

# **WELCOME**

## **To the C-470 Express Lanes Traffic Noise Open House**

### **Please Sign In**



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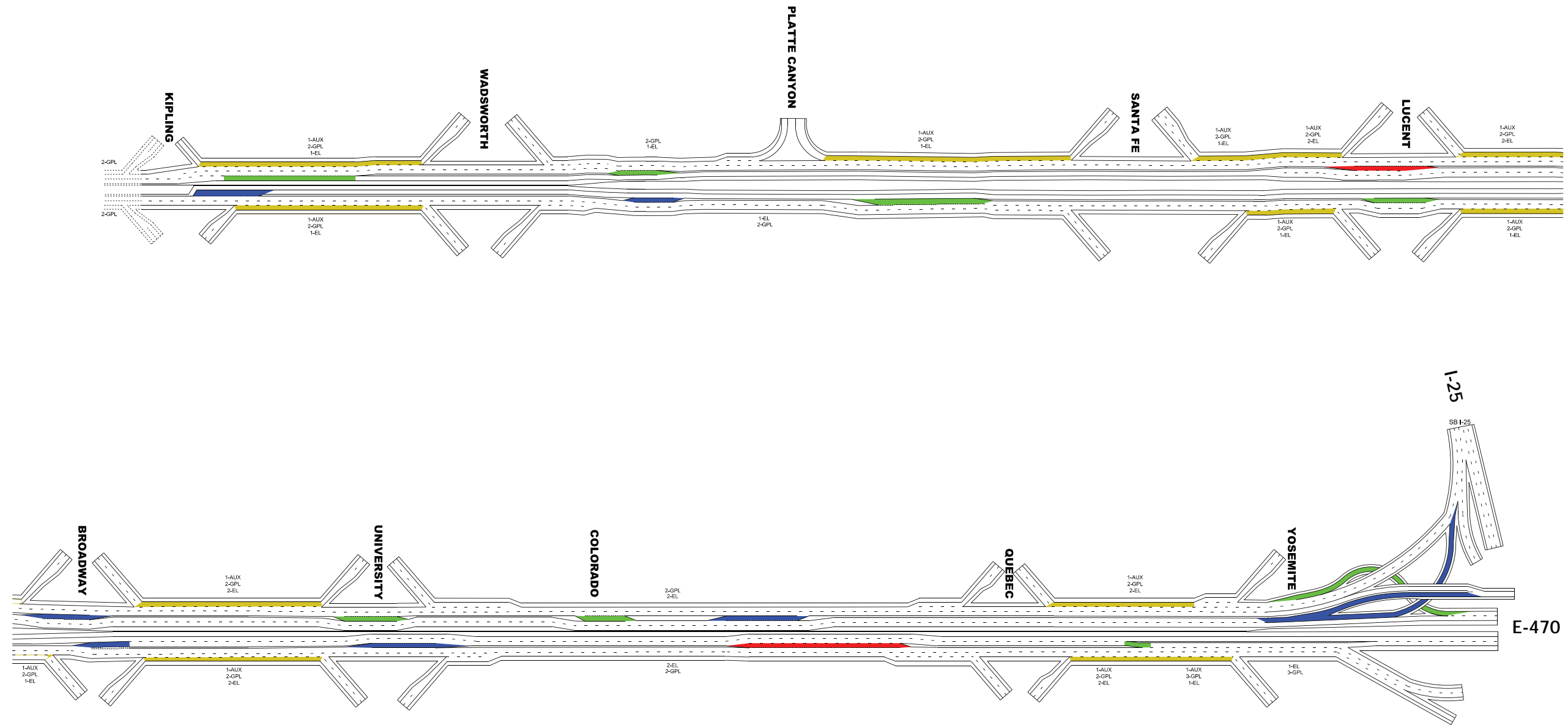
# Proposed Action - Ultimate Design for 2035



## The Ultimate Design for 2035 Includes:

- Westbound - two tolled express lanes from I-25 to Lucent; one tolled express lane from Lucent to Kipling
- Eastbound - one tolled express lane from Kipling to Broadway; two tolled express lanes from Broadway to I-25
- Auxiliary lanes in required select locations
- Direct connection ramps from I-25 to the westbound express lanes
- Water-quality features and noise barriers
- Reconstruction of:
  - Bridges over the South Platte River
  - Westbound bridge over Wadsworth
  - Realignment of substandard curves
  - C-470 Trail with added grade separations at Quebec and Colorado

# C-470 Corridor Access Schematic - Ultimate



**Ingress**

From these locations vehicles may enter the tolled express lanes from the general purpose lanes

**Egress**

From these locations vehicles may exit the tolled express lanes to the general purpose lanes

**Combined Ingress / Egress**

From these locations vehicles may enter or exit the tolled express lanes to/from the general purpose lanes

**Auxiliary Lanes**

Additional lanes that are continuous from one interchange on-ramp to the next interchange off-ramp



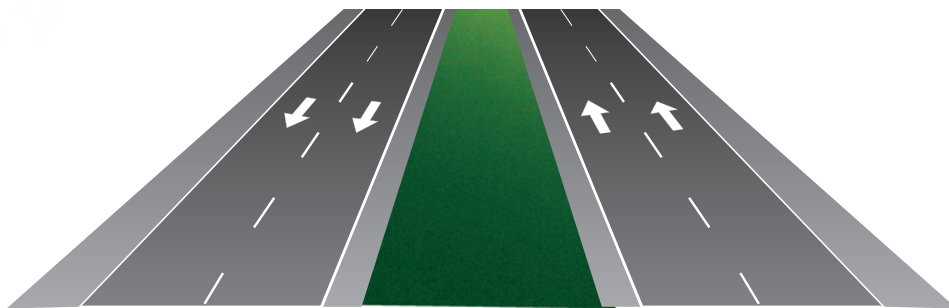
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*Draft - Final Ingress/Egress locations subject to further study*





**Existing C-470**  
2 General Purpose Lanes in each direction



**Proposed C-470 Interim - 1 Tolled Express Lane in each direction plus 2 General Purpose Lanes in each direction with Auxiliary Lanes (select locations)**



**Proposed C-470 Ultimate - 2 Tolled Express Lanes in each direction plus 2 General Purpose Lanes in each direction with Auxiliary Lanes (select locations)**

**General Purpose Lanes** - Continuous lanes that do not require the user to pay a toll, consistent with the two existing lanes on C-470.

**Tolled Express Lanes** - Continuous lanes that require the user to pay a toll. These lanes are separated from the General Purpose Lanes by a painted buffer.

**Auxiliary Lanes** - Lanes added to the right of the General Purpose Lanes connecting the on-ramp at one interchange to the off-ramp at the next interchange. Auxiliary lanes will improve safety and traffic performance. Proposed locations include:

**Westbound:**

- University to Broadway
- Broadway to Lucent
- Lucent to Santa Fe
- Santa Fe to Platte Canyon

**Eastbound:**

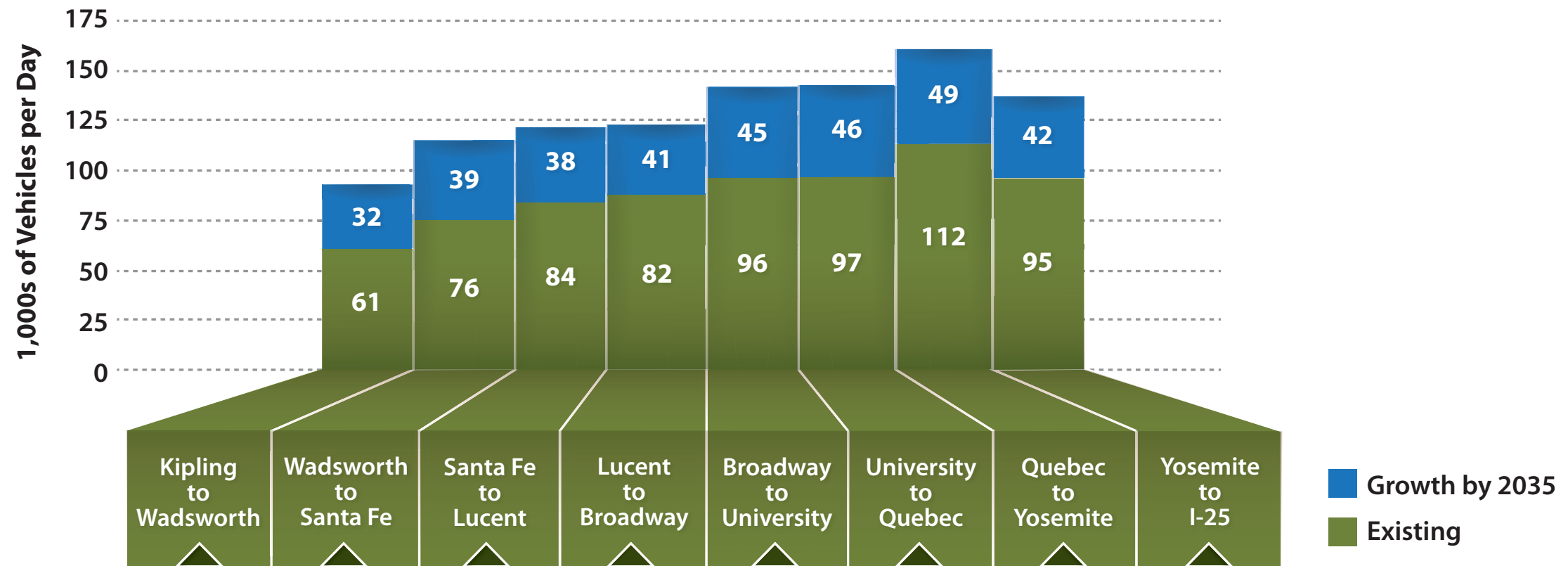
- Santa Fe to Lucent
- Lucent to Broadway
- Broadway to University
- Quebec to Yosemite

# What is the Current and Projected Traffic?

Over the 13.75-mile C-470 segment between I-25 and Kipling Parkway, average daily traffic is lowest at the western end (about 61,000 vehicles per day), and highest (112,000 vpd) near the eastern end (Quebec-Yosemite).

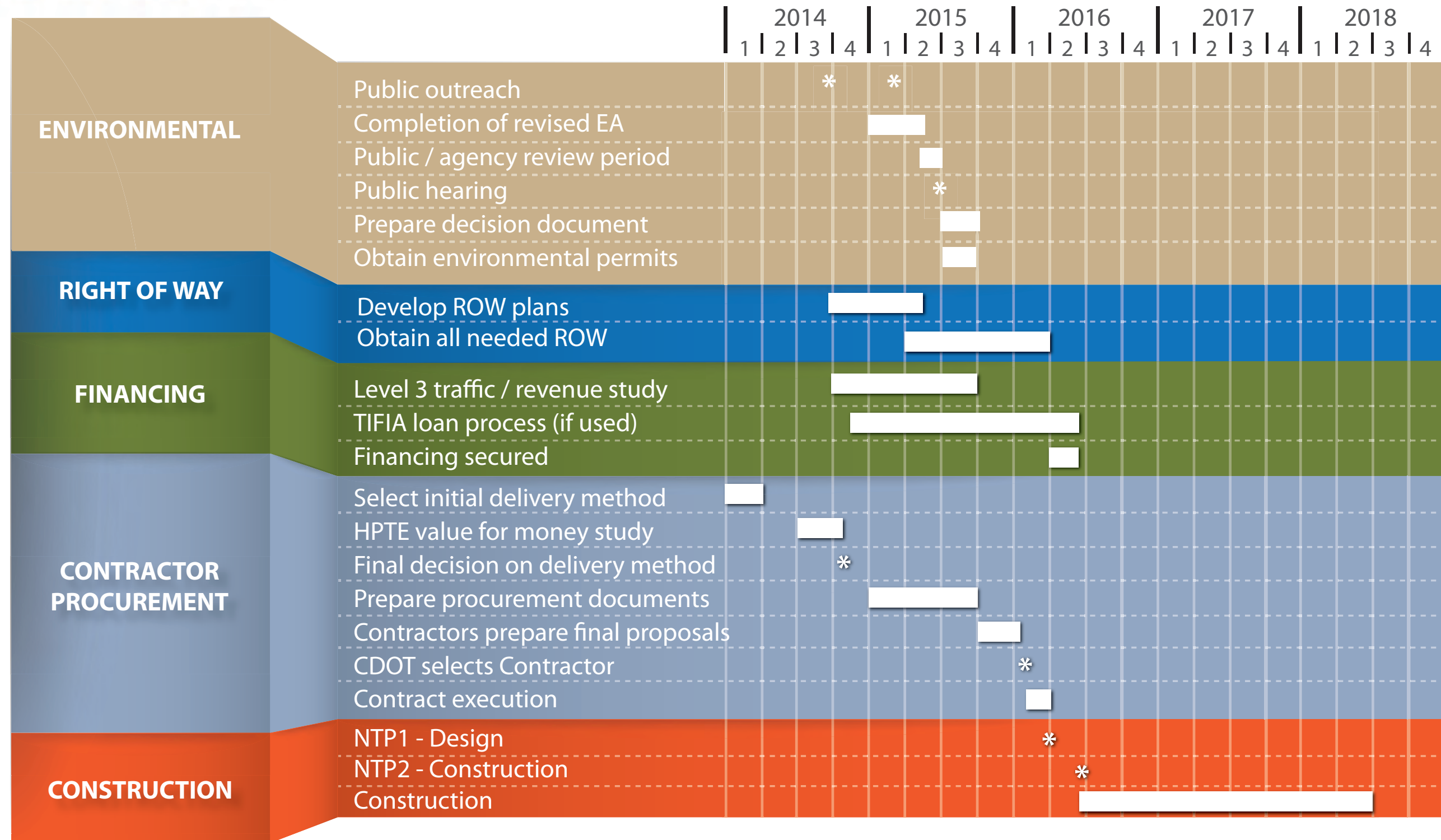
Between 2013 and 2035 (a span of 22 years) average weekday traffic demand is expected to increase by 44 to 52 percent, depending on location.

C-470 Average Weekday Traffic Volumes, by Location

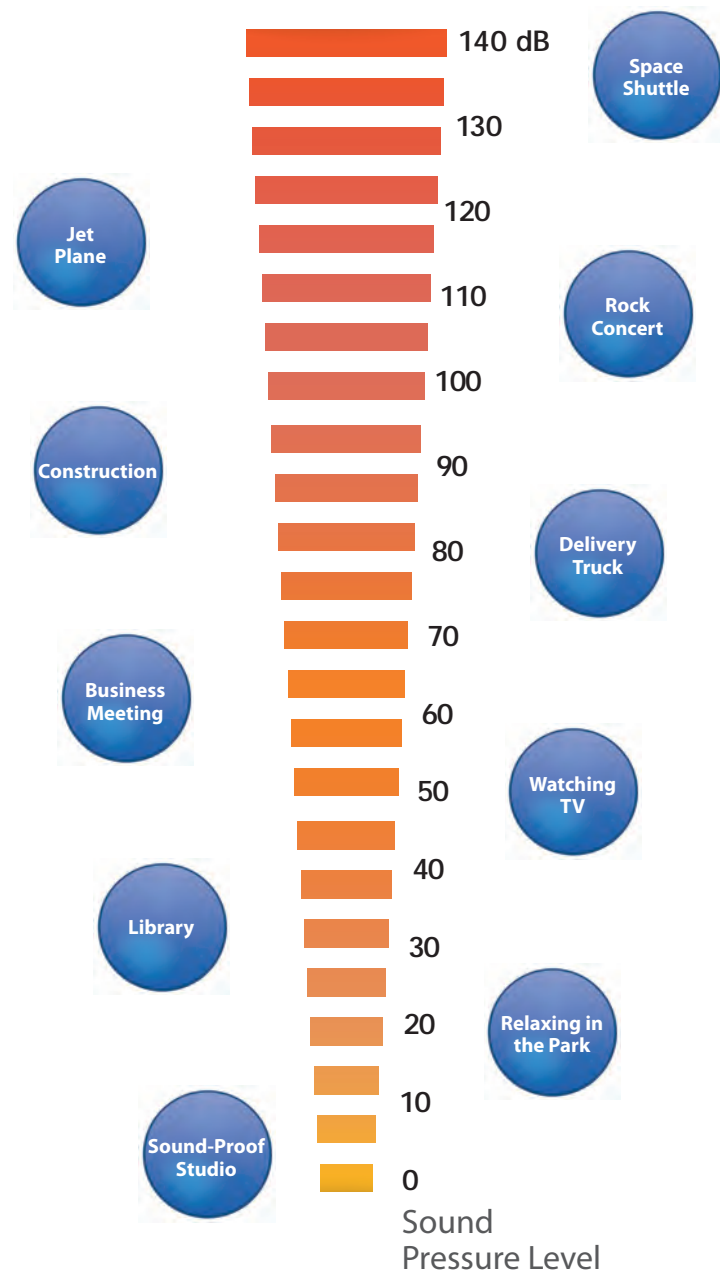




# Project Schedule Overview



## What are some common noise values?

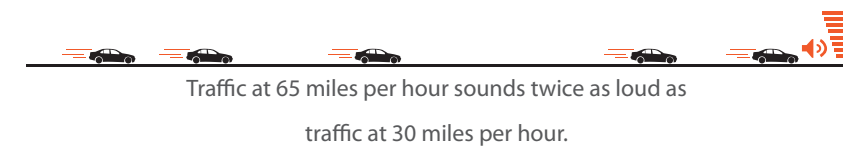


## How is a change in sound level perceived?



**Decibel Changes and Loudness**

## Traffic and Noise



**How Speed Affects Traffic Noise**



**How Traffic Volume Affects Noise**



**How Trucks Affect Traffic Noise**



# Noise Analysis and Mitigation

## How does CDOT/FHWA determine if I am impacted?

CDOT has analyzed noise levels along C-470 for today's traffic and for 2035 forecasted traffic.

Study findings suggest that various residential areas along C-470 are impacted by C-470 traffic noise in accordance with CDOT noise abatement criteria. Some of these areas are expected to be recommended for noise abatement.

## How does CDOT / FHWA determine if mitigation will be implemented?

If the analysis determines that forecasted noise levels for residences along the corridor meet CDOT criteria , noise abatement will be evaluated using the following steps:

### Is it Feasible?

- Can a 5dB(A) noise reduction be achieved by constructing a noise barrier or berm?
- Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
- Can a noise barrier or berm less than 20 feet tall be constructed?

### Is it Reasonable?

- Has the design goal of 7 dB(A) noise reduction for abatement measure been met for at least one impacted receptor?
- Is the Cost Benefit Index below \$6,800 per receptor per dB(A) reduced?

## \* We Are Here Tonight

### CDOT Noise Abatement Criteria

Activity Category	Activity Leq(h)*	Evaluation Location	Activity Description
B <sup>1</sup>	66	Exterior	Residential
C <sup>1</sup>	66	Exterior	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 studio, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.

<sup>1</sup>Includes undeveloped lands permitted for this activity category  
\*Hourly A-weighted sound level in dBA



# C-470 Noise Analysis and Mitigation Process Part 2

## \* We Are Here Tonight

### CDOT Noise Mitigation Implementation Next Steps

#### What are the Options for Noise Mitigation? If noise abatement is recommended what are the options?

Noise barriers are commonly constructed as walls, earthen berms, or a combination of the two. Walls are most common, and are usually constructed out of dense materials such as concrete or masonry block. Earth berms are a natural alternative to walls, but require much more land to construct.

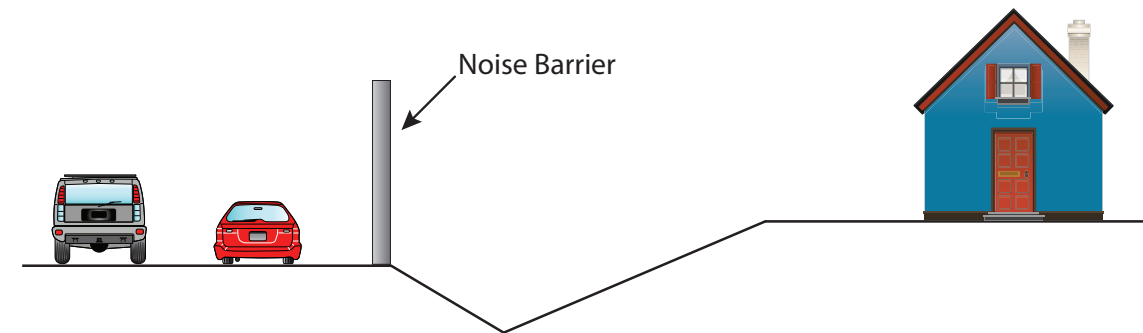
#### How Does CDOT/FHWA Involve the Community in Final Decisions to Construct Noise Mitigation?

CDOT shall solicit the opinions and desires of the benefitted receptors, those receptors receiving 5 dBA or more of noise reduction, whether to build or not build noise abatement measures that were recommended from noise mitigation analysis. **A simple majority (>50%) response is required.** An initial benefitted receptor preference survey will be completed as part of the environmental Assessment. A final benefitted receptor preference survey will be completed as part of the final design process, if necessary because of design changes.

#### How Will it Look Aesthetically?

During final design aesthetic treatments for recommended abatement measures will be coordinated with the benefitted receptors.

#### Typical Section





# C-470 - Kipling to Wadsworth

## Final Analysis of Traffic Noise Impacts and Recommended Mitigation



Redstone Ranch

CDOT Right of Way



Kipling

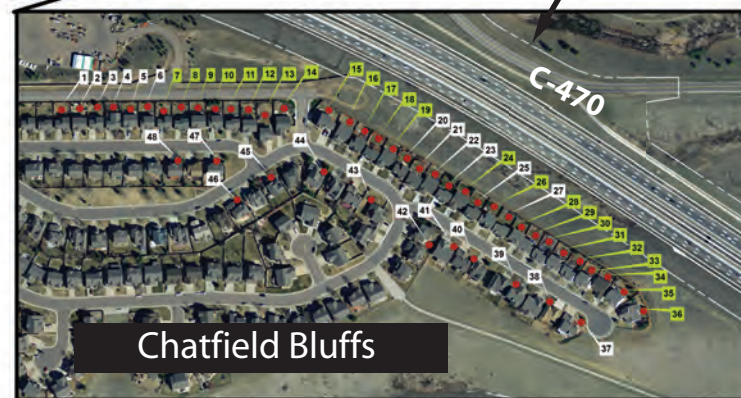
Wadsworth

C-470



Wingate

CDOT Right of Way



Chatfield Bluffs

CDOT Right of Way



Meadowbrook

C-470

**Notes:**

Recommended noise walls shown qualify for noise mitigation based on technical criteria. Final approval for construction is contingent upon a majority vote from the benefitted noise receptors.

If no recommended noise wall is shown, the location did not meet technical criteria for noise mitigation.

Recommended noise walls are shown in an approximate location and length. Final design will determine exact location and dimensions.

**Legend**

- # Less than 66 dB
- # Equal to or greater than 66 dB
- Receptor Location
- Recommended Noise Wall



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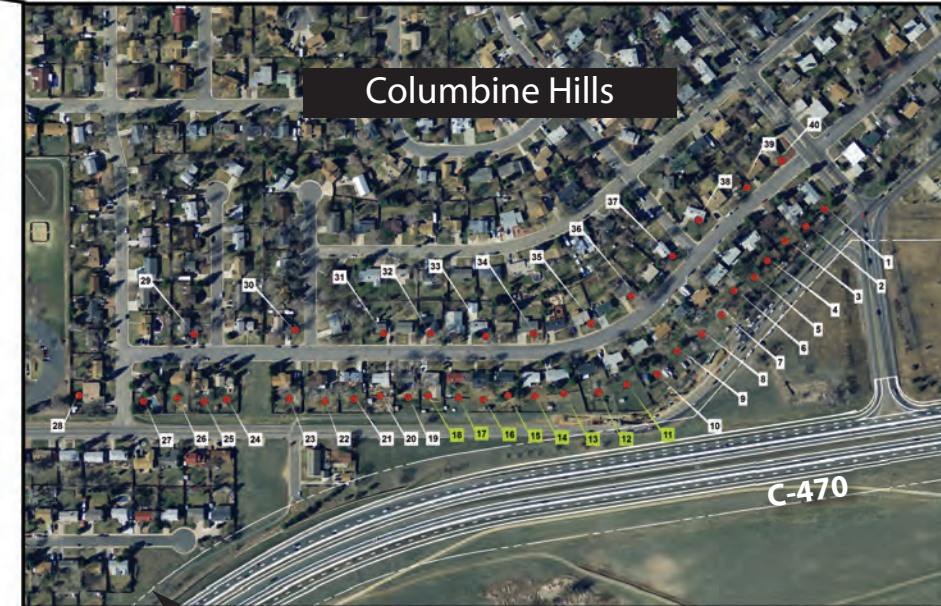
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# C-470 - Wadsworth to Platte Canyon

## Final Analysis of Traffic Noise Impacts and Recommended Mitigation



Noise Wall	
Approximate Length	900 ft
Height	Min. 8 ft
	Max. 16 ft
	Avg. 13.5 ft

CDOT Right of Way

CDOT Right of Way

### Legend

- Less than 66 dB
- Equal to or greater than 66 dB
- Receptor Location
- Recommended Noise Wall

### Notes:

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# C-470 - Platte Canyon to Santa Fe

## Final Analysis of Traffic Noise Impacts and Recommended Mitigation



**Legend**

- Less than 66 dB
- Equal to or greater than 66 dB
- Receptor Location
- Recommended Noise Wall

**Notes:**

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If no recommended noise wall is shown, the location did not meet technical criteria for noise mitigation.

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CDOT Right of Way

Noise Wall			
Approximate	Length	1,500 ft	
	Height	Min. 12 ft	
		Max. 16 ft	
		Avg. 15.5 ft	

Note: Recommended noise wall replaces existing noise wall.



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**Legend**

- # Less than 66 dB
- # Equal to or greater than 66 dB
- Receptor Location
- Recommended Noise Wall
- Four Story Residences
- Club House
- Three Story Parking Structure
- Single Story Parking Structure

**Notes:**

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Noise Wall		
Approximate Length		1,700 ft
Height		Min. 8 ft Max. 20 ft Avg. 18.5 ft

CDOT Right of Way



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**Legend**

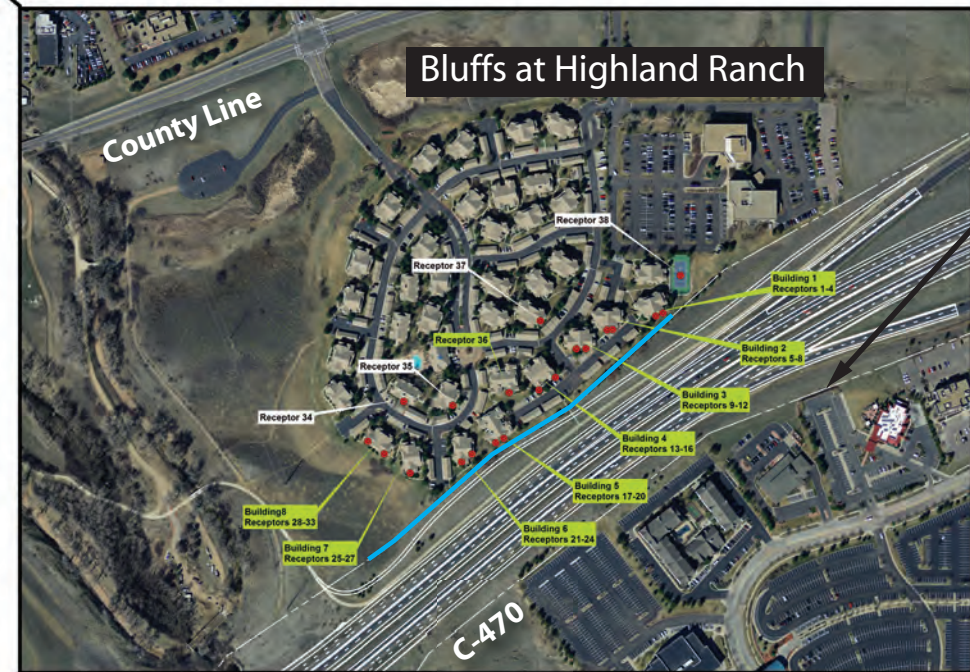
- Less than 66 dB
- Equal to or greater than 66 dB
- Receptor Location
- Recommended Noise Wall

**Notes:**

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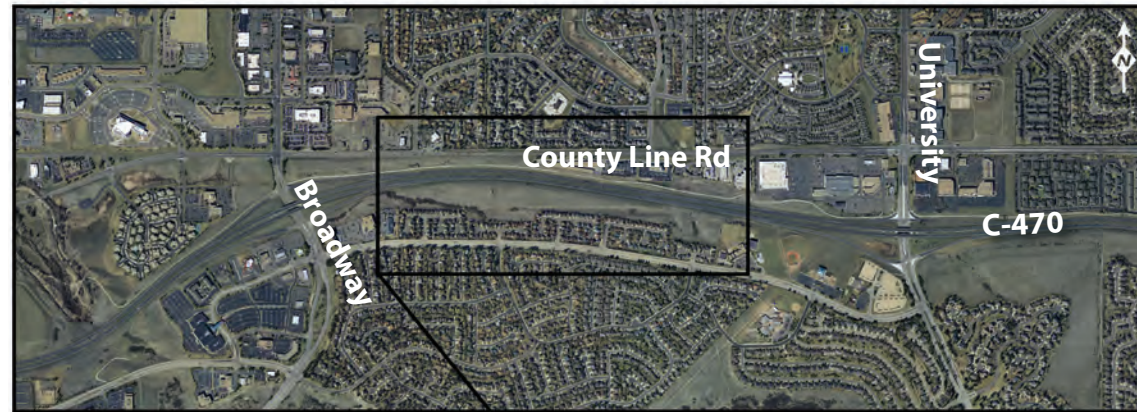
Noise Wall		
Approximate Length	1,200 ft	
Height	Min. 16 ft	
	Max. 20 ft	
	Avg. 17.5 ft	





# C-470 - Broadway to University

## Final Analysis of Traffic Noise Impacts and Recommended Mitigation



**Legend**

- Less than 66 dB
- Equal to or greater than 66 dB
- Receptor Location
- Recommended Noise Wall

**Notes:**

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# C-470 - University to Colorado

## Final Analysis of Traffic Noise Impacts and Recommended Mitigation

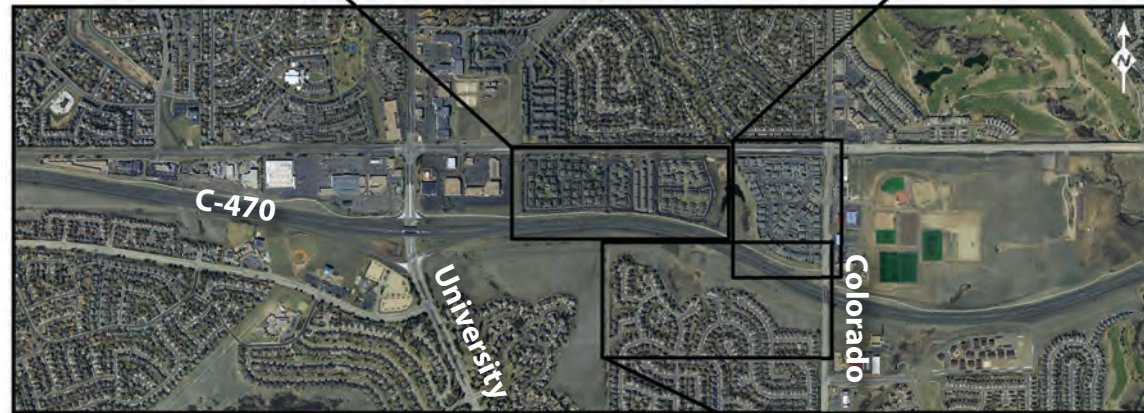
Combined Noise Wall  
 Approximate Length 4,350 ft  
 Height Min. 2 ft  
 Max. 18 ft  
 Avg. 16 ft

**Legend**

- Less than 66 dB
- Equal to or greater than 66 dB
- Receptor Location
- Recommended Noise Wall



Noise Wall  
 Approximate Length 380 ft  
 Height Min. 8 ft  
 Max. 8 ft  
 Avg. 8 ft



**Notes:**

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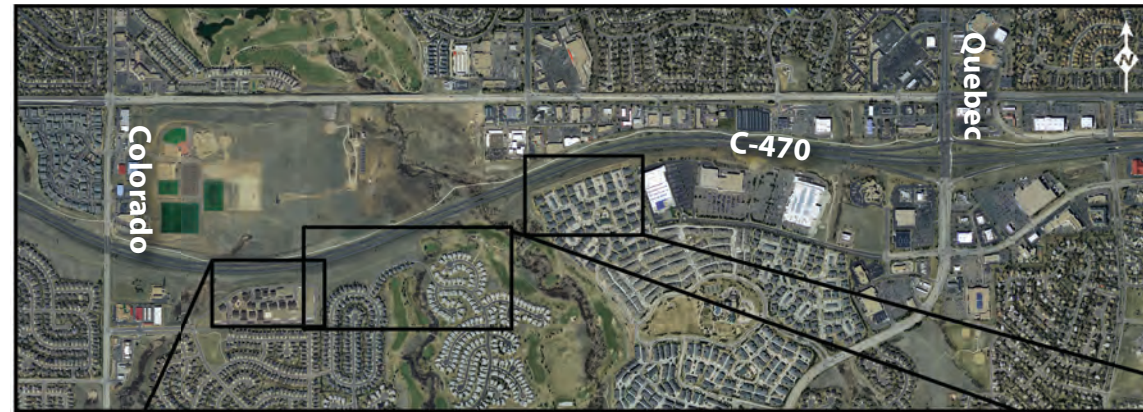


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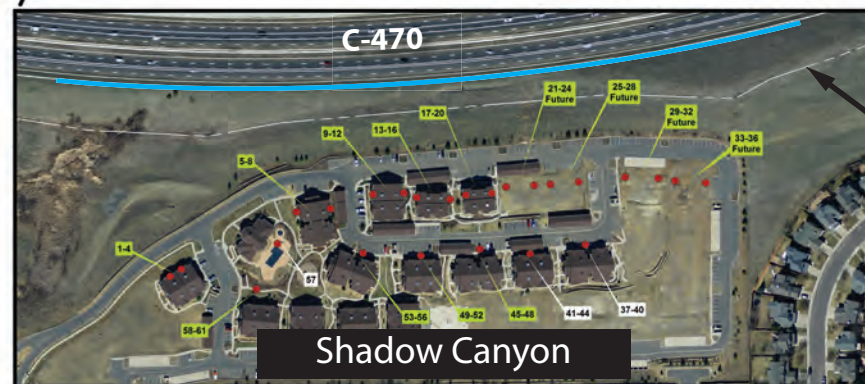
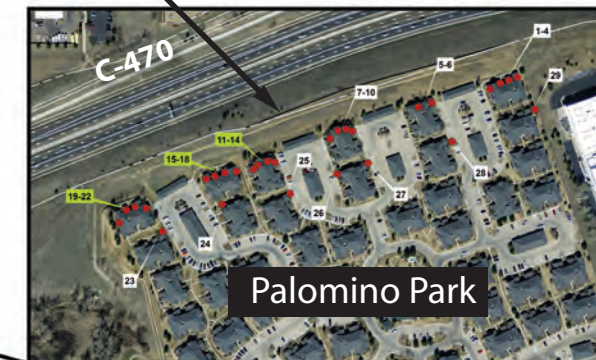
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CDOT Right of Way



CDOT Right of Way

**Shadow Canyon**

Wall

Approximate Length	1,700 ft
Height	Min. 12 ft Max. 20 ft Avg. 18.5 ft



CDOT Right of Way

**Province Center / Gleneagle**

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**Legend**

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- Equal to or greater than 66 dB
- Receptor Location
- Recommended Noise Wall

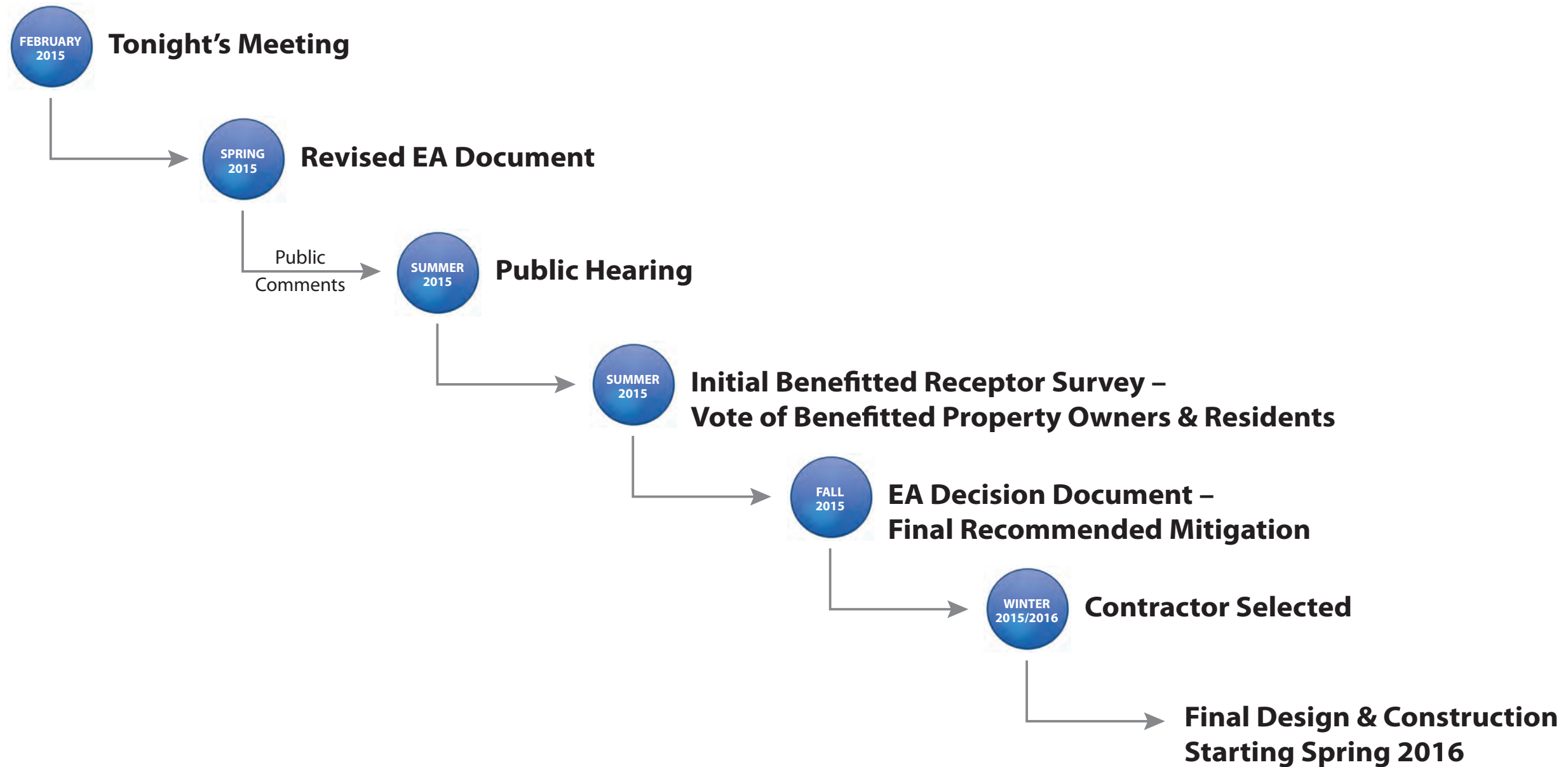


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# Next Steps for Noise Mitigation





# THANK YOU

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