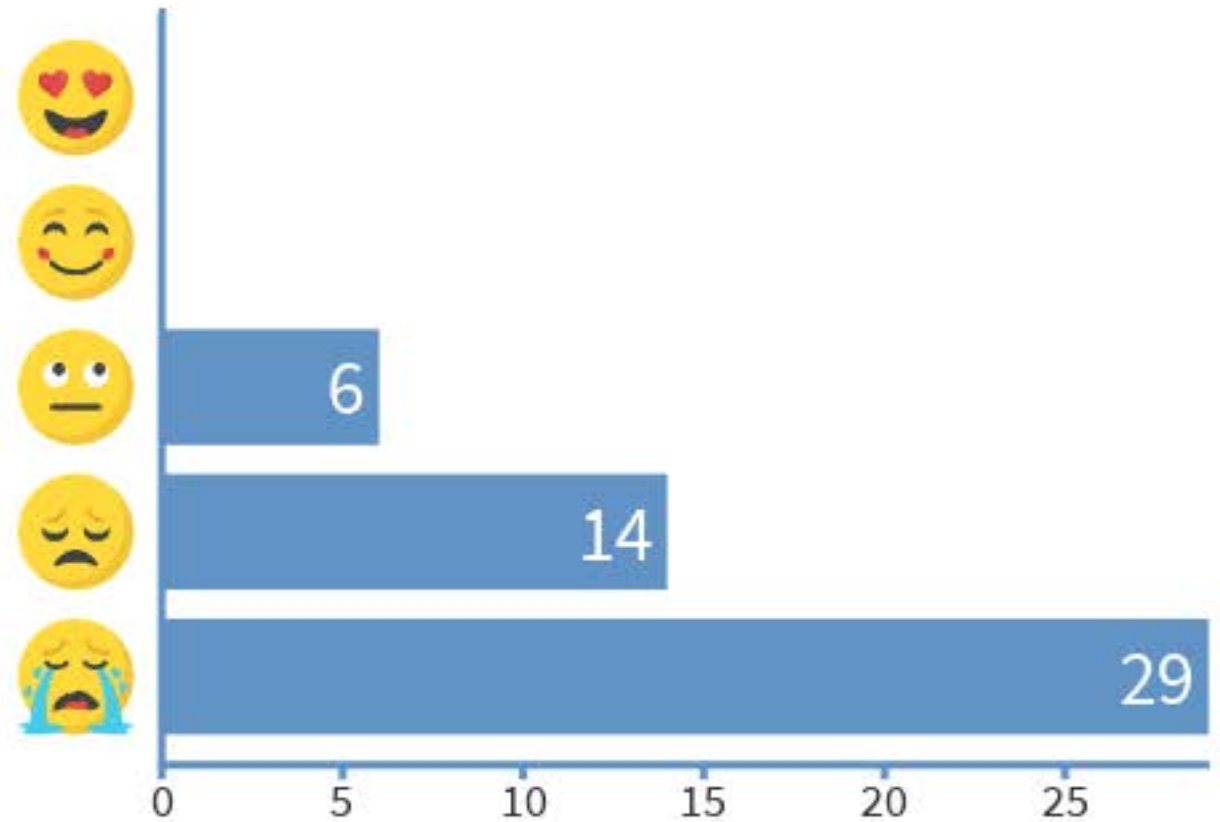
How does this street make you feel? (Federal Blvd)



When poll is active, respond at PollEv.com/kaylagilbert998

Text **KAYLAGILBERT998** to **22333** once to join

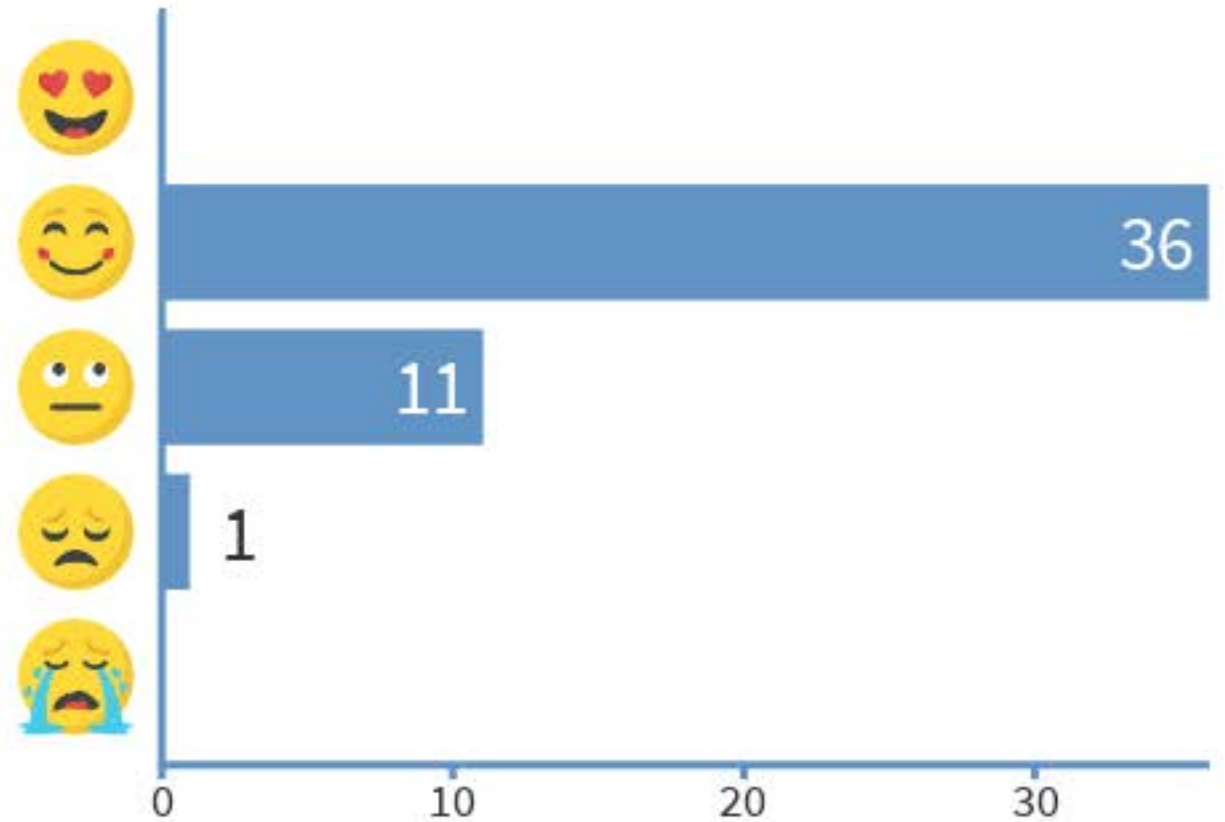
How does this street make you feel? (Federal Blvd / Decatur-Federal Station)



When poll is active, respond at PollEv.com/kaylagilbert998

Text **KAYLAGILBERT998** to **22333** once to join

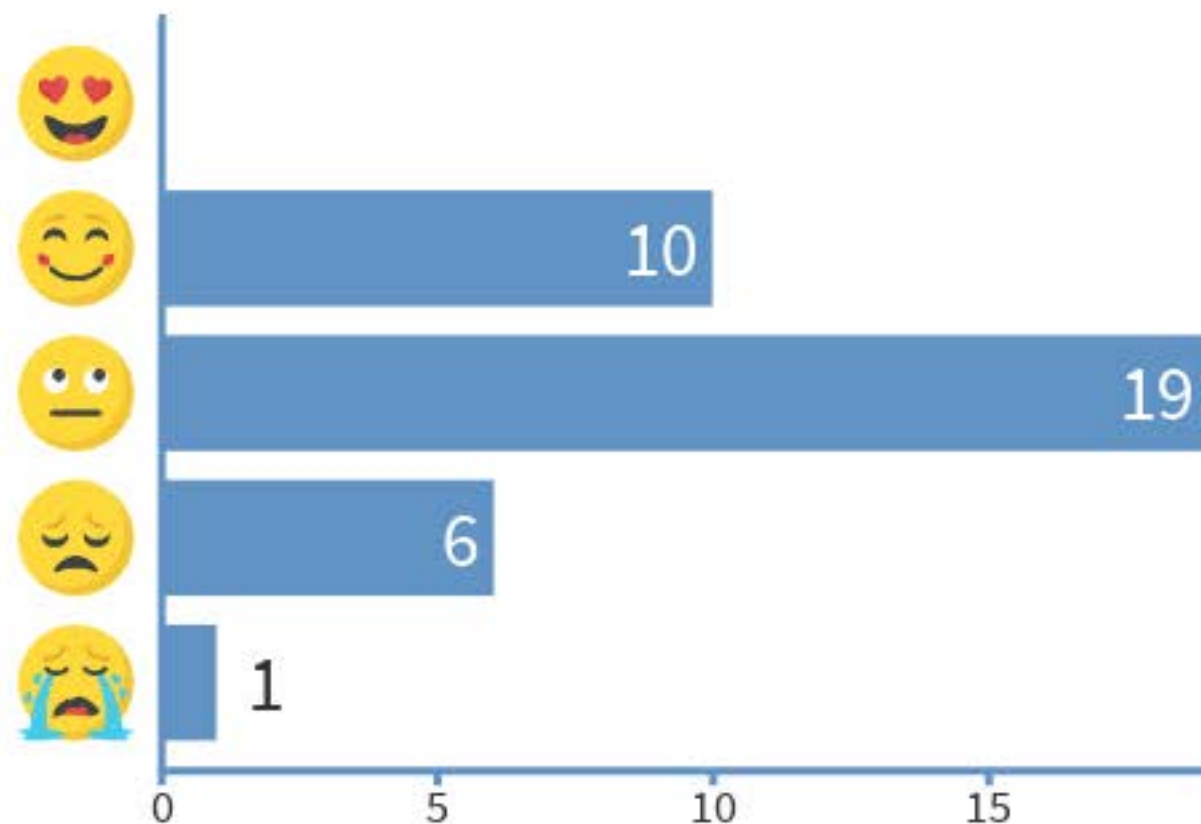
How does this street make you feel? (Morrison Road in Westwood)



When poll is active, respond at PollEv.com/kaylagilbert998

Text **KAYLAGILBERT998** to **22333** once to join

How does this street make you feel? (school in Montbello)





Denver Complete Streets Design Guidelines
January 2020 version

Denver Complete Streets Design Guidelines

January 2020
In-progress version

draft

DRAFT - DO NOT DISTRIBUTE

CONTENTS

Acknowledgements	3	Green Infrastructure.....	Error! Bookmark not defined.
Chapter 1: Introduction.....	4	Utilities	Error! Bookmark not defined.
Vision and Guiding Principles	4	Chapter 4: Implementation and Maintenance ..	Error! Bookmark not defined.
Policy Framework	4	Organizational Responsibilities	Error! Bookmark not defined.
Purpose of the Guidelines	5	Project Types	Error! Bookmark not defined.
Overview of the Guidelines	6	Project Development Process.....	Error! Bookmark not defined.
Chapter 2: Street Types and Design Framework	7	Project Review Process.....	Error! Bookmark not defined.
Street Elements and Priorities.....	7	Design Exception Process.....	Error! Bookmark not defined.
Safe Speeds	8	Maintenance Responsibilities	Error! Bookmark not defined.
Design Vehicles.....	9		
Downtown Streets	10		
Main Streets	12		
Mixed-Use Streets	14		
Commercial Streets.....	16		
Contemporary Parkways	18		
Industrial Streets.....	20		
Residential Streets.....	22		
Local Streets.....	24		
Shared Streets	26		
Overlays	28		
Chapter 3: Street Design Details.....	Error! Bookmark not defined.		
Pedestrian Realm and Curbside Features.....	Error! Bookmark not defined.		
Safe and Accessible Features	Error! Bookmark not defined.		



ACKNOWLEDGEMENTS

Forthcoming

draft

CHAPTER 1: INTRODUCTION

Vision and Guiding Principles

Streets make up a substantial portion of Denver's public space. How we design our streets reflects how we want to live.

The Complete Streets approach gives people walking, rolling, bicycling, taking transit, and scooting the same access to safe and comfortable streets as those driving a motor vehicle. Denver's Complete Streets Design Guidelines (Guidelines) embody that approach and establish new, comprehensive design standards for street projects.

The following **1** principles will guide the design of Complete Streets in Denver:

- **Safety:** Above all else, street design in Denver prioritizes the **2** safety of people, with an emphasis on protecting vulnerable users—such as people walking, rolling, and bicycling.
- **Accessibility and inclusivity:** Accessible and inclusive streets ensure that people with mobility impairments can travel and access destinations with the same dignity as everyone else.
- **Healthy and active living:** Complete Streets recognize that streets are more than just channels for transportation; proper street design encourages healthy and active travel and lifestyle options.
- **Environmental sustainability/resiliency:** Thoughtful design and operation of streets and transportation systems supports the environment by providing shade; reducing ground-level ozone; making places more comfortable for people walking, rolling, and bicycling; and improving resiliency to climate change.

- **Community character:** Streets that exhibit quality urban design become ingrained into the identity of a community, defining its culture and encouraging public pride.
- **Economic vitality:** Design that considers streets as places—not just transportation corridors—contributes to the economy: keeping and attracting residents, reducing the cost of transportation, improving property values, and increasing sales revenue.
- **Public space:** As the largest area of publicly-owned land in the city, streets have a responsibility to contribute well-designed, useful, and comfortable urban space for all users.
- **Adaptability to the future:** The future will yield trends in transportation and technology beyond our current understanding and foresight; flexible designs increase the ability to be nimble when change occurs.
- **Maintainability:** Good street design promotes more efficient maintenance, repair, sweeping, and snow clearance.

Policy Framework

Denver is rapidly growing but its street network is largely built out. As a result, widening streets to add travel lanes is not a practical solution to meet mobility demands. The City accommodates travel demand by providing a mix of transportation choices and by emphasizing efficient, safe, and sustainable ways of moving around.

Denver's modal hierarchy for its transportation system prioritizes people walking or rolling first, because everyone walks or rolls at some point during their commute, whether they are walking and rolling to and from a parked motor vehicle, to the bus, or to get exercise. Bicycling and transit are prioritized next, because these

Summary of Comments on AppendixC - Annotated Draft Guidelines.pdf

Page: 4

 Number: 1 Author: Julia Date: 2/22/2020 1:04:21 PM -07'00'

Only thing missing from DSP recommendations is designing consistent and complete networks, esp for people walking, rolling, biking, and using transit.

 Number: 2 Author: Julia Date: 2/22/2020 12:49:20 PM -07'00'

Explicitly mention safe speeds as fundamental aspect of promoting this safety.



Pedestrian Priority: Complete multimodal networks prioritize the most efficient modes first. People walking and rolling are the heart of the transportation system as everyone is a pedestrian at some point during their trip.

modes move the largest amount of people in the smallest amount of roadway space. People walking, rolling, and bicycling are also the most vulnerable roadway users when it comes to risk of injury or death in the event of a crash. Therefore, space and protection for those walking, rolling, and biking should be prioritized above motor vehicle travel and storage space. Freight and goods movement are prioritized next, as the movement of goods is necessary to keep Denver's thriving economy strong and vibrant. Finally, single occupancy motor vehicle trips are at the

bottom of the modal hierarchy. These trips are the least efficient means of moving people, from a physical space perspective, and one of the largest contributors to air and water pollution. Denver's Comprehensive Plan states a goal to reduce the percent of commuters who drive to work in single-occupancy vehicles to 50% by 2030. These Design Guidelines will help to achieve that goal by identifying improvements that make walking, biking, and taking transit easier and more convenient.

When prioritizing right-of-way space, the street planner or designer should first provide space for those at the top of the hierarchy before maximizing motor vehicle travel lanes.

While the overall modal hierarchy described applies to the entire transportation system in Denver, specific streets have individualized contexts and more nuanced priorities of uses. Chapter 2 includes guidance on which street uses have priority on


various street types. When designing a specific street, the designer should first consult Denver's street types and modal network plans in the *Denver Moves* plans and in *Blueprint Denver* to understand its characteristics.


Purpose of the Guidelines

The Denver Complete Streets Design Guidelines provide a framework to guide the City and County of Denver, its partner agencies, and private developers in designing, constructing, and maintaining Complete Streets. The Guidelines describe and illustrate design guidance for future investments in our streets. The Guidelines provide specific information and parameters related to design, construction, and maintenance of Denver's streets.

The guidance presented herein should be implemented with engineering judgement. The Guidelines integrate design flexibility to achieve outcomes that improve the public realm to support all modes of transportation while meeting requirements mandated by local, state, and federal authorities. This document presents minimum, maximum, and recommended design criteria that vary by street type. Construction-ready design standards and details are not included, as these are provided in separate City and County of Denver documents.

The Guidelines provide design standards and references to best practices to ensure consistency and quality as the City's transportation network develops over time. The information provided is compatible with the inherent flexibility provided in Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO), Manual on Uniform Traffic Control Devices (MUTCD), and Colorado Department of Transportation (CDOT) guidance.

 Number: 1 Author: Kayla Gilbert Date: 3/9/2020 9:39:48 AM
while still striving to meet the guiding principles in this document

 Number: 2 Author: Julia Date: 2/22/2020 1:04:50 PM -07'00'
Yes!

Overview of the Guidelines

Chapter 2: Street Types and Design Framework

This chapter provides a concise manual for designing streets based on a new street typology, which combines functional classification and land use context. For each of the street types, Chapter 2 provides design parameters and priorities for the public right-of-way and direction on use of general design features, which are described in detail in Chapter 3.

Chapter 3: Street Design Details

Chapter 3 is a companion section to the street types found in Chapter 2. The chapter provides details on design elements that are to be implemented throughout Denver, regardless of context. As practitioners use the street type guidance found in Chapter 2, reference should be made to the details called out and provided in the Street Design Details chapter to ensure consistent use of methods and materials across Denver. The elements of the chapter are organized into the following categories:

- Pedestrian Realm and Curbside Features
- Safe and Accessible Features
- Green Infrastructure
- Utilities

Chapter 4: Implementation and Maintenance

Chapter 4 provides general guidance on the roles and responsibilities of City and County Denver departments and its partner agencies for implementing and maintenance of Complete Streets. And because maintenance considerations are an important part of the final design of each project, Chapter 4 explores methods and standards for seasonal maintenance.

CHAPTER 2: STREET TYPES AND DESIGN FRAMEWORK

Denver has long had a system in place for classifying different streets. This functional classification system consists of a network of local, collector, and arterial streets. In this system, local streets are designed for the highest degree of property access and the lowest amount of through movement. Arterial streets are conventionally designed for the highest amount of through movement and the lowest degree of property access. Collector streets are in between a local street and an arterial street; they collect movement from local streets and convey it to arterial streets.

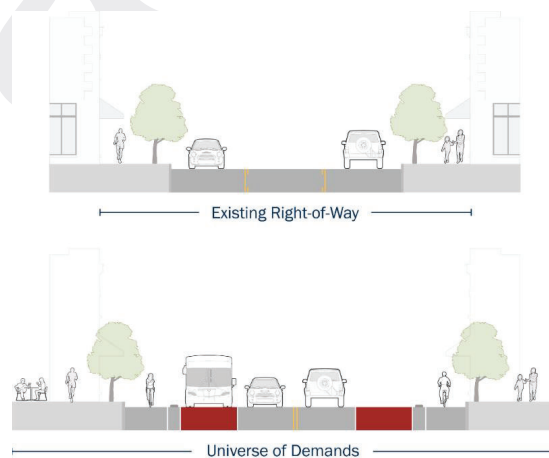
Blueprint Denver includes a typology for describing streets by their adjacent land use and character, in addition to their transportation function. This typology is applied to arterials and collectors, which have the most variation depending on land use and neighborhood context. Local streets, which vary less and are often characterized by residential uses, are found in all neighborhood contexts.

Complementing Denver's street types are pedestrian, bicycle, transit, historic parkway, ultra-urban green streets, school zone, and regular closure and festival street networks that must be considered when designing a street. These networks are described in the Overlays section and should be used alongside street type guidance to help set priorities, identify street design features, and create intuitive multimodal networks throughout Denver.

Street Elements and Priorities

Any street can be broken into three zones, including the pedestrian realm (which includes the frontage zone, sidewalk zone, and amenity zone), curbside, and travelway. Each of these zones can contain different street elements depending on the street type, surrounding land use, and modal priority for that street.

Street space is a mostly fixed quantity, particularly in retrofit situations. For many Denver street projects, there are more demands than can fit in a given right-of-way space. Because of this, the Guidelines provide information on which street elements are most important for a given street type. This chapter describes when and where these street elements should exist, their minimum and preferred widths, and other design elements that can or should be included.



Safe Speeds

A street is only as safe as its fastest traveling motor vehicle.

The relationship between traffic safety and motor vehicle speed is well documented: as motor vehicle speeds increase, the likelihood of a pedestrian surviving a crash decrease. For this reason, urban streets with a mix of modes typically promote lower speeds. The *Denver Vision Zero Action Plan* emphasizes actions to create safe speeds throughout the city.

1 The practitioner should design a street according to the target speed—the speed at which you want a person to drive. Target speeds should balance the needs of all anticipated street users based on context. In order to match design to driver expectation, the target and design speed should match the posted speed limit. While this is a departure from conventional methods of establishing design speeds and speed limits, it is a core Vision Zero and safe systems approach to street design.

Design Speed

Design speed is a tool used to determine geometric features of the roadway. The following section describes how to approach design speeds in two specific scenarios.

3 LOWERING THE DESIGN SPEED OF EXISTING STREETS

Existing roadway geometric features, signal timing, or other factors may result in a design speed or prevailing speed (the speed at which most people are driving at or below) higher than the target speed. In these cases, and as is feasible, measures should be considered to reduce the design speed to match the target speed. The Institute of Traffic Engineers (ITE) outlines 10 measures (not all of these are appropriate on every street) that can be used to lower design speeds and thereby achieve prevailing speeds that closely match target speeds:

- Setting signal timing for moderate progressive speeds from intersection to intersection;
- Using narrower travel lanes that cause motorists to naturally slow their speeds;
- Using physical measures such as curb extensions and medians to narrow the traveled way;
- Using design elements such as on-street parking to create side friction;
- Minimal or no horizontal offset between the inside travel lane and median curbs;
- Eliminating superelevation (banking of the roadway);
- Eliminating shoulders in urban applications, except for bicycle lanes;
- Smaller curb-return radii at intersections and elimination or reconfiguration of high-speed channelized right turns;
- Paving materials with texture (e.g., crosswalks, intersection operating areas) detectable by drivers as a notification of the possible presence of pedestrians; and
- Proper use of speed limit, warning, advisory signs and other appropriate devices to gradually transition speeds when approaching and traveling through a walkable area.


SELECTING A HIGHER DESIGN SPEED FOR OPERATIONAL REASONS

When it is not feasible or desirable for **2** design speed to match target speed, whether due to design vehicle requirements or other operational factors, the designer may select a design speed higher than the target speed. These cases should be limited; the default approach should be for the designer to design a street using the ideal target speed. If a higher design speed is selected, the designer should prioritize design treatments that separate moving motor vehicles from vulnerable users including people walking, rolling, bicycling, or scooting.

Page: 8

 Number: 1 Author: Julia Date: 2/22/2020 1:05:21 PM -07'00'
Yes!

 Number: 2 Author: Kayla Gilbert Date: 3/9/2020 9:40:43 AM
what would trigger this?

 Number: 3 Author: Julia Date: 2/22/2020 1:03:06 PM -07'00'
Why not mention vertical treatments here?

Design Vehicles

The following section offers design guidance for each of Denver's street design types. For the purposes of this guide, the design vehicle listed is for through motor vehicles and the design vehicle and corner radii will depend on intersecting streets, surrounding land uses, transit and freight turning needs, and sound engineering judgement.

How to Use this Chapter

The first step in designing a street is to identify the most appropriate street type based on *Blueprint Denver's* Street Types map and, if relevant, updated City plans. The practitioner should also identify relevant overlays. With that information in hand, the practitioner should use the design profiles on the pages that follow to design Complete Streets. For each street type, the profiles include:

- A general description of street characteristics
- An aspirational image of a typical street
- Guidance for what physical elements to prioritize within the street right-of-way
- Critical design parameters and operational characteristics
- Preferred, minimum, and maximum dimensions for each zone within the typical section
- Key design details, or elements, that would be appropriate for the street

Apart from Local Streets and Shared Streets, each street type includes two subtypes: arterials and collectors. Arterial streets typically have more general-purpose drive lanes and less curbside activity than collectors, but most design profile information is similar between the two. Information on the design profile pages applies to both arterial and collector streets equally unless otherwise noted.

Downtown Streets


Downtown streets are surrounded by the most intense land uses including hotels, street-level retail and office, residential, and mixed-use towers; are pedestrian-oriented with maximum building coverage of the site; and have narrow setbacks and strong engagement of the street. Many trips are local or represent the first or last mile of regional trips. Curb space is highly managed and there is a focus on highest and best use based on street network and adjacent land use needs, particularly pedestrian and bicycle connectivity. Street trees and green infrastructure, café seating, enhanced hardscaping, pedestrian lighting, and public plazas, make for a vibrant place on downtown streets.

Example Streets: Larimer Street, 14th Street

Right-of-Way Allocation Priorities

Street Element	Downtown Streets			1
	One-Way Arterial	Two-Way Arterial	Collector	
Frontage Zone	●	●	●	
Sidewalk	●	●	●	
Amenity Zone	●	●	●	
Curbside Zone	○	●	●	
Designated Bicycle Lanes	●	●	●	RELATIVE PRIORITY
Designated Transit Lanes	●	●	○	high ●
Drive Lanes	●	○	○	medium ●
Medians	—	○	—	low ○
				not compatible —

Priorities may change as a result of network overlays.

 Number: 1 Author: Kayla Gilbert Date: 3/9/2020 9:44:57 AM
love the relative priority listing. this is really helpful and informative.

Design Parameters and Operational Characteristics	
1 Design Vehicle	2 Arterial: WB-50; Collector: BUS-40
Design Speed	Arterial: 20 mph; Collector: 20 mph
Driveway Frequency	Very low (alleys and consolidated motor vehicle access)
Traffic Volumes	Low to moderate
Primary Curbside Uses	Transit, 3 Parking , 4 Loading
5 Freight Loading/Unloading	Alley and on-site accessed via alley (preferred) and on-street

Key 6 Design Details

7 Design Type	Design Element
8 Pedestrian Realm and Curbside Features	Pedestrian Lighting; Street Furniture; Street Trees and Supplemental Plantings; Bicycle and 8 Backpackless Mobility Parking ; Electric Vehicle Charging Stations; 9 Loading and Freight Zones; Mobility Hubs; Parking Meters/Pay Stations; Parklets; Transit Stops and Shelters
10 Safe and Accessible Features	Access Control & Diverters; Accessible Parking & Loading Zones; Crosswalks; Curb Extensions; 11 Bikeway Crossings; Hardened Centerlines ; In-Street Yield to Pedestrian Signs; Transit Signal Priority ; Corner Islands and Turn Wedges; No Turn on Red; Pedestrian Signal Phasing; 12 Used Crossings (collector)
13 Green Infrastructure	Bioretention Treatments; Permeable Surfaces; Tree Box Filters & Trenches

13 *Design elements in **bold** are most appropriate for this street type.*

	Frontage Zone	Sidewalk Zone	Amenity Zone	Curbside Zone	Outside Travel Lane	Inside 14 Travel Lane
Preferred	2'	12'	8'	8'	11'	10'
Minimum	0'	8'	5'	7'	10'	15
Maximum	6'	–	12'	9'	11'	11'

16 See the Denver Bikeway Design Manual for bikeway and bikeway buffer widths.

















-
- T** Number: 1 Author: Julia Date: 2/22/2020 1:47:17 PM -07'00'
Doesn't seem right that we expect trucks and buses on every single street downtown. Perhaps designations in Blueprint should be modified so that only streets that are designated bus/truck routes are designated arterials and the rest are collectors, with smaller design vehicles. See also comment on freight loading/unloading below.
-
- T** Number: 2 Author: Julia Date: 2/22/2020 2:46:51 PM -07'00'
For downtown streets, NACTO recommends SU-30. Let's send a signal to the motor carriers that they need to use smaller trucks in downtown Denver.
-
- T** Number: 3 Author: Julia Date: 2/22/2020 1:19:37 PM -07'00'
Do we really want this to be a primary use downtown? Should add/differentiate bike/micromobility parking versus car parking. Also, add parklets and green infrastructure.
-
- T** Number: 4 Author: Julia Date: 2/22/2020 1:20:04 PM -07'00'
Does this include passenger pick-up and drop off? Should be called out separately.
-
- T** Number: 5 Author: Julia Date: 2/22/2020 1:36:53 PM -07'00'
Relevant recommendation from NACTO: On narrow commercial streets that require frequent loading and unloading, consider the application of a shared street design to avoid large turning radii or freight vehicles parking on sidewalks.
-
- T** Number: 6 Author: Kayla Gilbert Date: 3/9/2020 9:41:37 AM
should there be a category for aesthetics, sustainability, land use?
-
- T** Number: 7 Author: Kayla Gilbert Date: 3/9/2020 9:46:06 AM
wonder if you'd consider listing these in the same relative priority type as on previous page? Instead of "bold is appropriate" it would be listed by priority level.
-
- T** Number: 8 Author: Julia Date: 2/22/2020 1:26:31 PM -07'00'
Better to refer more generically to micromobility? Could be docked scooters.
-
- T** Number: 9 Author: Kayla Gilbert Date: 3/9/2020 9:42:14 AM
dedicated zones, while limiting delivery/freight access in certain areas/times?
-
- T** Number: 10 Author: Kayla Gilbert Date: 3/9/2020 9:42:36 AM
no bike lanes?
-
- T** Number: 11 Author: Julia Date: 2/22/2020 2:51:06 PM -07'00'
Does this mean raised crossings? If so, then yes!
-
- T** Number: 12 Author: Julia Date: 2/22/2020 3:37:40 PM -07'00'
Problematic that this is limited to collectors when most of downtown is designated arterials. Also, add raised intersections.
-
- T** Number: 13 Author: Kayla Gilbert Date: 3/9/2020 9:47:42 AM
why are utilities not listed? previously were 4 categories on page 6, but this only lists three.
-
- T** Number: 14 Author: Kayla Gilbert Date: 3/9/2020 9:44:21 AM
if 2 travel lanes are even necessary?
-
- T** Number: 15 Author: Julia Date: 2/22/2020 2:40:57 PM -07'00'
Could we take this down to 9'? Thinking of streets like Wazee.
-
- T** Number: 16 Author: Kayla Gilbert Date: 3/9/2020 9:43:35 AM
why do we have to refer to an entirely different document for bike lanes? how many people will really do that, or just skip allocating space for a bike lane?

Main Streets





Main Streets are characterized by a mix of uses including retail, services, and restaurants, as well as residential. Buildings are pedestrian-oriented, with little front setback, a continuous street wall, and high transparency. Street-level uses are highly activated, including café seating in the right-of-way. Sidewalks are generally wider with fewer driveways to prioritize people walking or rolling. Consistent street trees, streetside planters, café seating (sometimes within the street), bump-out stormwater planters, and ultra-urban green infrastructure facilities provide a buffer between people walking or rolling and traffic.

Example Streets: E Colfax Avenue, Tennyson Street, Santa Fe Drive

Right-of-Way Allocation Priorities

Street Element	Main Streets	
	Arterial	Collector
Frontage Zone		
Sidewalk		
1. Amenities Zone		
Curbside Zone		
2. Designated Bicycle Lanes		
Designated Transit Lanes		
Drive Lanes		
3. Medians		

RELATIVE PRIORITY

high	
medium	
low	
not compatible	

Priorities may change as a result of network overlays.

Number: 1 Author: Julia Date: 2/22/2020 1:49:35 PM -07'00'

Should be high priority on arterials too. A buffer between the sidewalk and the street is even more important when there are more/faster vehicles going past.

Number: 2 Author: Julia Date: 2/22/2020 2:44:20 PM -07'00'

This should at least be medium. Main streets are where the destinations are that people are trying to get to by bike (along with every other mode), and with higher/volume speed of traffic need separated facilities rather than expecting bikes to mix with cars in the travel lanes.

Number: 3 Author: Julia Date: 2/22/2020 1:53:59 PM -07'00'

Maybe should be medium? If the street is four or more lanes wide, don't they help by providing pedestrian refuges and traffic calming? Isn't that the rationale for building them on Colfax?

Design Parameters and Operational Characteristics	
Design Vehicle	Arterial: 1 B-50; Collector: BUS-40
Design Speed	Arterial: 25 mph; Collector: 25 mph
Driveway Frequency	Low 2 moderate
Traffic Volumes	Moderate to high
Primary Curbside Uses	Transit, 3 arking, 4 ading,
Freight Loading/Unloading	Alley and on-site accessed via alley (preferred) and on-street


Key Design Details


Design Type	Design Element
Pedestrian Realm and Curbside Features	Pedestrian Lighting; Street Furniture; Street Trees and Supplemental Plantings; Bicycle and Dockless Mobility Parking ; Electric Vehicle Charging Stations; Loading and Freight Zones; Mobility Hubs ; Parking Meters/Pay Stations; Parklets; Transit Stops and Shelters
Safe and 5 ccessible Features	Access Control & Diverters; Accessible Parking & Loading Zones; Crosswalks; Curb Extensions; Driveway Crossings ; Hardened Centerlines; In-Street Yield to Pedestrian Signs; Transit Signal Priority ; Corner Islands and Turn Wedges; Median Refuge Islands (arterial); No Turn on Red; Pedestrian Signal Phasing; 6aised Crossings (collector)
Green Infrastructure	Bioretention Treatments; Permeable Surfaces; Tree Box Filters & Trenches


Design elements in **bold** are most appropriate for this street type.


	Frontage Zone	Sidewalk Zone	Amenity Zone	Curbside Zone	Outside Travel Lane	Inside Travel Lane
Preferred	2'	12'	8' 7	8'	11'	10'
Minimum	0'	8'	1.5'	7'	10'	10'
Maximum	6'	--	12'	9'	11'	11'


See the Denver Bikeway Design Manual for bikeway and bikeway buffer widths.


-
-  Number: 1 Author: Julia Date: 2/22/2020 2:48:31 PM -07'00'
Similar to downtown. We should send signal to motor carriers that on main streets they should be using smaller vehicles like SU-30.


 -  Number: 2 Author: Julia Date: 2/22/2020 2:49:55 PM -07'00'
Should be low - these detract from the pedestrian experience.

 -  Number: 3 Author: Julia Date: 2/22/2020 1:55:24 PM -07'00'
specify bike/micromobility parking, add parklets and green infrastructure.

 -  Number: 4 Author: Julia Date: 2/22/2020 2:19:16 PM -07'00'
Call out passenger pick-up and drop-off separately.

 -  Number: 5 Author: Kayla Gilbert Date: 3/9/2020 9:46:53 AM
again, buffered bike lanes?

 -  Number: 6 Author: Kayla Gilbert Date: 3/9/2020 9:46:31 AM
yay for vertical designs

















 -  Number: 7 Author: Julia Date: 2/22/2020 2:16:43 PM -07'00'
Should be at least 3'





Mixed-Use Streets

Mixed-Use Streets contain varied uses such as retail, office, residential, and restaurants. Buildings are pedestrian-oriented, typically multi-story, usually with high building coverage with a shallow front setback. A street wall is present, but may vary. Driveways are more frequent than on main streets but still limited to provide a friendly street for people walking or rolling and riding bicycles. Street trees within planting areas can include water quality features and elevated planters contribute to the streetscape. Some limited hardscaped areas with benches may be present, providing a buffer between people walking or rolling and traffic.

Example Streets: Federal Boulevard, Morrison Road

Right-of-Way Allocation Priorities

Street Element	Mixed-Use Streets	
	Arterial	Collector
Frontage Zone		
Sidewalk		
Amenity Zone		
Curbside Zone		
Designated Bicycle Lanes		
Designated Transit Lanes		
Drive Lanes		
Medians		

RELATIVE PRIORITY	
high	
medium	
low	
not compatible	

Priorities may change as a result of network overlays.

Number: 1 Author: Julia Date: 2/22/2020 2:45:15 PM -07'00'

Should be medium on arterials too. That's where the destinations are. We heard at the street design summit that people are interested in bike lanes on Federal.

Design Parameters and Operational Characteristics	
Design Vehicle	Arterial: WB-50; Collector: BUS-40
Design Speed	Arterial: 25 mph; Collector: 25 mph
Driveway Frequency	Low
Traffic Volumes	Moderate
Primary Curbside Uses	Transit, parking, loading
Freight Loading/Unloading	Alley and on-site accessed via alley (preferred) and on-street

Key Design Details

Design Type	Design Element
1 Pedestrian Realm and Curbside Features	Pedestrian Lighting; Street Furniture; Street Trees and Supplemental Plantings; Bicycle and Dockless Mobility Vehicle Parking; Electric Vehicle Charging Stations; Loading and Freight Zones; Mobility Hubs; Parking Meters/Pay Stations; Parklets; Transit Stops and Shelters
Safe and Accessible Features	Access Control & Diverters; Accessible Parking & Loading Zones; Crosswalks; Curb Extensions; Driveway Crossings; Hardened Centerlines; In-Street Yield to Pedestrian Signs; Transit Signal Priority; Corner Islands and Turn Wedges; Median Refuge Islands (arterials); No Turn on Red; Pedestrian Signal Phasing; Raised Crossings (collectors)
Green Infrastructure	Bioretention Treatments; Permeable Surfaces; Tree Box Filters & Trenches

Design elements in **bold** are most appropriate for this street type.

	Frontage Zone	Sidewalk Zone	Amenity Zone	Curbside Zone	Outside Travel Lane	Inside Travel Lane	Median
Preferred	2'	10'	8'	8'	11'	10'	18'
Minimum	0'	8'	1.5' ²	7'	10'	10'	6'
Maximum	6'	--	12'	9'	11'	11'	--

See the Denver Bikeway Design Manual for bikeway and bikeway buffer widths.

 Number: 1 Author: Julia Date: 2/22/2020 2:52:40 PM -07'00'

Street trees should be bolded. This is the number one thing people have told us they want on Federal Boulevard.

 Number: 2 Author: Julia Date: 2/22/2020 2:54:07 PM -07'00'

















Should be minimum of 3'





Commercial Streets

Commercial streets typically contain commercial uses including shopping centers, auto services, and offices. Buildings are often set back with on-site parking. Commercial streets have more frequent driveways to provide auto access to properties, but still provide adequate sidewalk space for people to walk and roll. Consistent street trees within lawns or planted areas may include water quality features and provide a buffer between people walking or rolling and traffic.

Example Streets: Leetsdale Drive, Peoria Street

Right-of-Way Allocation Priorities

Street Element	Commercial	
	Arterial	Collector
Frontage Zone		
Sidewalk		
1eninity Zone		
Curbside Zone		
Designated Bicycle Lanes		
Designated Transit Lanes		
Drive Lanes		
Medians		

RELATIVE PRIORITY	
high	
medium	
low	
not compatible	

Priorities may change as a result of network overlays.

Should be high priority on Arterials too - buffer is even more important with higher volumes/speeds of traffic.

Design Parameters and Operational Characteristics	
Design Vehicle	Arterial: WB-50; Collector: BUS-40
Design Speed	Arterial: 25 mph; Collector: 25 mph
Driveway Frequency	Moderate to high
Traffic Volumes	high
Primary Curbside Uses	Transit
Freight Loading/Unloading	On-site


Key Design Details

Design Type	Design Element
2 Pedestrian Realm and Curbside Features	Street Trees and Supplemental Plantings; Transit Stops and Shelters
3 Safe and Accessible Features	Crosswalks; Curb Extensions; Driveway Crossings; Hardened Centerlines; In-Street Yield to Pedestrian Signs; Transit Signal Priority; Corner Islands and Turn Wedges; Median Refuge Islands (arterials); No Turn on Red; Pedestrian Signal Phasing; Uncontrolled Pedestrian Crossings
Green Infrastructure	Bioretention Treatments; Tree Box Filters & Trenches


Design elements in **bold** are most appropriate for this street type.

	Frontage Zone	Sidewalk Zone	Amenity Zone	Curbside Zone	Outside Travel Lane	Inside Travel Lane	Median
Preferred	2'	6'	6'	8'	11'	10'	18'
Minimum	0'	5'	1.5'	7'	10'	10'	6'
Maximum	6'	–	12'	9'	11'	10'	–

See the Denver Bikeway Design Manual for bikeway and bikeway buffer widths.

 Number: 1 Author: Julia Date: 2/22/2020 2:56:19 PM -07'00'
Do we really high high frequency of driveways anywhere in the city? No!

 Number: 2 Author: Julia Date: 2/22/2020 2:57:02 PM -07'00'
Add pedestrian lighting, bold street trees

 Number: 3 Author: Julia Date: 2/22/2020 2:57:45 PM -07'00'
Bold driveway crossings, since these are so frequent

Contemporary Parkways

While Denver’s historic parkways play a significant role as civic space, they are not fully developed citywide. Opportunities exist to build new, contemporary parkways that embody the intent of the historic parkway system but include newer design elements. Some of Denver’s developing areas are excellent opportunities to expand the legacy of parkways, which could include creating new parkways or adapting existing roadways into parkways. Contemporary parkway design should include tree-lined sidewalks and ample green features. They should explore the integration of stormwater infrastructure, drought-tolerant plantings, high-efficiency lighting, integrated bicycle and transit connections, and various material and paving treatments.

Please see the Overlays section of this chapter for how to approach the retrofit of historic parkways.

Right-of-Way Allocation Priorities

Street Element	Contemporary Parkways
Frontage Zone	○
Sidewalk	●
Amenity Zone	●
Curbside Zone	○
Designated Bicycle Lanes	●
Designated Transit Lanes	○
Drive Lanes	⊙
Medians	●

RELATIVE PRIORITY	
high	●
medium	⊙
low	○
not compatible	—

Priorities may change as a result of network overlays.

Design Parameters and Operational Characteristics	
Design Vehicle	BUS-40
Design Speed	15 mph
Driveway Frequency	2 moderate
Traffic Volumes	varies
Primary Curbside Uses	Parking
Freight Loading/Unloading	Alley and on-site accessed via alley


Key Design Details


Design Type	Design Element
Pedestrian Realm and Curbside Features	Pedestrian Lighting ; Street Furniture; Street Trees and Supplemental Plantings ; Bicycle and Dockless Mobility Parking; On-Street Parking; Parklets
3 Safe and Accessible Features	Access Control and Diverters; Accessible Parking and Loading Zones; Chicanes and Pinch Points; Crosswalks; Curb Extensions ; Driveway Crossings; Hardened Centerlines; Transit Signal Priority; Corner Islands and Turn Wedges; Median Refuge Islands; No Turn on Red; Pedestrian Signal Phasing; Raised Crossings; Speed Humps and Tables; Uncontrolled Pedestrian Crossings
Green Infrastructure	Bioretention Treatments; Permeable Surfaces

Design elements in **bold** are most appropriate for this street type.


	Frontage Zone	Sidewalk Zone	4 Amenity Zone	Curbside Zone	Outside Travel Lane	Inside Travel Lane	Median
Preferred	2'	6'	8'	8'	11'	10'	-
Minimum	0'	5'	6'	7'	10'	10'	40'
Maximum	2'	-	12'	9'	11'	10'	60'

See the Denver Bikeway Design Manual for bikeway and bikeway buffer widths.

 Number: 1 Author: Julia Date: 2/22/2020 3:07:41 PM -07'00'
20 mph seems more compatible with intention of parkway experience.

 Number: 2 Author: Julia Date: 2/22/2020 3:00:23 PM -07'00'
Should be low - frequent driveways would significantly detract from the parkway experience.

 Number: 3 Author: Julia Date: 2/22/2020 3:34:59 PM -07'00'
Bold chicanes and pinch points, speed humps and tables

 Number: 4 Author: Julia Date: 2/22/2020 3:01:45 PM -07'00'
Preferred sidewalk/amenity zone should be bigger to support parkway experience.

Industrial Streets

Industrial streets are characterized by manufacturing but may contain other uses. Buildings are generally low-rise and may be set back to accommodate site specific needs. Adequate sidewalk space is provided, but driveway access is provided more frequently and streets may be wider to accommodate the movement of goods. Street trees within a lawn or stormwater planting area are used to separate people walking or rolling from motor vehicles and freight traffic. Green infrastructure is helpful to reduce pollutants.

Example Streets: Smith Road, Kalamath Street

Right-of-Way Allocation Priorities

Street Element	Industrial	
	Arterial	Collector
Frontage Zone	○	○
Sidewalk	●	●
1st Priority Zone	⊙	⊙
Curbside Zone	—	○
Designated Bicycle Lanes	⊙	⊙
Designated Transit Lanes	○	○
Drive Lanes	●	⊙
Medians	○	—

RELATIVE PRIORITY	
high	●
medium	⊙
low	○
not compatible	—

Priorities may change as a result of network overlays.

Should be high priority per description above - street trees separate people walking from motor vehicles.

Design Parameters and Operational Characteristics	
Design Vehicle	WB-40, WB-50, 2 B-67
Design Speed	3 Arterial: 30 mph; 2 Collector: 25 mph
Driveway Frequency	Moderate to high
Traffic Volumes	Moderate to high
Primary Curbside Uses	Loading, freight
Freight Loading/Unloading	On-site

Key Design Details

Design Type	Design Element
5 Pedestrian Realm and Curbside Features	Street Trees and Supplemental Plantings; Loading and Freight Zones; Transit Stops and 4 shelters
6 Safe and Accessible Features	Crosswalks; Curbside 1 extensions; Driveway Crossings; Median Refuge Islands (arterials) ; No Turn on Red; Pedestrian Signal Phasing; Uncontrolled Pedestrian Crossings
Green Infrastructure	Bioretention Treatments; Tree Box Filters & Trenches

Design elements in **bold** are most appropriate for this street type.

	Frontage Zone	Sidewalk Zone	Amenity Zone 7	Curbside Zone	Outside Travel Lane	Inside Travel Lane
Preferred	2'	6'	6' 8	9'	12'	11'
Minimum	0'	5'	1.5'	8'	10'	10'
Maximum	2'	–	12'	9'	12'	11'

See the Denver Bikeway Design Manual for bikeway and bikeway buffer widths.

-
- 1** Number: 1 Author: Kayla Gilbert Date: 3/9/2020 9:50:06 AM
crosswalks should be bold
-
- 1** Number: 2 Author: Julia Date: 2/22/2020 3:07:01 PM -07'00'
NACTO recommends WB-50 for designated truck routes - why would we design for anything bigger than that?
-
- 1** Number: 3 Author: Kayla Gilbert Date: 3/9/2020 9:48:40 AM
design speeds shouldn't be higher here than in other places. we're talking bigger trucks with higher capacity to kill people
-
- 1** Number: 4 Author: Kayla Gilbert Date: 3/9/2020 9:49:33 AM
many of these industrial areas currently have little to no shade and street trees. if trees are limited for things like trucks, please consider more shelters/shade to avoid heat island effect
-
- 1** Number: 5 Author: Julia Date: 2/22/2020 3:08:43 PM -07'00'
Bold street trees.
-
- 1** Number: 6 Author: Julia Date: 2/22/2020 3:09:05 PM -07'00'
Bold driveway crossings.
-
- 1** Number: 7 Author: Julia Date: 2/22/2020 3:10:48 PM -07'00'
Is 6' sufficient to support healthy trees? Should be 8?
-
- 1** Number: 8 Author: Julia Date: 2/22/2020 3:11:14 PM -07'00'
Should be 3' minimum

Residential Streets

Residential streets serve primarily residential uses, but may also include schools, civic uses, parks, small retail nodes, and other similar uses. Buildings on residential streets usually have a modest setback, which varies in depth by neighborhood context. Signalized crosswalks with high visibility markings provide ample crossing opportunities. Street trees within a lawn or planted area are used to separate people walking or rolling from traffic. These streets typically have higher traffic speeds and volumes than local streets and serve more land uses than just residential.

Example Streets: E 14th Avenue, Martin Luther King Boulevard

Right-of-Way Allocation Priorities

Street Element	Residential	
	Arterial	Collector
Frontage Zone	●	●
Sidewalk	●	●
Amenity Zone	●	●
Curbside Zone	○	●
Designated Bicycle Lanes	○	●
Designated Transit Lanes	●	○
Drive Lanes	○	○
Medians	●	—

RELATIVE PRIORITY	
high	●
medium	●
low	○
not compatible	—

Priorities may change as a result of network overlays.

Design Parameters and Operational Characteristics	
Design Vehicle	Arterial: Denver Fire Truck Collector: DL-23
Design Speed	1 Arterial: 25 mph; Collector: 25 mph
Driveway Frequency	Moderate to high
Traffic Volumes	Moderate
Primary Curbside Uses	Transit (arterial), parking
Freight Loading/Unloading	Alley and on-site accessed via alley (preferred) and on-Street

Key Design Details

Design Type	Design Element
2 Pedestrian Realm and Curbside Features	On-Street Parking; Transit Stops and Shelters
3 Safe and Accessible Features	Access Control and Diverters; Chicanes and Pinch Points (collector); Crosswalks; Curb Extensions; Driveway Crossings; In-Street Yield to Pedestrian Signs; Left-Turn Wedges; Median Refuge Islands (arterials); Neighborhood Traffic Circles (collector); No Turn on Red; Pedestrian Signal Phasing; Raised Crossings (collectors); Speed Humps and Tables (collector); Uncontrolled Pedestrian Crossings
Green Infrastructure	Bioretention Treatments; Tree Box Filters & Trenches

Design elements in **bold** are most appropriate for this street type.


Residential Arterial | Residential Collector

	Frontage Zone	Sidewalk Zone	Amenity 4 Zone	Curbside Zone	Outside Travel Lane	Inside Travel Lane	Median
Preferred	2'	6'	6'	8'	11'	15'	10'-16'
Minimum	0'	5'	1.5'	7'	10'	10'	6'
Maximum	2'	-	12'	9'	11'	10'	18'

See the Denver Bikeway Design Manual for bikeway and bikeway buffer widths.

1 Number: 1 Author: Julia Date: 2/22/2020 3:13:06 PM -07'00'
For residential, should be 20 mph

1 Number: 2 Author: Julia Date: 3/9/2020 9:50:41 AM
Add street trees, pedestrian lighting - we often hear people want more pedestrian lighting in their residential neighborhoods.

 Author: Kayla Gilbert Date: 3/9/2020 9:50:41 AM
agreed. why did we take away ped realm features for the neighborhood streets?

1 Number: 3 Author: Julia Date: 2/22/2020 3:35:17 PM -07'00'
Bold chicanes and pinch points, neighborhood traffic circles, raised crossings, speed humps and tables - traffic calming should be paramount in residential areas.

1 Number: 4 Author: Julia Date: 2/22/2020 3:16:19 PM -07'00'
Should be 8' to support healthy trees

1 Number: 5 Author: Julia Date: 2/22/2020 3:16:52 PM -07'00'
Reduce to 9 feet in residential areas. Reinforce slow speeds.

Local Streets

Local streets can vary in their land uses and are found in all neighborhood contexts. They are most often characterized by residential uses. Local streets provide the lowest degree of through travel but the highest degree of property access. These streets also form the backbone for Denver's Neighborhood Bikeways by using traffic calming, including medians, traffic circles, and bulb-outs to encourage slower speeds and promote safety for all roadway users. Street trees within a lawn or planted area is generally used to separate people walking or rolling from traffic.

Example Streets: Local streets are the predominant street type in Denver

Right-of-Way Allocation Priorities

Street Element	Local
Frontage Zone	○
Sidewalk	●
1 nenity Zone	⊙
Curbside Zone	●
2 esignated Bicycle Lanes	⊙
Designated Transit Lanes	—
Drive Lanes	○
Medians	—

RELATIVE PRIORITY	
high	●
medium	⊙
low	○
not compatible	—

Priorities may change as a result of network overlays.

 Number: 1 Author: Julia Date: 2/22/2020 3:20:43 PM -07'00'

Increase to high - need more street trees everywhere in Denver, and this reinforces the street as a place more than a thoroughfare.

 Number: 2 Author: Julia Date: 2/22/2020 3:20:09 PM -07'00'

I would actually put this at low. Local streets should be designed as slow streets where cars and bikes can comfortably mingle together.

Design Parameters and Operational Characteristics	
Design Vehicle	1J-30
Design Speed	20 mph
Driveway Frequency	High
Traffic Volumes	Low
Primary Curbside Uses	Parking
Freight Loading/Unloading	Alley and on-site accessed via alley (preferred) and on-street

Key Design Details

Design Type	Design Element
2 Pedestrian Realm and Curbside Features	Street Trees and Supplemental Plantings; On-Street Parking
4 Safe and 3 Accessible Features	Access Control and Diverters; Chicanes and Pinch Points; Crosswalks; Curb Extensions ; In-Street Yield to Pedestrian Signs; Neighborhood Traffic Circles; No Turn on Red; Pedestrian Signal Phasing; 5 Raised Crossings; Speed Humps and Tables; Uncontrolled Pedestrian Crossings
Green Infrastructure	Bioretention Treatments; Permeable Surfaces

Design elements in **bold** are most appropriate for this street type.

6

	Frontage Zone	Sidewalk Zone	Amenity Zone	Curbside Zone	Outside Travel Lane	Inside Travel Lane
Preferred	2'	6'	6'	8'	--	--
Minimum	0'	5'	1.5'	7'	--	--
Maximum	2'	--	12'	9'	--	--

See the Denver Bikeway Design Manual for bikeway and bikeway buffer widths.

-
- 1** Number: 1 Author: Julia Date: 2/22/2020 3:22:07 PM -07'00'
NACTO recommends DL-23 for neighborhood and residential streets, which is what most local streets are.
-
- 1** Number: 2 Author: Julia Date: 2/22/2020 3:22:47 PM -07'00'
Bold street trees, add pedestrian lighting
-
- 1** Number: 3 Author: Julia Date: 2/22/2020 3:35:23 PM -07'00'
-
- 1** Number: 4 Author: Julia Date: 2/22/2020 3:35:36 PM -07'00'
Bold chicanes and pinchpoints, neighborhood traffic circles, raised crossings, speed humps and tables. Traffic calming should be paramount on local neighborhood streets.
-
- 1** Number: 5 Author: Kayla Gilbert Date: 3/9/2020 9:52:04 AM
bold raised crossings
-
- 1** Number: 6 Author: Julia Date: 2/22/2020 3:43:40 PM -07'00'
Glad to see no minimums here. Would be great to explicitly discuss/endorse the concept of a yield street.
-
- 1** Number: 7 Author: Julia Date: 2/22/2020 3:42:19 PM -07'00'
Wide enough to support healthy trees? Should be 8'?

Shared Streets

A shared street is a street that includes a shared zone where pedestrians, bicyclists, and motor vehicles mix in the same space. Shared streets prioritize pedestrian mobility over motorist mobility, and they frequently feature design elements that encourage low motor vehicle speeds and volumes. Shared streets are appropriate where pedestrian activity is high and motor vehicle and transit demand is low. In downtown or mixed-use areas, shared streets often include café space, gathering areas, seating, art, and landscaping.

Shared street environments can be challenging for pedestrians with vision disabilities, because they often lack navigational cues such as curbs and defined crossings. Care must be taken to design shared streets that are accessible for all users, and designers should consult the United States Access Board's 2011 *Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way* (Proposed PROWAG).

Shared streets can either include curbs or be curbless, or flush. Curbless streets are sometimes preferred to promote flexibility and access for events and to message that motor vehicles are the guest. If a shared curbless street is chosen, the designer should include detectable elements to prevent pedestrians with vision disabilities from inadvertently crossing into vehicular lanes outside of designated crossings.

Example Streets: Fillmore Plaza, E 39th Avenue (planned)

Design Parameters and Operational Characteristics	
Design Vehicle	Denver Fire Truck
Design Speed	10 mph
Driveway Frequency	Low
Traffic Volumes	Low
Primary Curbside Uses	N/A
Freight Loading/Unloading	Alley and on-site accessed via alley (preferred) and on-street

Key Design Details

Design Type	Design Element
Pedestrian Realm and Curbside Features	Pedestrian Lighting; Street Furniture; Street Trees and Supplemental Plantings; Bicycle and Dockless Mobility Parking; Parklets
Safe and Accessible Features	Access Control and Diverters; Chicanes and Pinch Points; Crosswalks; Curb Extensions; In-Street Yield to Pedestrian Signs; Neighborhood Traffic Circles; No Turn on Red; Pedestrian Signal Phasing; Raised Crossings; Speed Humps and Tables; Uncontrolled Pedestrian Crossings
Green Infrastructure	Bioretention Treatments; Permeable Surfaces; Tree Box Filters & Trenches

Design elements in **bold** are most appropriate for this street type.

	Comfort Zone	Shared Zone
Preferred	--	--
Minimum	12'	16'
Maximum	-	24'

Overlays

Complementing Denver's street types are pedestrian, bicycle, transit, historic parkway, ultra-urban green streets, school zone, and regular closure and festival street networks that must be considered when designing a street. These street designations, or overlays, can be combined with any street type. This section describes how to apply the overlays.

Pedestrian Priority

The City of Denver has identified Pedestrian Priority Areas as areas where land use, built environment, and demographic factors contribute to high levels of walking. Pedestrian Priority Areas are a tool to inform how a street's design and operations should differ from standard design to serve high levels of walking. Pedestrian Priority Areas indicate places where a vibrant streetscape is desired to support economic vitality and sense of place; in these areas, the City will go beyond its policy to treat pedestrians with dignity and to provide them a safe place to walk.

At a minimum within Pedestrian Priority Areas, it may be appropriate to allocate more right-of-way width to the amenity zone, sidewalk zone, and frontage zone and to operate a street so that pedestrian convenience is paramount (e.g., shorter cycle lengths at traffic signals). Other streetscape design features—such as pedestrian-scale street lighting, sidewalk café design, and wayfinding—should be prioritized in Pedestrian Priority Areas.

Bicycle Priority

On streets with designated bikeways, design and operation prioritizes people riding bicycles over other modes. Existing and planned bikeways are shown in the City and County of Denver's latest GIS database.

Bikeway designations are typically selected based on a street's motor vehicle volumes, motor vehicle speeds, width, and number of travel lanes. More guidance on how to select a bicycle facility type as

well as standard design treatments for bikeways can be found in the *Denver Bikeway Design Manual*.

Sometimes, building bikeways requires trade-offs to prioritize safety for people using all modes of transportation. In these instances, it is appropriate to remove travel lanes and/or on-street parking in order to build comfortable and convenient bikeways.

On streets with existing or planned bikeways, the following design criteria and street elements should be prioritized.

- **Protected Intersections:** People biking are most vulnerable at intersections. Where space allows, protected intersections and adequate street buffers should be prioritized.
- **Bicycle Signals:** When space is limited and high turning volumes are anticipated, separate bicycle signal phasing should be considered.
- **Bicycle Parking:** End-of-trip facilities are particularly important to encourage bicycling. Bicycle parking in the furnishing zone or in place of an on-street parking space should be prioritized on most blocks.

Transit Priority

Denver Moves: Transit identifies Transit Capital Investment Corridors where frequent service throughout the day and evening is supported by various levels of capital investments. Those investments ensure rapid, reliable, and comfortable service that make transit a convenient choice.

There are three tiers of Transit Capital Investment Corridors that make up a connected network of high to moderate capacity transit priority routes. High-Capacity Transit Corridors can be rail or full bus rapid transit (BRT) corridors. Medium-Capacity Transit Corridors are those with either a rapid bus or full BRT. Speed and Reliability Corridors benefit from investments like transit-priority signals and transit lanes at key locations.

Where design and operations trade-offs are needed, transit reliability and access will be given priority on Transit Capital Investment Corridors. These trade-offs may include removal of a general-purpose travel lane or on-street parking. The following factors play a role in deciding when and where to make these types of trade-offs.

- **Person Throughput:** Transit-only lanes are justified if the shift from general-purpose travel lanes to transit lanes increases the total number of people that can be carried through a corridor
- **Bus Volume:** Transit-only or BRT lanes are typically more useful when there are higher volumes of buses using the dedicated lanes. Refer to City policy to determine if bus volumes warrant use of dedicated transit lanes.
- **Speed:** The transit-only or BRT lane provides an increase in transit operating speed (for the distance of the lane or in the corridor), improves the overall person speed through the corridor, or improves service reliability.
- **Increased Reliability:** The transit-only or BRT lane dramatically improves reliability and reduces travel time on consistently delayed bus routes and formalizes existing bus operational patterns

On Transit Capital Investment Corridors, the following design criteria and street elements should be prioritized.

- **Wider Outside Lanes:** Outside travel lanes used by buses should be between 11' and 12' wide to accommodate transit vehicles
- **Wider Sidewalk Corridors:** Sidewalk corridors on frequent transit routes should be sufficiently wide to accommodate higher volumes of people walking and rolling, as well as space for transit stop amenities
- **Floating Bus Stops:** Floating bus stops should be prioritized particularly on streets with both transit and bicycle priority, allowing these distinct roadway users ample space to reduce conflict.

- **Transit Signal Priority:** At key intersections, transit signal priority should be considered to increase speed and reliability of transit vehicles

For more information on key design features for transit projects, see *Denver Moves: Transit Appendix D: Transit-Friendly Streets Guide*.

Historic Parkways

Denver has a legacy of 35 unique streets that are formally designated parkways and boulevards. These streets were intended to be grand tree-lined avenues—part street, part park. While many of the parkways are wide, landscaped streets with park-like settings, some lack these characteristics. Existing designated parkways are individually distinct. While setbacks vary among parkways depending on individual design characteristics, they typically are ample with residential parkways having the deepest setbacks taken from the property line.

Designers should approach the retrofit of historic parkways with cross-departmental collaboration and integration of the design recommendations presented in Chapter 2 with the 2005 *Designated Parkway and Boulevards Design Guidelines*. Because Denver's existing historic parkways vary greatly in design and function, opportunities for redesign should respect each parkway's context while supporting the City's goals for traffic safety, multimodal infrastructure, green infrastructure, stormwater management, and travel behavior.

Ultra-Urban Green Streets

Green streets provide stormwater management by incorporating vegetation, soils, permeable surfaces, and other methods to slow and cleanse stormwater runoff from paved surfaces. These methods of water filtration remove much of the pollutants that accumulate on roadways and protect water quality in streams and rivers, improve air quality, benefit public health, reduce energy demands, and create pleasant, inviting spaces.

Denver's *Green Infrastructure Implementation Strategy* identifies high and medium priority streets and project recommendations for each in creating a network of green streets across Denver. This document should be consulted before beginning any project to identify opportunities for cross-department collaboration. Denver's *Ultra-Urban Green Infrastructure Guidelines* provide standard details and in-depth information about how to construct green street elements, such as streetside stormwater planters, green gutters, green alleys, and incorporating street trees. On streets with this designation, priority design elements include;

- **Wide amenity zone:** Most green street elements are focused in wide amenity zones. Features like landscaping and bioretention treatments make these streets pleasant for walking, rolling, and bicycling.
- **Medians:** Landscaped medians and traffic circles can provide both stormwater management and traffic calming effects.

School Zones

Denver is home to numerous elementary, middle, and high schools located on all types of streets. Streets in school zones should be designed to allow students to safely walk, roll, bike, or scoot to and around the school grounds. Speed limits in school zones can be set to a maximum of 10 mph below posted speed limit on the rest of the street unless approved by the City Traffic Engineer. Streets in school zones should be designed with a high degree of safety features for vulnerable users; the table to the right shows engineering treatments that are most appropriate for school zones (source: FHWA PEDSAFE).

In addition to coordinating education, enforcement, and encouragement activities in schools, Denver's Safe Routes to School program works with the community to identify engineering solutions that promote safety around Denver schools. If the practitioner is designing a street within a school zone, they should coordinate with the Denver Department of Transportation and Infrastructure (DOTI) Safe Routes to School staff to ensure that any known issues are being addressed.

Typical Engineering Treatments for School Zones		Performance Objective		
Treatment	Application	Speed Reduction	Visibility	Pedestrian Exposure
ALONG THE ROADWAY				
Roadway/Lane Narrowing (add bike or bus only lanes, sidewalks, medians, parking)	Arterial, Collector	X		X
Speed Humps/Speed Tables	Local	X		
Chicanes	Local	X		
Two-way to One-way conversion (at school drop-off zones)	Local		X	X
Midblock Crossings	Arterial, Collector, Local		X	X
Raised Pedestrian Crossing (Midblock)	Collector, Local	X	X	X
Median Refuge Island	Arterial, Collector	X	X	X
Pedestrian Hybrid Beacon/Rectangular Rapid Flashing Beacon	Arterial, Collector		X	X
AT INTERSECTIONS				
Parking Setbacks (daylighting)	Arterial, Collector, Local		X	
Curb Extensions	Arterial, Collector, Local	X	X	X
High-Visibility Crosswalks (Continental)	Arterial, Collector, Local		X	
Advance Yield/Stop Lines	Arterial, Collector, Local		X	
In-Street Pedestrian Crossing Sign	Collector, Local	X	X	
Raised Intersection	Collector, Local	X	X	X
Smaller Curb Radii	Arterial, Collector, Local	X		
Hardened Centerlines	Arterial, Collector, Local	X		
Mini Traffic Circles	Local	X		
Leading Pedestrian Intervals	Arterial, Collector		X	X
Right Turn on Red Restrictions	Arterial, Collector			X
Pedestrian Scale Lighting	Arterial, Collector, Local		X	

Regular Closure and Festival Streets

Regular Closure Streets are closed to motor vehicle traffic at regularly scheduled times, and Festival Streets are only closed for special events like markets, concerts, or open space programming. While any street can be closed regardless of street type designation, streets designed as Shared Streets are most conducive because of their function in Denver's street network and unique design elements such as distinct pavement materials.

Street closures—regular or infrequent—require permits to be obtained through the Department of Transportation and Infrastructure. Streets designed specifically to be Festival Streets should accommodate vendor booths, food trucks, performance stages, and other festival-related amenities by providing connections to electricity and access for loading and unloading. Motor vehicle access may be restricted using removable or collapsible bollards, or traffic control with temporary barriers and police enforcement can be required in the permit application.

draft