



Lead and Coal Studies

Public Meeting #3

December
2024





Outline

- Introduction
- Schedule
- Methodologies
- Safety Assessment
- Speed Data
- O/D Analysis
- Noise Assessment
- Alternative Analyses
- Safety Enhancements
- Next Steps / Questions





Public Meeting 1 – Tuesday, September 5, 2024

Study Origins

- FHWA and MPO led the Lead and Coal RSA
 - June 2022
 - 19 Findings
 - 4 concepts advanced for additional studies
- Lead-Coal Working Group
 - November 2022
- Lead-Coal Studies Task Force
 - Meets biweekly
 - Provides input on clarity and compares with personal experience



Progress within the Process

- RSA had 19 Findings
- This Study provides detailed analyses to complement the RSA
- Findings/options from this Study:
 - Documented in Final Report
 - Presented to the Lead and Coal Working Group
- Recommended “Implementation Package”, potentially including other findings from the RSA, to be selected by
 - L&C Task Force
 - Mayor’s Office
 - City DMD





Project Scope

- Evaluate Alternatives for Safety and Operations
 - Speed Limit Reduction
 - Single Lane Operation
 - Two-way Operation
 - Noise Assessment

Task	Date
Data Collection	May/June 2024
Crash Comparison and Trend Analysis	June/July 2024
Field Visits	July 2024
Working Group (Monthly, Last Wed.)	August 28, 2024
Public Meeting 1	September 5, 2024
Alternatives Analyses	June – November 2024
Noise Assessment	September 2024
Public Meeting 2	November 14, 2024
Task Force Meeting (Monthly, 1 st Wed.)	November 27, 2024
Public Meeting 3	December 18, 2024
Draft Report to Working Group	January 2025
Final Report	February 2025

Schedule

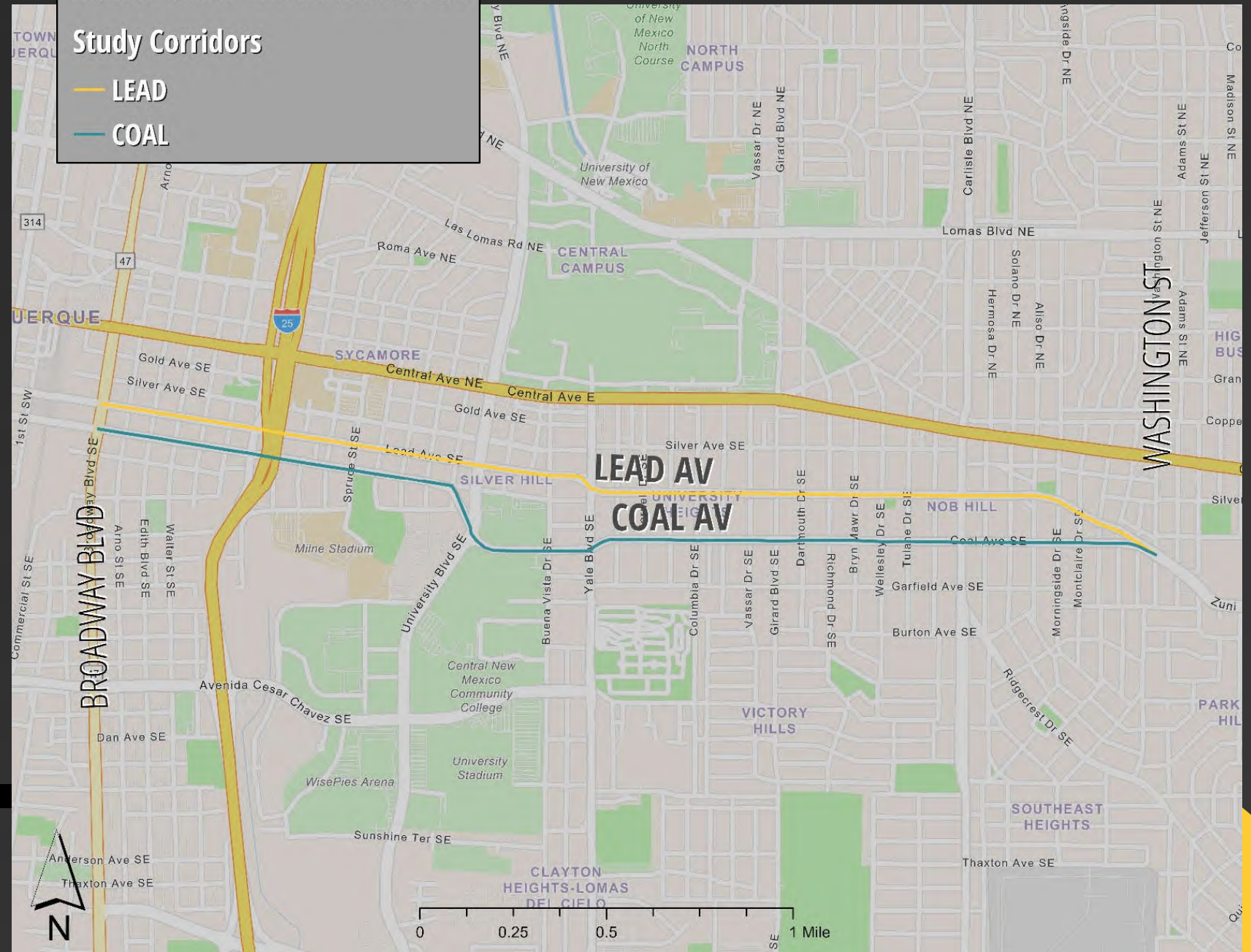


- • Functional Class
 - Principal Arterial
- • Posted Speed Limit
 - 30 MPH
- • Traffic Volume
 - 7,096 – 11,812 (one-way)
- • Travel Lanes
 - Two (each direction)
- • Length
 - Lead: 2.90 miles
 - Coal: 2.97 miles

Lead and Coal Studies

Study Corridors

- LEAD
- COAL

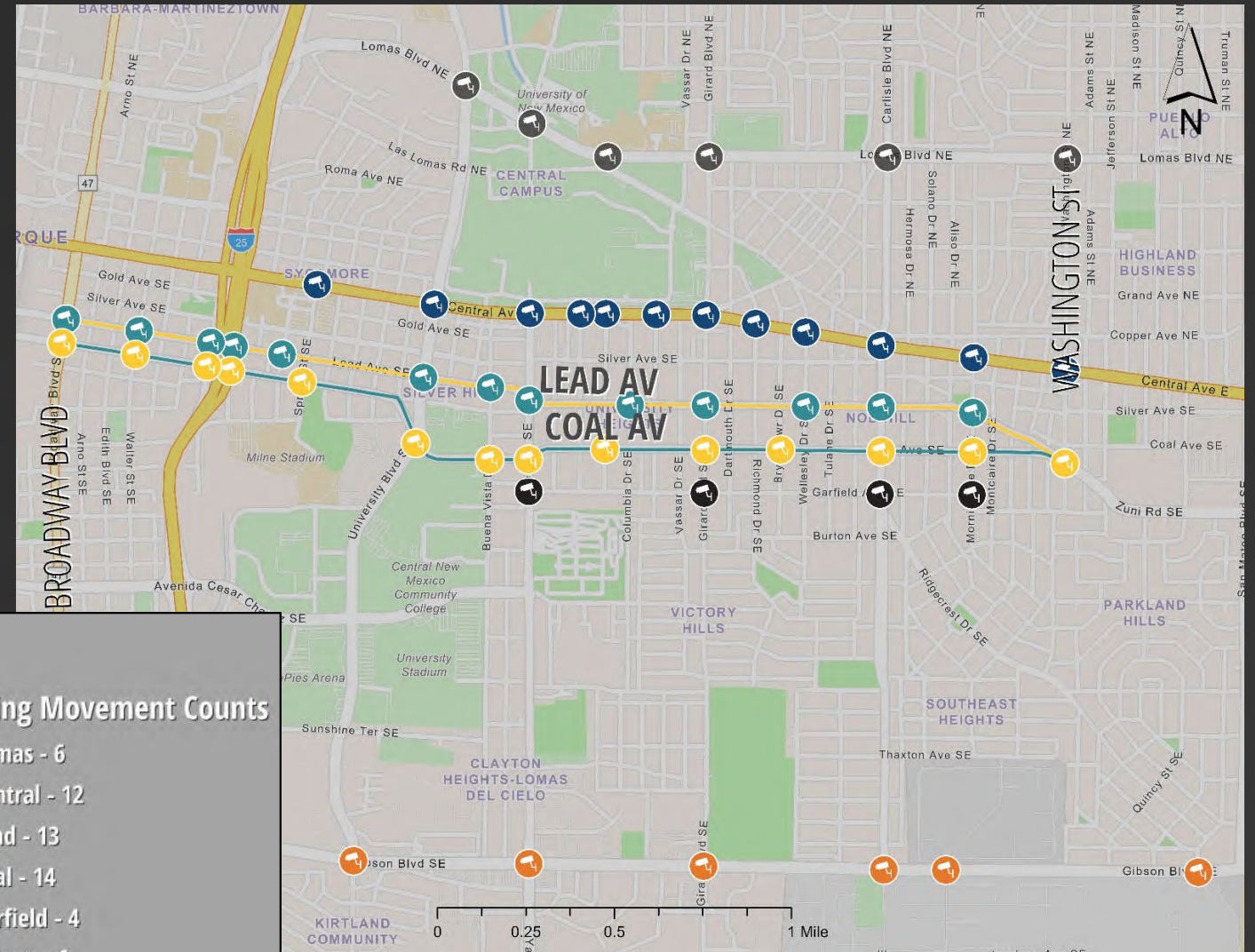


Study Area



Methodologies

- Data Collection
 - Crash Data
 - Speed Data (April 2024)
 - Turning Movement Counts
 - Noise Assessment



Lead and Coal Studies

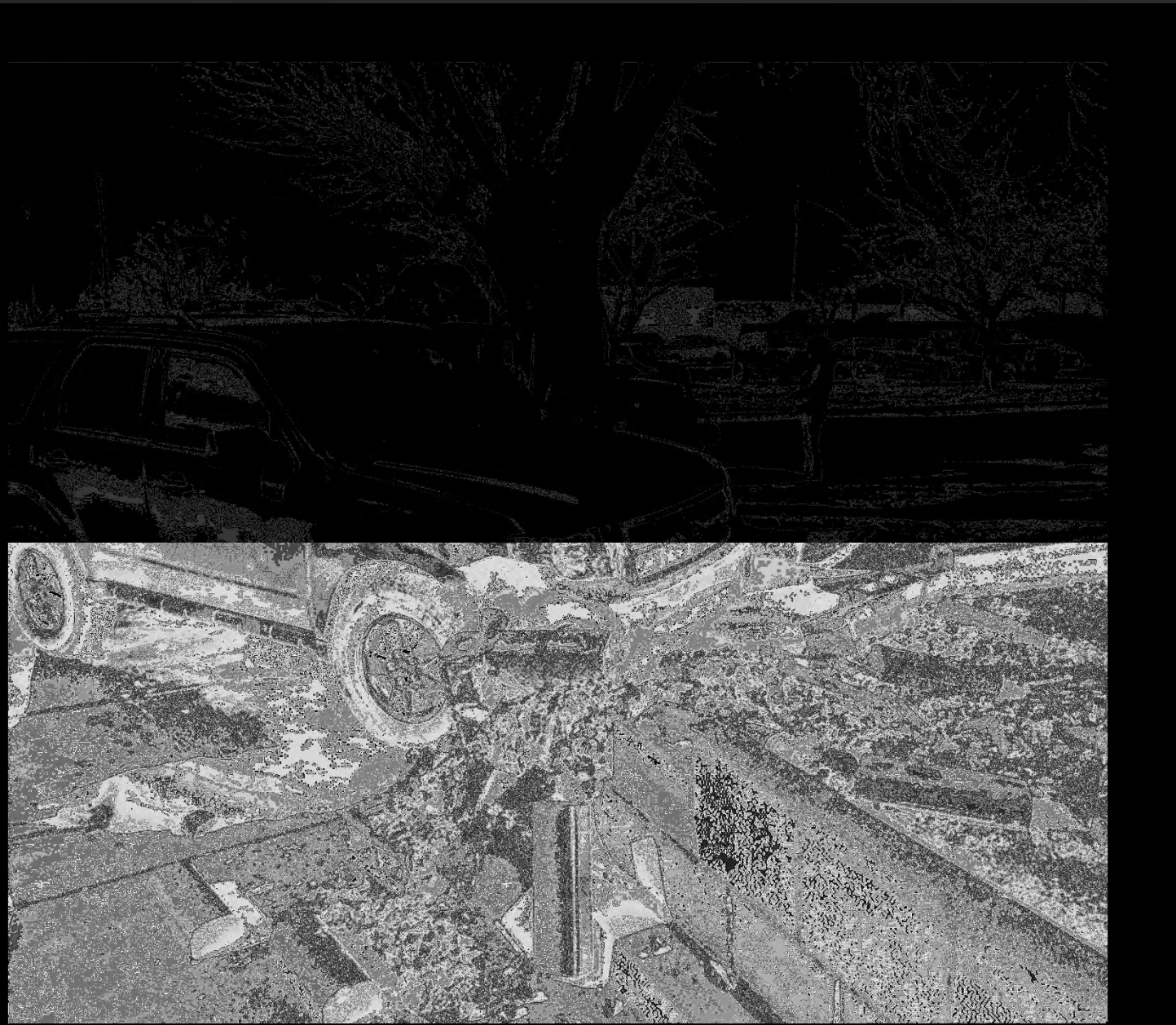
Study Corridors	Turning Movement Counts
— Coal Ave	🚗 Lomas - 6
— Lead Ave	🚗 Central - 12
	🚗 Lead - 13
	🚗 Coal - 14
	🚗 Garfield - 4
	🚗 Gibson - 6





Methodologies (cont.)

- Evaluate Alternatives for Safety and Operations
 - Highway Safety Manual
 - Highway Capacity Manual
 - Assessment for Alternatives (Delay, Travel Times)
 - Bicycle and Pedestrian Level of Service and Level of Traffic Stress



Source: <https://www.kunm.org/local-news/2021-05-18/lead-coal-crashes-continue-as-neighbors-await-study>

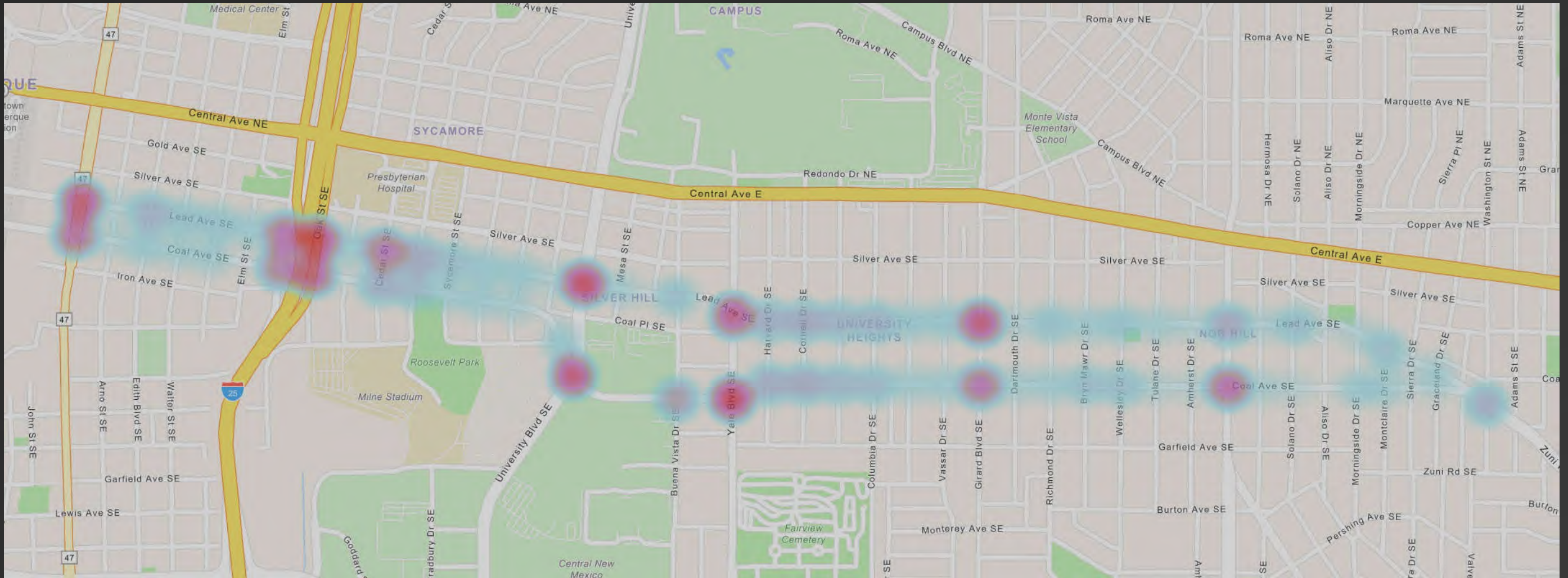
Crash Analysis

- All Crashes – 10-Year Heat Map
- Signalized Intersection Crash Rates
 - Crashes per Million Entering Vehicles





Crash Heat Map (2013-2022)

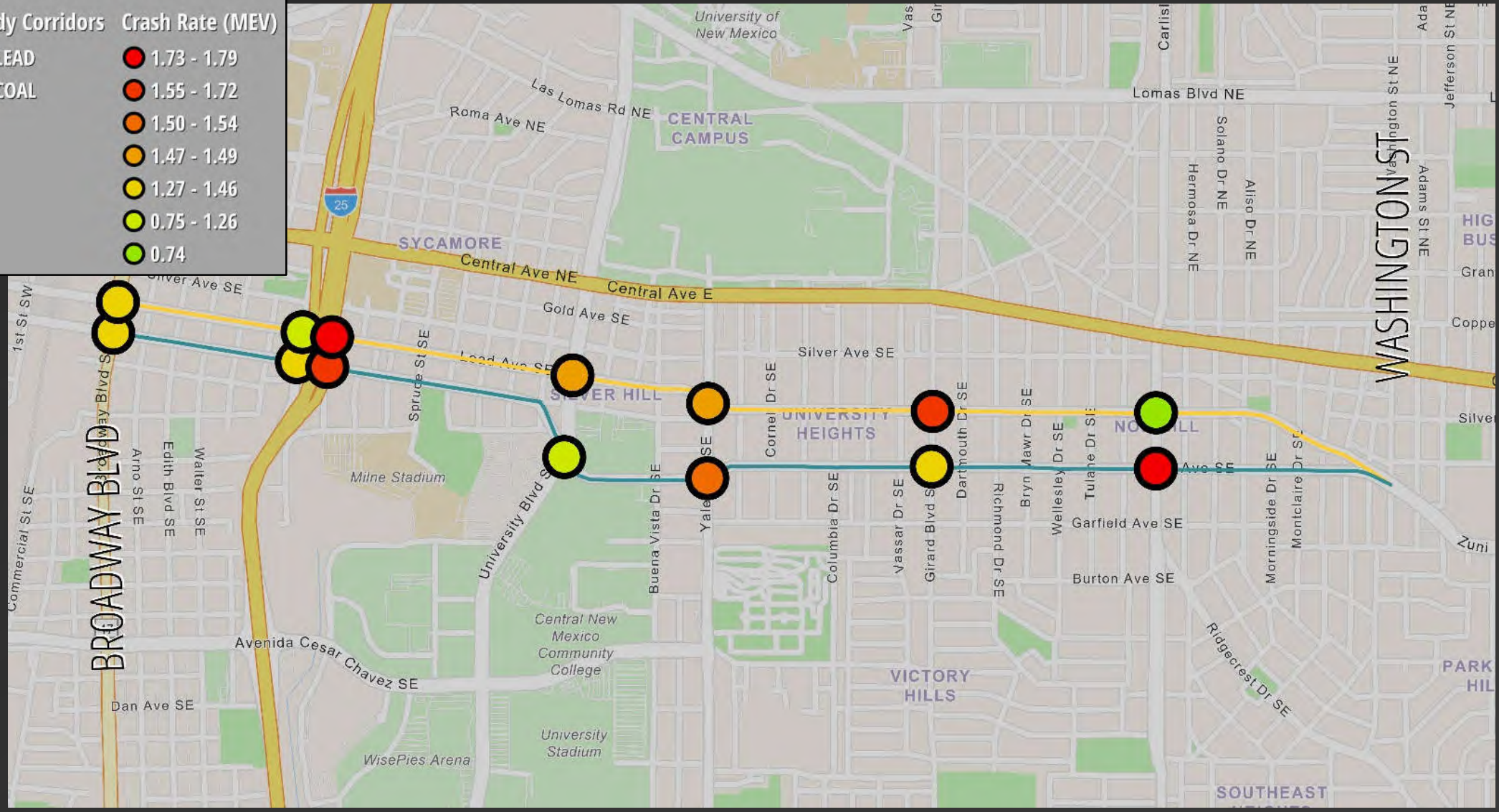




Lead/Coal Signalized Intersection Crash Rates

Lead and Coal Studies

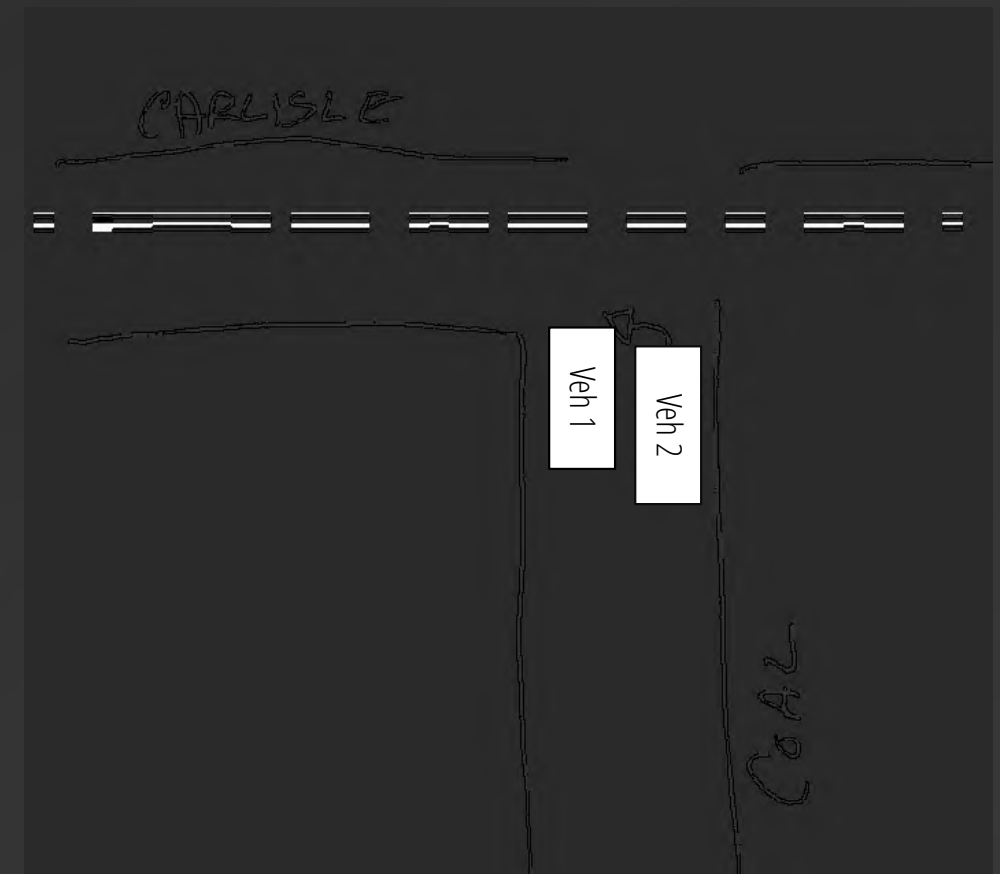
Study Corridors	Crash Rate (MEV)
LEAD	1.73 - 1.79
COAL	1.55 - 1.72
	1.50 - 1.54
	1.47 - 1.49
	1.27 - 1.46
	0.75 - 1.26
	0.74



Further Insights from Crash Reports

- High Rate of Speed
- Red Light Running
- Left-turns from the Right Lane (vise versa)

We were both going east on Coal. Veh 1 was in the left lane & Veh 2 was in the right lane. Veh 2 turned left from the right lane hitting the passenger side of Veh 1 car. No injuries for either party.



Speed Data

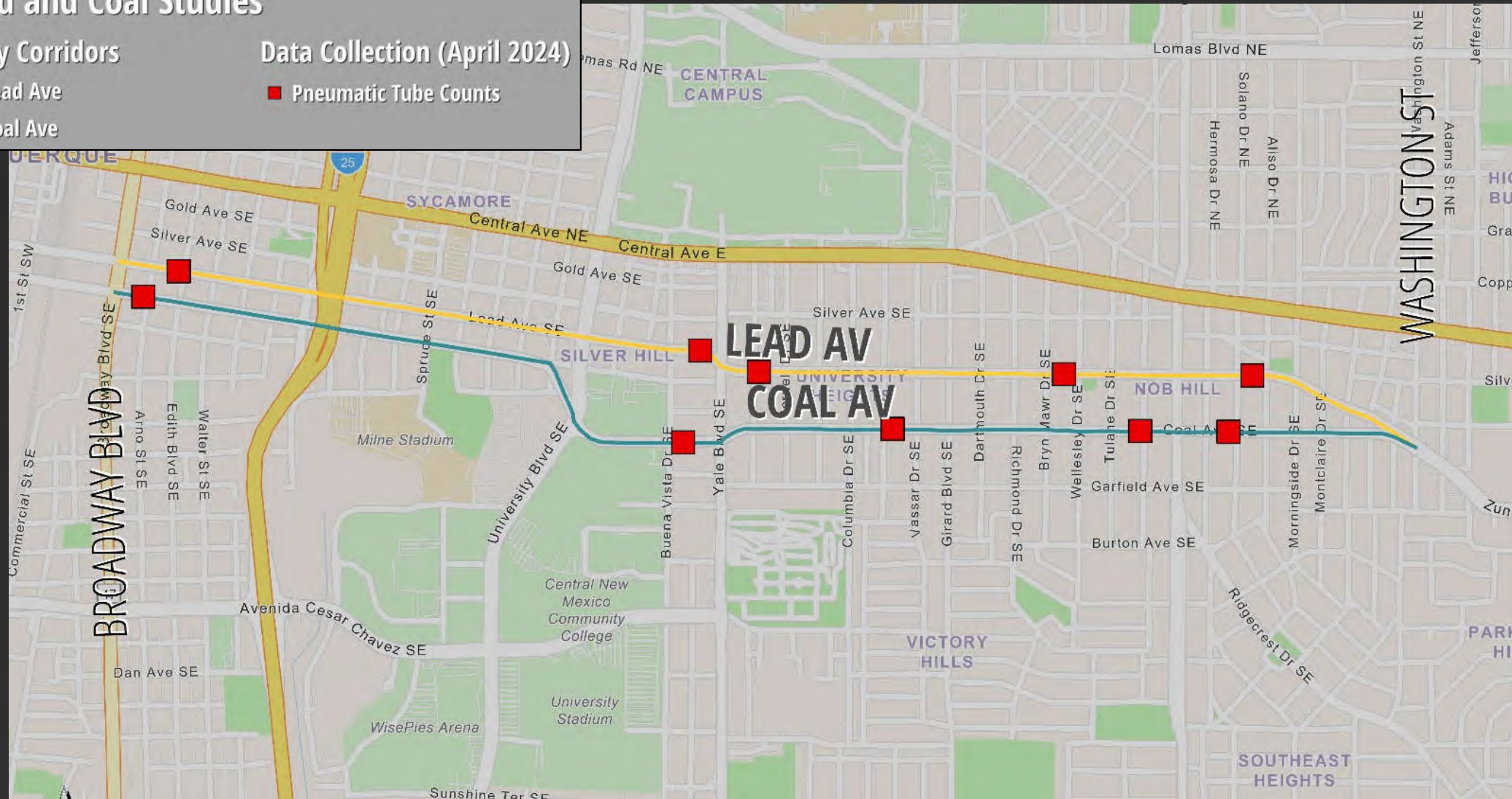
Lead and Coal Studies

Study Corridors

- Lead Ave
- Coal Ave

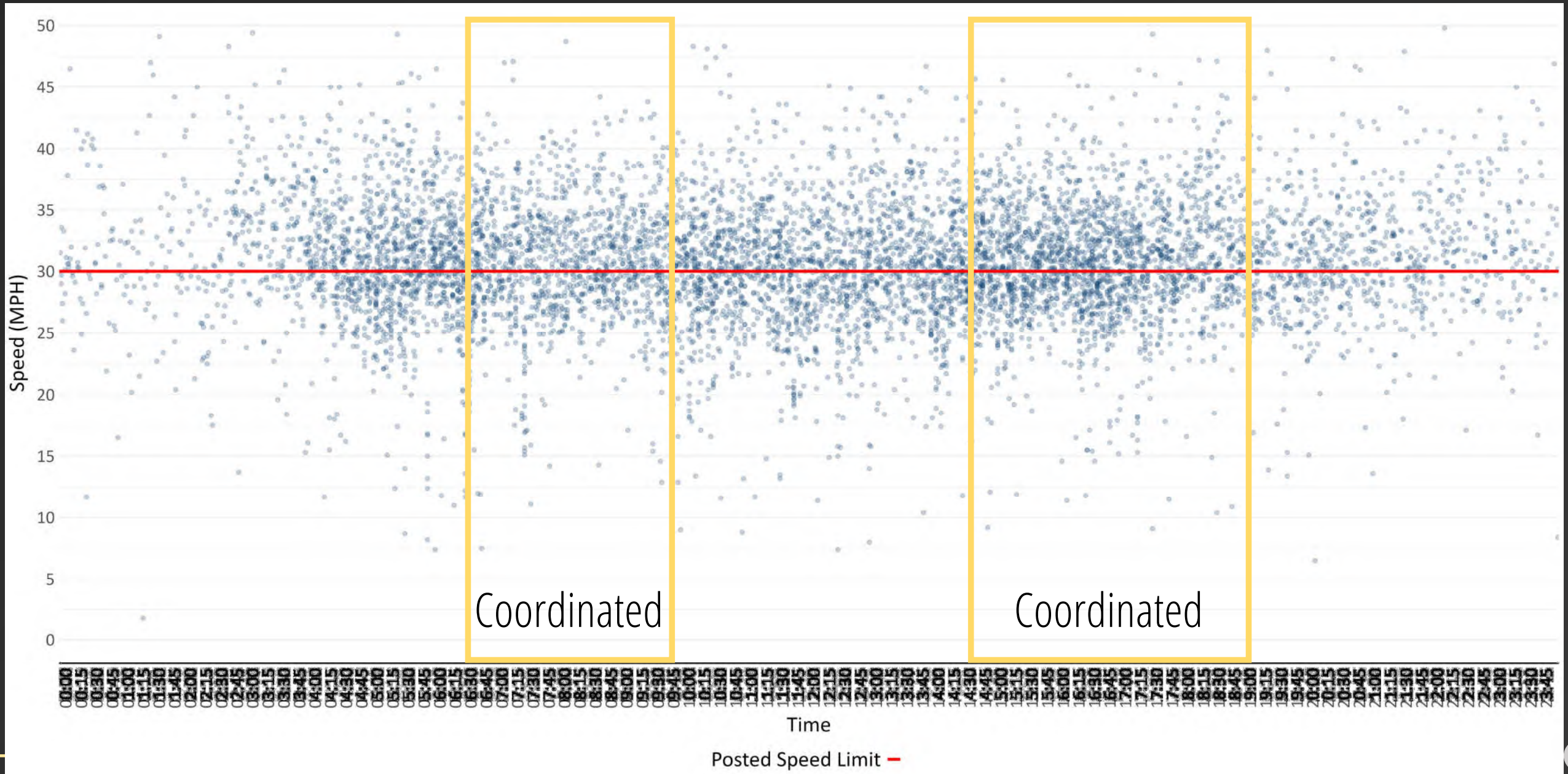
Data Collection (April 2024)

- Pneumatic Tube Counts



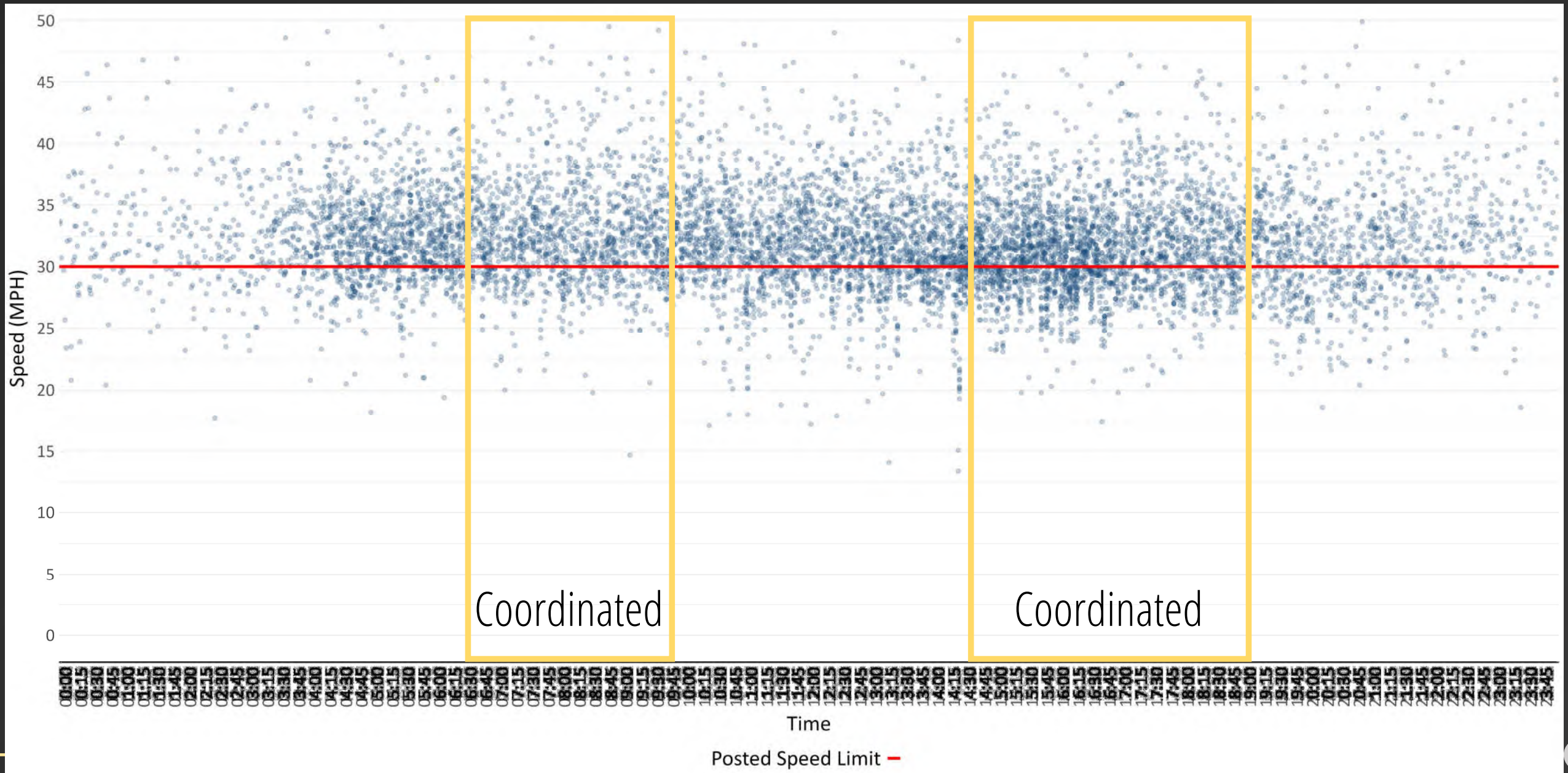
Counted on Wednesday, April 10, 2024

Coal – West of Arno



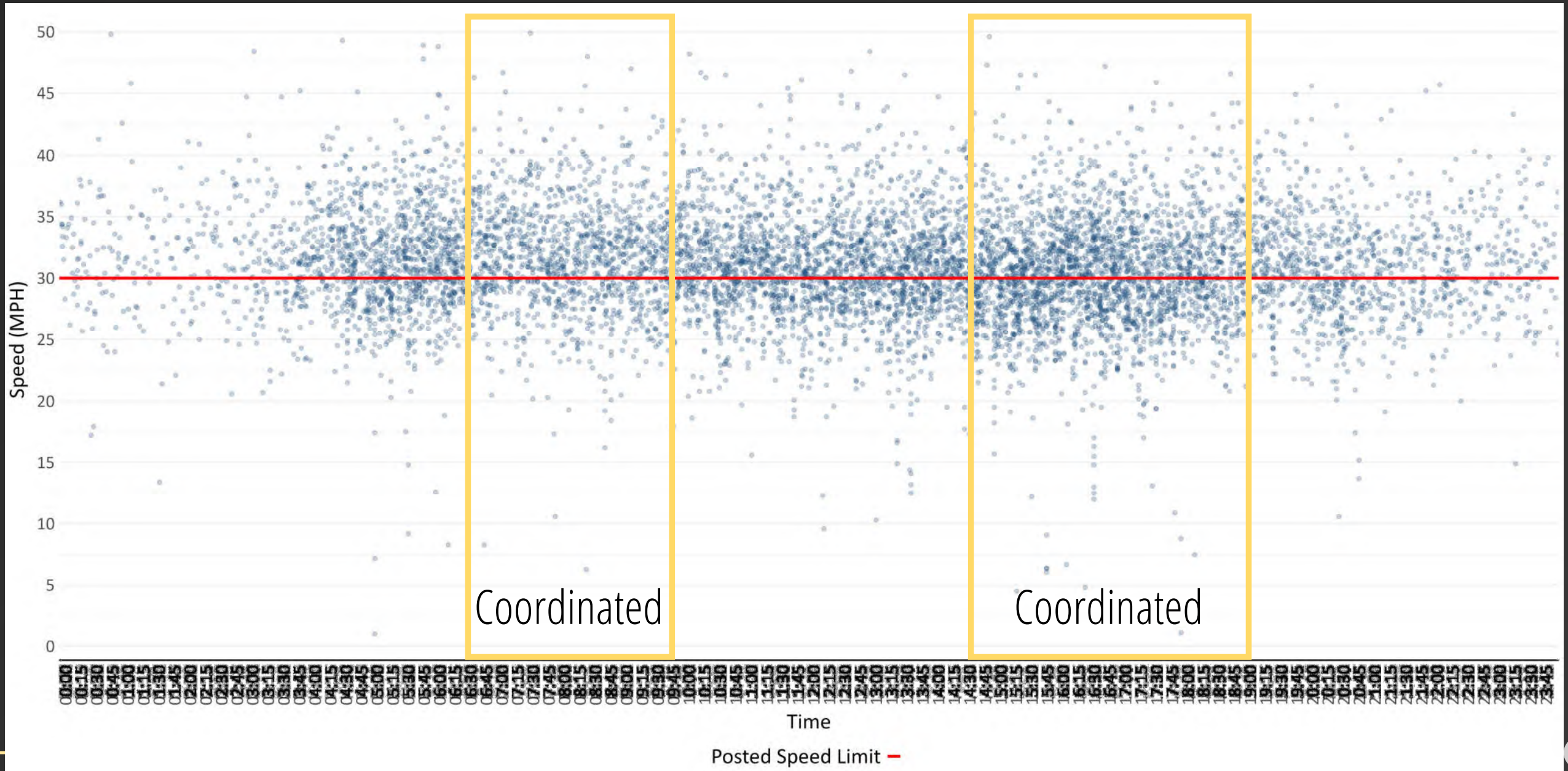
Counted on Wednesday, April 10, 2024

Coal – West of Amherst



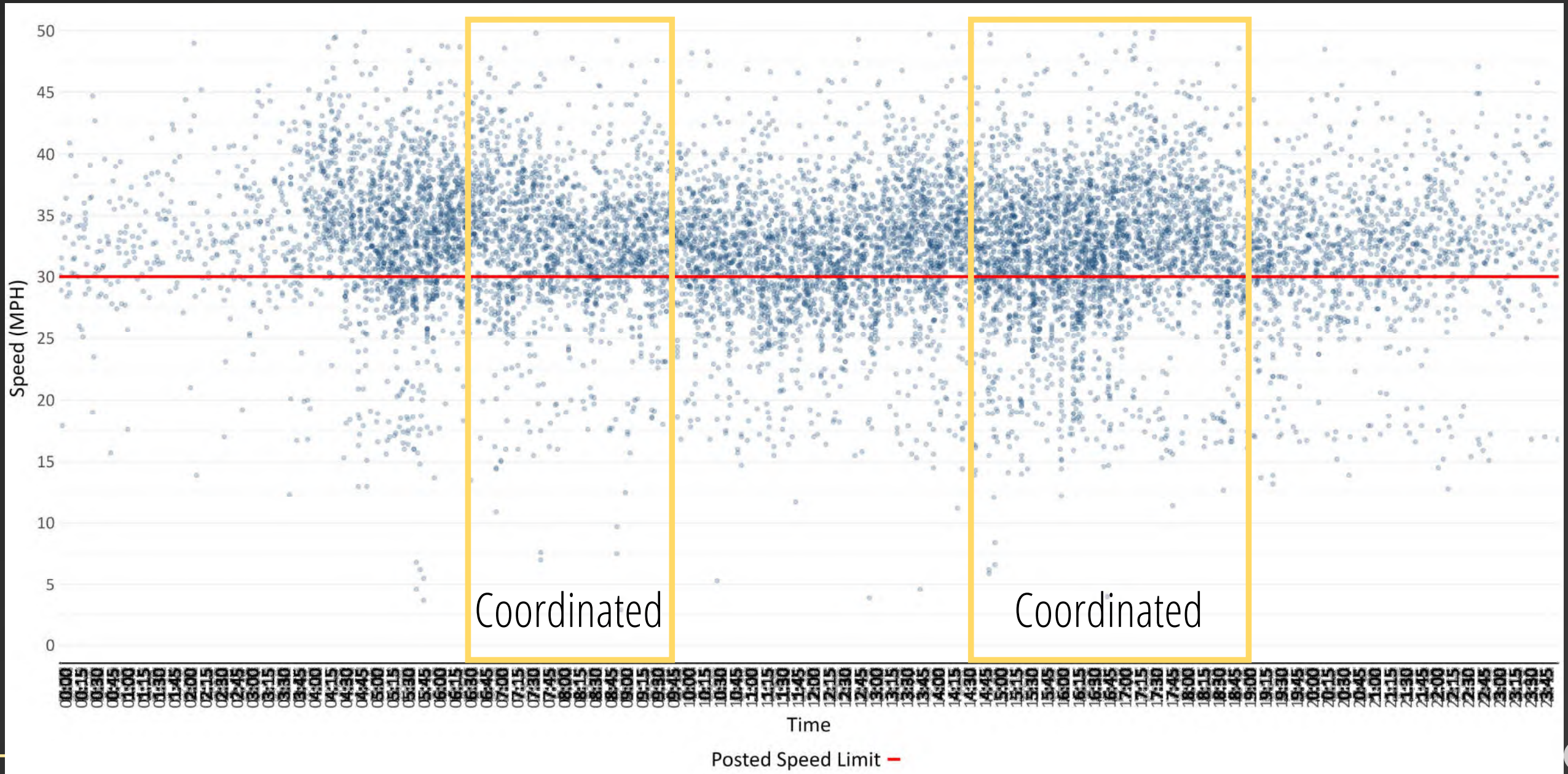
Counted on Wednesday, April 10, 2024

Lead – West of Aliso



Counted on Wednesday, April 10, 2024

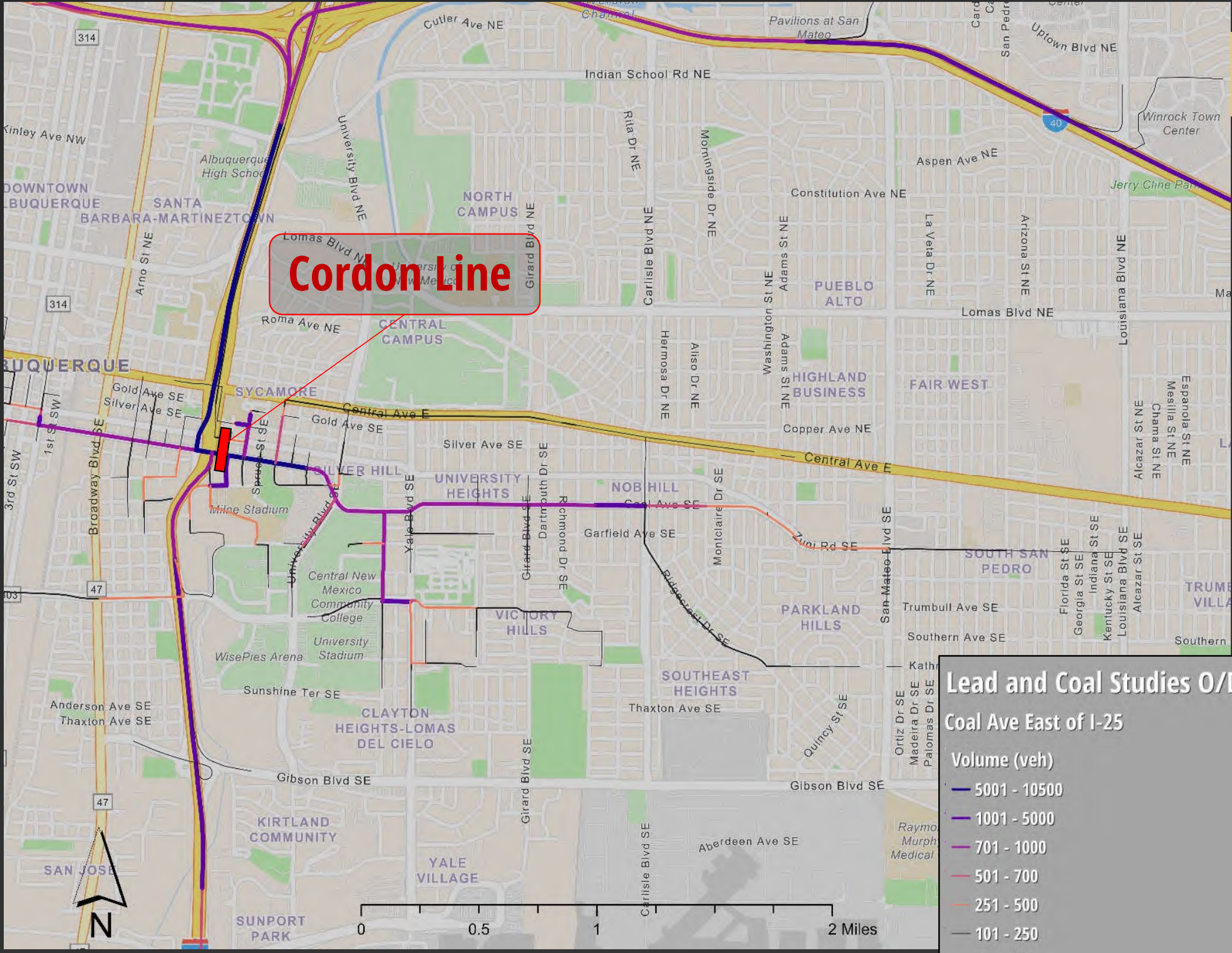
Lead – West of Edith



Origin/Destination Analysis



Origin/Destination Analysis



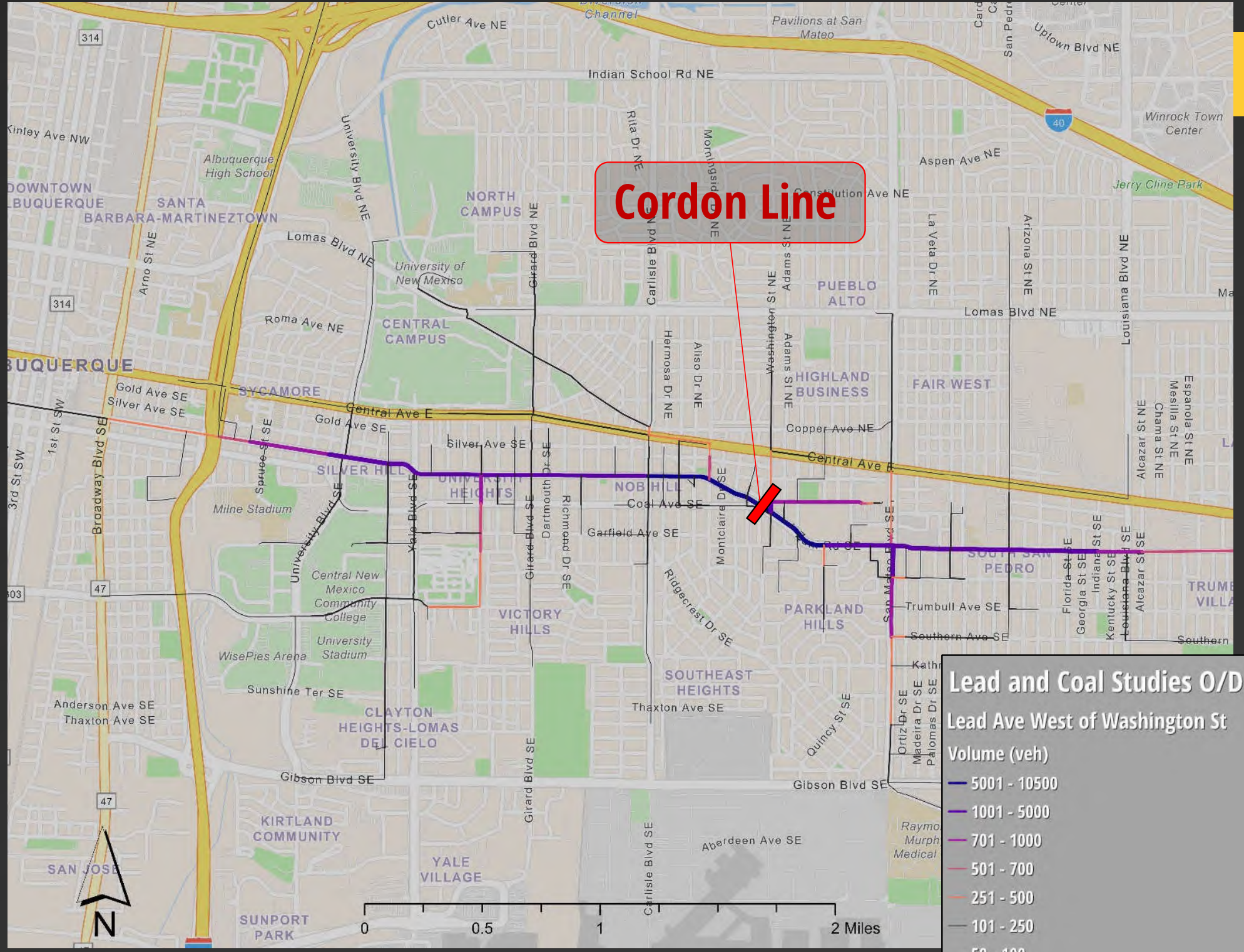
Cordon Line

Lead and Coal Studies O/D Analysis Coal Ave East of I-25

- Volume (veh)
- 5001 - 10500
 - 1001 - 5000
 - 701 - 1000
 - 501 - 700
 - 251 - 500
 - 101 - 250
 - 50 - 100

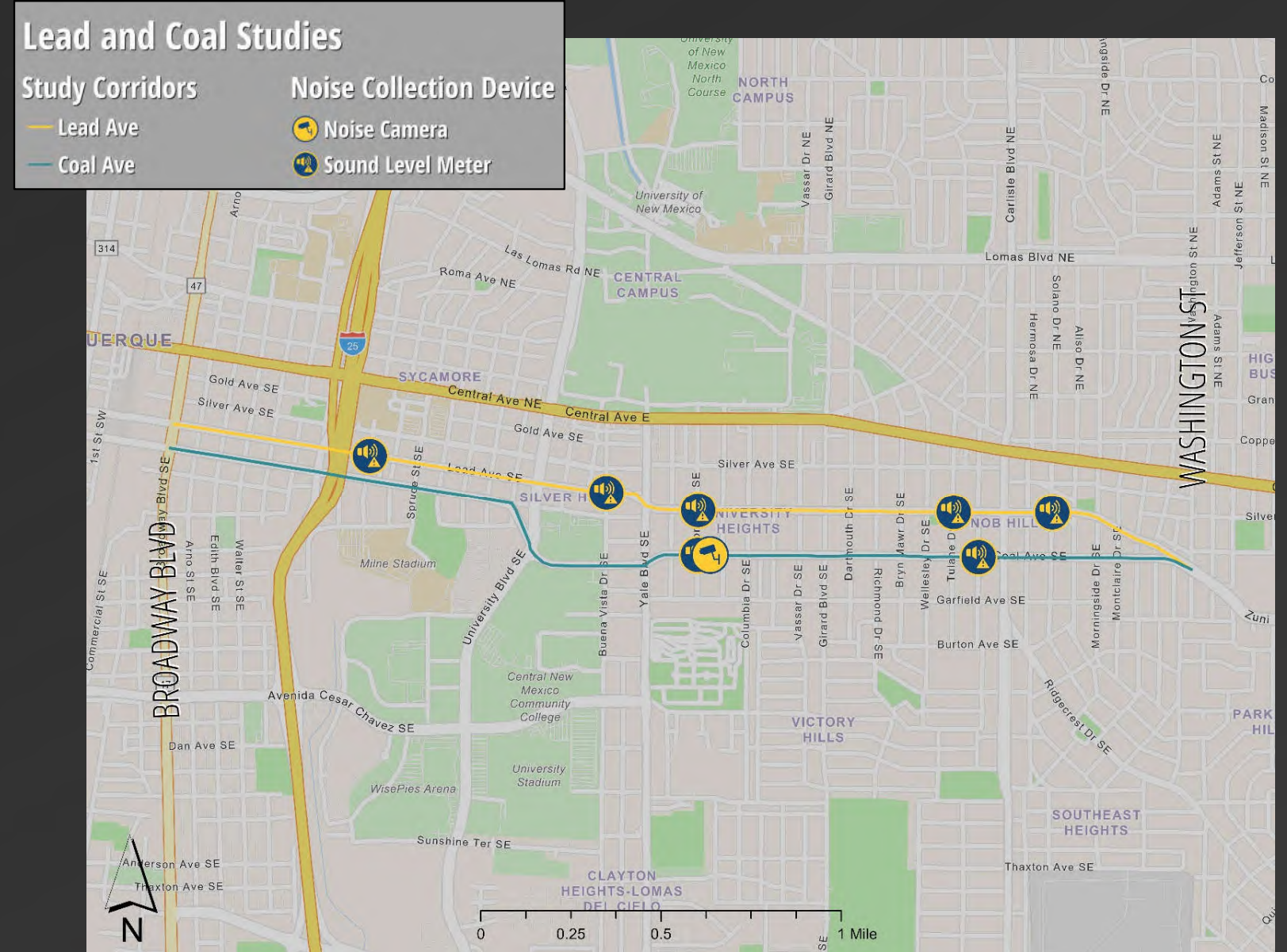


Origin/Destination Analysis



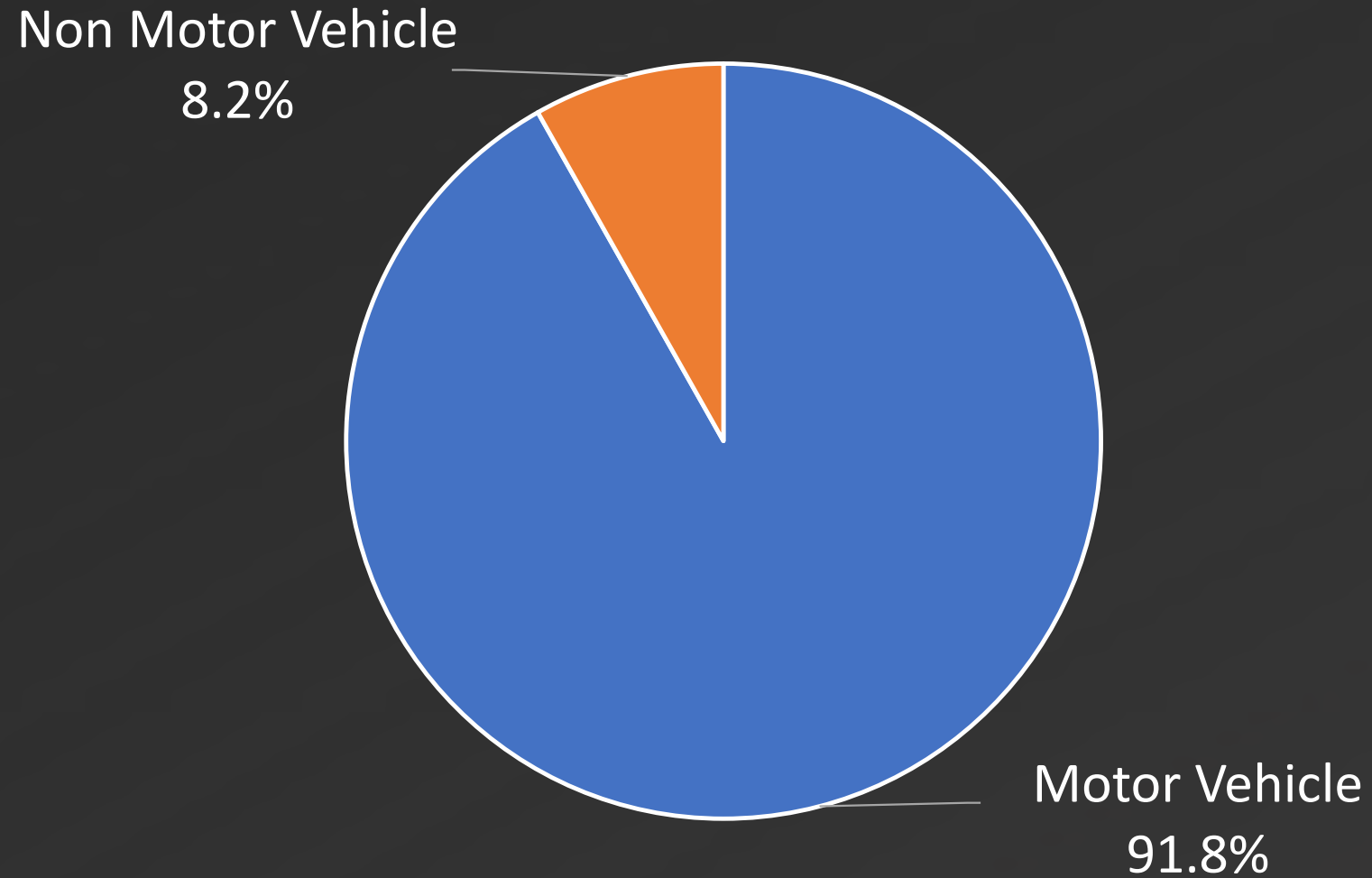
Noise Assessment – Analysis

- Sound Level Meter
 - Tuesday, 9/24/24 – Thursday, 9/26/24
- Noise Camera
 - Tuesday, 9/24/24 – Thursday, 9/26/24
- 5 of the 8 locations experienced peak hours approaching 66 dB.
 - 66dB is the residential limit per FHWA guidance.





Noise Sources for Noise Camera Triggers



171 triggers of ≥ 80 dB(A) over 50.5 hours of monitoring

Collected on Coal between Cornell & Stanford - Tuesday, 9/24/24 – Thursday, 9/26/24

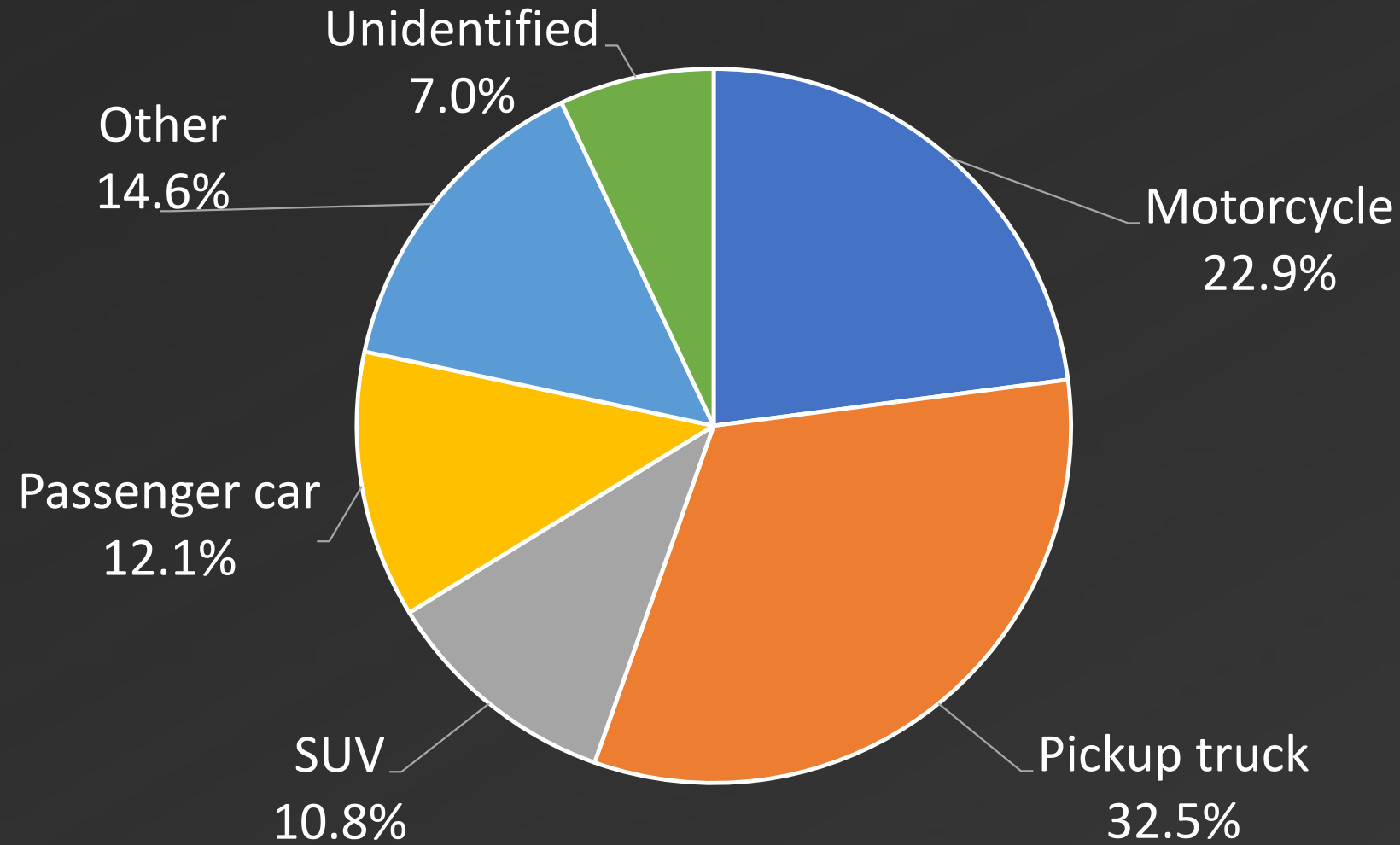


PB0

Cross Street and Date

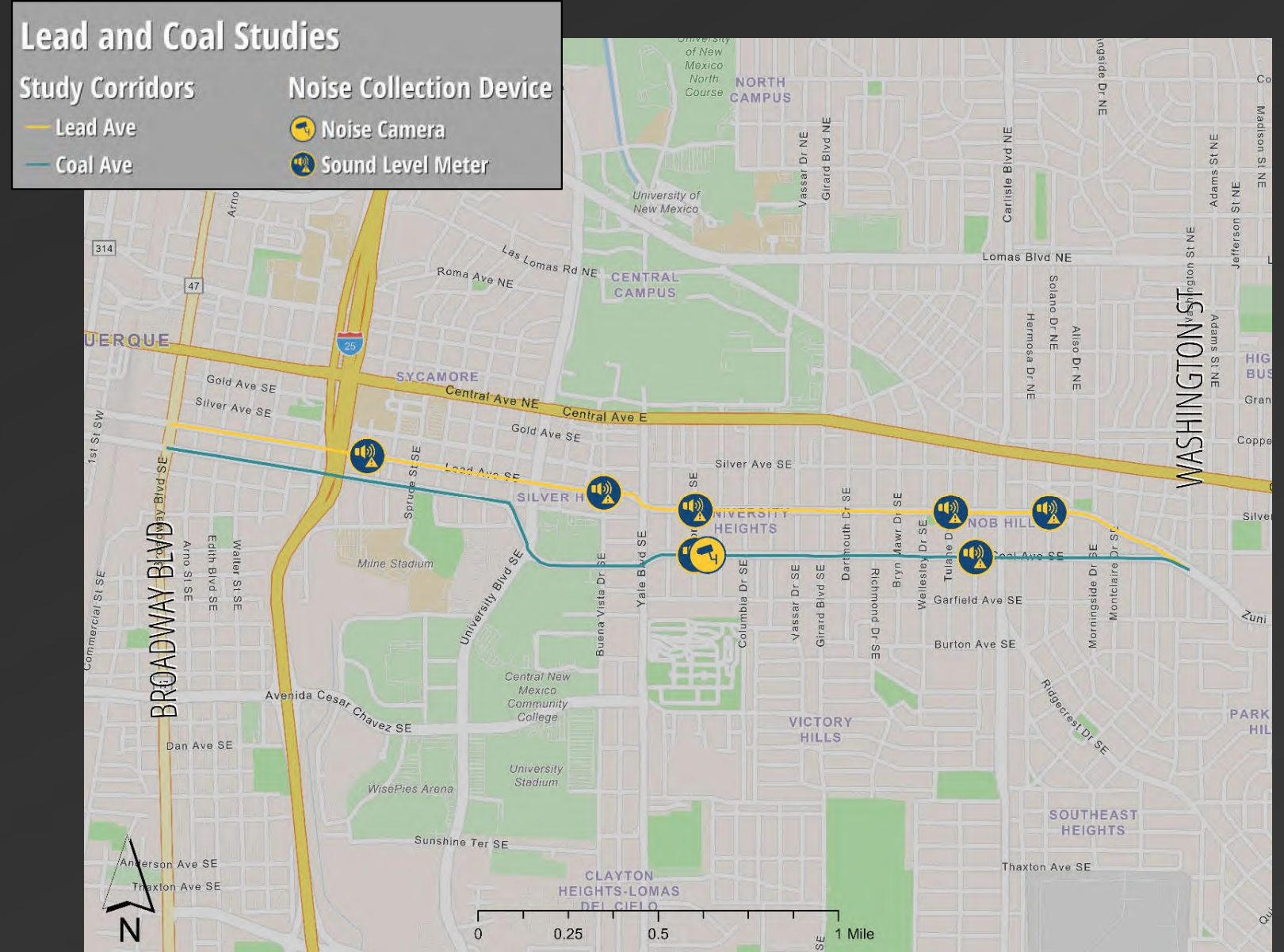
Paul Barricklow, 2024-11-13T21:10:26.141

Types of Motor Vehicles Triggering the Noise Camera



Noise Assessment – Analysis

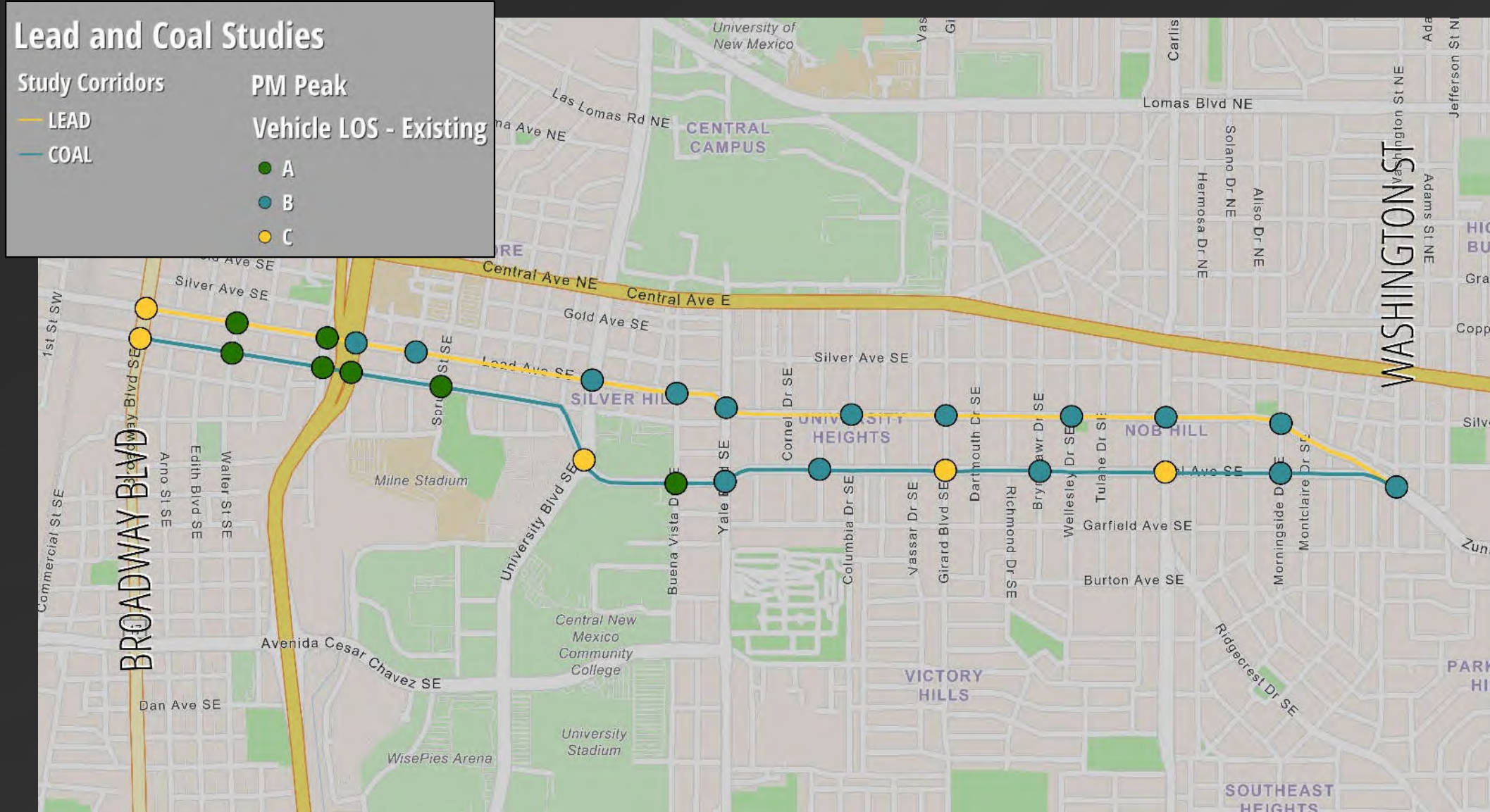
- Most sound triggers were motorcycles and pick-up trucks.
- Large commercial trucks are not a significant noise source; therefore, a truck restriction may not be an effective strategy.



Synchro Traffic Simulation Results

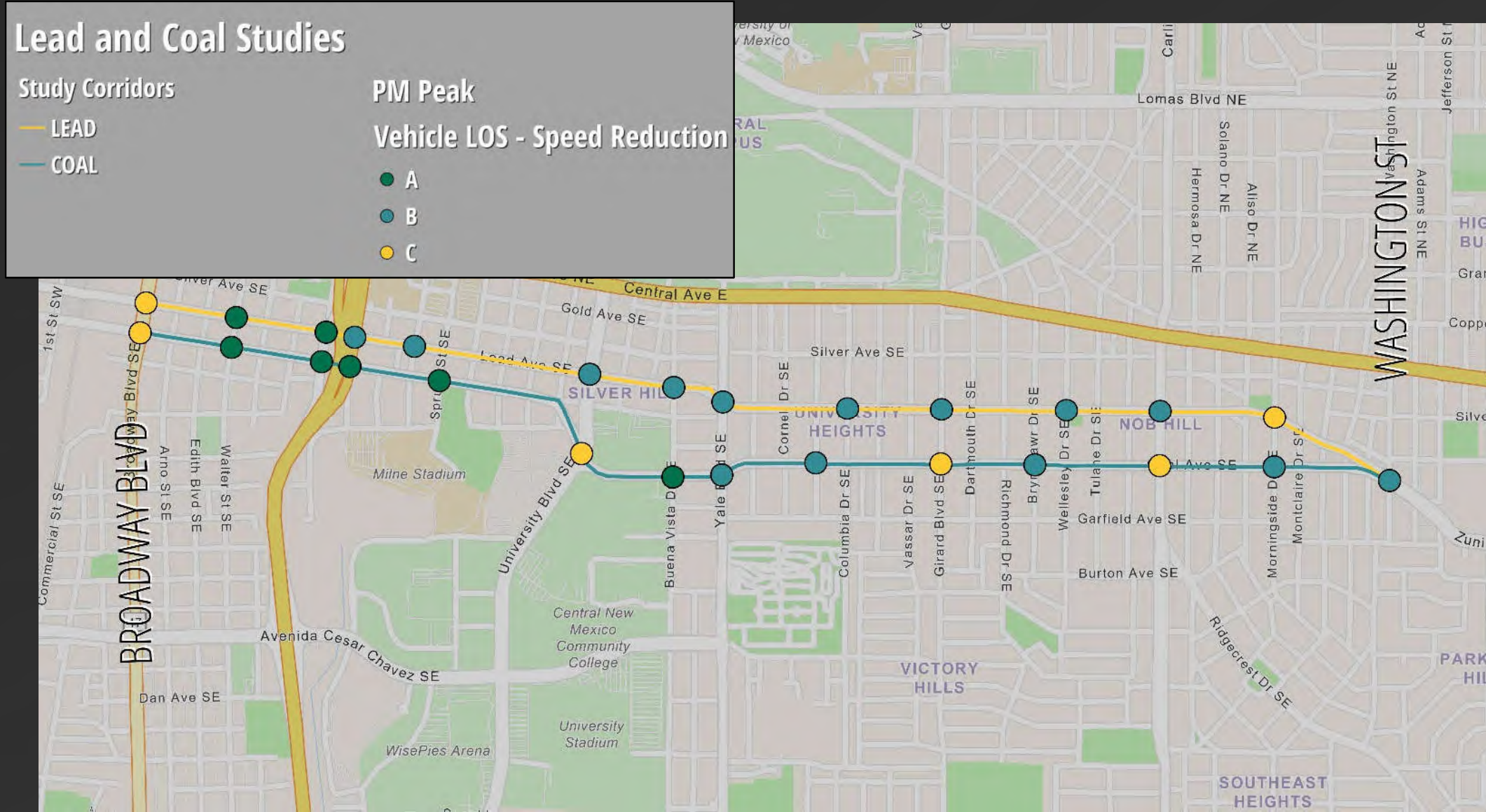


Intersection LOS - Existing PM





Intersection LOS – Speed Reduction PM





Intersection LOS – Single Lane PM

Lead and Coal Studies

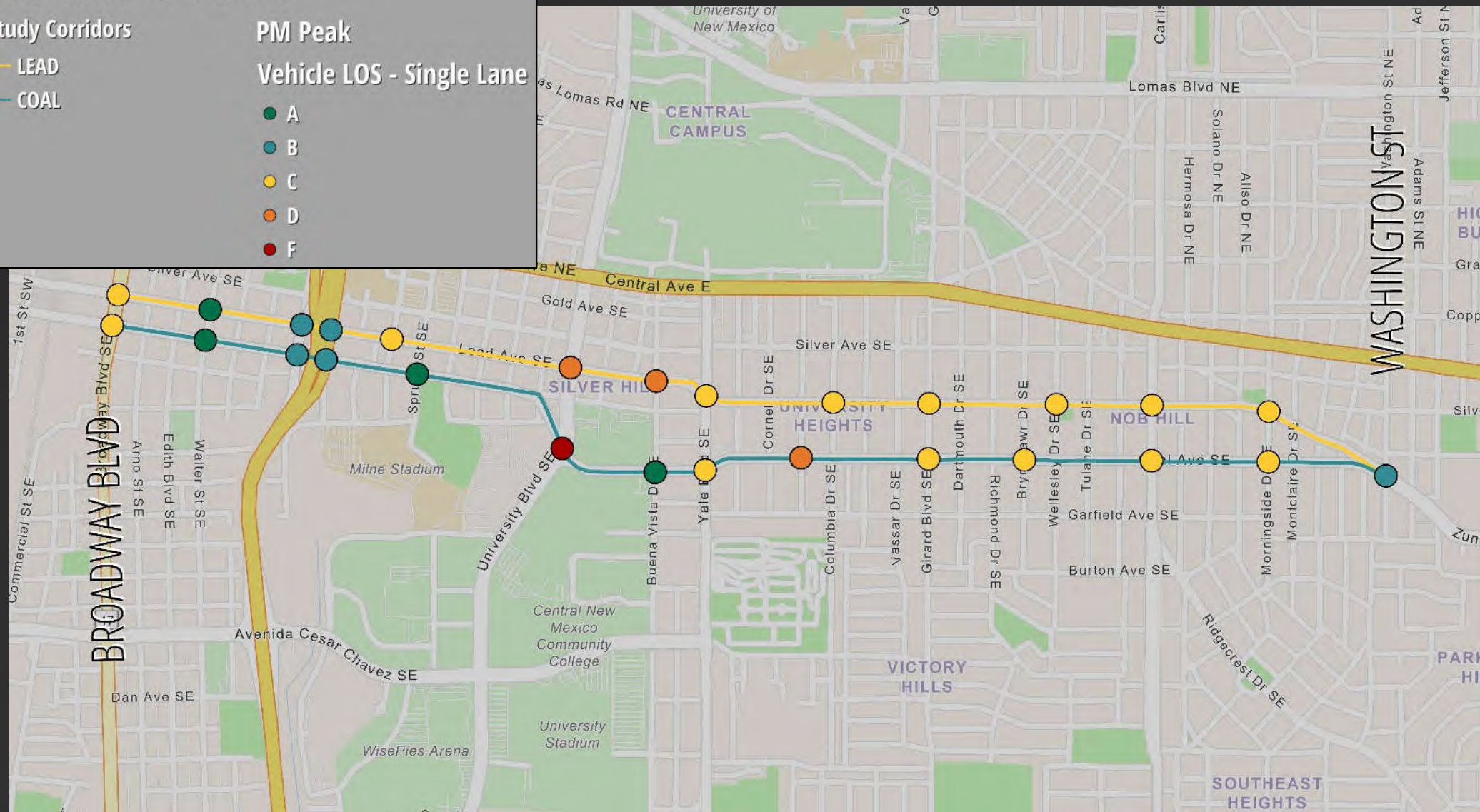
Study Corridors

- LEAD
- COAL

PM Peak

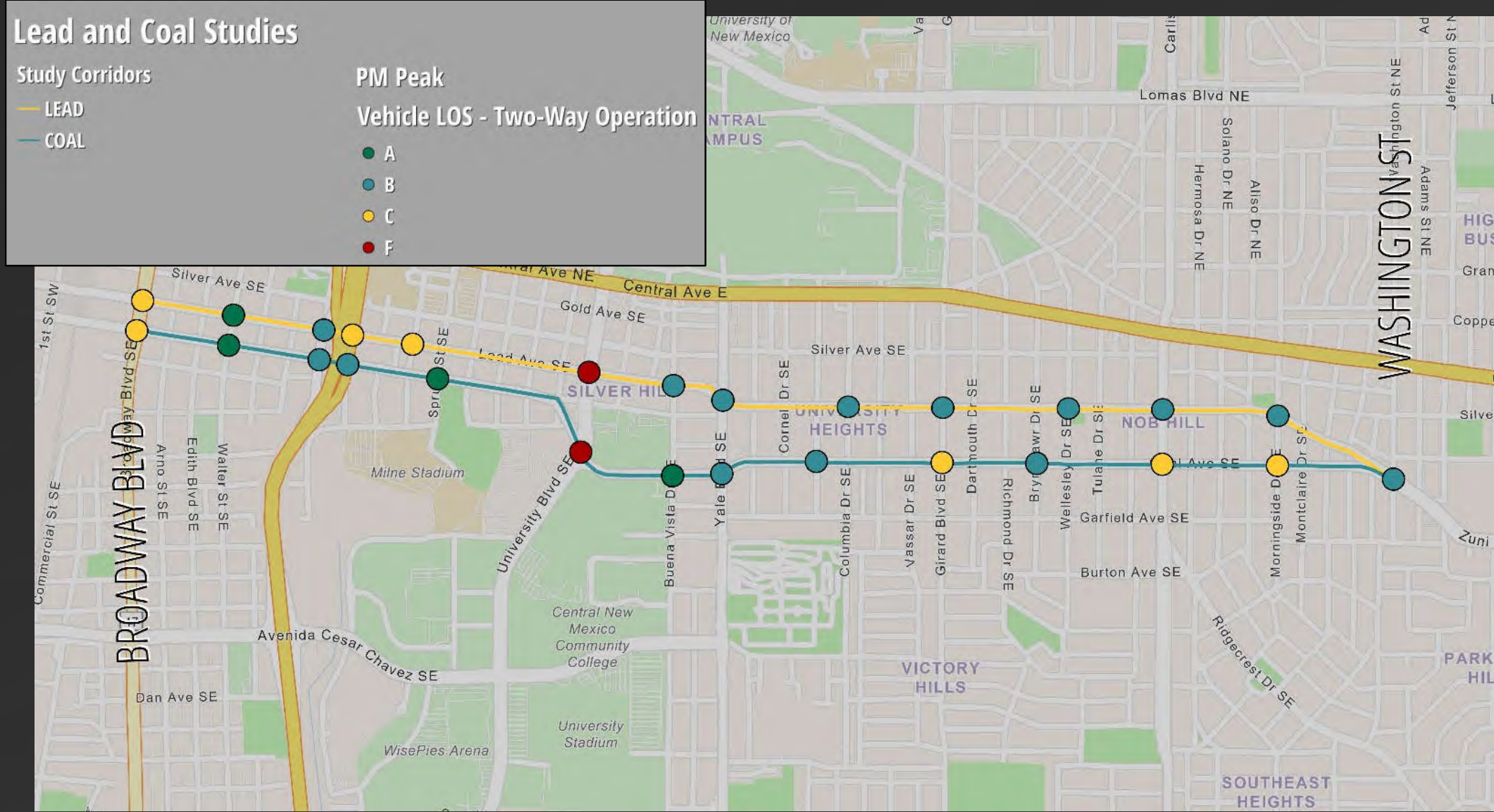
Vehicle LOS - Single Lane

- A
- B
- C
- D
- F





Intersection LOS – Two-Way PM



Travel Time Results - Broadway Blvd to I-25

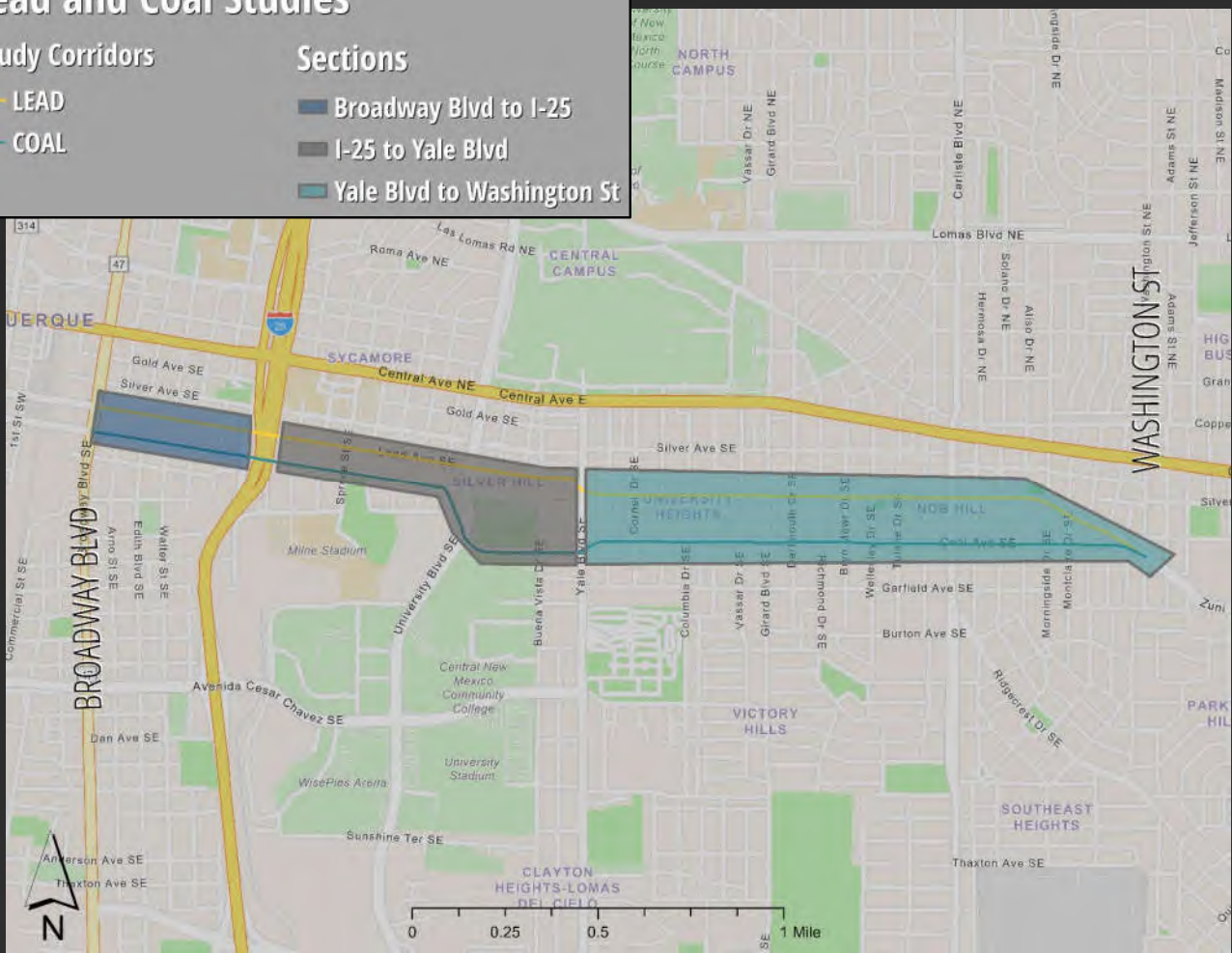
Lead and Coal Studies

Study Corridors

- LEAD
- COAL

Sections

- Broadway Blvd to I-25
- I-25 to Yale Blvd
- Yale Blvd to Washington St



Corridor	Scenario	Direction	AM Travel Time (mm:ss)	PM Travel Time (mm:ss)
Lead Ave	Existing	WB	1:25	1:35
	Speed Reduction	WB	0:10	0:18
	Single Lane	WB	0:35	0:28
		EB	-0:13	0:27
	Two-Way	WB	0:09	0:08
		EB	1:53	2:05
Coal Ave	Existing	EB	1:53	2:05
	Speed Reduction	EB	0:05	0:09
	Single Lane	EB	0:57	0:17
		EB	-0:18	0:19
	Two-Way	WB	0:21	-0:16





Travel Time – Results I-25 to Yale Blvd



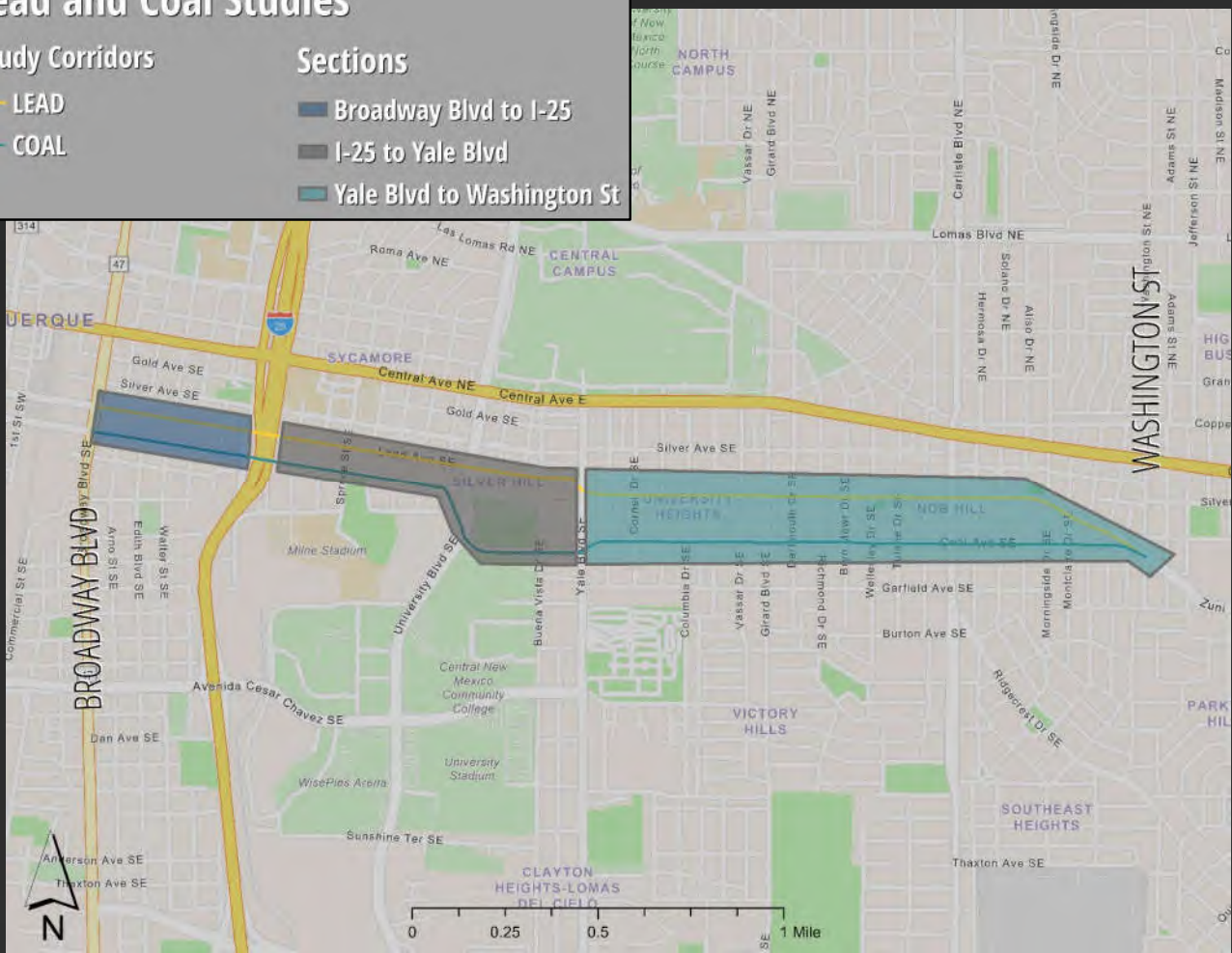
Lead and Coal Studies

Study Corridors

- LEAD
- COAL

Sections

- Broadway Blvd to I-25
- I-25 to Yale Blvd
- Yale Blvd to Washington St



Corridor	Scenario	Direction	AM Travel Time (mm:ss)	PM Travel Time (mm:ss)
Lead Ave	Existing	WB	2:34	2:39
	Speed Reduction	WB	0:26	0:29
	Single Lane	WB	10:00	05:00
		EB	-0:04	0:51
	Two-Way	WB	0:09	0:23
		EB	-0:04	0:51
Coal Ave	Existing	EB	2:48	4:12
	Speed Reduction	EB	0:15	01:00
	Single Lane	EB	02:00	04:00
		EB	-0:17	-01:00
	Two-Way	EB	-0:17	-01:00
		WB	0:13	01:00



Travel Time – Results Yale Blvd to Washington St

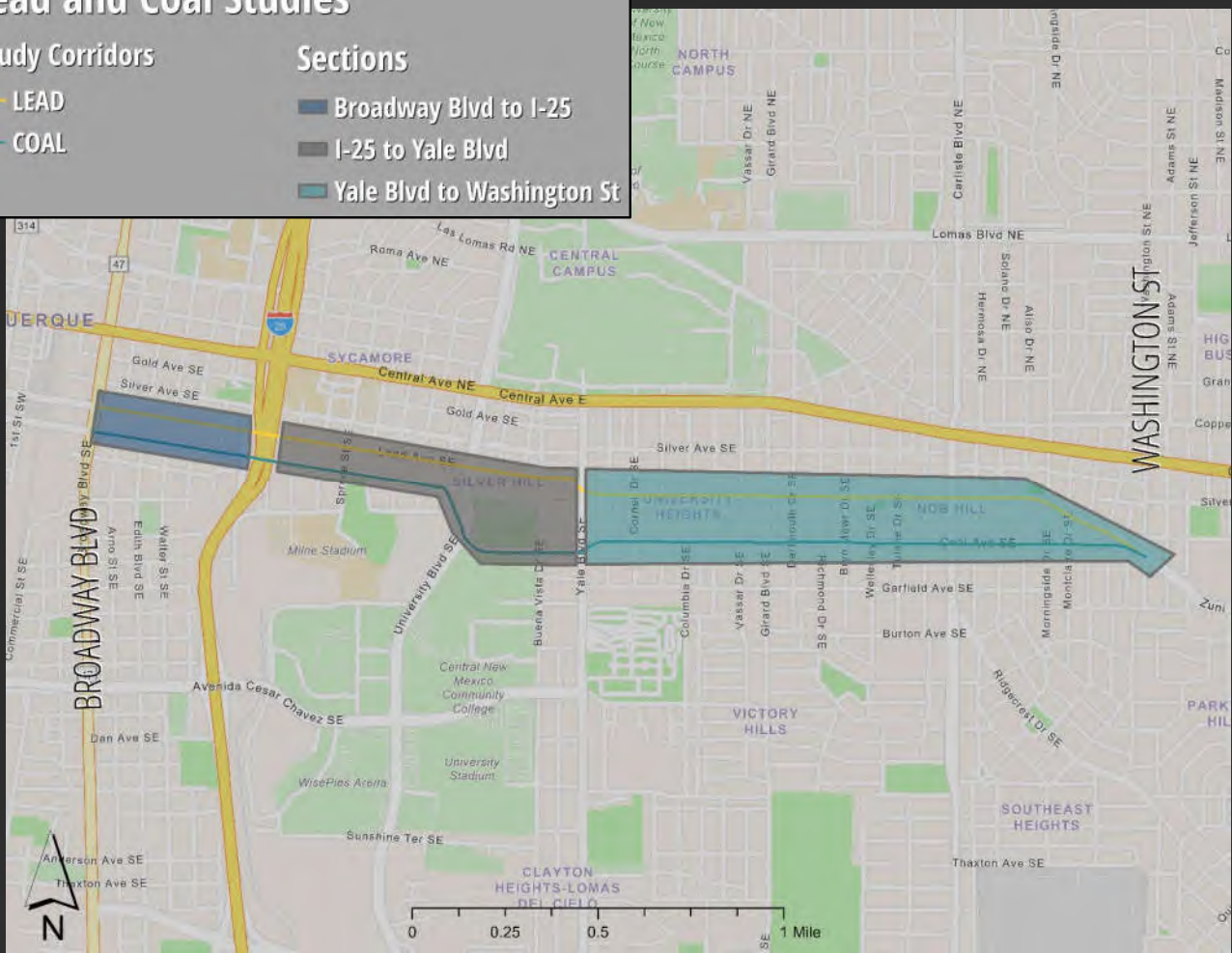
Lead and Coal Studies

Study Corridors

- LEAD
- COAL

Sections

- Broadway Blvd to I-25
- I-25 to Yale Blvd
- Yale Blvd to Washington St



Corridor	Scenario	Direction	AM Travel Time (mm:ss)	PM Travel Time (mm:ss)
Lead Ave	Existing	WB	3:38	4:08
	Speed Reduction	WB	0:15	-0:22
	Single Lane	WB	04:00	0:54
		EB	-0:27	0:38
	Two-Way	WB	-0:01	02:00
		EB	-0:01	02:00
Coal Ave	Existing	EB	3:13	3:37
	Speed Reduction	EB	0:20	0:16
	Single Lane	EB	0:05	0:45
		EB	0:15	0:24
	Two-Way	EB	0:15	0:24
		WB	-0:05	0:36





Queuing - Existing AM

Lead and Coal Studies

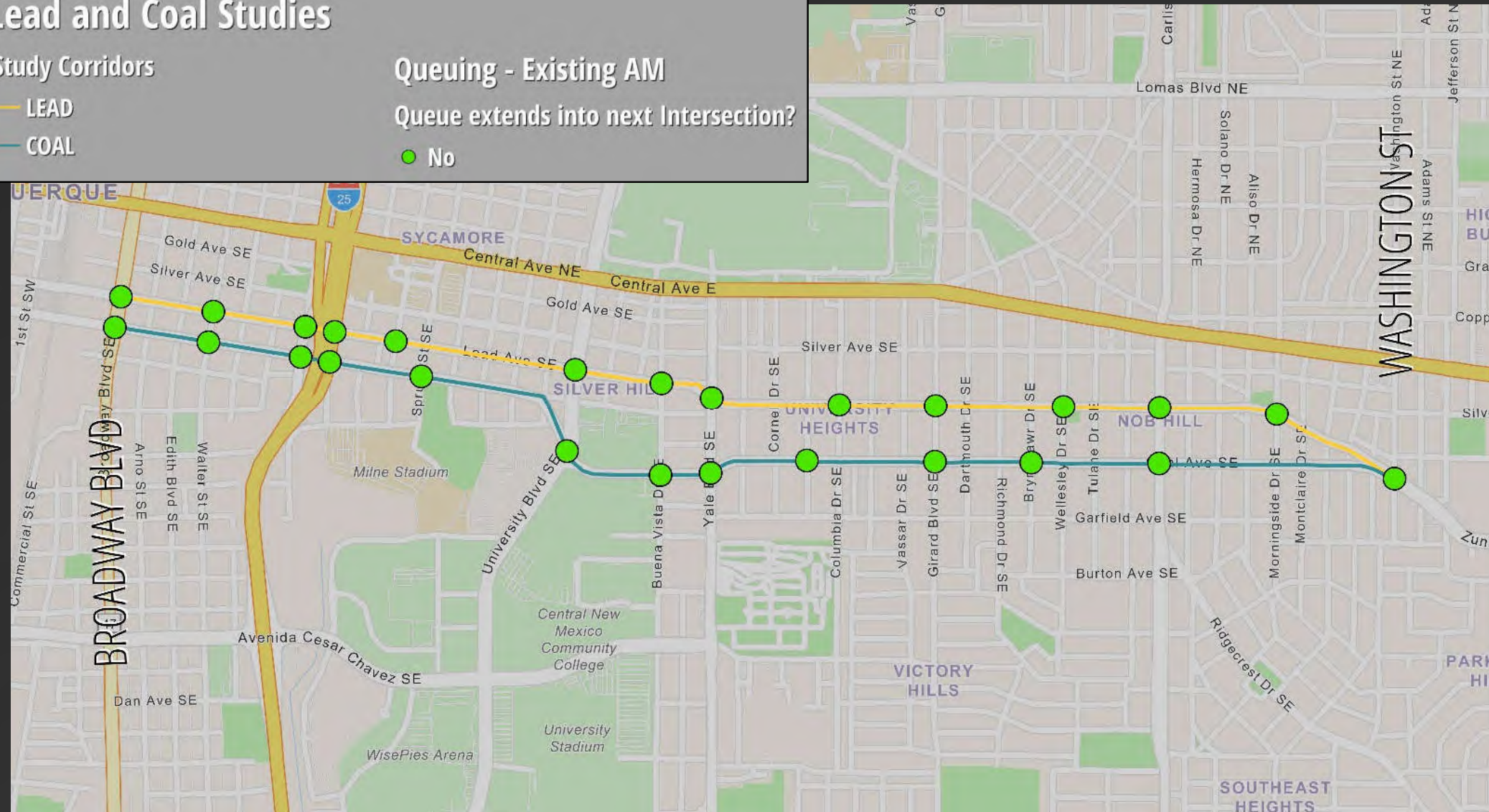
Study Corridors

- LEAD
- COAL

Queuing - Existing AM

Queue extends into next Intersection?

- No





Queuing - Existing PM

Lead and Coal Studies

Study Corridors

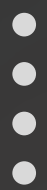
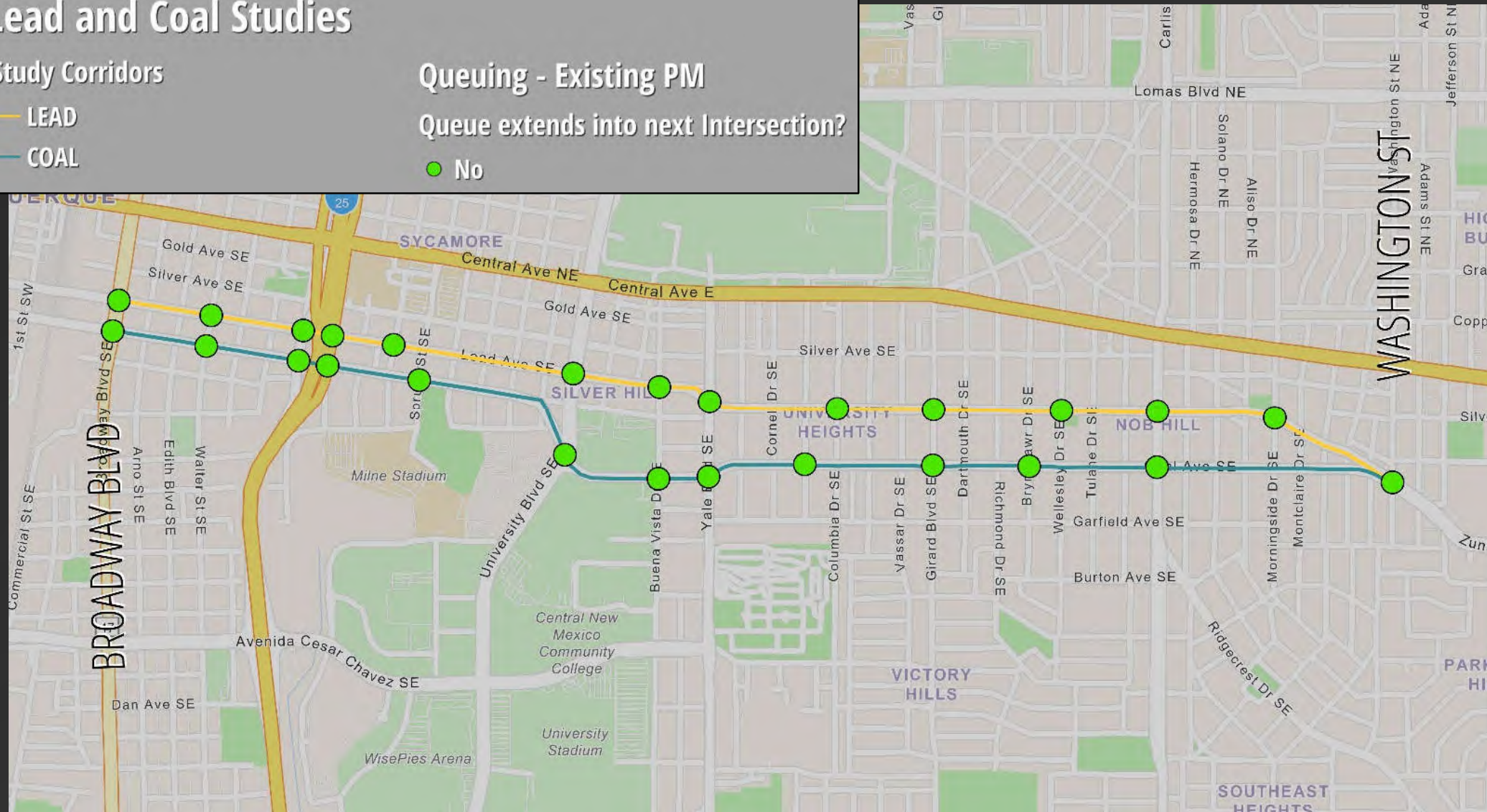
— LEAD

— COAL

Queuing - Existing PM

Queue extends into next Intersection?

● No





Queuing – Speed Reduction AM

Lead and Coal Studies

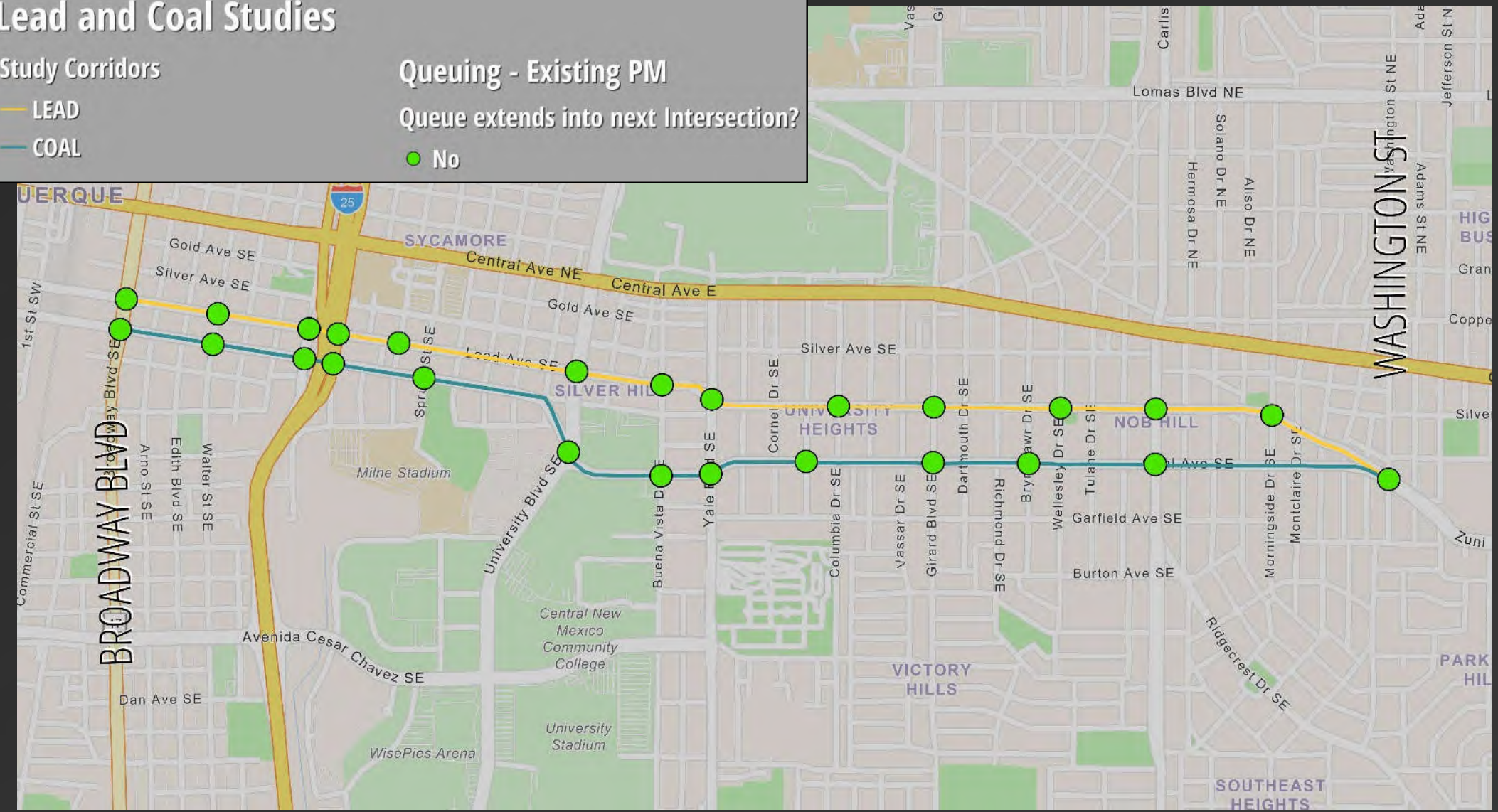
Study Corridors

- LEAD
- COAL

Queuing - Existing PM

Queue extends into next Intersection?

- No





Queuing – Speed Reduction PM

Lead and Coal Studies

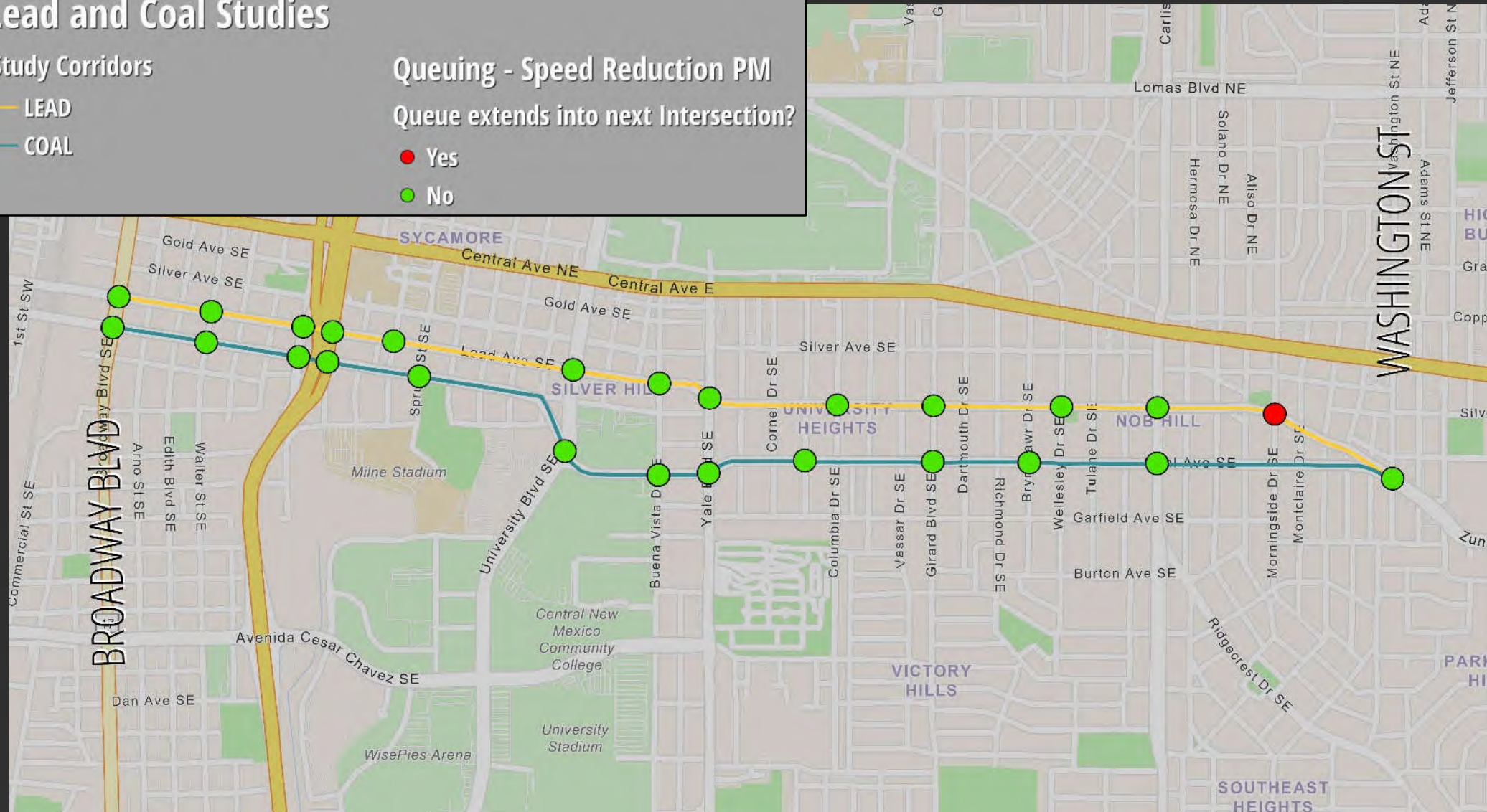
Study Corridors

- LEAD
- COAL

Queuing - Speed Reduction PM

Queue extends into next Intersection?

- Yes
- No





Queuing – Single Lane AM

Lead and Coal Studies

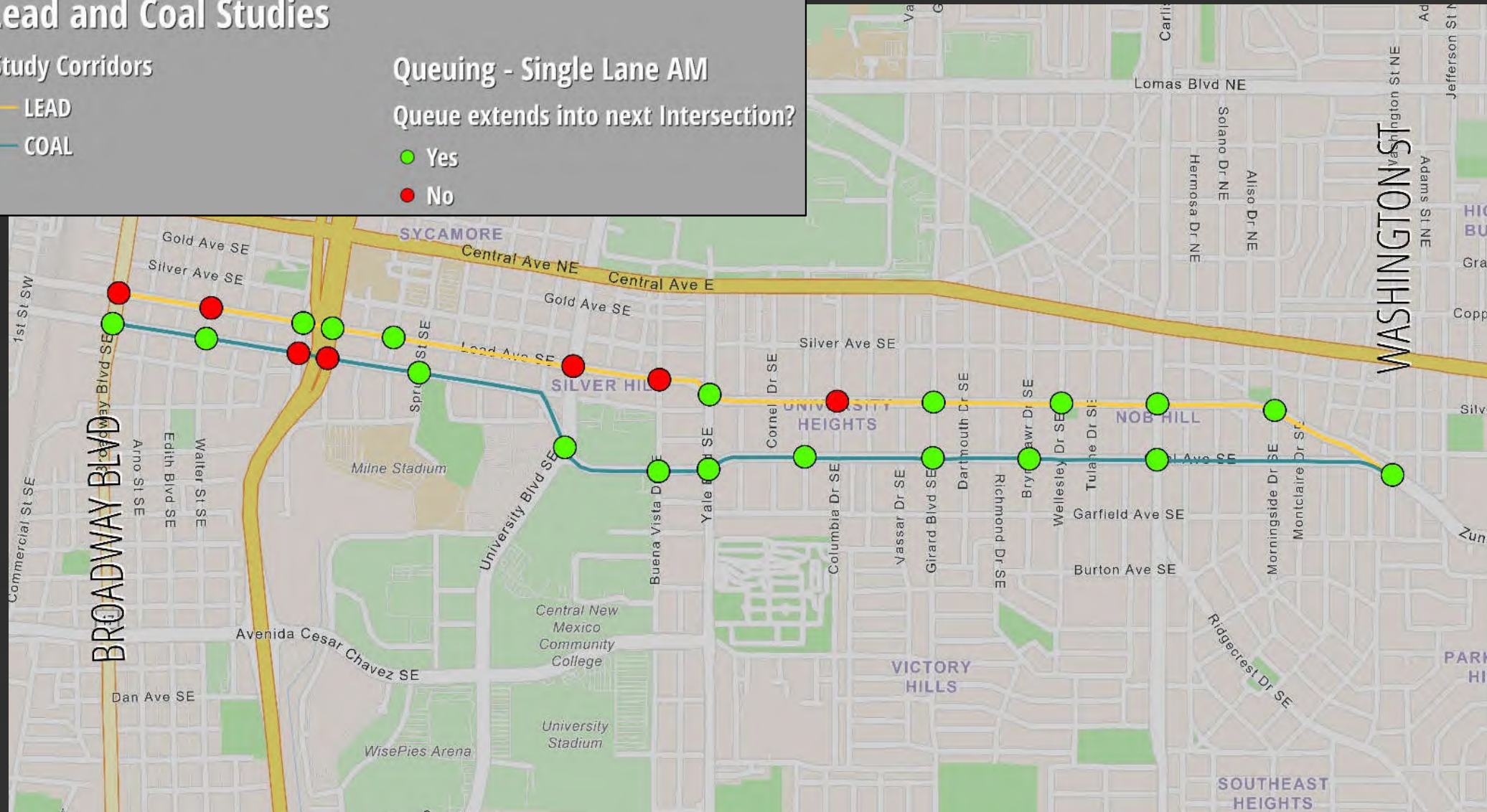
Study Corridors

- LEAD
- COAL

Queuing - Single Lane AM

Queue extends into next Intersection?

- Yes
- No





Queuing – Single Lane PM

Lead and Coal Studies

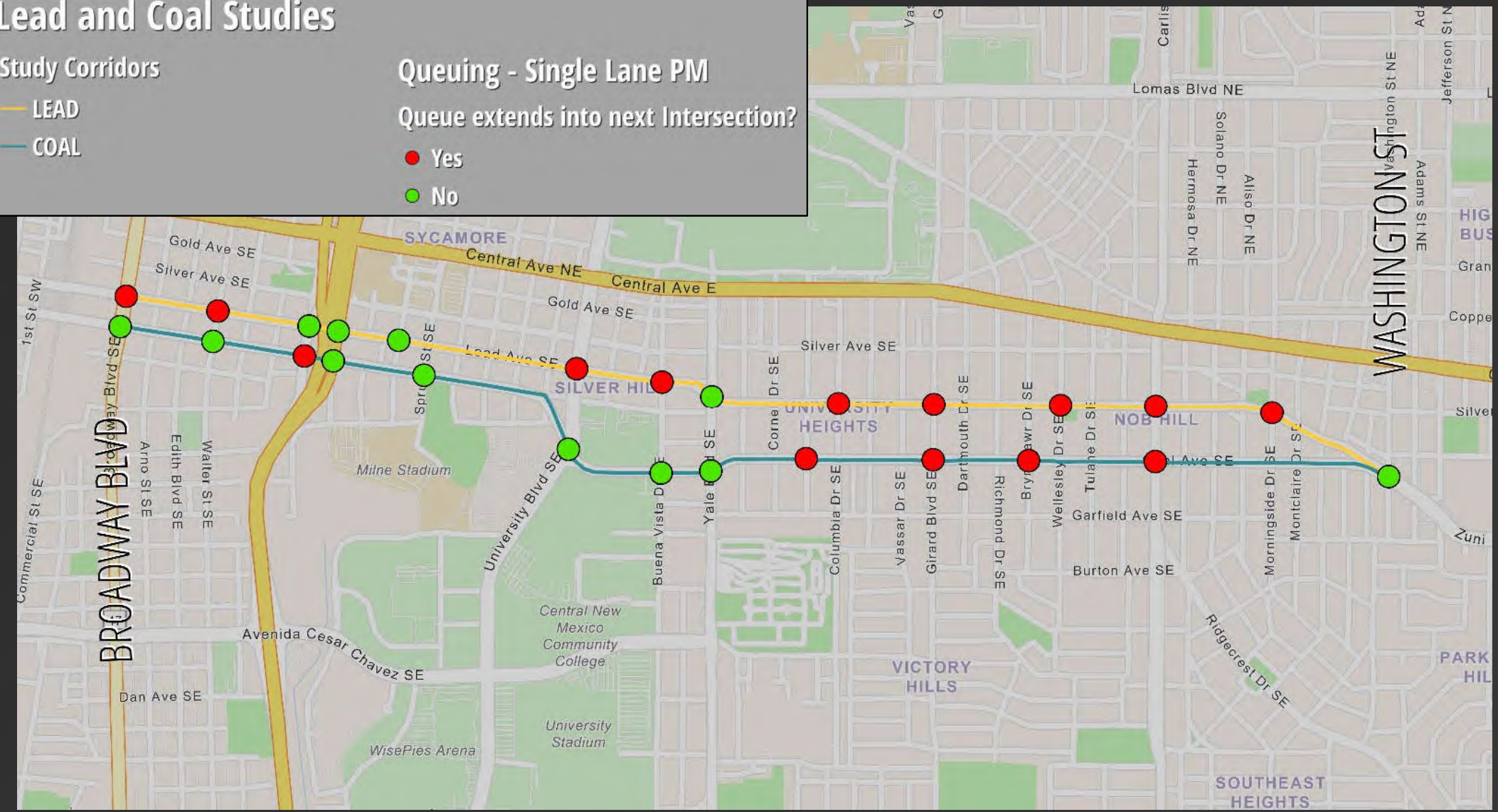
Study Corridors

- LEAD
- COAL

Queuing - Single Lane PM

Queue extends into next Intersection?

- Yes
- No





Queuing – Two-Way AM

Lead and Coal Studies

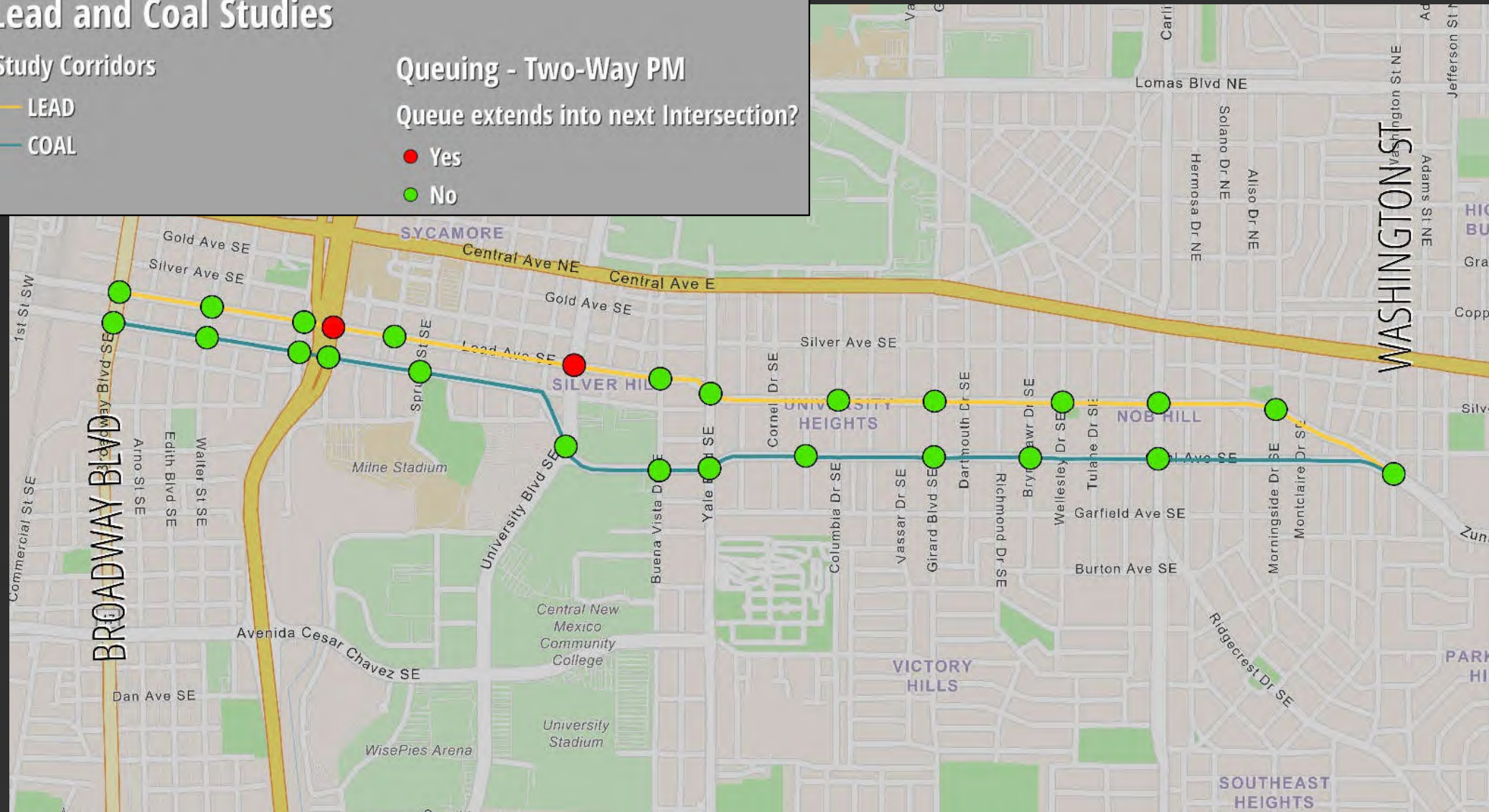
Study Corridors

- LEAD
- COAL

Queuing - Two-Way PM

Queue extends into next Intersection?

- Yes
- No





Queuing – Two-Way PM

Lead and Coal Studies

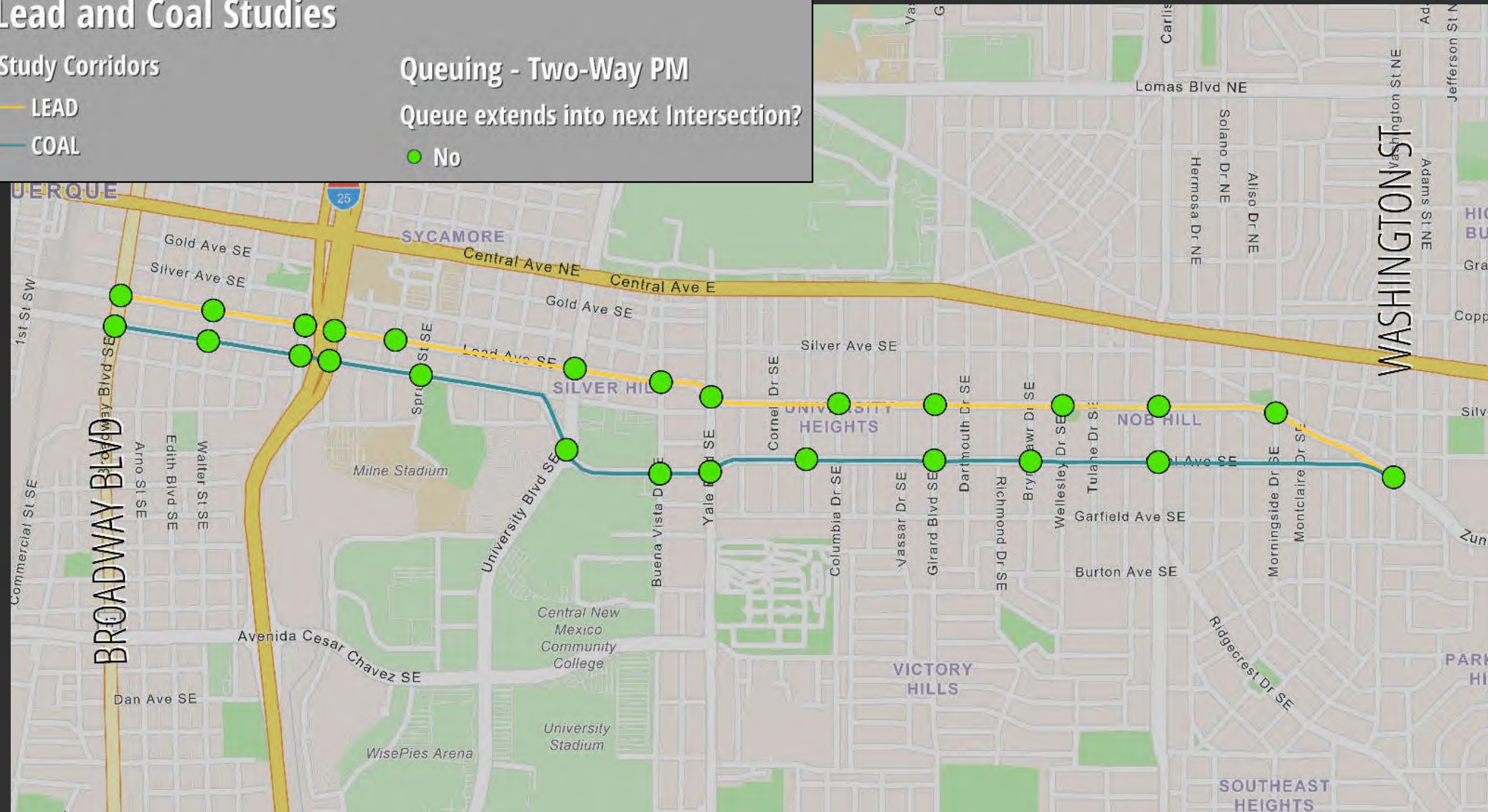
Study Corridors

- LEAD
- COAL

Queuing - Two-Way PM

Queue extends into next Intersection?

- No



Pedestrian and Bicycle Level of Traffic Stress

Pedestrian Level of Traffic Stress



Segment Criteria

- Traffic Volume
- Traffic Speed (85th Percentile)
- Sidewalk Width
- Buffer Width between Motor Vehicles and Pedestrian Space
 - Paved Shoulder Width
 - Bicycle Lane
 - Landscaping Buffer

Speed	Sidewalk Width	Buffer Width			
		> 10ft	5ft to 9ft	1ft to 4ft	None
≤ 20 mph	> 10ft	1	1	2	2
	8ft to 10ft	1	2	2	3
	5ft to 7ft	2	2	3	4
	<5ft	3	3	4	4
21-25mph	> 10ft	1	1	2	2
	8ft to 10ft	1	2	3	3
	5ft to 7ft	2	3	3	4
	<5ft	3	4	4	4
26-30mph	> 10ft	1	1	2	3
	8ft to 10ft	1	2	2	3
	5ft to 7ft	2	3	3	4
	<5ft	3	4	4	4
31-35mph	> 10ft	1	2	3	3
	8ft to 10ft	2	3	3	4
	5ft to 7ft	3	3	4	4
	<5ft	4	4	4	4
> 35mph	> 10ft	2	2	3	3
	8ft to 10ft	2	3	3	4
	5ft to 7ft	3	4	4	4
	<5ft	4	4	4	4

Pedestrian Level of Traffic Stress (PLTS)

- Not Included
- One-Way Traffic
- Land Use
- Lighting
- Sidewalk Condition
- Air Quality
- Personal Safety/Security

Pedestrian Level of Traffic Stress (PLTS)





Pedestrian Segment LTS - Existing

Lead and Coal Studies

Pedestrian LTS

Segments

- 3
- 4



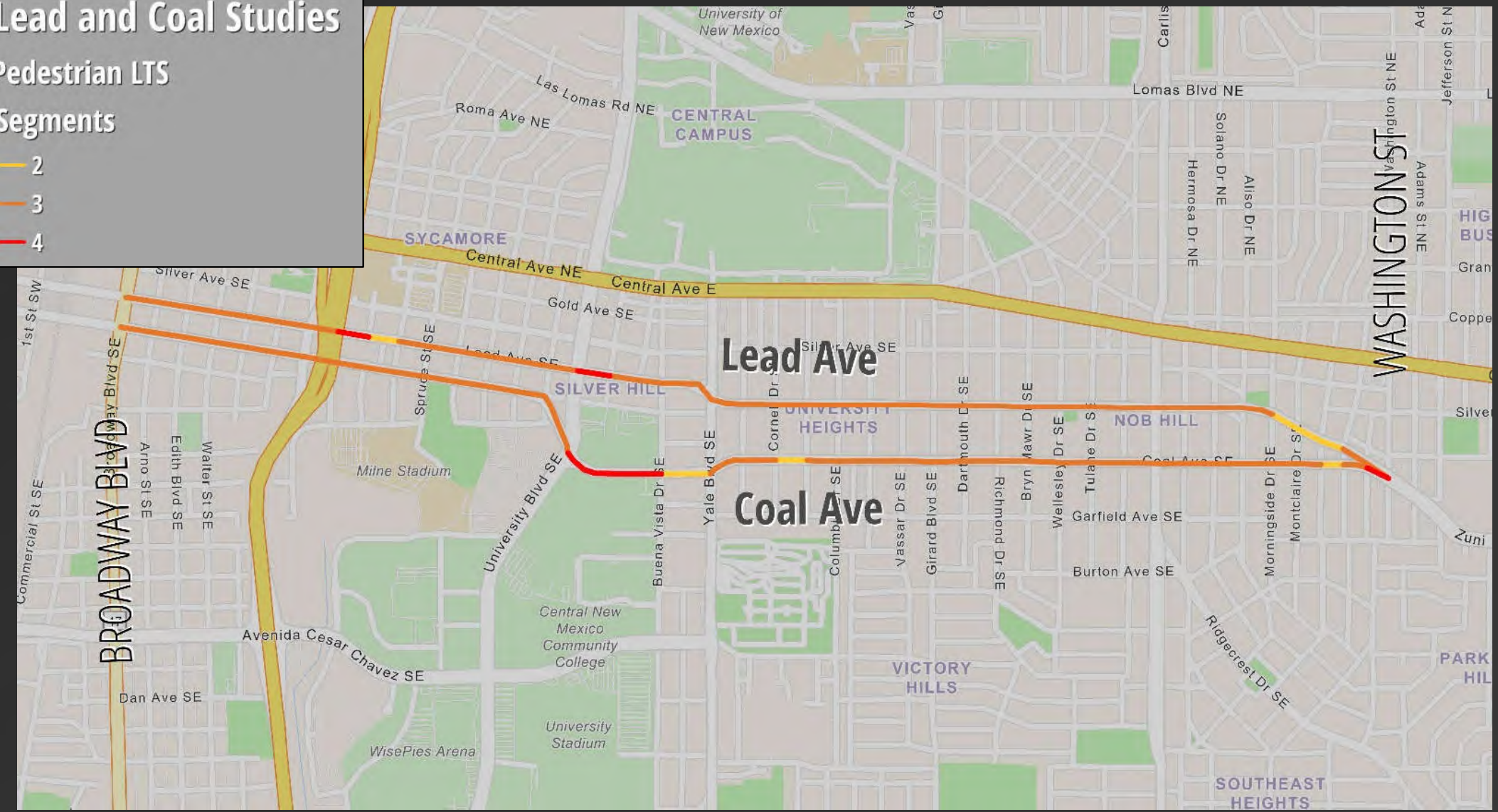
Pedestrian Segment LTS – Single Lane Alternative

Lead and Coal Studies

Pedestrian LTS

Segments

- 2
- 3
- 4



Pedestrian Segment LTS – Two-Way Alternative

Lead and Coal Studies
Pedestrian LTS
Segments

- 2
- 3
- 4



Bicycle Level of Traffic Stress



Segment Criteria

- Number of Lanes
- Bicycle Lane Width
- Traffic Speed (85th Percentile)
- Bicycle Lane Blockage

Table 2. Criteria for Bike Lanes Alongside a Parking Lane

	LTS ≥ 1	LTS ≥ 2	LTS ≥ 3	LTS ≥ 4
Street width (through lanes per direction)	1	(no effect)	2 or more	(no effect)
Sum of bike lane and parking lane width (includes marked buffer and paved gutter)	15 ft. or more	14 or 14.5 ft. ^a	13.5 ft. or less	(no effect)
Speed limit or prevailing speed	25 mph or less	30 mph	35 mph	40 mph or more
Bike lane blockage (typically applies in commercial areas)	rare	(no effect)	frequent	(no effect)

Note: (no effect) = factor does not trigger an increase to this level of traffic stress.

^a If speed limit < 25 mph or Class = residential, then any width is acceptable for LTS 2.

Table 3. Criteria for Bike Lanes Not Alongside a Parking Lane

	LTS ≥ 1	LTS ≥ 2	LTS ≥ 3	LTS ≥ 4
Street width (through lanes per direction)	1	2, if directions are separated by a raised median	more than 2, or 2 without a separating median	(no effect)
Bike lane width (includes marked buffer and paved gutter)	6 ft. or more	5.5 ft. or less	(no effect)	(no effect)
Speed limit or prevailing speed	30 mph or less	(no effect)	35 mph	40 mph or more
Bike lane blockage (may apply in commercial areas)	rare	(no effect)	frequent	(no effect)

Note: (no effect) = factor does not trigger an increase to this level of traffic stress.

Bicycle Level of Traffic Stress (BLTS)



Bicycle Segment LTS - Existing

Lead and Coal Studies
 Bicycle LTS
 Segments
 3



Bicycle Segment LTS – Speed Reduction (25 MPH)

Lead and Coal Studies
Bicycle LTS
Segments
— 2





Bicycle Segment LTS – Single Lane

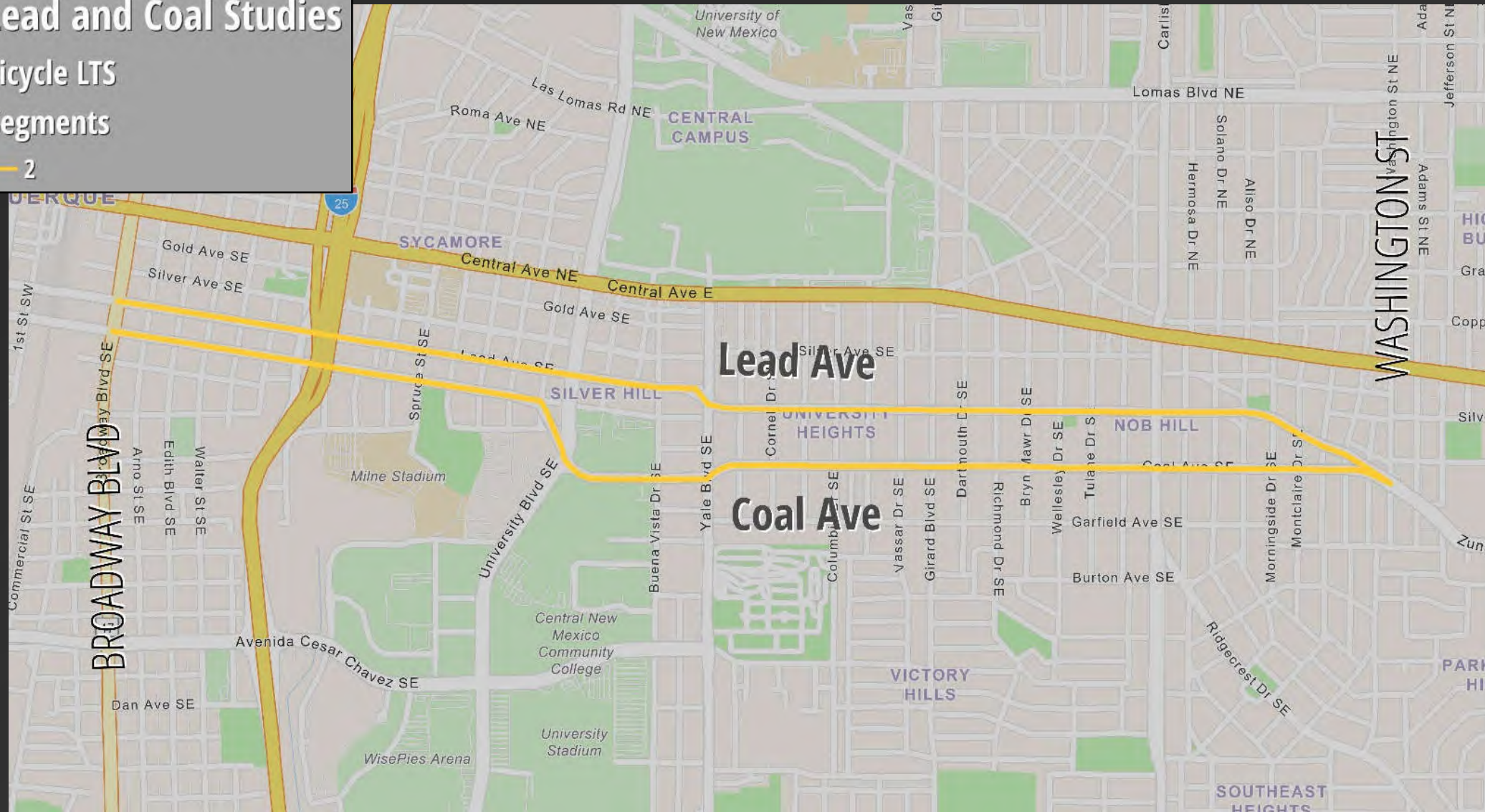
Lead and Coal Studies
Bicycle LTS
Segments
1





Bicycle Segment LTS – Two-Way

Lead and Coal Studies
 Bicycle LTS
 Segments
 — 2





Cost

Speed Reduction

Broadway Blvd to I-25	\$30,000
I-25 to Yale Blvd	\$40,000
<u>Yale Blvd to Washington St</u>	<u>\$40,000</u>
Total	\$110,000

Single Lane Operation

Broadway Blvd to I-25	\$175,000
I-25 to Yale Blvd	\$340,000
<u>Yale Blvd to Washington St</u>	<u>\$510,000</u>
Total	\$1,025,000

Two-Way Operation

Broadway Blvd to I-25	\$685,000
I-25 to Yale Blvd	\$1,020,000
<u>Yale Blvd to Washington St</u>	<u>\$1,100,000</u>
Total	\$2,805,000

Enhanced Safety Option

Broadway Blvd to I-25	\$195,000
I-25 to Yale Blvd	\$370,000
<u>Yale Blvd to Washington St</u>	<u>\$560,000</u>
Total	\$1,125,000



Summary of Alternatives

Existing Conditions





Existing Conditions

- Continued Speed Compliance Issues
- Continued Crash Problems
 - Red Light Running
 - Turning from Incorrect Lane
- Noise Issues are Present
 - Limited Mitigation Options





Speed Reduction Alternative

- Speed Impact
 - Reduction Corridor Wide to 25 MPH
 - Compliance marginal without Complimentary Features
- Enforcement Required
 - Automated
 - Active

Single Lane Alternative





Single Lane Alternative

- Increased Speed Compliance through “pace” Cars
 - Need for Emergency Bypass Areas
 - Potential for Violators
- Highest Travel Time, LOS, and Queuing
- Crash Impacts
 - Reduced Conflict Points
 - Potential Increase in Red Light Running
 - Eliminates Turning from Incorrect Lane

Two-Way Alternative





Two-way Alternative

- Increased Speed Compliance through “pace” Cars and Conflict Points
- Increased Travel Time and Queuing; Decreased LOS
 - Limited Left-turn Lane Opportunities
- Crash Impacts
 - Increased Conflict Points
 - Eliminates Turning from Incorrect Lane
- Geometric Challenges
 - Washington Intersection
 - Freeway Interchanges
 - NMDOT Coordination
- Highest Cost

Potential Enhanced Safety Package

Enhanced Safety Options

- Speed Mitigations
 - Reduced Speed Limit in Primary Residential Areas
 - West of I-25 - 2nd to Elm
 - East of Buena Vista to Washington
 - Narrow Driving Lanes to 10'
 - Intersection Gateway Treatments
 - Delineators @ Signalized Intersections and Stop Controlled Intersections
 - 8" Lane Stripes
- Left-turns from Right-lane (Vice Versa)
 - Install Thru-Left and Thru-Right Combo Arrows
 - Wrong-way Indicators
 - Solid White / Double Solid White Center Stripe on Intersection Approaches

Enhanced Safety Options(cont)

- Red Light Running
 - Reflective Signal Head Backplates
 - Advanced Vehicle Detection and 'Red Protect' Operations
- Additional Safety Features
 - Bicycle Lane Buffer (1-2ft)
 - Protected Bicycle Lanes
 - Green Bicycle Conflict Area Paint
 - Daylighting on side streets to define intersections
 - Reduce turning speeds



Additional Safety Countermeasures

- Reducing Lane Widths by adding Buffers to the Bicycle Lanes
- Changing the Environment with Vertical Objects
- Increasing the Width of Edge Striping to 6 or 8 inches



Separated Bike Lanes

Image retrieved from
https://westerntransportationinstitute.org/wp-content/uploads/2017/01/fhwahep17024_lg.pdf



Protected Bike Lanes

Image retrieved from
<https://www.longbeach.gov/goactive/b/mobility-toolkit/bicycle-treatments/protected-bike-lanes/>



Wider Edge Lines

Image retrieved from
<https://tti.tamu.edu/tti-publication/an-evaluation-of-the-effectiveness-of-wider-edge-line-pavement-markings/>

Enhanced Safety Options – Enhanced Safety Options



Next Steps

- Draft Report – January 2025
- Final Report – February 2025

Questions?



Survey QR Code

Paul Barricklow



pbarricklow@lee-eng.com

Stephen Montañó



smontano@lee-eng.com

Estela Gabaldon



egabaldon@lee-eng.com

Enhanced Safety Options – Single Lane



Enhanced Safety Options – Single Lane (Protected Bicycle Lane)



Enhanced Safety Options – Two-Way

