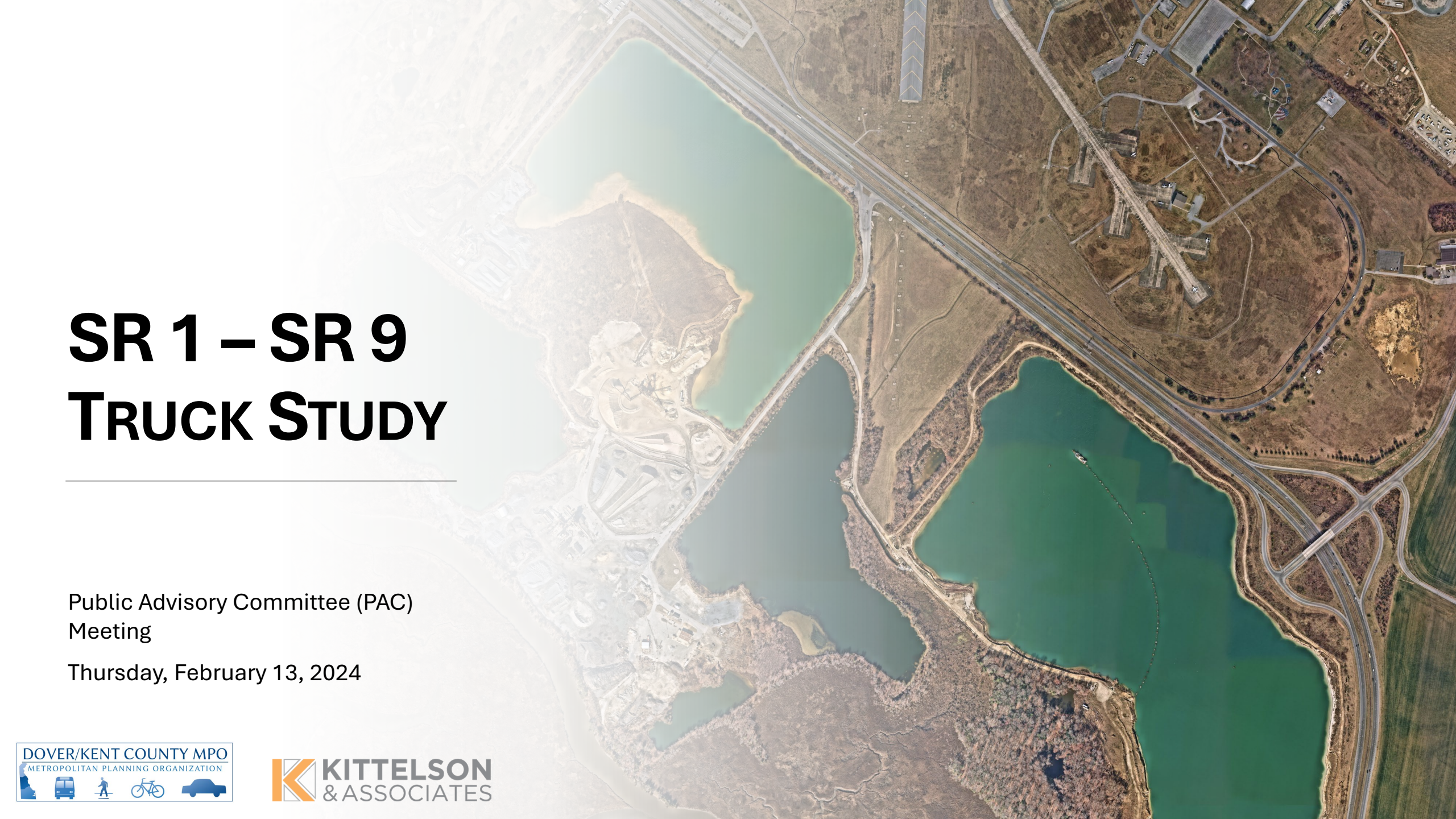
SR 1 – SR 9 Truck Study



Public Advisory Committee (PAC) Meeting

Thursday, February 13, 2024

DOVER/KENT COUNTY MPO
METROPOLITAN PLANNING ORGANIZATION

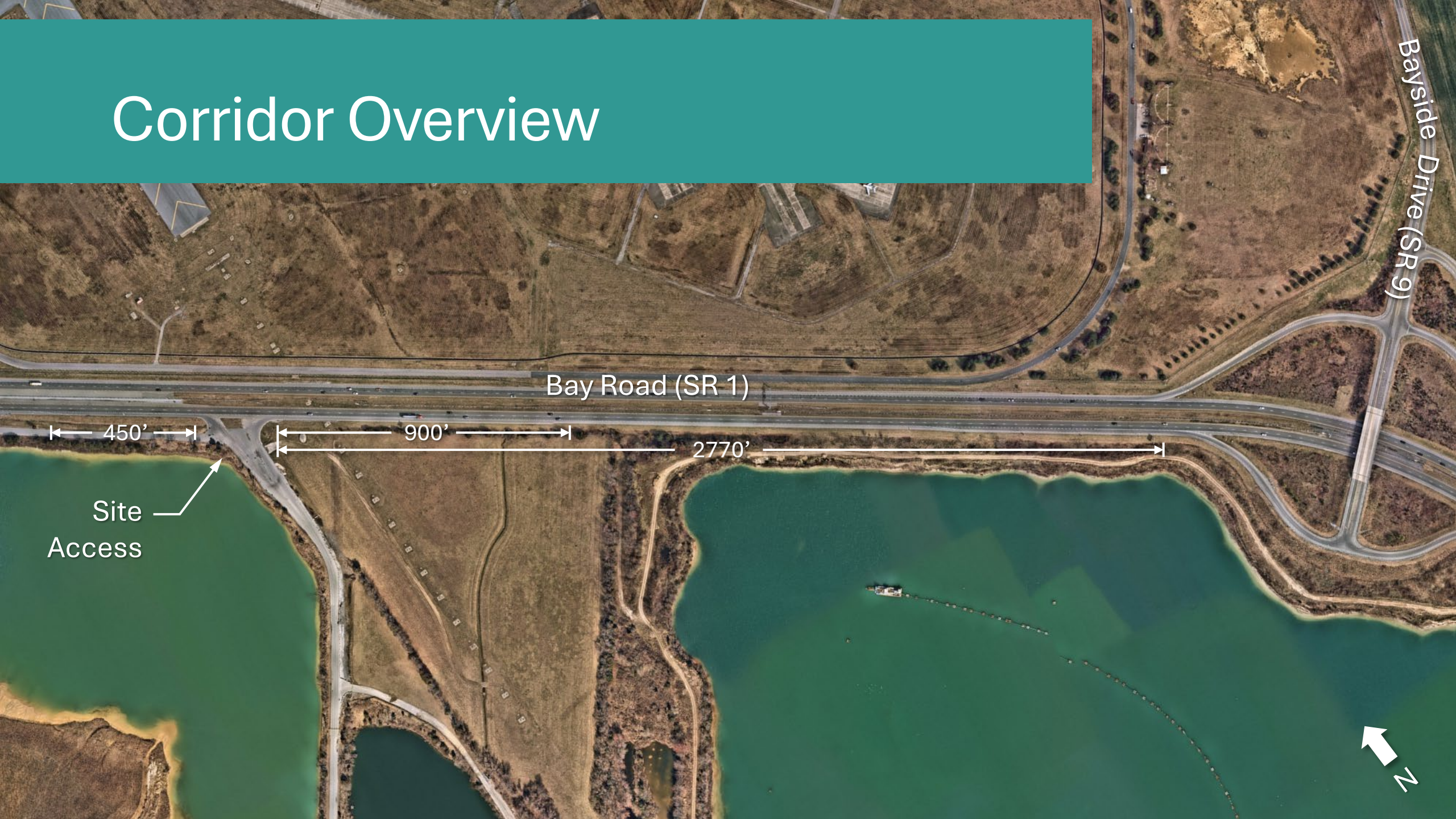
KITTELSON & ASSOCIATES


Site
Access
Bay Road (SR 1)
Dover Air
Force Base
Bayside Drive
(SR 9)
N

Existing Conditions

- Location and Site Operations
  - Along Bay Road (SR 1), south of Old Lebanon Road and north of Bayside Drive (SR 9)
  - 6 AM – 4 PM, Monday through Friday (typical, gravel operation)
- Site Access
  - Right-In / Right-Out configuration
  - Length of auxiliary lane: ~ 900 feet
- Challenges with truck acceleration and merging
  - SR 1 Posted Speed: 60 MPH
  - Seasonal variations
- Site Visit Observations from Tuesday, August 27, 2024

Corridor Overview



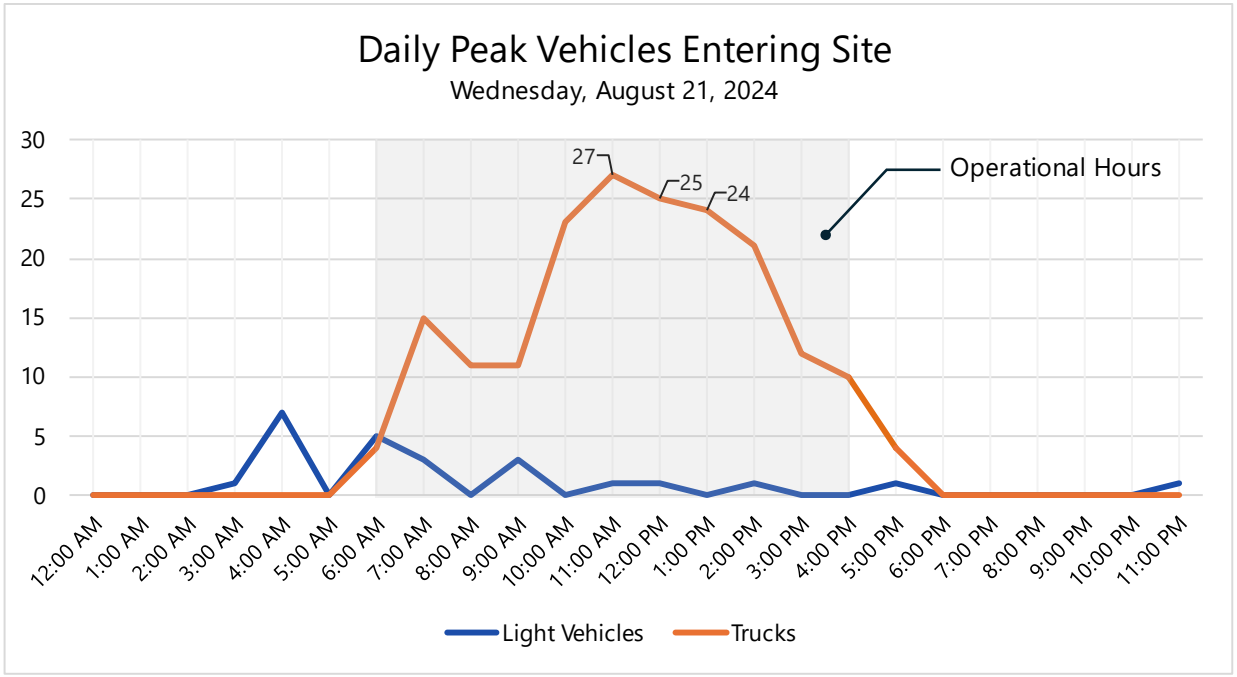
Data Collection

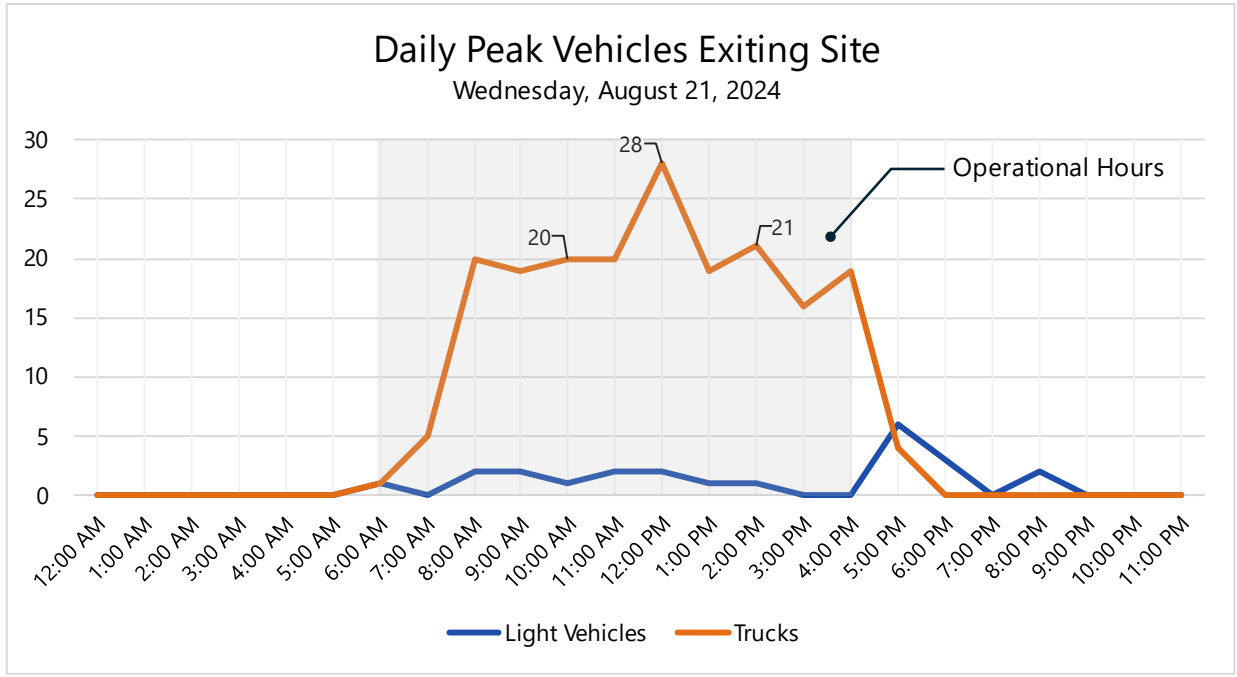
- Site volumes were collected over a three-day period
  - From Tuesday, August 20, 2024
  - To Thursday, August 22, 2024
  - Automatic Traffic Recorders (ATRs) and video recording

- Data Collected
  - Site Volumes
  - Turning Movements
  - Trucks Speeds

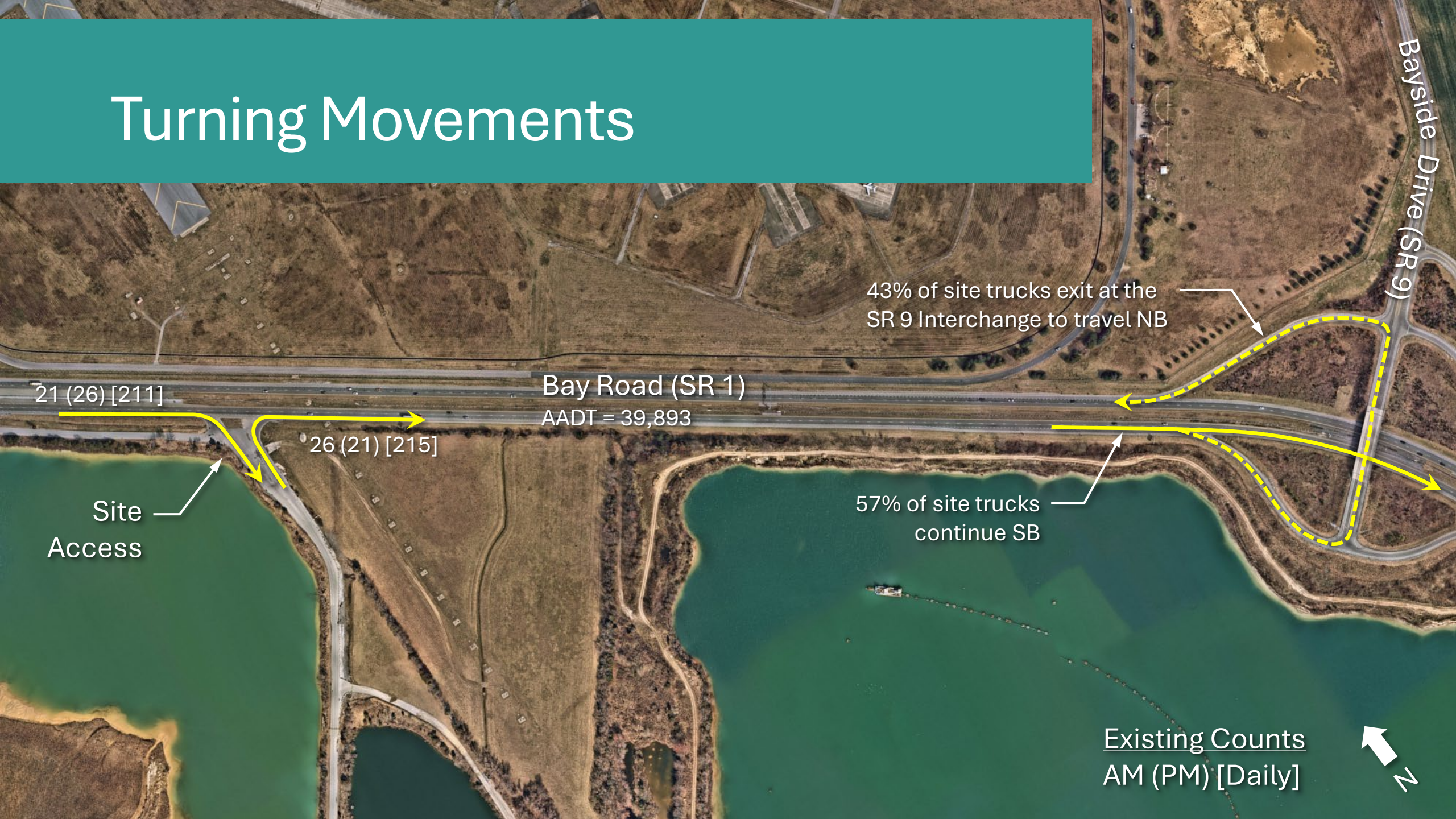
- Crash Data Summary

Site Volumes





Turning Movements



Turning Movements

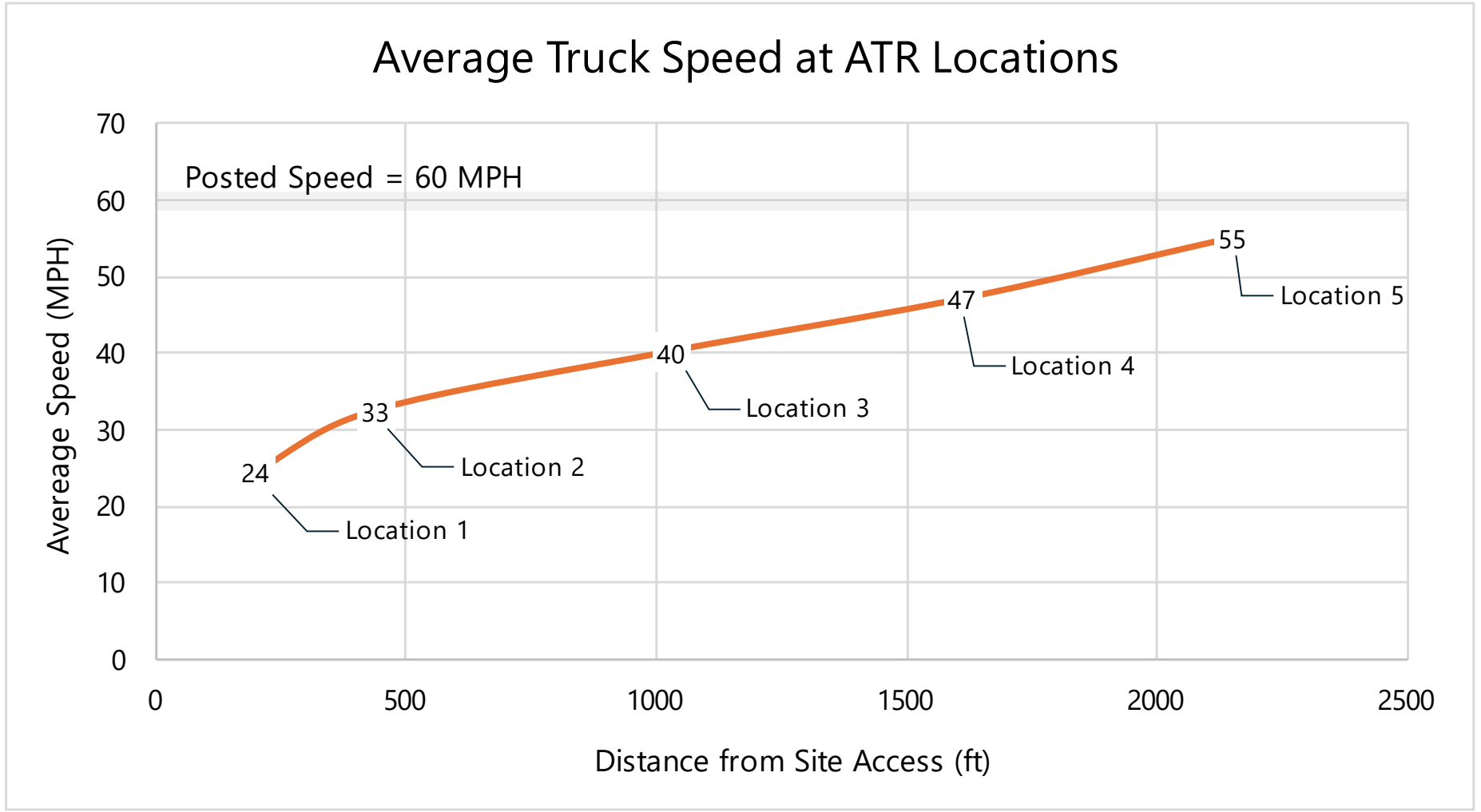
- Truck data was collected Wednesday, August 21, 2024
  - From 8:00 AM to 11:00 AM
  - From 12:00 PM to 3:00 PM
  - Automatic Traffic Recorders (ATRs) and video recording

- Data gathered included 139 Trucks exiting the gravel/asphalt site
  - 60 trucks (43%) exited at the SR 9 interchange
  - 79 trucks (57%) continued southbound on SR 1

- Additional traffic making a “U-turn” maneuver from SB to NB
  - 147 additional vehicles, including 73 trucks, used the interchange to turn around
  - In total, 133 trucks used the interchange to turn from SB to NB on SR 1

Truck Speeds

Truck Speeds



Crash Data Summary

- Review of crashes in the study corridor over a five-year period
  - From January 1, 2019
  - To December 31, 2023
- Crashes sorted by southbound traffic and hours of operation
- Low reported crashes but potential merging risks
- Vehicle classification is not included in the crash data (e.g., light, heavy, etc.)

Date	Classification	Impact	Driver Action	Injury	Fatality
2019-04-22	Property Damage Only	Sideswipe/Same Direction	Unknown	0	0
2019-07-03	Property Damage Only	Not a collision between two vehicles	Other	0	0
2020-07-24	Property Damage Only	Not a collision between two vehicles	Other	0	0
2022-01-03	Property Damage Only	Not a collision between two vehicles	Driving in a careless or reckless manner	1	0
2022-05-23	Property Damage Only	Not a collision between two vehicles	Unknown	0	0
2022-11-10	Property Damage Only	Not a collision between two vehicles	Animal in roadway	0	0
2023-03-28	Property Damage Only	Not a collision between two vehicles	Mechanical defects	0	0
2023-04-20	Property Damage Only	Sideswipe/Same Direction	Driver inattention, distraction, or fatigue	0	0
2023-09-27	Property Damage Only	Sideswipe/Same Direction	Improper lane change	0	0
2023-10-13	Property Damage Only	Not a collision between two vehicles	Mechanical defects	0	0

Auxiliary Lane Analysis

- AASHTO Guidance
  - Existing Lane Length: ~ 900 feet
  - Recommended Lane Length: 1,410 feet, assuming trucks begin at a stop condition

U.S. Customary

Acceleration Lane Length, L_a (ft) for Design Speed of Controlling Feature on Ramp, V' (mph)

Highway		Stop Condition	15	20	25	30	35	40	45	50
Design Speed, V (mph)	Merge Speed, V_a (mph)	Average Running Speed (i.e., Initial Speed) at Controlling Feature on Ramp, V'_a (mph)								
		0	14	18	22	26	30	36	40	44
30	23	180	140	—	—	—	—	—	—	—
35	27	280	220	160	—	—	—	—	—	—
40	31	360	300	270	210	120	—	—	—	—
45	35	560	490	440	380	280	160	—	—	—
50	39	720	660	610	550	450	350	130	—	—
55	43	960	900	810	780	670	550	320	150	—
60	47	1200	1140	1100	1020	910	800	550	420	180
65	50	1410	1350	1310	1220	1120	1000	770	600	370
70	53	1620	1560	1520	1420	1350	1230	1000	820	580
75	55	1790	1730	1630	1580	1510	1420	1160	1040	780
80	57	2000	1900	1800	1750	1680	1600	1340	1240	980

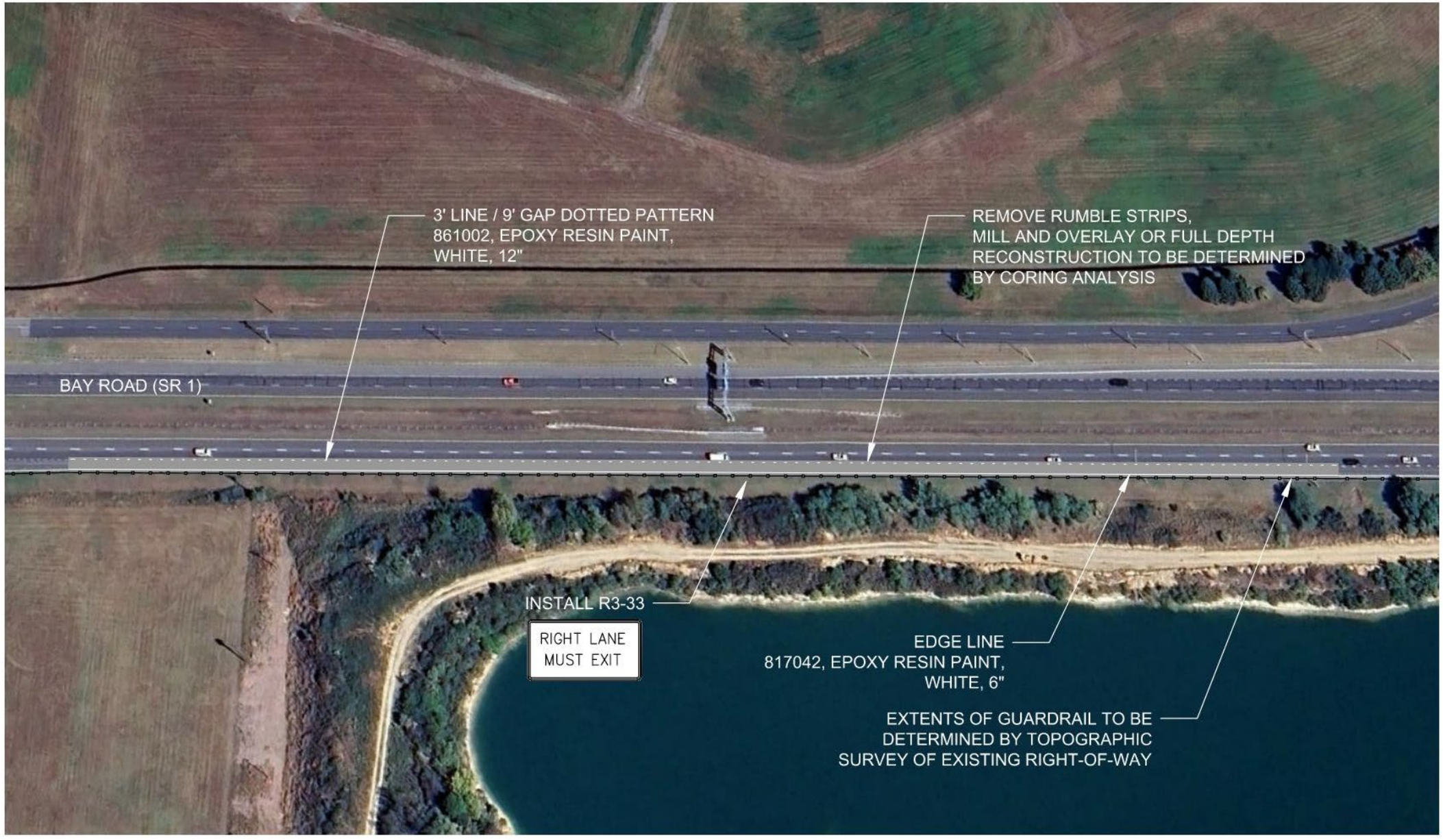
Note: Uniform 50:1 to 70:1 tapers are recommended where lengths of acceleration lanes exceed 1,300 ft.

V = design speed of highway (mph)
V_a = merge speed (mph)
V' = design speed of controlling feature on ramp (mph)
V'_a = average running speed (i.e., initial speed) at controlling feature on ramp (mph)
L_a = acceleration lane length (ft)

Concept Plan for Improvements

- Proposal
  - Convert shoulder to auxiliary lane
  - Improved safety and efficiency for truck movement

- Considerations
  - Additional SR 9 interchange traffic
  - Potential weaving conflicts



Scale: 1" = 120'

120 60 0 120

Striping Exhibit
Concept Plan
Dover, DE

Figure
7

Cost Estimate and Takeaways

- Two cost scenarios
  1. Milling & Overlay ~ $300,000
  2. Full-depth Reconstruction ~ $1,000,000

- Other considerations
  - Signage and Striping
  - Guardrail
  - Shoulder Width

DelDOT & Stakeholder Coordination

- Project Kickoff – Attended by DelDOT Planning Dept
- DelDOT Data sharing
  - Received as-built plans from DelDOT Gateway July 12, 2024
  - Received crash data August 2, 2024
- Met with gravel operators to understand operational details and needs
- Reviewed draft report and plan, and provided comments (Planning and Traffic)

Next Steps

- Technical Advisory Committee (TAC) meeting
  - Tuesday, February 18, 2025
- Incorporate Comments and Feedback
- Council meeting
  - Wednesday, March 12, 2025
- Finalize
- DelDOT Action if Project is Advanced
  - Pavement Core Sampling
  - Detailed design, refining assumptions made for signage, guardrail, pavement depth/width