WESTMINSTER | EST. 1870 |

72nd AVENUE
CORRIDOR STUDY

72nd Avenue Corridor Study

October 2024

consor

FELSBURG HOLT & ULLEVIG

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City of Westminster Chamber of Commerce
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Foothills Regional Housing
Jeffco Public Schools
Jefferson County
Regional Transportation District (RTD)
Westminster Public Schools

Corridor Businesses & Residents

Thank you to all the corridor businesses and residents that were engaged and provided feedback throughout each stage of the planning process.

ACRONYMS

ATIIP	Active Transportation Infrastructure Investment Program
BRT	Bus Rapid Transit
CDTO	Colorado Department of Transportation
CIP	Capital Improvements Program
DRCOG	Denver Regional Council of Governments
FASTER	Funding Advancement for Surface Transportation and Economic Recovery
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HIN	High-Injury Network
LOS	Level of Service
LPI	Leading Pedestrian Internal
MMOF	Multi-modal Transportation and Mitigation Options Fund
PHB	Pedestrian Hybrid Beacon
RAISE	Rebuilding American Infrastructure with Sustainability and Equity
RMS	Revitalizing Main Streets
RRFB	Rectangular Rapid Flashing Beacon
RTD	Regional Transportation District
SRTS	Safe Routes to School
TIP	Transportation Improvement Program
TOD	Transit-Oriented Development
USDOT	United States Department of Transportation

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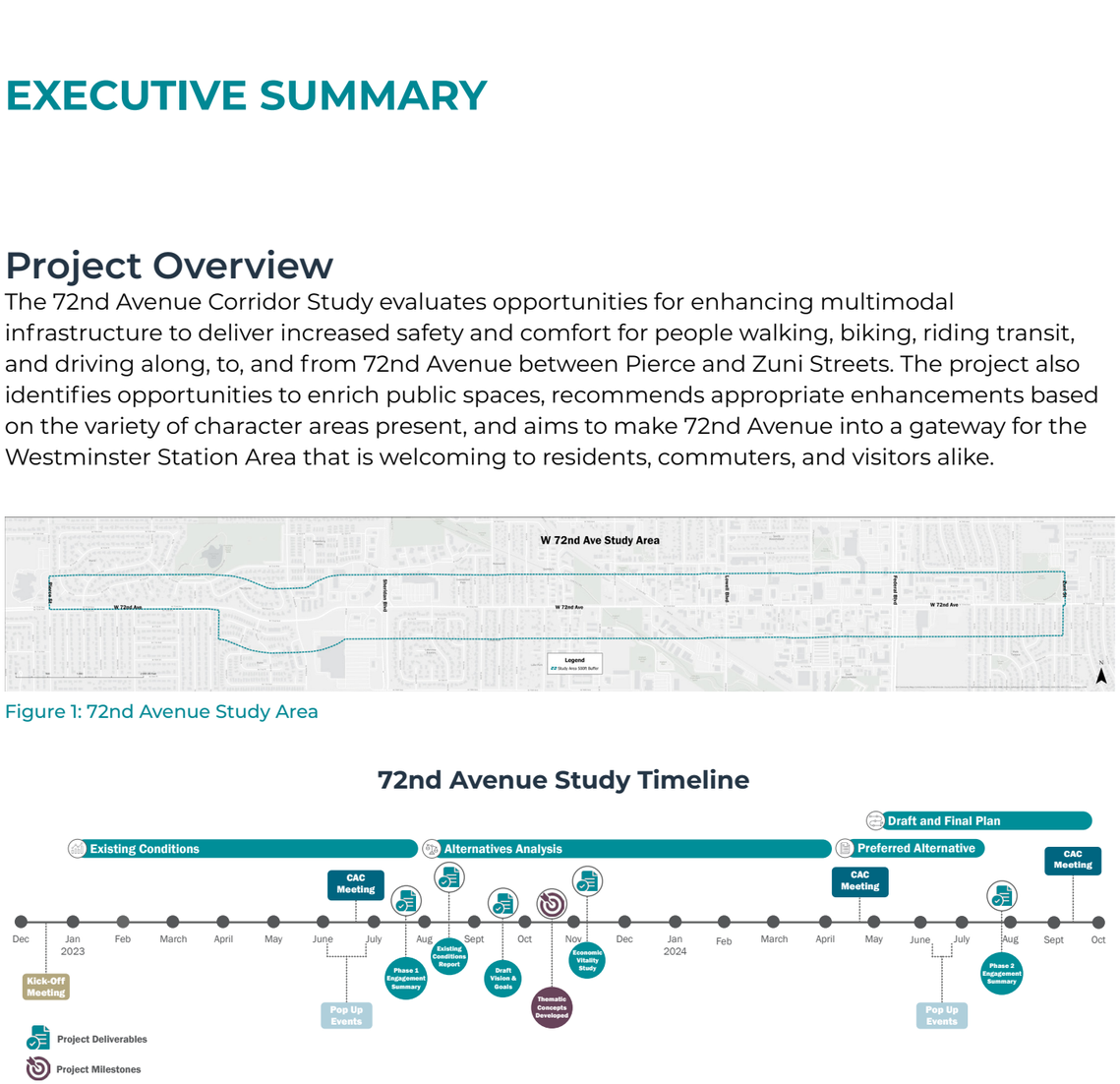
Executive Summary

Project Overview

The 72nd Avenue Corridor Study evaluates opportunities for enhancing multimodal infrastructure to deliver increased safety and comfort for people walking, biking, riding transit, and driving along, to, and from 72nd Avenue between Pierce and Zuni Streets. The project also identifies opportunities to enrich public spaces, recommends appropriate enhancements based on the variety of character areas present, and aims to make 72nd Avenue into a gateway for the Westminster Station Area that is welcoming to residents, commuters, and visitors alike.

Figure 1: 72nd Avenue Study Area

72nd Avenue Study Timeline



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72nd AVENUE
CORRIDOR STUDY

VISION & GOALS

The 72nd Avenue Corridor Study is guided by an overarching vision statement describing the desired future conditions of the corridor. The vision and goals are based on previous planning efforts, recent community feedback, and the needs identified through the evaluation of existing conditions.

VISION

"The vision for 72nd Avenue is a safe and accessible corridor that instills a sense of place and serves as an artistic and attractive gateway to the Westminster Station area, supporting multimodal connections to and from Westminster neighborhoods, businesses, parks, and schools."

GOALS

- Improve safety for all ages, abilities, and modes traveling along and across 72nd Avenue
- Enhance livability, foster maintainable and climate appropriate greenscaping and shade-enhancing improvements
- Enhance the corridor's visual appearance, establishing its sense of place and celebrating its history and identity through enhancements to the urban environment and fostering business revitalization
- Create opportunities for social interaction and community building
- Provide mobility choices and increase accessibility

Project Process

72nd Avenue is an important east-west connection to many area and regional destinations, including schools, businesses, services, parks and open space, Westminster Station, and regional trails such as Little Dry Creek. The project team captured feedback from a diversity of stakeholder groups using this corridor, including parents/caregivers whose children attend Westminster Public Schools, area residents and business owners, transit riders, and more.

Existing Conditions and Needs Assessment

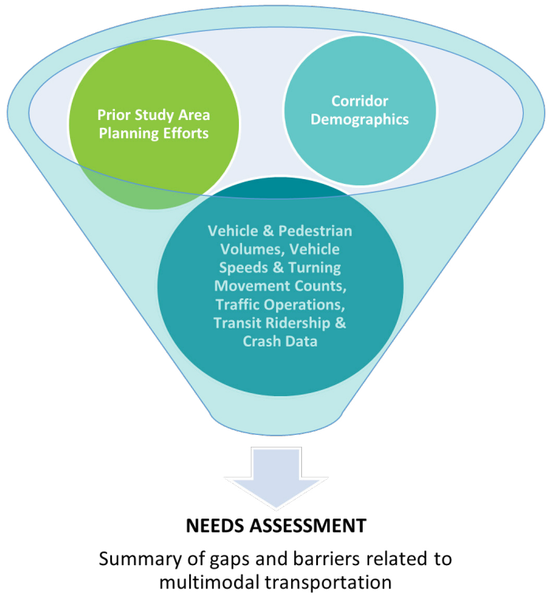


Figure 2: Needs Assessment Development Process

Public Engagement

The project team gathered feedback in two phases. Phase 1 engagement extended from Spring to July 2023 and focused on community visioning. This phase introduced and raised awareness about the project, presented information on previous planning efforts and initial findings from the existing conditions analysis, and hosted community listening and feedback opportunities with residents, business owners, community members, and area stakeholders.

Phase 2 engagement extended from Spring to Summer 2024 and focused on gathering feedback on proposed improvements. The second phase solicited feedback on elements of the two project alternatives, “Break the Barrier” and “Calm the Traffic,” which led to further design refinement. The project’s primary engagement avenues are outlined below. For a full summary of engagement activities, findings, and feedback, see the Appendix for the Phase 1 Engagement Summary and Phase 2 Engagement Summary.

Community Advisory Committee (CAC)

The CAC included representatives from critical local commissions, community-based organizations, organizations focused on regional mobility and health, and service providers, including:

- Bike Jeffco
- Colorado Department of Transportation (CDOT)
- Colorado Department of Public Health & Environment (CDPHE)
- City of Westminster Chamber of Commerce
- City of Westminster Planning Commission
- Denver Regional Council of Governments (DRCOG)
- Foothills Regional Housing
- Jeffco Public Schools
- Jefferson County
- Regional Transportation District (RTD)
- Westminster Public Schools

CAC members met three times at critical project milestones to help the project team develop project vision and goals, and provide feedback on draft project deliverables and findings, including existing conditions, project alternatives, and the draft of the Final Plan.

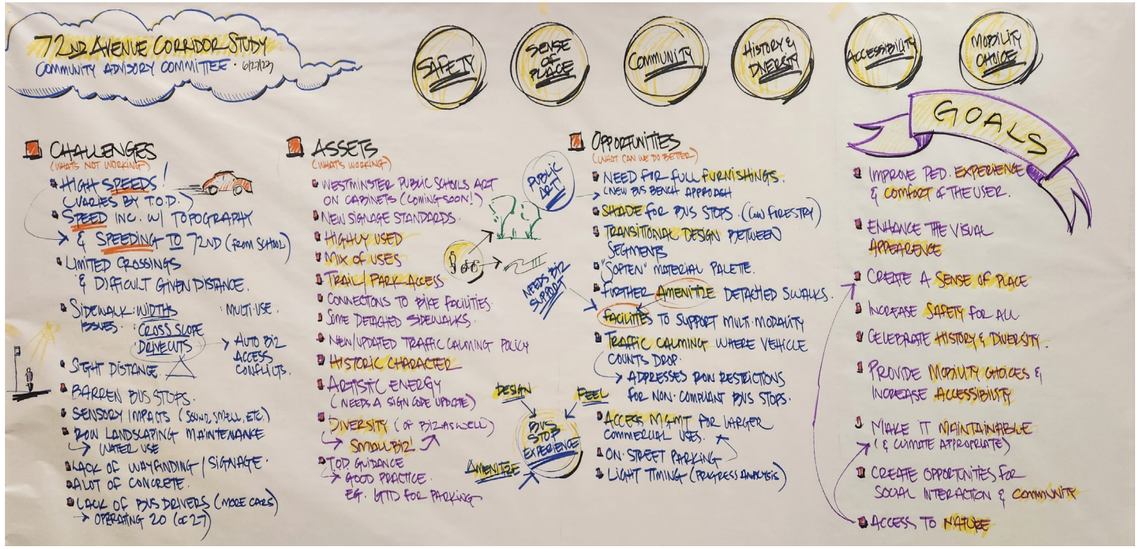


Figure 3: CAC #1 Community Visioning Exercise

Figure 4: CAC #2 Concept Alternatives Review

Business Outreach

The project team partnered with the City of Westminster staff to identify key business owners to engage with along the corridor. Westminster staff walked the study area and talked with business owners along the corridor, providing them information on the project and opportunities to provide feedback. These critical stakeholders were also invited to an in-person meeting in June 2023, then emailed to encourage them to provide virtual feedback on their needs, concerns, and vision for the future via a survey. Survey feedback from the business community was incorporated within the overall Phase 1 Engagement Summary in the Appendix.

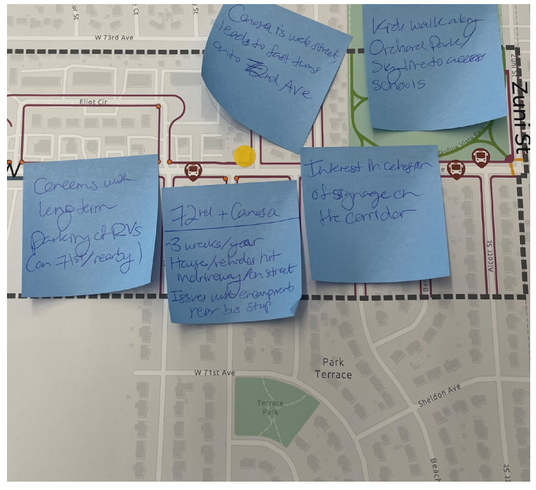


Figure 5: Business Owner Feedback from June 2023

Community Outreach and Online Engagement

In addition to business owner and CAC engagement, the project team conducted broad community engagement through pop-up events, outreach to Westminster Public Schools, and two online surveys posted on a Social Pinpoint online engagement platform. The City of Westminster Communications Department promoted the online surveys through social media channels, newsletters, and water bills.

Figure 6: Summer 2023 Neighbor Nights (left)

Figure 7: June 2024 Summer Block party (middle)

Figure 8: CAC Meeting #2 Walking Tour (right)

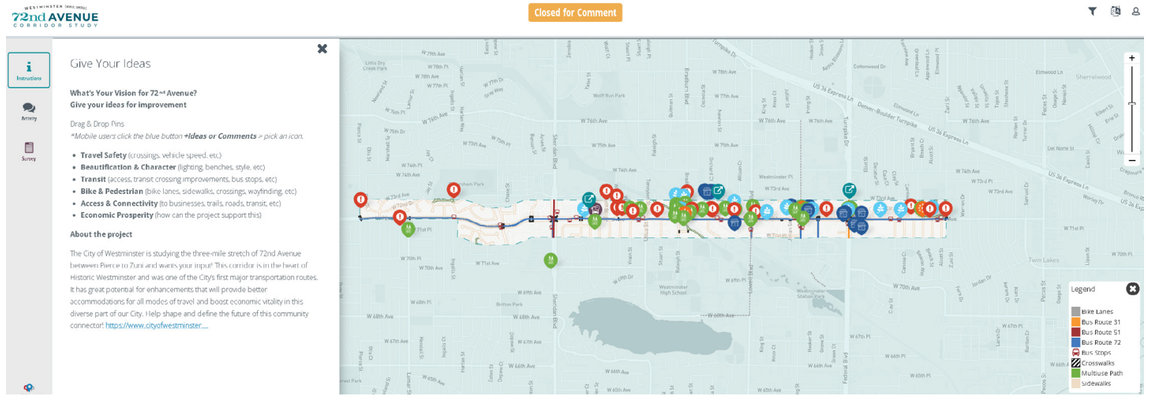


Figure 9: Phase 1 Online Feedback Map

Overall Feedback Takeaways & Themes

"Please let form follow function: wider paths, narrower crossings, and traffic calming all save lives...let's check off the critical safety improvements before worrying about aesthetics."

"Need more reasons to travel to/through this area like more shops, restaurants, and grocery stores worth coming to and gathering as a community in this area please!"

"We appreciate any consideration in improving landscaping and art in this neighborhood."

"This part of town is what SHOULD be called Downtown Westminster and nurtured as such. Please advance the improvements to this corridor and coordinated business development, community empowerment, etc. to help the area to reach its potential."

"I am very excited to see these improvements and the city paying attention to this area of Westminster as it has been overlooked for so many years."

"I teach high school students with blindness to travel via transit and plan walking routes along 72nd Ave, and I am eager to see pedestrian improvements along the corridor."

Preferred Alternative

Building upon both place-specific and corridor-wide recommendations from the needs assessment (and developed considering transportation improvements from the 2021 Westminster Transportation & Mobility Plan in mind) the project team developed two concept alternatives ("Break the Barrier" and "Calm the Traffic"), detailed further in the Alternatives Development section below. These concepts were developed within the context of corridor character zones (established during the Existing Conditions phase – see Figure 10 below). The variety of adjacent land uses, ranging from residential to commercial to mixed-use, influence the urban design elements and existing infrastructure present along the corridor. The varying conditions of the study area are characterized by a total of nine identifiable zones. There are five zone areas within three primary zone categories – residential corridor (2), commercial corridor (2), and open space gateway (1). Additionally, there are four transitional zones – two that are primarily residential, and two that are primarily commercial.

The team solicited feedback on the two concept alternatives from the CAC, business owners, Westminster Public Schools, and the general public. The preferred corridor alternative is shown on the next page.

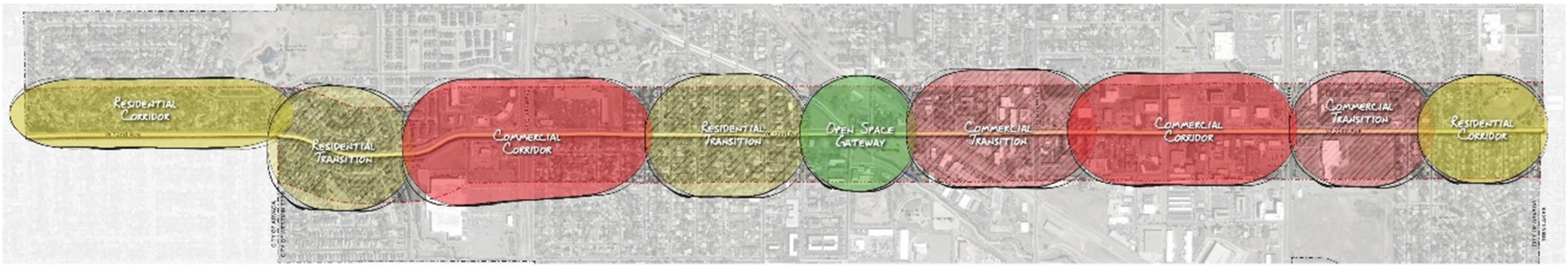
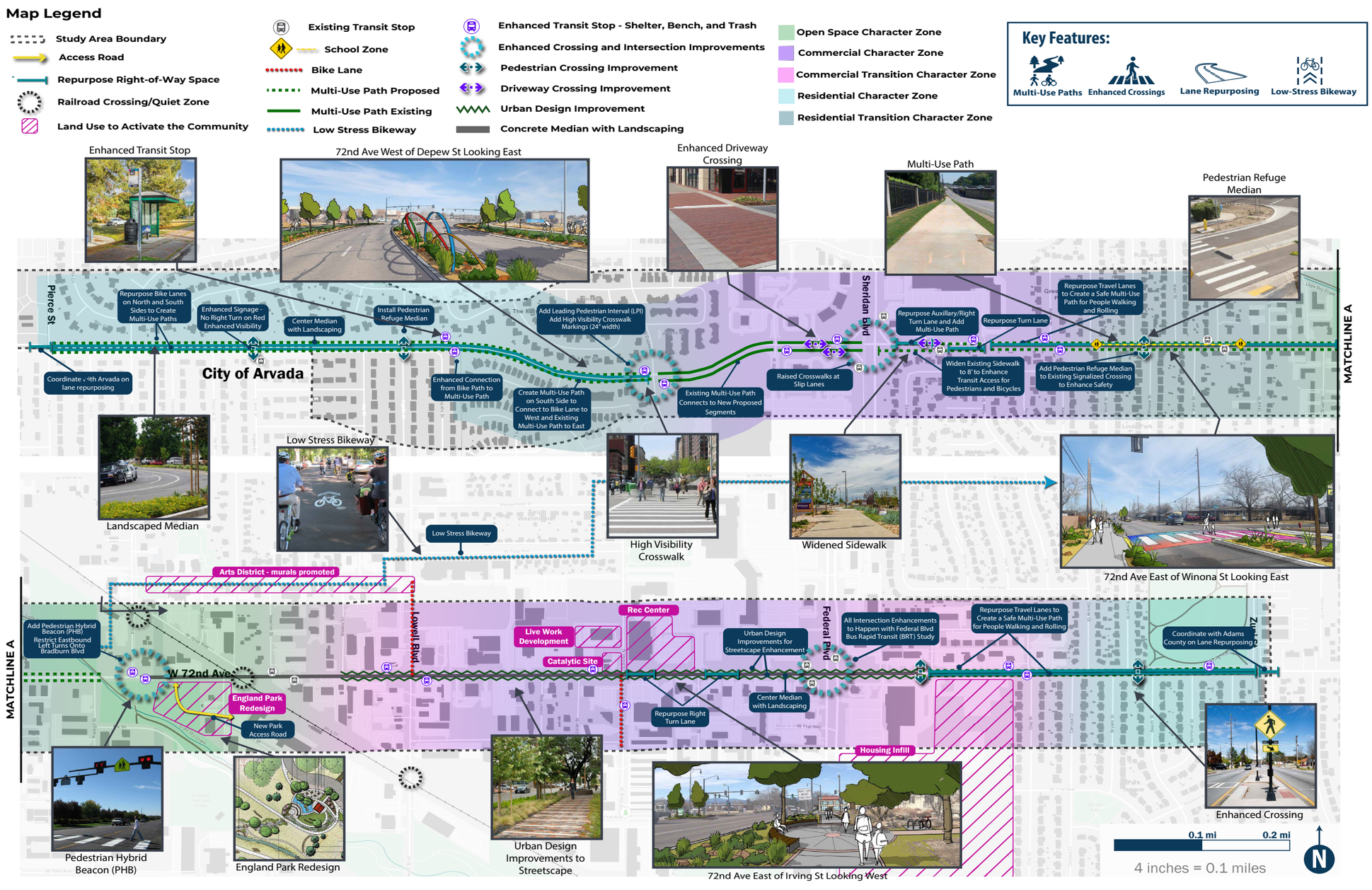


Figure 10: 72nd Avenue Corridor Character Zones

EXECUTIVE SUMMARY

Preferred Alternative Concept



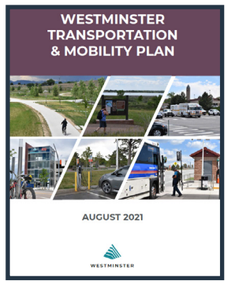
Existing Conditions

The first project phase culminated in an Existing Conditions Report, which was shared with the CAC and published on the project webpage (also see Existing Conditions Report in the Appendix). Key report takeaways are highlighted below.

Existing Plans Summary

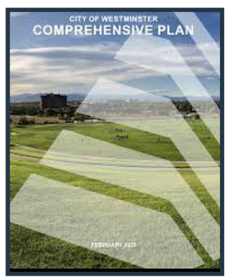
The project team reviewed planning efforts relevant to the study area to understand priorities and principles related to multimodal transportation planning and garner important recommendations to inform the future of the 72nd Avenue corridor.

Westminster Station Area Specific Plan (2017)
Calls for **enhancing pedestrian crossings** and **reevaluating crossing times** along 72nd Avenue.



Westminster Transportation & Mobility Plan (2021)
Notes 72nd Avenue as an area of high pedestrian demand and one of seven priority transit corridors recommended for stop and station enhancements. Mid-term recommended projects (6-10 years) include **completing missing sidewalk gaps** and long-term recommended projects (11+ years) include **upgrading on-street bike lanes** to buffered bike lanes and **widening sidewalks to be multiuse paths.**

Harris Park Community Vision Plan (2021) calls for **detached sidewalks, trees/landscaping**, additional **lighting**, **speed mitigation measures**, and an enhanced **connection to the Little Dry Creek Trail.**



The Westminster 2040 Comprehensive Plan provides two strong tranportation and safety-oriented goals bolstering the 72nd Avenue Study's importance:

- **Goal TM-1:** Develop a comprehensive multimodal transportation network that includes **convenient, safe, and accessible** transportation options for all and integrates land use.
- **Goal TM-3**: Reduce **traffic-related deaths and injuries** by improving the safety and comfort for all modes of transportation.

Corridor Demographics

Demographics data is from U.S. Census Bureau American Community Survey (ACS) 5 Year Estimates for 2012-2016 and 2017-2021. Population and household data encompass a ¼ mile radius (buffer) north and south along the corridor study area. Other demographic information for the corridor reflects data from the Block Groups encompassed within the ¼ mile corridor buffer.

Figure 11: 72nd Avenue Corridor Demographics

Mobility Assessment by Mode

Roadway/Driving Existing Conditions

Curb-to-curb width: Between 50-100 feet.

Lanes: 2-3 in each direction.

Speed Limit: The posted speed limit varies from 25 mph (in a school zone) to 40 mph.

- 85th percentile speeds (the speed at or below which 85 percent of all vehicles are observed to travel under free-flowing conditions) are consistently 5 to 8 mph above the posted speed limit.

Traffic Volumes: Range from between 11,597 to 20,949 vehicles per day.

Sound Wall: A sound wall exists on the south side of the corridor between Pierce Street and Ingalls Street. The City of Arvada is considering adding a Type 7 barrier along the sound wall given it has been hit and replaced in multiple locations.

Pedestrian Facilities Existing Conditions

Sidewalks: There is a combination of attached and detached sidewalks (ranging from 4-8 feet wide). A sidewalk gap exists on the south side of the corridor (between Eliot Circle and Clay Street).

Crosswalks: Marked crosswalks exist at all signalized locations crossing 72nd Avenue and some stop-controlled locations.

Curb Ramps: Most curb ramps at signalized intersections are ADA-compliant. However, many curb ramps at corners where residential intersections meet 72nd Avenue are not ADA-compliant.

Bicyclist Facilities Existing Conditions

Bicycle Facilities: No continuous bicycle facility is present along 72nd Avenue.

- On-street facilities exist between Pierce Street and Depew Street.
- Multiuse side paths exist between Depew Street and Sheridan Boulevard.

Level of Traffic Stress (LTS): The majority of the study area is categorized as a Level 4 LOS (highest level of stress) according to the 2021 Westminster Transportation & Mobility Plan. This means most people would not feel comfortable riding a bicycle along 72nd Avenue. See Figure 12 for a graphic illustrating typical LTS by bicycle facility types.

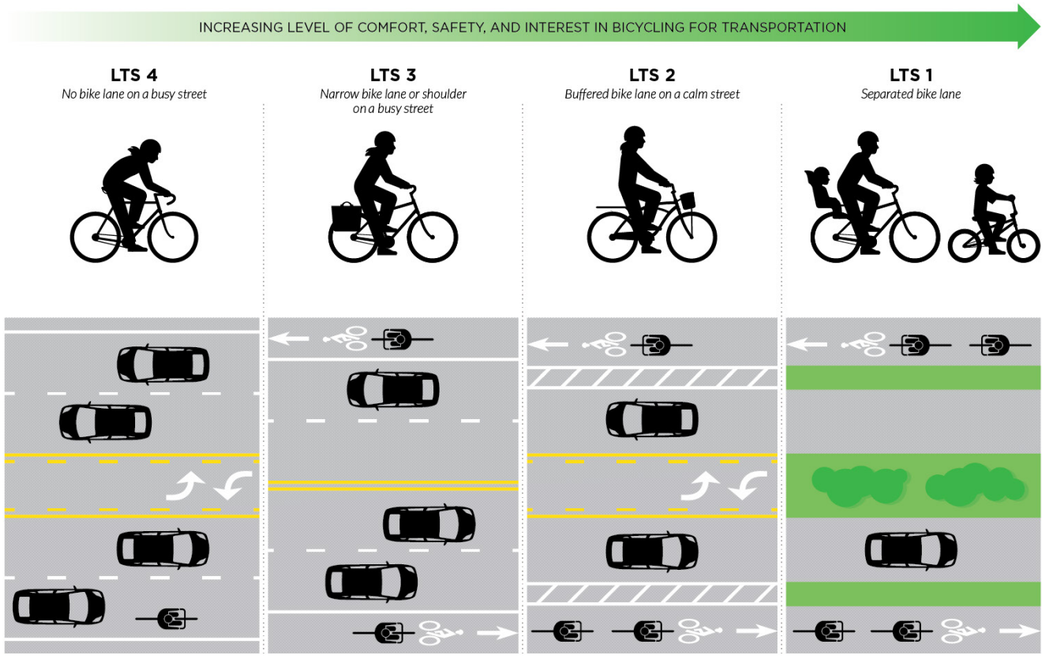


Figure 12: Level of Traffic Street (LTS) Facility Types Graphic

Transit Facilities Existing Conditions

Three RTD bus routes service the 72nd Avenue study area:

- **Route 72** runs Monday – Saturday (every hour) along 72nd Avenue from Arvada to Commerce City.
- **Route 51** runs Monday – Sunday (every 30 minutes) along Sheridan Boulevard to Englewood.
- **Route 31** runs Monday – Sunday (every 10 minutes) north on Federal Boulevard to Front Range Community College and south to the Decatur-Federal Station W line connection.

The maps on the following pages provide an orientation to the corridor's existing cross-sections and visually display existing conditions by mode.

EXISTING CONDITIONS

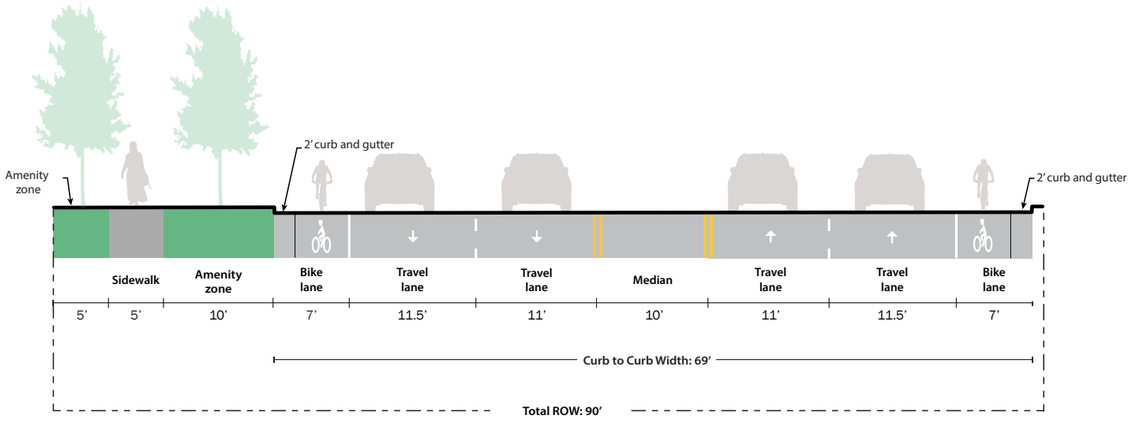
Cross Sections Reference Map

0.1 mi 0.2 mi

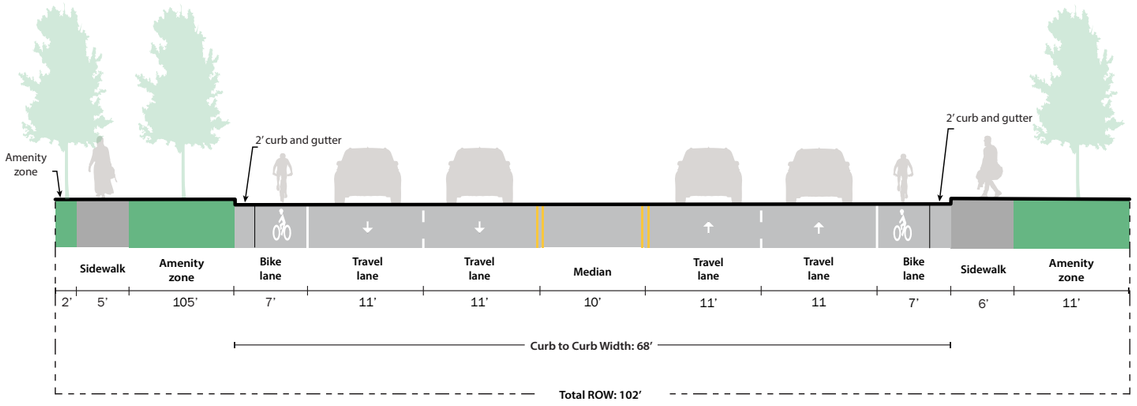
4 inches = 0.1 miles

N

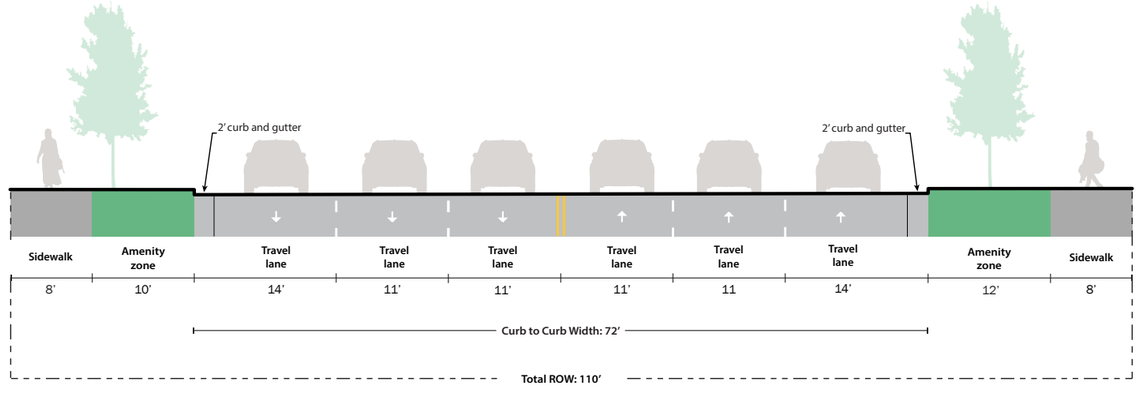
Section A: W 72nd Avenue West of N Lamar Street - Looking East



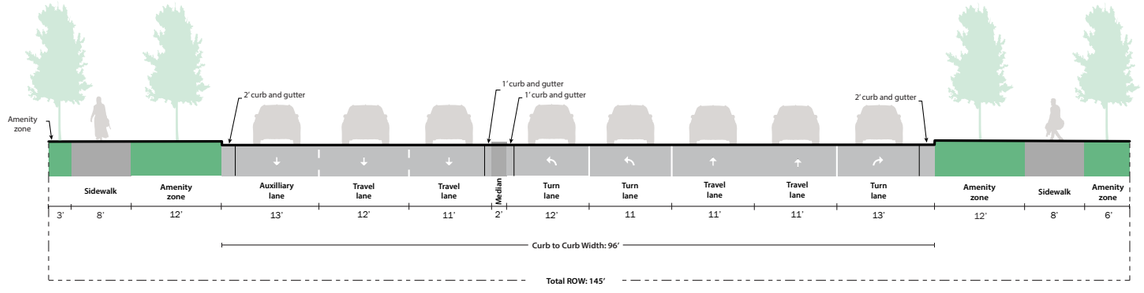
Section B: W 72nd Avenue West of Eaton Street - Looking East



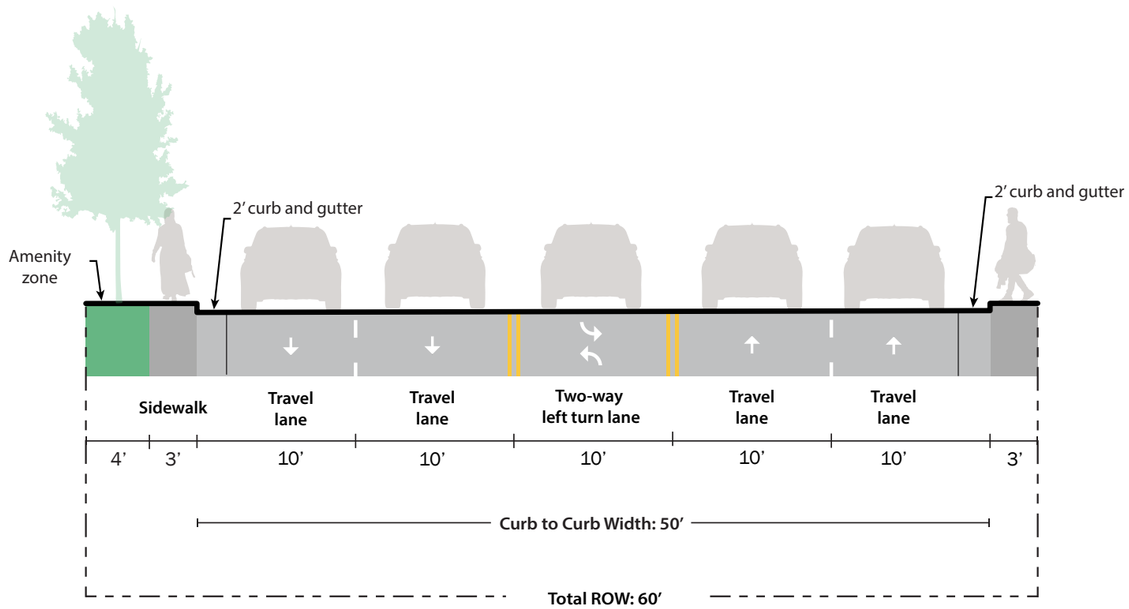
Section C: W 72nd Avenue East of Depew Street - Looking East



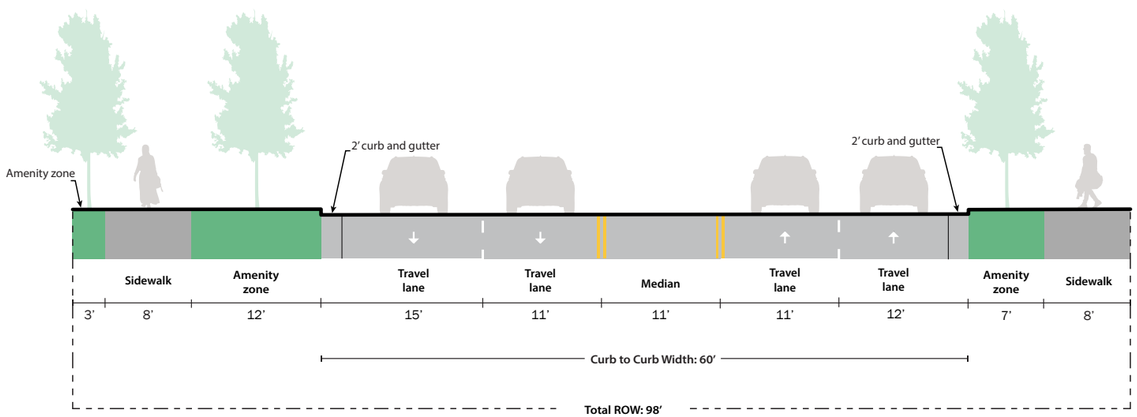
Section D: W 72nd Avenue West of Sheridan Street - Looking East



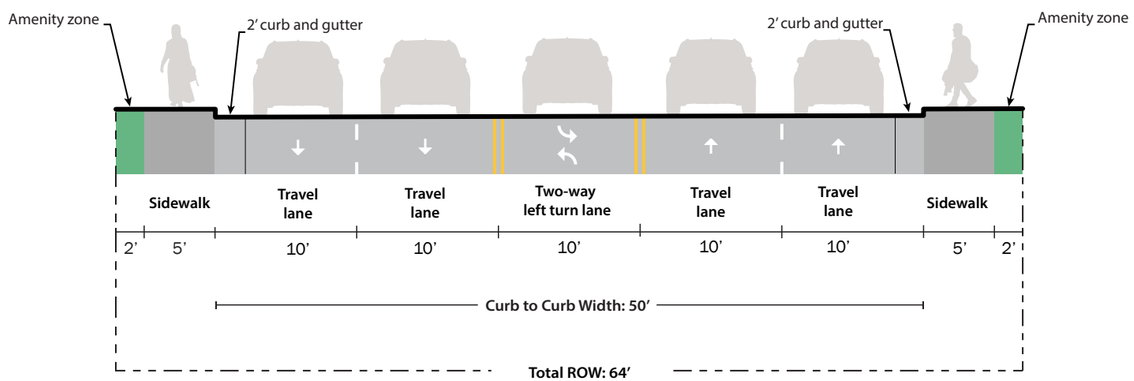
Section E: W 72nd Avenue West of N Vrain Street - Looking East



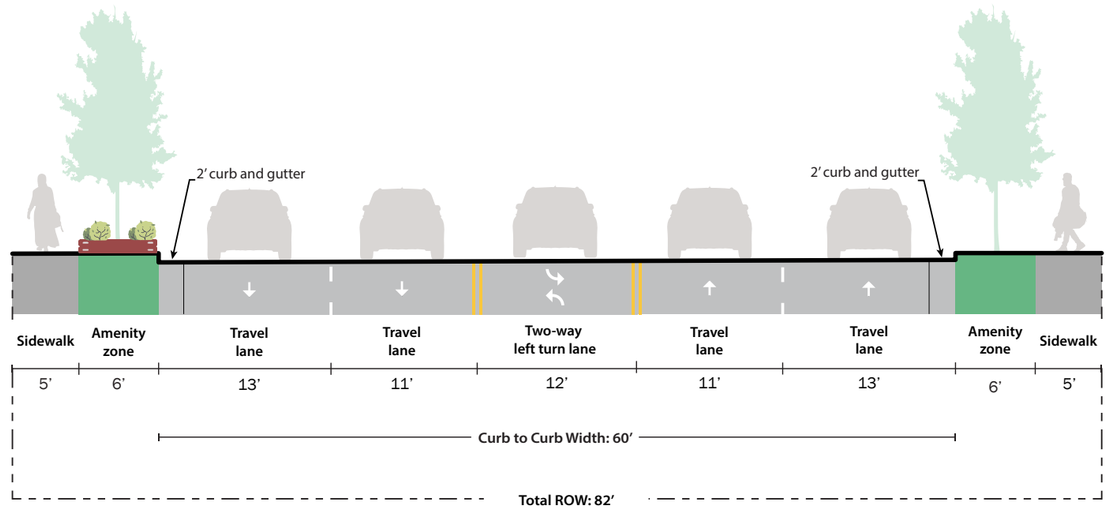
Section F: W 72nd Avenue West of Raleigh Street - Looking East



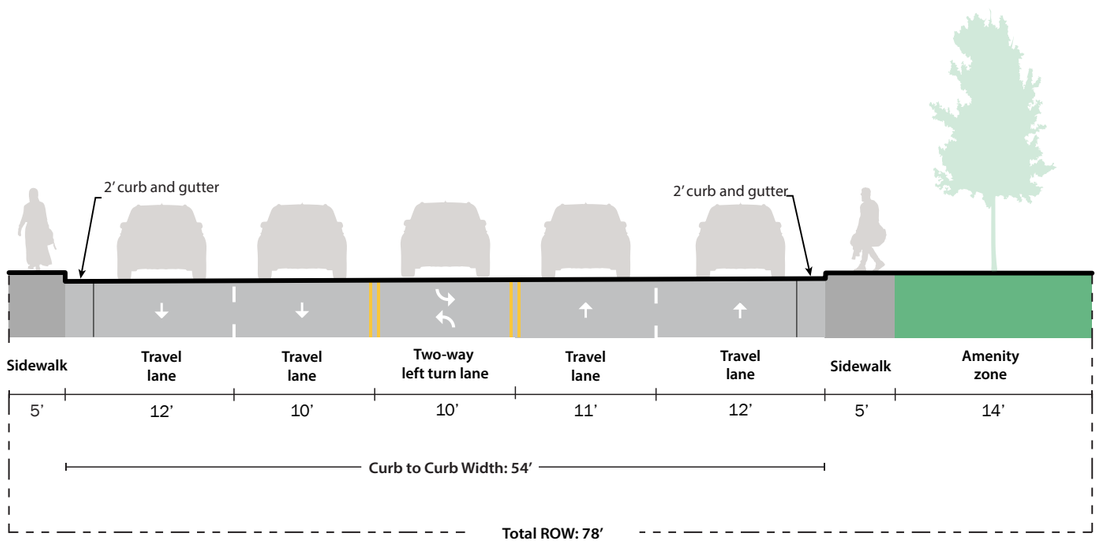
Section G: W 72nd Avenue West of Newton Street - Looking East



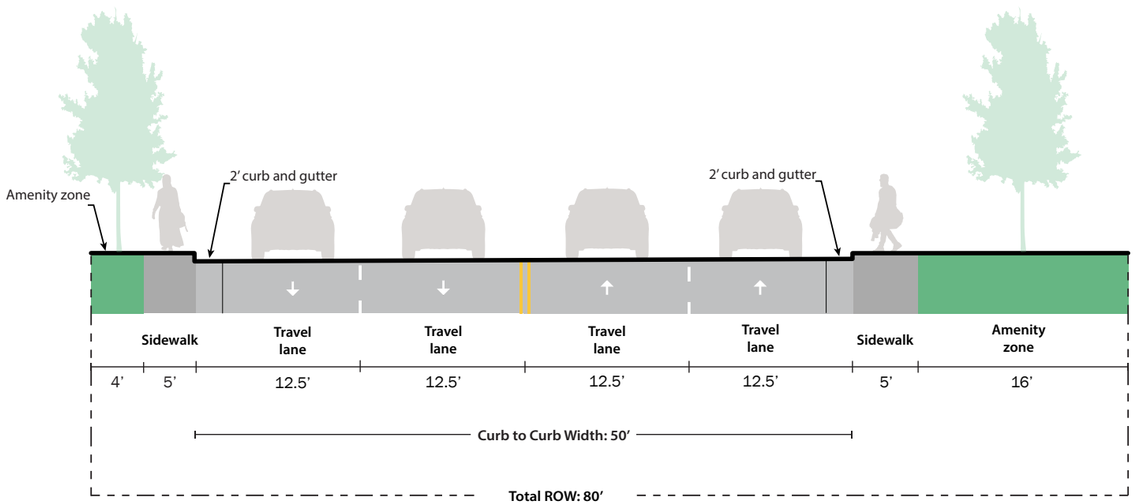
Section H: W 72nd Avenue West of Julian Street - Looking East



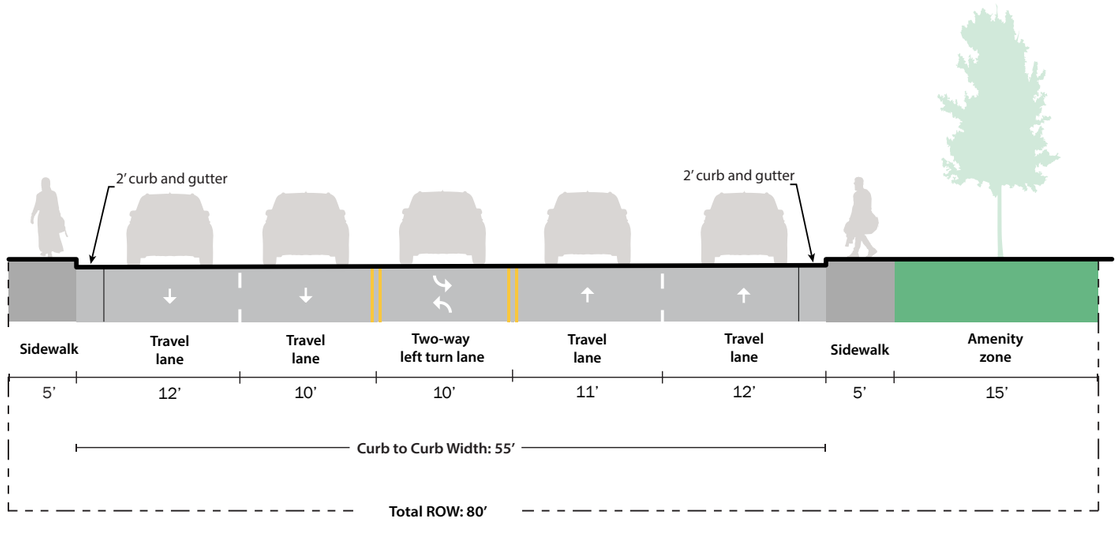
Section I: W 72nd Avenue West of Clay Street - Looking East



Section J: W 72nd Avenue West of Bryant Street - Looking East

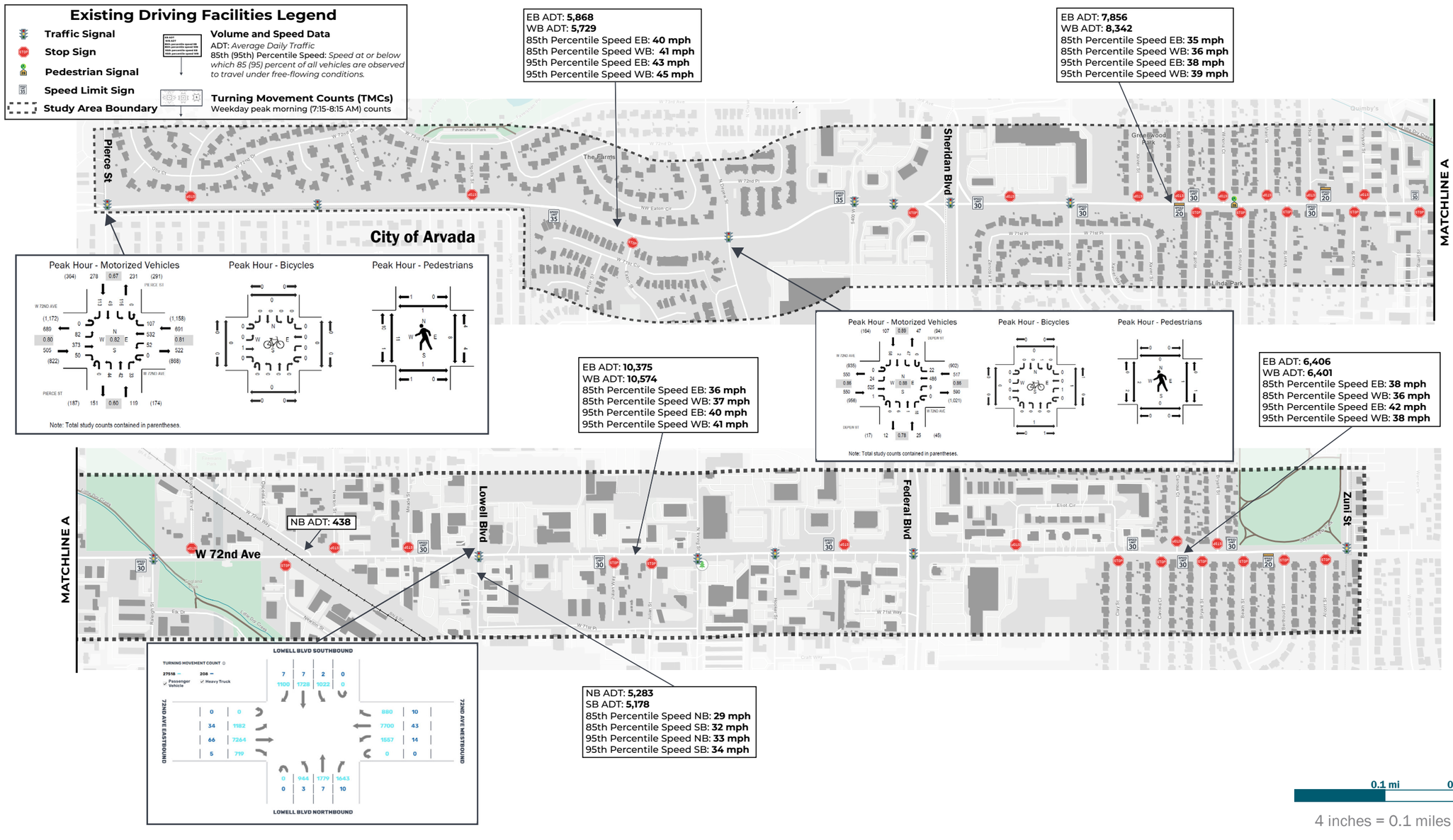


Section K: W 72nd Avenue West of Zuni Street - Looking East



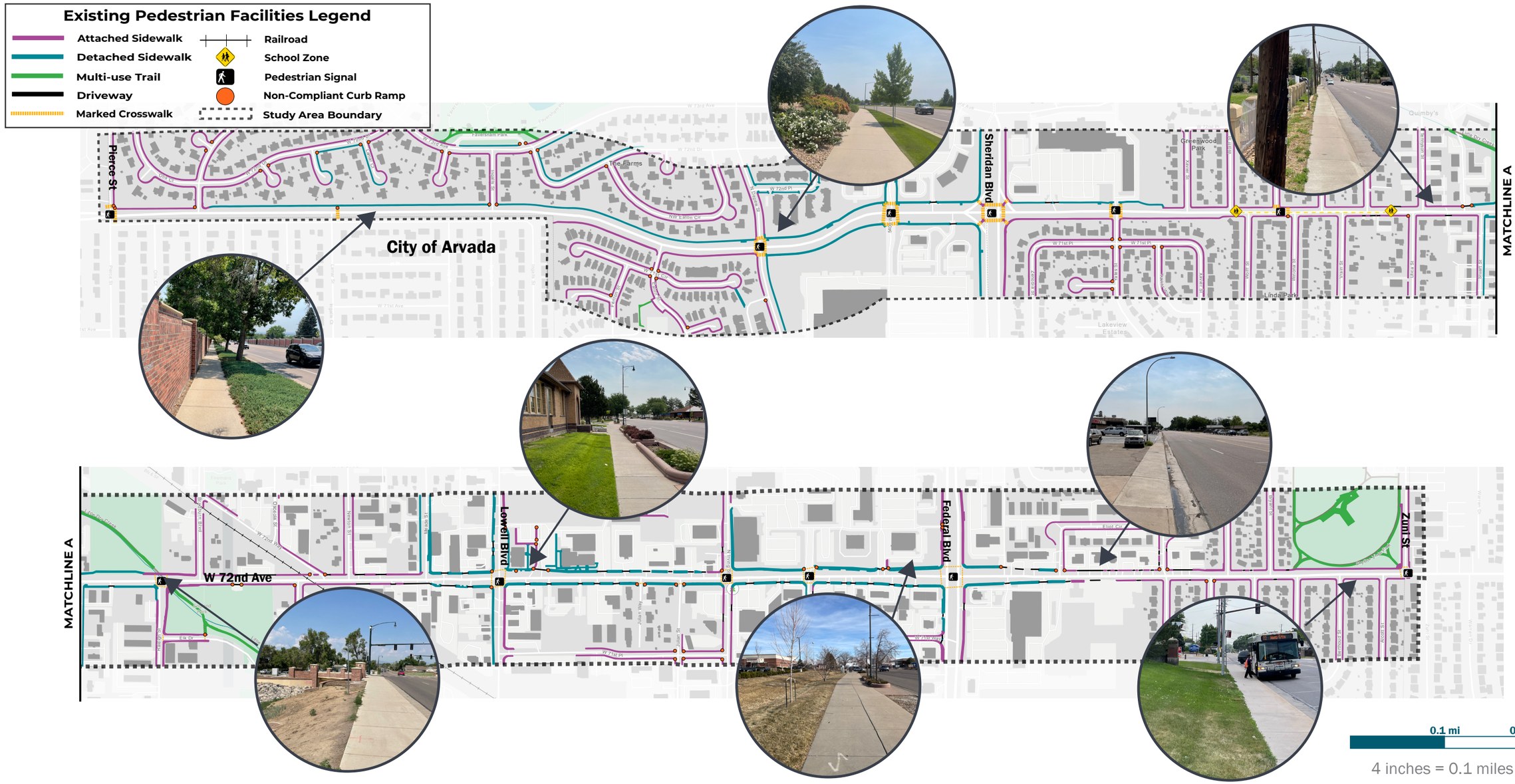
EXISTING CONDITIONS

Existing Driving Conditions Map



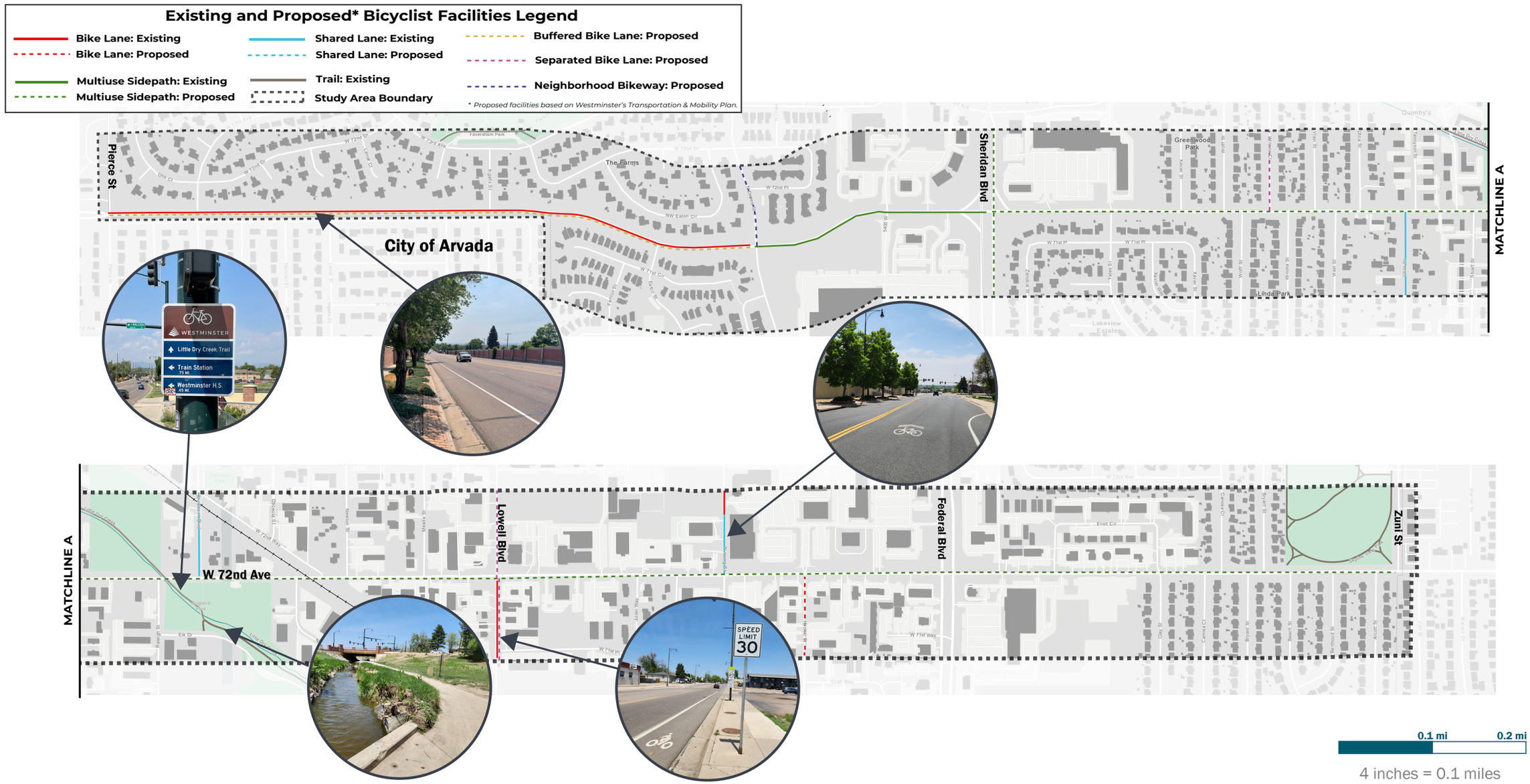
EXISTING CONDITIONS

Existing Pedestrian Conditions Map



EXISTING CONDITIONS

Existing Bicyclist Conditions Map

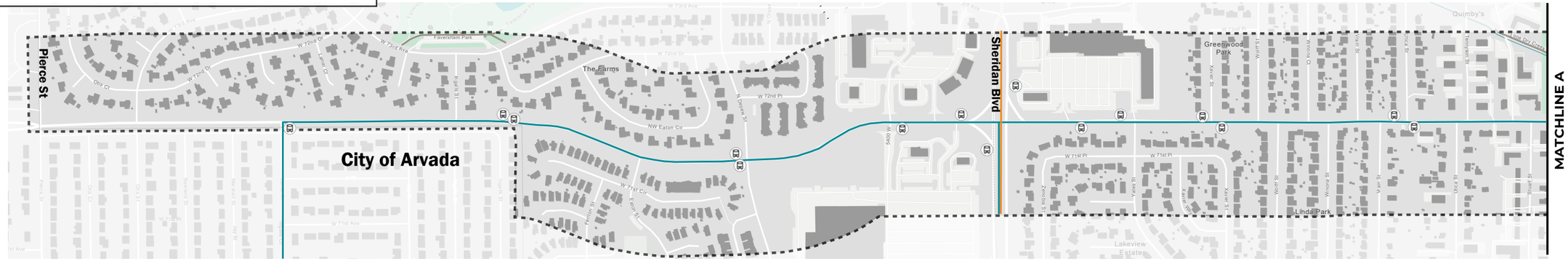


EXISTING CONDITIONS

Existing Transit Conditions Map

Existing Transit Facilities Legend

- Transit Stops
- Station Area
- Study Area Boundary
- RTD Bus Route 31
- RTD Bus Route 51
- RTD Bus Route 72



0.1 mi 0.2 mi

4 inches = 0.1 miles

N

Safety Assessment

The Colorado Department of Transportation (CDOT) provided crash data for 2015-2019. There were 736 crashes during this period. See page 44 for a study area crash map.

Crash Data Findings

- 72nd Avenue is considered a Denver Regional Council of Governments (DRCOG) High Injury Network (HIN) Corridor (see HIN map), with the portion of the study area between Sheridan Boulevard and Federal Boulevard considered a Critical Corridor. Critical Corridors identify the top 50% of killed and seriously injured (KSI) crash density corridors along the regional HIN.
- The two fatal crashes during the analysis period involved bicyclists or pedestrians.
- Crashes most commonly occur on weekdays and during typical periods of rush hour traffic, such as between 7:00 – 8:00 AM and between 3:00 – 5:00 PM.
- The study area intersections with the highest crash count (in order) include Federal Boulevard (228 crashes), Sheridan Boulevard (105 crashes), and Lowell Boulevard (92 crashes).
- The most common crash types on 72nd Avenue are outlined in Figure 13 below. Crash types in the "Other" category include sideswipe (opposite direction) crashes and those involving fixed objects such as signs, light/utility poles, wall/buildings, guard rails, trees/shrubbery, bridge rails, traffic signal poles, concrete barriers, fences, etc.

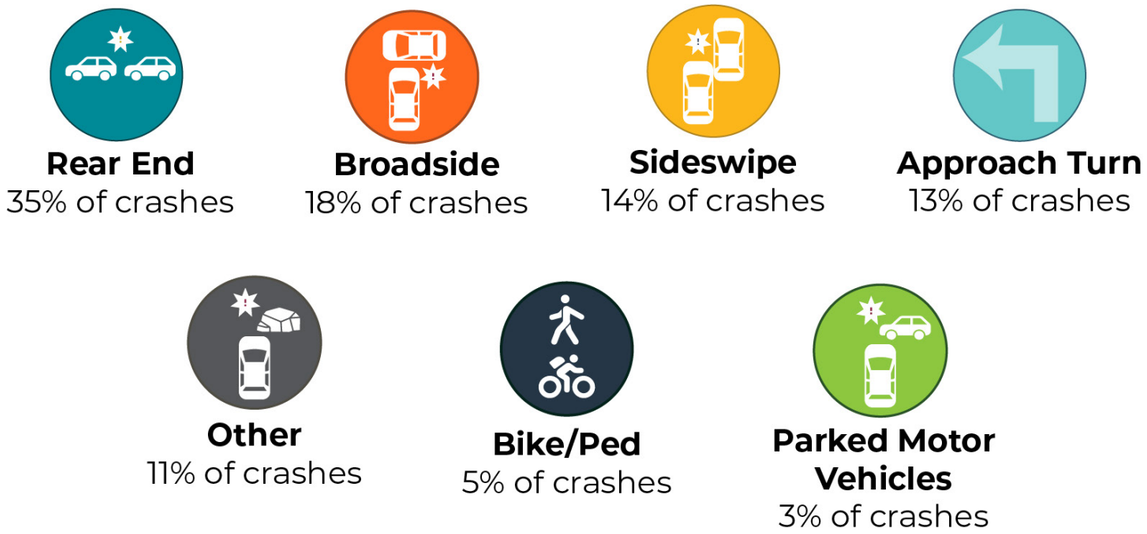


Figure 13: 72nd Avenue Study Area Crash Types

Needs Assessment

Overview

The existing conditions phase culminated in a needs assessment, including a summary of gaps and barriers related to multimodal transportation within the study area.

Corridor Wide Recommendations

- Increase winter clearance of sidewalks and bicycle facilities, given the existence of snow and ice inhibit safe multimodal travel.
- Upgrade all corridor facilities to be ADA-compliant, including curb ramps, access routes to bus stops, and bus stop landing pads.
- Ensure prioritization of pedestrian and transit rider infrastructure upgrades during development and redevelopment.
- Provide a continuous bicycle facility throughout the corridor that provides appropriate protection for users based on vehicular volumes and speeds.
- Implement traffic calming measures to reduce overall vehicle corridor speeds.
- Implement countermeasures to help remove 72nd Avenue from the DRCOG High-Injury Network.

Reference page 46 for a place-specific needs assessment.

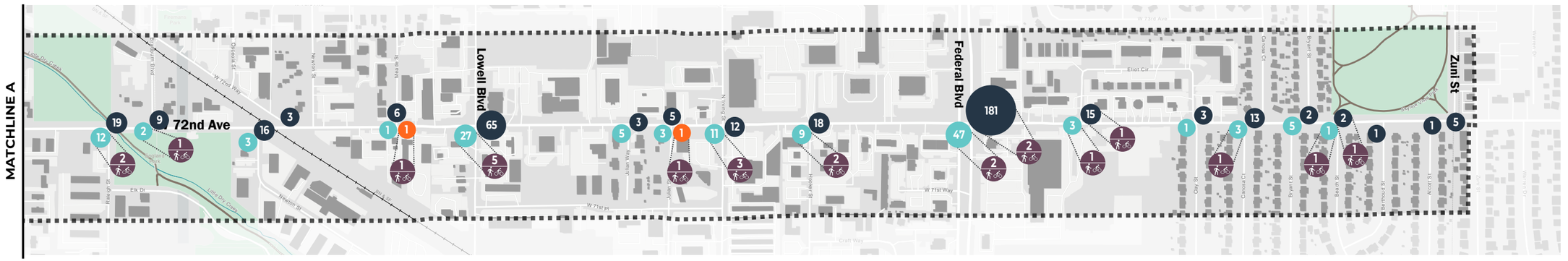
EXISTING CONDITIONS

72nd Avenue Study Area Crash Counts Map

Crash Severity and Count Legend

- Property Damage Only
- Serious Injury
- Fatal
- Bicycle/Pedestrian Involved
- Crash Severity Count
- Study Area Boundary

Note: Crash locations are approximate to nearest cross street



0.1 mi 0.2 mi

4 inches = 0.1 miles

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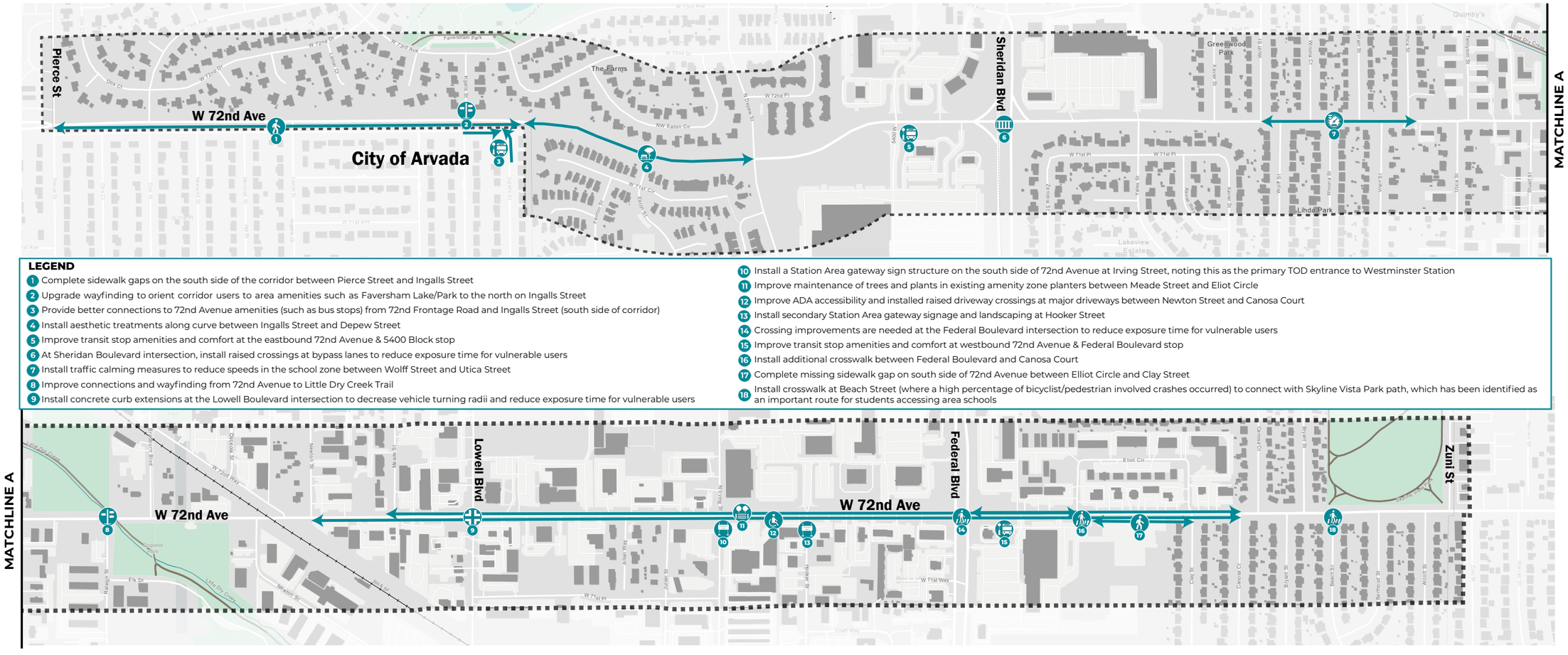
EXISTING CONDITIONS

Place Specific Needs Assessment



LEGEND

1. Complete sidewalk gaps on the south side of the corridor between Pierce Street and Ingalls Street
2. Upgrade wayfinding to orient corridor users to area amenities such as Faversham Lake/Park to the north on Ingalls Street
3. Provide better connections to 72nd Avenue amenities (such as bus stops) from 72nd Frontage Road and Ingalls Street (south side of corridor)
4. Install aesthetic treatments along curve between Ingalls Street and Depew Street
5. Improve transit stop amenities and comfort at the eastbound 72nd Avenue & 5400 Block stop
6. At Sheridan Boulevard intersection, install raised crossings at bypass lanes to reduce exposure time for vulnerable users
7. Install traffic calming measures to reduce speeds in the school zone between Wolff Street and Utica Street
8. Improve connections and wayfinding from 72nd Avenue to Little Dry Creek Trail
9. Install concrete curb extensions at the Lowell Boulevard intersection to decrease vehicle turning radii and reduce exposure time for vulnerable users
10. Install a Station Area gateway sign structure on the south side of 72nd Avenue at Irving Street, noting this as the primary TOD entrance to Westminster Station
11. Improve maintenance of trees and plants in existing amenity zone planters between Meade Street and Eliot Circle
12. Improve ADA accessibility and installed raised driveway crossings at major driveways between Newton Street and Canosa Court
13. Install secondary Station Area gateway signage and landscaping at Hooker Street
14. Crossing improvements are needed at the Federal Boulevard intersection to reduce exposure time for vulnerable users
15. Improve transit stop amenities and comfort at westbound 72nd Avenue & Federal Boulevard stop
16. Install additional crosswalk between Federal Boulevard and Canosa Court
17. Complete missing sidewalk gap on south side of 72nd Avenue between Elliot Circle and Clay Street
18. Install crosswalk at Beach Street (where a high percentage of bicyclist/pedestrian involved crashes occurred) to connect with Skyline Vista Park path, which has been identified as an important route for students accessing area schools

Economic Vitality Study

In February 2024, the project team developed an Economic Vitality Report to address economic development challenges and future opportunities along the corridor. Major study takeaways are summarized below.

Full-Service Grocery Store

During Phase 1 outreach, community members frequently cited their desire for a full-service grocery store at the eastern end of the corridor (near Federal Boulevard). To support such a convenience-oriented urban grocery store, the corridor would need approximately 1,000 to 3,000 additional households. A "conventional" suburban-style grocery store would need at least an additional 5,000 units. Continued household growth near the Transit-Oriented Development (TOD) area (between Lowell Boulevard and Federal Boulevard) and the Northgate area (Federal Boulevard and 72nd Avenue) will be key to demonstrating potential household support for a full-service grocery store.

Focus Area Recommendations

Hidden Lake Long-Term Redevelopment

The 150,000-square-foot shopping center at the northeast corner of 72nd Avenue and Sheridan Boulevard is a long-term future redevelopment candidate.

Harris Park Area

The Harris Plan Vision will guide the future of the area. The plan should be reviewed in light of development considerations, ensuring that they are aspirational but grounded in reality.

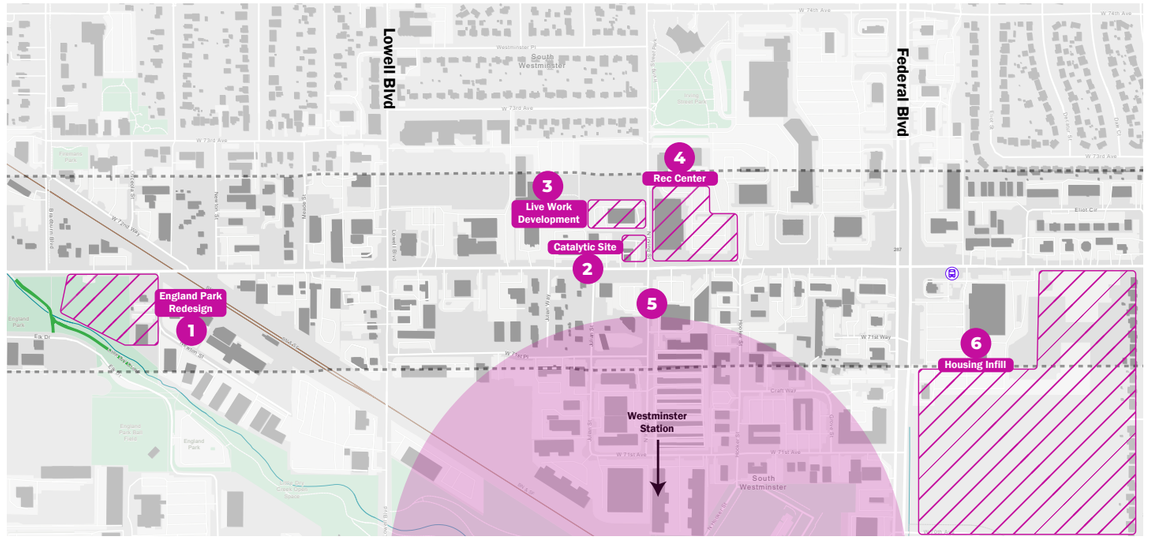
Westminster Station

The city has a station area plan bolstered by various redevelopment tools (urban renewal, opportunity area zones, etc.). Redevelopment challenges include Xcel's limited ability to readily provide increased utility services to new developments within the area. Working with Xcel and potentially the State of Colorado to overcome the infrastructure challenge is important in light of the area's housing need and the planned Bus Rapid Transit (BRT) investment along the Federal Boulevard corridor.

Northgate Commercial

Exploring other options for reuse of the Northgate commercial site may include a horizontal mixed-use center with additional residential units and other amenities to complement the planned Northgate residential development.

Land Use to Activate the Community



In the existing conditions phase, the project identified areas with community activation potential. These include existing, in-development proposals, and new opportunities identified during the study. Each provides potential corridor activation and contributions to the public realm.

Though outside the recommendations of this effort, a few planned or in-development projects exist within the 72nd Avenue study area. Implementation of 72nd Avenue streetscape and urban design elements should be planned with these projects in mind:

1 England Park Corridor Renovation

England Park is located south of 72nd Avenue and north of Elk Drive/Little Dry Creek trail. The 2017 England Park Corridor Master Plan outlined desired improvements for the site. The 72nd Avenue Corridor Study project team shared desired streetscape upgrades (including a multi-use path facility and tree lawn) for the corridor area abutting England Park, which will be incorporated during Phase 1 development, beginning in 2025. A new park access road will be installed within this segment too.

2 Vacant Gas Station at Northwest Corner of 72nd Avenue and Irving Street

Identified as a catalytic site for mixed-use development.

3 Vacant Building and Site North of Gas Station Site

Defined as “Character Area 6” in the Harris Park Community Vision Plan, this area contains some small commercial buildings, but most are vacant or underutilized. This area is primed for commercial, mixed-use, and residential uses, with potential for flexible community spaces and adaptive reuse of existing buildings. Identified as a potential candidate for live-work development.

4 Existing Recration Center At 72nd Street and Irving Street

Identified as a renovation project, with a planned expansion to offer increased amenities.

5 Westminster TOD Project

The 2017 Westminster Station Area Specific Plan identifies a potential new “mixed-use urban neighborhood and regional destination” within underutilized land, capitalizing upon adaptive reuse, redevelopment, and placemaking within the Station Area. The Station Area includes the area south of 72nd Avenue between Lowell Boulevard and Federal Boulevard (south to 69th/68th Avenues).

6 Northgate Residential Development Housing Infill

The Northgate property, south of 72nd Avenue between Federal Boulevard and Clay Street, is designated as residential medium density and has potential for housing infill.

Figure 14: England Park Corridor Final Master Plan - W 72nd Avenue Area

Figure 15: Westminster Station

Transportation & Urban Design Elements

The following section highlights the goals of proposed urban design and transportation elements for the 72nd Avenue Study. This includes general roadway and streetscape improvements, furnishings and fixtures, landscape elements, and crossing treatments. Additional feasibility and implementation studies are recommended for all described elements. In addition to the upfront installation costs, these elements will require ongoing maintenance to ensure the 72nd Avenue streetscape continues to be a safe, high-quality environment for users in the years to come. See The Plan for 72nd Avenue section for location-specific recommendations for each of the urban design and transportation elements.

Transportation Elements

Repurposing Travel Lanes

Goal: Accommodate multimodal travel and enhance safety outcomes through removing and repurposing through-travel lanes, center lanes, striped bike lanes, and right-turn lanes.

Pedestrian Travel Improvements

Goal: Provide a connected, continuous, and safe route for pedestrians by widening sidewalks, separating walkways from the roadway with planting and/or amenity areas, and transforming sidewalks into multi-use paths to accommodate two-way pedestrian travel as well as bicyclists.

Figure 16: Widened Sidewalk16

Bikeway Improvements

Goal: Provide a connected, continuous, and safe route for bicyclists in-line with proposed future facilities by upgrading existing striped bike lanes and utilizing wayfinding to direct bicyclists to parallel alternative routes where roadway widths and available right-of-way do not allow for desired upgrades on 72nd Avenue itself.

Figure 17: Neighborhood Bikeway

Crossing Materials and Signage Enhancements

Goal: Apply simple, low-cost treatments to existing or new crossings to increase pedestrian safety and motorist awareness.

TRANSPORTATION & URBAN DESIGN ELEMENTS

Crossing Infrastructure

Goal: Modify existing crossing facilities to be safer and more visible to both pedestrians and motorists.

Median Refuges aid in shortening crossing distances, reduce the time a pedestrian is exposed to traffic, and can allow for two-stage crossings for those unable to clear the intersection in one phase.

Figure 18: Widened Sidewalk

Raised Crosswalks provide several benefits to users, including greater pedestrian visibility for drivers, slowing down vehicles approaching the intersection, and enhancing accessibility for users.

Medians

Goal: Encourage safe driving conditions by limiting cross-lane car-on-car collisions, while accommodating plantings as appropriate widths exist, ensuring appropriate sight distances are mainted for all users, and including clear zones for maintenance vehicles.

Where feasible at crossings, medians should provide refuge. Medians can either be hardscape or planted, with planted medians raised in sloped tiers to allow for greater soil depth. Plantings are recommended for medians with a width of greater than 8 feet.

Figure 19: Water-Wise Landscaped Median

Enhanced Transit Stops

Goal: Recognizing that RTD route 72 is an important regional route, enhance the user experience at critical stops by adding amenities such as new seating, new signage and/or map and timetable information, trash receptacles, and shelters or awnings to provide shade/ refuge for users.

Currently, RTD route 72 runs on an hourly frequency and does not operate on Sundays. Reducing headways to 30 minutes or higher frequency and adding Sunday service would increase reliability and may increase ridership.

Figure 20: Enhanced Transit Stop

Enhanced Driveway Crossings

Goal: Make driveway crossings more visually evident to both vehicles and pedestrians by adding colored concrete or pavers.

Traffic Signals

Goal: Increase multimodal visibility and safety through signalization tweaks or modifications.

Leading Pedestrian Interval (LPI)
LPIs are phase adjustments that give pedestrians a 3- to 7-second advanced walk phase to enter an intersection prior to the parallel green signal beginning. This head start establishes the pedestrian's right of way in the crosswalk and makes them more visible to turning vehicles. LPIs have been shown to reduce the chance of a vehicle-pedestrian collision by as much as 60 percent. Westminster staff should evaluate and implement LPIs at all feasible signalized intersections along the 72nd Avenue corridor.

Pedestrian Hybrid Beacon (PHB)
PHBs are a preferred pedestrian crossing treatment when higher-speed traffic is present and a need exists for a crossing between existing enhanced or signalized crossings. When a PHB is activated (either by pedestrians pushing a button or through passive detection), the signal head activates flashing yellow lights to warn vehicles to slow down, then switches to a solid yellow light, finally switching to solid red to indicate the need for vehicles to stop. At this point, a walk signal appears to indicate pedestrians can begin crossing.

Figure 21: Leading Pedestrian Interval

Figure 22: Pedestrian Hybrid Beacon

Urban Design Elements

Urban Design and Streetscape Improvements

Goal: Enhance sidewalk and amenity zones in a highly commercialized portion of the study area from Meade Street to Eliot Circle to foster business revitalization, promote beautification, reduce the urban heat island effect, and provide an enhanced experience for corridor users.

Another consideration for this area is to recycle and/or repurpose the existing concrete planters. Currently, most of these are empty and unused, with only a few containing soil and tree plantings. Additional investment into the reuse or recycling of these fixtures into platforms for seating, public art, lighting, and/or planting should be explored where feasible or aligned with other public realm investments.

Figure 23: Amenity Zone Landscaping

Figure 24: Compact Seating Areas

Landscaping

Goal: Provide beautification alongside safety, comfort, and health benefits by reducing the urban heat island effect, improving air quality, reducing stormwater runoff, and lowering vehicle speeds.

Planting should generally be hardy, low-water, and low-maintenance species, with a preference toward native species. Native species are more resilient to Colorado's climate and can benefit local flora and fauna.

Choosing a range of species is recommended, including those with notable features in spring, summer, or fall, to ensure year-round visual appeal. In all planting areas, rock mulch is the recommended planting medium, as it allows for easy maintenance. Within medians, plantings should be clustered with decorative rock or mulch between clusters to allow for easy maintenance. Median plantings should require low maintenance and water needs and be small and hardy to survive harsh conditions, especially in winter months. A range of low-lying native species fit this need, while also providing varied colors, blooms, and forms for general aesthetic appearance and seasonal interest.

Trees should be placed strategically to limit maintenance, preserve views, and keep sight lines clear. Where possible, trees should be evenly placed, set back from intersections and driveways, and only be located in planting areas large enough to support their growth. In amenity zones, trees can generally be larger than traditional street tree species. In medians, trees should be smaller species to maintain safety for motorists traveling the corridor.

Signage and Wayfinding Improvements

Goal: Create a distinctive corridor branding presence that fosters placemaking, orients all users to key amenities/destinations, and increases road safety and motorist awareness.

Directional and route signage is recommended for those traveling along major sidewalks and multi-use paths. Markers noting amenities within the area such as parks and open spaces, civic and cultural destinations/services, and grocery stores are recommended.

Placemaking signage is also encouraged and could promote key neighborhoods or districts (such as the Westminster Station Area). This signage can be integrated into lighting fixtures or public art.

Figure 25: Example Wayfinding Signage

Lighting

Goal: Provide an appropriately-scaled lighting environment to encourage corridor activity during nighttime and low-lighting periods and enhance corridor user safety.

In addition to larger street fixtures, smaller pedestrian lights should be considered along wider multi-use paths at England Park, and along the streetscape improvement zone between Meade Street and Eliot Circle.

Figure 26: Dark Sky Roadway Lighting

Public Art

Goal: Create a cohesive, attractive, and recognizable character area along 72nd Avenue.
Art should be integrated within streetscape elements, including furnishings, fences and utility screens, lighting, signage, and wayfinding elements. Further coordination and engagement with community members on art fixtures and placement is recommended.

Figure 27: Path Integrated Art Installation

Figure 28: Decorative Space-Conscious Art

Figure 29: Mobility-Themed Art

The Plan for 72nd Avenue

Alternatives Development

Building upon both place-specific and corridor-wide recommendations from the Existing Conditions Report's needs assessment, and informed by Phase 1 community feedback, the project team developed two concept alternatives ("Break the Barrier" and "Calm the Traffic"). These concepts were developed within the context facility recommendations from the 2021 Westminster Transportation & Mobility Plan.

Parameters

At project inception, the consultant team and staff determined feasible design parameters to maximize the ease of installing future improvements and pursuing funding opportunities. For example, given the complex and lengthy process for acquiring right-of-way, designs were developed within existing city-owned right-of-way. Recommended improvements were grounded in enhancing comfort, safety, and livability. Furthermore, proposed designs created a gateway to Westminster Station, to foster the city's future Transit-Oriented Development (TOD) efforts.

Initial Concepts

In Spring 2024, following the alternatives analysis phase, the project team developed two initial corridor concepts, including 3D renderings to display existing and proposed conditions. Proposed improvements are deemed feasible given the corridor's current and projected future vehicular Average Daily Traffic (ADT), Turning Movement Counts (TMC), and Level of Service (LOS) data, as provided by DRCOG. Furthermore, these concepts recognize a need to accommodate multimodal users, a desire supported by community feedback. These concepts are developed with the 72nd Avenue corridor vision of fostering a "safe and accessible corridor that instills a sense of place and serves as an artistic and attractive gateway" in mind.

Both alternatives included:

- Lane repurposing
- Urban design enhancements
- Installation of multi-use paths and/or widened sidewalks
- Installation of a parallel bikeway (east of Bradburn Boulevard) in a pedestrian-priority zone, where traffic volumes and available right-of-way don't support installation of a bicycle facility on the corridor itself. The bikeway should include speed management features to slow traffic.
- Enhanced transit stops (including a shelter, bench, and trash can) throughout the corridor
- Enhanced crossings and/or intersection improvements at Depew Street, Sheridan Boulevard, and Federal Boulevard

THE PLAN FOR 72ND AVENUE

Concept Evaluation

Both concepts were vetted with Westminster staff, the Spring 2024 CAC meeting, the general public during pop-up events, and through the Phase 2 online Social Pinpoint survey, which received 160 total responses. The preferred alternative (outlined starting on page 96) advanced elements of both initial concepts.

"Break the Barrier"

The "Break the Barrier" concept focuses on enhancing north-south connectivity, as 72nd Avenue is a high-speed roadway that presents challenges for those crossing the corridor, particularly those walking and biking. In the residential portions of the corridor, crosswalks are non-existent or few and far between, creating challenging conditions for those accessing bus stops, parks, schools, and other area amenities. High volume intersections like Federal Boulevard, Sheridan Boulevard, and Lowell Boulevard are high-crash areas that present additional safety challenges for all roadway users.

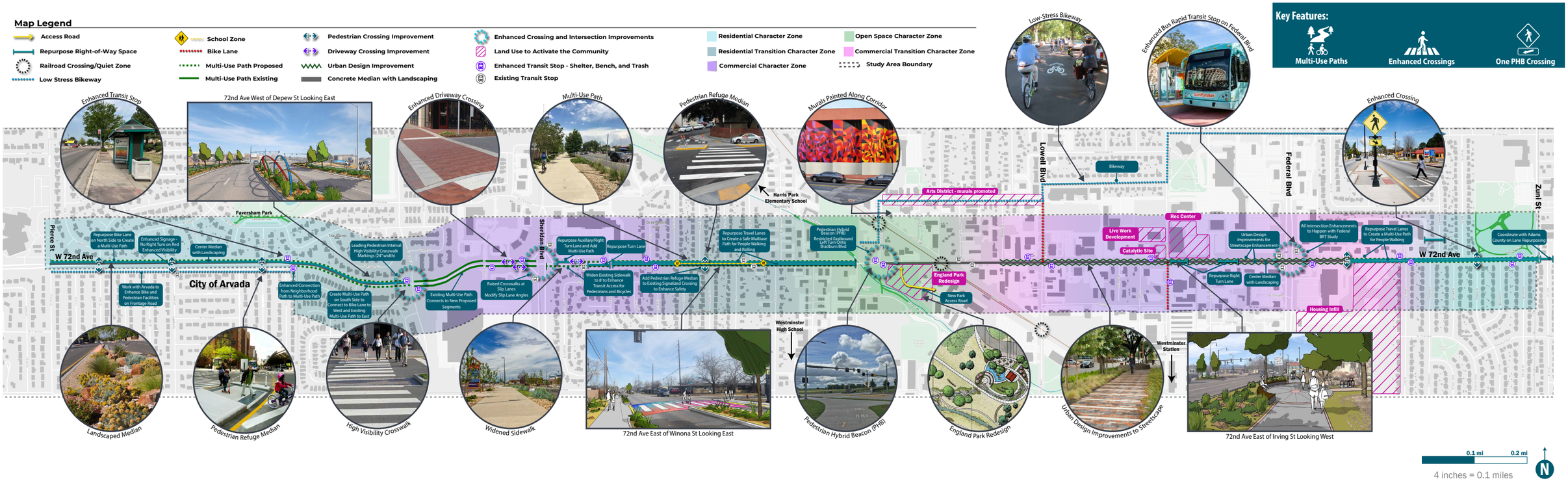
"Break the Barrier" differs from "Calm the Traffic" in a few main ways:

- Includes installation of a center median with landscaping in key corridor segments
- Recommends enhanced bicycle/pedestrian facilities on the frontage road between Pierce Street and Ingalls Street
- Recommends enhanced crossings throughout the study area

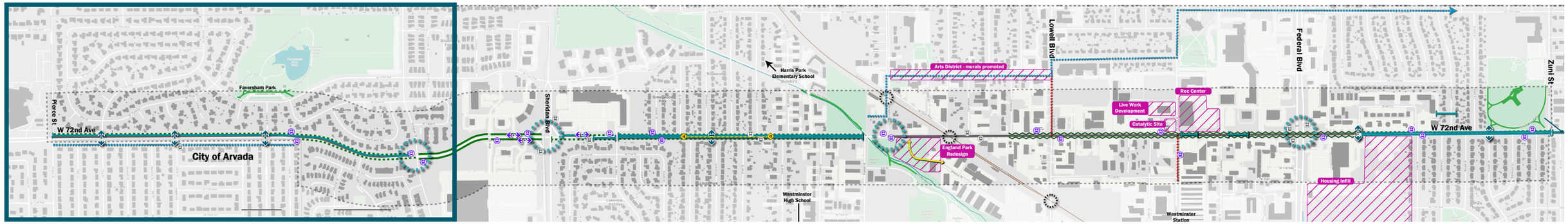
Figure 30: Narrow Landscaped Median

THE PLAN FOR 72ND AVENUE

“Break the Barrier” Alternative Concept



Key Map



"Break the Barrier"

Pierce Street to Depew Street

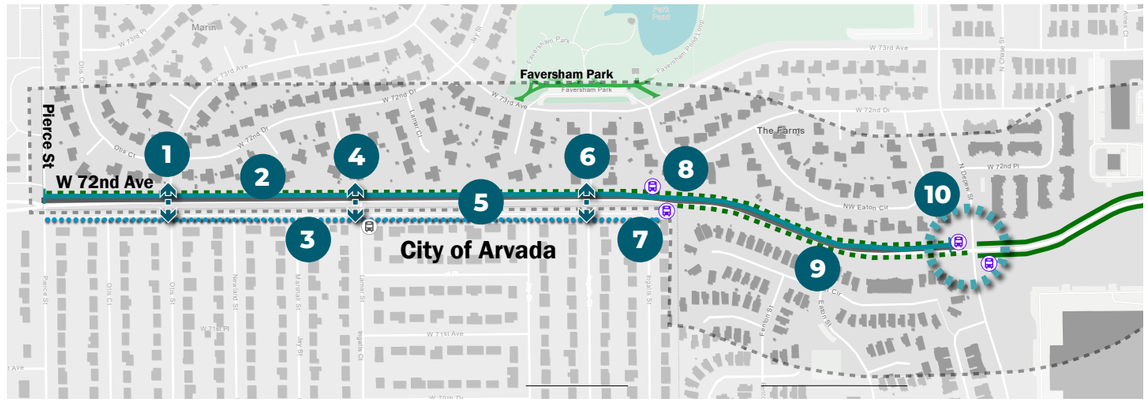


Figure 31: Rendering of Center Median with Landscaping West of Depew Street (Looking East)

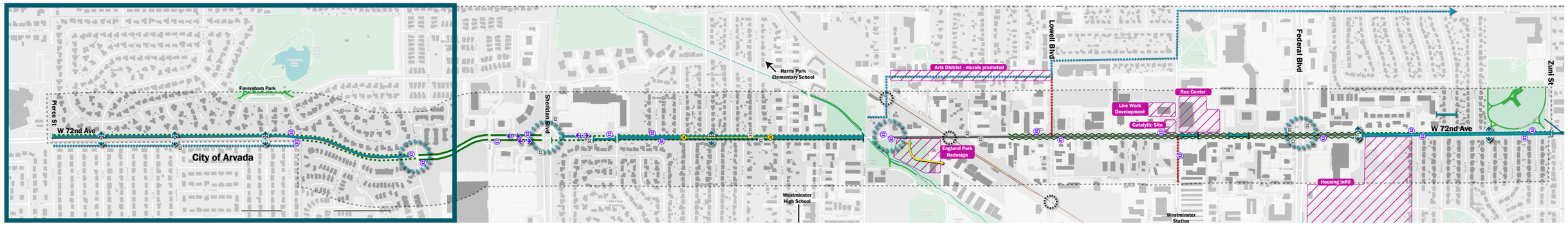
Map Legend

- Repurpose Right-of-Way Space
- Low Stress Bikeway
- Pedestrian Crossing Improvement
- Existing Transit Stop
- Enhanced Crossing and Intersection Improvements
- Concrete Median with Landscaping
- Multi-Use Path Proposed
- Multi-Use Path Existing
- Enhanced Transit Stop - Shelter, Bench, and Trash

Recommendations

1. Install pedestrian crossing improvements at Otis Street
2. Repurpose bike lane on north side from Pierce Street to Depew Street to create a multi-use path
3. Work with Arvada to enhance bike and pedestrian facilities on frontage road between Pierce Street and Ingalls Street
4. Add "No Right Turn on Red" signage and enhance crossing visibility at Lamar Street
5. Install center median with landscaping
6. Install pedestrian refuge median at Ingalls Street
7. Provide enhanced neighborhood connection to multi-use path east of Ingalls Street
8. Install enhanced transit stop at:
   - Ingalls Street (#11664 & 11665)
   - Depew Street (#11658 & #11659)
9. Create multi-use path on south side between Ingalls Street and Depew Street to connect to bikeway to west and existing multi-use path to east
10. Add Leading Pedestrian Interval (LPI) and high visibility crosswalk markings (24" width) at Depew Street

Key Map



"Break the Barrier"

Pierce Street to Depew Street

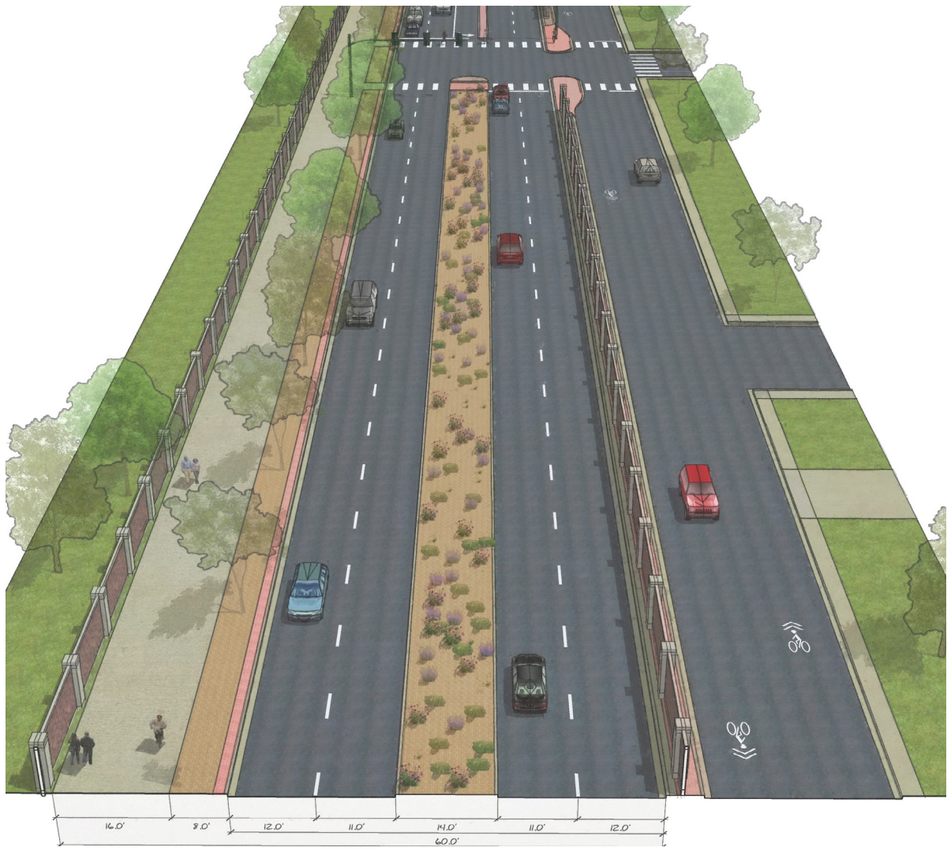
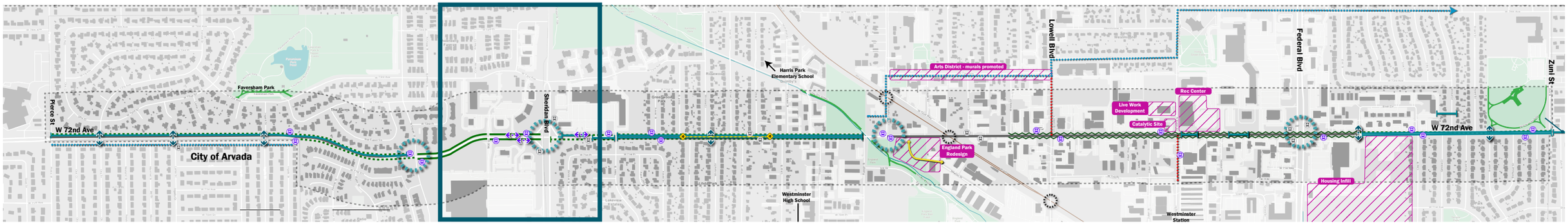


Figure 32: 3D Rendering of Concept Improvements at N Lamar Street (Looking East)

Map Legend

- Repurpose Right-of-Way Space
- Low Stress Bikeway
- Pedestrian Crossing Improvement
- Existing Transit Stop
- Enhanced Crossing and Intersection Improvements
- Concrete Median with Landscaping
- Multi-Use Path Proposed
- Multi-Use Path Existing
- Enhanced Transit Stop - Shelter, Bench, and Trash

Key Map



"Break the Barrier"

5400 W to Yates Street

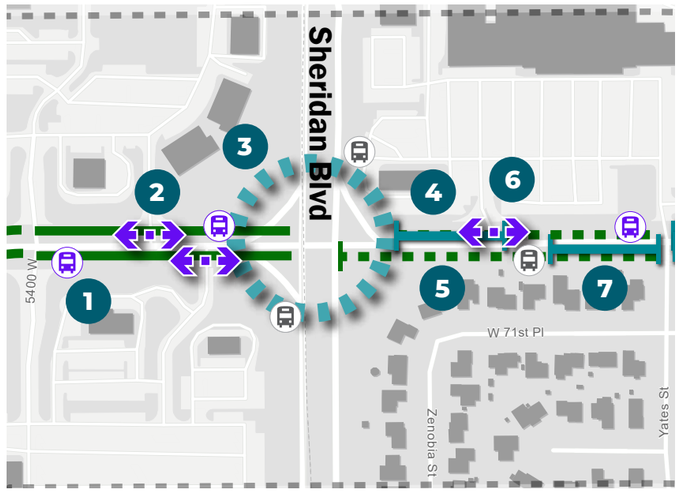


Figure 33: Enhanced Driveway Crossing

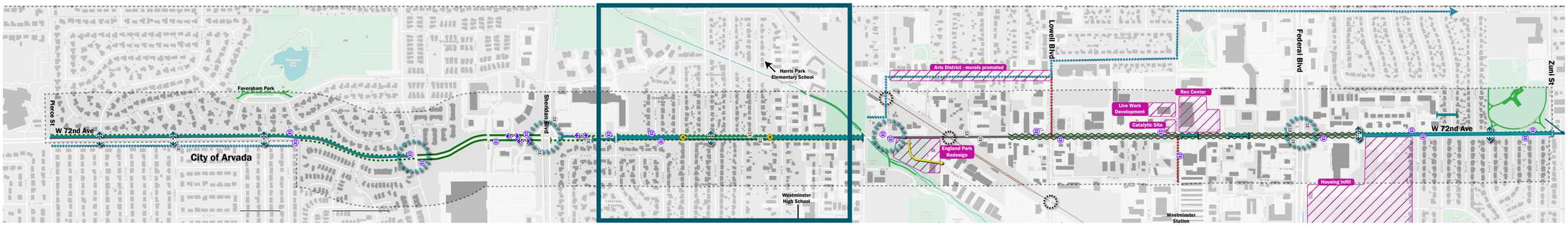
Map Legend

- Driveway Crossing Improvement
- Enhanced Crossing and Intersection Improvements
- Repurpose Right-of-Way Space
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Multi-Use Path Proposed
- Multi-Use Path Existing
- Existing Transit Stop

Recommendations

1. Install enhanced transit stop at:
   - 5400 West (#35181)
   - Sheridan Boulevard (#11693)
   - Yates Street (#22594)
2. Enhance driveway crossings at commercial center west of Sheridan Boulevard on north and south sides
3. Install raised crosswalks at slip lanes and modify slip lane angles at all four intersection approaches
4. On north side, repurpose auxillary/right turn lane, add multi-use path
5. On south side, widen existing sidewalk to 8' to enhance transit access for pedestrians and bicycles
6. Enhance driveway crossings at commercial center east of Sheridan Boulevard on north side
7. Repurpose right turn lane west of Yates Street to add multi-use path

Key Map



"Break the Barrier"

Yates Street to Raleigh Street

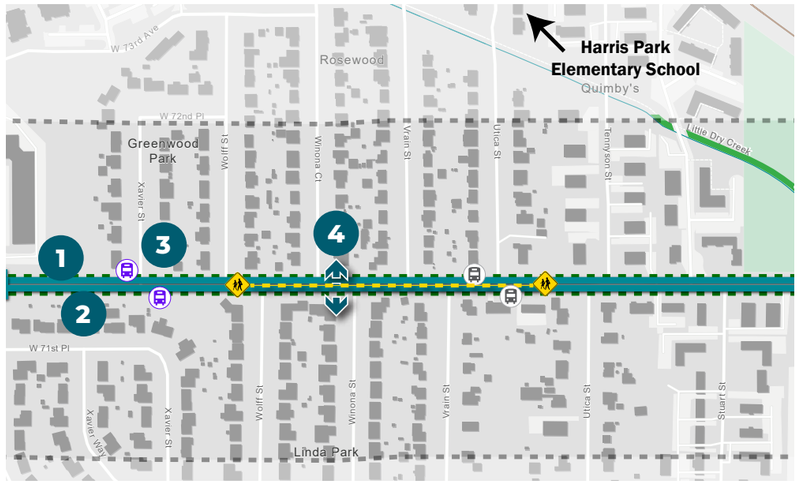


Figure 34: Artistic Crosswalk Rendering East of Winona Street (Looking East)

Map Legend

- School Zone
- Pedestrian Crossing Improvement
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Repurpose Right-of-Way Space
- Multi-Use Path Existing
- Multi-Use Path Proposed
- Existing Transit Stop

Recommendations

1. Repurpose lane to add multi-use path on the north side from Yates Street to Raleigh Street
2. Repurpose turn lane/widen existing sidewalk to 8-feet on south side
3. Install enhanced transit stop at:
   - Xavier Street (#11700 & #11701)
4. Add pedestrian refuge median and artistic crosswalk to existing signalized crossing east of Winona Street to enhance school zone safety

Figure 35: Pedestrian Refuge Median

Key Map

"Break the Barrier"

Raleigh Street to Eliot Circle

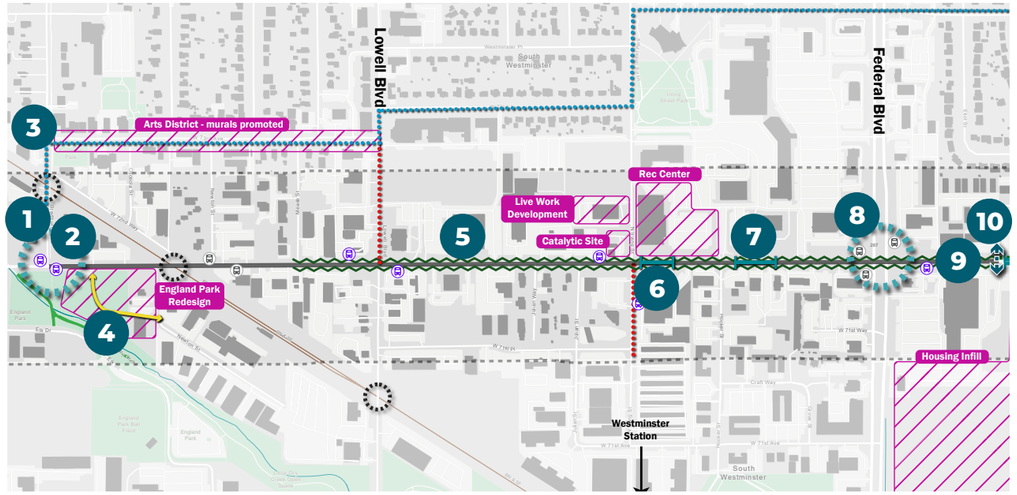


Figure 36: Urban Design and Streetscape Improvements Rendering West of Irving Street (Looking West)

Map Legend

- Access Road
- Repurpose Right-of-Way Space
- Railroad Crossing/Quiet Zone
- Urban Design Improvement
- Land Use to Activate the Community
- Low Stress Bikeway
- Bike Lane
- Multi-Use Path Existing
- Existing Transit Stop
- Concrete Median with Landscaping
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Enhanced Crossing and Intersection Improvements

Recommendations

1. At Bradburn Boulevard, install Pedestrian Hybrid Beacon and restrict eastbound left turn onto Bradburn Boulevard
2. Install enhanced transit stop at:
   - Bradburn Boulevard (#20082 & #11687)
   - Lowell Boulevard (#11675 & #11674)
   - Irving Street (#11667 & #14615)
   - Clay Street (#11660 & #11652)
   - Between Berthod and Alcott streets (#11649 & #11648)
3. Low stress bikeway
4. New park access road
5. Urban design and streetscape improvements
6. Repurpose right turn lane on westbound approach to Irving Street
7. Repurpose right turn lane east of Hooker Street
8. Enhanced Bus Rapid Transit (BRT) stop (enhancements to happen with Federal BRT Study)
9. Center median with landscaping from Meade Street to Eliot Circle
10. Install pedestrian crossing improvements at Eliot Circle

Key Map

"Break the Barrier"

Raleigh Street to Eliot Circle

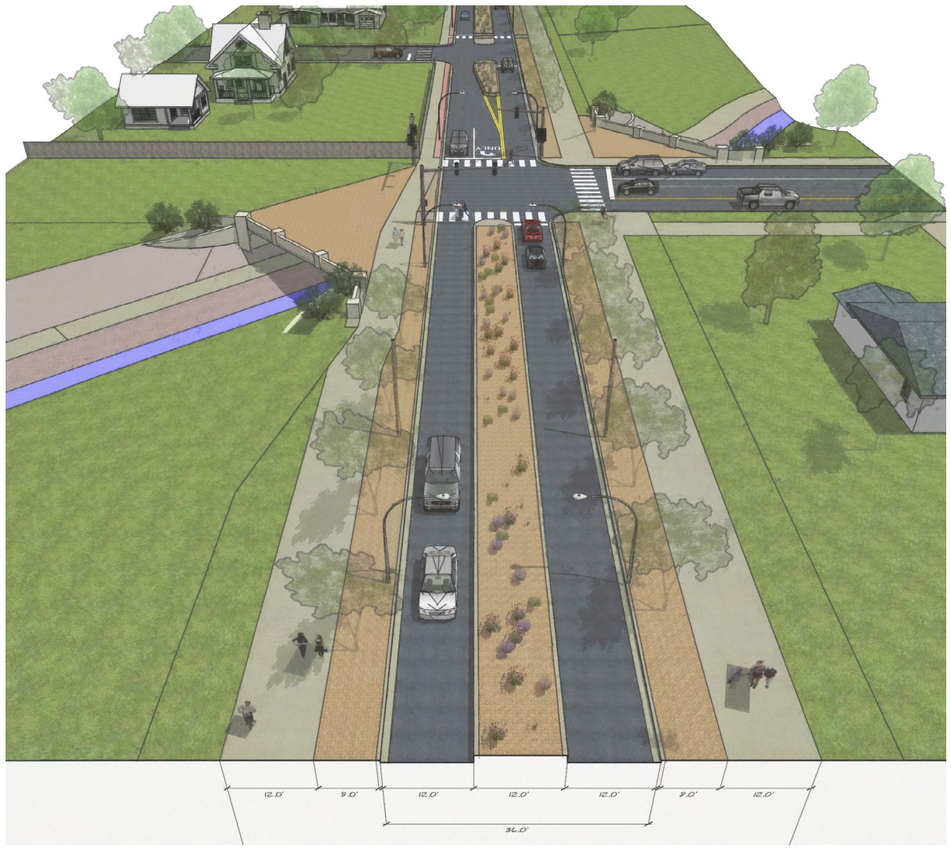
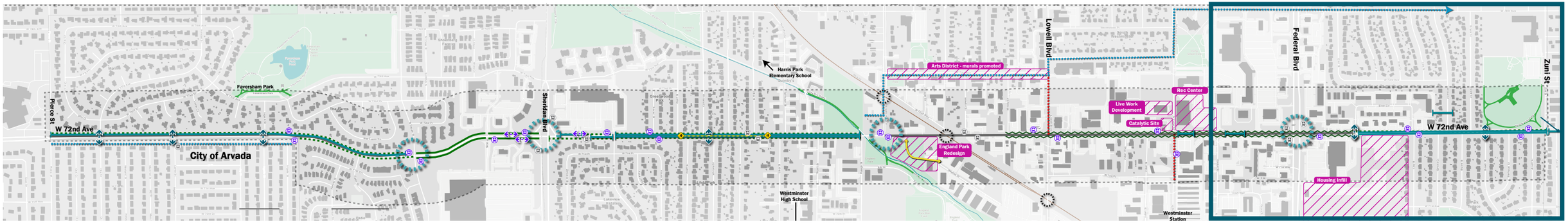


Figure 37: 3D Rendering of Concept Improvements at England Park (Looking East)

Map Legend

- Access Road
- Repurpose Right-of-Way Space
- Railroad Crossing/Quiet Zone
- Urban Design Improvement
- Land Use to Activate the Community
- Low Stress Bikeway
- Bike Lane
- Multi-Use Path Existing
- Existing Transit Stop
- Concrete Median with Landscaping
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Enhanced Crossing and Intersection Improvements

Key Map



"Break the Barrier"

Eliot Circle to Zuni Street

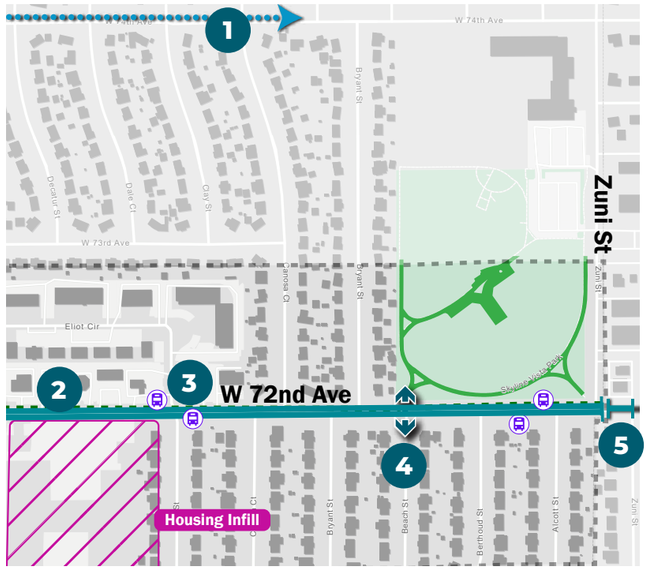


Figure 38: Multi Use Path

Map Legend

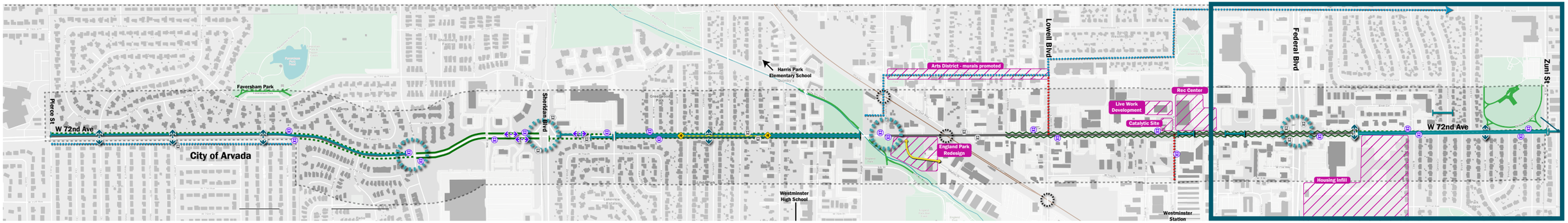
- Low Stress Bikeway
- Pedestrian Crossing Improvement
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Repurpose Right-of-Way Space
- Multi-Use Path Existing
- Multi-Use Path Proposed
- Land Use to Activate the Community

Recommendations

1. Low stress bikeway
2. Repurpose travel lanes on north/south sides between Eliot Circle and Zuni Street to create multi-use paths
3. Install enhanced transit stop at:
   - Clay Street (#11660 & #11652)
   - Between Berthod Street and Alcott Street (#11649 & #11648)
4. Install pedestrian crossing improvement at Beach Street
5. Coordinate with Adams County on lane repurposing

Figure 39: Enhanced Pedestrian Crossing

Key Map



“Break the Barrier”

Eliot Circle to Zuni Street

Figure 40: 3D Rendering of Concept Improvements at Orchard Park (Looking East)

Map Legend

- Low Stress Bikeway
- Pedestrian Crossing Improvement
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Multi-Use Path Existing
- Multi-Use Path Proposed
- Land Use to Activate the Community

“Calm the Traffic”

The “Calm the Traffic” concept focuses on providing safer travel conditions for all modes of travel (vehicles, bicycles, pedestrians, transit riders, and mobility-device users) along the corridor. This concept aims to enhance multimodal facilities and complete any existing gaps while slowing vehicular speeds.

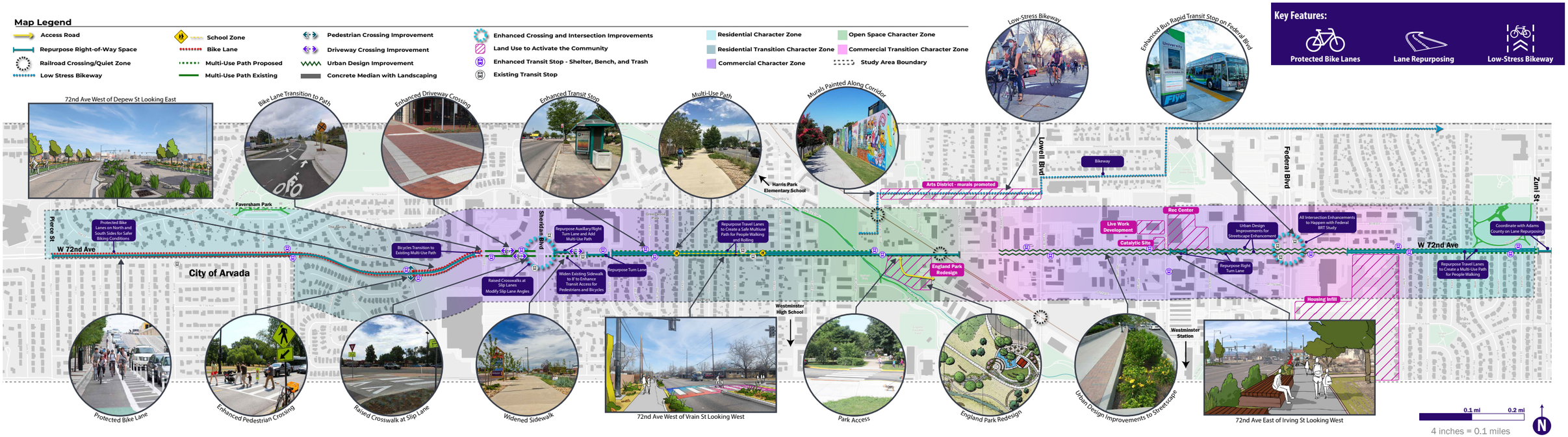
“Calm the Traffic” differs from “Break the Barrier” primary in its recommended installation of protected bike lanes between Pierce Street and Depew Street.

Figure 41: Protected Bike Lane

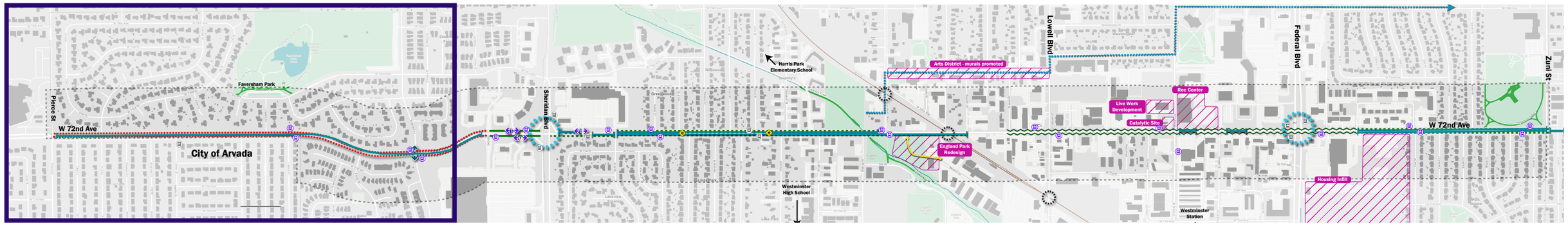
THE PLAN FOR 72ND AVENUE

THE PLAN FOR 72ND AVENUE

"Calm the Traffic" Alternative Concept



Key Map



"Calm the Traffic"

Pierce Street to Depew Street

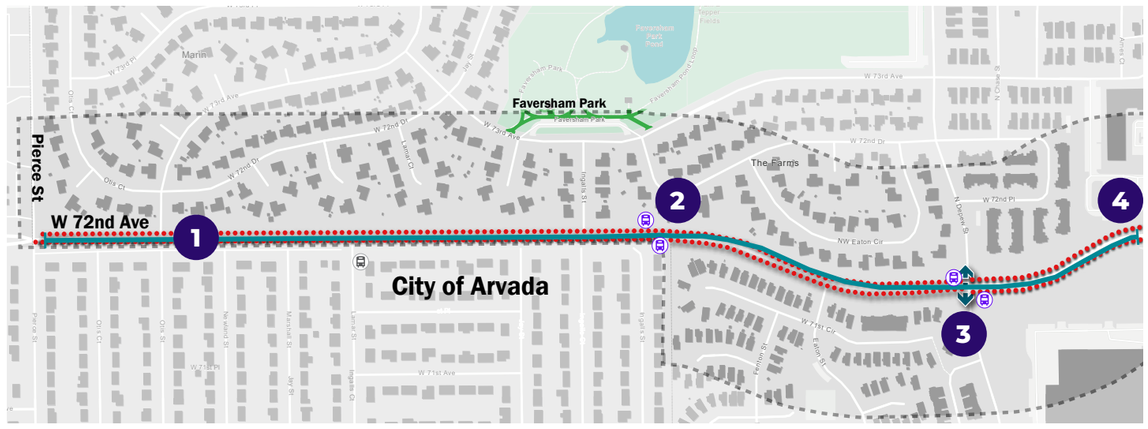


Figure 42: Graphic Representation of Proposed Protected Bike Lane West of Depew Street (Looking East)

Map Legend

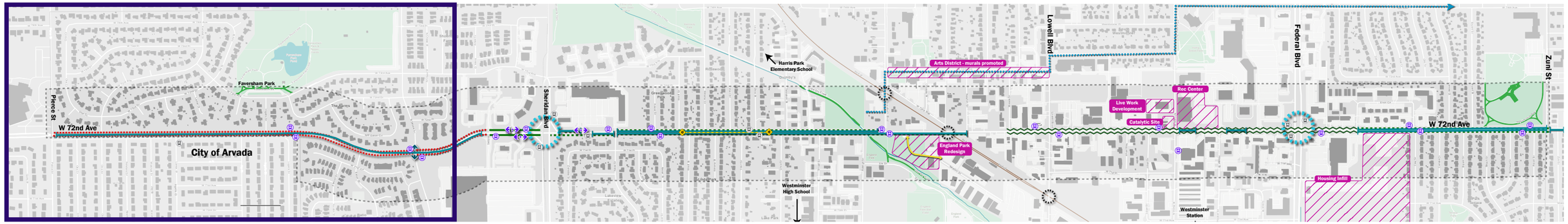
- Bike Lane
- Pedestrian Crossing Improvement
- Repurpose Right-of-Way Space
- Multi-Use Path Existing
- Existing Transit Stop
- Enhanced Transit Stop - Shelter, Bench, and Trash

Recommendations

1. Repurpose lanes to add protected bike lanes on north and south sides
2. Install enhanced transit stop at:
   - Ingalls Street (#11664 & 11665)
   - Depew Street (#11658 & #11659)
3. Install enhanced crosswalk markings and add Leading Pedestrian Interval (LPI) at Depew Street
4. Bicycles transition to existing multi-use path

Figure 43: Bicycle Lane Transition to Multi-Use Path

Key Map



"Calm the Traffic"

Pierce Street to Depew Street

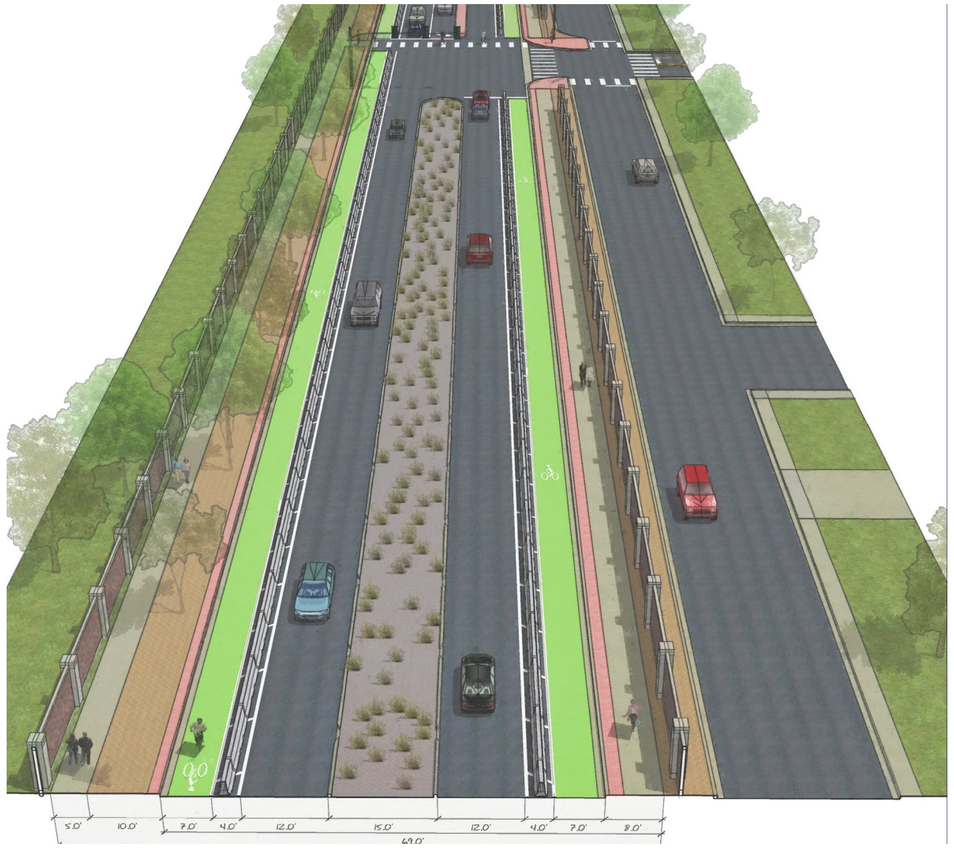
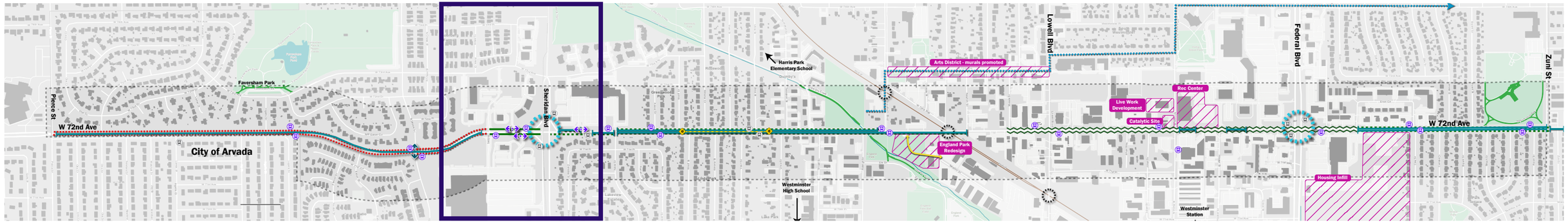


Figure 44: 3D Rendering of Concept Improvements at N Lamar Street (Looking East)

Map Legend

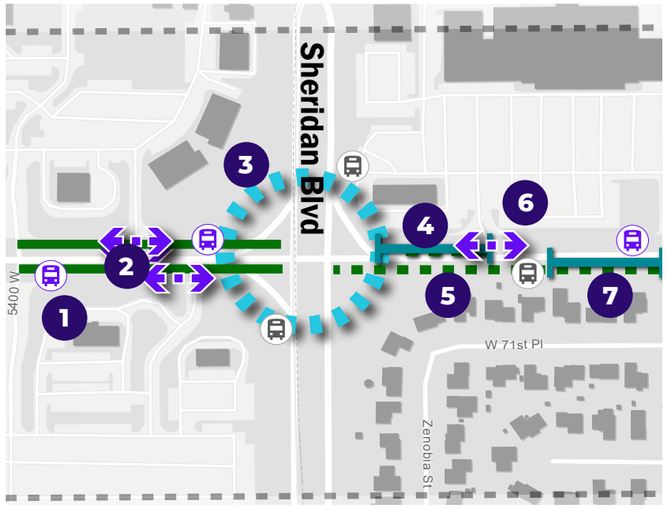
- Bike Lane
- Pedestrian Crossing Improvement
- Repurpose Right-of-Way Space
- Multi-Use Path Existing
- Existing Transit Stop
- Enhanced Transit Stop - Shelter, Bench, and Trash

Key Map



"Calm the Traffic"

5400 W to Yates Street



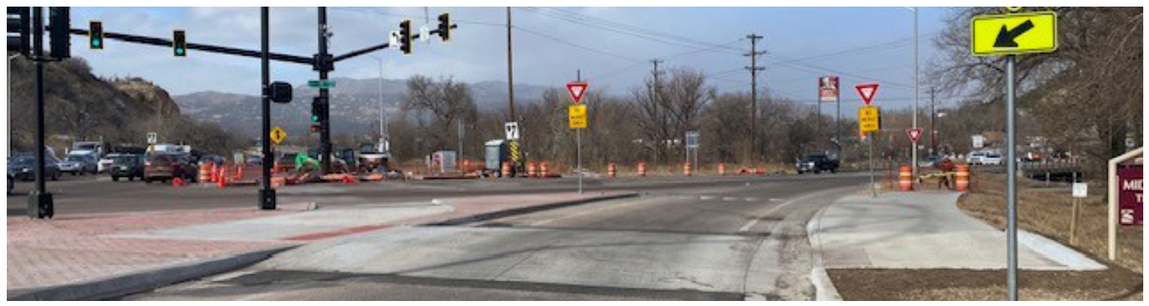


Figure 45: Raised Crosswalk

Map Legend

- Driveway Crossing Improvement
- Enhanced Crossing and Intersection Improvements
- Repurpose Right-of-Way Space
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Multi-Use Path Proposed
- Multi-Use Path Existing
- Existing Transit Stop

Recommendations

1. Install enhanced transit stop at:
   - 5400 West (#35181)
   - Sheridan Boulevard (#11693)
   - Yates Street (#22594)
2. Enhance driveway crossings at commercial center west of Sheridan Boulevard on north and south sides
3. Install raised crosswalks at slip lanes and modify slip lane angles at all four intersection approaches
4. On north side east of Sheridan Boulevard, repurpose auxillary/right turn lane, add multi-use path
5. On south side west of Sheridan Boulevard, widen existing sidewalk to 8' to enhance transit access for pedestrians and bicycles
6. Enhance driveway crossings at commercial center east of Sheridan Boulevard on north side
7. Repurpose right turn lane west of Yates Street to add multi-use path

Key Map

"Calm the Traffic"

Yates Street to Raleigh Street

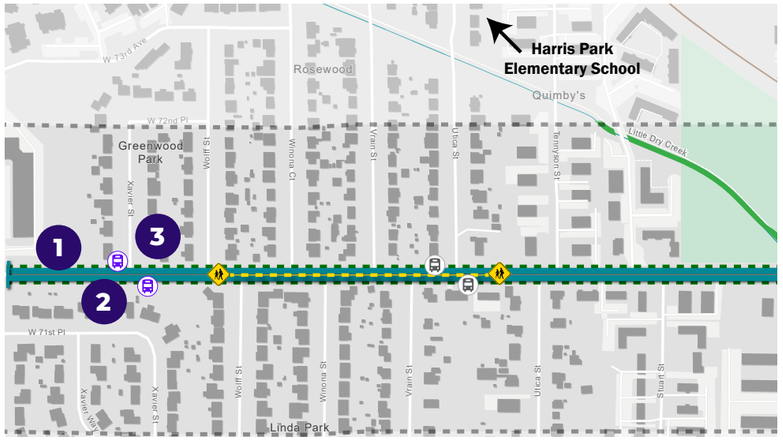


Figure 46: Enhanced Transit Stop

Map Legend

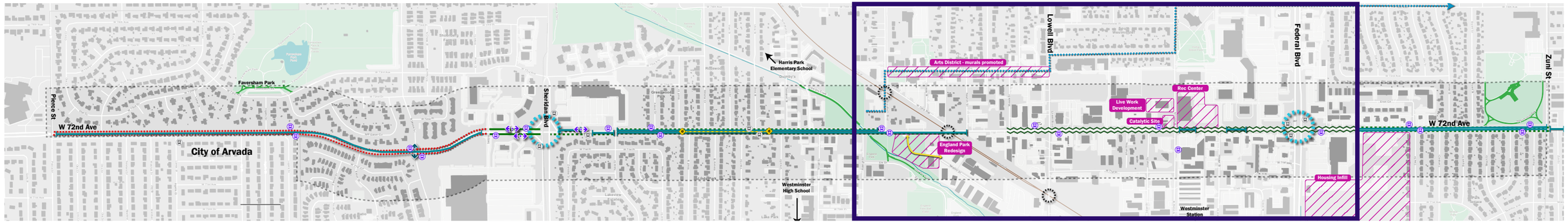
- School Zone
- Pedestrian Crossing Improvement
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Repurpose Right-of-Way Space
- Multi-Use Path Existing
- Multi-Use Path Proposed
- Existing Transit Stop

Recommendations

1. Repurpose lane to add multi-use path on the north side from Yates Street to Raleigh Street
2. Repurpose turn lane/widen existing sidewalk to 8-feet on south side
3. Install enhanced transit stop at:
   - Xavier Street (#11700 & #11701)

Figure 47: Multi-Use Path

Key Map



"Calm the Traffic"

Raleigh Street to Eliot Circle

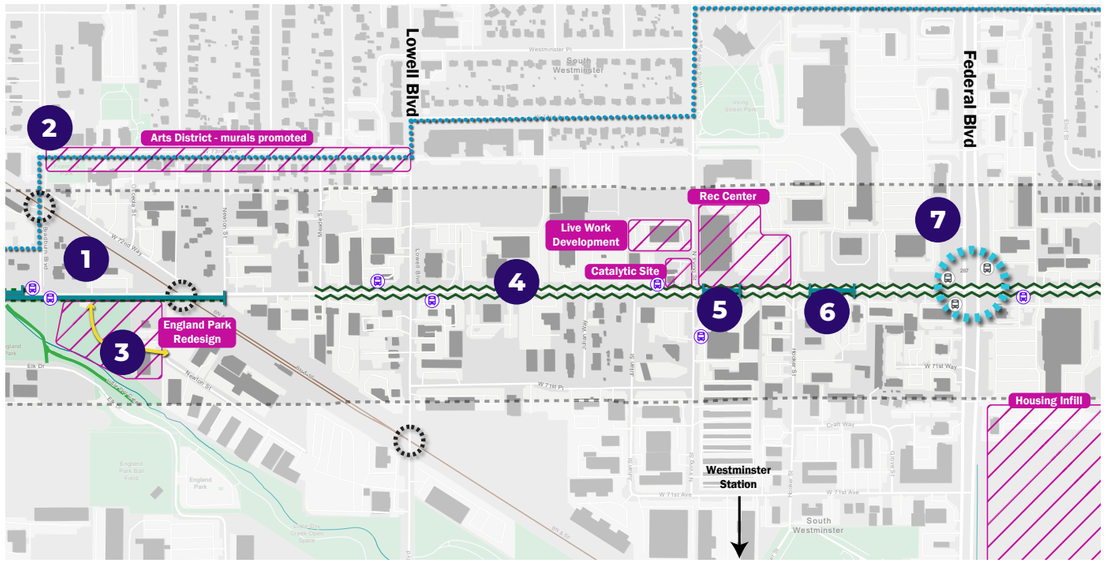


Figure 48: Rendering of Urban Design and Streetscape Enhancements West of Irving Street (Looking West)

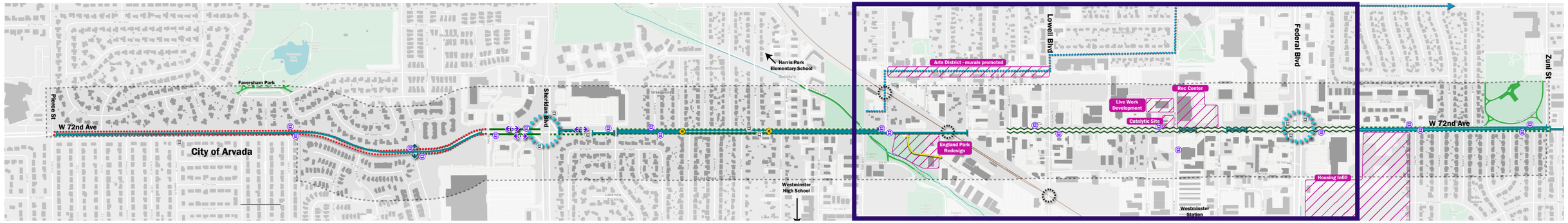
Map Legend

- Access Road
- Repurpose Right-of-Way Space
- Railroad Crossing/Quiet Zone
- Urban Design Improvement
- Land Use to Activate the Community
- Low Stress Bikeway
- Bike Lane
- Multi-Use Path Existing
- Existing Transit Stop
- Concrete Median with Landscaping
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Enhanced Crossing and Intersection Improvements

Recommendations

1. Install enhanced transit stop at:
   - Bradburn Boulevard (#20082 & #11687)
   - Lowell Boulevard (#11675 & #11674)
   - Irving Street (#11667 & #14615)
   - Clay Street (#11660 & #11652)
   - Between Berthod and Alcott streets (#11649 & #11648)
2. Low stress bikeway
3. New park access road
4. Urban design and streetscape improvements
5. Repurpose right turn lane on westbound approach to Irving Street
6. Repurpose right turn lane east of Hooker Street
7. Enhanced Bus Rapid Transit (BRT) stop (enhancements to happen with Federal BRT Study)

Key Map



“Calm the Traffic”

Raleigh Street to Eliot Circle

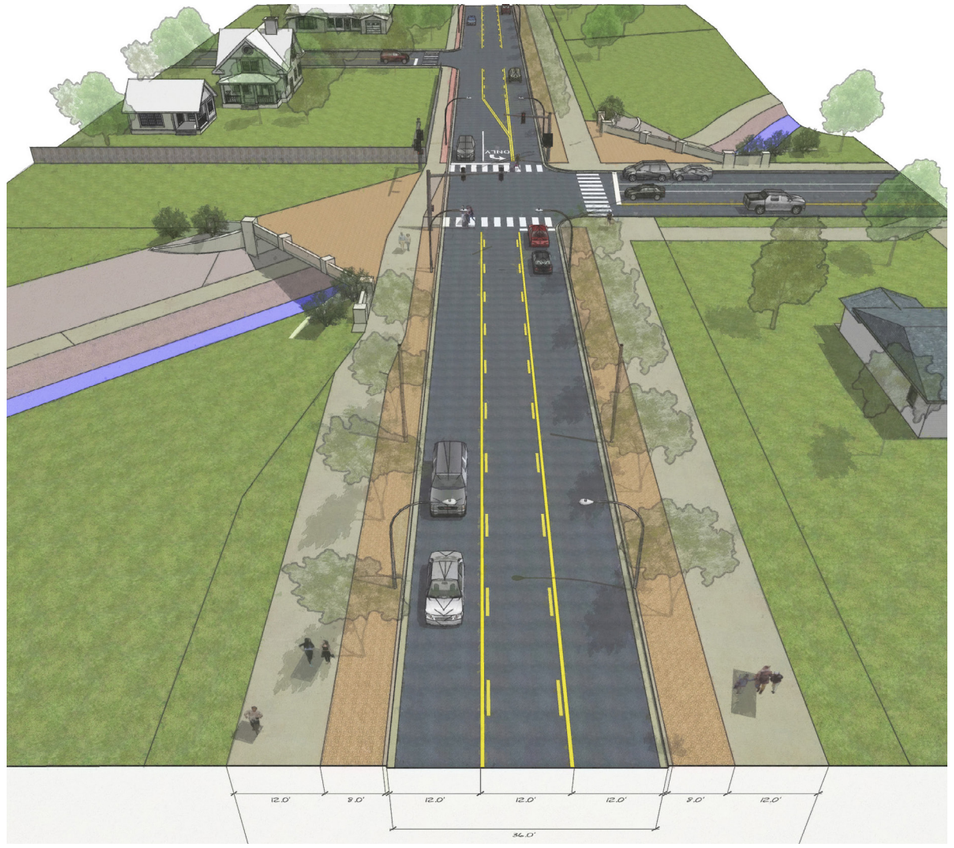
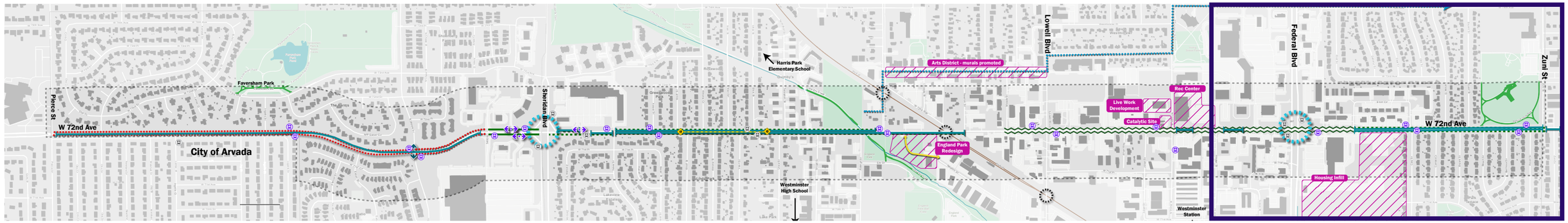


Figure 49: 3D Rendering of Concept Improvements at England Park (Looking East)

Map Legend

- Access Road
- Repurpose Right-of-Way Space
- Railroad Crossing/Quiet Zone
- Urban Design Improvement
- Land Use to Activate the Community
- Low Stress Bikeway
- Bike Lane
- Multi-Use Path Existing
- Existing Transit Stop
- Concrete Median with Landscaping
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Enhanced Crossing and Intersection Improvements

Key Map



“Calm the Traffic”

Eliot Circle to Zuni Street

Map Legend

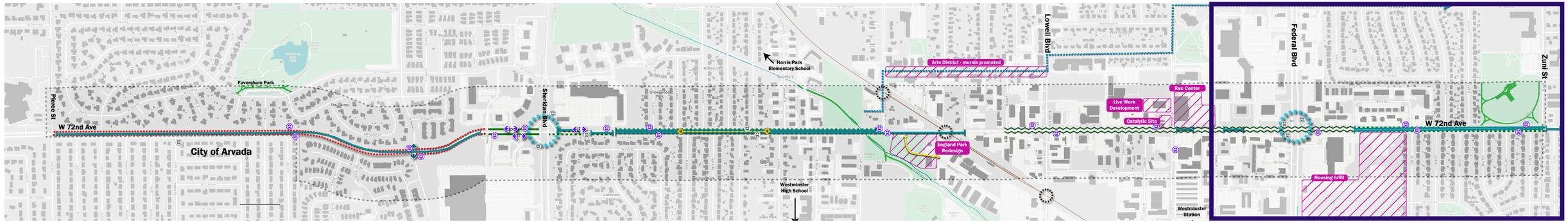
- Low Stress Bikeway
- Pedestrian Crossing Improvement
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Repurpose Right-of-Way Space
- Multi-Use Path Existing
- Multi-Use Path Proposed
- Land Use to Activate the Community

Recommendations

1. Bikeway
2. Repurpose travel lanes on north/south to create multi-use paths
3. Install enhanced transit stop at:
   - Clay Street (#11660 & #11652)
   - Between Berthod Street and Alcott Street (#11649 & #11648)
4. Coordinate with Adams County on lane repurposing

Figure 50: Neighborhood Bikeway

Key Map



“Calm the Traffic”

Eliot Circle to Zuni Street

Figure 51: 3D Rendering of Concept Improvements at Orchard Park (Looking East)

Map Legend

- Low Stress Bikeway
- Pedestrian Crossing Improvement
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Multi-Use Path Existing
- Multi-Use Path Proposed
- Land Use to Activate the Community

Preferred Alternative

The 72nd Avenue preferred alternative concept embodies the corridor's vision for:

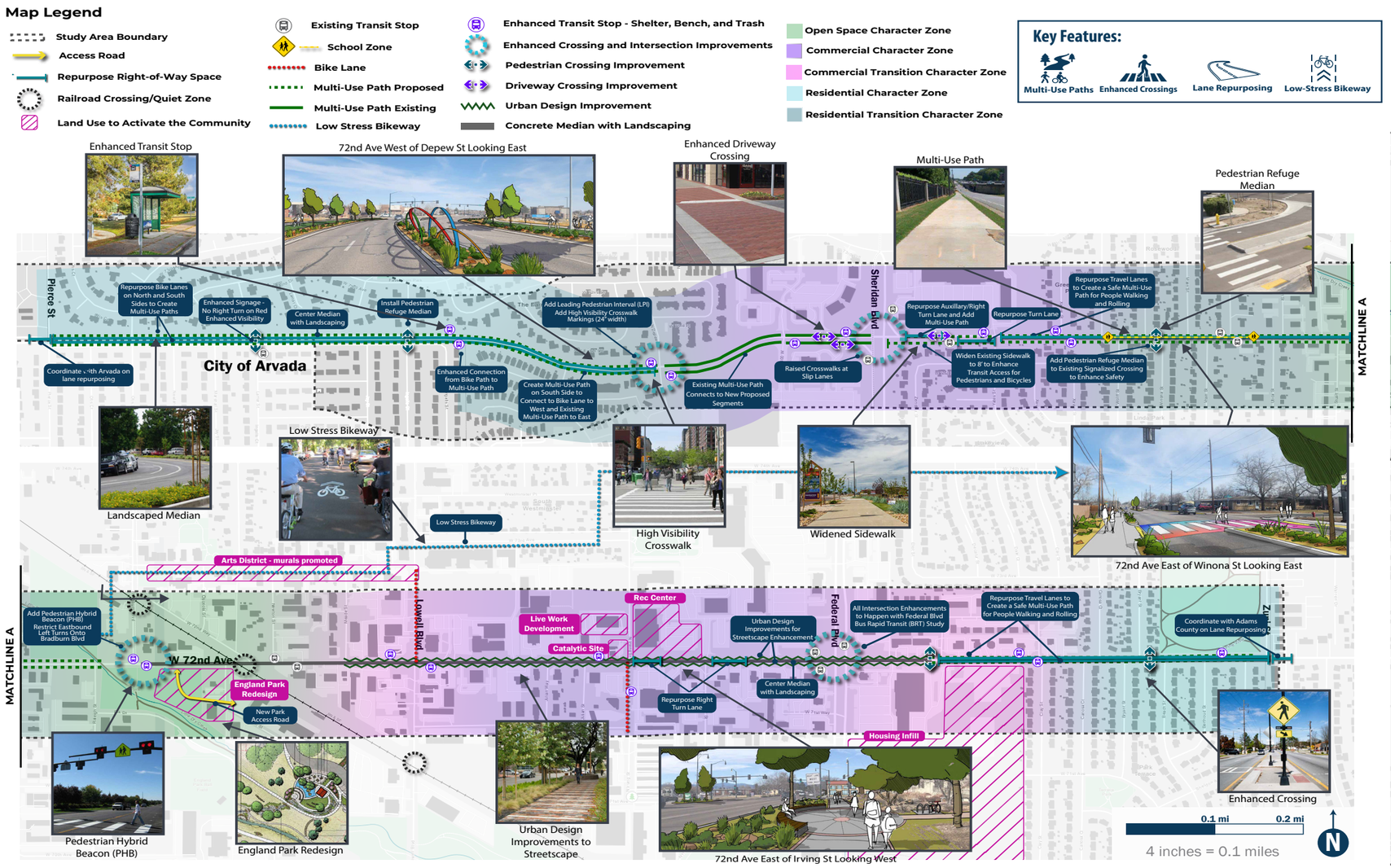
- **Providing Multimodal Options**: By installing continuous bicycling and walking facilities on or adjacent to 72nd Avenue for the full study area extent.
- **Traffic Calming:** By installing a center median with landscaping (where appropriate) and by repurposing underutilized travel/turn lanes to provide both physical and visual cues to remind motorists to reduce their speed.
- **Enhancing North/South Connections**: By installing new and enhanced high-visibility pedestrian crossings at both intersections and mid-block locations, prioritizing access to commercial centers, schools, parks, and other critical destinations.
- **Comfort/Livability:** By installing urban design improvements and public art to enhance the corridor's sense of place and reduce the urban heat island effect.

Figure 52: Vibrant Amenity Zone

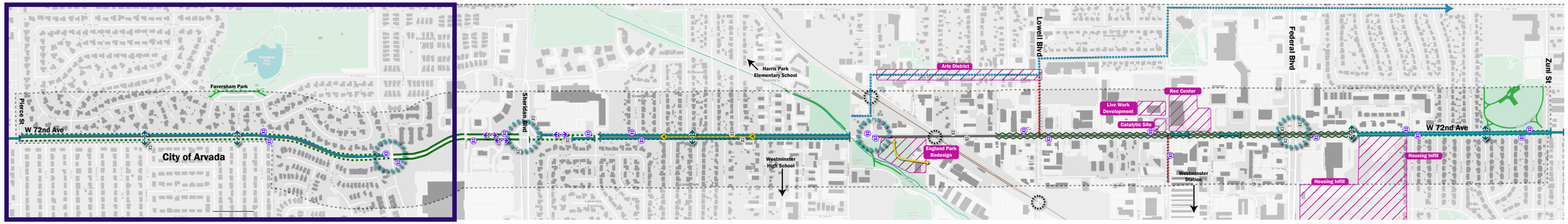
THE PLAN FOR 72ND AVENUE

THE PLAN FOR 72ND AVENUE

Preferred Alternative

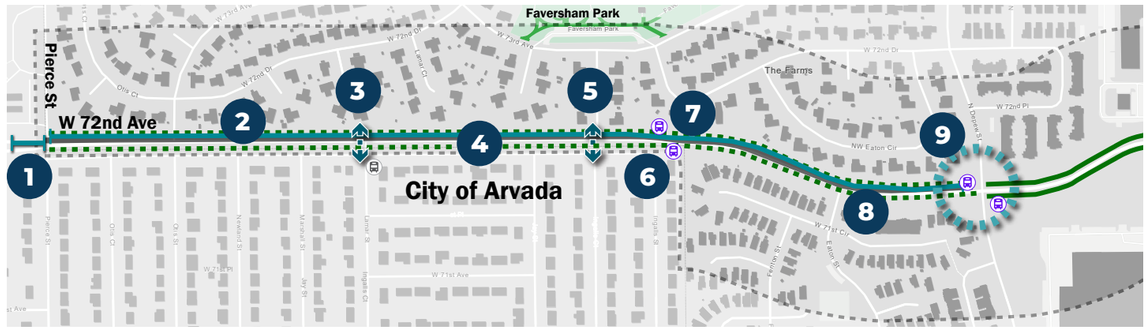


Key Map

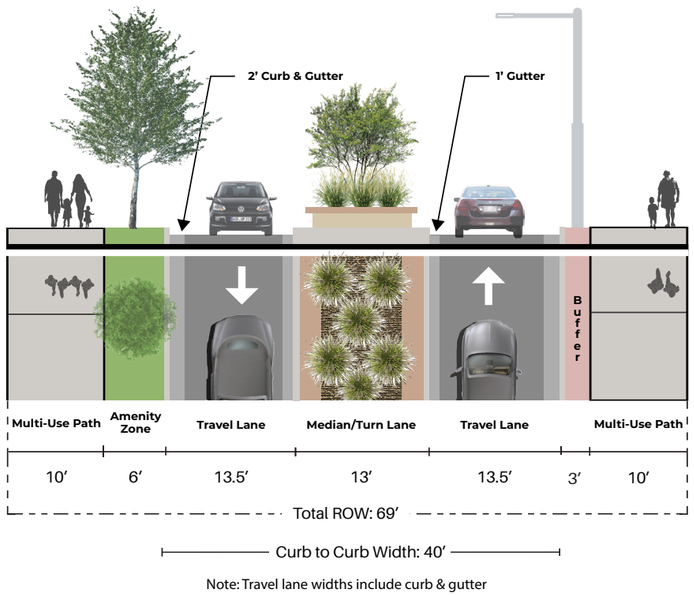


Preferred Alternative

Pierce Street to Depew Street



Pierce Street to Depew Street (Looking East)



Note: Travel lane widths include curb & gutter

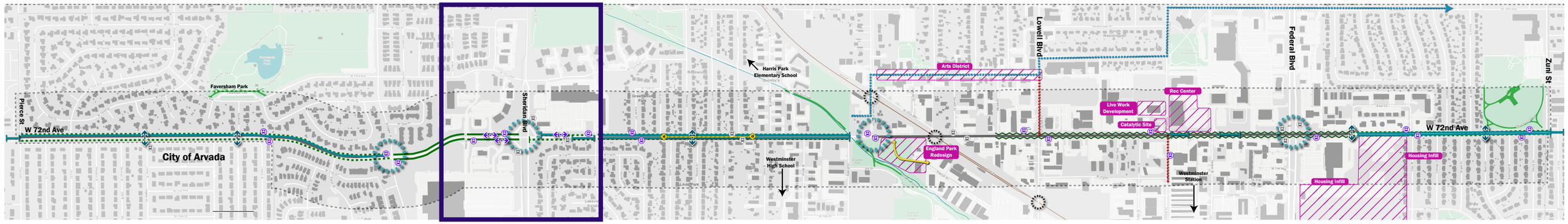
Map Legend

- Repurpose Right-of-Way Space
- Concrete Median with Landscaping
- Pedestrian Crossing Improvement
- Enhanced Crossing and Intersection Improvements
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Existing Transit Stop
- Multi-Use Path Proposed
- Multi-Use Path Existing

Recommendations

1. Coordinate with Arvada on lane repurposing
2. Repurpose travel lanes and bike lanes on north and south sides and transition to multi-use paths
3. Add “No Right Turn on Red” signage and enhance crossing visibility at Lamar Street
4. Install center median with landscaping
5. Install pedestrian refuge median at Ingalls Street
6. Provide enhanced neighborhood connection to multi-use path west of Ingalls Street
7. Install enhanced transit stop at:
   - Ingalls Street (#11664 & 11665)
   - Depew Street (#11658 & #11659)
8. Create multi-use path on south side to connect to existing multi-use path to east
9. Add Leading Pedestrian Interval (LPI) and high visibility crosswalk markings (24” width) at Depew Street

Key Map



Preferred Alternative

5400 W to Yates Street

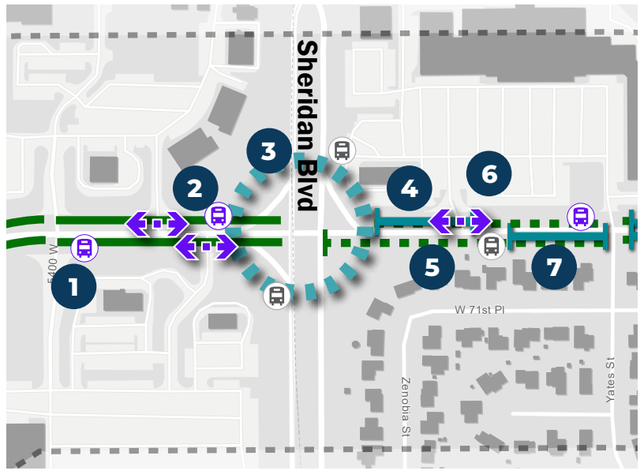


Figure 53: Multi-Use Path

Figure 54: Enhanced Transit Stop

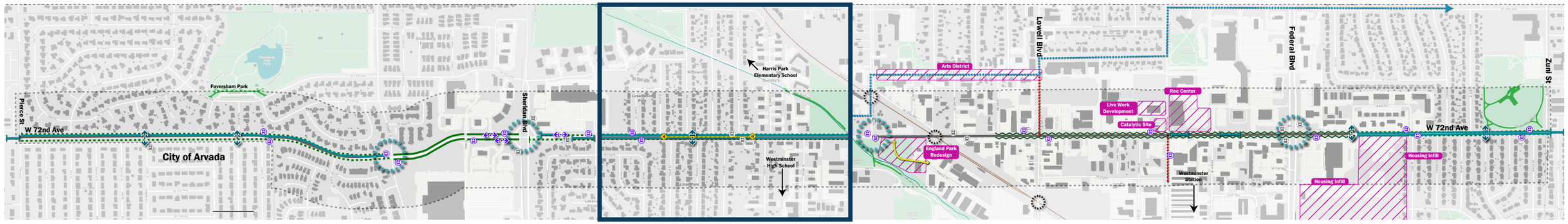
Map Legend

- Driveway Crossing Improvement
- Enhanced Crossing and Intersection Improvements
- Repurpose Right-of-Way Space
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Multi-Use Path Proposed
- Multi-Use Path Existing
- Existing Transit Stop

Recommendations

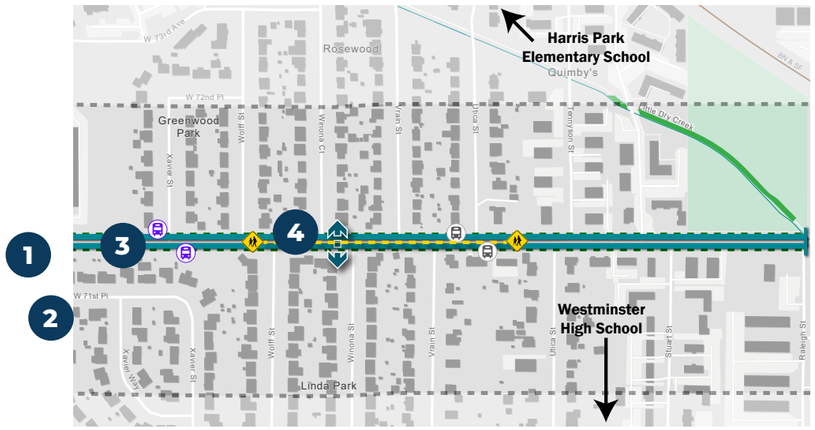
1. Install enhanced transit stop at:
   - 5400 West (#35181)
   - Sheridan Boulevard (#11693)
2. Enhance driveway crossings at commercial center west of Sheridan Boulevard on north and south sides
3. Install raised crosswalks at slip lanes and modify slip lane angles at all four intersection approaches at Sheridan Boulevard
4. On north side east of Sheridan Boulevard, repurpose auxillary/right turn lane, add multi-use path
5. On south side west of Sheridan Boulevard, widen existing sidewalk to 8’ to enhance transit access for pedestrians and bicycles
6. Enhance driveway crossings at commercial center east of Sheridan Boulevard on north side
7. Repurpose right turn lane west of Yates Street to add multi-use path

Key Map

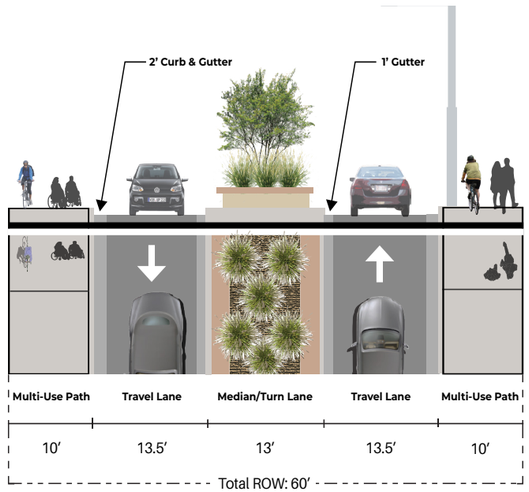


Preferred Alternative

Yates Street to Raleigh Street



Yates Street to Raleigh Street (Looking East)



Note: Travel lane widths include curb & gutter

Map Legend

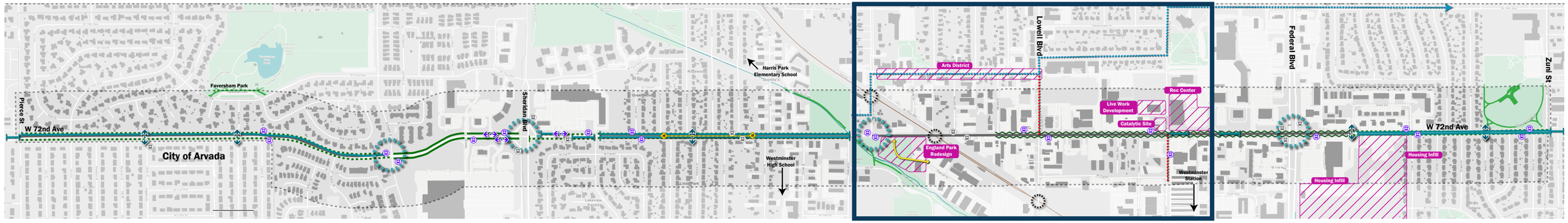
- School Zone
- Pedestrian Crossing Improvement
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Repurpose Right-of-Way Space
- Multi-Use Path Existing
- Multi-Use Path Proposed
- Existing Transit Stop

Recommendations

1. Repurpose lane to add multi-use path on the north side from Yates Street to Raleigh Street
2. Repurpose turn lane/widen existing sidewalk to 8-feet on south side
3. Install enhanced transit stop at Xavier Street (#11700 & #11701)
4. Add pedestrian refuge median and artistic crosswalk to existing signalized crossing to enhance school zone safety between Winona Court and Winona Street

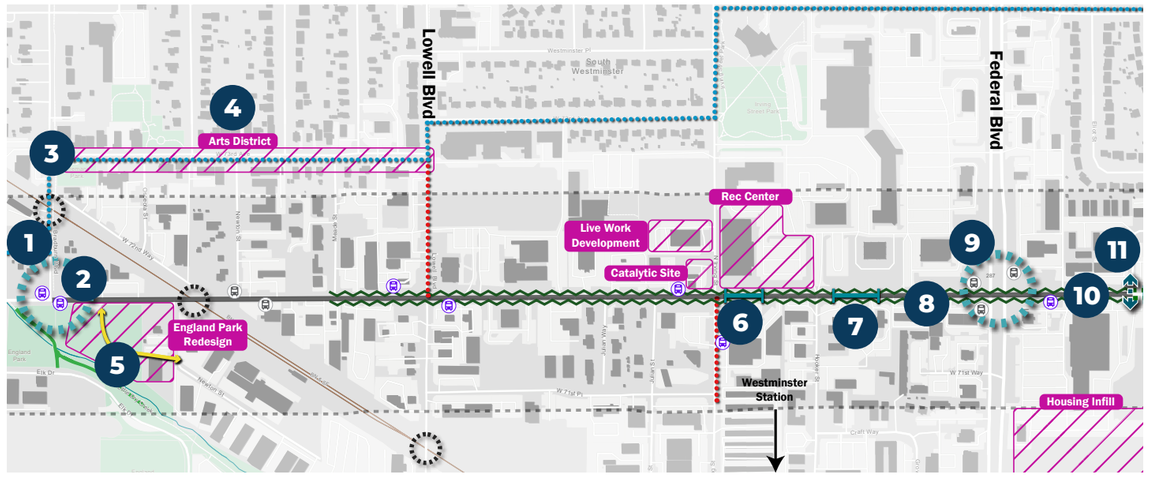
Figure 55: Pedestrian Refuge Median

Key Map

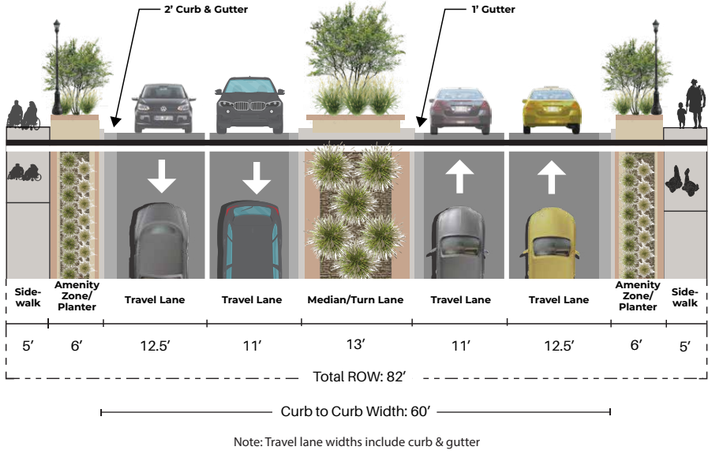


Preferred Alternative

Raleigh Street to Eliot Circle



Raleigh Street to Eliot Circle (Looking East)



Note: Travel lane widths include curb & gutter

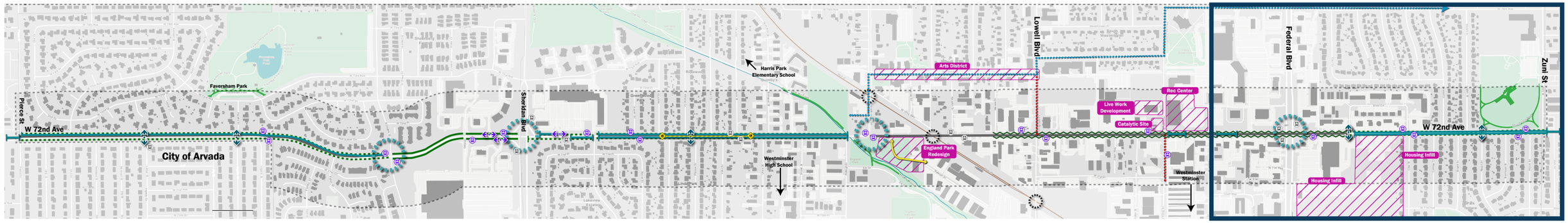
Map Legend

- Access Road
- Repurpose Right-of-Way Space
- Railroad Crossing/Quiet Zone
- Urban Design Improvement
- Land Use to Activate the Community
- Low Stress Bikeway
- Bike Lane
- Multi-Use Path Existing
- Existing Transit Stop
- Concrete Median with Landscaping
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Enhanced Crossing and Intersection Improvements

Recommendations

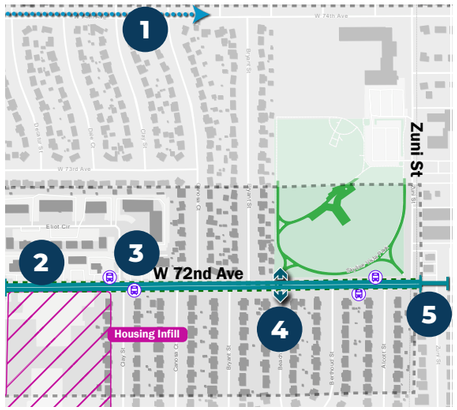
1. Install PHB with refuge median and add eastbound left turn restriction onto Bradburn Boulevard
2. Install enhanced transit stop at:
   - Bradburn Boulevard (#200082 & #11687)
   - Lowell Boulevard (#11675 & #11674)
   - Irving Street (#11667 & #14615)
   - Clay Street (#11660 & #11652)
   - Between Berthod and Alcott streets (#11649 & #11648)
3. Low stress bikeway
4. Promote arts district, including working with local artist to install murals on north side of 73rd Avenue
5. New park access road
6. Repurpose right turn lane on westbound approach to Irving Street
7. Repurpose right turn lane east of Hooker Street
8. Implement urban design and streetscape improvements from Meade Street to Eliot Circle
9. Transit stop enhancements to occur with Federal BRT Study
10. Center median with landscaping
11. Install pedestrian refuge median with RRFB or PHB at Eliot Circle

Key Map

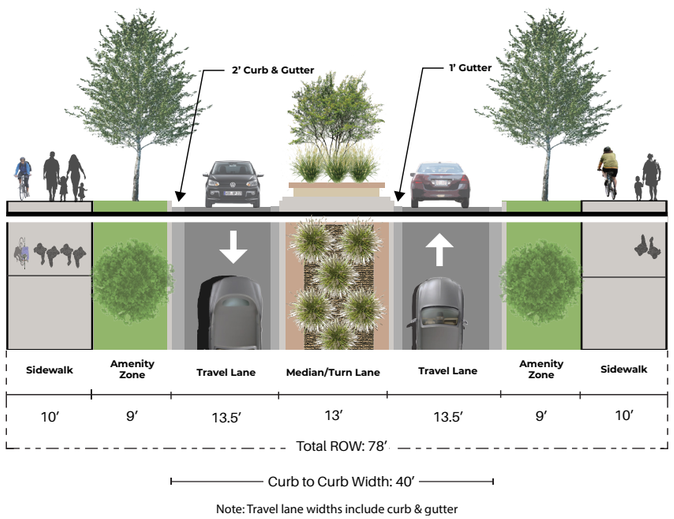


Preferred Alternative

Eliot Circle to Zuni Street



Eliot Circle to Zuni Street (Looking East)



Note: Travel lane widths include curb & gutter

Map Legend

- Low Stress Bikeway
- Pedestrian Crossing Improvement
- Enhanced Transit Stop - Shelter, Bench, and Trash
- Repurpose Right-of-Way Space
- Multi-Use Path Existing
- Multi-Use Path Proposed
- Land Use to Activate the Community

Recommendations

1. Low stress bikeway
2. Repurpose travel lanes on north/south sides between Eliot Circle and Zuni Street to create multi-use paths
3. Install enhanced transit stop at:
   - Clay Street (#11660 & #11652)
   - Between Berthod Street and Alcott Street (#11649 & #11648)
4. Install enhanced crossing at Beach Street to access Skyline Park
5. Coordinate with Adams County on lane repurposing and transition

Figure 56: Neighborhood Bikeway

Implementation Strategy

Funding and Phasing

The purpose of the 72nd Avenue Corridor Study is to evaluate opportunities for enhancing multimodal infrastructure and deliver increased safety and comfort for people walking, biking, riding transit, and driving along, to, and from 72nd Avenue between Pierce and Zuni Streets. The recommendations developed through this planning effort function as a holistic solution to re-envision 72nd Avenue and foster a safer traveling environment for all users. However, each design element and improvement can provide an incremental step towards achieving the overall vision. As a next step, more detailed design solutions should be developed, considering drainage analyses and referencing City of Westminster standards and nationally-recognized design guidelines, such as from the National Association of City Transportation Officials (NACTO).

Figure 57: Streetscape Planters

Though ultimately desired, it is unlikely all recommendations from the 72nd Study can be implemented as one complete project, given the three-mile corridor's extent. Funding for corridor improvements such as these is competitive and can be unpredictable. This plan presents recommendations grouped by corridor segments, so improvements can be designed and implemented as funding becomes available. With this type of implementation strategy, the 72nd Avenue corridor recommendations can be organized and packaged to take advantage of the multiple funding opportunities from federal, state, city, or local/regional programs.

Depending on project priorities, individual project costs, and available funding, different implementation strategies can be advanced to build out the project vision. One scenario might be to package all or many of the sidewalk/multi-use path and crosswalk enhancement projects

to pursue a pedestrian-focused grant opportunity. Another scenario could be to focus first on providing a continuous multi-use path network for a portion or all of the corridor, to be installed on one or both sides, as funding availability allows. Implementing the center median with landscaping in the two proposed corridor segments also presents a strategy to immediately enhance safety for corridor users.

Pilot project implementation offers an additional opportunity for rapidly deploying improvements. In light of ongoing corridor coordination with Adams County, as a first step, City staff could implement a paint-and-post pilot project from Eliot Circle to either Zuni Street or Pecos Street

72nd Avenue in historic Westminster is one of the city's original and major transportation routes. The corridor provides important east-west connections to schools, businesses & services, neighborhoods, parks, open spaces, trails, Westminster Station (served by RTD's B-Line), and other key destinations within the city and beyond. An ongoing collaboration between the City of Westminster, CDOT, RTD, and other partners will be key to implementing and maintaining the vision developed within this planning process. As this vision moves into the design phase, understanding how corridor improvements tie into adjacent municipalitys' ongoing/future projects (City of Arvada and Adams County) will be critical.

Figure 58: B Line to Westminster Station

Considering the overall funding landscaping, the current City of Westminster Capital Improvements Program (CIP) extends from 2023-2027. Programming discrete and prioritized improvements within the CIP budget for future years is a critical overall step to complete the corridor vision. Promising state and federal funding sources are outlined in detail within the Funding Opportunities section in the Appendix.

IMPLEMENTATION STRATEGY

Cost Estimates

EXHIBIT - B
72ND AVENUE CORRIDOR STUDY
Conceptual Rough Order of Magnitude Values
(Subject to Change)

10/2/2024

Item		PROJECT (ID)						Comment
Construction Cost (Conceptual)								
		Pierce - Depew (3)	Yates - Raleigh (5)	Raleigh - Eliot (6)	Eliot - Zuni (7)	Sheridan Intersection (4)	Study Area Total (1)	
Roadway		$ 6,608,403	$ 4,759,392	$ 8,638,079	$ 3,996,375	$ 850,000	$ 24,852,248	Includes roadway demo cost
Streetscape		$ -	$ 190,800	$ 1,736,044	$ 567,000	$ -	$ 2,493,844	
Signals		$ 2,325,000	$ 1,356,250	$ 3,100,000	$ 775,000	$ 775,000	$ 8,331,250	
Subtotal Estimated Cost		**$ 8,933,403**	**$ 6,306,442**	**$ 13,474,123**	**$ 5,338,375**	**$ 1,625,000**	**$ 35,677,343**	
Demo	1.0%	$ 89,334	$ 63,064	$ 134,741	$ 53,384	$ 16,250	$ 356,773	As a % of estimated cost subtotal
Drainage	5.0%	$ 446,670	$ 315,322	$ 673,706	$ 266,919	$ 81,250	$ 1,783,867	As a % of estimated cost subtotal
Utility Relocation	2.5%	$ 223,335	$ 157,661	$ 336,853	$ 133,459	$ 40,625	$ 891,934	As a % of estimated cost subtotal
Grading	2.0%	$ 178,668	$ 126,129	$ 269,482	$ 106,768	$ 32,500	$ 713,547	As a % of estimated cost subtotal
Hazardous Materials	1.0%	$ 89,334	$ 63,064	$ 134,741	$ 53,384	$ 16,250	$ 356,773	As a % of estimated cost subtotal
Subtotal Hard Cost		**$ 9,960,744**	**$ 7,031,682**	**$ 15,023,648**	**$ 5,952,288**	**$ 1,811,875**	**$ 39,780,237**	
Misc. Construction Cost Items								
Mobilization	8.0%	$ 796,860	$ 562,535	$ 1,201,892	$ 476,183	$ 144,950	$ 3,182,419	As a % of construction cost subtotal
Traffic Control	5.0%	$ 498,037	$ 351,584	$ 751,182	$ 297,614	$ 90,594	$ 1,989,012	As a % of construction cost subtotal
Erosion Control	1.5%	$ 149,411	$ 105,475	$ 225,355	$ 89,284	$ 27,178	$ 596,704	As a % of construction cost subtotal
Construction Survey	4.0%	$ 398,430	$ 281,267	$ 600,946	$ 238,092	$ 72,475	$ 1,591,209	As a % of construction cost subtotal
Material Testing	1.5%	$ 149,411	$ 105,475	$ 225,355	$ 89,284	$ 27,178	$ 596,704	As a % of construction cost subtotal
Utility Investigation / Potholing	2.5%	$ 249,019	$ 175,792	$ 375,591	$ 148,807	$ 45,297	$ 994,506	As a % of construction cost subtotal
Public Information Services	1.0%	$ 99,607	$ 70,317	$ 150,236	$ 59,523	$ 18,119	$ 397,802	As a % of construction cost subtotal
Total Misc. Construction Cost	**23.5%**	**$ 2,340,775**	**$ 1,652,445**	**$ 3,530,557**	**$ 1,398,788**	**$ 425,791**	**$ 9,348,356**	
Total Conceptual Hard Cost		**$ 12,301,519**	**$ 8,684,128**	**$ 18,554,205**	**$ 7,351,076**	**$ 2,237,666**	**$ 49,128,593**	
Project Contingency								
Scope Contingency	25.0%	$ 3,075,380	$ 2,171,032	$ 4,638,551	$ 1,837,769	$ 559,416	$ 12,282,148	Items not accounted for at conceptual level
Total Contingency	**25.0%**	**$ 3,075,380**	**$ 2,171,032**	**$ 4,638,551**	**$ 1,837,769**	**$ 559,416**	**$ 12,282,148**	
Total Expected Bid for Construction (Conceptual)		**$ 15,376,899**	**$ 10,855,160**	**$ 23,192,756**	**$ 9,188,845**	**$ 2,797,082**	**$ 61,410,741**	
Soft Cost								
Plans, Specificaions & Estimates	12.0%	$ 1,845,228	$ 1,302,619	$ 2,783,131	$ 1,102,661	$ 335,650	$ 7,369,289	
Survey, SUE, Geotechnical	5.0%	$ 768,845	$ 542,758	$ 1,159,638	$ 459,442	$ 139,854	$ 3,070,537	
ROW	1.0%	$ 153,769	$ 108,552	$ 231,928	$ 91,888	$ 27,971	$ 614,107	Assume TCEs
CEI	12.5%	$ 1,922,112	$ 1,356,895	$ 2,899,094	$ 1,148,606	$ 349,635	$ 7,676,343	Construction related soft cost
Total Soft Cost	**30.5%**	**$ 4,689,954**	**$ 3,310,824**	**$ 7,073,791**	**$ 2,802,598**	**$ 853,110**	**$ 18,730,276**	
Contingency								
Environmental Remediation	5.0%	$ 1,003,343	$ 708,299	$ 1,513,327	$ 599,572	$ 182,510	$ 4,007,051	Environmental Contingency
Owner Contingency	10.0%	$ 2,006,685	$ 1,416,598	$ 3,026,655	$ 1,199,144	$ 365,019	$ 8,014,102	Unknown Contingency During Construction
Total Contingency		**$ 3,010,028**	**$ 2,124,898**	**$ 4,539,982**	**$ 1,798,716**	**$ 547,529**	**$ 12,021,153**	
Overall Cost								
Total Rough Order of Magnitude Budget		**$ 23,076,881**	**$ 16,290,881**	**$ 34,806,528**	**$ 13,790,159**	**$ 4,197,721**	**$ 92,162,170**	

Notes:
1) Values are based on conceptual design by others and subject to change
2) Values shown are in 2024 dollars and subject to change

IMPLEMENTATION STRATEGY

Implementation Matrix

Project ID	72ND CORRIDOR STUDY: PIERCE STREET TO ZUNI STREET Project Description	Cost	Implementation Strategy	Potential Funding Sources CDOT FASTER Safety	CDOT FASTER Transit	DRCOG TIP	CDOT HSIP	CDOT RMS	FTA TOD Planning	CDOT SRTS Program	USDOT RAISE	FHWA ATIIP
1	Implement the holistic 72nd Avenue Study Vision from Pierce Street to Zuni Street	$92.2 M	Coordinate with City of Arvada, Adams County and Westminster Parks and Recreation to develop design plans	■	■	■	■	■	■		■	■
2	Complete signage, wayfinding and lighting study to improve legibility between multi-modal facilities, increase user awareness and improve nighttime safety	TBD						■	■			
3	**Install enhancements from Pierce Street to Depew Street, including:** · Center median with landscaping · Repurpose travel lanes and bike lanes on north and south sides and transition to multi-use paths · “No Right Turn on Red” signage and enhance crossing visibility at Lamar Street on south side · Pedestrian refuge median at Ingalls Street crossing · High visibility crosswalk markings and Leading Pedestrian Internal (LPI) at Depew Street intersection · Enhanced transit stops (with shelter, bench, and trash can) at Ingalls Street (#11664 & 11665) and Depew Street (#11658 & #11659) · Provide enhanced neighborhood connection to multi-use path west of Ingalls Street	$23.1 M	· For center median: Coordinate with Westminster Parks & Recreation to discuss maintenance and determine plantings · For multi-use paths: Coordinate with Arvada on lane repurposing transition west of Pierce Street · At Lamar Street: Coordinate with City of Arvada to provide enhancements · For transit stops: Coordinate with RTD to determine upgrade priority and investigate funding partnerships	■	■	■	■	■	■		■	■
4	**Install enhancements between 5400 W and Yates Street, including:** · Enhanced transit stops (with shelter, bench, and trash can at 5400 West (#35181), Sheridan Boulevard (#11693), Yates Street (#22594) and Xavier Street (#11700 & #11701) · Enhanced driveway crossings at commercial center west of Sheridan Boulevard on north and south sides · Raised crosswalks at slip lanes and modify slip lane angles at all four approaches at Sheridan Boulevard · Enhance driveway crossings at commercial center east of Sheridan Boulevard on north side · Repurpose right turn lane west of Yates Street to add multi-use path · On north side, repurpose auxillary/right turn lane and add multi-use path · On south side, widen existing sidewalk to 8’ to enhance transit access for pedestrians and bicycles	$4.2 M	· For transit stops: Coordinate with RTD to determine upgrade priority and investigate funding partnerships · For raised crosswalks at Sheridan Boulevard: Coordinate with CDOT; improvements can be completed by CDOT or City of Westminster		■	■			■			

IMPLEMENTATION STRATEGY

Project ID	Project Description	Cost Range	Implementation Strategy	Potential Funding Sources								
				CDOT FASTER Safety	CDOT FASTER Transit	DRCOG TIP	CDOT HSIP	CDOT RMS	FTA TOD Planning	CDOT SRTS Program	USDOT RAISE	FHWA ATIIP
5	**Install enhancements from Yates Street to Raleigh Street, including:** · Repurpose auxiliary/right turn lane to add multi-use path on the north side · Repurpose turn lane/widen existing sidewalk to 8-feet on south side · Between Winona Court and Winona Street, add pedestrian refuge median and install artistic crosswalk to existing signalized crossing to enhance school zone safety · Enhanced transit stops (with shelter, bench, and trash can at Yates Street (#22594) and Xavier Street (#11700 & #11701)	$16.3 M	· For artistic crosswalk: Coordinate with Westminster Public Schools to choose artist · For transit stops: Coordinate with RTD to determine upgrade priority and investigate funding partnerships		■	■			■			■
6	**Install enhancements from to Raleigh Street to Eliot Circle, including:** · Install center median with landscaping between Bradburn Boulevard and Eliot Circle · Repurpose travel lanes to create multi-use paths/widen sidewalks and add amenity space separating the sidewalk and roadway on both the north and south sides between Meade Street and Eliot Circle · Add bikeway north of corridor, beginning at Bradburn Boulevard along 73rd Avenue and extending until Canosa Court · On 73rd Avenue, promote arts district, including working with local artist to install murals on north side between Bradburn Bouleard and Lowell Boulevard · Pedestrian Hybrid Beacon (PHB) and eastbound left turn restriction onto Bradburn Boulevard · Repurpose right turn lane on westbound approaches to Irving Street · Repurpose right turn lane on east approach to Hooker Street · Enhanced transit stops (with shelter, bench, and trash can at Bradburn Boulevard (#200082 & #11687), Lowell Boulevard (#11675 & #11674), and Irving Street (#11667 & #14615) · Pedestrian refuge median with RRFB or PHB at Eliot Circle	$34.8 M	· For center median: Coordinate with Westminster Parks & Recreation to discuss maintenance and determine plantings · For arts district: Could be paired with infrastructure project when applying for Revitalizing Main Streets funding · For transit stops: Coordinate with RTD to determine upgrade priority and investigate funding partnerships		■	■		■			■
7	**Install enhancements from to Eliot Circle to Zuni Street, including:** · Repurpose travel lanes on north and south sides to create multi-use paths · Enhanced crossing at Eliot Circle · Enhanced crossing at Beach Street to access Skyline Park · Install safer driveway crossings (colored concrete/pavers) within the Urban Design Improvement Zone from Meade Street to Eliot Circle	$13.8 M	· For multi-use paths: Coordinate with Adams County on lane repurposing transition east of Zuni Street · For transit stops: Coordinate with RTD to determine upgrade priority and investigate funding partnerships		■	■			■			■

FUNDING OPPORTUNITIES

Funding Opportunities

Agency	Program	2024/2025 Due Date	Program Description	Funding Range	Cost Share	Eligible Uses
FTA	Pilot Program for Transit-Oriented Development (TOD) Planning	Anticipated Spring 2025 opening	The Transit Oriented Development (TOD) planning program provides funding for efforts associated with an eligible transit project for which the project sponsor will seek funding through FTA's Capital Investment Grants Program. TOD focuses growth around transit stations to create compact, mixed-use communities with easy access to jobs and services. TOD capitalizes on public investments in transit and supports transit systems by increasing ridership and fare revenue.	Varies	20% minimum (Max 80% federal contribution limit)	· Enhance economic development, ridership, and other goals established during the project development and engineering processes · Facilitate multimodal connectivity and accessibility · Increase access to transit hubs for pedestrian and bicycle traffic · Enable mixed-use development · Identify infrastructure needs associated with the eligible project · Include private sector participation
CDOT	Revitalizing Main Streets	2024 deadlines (a similar cycle is anticipated for 2025): · 2/28/24 · 4/24/24 · 6/26/24 · 8/28/24 · 10/30/24 · 12/18/24	The Revitalizing Main Streets grant program enhances active transportation safety and strengthens the connection of people to main streets and central economic hubs. The program encourages physical activity and enhances local economic vitality in towns and cities across Colorado through funding infrastructure improvements to make walking and biking easy, yielding long-term benefits that bolster community connections.	$10,000 to $250,000 awards	A 10% match is required of project costs, up to $250,000	· Expand sidewalks to increase ADA accessibility, or extend current sidewalks; · Increase walking trails throughout downtown areas; · Add separated bicycle lanes; · Increase street landscaping with a landscaped street buffer, street trees or · planter boxes in walking areas or sidewalks; · Reduced speed limits to allow for safer walking and biking; · Add a parklet into the downtown area; · Increase pedestrian amenities such as benches, sidewalk lighting or drinking · water fountains in walking or bicycle riding areas of downtown districts · Public art features may be included to enhance safety and encourage multimodal choices, not to exceed 10% of the grant request.
CDOT	Safe Routes to School (SRTS)	2024 applications are due 11/4/24. Bi-annual funding cycles	The goals of SRTS are: 1) To enable and encourage children in grades Kindergarten through 8, including those with disabilities, to walk and bicycle to school. 2) To make walking and bicycling to school safe and more appealing and 3) To facilitate the planning, development and implementation of projects that will improve safety, and reduce traffic and congestion, fuel consumption, and air pollution in the vicinity of schools.	Infrastructure: $100,000 to $750,000 awards Non-Infrastructure: $5000 minimum award, no maximum	Applicants provide 20% of the total project costs, unless qualifying for 100% funding	Funds are available for Safe Routes to School programs that benefit elementary and middle school children in kindergarten through 8th grade; most typically elementary and middle schools but any school that has students in K-8 grades is also eligible. Projects must be within a 2-miles radius of the identified school(s).

FUNDING OPPORTUNITIES

Funding Opportunities

Agency	Program	2024/2025 Due Date	Program Description	Funding Range	Cost Share	Eligible Uses
CDOT	Highway Safety Improvement Program (HSIP)	Next cycle for Fiscal Year 2028 is anticipated to begin in December 2024	The HSIP provides States with critical safety funding that is used to save lives and prevent serious injuries on all public roads. The Highway Safety Improvement Program is based on a performance-driven process that identifies and analyzes highway safety problems and advances highway safety improvement projects that have the greatest potential to reduce fatalities and serious injuries.	Varies	90% Federal / 10% non-Federal	Safety projects on all public roads.
USDOT	Rebuilding American Infrastructure with Sustainability and Equity (RAISE)	FY25 funding consideration due 1/13/25	The RAISE program funds both capital and planning grants. RAISE is a discretionary grant program for investments in surface transportation infrastructure that will have a significant local or regional impact.	Urban Areas: Minimum award of $5 million. Rural Areas: Minimum award of $1 million. No minimum amount for planning grants.	20% minimum (Max 80% federal contribution limit)	· highway or bridge projects · public transportation projects · passenger and freight rail transportation projects · port infrastructure investments · the surface transportation components of an airport project · intermodal projects whose components are otherwise an eligible project type · projects to replace or rehabilitate a culvert or prevent stormwater runoff for the purpose of improving habitat for aquatic species while advancing the goals of the RAISE program
USDOT	Active Transportation Infrastructure Investment Program (ATIIP)	Anticipated Summer 2025 opening	The Active Transportation Infrastructure Investment Program (ATIIP) is a new competitive grant program to construct projects to provide safe and connected active transportation facilities in active transportation networks or active transportation spines.	Planning/design: $100,000 Minimum. Active transportation projects: 15,000,000 Minimum.	20% minimum (Max 80% federal contribution limit)	Funding for active transportation networks that connect people to everyday destinations like public transportation, businesses, workplaces, schools and other community activity centers, as well as active transportation/trail spines that link communities and regions
USDOT	Transportation Improvement Program (TIP)	Next call for projects in 2025	The Denver Regional Council of Governments (DRCOG) Transportation Improvement Program (TIP) specifically programs the federally- and state-funded transportation improvements and management actions to be completed by the Colorado Department of Transportation (CDOT), the Regional Transportation District (RTD), local governments, and other project sponsors over a four-year period. The 8 counties in the Denver region hold subregional forums (Adams County is Westminster's subregion).	Sponsors must request a minimum of $100,000 in DRCOG allocated funds	20% match from non-federal financial resources for STBG, CMAQ, CRP, and TAP funding requests submitted for consideration	Project Categories Eligible for Regional and Suberegional Share Funding: · Multimodal Capital · Regional BRT Projects · Corridor Transit Planning · Arterial Safety /Regional Vision Zero · Active Transportation · Freight · Studies Other

FUNDING OPPORTUNITIES

Funding Opportunities

Agency	Program	2024/2025 Due Date	Program Description	Funding Range	Cost Share	Eligible Uses
CDOT	Funding Advancement for Surface Transportation and Economic Recovery (FASTER) Safety Mitigation Program	TBD - Funding requests are made via an application submitted by one of CDOT Engineering and evaluated by CDOT HQ	FASTER established the Road Safety Fund to support the construction, reconstruction, or maintenance of projects that the state Transportation Commission, a county, or municipality determine are needed to enhance the safety of a state highway, county road, or city street. The fund dollars are allocated based on a statutory formula: 60% to CDOT, 22% to counties, and 18% to municipalities. FSM planning estimates are established for each CDOT region using a formula based on an economic valuation of regional crash experience. The current regional planning distribution through Fiscal Year 2026 for Region 1 = 34.24%.	Varies	Local recipients are required to provide a minimum 20% local match	Eligible for use with all modes of travel during all phases of design and construction of accepted road safety projects; however, construction of infrastructure improvements is required. · Asset Management and Other Asset Management includes proactive projects that address the safety aspects of CDOT assets such as pavement (resurfacing/reconstruction), culvert repairs or rockfall mitigation · The Operations-related projects include portable and/or variable messaging signs or the installation of fiber optic lines · Other-related projects include planning/feasibility studies and pedestrian-bicycle facilities
CDOT	Funding Advancement for Surface Transportation and Economic Recovery (FASTER) Transit Grants	TBD - Funding requests are made via an application submitted by one of CDOT Engineering and evaluated by CDOT HQ	FASTER dollars have provided the first permanent infusion of state funds for transit, which have been instrumental in helping maintain existing local transit systems, guiding the first steps toward regional bus transit service, and determining the feasibility of a high speed rail system. FASTER transit funds are split between local transit grants ($5 million per year) and statewide projects ($10 million per year). The $5 million in local transit grants is awarded competitively by CDOT regional offices, while statewide funds are awarded by the CDOT Division of Transit and Rail to statewide, interregional, and regional projects.	Varies	Local recipients are required to provide a minimum 20% local match	Among the types of projects that have been awarded are the purchase or replacement of transit vehicles; construction of multimodal stations, and acquisition of equipment for consolidated call centers.

Appendices

WESTMINSTER | EST. 1870 |

72nd AVENUE CORRIDOR STUDY

NOVEMBER 2023

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Existing Conditions

1.1 Introduction

Project Purpose

The 72nd Avenue Corridor Study is to evaluating opportunities for enhancing multimodal infrastructure to deliver increased safety and comfort for people walking, biking, riding transit, and driving along, to, and from 72nd Avenue between Pierce and Zuni Streets. The project is also identifying opportunities to enrich public spaces, recommend appropriate enhancements based on the variety of character areas present and make 72nd Avenue into a gateway for the Westminster Station Area that is welcoming to residents, commuters and visitors alike.

Existing Conditions Process

The first phase of the planning process comprised an analysis of existing conditions, which included review of previous relevant planning documents from the City of Westminster, a physical assessment, a mobility and operational assessment and a review of safety data, which culminated in a comprehensive needs assessment. Simultaneously, targeted engagement with business and property owners, the general public and a community advisory committee informed the needs analysis.

1.2 Existing Plans Summary

Summary

The project team reviewed City of Westminster plans relevant to the study area to inform the existing conditions analysis. The goal of this review is to understand priorities and principles related to multi-modal transportation planning and garner important recommendations to inform the future of the 72nd Avenue corridor.

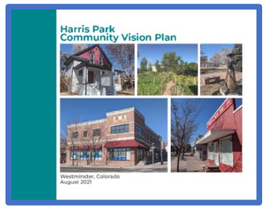
Westminster Station Area Specific Plan (2017)

- Calls for enhancing pedestrian crossings, plus reevaluating crossing times along 72nd Avenue given it acts as a “northern gateway” to Westminster Station.
- References the 2009 72nd Avenue Streetscape Plan (Utica Street to Meade Street) which called for wider sidewalks, tree lawns/street trees, decorating lighting, a planted median between Raleigh Street and Newton Street and enhanced crossings.

Westminster Transportation & Mobility Plan (2021)

- Identifies 72nd Avenue as one of seven priority transit corridors recommended for stop and station enhancements.
- The 72nd Avenue corridor is noted as an area of high pedestrian demand, particularly the areas directly east and west of Federal Boulevard.
- Mapped future recommended transportation improvements:
  - *Near Term Projects (0-5 years):* Conduct a corridor study, implement traffic signal infrastructure and ITS signal coordination improvements and evaluate bus stop amenity upgrades.
  - *Mid-Term Projects (6-10 years):* Complete the missing sidewalk between Clay Street and Eliot Street (south side).
  - *Long-Term Projects (11+ Years):* Upgrade on-street bike lanes to buffered bike lanes and widen sidewalks to be multiuse paths.

Harris Park Community Vision Plan (2021)



- Calls for installing intersection improvements and gateway elements (signage, landscaping) along 72nd Avenue at Bradburn Boulevard and Lowell Boulevard.
- Calls for detached sidewalks, trees/landscaping and additional lighting in multiple areas along the corridor.
- Calls for an enhanced connection to the Little Dry Creek Trail along 72nd Avenue between Bradburn Boulevard and Newton Street.
- Calls for speed mitigation measures along the corridor.

Federal Boulevard Multimodal Transportation Study (2021)

- The 72nd Avenue stops are the busiest within the entire Federal Boulevard study area (52nd Avenue to 120th Avenue).
- Within “Zone A” (52nd Avenue to 73rd Avenue), a new west-side BRT stop is planned south of the 72nd Avenue intersection, in addition to median refuge islands, red left-turn arrows, and separate turns lanes (where appropriate).
- 72nd Avenue is noted as the cross-street experiencing the highest number of KSI pedestrian crashes within Zone A.
- Federal Boulevard between 72nd Avenue and 76th Avenue is an Opportunity Zone, given the adjacency to the RTD B-Line route.
- 72nd Avenue stops have the longest bus dwell times in the study area – a stop’s physical infrastructure, passenger loading needs (such as wheelchairs), and rider questions impact dwell time.

1.3 Physical Assessment

1.3.1 Land Use and Zoning

Future Framework

The City of Westminster's 2040 Comprehensive Plan (approved in March 2023) outlines a future-thinking framework to support thriving communities citywide. Chapter 4: Transportation, Mobility and Connections focuses on transportation-supportive goals and policies. Two strong connection and safety-oriented goals bolstering this study's importance include:

- **Goal TM-1:** Develop a comprehensive multimodal transportation network that includes convenient, safe, and accessible transportation options for all and integrates land use."
- **Goal TM-3**: Reduce traffic-related deaths and injuries by improving the safety and comfort for all modes of transportation.

An eastern portion of the 72nd Avenue corridor study area (just west of Lowell Boulevard to just east of Federal Boulevard) is considered the Westminster Station neighborhood. The neighborhood's focal point is Westminster Station, located along Little Dry Creek and the Little Dry Creek Trail (see **Figure 1** below).

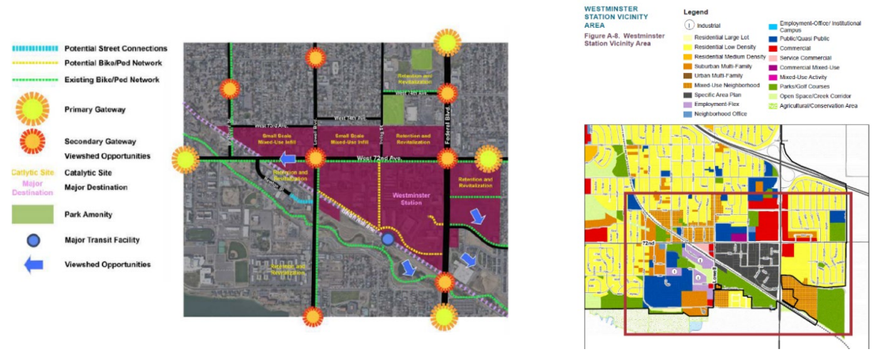


Figure 1: Westminster Station Transition Area Framework (City of Westminster 2040 Comprehensive Plan).

Corridor Demographics

Demographics data is from U.S. Census Bureau American Community Survey (ACS) 5 Year Estimates for 2012-2016 and 2017-2021. Population and household data encompasses a ¼ mile radius (buffer) north and south along the corridor study area. Other demographic information for the corridor reflects data from the Block Groups encompassed within the ¼ mile corridor buffer.

Population

Approximately 21,500 people in over 8,000 households live within the ¼ mile buffered corridor study area. The study area accounts for 19% of the City's population and 18% of the households. Median household sizes in the study area are approximately 2.7 persons per household, which is slightly larger than the City's median of 2.46 persons per household.

The median age in the study area (37 years) and in the City (38 years) is about the same, however, the corridor tends to be slightly younger. The exception is the oldest age group of over 75 years. A greater concentration of older seniors can be found in the study area (see **Figure 2** below).

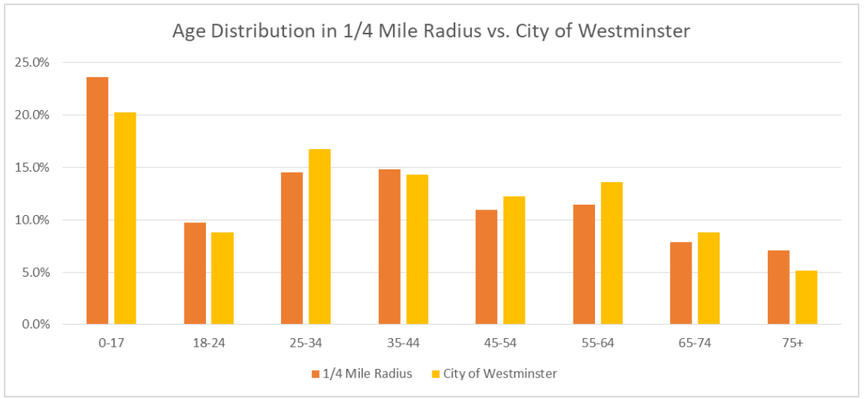


Figure 2: Age Distribution for Corridor Area vs. City of Westminster (2012-2016 and 2017-2021 ACS Data)

Race & Ethnicity

The majority of the City is Non-Hispanic White. The study area is home to a higher percentage of Hispanic or Latino residents compared to the City, at 40% of the study area population compared to 20% citywide (see **Figure 3** below).

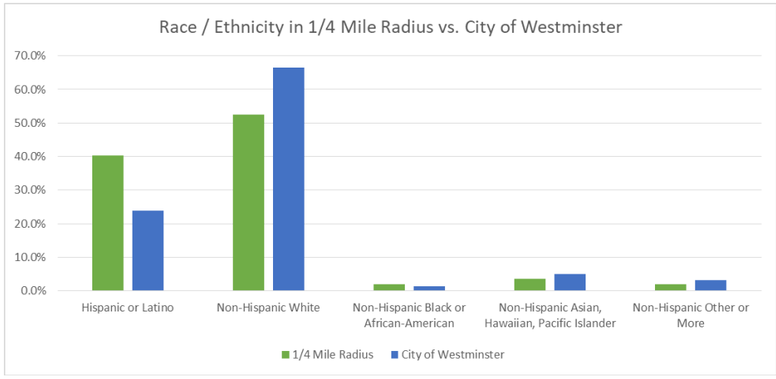


Figure 3: Race and Ethnicity for Corridor Area vs. City of Westminster (2012-2016 and 2017-2021 ACS Data)

Education
Most of the adults (the population aged 25 and over) in the study area and the City have a high school diploma (80-90% of the population). The bachelor's degree attainment rate in the City as a whole is about 40% among adults compared to the study area, which has a 20% bachelor's degree educational attainment rate.

Housing
Housing units in the study area are approximately 59% owner-occupied while units in the City of Westminster as a whole are approximately 65% owner-occupied.

Income
The median household income in the study area is about $58,500 while the City's median household income is estimated at $80,000. Most households in the study area have incomes in the $50,000 – $74,999 range, while most City households have household incomes over $150,000 (see **Figure 4** and **Figure 5** below).

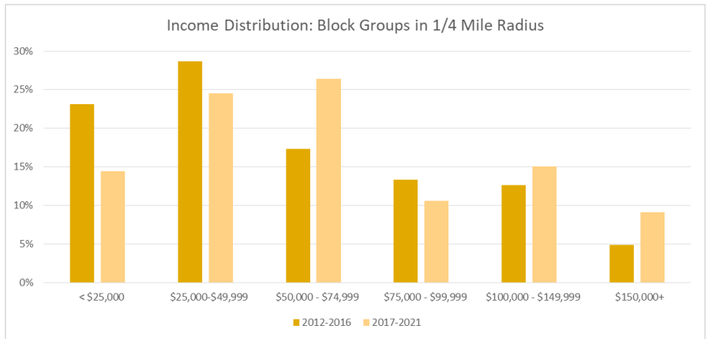


Figure 4: Income Distribution Data (2012-2016 and 2017-2021 ACS Data)

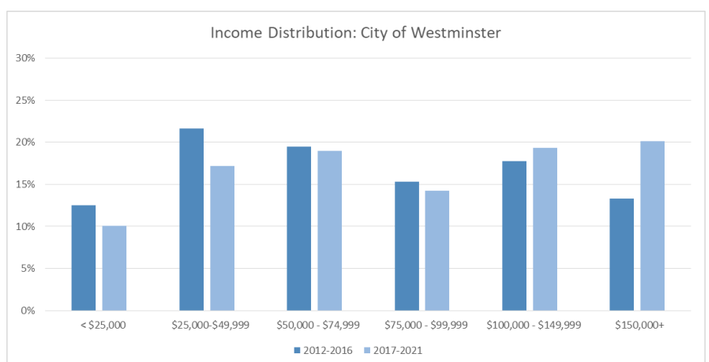


Figure 5: Income Distribution Data (2012-2016 and 2017-2021 ACS Data)

1.3.2 Urban Design

Summary

Adjacent land uses, whether residential, commercial or mixed-use, influence the urban design elements and existing infrastructure present along 72nd Avenue. Currently, the high-speed conditions and lack of continuous facilities for bicyclists and pedestrians create a high-stress environment for those navigating the corridor.

Character Zones
The varying conditions of the study area are characterized by a total of nine identifiable zones. There are five zone areas within three primary zone categories – residential corridor (2), commercial corridor (2), and open space gateway (1). Additionally, there are four transitional zones – two that are primarily residential, and two that are primarily commercial. See the character areas map below for a visual representation.

Residential Corridors

The two residential corridor zones bookend the study area, at the western end between Piece Street and Ingalls Court **(Figure 6)**, and at the eastern end between Canosa Court and Zuni Street (**Figure 7**).

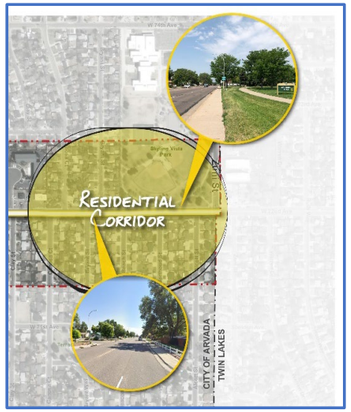


Figure 6 (left): Western End Residential Corridor Zone between Pierce Street and Ingalls Court (MIG)
Figure 7 (right): Eastern End Residential Corridor Zone between Canosa Court and Zuni Street (MIG)

The western residential corridor is enclosed by high brick walls on either side of the road and narrow sidewalks. In particular, the southern edge has no pedestrian facility and the adjacent wall blocks sunlight in the winter, leaving the bicycle facility snow-covered. The frontage road condition, which exists along much of the southern edge of this zone, should provide pedestrian access, but navigation is illegible.

The point of connection between the frontage road and 72nd Avenue at Ingalls Street is hidden and narrow (see **Figure 8** and **Figure 9** below). Crosswalks are infrequent and the curvature of the road may make it difficult to introduce others.

These conditions create a tunnel effect and, along with the middle turn lane, contribute to this segment's feel as a high-speed, high-volume corridor, which is compounded by the use of a crash barrier along part of the northern edge. Additionally, the walls significantly limit permeability into the surrounding neighborhoods. The area is largely comprised of single-family homes. Faversham Park is integrated at the northeast corner.

Figure 8: Existing wall on 72nd Avenue west of Ingalls Street

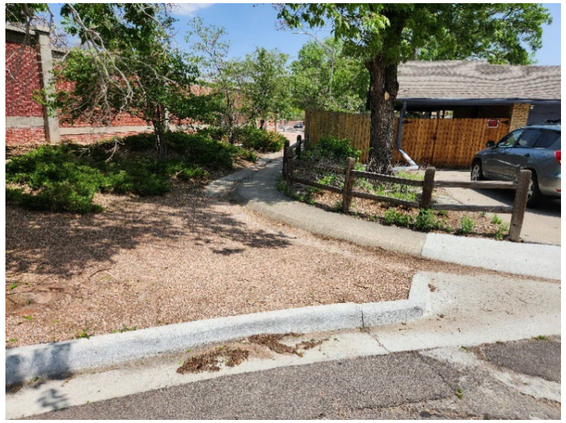


Figure 9: Dead end to sidewalk at the corner of Ingalls Street and 72nd Avenue Frontage Road

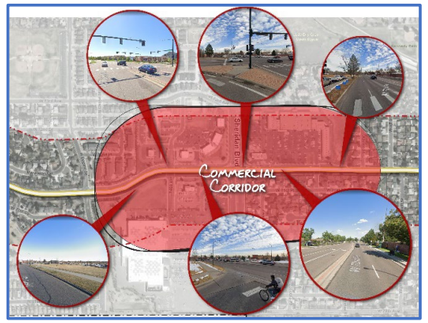
The eastern residential corridor feels more like a neighborhood collector, as houses and yards are clearly visible from, and at times oriented towards, the street. Sidewalks are still narrow and attached. The lack of buffer, either through a bicycle facility or vegetation, is consistent on both sides, placing pedestrians close to adjacent traffic (see **Figure 10** below). Unlike the western residential corridor, there is not a consistent material palette unifying the aesthetic. The lack of uniformity and the varied nature of the adjacent residence's orientation toward the street changes the 'feel' of the corridor. Crosswalks are also infrequent here. Again, the primary land-use is single-family housing and Skyline Vista Park forms a significant portion of the northern street frontage. The park provides one unique condition with a parallel, detached path providing a meandering, alternative to the street's attached sidewalk (**Figure 11**).

Figure 10 (left): Bus stop boarding area

Figure 11 (right): Existing multiuse path in Skyline Vista Park

Commercial Corridors

The two commercial corridors zones are internal to the study area, to the west between Depew Street and Xavier Street (**Figure 12**), and to the east between Lowell Boulevard and Federal Boulevard (**Figure 13**).



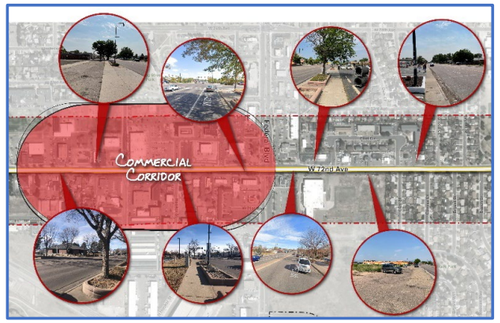


Figure 12 (left): Western End Commercial Corridor Zone between Depew Street and Xavier Street

Figure 13 (right): Eastern End Commercial Corridor Zone between Lowell Boulevard and Federal Boulevard

The western commercial corridor is characterized by modern suburban shopping center and strip mall style big box designs with larger, contiguous parking structures. Many of these businesses are regional or national chains. This area is dominated by single-story buildings, set back significantly from the street with parking or formally landscaped areas.

The road widens in this area to accommodate turn lanes and sidewalks are wider with green buffers between Depew Street and Sheridan Boulevard. While the sidewalks narrow east of Sheridan, most of the pedestrian facilities are detached from the road, and some near 10' in width (see **Figure 14** below).

The high brick wall characteristic is again present on the south side of the street, east of Sheridan where the single-family neighborhood abuts these busy roads. The southeast corner is in contrast with the more porous edges of the opposing three corners commercial uses. Though, while visually porous, access is often limited due to some minor grade changes, unbroken parking, and large areas for stormwater detention (especially in the northwest section of the intersection at 72nd Avenue and Sheridan Boulevard – see **Figure 15** below).

A narrow vacant lot separates the commercial activity from single-family residential at the northeast edge of this zone, and the high brick walls separate residential areas to the west. Modest, low-rise multifamily also serves as a transition to the single-family neighborhood to west.

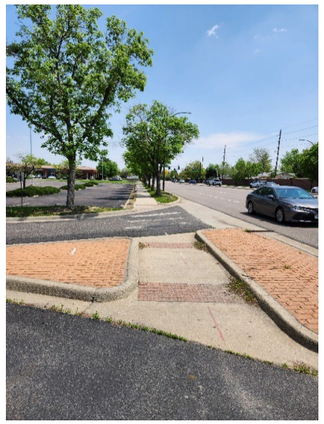


Figure 14 (left): Pedestrian refuge median at driveway entrance to Hidden Lakes Shopping Center, east of Sheridan Boulevard
Figure 15 (right): Detached sidewalk approaching Sheridan Boulevard

The eastern commercial corridor, conversely, is somewhat more traditional in its design and development patterns, with greater diversity and individuality in the building stock, much of which orients to 72nd Avenue. While this area is also dominated by single-story buildings with some strip mall conditions and modest setbacks (parking or landscaped), the overall feel is more local. The diversity of the commercial use and building style is balanced by the uniformity of the public realm, with consistent furnishings, raised planters, and colored concrete (see **Figure 16** below). Though dated, uniformity provides a strong foundation for further augmentation of the public realm.

Commercial activity is also mixed in this area, with local and chain retail and service businesses, office buildings, and some civic uses, such as the Colorado STEM Academy (see **Figure 17** below). This area also includes some vacant buildings, which provide an opportunity for redevelopment.

Figure 16: Planters east of Federal Boulevard

Figure 17: Sidewalks near Colorado STEM Academy

Open Space Gateway

The open space gateway is central to the study area, between Tennyson Street and Orchard Court (**Figure 18**). This area is characterized primarily by the Little Dry Creek canal and surrounding green space that runs northwest to southeast across the study area.

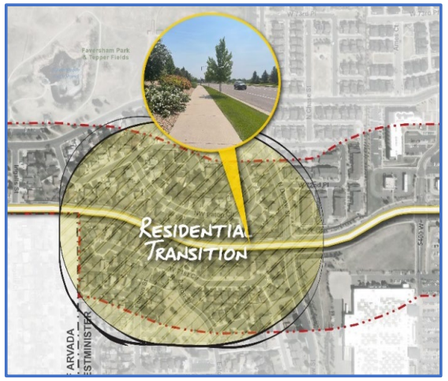
Additionally, the train tracks run parallel to the creek on the east, with interspersed development between the two. The confluence of the creek and the train tracks, one in an underpass and the other at grade, create a unique opportunity to leverage the atypical land use pattern to introduce area identity elements. The topography slopes upward to the east and north in this section between the creek and tracks.

To the western portion of this zone, the creek is abutted by residential single-family and modest low-rise multifamily uses, while the western portion is mostly abutted by commercial uses. Although the open space is currently unprogrammed and largely inaccessible to the public, England Park's ongoing master planning process will support upgrades in this area. The sidewalks in the western portion are wider and offer green buffers, while they remain relatively narrow and unprotected on the eastern side.

Figure 18: Open Space between Tennyson Street and Orchard Court (MIG)

Residential Transition Zones

These two zones sit on either side of the western commercial corridor, to the west between Ingalls Street and Depew Street (**Figure 19**), and to the east between Xavier Street and Tennyson Street (**Figure 20**).



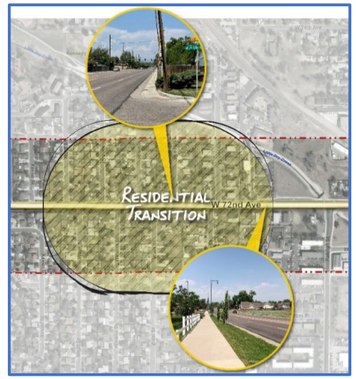


Figure 19 (left): Western Residential Transition Zone between Ingalls Street and Depew Street (MIG)
Figure 20 (right): Eastern Residential Transition Zone between Xavier Street and Tennyson Street (MIG)

The western zone continues the characteristics of the residential primary zone to the west, with high brick walls enclosing the street and surrounding single-family neighborhood. However, both sides of the street maintain a detached sidewalk (see **Figure 21**), the north of which manages a grade differential from the street providing a greater buffer. This is one of the only zones where a curve is introduced in the roadway. The conceal/reveal nature of the curve may provide an opportunity for identifying the transition with an aesthetic treatment. Faversham Park is integrated to the north and modest, low-rise multifamily serves as a transition to the commercial corridor to the east.

Figure 21: Detached sidewalk west of Depew Street

The eastern zone is a mix between the characteristics of the western and eastern residential primary zones, however, is most analogous with the eastern residential zone. The high brick wall along the south side of the street continues east about a block into this area, enclosing the neighborhood. The surrounding use on both sides is residential, with more permeable street frontages to the north and western portion of the area, including yards and intermittent fencing on individual lots.

The neighborhood transitions from single-family to modest, low-rise multifamily toward the west, adjacent to the open space gateway. A narrow vacant lot separates the single-family residential at the northwest edge of this zone where it abuts the commercial corridor. Sidewalks are narrow and attached, with limited crosswalks, and thus opportunities in the existing right-of-way may be limited (see **Figure 22** below).

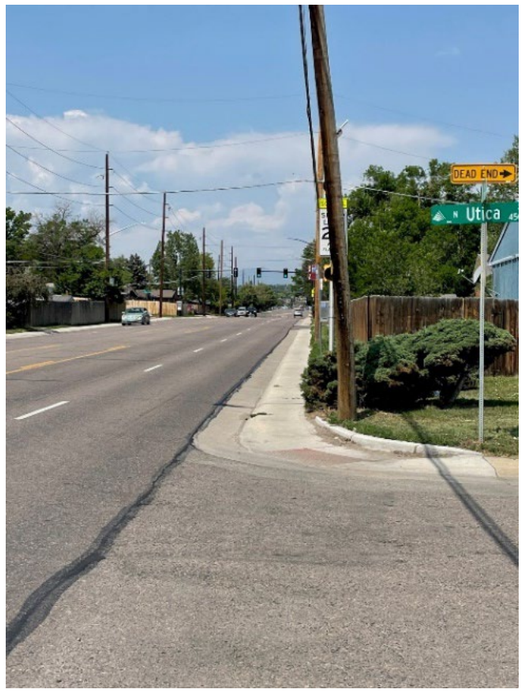


Figure 22: Narrow sidewalk at Utica Street

Commercial Transition Zones

The two commercial transition zones sit on either side of the eastern commercial corridor zone, to the west between Orchard Court and Lowell Boulevard (**Figure 23**), and to the east between Federal Boulevard and Canosa Court (**Figure 24**).

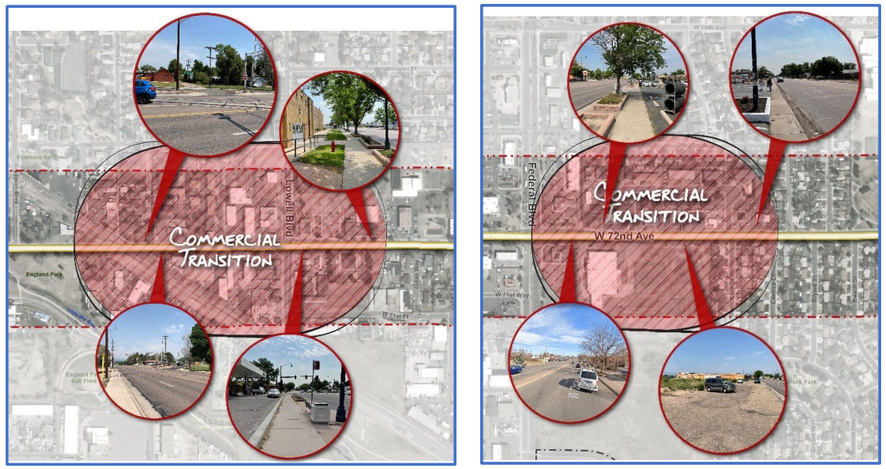


Figure 23: (left) Western Commercial Transition Zone between Orchard Court and Lowell Boulevard (MIG)
Figure 24: (right) Eastern Commercial Transition Zone between Federal Boulevard and Canosa Court (MIG)

The western zone shares characteristics with the adjacent commercial corridor to the east, with small scale service and retail businesses and varied architectural styles and setbacks. Both separated and strip mall style conditions exist. However, both parallel and perpendicular to the corridor, challenging grade changes present some difficulties in ease of access (see **Figure 25** below).

Figure 25: Sidewalk near railroad tracks near Orchard Court

Navigating contiguous vehicular access for some businesses as a pedestrian is dangerous and currently restricts the opportunity to extend some of the consistent urban design elements westward from the adjacent commercial zone. Furthermore, residences are interspersed occasionally along the street frontage and modest, low-rise multifamily extends beyond the commercial activity to the north. Sidewalks are narrow with frequent and/or expansive curb cuts. Small planters provide minimal buffering to the east end of the area.

The eastern zone changes quite abruptly from single family residential to commercial, just west of Canosa Court. Modest, low-rise multifamily serves as a minor transition on the north side of the street, behind street-front businesses. On the southern side of the street, a large vacant lot of mixed concrete and overgrown grass creates a vast expanse between the residential neighborhood to the east and big box commercial to the west, which provides opportunity for new development (see **Figure 26** below). In general, the commercial development pattern in this area transitions east to west from older small-scale local to newer big-box shopping center. Sidewalks are narrow, with small planters that provide minimal buffering in some places, while in others, private landscaping pushes the pedestrian very close to traffic (see **Figure 27** below). Crosswalks are limited. The road narrows to the east end of this zone, transitioning from the wider commercial area with a center turn lane to the residential corridor.

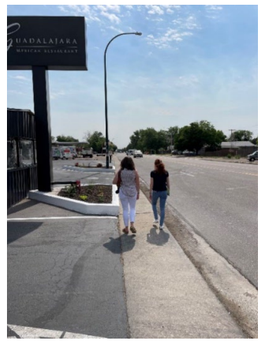


Figure 26: Vacant lot across from Eliot Circle
Figure 27: Narrow sidewalks near Guadalajara Restaurant

Cross Sections

Roadway configurations along the three-mile 72nd Avenue study area vary dramatically. The curb-to-curb width varies from 50-feet to nearly 100-feet with a variation between two and three lanes present in each direction. Portions of the corridor contain two-way center turn lanes or medians. The presence of sidewalks, and whether they are attached or detached, also varies throughout the corridor. Bicycle facilities are present in the western portion of the corridor but not elsewhere. The urban design varies too, including the presence or lack thereof of a planted buffer. The following cross sections show typical exhibits of the roadway at various locations along the corridor (also see **Figure 28**).

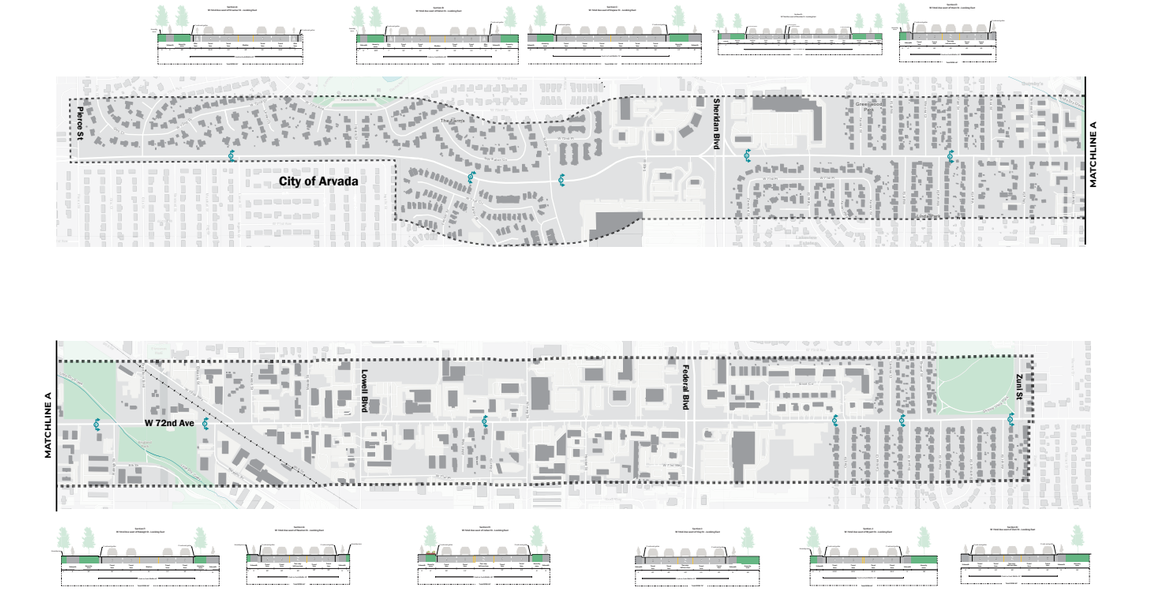


Figure 28: Cross Sections Reference Map

Figure 29: Section A (72nd Avenue West of N Lamar Street – Looking East)

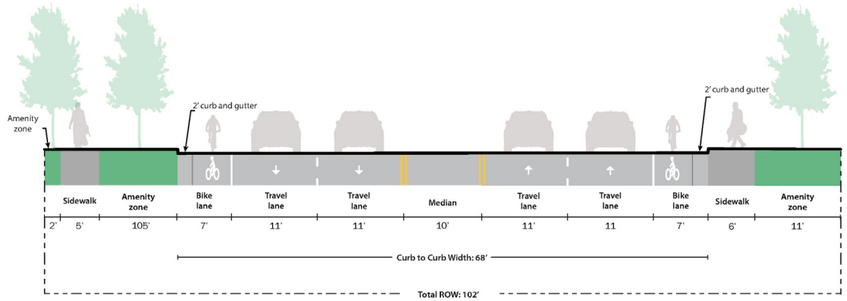


Figure 30: Section B (72nd Avenue West of Eaton Street – Looking East)

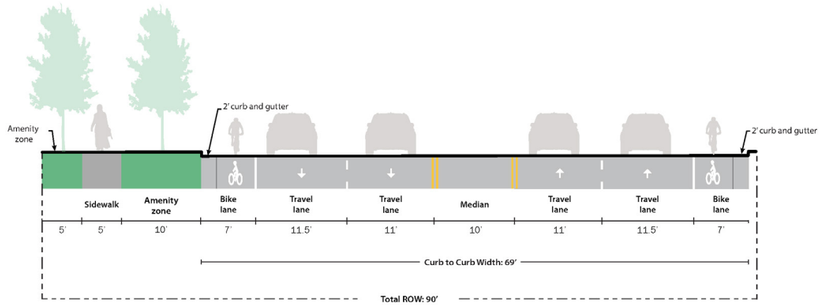


Figure 31: Section C (72nd Avenue East of Depew Street – Looking East)

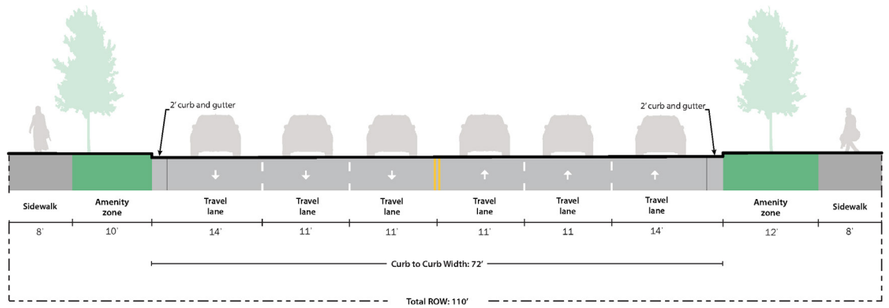


Figure 32: Section D (72nd Avenue West of Sheridan Boulevard – Looking East)

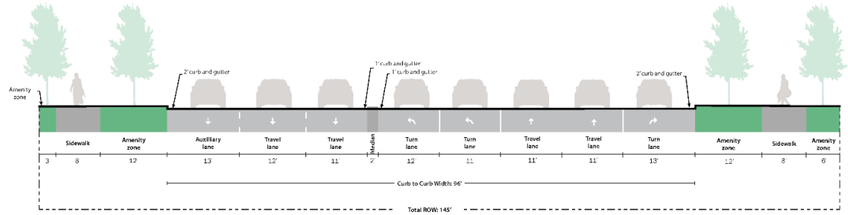


Figure 33: Section E (72nd Avenue West of Vrain Street – Looking East)

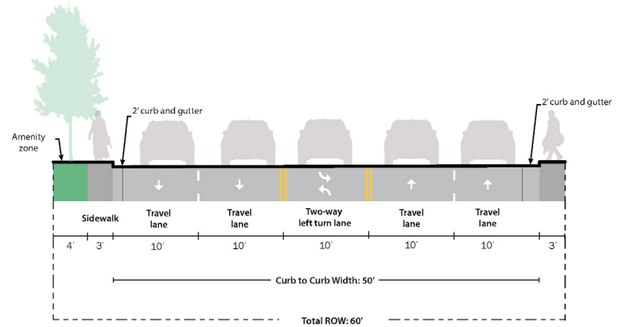


Figure 34: Section F (72nd Avenue West of Raleigh Street – Looking East)

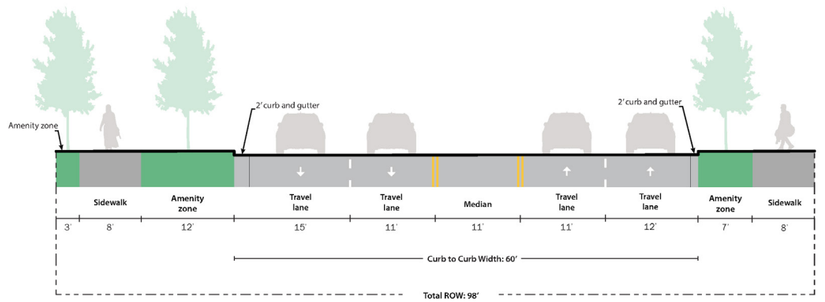


Figure 35: Section G (72nd Avenue West of Newton Street – Looking East)

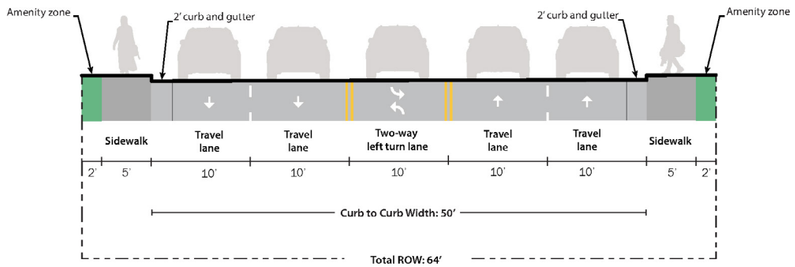


Figure 36: Section H (72nd Avenue West of Julian Street – Looking East)

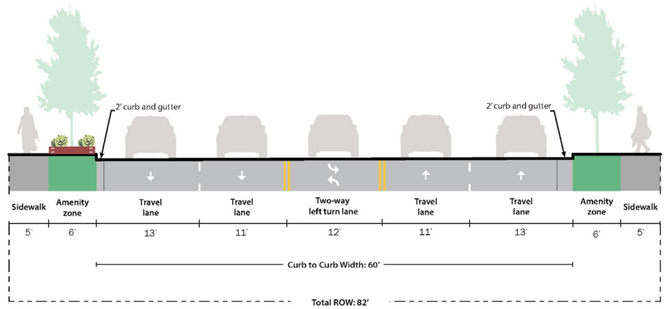


Figure 37: Section I (72nd Avenue West of Clay Street – Looking East)

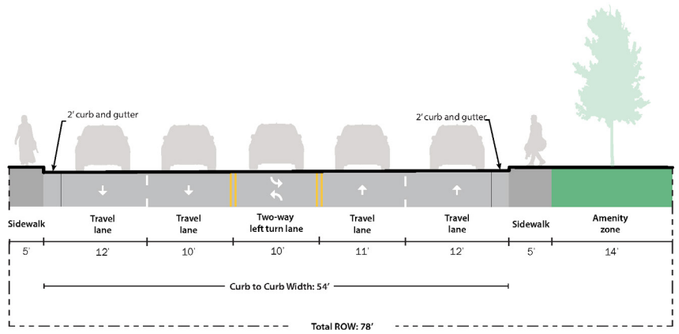


Figure 38: Section J (72nd Avenue West of Bryant Street – Looking East)

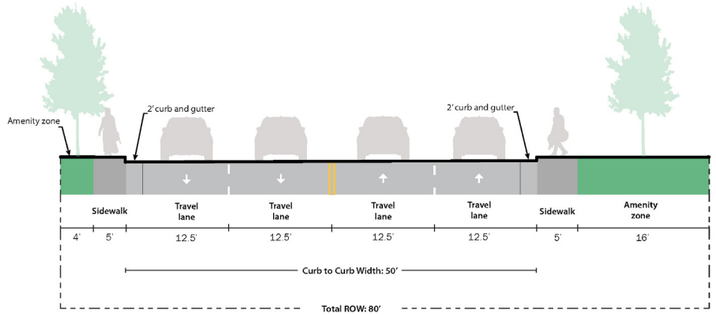
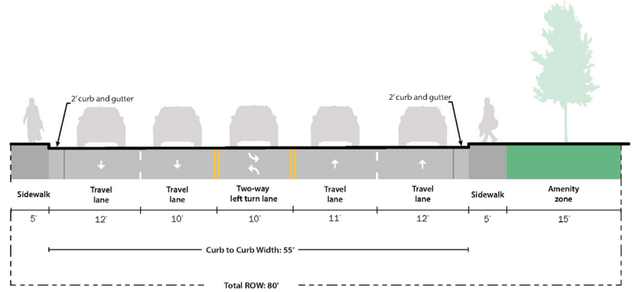


Figure 39: Section K (72nd Avenue West of Zuni Street – Looking East)



1.3.3 Environmental Overview

An Environmental Overview was completed to identify environmental resources that may affect the alternatives development and evaluation process and/or have major impacts to future environmental clearances and permitting processes. The review relied upon readily available existing data and "windshield" survey findings. The following environmental resources were reviewed and summarized:

- Threatened and endangered species, species of concern, migratory birds
- Historic and archaeological resources
- Environmental Justice communities
- Parks, open spaces, trails, recreational resources, and Section 6(f)
- Traffic noise
- Visual resources
- Hazardous materials

Relevant information is included for each resource including maps, photographs, and next steps to consider as this project advances from planning to implementation. The full overview is attached as **Appendix A**.

1.4 Mobility Assessment

1.4.1 People Walking

Summary

Adjacent land uses, whether residential, commercial or mixed-use, influence the current urban design elements and existing infrastructure present along 72nd Avenue. Currently, the high-speed conditions along the corridor may dissuade users from traveling on foot where existing facilities are lacking. A summary map of existing pedestrian facilities conditions is shown below in **Figure 40.**

Sidewalks

The majority of the 72nd Avenue corridor features sidewalks on both sides of the street, with a checkered pattern of detached and attached sidewalks present. A sidewalk gap does exist on the south side of 72nd Avenue between Elliot Circle and Clay Street. The sidewalks along the corridor range from 4 to 8 feet in width. Detached sidewalks are more common in two portions of the corridor: in a primarily residential portion on the western end (between Sheridan and Pierce Streets) and in a more commercial zone between Meade Street and just east of Federal Boulevard.

Crosswalks

In the residential portions of the corridor, crosswalks are non-existent or few and far between, creating challenging conditions for those accessing bus stops, parks and other amenities. Crossing at the Sheridan Boulevard intersections involves a two-staged crossing, including waiting at corner islands before navigating through traffic turning from or turning onto Sheridan Boulevard.

Curb Ramps

Though most curb ramps at major intersections are ADA complaint, many of the curb ramps at corners where residential intersections meet 72nd Avenue are non-compliant. Lack of compliance compromises the ability of those using mobility devices, pushing strollers or navigating with packages or suitcases. Findings and guidance from the City of Westminster's 2019 Americans with Disabilities Act Transition Plan may support future accessibility upgrades along corridors such as 72nd Avenue.

Pedestrian Volumes

The project team collected pedestrian and bicyclist counts (including people in crosswalks) at intersections along 72nd Avenue on Saturday, February 25, 2023 and Tuesday, February 28, 2023. These counts are summarized in **Table 1** and **Table 2** below. Not surprisingly, the signalized intersections experienced the highest pedestrian and bicyclist volumes, especially at Hooker Street, Pierce Street, and Raleigh Street.

Table 1: Weekday (Tuesday) Peak Hour AM and PM Counts

Intersection	Peak Hour	Ped/Bike Peak Hour Counts
72nd Avenue & Zuni Street	7:30 – 8:30 am	5
72nd Avenue & Zuni Street	4:00 – 5:00 pm	8
72nd Avenue & Federal Boulevard	7:30 – 8:30 am	18
72nd Avenue & Federal Boulevard	5:00 – 6:00 pm	14
72nd Avenue & Hooker Street	7:45 – 8:45 am	11
72nd Avenue & Hooker Street	4:00 – 5:00 pm	27
72nd Avenue & Irving Street	7:45 – 8:45 am	9
72nd Avenue & Irving Street	4:00 – 5:00 pm	16
72nd Avenue & Raleigh Street	7:45 – 8:45 am	21
72nd Avenue & Raleigh Street	4:00 – 5:00 pm	13
72nd Avenue & Winona Street	7:45 – 8:45 am	3
72nd Avenue & Winona Street	4:45 – 5:45 pm	7
72nd Avenue & Yates Street	7:45 – 8:45 am	7
72nd Avenue & Yates Street	5:00 – 6:00 pm	10
72nd Avenue & Sheridan Boulevard	7:15 – 8:15 am	13
72nd Avenue & Sheridan Boulevard	4:45 – 5:45 pm	9
72nd Avenue & 5400 West	7:30 – 8:30 am	2
72ndAvenue & 5400 West	4:30 – 5:30 pm	8
72nd Avenue & Depew Street	7:30 – 8:30 am	7
72nd Avenue & Depew Street	4:30 – 5:30 pm	7
72nd Avenue & Lamar Street	7:45 – 8:45 am	0
72nd Avenue & Lamar Street	4:45 – 5:45 pm	2
72nd Avenue & Pierce Street	7:15 – 8:15 am	22
72nd Avenue & Pierce Street	3:15 – 4:15 pm	14

Table 2: Weekend (Saturday) Peak Hour Counts

Intersection	Peak Hour	Ped/Bike Peak Hour Counts
72nd Avenue & Hooker Street	11:45 am – 12:45 pm	19
72nd Avenue & Yates Street	12:00 – 1:00 pm	5
72nd Avenue & 5400 West	12:00 – 1:00 pm	9

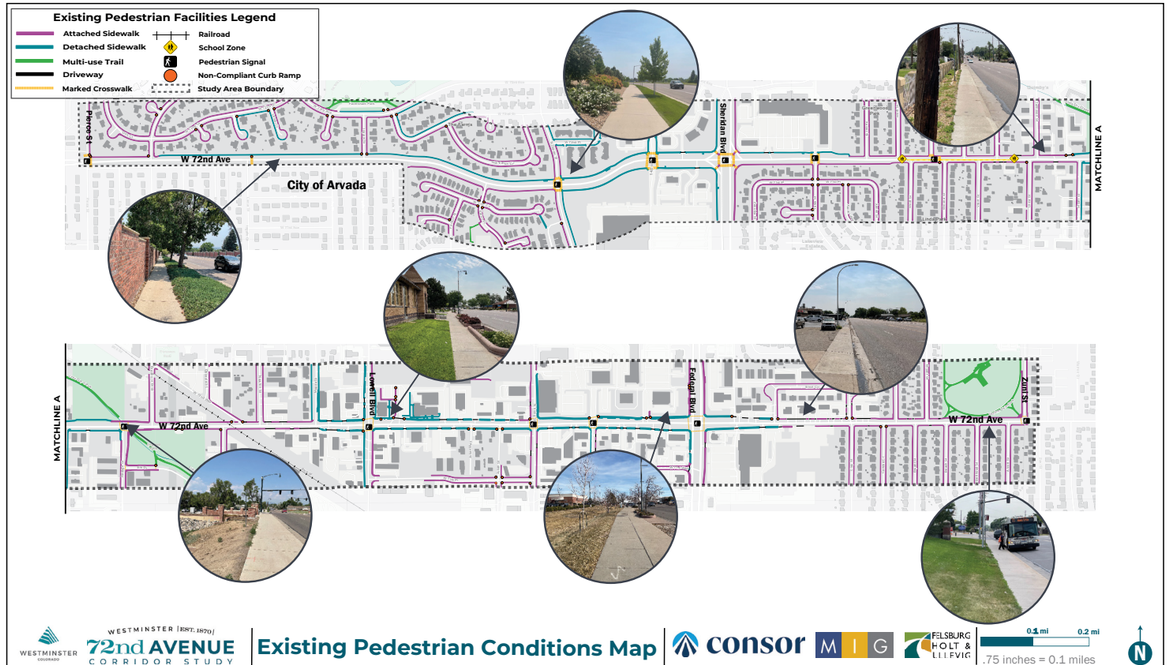


Figure 40: Existing Pedestrian Conditions Map

1.4.2 People Biking

Summary

Currently, 72nd Avenue lacks a continuous network of safe bicycling facilities along the corridor. People bicycling may choose to utilize the sidewalks and sidepaths rather than ride with vehicular traffic. Those approaching 72nd Avenue from parallel routes with existing facilities (such as Lowell Boulevard) typically meet challenging crossing conditions at intersections.

Existing & Planned Bicycle Facilities

A mix of bicycle facilities currently exist along the corridor. An on-street, seven-foot wide bicycle lane is present between Pierce Street and Depew Street. Detached multiuse paths exist between Depew Street and Sheridan Boulevard. No other bicycle facilities exist on 72nd Avenue in the study area. Bicycle facilities cross the corridor at Lowell Boulevard, Irving Street and Bradburn Boulevard.

The 2021 Transportation & Mobility Plan developed a future conditions assessment for 72nd Avenue, including calling for widening sidewalks to multiuse sidewalks along both sides of 72nd Avenue from Sheridan Boulevard to Zuni Street and upgrading the existing bike lanes between Pierce Street and Depew Street to buffered bike lanes. A summary map of both existing bicycle facilities and those proposed based on Westminster's 2021 Transportation & Mobility Plan is shown below in **Figure 41.**

A Level of Traffic Stress (LTS) developed for the corridor mapped ranges from 1 (little traffic stress) to 4 (the highest traffic stress). The majority of the study area is categorized as a Level 4 LOS (from Depew St to Zuni St) with the remainder a Level 3 (Pierce St to Depew St). View the LTS map on Page B-41 in the Current and Future Conditions Report.

1.4.3 Trail Users

There are over 150-miles of multi-use trails within Westminster. Little Dry Creek Trail is one of the city's important regional routes, and trail users travel the trail via an underpass at 72nd Avenue Little Dry Creek extends from Clear Creek Trail to the south, alongside Westminster Station, north to Standley Lake Regional Park. 72nd Avenue corridor users can also connect with the Skyline Vista Park trail system between Beach Street and Zuni Street.

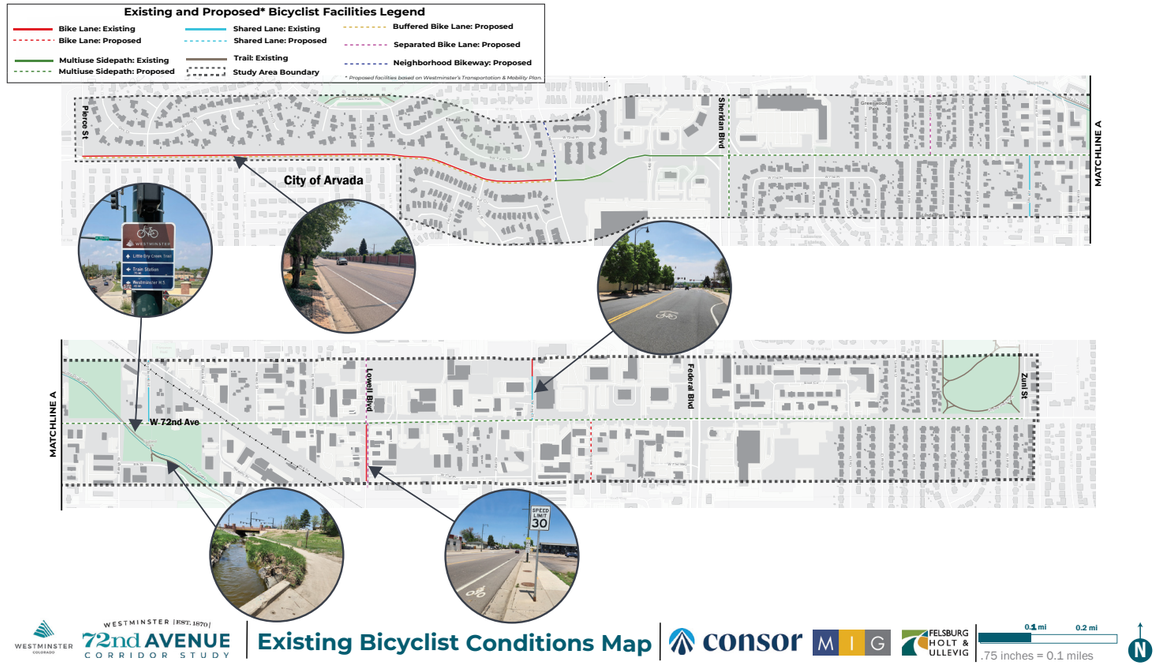


Figure 41: Bicyclist Conditions Map

1.4.4 Transit Operations and Amenities

Summary

Three RTD bus routes service the 72nd Avenue study area. Route 72 runs along 72nd Avenue from Arvada to Commerce City. Route 51 runs along Sheridan Boulevard to Englewood. Route 31 extends north on Federal Boulevard to Front Range Community College and south to the Decatur-Federal Station W line connection. Westminster Station is located just south of the corridor, between Lowell Boulevard and Federal Boulevard, and offers access via the B Line commuter rail daily, on an hourly frequency, to Union Station in downtown Denver. A summary map of existing transit conditions is shown below in **Figure 42.**

Bus Service

Table 3 summarizes the current service levels for the three aforementioned routes that serve the 72nd Avenue study area.

Table 3: Bus Service at Stops in the 72nd Avenue Study Area

Route	Name	Days of Operation	Peak Frequency
72	72nd Avenue	Monday – Saturday	1-hour
51	Sheridan Boulevard	Monday – Sunday	30-minutes
31	Federal Boulevard	Monday – Sunday	10-minutes

** Route 31 runs along Federal Boulevard and Route 51 runs along Sheridan Boulevard, both within the study area.*

Bus Stops

The 2021 Transportation & Mobility Plan recommends conducting a bus stop conditions inventory and corridor study to identify needed stop amenity upgrades, including both physical additions such as shelters and first and final mile connections.

Bus Stop Amenities

- There are 24 bus stops along 72nd Avenue in the study area:
    - Only two of the stops contain shelters.
    - 18 of the 24 stops (75%) contain only signs.
    - Five stops have trash cans and benches.
- Bus stops between Pierce Street and Sheridan Boulevard have no amenities, except for the 72nd Avenue and Sheridan Boulevard eastbound stop.

Bus Stop Access Challenges

- Multiple stops present challenges for users with mobility devices (such as wheelchairs), and small sidewalk widths may force users to travel on-street.
- Legibility of access points is also a challenge, as at 72nd Avenue and Ingalls Street westbound, where the sidewalk is hidden behind a brick wall.

Ridership

- Though not included in the study area, Westminster Station Gate D has a 2022 Average Weekday Daily *Boardings* (passengers entering the bus) of 10 (eastbound) and 12 (westbound), and an Average Weekday Daily *Alightings* (passengers exiting the bus) of 9 (eastbound) and 13 (westbound).
- The stops at Sheridan, Federal and 5400 Block have the highest ridership in the study area. View **Table 4** below for a full ridership summary by stop.

Table 4: Bus Stops, Amenities, and Ridership in the 72nd Avenue Study Area

Stop	Amenities	2022 Average Weekday Daily Boardings/Alightings
72nd Avenue & Lamar Street (Eastbound)	None	.2 / .6
72nd Avenue & Ingalls Street (Eastbound)	None	.1 / .2
72nd Avenue & Ingalls Street (Westbound)	None	.1 / .3
72nd Avenue & Depew Street (Eastbound)	None	.2 / .1
72nd Avenue & Depew Street (Westbound)	None	.5 / .2
72nd Avenue & 5400 Block (Eastbound)	None	10 / 4
72nd Avenue & Sheridan Boulevard (Eastbound)	Trash can, bench, shelter	10 / 1
72nd Avenue & Sheridan Boulevard (Westbound)	None	3 / 18
72nd Avenue & Yates Street (Westbound)	Bus pad	.1 / .5
72nd Avenue & Xavier Street (Eastbound)	None	.3 / .1
72nd Avenue & Xavier Street (Westbound)	None	1 / 7
72nd Avenue & Utica Street (Eastbound)	None	1 / .7
72nd Avenue & Utica Street (Westbound)	None	1 / 1
72nd Avenue & Raleigh Street (Eastbound)	None	5 / 2
72nd Avenue & Bradburn Street (Westbound)	None	3 / 5

72nd Avenue & Newton Street (Eastbound)	None	.3 / .3
72nd Avenue & Newton Street (Westbound)	None	1 / 1
72nd Avenue & Lowell Boulevard (Eastbound)	Trash can, bench	5 / 3
72nd Avenue & Lowell Boulevard (Westbound)	Trash can, bench	4 / 4
72nd Avenue & Irving Street (Eastbound)	None	1 / 6
72nd Avenue & Irving Street (Westbound)	Trash can, bench	5 / 2
72nd Avenue & Federal Boulevard (Eastbound)	Trash can, bench, shelter	9 / 4
72nd Avenue & Federal Boulevard (Westbound)	None	6 / 12
72nd Avenue & Clay Street (Eastbound)	None	1 / 1
72nd Avenue & Eliot Street (Westbound)	None	1 / 4
72nd Avenue & Berthoud Street	None	.4 / 3
72nd Avenue & Alcott Street (Westbound)	None	3 / 1

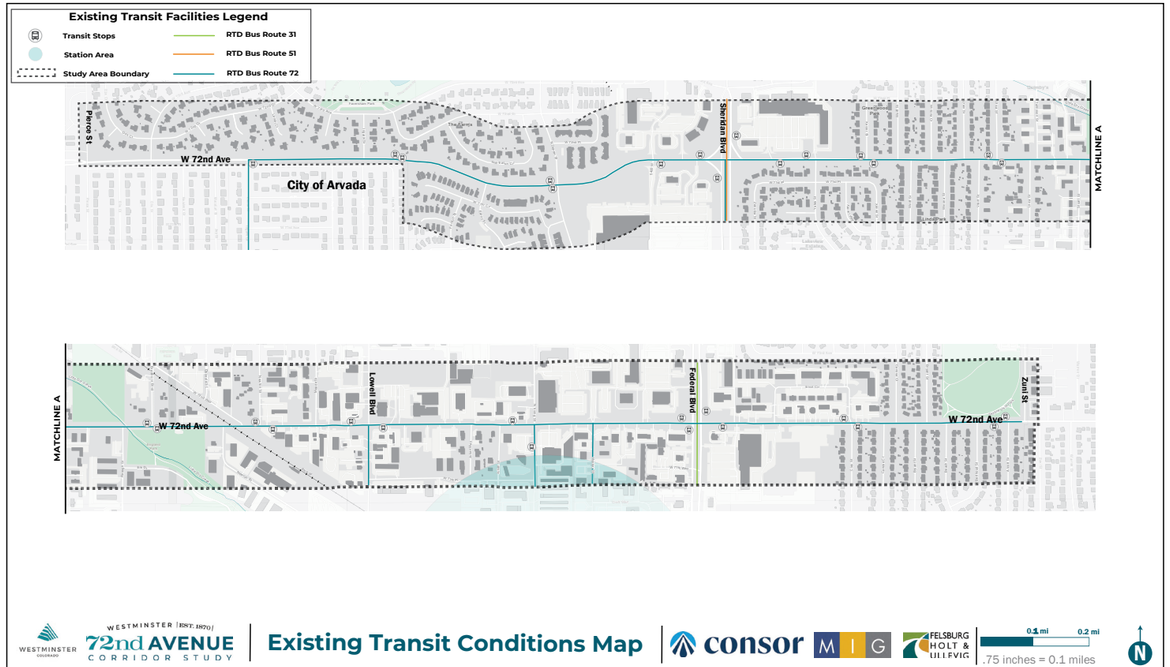


Figure 42: Existing Transit Conditions Map

1.4.5 People Driving

Summary

72nd Avenue is owned and managed by the City of Westminster. The corridor's traffic signals are operated either by the City of Westminster, City of Arvada, or the Colorado Department of Transportation (CDOT). The posted speed limit varies from 25 MPH (in a school zone) to 40 MPH throughout the study area. Speed limit signs exist on both sides of the roadway. Traffic volumes along the corridor are between 5,178 and 10,574 vehicles per day. See **Figure 44** for a summary map of existing driving conditions.

Traffic Volumes & Speeds

The project team collected average daily traffic (ADT) and speeds at five locations in the study area on Tuesday, February 29 and Wednesday, March 1 (view Table 5 below). The results suggest that volumes are highest (over 10,000) west of Julian Street and 85th percentile speeds are consistently between 5 to 8 mph above the speed limit throughout the corridor. Additionally, westbound speeds tended to be slightly higher than eastbound.

The majority of vehicles reported at the four locations below were Class 2 – Passenger Cars (80-84%), with the remainder of vehicles classified as either Class 3 – Other Two-Axle, Four-Tire Single Unit Vehicles (including pickups, vans, campers, motor homes and ambulances, representing 13-15%), larger axle vehicles/trailers (3-4%) and motorcycles (under 1%).

Table 5: Weekday (Tuesday & Wednesday) Traffic Speeds and Volumes

Location on 72nd Avenue	Eastbound Speed (85th percentile)	Westbound Speed (85th percentile)	Eastbound Average Daily Traffic (ADT)	Westbound Average Daily Traffic (ADT)
West of Eaton Street	40 mph	41 mph	5,868	5,729
West of Wolff Street	35 mph	36 mph	7,856	8,342
West of Julian Street	36 mph	37 mph	10,375	10,574
East of Canosa Court	38 mph	36 mph	6,406	6,401

Access

The majority of driveways along the corridor provide access to a variety of businesses in the commercial areas. However, there are also a handful of access points in residential segments, such as between Vrain Street and Stuart Street. Driveway pans can prove problematic to safe pedestrian travel, particularly in locations of attached and narrow sidewalks, or where sidewalk gaps exist (see **Figure 43**). Those using mobility devices are particularly inconvenienced by large and frequent driveway pans, which can be challenging to navigate, force users closer to traffic and introduce potential conflicts between vehicles entering or existing the access point and those navigating sidewalks.

Figure 43: Driveway entrances near Guadalajara Restaurant east of Federal Boulevard

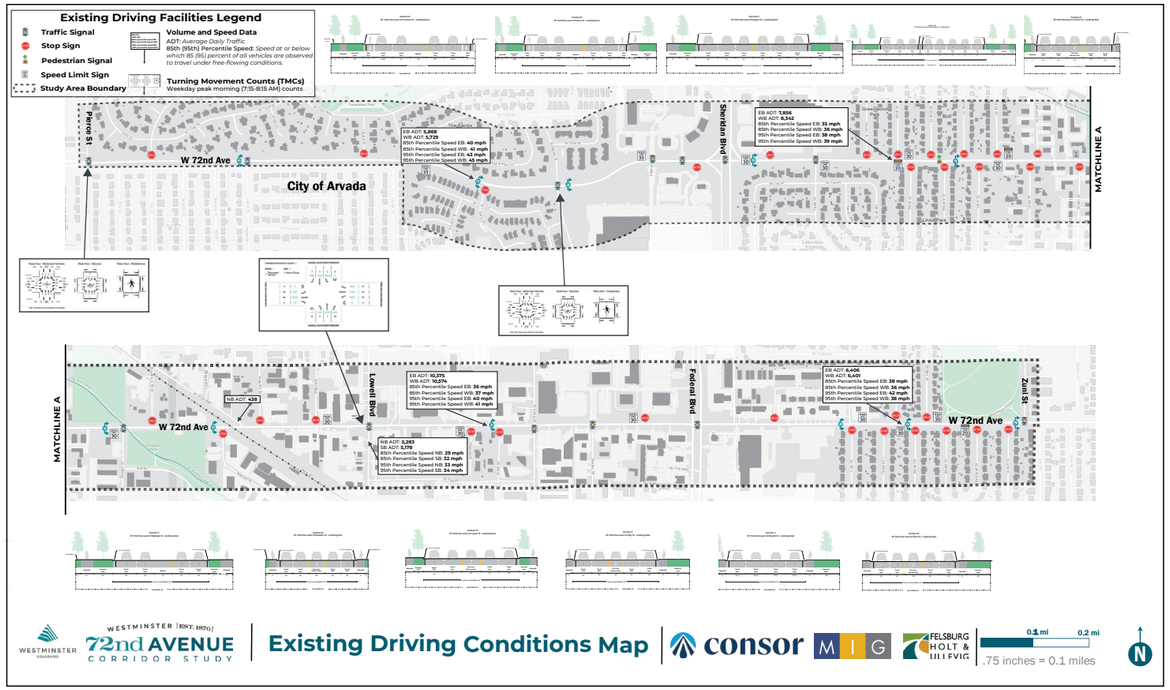


Figure 44: Existing Driving Conditions Map

1.4.6 Turning Movement Counts

The following diagrams show the turning movements collected for vehicles at 13 intersections along 72nd Avenue. Data for all modes was collected on Tuesday, February 28, 2023 during the AM and PM peak hours. See **Table 1** and **Table 2** above for pedestrian and bicycle counts summaries.

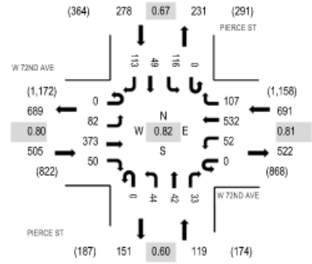


Figure 45: 72nd & Pierce St AM Peak Hour TMC

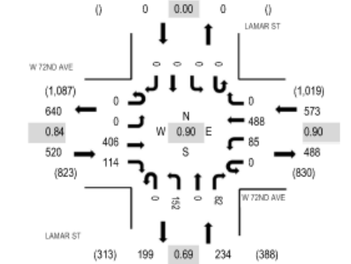


Figure 46: 72nd & Lamar St AM Peak Hour TMC

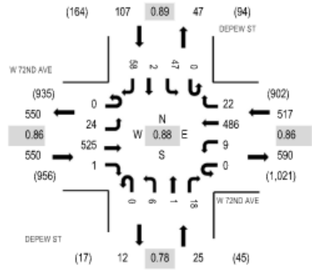


Figure 47: 72nd & Depew St AM Peak Hour TMC

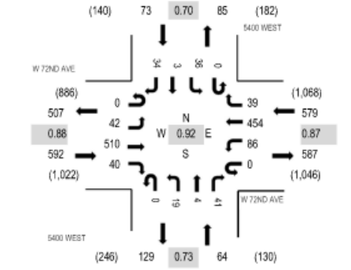


Figure 48: 72nd & 5400 West AM Peak Hour TMC

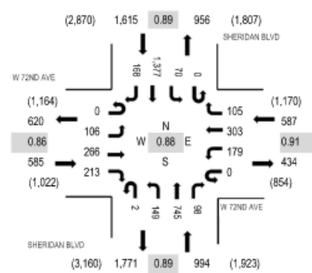


Figure 49: 72nd & Sheridan Blvd AM Peak Hour TMC

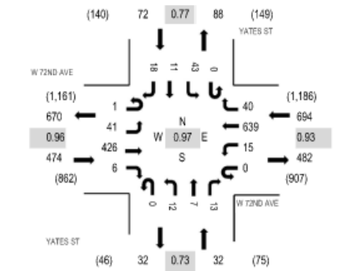


Figure 50: 72nd & Yates St AM Peak Hour TMC

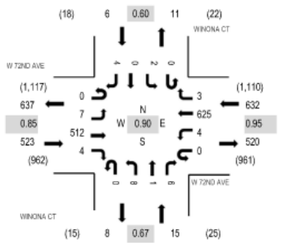


Figure 51: 72nd & Winona Ct AM Peak Hour TMC

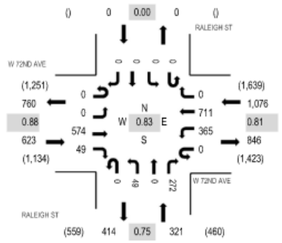


Figure 52: 72nd & Raleigh St AM Peak Hour TMC

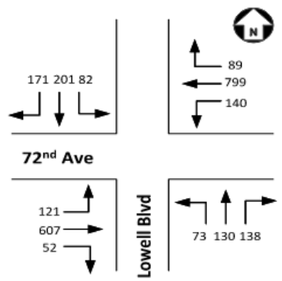


Figure 53: 72nd & Lowell Blvd AM Peak Hour TMC

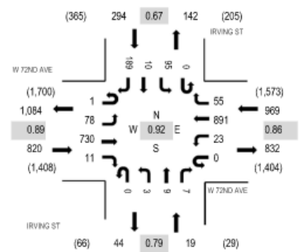


Figure 54: 72nd & Irving St AM Peak Hour TMC

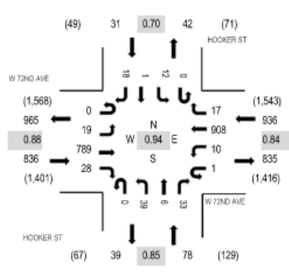


Figure 55: 72nd & Hooker St AM Peak Hour TMC

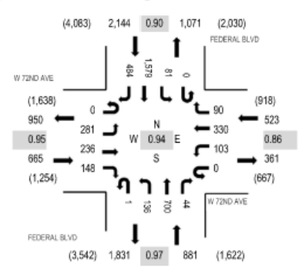


Figure 56: 72nd & Federal Blvd AM Peak Hour TMC

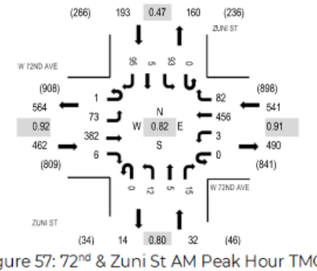


Figure 57: 72nd & Zuni St AM Peak Hour TMC

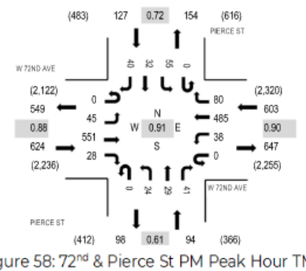


Figure 58: 72nd & Pierce St PM Peak Hour TMC

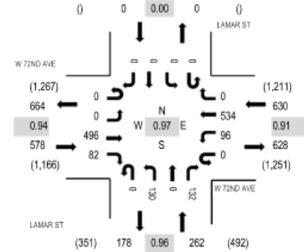


Figure 59: 72nd & Lamar St PM Peak Hour TMC

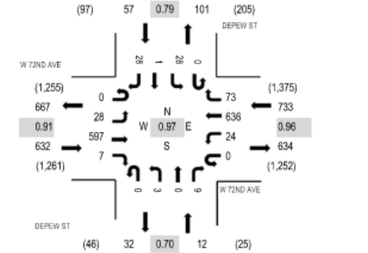


Figure 60: 72nd & Depew St PM Peak Hour TMC

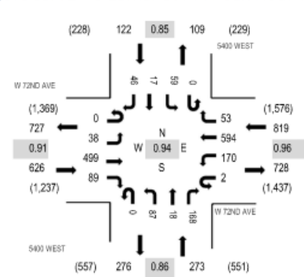


Figure 61: 72nd & 5400 West PM Peak Hour TMC

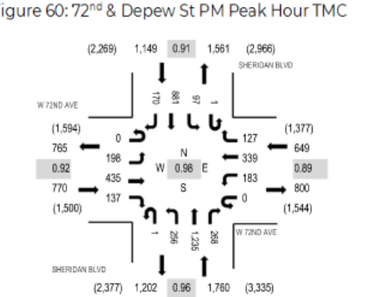


Figure 62: 72nd & Sheridan Blvd PM Peak Hour TMC

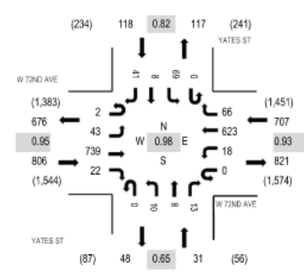


Figure 63: 72nd & Yates St PM Peak Hour TMC

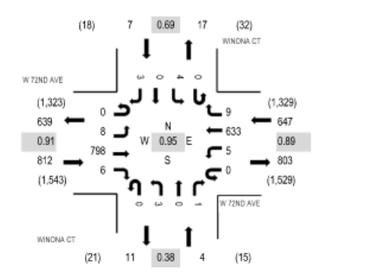


Figure 64: 72nd & Winona Ct PM Peak Hour TMC

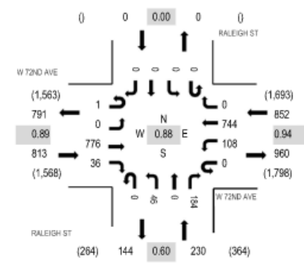


Figure 65: 72nd & Raleigh St PM Peak Hour TMC

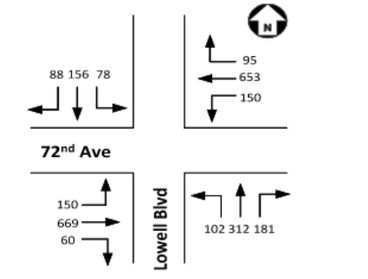


Figure 66: 72nd & Lowell Blvd PM Peak Hour TMC

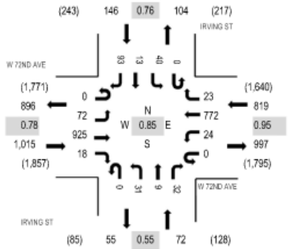


Figure 67: 72nd & Irving St PM Peak Hour TMC

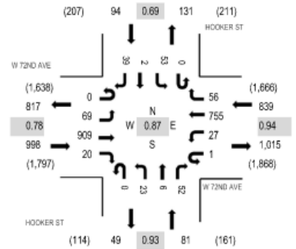


Figure 68: 72nd & Hooker St PM Peak Hour TMC

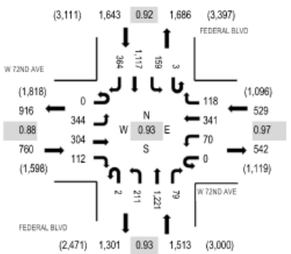


Figure 69: 72nd & Federal Blvd PM Peak Hour TMC

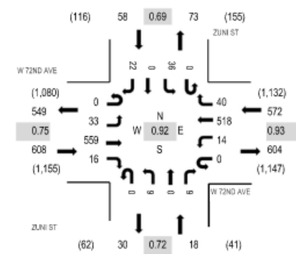


Figure 70: 72nd & Zuni St PM Peak Hour TMC

1.4.7 Traffic Operations Analysis

Summary

The project team conducted a traffic operations analysis for the 72nd Avenue study area using Synchro 11 software and signal timing from the City of Westminster and the Colorado Department of Transportation (CDOT). Synchro 11 utilizes the Highway Capacity Manual, 6th Edition (HCM) methodology to assess the performance of signalized intersections. The following table outlines the data that was used to code the traffic model.

Queues

The Highway Capacity Manual defines a Queue as: "A line of vehicles, bicycles, or persons waiting to be served by the system in which the flow rate from the front of the queue determines the average speed within the queue." The modeled 95th percentile vehicle queue length is used to estimate the extent of queued vehicles for an approach.

Synchro processes queue lengths in relation to the modeled geometric and traffic-related conditions of each movement. The '#' before the length indicates that the 95th percentile queue exceeds capacity and the actual queue may be longer. The 'm' before the length indicates that traffic in this queue is metered by an upstream traffic signal.

Level of Service (LOS)

The Highway Capacity Manual defines Level of Service (LOS) for signalized and unsignalized intersections as a function of the average vehicle control delay. LOS may be calculated for an intersection, or per movement or per approach for any intersection configuration. Signalized and unsignalized intersection LOS differ in their delay thresholds and are expressed in the form of an uppercase or lowercase letter, respectively.

Table 6: Level of Service Based on Average Vehicle Control Delay (seconds)

LOS	Signalized Intersection	Unsignalized Intersection
A	≤10	≤10
B	10–20	10–15
C	20–35	15–25
D	35–55	25–35
E	55–80	35–50
F	>80	>50

Existing Conditions Operations

The 72nd Avenue study area contains 13 signalized intersections. About 10,000 vehicles travel along the corridor in the morning peak hour, with closer to 17,000 vehicles during the evening peak hour.

To better understand traffic operations along the corridor, the project team conducted a traffic analysis using existing volume data and lane configurations. The analysis focused on the morning and evening peak hours. Summaries of the analysis for each intersection are shown in the table below.

Table 7: Average Vehicle Control Delay (seconds)

Intersection	AM Peak LOS (Delay in seconds/vehicle)	PM Peak LOS (Delay in seconds/vehicle)
72nd Avenue & Pierce Street	**C (23.3)**	**B (13.7)**
EB Left	A(8.5)	A (7.0)
EB Through	B (11.7)	B (10.9)
EB Right	B (10.7)	A (9.0)
WB Left	A (8.1)	A (7.0)
WB Through	A (0.3)	A (0.2)
WB Right	A (0.3)	A (0.2)
NB Left/Through/Right	E (72.9)	E (61.4)
SB Left/Through	F (89.2)	E (57.5)
SB Right	E (66.6)	D (53.2)
72nd Avenue & Lamar Street	**A (7.6)**	**B (13.6)**
EB Through/Right	A (3.7)	B (15.1)
WB Left	A (4.0)	A (5.6)
WB Through	A (3.6)	A (4.2)
NB Left/Right	C (26.1)	C (32.1)
72nd Avenue & Depew Street	**A (6.0)**	**A (4.3)**
EB Left	A (3.8)	A (3.9)
EB Through/Right	A (3.5)	A (3.3)
WB Left	A (3.7)	A (3.7)
WB Through	A (3.2)	A (3.1)
WB Right	A (2.7)	A (2.5)
NB Left	C (27.0)	C (26.7)
NB Through/Right	C (25.4)	C (26.0)
SB Left	C (26.7)	C (26.7)
SB Through/Right	C (27.8)	C (27.2)
72nd Avenue & 5400 West	**A (9.4)**	**B (12.6)**
EB Left	A (2.7)	A (7.2)
EB Through/Right	A (4.0)	B (10.1)
WB Left	A (2.6)	A (6.7)
WB Through	A (3.8)	A (8.8)
WB Right	A (3.3)	A (7.3)
NB Left	E (58.0)	C (25.8)
NB Through	D (53.7)	C (21.7)
NB Right	E (59.5)	C (29.7)
SB Left	E (56.4)	C (23.5)
SB Through/Right	E (58.1)	C (22.8)
72nd Avenue & Sheridan Boulevard	**C (31.6)**	**D (38.2)**
EB Left	E (58.7)	E (57.1)
EB Through	E (59.0)	E (72.5)
EB Right	Free	Free
WB Left	E (57.5)	E (62.9)
WB Through	D (50.2)	E (67.6)
WB Right	Free	Free
NB Left	E (77.7)	D (49.3)
NB Through	C (21.0)	B (17.3)
NB Right	Free	Free
SB Left	D (44.7)	E (60.6)
SB Through	B (16.8)	C (24.0)
SB Right	Free	Free
72nd Avenue & Yates Street	**A (4.9)**	**A (6.0)**
EB Left	A (3.5)	A (4.6)
EB Through	A (2.7)	A (4.1)
EB Right	A (2.3)	A (3.1)
WB Left	A (3.1)	A (5.3)
WB Through/Right	A (2.9)	A (3.9)
NB Left/Through/Right	C (26.7)	C (24.1)
SB Left/Through/Right	C (28.1)	C (26.8)
72nd Avenue & Winona Court	**A (3.1)**	**A (3.3)**
EB Through	A (3.1)	A (3.4)
WB Through	A (3.2)	A (3.2)
72nd Avenue & Raleigh Street	**B (13.3)**	**A (9.8)**
EB Through/Right	B (16.0)	B (14.7)
WB Left	C (28.1)	A (7.2)
WB Through	A (3.3)	A (3.5)
NB Left	D (40.6)	D (39.5)
NB Right	A (8.4)	A (8.1)
72nd Avenue & Lowell Boulevard	**B (19.0)**	**C (30.0)**
EB Left	A (9.4)	B (12.3)
EB Through	A (0.4)	B (19.9)
EB Right	A (0.1)	A (1.0)
WB Left	A (9.0)	C (21.7)
WB Through	A (7.4)	D (35.6)
WB Right	A (6.1)	B (12.1)
NB Left	D (42.7)	C (33.1)
NB Through/Right	D (51.5)	D (46.9)
SB Left	D (41.9)	C (34.8)
SB Through	D (54.2)	D (54.4)
SB Right	E (56.0)	A (3.8)
72nd Avenue & Irving Street	**B (12.1)**	**A (6.6)**
EB Left	A (5.5)	A (3.0)
EB Through/Right	A (2.3)	A (4.5)

WB Left	A (5.6)	A (1.2)
WB Through	A (0.5)	A (2.4)
WB Right	A (0.1)	A (0.0)
NB Left	D (44.9)	E (56.1)
NB Through/Right	D (44.8)	C (24.2)
SB Left	D (49.9)	E (60.1)
SB Through	D (44.5)	D (49.2)
SB Right	F (88.0)	B (15.9)
72nd Avenue & Hooker Street	**A (3.7)**	**A (5.2)**
EB Left	A (2.2)	A (4.0)
EB Through/Right	A (0.5)	A (0.8)
WB Left	A (2.4)	A (4.2)
WB Through	A (0.2)	A (0.3)
WB Right	A (0.0)	A (0.1)
NB Left	E (55.4)	D (47.7)
NB Through/Right	E (58.1)	D (49.5)
SB Left/Through/Right	E (55.5)	D (54.6)
72nd Avenue & Federal Boulevard	**C (32.9)**	**C (33.1)**
EB Left	E (68.8)	E (63.9)
EB Through	D (50.3)	D (40.9)
EB Right	D (53.5)	D (40.3)
WB Left	E (59.8)	E (56.9)
WB Through	E (64.1)	D (48.4)
WB Right	D (36.5)	D (43.9)
NB Left	E (67.5)	E (63.4)
NB Through	B (16.7)	C (27.2)
NB Right	A (7.4)	B (12.6)
SB Left	D (53.4)	D (47.7)
SB Through	C (20.3)	C (21.0)
SB Right	C (22.9)	A (9.3)
72nd Avenue & Zuni Street	**A (8.2)**	**A (3.7)**
EB Left	A (6.9)	A (2.4)
EB Through	A (5.4)	A (2.3)
WB Through/Right	A (3.2)	A (3.0)
SB Left	D (43.0)	C (30.7)
SB Right	B (12.2)	B (14.5)

All intersections operate at an overall LOS “D” or better during both the morning and evening peak hours. Detailed LOS and queuing reports can be found in **Appendix B**.

The following intersections have one or more movements that operate at or below a LOS “E” during either of the peak hours studied:

- 72nd Avenue & Pierce Street
- 72nd Avenue & 5400 West
- 72nd Avenue & Sheridan Boulevard
- 72nd Avenue & Lowell Boulevard
- 72nd Avenue & Irving Street
- 72nd Avenue & Hooker Street
- 72nd Avenue & Federal Boulevard

1.4.8 Travel Demand Modeling

Background

The Denver Regional Council of Governments (DRCOG) Focus 2.3.1 Travel Demand Model was used to develop long-range travel demand forecasts for the project corridor. The travel demand modeling process used a comparison of existing traffic counts with the 2020 base year model volume to adjust 2050 model forecasts according to procedures described in the National Cooperative Highway Research Program Report (NCHRP) 765. These forecasts were used to develop 2050 average annual daily traffic (AADT) and peak hour traffic volumes for the project corridor.

Model Transportation Network

In the travel demand model, the 2020 and 2050 transportation network is reflected as follows:

- Principal Arterial
- Four-lane (two lanes per direction)

Table 8 summarizes daily traffic volumes on 72nd Avenue obtained from the travel demand model for 2020 and 2050. The 2050 Forecasts are adjusted using NCHRP 765 methodology. Traffic growth between 2020 and 2050 is generally 1% per year.

Table 8: Daily Forecasts

Location	2023 Counts	2050 Forecasts
East of Canosa Street	12,800	18,900
West of Julian Street	20,900	25,800
West of Wolff Street	16,200	21,200
West of Eaton Street	11,600	17,500

Model Socioeconomics

Model socioeconomics were evaluated to verify expected population and employment growth. The maps in **Appendix C** depict 2020 and 2050 model population and employment within the project corridor vicinity, and the model population and employment growth between 2020 and 2050 within the project corridor vicinity.

1.5 Safety Assessment

1.5.1 Crash Analysis

Analysis Tools & Methodology

Crash data for the years 2015-2019 was provided by CDOT. There were 736 crashes during the 2015-2019 analysis period, with a breakdown of crashes by year shown in **Figure 71.** Both fatal crashes that occurred during the analysis period involved bicyclists or pedestrians. Crashes most commonly occurred on weekdays (see **Figure 72**), during Winter, Spring and Fall (see **Figure 73**) and during typical periods of rush hour traffic, such as between 7:00 – 8:00 AM and between 3:00 – 5:00 PM (see **Figure 74**).

72nd Avenue is considered a DRCOG High Injury Network (HIN) Corridor (see HIN map), with the portion of the study area between Sheridan Boulevard and Federal Boulevard considered a Critical Corridor. Critical Corridors identify the top 50% of killed and seriously injured (KSI) crash density corridors along the regional HIN. Locations with the highest crash frequency are highlighted in further detail below. Also see **Figure 75** for a map of all reported crashes during the analysis period.

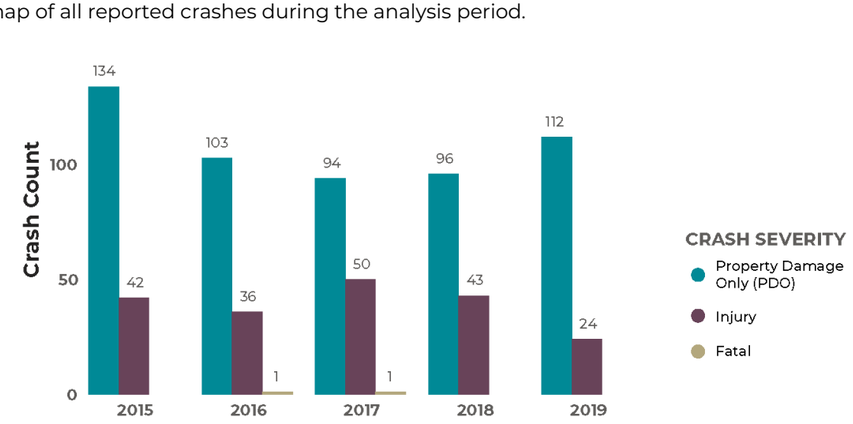


Figure 71: Crash Counts by Year and Severity

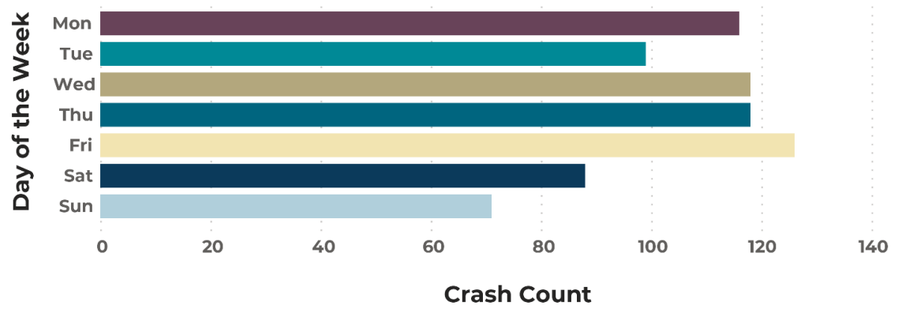


Figure 72: Crash Counts by Day of Week

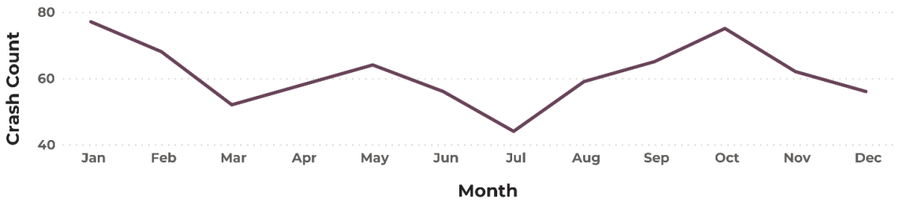


Figure 73: Crash Counts by Month

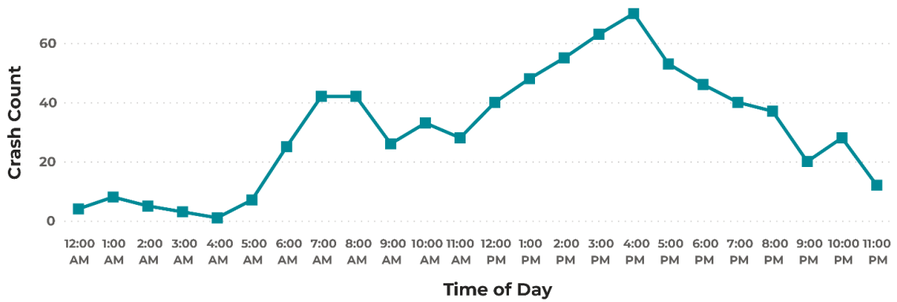


Figure 74: Crash Counts by Time of Day

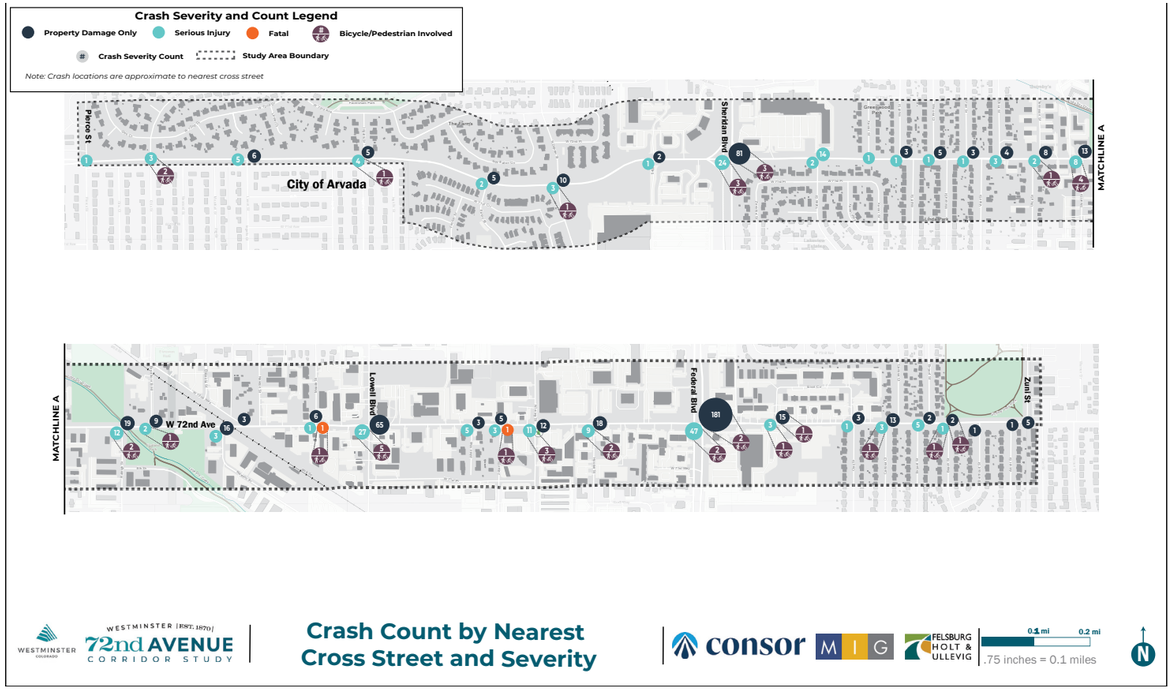


Figure 75: Crash Count by Nearest Cross Street and Severity

Federal Boulevard & 72nd Avenue

Figure 76: The intersection of 72nd Avenue and Federal Boulevard, looking east from 72nd Avenue

Of all intersections along the three-mile corridor, the Federal Boulevard intersection had the highest crash count during the 2015-2019 analysis period, at 228 total crashes. Though 181 (79%) of these were Property Damage Only (PDO) crashes, the remaining 47 crashes did result in injuries. Bicyclists/pedestrians were involved in four crashes at this intersection. Furthermore, according to the 2020 Transportation & Mobility Plan, the 72nd Avenue and Federal Boulevard intersection is within the top 10 intersections in Westminster with the highest number of crashes between 2015 and 2017.

Sheridan Boulevard & 72nd Avenue

Figure 77: The intersection of 72nd Avenue and Sheridan Boulevard, looking west from 72nd Avenue

The Sheridan Boulevard intersection had the second highest crash count of project area intersections during the 2015-2019 analysis period, at 105 total crashes. 23% (24) of these crashes resulted in injuries. Bicyclists/pedestrians were involved in five crashes at this intersection.

Lowell Boulevard & 72nd Avenue

Figure 78: The intersection of 72nd Avenue and Lowell Boulevard, looking east from 72nd Avenue

The Lowell Boulevard intersection had the third highest crash count during the 2015-2019 analysis period, at 92 total crashes. 29% (27) of these crashes resulted in injuries. Bicyclists/pedestrians were involved in five crashes at this intersection.

Crash Types

Review of the most common crash types revealed that more than a third (35%) of the 736 crashes that occurred along the study area during the 2015-2019 analysis period were rear-end crashes. Common crash types are defined below, and listed by most to least common for the 72nd Avenue study area data set. See **Figure 79** for a breakdown on crashes by crash type.

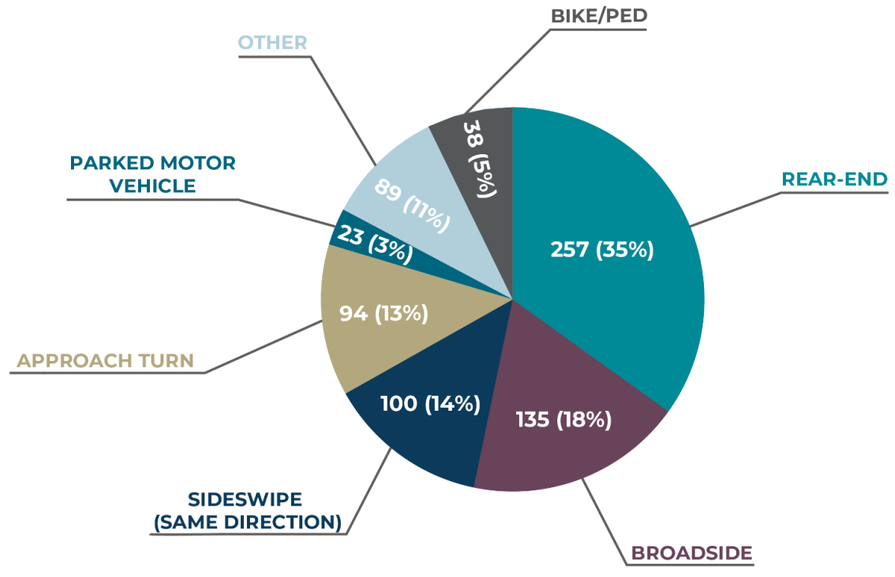


Figure 79: 2015-2019 72nd Avenue crashes by crash type

Rear-End
A crash type that involves two vehicles in a position of one behind the other and collide, regardless of what movements(s) either vehicle was in the process of making with the exception of one or both vehicles backing

Broadside
A crash type that involves two vehicle approaching from nonopposing angular directions (i.e. T-bone)

Sideswipe (same direction)
A crash type that involves two vehicles moving alongside each other and collide, with at least one of the vehicles being struck on the side

Approach Turn
A crash type that involves two vehicles in the opposite direction, one turns into the path of the other

Parked Motor Vehicle
A crash type in which a vehicle in motion collides with a parked motor vehicle, whether occupied or not.

Other
Crash types in the "Other" category included pedestrian or bicycle crashes, sidewalk (opposite direction) crashes and those involving fixed objects such as signs, light/utility poles, wall/buildings, guard rails, trees/shrubbery, bridge trails, traffic signal poles, concrete barriers, fences, etc.

Bike/Ped
Crash involving either a bicyclist or pedestrian. **Table 9** displays the percentage of crashes involving a bicyclist or pedestrian by intersection (sorted by west to east).

Table 9: Percentage of Overall Crashes Involving a Bicyclist or Pedestrian

Nearest Intersecting Street	Percent of Overall Crashes Involving a Bicyclist or Pedestrian
Pierce Street	0%
Otis Street	67%
Lamar Street	0%
Ingalls Street	11%
Eaton Street	0%
Depew Street	8%
5400 Block	0%
Sheridan Boulevard	5%
Yates Street	0%
Xavier Street	0%
Wolff Street	0%
Winona Court	0%
Vrain Street	0%
Utica Street	14%
Tennyson Street	0%
Stuart Street	19%
Raleigh Street	6%
Bradburn Boulevard	9%
72nd Way	0%
Newton Street	0%
Meade Street	13%
Lowell Boulevard	5%
Julian Way	0%
Julian Street	11%
Irving Street	13%
Hooker Street	7%
Federal Boulevard	2%
Eliot Circle	11%
Clay Street	0%
Canosa Court	6%
Bryant Street	0%
Beach Street	67%
Berthoud Street	0%
Alcott Street	0%
Zuni Street	0%

1.6 Needs Assessment

1.6.1 Needs Assessment Mapping

Overview

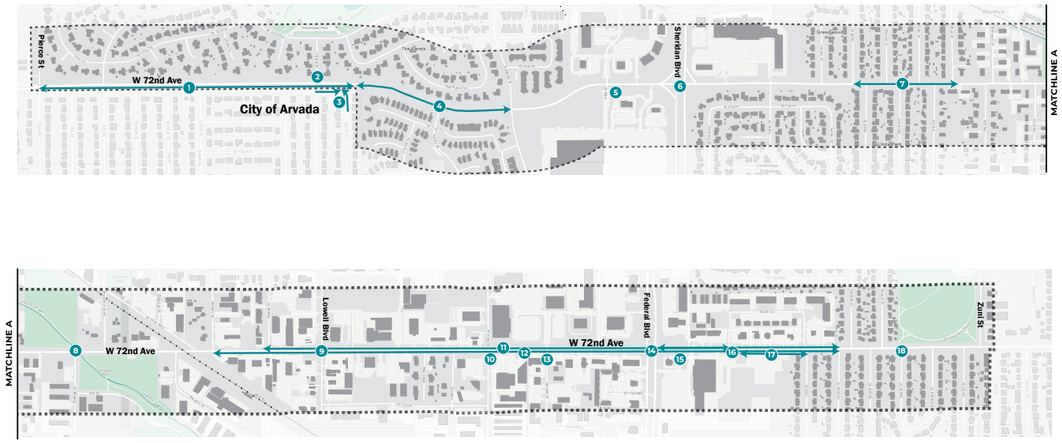
The needs assessment is a summary of gaps and barriers related to multimodal transportation within the study area. These mobility challenges were identified during the existing conditions phase and plan review performed by the project team as well as during the stakeholder engagement efforts. Reference **Figure 80** which aligns with the numbers below.

Place-Specific Recommendations

1. Complete sidewalk gaps on the south side of the corridor between Pierce Street and Ingalls Street.
2. Upgrade wayfinding to orient corridor users to area amenities such as Faversham Lake/Park to the north on Ingalls Street.
3. Provide better connections to 72nd Avenue amenities (such as bus stops) from 72nd Frontage Road and Ingalls Street (south side of corridor).
4. Install aesthetic treatments along curve between Ingalls Street and Depew Street.
5. Improve transit stop amenities and comfort at the eastbound 72nd Avenue & 5400 Block stop.
6. At Sheridan Boulevard intersection, install raised crossings at bypass lanes to reduce exposure time for vulnerable users.
7. Install traffic calming measures to reduce speeds in the school zone between Wolff Street and Utica Street.
8. Improve connections and wayfinding from 72nd Avenue to Little Dry Creek Trail.
9. Install concrete curb extensions at the Lowell Boulevard intersection to decrease vehicle turning radii and reduce exposure time for vulnerable users.
10. Install a Station Area gateway sign structure on the south side of 72nd Avenue at Irving Street, noting this as the primary TOD entrance to Westminster Station.
11. Improve maintenance of trees and plants in existing amenity zone planters between Meade Street and Eliot Circle.
12. Improve ADA accessibility and installed raised driveway crossings at major driveways between Newton Street and Canosa Court.
13. Install secondary Station Area gateway signage and landscaping at Hooker Street and 72nd Avenue.
14. Crossing improvements are needed at the Federal Boulevard intersection to reduce exposure time for vulnerable users.
15. Improve transit stop amenities and comfort at westbound 72nd Avenue & Federal Boulevard stop.
16. Install additional crosswalk between Federal Boulevard and Canosa Court.
17. Complete missing sidewalk gap on south side of 72nd Avenue between Elliot Circle and Clay Street.
18. Install crosswalk at Beach Street (where a high percentage of bicyclist/pedestrian involved crashes occurred) to connect with Skyline Vista Park path, which has been identified as an important route for students accessing area schools.

Corridor Wide Recommendations

- Increase winter clearance of sidewalks and bicycle facilities, given the existence of snow and ice inhibit safe multimodal travel.
- Upgrade all corridor facilities to be ADA compliant, including curb ramps, access routes to bus stops and bus stop landing pads.
- Ensure prioritization of pedestrian and transit rider infrastructure upgrades during development and redevelopment.
- Provide a continuous bicycle facility throughout the corridor that provides appropriate protection for users.
- Implement traffic calming measures to reduce overall vehicle corridor speeds.
- Implement countermeasures to help remove 72nd Avenue from the DRCOG High-Injury Network.



Needs Assessment Map

0.1 mi 0.2 mi
.75 inches = 0.1 miles

Figure 80: Needs Assessment Map

ENVIRONMENTAL OVERVIEW

Westminster 72nd Avenue Corridor Study

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FHU Reference No. 121120

April 2023

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Environmental Overview

The following environmental resources were reviewed in the context of the West 72nd Avenue corridor:

- Threatened and endangered species, species of concern, migratory birds
- Historic and archaeological resources
- Environmental Justice communities
- Parks, open spaces, trails, recreational resources, and Section 6(f)
- Traffic noise
- Visual resources
- Hazardous materials

Threatened and Endangered Species, Species of Concern, Migratory Birds

Threatened and endangered species, species of special concern, migratory birds, and eagles are specific wildlife resources that exist or have the potential to exist within the project area. These resources must be evaluated when using federally funded projects or operating along highway right-of-way (ROW). Wildlife or wildlife habitat can include wetlands, riparian areas, native shortgrass prairie, prairie dog colonies, or other areas that host species of avian, terrestrial, or aquatic species of interest. In the project corridor there is very little natural habitat remaining for wildlife. Trees in residential areas, parks, and along Little Dry Creek provide potential habitat for migratory birds. No known raptor nests are located within the vicinity of the project. **Table 1** identifies existing wildlife habitat resources in the environmental study area.

Table 1. Existing Wetlands/Other Waters of the US Resources and Areas of High Quality Wildlife Habitat

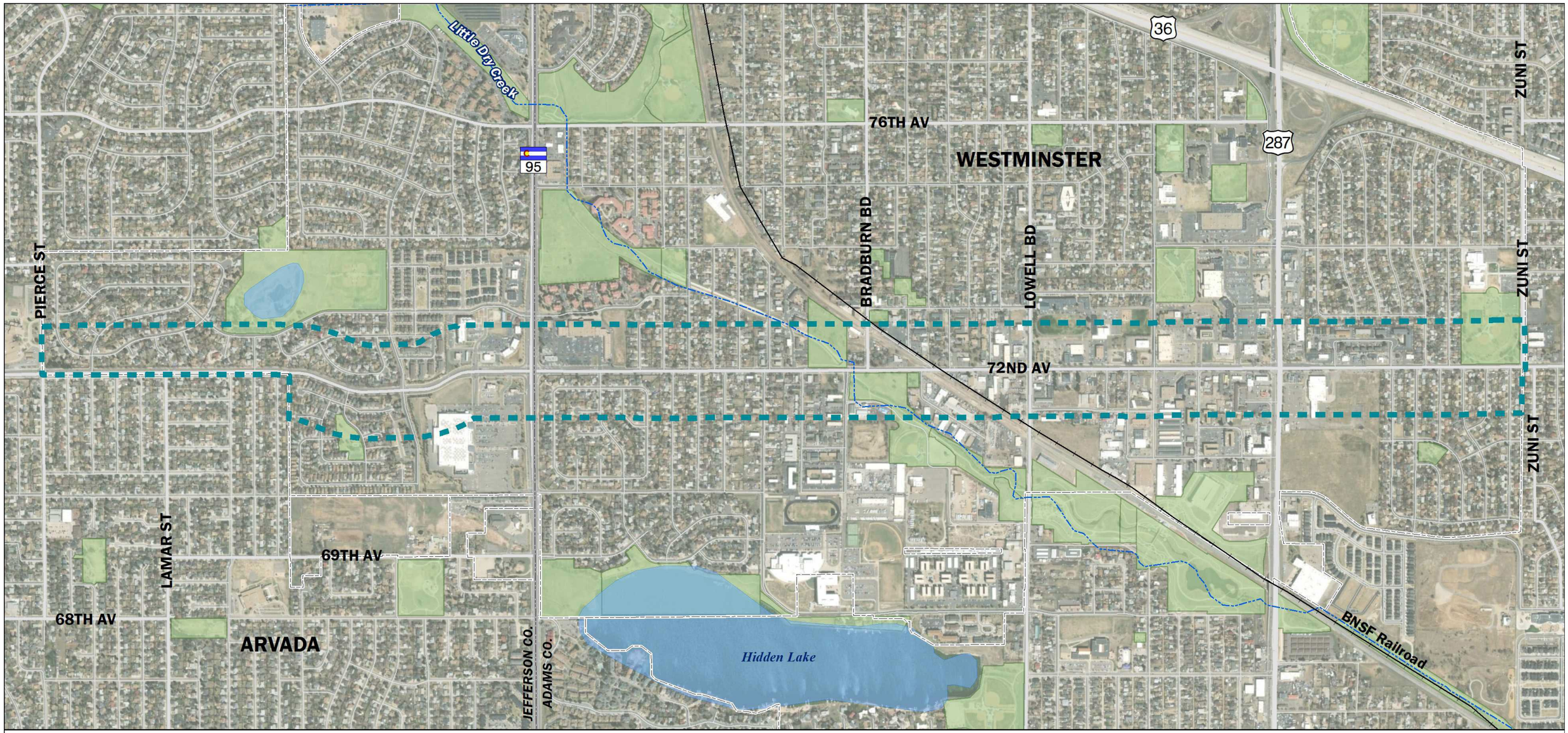
Site	Stream/Habitat Type	Within Environmental Study Area	Habitat Quality	Jurisdictional	Wildlife Corridor
Little Dry Creek	▪ Riverine wetlands and palustrine emergent wetlands. Includes aquatic species present in ditch channel ▪ Potential for raptor nests along creek	Yes	Medium	Yes	Yes
Isolated wetlands – unassociated with any named feature	▪ Palustrine emergent wetlands, freshwater ponds	Yes	Low	No	▪ Limited use as wildlife corridor possible

Next Steps for Implementation

Who	Potential agency and stakeholder involvement	▪ Federal Highway Administration (FHWA) ▪ Colorado Department of Transportation (CDOT) ▪ US Army Corps of Engineers (USACE)	▪ State Historic Preservation Officer (SHPO) ▪ US Fish and Wildlife Service (USFWS) ▪ Colorado Parks and Wildlife (CPW)
When	Critical schedule considerations	**Construction seasonal wildlife restrictions** ▪ **Migratory Birds/Song Birds**: April 1 to August 31 or in presence of active nests. ▪ **Raptors**: October 15 to July 31 or within various radii of active nests. ▪ **Ute Ladies'-tresses Orchid**: Survey for presence between late July/early August. ▪ **Reptiles/Amphibians**: Spring, if habitat is present for Common Garter Snake and Northern Leopard Frog. ▪ **Fish**: Coordinate with CPW to identify latest sampling records for species of concern. May impact bridge construction schedules.	
Why	Regulatory setting and general context	▪ **Section 7 of the Endangered Species Act**: Provides regulatory oversight when impacts may occur to species listed under the federal Endangered Species Act. Requires coordination with the USFWS and resource agencies, such as CPW, when impacts occur to wildlife species. ▪ **Migratory Bird Treaty Act**: Provides regulatory protection of native migratory birds, eggs, and young and requires coordination with the USFWS and CPW. ▪ **Bald and Golden Eagle Protection Act**: Provides regulatory protection of Bald and Golden Eagles, their nests, eggs, and young and requires coordination with USFWS and CPW. ▪ **Senate Bill 40 (SB 40) Wildlife Certification**: Occurs when a state agency plans project construction activities that impact riparian resources. It is based on an agreement between CPW and CDOT.	
How	NEPA pre-scoping considerations	▪ **Biological Resources Report**: Documents biological resources present in a project area, such as land cover, wetlands, waterways, wildlife, riparian, noxious weeds, and special status species. Defines the existing biological resources present to aid in decision-making and to identify required permitting.	
Next Steps	Funding, design, construction implications	When wetland and wildlife impacts are expected, build adequate time into the design schedule to consider temporary and permanent impacts and allow time for a wetland delineation, Biological Resources Report, SB 40 reporting, consultation, and consequent permitting. Development of wildlife crossings or fencing may be considered with future projects.	

Figure 1 shows the location of parks and streams in the corridor where migratory bird and wildlife habitat is most likely to be present.

Figure 1. Existing and Potential Wildlife Habitat



Historic and Archaeological Resources

Historic resources are any prehistoric or historic district, site, building, structure, or object included in, or eligible to, the National Register of Historic Places (NRHP). Historic resources encountered along the corridor include buildings, structures, a railroad, highways, and post-World War II residential subdivisions. For projects with a federal nexus, the responsible federal agency must comply with Section 106 of the National Historic Preservation Act of 1966, as amended [36 CFR 800]. The federal agency first determines whether an undertaking (i.e., the project) has the potential to affect historic resources. If so, the agency defines the Area of Potential Effects (APE), the area in which an undertaking may directly or indirectly cause changes in the character or use of historic resources. Once the APE has been defined, the agency then identifies historic resources and properties consistent with 36 CFR 800.4. The agency then consults with the appropriate SHPO and/or Tribal Historic Preservation Officer (THPO) on determinations of NRHP eligibility and proposed project effects to historic or potentially historic resources located within the APE. If only state funding (no federal) is applied to projects, the project will be subject to the Colorado State Historic Register Act, implemented through Colorado Revised Statute (CRS) 24-80.1-101 to 24-80.1-108. The Colorado State Historic Register Act authorizes the State Historical Society/SHPO to prepare and promulgate rules and procedures by which properties shall be determined to be eligible for, nominated to, and included in, or removed from the State Register of Historic Properties.

To create an understanding of the types of historic resources that may be included in the APE for future projects, this section identifies all existing (previously recorded) and potential (non-surveyed) historic resources located within the environmental study area. **Table 2** identifies existing historic resources, including properties either listed on the NRHP or officially eligible for the NRHP, and **Table 3** identifies additional properties within the study area with a high potential for being eligible to the NRHP.

Table 2. Known Historic Resources

(Site ID) Resource Name	Address/ Location	Year Built	Resource Type/ Description	NR Eligibility
(N/A) US Highway 287	0.5-miles west of Zuni Street	ca.1880	Early roadway from Wyoming south through Colorado. Important as a trade route during the late nineteenth century, eventually being designated as US 287 in 1935. No previous segments of US Highway 287 have been surveyed in Adams County.	Significant under **Criterion A** in the area of Transportation as a Cultural Route for its earliest use as the Overland Trail, used by indigenous groups, European and European-American explorers, emigrants and later stagecoach lines in the early and mid-19th century. The road was also an early project of the Colorado Highway Department (CHD) with improvements as early as 1912. Lastly, the road is significant as an important connector between farms and ranches in the high plains desert of southeastern Colorado.

(Site ID) Resource Name	Address/ Location	Year Built	Resource Type/ Description	NR Eligibility
(5AM.64) The Bowles House	3924 West 72nd Avenue, Westminster, CO 80003	ca.1877	Late-nineteenth century Italianate-style residence of Edward Bowles, a pioneer resident who came to the area when it was called DeSpain Junction. The name was later changed to Harris in the 1890s and eventually Westminster by 1911.	NRHP Listed, 11/03/1988
(5AM.442) Harris Park School	7200 Lowell Boulevard, Westminster, CO 80003	1892–1899	One-story school building with a rectangular plan, brick siding, gabled entrances and large double-hung windows. Originally designed in the Romanesque Revival style, the building was later remodeled into its current form with Craftsman style detailing.	NRHP Listed, 8/30/1990
(5AM.895) Union High School	3455 West 72nd Avenue, Westminster, CO 80003	1928	Two-story Art Deco style high school facility with an irregular plan, brick cladding, flat roof, and stepped parapet.	NRHP Listed, 1/14/2000
(5AM. 464.10) Denver Utah & Pacific, Colorado and Southern Railroad	West 72nd Avenue at Newton St	1930	Railroad siding for the Denver, Utah, & Pacific and later Colorado and Southern Railroad. The line was eventually purchased by BNSF before being abandoned.	NRHP Eligible, 6/8/2022
(5AM.1744) Skelly Oil Station	3750 West 72nd Avenue, Westminster, CO 80003	1927	Cottage style gas station with a rectangular plan, multiple roof forms, one-story with vertical siding and a decorative cornice.	NRHP Eligible, 5/25/2009
(5AM.2836) Penguin Building	7265 Lowell Boulevard, Westminster, CO 80003	1951	Two-story commercial building with brick façade and stepped parapet.	NRHP Eligible, 6/5/2012
(5AM.2841) Westminster Shopping Center	7200 Meade Street, Westminster, CO 80003	1955	Commercial building, one-story, in the modern style. Rectangular floor plan with brick cladding and a flat roof.	Officially Needs Data, 6/5/2012
(5AM.2842) Westminster Post Office	7262 Meade Street, Westminster, CO 80003	1960	International style, one-story post office with a rectangular plan and brick cladding.	NRHP Eligible, 6/5/2012

(Site ID) Resource Name	Address/ Location	Year Built	Resource Type/ Description	NR Eligibility
(5AM.2843) Westminster High School	7300 Lowell Boulevard, Westminster, CO 80003	1949–1951	Two-story school with an irregular plan, brick cladding and flat roof. The building has elements of the modern movement.	Officially Needs Data, 6/5/2012
(5AM.4140) Colorado State Highway 95	1-mile east of Pierce Street	ca.1920s	Colorado State Highway 95, locally known as Sheridan Boulevard, is a nearly 15-mile-long thoroughfare running north-south through the west metro Denver area. The highway, designated in the 1920s, served as an important traffic artery that facilitated suburban development in Denver in the early twentieth century, as well as post-World War II development in the northern suburbs.	Significant under **Criterion A** in the area of Transportation and Community Planning and Development at the local level as an important early project of the CHD due to its early connectivity to the suburbs of Denver during the 1920s and later post-World War II development of the northern suburbs.

Table 3. Non-Surveyed Properties Meeting the 45-Year Threshold (1978 and prior) for Potential NRHP Eligibility

Address/ Location	Year Built	Owner/Property Name	Property Type	Status
Properties Located in Adams County				
7190 Alcott Street	1959	Vo/Ho Residence	Single-Family Residence	Unsurveyed
7191 Alcott Street	1958	Gutierrez Residence	Single-Family Residence	Unsurveyed
7190 Beach Street	1958	Johnson/Ortiz Residence	Single-Family Residence	Unsurveyed
7191 Beach Street	1958	Maddox Residence	Single-Family Residence	Unsurveyed
7190 Berthoud Street	1958	Burnett Residence	Single-Family Residence	Unsurveyed
7191 Berthoud Street	1958	Briones/Sanchez Residence	Single-Family Residence	Unsurveyed
7215 Bradburn Boulevard	1897	Feltis Residence	Single-Family Residence	Unsurveyed
7190 Bryant Street	1958	Conniff Residence	Single-Family Residence	Unsurveyed
7191 Bryant Street	1958	Simental Residence	Single-Family Residence	Unsurveyed
7200 Bryant Street	1954	Rodriguez Residence	Single-Family Residence	Unsurveyed
7201 Bryant Street	1954	Posada Residence	Single-Family Residence	Unsurveyed
7190 Canosa Court	1958	Wodark Residence	Single-Family Residence	Unsurveyed
7191 Canosa Court	1959	Kruger Residence	Single-Family Residence	Unsurveyed
7200 Canosa Court	1954	Kuhne Residence	Single-Family Residence	Unsurveyed
7201 Canosa Court	1954	Robles Residence	Single-Family Residence	Unsurveyed

Address/ Location	Year Built	Owner/Property Name	Property Type	Status
7190 Clay Street	1958	Lucero/Sanchez Residence	Single-Family Residence	Unsurveyed
7191 Clay Street	1957	Arroyo/Zavaleta Residence	Single-Family Residence	Unsurveyed
7110 Federal Boulevard	1962	NGC Development LLC Property	Commercial Retail Building	Unsurveyed
7120 Federal Boulevard	1972	Westminster Station Northgate LLC	Commercial Restaurant	Unsurveyed
7190 Julian Way	1953	Pergola Property	Commercial Office Building	Unsurveyed
7191 Julian Way	1955	Pergola Property	Single-Family Residence	Unsurveyed
7185 Lowell Boulevard	1902	Smith Living Trust Property	Single-Family Residence	Unsurveyed
7205 Meade Street	1952	7205 Meade LLC Property	Commercial Retail Building	Unsurveyed
7190 Newton Street	1970	Ram Auto Repair Inc. Property	Automotive Service Garage	Unsurveyed
7215 Newton Street	1932	Chea Residence	Single-Family Residence	Unsurveyed
7193 Stuart Street	1962	Trujillo Property	Multi-Family Residential Apartment, 2-Story	Unsurveyed
7200 Tennyson Street	1962	Humble Avenue Capital LLC Property	Multi-Family Residential Apartment, 2-Story	Unsurveyed
7160 Utica Street	1951	Burns/Harris Residence	Single-Family Residence	Unsurveyed
7161 Utica Street	1957	Hahn/Knox Residence	Single-Family Residence	Unsurveyed
7201 Utica Street	1960	BB 6 LLC Property	Single-Family Residence	Unsurveyed
7160 Vrain Street	1953	Fazzi Residence	Single-Family Residence	Unsurveyed
7195 Vrain Street	1957	Hunter Residence	Single-Family Residence	Unsurveyed
7200 Vrain Street	1962	Santitago/Eugenio Residence	Single-Family Residence	Unsurveyed
7201 Vrain Street	1960	Bustillos Residence	Single-Family Residence	Unsurveyed
7193 Winona Court	1956	Gurule Residence	Single-Family Residence	Unsurveyed
7194 Winona Court	1956	2018-1 IH Borrower LP Property	Single-Family Residence	Unsurveyed
7200 Winona Court	1959	Carmona Residence	Single-Family Residence	Unsurveyed
7201 Winona Court	1959	Thomas Residence	Single-Family Residence	Unsurveyed
7191 Wolff Street	1956	Grant Property	Single-Family Residence	Unsurveyed
7192 Wolff Street	1956	Atencio Residence	Single-Family Residence	Unsurveyed
7200 Wolff Street	1962	Investment Corporation Inc. Property	Single-Family Residence	Unsurveyed
7205 Wolff Street	1965	Johnson Residence	Single-Family Residence	Unsurveyed
4911 West 71st Place	1977	Aramayo Residence	Single-Family Residence	Unsurveyed
4921 West 71st Place	1977	Mullins Residence	Single-Family Residence	Unsurveyed
4931 West 71st Place	1977	Piccone Residence	Single-Family Residence	Unsurveyed
4941 West 71st Place	1977	O'Rourke Residence	Single-Family Residence	Unsurveyed

Address/ Location	Year Built	Owner/Property Name	Property Type	Status
4951 West 71st Place	1977	Saynourat Residence	Single-Family Residence	Unsurveyed
4961 West 71st Place	1977	Phantharangsy Residence	Single-Family Residence	Unsurveyed
4971 West 71st Place	1977	Finkiewicz Residence	Single-Family Residence	Unsurveyed
5021 West 71st Place	1978	Hadzic Residence	Single-Family Residence	Unsurveyed
5031 West 71st Place	1978	Miguel Mendoza-Hall Residence	Single-Family Residence	Unsurveyed
5041 West 71st Place	1978	Givens Residence	Single-Family Residence	Unsurveyed
5051 West 71st Place	1978	Sawaqed Residence	Single-Family Residence	Unsurveyed
5061 West 71st Place	1978	Martinez Residence	Single-Family Residence	Unsurveyed
5071 West 71st Place	1978	Albert Residence	Single-Family Residence	Unsurveyed
2387 West 72nd Avenue	1966	Colaflo LLC Property	Commercial Retail Building	Unsurveyed
2735 West 72nd Avenue	1962	Hagos/Gaze Property	Commercial Retail Building	Unsurveyed
2755 West 72nd Avenue	1961	Correa Property	Commercial Restaurant	Unsurveyed
2785 West 72nd Avenue	1962	Villanueva-Macias Property	Automotive Service Garage	Unsurveyed
2827 West 72nd Avenue	1964	Montes Property	Commercial Retail Building	Unsurveyed
2835 West 72nd Avenue	1964	Montes Property	Commercial Restaurant	Unsurveyed
2895 West 72nd Avenue	1961	Montes Property	Commercial Bar/Tavern	Unsurveyed
2935 West 72nd Avenue	1962	Auyeung Property	Automotive Service Garage	Unsurveyed
2955 West 72nd Avenue	1961	Boerstler Farms Property	Automotive Service Garage	Unsurveyed
2957 West 72nd Avenue	1962	Mission Valley Shoppette LLC	Community Center	Unsurveyed
3006 West 72nd Avenue	1972	Baez/Romero Property	Commercial Bar/Tavern	Unsurveyed
3010 West 72nd Avenue	1963	Hondrogiannis Property	Commercial Restaurant	Unsurveyed
3086 West 72nd Avenue	1966	True Property	Office Building	Unsurveyed
3190 West 72nd Avenue	1964	Norman Property	Commercial Restaurant	Unsurveyed
3200 West 72nd Avenue	1963	72nd Corner LLC Property	Office Building	Unsurveyed
3250 West 72nd Avenue	1977	7160 Irving Street LLC Property	Commercial Warehouse	Unsurveyed
3290 West 72nd Avenue	1973	Dollar Tree	Commercial Retail	Unsurveyed
3295 West 72nd Avenue	1975	McDermott Athletic Center (MAC)	Community Center	Unsurveyed
3300 West 72nd Avenue	1974	Citizens Bank	Commercial Bank	Unsurveyed
3305 West 72nd Avenue	ca.1965	3305 West 72nd Avenue LLC	Commercial Gas Station (vacant)	Unsurveyed
3315 West 72nd Avenue	1965	Amalgamated Transit Union Local 1001	Commercial Office Building	Unsurveyed
3380 West 72nd Avenue	1960	Love Property	Commercial Medical Offices	Unsurveyed
3400 West 72nd Avenue	1929	Diverse Blue QOF LLC Property	Single-Family Residence	Unsurveyed

Address/ Location	Year Built	Owner/Property Name	Property Type	Status
3434 West 72nd Avenue	1965	Peerless Tyre Co.	Automotive Service Garage	Unsurveyed
3454 West 72nd Avenue	1976	Robert J. Landgraf Center for Teaching Excellence	Educational Facility	Unsurveyed
3485 West 72nd Avenue	1973	Joshnik Co LLLP Property	Commercial Gas Station	Unsurveyed
3489 West 72nd Avenue	1975	BSF Investment Group LLC Property	Commercial Office Building, 2-Story	Unsurveyed
3580 West 72nd Avenue	1955	Bohan Family Limited Partnership Property	Commercial Office Building	Unsurveyed
3590 West 72nd Avenue	1967	Bohan Property	Automotive Service Garage	Unsurveyed
3686 West 72nd Avenue	1964	Relay Hill A LLC Property	Office Building, Automotive Service Garage	Unsurveyed
3698 West 72nd Avenue	1926/ 1974	Relay Hill A LLC Property	Office Building, Automotive Service Garage	Unsurveyed
3710 West 72nd Avenue	1972	Speedy A LLC Property	Commercial Retail Building	Unsurveyed
3791 West 72nd Avenue	1957	RTF LLC Property	Automotive Service Garage and Car Wash	Unsurveyed
3949 West 72nd Avenue	1964	Dags LLC Property	Automotive Service Garage	Unsurveyed
3959 West 72nd Avenue	1954	Schofield Property	Single-Family Residence	Unsurveyed
4070 West 72nd Avenue	1974	4070 W 72nd LLC Property	Commercial Medical Offices	Unsurveyed
4183 West 72nd Avenue	1973	Orchard Crossing East LLC Property	Multi-Family Residential Apartment Complex	Unsurveyed
4195 West 72nd Avenue	1902	Adams County Housing Authority Property	Single-Family Residence	Unsurveyed
4250 West 72nd Avenue	1962	Alvarez Property	Multi-Family Residential Apartment, 2-Story	Unsurveyed
4280 West 72nd Avenue	1962	Mogo Realty LLC Property	Multi-Family Residential Apartment, 2-Story	Unsurveyed
4330 West 72nd Avenue	1962	Heavey/Latimer Property	Multi-Family Residential Apartment, 2-Story	Unsurveyed
4346 West 72nd Avenue	1964	Nicks Property	Multi-Family Residential Apartment, 1-Story	Unsurveyed
4440 West 72nd Avenue	1973	Wozny Property	Multi-Family Residential Apartment, 2-Story	Unsurveyed
4455 West 72nd Avenue	1962	LM Thomas Family LLC Property	Multi-Family Residential Apartment, 2-Story	Unsurveyed
4499 West 72nd Avenue	1927	Weston Property	Single-Family Residence	Unsurveyed
4544 West 72nd Avenue	1964	Lombardi Property	Residential Duplex	Unsurveyed
7150 Xavier Street	1977	Than Residence	Single-Family Residence	Unsurveyed
7200 Xavier Street	1968	Mandzic Residence	Single-Family Residence	Unsurveyed
7205 Xavier Street	1968	Davis Residence	Single-Family Residence	Unsurveyed
7151 Zenobia Street	1978	Castillo Residence	Single-Family Residence	Unsurveyed

Address/ Location	Year Built	Owner/Property Name	Property Type	Status
7181 Zuni Street	1955	Ramirez Residence	Single-Family Residence	Unsurveyed
Properties Located in Jefferson County				
7162 Ingalls Street	1969	Riggs Residence	Single-Family Residence	Unsurveyed
7163 Ingalls Street	1970	Bahlenhorst Residence	Single-Family Residence	Unsurveyed
7164 Ingalls Street	1969	Slicker Residence	Single-Family Residence	Unsurveyed
7165 Ingalls Street	1969	Gawlik Residence	Single-Family Residence	Unsurveyed
7157 Jay Street	1969	Burciaga Residence	Single-Family Residence	Unsurveyed
7166 Jay Street	1967	Driggers Residence	Single-Family Residence	Unsurveyed
7150 Lamar Street	1968	Montoya Residence	Single-Family Residence	Unsurveyed
7151 Lamar Street	1970	Mackey Residence	Single-Family Residence	Unsurveyed
7152 Marshall Street	1969	Scherer Residence	Single-Family Residence	Unsurveyed
7155 Newland Street	1970	Mandolini Residence	Single-Family Residence	Unsurveyed
7232 NW Eaton Circle	1978	Harris Residence	Single-Family Residence	Unsurveyed
7234 NW Eaton Circle	1978	Evans Residence	Single-Family Residence	Unsurveyed
7236 NW Eaton Circle	1978	Nguyen Residence	Single-Family Residence	Unsurveyed
7238 NW Eaton Circle	1977	Eaton Residence	Single-Family Residence	Unsurveyed
7242 NW Eaton Circle	1978	Gonzalez Residence	Single-Family Residence	Unsurveyed
7244 NW Eaton Circle	1977	Eaton Residence	Single-Family Residence	Unsurveyed
7248 NW Eaton Circle	1977	Jia Residence	Single-Family Residence	Unsurveyed
7259 NW Eaton Circle	1978	Elyashevich Residence	Single-Family Residence	Unsurveyed
7201 Otis Court	1975	Phalen Residence	Single-Family Residence	Unsurveyed
7211 Otis Court	1975	Sawaked Residence	Single-Family Residence	Unsurveyed
7221 Otis Court	1975	Miaskiewicz/Myers Residence	Single-Family Residence	Unsurveyed
7231 Otis Court	1975	Gallo Residence	Single-Family Residence	Unsurveyed
7241 Otis Court	1975	Bautista/Beggs Residence	Single-Family Residence	Unsurveyed
7161 Pierce Street	1969	Lee Residence	Single-Family Residence	Unsurveyed
7285 Pierce Street	1962	North Arvada Middle School	School Facility	Unsurveyed
5619 West 71st Circle	1978	Galkova/Truesdale Residence	Single-Family Residence	Unsurveyed
5631 West 71st Circle	1978	SRP Sub LLC Property	Single-Family Residence	Unsurveyed
5639 West 71st Circle	1978	Diehl Residence	Single-Family Residence	Unsurveyed
5641-5643 West 71st Circle	1975	Mendoza/Bills Property	Residential Duplex	Unsurveyed
5645-5647 West 71st Circle	1975	Vecchiarelli/Jaakkola Property	Residential Duplex	Unsurveyed
5651-5653 West 71st Circle	1975	Grab/Trujillo Property	Residential Duplex	Unsurveyed
5655-5669 West 71st Circle	1975	Hosek/Metzroth Property	Residential Duplex	Unsurveyed
5679 West 71st Circle	1978	Flores Residence	Single-Family Residence	Unsurveyed
5689 West 71st Circle	1978	Harvey Residence	Single-Family Residence	Unsurveyed
5699 West 71st Circle	1978	Goerke Residence	Single-Family Residence	Unsurveyed
6224 West 72nd Avenue	1968	Viburg Residence	Single-Family Residence	Unsurveyed
6244 West 72nd Avenue	1976	Edythbelle/Bettger Residence	Single-Family Residence	Unsurveyed

Address/ Location	Year Built	Owner/Property Name	Property Type	Status
6264 West 72nd Avenue	1970	Duff Residence	Single-Family Residence	Unsurveyed
6314 West 72nd Avenue	1971	Aviado Residence	Single-Family Residence	Unsurveyed
6334 West 72nd Avenue	1968	Neu Residence	Single-Family Residence	Unsurveyed
6354 West 72nd Avenue	1972	Ortivez Residence	Single-Family Residence	Unsurveyed
6524 West 72nd Avenue	1972	Mapes Residence	Single-Family Residence	Unsurveyed
6544 West 72nd Avenue	1963	Steinwagner Residence	Single-Family Residence	Unsurveyed
6664 West 72nd Avenue	1967	Ochoa Residence	Single-Family Residence	Unsurveyed
6724 West 72nd Avenue	1965	Cronce Residence	Single-Family Residence	Unsurveyed
6744 West 72nd Avenue	1963	Biesk Residence	Single-Family Residence	Unsurveyed
6774 West 72nd Avenue	1963	Steinwagner Property	Single-Family Residence	Unsurveyed
6784 West 72nd Avenue	1965	Mendoza Residence	Single-Family Residence	Unsurveyed
5910 West 72nd Drive	1978	Castaneda/Romero Residence	Single-Family Residence	Unsurveyed
5930 West 72nd Drive	1978	McKercher Residence	Single-Family Residence	Unsurveyed
5940 West 72nd Drive	1978	Mancha/Trujillo Residence	Single-Family Residence	Unsurveyed
6680 West 72nd Drive	1978	Doyle Residence	Single-Family Residence	Unsurveyed

Next Steps for Implementation

Who	Potential agency and stakeholder involvement	▪ FHWA / CDOT ▪ Advisory Council on Historic Preservation (ACHP) ▪ SHPO/THPO	▪ USACE ▪ Local municipalities ▪ Public stakeholders
When	Critical schedule considerations	▪ **SHPO/THPO Review**: The SHPO/THPO is granted a 30-day review period for initial agency consultation on determinations of eligibility and proposed project effects. If a project is determined to have an adverse effect to historic resources, the agency begins consultation to seek ways to avoid, minimize, or mitigate adverse effects. Resolving adverse effects can take up to six additional months.	
Why	Regulatory setting and general context	▪ **Colorado State Historic Register Act (CRS) 24-80.1-101 to 24-80.1-108)**: For projects with state funding and no federal nexus, projects are subject to historic review under the Colorado State Historic Register Act, implemented through CRS 24-80.1-101 to 24-80.1-108, including SHPO review. ▪ **Section 106 of the National Historic Preservation Act (NHPA) of 1966**: For projects with a federal nexus, federal agencies must comply with Section 106 of the NHPA of 1966, which requires agencies to consider the effects of their undertakings on historic properties and afford the ACHP a reasonable opportunity to comment. ▪ **Section 4(f) of the Department of Transportation Act of 1966 (DOT Act)**: Includes a special provision stipulating that FHWA/CDOT, Federal Transit Administration, or other operating administrations of the US Department of Transportation (USDOT) cannot approve the use of land from public or private historical sites unless there is no feasible or prudent avoidance alternative to the use or the agency determines that the use will have a de minimis (minimal) impact. ▪ In addition to federal and state laws and regulations, **local jurisdictions** may have ordinances and regulations that must be followed.	

How	NEPA pre-scoping considerations	CDOT evaluates the potential footprint of the alternative for all transportation projects to find ways to avoid, minimize, or mitigate impacts to known historic resources.
Next Steps	Funding, design, construction, and mitigation implications	Design solutions should seek ways to avoid or minimize impacts to historic resources in any way possible. For alternatives with significant impacts, provide a discussion of practicable alternatives or mitigation. Sites identified here as potential historic resources should be evaluated for NRHP eligibility to determine historic status and coordinate with the SHPO.

Figure 2 shows all existing historic resources and potential resources along the West 72nd Avenue corridor study area identified as part of this historic resources analysis. For confidential reasons, any known archaeological resources are not shown on **Figure 2**.

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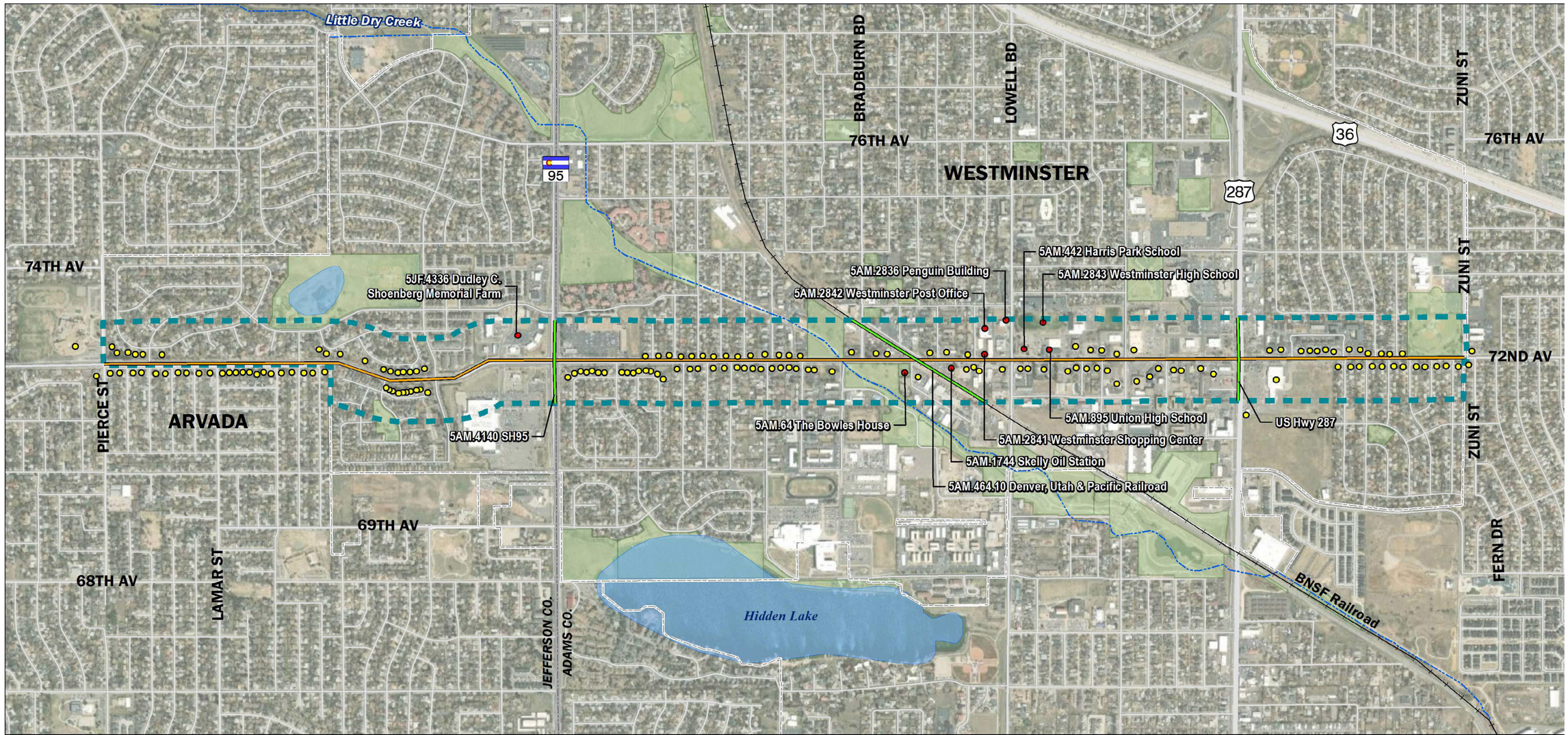
Figure 2. Existing and Potential Historic Resources



Legend

- NRHP Eligible and/or Listed Property
- Potential Historic Property
- NRHP Eligible and/or Listed Roadway
- Potential Historic Roadway
- Railroad
- Stream
- Waterbody
- Parks and Open Space
- Municipality Boundary
- County Boundary
- Environmental Study Area

Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community; SHPO, Compass Database

72nd Avenue Corridor Evaluation

Historic Resources

N

0 0.1 0.2 0.3 Miles

Westminster, Colorado

Environmental Justice

Consideration of low-income, minority, and limited English proficiency (LEP) populations along this corridor is important to stay in compliance with Executive Order 12898 and other federal and state laws and orders with non-discrimination statutes. FHWA and CDOT have established guidelines for identifying these populations, potential impacts, and potential mitigation measures.

The first step in the NEPA process for evaluating Environmental Justice is to define the area of potential impact in the Community Study Area. This area typically includes all communities within and adjacent to the project that may be affected. A community can be chosen from Census tracts, block groups, physical barriers, land-use patterns, political divisions, selected demographic characteristics, historical backgrounds, resident perceptions, and subdivisions and neighborhoods recognized by name and tradition. Census block groups adjacent to the project corridor were selected for the Community Study Area to illustrate the Environmental Justice populations adjacent to the project.

For this evaluation, data from the Denver Regional Council of Governments (DRCOG) Environmental Justice Dataset (2023), using the American Community Survey (ACS) 2017–2021 5-Year Estimates, was used to determine the number and distribution of minority residents and the number and distribution of residents with incomes below poverty levels. **Table 4** summarizes minority and low-income populations in the Community Study Area.

Table 4. Overview of Low-Income and Minority Populations in the Community Study Area

Location	Land Use/Housing	Overall Description
Minority Populations		
Under Executive Order 12898, minority, as it applies to Environmental Justice, is defined as a person who is Black: a person having origins in any of the Black racial groups of Africa; Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture of origin, regardless of race; Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent; American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through tribal affiliation or community recognition; Native Hawaiian or Pacific Islander: people having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.		
CT 102.08 BG 4, CT 102.09 BG 4, CT 102.08 BG 1	Residential medium- to high-density single-family housing, open space/park, church, school, and limited multi-dwelling units and commercial areas.	There are no census block groups with a minority percentage of 30% or greater. Commercial areas are located on the southwest corner of Colorado SH 95 and West 72nd Avenue. Area includes North Arvada Middle School, Red Rocks Church, and Grace Church.
CT 102.09 BG 3	Residential medium- to high-density single-family housing and multi-dwelling unit residential, open space/park, and limited commercial.	This census block group has a minority percentage of 47.63%. Multi-dwelling units and commercial areas lie east of Depew Street, south of 74th Avenue. Faversham Park is also located within the census block group.
CT 96.04 BG 2, CT 96.04 BG 3, CT 96.04 BG 4, CT 96.07 BG 1, CT 96.07 BG 3	Light industrial, mixed-use business district, medium- to high-density residential and multi-dwelling unit residential, commercial, schools, churches, retirement communities, and parks.	These block groups are located between Colorado SH 95 and Lowell Boulevard. The minority percentage in these block groups ranges from 48.51% to 69.1%. This area includes the BNSF Railroad, Westminster High School, San Marino retirement community, and England Park.

Location	Land Use/Housing	Overall Description
CT 96.04 BG 1, CT 96.06 BG 1	Commercial areas, residential medium- to high-density single-family housing and multi-dwelling unit residential, library, schools, parks and recreation areas, and churches.	These block groups are located between Lowell Boulevard and US 287. The minority percentage in these block groups ranges from 31.11% to 51.44%. This area includes the BNSF Railroad, Boys and Girls Club, Baker Elementary School, Irving Street Library, Westminster Municipal Court, Tay Do Asian Grocery, and Clear Creek Care Center.
CT 95.01 BG 1, CT 95.01 BG 2, CT 95.02 BG 1, CT 95.02 BG 2	Residential medium- to high-density single-family housing and multi-dwelling unit residential, open space/park, and limited commercial along US 287, West 72nd Avenue, and Pecos Street.	These block groups are located between US 287 and Pecos Street. The minority percentage in these block groups ranges from 51.4% to 72.78%. This area includes Adams County Fire Station #11, Skyline Vista Park, Orchard Park Academy, and First United Hmong Alliance.
Low-Income Populations		
Under FHWA Order 6640.23A, low-income populations are defined as any readily identifiable group of low-income persons (household income is at or below the Department of Health and Human Services [HHS] poverty guidelines) who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers, or Native Americans) who will be affected by a proposed DOT program, policy, or activity. Low-income for this analysis is defined as a household income at or below 200% of the federal poverty level. In 2021, 200% of the federal poverty level for a family of four was equal to $53,000.		
CT 102.08 BG 4 CT 102.09 BG 4	Residential medium- to high-density single-family housing, tennis courts, church, school, and limited multi-dwelling units.	Both block groups have less than 20% low-income populations. CT 102.08 BG 4 has 17.76% and CT 102.09 BG 4 has 7.27%.
CT 102.09 BG 1 CT 102.09 BG 3	Residential medium- to high-density single-family housing and multi-dwelling unit residential, open space/park, and limited commercial.	CT 102.09 BG 1 has a total of 40.68% low-income, which is designated as an Environmental Justice Zone due to the percentage of people with low-income being 1 standard deviation or more above the regional average.
CT 96.04 BG 2, CT 96.04 BG 3, CT 96.04 BG 4, CT 96.07 BG 1, CT 96.07 BG 3	Light industrial, mixed-use business district, medium- to high-density residential and multi-dwelling unit residential, commercial, schools, churches, retirement communities, and parks.	CT 96.04 BG 3 has a total of 84.15% low-income and CT 96.07 BG 3 has a total of 42.82%, which are both designated as an Environmental Justice Zone due to the percentage of people with low-income being 1 standard deviation or more above the regional average.
CT 96.04 BG 1, CT 96.06 BG 1	Commercial areas, residential medium- to high-density single-family housing and multi-dwelling unit residential, library, schools, parks and recreation areas, and churches.	Both block groups have less than 1 standard deviation above the regional average. CT 96.04 BG 1 has 22.48% and CT 96.06 BG 1 has 16.44%.
CT 95.01 BG 1, CT 95.01 BG 2, CT 95.02 BG 1, CT 95.02 BG 2	Residential medium- to high-density single-family housing and multi-dwelling unit residential, open space/park, and limited commercial along US 287, West 72nd Avenue, and Pecos Street.	CT 95.01 BG 1 has a total of 56.22% low-income and CT 95.02 BG 1 has a total of 39.8%, which are both designated as an Environmental Justice Zone due to the percentage of people with low-income being 1 standard deviation or more above the regional average.

The ACS 2016–2020 5-Year Estimates was used to determine the LEP populations. LEP is defined as individuals who do not speak English as their primary language and have a limited ability to read, write, speak, and understand English. LEP populations are identified to make sure that they can effectively participate in and

benefit from federally assisted projects and that project actions do not violate the Title VI prohibition against national origin discrimination.

USDOT LEP guidance establishes a "safe harbor," regarding the requirement to translate vital documents. The guidance states that LEP individuals must be provided "meaningful access," where oral language services are needed and are reasonable. CDOT provides written translation of vital documents for each eligible LEP language group that constitutes 5 percent or 1,000, whichever is less, of the population of persons eligible to be served or likely to be affected or encountered. If there are fewer than 50 persons in a language group that reaches the 5 percent trigger, vital written materials do not need to be translated. Rather, CDOT staff may provide written notice in the primary language of the LEP group of the right to receive competent oral interpretation of those written materials, free of cost. **Table 5** summarizes LEP populations in the community study area.

Table 5. Overview of LEP Populations in the Community Study Area

Census Block Group	Total Population	Total LEP	Percent LEP
Adams County			
CT 95.01 BG 1	1,289	317	25.86%
CT 95.01 BG 2	1,884	167	10.15%
CT 95.02 BG 1	1,277	259	20.65%
CT 95.02 BG 2	1,873	128	7.22%
CT 96.04 BG 1	1,158	37	3.32%
CT 96.04 BG 2	1,368	75	5.9%
CT 96.04 BG 3	6,18	98	17.07%
CT 96.04 BG 4	1,002	93	10.06%
CT 96.06 BG 1	1,503	162	11.38%
CT 96.07 BG 1	1,405	93	7.88%
CT 96.07 BG 3	1,648	304	20.19%
Jefferson County			
CT 102.08 BG 1	1,799	59	3.46%
CT 102.08 BG 4	865	58	7.44%
CT 102.09 BG 3	2,727	243	9.13%
CT 102.09 BG 4	1,207	141	12.53%

DRCOG has also created a dataset to display the Disproportionately Impacted Communities as defined by the Environmental Justice Act (HB21-1266) within the state of Colorado. This dataset includes census block groups where greater than 40 percent of households are (1) low-income, (2) housing cost-burdened, or (3) include people of color (minority). **Table 6** summarizes disproportionately impacted communities within the Community Study Area.

Table 6. Overview of Disproportionately Impacted Communities

Census Block Group	Total Population	% People of Color	% Low-Income	% Housing Cost-Burdened	Disproportionately Impacted Community
Adams County					
CT 95.01 BG 1	1,078	62.43	56.22	49.55	Low-Income, People of Color, Housing Cost-Burdened
CT 95.01 BG 2	2,011	54.1	14.73	48.17	People of Color, Housing Cost-Burdened
CT 95.02 BG 1	1,128	72.78	39.8	40.18	People of Color, Housing Cost-Burdened
CT 95.02 BG 2	1,904	71.8	34.93	41.21	People of Color, Housing Cost-Burdened
CT 96.04 BG 1	1,048	31.11	22.48	31.35	None
CT 96.04 BG 2	1,472	61.75	34.78	41.97	People of Color, Housing Cost-Burdened
CT 96.04 BG 3	738	48.51	84.15	50.61	Low-Income, People of Color, Housing Cost-Burdened
CT 96.04 BG 4	1,142	51.93	12.22	31.91	People of Color
CT 96.06 BG 1	1,320	51.44	16.44	53.61	People of Color, Housing Cost-Burdened
CT 96.07 BG 1	1,434	50	26.29	38.6	People of Color
CT 96.07 BG 3	1,534	69.1	42.82	64.41	Low-Income, People of Color, Housing Cost-Burdened
Jefferson County					
CT 102.08 BG 1	2,065	16.17	40.68	37.6	Low-Income
CT 102.08 BG 4	929	14.53	17.76	39.77	None
CT 102.09 BG 3	2,534	47.63	37.21	47.85	People of Color, Housing Cost-Burdened
CT 102.09 BG 4	1,196	10.79	7.27	11.62	None

Next Steps for Implementation

Who	Potential agency and stakeholder involvement	▪ FHWA ▪ CDOT ▪ Adams County	▪ Jefferson County ▪ City of Arvada ▪ City of Westminster	▪ Housing and Urban Development ▪ General public
When	Critical schedule considerations	Outreach to low-income, minority, and LEP populations should occur early to avoid schedule impacts because input from these populations could influence alternative and impact analyses.		
Why	Regulatory setting and general context	▪ **Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations**: CDOT is required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. ▪ **Title VI of the Civil Rights Act** prohibits recipients of federal financial assistance from discriminating based on race, color, or national origin in their programs or activities. ▪ **Executive Order 13166**: Requires federal agencies to provide services so that LEP persons will have meaningful access to those services. ▪ **FHWA Order 6640.23A, FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations**: Establishes policies and procedures for FHWA to use in complying with Executive Order 12898.		

		▪ **USDOT Order 5610.2, Order to Address Environmental Justice in Minority Populations and Low-Income Populations**: CDOT must consider Environmental Justice principles in all (USDOT) programs, policies, and activities and describe steps to prevent and address disproportionately high and adverse effects to minority or low-income populations. ▪ **Senate Bill 260 (SB21-260)**: Section 28 requires CDOT's Environmental Justice and equity branch to identify and address technological, language, and information barriers that may prevent disproportionately impacted communities from participating fully in transportation decisions that affect health, quality of life, and access for disadvantaged and minority businesses in project delivery. ▪ **Environmental Justice Act (HB21-1266)**: Includes important provisions to redress the effects of environmental injustice on disproportionately impacted communities, reduce climate pollution across several large sources of emissions, and create a new source of funding for implementing climate rules.
How	NEPA pre-scoping considerations	Under the NEPA process, the collection and evaluation of minority, low-income, and LEP populations is usually structured as a four-step process: 1. Define the area of potential impact (i.e., Community Study Area). 2. Identify minority, low-income, LEP populations within the Community Study Area, as well as disproportionately impacted communities. 3. Evaluate impacts/benefits to determine if there are any adverse and disproportionate impacts on the population and identify benefits. 4. Identify mitigation (if needed) and any need for specialized outreach.
Next Steps	Funding, design, construction, and mitigation implications	It is important to identify low-income, minority, and LEP populations, as well as any disproportionately impacted communities, early so that these populations can become involved and have a meaningful opportunity to participate during every project phase. Specialized outreach may be necessary based on the extent of anticipated impacts and stakeholder concerns. In addition, the project team will need to determine whether language assistance measures are needed to ensure meaningful access to the process. Consideration of businesses and community facilities important to low-income, minority, and LEP populations is also critical.

Figure 3 identifies locations with higher concentrations of low-income, minority, and LEP populations, as well as disproportionately impacted communities. As illustrated, portions of the Community Study Area include higher concentrations of these populations and may require specific outreach for future projects along West 72nd Avenue.

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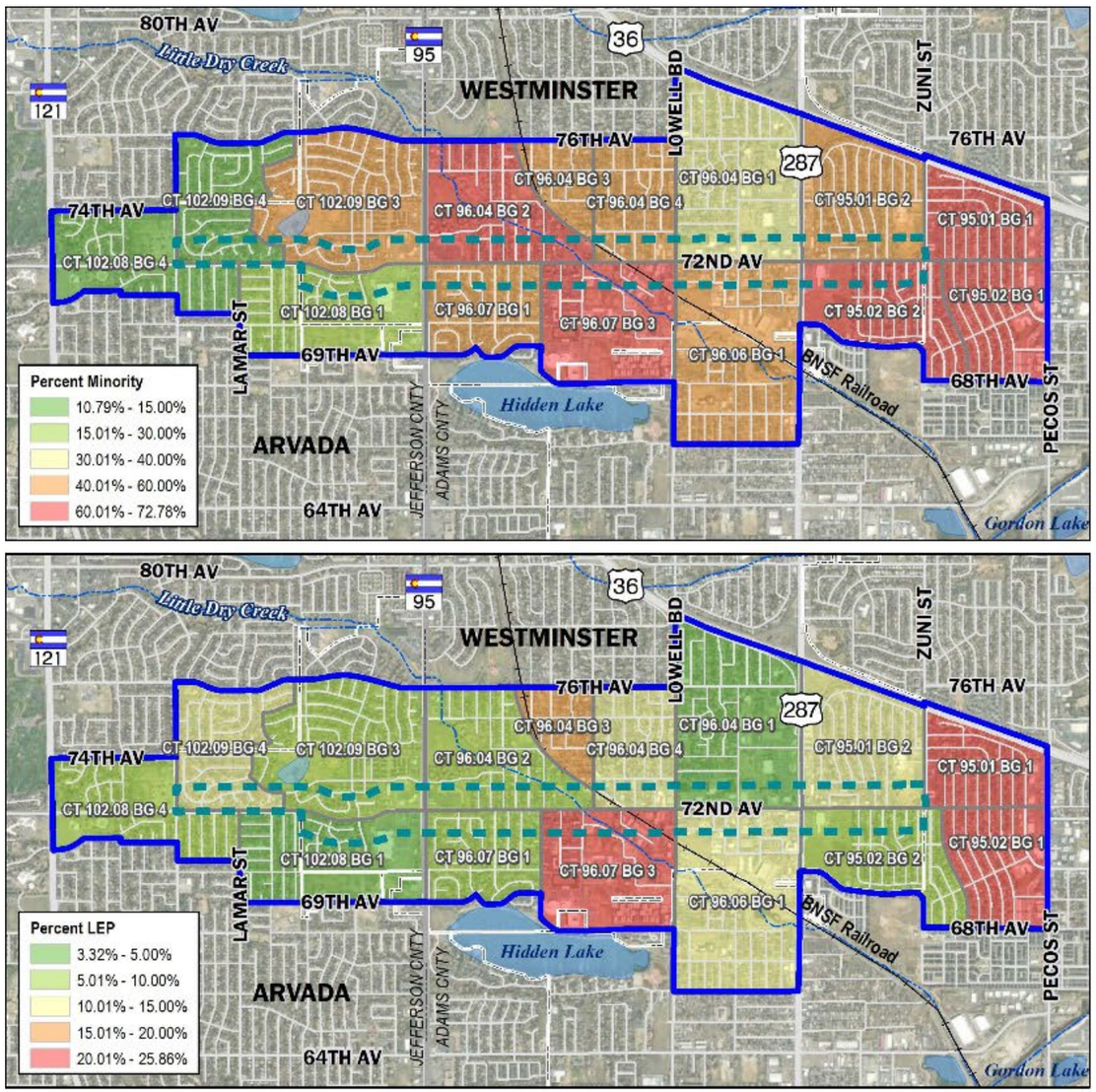
Figure 3. Environmental Justice Populations



Parks, Open Spaces, Trails, Recreational Resources and Section 6(f)

Publicly owned parks and trails warrant Section 4(f) consideration during federally funded projects. Section 6(f) protections apply to lands or facilities developed or purchased using Land and Water Conservation Funds (LWCF) through the National Park Service and CPW. Section 4(f) resources may include publicly owned parks, recreational areas, open space areas, and wildlife/waterfowl refuges. These resources must have a recreational use. Section 6(f) resource regulations apply when state and local governments obtain grants through LWCF to develop or make improvements to parks and outdoor recreation areas. **Table 7** lists existing parks and trails locations within the environmental study area, including LWCF status. The environmental study area does not include wildlife or have waterfowl refuges.

An evaluation is required to determine whether a publicly owned park, recreation area, or wildlife/waterfowl refuge is determined to be significant. If the resource is determined to be significant, a "use" of the Section 4(f) resource may occur. A use occurs when (1) land is permanently incorporated into a transportation project; (2) when there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or (3) when there is a constructive use.

Table 7. Parks and Trails Resources

Resource Name	LWCF	Resource Description
Parks		
Faversham Park and Tepper Fields	No	Neighborhood Park: Located north of West 73rd Avenue, west of Depew Street. Several amenities including basketball court, four (4) softball fields, playground, fishing pond, multiuse field, trail, and picnic facilities.
Local Park (Eaton Street)	No	Neighborhood Park: Northwest corner of 71st Place and Eaton Street in the Patio neighborhood.
Future Park Site	No	Proposed Park: Northwest corner of West 72nd Avenue and Bradburn Boulevard in the Quimby's neighborhood.
England Park	No	Community Park: South of West 72nd Avenue between Raleigh Street and Newton Street. Includes basketball court, picnic facilities, Little Dry Creek Trail, playground, baseball/softball field, and multiuse turf field.
Skyline Vista Park	No	Community Park: Northwest corner of West 72nd Avenue and Zuni Street. An open park with facilities for softball, volleyball & skating, plus a play area & picnic shelter.
Trails		
Faversham Park Trail	No	Local Trail: This trail is a 0.6-mile loop trail around Lake Faversham at Faversham Park.
West 72nd Avenue Trail	No	Local Trail: Parallels West 72nd Avenue on both sides. The sidewalk on both sides connects to the Sheridan Boulevard Trail and Sheridan Boulevard.
Sheridan Boulevard Trail	No	Local Trail: The sidewalk parallels Sheridan Boulevard on both sides and connects to Little Dry Creek Open Space north of West 72nd Avenue and Hidden Lake Open Space south of West 72nd Avenue.
Little Dry Creek Trail	No	Regional Trail: Parallels creek within Little Dry Creek Greenway and crosses West 72nd Avenue near Bradburn Boulevard.
Bradburn Boulevard Trail	No	Local Trail: The sidewalk parallels Bradburn Boulevard and connects to West 72nd Avenue at Bradburn Boulevard.
Lowell Boulevard Trail	No	Local Trail: The sidewalk parallels Lowell Boulevard and crosses West 72nd Avenue at Lowell Boulevard and connects to Little Dry Creek Open Space.
Wildlife and Waterfowl Refuges		
There are no designated wildlife or waterfowl refuges in the corridor or Section 4(f) properties.		

Next Steps for Implementation

Who	Potential agency and stakeholder involvement	▪ FHWA ▪ CDOT ▪ City of Westminster	▪ Jefferson and Adams Counties ▪ National Park Service ▪ CPW
When	Critical schedule considerations	The Section 4(f) evaluations and a determination of use should be initiated during the initial development of alternatives for the Proposed Action. Coordination with FHWA, CDOT, and the official with jurisdiction over the Section 4(f) resource may be required. An individual Section 4(f) approval could take up to a year or more to process.	
Why	Regulatory setting and general context	The **DOT Act of 1966** includes a special provision, Section 4(f), stipulating that FHWA and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply: ▪ There is no feasible and prudent avoidance alternative to the use of land; and the action includes all possible planning to minimize harm to the property resulting from such use; OR ▪ The Administration determines that the use of the property will have a de minimis impact. Recreational resources developed with federal funding through LWCF are protected under Section 6(f) of the Land and Water Conservation Act, which prohibits conversion of these properties to anything other than public outdoor recreation uses.	
How	NEPA pre-scoping considerations	Regardless of whether a project uses federal funding, if a Proposed Action would affect a Section 6(f) site, then a Section 6(f) evaluation may be required. Section 6(f) prohibits conversion of property acquired or developed with these grants to a non-recreational purpose without approval of the National Park Service. Section 4(f) and Section 6(f) evaluations include collection and analysis of baseline information and alternatives, coordination with the resource owner and/or agencies, supporting documentation, and public involvement.	
Next Steps	Funding, design, construction implications	When Section 4(f) and Section 6(f) evaluations are necessary, adequate time must be incorporated into the design schedule to avoid construction delays. Design modifications and/or mitigation considerations may be necessary in the Section 4(f) process. If a Section 6(f) conversion of land is necessary, CDOT must replace the land. The local agency, CPW, and National Park Service must approve the replacement land. Typically, replacement occurs at a one-to-one ratio.	

Figure 4 shows existing parks and trails within the environmental study area and adjacent communities and highlights resources with LWCF.

Figure 4. Park and Trail Resources

Traffic Noise

Consideration of traffic noise along this corridor is important because many nearby properties have noise-sensitive activities. Noise is generally defined as unwanted or excessive sound. FHWA established a national standard, and both FHWA and CDOT have established related guidelines for evaluating noise levels, potential impacts, and potential abatement measures. Noise analyses must be performed on Type I projects if noise-sensitive receptors are present within the noise study zone. Type I projects include increasing the number of through traffic lanes or significantly changing the horizontal or vertical position of a road. **Table 8** summarizes existing noise-sensitive areas in the project area.

Table 8. CDOT Noise Abatement Criteria and Noise-Sensitive Areas

Location	Noise-Sensitive Area Summaries	Potential Noise Impact and Abatement Evaluation Areas
Land Use Category B – 66 dBA Exterior (Leq(h))		
Residential		
Pierce Street to Sheridan Boulevard	Single-family homes are along this segment west of Depew Street. Multi-family homes are at the northeast corner of Depew Street and West 72nd Avenue.	Existing noise barriers are already constructed along West 72nd Avenue for residences. Additional noise abatement is not likely to be recommended.
Sheridan Boulevard to Federal Boulevard	Primarily single-family homes with some multi-family homes west of Raleigh Street. Scattered mixed-density housing from Raleigh Street to Federal Boulevard.	Residences adjacent to West 72nd Avenue where existing noise barriers are not present. Residences along Lowell Boulevard.
Federal Boulevard to Zuni Street	Single-family and multi-family homes are present along this segment of the West 72nd Avenue corridor.	Residences adjacent to West 72nd Avenue where existing noise barriers are not present.
Land Use Category C – 66 dBA Exterior (Leq(h))		
Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.		
Pierce Street to Sheridan Boulevard	Faversham Park, a residential playground, and park benches at the southwest corner of West 72nd Avenue and Sheridan Boulevard.	Park benches at the southwest corner of West 72nd Avenue and Sheridan Boulevard.
Sheridan Boulevard to Federal Boulevard	Schools and sporting areas from Lowell Boulevard to Irving Street. Trail along Little Dry Creek.	Schools and sporting areas adjacent to West 72nd Avenue, Lowell Boulevard, or Irving Street. Trail along Little Dry Creek.
Federal Boulevard to Zuni Street	Orchard Park trails, baseball fields, and sporting areas.	Orchard Park trails and baseball fields.
Land Use Category E – 71 dBA Exterior (Leq(h))		
Hotels, motels, time-share resorts, vacation rental properties, offices, restaurants/bars, and other developed lands, properties or activities not included in Categories A–D or F.		
Pierce Street to Zuni Street	Restaurants with patios scattered along the corridor. Bowles House museum. Westminster greenhouse patio.	Restaurants with patios west of Sheridan Boulevard and from Hooker Street to Canosa Street and the Bowles House museum.

Location	Noise-Sensitive Area Summaries	Potential Noise Impact and Abatement Evaluation Areas

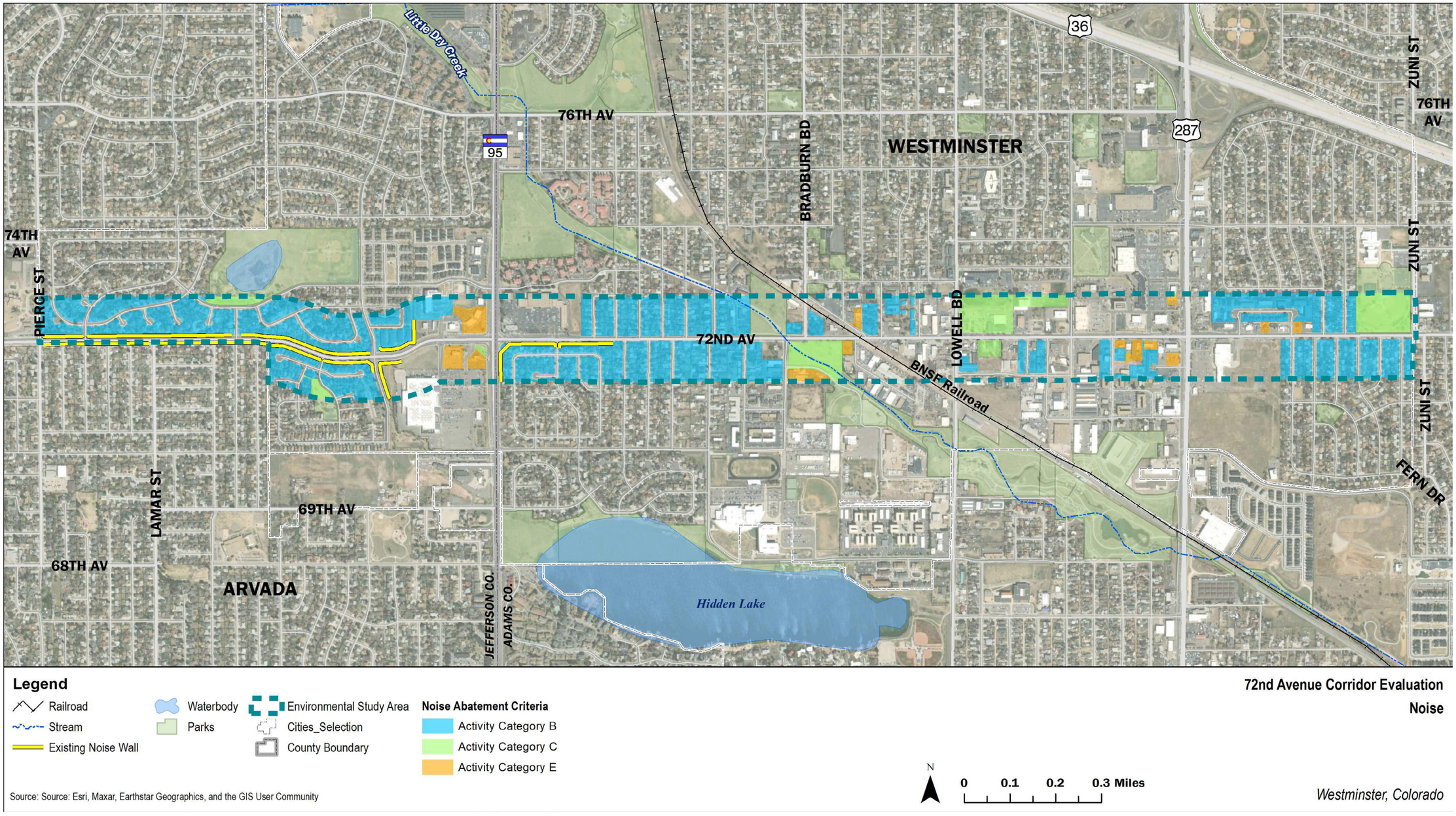
Notes:
The following land use categories are excluded from this table: A (serene lands), D (interior public spaces), F (agricultural and industrial lands), and G (lands not permitted for development).
dBA = A-weighted decibels
Leq(h) = one-hour equivalent sound level

Next Steps for Implementation

Who	Potential agency and stakeholder involvement	▪ FHWA ▪ CDOT	▪ Local governments and agencies ▪ Local property owners and tenants
When	Critical schedule considerations	Noise evaluations should be performed once: ▪ Proposed improvements for project alternatives have been identified ▪ Traffic projections are available	
Why	Regulatory setting and general context	▪ **23 CFR Part 772: Procedures for Abatement of Highway Traffic Noise and Construction Noise** identifies the federal highway noise standard that must be followed in evaluating and abating highway traffic noise pertaining to FHWA projects. This regulation required states to prepare and adopt state-specific noise guidelines. ▪ **CDOT Noise Analysis and Abatement Guidelines** provide the Colorado procedural and technical requirements for evaluating highway project traffic noise and considering noise mitigation actions where noise impacts are identified. The goal of these guidelines is to develop highway projects in a compatible relationship with noise-sensitive land uses.	
How	NEPA pre-scoping considerations	Noise evaluation is conducted for Type I projects to determine if traffic noise would have an impact on any receptors (e.g., homes, schools, parks, patios; either existing or permitted for development). "Impact" is defined as meeting or exceeding Noise Abatement Criteria or an increase in noise of at least 10 decibels. Receptors are typically identified as exterior areas of frequent human use. Other Type III projects do not require noise analysis. The evaluation includes identifying land uses and receptors, measuring and modeling existing traffic noise levels, modeling future traffic noise levels, determining future traffic noise impacts, and (if needed) identifying/evaluating abatement measures. For FHWA/CDOT to recommend noise abatement, the mitigation must be shown to be feasible and reasonable.	
Next Steps	Funding, design, construction, and mitigation implications	A traffic noise impact and abatement analysis will be considered through NEPA. If prospective noise abatement appears likely, the Benefited Receptor Preferences Survey can be completed after the Final Office Review but during the NEPA process (for Categorical Exclusions) or during final design for Environmental Assessments or Environmental Impact Statements. If all of the Noise Abatement Criteria are found to be feasible and reasonable, then the project becomes committed to constructing and funding those abatement measure(s). Noise walls may cost about $2 million per mile. The likelihood for abatement to be feasible and reasonable increases with a higher density of impacted receptors.	

Figure 5 highlights noise sensitive areas and existing noise abatement within the environmental study area. During NEPA analysis, the minimum noise study zone would include a 300-foot area in all directions from the proposed edge of travelled lanes throughout the extent of the project. For noise evaluations, the study zone may be expanded if warranted.

Figure 5. Noise Sensitive Areas



Visual Resources

The characterization of visual resources for the West 72nd Avenue corridor focuses on the visual character of corridor streetscapes, and visual compatibility with goals and policies in the City of Westminster 2040 Comprehensive Plan. This approach is intended to identify the variable conditions of corridor streetscapes in context to planning goals and establish a framework for visual resource assessments in future project implementation phases.

The late nineteenth century to early-to-mid-twentieth century corridor transportation network, community residences, schools, city buildings, farms, service stations, and shops define a distinctive "historic sense of place." In contrast, contemporary commercial centers, residential development, and corridor streetscapes create the image of an "area of change."

The following project planning goals and themes capture the context and distinct identity of the corridor:

- The West 72nd Avenue (also known as Wyoming Street) corridor is a unique 3-mile section of the City of Westminster that boasts a long history and has the potential to be a defining community connector.
- West 72nd Avenue is at the heart of the historic Westminster community, as it falls within the original boundary of Harris Park (later incorporated into the Town of Westminster) and is one of the City's first transportation corridors.
- The corridor spans historic areas and some of the most diverse areas of the city.
- West 72nd Avenue is characterized by numerous land uses, including a mix of commercial and retail spaces, schools, community destinations, underused parking lots, and residential areas.

The West 72nd Avenue Historic and Archaeological section provides site descriptions and mapping of historic resources, including several NRHP Eligible and/or Listed properties, as well as many unsurveyed sites.

Table 9 lists visual resource-related goals and policies for corridor gateways, streetscapes, public art, and aesthetics from sections of the Westminster Comprehensive Plan.

Table 9. Goals and Policies for Visual Resources

Section 4.0 Transportation, Mobility, and Connections (TM)
Thrive
Goal TM-2: Support the community's economic resilience, environment, public health, and quality of life for all community members.
2.4 Create a strong sense of entry into and passage through the city at key locations and along key corridors identified on **Map 7-1**.
2.5 Develop and maintain enhanced, cohesive streetscaping along major corridors, with consideration of the visual and physical character.
Map 4-1 Westminster's Master Street Network (West 72nd Avenue—Major Arterial)
Map 4-2 Bicycle Network and Improvements (West 72nd Avenue—Multiuse Sidepath)
Map 4-3 Priority Transit Corridors for Stop and Station Enhancements (72nd Westminster Station)
Section 5.0 Health, Wellness, and Community Services (HWS)
Arts and Culture
Goal HWS-5: Reflect the diversity of the community through public art and cultural programming.
5.1 Encourage the appropriate placement of public art, in key public locations, including plazas, gateways into the city, streetscapes, and individual developments.
5.2 Integrate public art and visually distinct designs into infrastructure that visually connect with nearby districts or neighborhoods.

Section 7.0 Housing and Neighborhoods (HN)
Established gateways and vibrant streetscapes can provide a clear and welcoming entry into the community by reflecting shared values and civic pride. The preservation of scenic views, as well as cultural and historical landmarks, add to a community's collective sense of history and character.
Streetscape and Public Realm
Goal HN-5: Maintain and enhance Westminster's positive image and character through attractive streetscapes.
5.1 Continue to develop and support enhanced streetscape, development continuity, and revitalization of key commercial corridors.
5.2 Improve the visual and physical character of residential corridors throughout the city, to include provisions to support multimodal transportation.
5.3 Create a strong sense of entry into and passage through the city at key locations, identified on **Map 7-2**, through gateway elements, streetscape enhancements, development scale and orientation, lighting, signage, and public art.
Views
Goal HN-6: Preserve views to the mountains, natural amenities, and scenic skylines from the public realm.
6.1 Maintain scenic vistas from rights of way, public facilities and public lands to Open Space, the mountains, Downtown Denver, and the Front Range area, as shown on **Map 7-2**.
Community Heritage
Goal HN-7: Identify, recognize, and protect Westminster's unique and irreplaceable historic and cultural heritage and diversity.
7.1 Protect historic and cultural resources for the aesthetic, cultural, educational, environmental, and economic contribution they make to maintaining and building Westminster's identity and quality of life.
Map 7-1. City Structure
▪ West 72nd Avenue: Multimodal Corridor
▪ Elements Adjacent to 72nd Avenue:
▪ Suburban
▪ Mixed-use Neighborhood
▪ Specific Area Plan
▪ Parks and Open Space
▪ Specific Area Plan
Map 7-2. Viewshed, Gateways, and Historic Context
▪ Adjacent to West 72nd Avenue:
▪ National Register of Historic Places
▪ Parks and Open Space
▪ Primary Views (south from Westminster Station)

Section 8.0 Community Places	
8.1 Focus and Transition Areas	
Westminster Station Transition Area	North side of West 72nd Avenue: Federal Boulevard to Bradburn/BNSF South side: Zuni Street to BNSF
Westminster Station Focus Area	South side of West 72nd Avenue: Federal Boulevard to Lowell Blvd
Harris Park Community Vision Plan	North side of West 72nd Avenue: Irving Street to England Park South side of West 72nd Avenue: Lowell Boulevard to BNSF

Source: City of Westminster Comprehensive Plan, February 2023

Criteria to evaluate the visual compatibility of corridor streetscapes with planning goals and policies include:

- **Intactness**: The integrity and condition of the corridor streetscapes
- **Unity**: Visual continuity of streetscapes with West 72nd Avenue travel lanes and adjacent development patterns

- **Focal Points**: Distinctive features that attract attention and leave a memorable impression or sense of place
- **Visual Compatibility**: Visually intact and unified streetscape conditions
- **Visual Incompatibility**: Visually contrasting streetscape conditions
- **Mixed Compatibility**: Variable or moderately contrasting streetscape conditions

The characterization of corridor streetscapes and viewsheds is organized into a sequence of eight segments (A–H) between Zuni Street and Pierce Street, as highlighted on **Figure 6**.

Segments A–E (Zuni Street to Stuart Street)

Visual Compatibility: Local patterns of West 72nd Avenue streetscape compatibility between Zuni Street and Stuart Street are the most variable in the corridor, with contrasting patterns of compatible, mixed, and incompatible streetscape conditions.

Gateways: The West 72nd Avenue and Zuni Street intersection is a recognized corridor gateway in the Westminster 2040 Plan, as shown on **Figure 6** and in **Table 10**. The West 72nd Avenue and Federal Boulevard intersection creates a gateway into visually harmonious streetscape and development patterns.

Focal Points: Historic properties between Irving Street and BNSF are visual points of interest and create a concentrated sense of place within the corridor, including:

- 1 – Harris Park School
- 2 – Union High School
- 3 and 4 – Westminster Shopping Center and Westminster Post Office
- 5 – Skelly Oil Station
- 6 – Bowles House

Parks and Open Space: The West 72nd Avenue corridor is unified with England Park, and local gateway walls and columns create a focal point at the Little Dry Creek stream crossing.

Segment F (Stuart Street to Sheridan Boulevard)

Visual Compatibility: The corridor streetscape between Stuart Street and Sheridan Boulevard represents contrasting compatibility, with:

- Visually incompatible sections west of Stuart Street to Wolf Street, continuing along the north side to near Yates Street, and
- Visually compatible sections along the walled section along the south side of West 72nd Avenue between Wolf Street and Sheridan Boulevard, and the shopping center gateway at West 72nd Avenue and Sheridan Boulevard intersection.

Focal Point: The Shoenberg Farm at West 73rd Avenue and Sheridan Boulevard is a historic landmark.

Segment G (Sheridan Boulevard to Depew Street)

Visual Compatibility: The West 72nd Avenue treelined streetscape is unified with the shopping center between Sheridan Boulevard and Depew Street.

Segment H (Depew Street to Pierce Street)

Visual Compatibility: West 72nd Avenue is enclosed by brick walls with street tree-lined sections, creating a unified streetscape.

Table 10 provides representative photographs along the corridor.

Table 10. Corridor Photographs

West 72nd Avenue & Zuni Street: Skyline Vista Park – Westminster Gateway

West 72nd Avenue & Zuni Street – View to the West

West 72nd Avenue & Beach Street – View to the West

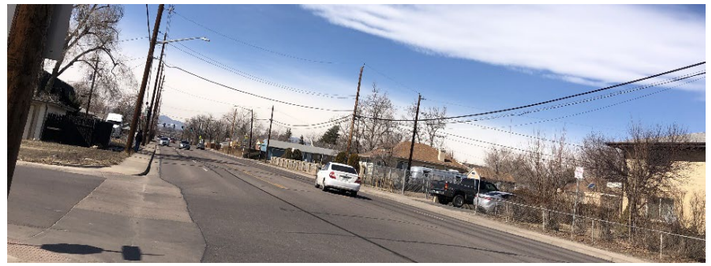
West 72nd Avenue & Clay Street – View to the West

Union High School

Harris Park School

West 72nd Avenue – Bowles House – View to the South

Little Dry Creek Bridge



West 72nd Avenue & Tennyson Street – View to the West

West 72nd Avenue & Sheridan Boulevard – View to the East

West 72nd Avenue & Depew Street – View to the West

West 72nd Avenue & Pierce Street – View to the East

Table 11 summarizes the visual compatibility of corridor streetscapes. The inventory and visual compatibility characterizations are based on field observations and interpretations in context to the City's vision and goals for visual resources. The inventory mapping also includes the presence of street-edge walls, historic property focal points, and intersection gateways. The Front Range foothills are partially visible to westbound travelers along the corridor between Zuni Street and Sheridan Boulevard.

Table 11. Visual Resource Characteristics

72nd Avenue Corridor Segments	Streetscape Compatibility	Walls	Focal Points & Gateways	72nd Avenue Streetscape Compatibility Summary
A. Zuni St to Federal				
Zuni St – Beach St (north)			72nd & Zuni	*Intact & unified gateway image*
Zuni St – Beach St (south)				Partially intact Streetscape
Beach St to Clay St (north)				Partially intact Streetscape
Beach St to Clay St (south)				*Intact & unified streetscape*
Clay St to Federal (sequence)				*Visually intact at 72nd & Federal*
B. Federal to Irving St				
North Side of 72 Ave (sequence)			72nd & Federal	*Variable intactness & unity – Compatible at 72nd Ave gateway*
South side of 72 Ave (sequence)				
C. Irving St to Lowell Blvd				
North Side of 72 Ave (sequence)				*Variable intactness & unity – historic context*
South side of 72 Ave (sequence)				
D. Lowell Blvd to BNSF				
North Side of 72 Ave				*Lacking intactness or unity – Historic context*
South side of 72 Ave				
E. BNSF to Stuart St				
North Side of 72 Ave (sequence)				*Partially intact – Aesthetic wall*
South side of 72 Ave				*Intact & unified – Aesthetic wall*
F. Stuart St to Sheridan				
Stuart St to Yates St (north)			72nd & Sheridan	*Partially intact streetscape*
Stuart St to Wolf St (south)				
Yates St to 95 (north)				*Intact & unified gateway image w/aesthetic wall on south side*
Wolf St to 95 (south)				
G. Sheridan to Depew St				
North Side of 72 Ave			72nd & Sheridan	*Intact & unified gateway image – Historic context at 73rd*
South side of 72 Ave				
H. Depew St to Pierce St				
North Side of 72 Ave				*Intact & unified streetscapes – aesthetic walls*
South side of 72 Ave				

Legend: Compatibility of 72nd Avenue Streetscapes with Westminster Comprehensive Plan Goals & Policies

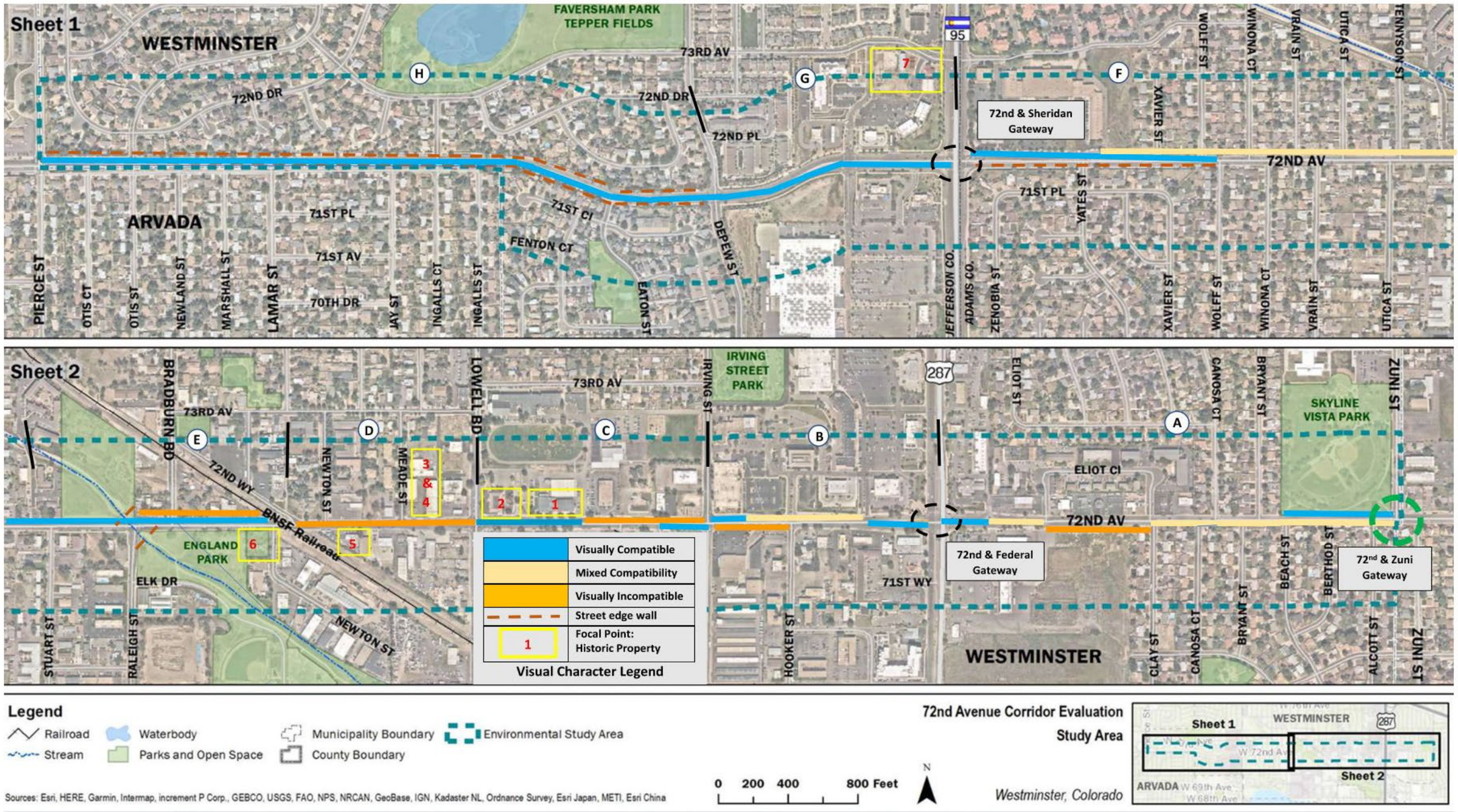
Compatible | Mixed Compatibility | Incompatible

Next Steps for Implementation

Who	Agency and stakeholder involvement	▪ Westminster ▪ CDOT ▪ Adams County	▪ Regional Transportation District ▪ Jefferson County ▪ Community stakeholders
When	Critical schedule considerations	None associated with visual resources	
Why	Regulatory setting and general context	▪ CDOT Visual Impact Assessment (VIA) Guidelines (CDOT, 2020) ▪ Applying the City of Westminster Comprehensive Plan goals and policies related to visual resources, aesthetic design, and gateway image ▪ Coordination with Section 4(f) and Section 106 resources	
How	NEPA pre-scoping considerations	▪ CDOT Visual Impact Assessment (VIA) scoping process provides a framework for establishing the environmental study area, appropriate level of study, and NEPA documentation. ▪ CDOT's VIA process includes four steps: Establishment, Inventory, Analysis, and Mitigation.	
Next Steps	Funding, design, construction, and mitigation implications	The role of visual mitigation in the NEPA and design process includes: ▪ Developing measures to avoid or minimize visual contrast of transportation improvements ▪ Conforming to local agency aesthetic design and visual management guidelines ▪ Establishing project design guidelines to achieve visual compatibility and continuity with landscape settings and viewsheds ▪ Creating opportunities for establishing context sensitive gateway images and coordinating with local planning goals for aesthetic improvements	

Figure 6 highlights the visual compatibility of streetscapes, street-edge walls, historic property focal points, and intersection gateways.

Figure 6. Visual Character



Hazardous Materials

The acquisition of property for ROW requires the evaluation of hazardous material concerns to protect worker health and safety, to provide liability due diligence for the purchasing entity, and to improve project alternatives analysis based on potential hazardous material impacts. Hazardous materials include substances or materials that the Environmental Protection Agency (EPA) has determined to be capable of posing an unreasonable risk to health, safety, or property. Hazardous materials may exist within the environmental study area at facilities that generate, store, or dispose of these substances, or at locations of past releases of these substances. Hazardous materials include asbestos, lead-based paint, heavy metals, dry cleaning solvents, and petroleum hydrocarbons (such as gasoline and diesel fuel), all of which could be harmful to human health and the environment.

Hazardous materials are regulated by various state and federal regulations. NEPA, as amended (42 US Code [USC] 4321 et seq., Public Law 91-190, 83 Stat. 852), mandates that decisions involving federal funds and approvals consider environmental effects from hazardous materials. Other applicable regulations include the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC 9601 et seq.), which provides federal authority for the identification, investigation, and cleanup of sites throughout the United States that are contaminated with hazardous substances (as specifically designated in the CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC 321 et seq.), which establishes a framework for the management of both solid and hazardous waste. The federal Hazardous and Solid Waste Amendments of 1984 established a new comprehensive regulatory program for underground storage tanks (USTs) containing petroleum products and hazardous chemicals regulated under CERCLA. In 2016, EPA retired the CERCLA Information System database, replacing it with a more modern system called the Superfund Enterprise Management System (SEMS).

Sites historically known to have released regulated materials into the ground (i.e., soil), groundwater, or surface water are typically automotive fueling stations, automotive sales/service stations, and dry cleaning facilities. Facilities that likely use petroleum products and/or hazardous materials daily are also considered properties with a high contamination potential.

UST site along the 72nd Avenue corridor

The environmental study area is developed with a mix of commercial, residential, and recreational development, as well as undeveloped property. Facilities that use hazardous materials are dispersed throughout the environmental study area. Most facilities identified in the environmental records search have been identified in the UST, leaking underground storage tank (LST), LUST TRUST and voluntary cleanup and redevelopment program (VCP) databases. UST and LST sites are typically associated with petroleum hydrocarbon use (e.g., automotive fueling stations) and potential releases.

Hazardous materials may exist along the West 72nd Avenue study corridor at facilities that generate, store, or dispose of these substances, or at locations of past releases of these substances. An environmental database records search conducted for the environmental study area (ERIS, 2023) was completed in accordance with the search radii specified in ASTM International (ASTM) Designation E 1527-21, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" (ASTM, 2021). For this assessment, ASTM-required databases with respect to the status of the listing and its location within the environmental study area boundaries were evaluated; non-ASTM required databases were not evaluated or listed within the results. Numerous facilities were identified in the environmental study area and several of

these facilities were identified with multiple database listings (ERIS, 2023). Generally, if a facility identified in the records database report is active with an event that had the potential to contaminate the environmental study area, or groundwater flow could cause migration of the contaminants into the environmental study area, then the facility may be considered to be a potential impact.

Summary of Hazardous Material Sites and Concerns

Figure 7 identifies the following sites with potential and hazardous materials concerns in the environmental study area:

- Fifty-two (52) facilities were listed within the LST database. LST facilities are ones that have had releases from their UST(s) and have applied for reimbursement of costs related to assessment and cleanup of petroleum contaminated sites. Of the 52 facilities, 18 facilities were listed under the LUST TRUST database, in which a responsible party may or may not have been identified. Many of the releases have been closed; however, there are facilities in which a corrective action plan is being implemented. Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.
- Thirty-eight (38) facilities were listed within the UST database. These facilities have at least one UST installed on-site. These facilities typically coincide with the LST database. The presence of a UST does not indicate a release has occurred.
- Twenty-one (21) listings were included in the VCP database. VCP's objective is to facilitate the redevelopment and transfer of contaminated properties. One of the VCP listings was also included in the Hazardous Waste Sites Generator (HAZ GEN) database. Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.
- Twelve (12) facilities were identified as RCRA very small quantity generators (VSQG) or a RCRA small quantity generators (SQG). Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.
  - A RCRA VSQG property is any person or site whose processes and actions create hazardous waste and generate 100 kilograms or less per month of hazardous waste, or one kilogram or less per month of acutely hazardous waste. Additionally, VSQG may not accumulate more than 1,000 kilograms of hazardous waste at any time.
  - A RCRA SQGs property generates more than 100 kilograms, but less than 1,000 kilograms, of hazardous waste per month.
- Twelve (12) facilities were listed within the solid waste facilities and landfill (SWF/LF) database. These facilities may consist of automotive repair facilities, registered tire haulers, and/or generators of medical waste. Additionally, five (5) historical landfills were listed with the database report. No detailed information for the historical landfills was available. Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.
- Five (5) facilities were listed in the Emergency Response Notification System (ERNS) database. The ERNS database includes oil (including petroleum products) and hazardous substances spill reports controlled by the National Response Center. Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.
- Four (4) facilities were listed that had registered aboveground storage tanks (ASTs), which may include facilities with backup generators or automotive services. ASTs are typically within a secondary containment and, depending on the size, are typically inspected each year by the Colorado Department of Labor and Employment – Division of Oil and Public Safety (CDLE – OPS).
- Four (4) facilities were listed in the RCRA Corrective Action (RCRA CORRACTS) database. The Corrective Action Program has identified these sites to ensure that cleanups occur. EPA and state regulators work with facilities and communities to design remedies based on the contamination,

geology, and anticipated use unique to each site. Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.

- Two (2) facilities were listed with Activity and Land Use (AUL) and Covenant restrictions. These types of restrictions can indicate that previous remediation activities were not cleaned up completely. Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.
- Two (2) facilities were included within the Colorado Brownfields database, which may indicate that there is real and/or perceived subsurface contamination. Nine (9) facilities were included in the Federal Brownfields database; one (1) of the Colorado Brownfields property was included in the federal database. These properties may have a potential presence of a hazardous substance, pollutant, or contaminant. Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.
- One (1) facility was listed within the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) and the CERCLIS No Further Remedial Action Planned (NFRAP) databases. It was also listed in the SEMS Archived Site Inventory. The CERCLIS database includes potential and confirmed hazardous waste sites at which the EPA has some involvement. The CERCLIS NFRAP and the SEMs Archive Inventory include archived sites for which EPA has determined that assessment has been completed and no further remedial action is planned at that time.

  This facility was also listed in the Hazardous Waste Sites – Corrective Action (HAZ CORRACTS) database, which lists hazardous waste generators with corrective actions under the Colorado Department of Public Health and Environment (CDPHE), and in the Hazardous Waste Sites – Treatment, Storage, and Disposal (HAZ TSD) database, which includes facilities that treat, store, dispose, or recycle hazardous waste on-site.

  Further evaluation and information will be needed depending on the extent of improvements associated with the alternatives under evaluation.

Hazardous materials are most likely to be encountered during ground-disturbing activities near sites with recognized or potential environmental conditions. LST sites that are closed still have the potential to have residual contamination present and should be investigated more thoroughly during any future project.

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Figure 7. Hazardous Materials – Sites with Potential Recognized Environmental Conditions

Next Steps for Implementation

Who	Potential agency and stakeholder involvement	▪ FHWA ▪ CDOT ▪ Local government agencies ▪ Local property owners and tenants	▪ CDPHE Hazardous Materials and Waste Management Division ▪ CDLE – OPS
When	Critical schedule considerations	▪ **Modified Environmental Site Assessment (MESA) or a Phase I Environmental Site Assessment (Phase I ESA)**: A MESA or a Phase I ESA can be conducted and completed in a relatively short time, approximately one to two months. ▪ **Phase II Limited Subsurface Investigation (Phase II LSI)**: If an ISA or a Phase I ESA reveals potential or recognized on-site contamination, a Phase II LSI may be required. A Phase II LSI can be completed within two to three months provided the necessary subsurface sampling and sampling analysis can be conducted without delay and right-of-entry to the property is granted. ▪ **Remedial Actions**: If a Phase II LSI reveals the need for remedial actions, the project could be significantly delayed. Remedial action does not have a standard timetable but is influenced by contaminants, extent of contamination, and physical setting. It requires coordination with relevant regulatory agencies, which may cause delays. ▪ **Validity of MESA or Phase I ESA**: MESAs and Phase I ESAs are valid for only 180 days. The report can be updated between 180 days and 1 year. After 1 year, the report may be used only as a reference for a future MESA or Phase I ESA due to the potential for changes in on-site conditions.	
Why	Regulatory setting and general context	A MESA should be conducted at site-specific locations to evaluate hazardous materials that may require remediation prior to acquisition or development based on ASTM standards E1527-21, which provide requirements for conducting a Phase I ESA with all appropriate inquiries. Compliance with all appropriate inquiries will allow protection from potential liability under CERCLA as an innocent landowner, a contiguous property owner, or a bona fide prospective purchaser.	
How	NEPA pre scoping considerations	CDOT requires a MESA or a Phase I ESA for Categorical Exclusion projects or acquisition of properties with potential hazardous materials concerns for ROW.	
Next Steps	Funding, design, construction, and mitigation implications	If a Phase II LSI and/or remediation activities are required based on the MESA or Phase I ESA findings, there may be substantial delays for property acquisition or construction in the vicinity. Also, a Phase II LSI and remedial activities could require additional funding. These activities are associated with the acquisition of properties. During the design process, this information can be used to identify avoidance options, when possible, and to develop specific contaminated soils/groundwater material management or mitigation measures such as a Materials Management Plan (MMP) to detail the Standard Operating Procedures for handling potentially contaminated media, specifically soil and/or groundwater. The MMP will be designed to minimize worker exposure to potentially contaminated material, prevent releases to the environment, and ensure proper disposal.	

Limitations and Exceptions

FHU's assessment of findings presented herein is based on observations of current environmental study area conditions and a review of reasonably ascertainable standard record resources. This assessment did not attempt to detect the presence of environmental contamination that may exist in areas that could not be visually inspected. Sampling of soils, groundwater, surface waters, and structures for lead-based paint and

asbestos was beyond the scope of this Corridor Conditions Report. A subsurface investigation of the environmental study area was not conducted. The assessment was limited to areas accessible along the public ROW and did not include access to fenced-in areas, interiors of buildings, rear lots, or areas not visible from public ROW in the environmental study area.

FHU's findings and opinions are based on information available from public sources on specific dates (e.g., databases). This information is updated continually and can be incomplete. FHU does not assume any liability for information that has been misrepresented for use or for items not visible, accessible, or present in the environmental study area at the time of the visual reconnaissance.

FHU conducted a "windshield" survey of properties adjoining the environmental study area on March 10, 2023, to evaluate the potential presence of regulated materials sources by driving the environmental study area via access roads but did not access any of the properties adjoining the environmental study area or properties that were occupied within the environmental study area.

FHU cannot warrant or guarantee that not finding indicators of hazardous materials means that hazardous materials do not exist within the environmental study area. No investigation is thorough enough to preclude the presence of materials in the environmental study area, which currently, or in the future, may be considered hazardous or may require management as a regulated material.

Opinions and judgment expressed herein, which are based on FHU's understanding and interpretation of current regulatory standards, should not be construed as legal opinion.

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HCM 6th Signalized Intersection Summary
1: Pierce St & W 72nd Ave

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	373	50	52	532	107	44	42	33	116	49	113
Future Volume (veh/h)	82	373	50	52	532	107	44	42	33	116	49	113
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	89	405	54	57	578	116	48	46	36	126	53	123
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	583	2089	931	640	2089	931	60	58	45	141	59	170
Arrive On Green	0.05	0.59	0.59	0.09	1.00	1.00	0.09	0.09	0.09	0.11	0.11	0.11
Sat Flow, veh/h	1781	3554	1584	1781	3554	1584	641	615	481	1272	535	1538
Grp Volume(v), veh/h	89	405	54	57	578	116	130	0	0	179	0	123
Grp Sat Flow(s),veh/h/ln	1781	1777	1584	1781	1777	1584	1737	0	0	1807	0	1538
Q Serve(g_s), s	2.3	6.4	1.7	1.4	0.0	0.0	8.8	0.0	0.0	11.7	0.0	9.3
Cycle Q Clear(g_c), s	2.3	6.4	1.7	1.4	0.0	0.0	8.8	0.0	0.0	11.7	0.0	9.3
Prop In Lane	1.00		1.00	1.00		1.00	0.37		0.28	0.70		1.00
Lane Grp Cap(c), veh/h	583	2089	931	640	2089	931	163	0	0	200	0	170
V/C Ratio(X)	0.15	0.19	0.06	0.09	0.28	0.12	0.80	0.00	0.00	0.89	0.00	0.72
Avail Cap(c_a), veh/h	583	2089	931	640	2089	931	192	0	0	200	0	170
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	8.5	11.5	10.6	8.1	0.0	0.0	53.2	0.0	0.0	52.7	0.0	51.6
Incr Delay (d2), s/veh	0.0	0.2	0.1	0.0	0.3	0.3	19.6	0.0	0.0	36.6	0.0	15.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	2.5	0.6	0.5	0.1	0.1	4.7	0.0	0.0	7.3	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.5	11.7	10.7	8.1	0.3	0.3	72.9	0.0	0.0	89.2	0.0	66.6
LnGrp LOS	A	B	B	A	A	A	E	A	A	F	A	E
Approach Vol, veh/h		548			751			130			302	
Approach Delay, s/veh		11.1			0.9			72.9			80.0	
Approach LOS		B			A			E			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	76.0		16.0	10.0	76.0		18.0				
Change Period (Y+Rc), s	4.5	5.5		* 4.7	4.5	5.5		4.7				
Max Green Setting (Gmax), s	5.5	68.5		* 13	5.5	68.5		13.3				
Max Q Clear Time (g_c+I1), s	4.3	2.0		10.8	3.4	8.4		13.7				
Green Ext Time (p_c), s	0.0	3.7		0.2	0.0	2.4		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			23.3
HCM 6th LOS			C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Lamar St

AM Existing
08/15/2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	406	114	85	488	152	82
Future Volume (veh/h)	406	114	85	488	152	82
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	441	124	92	530	165	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1613	450	638	2444	198	107
Arrive On Green	0.78	0.78	0.03	0.69	0.18	0.18
Sat Flow, veh/h	2838	765	1781	3647	1105	596
Grp Volume(v), veh/h	284	281	92	530	255	0
Grp Sat Flow(s),veh/h/ln	1777	1733	1781	1777	1708	0
Q Serve(g_s), s	2.7	2.7	1.1	3.3	8.6	0.0
Cycle Q Clear(g_c), s	2.7	2.7	1.1	3.3	8.6	0.0
Prop In Lane		0.44	1.00		0.65	0.35
Lane Grp Cap(c), veh/h	1044	1018	638	2444	306	0
V/C Ratio(X)	0.27	0.28	0.14	0.22	0.83	0.00
Avail Cap(c_a), veh/h	1044	1018	638	2444	512	0
HCM Platoon Ratio	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	3.0	3.0	4.0	3.4	23.8	0.0
Incr Delay (d2), s/veh	0.6	0.7	0.0	0.2	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.8	0.3	0.7	3.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	3.6	3.7	4.0	3.6	26.1	0.0
LnGrp LOS	A	A	A	A	C	A
Approach Vol, veh/h	565			622	255	
Approach Delay, s/veh	3.6			3.7	26.1	
Approach LOS	A			A	C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	6.0	39.3				45.3	14.7
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	2.0	28.0				34.0	18.0
Max Q Clear Time (g_c+I1), s	3.1	4.7				5.3	10.6
Green Ext Time (p_c), s	0.0	3.4				3.7	0.2

Intersection Summary			
HCM 6th Ctrl Delay			7.6
HCM 6th LOS			A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
3: Depew St & W 72nd Ave

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	525	1	9	486	22	6	1	18	47	2	58
Future Volume (veh/h)	24	525	1	9	486	22	6	1	18	47	2	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	571	1	10	528	24	7	1	20	51	2	63
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	680	2568	4	667	2508	1118	193	7	141	233	5	142
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	856	3640	6	840	3554	1585	1330	75	1491	1383	48	1510
Grp Volume(v), veh/h	26	279	293	10	528	24	7	0	21	51	0	65
Grp Sat Flow(s),veh/h/ln	856	1777	1869	840	1777	1585	1330	0	1565	1383	0	1558
Q Serve(g_s), s	0.6	3.3	3.3	0.3	3.1	0.3	0.3	0.0	0.7	2.1	0.0	2.4
Cycle Q Clear(g_c), s	3.7	3.3	3.3	3.5	3.1	0.3	2.7	0.0	0.7	2.8	0.0	2.4
Prop In Lane	1.00		0.00	1.00		1.00	1.00		0.95	1.00		0.97
Lane Grp Cap(c), veh/h	680	1254	1319	667	2508	1118	193	0	148	233	0	147
V/C Ratio(X)	0.04	0.22	0.22	0.01	0.21	0.02	0.04	0.00	0.14	0.22	0.00	0.44
Avail Cap(c_a), veh/h	680	1254	1319	667	2508	1118	325	0	303	370	0	301
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	3.7	3.1	3.1	3.7	3.1	2.6	26.9	0.0	24.9	26.2	0.0	25.7
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.2	0.0	0.1	0.0	0.4	0.5	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.8	0.8	0.0	0.7	0.1	0.1	0.0	0.3	0.7	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.8	3.5	3.5	3.7	3.2	2.7	27.0	0.0	25.4	26.7	0.0	27.8
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		598			562			28			116	
Approach Delay, s/veh		3.5			3.2			25.8			27.3	
Approach LOS		A			A			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		47.9		12.1		47.9		12.1				
Change Period (Y+Rc), s		* 5.6		6.4		* 5.6		6.4				
Max Green Setting (Gmax), s		* 36		11.6		* 36		11.6				
Max Q Clear Time (g_c+I1), s		5.7		4.8		5.5		4.7				
Green Ext Time (p_c), s		3.9		0.2		4.0		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			6.0									
HCM 6th LOS			A									

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: 5400 West

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	510	40	86	454	39	19	4	41	36	3	34
Future Volume (veh/h)	42	510	40	86	454	39	19	4	41	36	3	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	554	43	93	493	42	21	4	45	39	3	37
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	756	3689	284	732	2736	1196	104	106	88	134	7	84
Arrive On Green	0.03	0.76	0.76	0.04	0.77	0.77	0.06	0.06	0.06	0.06	0.06	0.06
Sat Flow, veh/h	1781	4835	372	1781	3554	1553	1367	1870	1560	1356	120	1483
Grp Volume(v), veh/h	46	389	208	93	493	42	21	4	45	39	0	40
Grp Sat Flow(s),veh/h/ln	1781	1702	1803	1781	1777	1553	1367	1870	1560	1356	0	1603
Q Serve(g_s), s	0.7	3.7	3.7	1.3	4.4	0.8	1.8	0.2	3.4	3.4	0.0	2.9
Cycle Q Clear(g_c), s	0.7	3.7	3.7	1.3	4.4	0.8	4.7	0.2	3.4	3.6	0.0	2.9
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		0.93
Lane Grp Cap(c), veh/h	756	2597	1376	732	2736	1196	104	106	88	134	0	91
V/C Ratio(X)	0.06	0.15	0.15	0.13	0.18	0.04	0.20	0.04	0.51	0.29	0.00	0.44
Avail Cap(c_a), veh/h	875	2597	1376	839	2736	1196	245	298	248	273	0	255
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.85	0.85	0.85	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	2.6	3.8	3.8	2.5	3.7	3.3	57.1	53.5	55.0	55.2	0.0	54.8
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.1	0.1	0.0	0.9	0.1	4.5	1.2	0.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.1	1.2	0.3	1.3	0.2	0.7	0.1	1.4	1.2	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.7	3.9	4.0	2.6	3.8	3.3	58.0	53.7	59.5	56.4	0.0	58.1
LnGrp LOS	A	A	A	A	A	A	E	D	E	E	A	E
Approach Vol, veh/h		643			628			70			79	
Approach Delay, s/veh		3.9			3.6			58.7			57.3	
Approach LOS		A			A			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	97.5		13.7	7.9	98.4		13.7				
Change Period (Y+Rc), s	4.0	* 6		6.9	4.0	* 6		6.9				
Max Green Setting (Gmax), s	12.0	* 72		19.1	12.0	* 72		19.1				
Max Q Clear Time (g_c+I1), s	3.3	5.7		5.6	2.7	6.4		6.7				
Green Ext Time (p_c), s	0.1	4.2		0.2	0.0	3.7		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			9.4									
HCM 6th LOS			A									

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
5: Sheridan Blvd

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	266	213	179	303	105	151	745	98	70	1377	168
Future Volume (veh/h)	106	266	213	179	303	105	151	745	98	70	1377	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	289	0	195	329	0	164	810	0	76	1497	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	170	353		257	486		202	2362		509	2879	
Arrive On Green	0.08	0.17	0.00	0.10	0.18	0.00	0.06	0.46	0.00	0.15	0.56	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	115	289	0	195	329	0	164	810	0	76	1497	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	3.9	9.4	0.0	6.6	10.4	0.0	5.6	12.2	0.0	2.3	21.7	0.0
Cycle Q Clear(g_c), s	3.9	9.4	0.0	6.6	10.4	0.0	5.6	12.2	0.0	2.3	21.7	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	170	353		257	486		202	2362		509	2879	
V/C Ratio(X)	0.68	0.82		0.76	0.68		0.81	0.34		0.15	0.52	
Avail Cap(c_a), veh/h	374	429		461	489		202	2362		509	2879	
HCM Platoon Ratio	1.67	1.67	1.67	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.00	0.99	0.99	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	54.1	49.0	0.0	53.0	46.6	0.0	55.9	20.6	0.0	44.6	16.1	0.0
Incr Delay (d2), s/veh	4.6	10.0	0.0	4.5	3.6	0.0	21.9	0.4	0.0	0.1	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	4.4	0.0	2.9	4.6	0.0	3.0	4.7	0.0	1.0	7.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.7	59.0	0.0	57.5	50.2	0.0	77.7	21.0	0.0	44.7	16.8	0.0
LnGrp LOS	E	E		E	D		E	C		D	B	
Approach Vol, veh/h		404			524			974			1573	
Approach Delay, s/veh		58.9			53.0			30.6			18.2	
Approach LOS		E			D			C			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	74.2	15.4	18.4	24.2	62.0	10.9	22.9
Change Period (Y+Rc), s	5.0	6.5	6.5	* 6.5	6.5	* 6.5	5.0	6.5
Max Green Setting (Gmax), s	7.0	59.5	16.0	* 15	11.0	* 56	13.0	16.5
Max Q Clear Time (g_c+I1), s	7.6	23.7	8.6	11.4	4.3	14.2	5.9	12.4
Green Ext Time (p_c), s	0.0	13.2	0.3	0.5	0.1	5.9	0.2	0.7

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
6: Yates St

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	426	6	15	639	40	12	7	13	43	11	18
Future Volume (veh/h)	42	426	6	15	639	40	12	7	13	43	11	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	46	463	7	16	695	43	13	8	14	47	12	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	611	2584	1126	753	3570	220	116	41	50	162	19	29
Arrive On Green	0.73	0.73	0.73	0.73	0.73	0.73	0.07	0.07	0.07	0.07	0.07	0.07
Sat Flow, veh/h	720	3554	1549	923	4910	302	465	561	684	913	262	398
Grp Volume(v), veh/h	46	463	7	16	481	257	35	0	0	79	0	0
Grp Sat Flow(s),veh/h/ln	720	1777	1549	923	1702	1808	1711	0	0	1574	0	0
Q Serve(g_s), s	1.3	2.5	0.1	0.3	2.7	2.7	0.0	0.0	0.0	1.7	0.0	0.0
Cycle Q Clear(g_c), s	4.0	2.5	0.1	2.8	2.7	2.7	1.1	0.0	0.0	2.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.17	0.37		0.40	0.59		0.25
Lane Grp Cap(c), veh/h	611	2584	1126	753	2475	1314	207	0	0	210	0	0
V/C Ratio(X)	0.08	0.18	0.01	0.02	0.19	0.20	0.17	0.00	0.00	0.38	0.00	0.00
Avail Cap(c_a), veh/h	611	2584	1126	753	2475	1314	388	0	0	385	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.2	2.6	2.2	3.0	2.6	2.6	26.3	0.0	0.0	27.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.1	0.0	0.1	0.2	0.3	0.4	0.0	0.0	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.5	0.0	0.0	0.5	0.6	0.5	0.0	0.0	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.5	2.7	2.3	3.1	2.8	2.9	26.7	0.0	0.0	28.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	A	C	A	A
Approach Vol, veh/h		516			754			35			79	
Approach Delay, s/veh		2.8			2.8			26.7			28.1	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	49.0	11.0	49.0	11.0
Change Period (Y+Rc), s	* 5.4	6.6	* 5.4	6.6
Max Green Setting (Gmax), s	* 37	11.4	* 37	11.4
Max Q Clear Time (g_c+I1), s	6.0	4.9	4.8	3.1
Green Ext Time (p_c), s	3.8	0.2	5.5	0.1

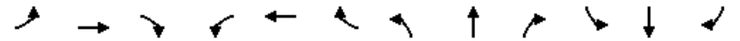
Intersection Summary	
HCM 6th Ctrl Delay	4.9
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

AM Existing
08/15/2023



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	516	0	0	628	0	0	0	0	0	0	0
Future Volume (vph)	0	516	0	0	628	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	3539	0	0	3539	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3539	0	0	3539	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		861			1614			270			311	
Travel Time (s)		19.6			36.7			6.1			7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	561	0	0	683	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	561	0	0	683	0	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2							
Detector Template		Thru			Thru							
Leading Detector (ft)		100			100							
Trailing Detector (ft)		0			0							
Detector 1 Position(ft)		0			0							
Detector 1 Size(ft)		6			6							
Detector 1 Type		Cl+Ex			Cl+Ex							
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0							
Detector 1 Queue (s)		0.0			0.0							
Detector 1 Delay (s)		0.0			0.0							
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type		NA			NA							
Protected Phases		1			1							
Permitted Phases												
Detector Phase		1			1							
Switch Phase												
Minimum Initial (s)		25.0			25.0							

Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

AM Existing
08/15/2023

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	20.0

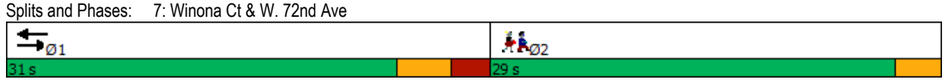
Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

AM Existing
08/15/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)		31.0			31.0							
Total Split (s)		31.0			31.0							
Total Split (%)		51.7%			51.7%							
Maximum Green (s)		25.0			25.0							
Yellow Time (s)		3.5			3.5							
All-Red Time (s)		2.5			2.5							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		6.0			6.0							
Lead/Lag		Lead			Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		None			None							
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		31.8			31.8							
Actuated g/C Ratio		0.89			0.89							
v/c Ratio		0.18			0.22							
Control Delay		3.1			3.2							
Queue Delay		0.0			0.0							
Total Delay		3.1			3.2							
LOS		A			A							
Approach Delay		3.1			3.2							
Approach LOS		A			A							
Queue Length 50th (ft)		0			0							
Queue Length 95th (ft)		85			106							
Internal Link Dist (ft)		781			1534			190			231	
Turn Bay Length (ft)												
Base Capacity (vph)		3159			3159							
Starvation Cap Reductn		0			0							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.18			0.22							

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 35.6			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.22			
Intersection Signal Delay: 3.1		Intersection LOS: A	
Intersection Capacity Utilization 25.8%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Winona Ct & W. 72nd Ave



Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

AM Existing
08/15/2023

Lane Group	Ø2
Minimum Split (s)	30.0
Total Split (s)	29.0
Total Split (%)	48%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
8: Raleigh St & W. 72nd Ave

AM Existing
08/15/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	574	49	365	711	49	272	
Future Volume (vph)	574	49	365	711	49	272	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		0	100		180	180	
Storage Lanes		0	1		1	0	
Taper Length (ft)			25		25		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	1.00		1.00		0.99	0.99	
Frt	0.988					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3489	0	1770	3539	1770	1583	
Flt Permitted			0.326		0.950		
Satd. Flow (perm)	3489	0	606	3539	1744	1560	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	11					296	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1614			1960	301		
Travel Time (s)	36.7			44.5	6.8		
Confl. Peds. (#/hr)		3	3		10	1	
Confl. Bikes (#/hr)						1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	624	53	397	773	53	296	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	677	0	397	773	53	296	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	12			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (ft)	100		20	100	20	20	
Trailing Detector (ft)	0		0	0	0	0	
Detector 1 Position(ft)	0		0	0	0	0	
Detector 1 Size(ft)	6		20	6	20	20	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 1 Extend (s)	0.0			0.0			

Lanes, Volumes, Timings
8: Raleigh St & W. 72nd Ave

AM Existing
08/15/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Turn Type	NA		pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases			6			8	
Detector Phase	2		1	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		4.0	10.0	4.0	4.0	4.0
Minimum Split (s)	70.0		20.0	90.0	30.0	30.0	30.0
Total Split (s)	70.0		20.0	90.0	30.0	30.0	30.0
Total Split (%)	58.3%		16.7%	75.0%	25.0%	25.0%	25%
Maximum Green (s)	64.2		15.5	84.2	24.5	24.5	24.0
Yellow Time (s)	3.6		3.0	3.6	3.0	3.0	3.5
All-Red Time (s)	2.2		1.5	2.2	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8		4.5	5.8	5.5	5.5	
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max		None	C-Max	Max	Max	None
Walk Time (s)	5.0				9.0	9.0	9.0
Flash Dont Walk (s)	13.0				16.0	16.0	16.0
Pedestrian Calls (#/hr)	3				8	8	0
Act Effct Green (s)	65.4		85.5	84.2	24.5	24.5	
Actuated g/C Ratio	0.54		0.71	0.70	0.20	0.20	
v/c Ratio	0.36		0.70	0.31	0.15	0.53	
Control Delay	16.0		28.1	3.3	40.6	8.4	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	16.0		28.1	3.3	40.6	8.4	
LOS	B		C	A	D	A	
Approach Delay	16.0			11.7	13.3		
Approach LOS	B			B	B		
Queue Length 50th (ft)	150		128	54	34	0	
Queue Length 95th (ft)	192		249	37	71	76	
Internal Link Dist (ft)	1534			1880	221		
Turn Bay Length (ft)			100		180	180	
Base Capacity (vph)	1906		582	2483	361	554	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.36		0.68	0.31	0.15	0.53	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 21 (18%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 13.3 Intersection LOS: B

Lanes, Volumes, Timings
8: Raleigh St & W. 72nd Ave

AM Existing
08/15/2023

Intersection Capacity Utilization 71.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 8: Raleigh St & W. 72nd Ave

HCM 6th Signalized Intersection Summary
9: Lowell Blvd & W. 72nd Ave

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	121	607	52	140	799	89	73	130	138	82	201	171
Future Volume (veh/h)	121	607	52	140	799	89	73	130	138	82	201	171
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	132	660	57	152	868	97	79	141	150	89	218	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	439	2052	912	579	2066	920	189	260	230	221	285	239
Arrive On Green	0.10	1.00	1.00	0.07	0.77	0.77	0.05	0.15	0.15	0.06	0.15	0.15
Sat Flow, veh/h	1781	3554	1580	1781	3554	1582	1781	1777	1569	1781	1870	1569
Grp Volume(v), veh/h	132	660	57	152	868	97	79	141	150	89	218	186
Grp Sat Flow(s),veh/h/ln	1781	1777	1580	1781	1777	1582	1781	1777	1569	1781	1870	1569
Q Serve(g_s), s	3.7	0.0	0.0	4.2	9.8	1.8	4.5	8.8	10.8	5.0	13.4	13.7
Cycle Q Clear(g_c), s	3.7	0.0	0.0	4.2	9.8	1.8	4.5	8.8	10.8	5.0	13.4	13.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	439	2052	912	579	2066	920	189	260	230	221	285	239
V/C Ratio(X)	0.30	0.32	0.06	0.26	0.42	0.11	0.42	0.54	0.65	0.40	0.76	0.78
Avail Cap(c_a), veh/h	440	2052	912	721	2066	920	189	370	327	284	405	340
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.0	0.0	0.0	8.8	6.8	5.9	41.3	47.5	48.3	40.7	48.8	48.9
Incr Delay (d2), s/veh	0.4	0.4	0.1	0.2	0.6	0.2	1.5	1.8	3.1	1.2	5.4	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.1	0.0	1.6	3.2	0.7	2.0	4.0	4.4	2.3	6.7	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.4	0.4	0.1	9.0	7.4	6.1	42.7	49.2	51.5	41.9	54.2	56.0
LnGrp LOS	A	A	A	A	A	A	D	D	D	D	D	E
Approach Vol, veh/h		849			1117			370			493	
Approach Delay, s/veh		1.8			7.5			48.8			52.6	
Approach LOS		A			A			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.4	75.3	10.0	24.3	9.9	75.8	10.7	23.6				
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0				
Max Green Setting (Gmax), s	16.0	48.0	6.0	26.0	6.0	48.0	11.0	25.0				
Max Q Clear Time (g_c+I1), s	6.2	2.0	6.5	15.7	5.7	11.8	7.0	12.8				
Green Ext Time (p_c), s	0.3	5.5	0.0	1.4	0.0	7.8	0.1	1.3				
Intersection Summary												
HCM 6th Ctrl Delay			19.0									
HCM 6th LOS			B									

HCM 6th Signalized Intersection Summary
10: Irving St

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	79	730	11	23	891	55	3	9	7	95	10	189
Future Volume (veh/h)	79	730	11	23	891	55	3	9	7	95	10	189
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	86	793	12	25	968	60	3	10	8	103	11	205
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	487	2470	37	542	2405	1070	219	136	109	245	265	225
Arrive On Green	0.04	0.92	0.92	0.04	1.00	1.00	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1781	3582	54	1781	3554	1580	1165	962	770	1395	1870	1585
Grp Volume(v), veh/h	86	393	412	25	968	60	3	0	18	103	11	205
Grp Sat Flow(s),veh/h/ln	1781	1777	1859	1781	1777	1580	1165	0	1732	1395	1870	1585
Q Serve(g_s), s	1.8	3.1	3.1	0.5	0.0	0.0	0.3	0.0	1.1	8.3	0.6	15.3
Cycle Q Clear(g_c), s	1.8	3.1	3.1	0.5	0.0	0.0	0.9	0.0	1.1	9.4	0.6	15.3
Prop In Lane	1.00		0.03	1.00		1.00	1.00		0.44	1.00		1.00
Lane Grp Cap(c), veh/h	487	1225	1282	542	2405	1070	219	0	245	245	265	225
V/C Ratio(X)	0.18	0.32	0.32	0.05	0.40	0.06	0.01	0.00	0.07	0.42	0.04	0.91
Avail Cap(c_a), veh/h	535	1225	1282	612	2405	1070	219	0	245	245	265	225
HCM Platoon Ratio	1.33	1.33	1.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.95	0.95	0.95	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.3	1.7	1.7	5.5	0.0	0.0	44.8	0.0	44.7	48.7	44.5	50.8
Incr Delay (d2), s/veh	0.2	0.7	0.6	0.0	0.5	0.1	0.0	0.0	0.1	1.1	0.1	37.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	1.1	1.1	0.2	0.2	0.0	0.1	0.0	0.5	3.0	0.3	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.5	2.3	2.3	5.6	0.5	0.1	44.9	0.0	44.8	49.9	44.5	88.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	D	F
Approach Vol, veh/h		891			1053			21			319	
Approach Delay, s/veh		2.6			0.6			44.8			74.2	
Approach LOS		A			A			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	88.7		24.0	8.8	87.2		24.0				
Change Period (Y+Rc), s	5.0	6.0		7.0	5.0	6.0		7.0				
Max Green Setting (Gmax), s	7.0	78.0		17.0	7.0	78.0		17.0				
Max Q Clear Time (g_c+I1), s	2.5	5.1		17.3	3.8	2.0		3.1				
Green Ext Time (p_c), s	0.0	6.1		0.0	0.0	9.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			12.1
HCM 6th LOS			B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
11: Hooker St

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	789	28	11	908	17	39	6	33	12	1	18
Future Volume (veh/h)	19	789	28	11	908	17	39	6	33	12	1	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.98		0.96	0.98		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	858	30	12	987	18	42	7	36	13	1	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	533	2789	98	574	2809	1225	151	15	78	60	14	47
Arrive On Green	0.03	1.00	1.00	0.02	1.00	1.00	0.06	0.06	0.06	0.06	0.06	0.06
Sat Flow, veh/h	1781	3502	122	1781	3554	1550	1365	255	1313	310	243	791
Grp Volume(v), veh/h	21	435	453	12	987	18	42	0	43	34	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1848	1781	1777	1550	1365	0	1569	1344	0	0
Q Serve(g_s), s	0.3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	3.2	0.1	0.0	0.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.2	0.0	0.0	2.8	0.0	3.2	3.3	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.84	0.38		0.59
Lane Grp Cap(c), veh/h	533	1415	1472	574	2809	1225	151	0	93	121	0	0
V/C Ratio(X)	0.04	0.31	0.31	0.02	0.35	0.01	0.28	0.00	0.46	0.28	0.00	0.00
Avail Cap(c_a), veh/h	622	1415	1472	673	2809	1225	264	0	222	242	0	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.71	0.71	0.71	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.2	0.0	0.0	2.4	0.0	0.0	54.4	0.0	54.6	54.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.5	0.5	0.0	0.2	0.0	1.0	0.0	3.5	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.2	0.2	0.0	0.1	0.0	1.3	0.0	1.4	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.2	0.5	0.5	2.4	0.2	0.0	55.4	0.0	58.1	55.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	E	E	A	A
Approach Vol, veh/h		909			1017			85			34	
Approach Delay, s/veh		0.6			0.3			56.8			55.5	
Approach LOS		A			A			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	101.6		13.1	6.0	100.9		13.1				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	79.0		17.0	8.0	79.0		17.0				
Max Q Clear Time (g_c+I1), s	2.2	2.0		5.3	2.3	2.0		5.2				
Green Ext Time (p_c), s	0.0	7.0		0.1	0.0	9.5		0.2				

Intersection Summary			
HCM 6th Ctrl Delay			3.7
HCM 6th LOS			A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
12: Federal Blvd & W. 72nd Ave

AM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	281	236	148	103	330	90	137	700	44	81	1579	484
Future Volume (veh/h)	281	236	148	103	330	90	137	700	44	81	1579	484
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	305	257	161	112	359	98	149	761	48	88	1716	526
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	363	640	284	166	438	194	202	2638	818	248	2749	838
Arrive On Green	0.03	0.06	0.06	0.02	0.04	0.04	0.06	0.52	0.52	0.07	0.54	0.54
Sat Flow, veh/h	3456	3554	1577	3456	3554	1577	3456	5106	1583	3456	5106	1557
Grp Volume(v), veh/h	305	257	161	112	359	98	149	761	48	88	1716	526
Grp Sat Flow(s),veh/h/ln	1728	1777	1577	1728	1777	1577	1728	1702	1583	1728	1702	1557
Q Serve(g_s), s	10.5	8.4	11.9	3.9	12.0	5.9	5.1	10.2	1.3	2.9	28.0	28.3
Cycle Q Clear(g_c), s	10.5	8.4	11.9	3.9	12.0	5.9	5.1	10.2	1.3	2.9	28.0	28.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	363	640	284	166	438	194	202	2638	818	248	2749	838
V/C Ratio(X)	0.84	0.40	0.57	0.67	0.82	0.50	0.74	0.29	0.06	0.35	0.62	0.63
Avail Cap(c_a), veh/h	403	640	284	317	503	223	202	2638	818	248	2749	838
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.9	50.2	51.9	58.1	56.2	35.7	55.6	16.5	7.3	53.0	19.3	19.3
Incr Delay (d2), s/veh	11.9	0.1	1.6	1.7	7.9	0.7	11.9	0.3	0.1	0.3	1.1	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	3.9	5.2	1.8	6.2	2.4	2.5	3.9	0.7	1.3	10.6	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.8	50.3	53.5	59.8	64.1	36.5	67.5	16.7	7.4	53.4	20.3	22.9
LnGrp LOS	E	D	D	E	E	D	E	B	A	D	C	C
Approach Vol, veh/h		723			569			958			2330	
Approach Delay, s/veh		58.8			58.5			24.2			22.2	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	68.0	10.8	26.6	12.0	70.6	17.6	19.8
Change Period (Y+Rc), s	6.0	* 6	5.0	5.0	5.0	6.0	5.0	5.0
Max Green Setting (Gmax), s	6.0	* 62	11.0	20.0	7.0	61.0	14.0	17.0
Max Q Clear Time (g_c+I1), s	4.9	12.2	5.9	13.9	7.1	30.3	12.5	14.0
Green Ext Time (p_c), s	0.0	12.4	0.0	0.8	0.0	28.8	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	32.9
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
13: W. 72nd Ave & Zuni St

AM Existing
08/15/2023

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Lane Configurations							
Traffic Volume (vph)	74	388	456	82	98	95	
Future Volume (vph)	74	388	456	82	98	95	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	50			0	100	100	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00	
Ped Bike Factor	1.00		1.00			0.98	
Frt			0.977			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1770	3539	3446	0	1770	1583	
Flt Permitted	0.431				0.950		
Satd. Flow (perm)	802	3539	3446	0	1770	1550	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			67			103	
Link Speed (mph)		30	30		25		
Link Distance (ft)		2630	378		264		
Travel Time (s)		59.8	8.6		7.2		
Confl. Peds. (#/hr)	2			2		3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	80	422	496	89	107	103	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	80	422	585	0	107	103	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		24	24		12		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1	2	2		1	1	
Detector Template	Left	Thru	Thru		Left	Right	
Leading Detector (ft)	20	100	100		20	20	
Trailing Detector (ft)	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	
Detector 1 Size(ft)	20	6	6		20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94	94				
Detector 2 Size(ft)		6	6				
Detector 2 Type		Cl+Ex	Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)		0.0	0.0				
Turn Type	Perm	NA	NA		Prot	Perm	

Lanes, Volumes, Timings
13: W. 72nd Ave & Zuni St

AM Existing
08/15/2023

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Protected Phases		2	2		3		4
Permitted Phases	2					3	
Detector Phase	2	2	2		3	3	
Switch Phase							
Minimum Initial (s)	20.0	20.0	20.0		5.0	5.0	1.0
Minimum Split (s)	44.0	44.0	44.0		12.0	12.0	7.0
Total Split (s)	44.0	44.0	44.0		12.0	12.0	4.0
Total Split (%)	73.3%	73.3%	73.3%		20.0%	20.0%	7%
Maximum Green (s)	38.0	38.0	38.0		6.0	6.0	-2.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0	
Lead/Lag					Lead	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Walk Time (s)							10.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							5
Act Effct Green (s)	44.8	44.8	44.8		6.0	6.0	
Actuated g/C Ratio	0.75	0.75	0.75		0.10	0.10	
v/c Ratio	0.13	0.16	0.23		0.61	0.42	
Control Delay	6.9	5.4	3.2		43.0	12.2	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	6.9	5.4	3.2		43.0	12.2	
LOS	A	A	A		D	B	
Approach Delay		5.6	3.2		27.9		
Approach LOS		A	A		C		
Queue Length 50th (ft)	15	43	26		38	0	
Queue Length 95th (ft)	56	111	55		#99	38	
Internal Link Dist (ft)		2550	298		184		
Turn Bay Length (ft)	50				100	100	
Base Capacity (vph)	598	2642	2590		177	247	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.13	0.16	0.23		0.60	0.42	

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 20 (33%), Referenced to phase 2:EBWB, Start of Yellow			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.61			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 53.8%		ICU Level of Service A	

Lanes, Volumes, Timings
13: W. 72nd Ave & Zuni St

AM Existing
08/15/2023

Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 13: W. 72nd Ave & Zuni St

HCM 6th Signalized Intersection Summary
1: Pierce St & W 72nd Ave

PM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	551	28	38	485	80	24	29	41	55	32	40
Future Volume (veh/h)	45	551	28	38	485	80	24	29	41	55	32	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	599	30	41	527	87	26	32	45	60	35	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	640	2194	977	572	2194	977	37	46	65	101	59	135
Arrive On Green	0.05	0.62	0.62	0.09	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1781	3554	1582	1781	3554	1582	430	529	744	1145	668	1531
Grp Volume(v), veh/h	49	599	30	41	527	87	103	0	0	95	0	43
Grp Sat Flow(s),veh/h/ln	1781	1777	1582	1781	1777	1582	1703	0	0	1813	0	1531
Q Serve(g_s), s	1.1	9.3	0.9	0.9	0.0	0.0	7.1	0.0	0.0	6.0	0.0	3.2
Cycle Q Clear(g_c), s	1.1	9.3	0.9	0.9	0.0	0.0	7.1	0.0	0.0	6.0	0.0	3.2
Prop In Lane	1.00		1.00	1.00		1.00	0.25		0.44	0.63		1.00
Lane Grp Cap(c), veh/h	640	2194	977	572	2194	977	148	0	0	160	0	135
V/C Ratio(X)	0.08	0.27	0.03	0.07	0.24	0.09	0.70	0.00	0.00	0.59	0.00	0.32
Avail Cap(c_a), veh/h	670	2194	977	601	2194	977	231	0	0	246	0	208
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.93	0.93	0.93	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.0	10.6	9.0	7.0	0.0	0.0	53.3	0.0	0.0	52.6	0.0	51.3
Incr Delay (d2), s/veh	0.0	0.3	0.1	0.0	0.2	0.2	8.1	0.0	0.0	4.9	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.6	0.3	0.3	0.1	0.0	3.4	0.0	0.0	3.0	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.0	10.9	9.0	7.0	0.2	0.2	61.4	0.0	0.0	57.5	0.0	53.2
LnGrp LOS	A	B	A	A	A	A	E	A	A	E	A	D
Approach Vol, veh/h		678			655			103			138	
Approach Delay, s/veh		10.5			0.7			61.4			56.2	
Approach LOS		B			A			E			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	79.6		15.1	10.0	79.6		15.3				
Change Period (Y+Rc), s	4.5	5.5		* 4.7	4.5	5.5		4.7				
Max Green Setting (Gmax), s	7.5	60.5		* 16	7.5	60.5		16.3				
Max Q Clear Time (g_c+I1), s	3.1	2.0		9.1	2.9	11.3		8.0				
Green Ext Time (p_c), s	0.0	3.3		0.3	0.0	3.7		0.5				

Intersection Summary			
HCM 6th Ctrl Delay		13.7	
HCM 6th LOS		B	

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
2: Lamar St

PM Existing
08/15/2023

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	496	82	96	534	130	132
Future Volume (veh/h)	496	82	96	534	130	132
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	539	89	104	580	141	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1730	285	509	2369	166	168
Arrive On Green	0.19	0.19	0.03	0.67	0.20	0.20
Sat Flow, veh/h	3148	503	1781	3647	829	840
Grp Volume(v), veh/h	313	315	104	580	285	0
Grp Sat Flow(s),veh/h/ln	1777	1780	1781	1777	1675	0
Q Serve(g_s), s	9.1	9.2	1.4	3.9	9.8	0.0
Cycle Q Clear(g_c), s	9.1	9.2	1.4	3.9	9.8	0.0
Prop In Lane		0.28	1.00		0.49	0.50
Lane Grp Cap(c), veh/h	1007	1008	509	2369	335	0
V/C Ratio(X)	0.31	0.31	0.20	0.24	0.85	0.00
Avail Cap(c_a), veh/h	1007	1008	509	2369	447	0
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	14.3	14.3	5.5	4.0	23.1	0.0
Incr Delay (d2), s/veh	0.8	0.8	0.1	0.2	9.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	3.9	0.3	0.9	4.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.1	15.1	5.6	4.2	32.1	0.0
LnGrp LOS	B	B	A	A	C	A
Approach Vol, veh/h	628			684	285	
Approach Delay, s/veh	15.1			4.4	32.1	
Approach LOS	B			A	C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	6.0	38.0				44.0	16.0
Change Period (Y+Rc), s	4.0	4.0				4.0	4.0
Max Green Setting (Gmax), s	2.0	30.0				36.0	16.0
Max Q Clear Time (g_c+I1), s	3.4	11.2				5.9	11.8
Green Ext Time (p_c), s	0.0	3.6				4.1	0.2

Intersection Summary			
HCM 6th Ctrl Delay		13.6	
HCM 6th LOS		B	

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
3: Depew St & W 72nd Ave

PM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	28	597	7	24	636	73	3	0	9	28	1	28
Future Volume (veh/h)	28	597	7	24	636	73	3	0	9	28	1	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	30	649	8	26	691	79	3	0	10	30	1	30
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	579	2599	32	634	2569	1144	200	0	121	219	4	117
Arrive On Green	0.72	0.72	0.72	0.72	0.72	0.72	0.08	0.00	0.08	0.08	0.08	0.08
Sat Flow, veh/h	699	3595	44	776	3554	1583	1365	0	1571	1389	51	1525
Grp Volume(v), veh/h	30	321	336	26	691	79	3	0	10	30	0	31
Grp Sat Flow(s),veh/h/ln	699	1777	1862	776	1777	1583	1365	0	1571	1389	0	1576
Q Serve(g_s), s	0.9	3.7	3.7	0.7	4.0	0.9	0.1	0.0	0.4	1.2	0.0	1.1
Cycle Q Clear(g_c), s	4.9	3.7	3.7	4.4	4.0	0.9	1.2	0.0	0.4	1.6	0.0	1.1
Prop In Lane	1.00		0.02	1.00		1.00	1.00		1.00	1.00		0.97
Lane Grp Cap(c), veh/h	579	1285	1347	634	2569	1144	200	0	121	219	0	121
V/C Ratio(X)	0.05	0.25	0.25	0.04	0.27	0.07	0.02	0.00	0.08	0.14	0.00	0.26
Avail Cap(c_a), veh/h	579	1285	1347	634	2569	1144	359	0	304	380	0	305
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	3.7	2.8	2.8	3.5	2.9	2.4	26.7	0.0	25.7	26.5	0.0	26.1
Incr Delay (d2), s/veh	0.2	0.5	0.4	0.1	0.3	0.1	0.0	0.0	0.3	0.3	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.8	0.9	0.1	0.8	0.2	0.0	0.0	0.1	0.4	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.9	3.3	3.3	3.7	3.1	2.5	26.7	0.0	26.0	26.7	0.0	27.2
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		687			796			13			61	
Approach Delay, s/veh		3.3			3.1			26.2			27.0	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		49.0		11.0		49.0		11.0				
Change Period (Y+Rc), s		* 5.6		6.4		* 5.6		6.4				
Max Green Setting (Gmax), s		* 36		11.6		* 36		11.6				
Max Q Clear Time (g_c+I1), s		6.9		3.6		6.4		3.2				
Green Ext Time (p_c), s		4.7		0.1		5.9		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		4.3	
HCM 6th LOS		A	

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
4: 5400 West

PM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	38	499	89	172	594	53	87	18	168	59	17	46
Future Volume (veh/h)	38	499	89	172	594	53	87	18	168	59	17	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	41	542	97	187	646	58	95	20	183	64	18	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	502	2098	369	586	1852	825	278	292	245	292	68	188
Arrive On Green	0.04	0.48	0.48	0.08	0.52	0.52	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1781	4368	767	1781	3554	1584	1325	1870	1573	1173	435	1207
Grp Volume(v), veh/h	41	420	219	187	646	58	95	20	183	64	0	68
Grp Sat Flow(s),veh/h/ln	1781	1702	1731	1781	1777	1584	1325	1870	1573	1173	0	1642
Q Serve(g_s), s	0.7	4.4	4.5	3.0	6.4	1.1	4.1	0.5	6.7	3.0	0.0	2.2
Cycle Q Clear(g_c), s	0.7	4.4	4.5	3.0	6.4	1.1	6.3	0.5	6.7	3.5	0.0	2.2
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	502	1635	831	586	1852	825	278	292	245	292	0	256
V/C Ratio(X)	0.08	0.26	0.26	0.32	0.35	0.07	0.34	0.07	0.75	0.22	0.00	0.27
Avail Cap(c_a), veh/h	666	1635	831	677	1852	825	361	408	343	365	0	359
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	7.2	9.2	9.3	6.5	8.4	7.1	25.1	21.6	24.2	23.1	0.0	22.3
Incr Delay (d2), s/veh	0.1	0.4	0.8	0.2	0.4	0.1	0.7	0.1	5.5	0.4	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.4	1.6	0.9	2.0	0.3	1.3	0.2	2.7	0.8	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.2	9.6	10.1	6.7	8.8	7.3	25.8	21.7	29.7	23.5	0.0	22.8
LnGrp LOS	A	A	B	A	A	A	C	C	C	C	A	C
Approach Vol, veh/h		680			891			298			132	
Approach Delay, s/veh		9.6			8.3			27.9			23.2	
Approach LOS		A			A			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.9	34.8		16.3	6.5	37.3		16.3				
Change Period (Y+Rc), s	4.0	* 6		6.9	4.0	* 6		6.9				
Max Green Setting (Gmax), s	8.0	* 22		13.1	8.0	* 22		13.1				
Max Q Clear Time (g_c+I1), s	5.0	6.5		5.5	2.7	8.4		8.7				
Green Ext Time (p_c), s	0.1	3.6		0.3	0.0	3.7		0.4				

Intersection Summary			
HCM 6th Ctrl Delay		12.6	
HCM 6th LOS		B	

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary
5: Sheridan Blvd

PM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	198	435	137	183	339	127	257	1235	268	98	881	170
Future Volume (veh/h)	198	435	137	183	339	127	257	1235	268	98	881	170
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	215	473	0	199	368	0	279	1342	0	107	958	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	271	493		262	439		497	2791		163	2234	
Arrive On Green	0.16	0.28	0.00	0.02	0.04	0.00	0.14	0.55	0.00	0.05	0.44	0.00
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	5106	1585
Grp Volume(v), veh/h	215	473	0	199	368	0	279	1342	0	107	958	0
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1702	1585
Q Serve(g_s), s	7.2	15.7	0.0	6.9	12.3	0.0	9.0	19.4	0.0	3.7	15.6	0.0
Cycle Q Clear(g_c), s	7.2	15.7	0.0	6.9	12.3	0.0	9.0	19.4	0.0	3.7	15.6	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	271	493		262	439		497	2791		163	2234	
V/C Ratio(X)	0.79	0.96		0.76	0.84		0.56	0.48		0.66	0.43	
Avail Cap(c_a), veh/h	374	493		374	489		497	2791		432	2234	
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.00	0.99	0.99	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	49.6	43.0	0.0	57.4	56.4	0.0	47.8	16.7	0.0	56.2	23.4	0.0
Incr Delay (d2), s/veh	7.5	29.5	0.0	5.5	11.2	0.0	1.4	0.6	0.0	4.4	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	7.8	0.0	3.3	6.6	0.0	3.9	7.2	0.0	1.7	6.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	72.5	0.0	62.9	67.6	0.0	49.3	17.3	0.0	60.6	24.0	0.0
LnGrp LOS	E	E		E	E		D	B		E	C	
Approach Vol, veh/h		688			567			1621			1065	
Approach Delay, s/veh		67.7			65.9			22.8			27.7	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.8	59.0	14.1	23.2	10.7	72.1	15.9	21.3
Change Period (Y+Rc), s	6.5	* 6.5	5.0	6.5	5.0	6.5	6.5	* 6.5
Max Green Setting (Gmax), s	15.0	* 53	13.0	16.5	15.0	52.5	13.0	* 17
Max Q Clear Time (g_c+I1), s	11.0	17.6	8.9	17.7	5.7	21.4	9.2	14.3
Green Ext Time (p_c), s	0.3	7.1	0.2	0.0	0.2	10.8	0.2	0.5

Intersection Summary		
HCM 6th Ctrl Delay		38.2
HCM 6th LOS		D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [NBR, EBR, WBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
6: Yates St

PM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	739	22	18	623	66	10	8	13	69	8	41
Future Volume (veh/h)	45	739	22	18	623	66	10	8	13	69	8	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	49	803	24	20	677	72	11	9	14	75	9	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	569	2431	1060	512	3202	337	114	81	81	187	22	61
Arrive On Green	0.68	0.68	0.68	0.68	0.68	0.68	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	712	3554	1549	662	4679	493	301	702	702	794	191	528
Grp Volume(v), veh/h	49	803	24	20	491	258	34	0	0	129	0	0
Grp Sat Flow(s),veh/h/ln	712	1777	1549	662	1702	1768	1705	0	0	1513	0	0
Q Serve(g_s), s	1.6	5.5	0.3	0.8	3.2	3.2	0.0	0.0	0.0	3.8	0.0	0.0
Cycle Q Clear(g_c), s	4.9	5.5	0.3	6.3	3.2	3.2	1.1	0.0	0.0	4.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.28	0.32		0.41	0.58		0.35
Lane Grp Cap(c), veh/h	569	2431	1060	512	2329	1210	277	0	0	270	0	0
V/C Ratio(X)	0.09	0.33	0.02	0.04	0.21	0.21	0.12	0.00	0.00	0.48	0.00	0.00
Avail Cap(c_a), veh/h	569	2431	1060	512	2329	1210	392	0	0	379	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.4	3.9	3.0	5.1	3.5	3.5	23.9	0.0	0.0	25.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.1	0.2	0.4	0.2	0.0	0.0	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.3	0.1	0.1	0.7	0.9	0.4	0.0	0.0	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.6	4.1	3.1	5.3	3.7	3.9	24.1	0.0	0.0	26.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	C	A	A	C	A	A
Approach Vol, veh/h		876			769			34			129	
Approach Delay, s/veh		4.1			3.8			24.1			26.8	
Approach LOS		A			A			C			C	

Timer - Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		46.5		13.5		46.5		13.5
Change Period (Y+Rc), s		* 5.4		6.6		* 5.4		6.6
Max Green Setting (Gmax), s		* 37		11.4		* 37		11.4
Max Q Clear Time (g_c+I1), s		7.5		6.9		8.3		3.1
Green Ext Time (p_c), s		7.0		0.2		5.6		0.1

Intersection Summary		
HCM 6th Ctrl Delay		6.0
HCM 6th LOS		A

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑							
Traffic Volume (vph)	0	804	0	0	642	0	0	0	0	0	0	0
Future Volume (vph)	0	804	0	0	642	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt												
Flt Protected												
Satd. Flow (prot)	0	3539	0	0	3539	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	3539	0	0	3539	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		861			1614			270			311	
Travel Time (s)		19.6			36.7			6.1			7.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	874	0	0	698	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	874	0	0	698	0	0	0	0	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			0			0	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2			2							
Detector Template		Thru			Thru							
Leading Detector (ft)		100			100							
Trailing Detector (ft)		0			0							
Detector 1 Position(ft)		0			0							
Detector 1 Size(ft)		6			6							
Detector 1 Type		Cl+Ex			Cl+Ex							
Detector 1 Channel												
Detector 1 Extend (s)		0.0			0.0							
Detector 1 Queue (s)		0.0			0.0							
Detector 1 Delay (s)		0.0			0.0							
Detector 2 Position(ft)		94			94							
Detector 2 Size(ft)		6			6							
Detector 2 Type		Cl+Ex			Cl+Ex							
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0							
Turn Type		NA			NA							
Protected Phases		1			1							
Permitted Phases												
Detector Phase		1			1							
Switch Phase												
Minimum Initial (s)		25.0			25.0							

Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	Ø2
Lane Configurations	
Traffic Volume (vph)	
Future Volume (vph)	
Ideal Flow (vphpl)	
Lane Util. Factor	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Peak Hour Factor	
Adj. Flow (vph)	
Shared Lane Traffic (%)	
Lane Group Flow (vph)	
Enter Blocked Intersection	
Lane Alignment	
Median Width(ft)	
Link Offset(ft)	
Crosswalk Width(ft)	
Two way Left Turn Lane	
Headway Factor	
Turning Speed (mph)	
Number of Detectors	
Detector Template	
Leading Detector (ft)	
Trailing Detector (ft)	
Detector 1 Position(ft)	
Detector 1 Size(ft)	
Detector 1 Type	
Detector 1 Channel	
Detector 1 Extend (s)	
Detector 1 Queue (s)	
Detector 1 Delay (s)	
Detector 2 Position(ft)	
Detector 2 Size(ft)	
Detector 2 Type	
Detector 2 Channel	
Detector 2 Extend (s)	
Turn Type	
Protected Phases	2
Permitted Phases	
Detector Phase	
Switch Phase	
Minimum Initial (s)	20.0

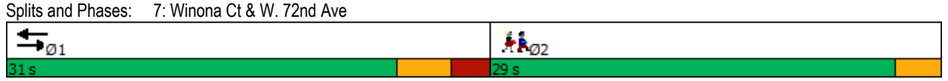
Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)		31.0			31.0							
Total Split (s)		31.0			31.0							
Total Split (%)		51.7%			51.7%							
Maximum Green (s)		25.0			25.0							
Yellow Time (s)		3.5			3.5							
All-Red Time (s)		2.5			2.5							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		6.0			6.0							
Lead/Lag		Lead			Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		None			None							
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		31.8			31.8							
Actuated g/C Ratio		0.89			0.89							
v/c Ratio		0.28			0.22							
Control Delay		3.4			3.2							
Queue Delay		0.0			0.0							
Total Delay		3.4			3.2							
LOS		A			A							
Approach Delay		3.4			3.2							
Approach LOS		A			A							
Queue Length 50th (ft)		0			0							
Queue Length 95th (ft)		142			108							
Internal Link Dist (ft)		781			1534			190			231	
Turn Bay Length (ft)												
Base Capacity (vph)		3159			3159							
Starvation Cap Reductn		0			0							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.28			0.22							

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 35.6			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.28			
Intersection Signal Delay: 3.3		Intersection LOS: A	
Intersection Capacity Utilization 27.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Winona Ct & W. 72nd Ave



Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	Ø2
Minimum Split (s)	30.0
Total Split (s)	29.0
Total Split (%)	48%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

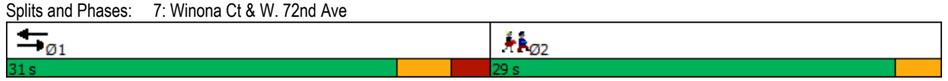
Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)		31.0			31.0							
Total Split (s)		31.0			31.0							
Total Split (%)		51.7%			51.7%							
Maximum Green (s)		25.0			25.0							
Yellow Time (s)		3.5			3.5							
All-Red Time (s)		2.5			2.5							
Lost Time Adjust (s)		0.0			0.0							
Total Lost Time (s)		6.0			6.0							
Lead/Lag		Lead			Lead							
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0			3.0							
Recall Mode		None			None							
Walk Time (s)												
Flash Dont Walk (s)												
Pedestrian Calls (#/hr)												
Act Effct Green (s)		31.8			31.8							
Actuated g/C Ratio		0.89			0.89							
v/c Ratio		0.28			0.22							
Control Delay		3.4			3.2							
Queue Delay		0.0			0.0							
Total Delay		3.4			3.2							
LOS		A			A							
Approach Delay		3.4			3.2							
Approach LOS		A			A							
Queue Length 50th (ft)		0			0							
Queue Length 95th (ft)		142			108							
Internal Link Dist (ft)		781			1534			190			231	
Turn Bay Length (ft)												
Base Capacity (vph)		3159			3159							
Starvation Cap Reductn		0			0							
Spillback Cap Reductn		0			0							
Storage Cap Reductn		0			0							
Reduced v/c Ratio		0.28			0.22							

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 35.6			
Natural Cycle: 65			
Control Type: Semi Act-Uncoord			
Maximum v/c Ratio: 0.28			
Intersection Signal Delay: 3.3		Intersection LOS: A	
Intersection Capacity Utilization 27.2%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 7: Winona Ct & W. 72nd Ave



Lanes, Volumes, Timings
7: Winona Ct & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	Ø2
Minimum Split (s)	30.0
Total Split (s)	29.0
Total Split (%)	48%
Maximum Green (s)	26.0
Yellow Time (s)	3.0
All-Red Time (s)	0.0
Lost Time Adjust (s)	
Total Lost Time (s)	
Lead/Lag	Lag
Lead-Lag Optimize?	
Vehicle Extension (s)	3.0
Recall Mode	None
Walk Time (s)	7.0
Flash Dont Walk (s)	13.0
Pedestrian Calls (#/hr)	3
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay	
Queue Delay	
Total Delay	
LOS	
Approach Delay	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	

Intersection Summary

Lanes, Volumes, Timings
8: Raleigh St & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Lane Configurations							
Traffic Volume (vph)	776	36	108	744	46	184	
Future Volume (vph)	776	36	108	744	46	184	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		0	100		180	180	
Storage Lanes		0	1		1	0	
Taper Length (ft)			25		25		
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Ped Bike Factor	1.00		1.00		0.99	0.98	
Frt	0.993					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3511	0	1770	3539	1770	1583	
Flt Permitted			0.251		0.950		
Satd. Flow (perm)	3511	0	467	3539	1759	1552	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	6					200	
Link Speed (mph)	30			30	30		
Link Distance (ft)	1614			1960	301		
Travel Time (s)	36.7			44.5	6.8		
Confl. Peds. (#/hr)		1	1		4	4	
Confl. Bikes (#/hr)						2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	843	39	117	809	50	200	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	882	0	117	809	50	200	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Right	Left	Left	Left	Right	
Median Width(ft)	24			12	12		
Link Offset(ft)	0			0	0		
Crosswalk Width(ft)	16			16	16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)		9	15		15	9	
Number of Detectors	2		1	2	1	1	
Detector Template	Thru		Left	Thru	Left	Right	
Leading Detector (ft)	100		20	100	20	20	
Trailing Detector (ft)	0		0	0	0	0	
Detector 1 Position(ft)	0		0	0	0	0	
Detector 1 Size(ft)	6		20	6	20	20	
Detector 1 Type	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0		0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0		0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94			
Detector 2 Size(ft)	6			6			
Detector 2 Type	Cl+Ex			Cl+Ex			
Detector 2 Channel							
Detector 2 Extend (s)	0.0			0.0			

Lanes, Volumes, Timings
8: Raleigh St & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	Ø4
Turn Type	NA		pm+pt	NA	Prot	Perm	
Protected Phases	2		1	6	8		4
Permitted Phases			6			8	
Detector Phase	2		1	6	8	8	
Switch Phase							
Minimum Initial (s)	10.0		4.0	10.0	4.0	4.0	4.0
Minimum Split (s)	74.0		15.0	89.0	31.0	31.0	31.0
Total Split (s)	74.0		15.0	89.0	31.0	31.0	31.0
Total Split (%)	61.7%		12.5%	74.2%	25.8%	25.8%	26%
Maximum Green (s)	68.2		10.0	83.2	25.5	25.5	25.0
Yellow Time (s)	3.6		3.5	3.6	3.0	3.0	3.5
All-Red Time (s)	2.2		1.5	2.2	2.5	2.5	2.5
Lost Time Adjust (s)	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8		5.0	5.8	5.5	5.5	
Lead/Lag	Lag		Lead				
Lead-Lag Optimize?	Yes		Yes				
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max		None	C-Max	Max	Max	None
Walk Time (s)	5.0				9.0	9.0	9.0
Flash Dont Walk (s)	13.0				16.0	16.0	16.0
Pedestrian Calls (#/hr)	1				6	6	5
Act Effct Green (s)	70.2		84.0	83.2	25.5	25.5	
Actuated g/C Ratio	0.58		0.70	0.69	0.21	0.21	
v/c Ratio	0.43		0.28	0.33	0.13	0.41	
Control Delay	14.7		7.2	3.5	39.5	8.1	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	14.7		7.2	3.5	39.5	8.1	
LOS	B		A	A	D	A	
Approach Delay	14.7			4.0	14.4		
Approach LOS	B			A	B		
Queue Length 50th (ft)	186		15	73	32	0	
Queue Length 95th (ft)	243		37	32	67	62	
Internal Link Dist (ft)	1534			1880	221		
Turn Bay Length (ft)			100		180	180	
Base Capacity (vph)	2055		435	2453	376	487	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.43		0.27	0.33	0.13	0.41	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Yellow			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.43			
Intersection Signal Delay: 9.8		Intersection LOS: A	

Lanes, Volumes, Timings
8: Raleigh St & W. 72nd Ave

PM Existing
08/15/2023

Intersection Capacity Utilization 63.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 8: Raleigh St & W. 72nd Ave

Lanes, Volumes, Timings
9: Lowell Blvd & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	669	60	150	653	95	102	312	181	78	156	88
Future Volume (vph)	150	669	60	150	653	95	102	312	181	78	156	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	235		135	185		180	255		0	200		0
Storage Lanes	1		1	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor	1.00		0.96	1.00		0.98	1.00	0.99		1.00		0.98
Frt			0.850			0.850		0.945				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	3321	0	1770	1863	1583
Flt Permitted	0.323			0.306			0.440			0.238		
Satd. Flow (perm)	601	3539	1527	568	3539	1559	816	3321	0	442	1863	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			100			136		87				136
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1960			1340			378			311	
Travel Time (s)		44.5			30.5			8.6			7.1	
Confl. Peds. (#/hr)	2		6	6		2	5		5	5		5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	727	65	163	710	103	111	339	197	85	170	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	163	727	65	163	710	103	111	536	0	85	170	96
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	pm+pt	NA	custom	pm+pt	NA	custom	pm+pt	NA		pm+pt	NA	custom

Lanes, Volumes, Timings
9: Lowell Blvd & W. 72nd Ave

PM Existing
08/15/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		6	6		2	8			4		8
Detector Phase	5	2	6	1	6	2	3	8		7	4	8
Switch Phase												
Minimum Initial (s)	6.0	15.0	15.0	6.0	15.0	15.0	6.0	8.0		6.0	8.0	8.0
Minimum Split (s)	15.0	55.0	55.0	20.0	55.0	55.0	18.0	27.0		15.0	27.0	27.0
Total Split (s)	15.0	55.0	55.0	20.0	55.0	55.0	18.0	27.0		15.0	27.0	27.0
Total Split (%)	12.5%	45.8%	45.8%	16.7%	45.8%	45.8%	15.0%	22.5%		12.5%	22.5%	22.5%
Maximum Green (s)	11.0	49.0	49.0	16.0	49.0	49.0	14.0	21.0		11.0	21.0	21.0
Yellow Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	4.0		3.0	4.0	4.0
All-Red Time (s)	1.0	2.0	2.0	1.0	2.0	2.0	1.0	2.0		1.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	None
Walk Time (s)		5.0	5.0		5.0	5.0		5.0			5.0	5.0
Flash Dont Walk (s)		18.0	18.0		18.0	18.0		20.0			20.0	20.0
Pedestrian Calls (#/hr)		4	6		6	4		5			5	5
Act Effct Green (s)	71.5	60.0	60.7	72.9	60.7	60.0	33.9	22.5		30.3	18.9	22.5
Actuated g/C Ratio	0.60	0.50	0.51	0.61	0.51	0.50	0.28	0.19		0.25	0.16	0.19
v/c Ratio	0.36	0.41	0.08	0.36	0.40	0.12	0.35	0.77		0.40	0.58	0.24
Control Delay	12.3	19.9	1.0	21.7	35.6	12.1	33.1	46.9		34.8	54.4	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	12.3	19.9	1.0	21.7	35.6	12.1	33.1	46.9		34.8	54.4	3.8
LOS	B	B	A	C	D	B	C	D		C	D	A
Approach Delay		17.3			30.8			44.5			35.8	
Approach LOS		B			C			D			D	
Queue Length 50th (ft)	50	176	0	80	260	16	62	176		47	120	0
Queue Length 95th (ft)	82	223	7	137	353	52	105	238		84	194	19
Internal Link Dist (ft)		1880			1260			298			231	
Turn Bay Length (ft)	235		135	185		180	255			200		
Base Capacity (vph)	472	1769	821	521	1788	847	352	733		239	333	419
Starvation Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.35	0.41	0.08	0.31	0.40	0.12	0.32	0.73		0.36	0.51	0.23

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 99 (83%), Referenced to phase 2:EBTL and 6:WBTL, Start of Yellow
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 30.0 Intersection LOS: C
Intersection Capacity Utilization 64.7% ICU Level of Service C

Lanes, Volumes, Timings
9: Lowell Blvd & W. 72nd Ave

PM Existing
08/15/2023

Analysis Period (min) 15

Splits and Phases: 9: Lowell Blvd & W. 72nd Ave

Lanes, Volumes, Timings
10: Irving St

PM Existing
08/15/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	925	18	24	772	23	31	9	32	40	13	93
Future Volume (vph)	72	925	18	24	772	23	31	9	32	40	13	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	85		0	200		145	0		0	150		150
Storage Lanes	1		0	1		1	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	1.00	1.00		1.00		0.97		0.98		0.99		
Frt		0.997				0.850		0.883				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3526	0	1770	3539	1583	1770	1619	0	1770	1863	1583
Flt Permitted	0.312			0.261			0.748			0.728		
Satd. Flow (perm)	580	3526	0	484	3539	1542	1393	1619	0	1345	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3				77		35				101
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		1340			476			286			312	
Travel Time (s)		30.5			10.8			7.8			8.5	
Confl. Peds. (#/hr)	2		7	7		2			6	6		
Confl. Bikes (#/hr)			1									
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	1005	20	26	839	25	34	10	35	43	14	101
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	1025	0	26	839	25	34	45	0	43	14	101
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2		1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	

Lanes, Volumes, Timings
10: Irving St

PM Existing
08/15/2023

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Type	pm+pt	NA		pm+pt	NA	custom	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6		2	8			4		4
Detector Phase	5	2		1	6	2	8	8		4	4	4
Switch Phase												
Minimum Initial (s)	5.0	15.0		5.0	15.0	15.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	12.0	84.0		12.0	84.0	84.0	24.0	24.0		24.0	24.0	24.0
Total Split (s)	12.0	84.0		12.0	84.0	84.0	24.0	24.0		24.0	24.0	24.0
Total Split (%)	10.0%	70.0%		10.0%	70.0%	70.0%	20.0%	20.0%		20.0%	20.0%	20.0%
Maximum Green (s)	7.5	78.0		7.5	78.0	78.0	17.0	17.0		17.0	17.0	17.0
Yellow Time (s)	3.5	4.0		3.5	4.0	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	1.0	2.0		1.0	2.0	2.0	3.0	3.0		3.0	3.0	3.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0		4.5	6.0	6.0	7.0	7.0		7.0	7.0	7.0
Lead/Lag	Lead	Lag		Lead	Lag	Lag						
Lead-Lag Optimize?	Yes			Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	Max	C-Max	None	None		None	None	None
Walk Time (s)		5.0			5.0	5.0	5.0	5.0		5.0	5.0	5.0
Flash Dont Walk (s)		14.0			14.0	14.0	20.0	20.0		20.0	20.0	20.0
Pedestrian Calls (#/hr)		6			2	6	6	6		0	0	0
Act Effct Green (s)	96.3	90.6		94.3	88.0	90.6	10.0	10.0		10.0	10.0	10.0
Actuated g/C Ratio	0.80	0.76		0.79	0.73	0.76	0.08	0.08		0.08	0.08	0.08
v/c Ratio	0.15	0.38		0.06	0.32	0.02	0.29	0.27		0.38	0.09	0.45
Control Delay	3.0	4.5		1.2	2.3	0.0	56.1	24.2		60.1	49.2	15.9
Queue Delay	0.0	0.0		0.0	0.1	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	3.0	4.5		1.2	2.4	0.0	56.1	24.2		60.1	49.2	15.9
LOS	A	A		A	A	A	E	C		E	D	B
Approach Delay		4.4			2.3			37.9			30.9	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)	10	89		1	37	0	25	7		32	10	0
Queue Length 95th (ft)	m22	111		m4	45	m0	56	42		67	30	51
Internal Link Dist (ft)		1260			396			206			232	
Turn Bay Length (ft)	85			200		145				150		150
Base Capacity (vph)	541	2663		465	2596	1183	197	259		190	263	310
Starvation Cap Reductn	0	0		0	580	0	0	0		0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.14	0.38		0.06	0.42	0.02	0.17	0.17		0.23	0.05	0.33

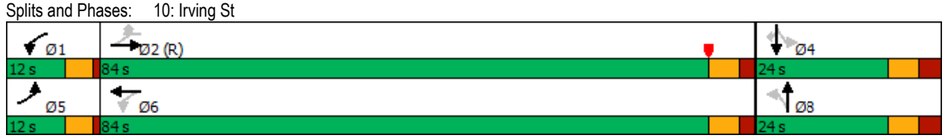
Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 27 (23%), Referenced to phase 2:EBTL, Start of Yellow			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.45			
Intersection Signal Delay: 6.6		Intersection LOS: A	

Lanes, Volumes, Timings
10: Irving St

PM Existing
08/15/2023

Intersection Capacity Utilization 55.5% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 10: Irving St



HCM 6th Signalized Intersection Summary
11: Hooker St

PM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	909	20	28	755	56	23	6	52	53	2	39
Future Volume (veh/h)	69	909	20	28	755	56	23	6	52	53	2	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	0.98		0.96	0.98		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	75	988	22	30	821	61	25	7	57	58	2	42
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	564	2577	57	496	2543	1106	202	20	166	113	15	57
Arrive On Green	0.06	1.00	1.00	0.04	1.00	1.00	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1781	3553	79	1781	3554	1545	1341	170	1383	548	125	471
Grp Volume(v), veh/h	75	494	516	30	821	61	25	0	64	102	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1856	1781	1777	1545	1341	0	1552	1144	0	0
Q Serve(g_s), s	1.4	0.0	0.0	0.5	0.0	0.0	0.0	0.0	4.5	6.6	0.0	0.0
Cycle Q Clear(g_c), s	1.4	0.0	0.0	0.5	0.0	0.0	2.4	0.0	4.5	11.2	0.0	0.0
Prop In Lane	1.00		0.04	1.00		1.00	1.00		0.89	0.57		0.41
Lane Grp Cap(c), veh/h	564	1289	1346	496	2543	1106	202	0	187	185	0	0
V/C Ratio(X)	0.13	0.38	0.38	0.06	0.32	0.06	0.12	0.00	0.34	0.55	0.00	0.00
Avail Cap(c_a), veh/h	629	1289	1346	578	2543	1106	230	0	220	215	0	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	0.75	0.75	0.75	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.9	0.0	0.0	4.1	0.0	0.0	47.5	0.0	48.4	52.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.8	0.8	0.0	0.3	0.1	0.3	0.0	1.1	2.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.3	0.3	0.2	0.1	0.0	0.7	0.0	1.8	3.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.0	0.8	0.8	4.2	0.3	0.1	47.7	0.0	49.5	54.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	D	D	A	A
Approach Vol, veh/h		1085			912			89			102	
Approach Delay, s/veh		1.0			0.4			49.0			54.6	
Approach LOS		A			A			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.5	93.0		20.4	7.7	91.9		20.4				
Change Period (Y+Rc), s	4.0	6.0		6.0	4.0	6.0		6.0				
Max Green Setting (Gmax), s	8.0	79.0		17.0	8.0	79.0		17.0				
Max Q Clear Time (g_c+I1), s	2.5	2.0		13.2	3.4	2.0		6.5				
Green Ext Time (p_c), s	0.0	8.5		0.1	0.1	7.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			5.2									
HCM 6th LOS			A									

Notes
User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary
12: Federal Blvd & W. 72nd Ave

PM Existing
08/15/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	344	304	112	70	341	118	213	1221	79	162	1117	364
Future Volume (veh/h)	344	304	112	70	341	118	213	1221	79	162	1117	364
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	374	330	122	76	371	128	232	1327	86	176	1214	396
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	429	763	340	122	447	197	287	2213	686	461	2511	774
Arrive On Green	0.12	0.21	0.21	0.07	0.25	0.25	0.08	0.43	0.43	0.13	0.49	0.49
Sat Flow, veh/h	3456	3554	1583	3456	3554	1563	3456	5106	1584	3456	5106	1574
Grp Volume(v), veh/h	374	330	122	76	371	128	232	1327	86	176	1214	396
Grp Sat Flow(s),veh/h/ln	1728	1777	1583	1728	1777	1563	1728	1702	1584	1728	1702	1574
Q Serve(g_s), s	12.8	9.6	7.9	2.6	11.8	8.8	7.9	23.9	3.0	5.6	19.0	11.8
Cycle Q Clear(g_c), s	12.8	9.6	7.9	2.6	11.8	8.8	7.9	23.9	3.0	5.6	19.0	11.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	429	763	340	122	447	197	287	2213	686	461	2511	774
V/C Ratio(X)	0.87	0.43	0.36	0.62	0.83	0.65	0.81	0.60	0.13	0.38	0.48	0.51
Avail Cap(c_a), veh/h	490	770	343	346	622	274	346	2213	686	461	2511	774
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	40.8	40.1	55.0	43.7	42.5	54.1	26.0	12.3	47.5	20.3	6.8
Incr Delay (d2), s/veh	12.3	0.1	0.2	1.9	4.7	1.3	9.4	1.2	0.4	0.2	0.7	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	4.2	3.1	1.1	4.9	3.2	3.8	9.5	1.5	2.4	7.4	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.9	40.9	40.3	56.9	48.4	43.9	63.4	27.2	12.6	47.7	21.0	9.3
LnGrp LOS	E	D	D	E	D	D	E	C	B	D	C	A
Approach Vol, veh/h		826			575			1645			1786	
Approach Delay, s/veh		51.3			48.5			31.6			21.0	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	58.0	9.2	30.8	15.0	65.0	19.9	20.1
Change Period (Y+Rc), s	6.0	* 6	5.0	5.0	5.0	6.0	5.0	5.0
Max Green Setting (Gmax), s	9.0	* 52	12.0	26.0	12.0	49.0	17.0	21.0
Max Q Clear Time (g_c+I1), s	7.6	25.9	4.6	11.6	9.9	21.0	14.8	13.8
Green Ext Time (p_c), s	0.0	17.6	0.0	1.4	0.1	22.4	0.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	33.1
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
13: W. 72nd Ave & Zuni St

PM Existing
08/15/2023

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Lane Configurations							
Traffic Volume (vph)	33	575	518	40	36	22	
Future Volume (vph)	33	575	518	40	36	22	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	50			0	100	100	
Storage Lanes	1			0	1	0	
Taper Length (ft)	25				25		
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00	
Ped Bike Factor	1.00		1.00			0.98	
Frt			0.989			0.850	
Flt Protected	0.950				0.950		
Satd. Flow (prot)	1770	3539	3495	0	1770	1583	
Flt Permitted	0.423				0.950		
Satd. Flow (perm)	788	3539	3495	0	1770	1553	
Right Turn on Red				Yes		Yes	
Satd. Flow (RTOR)			24			24	
Link Speed (mph)		30	30		25		
Link Distance (ft)		2630	378		264		
Travel Time (s)		59.8	8.6		7.2		
Confl. Peds. (#/hr)	1			1		2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	36	625	563	43	39	24	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	36	625	606	0	39	24	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		24	24		12		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Number of Detectors	1	2	2		1	1	
Detector Template	Left	Thru	Thru		Left	Right	
Leading Detector (ft)	20	100	100		20	20	
Trailing Detector (ft)	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0		0	0	
Detector 1 Size(ft)	20	6	6		20	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94	94				
Detector 2 Size(ft)		6	6				
Detector 2 Type		Cl+Ex	Cl+Ex				
Detector 2 Channel							
Detector 2 Extend (s)		0.0	0.0				
Turn Type	Perm	NA	NA		Prot	Perm	

Lanes, Volumes, Timings
13: W. 72nd Ave & Zuni St

PM Existing
08/15/2023

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	Ø4
Protected Phases		2	2		3		4
Permitted Phases	2					3	
Detector Phase	2	2	2		3	3	
Switch Phase							
Minimum Initial (s)	6.0	6.0	6.0		5.0	5.0	1.0
Minimum Split (s)	43.0	43.0	43.0		11.0	11.0	7.0
Total Split (s)	43.0	43.0	43.0		11.0	11.0	6.0
Total Split (%)	71.7%	71.7%	71.7%		18.3%	18.3%	10%
Maximum Green (s)	37.0	37.0	37.0		5.0	5.0	0.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	6.0	
Lead/Lag					Lead	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0
Recall Mode	C-Max	C-Max	C-Max		None	None	None
Walk Time (s)							10.0
Flash Dont Walk (s)							15.0
Pedestrian Calls (#/hr)							3
Act Effct Green (s)	48.6	48.6	48.6		5.0	5.0	
Actuated g/C Ratio	0.81	0.81	0.81		0.08	0.08	
v/c Ratio	0.06	0.22	0.21		0.27	0.16	
Control Delay	2.4	2.3	3.0		30.7	14.5	
Queue Delay	0.0	0.0	0.0		0.0	0.0	
Total Delay	2.4	2.3	3.0		30.7	14.5	
LOS	A	A	A		C	B	
Approach Delay		2.3	3.0		24.5		
Approach LOS		A	A		C		
Queue Length 50th (ft)	1	11	28		14	0	
Queue Length 95th (ft)	m18	106	65		39	19	
Internal Link Dist (ft)		2550	298		184		
Turn Bay Length (ft)	50				100	100	
Base Capacity (vph)	638	2866	2835		147	151	
Starvation Cap Reductn	0	0	0		0	0	
Spillback Cap Reductn	0	0	0		0	0	
Storage Cap Reductn	0	0	0		0	0	
Reduced v/c Ratio	0.06	0.22	0.21		0.27	0.16	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 16 (27%), Referenced to phase 2:EBWB, Start of Yellow
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.27
Intersection Signal Delay: 3.7 Intersection LOS: A
Intersection Capacity Utilization 39.8% ICU Level of Service A

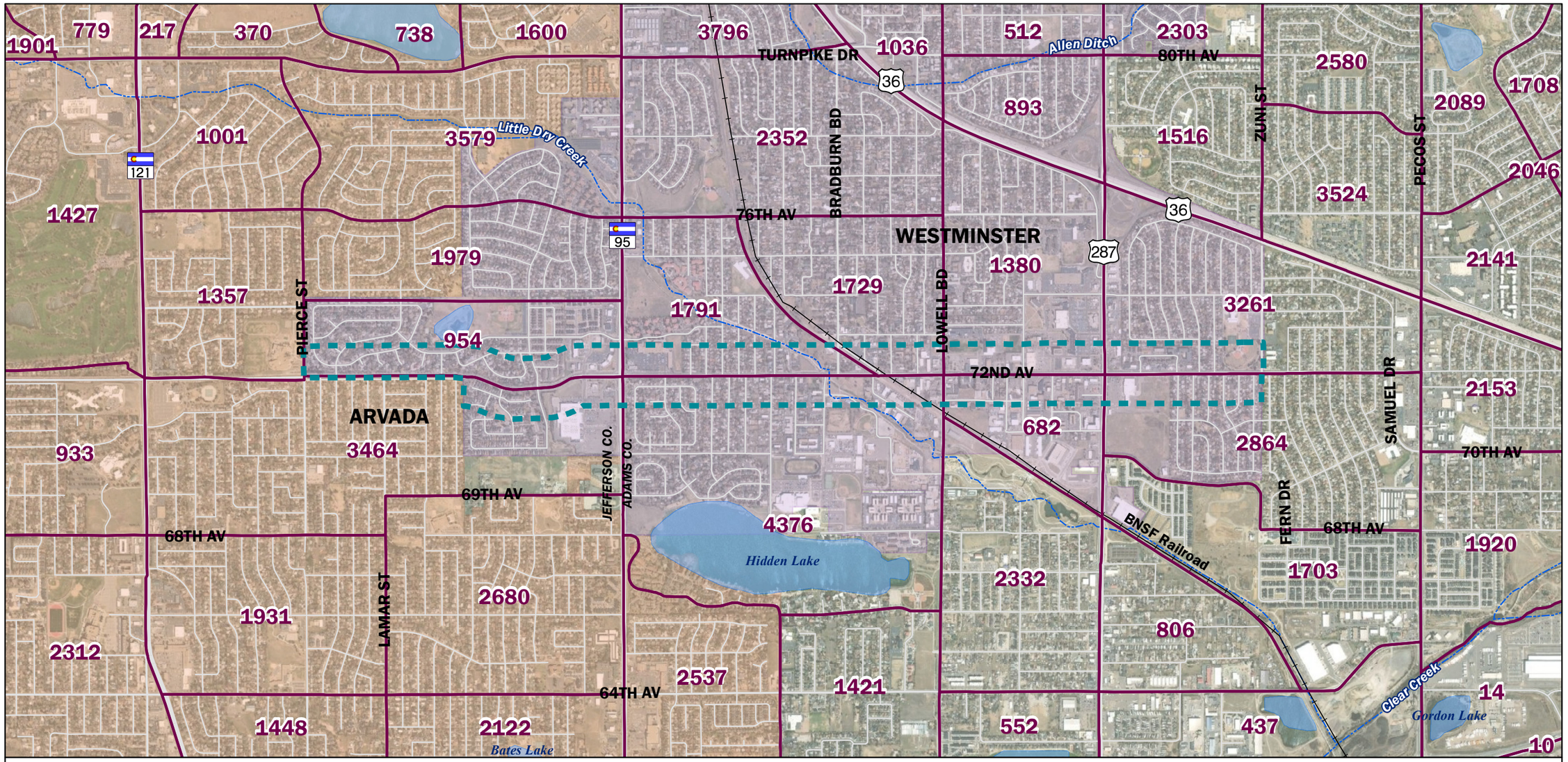
Lanes, Volumes, Timings
13: W. 72nd Ave & Zuni St

PM Existing
08/15/2023

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: W. 72nd Ave & Zuni St



Legend

- Traffic Analysis Zones
- Railroad
- Stream
- Waterbody
- Parks and Open Space
- ARVADA
- WESTMINSTER
- Environmental Study Area

Source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,

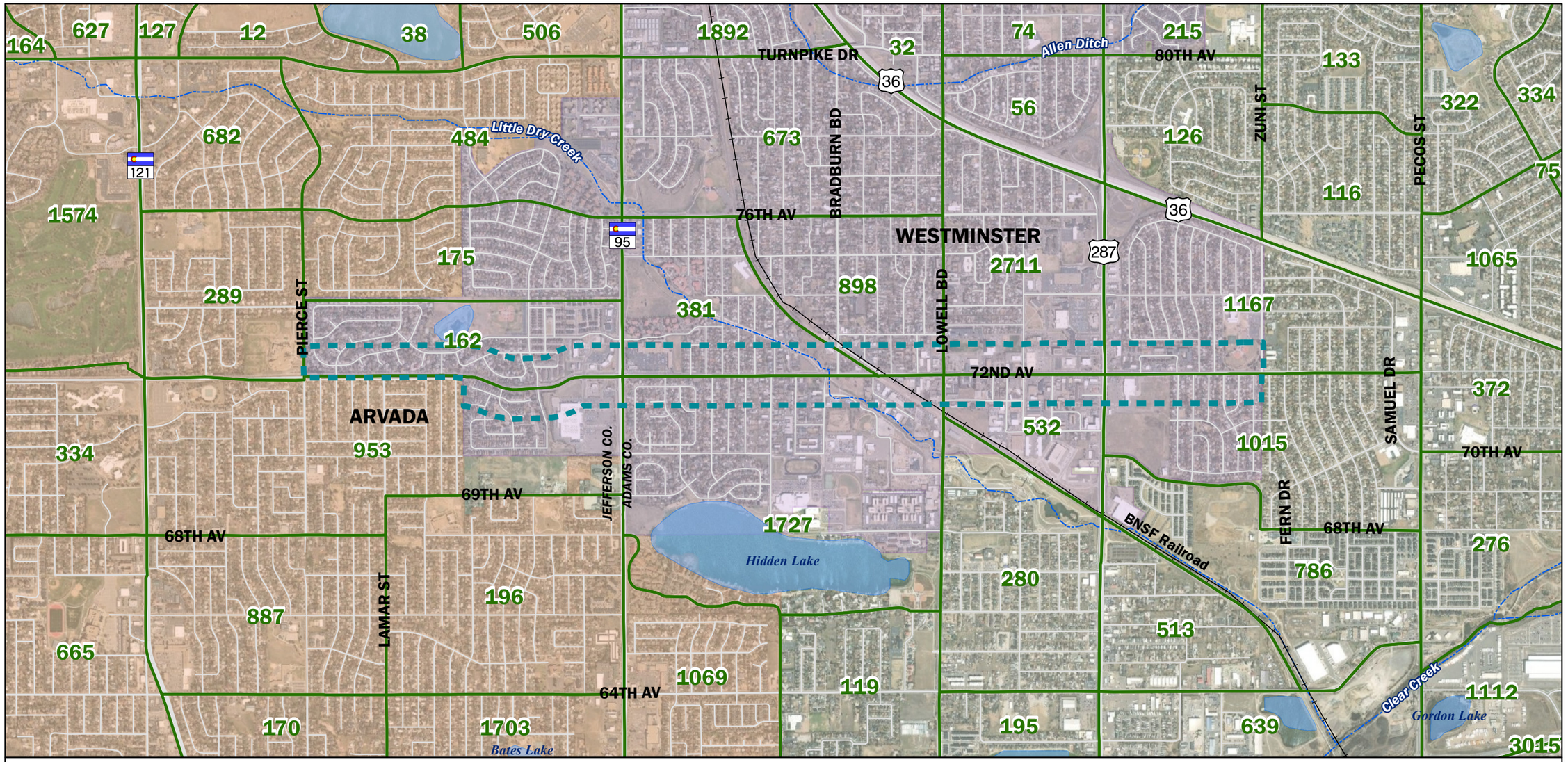
0 0.1 0.2 0.3 Miles

N

72nd Avenue Corridor Evaluation

2020 Population

Westminster, Colorado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127
12
38
506
1892
74
215
164
TURNPIKE DR
32
Allen Ditch
80TH AV
133
36
56
322
334
682
484
Little Dry Creek
673
BRADBURN BD
126
ZUNI ST
PECOS ST
121
75
1574
76TH AV
116
36
95
WESTMINSTER
287
175
2711
1065
898
LOWELL BD
289
381
1167
PIERCE ST
162
72ND AV
372
ARVADA
532
SAMUEL DR
334
953
1015
70TH AV
JEFFERSON CO.
ADAMS CO.
69TH AV
FERN DR
1727
BNSF Railroad
68TH AV
Hidden Lake
68TH AV
276
786
280
LAMAR ST
196
887
513
665
Clear Creek
1069
119
1112
64TH AV
Gordon Lake
170
1703
195
639
3015
Bates Lake
Legend
Traffic Analysis Zones
Railroad
Stream
Waterbody
Parks and Open Space
ARVADA
WESTMINSTER
Environmental Study Area
Source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
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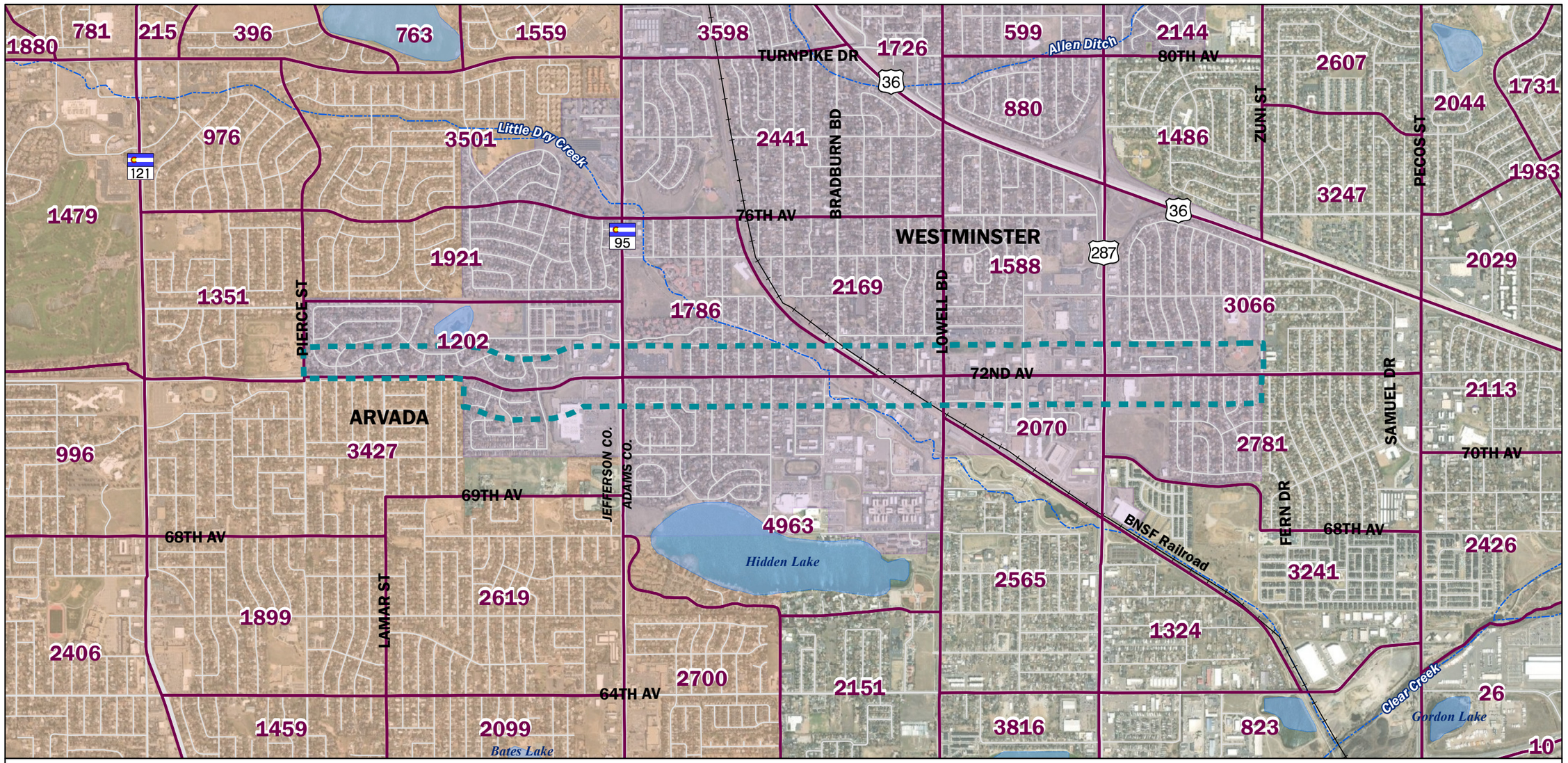
72nd Avenue Corridor Evaluation
2020 Employment
Westminster, Colorado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TURNPIKE DR
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Allen Ditch
2144
80TH AV
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880
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3501
Little Dry Creek
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BRADBURN BD
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ZUNI ST
PECOS ST
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1983
1479
76TH AV
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WESTMINSTER
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1588
2029
1921
1351
2169
LOWELL BD
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PIERCE ST
1786
1202
72ND AV
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ARVADA
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SAMUEL
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70TH AV
JEFFERSON CO.
ADAMS CO.
69TH AV
FERN DR
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BNSF Railroad
68TH AV
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Hidden Lake
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3241
68TH AV
1899
LAMAR ST
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2406
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Clear Creek
26
64TH AV
2151
Gordon Lake
1459
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3816
823
10
Bates Lake
Legend
Traffic Analysis Zones
Railroad
Stream
Waterbody
Parks and Open Space
ARVADA
WESTMINSTER
Environmental Study Area
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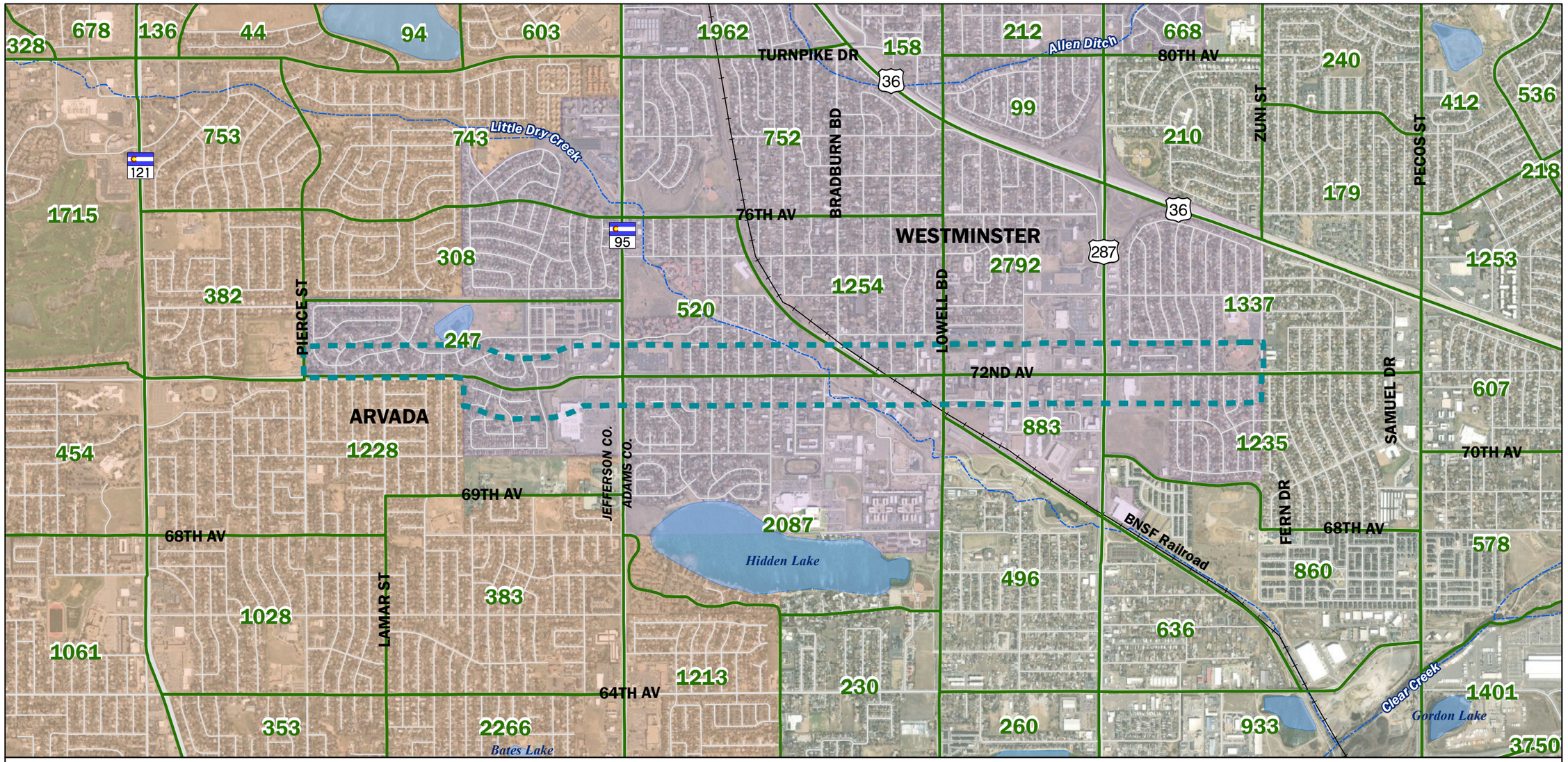
72nd Avenue Corridor Evaluation
2050 Population
Westminster, Colorado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210
412
536
121
BRADBURN BD
ZUNI ST
PECOS ST
1715
76TH AV
95
36
179
218
WESTMINSTER
287
308
2792
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382
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1337
PIERCE ST
520
LOWELL BD
247
72ND AV
607
ARVADA
883
1235
SAMUEL DR
454
1228
JEFFERSON CO.
ADAMS CO.
70TH AV
69TH AV
FERN DR
68TH AV
2087
BNSF Railroad
578
Hidden Lake
496
860
68TH AV
LAMAR ST
383
636
1028
1061
1213
Clear Creek
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64TH AV
230
Gordon Lake
353
2266
260
933
3750
Bates Lake
Legend
Traffic Analysis Zones
Railroad
Stream
Waterbody
Parks and Open Space
ARVADA
WESTMINSTER
Environmental Study Area
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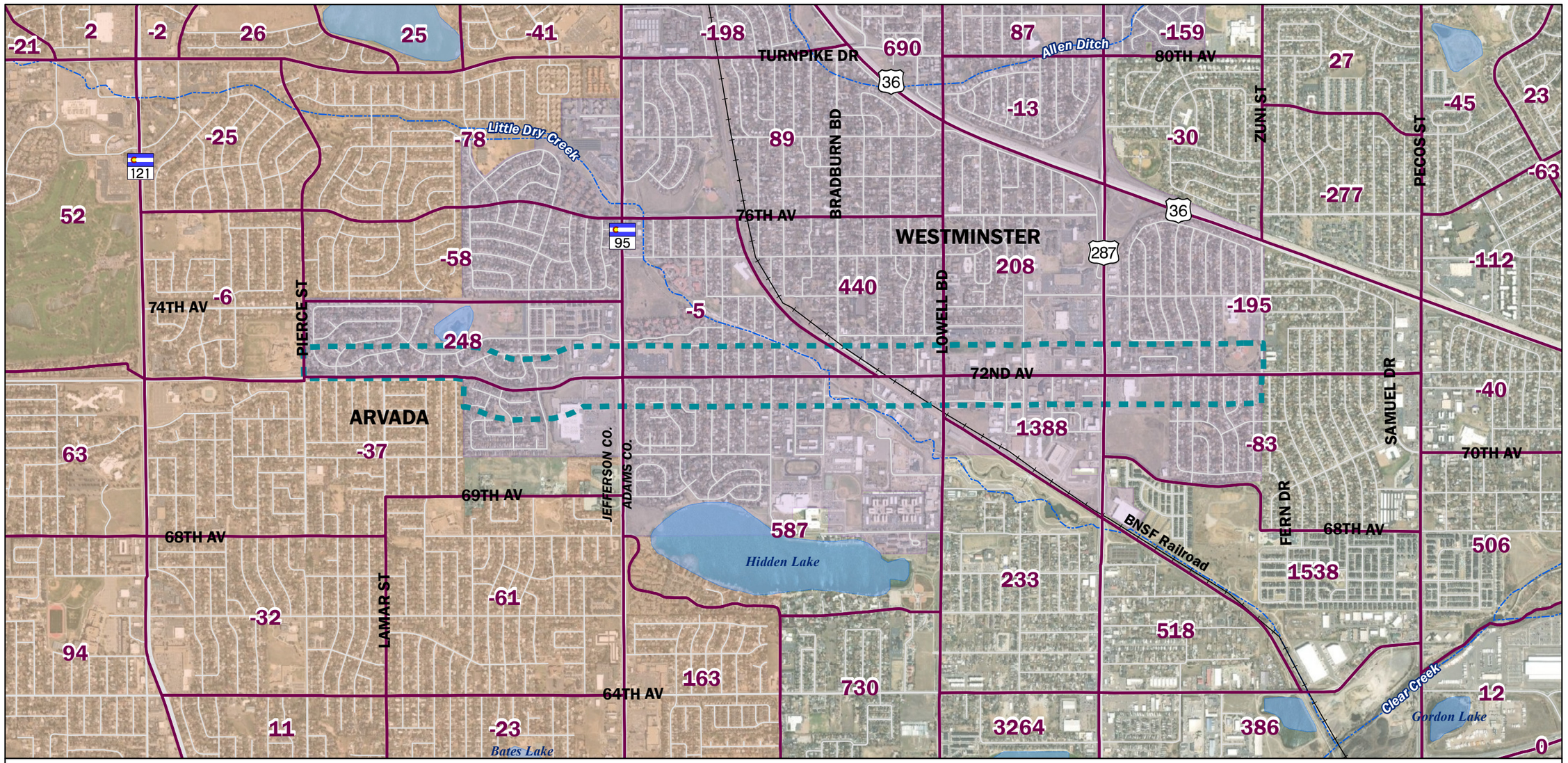
2050 Employment
Westminster, Colorado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440
208
-195
-112
-63
-277
-5
248
-6
74TH AV
PIERCE ST
TURNPIKE DR
Little Dry Creek
Allen Ditch
80TH AV
ZUNI ST
PECOS ST
BRADBURN BD
76TH AV
LOWELL BD
WESTMINSTER
72ND AV
SAMUEL DR
ARVADA
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-37
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70TH AV
69TH AV
JEFFERSON CO.
ADAMS CO.
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Hidden Lake
FERN DR
68TH AV
BNSF Railroad
506
68TH AV
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-61
233
1538
LAMAR ST
94
518
163
730
64TH AV
Clear Creek
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Gordon Lake
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-23
Bates Lake
3264
386
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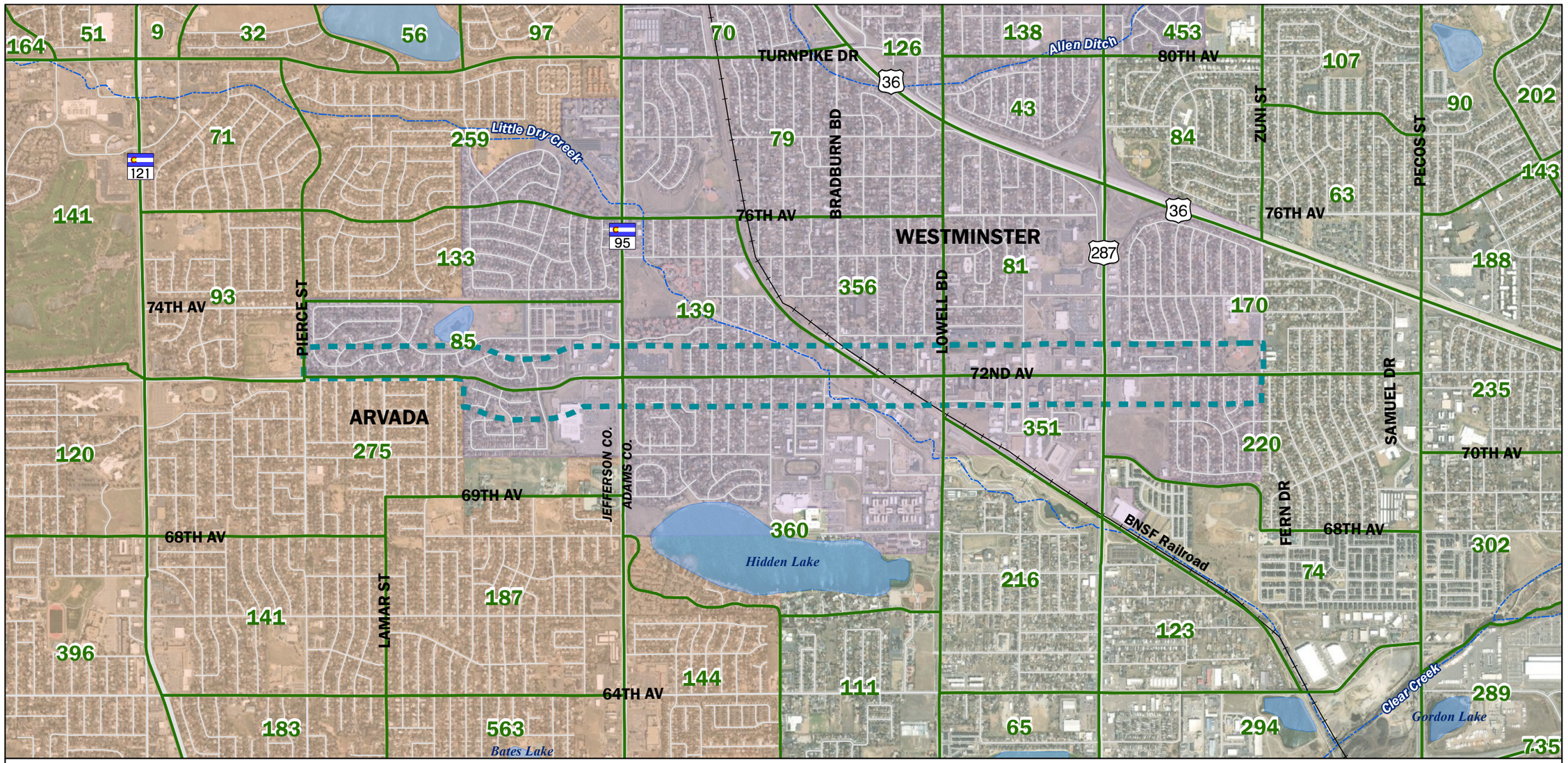
287
Legend
Traffic Analysis Zones
Railroad
Stream
Waterbody
Parks and Open Space
ARVADA
WESTMINSTER
Environmental Study Area
Source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,
0 0.1 0.2 0.3 Miles
N
72nd Avenue Corridor Evaluation
2020-2050 Population Change
Westminster, Colorado



Legend

- Traffic Analysis Zones
- Railroad
- Stream
- Waterbody
- Parks and Open Space
- ARVADA
- WESTMINSTER
- Environmental Study Area

Source: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,

0 0.1 0.2 0.3 Miles

N

72nd Avenue Corridor Evaluation

2020-2050 Employment Change

Westminster, Colorado

APPENDIX B

72nd Avenue Study and Plan
Economic Vitality Study
Westminster, Colorado

February 15, 2024

Prepared for:

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APPENDIX B

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Real Estate Markets	10
Retail Market	13
Office Market	19
Industrial Market	20
Residential Market	21
Redevelopment Potentials	24

Executive Summary

This memo is an appendix to the 72nd Avenue Study and Plan which is planning for transportation, mobility, and urban design improvements between Zuni Street and Pierce Street on 72nd Avenue in the City of Westminster. This memo addresses related economic development issues along the corridor.

Demographics and Background

- **Households**: An estimated 8,000 households live in the ¼ mile radius around the 72nd Avenue corridor between Zuni Street and Pierce Street. The corridor saw an increase in about 200 households in the last five years while the City grew by 4,400 households. Average household sizes are approximately 2.66 persons per household in the corridor compared to the City at 2.46 persons.

- **Incomes, Race and Ethnicity**: Median household incomes are estimated at $58,467 in comparison to the City of Westminster at $80,355. Median ages in both the City and the corridor are about 37 years of age. The corridor as well as the City tends to be Hispanic / Latino and White.

- **Citywide Studies**: Two Citywide studies relevant to this corridor are as follows:

    - **Retail**: The Citywide Retail Strategy included the 72nd Avenue Corridor in the "South Westminster" district. South Westminster has both the oldest retail inventory on average, and is the area within the City with the least affluent surrounding demographics.

    - **Housing**: The Housing Needs Assessment mentioned the rising rents as well as the increasing homeownership gap within the City.

- **Retail:** Retail in the 72nd Avenue corridor area comprises approximately 10% of the overall retail square footage in the City of Westminster. The Sheridan Avenue intersection includes a Wal-Mart Supercenter and newer retail offerings. There are a variety of larger box retailers near Federal Boulevard and 72nd Avenue. The community's most pressing concern in the eastern end of the corridor is the desire for a full-service grocery store. In order to support a grocery store near Federal Boulevard and 72nd Avenue, approximately **1,000 to 3,000** additional households would be needed for a convenience oriented urban grocery store. A "conventional" suburban-style grocery store would need at least an additional **5,000** units in close proximity.

- **Office**: Office development is typically tied to employment growth. Given the market challenges, it is unlikely that any speculative large-scale office development will occur in the near future. Should the Northgate development occur along with redevelopment at the Westminster station and the addition of a significant number of housing units, smaller scale office space providing medical and other personal services may be a longer term potential in the area.

- **Industrial**: As area redevelopment occurs and land values increase, there may be increased pressure on corridor industrial properties to redevelop to other uses. While this may take some time, City policies around jobs retention and the significance of maintaining industrial land uses may need to be examined in light of changes occurring in the future.

- **Residential**: Multifamily rental units in and around the 72nd Avenue Corridor help provide affordable rental housing options for the City and metro area. The existing rental units are a mix of market rate affordable and deed-restricted affordable housing. Vacancy rates are much lower then the Citywide average, indicative of the need. Ownership housing prices have seen significant increases in the last five years. Prices, however, remain relatively attainable in the corridor area compared to the rest of the metro area.

Executive Summary

Focus Area Recommendations:

- **Hidden Lake Long Term Redevelopment: The shopping center at the northeast corner of 72nd Avenue and Sheridan Boulevard is a long term future redevelopment candidate.** Future potentials could include a mix of residential types, including single family residential, townhouses, and apartments (including mixed income residential), additional medical office, along with specialty retail.

- **Harris Park area:** The Harris Plan Vision is guiding the future of the area. The plan should be reviewed in light of development considerations, ensuring that they're aspirational but grounded in reality. Along 72nd Avenue, social paths should be normalized and track crossings made safer. Additional wayfinding from 72nd Avenue should be provided.

- **Westminster Station:** The City has a **station area plan** in place and various redevelopment tools (Urban Renewal, Opportunity Area Zones, etc). Some of the redevelopment challenges include Xcel's limited ability to readily provide increased utility services to new development within the area. **Working with Xcel and potentially the State to overcome the infrastructure challenge** is important in light of the area housing need and the planned Bus Rapid Transit investment along the Federal Boulevard corridor.

- **Northgate Commercial:** Exploring other options for **reuse of the Northgate commercial site may include a horizontal mixed use center with additional residential units and other amenities to** complement the planned Northgate residential development.

- As the area densifies, a more appropriate location for a full-service grocery store could be within the large center at the northwest corner of Federal Boulevard and 72nd Avenue.

Demographics

Population and Households

There are an estimated 8,000 households in the 1/4 mile radius around the 72nd Avenue Corridor. Between 2012-2016 and 2017-2021, the number of persons decreased slightly in the 1/4 mile radius, although the number of households increased indicating a decrease in average household sizes.

The City of Westminster also saw a decrease in average household sizes during this time. It also saw an increase in both population and households with the addition of 4,400 households.

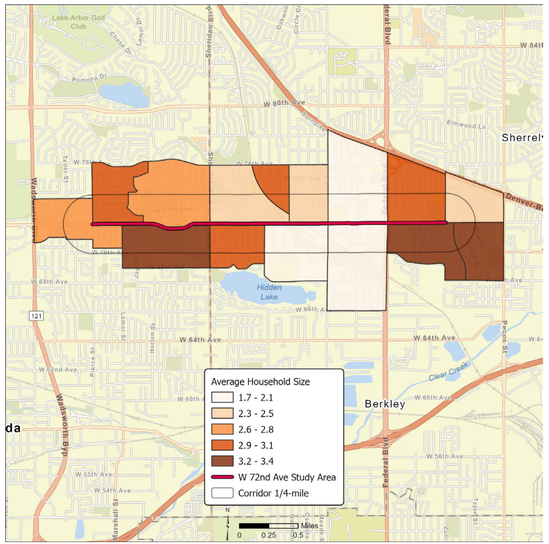
Population and Households, 2012-2016, 2017-2021

	2012-2016	2017-2021	Change
1/4 Mile Radius			
Persons	21,604	21,533	-71
Households	7,863	8,082	219
Persons / Households	2.75	2.66	
City of Westminster			
Persons	111,770	115,535	3,765
Households	42,573	46,968	4,395
Persons / Households	2.63	2.46	

Source: American Community Survey 5 Year Estimates, 2012-2016 and 2017-2021 ArLand

DRCOG currently forecasts an annual 0.6% household growth rate in the corridor for the next ten years. This will accommodate potential growth at the proposed Northgate community east of Federal Boulevard and 72nd Avenue. These growth forecasts could be adjusted as Westminster Station Area redevelopment occurs.

Average Household Size



Source: 2017-2021 American Community Survey 5 Year Estimates, ArLand

Household Incomes

The median household incomes in the 1/4 mile radius are estimated at less than $60,000 and lag in comparison to median household incomes in the City overall. Additionally, between 2012-2016 and 2017-2021, while both areas saw an overall increase, the 1/4 mile radius also lagged in terms of overall annual percentage change growing by 2.3% annually compared to the City which grew by 2.9% annually during this time period.

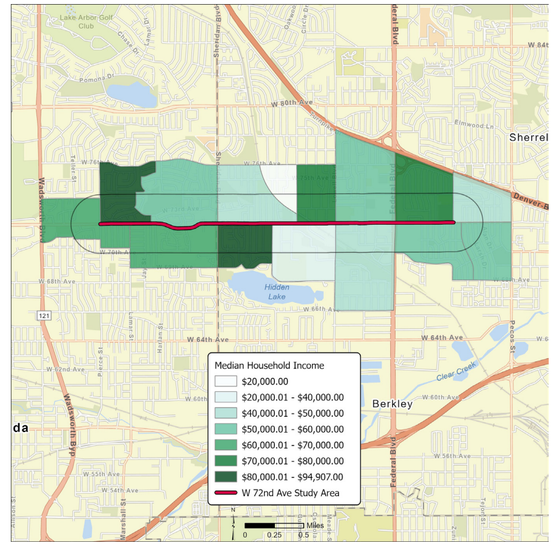
Change in Median Household Incomes: 1/4 Mile Radius vs. City

	2012-2016	2017-2021	Annual Percentage Change
1/4 Mile Radius	$52,209	$58,467	2.3%
City of Westminster	$69,805	$80,355	2.9%

Household Income Distribution, 2017-2021: 1/4 Mile Radius vs. City

Sources for table and chart: American Community Survey 5 year Estimates, 2012 -2016 and 2017-20211, ArLand

Median Household Income



Source: 2017-2021 American Community Survey 5 Year Estimates, ArLand

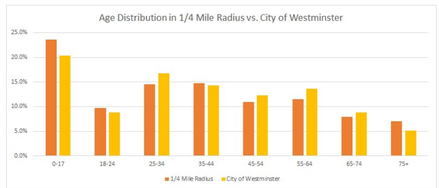
Ages

Residents in the 1/4 mile radius are generally younger than the City. Median ages are slightly younger at 37.09 years in the corridor compared to 37.6 years in the City overall. The 1/4 mile radius has a higher percentage of residents 0-24 years, 35-44 years, and over 75 years old.

Median ages tend to be higher northwest of Federal Boulevard and 72nd Avenue which may be indicative of older, settled residential neighborhoods.

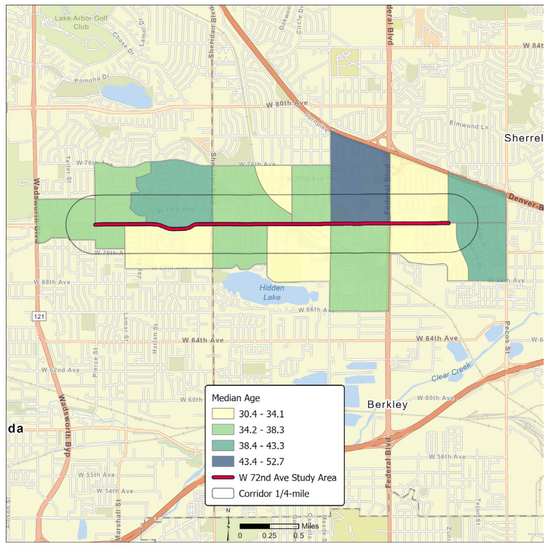
	2012-2016	2017-2021	Change
1/4 Mile Radius	35.09	37.09	2.00
City of Westminster	36.30	37.60	1.30

Age Distribution, 2017-2021: 1/4 Mile Radius vs. City



Sources for table and chart: American Community Survey 5 Year Estimates, 2012-2016 and 2017-2021, ArLand

Median Age



Source: 2017-2021 American Community Survey 5 Year Estimates, ArLand

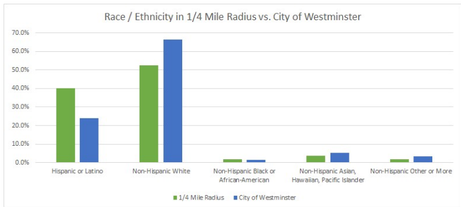
Race and Ethnicity

The non-Hispanic White population is over 50% of the corridor population followed by the Hispanic / Latino population which comprises about 40% of the corridor population. Black, Asian and other races as well as mixed race residents comprise the balance.

In the City of Westminster, the non-Hispanic White population comprises over 65% of the population followed by Hispanic / Latino residents at over 24% of the population. Asian Pacific Islanders comprise over 5% of the population followed by Black, mixed and other race persons.

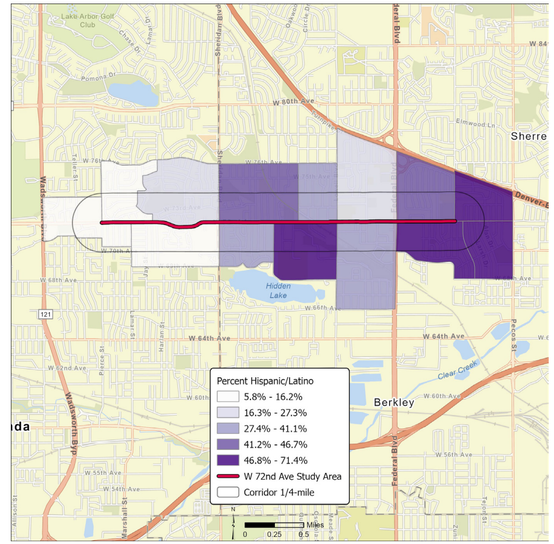
The neighborhoods east of Federal Boulevard tend to have a higher percentage of Hispanic / Latino residents in comparison to the neighborhoods west of Federal Boulevard. The neighborhoods west of Sheridan Boulevard tend to be predominantly non-Hispanic White.

Race / Ethnicity, 2017-2021: 1/4 Mile Radius vs. City



Source: 2017-2021 American Community Survey 5 Year Estimates, ArLand

Race and Ethnicity



Source: 2017-2021 American Community Survey 5 Year Estimates, ArLand

Real Estate Markets

72nd Avenue Corridor Needs

Changes in behavior occurring during the Covid-19 Pandemic continue to be felt throughout the region, with impacts on real estate markets. While changes in real estate markets had been occurring, the Pandemic hastened or exacerbated trends.

Key considerations as we examine 72nd Avenue Corridor opportunities are summarized below:

- **Retail and restaurants**: Retail markets were shifting prior to Covid (increased on-line shopping; the demise of some retail store types). Retail and restaurants are continuing to adjust to a post-Covid reality of operating. There are national credit retailers along 72nd Avenue, particularly at Federal Boulevard and Sheridan Boulevard. Sheridan Boulevard retail is relatively healthy although there are second generation retail uses at the northeast corner of Sheridan Boulevard and 72nd Avenue. Federal Boulevard and 72nd Avenue lost a smaller Wal-Mart store (which included groceries) . Its closure is indicative of the ever-changing nature of retail and the reality that location and operations decisions are dictated elsewhere.

- **Housing**: In the City of Westminster and across the region, the increased unaffordability of housing (both rental and ownership) is of paramount concern. While the increase in housing values may be benefitting some, others have found that cost burdens have increased as housing prices and rents have increased significantly.

- **Office**: The office sector has been one of the hardest hit by the Pandemic. Increased office sublease vacancies are starting to be seen as office employees are choosing to work in a hybrid fashion with continued consequences for the office market.

Other Area Considerations

- **Federal Boulevard Bus Rapid Transit:** The Colorado Department of Transportation (CDOT) has started planning for a Bus Rapid Transit route that will encompass 18 miles of Federal Boulevard from 120th Avenue in Westminster to Dartmouth Avenue in south Denver. It will help better connect the 72nd Avenue corridor in Westminster to the rest of the region and help build momentum for redevelopment at the Westminster Station which is currently working through infrastructure provision issues.

- **St. Anthony North Healthcare Investment:** St. Anthony North at 84th Avenue and Federal Boulevard is expanding by 133,000 square feet to keep up with rapid area growth as well as add additional services including a cancer center, advanced technology services, and more intensive care beds.

  A number of regional hospitals are embarking upon major expansions and/or relocations in order to upgrade facilities, keep up with area growth, and prepare for changes in medical technology and health care needs. One of the challenges that facilities have is in attracting a workforce with proximity to "missing middle" housing especially important with potential for increased demand throughout the immediate regional area.

- **Uplands Redevelopment:** A "missing middle" and affordable community, this new community of 2,350 homes will be built over the next 15 to 20 years between Federal and Lowell Boulevards and 84th and 88th Avenues. As these homes are built out, they are expected to create demand for increased commercial and personal services.

72nd Avenue Corridor Needs

Past studies relevant to this task include a 2022 Citywide Retail Strategy and a 2023 Housing Needs Assessment.

2022 Citywide Retail Strategy

- The strategy acknowledges a new normal, ie open air retail districts and projects favored over enclosed malls. On-line continues to be popular and growing. Some stores are being increasingly used as convenience fulfillment centers, particularly for commodity goods.
- The City was divided into sub-sections. Retail along the 72nd Avenue Corridor is in the section called "South Westminster". 72nd Avenue is the primary east-west corridor in this area bounded by 88th Avenue to the north and the City boundary to the south.
- South Westminster has both the oldest retail inventory on average, and is the area within the City with the least affluent surrounding demographics. Retail vacancy rates during the time of the study were 14.5%, (much higher than the other sub-sections of the City).
- Lack of aggregate demand, south to north development patterns that favor the north and physical barriers discourage the flourishing of retail in South Westminster.
- Encouraging denser development, in the long term may lead to growing aggregate demand over time, however, it is unlikely that a "magic retailer" will appear that might backfill some of the now vacant spaces.
- South Westminster is increasingly left behind as a retail district. Federal Boulevard and 72nd Avenue has significant vacancies and second generation uses (Planet Fitness) backfilling spaces. The recommendation was to potentially master plan a commercial or mixed-use, mixed income housing development on the Northgate commercial site.

2023 Housing Needs Assessment

A draft Housing Needs Assessment was released in December 2023 updated a previous 2016 analysis. The primary objective was to assess the extent to which the pandemic and other changing factors changed overall housing conditions for the City's residents. In general, as the 72nd Avenue Corridor considers future potentials, the addition of residential is an option that would help meet housing needs and lend vibrancy to the corridor.

- **Naturally Occurring Affordable Housing (NOAH):** As the draft Housing Needs Assessment identifies, the City's NOAH is predominantly located in South Westminster in close proximity to 72nd Avenue. NOAH is defined as properties with average asking rents below $1,200 monthly in Class B or Class C buildings.
- **Rental Gap**: The assessment estimated that the City has a rental gap of approximately 2,650 units for renter households earning $31,500 or less (in 2021). Smaller deficits can also be found at the market rate and luxury tiers for households making more than $125,000 although it is assumed that these households are able to find housing. One of the challenges is that the lack of available rental housing at the highest tiers leads to more competition for more moderately priced units.
- **Homeownership Gap**: Although Westminster has been a relatively "affordable" homeownership market, there has been a continued increase in the median home price. In recent years, the City has had a severe shortage of ownership homes which are affordable to households earning below 80% of AMI ($83,840 in 2021). Between 2017 and 2021, the shortfall grew from 7,483 to 8,294 units. At the same time, the City also has an over 8,000-unit surplus of market rate homes (affordable to households making at least $125,000)

Retail

The retail sector has seen a tremendous amount of recent change.

The onset of Covid-19 exacerbated retail trends already underway

- Online purchases represent 18% of all retail sales nationally and will likely continue to increase. Retail is changing to better align with consumer tastes and preferences and more online purchases. While specialty retail continues to exist, many retailers also have developed a substantial on-line presence. In addition to increased on-line sales, open-air retail districts are increasingly popular compared to enclosed centers and malls. Some stores are increasingly being used as convenience fulfillment centers.

Retail centers have been transitioning to mixed use and entertainment centers

- Developments with a mix of uses not only rely less exclusively on only one sector like retail, which makes their revenue more resilient, but these places also create synergies. Multiple synergies exist when "the existence of one supports demand for the others, such as retail serving as an amenity for office users and multi-family residents, or office and multi-family tenants providing foot traffic for retailers" (Ferramosca 2022).

A mix of uses creates demand for nearby residential

- Mixed-use developments create demand for multi-family developments adjacent to or nearby. Such demand is notable within a quarter mile of the mixed-use development. More importantly, people want to be near this type of place because they can have a variety of experiences even if they don't live within the mixed-use development's boundary. Renters are willing to pay a premium to live in or near a neighborhood with convenient access to goods and services when compared to older neighborhoods without such uses (Ferramosca 2022).

Note: Ferramosca, Peter. High-growth Areas surrounding Placemaking, Mixed Use Projects Signal Investment Opportunity. CoStar Insight. October 19, 2022

Mixed Use Bradburn Village: Westminster, CO

Source: CoStar and Continuum website

Retail

Retail in the 72nd Avenue corridor comprises approximately 10% of the overall retail square footage in the City of Westminster.

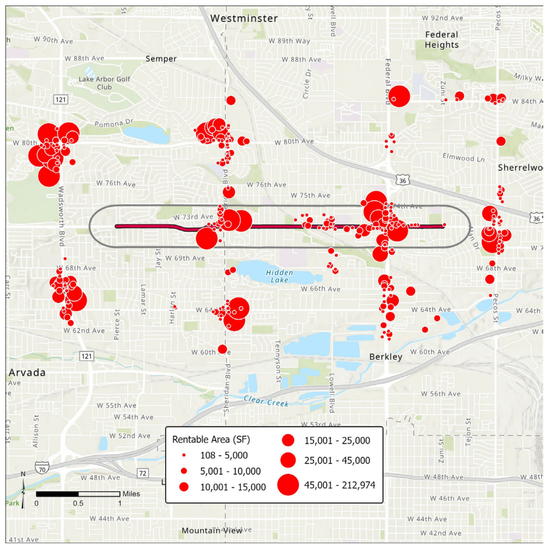
- The average rental rate in the corridor is $16.23 per square foot compared to the City average at $18.26.
- Vacancy rates at an estimated 6%-10% and include the vacant grocery store space at the Northgate Shopping Center.
- The Sheridan Avenue intersection includes a Wal-Mart Supercenter and newer retail offerings. MJ Developers has recently announced that it would be developing historic Shoenberg Farms into a 6-tenant food hall and incubator space.
- The corridor also includes smaller retail outlets which tend to be older strip commercial centers housing a variety of locally owned businesses. Subjective Coffee recently joined Valente's Italian Deli /Grocery near Lowell Boulevard and 72nd Avenue.
- There are a variety of larger box retailers near Federal Boulevard and 72nd Avenue. The community's most pressing concern in the eastern end of the corridor is the desire for a full-service grocery store.

	City of Westminster	Regional Market Area	72nd Avenue Corridor (1/4 Mile Radius)
Retail			
No. of Buildings	443	297	82
Inventory (SF)	8.9 M	3.4 M	894,530
NNN Lease Rate per SF (9/2023)	$18.26	$16.25	$16.23
Vacancy Rate (9/2023)	4.7%	3.9%	6%-10% [1]
New additions SF (Last 5 Years)	45,900	6,124	4,719

Source: ArLand, CoStar

[1] Estimate only; CoStar N/A

Retail



Source: CoStar, ArLand

Retail

The 72nd Avenue Study Area is in close proximity to a number of neighborhood retail centers and strip commercial centers as shown in the figure.

Northgate Shopping Center Anchor

Source: Marketing Brochures

The 45,000 square foot store at the Northgate Shopping Center at Federal Boulevard and 72nd Avenue is vacant. Built in 1962 and renovated in 2008, its recent tenant history includes a Hispanic / Latino grocery store and a Wal-Mart neighborhood center.

The total center is about 58,000 square feet of gross leasable area on 5 acres which is too small for a full-service (non-ethnic) suburban grocery store anchored center. The anchor store space is about the appropriate size for a Hispanic / Latino grocery store. One challenge is the constant consolidation and change in this segment of the market. Additionally, Hispanic / Latino grocery stores already have a presence in the area with a small Save-A-Lot closeby and a larger Lowe's Mercado at 73rd Avenue and Pecos Street.

Shopping Centers

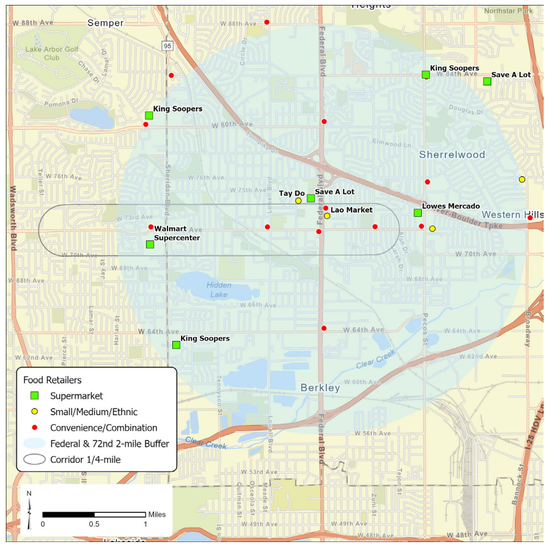
Source: CoStar, ArLand

Retail

There are a number of neighborhood grocery stores in the 2-mile radius which is the approximate market area for a suburban neighborhood grocery store.

- The Walmart Supercenter at Sheridan Boulevard and 72nd Avenue serves a broad regional area including the neighborhoods near Federal Boulevard and 72nd Avenue.
- The market area includes several King Soopers at the peripheries.
- The Save-A-Lot at approximately Federal Boulevard and 74th Avenue is the closest neighborhood grocery store for the neighborhoods around Federal Boulevard and 72nd Avenue. While it is focused on the Hispanic consumer, it provides a full range of grocery-related items.
- The 30,000 square foot Lowe's Mercado at 73rd Avenue and Pecos Street also serves the neighborhood particularly the eastern end of the corridor.
- Tay Do and the Lao Market help serve the Asian households in the area. They are smaller stores and primarily offer meat, fish, produce, canned and frozen foods.
- This market area has a number of specialty stores (desserts, bakeries) many of which are oriented to the Hispanic consumer. There are a number of 7-11s and convenience stores at gas stations which are also shown.

Supermarket and Grocery Stores



Source: City of Westminster, ArLand

Retail

2 Mile Radius Households	25,000
Avg Household Income	$68,434
Total Household Incomes	$1,710,850,000

Category	% Retail Expenditures [1]	Demand (retail potential)	Supportable s.f. at @$600 / s.f.	Supportable s.f. at @$650 / s.f.
Grocery Stores	5.9%	$101,089,269	168,482	155,522

Existing Retail Supply	Approx Revenues	$ / s.f.	Estimated s.f.[1]
King Soopers	$45,000,000	$600	75,000
King Soopers	$36,000,000	$600	60,000
Walmart Supercenter [2]	$52,000,000	$650	80,000
Save-A-Lot	$10,000,000	$500	20,000
Lowe's Mercado	$15,000,000	$500	30,000
Tay Do Asian Supermarket	$2,925,000	$325	9,000
Lao Market	$975,000	$325	3,000
Total Supply	**$161,900,000**		**277,000**
Deficit	($72,886,829)	$600	(121,478)
Estimated Additional Households Needed in 2-Mile Radius to Support a Grocery Store	**1,000 to 5,000 [3]**		

Source: ESRI, City of Westminster Citywide Retail Strategy, CoStar, ArLand
[1] %age of typical household expenditure on groceries
[2] Estimated grocery s.f. in store
[3] Currently, deficit of households in market area to support a grocery store. Strongest desire for grocery store near 72nd Avenue and Federal Boulevard. The addition of 3,000 walkable dense units near that intersection could support a convenience oriented urban grocery store. (minimum threshold typically needed).
The strongest desire for a "conventional" grocery store has been expressed by the area's older residents. In that scenario, 5,000+ additional units would be needed (typical minimum threshold needed).

Neighborhood demographics don't support another full-service grocery store at this time.

- The grocery store market area would ideally support about 170,000 square feet of grocery retail. There are about 275,000 square feet of grocery retail in the 2-mile market area.
- Additional households would be needed to support a grocery store. The strongest desire has been expressed for the 72nd Avenue and Federal Boulevard intersection. The addition of 3,000 walkable dense units at or near the station area could help support a small convenience-oriented grocery store.
- The ideal scenario is the implementation and buildout of the Westminster Station Area. The Station Area plan forecasts an additional 2,600 residents. One of the challenges is the current inability to provide public services via Xcel to the station area and the need to provide an additional substation.
- As of September 2023, a development pre-proposal application had been submitted to the City to potentially add approximately 290 housing units to the Northgate property.
- Between Federal and Lowell Boulevards, 84th and 88th Avenues, the Uplands community is adding over 2,350 residential units in a mixed use, mixed income configuration with about 450 units slated to be income-restricted, affordable and workforce housing.

Retail

- DRCOG forecasts that the 2 mile radius will grow by 0.9% per year based on regional forecast growth allocations. (The corridor is forecast to grow by 0.6% per year.)
- The planned addition of several thousand units in the broader 2-mile radius will help bolster demand for an expansion of grocery store options in the area.
- **Continued household growth near the TOD and Northgate areas will be key to demonstrating potential household support for a full-service grocery store near 72nd Avenue and Federal Boulevard.**

Uplands Development in Westminster

Source: Denver Business Journal

Westminster TOD Massing at Build-Out

Source: Westminster Station Area Specific Plan

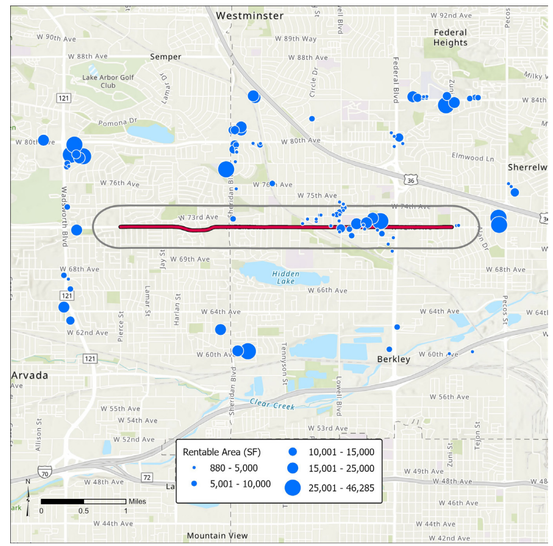
Office

- The regional office market area is comprised of 1.0 million square feet of office uses, focused on primary corridors. There are a cluster of office buildings near Federal Boulevard and 72nd Avenue.
- One of the current challenges with future office development (September 2023) is the Pandemic and remote work impact on office space utilization. Downtown Denver office vacancies are estimated at 30%. Regional office space vacancies are lower at 6.4%. Vacancies directly on the 72nd Avenue corridor are an estimated 9.4%. City of Westminster vacancies are close to 13%.
- While office space has been built relatively recently in the City, the regional market area and the 72nd Avenue Corridor has seen no recently built additional office space.
- Office development is typically tied to employment growth. Given the market challenges, it is unlikely that any speculative office development will occur in the near future.
- Should the Northgate development occur along with redevelopment at the Westminster station and the addition of a significant number of housing units, smaller scale office space providing medical and other personal services may be a longer term potential in the area.

	City of Westminster	Regional Market Area	72nd Avenue Corridor (1/4 Mile Radius)
Office			
No. of Buildings	182	104	31
Inventory (SF)	6.2 M	1.0 M	204,970
Lease Rate per SF (9/2023)	$25.65	$17.63	$17.96
Vacancy Rate (9/2023)	12.9%	6.4%	9.4%
New additions SF (Last 5 Years)	58,002	0	0

Source: ArLand, CoStar

Office



Source: CoStar, ArLand

Industrial

The industrial section of the 72nd Avenue corridor is a significant portion of the City's total industrial properties. These buildings tend to be older and smaller industrial buildings. The vacancy rate for the industrial along the corridor is nearly 7%. In the City, the industrial vacancy rate is 8.0%.

As area redevelopment occurs and land values increase, there may be increased pressure on these industrial properties to redevelop to other uses. While this may take some time, City policies around jobs retention and the significance of maintaining industrial land uses may need to be examined in light of changes occurring in the future.

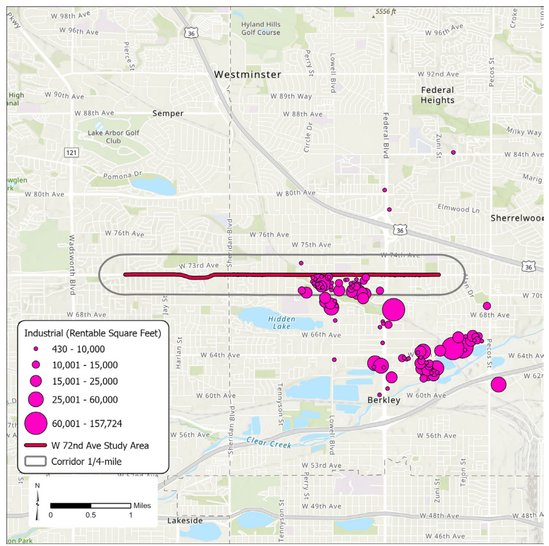
	City of Westminster	72nd Avenue Corridor (1/4 Mile Radius)
Industrial		
No. of Buildings	43	39
Inventory (SF)	545,446	453,122
NNN Lease Rate per SF (9/2023)	$10.25	$9.93
Vacancy Rate (9/2023)	8.0%	6.9%
New additions SF (Last 5 Years)	0	0

Source: ArLand, CoStar

Fabrication / Welding

Source: Advanced Manufacturing Center, CCD

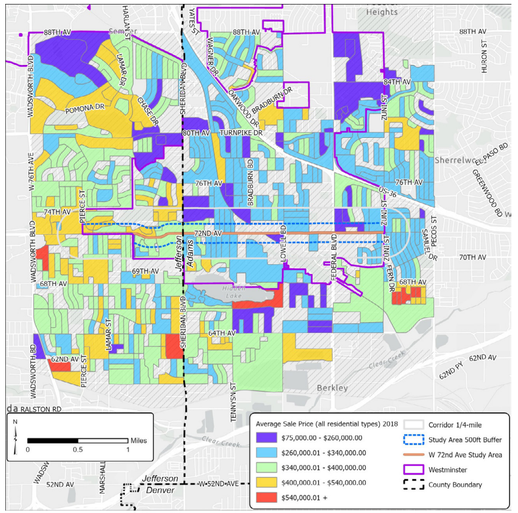
Industrial



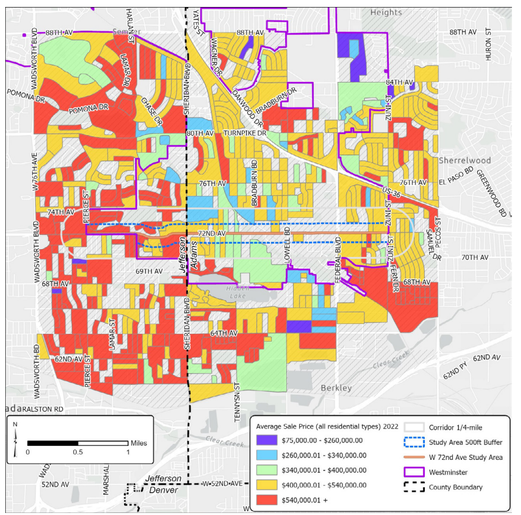
Source: CoStar, ArLand

Ownership Housing

All Sales 2018



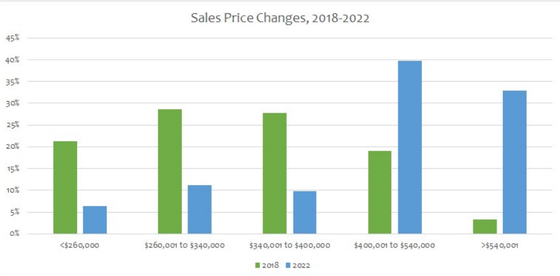
All Sales 2022



Source: Adams and Jefferson County Assessors Data, ArLand

The 72nd Avenue Corridor is in the center of the maps. These maps show average sales prices for all housing types (single family, townhouses, condos, etc.) averaged to the Census Blocks in 2018 on the left and 2022 on the right. The maps show the fairly dramatic increases in sales prices over the last five years.

Ownership Housing



Source: Adams and Jefferson County Assessors Data, ArLand

		Average Sales Prices All Housing Types
Adams County	2018	$327,926
	2022	$468,618
	Change	$140,692
	Percentage Change	42.9%
Jefferson County	2018	$357,868
	2022	$534,027
	Change	$176,159
	Percentage Change	49.2%

Source: Adams and Jefferson County Assessors, ArLand

In 2018, there was a fairly even distribution of price points in the houses sold up to about $500,000. By 2022, prices had shifted upwards with most homes sold priced between $400,000 and $540,000 (for all residential unit types including single family, townhomes, condos, etc.)

The 72nd Avenue Corridor area remains a relatively affordable housing market. The average sales price east of Sheridan is about $468,000, while the average sales price west of Sheridan is about $530,000.

In the last five years, sales prices have increased by over 40%. They remain, however, less expensive than the Denver metro area.

According to the Denver Metro Association of Realtors, the 2022 Denver metro peak median sales price for single family detached houses was $680,000. The median sales price for attached houses was $440,000.

Multifamily Rentals

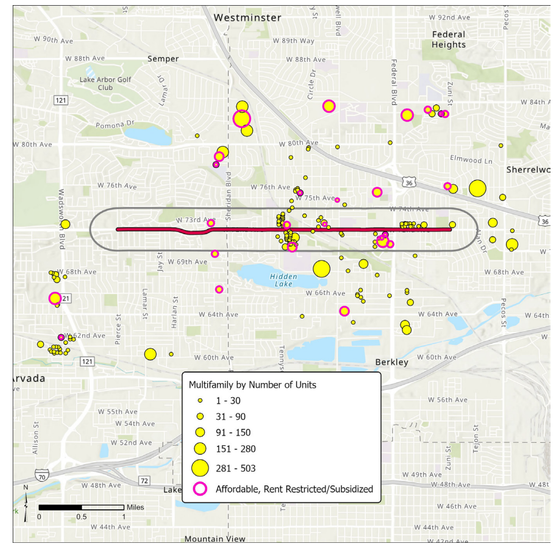
Multifamily rental units in and around the 72nd Avenue Corridor help provide affordable rental housing options for the City and metro area. The rental units are a mix of market rate affordable and deed-restricted affordable housing.

- Average rents per square foot are $1.60 compared to the City at $2.10 per square foot. Per the 2023 Housing Needs Assessment, many of the units in the area provide the City's Naturally Occurring Affordable Housing.
- Vacancy rates are much lower at 3.5% within the rentals along the corridor indicating the high level of need for affordable rental housing.

	City of Westminster	Regional Market Area	72nd Avenue Corridor (1/4 Mile Radius)
Multifamily			
No. of Buildings	149	163	72
No. of Units	14,892	6,602	1,292
Average Rent per Unit	$1,779	$1,313	$1,113
Average Rent per SF	$2.10	$1.84	$1.62
Vacancy Rate (9/2023)	5.7%	4.7%	3.5%
New additions Units (Last 5 Years)	470	0	0

Source: ArLand, CoStar

Multifamily



Source: CoStar, ArLand

Redevelopment Potentials

Lot Sizes

In order to start identifying nodes where economic development activity / redevelopment can take place along the 72nd Avenue Corridor, we have examined parcels using several different metrics including lot sizes and land values.

The availability of larger lots can help provide redevelopment focal points.

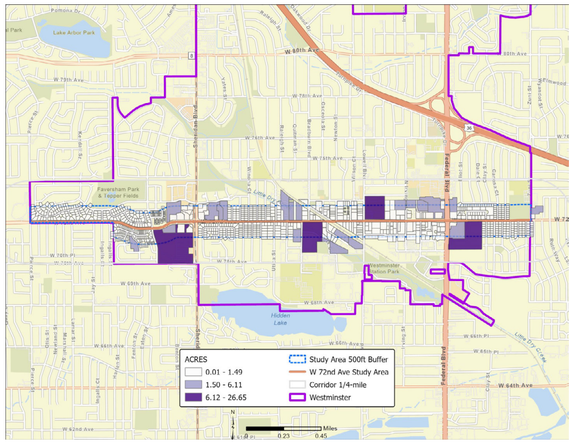
(From west to east)

- **Sheridan Boulevard Intersection:** several larger parcels are located west of the intersection. The property south of 72nd Avenue (on the west side) is a relatively newer retail center with a mix of anchor uses and pad sites. The area north of 72nd Avenue (also on the west side) is part of the Shoenberg Farm development. A city owned historic parcel / building is in the implementation stages for a food hall.

- **Lowell Boulevard to Federal Boulevard:** There are a number of large and mid-sized parcels. Several significant economic development efforts are located in this general area. Successful implementation of these plans would help galvanize corridor redevelopment. The Harris Park Vision Plan provides the framework for some of the corridor area north of 72nd Avenue. The Westminster Station Area Plan provides a vision for the area south of 72nd Avenue. Both of these plans will be further discussed.

- **Federal Boulevard:** As previous mentioned, a pre-application (Northgate) is in for a residential development proposal for the large property on the southeast corner of Federal Boulevard and 72nd Avenue. A residential neighborhood focused on "missing middle" housing would help provide additional support for neighborhood commercial services.

Lot Sizes

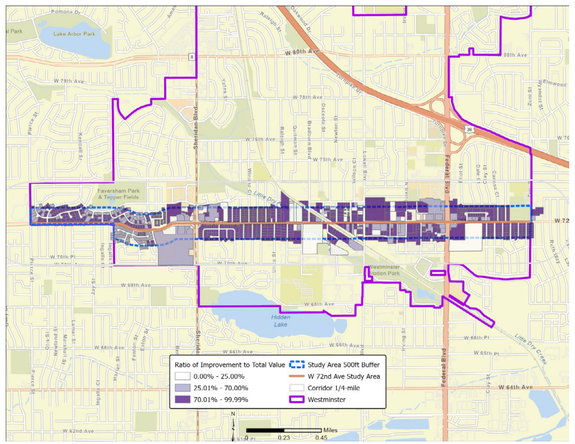


Source: Adams and Jefferson Counties Assessors Data, ArLand

Land Value Analysis

The land value analysis also highlights those parcels (in white or lightly shaded) where the value of the building improvements is relatively low compared to the total value of the building and land, indicating the potential for redevelopment. Those properties tend to be potential redevelopment candidates. The same locations, as previously discussed, emerge.

Land Value Analysis



Economic Vitality

Westminster Station Area

- **Significant Public Investment**: The potential primary catalyst for 72nd Avenue corridor redevelopment is Westminster Station Area redevelopment. The City of Westminster has invested significant resources with estimated public investments so far are well over $40 million in roads, the plaza, structured parking, the park, and stormwater.

- **Ralston Street Corridor in Arvada**: The City of Arvada's Olde Town station redevelopment is good proxy for the length of time, investment, and effort it takes to catalyze redevelopment on a corridor adjacent to a transit station. (It has taken decades). The east-west **Ralston Street Corridor near Olde Town** is now redeveloping with most of the newer redevelopment a mix of market rate and affordable housing.

- **Infrastructure Challenges:** The City has a station area plan in place and various redevelopment tools (Urban Renewal, Opportunity Area Zones, etc). Some of the significant redevelopment challenges include Xcel's limited ability to readily provide increased utility services to new development within the area. **Working with Xcel and potentially the State to overcome the infrastructure challenge** is important considering the area housing need and the planned Bus Rapid Transit investment along the Federal Boulevard Corridor.

Northgate

- **Northgate Residential**: The current proposed Northgate development of approximately 290 additional residential units, in a mix of housing unit types, could be a welcome addition to the area. The new development is just south of the currently vacant Northgate commercial center.

- **Northgate Commercial**: The Northgate commercial in-line retail appears to be partially leased. While rents and revenues are low, the owners may not have an incentive to sell. Second and third generation store types are likely to be attracted to the store. The commercial center's size and competition makes it very difficult to re-lease as a full-service grocery store.

- **Save-A-Lot: Save-A-Lot just northwest of Federal Boulevard and 72nd Avenue helps fill gaps** in markets like these. It is small at 20,000 square feet, however, and local residents may not feel that it fills their needs.

- **Other Options**: Exploring other options for **reuse of the Northgate commercial site may include a horizontal mixed use center with additional residential units and other amenities to** complement the planned Northgate residential development.

- **Location:** As the area densifies, a more appropriate location for a full-service grocery store could be within the large commercial center at the northwest corner of Federal Boulevard and 72nd Avenue.

ARLAND
Land Use Economics
Www.arlandllc.com

Introduction

The primary purposes of the first phase of engagement were to introduce and raise awareness about the project, present information on previous planning efforts and initial findings from the existing conditions analysis, and to listen to the community and stakeholders. The project team offered a handful of engagement events and activities as an opportunity to engage with local residents, business owners, community members, and stakeholders. The following document summarizes these events and activities and the feedback received.

The feedback received through Phase 1, supplemented with existing conditions analysis, informs the development of the project's vision and goals as well as the identification of improvement concepts.

Community Engagement

Online Information and Activities

At the onset of the project and to support Phase 1 engagement, the city developed a website dedicated to the project: https://www.westminsterco.gov/72ndAvenueStudy. During Phase 1 engagement, the project website included introductory information about the project, and a link to two online engagement activities, a comment map and a survey, hosted by Social Pinpoint. The online activities generated 684 total engagements, including 1,775 Impressions, by 612 unique users.

Comment Map

Visitors added 116 pins to the comment map, as well as 430 likes (upvotes) to comments and 89 dislikes (downvotes) to comments. Users were required to select a category for the map pins; the categories included: access/connectivity, beautification/character, bike/pedestrian, economic prosperity, transit, and travel safety. The most selected pin category was bike/pedestrian followed by travel safety, beautification/character, economic prosperity, access/connectivity, and then transit.

The following resounding comments emerged from the online comment map:

- Narrow sidewalks are stressful
- Unkempt character could be improved
- General support for more bike and trail facilities
- Concerns about speeding
- Desire for increased access to food options

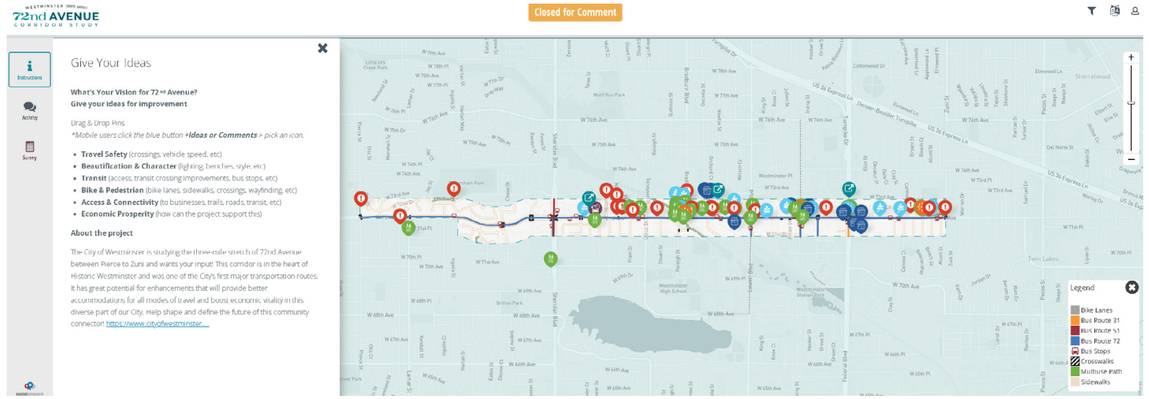


Figure 1: Social Pinpoint Map Feedback

The following comments received more than 10 likes/upvotes:

Comments received at the Summer Block Party:

- "With the Walmart gone, nearby residents no longer have a grocery store close. I'd like to be able to walk to a grocery store or market."
- Sidewalks are really narrow and close to the road in many places which makes walking along 72nd Ave stressful
- Beautification! We would like to see these planters brought back to life
- "I'd hate to see a travel lane be used for a bike lane. There are many bike lanes in the City that aren't used at all."

Comments received via Social Pinpoint:

- Narrow sidewalks along 72nd with poles in the middle of the sidewalk make me avoid 72nd at all when biking. I've had to wait for traffic to clear so I can ride in the street and pass certain areas with posts in the middle of the sidewalk. Makes me hesitate to let my kids bike or walk from Sheridan to Lowell along 72nd.
- Improved connectivity to the trail in this area would be a great amenity. Also the sidewalk is not wide enough in this area and a detached sidewalk would create a far better environment to walk.
- Let's protect this area from cars and build a safe bike/pedestrian area.
- Lowell further south serves as a bike corridor into Denver and this area should be improved with bike infrastructure.
- Something needs to be done with the empty lot East of the old Walmart. It is currently a prime spot for dumping old furniture and other trash.

- Parking for the local businesses would be beneficial.
- Would love to see more food options in this area. Maybe more restaurants, a weekend farmer's market, or small grocery store with local produce and goods would be great!
- We need traffic control in this entire area, it is like a race track which is no surprise since nobody ever gets pulled over and ticketed."
- There are several concrete planters along 72nd that are not maintained and either are full of weeds and/or trash or have half dead scraggly bushes. These are an eyesore. There are also several businesses with weedy and poorly kept parking lots. These businesses make the whole area look derelict.
- We need a grocery store off of Federal and 72nd. Right now you can't just run quickly to the grocery store.

Online Survey

Visitors to the site were also provided with an optional survey; 36 responses were received. When asked about typical travel on 72nd Avenue, the majority of respondents indicated that they drive the corridor, followed by walking, then biking, then transit. When asked about the primary idea or wish to improve 72nd Avenue, the top answers were for bike/pedestrian and sidewalk improvements. This was followed by economic/beautification. Lastly, when asked about using/accessing different modes of travel in the future, there was a resounding desire to be able to walk, bike, and take transit; 79 out of 105 responses (over 75%) desired to take these modes in the future.

Community Events

The project team was available at two community events, including:

- **Friday, June 2**: Summer Block Party in Historic Westminster at 73rd Avenue and Bradburn Boulevard
- **Friday, June 23**: Neighbor Nights at Fireman Park

Figure 2: Neighbor Nights Event

The two community events were a time to introduce and raise awareness about the project and to have conversations with community members regarding their thoughts on 72nd Avenue. The activities available at the events mimicked the online activities. The project team had numerous conversations with community members, many of whom live proximate to 72nd Avenue, about their current experience when traveling along the corridor.

The comments received at the events were added to the online commenting map to allow online participants a way to see the feedback received in-person.

Stakeholder Engagement

Community Advisory Committee

On June 27, 2023, the project team convened the first meeting of the Community Advisory Committee (CAC). The CAC is a group of stakeholders with a vested interest in the transportation and economic vitality of the 72nd Avenue corridor. The CAC includes representation from the Westminster Chamber of Commerce, Mile High Connects, Westminster Public Schools, Jefferson County, Bike Jeffco, Jefferson County Housing Authority, CDOT, RTD, and DRCOG.
The purposes of this first meeting were to introduce the project, review highlights and key findings for the existing conditions analysis, introduce the character areas, and complete a visioning exercise.

Figure 3: CAC Walking Tour

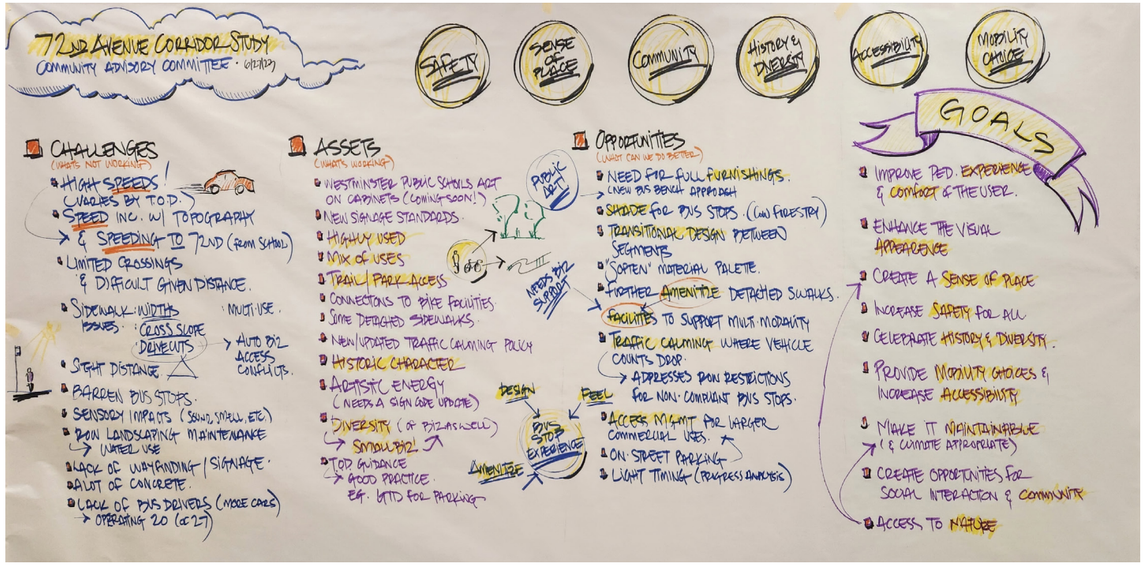


Figure 4: CAC Visioning Exercise

Prior to the meeting, attendees participated in a walking tour along the corridor (see Figure 49). This experience informed the responses and dialogue as a part of the visioning exercise. The visioning exercise was the focus on the meeting; attendees discussed the challenges, assets, and opportunities.

The feedback was synthesized into the following ideas for study goals:

- Improve the experience and comfort of the user
- Enhance the visual appearance
- Create a sense of place
- Increase safety for all
- Celebrate history and diversity
- Provide mobility choices and increase accessibility
- Make It maintainable (and climate appropriate)
- Create opportunities for social interaction and community
- Access to nature

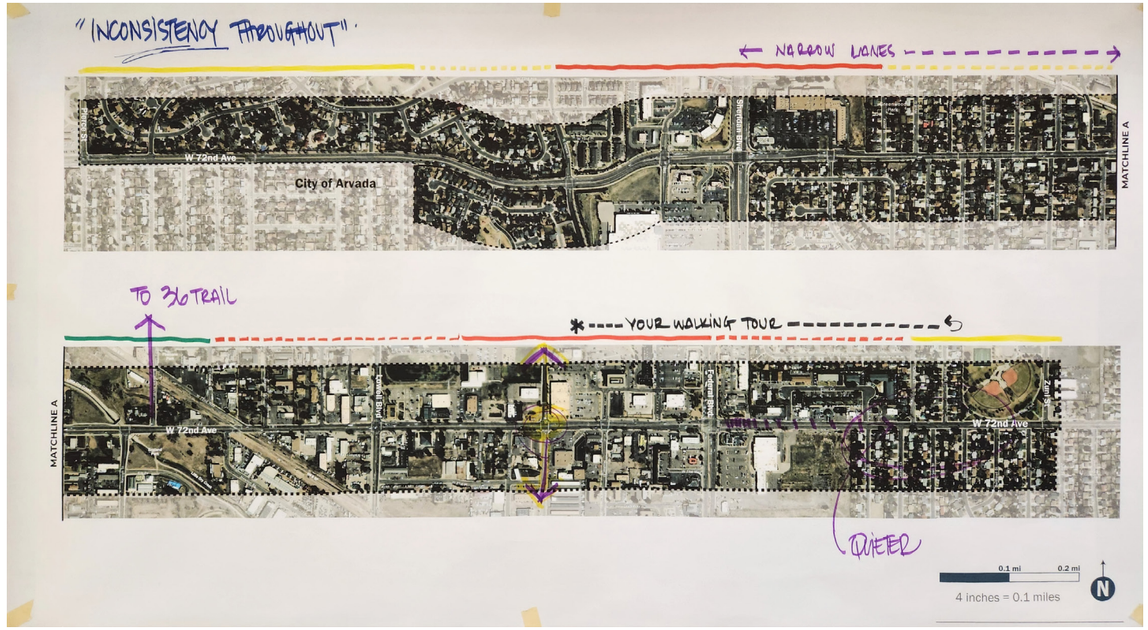


Figure 5: CAC Wall Map Graphic Feedback

Introduction

The primary purposes of the second phase of engagement were to:

- Introduce the two conceptual designs and their respective improvement components to the community and stakeholders
- Collect feedback on preferred alternatives
- Educate the Westminster community on the project

This engagement phase ran from April through July 2024 and included:

- Two pop-ups at existing community events, including the Summer Block Party right along the corridor and a Movie Night at Westminster High School.
- A continuation of targeted outreach to business owners, community members, and stakeholders.
- Digital engagement that featured interactive representations of the corridor concepts and survey questions.

Community Engagement

Online Information and Activities

During Phase 2 engagement, the project website was utilized to provide updates on the study and to promote the virtual feedback opportunities. The team implemented online engagement tools hosted on a Social Pinpoint page to inform and consult with participants. Digital content featured the final two design concepts: “Break the Barrier” and “Calm the Traffic.” The site included two interactive “hot spot” maps where visitors could learn about each concept by clicking on flashing icons noting potential corridor improvements.

Additionally, visitors had an opportunity to help prioritize concept elements and share open-ended comments.

By the numbers on Social Pinpoint

- **1,547** page views on Social Pinpoint
- **777** visits
- **336** viewed “Break the Barrier”
- **202** viewed “Calm the Traffic”
- **621** unique visitors
- **160** survey responses
- **88** responses to “Break the Barrier”
- **72** responses to “Calm the Traffic”
- **52** open-ended responses/comments

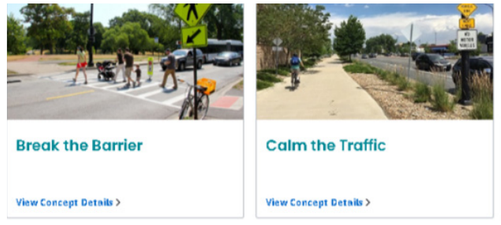


Figure 1: Surveys for Both Concepts

Figure 2: Images for Proposed Improvements

Online Surveys

Respondents were asked to indicate their current mode of travel. They were also asked if any of the improvement concepts would encourage them to change their current mode of travel or consider an additional mode of travel. Respondents were asked which of the key features of each concept were most likely to achieve the goal of the concept (to “break the barrier” and to “calm traffic”).

“Break the Barrier”

“Break the Barrier” is a concept that may mean a variety of things to community members depending upon how they currently travel and for what reasons. Due to the more complex nature of this concept, survey questions were more in depth with categories. Respondents were asked to indicate which of the features from the concept were most likely to:

- Enhance North/South Connectivity
- Increase Safety
- Increase Comfort & Livability
- Support Efficiently Traveling Around Westminster

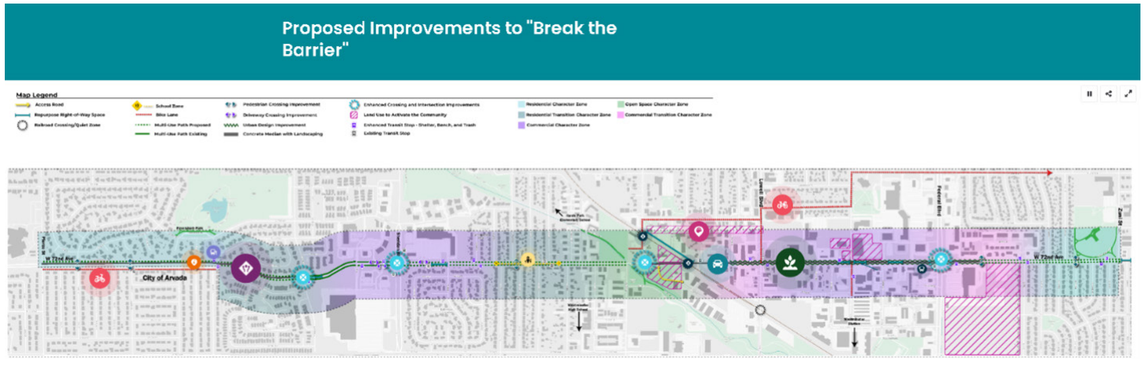


Figure 3: “Break the Barrier” Hotspot Map

Respondents to this survey indicated they are primarily vehicle drivers and pedestrians with a small percentage of the other modes of travel (see Figure 54).

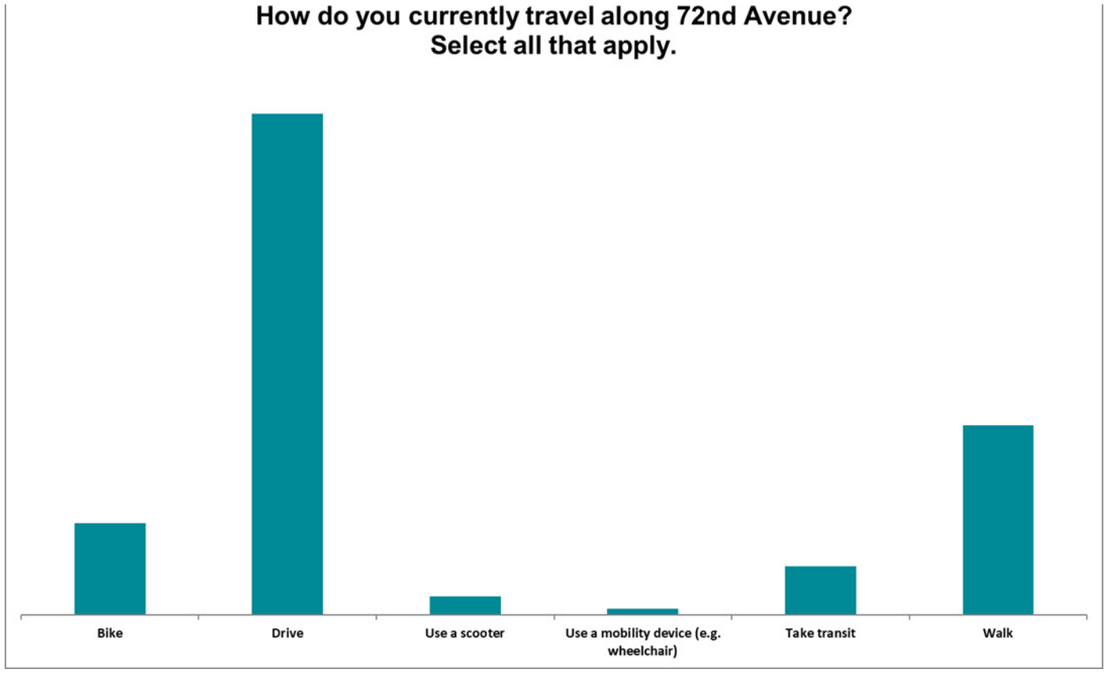


Figure 4: “Break the Barrier” Current Mode ofTravel Survey

Respondents were asked if potential improvements would encourage them to use a different mode of transportation. Pedestrian improvements ranked highly along with intersection improvements. It is favorable that all recommended improvements were indicated as an opportunity to consider different modes (see Figure 57).

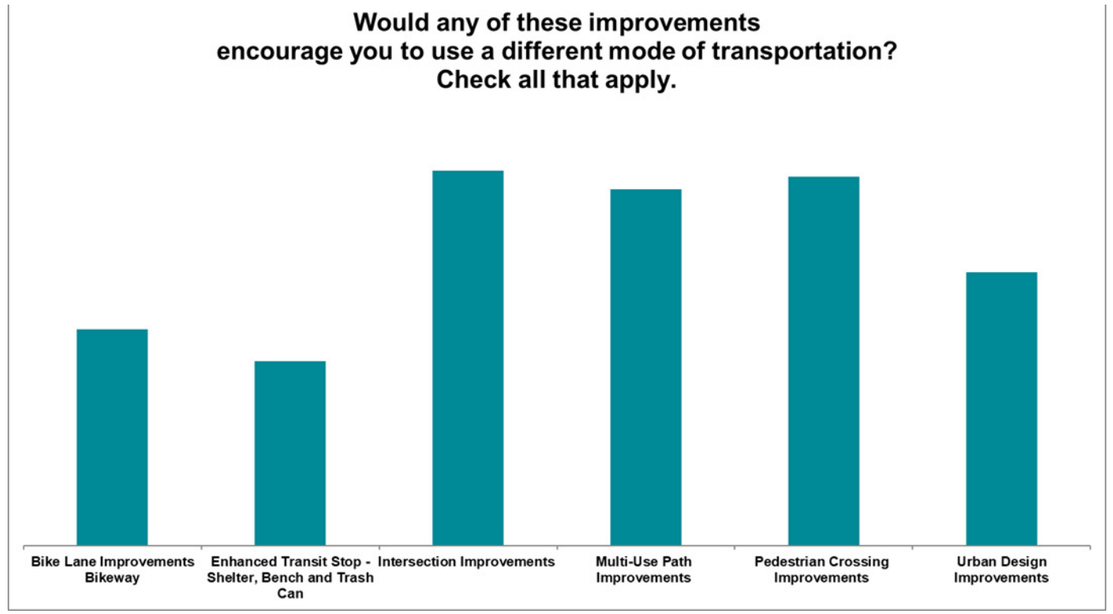


Figure 5: “Break the Barrier” New Modes of Travel Survey

North/South Connections

The most likely improvements to enhance north/south connectivity are pedestrian crossings followed closely by the multi-use path and intersection improvements. The least likely way to enhance north/south connectivity was bike lanes (see Figure 56).

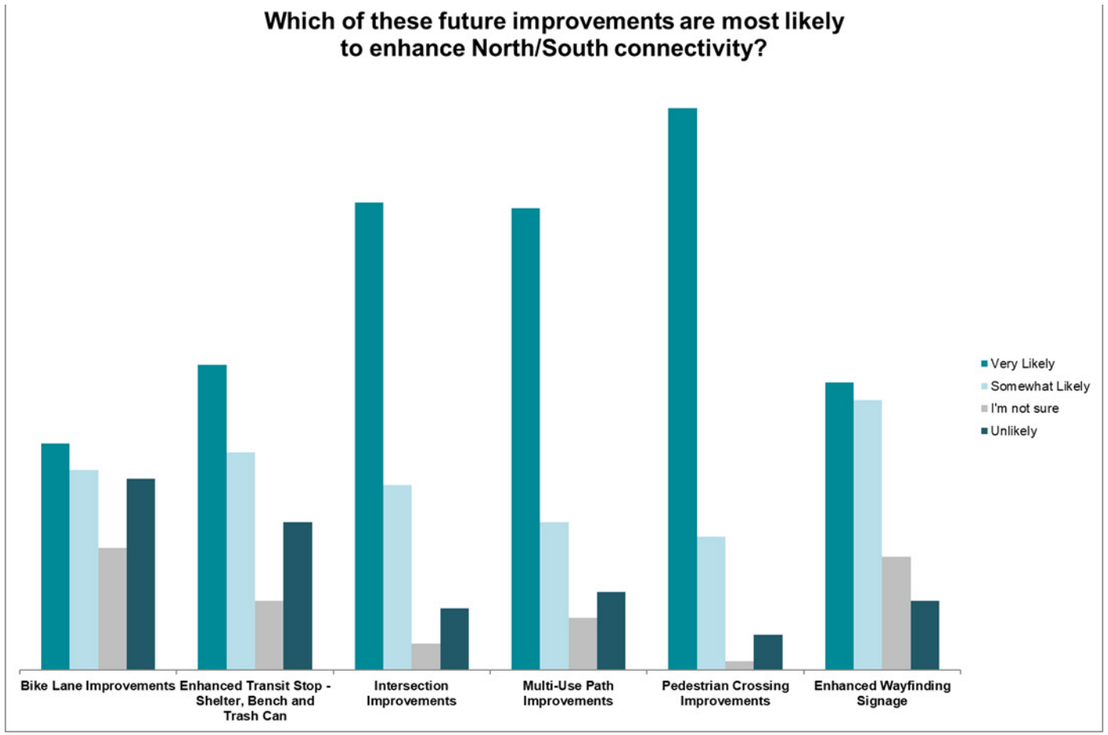


Figure 6: “Break the Barrier” North/South Connections Survey

Safety

The improvements most likely to increase safety in the corridor included pedestrian crossings and intersection improvements followed closely by the multi-use path and bike lanes. The least likely to impact safety was the landscaped median (see Figure 57).

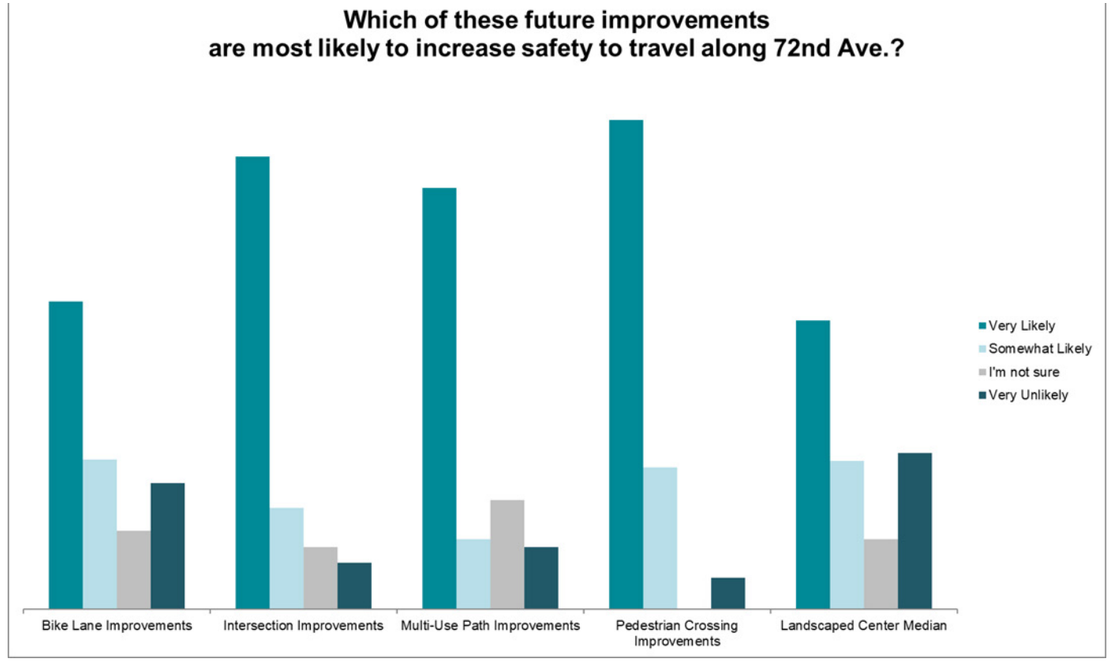


Figure 7: “Break the Barrier” Safety Survey

Comfort and Livability

The improvements most likely to improve comfort and livability were business revitalization and urban design and streetscapes. The least likely to impact comfort and livability was public art (see Figure 58).

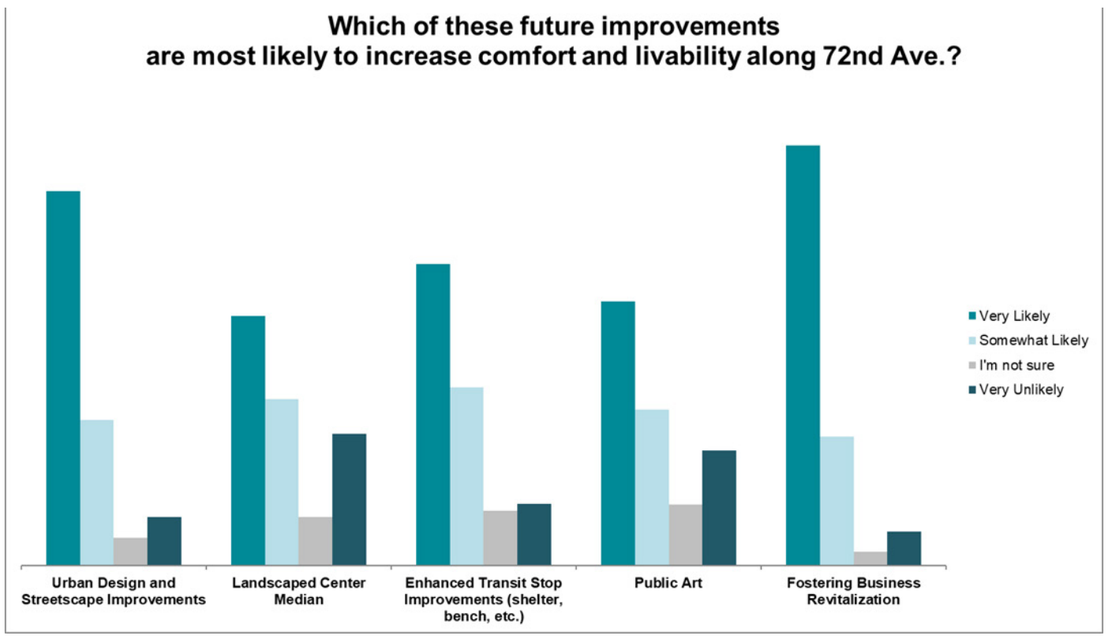


Figure 8: “Break the Barrier” Comfort & Livability Survey

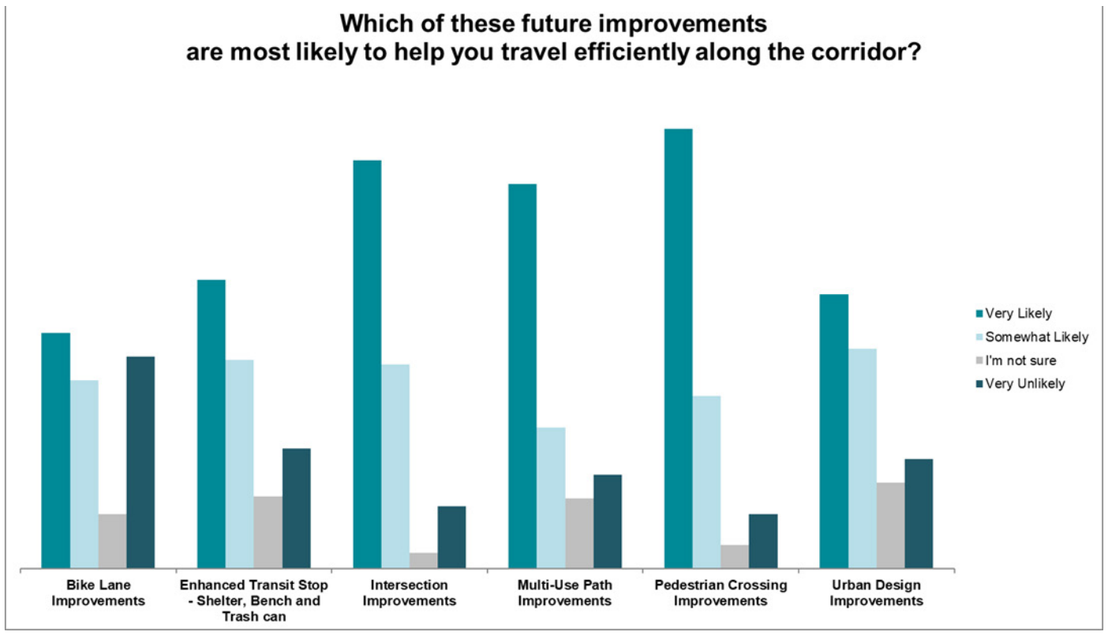


Figure 9: “Break the Barrier” Getting You Where You Need to Go Survey

Getting You Where You Need to Go

The most likely improvements to help respondents move in and around the corridor included pedestrian crossings and intersection improvements followed closely by the multi-use path. The least likely to achieve this outcome was bike lanes (see Figure 59).

The following comments emerged from the **“Break the Barrier”** online survey:

- Landscaping improvements are desperately needed to increase livability
- Increased pedestrian access and safety is needed at Raleigh and Zuni Streets within the school zones.
- Better lighting would improve safety and deter crime.
- Focus on critical safety improvements before worrying about aesthetics.
- More ADA-accessibility, sidewalks that don’t stop and pedestrian overpasses to safely cross areas like 72nd and Sheridan/Federal.

“Calm the Traffic”

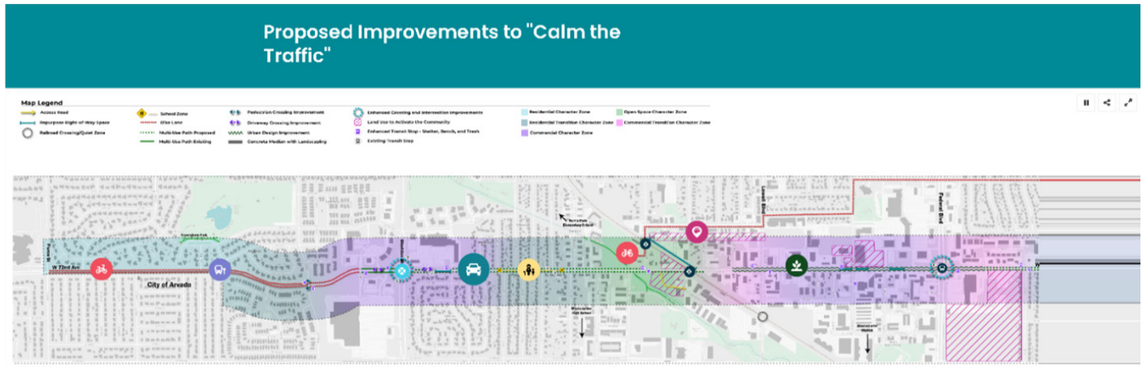


Figure 10: “Calm the Traffic” Hotspot Map

Of the 59 respondents to this survey, most indicated driving followed by walking and biking as current modes of travel. No responses were noted for transit, mobility devices or the use of a scooter (see Figure 61).

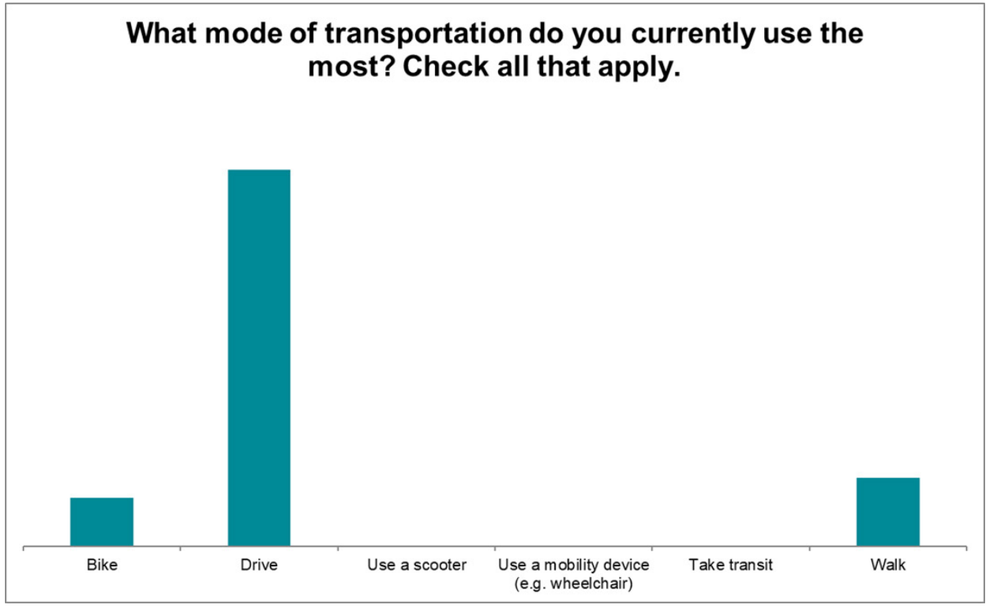


Figure 11: “Calm the Traffic” Current Mode of Travel Survey

Respondents were asked which of the key features from the concept were most likely to help calm traffic. Intersection improvements, high visibility crossings and lane repurposing received the most favorable responses. The least likely improvement was noted as the low-stress bikeway followed closely by bike lanes (see Figure 62).

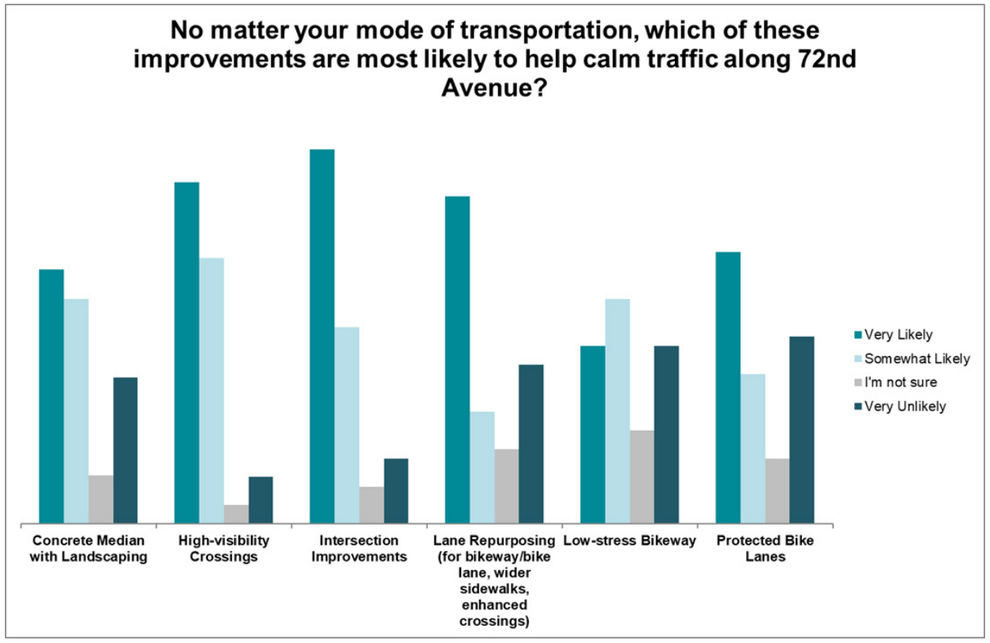


Figure 12: “Calm the Traffic” Survey

Respondents were asked if any of the improvements would encourage a different mode of transportation. Each improvement received votes with high-visibility crosswalks having the highest number and enhanced bus stops having the lowest (see Figure 63).

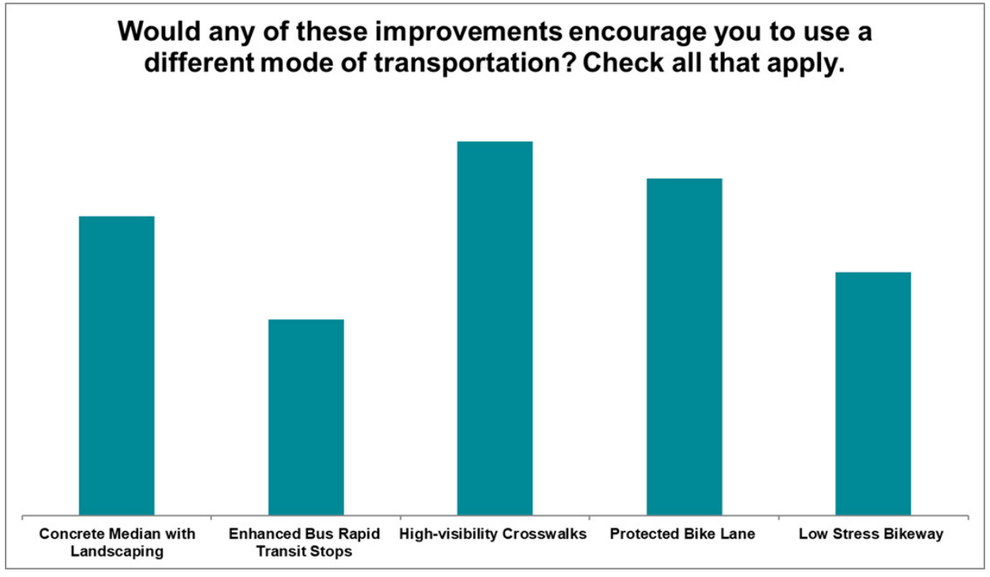


Figure 13: “Calm the Traffic” New Modes of Travel Survey

The following comments emerged from the **“Calm the Traffic”** online survey:

- There is too much traffic on 72nd Avenue to support any fewer lanes.
- Improving landscaping and art in the neighborhood would be appreciated.
- Traffic needs to be slowed down due to high rates of speed and racing.
- Protected bike lanes would need to make cyclists visible to turning cars.
- Repurposing lanes will increase driver frustration and likely result in dangerous lane changes.

Community Events

The project team was available at two community events, including:

- **Friday, June 7**: Summer Block Party in Historic Westminster at 73rd Avenue and Bradburn Boulevard
- **Friday, June 14**: Neighbor Movie Night at Westminster High School

The two community events offered the opportunity to show the “Break the Barrier” and “Calm the Traffic” design concepts and to collect feedback on which improvement categories were most important to attendees. The activities available at the events mirrored the virtual engagement activities on Social Pinpoint.

Through conversations with community members, many of whom live near 72nd Avenue, the following categories received a total of 60 votes on poster boards with sticker dots. The top priorities included:

- **Comfort & Livability** – 20.5 votes
- **Safety** – 18.5 votes
- **Calming the Traffic** – 13 votes
- **North/South Connections** – 5 votes
- **Getting where you need to go** – 3 votes

Communications and Marketing

The Westminster communication staff pushed content on social media platforms (see Figure 64) and in a city-wide newsletter that was published in late July. Additionally, Westminster Public Schools shared content on their social media platforms to reach parents and students.

As noted earlier in the summary, the Community Development staff sent email communications to the business owners along the corridor to engage in the survey.

Business cards were also posted in the lobby of the Westminster municipal building.

Figure 14: Example Social Media Post

Stakeholder Engagement

The project team met with the CAC in April 2024 during Phase 2 engagement. The meeting provided a project recap of takeaways from existing conditions, then focused most of the time on soliciting feedback from the CAC on the two project alternatives. The concept maps were paired with 3D graphics of detailed improvements, all of which were printed out at large scale. Attendees were encouraged to provide feedback by adding green dots to show support and yellow dots to indicate concern and add sticky notes and verbal feedback for greater background.

Figure 15: CAC Member Discussion

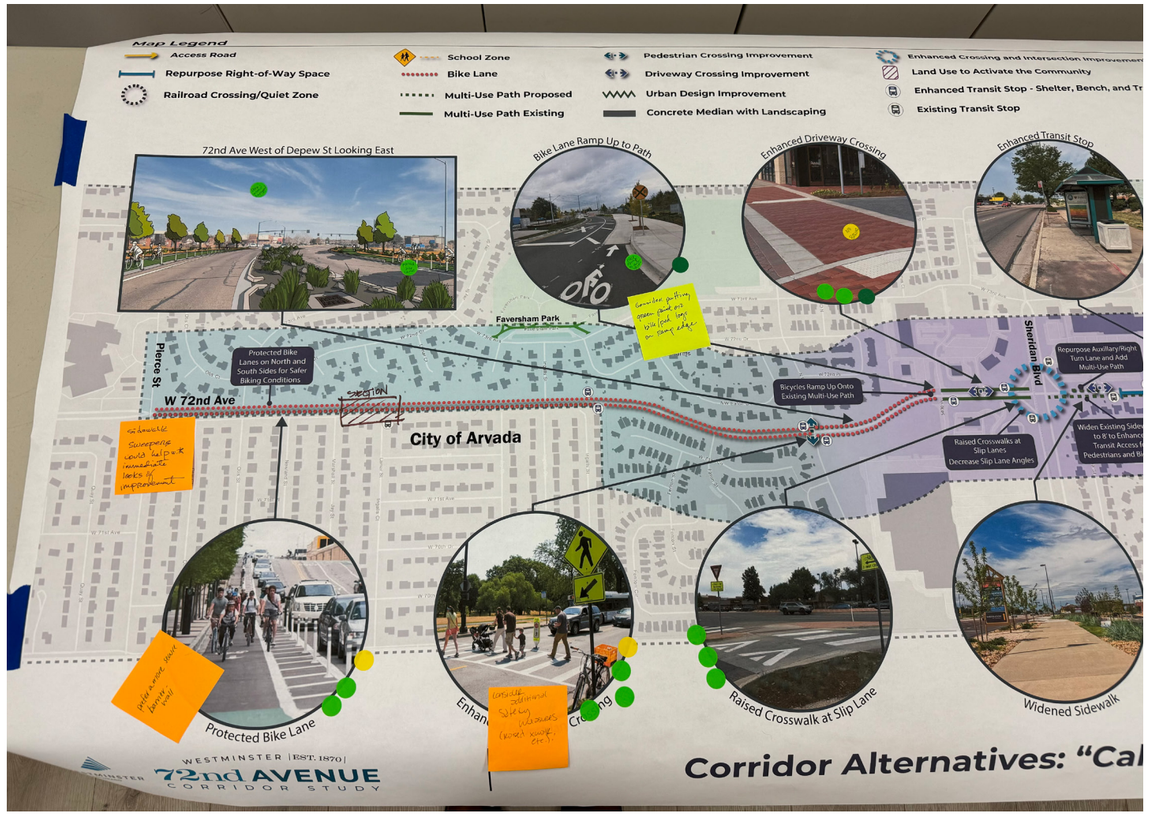


Figure 16: CAC Meeting "Calm the Traffic" Feedback