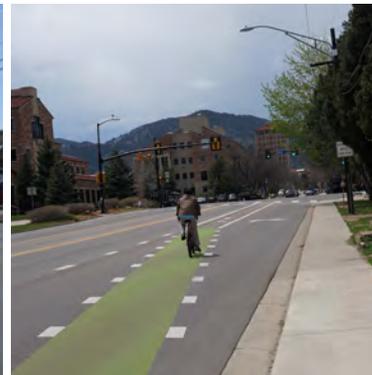
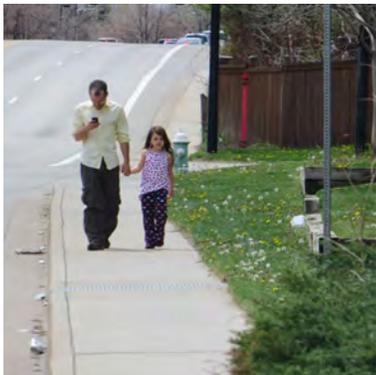




# CITY OF BOULDER Sustainable Streets + Centers



November 2013

**PHASE I FINAL**

**N NELSON**  
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# EXECUTIVE SUMMARY

## PROJECT PURPOSE

The purpose of the Sustainable Streets and Centers (SS&C) project is to develop tools to help shape a more sustainable urban form and improve the quality of streets and centers by better integrating transportation and land use in context-specific settings. It is envisioned as a complementary implementation tool to the Community Design section of the Boulder Valley Comprehensive Plan (BVCP), and the Complete Streets and Transportation Demand Management (TDM) policies of the Transportation Master Plan (TMP). SS&C will provide a more detailed design guidance to advance integrated land use and transportation as well as a high quality of urban form, particularly in parts of the city that do not have adopted area plans, design guidelines, or other forms of context-specific guidance.

This document details Phase I of the project, which focuses on:

1. Illustrative and narrative descriptions of strengths and weaknesses of existing urban design, land use, and transportation interface conditions along 3 corridors.
2. Relevant best practice examples of how other communities have addressed similar conditions through various design policies, standards and regulatory mechanisms.

The corridors selected for documentation and analysis are corridors that do not currently meet the City's objectives for walkability, built form and transportation networks, and have low single occupancy vehicle usage. The corridors include segments of Arapahoe Avenue, Colorado Avenue, and 30<sup>th</sup> Street, and are illustrated in Figure 1 below.



Three corridors were selected as prototypes for analysis: (1) East Arapahoe Avenue from 28th Street to 63rd Street, (2) 30th Street between Baseline Road and Arapahoe Avenue, and (3) Colorado Avenue between Foothills Parkway and Folsom Street. The corridors selected for documentation and analysis are corridors that do not currently meet the City's objectives for walkability, built form and transportation networks, and have low single occupancy vehicle usage.

Image from Nelson\Nygaard

## METHODOLOGY

Three corridors were selected as prototypes for analysis: (1) East Arapahoe Avenue from 28<sup>th</sup> Street to 63<sup>rd</sup> Street, (2) 30<sup>th</sup> Street between Baseline Road and Arapahoe Avenue, and (3) Colorado Avenue between Foothills Parkway and Folsom Street. These three corridors were selected for analysis because of the various land use and transportation interface challenges they convey that are typical of most areas in the eastern parts of Boulder. While Boulder generally west of Folsom Street exemplifies a well connected and compact land use development pattern with a fine-grain network of bike, pedestrian, and transit infrastructure, areas east of Folsom lack connectivity and provide opportunity for redevelopment and some new development. Along these corridors, the City of Boulder identified 12 focus areas for detailed analysis with distinct land use and transportation characteristics. Two of the focus areas were further subdivided to respect their disparate characteristics.

The 14 focus areas are presented in Figure 1 below.

As the city grows and redevelopment occurs along these corridors, it will be important to identify new land use patterns that support a connected street network and a mix of uses. By identifying the opportunities and challenges in these areas from an urban design, land use, and transportation perspective, the City of Boulder can work to connect east Boulder to the rest of the city. Changes outlined in this report can serve as examples of what the built environment could look like on other similar corridors.

To highlight the changes needed along these corridors, a section profile was developed for each of the 14 focus areas. These provide a description of the site, opportunities and challenges from a land use and transportation perspective, and detailed data on site design, parking, bicycle and pedestrian facilities, etc. (see image on next page).



**Existing** Pedestrians cross without a crosswalk between Scott Carpenter Park and the Research Lab at CU East Campus.

**Opportunities** Provide more mid block crossings on long stretches of road with no intersections (there is no crossing for over a half-mile from Arapahoe Avenue to Colorado Avenue).

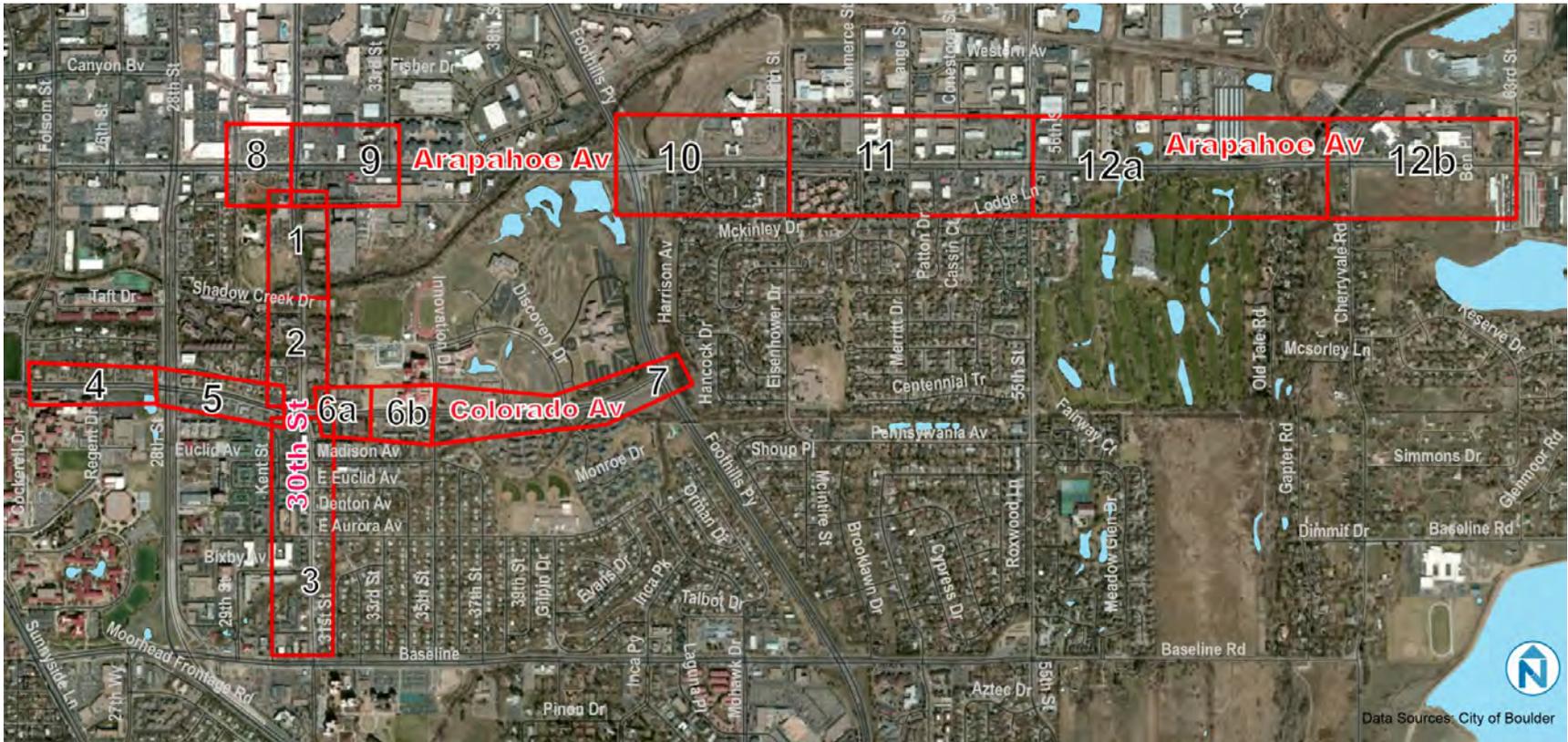
**Challenges** Resistance to addition of signals.

Each section profile provides an overview of transportation and land use opportunities and challenges for each focus area. For example, along 30<sup>th</sup> Street between Arapahoe Avenue and Boulder Creek Path, lack of street connectivity and safe crossings forces pedestrians to cross mid-block without a cross walk.

Image from Nelson\Nygaard

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Figure 1 Focus Areas for Detailed Analysis



## SUMMARY OF CORRIDOR ASSESSMENT

The corridor assessment provided a number of interesting conclusions from a land use, transportation, and urban form standpoint. While bike, pedestrian, and transit facilities were documented along most corridor segments, a general lack of safe crossings and medians were documented to help link parcels and streets. From a parcel perspective, ample intra-site pedestrian connectivity and paths from the parcel to the street was documented, however parcels are often set back from the street and/or blocked or cut off from the street with walls or fences. There is significant opportunity to mitigate these issues by implementing marked crossings and by promoting street-fronting development. General strengths, weaknesses, and opportunities are documented in Figure 2 through Figure 4 below.

Figure 2 Summary of Strengths



### Strengths

- Bike/pedestrian facilities on most streets
- Good transit facilities near commercial centers
- Well-lit intersections
- Ample greenspace on most streets
- Intra-site pedestrian connectivity
- Paths from parcel to street in commercial areas

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Figure 3 Summary of Weaknesses



### Weaknesses

- Lack of safe crossings
- Less than 4 foot medians
- Sidewalks less than 5 feet adjacent to 4 lanes of traffic
- Poor mid-block/path lighting
- Lack of connectivity between parcels and streets
- Land uses cut off from corners
- Buildings set back more than 100' from curb
- Walls and fences along the street and between parcels

Figure 4 Summary of Opportunities



### Opportunities

- Increase crossing opportunities through RRFBs, crossing islands, or full signals
- Transit access roads to local streets
- Continue street fronting development
- Promote courtyard development

## POLICY BEST PRACTICES

A best practice review was conducted to identify how other communities create walkable and sustainable streets. Policies include form-based codes, large retail establishment design standards, functional street classification standards, parking regulation and design standards, transit street guidelines and overlay districts, block standards, stormwater mitigation, development incentives for public amenities, street tree policies, and funding and incentive programs for redevelopment areas.

The summary of best practices resulted in more than 25 applicable policies for the City of Boulder to consider implementing to support human-scale development and multimodal connectivity in Boulder. Figure 5 provides a high-level summary of these potential policies. While the figure below provides examples of policies from other communities, some of which may or may not be applicable to Boulder, it is important to note that Boulder also has many similar codes and policies aimed at addressing similar land use issues. However, analysis of Boulder’s codes was beyond the scope of this phase of the project.

Figure 5 Summary of Best Practice Policies

Category	Topic	Summary of Potential Policies
A. Form-Based Code	Form-Based Code	Require design standards for all district streets including property line, setback, driveway, median, pedestrian lighting, and minimum sidewalk requirements.
B. Large Retail Establishment Design Standards	Façade Design Standards	Develop requirements for building facades, including windows, entrances, and awnings.
	Building Entrances	Requires a minimum number of building entrances and that the location of the entrances be located on the side with the highest pedestrian activity.
	Active Uses along Streets	Require a maximum setback.
	Internal Accessways	Require sidewalks on internal streets and minimize square footage of parking.
C. Functional Classification	City Street Classification Systems	Provide design standards for street classifications including dimensions for sidewalks and curb extensions and number of trees and sidewalk planters.
	City Adopted Multimodal Performance Measures	Evaluate project impacts to all users; e.g. used to justify a road diet.
D. Parking	Reduced Parking Requirements for High Frequency Transit	Reduce residential parking requirements by a certain percentage within a certain distance of high frequency transit.
	Eliminated Parking Minimums and Established Maximums	Establish parking maximums.

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Category	Topic	Summary of Potential Policies
	Demand-Based Parking Requirements	Estimate parking demand based on parking and vehicle ownership rates of similar developments.
	Incentives for Structured Parking	Provide incentives for structured parking with active ground floor uses.
	Parking Location Requirements	Locate parking behind building or to the side with screen; require landscaping or low walls to hide parking.
	Shared Parking	Allow developers to provide parking off-site up to a certain distance.
	Parking Lot Design	Require a certain number of trees per parking space.
E. Transit	Transit Stops Integrated with New Development	Encourage developers to build transit stations in new development.
	Developer Transit Requirements	Require developer to pay Traffic Mitigation Payment to go toward transit.
	TOD Overlay Zone Districts	Require entrances to face street, parking behind buildings, and central feature/gather spaces.
	Transit Street Standards	Develop guidelines for transit stops, bus bulbs, boarding islands by transit typ.
F. Conflicting/Contradictory Boulder Conditions	Shared Use Paths	Develop standards for shared use paths included separation of lanes and intersection treatments for trail users.
	Sight Triangles	Requires corner curb radii to slow turning vehicles and reduce crossing distance.
G. Block Standards	Maximum Block Size and Intersection Spacing	Set maximum block size based on type (low density mixed-use, neighborhood commercial, multifamily, etc.).
H. Stormwater Mitigation	Stormwater Mitigation	Require development of any size, whether new construction or redevelopment, to meet requirements for stormwater infiltration and discharge (either by on-site infiltration or off-site flow), flow control, and pollution reduction.
I. Development Incentives for Public Amenities	Density Bonus for Public Space	Provide optional density bonus and increased height in certain urban center districts in exchange for meeting specific planned unit development criteria.
	Public Space Requirement	Require development in specific zones to dedicate a minimum percentage of the site to on-site public use space and a minimum percentage to off-site parkland or public right-of-way.
J. Street Tree Policies	Requirements for Street Trees in New Developments	Develop requirements for tree plantings in new developments.
	Requirements for Maintenance and Replacement of Street Trees	Require property owners next to street trees to maintain the trees using specific arboricultural methods.

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Category	Topic	Summary of Potential Policies
K. Funding/ Incentives	Developer Incentives	Provides assistance for permanent building improvements, encouragement of residential development, and design work for new structures within the East University Avenue Tax Increment Finance (TIF) District.
	Developer Incentives	SANDAG established a \$25 million Smart Growth Incentive Program for infrastructure providers, which will act as the initial incentive for communities willing to adopt land use changes that support the Regional Comprehensive Plan goals.
	Value Capture	The TSDC was the first multimodal fee, allocating project costs among motorized vehicles, transit, and nonmotorized (bicycle and pedestrian trips). The TSDC is calculated by the change in vehicle trips from the development.
	Value Capture	The City of San Francisco implemented a citywide Transit Impact Development Fee (TIDF) on most non-residential new development projects to offset the impacts on the transit system.

## **STREET TYPOLOGY FRAMEWORK & OVERLAY**

In Phase II, the team will create a city-wide street typology system based upon the corridors observed in Phase I. A draft street typology system was created to serve as the framework for more detailed analysis in Phase II (see Figure 6). The purpose of street typologies is to guide design decisions by taking into account both a street's function from a transportation perspective as well as its land use context. The typology includes metrics and standards that create the ideal street by type. The goal for the community is to bridge the gap between existing conditions and typology goals.

Overlays, or additional levels of design focus, will also be applied to enhance each street type. For example, historic district or transit district overlays may be applied. A list of street type overlays is provided in Figure 7.

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Figure 6 Draft Street Typology Framework

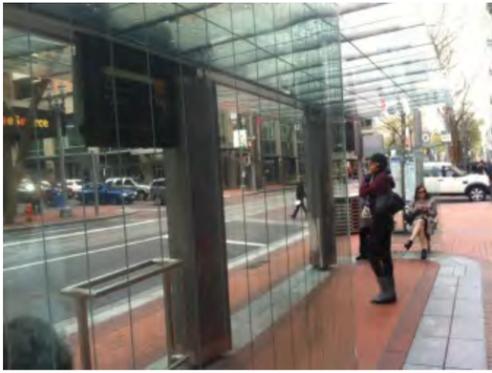
		Land Use				
		Commercial	Residential	Industrial	Institutional	Mixed-Use
Street Type	Multiway Boulevard			N/A		
	Boulevard					
	Avenue			N/A		

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		Land Use				
		Commercial	Residential	Industrial	Institutional	Mixed-Use
Street Type	General Street			N/A		
	Alley				N/A	

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Figure 7 Street Type Overlay

	Commercial	Residential	Industrial	Institutional	Mixed-Use
Transit Street					
Center Type	Downtown Center	Regional Center	Industrial Center	Institutional Center	Neighborhood/Mixed-Use Center
			N/A		
					

## APPLICATION OF STREET TYPOLOGY & BEST PRACTICE POLICIES

Using the street typology framework and best practices research, potential changes to each site were developed to show how the street typologies could be applied at the site level. It is important to note that these recommendations are not site specific. Rather, they represent how the existing land use and transportation opportunities could be addressed by applying policies identified in the best practice summary.

**STREET TYPOLOGY**

**Residential Avenue**

As a Residential Avenue, this prototype's sidewalks and bicycle facilities are narrower than standard, spacing between crossings is a half-mile, there are numerous driveways, and parcels are not connected.

**Policies Applied**

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On a Residential Avenue, these might include: <ul style="list-style-type: none"> <li>6' sidewalks (minimum)</li> <li>5' buffer</li> <li>6' bike lanes</li> <li>Trees every 20-25'</li> <li>Driveway width &lt; 12'; minimize driveways</li> <li>Lighting every 25'</li> <li>Target speed 25 mph</li> <li>Crossings every 200-400'</li> <li>Parking optional</li> </ul>
C2	City Adopted Multi-modal Performance Measures	Woven into development process to assess impacts to all modes; used to justify actions.
B4	Internal Accessways	Require consideration of alleys for residential access. Require development to provide a pedestrian or full motorized connection to at least two of its neighboring parcels.
G1	Maximum Block Size and Intersection Spacing	Limit block size to 5 acres and include pedestrian passageways every 250-500 feet.
I2	Public Space Requirement	In areas without access to public space (map green space within 5 and 10-minute walk from development), require a certain percent to be dedicated to public space.

**Before**

A cross-section diagram of a 114-foot wide Residential Avenue. From left to right: a 25-foot sidewalk with a tree, a 4.5-foot bike lane, a 46-foot roadway with a striped median (not continuous), a 9-foot shoulder, and a 25-foot sidewalk with a house. The total width is 114 feet.

**After**

A cross-section diagram of a 114-foot wide Residential Avenue after improvements. From left to right: a 25-foot sidewalk with a tree, a 15-foot shoulder, a 33-foot roadway with a TWLTL (Two-Way Left Turn Lane), a 15-foot shoulder, and a 25-foot sidewalk with a house. The total width is 114 feet.

Each section profile was assigned a street typology and includes a list of recommended policies based on the policies identified in the Best Practice section.

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## SUSTAINABLE STREETS + CENTERS

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**1** To achieve sidewalk and bike lane widths matching the street typology, narrow the four-lane road to three lanes, widen sidewalk, add a green buffer, and widen bike lanes. When possible, add crossing islands at public streets or desire lines (policy C1, C2).

**2** Reduce driveways (and thus vehicle-bike-pedestrian conflicts) by providing access to homes with alleys. Gates or other opening allow for intra-block circulation (policy B4).



*This alley in Portland, OR provides access to homes from the back of lots, allowing an uninterrupted curb line along the parallel main street.*

**3** A sidewalk or path adjacent to parking can connect parcels to each other and to adjacent streets (policy G1).

**4** In a high-density residential area not proximate to a park, provide green space in new developments for residents and the public (policy I2).



In addition to the recommended policies, a graphic is provided to show how the policies could be applied at the street level.

## CONCLUSION

The documentation and analysis of the 14 sites yielded a number of key findings that should be addressed during Phase II of the process:

**Connectivity.** Arterials may provide through access for cars, but because there are often no parallel through facilities, these arterials must also function as through access for walking and cycling. Thus arterials require robust walking and bicycling infrastructure. In areas that have superblock development patterns – a localized small street network boxed in by arterials – connecting parcels and intra-block streets allows people to circulate without being forced onto the arterials. A 1,500 block feels long and uninviting to a pedestrian; blocks of 200-500 feet impart a more urban feeling.

**Crossings.** To walk or cycle, a person needs to cross streets. While resistance to additional signals is often high, it is also unsustainable to provide street crossings every half-mile. Long signal spacing leads to platooning and drivers speeding between signals, while shorter signal spacing can reduce congestion by progressing traffic at a steady rate. Similar to the city's standard for raised crossings at slip lanes, crossing spacing standards can be developed and met through a variety of means – RRFBs, refuge islands, overhead flashing signage, underpasses, or full signals.

**Match facilities to demand.** Many communities have found that arterial roadways built in the 1960s and 1970s have capacity that materializes for a few hours of the day, or not at all. At the same time, streets with high transit activity, for example, relegate pedestrians to 4-foot sidewalks. Streets can change, and can be modified over time to meet actual demand.

**Scale facilities appropriately.** Walking on a 4' sidewalk on a two-lane, 20 mph residential street is pleasant; walking on the same facility on a four-lane, 35 mph roadway is not. The wider the vehicle space and the faster the vehicle travel, the more separation is needed between modes. Generous sidewalk widths and paths help, but on Boulder's larger streets grass or planted buffers are also needed to mitigate the impacts of vehicles on pedestrians and cyclists.

**Parking management.** Parking is currently a necessary feature of most developments, but its impact can be softened and reduced over time. Shared parking supplies in the center of a block, breaking up parking with trees, and reducing parking requirements can improve a street's walkability. Parking lots are major detractors to an interesting, walkable environment.

**Use street design to bring about city goals.** In addition, the sites have the ability to bring forth other related city initiatives such as affordable housing, access management, and transit priority corridors.



**SUSTAINABLE STREETS + CENTERS**

City of Boulder

**PART 1**

---

# 1 INTRODUCTION

## PROJECT PURPOSE

The Sustainable Streets and Centers project assesses the existing street network and site design along key corridors. Using these corridors as prototypical examples, the project recommends important policies and strategies that can be implemented throughout the city to create a higher-quality built environment that is more attractive for people to walk, bike, and take transit within and between neighborhoods.

Ultimately, this project will guide future growth, redevelopment, and in-fill development to ensure the city's built form and transportation network are aligned and support the city's overarching goals of reducing the number of people who drive alone and support the City's Sustainability Framework.

## METHODOLOGY

Three corridors were selected as prototypes for analysis: East Arapahoe Avenue from 28<sup>th</sup> Street to 63<sup>rd</sup> Street, 30<sup>th</sup> Street between Baseline Road and Arapahoe Avenue, and Colorado Avenue between Foothills Parkway and Folsom Street. Along these corridors, the City of Boulder identified 12 focus areas with distinct land use and transportation characteristics that were selected for detailed analysis. Two of the focus areas were further subdivided to respect their disparate characteristics.

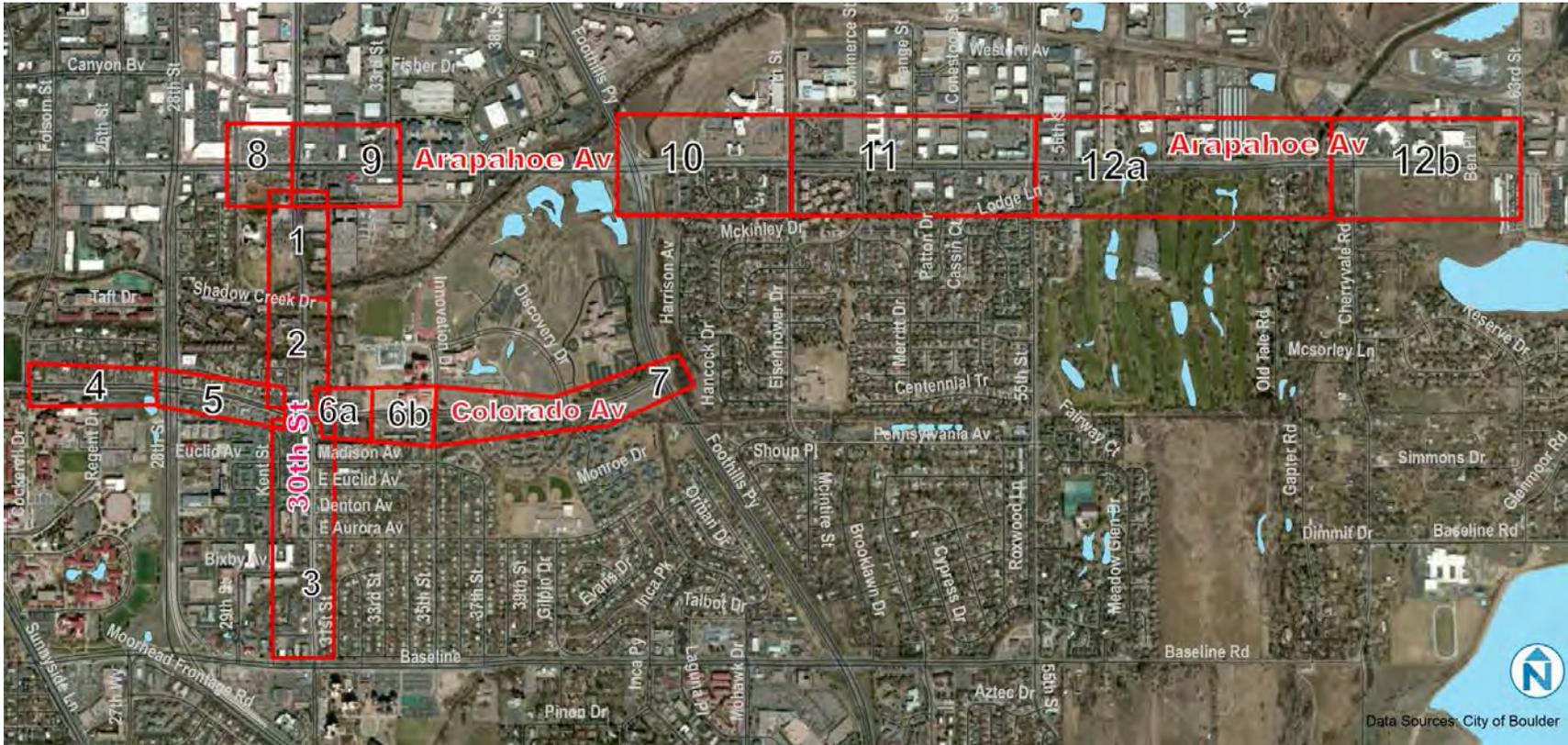
The 14 focus areas are presented in Figure 6 below.

## Why These Corridors?

These three corridors were selected because they have been identified by the City of Boulder as opportunity areas for growth. While west Boulder is largely built out, there is opportunity for new development in east Boulder. As the city grows, it will be important to identify new land use patterns that support a connected street network and a mix of uses. Currently, these three corridors are characterized by six or eight-lane streets, long blocks, and active uses set back behind parking lots, making it less attractive for people to bike, walk, and take transit. By identifying the opportunities and challenges in these areas from an urban design, land use, and transportation perspective, the City of Boulder can work to connect east Boulder to the rest of the city. Changes outlined in this report can serve as examples of what the built environment could look like on other similar corridors.

SUSTAINABLE STREETS + CENTERS  
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Figure 8 Focus Areas for Detailed Analysis



## **Project Process**

To understand the locations at the street level, four days of fieldwork were conducted to assess land use and transportation conditions. To begin, the team walked each of the 14 identified focus areas. Based on observations, a representative site or sites at the parcel level were selected for detailed data collection in each focus area. A detailed data collection sheet was developed documenting:

- Land use type
- Current zoning
- General Building form – number of stories
- Site design – building setback, placement of parking, inclusion of landscaping
- Street characteristics – street width, number of lanes, signal spacing, and presence of a median
- Street connectivity – block spacing
- Parking – presence of on- and off-street parking
- Walking network – sidewalk width and condition; presence of a multi-use path
- Transit system – presence of a bus stop
- Biking network – presence and width of a bike path or trail

Extensive photos and videos were taken throughout the corridors to document the urban form, land use, and transportation conditions.

## **Data Analysis**

Based on the fieldwork, a profile was developed for each focus area. The profile includes an overview of the site, land use and transportation opportunities and challenges, and a cross-section. The profiles were used to identify overall strengths and weaknesses on the corridors. A review of best practice policies shaping land use and

transportation was conducted to understand how other communities bring forth good urban design. Based upon the opportunities identified for each site, 3-5 policies from the best practice review have been applied to the 14 sites. To frame policy selection, a draft street typology characterization was created. Part II of this report consists of the site-by-site existing conditions and potential changes sections.

## 2 RELEVANT STUDIES

A number of plans and policies guide land use, urban design, and transportation decisions in the Boulder community. This section provides an overview of these documents with a particular focus on plans and policies that would affect the corridors studied during this process.

Projects that interface with this effort include:

- [East Campus Vision, 2011](#). The East Campus borders Arapahoe Avenue and Colorado Avenue, two study area corridors.
- [Boulder Valley Comprehensive Plan, 2010](#). This plan was most recently updated in 2010 and includes land use policies and land use and area maps.
- [Boulder Valley Regional Center Transportation Connections Plan, 2002](#). This addresses the multi-modal transportation system needs for moving to and through the area located between Folsom and the approximate 35th Street alignment, and from Boulder Creek to the north side of Pearl Street. For the Sustainable Streets and Centers project, this plan pertains particularly to the Arapahoe Avenue section between 30th and 33rd Street and the 30th Street section between Arapahoe Avenue and Boulder Creek Path.
- [Downtown Urban Design Guidelines, 2002](#). This guide applies urban design standards to the downtown area.

In addition, the city is currently updating its Transportation Master Plan, and is also undertaking a study of parking and access management. The TMP's goal is to integrate all modes, which is directly relevant to the policies that will emerge from Sustainable Streets and Centers. The Boulder Valley Regional Centers Design Guidelines is another effort that will affect and be affected by this project.

Boulder's communities and planning staff undertake area plans to define street and urban form guidelines in areas outside of downtown. These area plans can be found [here](#). One plan of especial importance is the Transit Village Area Plan.

### TRANSIT VILLAGE AREA PLAN, 2007

The Transit Village Area Plan was developed in 2007 to further define the city's vision for the 160-acre Transit Village area located in the geographic center of the city. The Transit Village – also known as Boulder Junction – will undergo tremendous change in the next decades. First, the Regional Transportation District (RTD) will develop a new transit facility in the area which will be the end of the bus rapid transit line (BRT) between Boulder and Denver. Secondly, a new neighborhood will be developed on land owned by the city near the Pearl Parkway and 30<sup>th</sup> Street intersection.

The Transit Village Area Plan includes:

- Land use plan with land use prototypes guiding development
- Urban design guidelines including guidelines for transit stops, open space, building placement and design, parking structures, and mixed-use buildings
- Transportation connections guidelines to ensure street connectivity and multimodal access
- Transportation demand management guidelines that include parking

In order to implement the Sustainable Streets and Centers recommendations, further analysis of existing codes and guidelines will be needed to identify roadblocks, challenges, contradictions, and constraints within existing plans.

### 3 OVERALL ASSESSMENT

Certain themes emerged from the land use and transportation sides as summarized in the following tables.

Figure 9 Overall Strengths

Strengths	
<p><b>Bike/pedestrian facilities on most streets</b> Bike and pedestrian facilities line most streets in the study area. In many cases, wide multi-use paths provide shared space separated from vehicle traffic for bicyclists and pedestrians.</p>	
<p><b>Good transit facilities near activity centers</b> Covered transit facilities with seating, signage, and trash receptacles are located at key transfer points and near major activity centers in the study area. In the less dense sections of the study area, transit facilities could be improved with seating and coverage where the number of boardings warrant the improvement.</p>	

## SUSTAINABLE STREETS + CENTERS

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### Strengths

#### Well-lit intersections

At nighttime, major intersections are well-lit and cross-walks are visible.



#### Ample greenspace on most streets

Greenspace – particularly between the street and the sidewalk – helps create a visual buffer between pedestrians and the cars. Streets with greenspace are more pleasant than those without and feel safer. Many of the corridors in the study area include greenspace – particularly on 30<sup>th</sup> Street between Arapahoe Avenue and Boulder Creek Path and on Colorado Avenue between 30<sup>th</sup> Street and Foothills Parkway.



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### Strengths

#### Intra-Parcel pedestrian connectivity

Intra-site pedestrian connectivity helps pedestrians travel within the site safely. Many parcels in the study area, particularly residential parcels, provide pedestrian connectivity within an individual site.



#### Paths from parcel to street in commercial areas

Paths between the parcel and the street improve access and are often the most direct route to a land use for people on foot or bike. In a few commercial areas, paths and pedestrian walkways connect the parcel and the sidewalk. However, as noted in the “weaknesses” section below, there is generally a lack of connectivity between the street and residential properties.



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Figure 10 Overall Weaknesses

Weaknesses	
<p><b>Lack of safe crossings</b></p> <p>In many areas of the study area, there are long stretches of road with no safe crossings. Examples include 30<sup>th</sup> Street between Arapahoe Avenue and Colorado Avenue and Colorado Avenue between Innovation Drive and Discovery Drive. Providing safe crossings every 300-500' would help to connect neighborhoods and access to transit and services.</p>	
<p><b>Less than 4 foot medians</b></p> <p>Medians provide a refuge for pedestrians who do not finish a crossing in one signal cycle and opportunity for landscaping. In the study area, many medians measured less than 4', which is an uncomfortable place to stand on six-lane roads such as those under examination. At minimum, medians should be 6 feet wide, or the width of a person with a stroller or bicycle.</p>	

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### Weaknesses

#### Sidewalks less than 5 feet against 4 lanes of traffic

Ideally, sidewalks should be 5 or 6 feet wide, with more generous facilities as pedestrian volumes increase. On wide roads that invite high vehicle speeds, a landscaped buffer between the sidewalk and the road increases comfort for walking. Although many areas of the study area include wide multiuse paths and greenspace (as noted in the "strengths section above) there are also a number of areas where sidewalks are less than 5 and have no buffer. A prime example is on 30<sup>th</sup> Street between Aurora Avenue and Baseline Road.



#### Poor mid-block/path lighting

Although intersections at night are generally well-lit, lighting along blocks and on multiuse paths is poor in most areas. Requiring street lights ever 20-30 feet along the street will help pedestrians and bicyclists feel safer when traveling at night. Pedestrian-scale lighting can be integrated between existing cobra-heads.



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### Weaknesses

#### Lack of connectivity between parcels and streets

In many areas – particularly on residential parcels – there is a lack of connectivity between the building and the street. In the multifamily unit along 30<sup>th</sup> Avenue pictured at right, there is no sidewalk connecting the units to the street. Instead, sidewalks link to the back of the building where parking is located.



#### Land uses cut off from corners

In many instances in the study area, land uses are cut off from corners either by a lack of sidewalk connectivity (as noted above) or by an actual fence (as pictured at right). Intersections are natural nodes of activity in a network, but fences shut activity away from street users.



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### Weaknesses

#### **Buildings set back more than 100' from curb**

Wide setbacks usually mean that parking is located in front of the building. From an urban design perspective, parking abutting the street makes the street less visually appealing.

Wide setbacks with parking in front of the building can be found throughout the study area. For example, the Home Depot on the corner of 30<sup>th</sup> Street and Arapahoe Avenue is set 500 feet back from the sidewalk. Wide setbacks with parking in front of the building are also located at the community pool in Scott Carpenter Park on 30<sup>th</sup> Street and on Colorado Avenue between Discovery Drive and Foothills Parkway.



#### **Lack of connectivity between parcels. Walls and fences block access, especially for walking and bicycling.**

Walls and fences abutting the sidewalk make walking and biking less visually appealing. Walls and fences are located throughout the study area, both along the streets (left) and between parcels (right – planks from a fence have been removed to allow for access between parcels).



Figure 11 Opportunities

Opportunities

Increase crossing opportunities through Reflective Rapid Flash Beacons (RRFB), crossing islands, or full signals. Crossings are especially important at transit stops.



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### Opportunities

Transition access roads to local streets.



**Promote courtyard development.** Provision of parking takes the place of building-street interactions on many study area parcels. Wrapping parking in a courtyard style provides car spaces for residents while creating street-fronting land use on all sides of the parcel.



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### Opportunities

**Continue street fronting development.** Several developments have excellent interface with the street, which makes a street more interesting for those on foot or bike.



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### Opportunities

**Develop existing activity areas into people-friendly places.** Streets provide not just a transportation function, but also a placemaking opportunity. Intersections and activity nodes can become places that encourage staying. For example, at 28<sup>th</sup> Street and College Avenue retail, student housing, and a pedestrian connection to campus make this node ripe for placemaking.



Transportation networks balance both placemaking as well as people movement, or “to” and “through” functions. Certain nodes of activity are already evident along the three corridors and present opportunities for multimodal hubs of commercial, retail, and higher-density residential development. These opportunity activity centers are shown in Figure 10.

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Figure 12 Potential Nodes of Activity



## 4 POLICY PEER REVIEW

As part of Phase I, a scan of land use and development policies adopted by other communities was undertaken. This chapter provides examples, which may or may not be applicable to Boulder, as a backdrop for understanding issues tackled in other codes. Analysis of Boulder's codes was beyond the scope of this phase of the project.

### A. FORM-BASED CODE

Traditional land use codes regulate the use that may occur on a parcel of land. Traditional development created compact, walkable urban spaces, while a more recent focus on separating uses through zoning has contributed to urban sprawl and a lack of safe pedestrian facilities. In contrast, form-based codes focus less on the use of land and more on the urban form of development. Form-based codes regulate the form and scale of development, including the relationship between buildings to each other and to the street, and the scale and typologies of blocks and streets.

#### A1: Denver Formed Based Code

Denver's Central Platte Valley District provides an early example of form-based code that has resulted in a quality built environment over time. Originally an industrial area and major rail yard, the City and County of Denver developed the [Denver Commons Design Standards and Guidelines](#) in 1997 to redevelop the area after it had deteriorated due to the decline in the rail industry.



Aerial photo of Denver Central Platte Valley District  
Source: Denverinfill.com

The plan specifies design standards for streets, blocks, and buildings in great detail, including streetscape design, landscape design, vehicle circulation and access, standards for blocks and zone lots to create an orderly grid, pedestrian active-use requirements on first floors, setback and built-to requirements, criteria for buildings over a certain height to reduce bulk, sunlight access, commercial, residential, and mixed-use building design, and parking garage design. Design guidelines recommend that lots follow a perpendicular pattern to blend with the city's traditional street pattern and lots should be consistent in size. Buildings are required to front the property or setback line for at least 33% of the property frontage. Another 1/3 of the building must be within 8 feet of the property or setback line. The plan calls out key streets with specific design requirements, such as the pedestrian-oriented 16<sup>th</sup> Street that connects the Commons Park with downtown and the civic center. Specific standards are outlined below.

## SUSTAINABLE STREETS + CENTERS

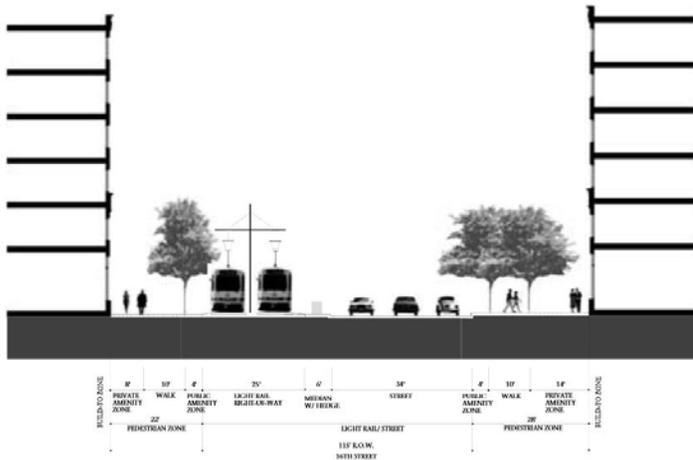
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### Design standards:

- Proposed public right-of-way: 115'
- Light rail corridor: 25'
- Safety median: 6'
- Auxiliary lane: north side of street
- Sidewalks: 10' minimum on both sides
- Public amenity zone: 5'
- Pedestrian sidewalk lighting
- Street lighting
- Special paving in pedestrian zones on both sides

### Design guidelines:

- Street trees spaced 30'
- Private amenity zone: 12'
- Special amenities: café tables, seating, kiosks, etc.



Denver Commons 16<sup>th</sup> Street Mall (Wewatta Street to Chestnut Street)

Source: Denver Commons Design Standards and Guidelines

Design standards noted above have redeveloped Denver's Central Platte Valley District into one of the most lively mixed used areas in downtown Denver, including a riverfront park (Commons Park), Confluence Park and Plaza, three pedestrian bridges that connect the district to the rest of the city across railroad tracks and the river, commercial retail, and many new apartment, townhome, condo, and senior housing developments. Three light rail routes now pass through this neighborhood.



Pedestrian-scaled, walkable areas in Denver's Central Platte Valley District

Source: 21<sup>st</sup> Century Urban Solutions

## A2: City of Santa Ana Transit Zoning Code

The [City of Santa Ana Transit Zoning Code](#) is a more recent example of a form-based code for an existing mixed-use district located adjacent to regional, high-capacity transit. The code divides the 457 acre community into a set of zones based on their role in the district and development intensity, including the Transit Village, Downtown, Urban Center, Corridor, Urban Neighborhood 2, and Urban Neighborhood 1. For example, the Transit Village zone is the most densely developed, with transit-supportive mixed-use development and pedestrian-oriented uses at street level. The Downtown zone includes the historic shopping district in downtown Santa Ana.

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Development standards in this area are intended to preserve the pre-WWII character of the area. The zone types are not directly related to the type and level of transit service present in the zone.

Urban form elements are specified for each zone, such as building types and height, frontage types (arcade, gallery, shopfront, etc.), and building setbacks for all sides of the parcel. Driveway standards and parking requirements, including setbacks for off-street parking, for each zone are also specified. For example, the Transit Village zone requires the following:

**Figure 13 Santa Ana Transit Village Zone Building Setbacks**

Building Setbacks	In feet
Front yard	0'-10'
Side Street	0'-10'
Side yard	0'
Rear yard	15'
Alley rear yard	3'

**Figure 14 Santa Ana Transit Village Zone - Parking Setback Standards**

Setback	Above Grade	Subterranean
Front yard	Min. 40% design lot depth	0' min.
Street side	10' min.	0' min.
Side yard	0' min.	0' min.
Rear yard	10' min.	3' min.
Alley yard	3' min.	3' min.

**Figure 15 Santa Ana Transit Village Zone - Driveway Standards**

Type	Min Width	Max Width
1-way	8'	12'
2-way	20'	25'
Parking	Not permitted	Not permitted



This simulated image depicts a streetcar line traveling through downtown Santa Ana  
 Source: SantaAnaTransitVision.com

Santa Ana is currently served by two Metrolink routes, the Inland Empire and the Orange County Line. The City of Santa Ana is undergoing the [Santa Ana-Garden Grove Fixed Guideway \(Streetcar\) project](#) to serve the city’s historic downtown and connect travelers using the Metrolink routes to the rest of the city. The Transit Zoning Code will help guide intensified development in Santa Ana to support increased transit services.

## B. LARGE RETAIL ESTABLISHMENT DESIGN STANDARDS

### B1. Façade Design Standards

To ensure large retail establishments activate façade walls and create visual interest along the length of ground floor walls, the City of Fort Collins, Colorado requires certain design standards and guidelines for the development of large retail establishments.

After a moratorium to study the issue, the Fort Collins City Council adopted [Design Standards and Guidelines for Large Retail Establishments](#) in 1995 to lessen the impact of these developments on the community. Fort Collins was one of the first communities in the U.S. to address this issue and created a model that many other cities subsequently followed.

The standards (required) and guidelines (voluntary) apply during the development review process to all planned unit developments in Community Regional Shopping Centers and all retail establishments larger than 25,000 square feet that are permitted by right. The standards require façades greater than 100 feet in length to integrate projections or recesses that extend at least 20% of the length of the wall. Ground floor façades that face toward the street must incorporate arcades, display windows, entry areas, awnings, or other features that cover at least 60% of the façade.

### B2. Building Entrances



Suburban Fort Collins Whole Foods with multiple entrances and activated side facades.

Source: Winn Richey



Fort Collins Whole Foods site located on US Route 287, loading areas face alley.

Source: Google Maps

Multiple building entrances provide several benefits, including reducing walking distances for pedestrians, improving pedestrian access from sidewalks, providing access to stores within a retail complex, and dividing up large expanses of blank walls.

The Fort Collins [Design Standards and Guidelines for Large Retail Establishments](#) requires large retail buildings to provide multiple entrances. The design standard calls for at least two sides of the building to include customer entrances. The entrances must be located on the sides of the building with the highest pedestrian activity and one of the entrances must be on a side with the most direct pedestrian access from the street.

For example, the Whole Foods show below was built in a suburban environment just off of U.S. Route 287. The building features multiple entrances, active and interesting facades, and loading areas facing an alley.

### B3. Active Uses Along Streets

Activating street frontages by requiring maximum setbacks creates inviting pedestrian and bicycle environments and helps reduce auto trips to retail and other commercial destinations.

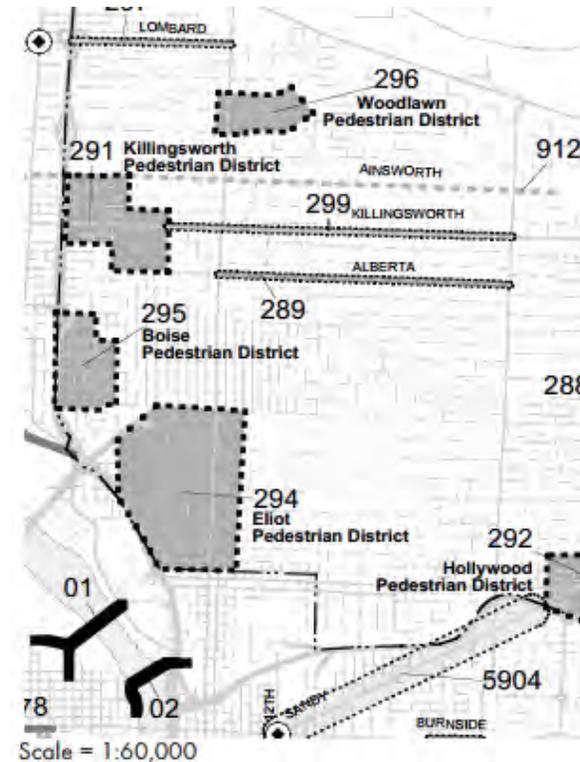
In Portland, Oregon, [Zoning Code Chapter 33.130](#) regulates development in commercial zones. Under this code, development in a General Commercial zone (existing or newer commercial areas characterized by auto-oriented urban design) located on a Transit Street or within a Pedestrian District is required to have a maximum setback of 10 feet. Either 50% or 100% of the building must meet this requirement, depending on several variables related to the number of transit streets the site abuts.

Pedestrian Districts were first designated in Portland in 1977 to direct funding to improve pedestrian facilities in key areas. As specified in [Portland's Pedestrian Master Plan](#), these districts are generally 8 to 400 acres in size, include a dense mix of uses, and are served by frequent transit. Pedestrian Districts typically cover any neighborhood commercial district and are added or changed over time as needed.

Transit Streets, as described in the [Transportation Element of Portland's Comprehensive Plan](#), prioritize movement for all transit modes and include a hierarchy of streets, including Regional Transitways, Major Transit Priority Streets, Transit Access Streets, Community Transit Streets, and Local Service Transit Streets.

However, according to section 33.130.215D, very large retail establishments (100,000 square feet or larger) are exempt from maximum setback under certain conditions:

- Additional buildings constructed at the same time as the large retail structure meet the maximum setback requirement along at least 25% of the frontage along a transit street or other street within a Pedestrian District.



Portland's Pedestrian Districts cover neighborhood commercial areas to direct funding to key pedestrian improvements.

Source: Portland Pedestrian Master Plan

- An internal circulation system is developed that meets specific criteria in order to mimic a finer-grained public street network.
- Connections are provided to other adjacent commercial, office, or institutional developments.

## B4. Internal Accessways

Providing throughways or internal accessways within a larger site breaks up the massive scale of the development and improves circulation through and around the site.

As discussed above, [Portland Zoning Code 33.130.215D](#) exempts very large retail establishments from the maximum setback requirement under specific circumstances, one of which is to provide an internal circulation system. This system must meet the following criteria:

- Internal accessways resembling streets must break up the parking area into segments no larger than 55,000 square feet.
- Internal accessways must join a transit street or other street in a Pedestrian District at least every 250 feet.
- Internal accessways must have one or more auto travel lanes and include pedestrian facilities on both sides. Sidewalks and landscaping must meet minimum dimensions and standards, including curb extensions at internal accessway intersections.

For example, the suburban Cascade Station shopping complex in Portland, Oregon features a variety of retail stores, each with their own entrance, internal accessways off of a transit street (regional MAX light rail) spaced at least every 250 feet, and retail uses abutting the transit street.



Suburban Cascade Station shopping complex with internal accessways to improve circulation and retail fronting transit streets.

Source: CBRE

## C. FUNCTIONAL CLASSIFICATION

### C1. City Street Classification Systems

Streets are complex places with multiple uses and users who need to employ space in different ways. To frame the spatial and temporal needs of urban streets, many cities classify their streets into typologies with associated design standards. Street typologies guide decision making and help prioritize investment.

The City of Santa Monica developed a set of multi-modal street typologies in their award-winning [Land Use and Circulation Element \(LUCE\)](#). The street typologies are defined by street type and use, land use context, and special overlays. Santa Monica's street typologies include boulevards, special streets, downtown and neighborhood commercial streets, major, secondary, minor, and industrial avenues, neighborhood streets, shared streets, parkways, pathways, bikeways,

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highways, and alleys. Each typology has associated design guidelines that are unenforceable recommendations. Actual design of streets involves collaboration between the City of Santa Monica, public transportation stakeholders, and emergency service providers.



Santa Monica Street Typologies

Source: Santa Monica Land Use and Circulation Element

In December 2010, San Francisco adopted the Better Streets Plan – a new comprehensive street design guidebook including developer requirements. The Better Streets Plan is codified in [Municipal Code Section 138.1](#); numerous city codes were changed to facilitate implementation of the adopted guidelines on city streets – any changes to the right-of-way must follow the new standards. These include necessary sidewalk width, street trees, and intersection design templates. The design guidance all corresponds to a series of street typologies that factor together street type and land use context. For example:

Neighborhood commercial streets:

- Sidewalks: 15 feet

- Standard improvements
  - Marked crosswalks with curb ramps
  - Pedestrian signals
  - Corner curb extensions
  - Street trees
  - Sidewalk planters
  - Stormwater control measures
- Case by case additions
  - Mid-block crossing
  - High visibility crosswalks
  - Special crossing treatments (warning signs, beacons, etc.)
  - Raised crossing
  - Extended bulb-out
  - Mid-block bulb-out
  - Pedestrian refuge island
  - Transit bulb-out or boarding island
  - Perpendicular or angular parking
  - Flexible use of parking lane
  - Parking lane planters
  - Sidewalk pocket park
  - Shared public way

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Key:  = YES  
 = MAYBE  
 = NO

	Curb Ramps	Marked Crosswalks	Ped Signals - Countdown and APS	Corner Curb Extensions	Street Trees	Tree Grates	Sidewalk Planters	Stormwater Control	Pedestrian Lighting	Special Paving	Site Furnishings
Downtown Commercial*	YES	YES	YES	YES	YES	YES	YES <i>planter box</i>	YES	YES	YES	YES
Commercial Throughway	YES	YES	YES	YES	YES	MAYBE	YES <i>planter box</i>	YES	YES	YES <i>furnishings zone</i>	YES
Neighborhood Commercial	YES	YES	YES	YES	YES	MAYBE	YES <i>planter box</i>	YES	YES	YES <i>furnishings zone</i>	YES
Downtown Residential	YES	YES	YES	YES	YES	MAYBE	YES	YES	YES	YES <i>furnishings zone</i>	YES
Residential Throughway	YES	YES	YES	YES	YES	NO	YES	YES <i>at corners</i>	YES	NO	MAYBE
Neighborhood Residential	YES	MAYBE	MAYBE	MAYBE	YES	NO	YES <i>planter strip</i>	YES <i>at corners</i>	YES	NO	NO
Industrial	YES	MAYBE	MAYBE	NO	YES	NO	NO	YES	NO	NO	NO
Mixed-use	YES	YES	YES	YES	YES	MAYBE	YES	YES	MAYBE	YES <i>furnishings zone</i>	YES
Parkway	YES	YES	YES	YES	YES	NO	YES <i>planter strip</i>	YES	YES	NO	YES
Park Edge	YES	YES	YES	YES	YES	NO	YES <i>planter strip</i>	YES	YES	NO	YES
Boulevard	YES	YES	YES	YES	YES	MAYBE	YES	YES	YES	YES <i>furnishings zone</i>	YES
Ceremonial	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
Alley	YES <i>prefer shared st. or raised xing</i>	MAYBE	n/a	NO	YES	MAYBE	YES	YES	YES	YES <i>entire r.o.w.</i>	MAYBE
Shared Public Way	n/a	n/a	n/a	n/a	YES	MAYBE	YES	YES	YES	YES <i>entire r.o.w.</i>	YES
Paseo	n/a	n/a	n/a	n/a	YES	MAYBE	YES	YES	YES	YES <i>entire r.o.w.</i>	YES

San Francisco Better Streets Plan Standard Streetscape Elements by Street Type

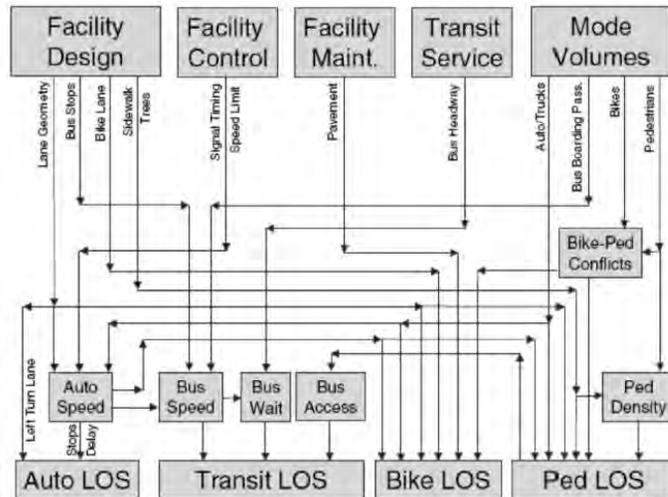
Source: [www.sfbetterstreets.org](http://www.sfbetterstreets.org)

## C2. City Adopted Multimodal Performance Measures

Evaluating progress and performance over time creates transparency and accountability that can justify increased and continued multimodal transportation investment. Until recently, transportation planners used performance metrics that primarily focused on measures that assess traffic conditions, such as roadway level of service (LOS) ratings, volume-to-capacity (V/C) ratios, system-wide vehicle miles traveled, vehicle hours of delay, and average travel time, all of which emphasize motor vehicle traffic speed and delay.

A useful supplement to traditional traffic performance measures is multimodal level of service (MMLOS) metrics, which measure capacity and environmental conditions for automobile users, pedestrians, transit, and bicycle users along roadways.

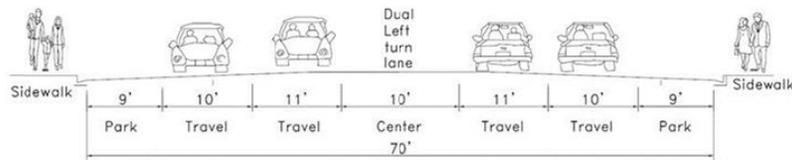
During their recent General Plan update, the City of Pasadena took the opportunity to revise their transportation system performance measures to better reflect the community's values of safety, sustainability, and livability. To measure the performance of intersections, the City now uses multimodal level of service (MMLOS), in addition to the traditional auto V/C metrics that measure the quality of service for non-auto modes using available data such as intersection geometry, signal timing, speed limit, bus headways, transit usage, auto traffic volumes, and pedestrian volumes. Similar to traditional level of service measures, MMLOS is measured from A-F. Street segment performance measures now include MMLOS measures for autos, pedestrians, bicycles, and transit. Use of MMLOS measures is implemented through the City's Transportation Impact Review [Current Practice and Guidelines](#). The following thresholds determine which projects must undergo a Transportation Assessment or more rigorous detailed Transportation Impact Study.



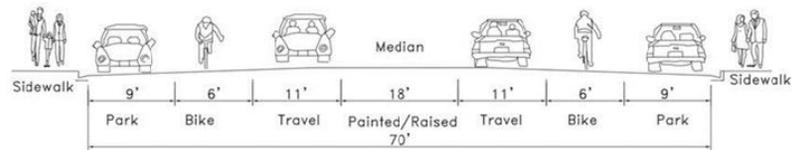
City of Pasadena Multimodal Level of Service Model.

Source: City of Pasadena Complete Streets Transportation Review Guidelines presentation

Type of Project	Exemption	Category 1: Transportation Assessment	Category 2: Transportation Impact Study
Residential	4 net new units or less	5-25 net new units	26 or more net new units
Commercial	Less than 70 daily trips and less than 11 peak hour trips	71-150 daily trips or 11-20 peak hour trips	151 or more daily trips or more than 20 peak hour trips



Existing Cross Section



Proposed Cross Section

City of Pasadena road diet project on Orange Grove Boulevard used MMLOS to assess transportation impacts

Source: Moving Towards Complete Streets – MMLOS Applications by Kittleson & Associates

In 2013, the City implemented these new performance metrics in a [road diet project on Orange Grove Boulevard](#) to evaluate the impact on autos, transit, bicyclists, and pedestrians. The MMLOS analysis found that transit, bicycle, and pedestrian LOS would overall increase largely due to the decrease in motorist speeds and the addition of a bicycle lane. The impact on autos through this corridor was found to be minor. Utilizing the MMLOS measures brought to light the benefit to non-auto modes of this road diet project.

## D. PARKING

### D1. Parking Requirements

#### Reductions for high frequency transit

Reduced minimum parking requirements in areas well-served by transit is a common tool used by cities to encourage smart growth and improve pedestrian accessibility to transit in these areas. The reduced requirement acknowledges the lower demand for parking in areas with high capacity transit.

The [City of San Diego Municipal Code Chapter 14](#) requires compliance with supplemental parking regulations in specific transit use areas. The Transit Area Overlay Zone provides reduced parking minimums for multifamily residential uses and any non-residential use. Implementation of the Transit Area Overlay Zone occurs together with the Transit-Oriented Development Design Guidelines of the Land Development Manual.

Parking requirements for multiple dwelling unit types within Transit Areas generally require 0.25 fewer parking spaces compared to Basic areas. For example, a minimum of 2.0 auto parking spaces are required per dwelling unit for a 2 bedroom unit in a multiple dwelling development in a Basic zone, compared to a minimum of 1.75 spaces in a Transit Area. For non-residential use zones, the minimum parking requirement in Transit Areas compared to Basic areas varies by use, and in some cases is the same.

The City of Hayward, California has implemented a transit zone parking reduction policy. Regardless of the type of zoning, [Municipal Code Article 2](#) Section 10-2.404 provides developers with a parking credit for proximity to transit. For development within 500 feet of bus transit, 1,000 feet of rail transit, and outside of the Central Parking District, a reduction of up to 15% is given. Retail uses must provide a bus stop and shelter adjacent to the site to receive the credit.

## Eliminated Minimums and Establish Maximums

The City of San Francisco eliminated minimum parking requirements in downtown zoning districts and set maximum limits below one space per unit. For example, dwelling units in the Rincon Hill Downtown Residential zone are allowed up to one parking space for each two dwelling units. The [Municipal Code Section 151.1](#) describes the specific districts in which no parking is required for any use and provides a table listing the maximum parking allowed for each use. Variances to allow more parking than is provided for in the City Code will not be granted for any reason.

## Eliminate Parking Requirements

The [Rincon Hill Area Plan](#) was the first neighborhood in San Francisco to eliminate parking requirements for any use. This unique parking policy specifies the maximum allowable parking spaces as up to one space per two units by right, with an additional one space per unit allowed if the spaces are not independently accessible. Any parking provided must be unbundled from the purchase price or rental cost of the home or commercial space. In new developments with more than 50 units, at least one parking space must be offered to a car-sharing organization.

For example, the One Rincon Hill residential development was permitted by the [San Francisco Planning Commission in May 2012](#) to construct 709 parking spaces for 709 dwelling units because more than half of the parking spaces are efficiently-stored valet spaces and are not independently accessible.

## Demand-Based Parking Requirements

One way to “right size” the parking requirement for any particular development involves adjusting the parking requirements based on actual usage over time.

As part of their efforts to provide a variety of transportation options that meet the mobility needs of the community, the City of Cambridge, MA requires a Parking Analysis to be completed for developments larger than 10,000 sq. ft. or more than 10 dwelling units by developers that request a deviation from the established parking requirements and for developments with higher density than the as-of-right density allowed in a zone. [Off Street Parking and Loading Requirements](#) section 6.35.3 specifies that the analysis should include the following, with guidance from the Traffic, Parking and Transportation Department:

- An estimation of the daytime and nighttime parking demand of the new development based on vehicle ownership rates of similar developments in the same area and parking permit and vehicle registration data for the area. The analysis can include differences in demand due to characteristics of the development and residents, including owner-occupied or renter-occupied, presence of below-market-rate units, and presence of elderly-oriented units.
- Proximity to rapid transit stations and bus stops, bike facilities, and car sharing facilities.
- On-street parking capacity and utilization in the area.



One Rincon Hill residential development meets reduced parking requirements.

Source: SocketSite

- Off-street parking capacity and utilization of facilities that would be available to residents or visitors of the development through a long-term lease.
- Transportation demand management strategies that will be employed to reduce parking demand.

## D2. Incentives for Structured Parking

Structured parking uses land more efficiently than parking lots by providing more parking spaces in a smaller amount of space. Structured parking, when regulated and designed well, can also help communities improve urban design.

The [City of Milwaukee Municipal Code Section 19.611.4](#) provides an incentive to encourage developers to construct structured parking rather than parking lots. The code allows developers an additional 0.50 sq. ft. of floor area above the maximum FAR for every 1 sq. ft. of structured parking constructed.

The [City of Charlotte Transit Supportive Overlay Zone](#) section 10.907.5.d incentivizes structured parking with active uses along the ground level. Structured parking facilities with retail, office, civic, institutional, or residential uses along at least 75% of the first floor that fronts a street receives a FAR credit. Two hundred percent (200%) of the total square footage of the uses goes toward the required FAR minimum.

In the [Planned Mixed Use District](#), the City of Gladstone, MO requires developments that must provide more than 200 spaces to supply not more than 50% of the spaces at street level.

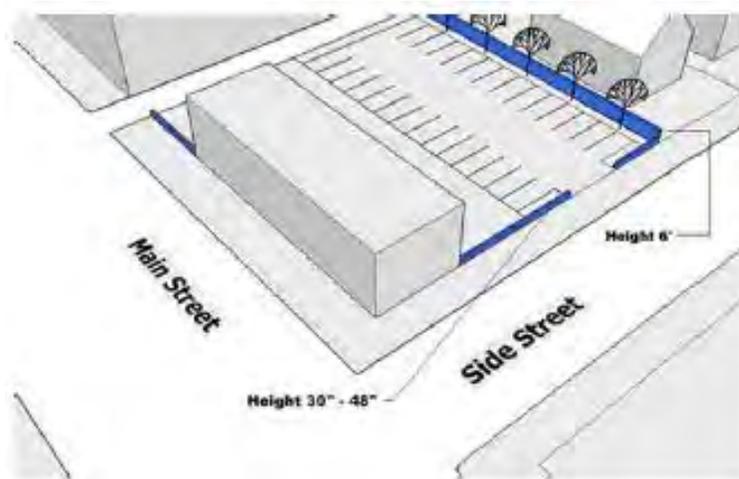
## D3. Parking Location Requirements

Buildings fronting the street improve urban design, the pedestrian environment, and accessibility. Requiring parking lots to be located behind a building is one way to ensure buildings will abut the street.

In 2009, the [City of Albuquerque](#) instated a voluntary form-based zoning code that requires parking to be located behind the building (or at least to the side with screening) for all building types. The original zoning code remains in place, and a developer may apply to the City for a zone map change in order to use the form-based code.

The City of Gladstone, MO instituted a requirement in the [Planned Mixed Use District](#) that no surface parking can be located between a building and the public street that the building faces. Parking must be located behind the building or to the side. Surface parking that can be seen from the public right-of-way must be screened with landscaping and a low wall or fence less than 3.5 feet in height. No parking structures are allowed to abut any public street, unless retail, office, or residential uses are provided at street level for the entire street frontage.

Denver created [Main Street Zone Districts](#) to enhance the function and aesthetics of streets, improve access to transit use, walking, and shopping, and more efficiently use land in their commercial corridors. In these districts, no parking is allowed between a building and the street. Surface parking visible from the public right-of-way must be screened by a masonry wall, iron railing, or hedge that is 30-48 inches in height. Parking lots adjacent to a residential zone must be screened by a wall or fence on the lot line 6 feet in height or by a landscaped buffer 5 feet in width with trees spaced 25 feet apart within a 5 foot buffer area.



Parking lot location and screening Denver's Main Street Zone Districts

Source: City of Denver

Denver coupled the parking location requirements with building location requirements. Buildings, except those used exclusively for residential purposes, must front the street, with a distance of less than 1.5 feet between the building and the lot line. Buildings must also take up at least 75% of the lineal street frontage on a Main Street and 25%-40% of a side street, depending on the zone.

## D4. Shared Parking

Shared parking agreements allow drivers accessing different buildings to share one parking facility. Shared parking is most often organized between complimentary uses, such as offices (which need parking facilities during weekdays) and restaurants (whose patrons frequent their locations on evenings and weekends). Shared parking reduces the amount of space dedicated to the storage of cars and can increase housing affordability when parking costs are unbundled from housing costs.

In 2012, the City of Los Angeles added [Section 13.15](#) to the Municipal Code to permit shared parking in Modified Parking Requirement Districts (MPRDs), along with six other parking strategies (change of use parking standards, parking reduction approval, decreased parking requirements, increased parking requirements, commercial parking credits, and maximum parking requirements), in an effort to allow a tailored approach to parking management in each district. While shared parking was previously permitted in Los Angeles if a developer implemented transportation demand management strategies, the MPRD concept streamlines the process to create shared parking agreements along with other parking management strategies.

Required parking spaces may be provided off-site in a shared parking lot, and a contract is required to formalize the agreement. The developer must [assess parking needs](#) for the proposed shared uses, including a parking analysis to determine parking demand each hour over 24 hours across one week, and a report on the uses, hours of operation, codified parking requirements, spaces allocated to each use, and location of the shared parking facility.

Los Angeles allows greater distances from the shared parking facility than most other cities that permit shared parking, such as San Diego (600 ft), Seattle (800 ft), and Eugene, OR (1,320 ft). In Los Angeles, parking can be shared by uses located within 1,500 ft (0.28 mi) from the parking supply.

Shared parking agreements complement Los Angeles' downtown adaptive reuse ordinance, which makes it easier for developers to convert downtown office and commercial buildings to residential uses. Buildings constructed prior to 1974 are not required to add parking if rehabilitated for residential use. Since the ordinance was passed in 1999, nearly 15,000 residential units have been constructed through adaptive reuse.

## D5. Parking Lot Design

The design and landscaping of parking lots impact safety, aesthetics, urban heat, and stormwater management. Good design can create shaded, well-drained spaces that provide a community asset through adding to the urban canopy of a community.

For example, the [City of Portland Land Use Code Chapter 33.248](#) requires parking lots to be adequately landscaped, including trees, shrubs, and groundcover. In the interior of a parking lot, one large tree is required per 4 parking spaces, one medium tree per 3 parking spaces, or one small tree per 2 parking spaces. At least 20% of the trees planted in a parking lot must be evergreen trees. Additionally, 1.5 shrubs per parking space are required and the shrubs may be either evergreen or deciduous. The remainder of the planting area must be planted with ground cover plants that must be spaced so that they will completely cover the area within 3 years.

## E. TRANSIT

### E1. Transit Stops Integrated with New Developments

Integrating transit stops into commercial developments improves accessibility to the stations, reduces the cost of public infrastructure provision, decreases parking needs, and increases the marketability of the development.

Portland State University was involved from the start of the process to develop the Portland Streetcar, donating several million dollars to the project. The University took the opportunity to incorporate a streetcar stop into the new Urban Center and Plaza constructed in 2000. The Urban Center includes 28,000 sq. ft. of retail space, the College of Urban and Public Affairs, the Urban Plaza (with green stormwater features), and transit facilities for both light rail and the streetcar. Light rail stops are adjacent to the site, while the streetcar cuts diagonally through the Urban Plaza. The University provides \$20,000 per year to maintain the streetcar station. Today, over 40% of students travel to campus on public transit.



Portland Streetcar stop in Urban Plaza on Portland State University campus.

Source: Flickr User SFCityscape

## E2. Developer Requirements

Most cities fund the extension of public services, at least in part, to serve new development through exactions and impact fees, in effect requiring new development to pay for itself. Revenues generated through impact fees can fund a variety of public services, including public transportation.

Montgomery County, MD uses a unique system to finance the transit needs of new development, called [Transportation Policy Area Review \(TPAR\)](#). The TPAR test assesses average transportation system performance with regard to roadways and transit services for defined policy areas (districts) within the county. Transit adequacy is measured in terms of coverage, peak headway, and span of service. Different adequacy standards are defined for urban, suburban, and rural policy areas. Planning Department staff update this analysis every two years.

During the development application process, the developer identifies the policy area the development is located in, the type and size of development, and the estimated additional peak period trips generated by the new development. If a policy area is found to be inadequate in transit service, then the developer must make a Traffic Mitigation Payment that will go toward making necessary improvements in the system. The developer also has the option of making improvements to increase roadway or transit capacity in the policy area by addressing identified roadway or transit inadequacies, such as purchasing new buses. The Traffic Mitigation Payment is equal to 25% of the transportation impact tax if either the roadway or transit capacity is inadequate and 50% if both are found to be inadequate. The transportation impact tax varies based on building type and area of development, and ranges from \$1,228-\$20,258 per

dwelling unit for residential development and \$3.10-\$14.80 per square foot for non-residential development.<sup>1</sup>

## E3. TOD Overlay Zone Districts

The City of Fort Collins is currently constructing a new Bus Rapid Transit system – the Mason Express (MAX) – that will open in the spring of 2014. The MAX will operate for much of the way along a dedicated transit-only guideway parallel to the BNSF railway and will connect key destinations such as Midtown, Colorado State University, and downtown. About 60% of all Fort Collins employment is located within one mile of the MAX, providing a strong ridership market.

[Municipal Zoning Code Division 3.10](#) provides development standards for the Transit-Oriented Overlay Zone south of Prospect Road, which is the southern border of the CSU-Fort Collins campus. The purpose of the overlay zone is to increase densities and mixes of uses and to improve design to create pedestrian-oriented, well-connected commercial and residential developments. The overlay zone regulates site planning, streetscape and pedestrian connections, and character and image.

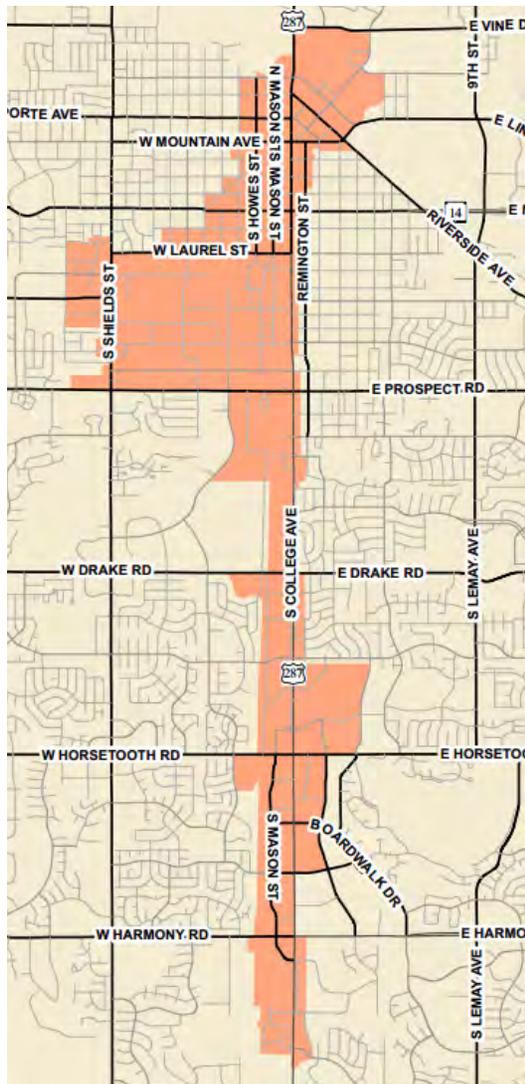
The Overlay Zone requires that buildings and entrances must face streets, off-street parking must be located behind, above, or below street-facing buildings, a central feature or gathering space must be provided at each station area, outdoor spaces for residents and workers should be developed and connected by a walkway system, and streetscapes must be improved according to specific design criteria.

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<sup>1</sup> New and Revised Impact Taxes Effective July 1, 2013:  
<http://permittingservices.montgomerycountymd.gov/DPS/pdf/NewAndRevisedImpactTaxesEffectiveJuly12013.pdf>

## SUSTAINABLE STREETS + CENTERS

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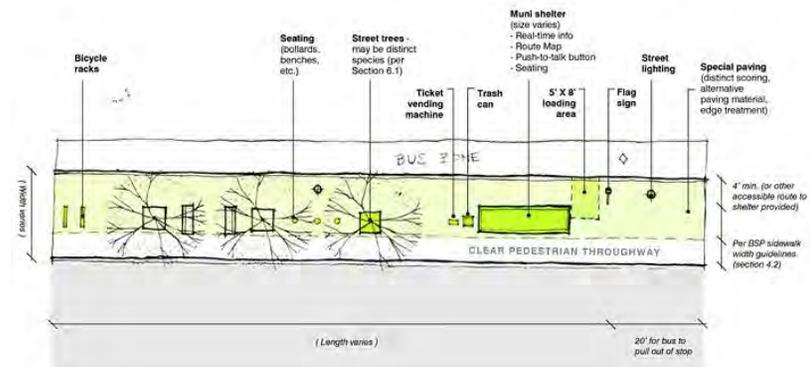
City of Fort Collins Transit-Oriented Development Overlay Zone Map

Source: City of Fort Collins

The intent of a transit-oriented overlay zone can easily be implemented as a transit-oriented zoning district rather than an overlay zone.

### E4. Transit Street Standards

To be highly successful, major transit corridors or nodes require different street design standards than major auto carrying roadways. Cities like Vancouver, B.C. ([TOD Community Design Guidelines](#)), New York ([Street Design Manual](#)), San Francisco ([Better Streets Plan](#)), and Chicago ([Complete Streets Chicago](#)) have developed specific street design guidelines for transit priority corridors.



San Francisco Better Streets Plan bus stop layout

Source: San Francisco Better Streets

In accordance with San Francisco's "Transit-First" policy, San Francisco's Better Streets Plan includes guidelines for the placement and layout of transit stops, transit bulb-outs, transit boarding islands, and guidelines by type of transit.

The Better Streets Plan was adopted by the City and County of San Francisco in 2010 and was incorporated into the [San Francisco Municipal Code](#) and the General Plan. All streetscape and pedestrian improvements on existing or new rights-of-way must adhere to the

design principles and guidelines in the Better Streets Plan and are subject to approval by the City and other permitting bodies through the development permit process.

## F. CONFLICTING/CONTRADICTIONARY BOULDER CONDITIONS

### F1. Shared Use Paths

Shared use paths are a complementary bicycle and pedestrian facility to sidewalks and on-road bicycle facilities. Off-street paths provide a higher level of safety from vehicles for non-motorized users. Yet conflicts between pedestrians and bicyclists can arise without adequate design and signage.

To improve safety on multi use paths shared by users traveling at different speeds, the following key elements are necessary:

- Ample width to allow space between users
- Delineated lanes for different users, such as bicycle and pedestrian lanes
- Signage that clearly describes the rules of conduct, including which modes have right-of-way on which side of the path

The rules of conduct on an off-street trail are most often not codified or enforced, except by peer pressure from other users.



Shared use path signage in Seattle, WA  
Source: Flickr User Bmaas

For example, a 2.8 mile shared use path loops around Green Lake in Seattle. The trail is separated into two lanes – one for pedestrians and one for cyclists or other users on wheels. The inner pedestrian lane is bidirectional while the outer cyclist lane runs counterclockwise around the lake. Clear signage informs users which side of the pathway to use.

Safety at intersection crossings is key for off-street paths. Bicycle signals, which increase the convenience of cycling and decrease travel time, are increasingly installed by cities that want to make bicycling a mode competitive with driving. Bicycle traffic signals can be relatively inexpensive to install. For example, installation of a new bicycle signal in Salem, OR cost \$1,000 in 2012.<sup>2</sup>

The [Springwater Corridor trail](#) in Portland is a 16.8 mile trail that runs to the east of the city. Throughout the route, the trail crosses many minor and major roadways and private driveways, which created a need for treatments at crossings to improve safety. At minor intersections, the following improvements were made:

- Bollards or boulders to inhibit vehicles from entering the trail
- Removal or pruning of vegetation to increase intersection visibility
- Stop signs

<sup>2</sup> Bicycle traffic signals get a green light. First Coast News. 12/2/2012.  
<http://www.firstcoastnews.com/news/strange/article/285185/82/Bicycle-traffic-signals-get-a-green-light>

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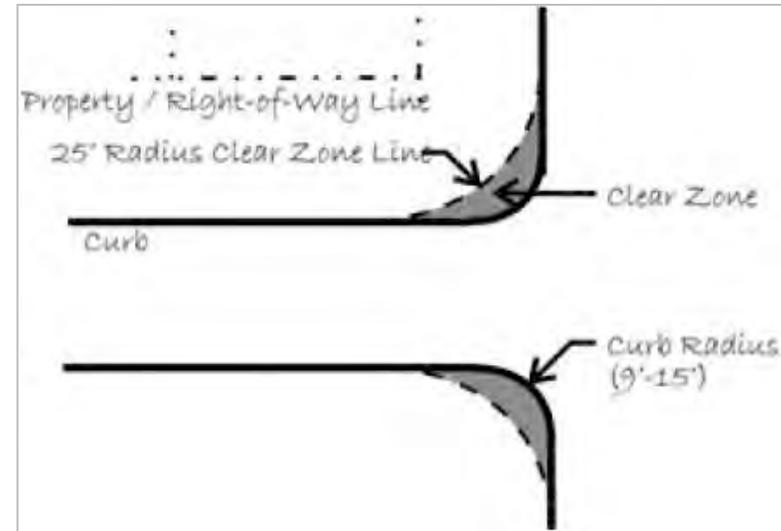
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- Crosswalk striping
- Signage to warn autos and trail users of crossings
- Major intersections required greater levels of treatments in order to increase safety:
- Pedestrian and bicyclist push activated traffic signals
- In-pavement sensors for bicyclist traffic signals
- Median refuge islands
- Curb extensions to minimize crossing distances

The city developed a criterion to determine when a bicycle traffic signal was warranted at a crossing. Based on user counts, a signal is required when there are a minimum of 100 trail users per hour during any four hours of a day.

### F2. Sight Triangles

Intersection sight distance provided by a clear zone is critical for the safety of all roadway users. Adequate visibility allows drivers to safely travel through an intersection or turn left or right without endangering other drivers, pedestrians, or bicyclists. The corners of buildings and on-street parking can interfere with intersection visibility and an adequate clear zone.



City of Hercules corner curb radii and clear zone requirements

Source: City of Hercules Regulating Code

The [City of Hercules, CA Regulating Code](#) for the Central Hercules Plan, which is a form-based code, applies to certain areas of the downtown and waterfront. The code requires a corner curb radius of 4-15 feet and a clear zone with a radius of 25 feet. The clear zone must be free of buildings, telephone poles, fire hydrants, and any other obstruction. These regulations are intended to slow turning vehicles, reduce pedestrian crossing distances, and allow emergency vehicles a wider turning radius. These regulations are set irrespective of the roadway design speed. The area includes a variety of roadways, such as four-lane avenues, two-lane avenues, and neighborhood streets and lanes. The widest roadway in the area governed by these regulations is 110 feet with 2 travel lanes, a bicycle lane, on-street parking, and a sidewalk on each side of the street.

The [City of Fort Collins Streetscape Design Standards and Guidelines](#) apply to all streets in the City. This document refers to the [Larimer County Urban Area Street Standards](#) for standards regulating sight distance triangles at intersections. Based on the design speed of the major street, from 15 MPH to 55 MPH, the corner intersection sight distance varies from 210-1240 feet.

If the line of sight created by the sight triangle crosses over private property, a Sight Distance Easement must be dedicated to the local municipality and maintained by the private property owner. The line of sight must be kept clear of any obstruction taller than 30 inches, including buildings, vehicles parked on private property, trees, etc.

## G. BLOCK STANDARDS

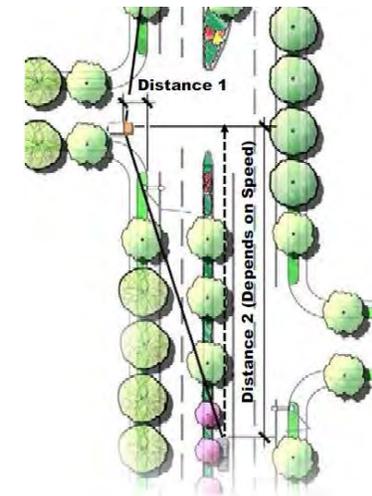
### G1. Maximum Block Size and Intersection Spacing

Block size, which defines intersection density, is an enormously important factor that influences the accessibility and walkability of an area. Smaller block sizes decrease walking distances and, coupled with good urban design, increase walkability and improve the pedestrian experience. A 2010 study by Ewing and Cervero found that intersection density is one of the most important urban form factors for increasing walking and decreasing driving.<sup>3</sup>

Many cities specify maximum block lengths or sizes in their land use codes. For example, the City of Fort Collins specifies block size requirements for developments in the [Land Use Code](#), as follows:

- Low density mixed-use neighborhood districts

- maximum block size 12 acres
- block faces longer than 700 feet require a mid block pedestrian walkway
- Community or neighborhood commercial districts
  - Maximum block size 7 acres; supermarkets permitted on 10 acre blocks
- Multifamily developments
  - Maximum block size 7 acres



City of Fort Collins sight triangle requirements depend on roadway design speed.

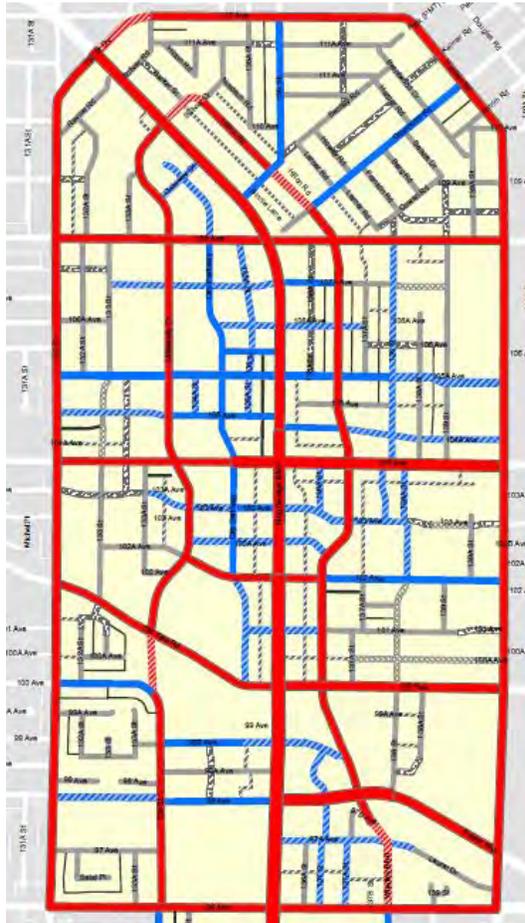
Source: City of Fort Collins Streetscape Design Standards and Guidelines

The City of Hercules, CA included street standards in the [Regulating Code for the Central Hercules Plan](#), where even the higher-order streets, like main arterials as compared to neighborhood streets or lanes, are narrow. Block lengths are limited to 500 feet, and pedestrian passage-ways at 250-foot intervals are required. Alleys are also required to provide access to parking and loading areas behind buildings and to minimize the number of curb cuts, which decrease pedestrian and bicyclist safety.

In Surrey, BC, the City Centre Plan update includes a [Road Network Concept](#), which provides guidelines for new streets and pedestrian connections to support a more fine-grained street network and connections to transit. A supporting [Road Width Concept](#) defines a hierarchy of roadway widths to serve varying mobility needs, whether auto, transit, or pedestrian. The City intends to build new [Green Lanes](#), or narrow tree lined streets, to increase the intersection

<sup>3</sup> Ewing, Reid and Cervero, Robert (2010) 'Travel and the Built Environment', Journal of the American Planning Association, First published on: 11 May 2010

density of the city center, especially in the downtown core near the widest north-south and east-west arterials.



Surrey, BC Road Network Concept to increase street connectivity.

Source: Surrey City Centre Plan Road Network Concept

## H. STORMWATER MITIGATION

Effectively managing stormwater runoff reduces flooding occurrences, lessens the burden on public stormwater infrastructure, improves ecological functioning, and supports human health.

### H1. Stormwater Mitigation Portland, Oregon

Portland, Oregon requires any development of any size, whether new construction or redevelopment, to meet requirements for stormwater infiltration and discharge (either by on-site infiltration or off-site flow), flow control, and pollution reduction. These requirements are described in [Portland's Stormwater Management Manual](#), which is administered by the Bureau of Environmental Services and adopted by the City Council as an administrative rule. Development proposals must demonstrate compliance during the review and permit process.

The level of stormwater management depends on the technical feasibility of the site, and includes:

- Category 1: total on-site infiltration with vegetated infiltration facilities
- Category 2: total on-site infiltration with vegetated facilities that overflow to subsurface infiltration facilities
- Category 3: on-site detention with vegetated facilities (that meet pollution reduction and flow control requirements) that overflow to a drainageway, river, or storm-only pipe
- Category 4: on-site detention with vegetated facilities (that meet pollution reduction and flow control requirements) that overflow to the combined sewer system

Flow control techniques include retention and detention facilities. Pollution reduction standards require 70% of total suspended solids to be removed from 90% of the average annual runoff. [Three methodologies](#) are available to developers when sizing stormwater facilities in order to meet the management standards:

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- **Simplified Approach:** Applies to projects less than 10,000 square feet. Involves calculating the amount of new or redeveloped impervious area multiplied by a sizing factor depending on the facility type. Swales, planters, basins, filter strips, and a subsurface infiltration facility are allowed when using this approach. One infiltration test must be performed prior to selecting and sizing stormwater facilities.
- **Presumptive Approach:** Applies to projects 10,000 square feet to 1 acre in size and/or street improvements. The Presumptive Approach Calculator (PAC) allows the specific on-site infiltration variables to be considered. A calculation worksheet and users manual are provided to developers by the City. Similar to the Simplified Approach, vegetated surface facilities and subsurface infiltration facilities are required.
- **Performance Approach:** Applies to unique projects needing greater analysis than available with the first two approaches, such as projects larger than 1 acre or projects using an emerging design technology. The stormwater management plan will be reviewed by technical staff and the Chief Engineer.

Regardless of the type of use, the highest technically feasible level of stormwater management must be used, and applicants must demonstrate the need decrease to a lower category during the permitting process.

For example, the recently constructed RiverEast Center in Portland features vegetated infiltration swales between the sidewalk and parking area, between individual parking bays, and between the building and pedestrian walkways.



RiverEast Center in Portland, OR  
Source: RiverEast Center



Vegetated bioswale between parking bays  
Source: Land Perspectives



Vegetated bioswales adjacent to building and between sidewalk and street  
Source: Land Perspectives

## I. DEVELOPMENT INCENTIVES FOR PUBLIC AMENITIES

### 11. Density Bonus for Public Space

Many cities elect to allow developers additional density or increased building heights, which boost the profitability of their projects, in exchange for providing certain public goods, like public open space. The City of Fort Myers, Florida identified public open space, especially along the waterfront, as critically important to the economic health of their downtown. While public open space is often one of many public goods a developer can provide under typical density bonus programs, Fort Myers makes the provision of public open space mandatory in order to receive the benefit of increased density in downtown areas.

[Municipal Code Section 118.8.5](#) provides for an optional density bonus and increased height in certain urban center districts in exchange for meeting specific criteria. A developer must use the planned unit development process to apply for the density bonus.

Each of the criteria must be fully met in order to receive the density bonus: affordable workforce housing, financial contribution to para-transit service and pedestrian connections to the public right-of-way, mandatory public open space, mixed uses to include retail, office, and residential in specific percentages, public parking, public use of water-dependent uses (like marinas, boat ramps, and parks), and superior architectural design. The mandatory public open space criterion requires the developer to provide public space on-site or within the urban center district. Properties located on the riverfront must additionally preserve a view corridor to allow clear view of the river from the street.

## 12. Public Space Requirement

Public space and amenities, such as parks, public plazas, day cares for children and the elderly, and public art or an arts center, are critical components of complete communities in that they provide public gathering spaces, necessary services, and increase general livability of a community.

The [Montgomery County, Maryland Zoning Code](#) requires development in specific zones to dedicate a minimum percentage of the site to on-site public use space and a minimum percentage to off-site parkland or public right-of-way. The requirement for public use space may be satisfied by providing off-site space in the same district or by paying a fee in lieu.

Public use space is considered to include the following: “green areas, gardens, plazas, walks, pathways, promenades, arcades, urban parks, town squares, public plazas with elements such as water features, and passive and active recreational areas including outdoor recreation areas for a child day care facility.”

Figure 16 Public Use Space Requirements by Zone, Montgomery County, Maryland

Land Use Zone	On-Site Public Use Space	Off-Site Parkland
Transit-Oriented Mixed Use Development (within the General Commercial Zone)	10%	25%
Life Sciences Center – Industrial Zone	20%	-
Central Business District (CBD) Zones	10%-20%	-

The variation in the percent requirement in the CBD zones is due to whether the standard or optional method is used to determine how much public use space is required. The optional method allows greater densities in exchange for meeting additional development criteria, such as providing more public use space and public facilities and amenities. Provision of the additional amenities off-site or payment in lieu are also acceptable. Additionally, if residential uses are included in the proposed development, moderately priced dwelling units may be included as an additional amenity.

Public facilities and amenities are considered to include: green areas, open space, streetscaping, public space for performances and events, new or improved pedestrian facilities, improved pedestrian access to transit, dedicated spaces open to the public such as museums and cultural arts centers, day cares for children, adults, and persons with disabilities, public art, and publicly owned or operated government facilities.



Development proposal in Montgomery County, MD to include required public space  
Source: Development proposal

A [proposed development](#) went to the Montgomery County Planning Commission on July 11, 2013 for a multi-family development including 145 dwelling units and 6,500 square feet of ground floor retail. The proposal was required to allocate 23.2% of the lot for on-site public use space, 36.1% of the lot for off-site public use space, 34.7% of the lot for public amenity space, and install an art piece. Additionally, 15% of the units will be moderately priced dwelling units.

## J. STREET TREE POLICIES

### J1. Requirements for Street Trees in New Developments

Street trees provide canopy and shade, reduce urban heat, improve aesthetics of the street for pedestrians and other users, and provide a protective barrier between the sidewalk and auto travel lanes.

City of Fort Collins' [Land Use Code Section 3.2.1](#) describes the extensive Landscaping and Tree Protection requirements of developers. In an effort to increase the City's tree canopy, all developments must plant "groves and belts of trees along city streets, in and around parking lots, and in all landscape areas that are located within fifty (50) feet of any building or structure." Canopy shade trees must be spaced exactly 30 feet to 40 feet apart and must make up at least 50% of all tree plantings on site.

Canopy shade street trees must be planted along the entire block in the street right-of-way either between the street and sidewalk at 30-40 foot spacing or (if the sidewalk directly abuts the street) between the building and the sidewalk with the same spacing. If the sidewalk abuts both the street and the building, canopy shade trees must be planted in at least 16 square foot cutouts at 30-40 foot intervals.

Further, Fort Collins recognizes the importance of species diversity in preventing insect or disease infestations. The Code lays out requirements for tree species diversity on site based on the number of trees.

### J2. Requirements for Maintenance and Replacement of Street Trees

The City of Portland outlines a wide-ranging list of Street Tree and Other Public Tree Regulations in [City Code Chapter 20.40](#). According to this code, property owners of land next to street trees that extend into the street are required to maintain the trees using specific arboricultural methods. Further, if the property owner fails to properly maintain a tree and the tree causes harm to any person, the property owner is legally liable for the damage.

If the City Forester deems that a tree on the street or extending into the street from private property must be removed due to age or disease, the Forester can require the property owner to pay for a replacement tree and can specify the type of replacement tree.

## K. FUNDING/INCENTIVES

### K1. Developer Incentives

The zoning code alone does not always result in the ideal transportation system or street design. As a result, developer incentives are often necessary to ensure that streets are built safely for all modes and parcels are designed to face the street at a human scale. Developer incentives can be particularly useful in areas that need to be redeveloped or for large institutions (such as universities) that own a significant amount of developable land.

#### Champaign, IL Redevelopment Incentive Program

The Champaign, IL Redevelopment Incentive Program (RIP) provides assistance for permanent building improvements, encouragement of residential development, and design work for new structures within the East University Avenue Tax Increment Finance (TIF) District. This program is open to all properties within the district on a first-come basis with new funding provided each fiscal year. The program provides incentives for new construction, renovation, residential redevelopment, and façade renovation of existing buildings. A grant for new construction, for example, is a maximum of \$100,000.

#### SANDAG TransNet Smart Growth Incentive Program

The Regional Comprehensive Plan (RCP) for the San Diego Region includes an element titled “Integrated Regional Infrastructure Strategy (IRIS).” Local jurisdictions, acting together as the San Diego Association of Governments (SANDAG), have endorsed an urban form that channels much of the region’s future growth into existing urban communities where infrastructure and services are already in place. The RCP was developed using smart growth policies. The RCP states that if the goals and objectives of the RCP are implemented, an increasing proportion of the growth will occur as redevelopment and

urban infill. SANDAG established a \$25 million Smart Growth Incentive Program for infrastructure providers, which will act as the initial incentive for communities willing to adopt land use changes that support the RCP goals. Thus, the transportation-land use link will filter down to the jurisdictions’ capital improvement programs, and infill infrastructure funding will take place out of the competitive process.

The goal of the *TransNet* Smart Growth Incentive Program (SGIP) is to fund comprehensive public infrastructure projects and planning activities that will facilitate compact, mixed-use development focused around public transit, and that will increase housing and transportation choices. The projects funded under this program will serve as models for how modest investments in infrastructure and planning can make smart growth an asset to communities around the region. More information is available [here](#).

### K2. Value Capture

Value capture is a public finance tool that recognizes that transportation access provided by public tax dollars dramatically increases the value from and recoups a portion of that increased value to assist in paying for transportation investments. Value capture is based on the premise of proportionality – those who benefit most from transportation investments contribute the most.

There are a number of ways to capture the value of transportation infrastructure and services for reinvestment in the system. Value capture strategies can apply to unique properties, to localized districts, or even citywide. Value capture mechanisms include:

- **Tax Increment Financing (TIF)** captures future additional tax revenues resulting from the added value of a new transportation service and then borrows against them to provide up front financing for the transportation project. TIF districts are premised on the “but for” notion – enhanced

development value, and the resulting higher tax proceeds, would not be possible “but for” the provision of the enhanced transportation.

- **Transportation Benefit Districts or Special Assessment Districts (SAs)** are areas within which all properties are levied a fee for (typically) a new transportation project or service. They presume that properties in close proximity to this new service enjoy a special benefit and therefore are logically subject to a special assessment. Special assessment districts have been used across the country for such projects as modern streetcars in Portland or a new infill metro station in Washington DC. Special assessments can, in theory, cover the whole cost of new investment but most often cover all or part of the state or local portion of a project.
- **Development Impact Fees (DIF)** provide a mechanism for new development to pay for the new or expanded transportation facilities or services necessary to support it. They are often used in association with Adequate Public Facility Ordinances (APFOs) or concurrency requirements but do not require them. More than half of U.S. states use such fees in one form or another but they are most prevalent in fast-growing areas and have been utilized extensively in California, Texas and Florida. DIFs are generally applied at the county or municipal level. They are similar to development exactions, except that the transportation improvements they support are commonly off-site.

### **Portland, Oregon Transportation System Development Charges**

The City of Portland implemented a transportation system development (TSDC) charge program in 1997. The TSDC was the first multimodal TCSD, allocating project costs among motorized vehicles, transit, and nonmotorized (bicycle and pedestrian trips). The TSDC is calculated by the change in vehicle trips from the development (e.g., a development is charged for the additional trips its business adds to the City’s roads). The rates are based on what funds the City needs to construct infrastructure (capitol costs) to accommodate the additional trips the development creates. Generally, about one-quarter of a project’s cost may be paid for TSDC revenues. The remainder of the project costs is paid for with other revenue.

### **San Francisco Transit Impact Development Fee**

The City of San Francisco implemented a citywide Transit Impact Development Fee (TIDF) on most non-residential new development projects to offset the impacts on the transit system. Revenue generated by the fee is directed to the San Francisco Municipal Transportation Agency (SFMTA) and is used to fund Muni capital and operations.

The TIDF is calculated based on the number of gross square feet of new development multiplied by the TIDF per gross square foot of development rate.

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Economic Activity Category	TIDF per Gross Square Foot of Development
Day Care/Community Center	\$13.30
Post-Secondary School	\$13.30
Museum	\$11.05
Other Institutional	\$13.30
Management, Information, and Professional Services	\$12.64
Medical and Health Services	\$13.30
Production/Distribution/Repair	\$6.80
Retail/Entertainment	\$13.30
Visitor Services	\$12.64

Source: San Francisco Planning Code Ordinance Number 247-12

Effective February 2013, TIDF credits are available for small businesses and for developments that provide less parking than the maximum authorized under the Code. For example, developments that provide 50% or less of the maximum allowed parking receive a 90% TIDF credit.

## SUMMARY OF BEST PRACTICE POLICIES

The policies examined are applied in numerous ways:

- Place – by designated district or corridor
- Mode – e.g. a pedestrian district
- Type of development
- Size of development
- Enforcement - voluntary, design guideline, development review, or zoning code

The table below summarizes key elements of all policies examined.

**SUSTAINABLE STREETS + CENTERS**

City of Boulder

Figure 17 Summary of Policies

Category	Policy #	Topic	City	Code/Policy Name	Applies To	Policy Summary
L. Form-Based Code	A1	Form-Based Code	Denver, CO	Denver Commons Design Standards and Guidelines	Central Platte Valley District (industrial redevelopment)	Design standards for all district streets including - 33% of buildings must front property line - 6' median - pedestrian lighting - 10' minimum sidewalks
	A2	Form-Based Code	Santa Ana, CA	Transit Zoning Code	457 acre mixed-use district next to rail	- setback standard max 10' front yard - driveway max width 2-way of 25'
M. Large Retail Establishment Design Standards	B1	Façade Design Standards	Fort Collins, CO	Design Standards and Guidelines for Large Retail Establishments	-New retail larger than 25,000 sq ft - Any developments within Community Regional Shopping Centers	- Facades >100' require projections/recesses - 60% of ground floor requires windows, entrances, awnings
	B2.	Building Entrances	Fort Collins, CO	Design Standards and Guidelines for Large Retail Establishments	-New retail larger than 25,000 sq ft - Any developments within Community Regional Shopping Centers	Requires 2 entrances - most direct side of building and highest ped activity side

**SUSTAINABLE STREETS + CENTERS**

City of Boulder

Category	Policy #	Topic	City	Code/Policy Name	Applies To	Policy Summary
	B3.	Active Uses along Streets	Portland, OR	Zoning Code Chapter 33.130	Commercial developments located on a Transit Street or within a Pedestrian District	- Max setback 10'
	B4.	Internal Accessways	Portland, OR	Zoning Code Chapter 33.130	Developments over 100,000 sq ft who deviate from setback max on Transit Streets or in Pedestrian Districts (see above)	<ul style="list-style-type: none"> <li>- Internal streets provided with sidewalks</li> <li>- Parking areas no larger than 55,000 sq ft</li> <li>- Internal streets meet public street every 250 ft</li> </ul>
N. Functional Classification	C1.	City Street Classification Systems	Santa Monica, CA	Land Use and Circulation Element - street typologies	All streets - recommendations only	Design standards
		City Street Classification Systems	San Francisco, CA	Better Streets Plan, in Municipal Code 138.1	Any changes to ROW city-wide	Example: Neighborhood Street <ul style="list-style-type: none"> <li>- 15' sidewalks</li> <li>- Curb extensions</li> <li>- Trees</li> <li>- Sidewalk planters</li> </ul>

**SUSTAINABLE STREETS + CENTERS**

City of Boulder

Category	Policy #	Topic	City	Code/Policy Name	Applies To	Policy Summary
	C2.	City Adopted Multimodal Performance Measures	Pasadena, CA	Transportation Impact Review	New Residential >4 units New commercial >70 daily trips generated or >10 peak trips	Evaluates project impacts to all users; e.g. used to justify a road diet
O.Parking	D1.	Reduced Parking Requirements for High Frequency Transit	San Diego, CA	Municipal Code Chapter 14 (TOD Development Design Guidelines)	Transit Area Overlay Zone developments	- Reduces residential parking requirements by 0.25
		Reduced Parking Requirements for High Frequency Transit	Hayward, CA	Municipal Code Article 2 Section 10-2.404	All developments near transit	- Within 500' of bus, 1,000' of rail, and outside Central Parking District, allows reduction of up to 15% - Retail uses must provide a bus stop and shelter
		Eliminated Parking Minimums and Established Maximums	San Francisco, CA	Municipal Code Section 151.1	Downtown	No minimums; residential 1 space per 2 dwelling units
		Eliminate Parking Requirements	San Francisco, CAQ	Municipal Code Section 151.1	Downtown	- Establishes maximums - Parking unbundled from apartment cost - If >50 units, 1 space provided for carshare
		Demand-Based Parking Requirements	Cambridge, MA	City code Off Street Parking and Loading Requirements	Developments larger than 10,000 sq ft or >10 units	Estimate parking demand based on parking and vehicle ownership rates of similar developments

**SUSTAINABLE STREETS + CENTERS**

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Category	Policy #	Topic	City	Code/Policy Name	Applies To	Policy Summary
	D2.	Incentives for Structured Parking	Milwaukee, WI	Municipal Code section 19.611.4	Downtown developments	Additional 0.5 sq ft above max FAR for every 1 sq ft of structured parking
		Incentives for Structured Parking	Charlotte, NC	Transit Supportive Overlay Zone	Developments in overlay zone	Structured parking with active ground floor uses on 75% of first floor get FAR credit
		Incentives for Structured Parking	Gladstone, MO	Planned Mix Use District	Developments in mixed-use district	In developments with 200 or more spaces, no more than 50% can be at street level
	D3.	Parking Location Requirements	Albuquerque, NM	Form-based zoning code	Voluntary for all buildings	Locate parking behind building or to the side with screen
		Parking Location Requirements	Gladstone, MO	Planned Mix Use District	Developments in mixed-use district permitted to use shared facilities (not required)	Parking must be behind or to the side; surface parking seen from street must be screened with landscaping or a low wall
		Parking Location Requirements	Denver, CO	Zoning code	Main Street Zone Districts	<ul style="list-style-type: none"> <li>- No parking between building and street</li> <li>- Surface parking must be screened</li> <li>- Building setback no more than 1.5' from lot line</li> <li>- Building must take up at least 75% of the frontage on a main street</li> </ul>
	D4.	Shared Parking	Los Angeles, CA	Municipal Code Section 13.15	Modified Parking Requirement Districts	Developer assesses parking needs over 24 period across one week and can provide parking off-site up to 0.28 miles away
	D5.	Parking Lot Design	Portland, OR	Land Use Code chapter 33.248	All developments	1 tree per 4 parking spaces or 1 small tree per 2 parking spaces

**SUSTAINABLE STREETS + CENTERS**

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Category	Policy #	Topic	City	Code/Policy Name	Applies To	Policy Summary
P. Transit	E1.	Transit Stops Integrated with New Development	Portland, OR	NA	NA	University took lead and built streetcar station in new development
	E2.	Developer Transit Requirements	Montgomery County, MD	Transportation Policy Area Review	Policy areas defined by county	Developments that do not have adequate payment require develop to pay Traffic Mitigation Payment to go toward transit - ranges from \$1,228-\$20,258 per DU for residential and \$3.10-\$14.80 per sq ft for non-residential
	E3.	TOD Overlay Zone Districts	Fort Collins, CO	Municipal Zoning Code Division 3.10	TOD Overlay Zone developments	Requires: - Entrances facing street - parking behind buildings - Central feature/gathering space
	E4.	Transit Street Standards	San Francisco, CA	Municipal Code	Transit-first Policy for all changes to ROW	Guidelines for transit stops, bus bulbs, boarding islands by transit type
Q. Conflicting/Contradictory Boulder Conditions	F1.	Shared Use Paths	Seattle, WA	NA	Green Lake loop	Path separated into two lanes: bi-directional pedestrians traffic and one-way bicycle/wheeled traffic
		Shared Use Paths	Portland, OR	NA	Springwater Corridor	Intersection treatments for trail users
	F2.	Sight Triangles	Hercules, CA	CA Regulating Code	Downtown and waterfront	Requires corner curb radii 4-15' and clear zone with radii 25' to slow turning vehicles and reduce crossing distance
		Sight Triangles	Fort Collins, CO	Design Standards and Guidelines	All city streets	Sight triangle based on design speed

**SUSTAINABLE STREETS + CENTERS**

City of Boulder

Category	Policy #	Topic	City	Code/Policy Name	Applies To	Policy Summary
R. Block Standards	G1.	Maximum Block Size and Intersection Spacing	Fort Collins, CO	Land Use Code	Low-density mixed-use neighborhoods, community or neighborhood commercial districts, multifamily developments	Low density mixed-use: max block size 12 acres; neighborhood commercial: max block size 7 acres; multifamily: max block size 7 acres
		Maximum Block Size and Intersection Spacing	Hercules, CA	Regulating Code for the Central Hercules Plan	Downtown	Block lengths are limited to 500 feet and pedestrian passage-ways at 250-foot intervals are required; alleys are also required
		Maximum Block Size and Intersection Spacing	Surrey, BC	Road Network Concept Plan	Downtown	Road width concept defines hierarchy of roadway widths to serve varying mobility needs
S. Stormwater Mitigation	H1.	Stormwater Mitigation	Portland, OR	Portland Stormwater Management Manual	All development	Portland, Oregon requires any development of any size, whether new construction or redevelopment, to meet requirements for stormwater infiltration and discharge (either by on-site infiltration or off-site flow), flow control, and pollution reduction

**SUSTAINABLE STREETS + CENTERS**

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Category	Policy #	Topic	City	Code/Policy Name	Applies To	Policy Summary
T. Development Incentives for Public Amenities	I1.	Density Bonus for Public Space	Fort Myers, FL	Municipal Code Section 118.8.5	Certain urban center districts	Optional density bonus and increased height in certain urban center districts in exchange for meeting specific planned unit development criteria
	I2.	Public Space Requirement	Montgomery County, MD	Montgomery County Zoning Code	Certain urban center zones	Requires development in specific zones to dedicate a minimum percentage of the site to on-site public use space and a minimum percentage to off-site parkland or public right-of-way. <b>Example:</b> one development was required to allocate 23.2% of the lot for on-site public use space, 36.1% of the lot for off-site public use space, 34.7% of the lot for public amenity space, and install an art piece.
U. Street Tree Policies	J1.	Requirements for Street Trees in New Developments	Fort Collins, CO	Land Use Code Section 3.2.1	Citywide	All developments must plant "groves and belts of trees along city streets, in and around parking lots, and in all landscape areas that are located within fifty (50) feet of any building or structure. Canopy shade trees must be spaced exactly 30 feet to 40 feet apart and must make up at least 50% of all tree plantings on site.
	J2.	Requirements for Maintenance and Replacement of Street Trees	Portland, OR	City Code Chapter 20.40	Property owners of land next to street trees	Property owners next to street trees required to maintain the trees using specific arboricultural methods. If the property owner fails to properly maintain a tree and the tree causes harm to any person, the property owner is liable.

**SUSTAINABLE STREETS + CENTERS**

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Category	Policy #	Topic	City	Code/Policy Name	Applies To	Policy Summary
V. Funding/ Incentives	K1.	Developer Incentives	Champaign, IL	Redevelopment Incentive Program	East University Avenue Tax Increment Finance (TIF) District	Provides assistance for permanent building improvements, encouragement of residential development, and design work for new structures within the East University Avenue Tax Increment Finance (TIF) District.
		Developer Incentives	SANDAG, CA	TransNet Smart Growth Incentive Program	All jurisdictions in the region	SANDAG established a \$25 million Smart Growth Incentive Program for infrastructure providers, which will act as the initial incentive for communities willing to adopt land use changes that support the Regional Comprehensive Plan goals.
	K2.	Value Capture	Portland, OR	Transportation System Development Charges	All development	The TSDC was the first multimodal fee, allocating project costs among motorized vehicles, transit, and nonmotorized (bicycle and pedestrian trips). The TSDC is calculated by the change in vehicle trips from the development.
	K2.	Value Capture	San Francisco, CA	Transit Impact Development Fee	Most new non-residential development over 800 square feet	The City of San Francisco implemented a citywide Transit Impact Development Fee (TIDF) on most non-residential new development projects to offset the impacts on the transit system.

## 5 POTENTIAL SITE CHANGES

As discussed in Chapter 4 numerous exemplary policies could be applied to Boulder streets. In Phase II, the team will create a city-wide street typology and center system based upon the areas observed in Phase I. Thus a draft street typology system has been created to serve as the framework for the more detailed analysis to take place in Phase II. The purpose of street typologies is to guide design decisions by taking into account both a street's function from a transportation perspective as well as its land use context. A street typology contains land use and transportation metrics that create the ideal street of the specific type in which it falls, and the goal becomes bridging the gap between existing conditions and typology goals. Creating street typologies also helps guide the selection of 3-4 policies from the best practices section that can be applied to each site.

Overlays, or additional levels of design focus, are applied to enhance each type. For instance, historic districts, transit nodes, or pedestrian district overlays may be applied. A transit node, for example, might require additional sidewalk width to accommodate waiting transit passengers and passing sidewalk users. For example, the intersection of two commercial boulevards might be a designated downtown center, requiring shared parking, public space, and a transit stop.

For Boulder, five land use contexts, five roadway functions, and one two overlay types were selected, as summarized below.

- Street Context
  - Commercial – Larger-scale retail such as grocery stores or hardware stores as well as regional destinations and office uses.
- Residential – Single family and multifamily residential housing. Residential streets typically have sidewalks and on-street parking.
- Industrial – Warehouses, factories, and other large-scale industry.
- Institutional – Colleges, universities, and hospitals. On-street parking may be provided, but more typically surface parking is provided and should be placed behind building frontages.
- Mixed-Use - Neighborhood retail mixed with residential uses, civic spaces, and schools. On-street parking may be provided. Any surface parking is placed behind building frontages, which should primarily be accessed directly from the sidewalk.
- Roadway Function
  - Multiway Boulevard - Separate through travel lanes from local access lanes to simultaneously move vehicles while providing a calm, spacious pedestrian and living environment for adjacent residences and businesses.
  - Boulevard – Boulevards are primary travel routes providing direct connections and typically require spatial separation of all modes.
  - Avenue - Avenues carry a medium level of traffic. Often they are wide enough to support elements such as trees and on-street parking, but have lower speeds and volume than Boulevards, making for a pleasant walking environment. Avenues often function as neighborhood main streets.
  - General Street - Streets carry local traffic and are generally low volume and low speed.

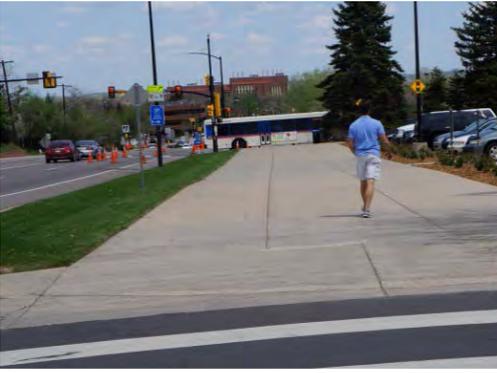
- Alleys – Alleys provide back-end access to residential and commercial development. Alleys are typically narrow and carry low volume and low traffic speed.
- Overlays
  - Transit Street – On a street with transit service, additional considerations include safe crossings at transit stops, passenger amenities, and pedestrian space.
  - Center Type – At intersections, street types may form centers of activity. At the intersection of two boulevards, for example, that are within a designated commercial center/downtown center district, extra care paid to urban design or requirements for public space concentrate activity and staying power within the center.

A draft street typology framework and street type overlay are provided in Figure 17 and Figure 18 below.

In creating street typologies, communities also determine the transportation and land use characteristics and design metrics for elements such as sidewalk width, building setback, driveway design, lighting standards, travel lane number and width, transit provisions, and other features.

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City of Boulder

Figure 18 Draft Street Typology Framework

		Land Use				
		Commercial	Residential	Industrial	Institutional	Mixed-Use
Street Type	Multiway Boulevard			N/A		
	Boulevard					
	Avenue			N/A	 	

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		Land Use				
		Commercial	Residential	Industrial	Institutional	Mixed-Use
Street Type	General Street			N/A		
	Alley				N/A	

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Figure 19 Street Type Overlay

	Commercial	Residential	Industrial	Institutional	Mixed-Use
Transit Street					
	Downtown Center	Regional Center	Industrial Center	Institutional Center	Neighborhood/Mixed-Use Center
Center Type			N/A		
					

## CONCLUSION

Analysis of the 14 sites is contained in Part 2 of this document. Emerging from Phase I, there are several themes that should be addressed:

**Connectivity.** Arterials may provide through access for cars, but because there are often no parallel through facilities, these arterials must also function as through access for walking and cycling. Thus arterials require robust walking and bicycling infrastructure. In areas that have superblock development patterns – a localized small street network boxed in by arterials – connecting parcels and intra-block streets allows people to circulate without being forced onto the arterials. A 1,500 block feels long and uninviting to a pedestrian; blocks of 200-500 feet impart a more urban feeling. Connectivity need not entail new public streets; rather, it can be achieved by formalizing existing parking lanes or through connecting parcels with paths.

**Crossings.** To walk or cycle, a person needs to cross streets. While resistance to additional signals is often high, it is also unsustainable to provide street crossings every half-mile. Long signal spacing leads to platooning and drivers speeding between signals, while shorter signal spacing can reduce congestion by progressing traffic at a steady rate. Similar to the city's standard for raised crossings at slip lanes, crossing spacing standards can be developed and met through a variety of means – RRFBs, refuge islands, overhead flashing signage, underpasses, or full signals.

**Match facilities to demand.** Many communities have found that arterial roadways built in the 1960s and 1970s have capacity that materializes for a few hours of the day, or not at all. At the same time, streets with high transit activity, for example, relegate pedestrians to 4-foot sidewalks. Streets can change, and can be modified over time to meet actual demand.

**Scale facilities appropriately.** Walking on a 4' sidewalk on a two-lane, 20 mph residential street is pleasant; walking on the same facility on a four-lane, 35 mph roadway is not. The wider the vehicle space and the faster the vehicle travel, the more separation is needed between modes. Generous sidewalk widths and paths help, but on Boulder's larger streets grass or planted buffers are also needed to mitigate the impacts of vehicles on pedestrians and cyclists.

**Parking management.** Parking is a currently a necessary feature of most developments, but its impact can be softened and reduced over time. Shared parking supplies in the center of a block, breaking up parking with trees, and reducing parking requirements can improve a street's walkability. Parking lots are major detractors to an interesting, walkable environment.

**Use street design to bring about city goals.** In addition, the sites have the ability to bring forth other related city initiatives such as affordable housing, access management, and transit priority corridors.

## **PART 2**

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*Part 2 of this document includes the site profiles, containing site strengths, weaknesses, opportunities, and potential changes. Study corridors were used as the basis for the profiles, but potential changes are to be viewed from a prototypical basis rather than as site-specific recommendations. The purpose is to show the types of places that could be created under a modified land use and planning system.*

## **PART 2**

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# 1 30th Street From Arapahoe Avenue To Boulder Creek Path

## Site Overview

### Key Diagram



This section of 30th Street lies on the north edge of the 30th Street study area just south of Arapahoe Avenue. Major landmarks include Scott Carpenter Park on the west side of the street and the University of Colorado's East Campus Laboratory on the east side of the street.

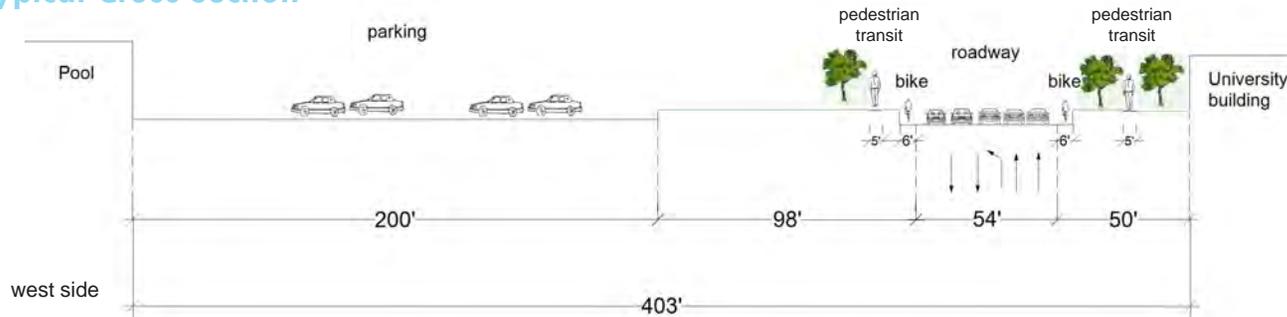
In general, this section of 30th Street is a relatively pleasant place to walk due to old growth trees and wide grass sidewalk buffers that line both sides of the street. Six-foot bicycle lanes are provided on both sides of the street. The street generally consists of two lanes per direction plus a left turn lane, with a narrow median as 30th Street approaches Arapahoe Avenue. There is no connectivity, however, between



the east and west sides of the street. Signals are located at Arapahoe Avenue and Colorado Avenue, leaving a half-mile in between without a pedestrian crossing. Numerous

pedestrians were observed running across the street between the Scott Carpenter Park parking lot and the CU East Campus Laboratory.

### Typical Cross Section



# 1. 30th Street From Arapahoe Avenue To Boulder Creek Path

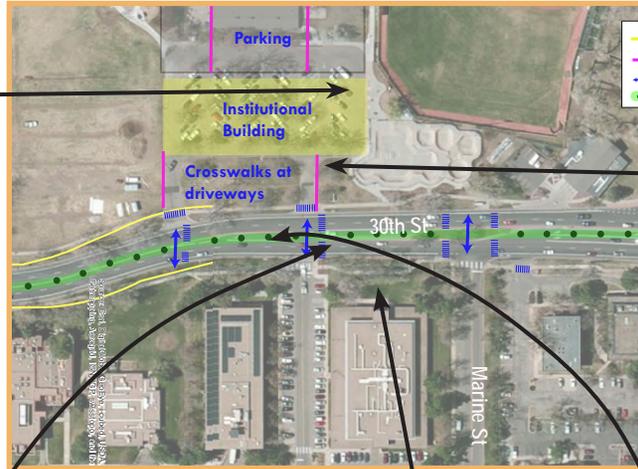
## Existing Conditions - Land Use & Site Design



**Existing** Pedestrians accessing Scott Carpenter Park from the street must walk through the parking lot.

**Opportunities** Ensure sidewalk connectivity between building, parking, and the street.

**Challenges** Site design codes may not currently require pedestrian infrastructure through parking lots.



**Existing** The pool building at Scott Carpenter Park is set behind parking and an expansive lawn. The front door is nearly 300' from the sidewalk.

**Opportunities** Adopt narrower setbacks. The greenery helps soften the parking lot.

**Challenges** Parking is often built in front of buildings, becoming a barrier between street views and the land use.



**Existing** The setback of approximately 50' is narrow enough to provide a sense of enclosure to the east side of the street.

**Opportunities** This setback is well-utilized with plantings and a ribbon path.

**Challenges** Setback is also a factor of street type. Wider streets may need wider buffers and sidewalks to feel safe, which in turn pushes building fronts farther from the street.



**Existing** Pedestrians have a sidewalk connecting directly from the CU East Lab to parking and the street.

**Opportunities** Layout of the site with parking in a narrow strip between buildings makes connections easier.

**Challenges** Sidewalks are often missing along driveways and parking areas in other portions of the study area.



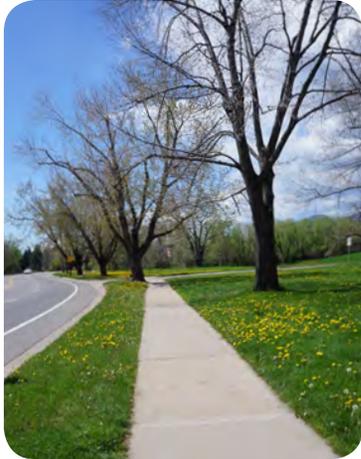
**Existing** Old growth trees and pedestrian seating provide a pleasant environment for pedestrians between the building and the street.

**Opportunities** Where space allows, provide seating and greenery between buildings and sidewalks.

**Challenges** Retrofitting existing spaces can be challenging to implement. Land may not be owned by the city.

# 1. 30th Street From Arapahoe Avenue To Boulder Creek Path

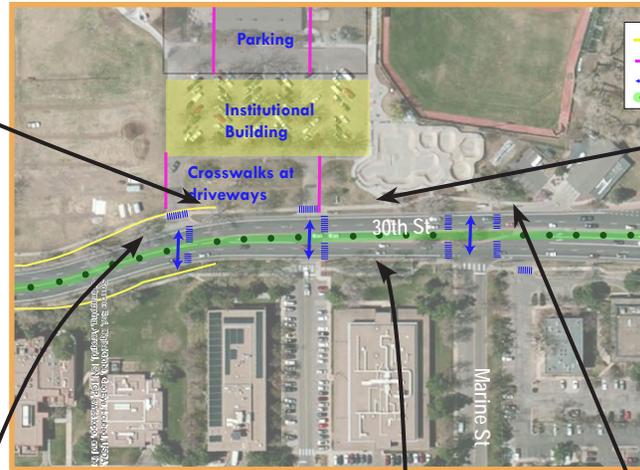
## Existing Conditions - Transportation



- Existing** Old growth trees line the street providing a buffer between the sidewalk and the street.
- Opportunities** Require landscaping between the street and the sidewalk, especially on streets with speed limits over 30 mph.
- Challenges** Retrofitting existing sidewalks may prove difficult.



- Existing** A 6-foot bike lane allows some bicyclists to feel comfortable biking, however, many also rode on the sidewalk.
- Opportunities** If space allows, provide a buffer between cyclists and vehicle traffic, which attracts more cyclists.
- Challenges** On a 35 mph road, a buffer may increase safety, but right-of-way may be limited.



- Existing** Perpendicular parking is located between the CU Research Lab buildings.
- Opportunities** This parking lot style allows the building to front the street instead of the parking area.
- Challenges** Space for this parking facility breaks up the building line.



- Existing** Pedestrians cross without a crosswalk between Scott Carpenter Park and the Research Lab at CU East Campus.
- Opportunities** Provide more mid block crossings on long stretches of road with no intersections (there is no crossing for over a half-mile from Arapahoe Avenue to Colorado Avenue).
- Challenges** Resistance to addition of signals.



- Existing** South of Arapahoe Avenue, the median widens briefly to include trees.
- Opportunities** Trees not only beautify streets, they also help calm traffic.
- Challenges** Street width varies throughout Boulder corridors, meaning space for a planted median is often unavailable for a street's full length.

# 1. 30th Street From Arapahoe Avenue To Boulder Creek Path

## “Typical” Section Data Details

		Parcel ID: 0085193	Parcel ID: 0085213
Site Design	Metric	West	East
	# of stories	0	3
	Setback from curb	286'	25'
	Building doors/windows	-	Face street
	Building permeability	Park	Windows/door
	Building has frontage?	N	Y
	Building frontage type	-	Sidewalk
	Zoning	Residential - Low 1 (RL-1)	Public (P)
	Land Use	Park	Research Lab
	Parking	Metric	West
Parking presence?		Y	Y
Parking type		Strip or wraparound parking	Large lot parking
Parking management		Business Restricted	UC Restricted
Estimate of occupancy		90%	0.9
Driveways		2	1
Driveway design		At sidewalk level	Across sidewalk
Greenery (b/t sidewalk and building)	Metric	West	East
	Landscaping Presence?	Y	Y
	Landscaping type	Full growth trees; lawn	Full growth trees
	Landscaping width	101'	20'
	Number of Trees	10	10
	Public space presence?	Y	Y
Bicycle	Metric	West	East
	Bike parking?	Y	Y
	Bike Lane presence?	Y	Y
	Multiuse Path?	N	N
	Bike lane/Path width	5'	6'
	Bike lane/Path buffer	0	0

		West	East
Pedestrian	Metric		
	Sidewalk presence?	Y	Y
	Sidewalk Width	5'	5'
	Sidewalk Condition	Meets demand; buffered	Meets demand; buffered
	Effective sidewalk width	5'	4'5"
	Buffer (b/t sidewalk and road)	Grass	Trees
	Buffer Width	6'	>5 ft
	# of Trees	1	5
	Midblock crossing presence?	N	N
	Midblock crossing type	-	--
	Ped/bike path to building front?	Y	Y
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	--	--
	Transit	Metric	West
Bus stop presence?		N	N
Bus stop condition		--	--
Distance from stop to legal crossing		--	--
Distance from stop to land use entrance		--	--
Traffic	Metric	West	East
	Block spacing	2668'	2668'
	Signal Spacing	2668'	
	Street Layout	2+2 with 1 Left turn lane	
	Width of Travel+Turn lanes	58'	
	Speed Limit	35	
	Median presence	N	
	Median Width	-	
Median type	-		

# 1 30th Street From Arapahoe Avenue To Boulder Creek Path

## Potential Changes



## STREET TYPOLOGY

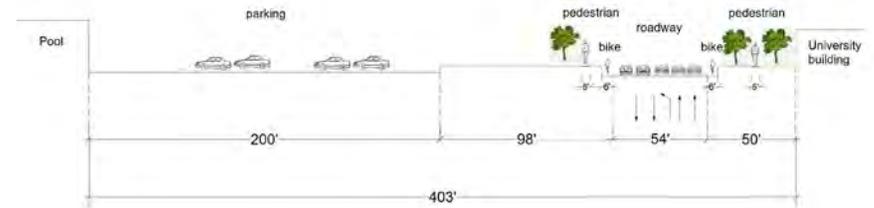
### Institutional Avenue

Institutional uses often have large parking facilities to handle influxes of users. To encourage employees and visitors to circulate by foot or bike, provide safe crossings. On a street without signals, this can be accomplished by providing a continuous median; this also beautifies the street.

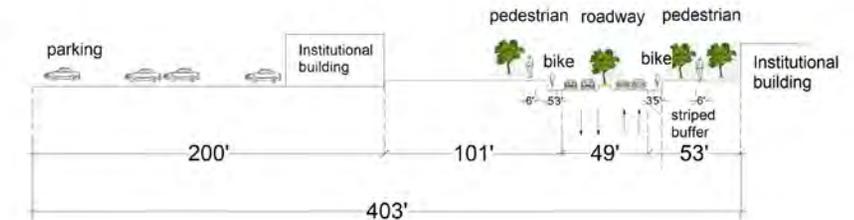
### Policies Applied

Code #	Code Name	Application to Prototype
A1	Form-based code	Adopt setback standards that accommodate institutional goals. Setbacks of 50-100' can be okay if they are grassy/landscaped.
C1	City street classification system	<p>The overarching typology system will include design metrics. On an Institutional Avenue these might include:</p> <ul style="list-style-type: none"> <li>• 6-12' sidewalks</li> <li>• Path or bicycle lane</li> <li>• Buffer on-street bike lanes (depending on vehicle speed and volume)</li> <li>• Trees every 20-25'</li> <li>• Lighting every 20-30'</li> <li>• Target speed 20-25 mph</li> <li>• Crossings every 300-600' or across from complementary uses</li> <li>• On-street parking optional</li> </ul>
D5	Parking lot design	Fold into institutional zone or require separately that parking areas include landscaping every block of 40 parking spaces or a tree per every 5 parking spaces.
G1	Maximum block size and intersection spacing	This can be included in the institutional form-based code, and may include maximum block size of 5 acres and crossings every 300-600'.

### Before



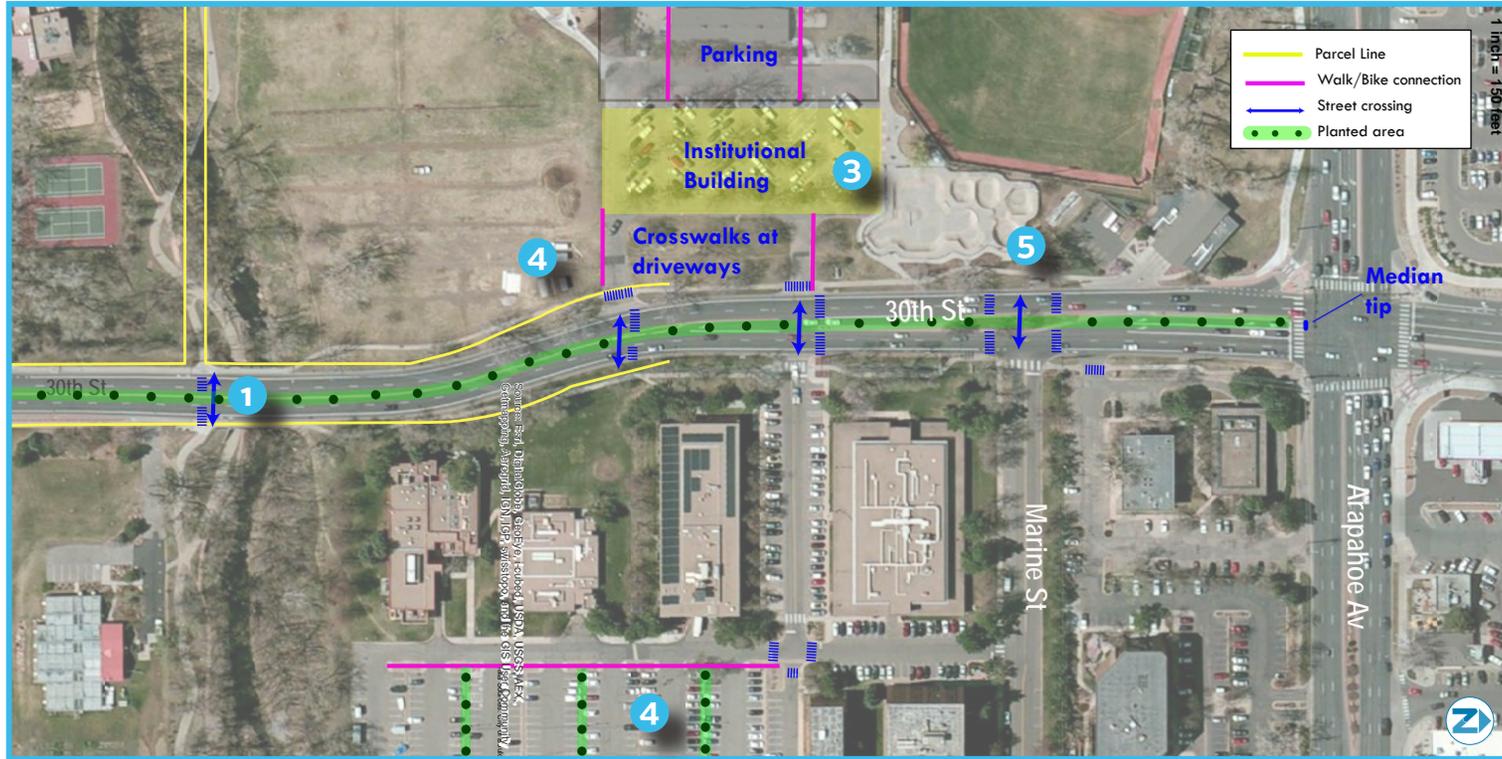
### After



On four lane roads with few driveways, removing a turn lane allows for a planted median and striped buffers between cyclists and drivers.

# 1. 30th Street From Arapahoe Avenue To Boulder Creek Path

## Potential Changes



**1** The street classification crossing spacing can be achieved by adding a median. This provides a refuge island (policy C1).

**3** Institutional design standards may allow for 50-100' green setbacks, which are often associated with campus developments, but stipulate that parking uses must be located behind an active use (policy A1).

**4** Including sidewalks or paths along driveways and through parking areas enforces a site's walkability. Breaking up large parking fields with streetscape provides visual interest and reduces runoff (policy D5).

**5** Block standards can be used to turn public street crossings into full intersections (policy G1).

**2** On boulevards and avenues, depending on 85th percentile speed and traffic volumes, protect cyclists with striped buffers or full separation (policy C1).



*Striped buffers add separation between cyclists and vehicle traffic on Baseline Road.*

# 2 30th Street From Boulder Creek Path To Colorado Avenue

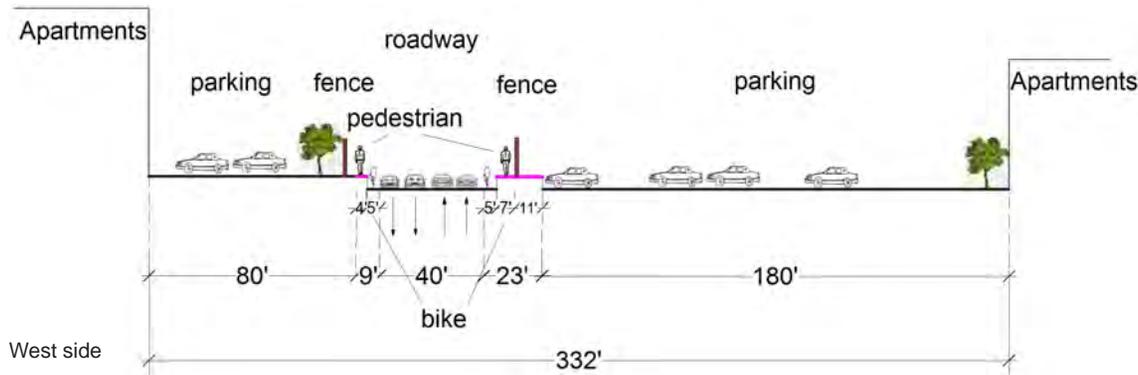
## Site Overview

### Key Diagram



This section of 30th Street is just north of Colorado Avenue. Compared to the site to the north on 30th Street with Scott Carpenter Park, this section feels very different for pedestrians with a 4-foot sidewalk and few trees, particularly on the west side of the street. Although there are bike lanes on both sides of the street, four 9-foot travel lanes at 35 miles per hour make the roadway feel high-speed and unsafe. As a result, numerous cyclists were documented riding on the sidewalk. Multifamily housing is located on both sides of the street. On the east side of the street, multifamily housing is street-facing with a wide landscaped barrier, large trees, and a wide sidewalk. Conversely, housing on the west side of the street is guarded by a fence that creates a physical barrier between the street/sidewalk and the building. This barrier makes walking along the street much more uncomfortable and also limits pedestrian connectivity from the street to the building.

### Typical Cross Section



## 2. 30th Street From Boulder Creek Path To Colorado Avenue

### Existing Conditions - Land Use & Site Design



**Existing** This apartment building is hidden behind a fence and parking lot.

**Opportunities** Increase permeability of properties by reducing fence height.

**Challenges** Fences along the sidewalk, especially on a narrow sidewalk, provide an unpleasant pedestrian experience.



**Existing** Walking north on 30th Street from Colorado Avenue, it appears like the sidewalk ends and becomes Smiley Court property.

**Opportunities** Maintain public sidewalks as open to all.

**Challenges** Private developer may intend a sidewalk for its residents only.



**Existing** A large parking lot is located in front of Smiley Court.

**Opportunities** Flip the courtyard style so the parking is behind the buildings.

**Challenges** Retrofitting an existing building is not feasible.



**Existing** An internal block network connects Smiley Court residents to their apartments.

**Opportunities** Provide greenery, trees, and pedestrian access between the sidewalk and the buildings.

**Challenges** Only two access points from Smiley Court go through the fence fronting the parcel.

## 2. 30th Street From Boulder Creek Path To Colorado Avenue

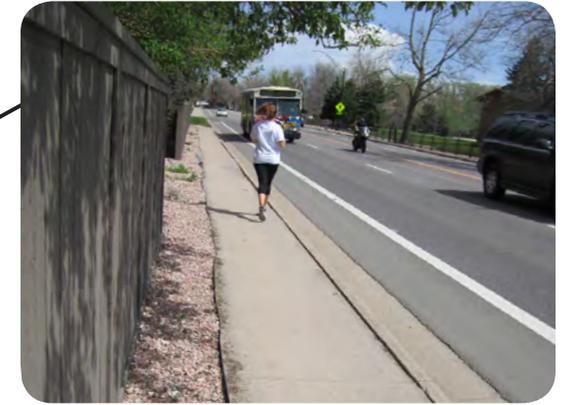
### Existing Conditions - Transportation



**Existing** This goat trail reveals a walking route from 30th Street up to Colorado Avenue.

**Opportunities** Connect pedestrian desire lines with sidewalks or paths.

**Challenges** This grade change makes adding pedestrian paths difficult.



**Existing** The sidewalk on the west side of 30th Street is only 4' wide and does not have a buffer. Bike lanes on both sides are just 4 - 5' wide.

**Opportunities** Vehicle volumes appear low; pilot a road diet that would allow expansion of pedestrian and bicycling facilities.

**Challenges** Careful tracking of before and after data will be needed to assuage concerns regarding traffic impacts.



**Existing** At Smiley Court, a fence separates the sidewalk; there is no gate to pass between each side from 30th Street to Boulder Creek Path.

**Opportunities** Privately built walking facilities should not be fenced off from public facilities.

**Challenges** It appears the concrete sidewalk may have been built by the developer. Ensuring coordination between private and city facilities is challenging without an agency leader.



**Existing** Bicyclists try to cross 30th Avenue.

**Opportunities** Crossing islands would allow people to cross in two stages.

**Challenges** The street does not have extra room for islands without a road diet.

## 2. 30th Street From Boulder Creek Path To Colorado Avenue

### “Typical” Section Data Details

		Parcel ID: 0006657	Parcel ID: 0085213
<b>Site Design</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	# of stories	3	2
	Setback from curb	80'	60 - 180'
	Building doors/windows	Not visible	Face street
	Building permeability	Wall	Poor - wide setback
	Building has frontage?	N	N
	Building frontage type	-	-
	Zoning	Residential Medium 2 (RM-2)	Public (P)
	Land Use	Residential	Residential
	<b>Parking</b>	<b>Metric</b>	<b>West</b>
Parking presence?		Y	Y
Parking type		Strip	Wraparound
Parking management		Residential Restricted	Residential Restricted
Estimate of occupancy		5%	0.6
Driveways		1	1
Driveway design		Across sidewalk	At sidewalk level
<b>Greenery (b/t sidewalk and building)</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	Landscaping Presence?	N	Y
	Landscaping type	N	Full growth trees
	Landscaping width	0	21'
	Number of Trees	0	5
	Public space presence?	N	N
Public space type	---	---	
<b>Bicycle</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	Bike parking?	N	Y
	Bike Lane presence?	Y	Y
	Multiuse Path?	N	N
	Bike lane /Path width	5'	5'
	Bike lane/Path buffer	0	0

		West	East
<b>Pedestrian</b>	<b>Metric</b>		
	Sidewalk presence?	Y	Y
	Sidewalk Width	4'	7'
	Sidewalk Condition	ADA Compliant	Meets demand; buffered
	Effective sidewalk width	4'	7'
	Buffer (b/t sidewalk and road)	No buffer	Pavers & Fence
	Buffer Width	0	0
	# of Trees	0	3
	Midblock crossing presence?	N	N
	Midblock crossing type	-	--
	Ped/bike path to building front?	N	Y
	Pedestrian-scale lighting?	Y on building	N
	Pedestrian lighting spacing	--	--
	<b>Transit</b>	<b>Metric</b>	<b>West</b>
Bus stop presence?		N	N
Bus stop condition		--	--
Distance from stop to legal crossing		--	--
Distance from stop to land use entrance		--	--
<b>Traffic</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	Block spacing	766'	1250'
	Signal Spacing	2668'	
	Street Layout	2+2	
	Width of Travel+Turn lanes	40'	
	Speed Limit	35	
	Median presence	N	
	Median Width	-	
Median type	-		

# 2 30th Street From Boulder Creek Path To Colorado Avenue

## Potential Changes

### STREET TYPOLOGY

#### Residential Transit Street

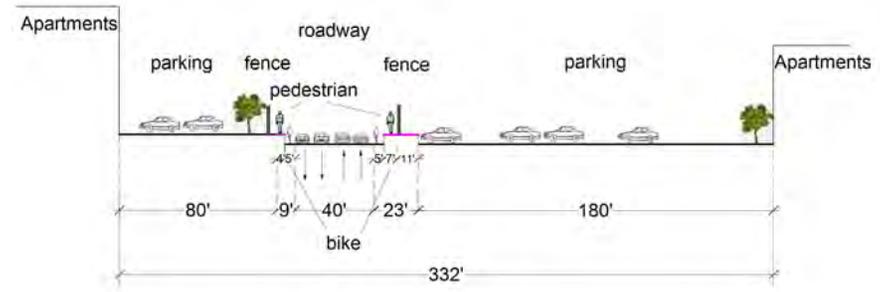
On streets with primarily one land use type (multi-family housing) make transit attractive to circulate residents to destinations. On-street parking imparts a more urban feeling to a street and increases supply.

#### Policies Applied

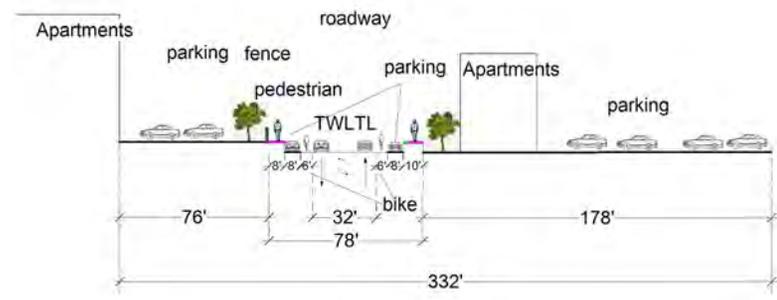
Code #	Code Name	Application to Prototype
C1	City street classification system	<p>The overarching typology system will include design metrics. On an Residential Transit Street these might include:</p> <ul style="list-style-type: none"> <li>• 6-12' sidewalks</li> <li>• Enhanced bus stops (shelter, real-time information)</li> <li>• 6' bicycle lane</li> <li>• Consolidate driveways when possible</li> <li>• Trees every 20-25' (or landscaping if space is not available)</li> <li>• Lighting every 20-30'</li> <li>• Target speed 15-20 mph</li> <li>• Crossings every 300-600' or at desire lines/ public streets</li> <li>• On-street parking</li> </ul>
B3	Active uses along streets	Residential setbacks can still include fences below a certain height and landscaping to provide privacy.
D1	Demand-based parking requirements	In a city like Boulder that has walkable streets and high bike mode share, parking requirements might not reflect reality. Assessing actual parking usage at different times of day may reveal reduced parking needs for residential development.
E4	Transit street standards	Develop design guides for transit streets or for any transit stop. Standards might include station design, amenities based on ridership, or bus-bike design options.



#### Before



#### After



On high-density residential streets, provide on-street parking. On streets with numerous driveways, a three-lane section with the center lane for left turns can increase safety by reducing rear-end collisions on the existing four-lane section.

## 2. 30th Street From Boulder Creek Path To Colorado Avenue

### Potential Changes



**1** Provide crossings at desire lines and connect public streets. Analyze volumes to determine lanes needed – signalized streets can carry approximately 800 vehicles per lane per hour (policy C1).

**2** Lower fence heights to eye level and modify site layout to wrap parking (policy B3).

**3** Analyze parking usage overnight and during a peak season to gauge actual demand for parking (policy D1).

**4** Enhance transit with bus bulbs, allowing transit amenities such as shelters and lighting in areas without wide sidewalks (policy E4).

# 3 30th Street From Colorado Avenue To Baseline Road

## Key Diagram

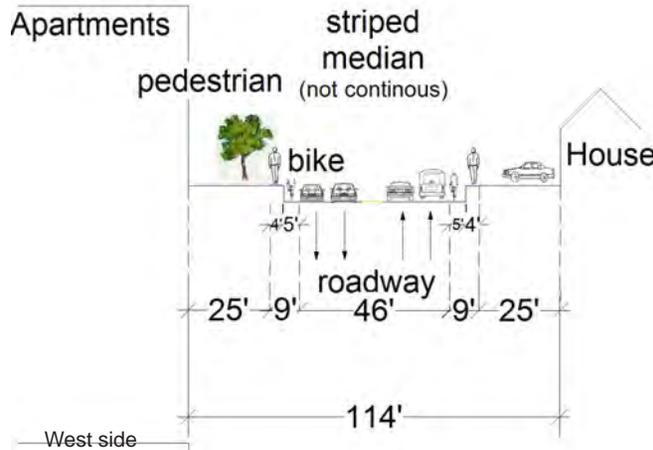


## Site Overview



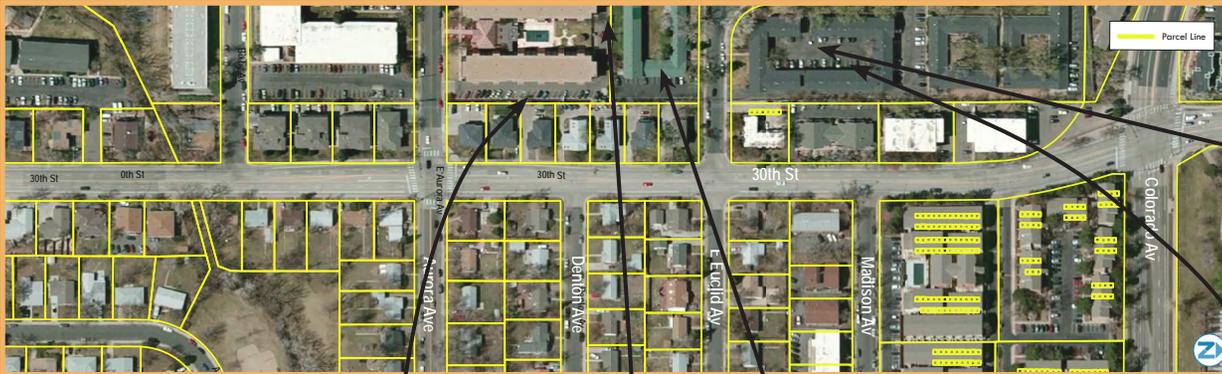
This section of 30th Street between Colorado Avenue and Baseline Road is a residential neighborhood with multi-family housing on the west side and single-family housing to the east. Buildings on the west side of the street are oriented away from the street (residents access homes from parking behind the buildings, with little pedestrian access to 30th Street). Although trees provide a buffer between the street and the buildings, there is no buffer between the sidewalk and the road on either side of the street. Sidewalks are also particularly narrow along this segment (4-feet) which makes for an unpleasant walking experience.

### Typical Cross Section



### 3. 30th Street From Colorado Avenue To Baseline Road

#### Existing Conditions - Land Use & Site Design



**Existing** Parking for uses along 30th Street is located behind apartment buildings, allowing active uses to front the street

**Opportunities** Build parking behind buildings.

**Challenges** Link parking spaces to the street as well.



**Existing** Fences block access between sites

**Opportunities** Limit fences between sites to foster internal block circulation.

**Challenges** Fencing is built by the developer; would require modifying building codes.



**Existing** A piece of this fence is missing in a development to the west of 30th Street, symbolizing a desire for improved connectivity between developments along the corridor.

**Opportunities** Provide a network of sidewalks between developments. Limit fences.

**Challenges** Requires changing building codes.



**Existing** This apartment building on Kent Street and Adams Circle exhibits positive elements of street fronting buildings with a green setback, a driveway leading into courtyard parking, and on-street parking.

**Opportunities** Use this design as one model for future apartment developments.

**Challenges** High-density housing similar to this would benefit from ground floor or corner retail.



**Existing** Bike parking located under the stairwell of an apartment building on 30th.

**Opportunities** Bike parking in creative locations provides de facto covered parking.

**Challenges** The bike parking remains unsecured.

### 3. 30th Street From Colorado Avenue To Baseline Road

#### Existing Conditions - Transportation



**Existing** A bicyclist rides on the 4' sidewalk. Although there is a bicycle lane, it is only 5' wide.

**Opportunities** Remove a travel lane to make more room for bicyclists and pedestrians.

**Challenges** Although vehicle volumes on 30th Street appear medium to low, a road diet may incite concerns about traffic flow.



**Existing** A group of people wait on a crowded sidewalk for the bus.

**Opportunities** Ensure that bus stops are located on sidewalks that allow at least 4' clearance around waiting passengers.

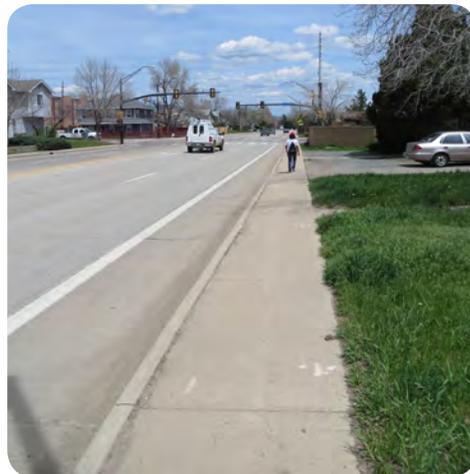
**Challenges** On a street with limited right-of-way, providing space for bus passengers requires a road diet or impinging upon private property.



**Existing** Housing along the west side of the street does not interface with 30th Street.

**Opportunities** Build sidewalks connecting apartments to the street.

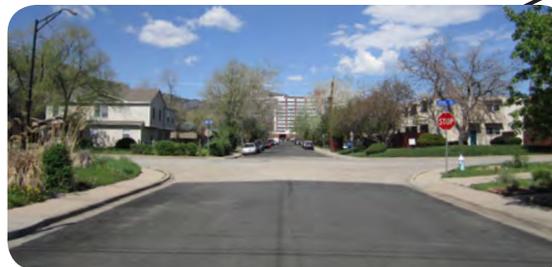
**Challenges** Require site connectivity in building code and site design.



**Existing** Narrow (4') sidewalks line the east and west sides of the street, making for an uncomfortable walking experience.

**Opportunities** Widen sidewalks to 6' minimum whenever possible and provide a buffer greenery between the sidewalk and the road.

**Challenges** Widening sidewalks on a street like 30th Street may require a road diet.



**Existing** Several streets intersect 30th Street between Colorado Avenue and Baseline Street, but there are no pedestrian crossings provided except at Aurora Avenue.

**Opportunities** People were observed crossing 30th Street to access residential areas. Provide crosswalks and pedestrian signals to foster safe connections.

**Challenges** Adding signal infrastructure requires time and resources.

### 3. 30th Street From Colorado Avenue To Baseline Road

#### “Typical” Section Data Details

		Parcel ID: 0011380	Parcel ID: 0011008
<b>Site Design</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	# of stories	2	1
	Setback from curb	31'	29'
	Building doors/windows	Street fronting	Street fronting
	Building permeability	Windows	Windows
	Building has frontage?	N	N
	Building frontage type	--	--
	Zoning	Residential - High 5 (RH-5)	Residential-Low 1 (RL-1)
	Land Use	Residential	Residential
<b>Parking</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	Parking presence?	N	Y
	Parking type	--	Driveway
	Parking management	Residential Restricted	Residential Restricted
	Estimate of occupancy	100% (behind building)	1
	Driveways	0	3
	Driveway design	--	Across sidewalk
<b>Greenery (b/t sidewalk and building)</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	Landscaping Presence?	Y	Y
	Landscaping type	Full growth trees; lawn	Full growth trees
	Landscaping width	31'	20'
	Number of Trees	3	3
	Public space presence?	N	N
<b>Bicycle</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	Bike parking?	N	N
	Bike Lane presence?	Y	Y
	Multiuse path?	N	N
	Bike lane width	5'	5'
	Bike lane/Path buffer	0	0

		West	East
<b>Pedestrian</b>	<b>Metric</b>		
	Sidewalk presence?	Y	Y
	Sidewalk Width	4'	4'
	Sidewalk Condition	ADA Compliant	ADA Compliant
	Effective sidewalk width	4'	2'8"
	Buffer (b/t sidewalk and road)	No buffer	No buffer
	Buffer Width	0	0
	# of Trees	0	0
	Midblock crossing presence?	N	N
	Midblock crossing type	--	--
	Ped/bike path to building front?	N	Y
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	--	--
<b>Transit</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	Bus stop presence?	N	N
	Bus stop condition	--	--
	Distance from stop to legal crossing	--	--
	Distance from stop to land use entrance	--	--
<b>Traffic</b>	<b>Metric</b>	<b>West</b>	<b>East</b>
	Block spacing	354'	1321'
	Signal Spacing	1347'	
	Street Layout	2+2 with Left turn lanes	
	Width of Travel+Turn lanes	45'-50'	
	Speed Limit	35	
	Median presence	Y - not continuous	
	Median Width	6' (when present)	
Median type	Striped		

# 3 30th Street From Colorado Avenue To Baseline Road

## Potential Changes

Focus Area



## STREET TYPOLOGY

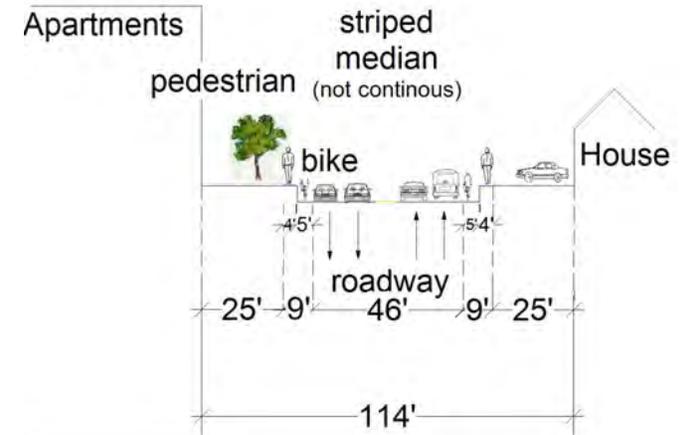
### Residential Avenue

As a Residential Avenue, this prototype's sidewalks and bicycle facilities are narrower than standard, spacing between crossings is a half-mile, there are numerous driveways, and parcels are not connected.

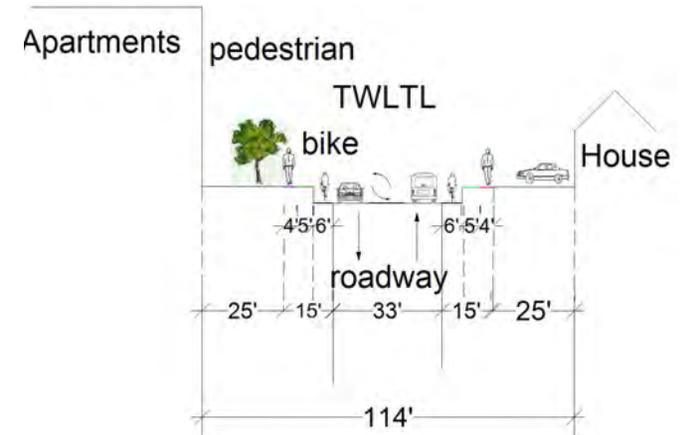
### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On a Residential Avenue, these might include: <ul style="list-style-type: none"> <li>• 6' sidewalks (minimum)</li> <li>• 5' buffer</li> <li>• 6' bike lanes</li> <li>• Trees every 20-25'</li> <li>• Driveway width &lt;12'; minimize driveways</li> <li>• Lighting every 25'</li> <li>• Target speed 25 mph</li> <li>• Crossings every 200-400'</li> <li>• Parking optional</li> </ul>
C2	City Adopted Multi-modal Performance Measures	Woven into development process to assess impacts to all modes; used to justify actions.
B4	Internal Accessways	Require consideration of alleys for residential access. Require development to provide a pedestrian or full motorized connection to at least two of its neighboring parcels.
G1	Maximum Block Size and Intersection Spacing	Limit block size to 5 acres and include pedestrian passageways every 250-500 feet.
I2	Public Space Requirement	In areas without access to public space (map green space within 5 and 10-minute walk from development), require a certain percent to be dedicated to public space.

### Before



### After



Add buffers to sidewalks and reduce rear-end collisions by turning the middle lane into a turn lane.

### 3. 30th Street From Colorado Avenue To Baseline Road

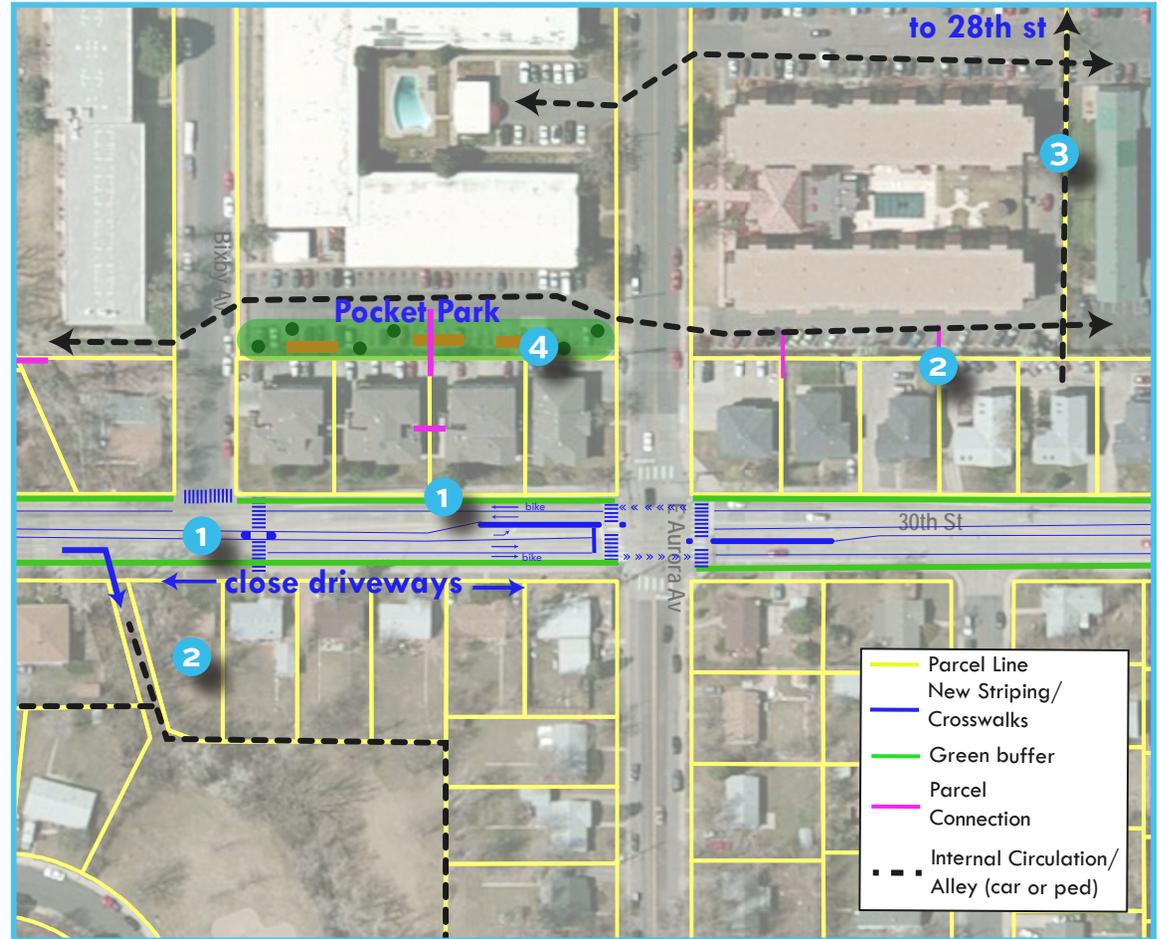
#### Potential Changes

**1** To achieve sidewalk and bike lane widths matching the street typology, narrow the four-lane road to three lanes, widen sidewalk, add a green buffer, and widen bike lanes. When possible, add crossing islands at public streets or desire lines (policy C1, C2).

**2** Reduce driveways (and thus vehicle-bike-pedestrian conflicts) by providing access to homes with alleys. Gates or other opening allow for intra-block circulation (policy B4).



*This alley in Portland, OR provides access to homes from the back of lots, allowing an uninterrupted curb line along the parallel main street.*



**3** A sidewalk or path adjacent to parking can connect parcels to each other and to adjacent streets (policy G1).

**4** In a high-density residential area not proximate to a park, provide green space in new developments for residents and the public (policy I2).

# 4 Colorado Avenue From Folsom to 28th Streets

## Site Overview

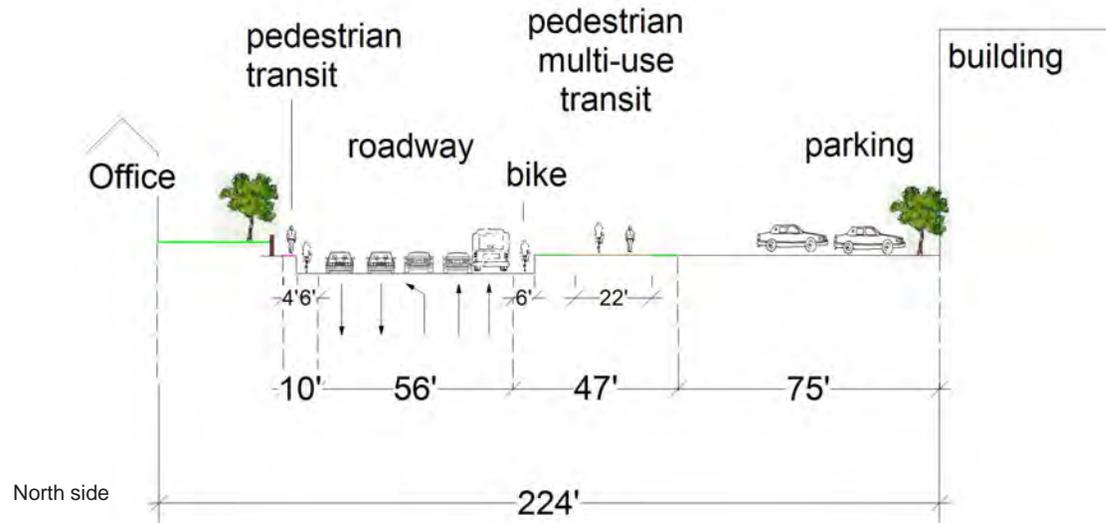
### Key Diagram



This site is located on Colorado Avenue between Folsom Street and 28th Street. The University of Colorado main campus is located on the south side of the street; residential housing is located on the north side of the street. The north and south sides of the street are markedly different. While a nearly 23' multiuse path with a wide grass buffer spans the south side of the street in front of the University, a mere 4' sidewalk with no buffer lines the north side of the street.



### Typical Cross Section



# 4. Colorado Avenue From Folsom To 28th Streets

## Existing Conditions - Land Use & Site Design



**Existing** Bicycle parking is provided against the building front.

**Opportunities** Ensure that bike parking is built in a secure, well-lit area like in the example.

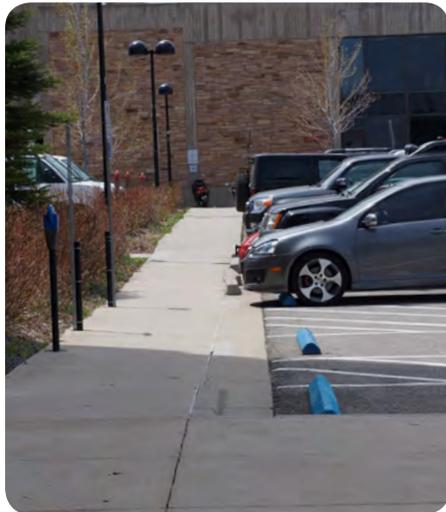
**Challenges** Given the snowy climate, covered bike parking protects bikes from the elements.



**Existing** Private street (26th Street) does not connect to the rest of the street network.

**Opportunities** Improve density of street network by adding a connection to University Heights Avenue.

**Challenges** There may not be public right-of-way available to make the connection.



**Existing** Sidewalk connects parking lot, building, and street in the block interior. Lighting is present above the sidewalk.

**Opportunities** Ensure sidewalks are installed within the site to improve circulation and access to the street.

**Challenges** Good site design must be built into city codes.



**Existing** This crosswalk goes through the parking lot.

**Opportunities** This is a good example of connecting the active land use to the sidewalk through parking.

**Challenges** Design parking lots to ensure low travel speeds to protect pedestrians.



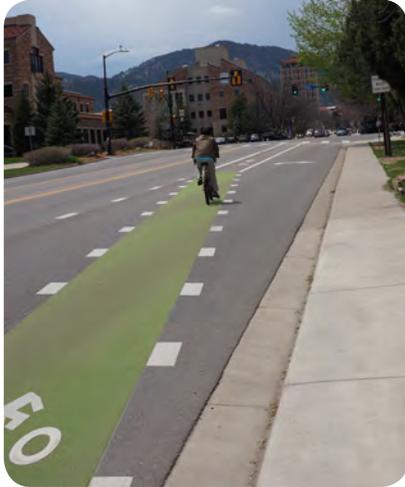
**Existing** Landscaped buffer between the multiuse path and street-facing parking.

**Opportunities** Landscaped parking buffers rather than concrete add visual interest and greenery.

**Challenges** This type of design may require additional drainage.

# 4. Colorado Avenue From Folsom To 28th Streets

## Existing Conditions - Transportation



**Existing** This “mixing zone” between cyclist and right turning vehicles has been painted green.

**Opportunities** Intersections are major conflict points for all users. Clarifying user space and highlighting vulnerable users is a great practice.

**Challenges** Pairing new designs with “yield to cyclist” signs may be useful in the short term.



**Existing** On the north side of Colorado Avenue, a 4’ sidewalk is blocked by trash cans.

**Opportunities** Widen sidewalks to a minimum of 6’ and require residents to place trash cans at the end of their driveway, not in the public realm.

**Challenges** When sidewalks are this narrow, any type of obstacle can create a major barrier for pedestrians.



**Existing** A bus stop with a bench has been recessed into the property, providing space for passengers to wait without blocking the sidewalk.

**Opportunities** Widen sidewalks to provide ample room for pedestrians and people waiting for the bus.

**Challenges** This works well only if property owners are willing.



**Existing** This raised crosswalk includes warning signage and an advisory speed limit for cyclists. The crossing island is protected with bollards.

**Opportunities** Raised crosswalks are common in Boulder and a great practice. Adding warning signage and bollards further protects pedestrians.

**Challenges** None.



**Existing** There is no crosswalk at the east leg of Regent Street and Colorado Avenue, a busy university location.

**Opportunities** At signalized intersections, stripe high visibility crosswalks at all intersection legs.

**Challenges** Intersections with missing crosswalks reduce pedestrian presence at crossings.

## 4. Colorado Avenue From Folsom To 28th Streets

### “Typical” Section Data Details

		Parcel ID: 0004889	Parcel ID: 0505295
<b>Site Design</b>	Metric	North	South
	# of stories	2	3
	Setback from curb	43'	115'
	Building doors/windows	Face Street	Behind Parking
	Building permeability	Windows/door	Poor - wide setback
	Building has frontage?	N	N
	Building frontage type	--	--
	Zoning	Residential Low 1 (RL-1)	Public (P)
	Land Use	Residential	School
	<b>Parking</b>	Metric	North
Parking presence?		Y	Y
Parking type		Driveway	Strip or wraparound parking
Parking management		Residential Restricted	Business Restricted
Estimate of occupancy		0%	0.8
Driveways		2	1
<b>Greenery (b/t sidewalk and building)</b>	Metric	North	South
	Landscaping Presence?	Y	Y
	Landscaping type	Tree lawn	Tree Wells
	Landscaping width	32'	7'
	Number of Trees	5	8
	Public space presence?	N	N
	Public space type	--	--
<b>Bicycle</b>	Metric	North	South
	Bike parking?	N	Y
	Bike Lane presence?	Y	Y
	Multiuse path?	N	Y
	Bike lane width	6'	6'
	Bike lane/Path buffer	0	0

		North	South
<b>Pedestrian</b>	Metric	North	South
	Sidewalk presence?	Y	N - Path
	Sidewalk Width	4'	22' 6" - Path
	Sidewalk Condition	ADA Compliant	Meets demand; buffered
	Effective sidewalk width	4'	22' 6" - Path
	Buffer (b/t sidewalk and road)	No buffer	Grass
	Buffer Width	0	>5 ft
	# of Trees	0	0
	Midblock crossing presence?	N	N
	Midblock crossing type	--	--
	Ped/bike path to building front?	N	Y
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	--	--
<b>Transit</b>	Metric	North	South
	Bus stop presence?	Y	N
	Bus stop condition	Sign only	--
	Distance from stop to legal crossing	49' (Short)	--
	Distance from stop to land use entrance	134' (Short)	--
<b>Traffic</b>	Metric	North	South
	Block spacing	768'	768'
	Signal Spacing	768'	
	Street Layout	3+3 with 1 Left turn lane	
	Width of Travel+Turn lanes	56'	
	Speed Limit	30	
	Median presence	N	
	Median Width	--	
Median type	--		

# 4 Colorado Avenue From Folsom to 28th Streets

## Potential Changes

Focus Area



### STREET TYPOLOGY

#### Institutional Transit Street

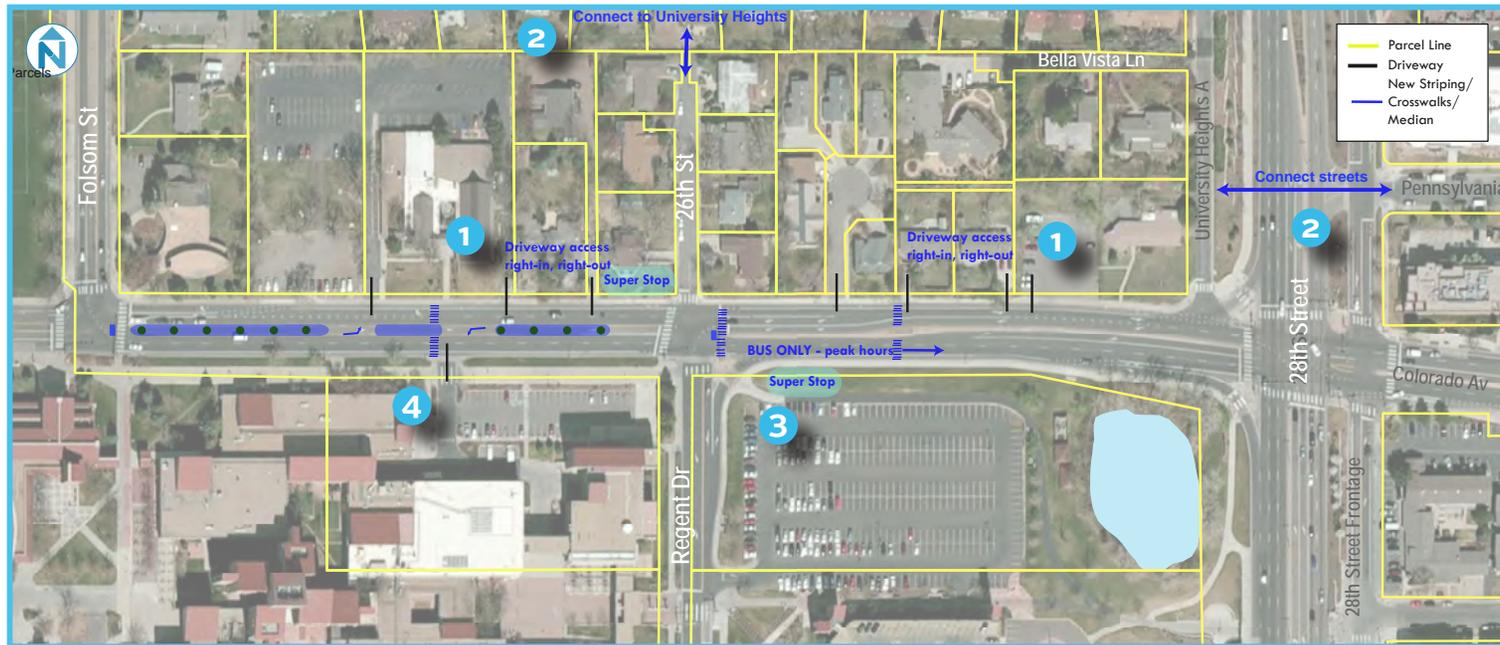
Prioritized transit to institutional uses can reduce the need for parking. Ensure fast travel times with peak-hour bus-only lanes and provide safe crossings across complementary uses, such as remote parking or offices and the institutional main campus.

#### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On an Institutional Transit Street these might include: <ul style="list-style-type: none"> <li>• 10-15' sidewalks</li> <li>• Enhanced bus stops (shelter, real-time information)</li> <li>• Super stop or transit hub at major destination</li> <li>• 6' bicycle lane and/or multi-use path</li> <li>• Provide median refuge island / gateway</li> <li>• Trees every 20-25' (or landscaping if space is not available)</li> <li>• Lighting every 20-30'</li> <li>• Target speed 25-30 mph</li> <li>• Crossings every 300-600' or at desire lines/public streets</li> <li>• Parking optional</li> </ul>
B4	Internal accessways	Connect public streets with bike/pedestrian or fully motorized access.
E4	Transit street standards	Develop design guides for transit streets or for any transit stop. Standards might include station design, amenities based on ridership, or bus-bike design options. On a busy street, the standards toolbox may include peak hour bus-only lanes.
G4	Maximum block size and intersection spacing	If vehicle speeds are low, unsignalized crossings can be provided using medians as refuge islands paired with warning signage.

## 4. Colorado Avenue From Folsom To 28th Streets

### Potential Changes



**1** A median refuge can still allow driveway access. For low-volume driveways, a continuous median can be provided, limiting access to right-in, right-out. On a connected city grid, this is not onerous to driveway users and the median provides opportunity for pedestrian crossings (policy C1).

**2** Provide alternate routes by connecting public streets (policy B4).

**3** Designate curb lanes as bus-only during peak hours and pair with “super stops” with excellent amenities (policy E4).

**4** When spacing between public streets is long (>600’) integrate midblock crossings (policy G4).

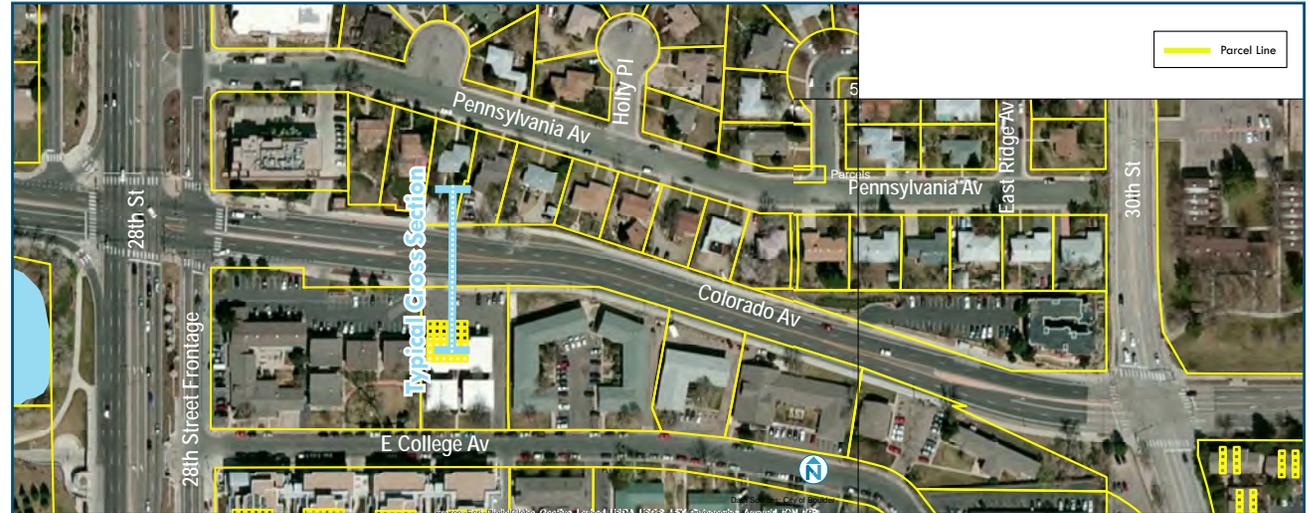
# 5 Colorado Avenue From 28th To 30th Streets

## Site Overview

### Key Diagram

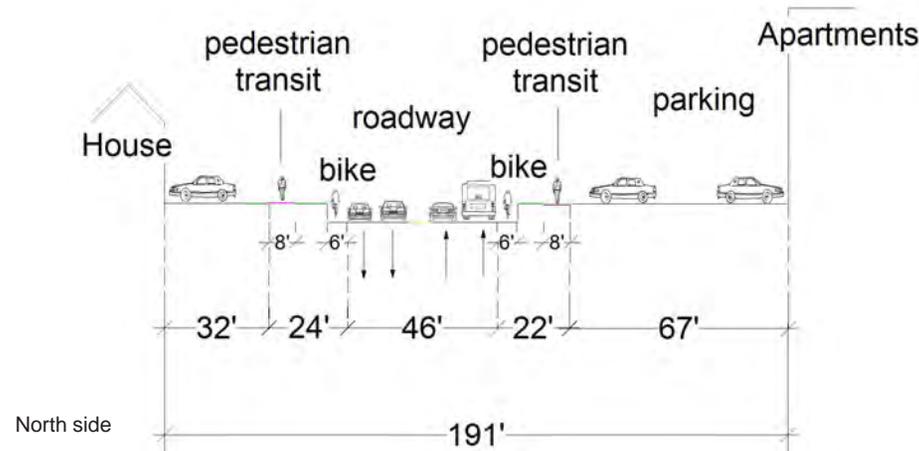


This section of Colorado Avenue is unique in that the land uses along it face away from the street. College Avenue to the south and Pennsylvania Avenue to the north are the “front doors” of the residential land uses that line Colorado Avenue – single family along the north side and multi-family, high density to the south. If the function of Colorado Avenue is for movement of vehicles, there is an opportunity to connect College and Pennsylvania Avenues to the east and west to create bicycle boulevards or quieter places to walk.



Colorado Avenue consists of two lanes per direction with one left turn lane at the intersections. Bike lanes and generous (8’ sidewalks), plus generally low vehicle volumes observed during weekdays, combine to make for a fairly safe walking and cycling environment.

### Typical Cross Section



## 5. Colorado Avenue From 28th To 30th Streets

### Existing Conditions - Land Use & Site Design



Pennsylvania Ave



Colorado Ave



**Existing** Residential development closer to 30th Street is cut off from the street with no connection to the sidewalk.

**Opportunities** Provide a sidewalk or path from a development to the closest street on all sides.

**Challenges** None

**Existing** Back doors of single-family housing on the north side of the street face Colorado Avenue. One block north, Pennsylvania Avenue provides front door access to homes and a quiet place to walk or cycle.

**Opportunities** Promote side streets as bicycle boulevards, which is especially important to attract novice cyclists.

**Challenges** Pennsylvania Avenue does not connect east to 30th Avenue.



**Existing** Several apartments have their front doors facing College Avenue, providing courtyard public space.

**Opportunities** Incorporate public space into apartment developments.

**Challenges** Due to the narrow lot size between Colorado and College Avenues (around 150-200 feet) the backs of buildings will end up against one street.



**Existing** Colorado Avenue is the “back door” to developments along Pennsylvania and College Avenues.

**Opportunities** If parking is built behind a parcel, adopting a U-style building means that part of the building will still front on the street.

**Challenges** Some parcels were developed without full intensity of use, making it difficult to add density.

# 5. Colorado Avenue From 28th To 30th Streets

## Existing Conditions - Transportation



**Existing** Parallel Pennsylvania Avenue provides a quieter, safer feeling than Colorado Avenue; however, the street does not go through.

**Opportunities** If residents are concerned about traffic, providing a non-motorized path connection across 30th Street can still densify the block network without accommodating cars.

**Challenges** Such a connection might cut through private property.



**Existing** At this driveway, the sidewalk level is maintained across the access point, which is a good practice.

**Opportunities** Design sidewalks as dominant over driveways.

**Challenges** At locations without a sidewalk buffer, the driveway grade will be sharp leading down from sidewalk to street.



**Existing** This median tip at 28th Street and Colorado Avenue protects crossing pedestrians from turning traffic.

**Opportunities** Extend medians past crosswalks when present.

**Challenges** Many medians in Boulder are just 3' wide, which is too narrow to protect a cyclist or a person wheeling a stroller if they end up waiting in the center of the crosswalk.



**Existing** The crossing and underpass to CU provided at College Avenue makes this street ideal as a walking and biking route.

**Opportunities** Connect College Avenue east across 30th Avenue to 33rd Street or Madison Avenue and provide a connection to multi-use paths.

**Challenges** Connections may cut through private property.



**Existing** Lighting at crosswalks is decent during early morning hours, but lights quickly fade away between street lights, leaving transit access routes dark.

**Opportunities** Add lighting midblock to illuminate walking routes.

**Challenges** Narrow sidewalks leave little room for adding poles.

## 5. Colorado Avenue From 28th To 30th Streets

### "Typical" Section Data Details

		Parcel ID: 0005823	Parcel ID: 081876
Site Design	Metric	North	South
	# of stories	2	2
	Setback from curb	50'	83'
	Building doors/windows	Lawn	Behind Parking
	Building permeability	Windows/door	Poor - wide setback
	Building has frontage?	N	N
	Building frontage type	--	--
	Zoning	Residential Low 1 (RL-1)	Residential High 3 (RH-3)
	Land Use	Residential	Residential
	Parking	Metric	North
Parking presence?		Y	Y
Parking type		Driveway	Strip or wraparound parking
Parking management		Residential Restricted	Residential Restricted
Estimate of occupancy		0%	0.5
Driveways		2	1
Driveway design		At sidewalk level	At sidewalk level
Greenery (b/t sidewalk and building)	Metric	North	South
	Landscaping Presence?	Y	N
	Landscaping type	Tree lawn	-
	Landscaping width	95'	0
	Number of Trees	0	0
	Public space presence?	N	N
Bicycle	Metric	North	South
	Bike parking?	N	N
	Bike Lane presence?	Y	Y
	Multiuse path?	N	N
	Bike lane width	6'	6'
	Bike lane/path buffer	0	0

		North	South
Pedestrian	Metric	North	South
	Sidewalk presence?	Y	Y
	Sidewalk Width	8'	8'
	Sidewalk Condition	Meets demand; buffered	Meets demand; buffered
	Effective sidewalk width	4'	8'
	Buffer (b/t sidewalk and road)	No buffer	Grass
	Buffer Width	0	2-8'
	# of Trees	0	0
	Midblock crossing presence?	N	N
	Midblock crossing type	--	--
	Ped/bike path to building front?	Y	N
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	--	--
Transit	Metric	North	South
	Bus stop presence?	N	N
	Bus stop condition	--	--
	Distance from stop to legal crossing	--	--
	Distance from stop to land use entrance	--	--
Traffic	Metric	North	South
	Block spacing	1400'	1400'
	Signal Spacing	1400'	
	Street Layout	2+2 with 1 Left turn lane	
	Width of Travel+Turn lanes	60'	
	Speed Limit	30	
	Median presence	Y	
	Median Width	5-10' (tapered)	
Median type	Striped / Concrete (not continuous)		

# 5 Colorado Avenue From 28th To 30th Streets

## Potential Changes



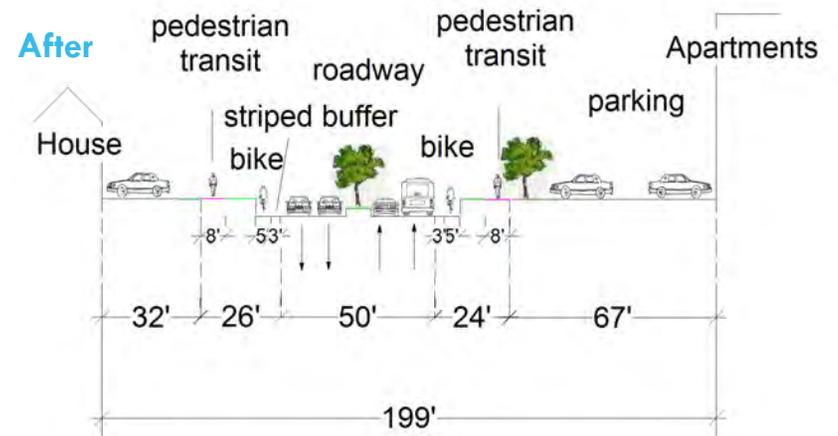
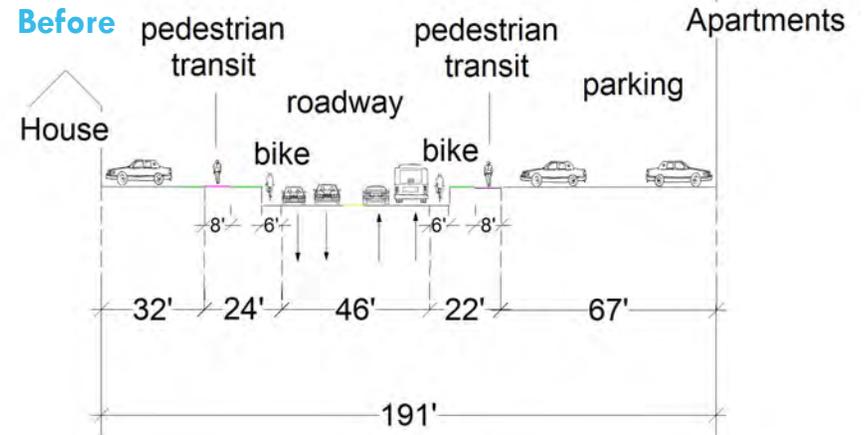
### STREET TYPOLOGY

#### Residential Avenue

In a primarily residential area with a four-lane street, incorporate landscaping to soften the impact of traffic and make the street welcoming for walking and cycling. Most study area streets are avenues, boulevards, or multiway boulevards, but this site affords the chance to examine a residential general street on the blocks parallel to the primary corridor.

#### Policies Applied

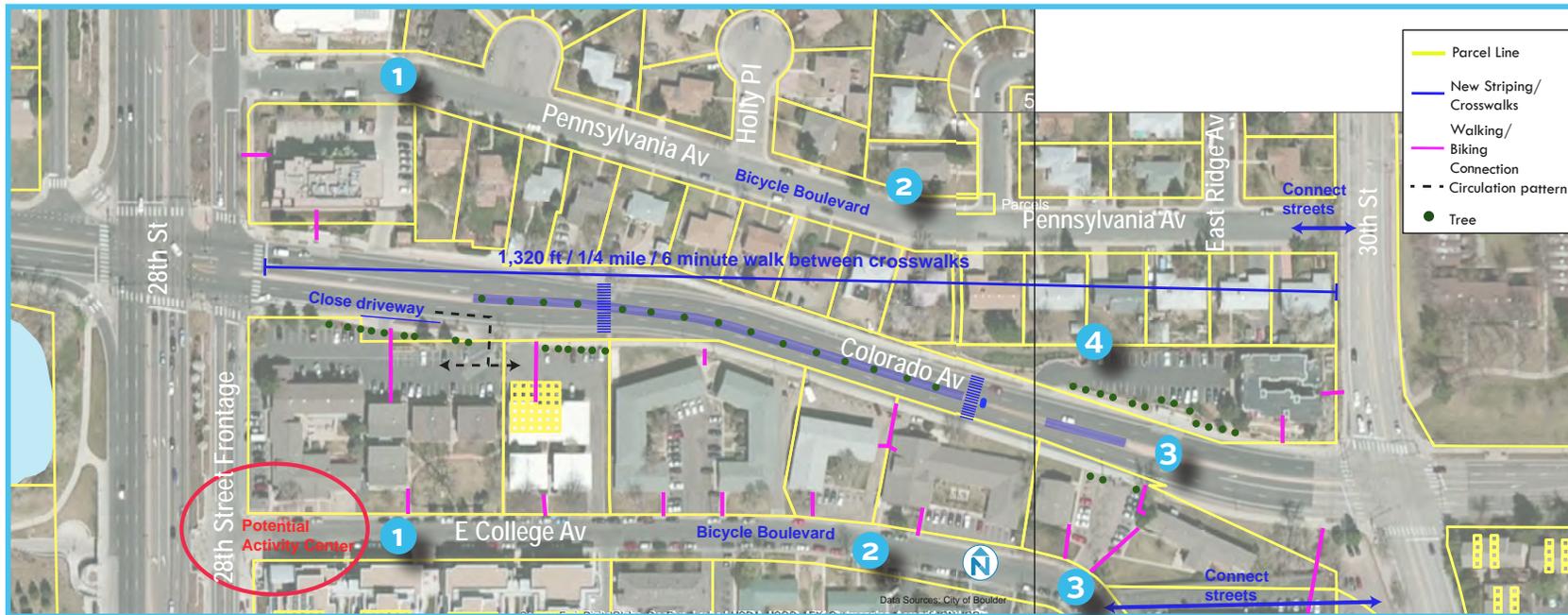
Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On a Residential Avenue, characteristics will be similar to site #3 (also a Residential Avenue). Parallel to the Residential Avenue are potential Residential General Streets, with characteristics that might include: <ul style="list-style-type: none"> <li>• 6-8' sidewalk</li> <li>• Bicycle Boulevard (if part of master plan network)</li> <li>• Lighting every 30'</li> <li>• On-street parking</li> <li>• Target speed 15-20 mph</li> </ul>
B2	Building entrances	Require developments to provide an access point to adjacent public streets the development abuts.
D3	Parking location requirements	Require surface parking to be shielded from public view.
J1	Street tree requirements	Allow parking location requirement to be met through planting of trees.



*In instances where four lanes are needed due to traffic volumes, slightly widening the cross section allows for a continuous, planted 8-foot median, greatly adding to a street's aesthetics.*

## 5. Colorado Avenue From 28th To 30th Streets

### Potential Changes



**1** On Residential General Streets, vehicle speeds and volumes are low, meaning the street requires less design features to ensure safety and comfort. People feel safe crossing at any location or cycling in travel lanes (policy C1).

**2** Bicycle boulevards often run parallel to larger arterials and provide a low-speed, low-volume place to ride. Connected street networks are needed for effective bicycle boulevards (policy C1).



*This bicycle boulevard in Portland, OR parallels an arterial. Rather than stop signs or signals that slow cyclists, the boulevard utilizes traffic circles.*

**3** On streets with narrow blocks, often times one side of development (front door) faces one street while the other side (back door) faces another street. Provide access to both sides of development from public streets (policy B2).

**4** Trees can shield street users from viewing a parking field, and can be maintained by the developer (policies D3, J1).

# 6a Colorado Avenue From 30th Street To Innovation Drive

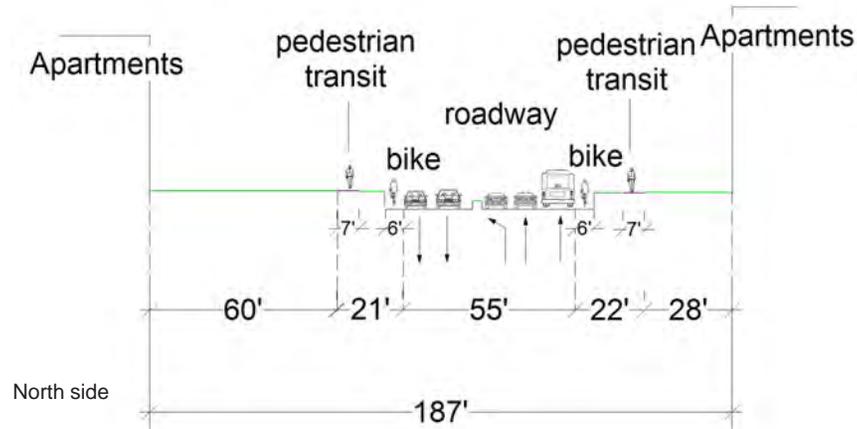
## Site Overview

### Key Diagram



The nature of Colorado Avenue closer to 30th Street has a distinct feel different from the section east of Wimbledon Court, thus this section has been subdivided into two sections. The design of intersections is crucial to imparting a definition to street space. At 30th Street and Colorado Avenue, there are active uses (residential) on all four corners, but many are fenced off from the intersection. The developments on the northwest and southeast corners front the street, helping to shape the intersection. The development at the northeast corner is set back from the street and fenced. East of 30th Street, traffic volumes appear fairly low. On-street bicycle lanes transition into paths east of section 6a.

### Typical Cross Section



## 6a. Colorado Avenue From 30th Street To Innovation Drive

### Existing Conditions - Land Use & Site Design



**Existing** A fence cuts off access to Smiley Court.

**Opportunities** With such a wide green setback, there is potential for public open space fronting the apartment building.

**Challenges** Private property owners may want to restrict access.



**Existing** On the southeast corner of 30th Street and Colorado Avenue, the Wimbledon apartment complex fronts the street.

**Opportunities** Having a use on the corner of each intersection defines the space, even if doors do not open directly out onto the street.

**Challenges** The nature of apartment buildings means that a blank wall will face one side – in this case, 30th Street.



**Existing** The tree canopy and apartments help frame the street.

**Opportunities** Fences protect the privacy of ground floor residents without blocking the land use from view from the street.

**Challenges** Adopt height limits on fencing.



**Existing** Some bike parking has been provided under stairwells.

**Opportunities** The unused space beneath stairwells helps shield bicycles from weather.

**Challenges** An enclosed space would provide security from theft as well.



**Existing** Wimbledon apartments have a donut pattern, with parking hidden in the lot interior.

**Opportunities** Good sidewalk circulation has been provided in the parking areas.

**Challenges** Away from the street, developments need good lighting to provide security.

## 6a. Colorado Avenue From 30th Street To Innovation Drive

### Existing Conditions - Transportation



**Existing** This is a well-designed bus stop, but it is cut off from the most active use in the area, Smiley Court apartments.

**Opportunities** Provide a fence opening and path from the bus stop to Smiley Court.

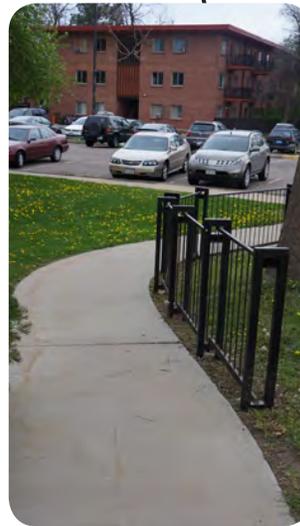
**Challenges** If security issues are present, the gate might require key access.



**Existing** A grassy median measures 14' at its widest and leads up to 30th Street.

**Opportunities** Approaching 30th Street, this resource could be used as a gateway or planted to slow travel speeds entering the busier section of Colorado Avenue west of 30th Street.

**Challenges** The median is fairly short – approximately 90 feet – potentially limiting possibilities.



**Existing** A path is provided from the parking lot out to Colorado Avenue.

**Opportunities** Numerous pedestrians and cyclists were observed using 30th Street; this type of path promotes non-motorized access to this high-density use.

**Challenges** Pathways require lighting to ensure safe access.



**Existing** At the Smiley Court apartment entrance off 30th Street, a walkway is provided along the driveway and into the parking lot.

**Opportunities** Require sidewalks along driveways and access roads.

**Challenges** There is no crossing for pedestrians, and the median island is just 3' wide at this location.



**Existing** The entrance to Wimbledon Apartments lacks sidewalks.

**Opportunities** Driveways, part of the private property, often lack connections. Require driveways to provide sidewalks.

**Challenges** Adding sidewalk might require new drainage.

## 6a. Colorado Avenue From 30th Street To Innovation Drive

### “Typical” Section Data Details

		Parcel ID: 0085213	Parcel ID: 0093612
<b>Site Design</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	# of stories	2	3
	Setback from curb	80'	50'
	Building doors/windows	Lawn	Face away from street
	Building permeability	Poor - wide setback	Windows/door
	Building has frontage?	N	N
	Building frontage type	-	-
	Zoning	Public (P)	Residential High 5 (RH-5)
	Land Use	Residential	Residential
	<b>Parking</b>	<b>Metric</b>	<b>North</b>
Parking presence?		Y	Y
Parking type		Parking behind building	Strip or wraparound parking
Parking management		Residential Restricted	Residential Restricted
Estimate of occupancy		40%	0.5
Driveways		0	1
Driveway design		Across sidewalk	At sidewalk level
<b>Greenery (b/t sidewalk and building)</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Landscaping Presence?	Y	Y
	Landscaping type	Full-growth trees; lawn	Full-growth trees; lawn
	Landscaping width	60'	28'
	Number of Trees	11	6
	Public space presence?	N	N
<b>Bicycle</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Bike parking?	Y	Y
	Bike Lane presence?	Y	Y
	Multiuse path?	N	N
	Bike lane width	6'	6'
	Bike lane/Path buffer	0	0

		North	South
<b>Pedestrian</b>	<b>Metric</b>		
	Sidewalk presence?	Y	Y
	Sidewalk Width	7'	7'
	Sidewalk Condition	Meets demand; buffered	Meets demand; buffered
	Effective sidewalk width	7'	7'
	Buffer (b/t sidewalk and road)	Grass	Trees
	Buffer Width	>5 ft	>5 ft
	# of Trees	0	2
	Midblock crossing presence?	N	N
	Midblock crossing type	-	-
	Ped/bike path to building front?	Y	N
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	-	-
<b>Transit</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Bus stop presence?	Y	N
	Bus stop condition	Sign + bench	-
	Distance from stop to legal crossing	544'	-
	Distance from stop to land use entrance	110'	-
<b>Traffic</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Block spacing	493'	493'
	Signal Spacing	3800'	
	Street Layout	2+2	
	Width of Travel+Turn lanes	55'	
	Speed Limit	30	
	Median presence	Y	
	Median Width	3'	
Median type	Grass		

# 6a Colorado Avenue From 30th Street To Innovation Drive

## Potential Changes

Focus Area



### STREET TYPOLOGY

#### Residential Avenue

High-density residential areas are candidates for further density and can be supported with high-frequency transit.

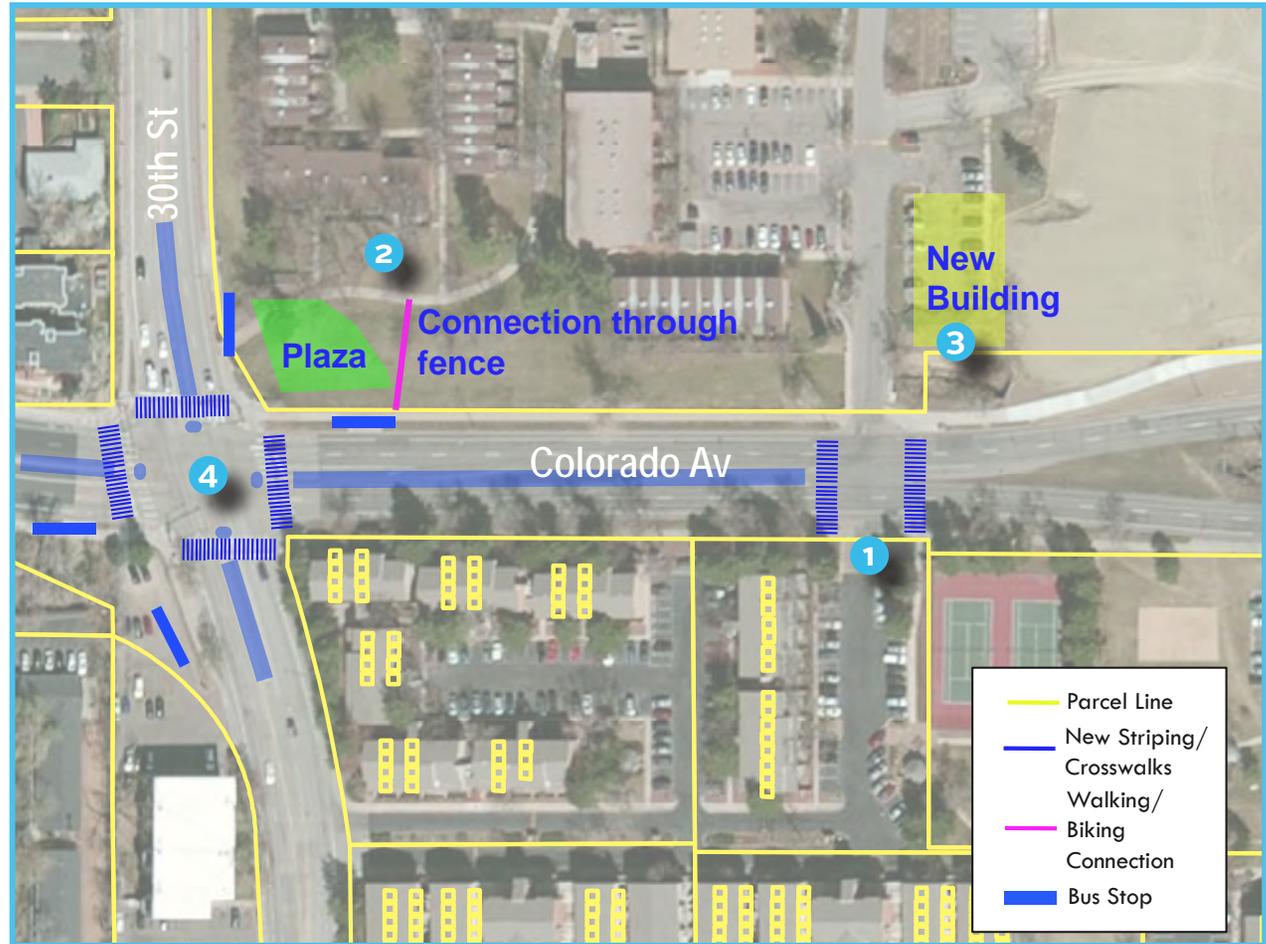
#### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On a Residential Avenue (similar to sites 3 and 5), these might include: <ul style="list-style-type: none"> <li>• 6' sidewalks</li> <li>• 5' buffer</li> <li>• 6' bike lane and/or path (depends on location within path network)</li> <li>• Trees every 20-25'</li> <li>• Lighting every 25'</li> <li>• Target speed 25 mph</li> <li>• Crossings every 200-400'</li> <li>• On-street parking optional</li> </ul>
B3	Active uses along streets	For residential areas, active uses can also refer to sight lines and access to use. Discourage fences; if they are desired for security reasons, provide secure gates through to public streets.
D1	Reduced parking requirements for high-frequency transit	On a street with existing or planned high-frequency transit, allow for reduced residential parking requirements.
E3	TOD overlay zone district	Intersections that function as transit hubs and are slated as activity centers can be subject to additional design metrics, such as inclusion of public space, that further establish placemaking and promote transit use.

## 6a. Colorado Avenue From 30th Street To Innovation Drive

### Potential Changes

- 1** On Residential Boulevards, provide crossings that accommodate desire lines (policy C1).
- 2** Connect high density residential through fences to transit and public streets (policy B3).
- 3** By reducing parking requirements near transit, space becomes available for other uses that complement existing land uses, such as neighborhood retail (policy D1).
- 4** Where transit services meet and transfers occur, plus in areas designated for TOD, calm intersections by adding medians and curb extensions if on-street parking is present. Provide public space to serve both transit riders and the general public (policy E3).



# 6b Colorado Avenue From 30th Street To Innovation Drive

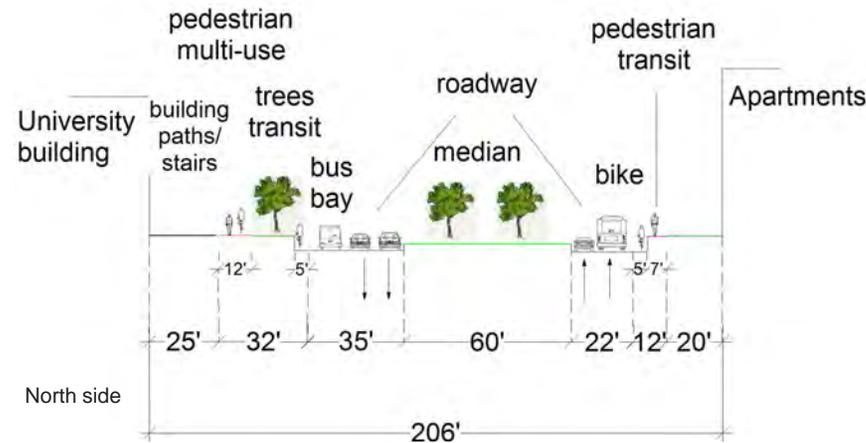
## Site Overview

### Key Diagram



Moving out toward Innovation Drive, the density of Colorado Avenue reduces. Several laboratory buildings, surrounded by open fields, impart a wide-open sense of scale to site 6b. A 60' wide planted median further instills the sense of this portion of the street as a parkway. There are no vehicle signals from 30th Street to Foothills Parkway, a distance of more than a half-mile. A RRFB located just east of Innovation Drive provides the only legal means of crossing, and was observed to be well-used. High-density residential along the south side of Colorado Avenue turns into single family housing south of Madison Avenue. A nicely landscaped multi-use path runs along the north side of Colorado Avenue and an on-street bike lane along the south side.

### Typical Cross Section



# 6b. Colorado Avenue From 30th Street To Innovation Drive

## Existing Conditions - Land Use & Site Design



**Existing** The biotechnology building provides an open frontage onto Colorado Avenue.

**Opportunities** Create developments that mimic the site design of the biotechnology building.

**Challenges** This building is one piece of the east campus but currently it stands alone, without any sense of place.



**Existing** To the east of the biotechnology building, another university facility has been built behind a parking lot.

**Opportunities** The campus master plan shows this parking lot as a potential development site long-term.

**Challenges** Taking away parking can be difficult; building parking from the outset behind a facility leaves opportunities for shared parking when the interior of a large parcel like the east campus develops.



**Existing** Wimbledon Apartments line Colorado Avenue.

**Opportunities** This site contains two long, narrow buildings with parking between and away from the street.

**Challenges** Site design depends in part upon the size and shape of the parcel.



**Existing** This section measures more than 200 feet building to building.

**Opportunities** The narrow building setbacks allow each side of the street to communicate and the wide median adds a parkway feeling.

**Challenges** The center of the median contains a ditch and there is only one crossing opportunity along the median's 1,050 feet.



**Existing** Bike parking is provided within the building's footprint and adjacent to the building entrance.

**Opportunities** Place bike parking next to entrances and provide lighting as in this example.

**Challenges** None

## 6b. Colorado Avenue From 30th Street To Innovation Drive

### Existing Conditions - Transportation



**Existing** This bus stop has an accessible path and landing pad.

**Opportunities** Adopt bus bays only when vehicle speeds or volumes are high.

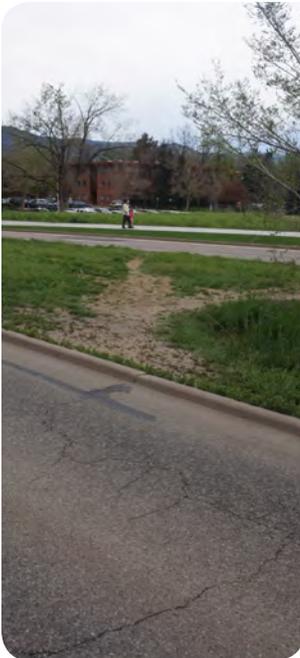
**Challenges** Rather than striping the bike lane to hug the curb, some cities provide a mixing zone where bikes and buses travel around each other.



**Existing** RRFBs are an acceptable street crossing design in lower density areas where pedestrian activity may be low.

**Opportunities** This design utilizes shark's teeth, signage, and flashing orange lights to alert motorists. Given the length of the crossing and multiple lanes, installing overhead flashing signals may reduce multiple threat injuries as the flashing light is fairly small.

**Challenges** Adding overhead signals adds expense.



**Existing** There is no legal crossing from 30th Street to the RRFB east of Innovation Drive – a distance of 0.3 miles. This desire line shows the need for another crossing opportunity.

**Opportunities** A RRFB can provide safety for those crossing without installation of a full signal.

**Challenges** Pedestrians were also observed crossing at 33rd Street, which does not have a median refuge.



**Existing** At this location the concrete area is technically sidewalk, yet cyclists ride on it as through it is a path.

**Opportunities** Better define path space with street markings to reduce conflicts between cyclists and pedestrians.

**Challenges** In lower density areas where crossings are infrequent, it may be difficult – or unnecessary – to enforce riding on sidewalk and wrong way riding violations. As the East Campus area develops, however, defining cyclist rules of the road without deterring ridership will be needed. Turns for path users are accommodated with underpasses but bike lane users cannot access the underpass without jumping the curb or backtracking.



**Existing** East of 35th Street, cyclists have the choice of a bike lane or a multi-use path. Paths are an important part of the cycling network in Boulder; however, on-street lanes are also vital as they provide the direct link to destinations and allow path users to merge into traffic to make turns.

**Opportunities** Having both options, especially on a 40 mph road like Colorado Avenue, accommodates many types of cyclist.

**Challenges** As observed, there seem to be few conflicts between cyclists and pedestrians, but as mode shares for both increase, more clearly marking shared-use paths may be needed.

## 6b. Colorado Avenue From 30th Street To Innovation Drive

### "Typical" Section Data Details

		Parcel ID: 0085213	Parcel ID: 0093612
<b>Site Design</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	# of stories	4	2
	Setback from curb	32'	28'
	Building doors/windows	Street fronting	Face street; behind lawn
	Building permeability	Windows/door	Windows/door
	Building has frontage?	Y	N
	Building frontage type	Door	-
	Zoning	Public (P)	Residential High 5 (RH-5)
	Land Use	University - Biotech	Residential
	<b>Parking</b>	<b>Metric</b>	<b>North</b>
Parking presence?		N - lot in next parcel over	Y
Parking type		-	Strip or wraparound parking
Parking management		-	Residential Restricted
Estimate of occupancy		-	0.5
Driveways		0	1
Driveway design		-	At sidewalk level
<b>Greenery (b/t sidewalk and building)</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Landscaping Presence?	N	Y
	Landscaping type	-	Full-growth trees; lawn
	Landscaping width	-	20'
	Number of Trees	-	8
	Public space presence?	N	N
Public space type	-	-	
<b>Bicycle</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Bike parking?	Y	N
	Bike Lane presence?	Y	Y
	Multiuse path?	Y	N
	Bike lane/path width	5' lane / 12' path	5'
	Bike lane/Path buffer	0	0

		North	South
<b>Pedestrian</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Sidewalk presence?	N - Path	Y
	Sidewalk Width	-	7'
	Sidewalk Condition	Meets demand; buffered	Meets demand
	Effective sidewalk width	12' - Path	7'
	Buffer (b/t sidewalk and road)	Trees	None
	Buffer Width	>5 ft	0
	# of Trees	5	0
	Midblock crossing presence?	N	N
	Midblock crossing type	-	-
	Ped/bike path to building front?	Y	Y
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	-	-
<b>Transit</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Bus stop presence?	Y	N
	Bus stop condition	Schedule; Bench	-
	Distance from stop to legal crossing	550'	-
	Distance from stop to land use entrance	100'	-
<b>Traffic</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Block spacing	906'	906'
	Signal Spacing	3800'	
	Street Layout	2+2 (plus bus bay north side)	
	Width of Travel+Turn lanes	22' for 2 lanes	
	Speed Limit	40	
	Median presence	Y	
	Median Width	60'	
Median type	Trees		

# 6b Colorado Avenue From 30th Street To Innovation Drive

## Potential Changes



### STREET TYPOLOGY

#### Institutional Boulevard

Institutions often have a campus-style development pattern with internal parking and circulation networks. Yet providing a link between the street and institutional uses ensures that campuses activate public street life.

#### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On an Institutional Boulevard, these might include: <ul style="list-style-type: none"> <li>• 8'-12' sidewalks</li> <li>• 5' buffer (minimum)</li> <li>• 6' buffered bike lanes</li> <li>• Trees every 20-25'</li> <li>• Driveway width &lt;12'; minimize driveways</li> <li>• Lighting every 20'-30'</li> <li>• Target speed 25-30 mph</li> <li>• Crossings every 200-400'</li> <li>• Parking optional</li> <li>• 2-3 travel lanes per direction</li> </ul>
A1	Form-based code	Develop standards for institutional zones including building setback, public space, and multiple access points (to alleviate congestion). Include gateway treatments as a tool for traffic calming.
D5	Parking lot design	Fold into institutional zone or require separately that parking areas include landscaping every block of 40 parking spaces or a tree per every 5 parking spaces.
K1	Developer incentives	Encourage large institutions to include city or region standards or plans into developments.

## 6b. Colorado Avenue From 30th Street To Innovation Drive



**1** To achieve crossing spacing, add RRFB's similar to the existing beacon to accommodate transit riders and the existing desire line (policy C1).

**3** Design of parking lots can be broken up with trees or landscaping and walkways (policy D5).

**2** As an institutional zone, a gateway treatment highlighting the institution can also provide traffic calming by signaling to drivers that they are entering a pedestrian-focused area. Gateways may include curb extensions, pavement paint, unique crosswalks, or signage. An institutional zone standard might also include internal site connections and bicycle parking (policy A1).



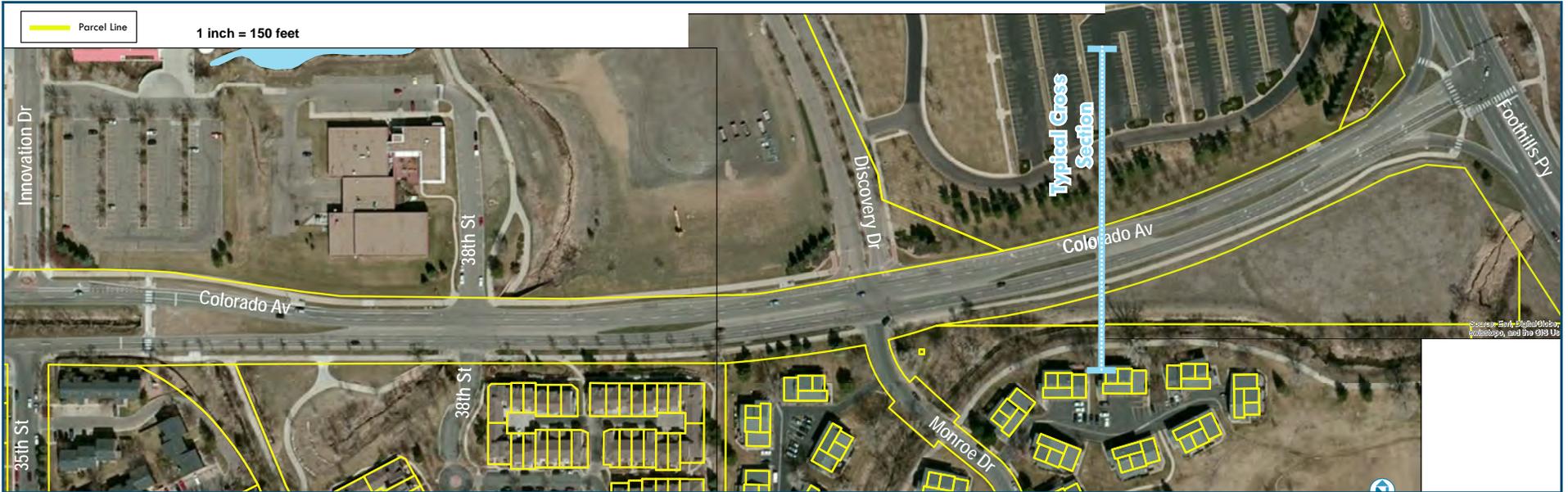
Gateway treatment in Riverside, CA

**4** An incentive program such as grants can encourage institutions or developers to create sites that match city goals and standards, such as setbacks of less than 50', public space inclusion, or parks fronting streets (policy K1).

# 7 Colorado Avenue From Innovation Drive To Foothills Parkway

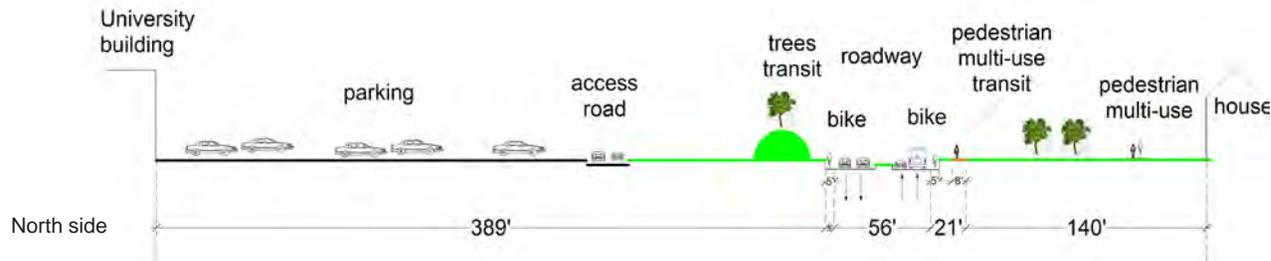
## Site Overview

### Key Diagram



East of Innovation Drive, Colorado Avenue feels like open frontier. Some new-looking housing between 35th Street and Monroe Drive on the south side of the street is promising, with residential interfacing well with the street. Sidewalk is lacking along the north side of the street east of Discovery Drive. In this section of Colorado Avenue there are access points to the trail network. Bicyclists were observed crossing Colorado Avenue at Monroe Street to access these resources, but there is no legal crossing or median refuge. The new university development at the corner of Colorado Avenue and Foothills Parkway follows non-urban design with a large parking lot fronting the building. Construction of the site between 38th Street and Discovery Drive appears to follow a similar auto-centric pattern.

### Typical Cross Section



## 7. Colorado Avenue From Innovation Drive To Foothills Parkway

### Existing Conditions - Land Use & Site Design



**Existing** A well-used multi-use path runs through the neighborhood off Monroe Drive.

**Opportunities** Connect high-density residential neighborhoods to downtown with paths to encourage bicycling.

**Challenges** Crossing Colorado Avenue may be challenging for novice cyclists; at Monroe Drive there is no signal or refuge island across 5 lanes of traffic.



**Existing** The university building at the northwest corner of Foothills Parkway and Colorado Avenue is flanked by a 200 foot-wide parking lot.

**Opportunities** The parking lot is identified on the campus master plan as a future development.

**Challenges** Ensure that parking is not replaced 1:1 if future transit or alternate options are available.



**Existing** The area at the southwest corner of Foothills Parkway and Colorado Avenue is an empty field.

**Opportunities** This could be developed or turned into recreation area as the eastern part of the city grows.

**Challenges** The site is an awkward triangle shape.



**Existing** Townhome-style housing along the south side of Colorado Avenue provides clear access to the street.

**Opportunities** This provides a good example of how medium-density housing can provide privacy but still interact with the street.

**Challenges** The development is a solitary patch of housing, without walkable or bikeable destinations close by.



**Existing** The development along Monroe Drive generally follows a donut style, with buildings wrapped around central parking.

**Opportunities** The site generally includes sidewalks along main roads and a property path network linking to city paths.

**Challenges** The development's streets do not follow a typical grid, which may make it confusing for people to find the paths.

## 7. Colorado Avenue From Innovation Drive To Foothills Parkway

### Existing Conditions - Transportation



**Existing** At Monroe Drive, cyclists are frequently observed crossing to access a path.

**Opportunities** Provide at minimum a refuge island so cyclists can find gaps in traffic and cross in two stages.

**Challenges** This might require shifting lanes to find enough width for an island.



**Existing** The university parcel provides a sidewalk through and at the edge of the parking lot.

**Opportunities** If large parking lots must be built, include walkways and greenery.

**Challenges** The site lacks direct connections from area paths for bicycle access.



**Existing** This level area sits on top of the berm between the university building and Colorado Avenue.

**Opportunities** A pathway could be constructed linking the bus stop to the university and to points further west.

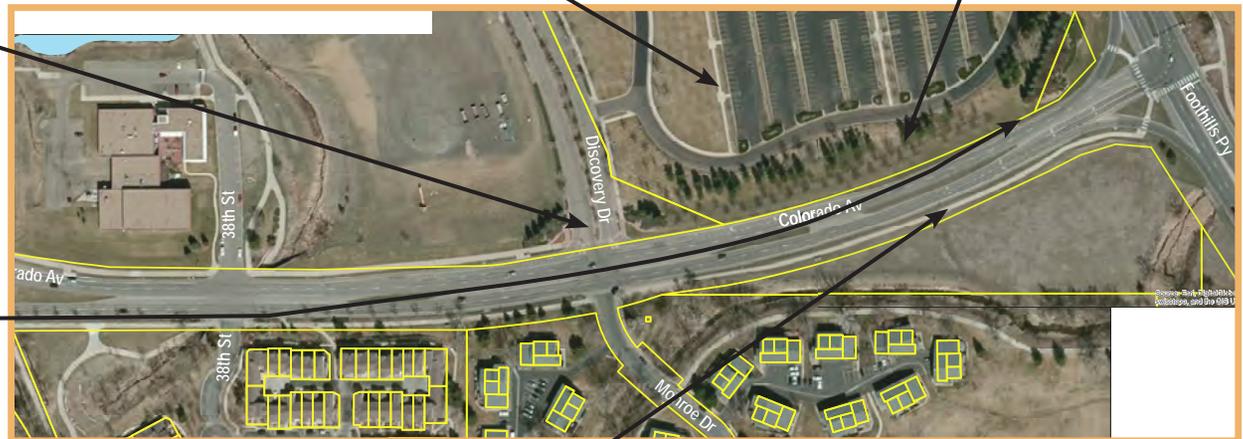
**Challenges** Preserving the existing trees is a priority as well.



**Existing** Riders at this westbound bus stop have no sidewalk for access or egress.

**Opportunities** As a policy, provide sidewalks at all transit stops.

**Challenges** There is no sidewalk between Discovery Drive and Foothills Parkway; the steep grade along this section may make sidewalk difficult to add.



**Existing** The path along Colorado Avenue connects beyond Foothills Parkway and is well-used.

**Opportunities** On 40 mph roads like this one, a path can attract users of all skill levels.

**Challenges** On other similar roads, right-of-way may not be available to construct off-street facilities.

## 7. Colorado Avenue From Innovation Drive To Foothills Parkway

### “Typical” Section Data Details

		Parcel ID: 0108661	Parcel ID: 67146
Site Design	Metric	North	South
	# of stories	3	2
	Setback from curb	407'	150'
	Building doors/windows	Behind parking	Behind lawn
	Building permeability	Poor - wide setback	Poor - wide setback
	Building has frontage?	N	N
	Building frontage type	-	-
	Zoning	Public (P)	Residential Medium 1 (RM-1)
	Land Use	Institutional	Residential
	Parking	Metric	North
Parking presence?		Y	N
Parking type		Large lot parking	On-street parallel
Parking management		Business restricted	Free
Estimate of occupancy		5%	0.5
Driveways		0	0
Driveway design		-	-
Greenery (b/ sidewalk and building)	Metric	North	South
	Landscaping Presence?	Y	Y
	Landscaping type	Full-growth trees; lawn	Full-growth trees; lawn
	Landscaping width	140'	100'
	Number of Trees	15	20
	Public space presence?	N	N
Bicycle	Metric	North	South
	Bike parking?	N	N
	Bike Lane presence?	Y	Y
	Multiuse path?	N	Y
	Bike lane width	5'	5'
	Bike lane/Path buffer	0	7'

		North	South
Pedestrian	Metric	North	South
	Sidewalk presence?	N	N - Path
	Sidewalk Width	-	8' - Path
	Sidewalk Condition	-	Meets demand; buffered
	Effective sidewalk width	-	8' - Path
	Buffer (b/t sidewalk and road)	-	Grass
	Buffer Width	-	>5 ft
	# of Trees	0	0
	Midblock crossing presence?	N	N
	Midblock crossing type	-	-
	Ped/bike path to building front?	N	N
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	-	-
Transit	Metric	North	South
	Bus stop presence?	Y	N
	Bus stop condition	Sign only	-
	Distance from stop to legal crossing	250'	-
	Distance from stop to land use entrance	450'	-
	Metric	North	South
	Block spacing	1000'	1000'
	Signal Spacing	3800'	
	Street Layout	2+2 with 1 left turn	
	Width of Travel+Turn lanes	79'	
	Speed Limit	45	
	Median presence	Y	
	Median Width	10'	
Median type	Concrete with grass		

# 7 Colorado Avenue From Innovation Drive To Foothills Parkway

Potential Changes



## STREET TYPOLOGY

### Mixed-Use Boulevard

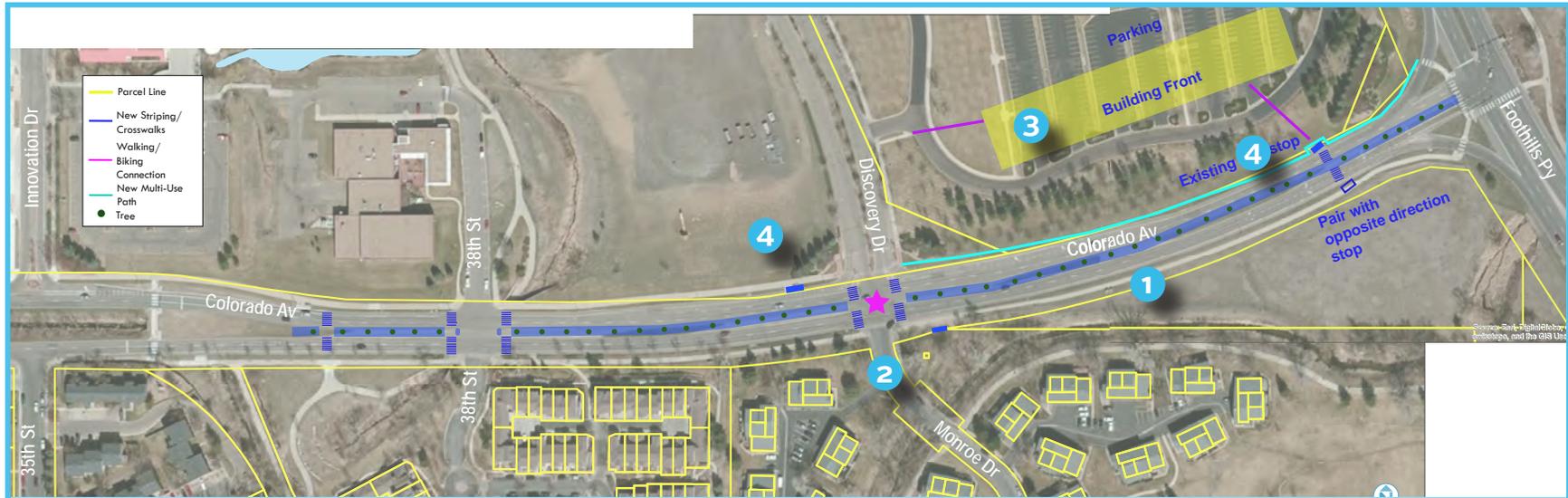
Large greenfield developments provide an excellent opportunity to create vibrant, streets.

#### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On a Mixed-Use Boulevard these might include: <ul style="list-style-type: none"> <li>• 8-15' sidewalks</li> <li>• Buffered bike lanes and/or path</li> <li>• No parking</li> <li>• Crossings every 300-500'</li> <li>• Lighting every 25-30'</li> <li>• Trees every 20-25' or landscaped buffer between path/sidewalk and street</li> <li>• Target speed 25-30 mph</li> </ul>
A1	Form-based code	An overlay to the typology can include institutional district standards including green setbacks, active uses fronting streets, frequent street crossings, and placemaking.
H1	Stormwater mitigation	On greenfield development sites, mitigate the loss of greenery with a stormwater mitigation plan.
K2	Value capture	Use development as occasion to leverage a fee that increases transit frequencies or improves amenities as a resource that will then be patronized by users.
E4	Transit street standards	Require that all transit stops be connected to sidewalks and the nearest destination.

## 7. Colorado Avenue From Innovation Drive To Foothills Parkway

### Potential Changes



**1** On Mixed-Use Boulevards, 2-3 travel lanes per direction are provided. A 15' planted median can fit within the existing curb lines if the bike lane is removed and users moved to the multi-use path. The wide median means turn lanes can be provided where needed and 5' remain for a pedestrian refuge. In future developments, the median should measure 16' to provide the desired 6' refuge, and buffered bike lanes may be included to supplement paths (policy C3).

**2** As an area bordering an institutional zone, intersection treatments such as welcoming signage or pavement designs signifies to the street user that they are entering a unique place (policy A1).

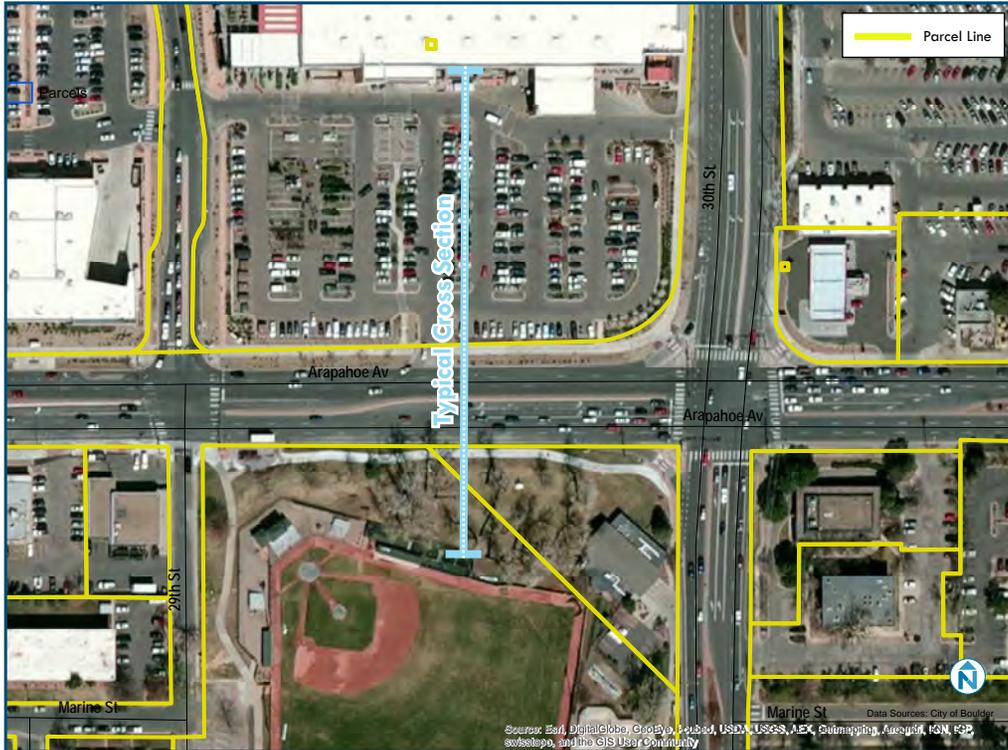
**3** Institutional zone standards may relegate parking uses to behind the active building use. Connections from transit stops and provision of direct pedestrian routes facilitate access (policy A1).

**4** All transit stops must have a safe means of crossing the street, since an eastbound customer becomes a westbound rider on the return trip. All stops must also have sidewalk access to destinations. In this case, adding a multi-use path satisfies the needs of both pedestrians and cyclists. Development fees used to improve transit reap value for the developer by providing users an alternate method of commuting (policies K2, E4).

# 8 Arapahoe Avenue from 28th-29th Streets

## Site Overview

### Key Diagram

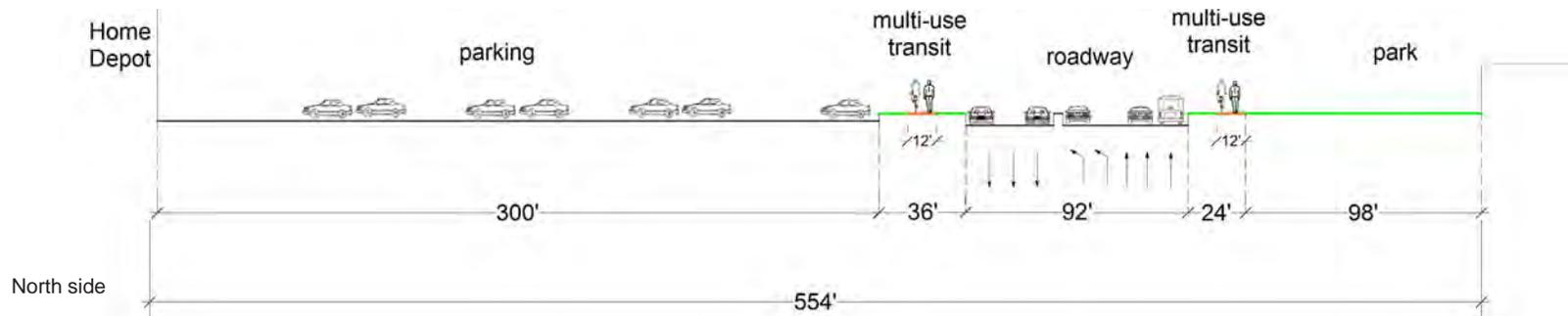


This section of Arapahoe Avenue is at the western edge of the study area and is characterized by big-box retail on the north side and Scott Carpenter Park on the south side.

Like the rest of Arapahoe Avenue, this section contains six lanes plus left turn lanes, free right turn lanes, and a median of 4 - 5 feet. The street's buffered multi-use path and the short length between signals (650 feet from 28th to 29th Streets), however, makes this portion of Arapahoe Avenue feel more comfortable for walking.

The Home Depot site along the north end contains a large, street-fronting parking lot that degrades visual interest and sense of enclosure, but the site does exhibit positive design qualities in its parking lot with a crosswalk and sidewalk leading to the front door.

### Typical Cross Section



## 8. Arapahoe Avenue from 28th-29th Streets

### Existing Conditions - Land Use & Site Design



**Existing** North of 28th Street, the side entrance to Home Depot on the east side and shopping center to the west creates a small intersection.

**Opportunities** Increase block density by creating an internal block network.

**Challenges** Many links between shopping areas are blocked by a median.



**Existing** The bus stop along the south side of the street is located near a legal crossing.

**Opportunities** Provide safe crossings at all bus stops.

**Challenges** Walking from the bus stop to the Home Depot entrance measures 690 feet due to the wide lot setback.



**Existing** On the south side, the setback is much narrower than on the north side, which adds a sense of enclosure to the street. The land use of the park is clearly visible from the sidewalk.

**Opportunities** Adopt narrower setbacks.

**Challenges** Parking is often built in front of buildings, becoming a barrier between street views and the land use.



**Existing** Bicycle parking provided against the building front.

**Opportunities** Integrate covered facilities into site design.

**Challenges** Space is a premium.



**Existing** Active uses are set back hundreds of feet from the street and sidewalk.

**Opportunities** Infill development in the short-term and regulations placing active uses against the street in the long-term active space.

**Challenges** In many places sites for infill are awkwardly shaped - often long and narrow - making development difficult.

## 8. Arapahoe Avenue from 28th-29th Streets

### Existing Conditions - Transportation



**Existing** A crosswalk and sidewalk guide customers from the street to the front entrance.

**Opportunities** Integrate walking facilities through parking lots. Pair with greenery.

**Challenges** Even with a path, the wide setback makes accessing the land use unappealing.



**Existing** The 3'10" median barely provides space for a person to stand.

**Opportunities** Extend median with a tip capping the crosswalk. If space allows, narrow travel lanes to 10' and widen median to 6'.

**Challenges** Where lanes are already 10', widening the median requires removing a turn lane.



**Existing** High-quality transit stop with shelter, seating, information, and bike parking.

**Opportunities** Integrate transit stops into the public realm.

**Challenges** A stop of this size may be difficult to install on narrow sidewalks.



**Existing** Multi-use path buffered on both sides with landscaping shields user from parking use.

**Opportunities** On wide roads with high speeds and volumes, paths offer cyclists a safe place to ride. Landscaping helps to buffer users from vehicle traffic.

**Challenges** Paths resemble sidewalks; except at intersections, there is often no markings indicating permitted use by multiple modes. Signage may be needed to minimize conflicts between pedestrians and cyclists.

## 8. Arapahoe Avenue from 28th-29th Streets

### "Typical" Section Data Details

		Parcel ID:	Parcel ID:
<b>Site Design</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	# of stories	1	1
	Setback from curb	336 ft	98 ft
	Building doors/windows	Facing Street/Behind Parking	Park-No building
	Building permeability	Poor - wide setback	--
	Building has frontage?	N	N
	Building frontage type	Parking	Trees
	Zoning	Business - Regional 1 (BR-1)	Residential - Low 1 (RL-1)
	Land Use	Home Depot	Park
	<b>Parking</b>	<b>Metric</b>	<b>North</b>
Parking presence?		Y	N
Parking type		Large Lot Parking	--
Parking management		Free	--
Estimate of occupancy		70%	--
Driveways		1	0
Driveway design	Across sidewalk	--	
<b>Greenery (b/t sidewalk and building)</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Landscaping Presence?	Y	Y
	Landscaping type	Shrubs	Park
	Landscaping width	8'	--
	Number of Trees	10	--
	Public space presence?	N	Y
	Public space type	--	Park
<b>Bicycle</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Bike parking?	Y	Y
	Bike Lane presence?	N - Path	N - Path
	Multiuse path?	Y	Y
	Bike lane/Path width	12'	10' 2"
	Bike lane/Path buffer	delete	delete

		North	South
<b>Pedestrian</b>	<b>Metric</b>		
	Sidewalk presence?	N - Path	N - Path
	Sidewalk Width	--	--
	Sidewalk Condition	Meets demand; buffered	Meets demand; buffered
	Effective sidewalk width	12' - Path	10' 2" - Path
	Buffer (b/t sidewalk and road)	Trees	Trees
	Buffer Width	> 5ft	>5 ft
	# of Trees	10	6
	Midblock crossing presence?	N	N
	Midblock crossing type	--	--
	Ped/bike path to building front?	Y	N
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	--	--
	<b>Transit</b>	<b>Metric</b>	<b>North</b>
Bus stop presence?		N	Y
Bus stop condition		--	Shelter; Bench
Distance from stop to legal crossing		--	Short (44')
Distance from stop to land use entrance		--	Far (690')
<b>Traffic</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Block spacing	565'	565'
	Signal Spacing	565'	
	Street Layout	3+3 with 1-2 Left turn lanes	
	Width of Travel+Turn lanes	82	
	Speed Limit	45	
	Median presence	Y	
	Median Width	3' 10"	
	Median type	Concrete	

# 8 Arapahoe Avenue from 28th-29th Streets

## Potential Changes

### STREET TYPOLOGY

#### Commercial Boulevard

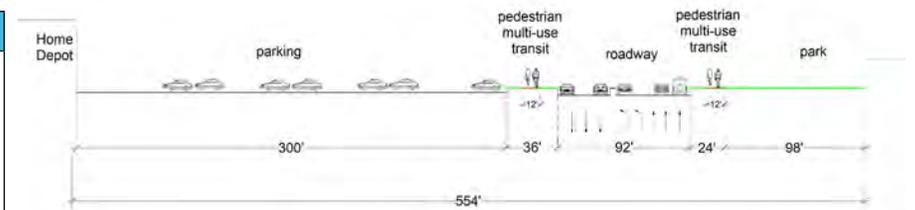
An urban street with three lanes per direction is difficult to tame for pedestrians and cyclists and should occur only when traffic data supports it.

#### Policies Applied

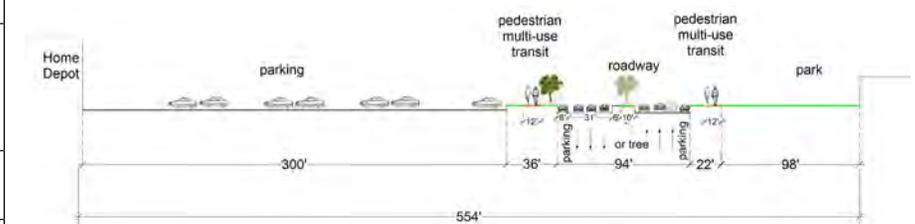
Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On a Commercial Boulevard these might include: <ul style="list-style-type: none"> <li>• 10-20' sidewalks or paths</li> <li>• 2-3 lanes per direction</li> <li>• Planted median with 6' refuge at intersections</li> <li>• Median lighting</li> <li>• Sidewalk lighting every 25'</li> <li>• Target speed 30 mph</li> <li>• Crossings every 200-400'</li> <li>• On-street parking provided</li> <li>• Driveways consolidated</li> </ul>
B4	Internal accessways	Require developers to provide pedestrian paths within development and to neighboring parcels. In dense retail districts, block connections can be formed through existing parking lanes.
E4	Transit street standards	If a street is a priority transit corridor, implement tools like bus-only lanes during peak hours.
H1	Stormwater mitigation	Mitigate large parking lots with stormwater programs.
K1	Developer incentives	Grant programs encourage retrofit of existing development with provision of multimodal accommodations and pedestrian paths.



#### Before



#### After



Modest increase to the roadway cross section and elimination of one of two left turn lanes allows for a generous median and on-street parking while still maintaining three travel lanes per direction.

## 8. Arapahoe Avenue from 28th-29th Streets

### Potential Changes

**1** On Commercial Boulevards, planted medians provide a traffic calming effect and soften the impact of six lanes of traffic. On-street parking provides access to businesses and can reduce the need for surface parking (policy C1).

**2** Large-scale commercial development like this example was built with vehicle circulation in mind, thus vehicles are the street's primary users. Yet these parking alleys provide great opportunity to formalize a new circulation network that takes stress away from arterials and fosters walking or biking, rather than driving, between land uses. For future development, buildings can be built against the most active street, with parking and loading behind (policy B4, K2).



*A much more pedestrian-scale block network can be created just by formalizing parking alleys. This would reduce the need for arterial travel by providing routes parallel to existing roads.*

**3** Designate curb lanes as bus-only during peaks to speed travel times (policy E4).



**4** Trees and greenery planted in parking areas reduce runoff and are typically the developer's responsibility to maintain. Integrating bioswales and porous pavements may also be folded into developer responsibilities (policy H1).

*At this large retail establishment, rows of trees are integrated with surface parking. The store also provides rooftop parking, which reduces the size of surface parking needed.*



# 9 Arapahoe Avenue From 30th To 33rd Streets

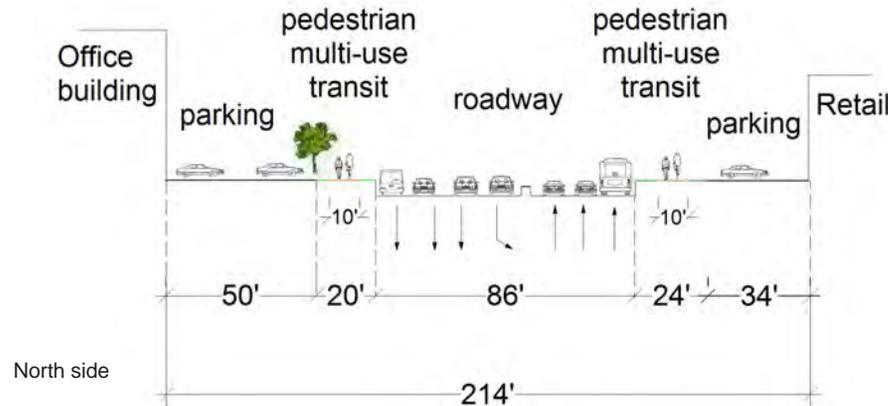
## Site Overview

### Key Diagram



This portion of Arapahoe Avenue consists of strip retail built on parcels of various sizes and shapes. On the north side, retail and office uses fronting Arapahoe Avenue have parking lots that blend into large parking areas for retail along Canyon Boulevard. On the south side, small-scale retail establishments exist without any connection to one another. Parallel to Arapahoe Avenue to the south, Marine Street offers quiet respite from the traffic noise. Multi-use paths line both sides of Arapahoe Avenue, although all pedestrian and bicycle accommodation is dropped from the KFC site to 500 feet east.

### Typical Cross Section



## 9. Arapahoe Avenue From 30th To 33rd Streets

### Existing Conditions - Land Use & Site Design



**Existing** The short buildings along this corridor paired with the wide roadway gives no sense of enclosure to the space. The land uses are hard to see.

**Opportunities** Shorter developments can be built closer to the curb line to help frame Arapahoe Avenue.

**Challenges** Narrow parking lots make infill difficult.



**Existing** At the parcel next to the office building shown right, a continuing parking lot is separated from the office parcel by some landscaping.

**Opportunities** In the short term, cutting a path through the landscaping and connecting parking can begin the process of creating frontage roads.

**Challenges** The city would need the cooperation of property owners as the landscaping area is likely privately owned.



**Existing** Along the north side of Arapahoe Avenue, parking lots could potentially be linked into a frontage road.

**Opportunities** Providing local access on frontage roads can reduce rear-end collisions on the through lanes caused by slowing turning vehicles.

**Challenges** Building out parking into frontage roads requires new linkages between parcels and building parking areas into public roads.



**Existing** A fairly new-looking development along the northeast side of Arapahoe Avenue and 33rd Street is cut off from the intersection with a low wall.

**Opportunities** There are numerous shopping uses along the south side of Arapahoe and the crossing is well-used from north to south. Link apartment dwellers to this crosswalk directly from the building.

**Challenges** The apartment does provide sidewalk access a few hundred feet away from the intersection and this may be enough to satisfy site review guidelines.



**Existing** The KFC parcel along the south side of Arapahoe Avenue has outside seating and parking along the side of the building.

**Opportunities** Only handicap parking is provided directly in front of the building, allowing street users to clearly see the land use.

**Challenges** The driveway access to the site is auto-dominated.

## 9. Arapahoe Avenue From 30th To 33rd Streets

### Existing Conditions - Transportation



**Existing** Marine Street provides a pleasant walking and cycling alternative to the traffic noise and wide roadway on Arapahoe Avenue.

**Opportunities** Marine Street would be a great bike facility if it had a dashed centerline and connected west and east to the existing trail.

**Challenges** Making street connections would likely only happen as parcels develop.



**Existing** The section of Arapahoe Avenue along the south side lacks a sidewalk.

**Opportunities** Given the numerous retail uses in this area, adding a sidewalk should be a high priority.

**Challenges** The parcel line appears to end right at the existing curb, meaning a new sidewalk would require private land.



**Existing** Parallel to Arapahoe Avenue to the south, Marine Street lacks a sidewalk.

**Opportunities** This street has several university and community services buildings and needs a sidewalk.

**Challenges** This area is owned by the university and requires the institution to build a sidewalk.



**Existing** In the parking area along the north side of the street, landscaped areas and low lighting break up the lot.

**Opportunities** Adopt parking lot standards that require breaking up parking lots with landscaping every 50 spaces.

**Challenges** Adding landscaping to existing parking requires removing spaces.



**Existing** East of the KFC, pedestrians and cyclists use the parking lot for access to businesses and as a throughway.

**Opportunities** Paired with the north side of the street, there is an opportunity to build a multiway boulevard along this retail node.

**Challenges** Transitioning Arapahoe Avenue from/to a multiway between retail nodes requires careful signage and design to ensure user legibility.

## 9. Arapahoe Avenue From 30th To 33rd Streets

### “Typical” Section Data Details

		Parcel ID: 0033105	Parcel ID: 0011451
Site Design	Metric	North	South
	# of stories	3	1
	Setback from curb	70'	58'
	Building doors/windows	Behind parking	Face street
	Building permeability	Windows/door	Can see into storefront easily
	Building has frontage?	N	Y
	Building frontage type	-	Café seating
	Zoning	Business Regional 1 (BR-1)	Business Regional 1 (BR-1)
	Land Use	Office	KFC/Taco Bell
	Parking	Metric	North
Parking presence?		Y	Y
Parking type		Strip/wrap around	Strip
Parking management		Business restricted	Business restricted
Estimate of occupancy		90%	0% (not open)
Driveways		1	2
Driveway design		At sidewalk level	Across sidewalk
Greenery (b/ sidewalk and building)	Metric	North	South
	Landscaping Presence?	Y	Y
	Landscaping type	Tree wells	Rocks
	Landscaping width	4'	6'
	Number of Trees	4	3
	Public space presence?	N	N
Bicycle	Metric	North	South
	Bike parking?	Y	Y
	Bike lane presence?	N	N
	Multiuse path?	Y	Y
	Bike lane width	0'	0'
	Bike lane/path buffer	10'	10'

		North	South
Pedestrian	Metric	North	South
	Sidewalk presence?	N - Path	N - Path
	Sidewalk Width	10' - Path	10' - Path
	Sidewalk Condition	Meets demand; buffered	Meets demand; buffered
	Effective sidewalk width	10'	5'
	Buffer (b/t sidewalk and road)	Grass	Grass
	Buffer Width	2-5 ft	>5 ft
	# of Trees	3	1
	Midblock crossing presence?	N	N
	Midblock crossing type	-	-
	Ped/bike path to building front?	Y	Y
	Pedestrian-scale lighting?	N	Y
	Pedestrian lighting spacing	-	2
	Transit	Metric	North
Bus stop presence?		N	N
Bus stop condition		-	-
Distance from stop to legal crossing		-	-
Traffic	Metric	North	South
	Block spacing	585'	1962'
	Signal Spacing	945'	
	Street Layout	3+3 with 1-2 left turn lanes	
	Width of Travel+Turn lanes	87'	
	Speed Limit	45	
	Median presence	Y	
	Median Width	3'	
	Median type	Concrete	

# 9 Arapahoe Avenue From 30th To 33rd Streets

## Potential Changes

### STREET TYPOLOGY

#### Commercial Multiway Boulevard

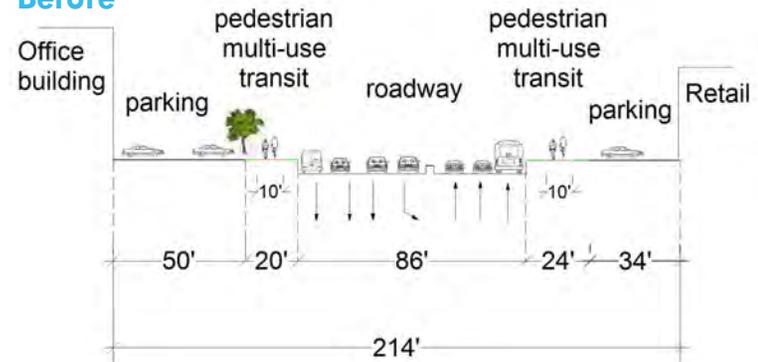
Commercial corridors that are also major arterials need to provide both through movement but also placemaking to support businesses.

#### Policies Applied

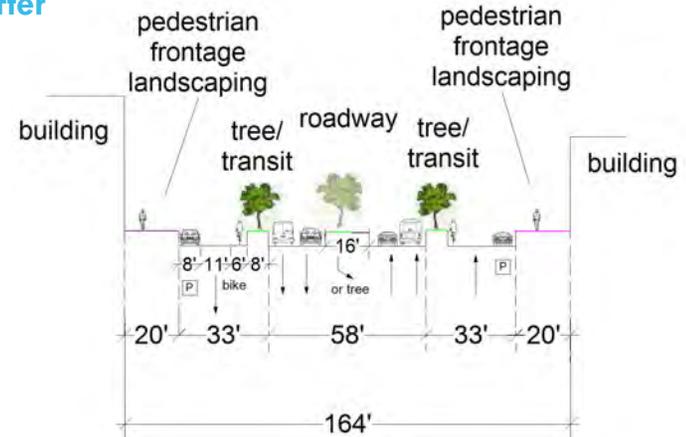
Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On a Commercial Multiway Boulevard these might include: <ul style="list-style-type: none"> <li>• 6-12' sidewalks</li> <li>• Path or bicycle lane</li> <li>• Buffer on-street bike lanes (depending on vehicle speed and volume)</li> <li>• Trees every 20-25'</li> <li>• Lighting every 20-30'</li> <li>• Target speed 20-25 mph</li> <li>• Crossings every 300-600' or across from complementary uses</li> <li>• On-street parking optional</li> </ul>
A1	Form-based code	Designate as a retail district or other such term that enforced street fronting land uses and connected parcels with shared parking.
K2	Value capture	Require developers to build walking, cycling, and transit infrastructure.
E4	Transit street standards	An existing bus stop has no sidewalk; transit standards require provision of walking facilities.
D4	Shared parking	For commercial and retail uses where turnover is high and uses with different peaks are adjacent, a shared parking supply still provides good business access but reduces unnecessary allocation of space to parking. Analysis of the actual parking needs at businesses based on other examples may be included in development applications.



#### Before



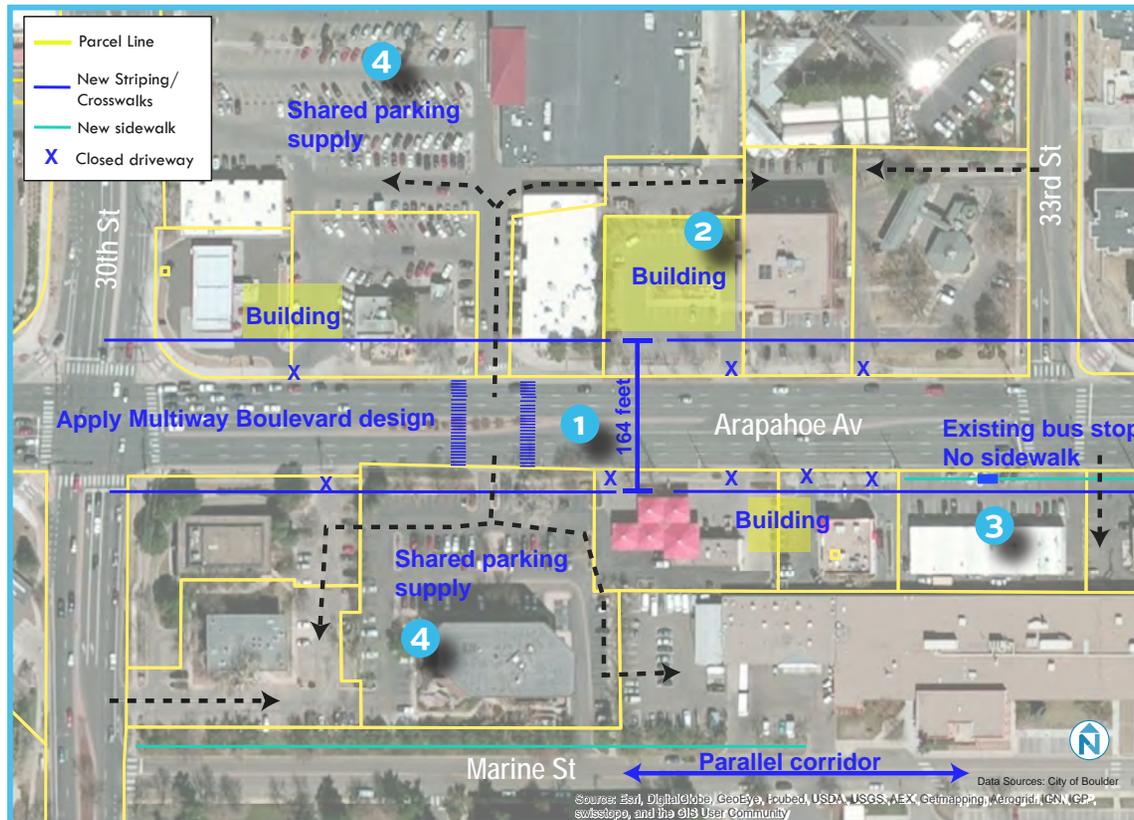
#### After



The utility of multiway boulevards is that they contain numerous design elements that can be widened or added to conform to available space. In this example, the street might contain wider side medians, a multi-use path, or angled parking. The narrowest building-to-building width is 164', and the widest is 236', leaving a lot of space for modifications to a typical section.

## 9. Arapahoe Avenue From 30th To 33rd Streets

### Potential Changes



**1** The type of development built based on current policies results in 164-236 feet between active uses, which can easily fit a multiway cross-section. Actual right-of-way is narrower, but the purpose is to show what the existing regulatory framework has produced and the long spacing between destinations (policy C1).

**2** Additional buildings take the place of parking and driveways are closed with access provided to a block through a few primary points. (policy A1).

**3** Developers reap benefits by building housing and retail, and this occurrence provides opportunity to capture the value of development by building sidewalks, high-quality transit facilities, and bike facilities (policies K2, E4).

**4** A centrally placed shared parking supply gets people walking from cars to destinations (policy D4).

# 10 Arapahoe Avenue From Foothills Parkway To 48th Street

## Site Overview

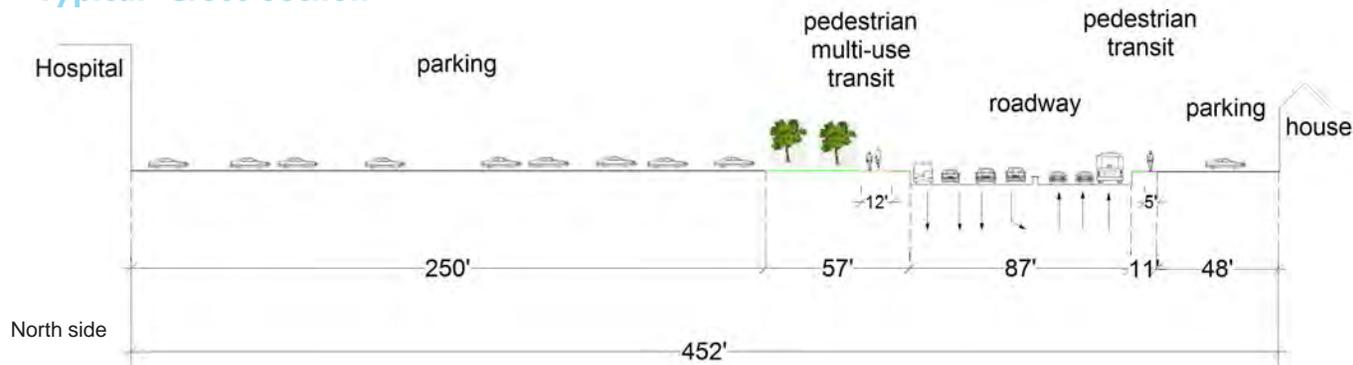
### Key Diagram



East of Foothills Parkway, Arapahoe Avenue's lower density land uses and wide right-of-way gives the street a wide-open feeling. This detail area is dominated by the new Boulder Hospital site along the north side. Several one and two-story office buildings to the south are transitioning to doctor offices for the personnel using the new hospital facility, but there is no easy way to cross Arapahoe Avenue by foot, which may lead to numerous short driving trips from the hospital to medical offices. The street here consists of three lanes per direction with a narrow median. A generous path along the north side is provided but the south side sidewalk is fairly narrow.



### Typical Cross Section



# 10. Arapahoe Avenue From Foothills Parkway To 48th Street

## Existing Conditions - Land Use & Site Design



**Existing** This bus stop across from MacArthur Drive and in front of the western part of the hospital site has a sign only.

**Opportunities** This location already has a break in the median and is between legal crossings at Foothills Parkway and 48th Street, making it a prime candidate for a new vehicle or pedestrian signal.

**Challenges** Signal warrants typically prove challenging for additional signals, especially as Arapahoe Avenue is a state highway.



**Existing** At 48th Street, there is a direct entrance to the hospital.

**Opportunities** Connecting the path through parking and directly to the land use front door emphasizes the ease of access by bike and foot.

**Challenges** At this new development, there was opportunity to reduce the size of the parking field in front of the hospital, but in the end the development follows the suburban-style pattern seen on much of the corridor.



**Existing** In front of the medical office buildings on the south side there are single family homes.

**Opportunities** None

**Challenges** As the corridor develops, sprinkling higher density housing in with single family requires careful work with the community.

**Existing** Directly across from the hospital, the eastern end of MacArthur Lane is fenced off from the street.

**Opportunities** This link would make a logical connection from the medical areas to the hospital.

**Challenges** Although the parcel map shows a public right-of-way through MacArthur Lane, past attempts to open the fence have been unsuccessful.



# 10. Arapahoe Avenue From Foothills Parkway To 48th Street

## Existing Conditions - Transportation



**Existing** At intersections, such as at Foothills Parkway, cyclists use pedestrian signals to cross the street.

**Opportunities** At these major intersections, leading the path directly to push buttons may be the safest way to get cyclists and pedestrians across.

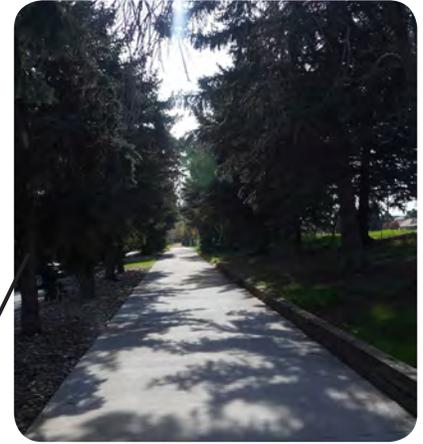
**Challenges** For novice cyclists, it may be unclear that they should use pedestrian signals.



**Existing** In front of the hospital, a well-designed bus stop has its own direct access to the hospital entrance.

**Opportunities** Emphasize transit with connections such as these to land use entrances.

**Challenges** None



**Existing** Along the north side of the street, a multi-use path is well-buffered from traffic noise on Arapahoe Avenue.

**Opportunities** Given Arapahoe Avenue's status as a state highway, buffering paths in this manner may be a long-term solution to create a pleasant environment.

**Challenges** This design may be difficult given available building frontage area space.



**Existing** Warning signage alerts path users to a driveway location.

**Opportunities** The design of the driveway reinforces the supremacy of the path by using a crossing at driveway level.

**Challenges** In areas with numerous curb cuts, this type of design is not always incorporated.



**Existing** At MacArthur Drive, turn this median break into a full intersection.

**Opportunities** A connection here would attract medical office users along the south side to walk or bike back and forth to the hospital.

**Challenges** Adding signals is often met with resistance; this could initially be signaled as a HAWK to allay traffic concerns.



**Existing** At night, the same path has no lighting.

**Opportunities** Provide pedestrian scale lighting (bulbs at 14-18 feet high) to improve security along the path.

**Challenges** None

# 10. Arapahoe Avenue From Foothills Parkway To 48th Street

## "Typical" Section Data Details

		Parcel ID: 0512684	Parcel ID: 0009687
<b>Site Design</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	# of stories	3	1
	Setback from curb	339'	54'
	Building doors/windows	Behind parking	Behind parking
	Building permeability	Poor-wide setback	Windows/door
	Building has frontage?	N	N
	Building frontage type	-	-
	Zoning	Public (P)	Residential High 4 (RH-4)
	Land Use	Hospital	Residential
	<b>Parking</b>	<b>Metric</b>	<b>North</b>
Parking presence?		Y	Y
Parking type		Large lot parking	Driveway
Parking management		Free	Residential restricted
Estimate of occupancy		50%	0
Driveways		1	1
Driveway design		At sidewalk level	At sidewalk level
<b>Greenery (b/t sidewalk and building)</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Landscaping Presence?	Y	Y
	Landscaping type	Full growth trees	Grass
	Landscaping width	37'	7'
	Number of Trees	25	2
	Public space presence?	N	N
<b>Bicycle</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Bike parking?	N	N
	Bike lane presence?	N	N
	Multiuse path?	Y	N
	Bike lane width	0'	0'
	Bike lane/path buffer	0'	0'

		North	South
<b>Pedestrian</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Sidewalk presence?	N - Path	Y
	Sidewalk Width	12' - Path	5'
	Sidewalk Condition	Meets demand; buffered	ADA compliant width
	Effective sidewalk width	12' - Path	4'6"
	Buffer (b/t sidewalk and road)	Grass	Grass
	Buffer Width	>5 ft	2-5 ft
	# of Trees	5	0
	Midblock crossing presence?	N	N
	Midblock crossing type	-	-
	Ped/bike path to building front?	N	N
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	-	-
<b>Transit</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Bus stop presence?	Y	N
	Bus stop condition	Shelter; Bench	Sign only
	Distance from stop to legal crossing	145'	700'
	Distance from stop to land use entrance	515'	95' (house)
<b>Traffic</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Block spacing	1600'	750'
	Signal Spacing	1600'	
	Street Layout	3+3 with 1 left turn	
	Width of Travel+Turn lanes	90'	
	Speed Limit	45	
	Median presence	Y	
	Median Width	2'6"-12'	
Median type	Concrete		

# 10 Arapahoe Avenue From Foothills Parkway To 48th Street

## Potential Changes

Focus Area



### STREET TYPOLOGY

#### Institutional Boulevard

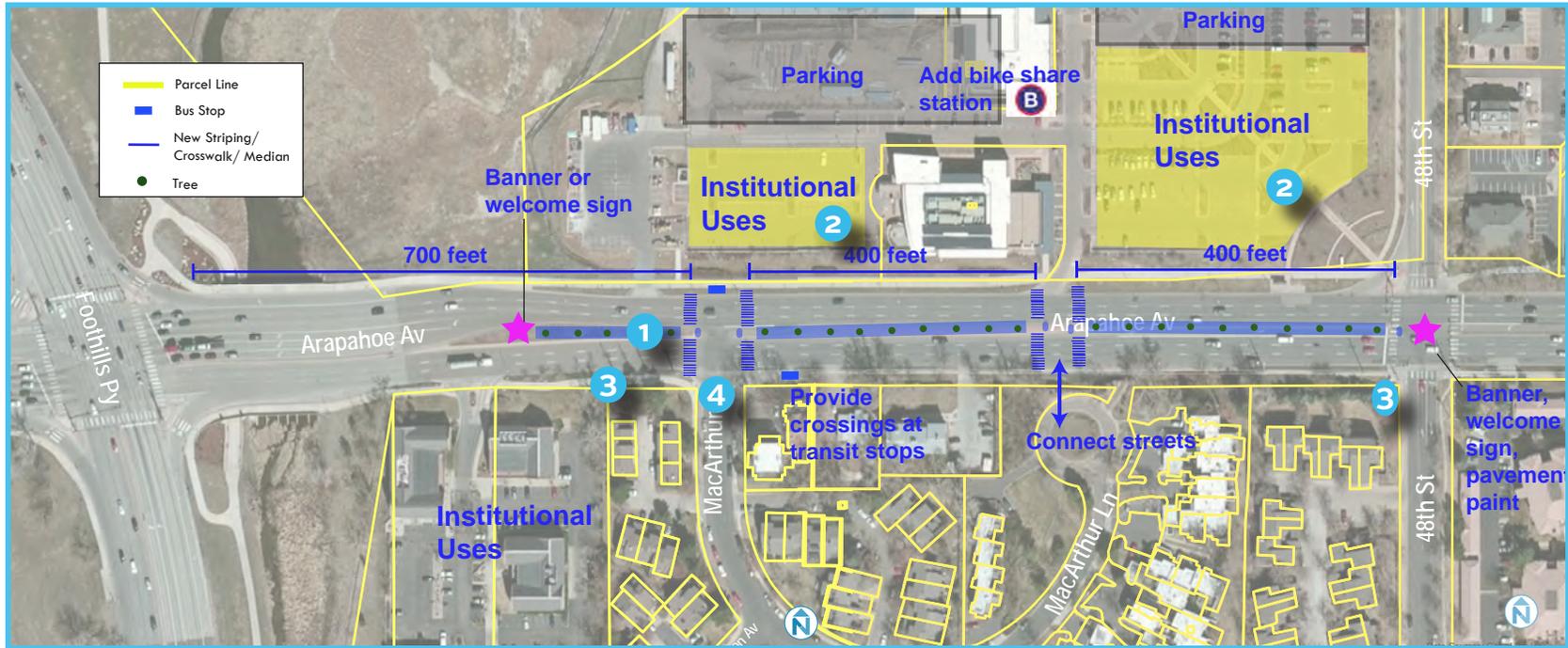
Auto trip reductions midday to and from institutional uses can be achieved by providing safe and comfortable means of circulating within a campus.

#### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On an Institutional Boulevard these might include: <ul style="list-style-type: none"> <li>• 8'-12' sidewalks</li> <li>• 5' buffer (minimum)</li> <li>• 6' buffered bike lanes or 10-15' path</li> <li>• Trees every 20-25'</li> <li>• Driveway width &lt;12' one-way</li> <li>• Lighting every 20'-30'</li> <li>• Target speed 25-30 mph</li> <li>• Crossings every 200-400'</li> <li>• Parking optional</li> <li>• 2-3 travel lanes per direction</li> </ul>
D3	Parking location requirements	Require parking lots of a certain size to be located away from the most active street abutting a development.
A1	Form-based code	Develop standards for institutional zones including building setback, public space, and multiple access points (to alleviate congestion). Include gateway treatments as a tool for traffic calming.
D1	Reduce parking requirements on transit corridor	On corridors with high-frequency transit, allow for reduced parking.
E4	Transit street standards	If transit stops are provided, ensure safe crossings are also built.

# 10. Arapahoe Avenue From Foothills Parkway To 48th Street

## Potential Changes



**1** Adding a landscaped median and additional crossings turns an institutional campus into a walkable boulevard (policy C1).

**2** A 100,000 square foot parking lot, even a well-designed one like this with sidewalks and greenery, is visually detracting from a multimodal corridor. Build against the most active street, placing parking behind. Incorporate bike sharing to encourage short trips by bicycle (policy D3).



*This hospital in Queens, NY fronts the street, with parking behind the building.*

**3** Signs or special pavement markings bookend an institutional campus (policy A1).

**4** Add a crossing at transit stops (policy E4).

# 11 Arapahoe Avenue From 48th To 56th Streets

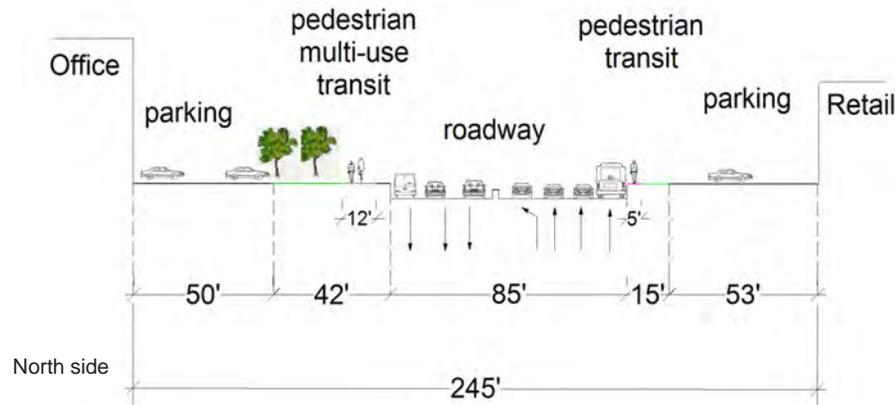
## Site Overview

## Key Diagram



This section has numerous land uses and site designs. Along the south side, Arapahoe Avenue heading east has medium and high density housing, a large shopping center, and more auto-oriented industrial uses toward 55th Street. Along the north side, offices about the hospital along 48th Street, followed by the Ball factory and more office and industrial uses. Some buildings, such as the parcel on the northwest corner of Arapahoe Avenue and 55th Street, directly front the street while others have been built with parking frontages.

## Typical Cross Section



# 11. Arapahoe Avenue From 48th To 56th Streets

## Existing Conditions - Land Use & Site Design



- Existing** At night, lighting provided against the buildings illuminates the path.
- Opportunities** Requiring lighting against the side of buildings supports city-provided lighting.
- Challenges** Adding this requirement to site design depends upon individual community plans.



- Existing** The industrial areas north of Arapahoe Avenue lend themselves well to frontage roads with sidewalks.
- Opportunities** Provide an alternate walk route away from Arapahoe Avenue's traffic.
- Challenges** Pedestrian activity in these areas is low.



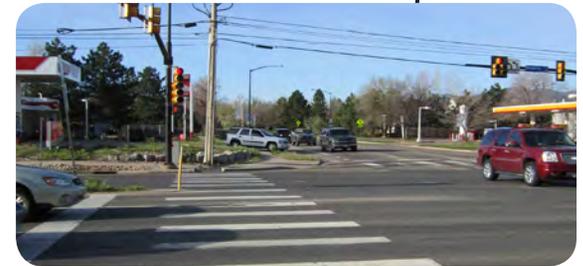
- Existing** Behind the shopping area along the north side of Arapahoe Avenue, the parking lot contains public space.
- Opportunities** Require public space in parking lots combined with landscaping.
- Challenges** Adding public space in existing parking requires removing spaces.



- Existing** Between garage units provided against Arapahoe Avenue, a direct path would access the sidewalk.
- Opportunities** Build a sidewalk from the land use to the sidewalk when space like this is available.
- Challenges** A sidewalk is provided at the intersections, but there is no link between 48th Street and Eisenhower Drive, reducing the site's permeability for residents.



- Existing** The shopping center at Conestoga Avenue has a general U-shape with parking in the center.
- Opportunities** The narrow strip of parking in front of Ozo Coffee allows street users to see the land use.
- Challenges** A busy retail establishment like Ozo would benefit further from a street-fronting building.



- Existing** At Arapahoe Avenue and 55th Street, two gas stations on the south corners detract from this node's vitality.
- Opportunities** Over time, transition gas stations to alternate uses and reduce instances where two auto-oriented businesses dominate an intersection.
- Challenges** Corners make sense for gas stations in terms of visibility and access.

# 11. Arapahoe Avenue From 48th To 56th Streets

## Existing Conditions - Transportation



**Existing** In this section of Arapahoe Avenue, the curb lane is very wide – approximately 16 feet.

**Opportunities** This wide curb lane provides room for options such as a widened median refuge, wider south side sidewalk, or even future BRT.

**Challenges** Depending upon the design chosen, implementation may necessitate moving curb lines.



**Existing** Pedestrians walk from housing and other retail uses to the shopping center at Arapahoe Avenue and Conestoga Street.

**Opportunities** Link parcels with a frontage road to provide local access.

**Challenges** A frontage road may require moving some parking.



**Existing** Walk and bike access to the shopping area provided directly from the sidewalk.

**Opportunities** This type of entrance adds layers to the pedestrian network and means people do not have to walk to the vehicle entrance to access businesses.

**Challenges** None



**Existing** The entrance to this busy shopping center has no sidewalks.

**Opportunities** Ensure that driveways have non-motorized access.

**Challenges** In this case, adding sidewalk requires narrowing the driveway or moving utilities.



**Existing** The intersection at Conestoga Avenue is well-used by pedestrians.

**Opportunities** Make the crossing more pedestrian friendly with a wider median refuge, median tip, and fixed-time pedestrian signals.

**Challenges** None

# 11. Arapahoe Avenue From 48th To 56th Streets

## "Typical" Section Data Details

		Parcel ID: 05121288	Parcel ID: 0106636
<b>Site Design</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	# of stories	2	1
	Setback from curb	88'	86'
	Building doors/windows	Face street	Behind parking/lawn
	Building permeability	Poor - wide setback	Windows/Doors visible
	Building has frontage?	N	N
	Building frontage type	-	-
	Zoning	Industrial - General (IG)	Business-Community 1 and 2 (BC-1/2)
	Land Use	Strip Commercial	Strip Mall; Ozo Coffee
	<b>Parking</b>	<b>Metric</b>	<b>North</b>
Parking presence?		Y	Y
Parking type		Strip/wrap around	Strip/Wrap around
Parking management		Business restricted	Free
Estimate of occupancy		10%	40%
Driveways		0	1
Driveway design		-	More than 2 lanes wide
<b>Greenery (b/t sidewalk and building)</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Landscaping Presence?	Y	Y
	Landscaping type	Full growth trees	Full growth trees
	Landscaping width	27'	25'
	Number of Trees	15	2
	Public space presence?	N	N
	Public space type	-	-
<b>Bicycle</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Bike parking?	Y	Y
	Bike lane presence?	N	N
	Multiuse path?	Y	N
	Bike lane width	0'	0'
	Bike lane/path buffer	0'	0'

		North	South
<b>Pedestrian</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Sidewalk presence?	N - Path	Y
	Sidewalk Width	12' - Path	4'
	Sidewalk Condition	Meets demand; buffered	ADA compliant width
	Effective sidewalk width	12' - Path	4'
	Buffer (b/t sidewalk and road)	Pavers	No buffer
	Buffer Width	2-5'	0
	# of Trees	0	0
	Midblock crossing presence?	N	N
	Midblock crossing type	-	-
	Ped/bike path to building front?	N	N
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	-	-
	<b>Transit</b>	<b>Metric</b>	<b>North</b>
Bus stop presence?		Y	N
Bus stop condition		Sign only	-
Distance from stop to legal crossing		97'	-
Distance from stop to land use entrance		94'	-
<b>Traffic</b>	<b>Metric</b>	<b>North</b>	<b>South</b>
	Block spacing	537'	270'
	Signal Spacing	1066'	
	Street Layout	3+3 with 1 left turn	
	Width of Travel+Turn lanes	83'	
	Speed Limit	45 mph	
	Median presence	Y	
	Median Width	2' 6"	
Median type	Concrete/Grass		

# 11 Arapahoe Avenue From 48th To 56th Streets

## Potential Changes

Focus Area



### STREET TYPOLOGY

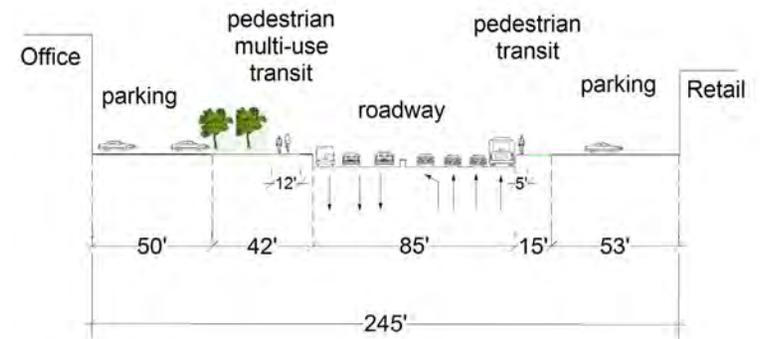
#### Mixed-Use Multiway Boulevard

Multiway Boulevards create two distinct environments – a throughway for vehicle traffic in the center and a pedestrian-oriented business district along the frontage roads.

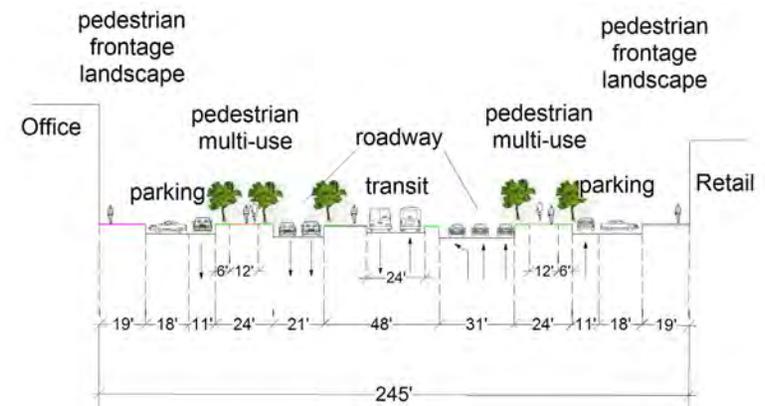
#### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On an Mixed-Use Multiway Boulevard, these might include: <ul style="list-style-type: none"> <li>• 12'-20' sidewalks</li> <li>• 10-12' path</li> <li>• Trees every 20-25' – trees important to frame the wide cross section</li> <li>• Lighting every 25'</li> <li>• Target speed 30-35 mph center roadway; 20-25 mph frontage lanes</li> <li>• Crossings every 400'-600'</li> <li>• Angled or parallel parking on frontage lanes</li> <li>• Center-running transit lanes or transit priority measures</li> </ul>
A1	Form-based code	As a node of activity, create a district type (such as a Pedestrian District, Activity Center, or other such designation) to create pedestrian, bicycle, and transit-friendly streets with visual interest that encourage further development. The code can govern setback distance, internal accessways, intra-district lighting, and streetscape standards.
B2	Building Entrances	Streets within the district can be activated by requiring multiple entrances – along the main street and along side streets.
D1	Reduce parking requirements on transit corridor	Encourage transit use by reducing parking requirements for new developments and allowing shared parking (see D4).
D4	Shared parking	As the activity node grows to include uses that have peak parking needs at different times of day, shared parking allows developers to build without providing dedicated, new parking.

#### Before

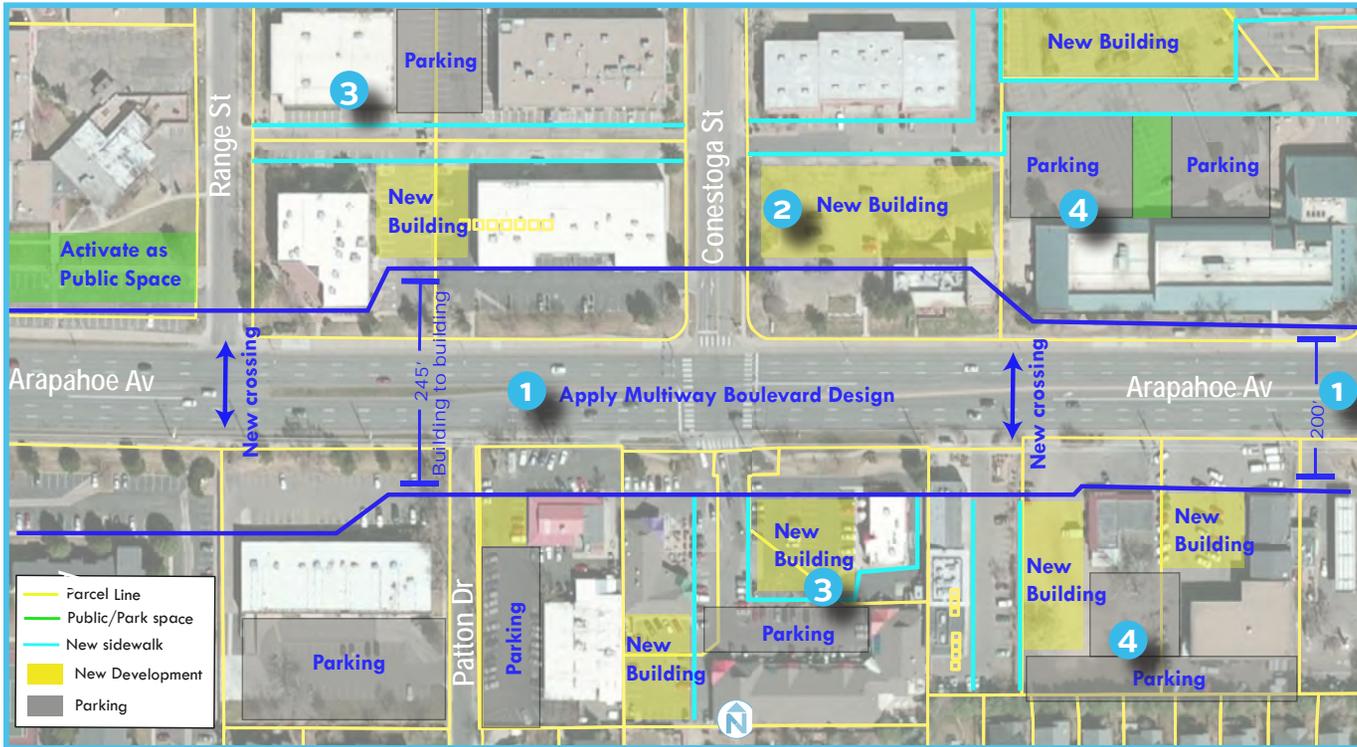


#### After



# 11. Arapahoe Avenue From 48th To 56th Streets

## Potential Changes



- 2 Encourage urban form that attracts users in a designated activity node or pedestrian oriented district (policy A1).
- 3 Take advantage of access lanes to provide sidewalks and building entrances from multiple sides of development (policy B2).
- 4 Maintain parking facilities behind development (policies D1, D4).

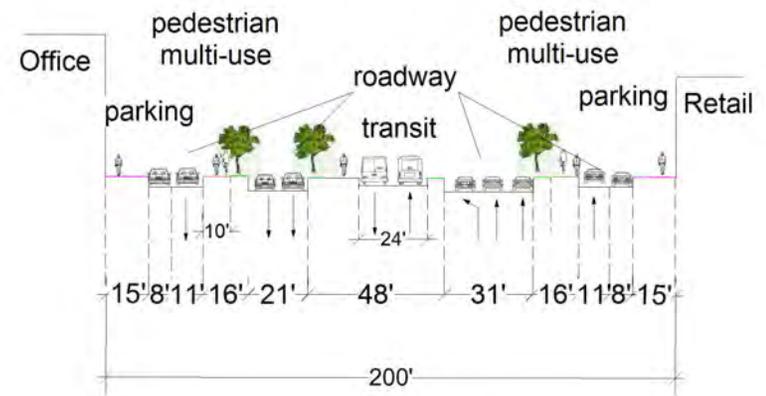
1 Multiway boulevards include several design elements that can vary in size to fit space available. For example, reducing path width, eliminating a buffer, and turning angle parking to parallel can reduce the cross section to 200'. Narrow elements or delete as needed to fit (policy C1).



Shattuck Avenue in Berkeley, CA provides business access with angled parking in the frontage lane.



Center-running transit on a commercial corridor in Eugene, OR.



# 12a Arapahoe Avenue From 56th Street To Old Tale Road

## Key Diagram

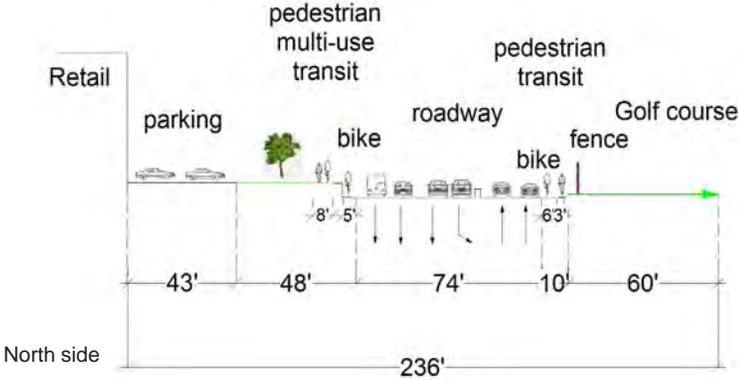


## Site Overview



This portion of Arapahoe Avenue is dominated by the golf course to the south and industrial uses to the north. The south side lacks a sidewalk in many places, while along the north, the multi-use path continues. There is no legal crossing in this area; signals are spaced 0.7 miles apart.

## Typical Cross Section



# 12a. Arapahoe Avenue From 56th Street To Old Tale Road

## Existing Conditions - Land Use & Site Design



**Existing** Space to the side of parcels not currently used for parking.

**Opportunities** As Arapahoe Avenue develops, providing access to sites beyond those fronting Arapahoe make sites attractive for development.

**Challenges** Developing a street network may not happen until development.

**Existing** Industrial uses north of Arapahoe Avenue are generally low-volume.

**Opportunities** Transition to a public street as the corridor develops.

**Challenges** Retaining industry is important to an urban economy, and the uses in this area are all still active.



**Existing** Land uses such as the dinner theater at the corner of 55th Street and Arapahoe Avenue activate the street at night.

**Opportunities** The site is set back from the street by parking.

**Challenges** The site is still active and the building cannot be moved.

**Existing** Small-scale industrial and retail uses along the north side of Arapahoe Avenue.

**Opportunities** As noted, the parking strips in front of retail could be converted to frontage roads.

**Challenges** Parking areas are privately owned, meaning such a design may have to wait until site redevelopment.



# 12a. Arapahoe Avenue From 56th Street To Old Tale Road

## Existing Conditions - Transportation



**Existing** In front of the golf course, there is no sidewalk accessing the bus stop.

**Opportunities** Transition shoulder into sidewalk to provide access to the golf course and bus stop.

**Challenges** Curb and sidewalk may require new drainage.



**Existing** In front of the golf course, there is no sidewalk. Signals are spaced 3,500 feet apart.

**Opportunities** Transition shoulder into sidewalk and provide a HAWK at this median break.

**Challenges** Curb and sidewalk may require new drainage.



**Existing** The generous multi-use path along the north side provides walking and biking access.

**Opportunities** If a facility can only be provided on the north side, provide safe crossings from bus stops and housing on the south side to access this facility.

**Challenges** Adding signalization to this state highway will be difficult.



**Existing** The intersection of 55th Street and Arapahoe Avenue has numerous land uses.

**Opportunities** This intersection can become an activity node for the corridor.

**Challenges** Auto-oriented uses are prevalent along the south side.



**Existing** Access to offices along the north side lack sidewalks.

**Opportunities** In all new developments, require sidewalks on access roads.

**Challenges** This site will remain as existing until development occurs.

# 12a. Arapahoe Avenue From 56th Street To Old Tale Road

## “Typical” Section Data Details

		Parcel ID: 0036909	Parcel ID: 0085219
Site Design	Metric	North (part 2 of 5)	South (part 2 of 5)
	# of stories	2	Golf Course
	Setback from curb	85'	Golf Course
	Building doors/windows	Face street;behind parking/lawn	Golf Course
	Building permeability	Poor-wide setback	Golf Course
	Building has frontage?	N	Golf Course
	Building frontage type	-	Golf Course
	Land Use	Commercial	Golf Course
	Parking	Metric	North (part 2 of 5)
Parking presence?		Y	Golf Course
Parking type		Strip/wraparound	Golf Course
Parking management		Business restricted	Golf Course
Estimate of occupancy		90%	Golf Course
Driveways		1	Golf Course
Driveway design		At sidewalk level	Golf Course
Greenery (b/t sidewalk and building)	Metric	North (part 2 of 5)	South (part 2 of 5)
	Landscaping Presence?	Y	Golf Course
	Landscaping type	Grass	Golf Course
	Landscaping width	30'	Golf Course
	Number of Trees	1	Golf Course
	Public space presence?	N	Golf Course
Bicycle	Metric	North (part 2 of 5)	South (part 2 of 5)
	Bike parking?	N	N
	Bike lane presence?	Y	Y
	Multiuse path?	Y	N
	Bike lane width	5'	6'
	Bike lane/path buffer	3'	0'

		North (part 2 of 5)	South (part 2 of 5)
Pedestrian	Metric	North (part 2 of 5)	South (part 2 of 5)
	Sidewalk presence?	N - path	N
	Sidewalk Width	8' - Path	3' shoulder
	Sidewalk Condition	Meets demand; buffered	None
	Effective sidewalk width	8' - Path	-
	Buffer (b/t sidewalk and road)	Grass	No buffer
	Buffer Width	2-5 ft	0
	# of Trees	0	0
	Midblock crossing presence?	N	N
	Midblock crossing type	-	-
	Ped/bike path to building front?	N	N
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	-	-
	Transit	Metric	North (part 2 of 5)
Bus stop presence?		Y	Y
Bus stop condition		Shelter	Sign only
Distance from stop to legal crossing		1390'	1390'
Distance from stop to land use entrance		115'	1077'
Traffic	Metric	North (part 2 of 5)	South (part 2 of 5)
	Block spacing	966'	1337'
	Signal Spacing	3475'	
	Street Layout	3+2 with 1 left turn	
	Width of Travel+Turn lanes	66'	
	Speed Limit	45	
	Median presence	Y	
	Median Width	3'	
Median type	Grass		

# 12a Arapahoe Avenue From 56th Street To Old Tale Road

## Potential Changes



### STREET TYPOLOGY

#### Industrial Boulevard

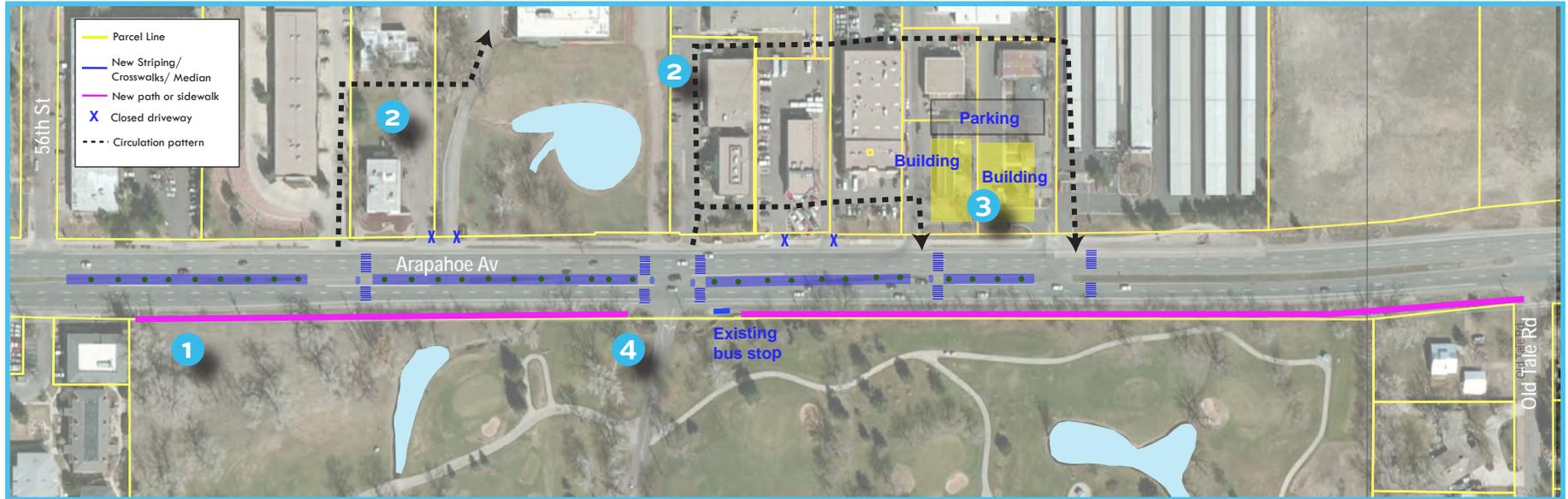
Even on industrial streets people were observed walking and cycling and providing good infrastructure is still important.

#### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On an Industrial Boulevard these might include: <ul style="list-style-type: none"> <li>• 8'-12' sidewalks or path</li> <li>• 5' buffer (minimum)</li> <li>• Multi-use path for cyclists</li> <li>• Trees every 25-35'</li> <li>• Lighting every 20'-30'</li> <li>• Target speed 30 mph</li> <li>• Crossings every 300-500'</li> <li>• Loading zones optional</li> <li>• 2-3 travel lanes per direction</li> </ul>
B4	Internal accessways	Require parcels to connect to each other and formalize access lanes inside blocks into streets.
B3	Active uses along streets	Industrial uses are still active uses that add (or detract) from walkability. Site buildings against active streets and provide loading and parking behind.
E4	Transit street standards	An existing bus stop is provided without any means of crossing the street. A westbound bus rider becomes an eastbound rider on the return trip, thus safe crossings are a requirement for transit stops.

## 12a. Arapahoe Avenue From 56th Street To Old Tale Road

### Potential Changes



**1** Provide walking/bicycling facilities on both sides of the street and add crossings (policy C1).

**2** Consolidate driveways, allowing for a continuous median (policy B4).

**3** Industrial uses can frame the street, with parking located behind (policy B3).

**4** Do not place transit stations without also providing a safe crosswalk (policy E4). The crosswalk type must take into account vehicle speeds and volumes – it may require a full signal, RRFB, or other control.

# 12b Arapahoe Avenue From Cherryvale To 63rd Streets

## Key Diagram

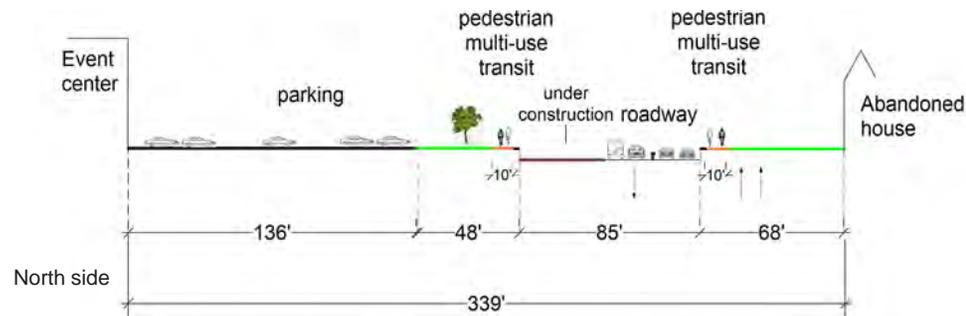


## Site Overview



From Cherryvale Road to 63rd Street, Arapahoe Avenue has large empty or condemned parcels ripe for future development. Car dealerships along the north side and the Avalon event center are the primary active uses. Streets like Cherryvale Road, Ben Place, and 63rd Street can become potential full streets providing access on both sides of Arapahoe Avenue. This section of the street is under construction, with half the road open to traffic. Despite the closures, traffic seemed to function normally, either due to driver knowledge of the closure and detouring, or due to traffic volumes lower than the street capacity. Conducting traffic counts and LOS calculations would be extremely valuable for future planning of the right-of-way.

## Typical Cross Section



## 12b. Arapahoe Avenue From Cherryvale To 63rd Streets

### Existing Conditions - Land Use & Site Design



**Existing** The Avalon event center is fronted by a large parking lot.

**Opportunities** This type of land use has the power to attract nighttime users and active Arapahoe Avenue. Implement shared parking with nearby daytime developments.

**Challenges** Connecting this parking resource to a future development site is needed.



**Existing** The intersection of 63rd Street and Arapahoe Avenue can become another node of activity along the corridor.

**Opportunities** Currently there are active uses along the south and northeast sides. This node, plus Cherryvale Road and 55th Street, can become hubs of activity anchoring Arapahoe Avenue.

**Challenges** Retaining the industrial active uses may be a community priority.



**Existing** Half of Arapahoe Avenue is currently under construction.

**Opportunities** The reconstruction can be a catalyst to spur development.

**Challenges** Since Arapahoe Avenue does not have a local area plan, developers can simply follow the zoning code and build suburban, auto-oriented sites.



**Existing** Condemned or abandoned housing on the narrow parcels on the south side of the street provide opportunity for development.

**Opportunities** Depending on the desire of the property owners, there is potential here for both large-scale development on the parcel against Arapahoe Avenue and Cherryvale Road plus smaller-scale retail on the abandoned housing lots. Alternating large and small buildings creates visual interest and provides opportunities for different business types (e.g. big-box or a coffee shop) to flourish.

**Challenges** New developments will need to fit against the active industrial use along 63rd Street.



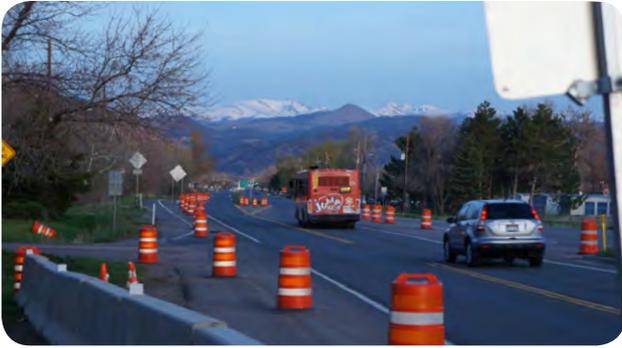
**Existing** During construction, Jersey barriers provide a temporary sidewalk.

**Opportunities** In the area of Arapahoe without sidewalk (see Site #12a), Jersey barriers can provide some sense of safety from traffic in the short-term.

**Challenges** Barriers distract from aesthetics.

# 12b. Arapahoe Avenue From Cherryvale To 63rd Streets

## Existing Conditions - Transportation



**Existing** Currently, in some sections Arapahoe Avenue is down to one lane per direction during construction.

**Opportunities** Many communities are finding that highways built in the past 40 years have ended up over capacity. Collecting traffic counts during this time would be an interesting way to understand how traffic operates during constrained conditions.

**Challenges** Removing lanes on a state highway requires state approvals.



**Existing** Along the north side of Arapahoe Avenue, the path under construction winds through frontage areas.

**Opportunities** This path, although perhaps less direct than a straight line, will shield users from vehicle traffic and gets people closer to building front doors.

**Challenges** The windy nature of the path requires that the city own a significant chunk of the land behind the curb.



**Existing** Similar to other existing areas of Arapahoe Avenue, the construction shows the casting for a long left turn lane with a 2' median at the tip (where a crosswalk would be).

**Opportunities** Although already constructed, the left turn lane could be kept closed for the short-term to see if demand actually warrants it.

**Challenges** None



**Existing** On the south side, the newly constructed multi-use path measures 10' and has 2' of pavers along the curb.

**Opportunities** This provides a needed link in the network complementing the multi-use path on the north side.

**Challenges** Given the high speeds on Arapahoe Avenue, a buffered path would have provided relief from traffic noise and provided a more pleasant walking and biking environment.



**Existing** It appears that 62nd Street/Ben Place is being set up to be an intersection given this newly constructed driveway (behind the driveway is an empty field).

**Opportunities** This location is 438 feet from the 63rd Street intersection which makes for a medium-sized urban block. Make this location into a multimodal intersection with pedestrian and bicycle crossings and a median refuge island.

**Challenges** Development of the intersection may have to wait until a property owner builds on the site.

# 12b. Arapahoe Avenue From Cherryvale To 63rd Streets

## "Typical" Section Data Details

		Parcel ID: 0036921	Parcel ID: 36521	
<b>Site Design</b>	<b>Metric</b>	<b>North (part 4 of 5)</b>	<b>South (part 4 of 5)</b>	
	# of stories	1	abandoned houses	
	Setback from curb	190'	n/a	
	Building doors/windows	Behind parking	n/a	
	Building permeability	Poor-wide setback	n/a	
	Building has frontage?	N	n/a	
	Building frontage type	-	n/a	
	Land Use	Commercial	n/a	
	<b>Parking</b>	<b>Metric</b>	<b>North (part 4 of 5)</b>	<b>South (part 4 of 5)</b>
		Parking presence?	Y	n/a
Parking type		Large parking lot	n/a	
Parking management		Free	n/a	
Estimate of occupancy		0%	n/a	
Driveways		0	n/a	
Driveway design		-	n/a	
<b>Greenery (b/ sidewalk and building)</b>	<b>Metric</b>	<b>North (part 4 of 5)</b>	<b>South (part 4 of 5)</b>	
	Landscaping Presence?	Y	n/a	
	Landscaping type	Grass	n/a	
	Landscaping width	35'	n/a	
	Number of Trees	0	n/a	
	Public space presence?	N	n/a	
	Public space type	-	n/a	
<b>Bicycle</b>	<b>Metric</b>	<b>North (part 4 of 5)</b>	<b>South (part 4 of 5)</b>	
	Bike parking?	Y	N	
	Bike lane presence?	N	N	
	Multiuse path?	Y	Y	
	Bike lane width	0'	0'	
	Bike lane/path buffer	2'	2'	

		North (part 4 of 5)	South (part 4 of 5)
<b>Pedestrian</b>	<b>Metric</b>	<b>North (part 4 of 5)</b>	<b>South (part 4 of 5)</b>
	Sidewalk presence?	N - Path	N - Path
	Sidewalk Width	10' - Path	10' - Path
	Sidewalk Condition	Meets demand; buffered	Meets demand; buffered
	Effective sidewalk width	10' - Path	10' - Path
	Buffer (b/t sidewalk and road)	Pavers	Pavers
	Buffer Width	2-5 ft	2-5 ft
	# of Trees	0	0
	Midblock crossing presence?	N	N
	Midblock crossing type	--	--
	Ped/bike path to building front?	N	N
	Pedestrian-scale lighting?	N	N
	Pedestrian lighting spacing	--	
<b>Transit</b>	<b>Metric</b>	<b>North (part 4 of 5)</b>	<b>South (part 4 of 5)</b>
	Bus stop presence?	N	N
	Bus stop condition	-	-
<b>Traffic</b>	<b>Metric</b>	<b>North (part 4 of 5)</b>	<b>South (part 4 of 5)</b>
	Block spacing	480'	1781
	Signal Spacing	1781'	
	Street Layout	2+2 with construction	
	Width of Travel+Turn lanes	CONSTRUCTION ZONE	
	Speed Limit	25 in construction zone	
	Median presence	CONSTRUCTION ZONE	
	Median Width	CONSTRUCTION ZONE	
	Median type	CONSTRUCTION ZONE	

# 12b Arapahoe Avenue From Cherryvale To 63rd Streets

Potential Changes



## STREET TYPOLOGY

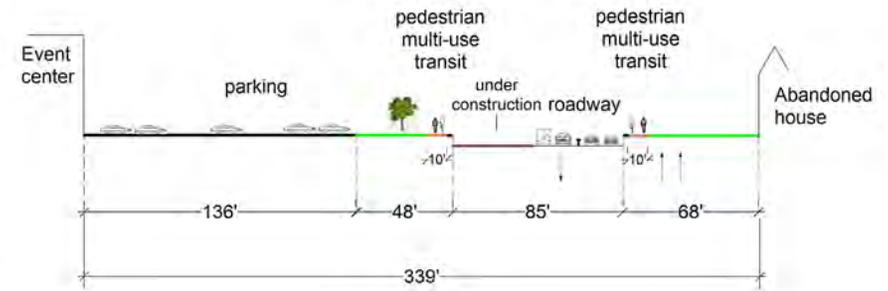
### Commercial Transit Street

In areas with development potential, framing parcels with walkable blocks and providing high-quality transit are the bones for multimodal street use.

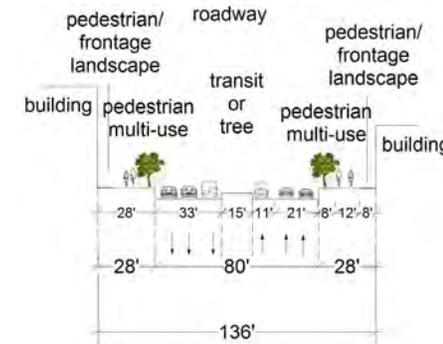
#### Policies Applied

Code #	Code Name	Application to Prototype
C1	City street classification system	The overarching typology system will include design metrics. On an Commercial Transit Street these might include: <ul style="list-style-type: none"> <li>• 10-20' sidewalks or path</li> <li>• 5' buffer (minimum)</li> <li>• Buffered bike lanes or path</li> <li>• Trees every 20-25'</li> <li>• Lighting every 20'-30'</li> <li>• Target speed 25-30 mph</li> <li>• Crossings every 200-400'</li> <li>• Parking optional</li> <li>• 2 travel lanes per direction</li> </ul>
A1	Form-based code	Designate a redevelopment zone including setback standards, streetscape design, and a robust parking management and design element.
D2	Incentives for structured parking	In an area with a wealth of potential future development, consider incentives or subsidies so initial developments contain structured parking to become future shared parking resources.
E2	Developer transit requirements	On a designated transit corridor, developers must help fund service improvements.
G1	Maximum block size and intersection spacing	This can also be included in the street typology and form-based code.

#### Before



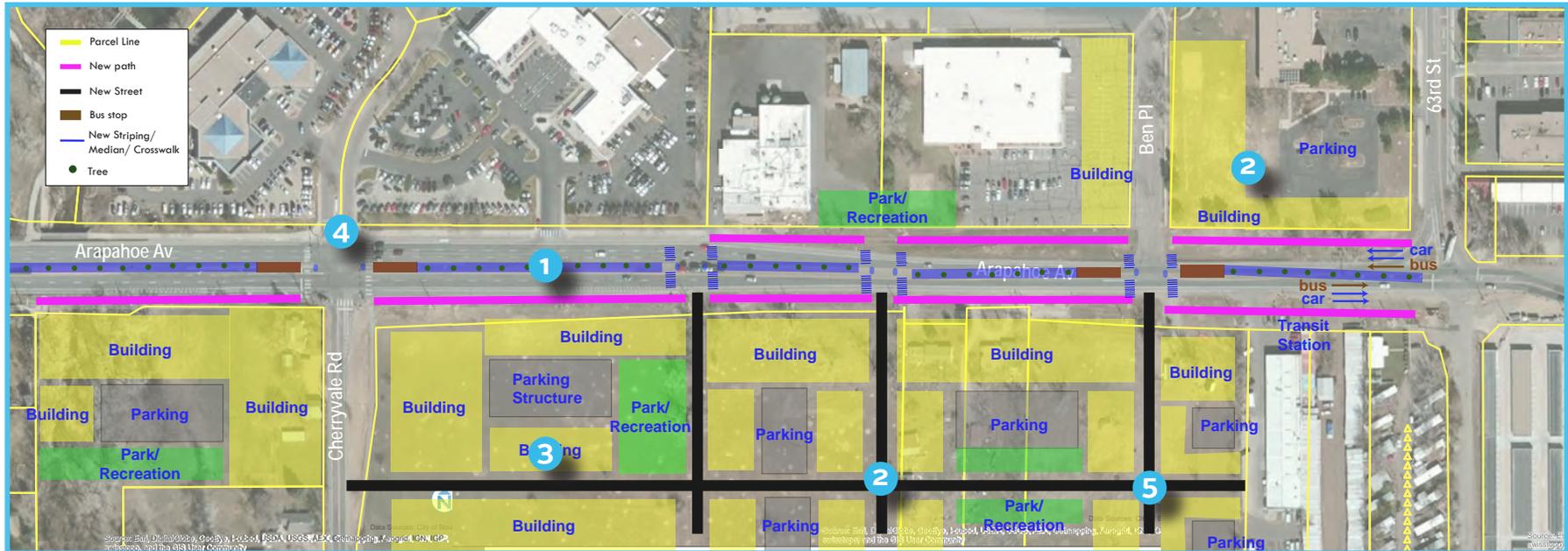
#### After



The above "after" cross-section shows how this site might look operating under the current right-of-way constraints. Certain Commercial Transit Street desired elements are not included, such as on-street parking, due to space constraints.

## 12b. Arapahoe Avenue From Cherryvale To 63rd Streets

### Potential Changes



**1** On this developing corridor, an emphasis on transit to access commercial uses results in center-running transit-only lanes, crossings at every block, and new multi-use paths (policy C1).

**2** With a wealth of land available for redevelopment, creating design standards for incoming developers is crucial to the area's success as a future activity node. Street fronting buildings, parking in block interiors, requirements for public or recreation space, and block standards will create a city and regional destination (policy A1).

**3** Initial developments set the tone for the rest of the zone, thus thinking through how and where to maximize parking capacity while minimizing building footprint will have major benefits throughout the life of the area (policy D2).

**4** Developers can help fund transit amenities and station maintenance (policy E2).

**5** Lay out a street network grid before development occurs to ensure walkable block spacing standards (policy G1).