

# Complete Networks

A high-quality multimodal transportation system is made up of several networks, each of which serve a particular transportation mode that moves people from place to place.



Working together as a system, complete networks create reliable and attractive transportation choices for all modes including biking, walking and transit. Denver defines the streets that make up these transportation networks as modal priority streets. Modal priority streets are designed and operated to prioritize the comfort and convenience of a specific transportation mode.

The complete network concept builds upon the complete streets philosophy: all streets should be designed safely for the most vulnerable users, especially those in our community who are the youngest and oldest and those with disabilities. This philosophy also recognizes that people walking are the heart of the transportation system as everyone is a pedestrian at some point during their trip—when we drive, for example, we still need to walk to and from our car.

Complete networks recognizes that not every street can prioritize every mode. The complete network enables some streets to prioritize one or more modes so that collectively, every mode has a complete and interconnected system. The following pages describe where modal priorities will occur within the Denver street network and how a street’s design and operations should differ if it is designated as a modal priority street.

## Pedestrian

The pedestrian network includes all sidewalks and trails in the city. *Blueprint Denver* also identifies Pedestrian Enhanced areas. These are areas where there is a focus on creating vibrant, walkable places with wider, enhanced sidewalks.

## Bicycle

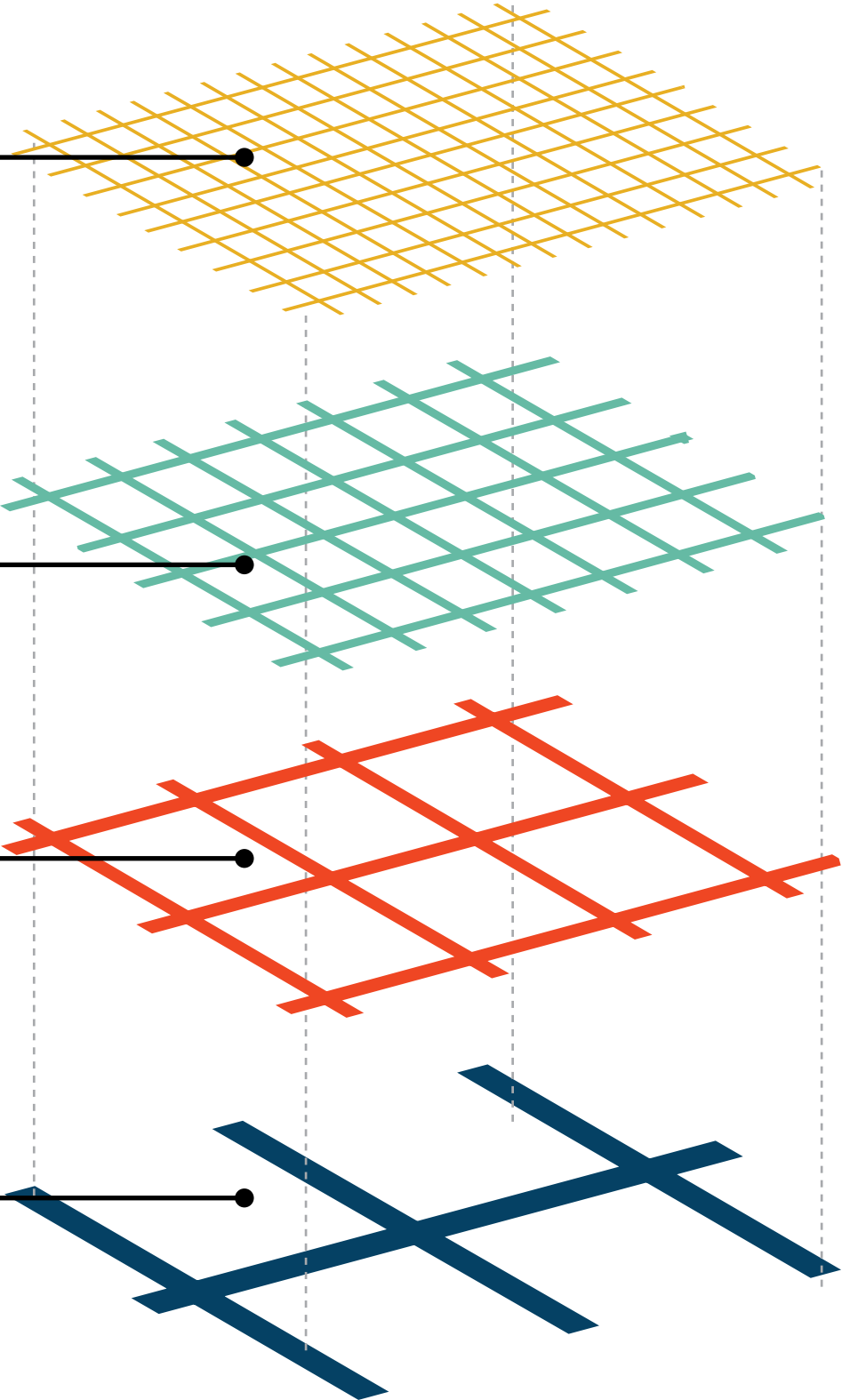
Bicycle priority streets will prioritize comfort and convenience for people biking.

## Transit

Transit priority streets allow transit to be rapid and reliable with special attention to accessible, safe and enhanced transit stops and stations. This Denver network will complement the regional transit system.

## Auto and Goods

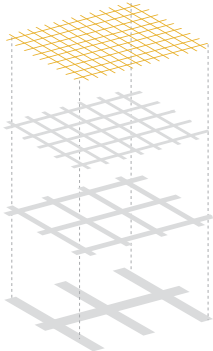
Movement of vehicles remains an integral component of the street network. The movement of goods including freight and deliveries is an integral part of the transportation system. A network for the movement of goods has been established regionally by DRCOG but will be refined for Denver in an update to the Strategic Transportation Plan.





# Pedestrian Enhanced

People walking (including those using mobility devices) are the priority in the design of all streets. Certain streets can be further enhanced to create vibrant public spaces and encourage walking.



Pedestrians—people walking and using mobility devices—must be prioritized on every street in Denver. This includes providing a safe crossing environment, adequate sidewalk space and good walking conditions.

While pedestrians are a priority on every street, certain Denver streets are identified as “Pedestrian Enhanced” areas. These are areas where the surrounding land uses offer additional opportunities to further reinforce the pedestrian environment to create walkable, vibrant public spaces. This includes creating a wider pedestrian realm (the combined tree lawn or amenity zone and sidewalk) and prioritizing people walking over other modes in both the design and operation of the street.

## Intersections and Crossings

Denver has policies for the installation of crosswalks and enhancement devices at uncontrolled locations. Beyond measures that affect the convenience of people walking, there are a variety of safety countermeasures that can be applied to intersections to improve safety and comfort. Pedestrian enhanced areas are not intended to inform safety countermeasures, including uncontrolled pedestrian crossings, as identifying appropriate locations for these measures requires location-specific engineering studies.

The following sections highlight some example features of pedestrian enhanced areas. These pedestrian-friendly amenities are not limited to pedestrian enhanced areas, but are often concentrated here.

### 01 Amenities

Pedestrian enhanced areas provide amenities such as trees, attractive landscaping, café seating, benches, public art, trash/recycling receptacles and bicycle parking.



### 02 Lighting

In pedestrian enhanced areas, pedestrian-scaled lighting to improve the environment for people walking is common.



### 03 Green infrastructure

Street trees, landscaping and water quality facilities improve the pedestrian experience by providing shade, lowering local temperatures and creating a buffer from traffic.



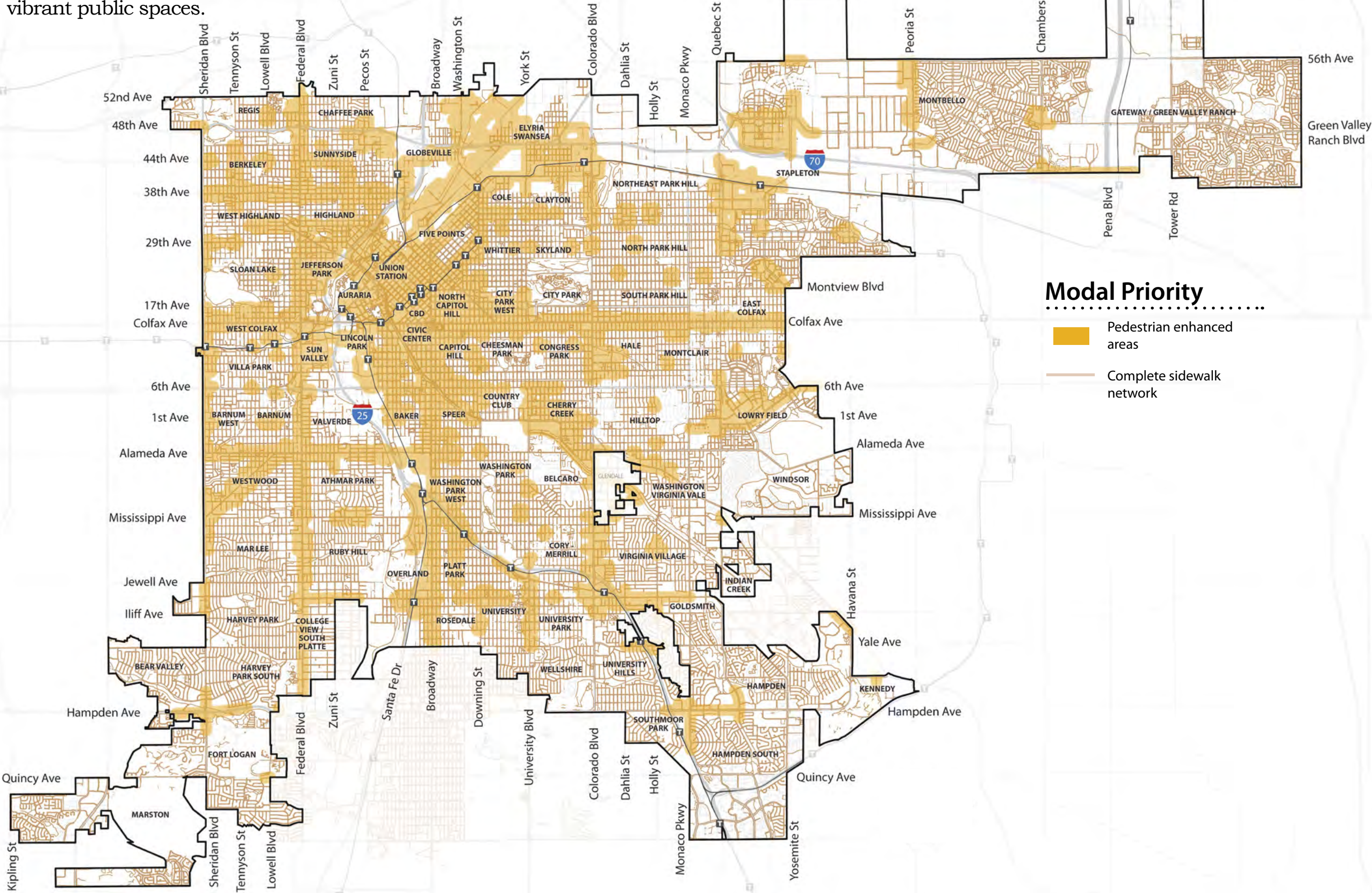
### 04 Wider Sidewalks

In pedestrian enhanced areas, sidewalks are wider than the normal city standard. This allows more people to comfortably walk on the sidewalk. Wider sidewalks also provide room for placemaking features such as pedestrian amenities, lighting and green infrastructure.



# Pedestrian Enhanced

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## Modal Priority

- Pedestrian enhanced areas
- Complete sidewalk network

## Prioritizing Pedestrian Comfort

While people walking are a priority on every street, the maps shows areas where additional opportunities exist to enhance the pedestrian environment. These are known as pedestrian enhanced areas. These areas come from the *Denver Moves: Pedestrians & Trails* plan. These streets align with the centers and corridors identified in the future places map.

Pedestrian enhanced areas will be further defined on this map and updated as the result of the completion of small area plans.

## Safety

Consistent with Denver's *Vision Zero Action Plan*, which aims to eliminate traffic deaths, improvements are made to intersections and roadways to increase safety. These improvements sometimes have trade-offs to other modes in order to prioritize safety.

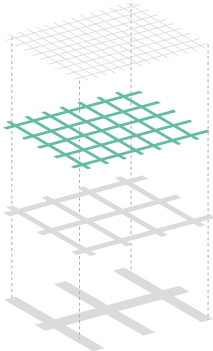
## Making Trade-offs

To build wider sidewalks, improve crossings for people walking, or enhance the pedestrian environment, there will occasionally be trade-offs, especially for vehicular mobility. These might include reduced vehicle speeds, restricting turning movements or additional signals to improve safety. Widening sidewalks or improving intersections sometimes will result in a reduction of available on-street parking.



# Bicycle Priority

Bicycle priority streets prioritize comfort and convenience for people biking.



On bicycle priority streets, design and operation prioritizes people riding bicycles over other modes.

These bicycle priority streets are the high and medium ease-of-use bicycle facilities identified in the *Denver Moves: Bicycles* plan. Ease-of-use refers to the level of comfort experienced by the user of the bikeway. This includes bikeways where people riding bikes are separated from moving traffic by a physical barrier and busy intersections are designed to easily be crossed on a bike. These facilities encourage biking by increasing the comfortably for those who may not otherwise choose to ride a bicycle on a city street. Low ease-of-use facilities such as a shared roadway are not considered bicycle priority streets. Bikeway designations in Denver are typically selected based on a street's width, number of travel lanes, vehicle volume and speed.

## Intersections

Maintaining the comfort of a bikeway along a street requires appropriate intersection treatments. These treatments, which occur at cross streets and driveways, can include features such as bike boxes, two-stage turn queue boxes, traffic signals, or exclusive signal phase. These treatments The selection of specific intersection treatments requires engineering study.

The following sections highlight some examples of how bicycles may be prioritized on bicycle priority streets:

### 01 Protected Bike Lane

A protected bike lane makes biking more comfortable and safe by providing a buffer between moving traffic and people on bikes. Sometimes physical barriers are used such as curbs, bollards or parked cars.



### 02 Intersection Treatments

Green pavement markings can increase the ease and comfort of people riding bicycles by showing the safest path through the intersection. These markings also help increase drivers' awareness of people on bikes.



### 03 Signage

Strategically placed signage helps people on bicycles navigate to popular destinations.



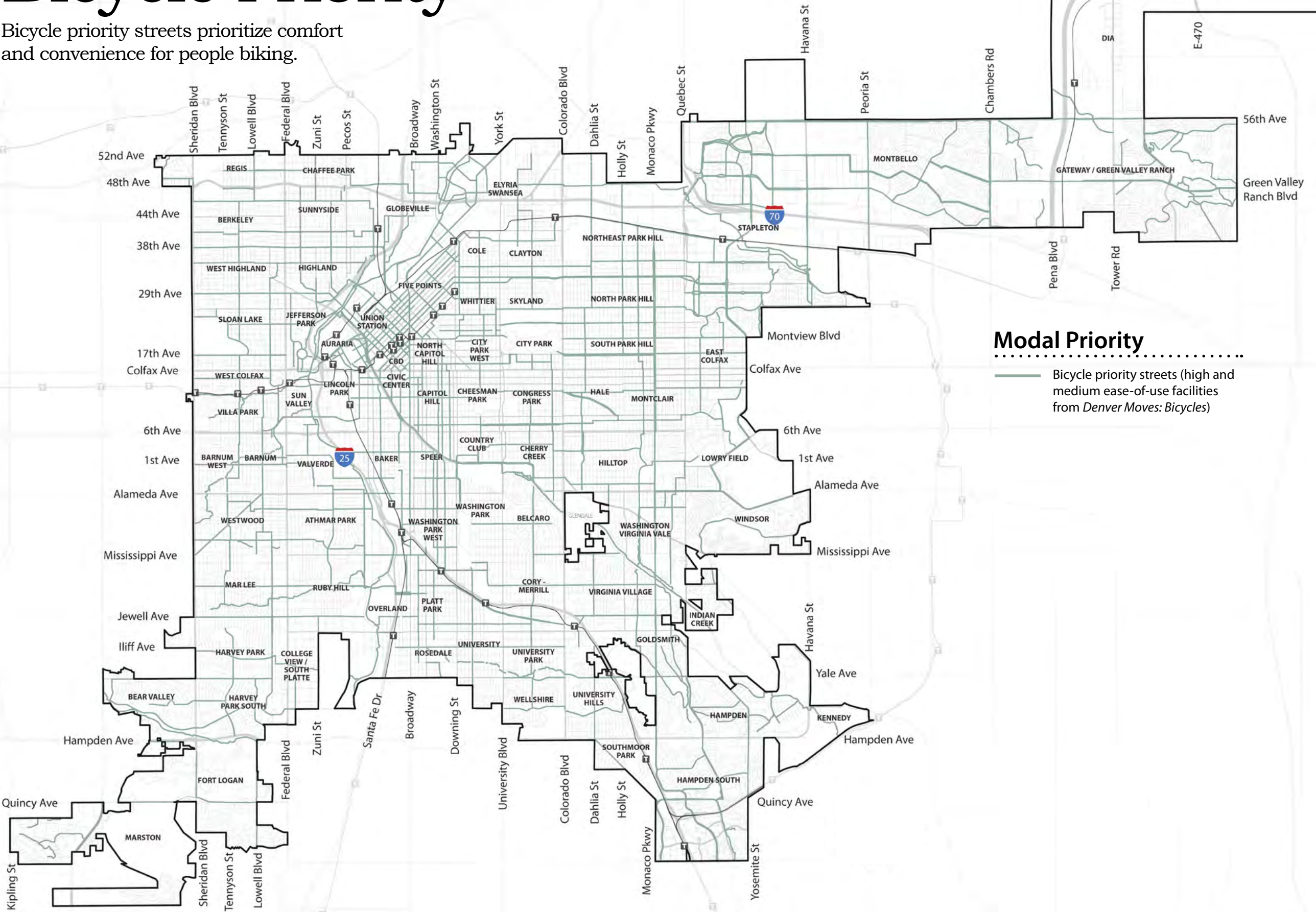
### 04 Bike Signals/ Detection

Bike signals are special traffic lights that give bicyclists time to move across the intersection.



# Bicycle Priority

Bicycle priority streets prioritize comfort and convenience for people biking.



The bicycle priority streets shown on this map will create a complete network for people riding bicycles.

The streets shown as a part of this network contain the high and medium-ease-of-use facilities that have been identified by the *Denver Moves: Bicycles* plan.

Some of the streets indicated on this map have not yet been improved for bicycles, but have been identified for bike facility improvements in the future. This maps shows what the complete network will look like when those facilities are built-out.

### Safety

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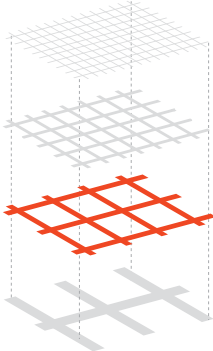
### Making Trade-offs

To build a bikeway that makes riding a bike feel safe, comfortable and convenient, there will occasionally be trade-offs to vehicular mobility and on-street parking. These trade-offs may result in drivers more frequently having to stop at traffic signals, a slight increase of travel time for driving on certain corridors or a reduction of the availability of on-street parking.



# Transit Priority

Implementing the transit priority streets will result in a complete high-quality transit network for Denver that complements the existing regional rail system.



Transit can move the most people rapidly through a corridor. Transit priority streets are those where transit will be prioritized over other modes when making decisions about how to design or operate the right-of-way. By prioritizing the design or operation of a particular street to benefit transit, it will help transit to reach its potential to transport more people rapidly and reliably.

*Blueprint Denver's* growth strategy (see Chapter 2) is founded on rapid, reliable and high-quality transit connecting Denver's centers and corridors to people to jobs, services and housing. Denver's transit plan, *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 capital investments ensure rapid, reliable and comfortable service that make transit a convenient choice. Transit capital investments take many forms, but they are direct expenditures by the city (and its partners) on corridors that are or aspire to be mixed-use, transit-supportive places and connect neighborhoods and community destinations.

In *Blueprint Denver*, transit priority streets are the medium- and high-capacity transit capital investment corridors from *Denver Moves: Transit*. High-capacity transit may include rail or bus rapid transit. Medium-capacity corridors are those with either a rapid bus or full BRT.

The following sections show how the design and operation of transit priority streets will prioritize transit.

## 01 Operational

Operational improvements, such as transit signal priority to prioritize transit at traffic signals, reduces travel time and improves reliability.



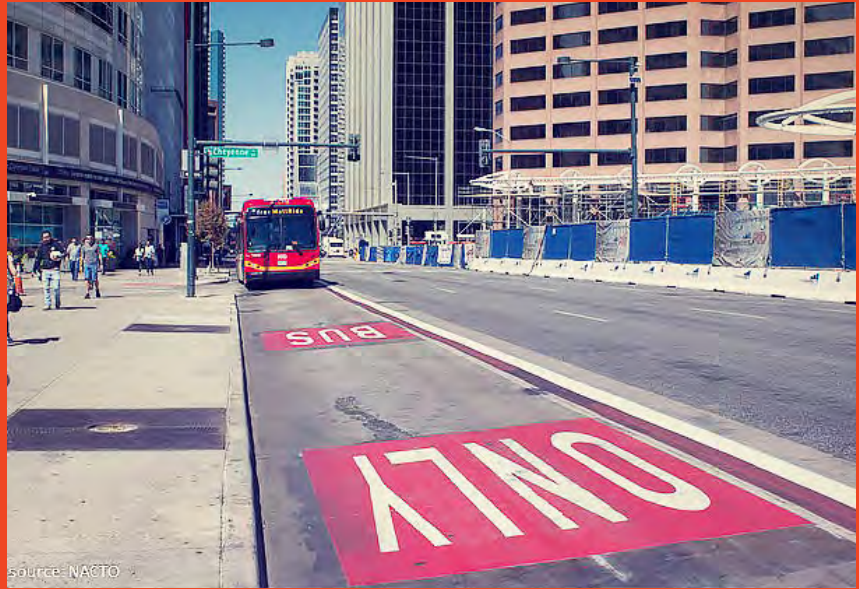
## 02 Higher capacity vehicles

Vehicles such as rail or rapid bus have the ability to increase the person-throughput of a corridor.



## 03 Dedicated transit lanes or grade separation

Transit runs in exclusive lanes or in dedicated guide-ways (such as rail). This helps transit to move the most amount of people reliably and efficiently.



## 04 Enhanced stops/ stations

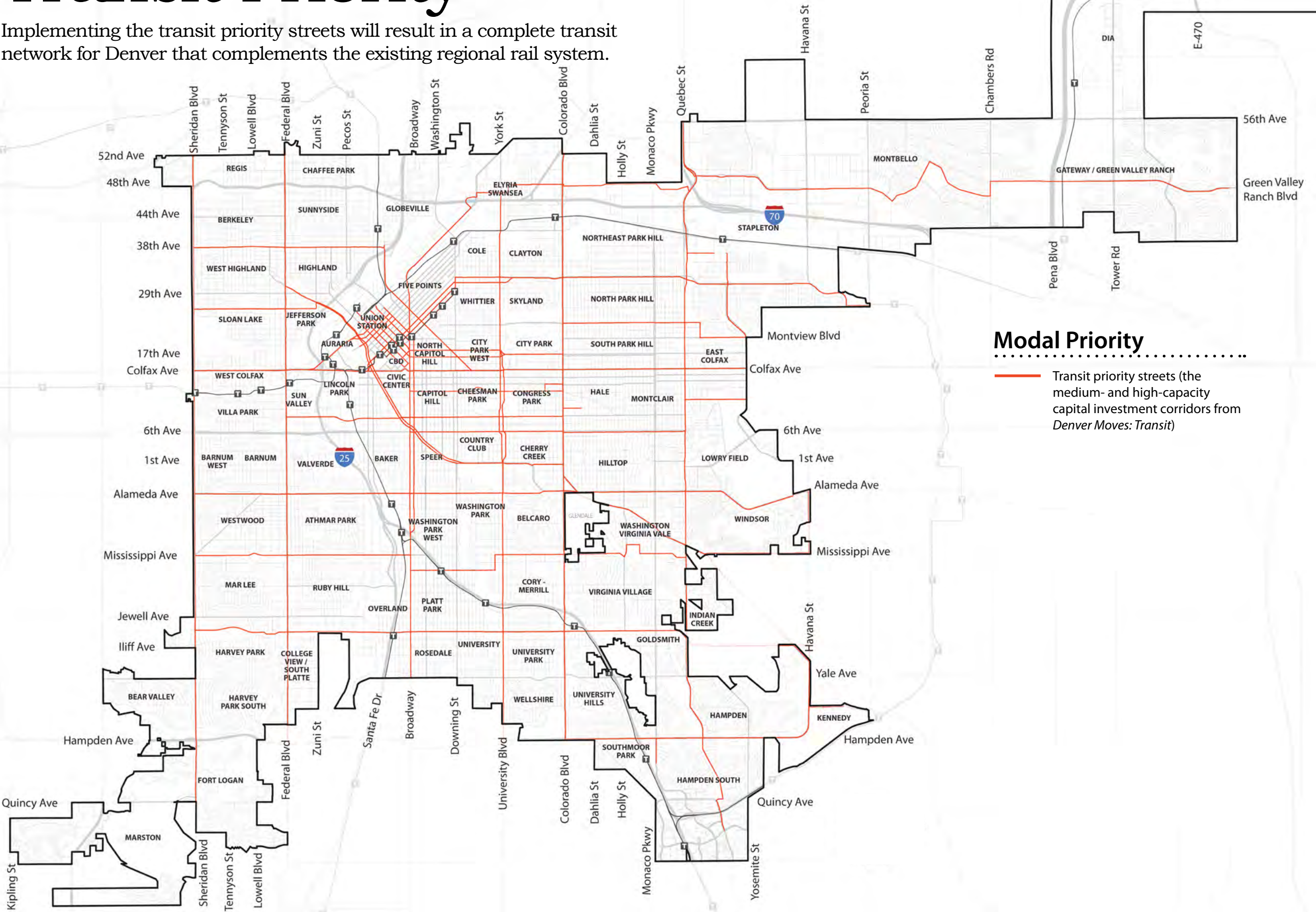
Stops with shelters that protect riders from the elements, real-time transit information and off-board ticket stations, are some of the amenities that will be expected on transit priority streets.





# Transit Priority

Implementing the transit priority streets will result in a complete transit network for Denver that complements the existing regional rail system.



The streets shown in this map create a complete network for transit by prioritizing transit as a mode. This network, which matches the medium- and high-capacity capital investment corridors in *Denver Moves: Transit*, complements the existing regional rail system in Denver. It is also complemented by a larger high frequency transit network within Denver, which is shown and described in *Denver Moves: Transit*.

## Making Trade-offs

To move more people on city streets, higher-capacity modes will be prioritized to provide reliable, rapid and high-quality service. Where design and operations trade-offs are needed, transit reliability and access will take precedence on transit priority streets. These trade-offs may include removal of a travel lane or on-street parking. This section describes some of the factors that will be considered when making a trade-off in order to prioritize transit on a particular corridor.

## 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 business access transit lanes are justified by a combined flow of 30-40 in-service transit vehicles or more per hour during peak operations—typically representing a minimum of one bus per traffic signal cycle. This level of operation ensures a transit lane never looks “empty” and virtually guarantees the lane is moving more people during an hour than a general-purpose traffic lane.

## Speed

The transit-only lane provides an increase in transit operating speed (for distance of the lane or in the overall corridor), improves the overall person speed through the corridor or improves service reliability.

## Increased Reliability

The transit-only or business access transit lane dramatically improves reliability and reduces travel time for consistently delayed bus services.