

A large yellow and red dredging vessel is positioned in the middle of a wide, calm lake. The vessel has a complex structure with tall masts and a crane-like arm. The water is still, reflecting the surrounding green forested hills and the sky. The background is a dense line of trees under a clear blue sky with a few light clouds.

Dredging Program Review

Overview

Impacts

Costs

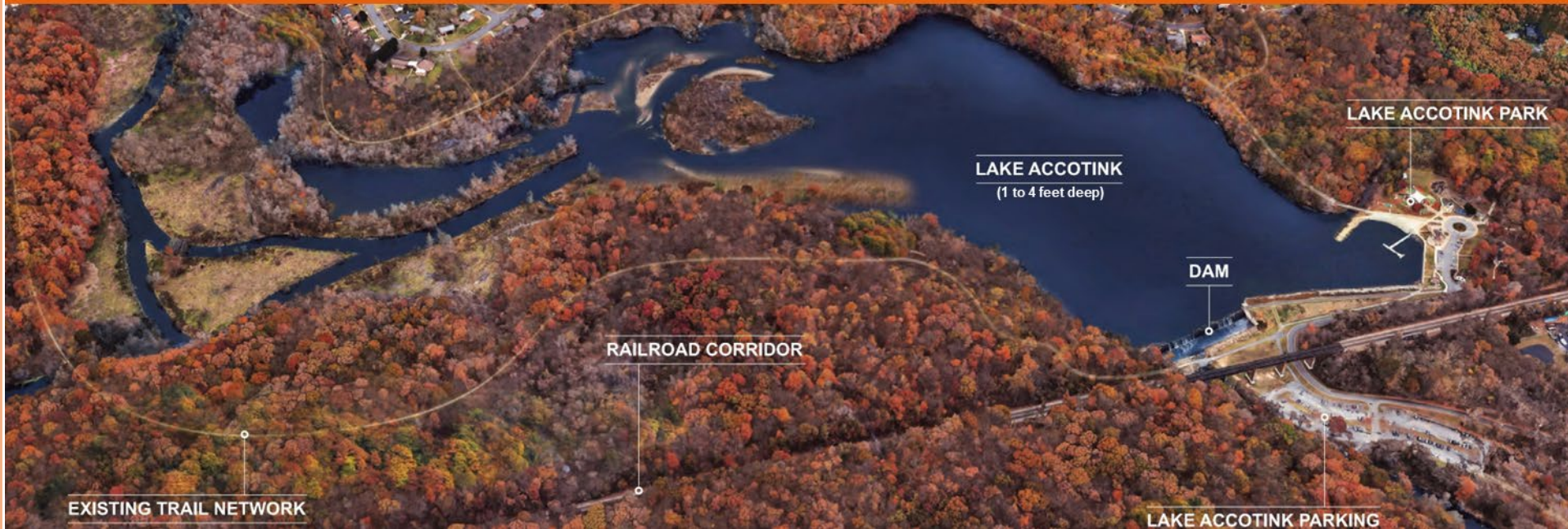
Dredge Program Objectives

- Increase lake depth to 8 feet within existing footprint
- Retain and enhance open water aesthetic and recreational value of the lake
- Establish maintenance dredging plan to preserve the lake as a valuable community asset

Lake Accotink Information	
Watershed Area	19,600 acres
Lake Area	55 acres
Average Sedimentation Rate	19,200 cubic yards per year
Previous Dredging Events	1960s, 1985, 2008

All values are approximate

Pre-Dredge Conditions



Proposed Post-Dredge Conditions



Dredging Program Overview

Step 1: Dewatering Site Preparations*

Step 2: Dredging

Step 3: Sediment Dewatering

Step 4: Off-Site Transportation and Disposal



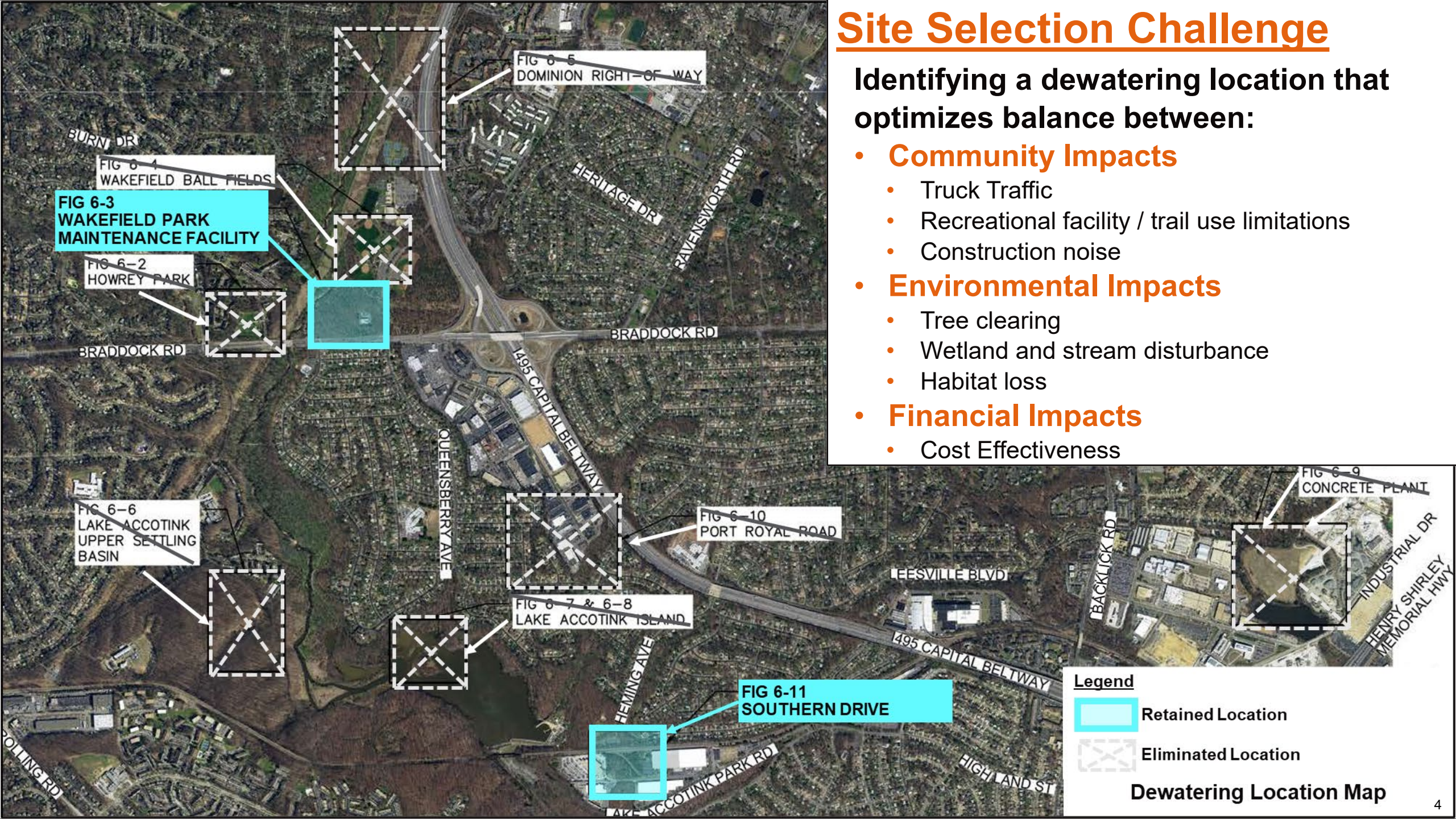
Base Dredging Program – one-time 500,000 cubic yard (cy) removal event (assumed 3-year duration)

Maintenance Dredging Program – 150,000 cy removal every 5 years on average

Site Selection Challenge

Identifying a dewatering location that optimizes balance between:

- **Community Impacts**
 - Truck Traffic
 - Recreational facility / trail use limitations
 - Construction noise
- **Environmental Impacts**
 - Tree clearing
 - Wetland and stream disturbance
 - Habitat loss
- **Financial Impacts**
 - Cost Effectiveness



Legend

 Retained Location

 Eliminated Location

Dewatering Location Map

Lake Accotink Dredging Program Using Wakefield Park Maintenance Facility

Step 1: Preparations

Clear & Construct
Dewatering Location



Construct New
Site Entrance

Construct Permanent
Underground Pipeline



BRADDOCK RD (VA-620)

BRADDOCK RD (VA-620)

I-495

I-495

Lake
Accotink



Lake Accotink Dredging Program Using Wakefield Park Maintenance Facility

Step 2: Dredging



BRADDOCK RD (VA-620)

2b. Transport Sediment
Via Underground Pipeline

2a. Dredge Sediment
(500,000 cubic yards)

Lake
Accotink



Lake Accotink Dredging Program Using Wakefield Park Maintenance Facility

Step 3: Dewatering

3. Dewater Sediment,
Treat Water

BRADDOCK RD (VA-620)

BRADDOCK RD (VA-620)

I-495

I-495

Lake
Accotink



6 MILES TO I-66 VIA VA-123

Lake Accotink Dredging Program Using Wakefield Park Maintenance Facility

Step 4: Offsite Disposal

4b. Outgoing Trucks to Disposal Facility

4a. Incoming Truck Route

BRADDOCK RD (VA-620)

BRADDOCK RD (VA-620)

Right Turn Only Entrance/Exit

I-495

Lake Accotink

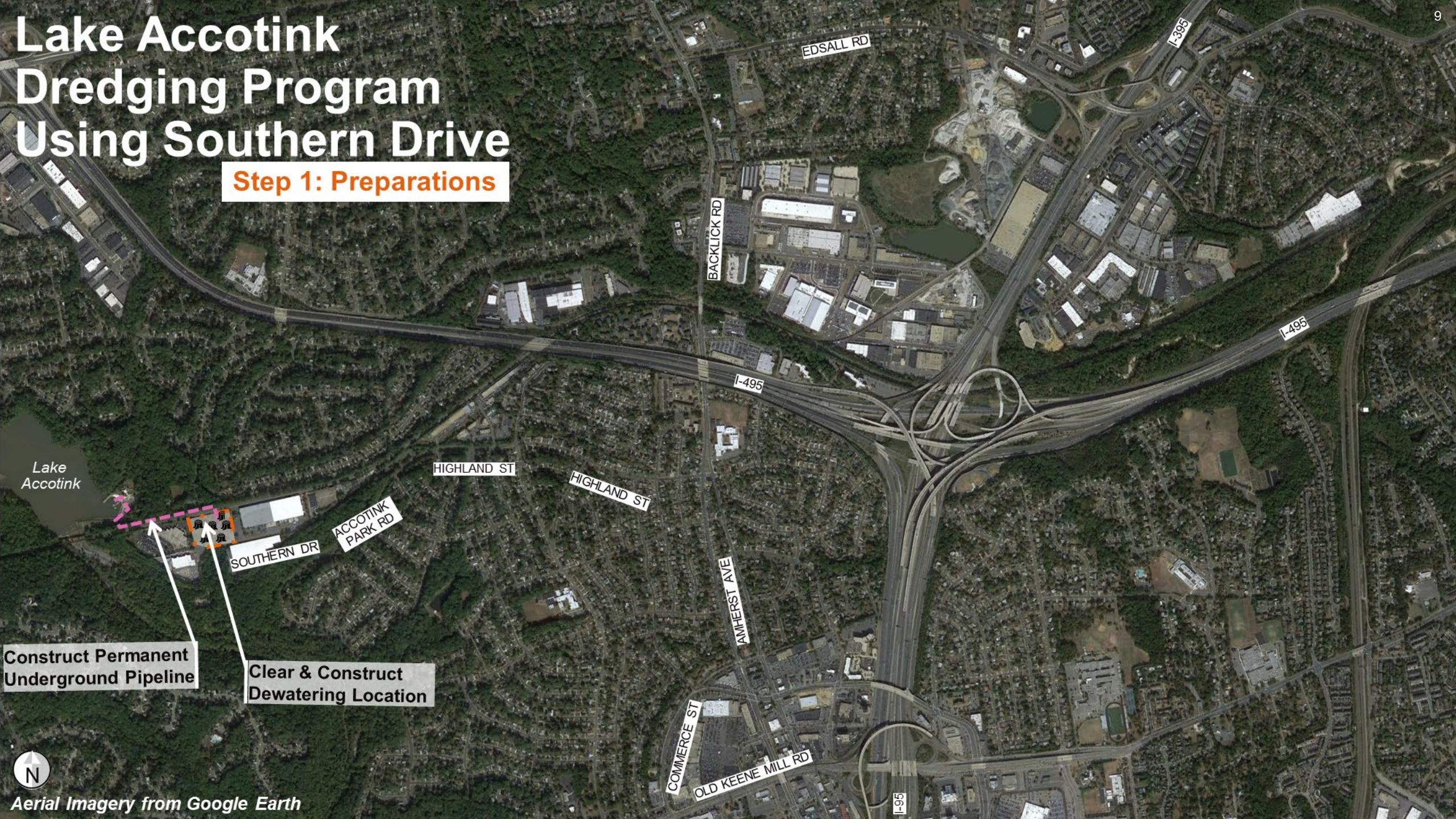


Aerial Imagery from Google Earth

Roadway Name	VDOT 2019 Traffic Data – All Traffic Trips (One Way)	VDOT 2019 Traffic Data – Truck Trips (One Way)	Estimated Daily Project Truck Trips (One Way)
Braddock Rd (VA-620)	39,000 - 71,000	354 - 607	95
Ox Rd / Chain Bridge Rd (VA-123)	20,000 - 39,000	381 - 744	95

Lake Accotink Dredging Program Using Southern Drive

Step 1: Preparations



Lake Accotink

Construct Permanent Underground Pipeline

Clear & Construct Dewatering Location



Lake Accotink Dredging Program Using Southern Drive

Step 2: Dredging

2a. Dredge Sediment
(500,000 cubic yards)

2b. Transport Sediment
Via Underground Pipeline



Lake
Accotink

SOUTHERN DR
ACCOTINK
PARK RD

HIGHLAND ST

HIGHLAND ST

AMHERST AVE

COMMERCE ST

OLD KEENE MILL RD

EDSALL RD

BACKLICK RD

I-395

I-495

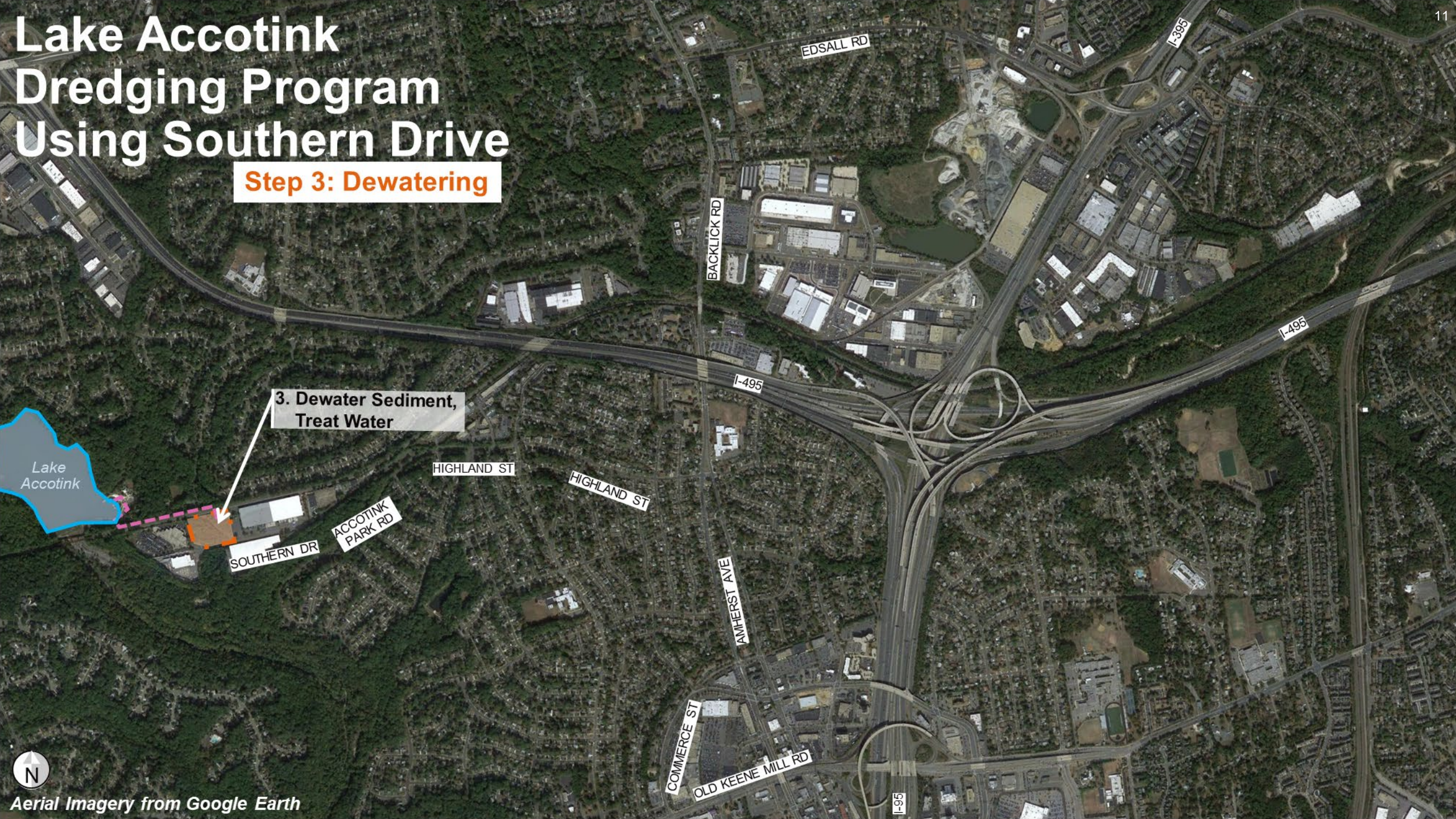
I-495

I-95



Lake Accotink Dredging Program Using Southern Drive

Step 3: Dewatering



3. Dewater Sediment,
Treat Water

Lake
Accotink

SOUTHERN DR

ACCOTINK
PARK RD

HIGHLAND ST

HIGHLAND ST

AMHERST AVE

COMMERCE ST

OLD KEENE MILL RD

EDSALL RD

BACKLICK RD

I-395

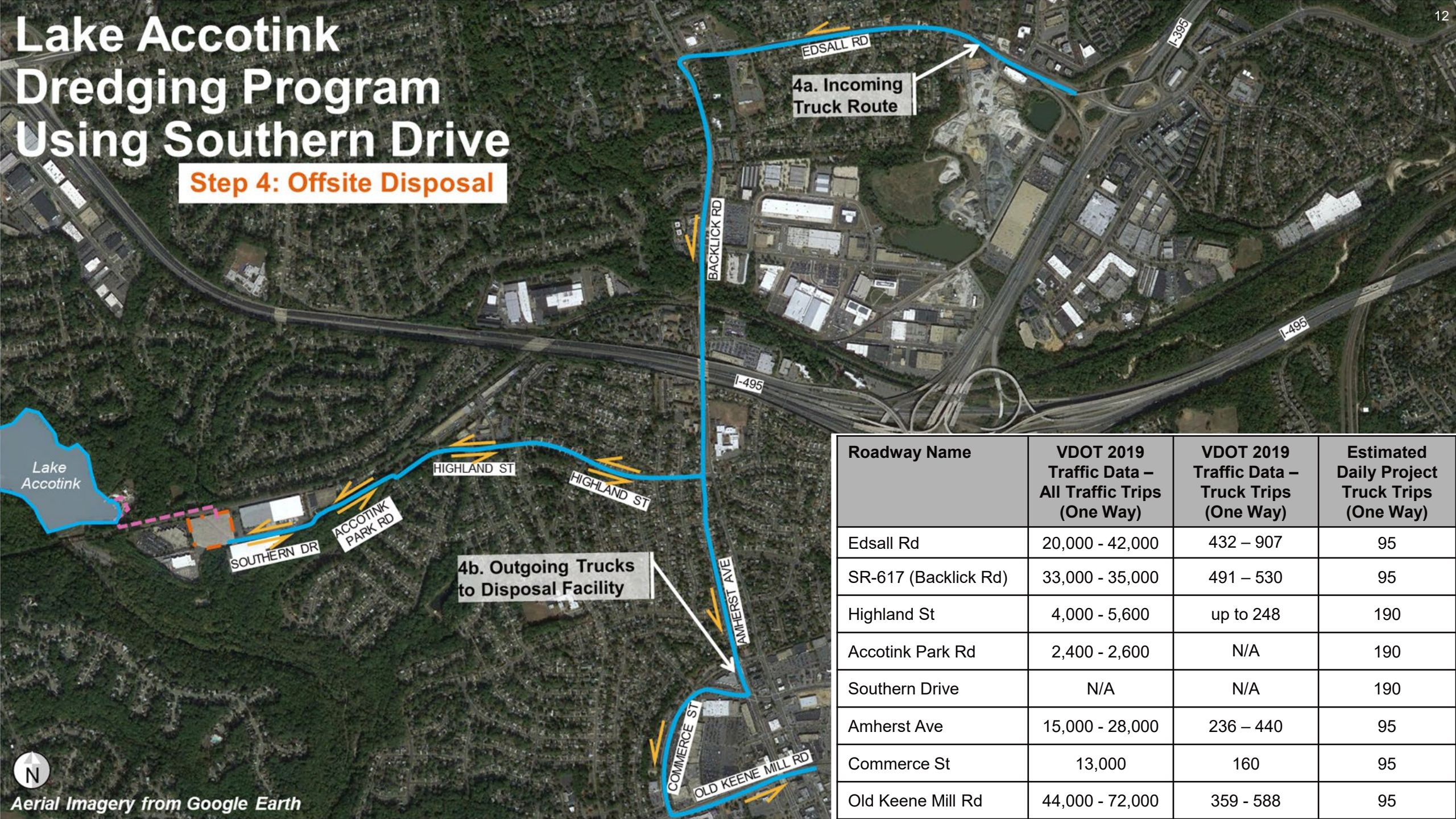
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I-95



Lake Accotink Dredging Program Using Southern Drive

Step 4: Offsite Disposal



Roadway Name	VDOT 2019 Traffic Data – All Traffic Trips (One Way)	VDOT 2019 Traffic Data – Truck Trips (One Way)	Estimated Daily Project Truck Trips (One Way)
Edsall Rd	20,000 - 42,000	432 – 907	95
SR-617 (Backlick Rd)	33,000 - 35,000	491 – 530	95
Highland St	4,000 - 5,600	up to 248	190
Accotink Park Rd	2,400 - 2,600	N/A	190
Southern Drive	N/A	N/A	190
Amherst Ave	15,000 - 28,000	236 – 440	95
Commerce St	13,000	160	95
Old Keene Mill Rd	44,000 - 72,000	359 - 588	95

Lake Accotink

SOUTHERN DR

ACCOTINK PARK RD

HIGHLAND ST

HIGHLAND ST

BACKLICK RD

EDSALL RD

AMHERST AVE

COMMERCE ST

OLD KEENE MILL RD

4b. Outgoing Trucks to Disposal Facility

4a. Incoming Truck Route



Dredge Program Cost

Category	Opinion of Probable Cost ^(a)
Base Dredge Event^(b)	
Dewatering Site & Permanent Pipeline Construction ^(c)	\$13.0M (\$9.1M to \$19.5M)
Dredging	\$23.0M (\$16.1M to \$34.6M)
Material Processing	\$24.9M (\$17.4M to \$37.3M)
Transportation & Disposal ^(d)	\$34.4M (\$24.1M to \$51.6M)
Total for Base Dredge	\$95.3M (\$66.7M to \$143.0M)
Maintenance Dredging Events^(e)	
Event 1 (Year 5 Post-Base Dredge)	\$46.5M
Event 2 (Year 10 Post-Base Dredge)	\$59.4M
Event 3 (Year 15 Post-Base Dredge)	\$96.8M
Event 4 (Year 20 Post-Base Dredge)	\$123.5M

Notes:

- (a) The opinions of probable cost presented herein are based on Arcadis' experience, vendor estimates, and Fairfax County staff input. These opinions of probable cost have been prepared for the purpose of comparing potential alternatives and are based on available information from site investigations and the anticipated dredge program scope. These opinions of probable cost are AACE Class 4 level and expected to be within -30% to +50% of the actual project cost. Changes in cost elements are likely to occur as a result of new information and data collected during an engineering design phase, selection of dewatering site location, and determination of final disposal location. Utilization of this cost information beyond the stated purpose is not recommended.
- (b) The base dredge event is assumed to include removal of 500,000 cubic yards of sediment from Lake Accotink and be completed over a three-year period from 2024 to 2026. Costs shown were developed in 2022 dollars and escalated to the mid-point of construction (2025) using a 5% annual inflation factor. Costs are shown to the nearest \$0.1M.
- (c) Cost assumes dewatering site constructed at the Wakefield Park Maintenance Facility location.
- (d) Cost shown assumes transportation and disposal to Luck Ecosystems.
- (e) Maintenance dredging events are expected to continue in perpetuity but only the first four maintenance dredging cycles are shown. The costs presented herein assume \$30.0M (in 2022 dollars) per maintenance dredging event and are escalated to the applicable event year using a 5% annual inflation factor and completion of the first maintenance dredge in 2031.

Many Factors Impact Project Cost

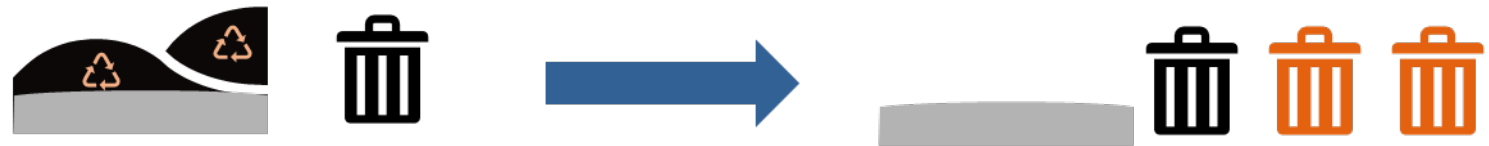
43% Increase in
Required Sediment
Removal Volume



Inflation /
Supply Chain Impacts
(>15% Consumer Price Index
Increase Over Last 3 Years)



Sediment Properties
Limit Onsite
Reuse/Disposal



Larger Than Expected
Dewatering Site
Capacity Required



Land Use Conflicts Limit
Dewatering and
Disposal Options



