

East Coast Greenway

Southeast Greenways & Trails Summit
April 3 • #GreenwaySummit



Thank you,
Southeast Greenways &
Trails Summit sponsors





Sticker Shock *A Tale of Two Trails*

Iona L. Thomas, AICP

McAdams



1 TEAM INTRODUCTIONS

ABOUT MCADAMS



LAND PLANNING

15
professional
land surveyors

100+
professional engineers
+ engineering interns



STORMWATER



CIVIL ENGINEERING



GEOMATICS



CONSTRUCTION ADMINISTRATION



NATURAL RESOURCES



LANDSCAPE ARCHITECTURE

24
registered landscape
architects + designers

6
certified
planners

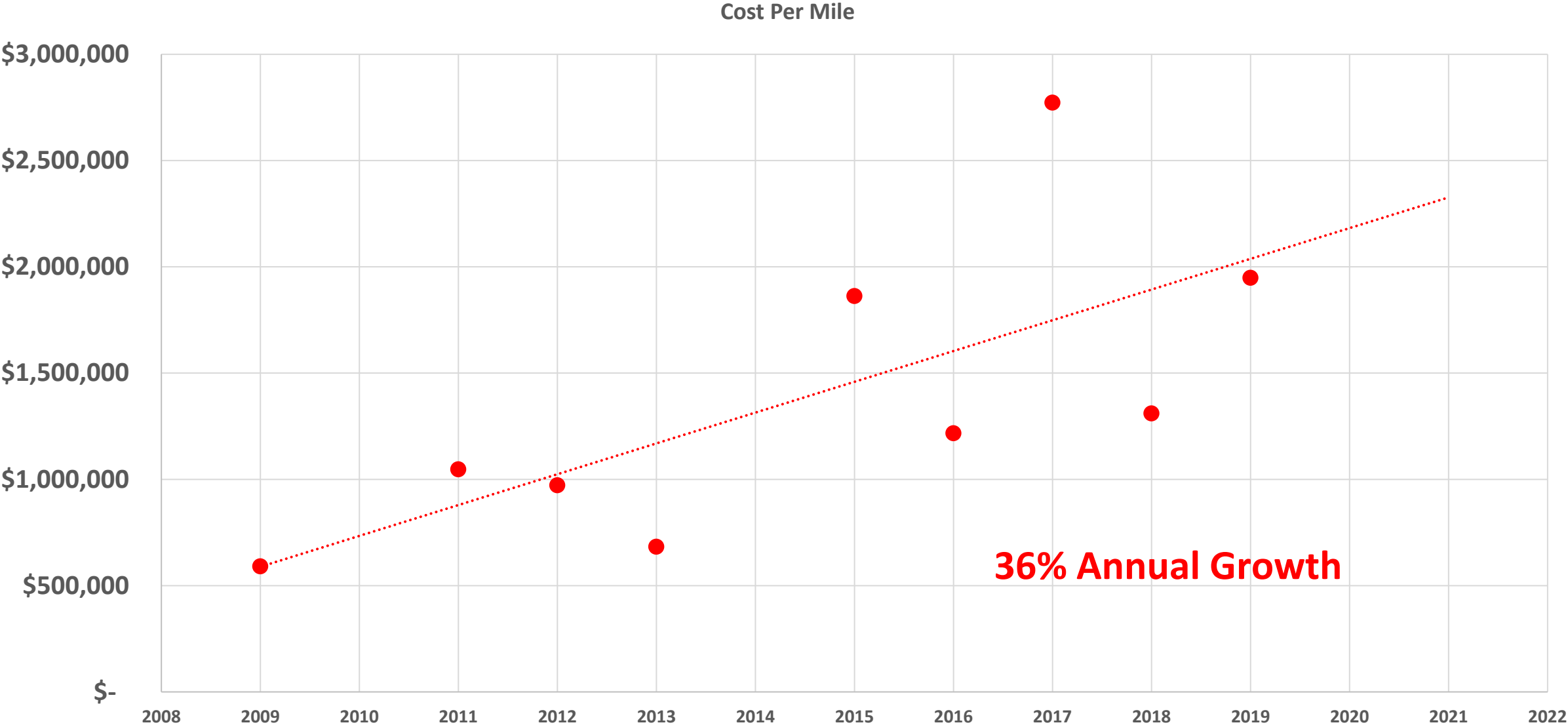
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LEED AP's



STREAM + WETLAND DESIGN



STICKER SHOCK



How Trails Are Developed

REGIONAL PLANNING

• State / MPO, RPO, COG / Non-Profit Led

MUNICIPAL PLANNING

• County / City / Town Led

CORRIDOR / FEASIBILITY

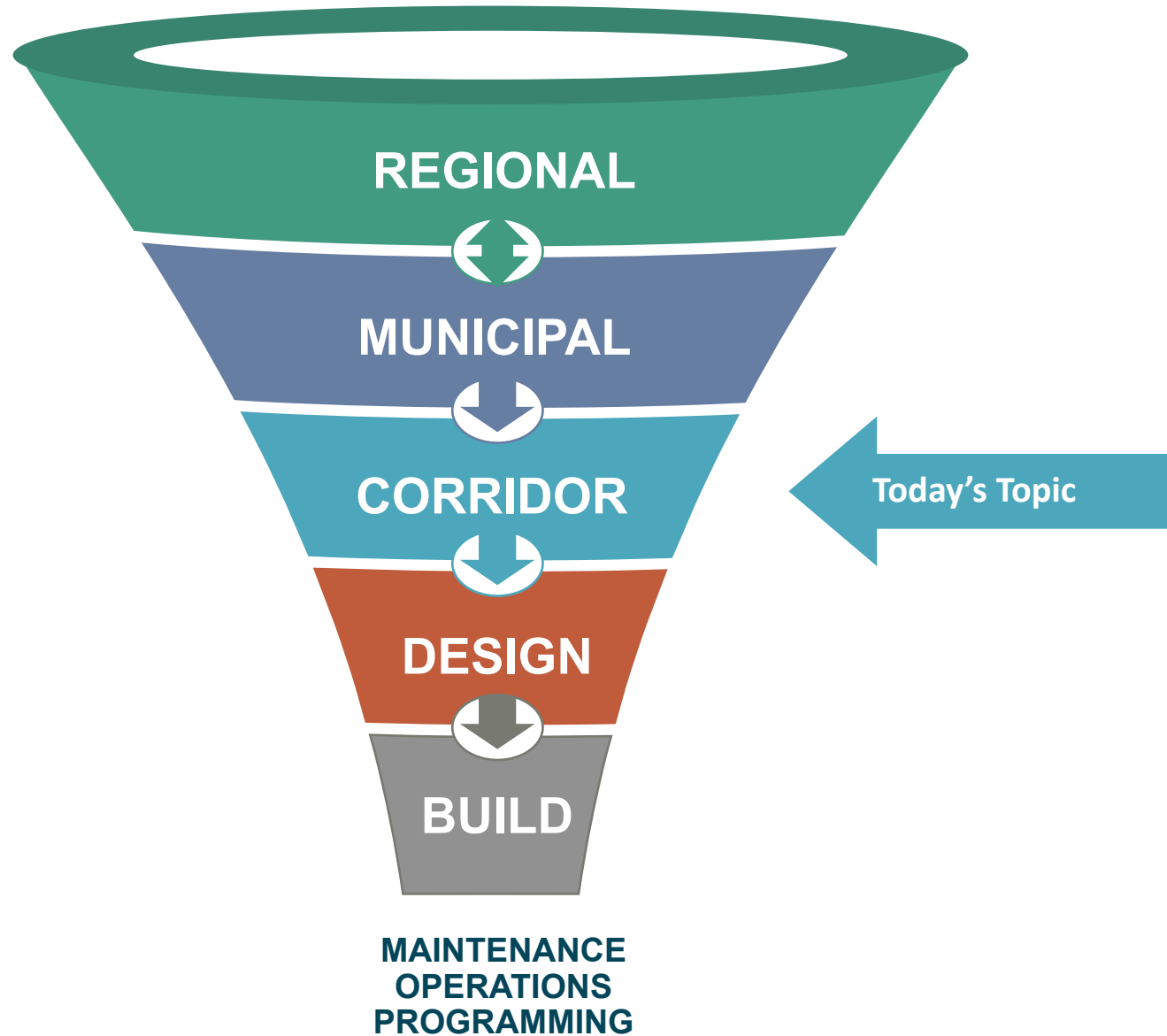
• Municipal / NCDOT / State Parks Led

DESIGN / ACQUISITION

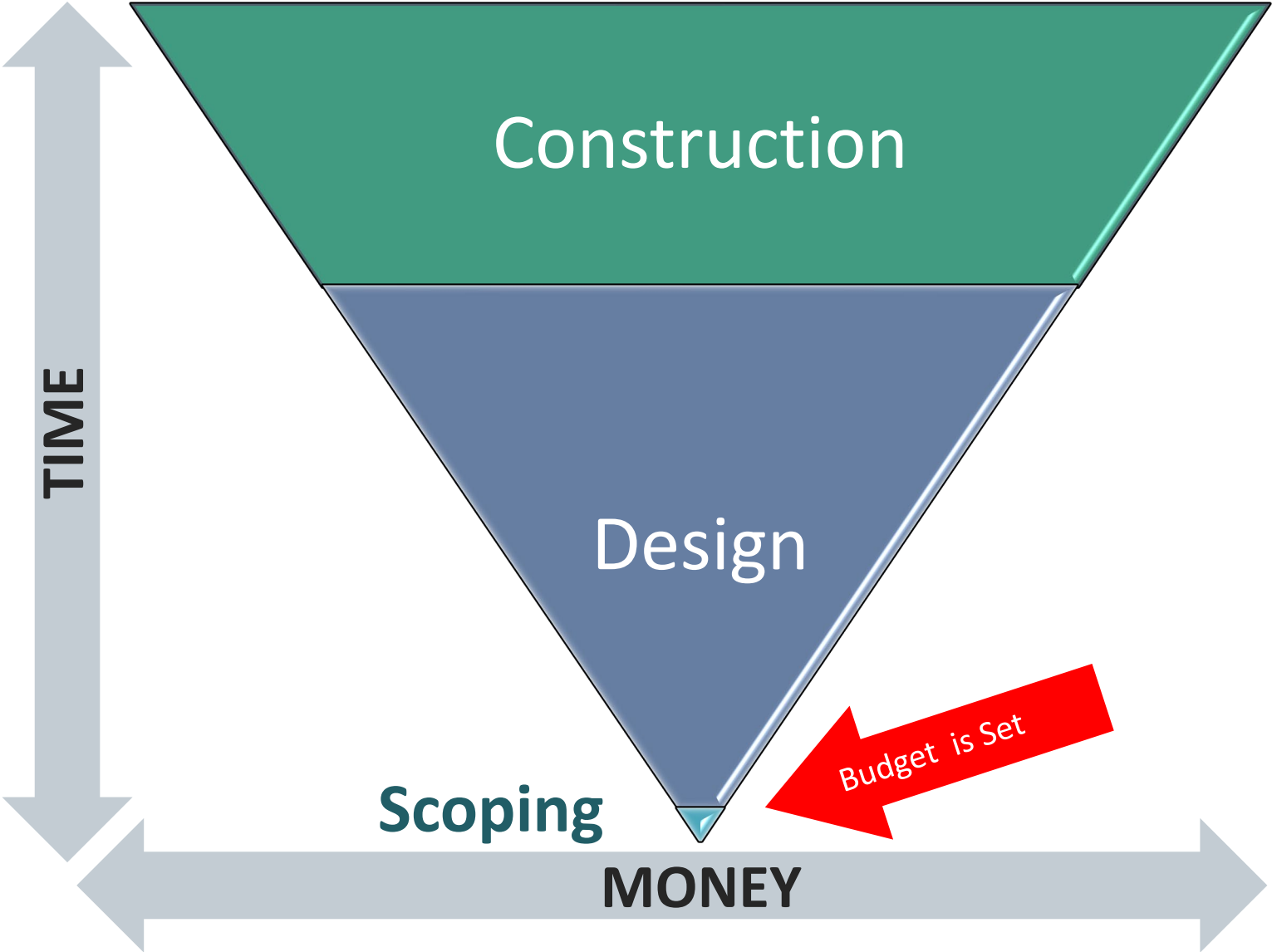
• Municipal / NCDOT / State Parks Led

CONSTRUCTION

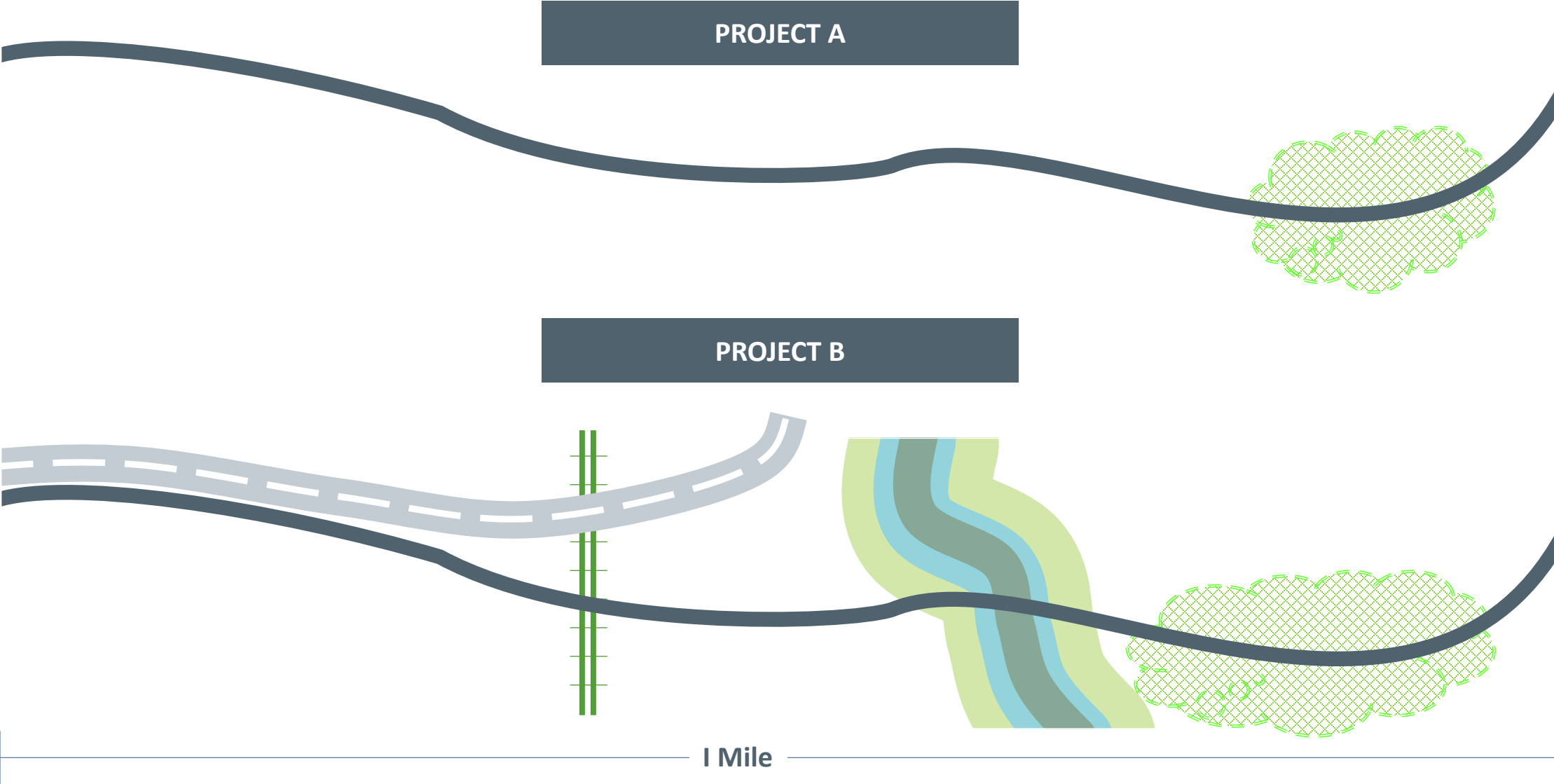
• Municipal / NCDOT / State Parks Led



Scoping is the Foundation



A Tale of Two Trails



Elements of Proper Scoping

- > Property
- > FEMA
- > Jurisdictional Features
- > Threatened & Endangered Species
- > Drainage
- > Railroad
- > Utilities
- > Survey
- > Bridges & Other Structures
- > Road Crossings
- > Geotechnical Investigations
- > Construction Cost Escalation
- > Construction Administration & Inspections

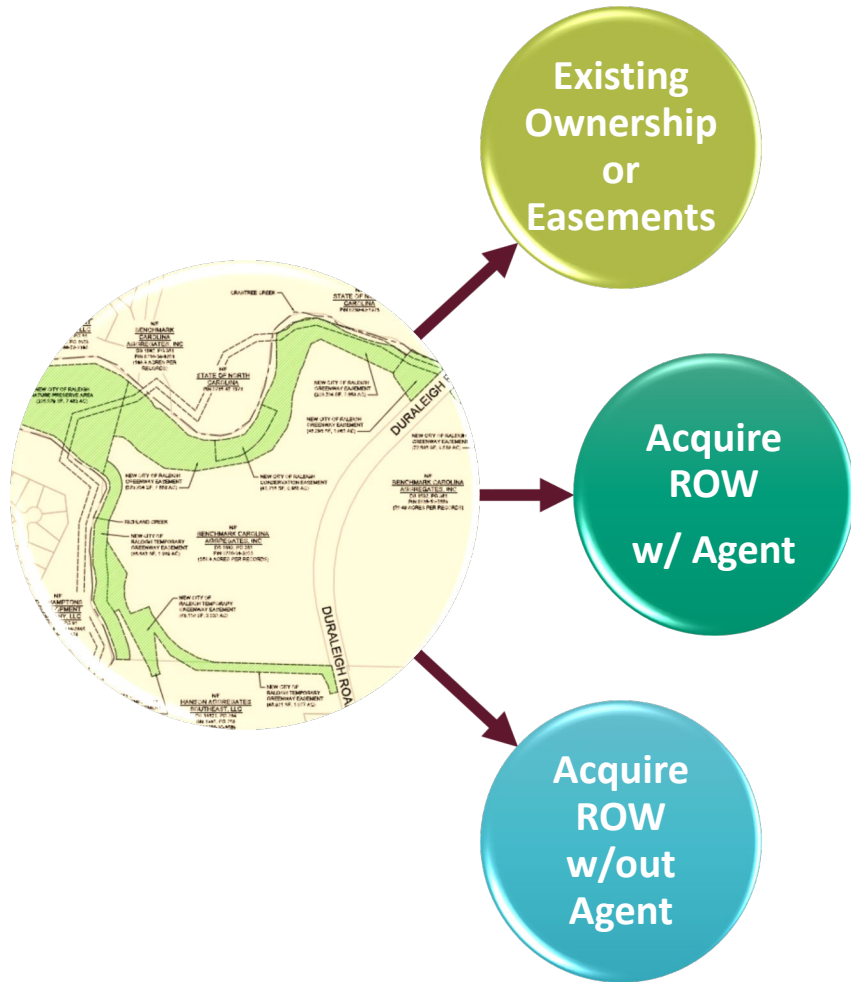
These topics will effect both your design and construction budgets and schedules.



Walk Your Projects



Property Acquisition



- Select NCDOT pre-qualified firm
- Include property acquisition services in design fee
 - Survey
 - Appraisals
 - Acquisition Negotiation
 - Recording
 - Purchase price
 - ROW Certification Coordination
- Include significant time in schedule
- Include all of the above costs except acquisition negotiations fees
- Include significant time in schedule

PROJECT A

Base Cost:	\$ 945,000
ROW Impact:	-
Adjusted Cost:	\$ 945,000
Design Schedule:	10 Months
ROW Impact:	-
Adjusted Schedule:	10 Months

PROJECT B

Base Cost:	\$ 945,000
ROW Impact:	+ 60,000
Adjusted Cost:	\$1,005,000
Design Schedule:	10 Months
ROW Impact:	+6 Months
Adjusted Schedule:	16 Months

Clearzone / Drainage / Property Relationship



The Clearzone/Drainage Relationship

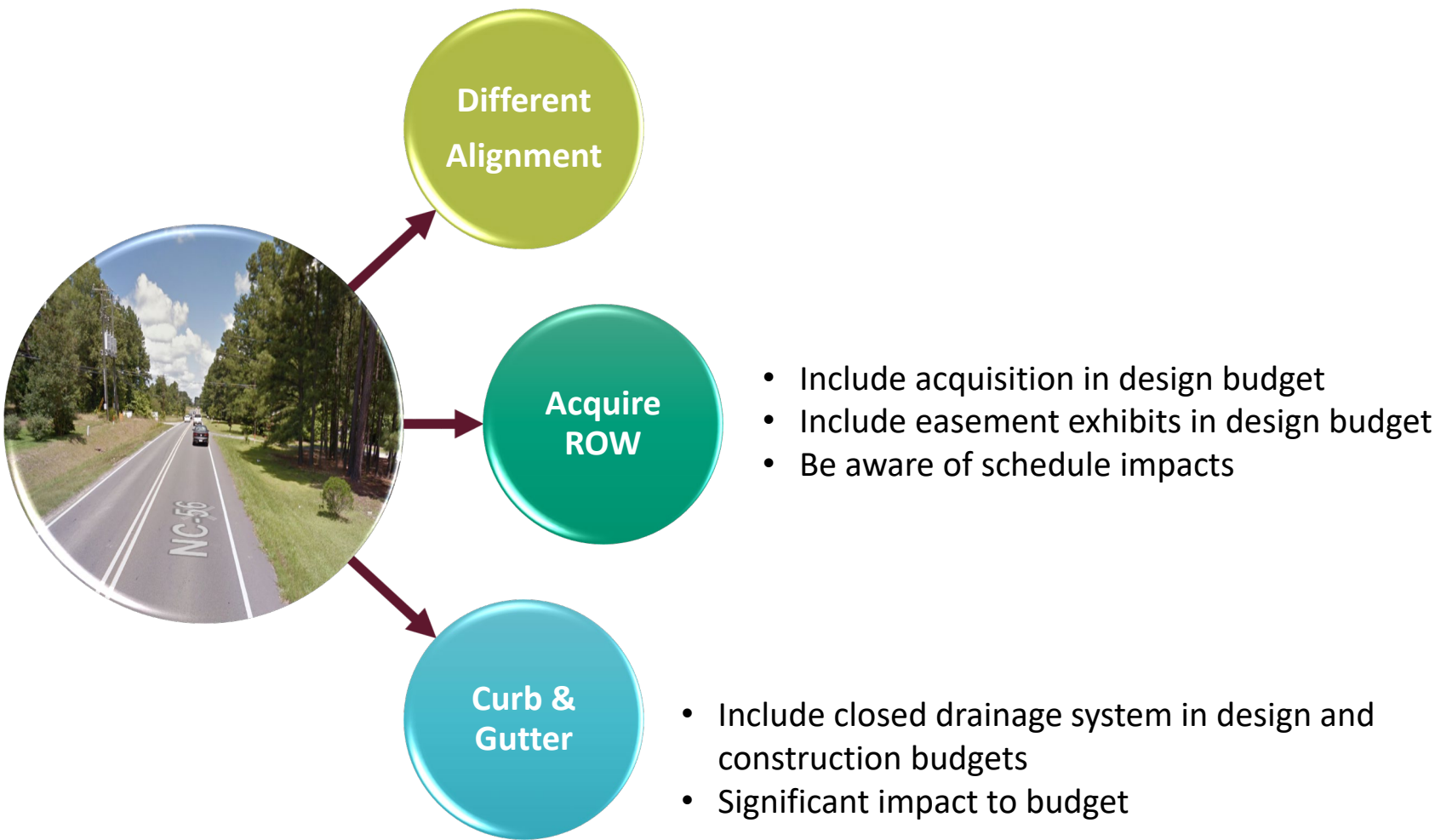


- NC 56 Granville Co.
- Speed limit 35 MPH
- ADT 9800
- Clearzone is 14-16 feet

Multi-use Path with Cur & Gutter



The Clearzone/Drainage Relationship



PROJECT A

Base + Adds Cost:	\$ 945,000
Diff Align Impact:	-
Adjusted Cost:	\$ 945,000

Design Schedule:	10 Months
Diff Align Impact:	-
Adjusted Schedule:	10 Months

PROJECT B

Base + Adds Cost:	\$ 1,005,000
C&G Impact	\$ 400,000
Adjusted Cost:	\$ 1,405,000

Design Schedule:	16 Months
C&G Impact:	-
Adjusted Schedule:	16 Months

FEMA Compliance

- > Detailed study vs. Limited Detail Study (LDS)
 - > Detailed Study has regulated **Floodway**
 - > LDS has “**Non-encroachment areas**”
 - > Both have established Base Flood Elevations (**BFE**)

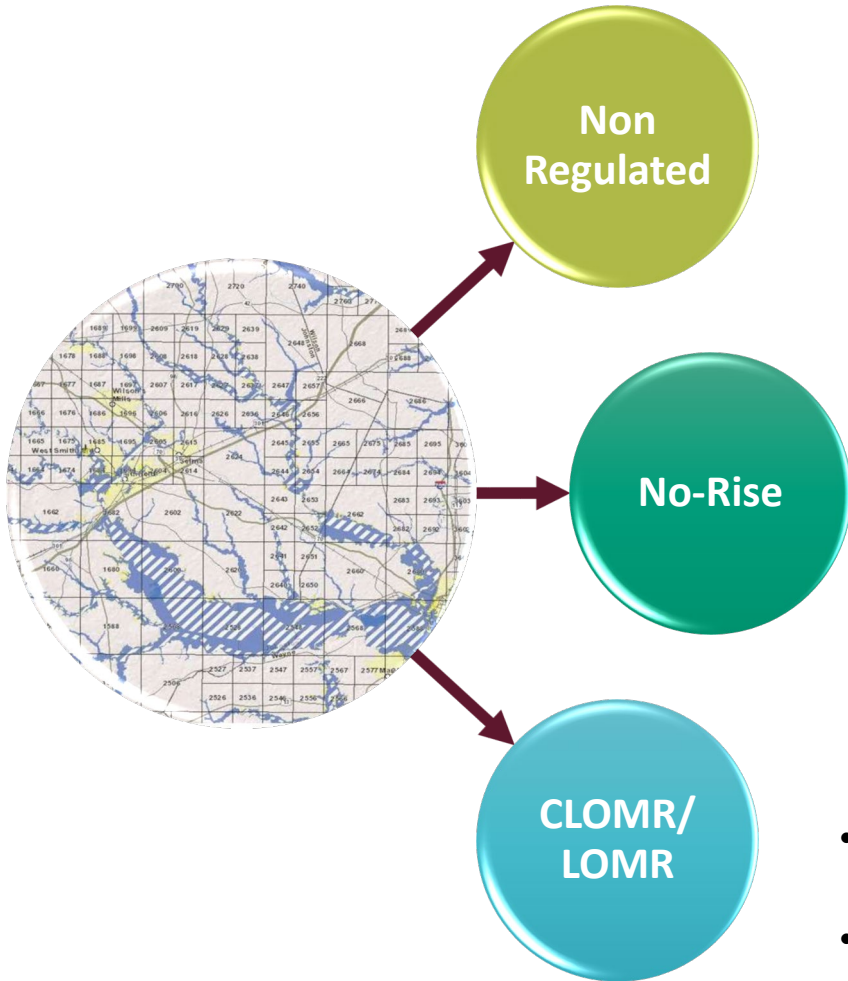


FEMA Compliance

- > How does FEMA impact my project?
 - > No-Rise vs. Conditional Letter of Map Revision (CLOMR)
 - > No-Rise
 - > Decrease in BFE less than 0.1', no additional action required
 - > Decrease in BFE greater than 0.1', LOMR required
 - > Permitted at the local level – City or County Floodplain Administrator
 - > CLOMR
 - > Increase in base flood elevation greater than 0.01'
 - > Decrease in base flood elevation greater than 0.1'
 - > Permitted at State and Federal Level
 - > NC Floodplain Mapping Program
 - > FEMA
 - > Requires Letter of Map Revision (LOMR) after construction complete
 - > Most projects with new stream crossing will result in CLOMR
 - > Lateral, at-grade encroachments may qualify for No-Rise



Regulated Floodplains



- Include modeling and Local Floodplain Coordination in design budget

- Include modeling and FEMA/NCFPM coordination in design budget
- Include FEMA fees in design budget

PROJECT A

Base + Adds Cost: \$945,000
 Non-FEMA -
Adjusted Cost: \$945,000

Design Schedule: 10 Months
 Non-FEMA -
Adjusted Schedule: 16 Months

PROJECT B

Base + Adds Cost: \$1,405,000
 CLOMR Impact: \$ 70,000
Adjusted Cost: \$1,475,000

Design Schedule: 16 Months
 CLOMR Impact: 6 Months
Concurrent with ROW Acquisition
Adjusted Schedule: 16 Months

Jurisdictional Features



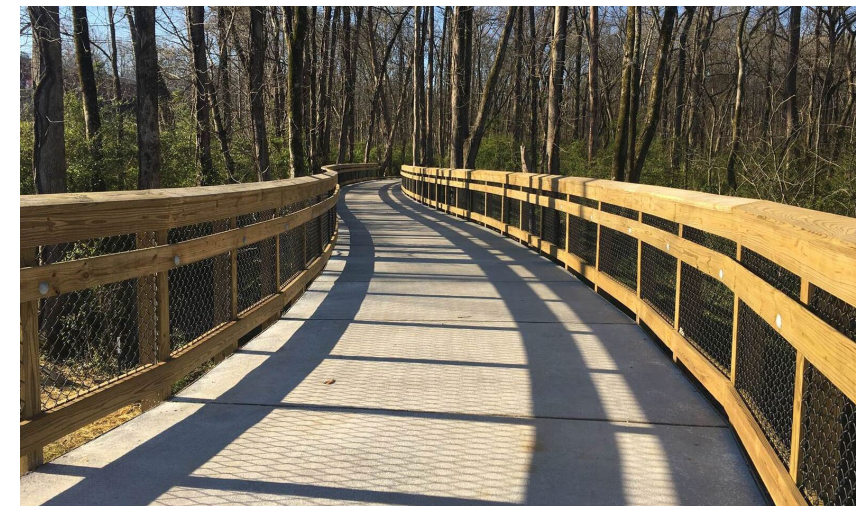
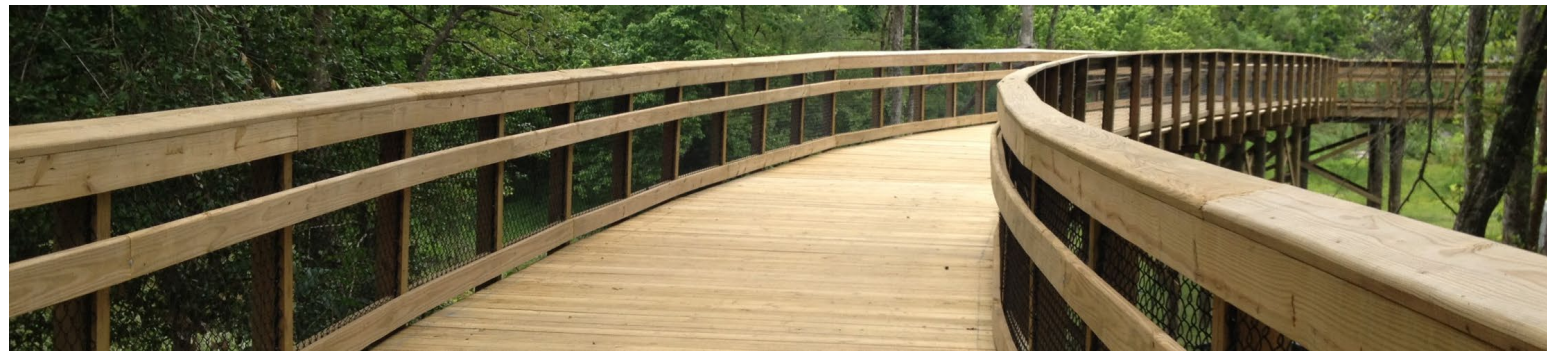
Compensatory Mitigation

Fee Category	Unit	Cost
Riparian Buffer	Square foot	\$1.08
Stream	Linear foot	\$289-\$381
Nonriparian Wetland	Acre (.25 min)	\$25,874-\$50,313
Riparian Wetland	Acre (.25 min)	\$39,428-\$69,736
Coastal Wetland	Acre (.25 min)	\$171,544

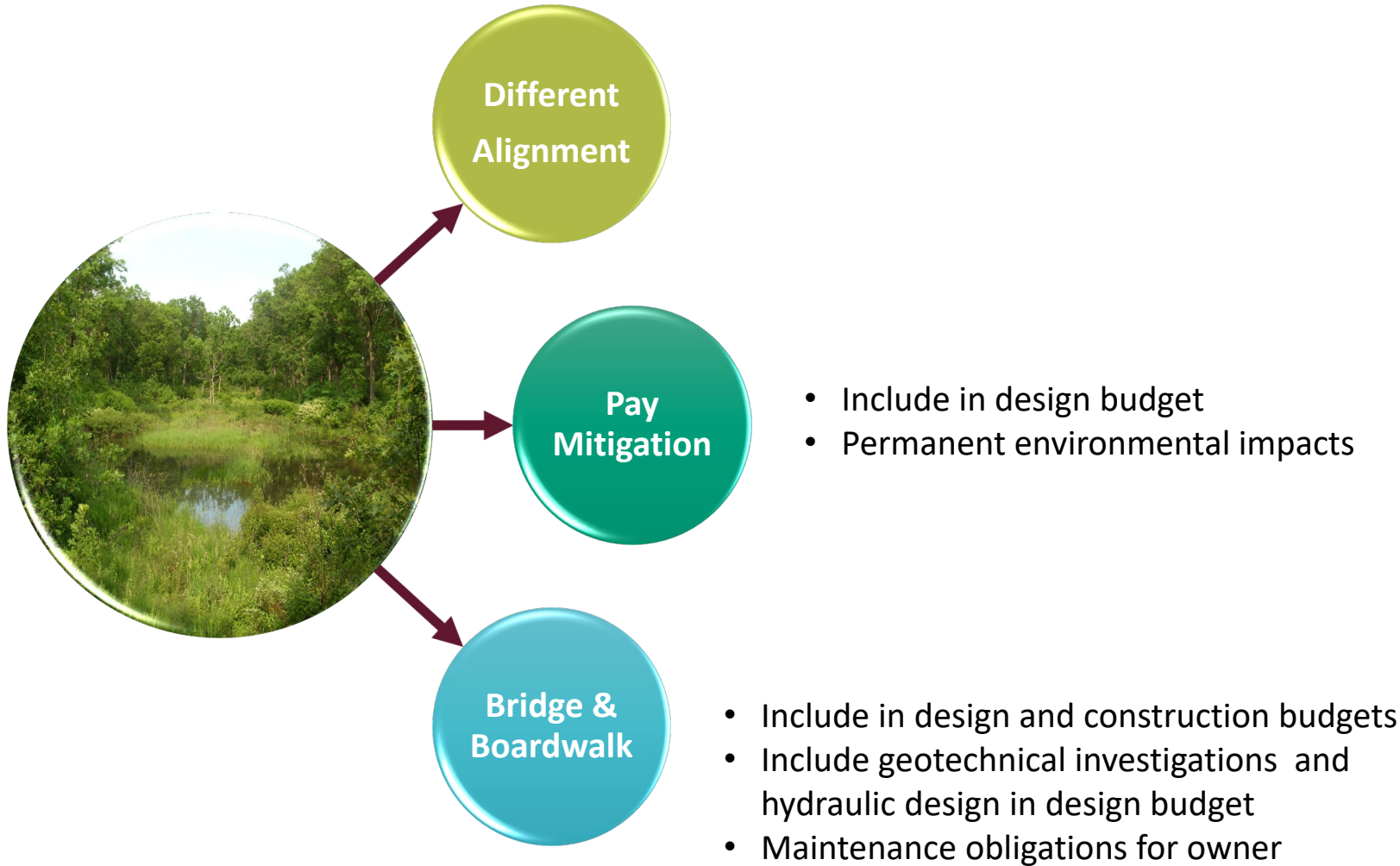
- Impacts to wetlands occur when permanently filled
- Impacts to streams occur when they are piped
- Ratio is usually 2:1
- “Like” credit must be available in your HUC



Bridges and Boardwalk



Jurisdictional Streams & Wetlands



PROJECT A

Base + Adds Cost:	\$ 945,000
Boardwalks:	\$ 400,000
Adjusted Cost:	\$1,345,000

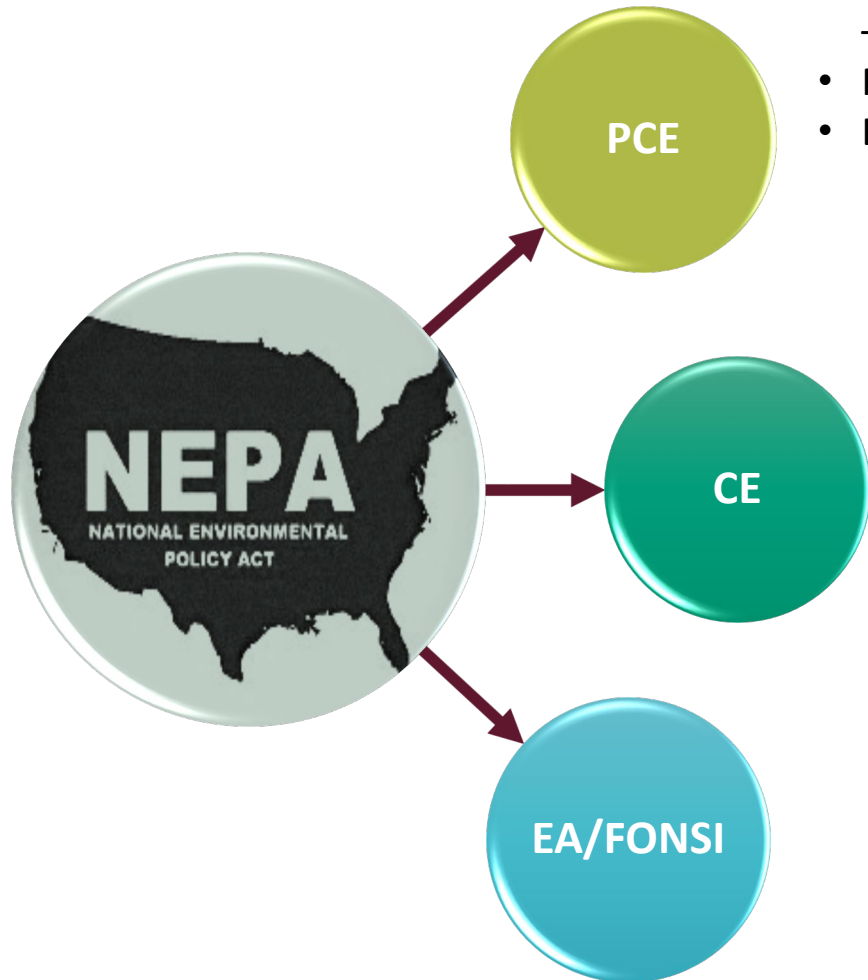
Design Schedule:	10 Months
Bridges + Bwalks:	Impacts Const Sked
Adjusted Schedule:	10 Months

PROJECT B

Base + Adds Cost:	\$ 1,475,000
Bridges + Bwalk:	\$ 750,000
Adjusted Cost:	\$ 2,225,000

Design Schedule:	16 Months
Bridges + Bwalks:	Impacts Const Sked
<i>Concurrent with ROW Acquisition</i>	
Adjusted Schedule:	16 Months

NEPA



- Most common document for LAPP projects – basic checklist
- May require FHWA coordination
- Budget for
 - Natural Systems Investigations
 - Document Preparation & Coordination

- More detailed document
- Higher budget

- Rare for LAPP projects
- Higher budget

PROJECT A

Base + Adds Cost:	\$1,345,000
PCE:	\$ 30,000
Adjusted Cost:	\$1,375,000

Design Schedule:	10 Months
PCE:	3 Months
Adjusted Schedule:	13 Months

PROJECT B

Base + Adds Cost:	\$2,225,000
PCE:	\$ 30,000
Adjusted Cost:	\$2,255,000

Design Schedule:	16 Months
PCE:	-
<i>Concurrent with ROW Acquisition</i>	
Adjusted Schedule:	16 Months

Utilities

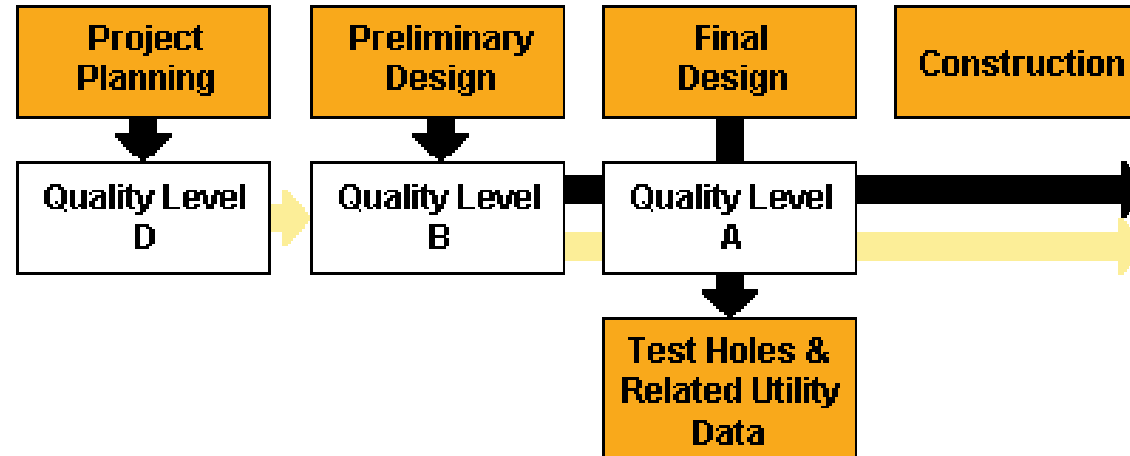


Photo: Gary Borland, Cardno TBE Inc



Subsurface Utility Engineering (SUE)

"The Federal Highway Administration has been encouraging the use of Subsurface Utility Engineering on Federal-aid highway projects since 1991. Proper use of this cost-effective professional engineering service **will eliminate many of the utility problems typically encountered** on highway projects. Using this technology, it will be possible to **avoid many utility relocations** before construction and many unexpected encounters during construction, thereby **eliminating many costly, time-consuming project delays.**"



Quality Level D - Information derived from existing records or oral recollections.

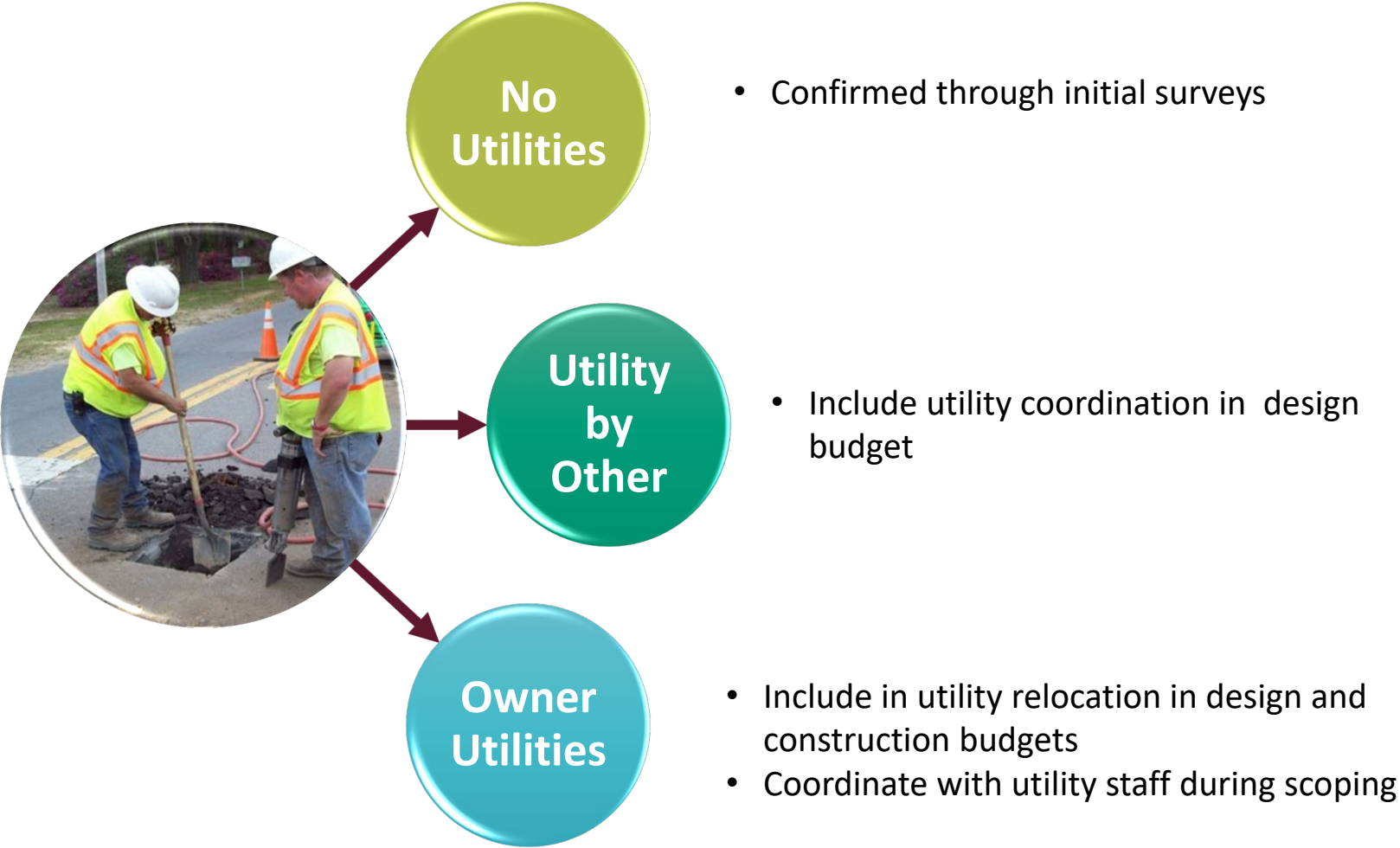
Quality Level C - Information obtained by surveying and plotting visible above-ground utility features and by using professional judgment in correlating this information to Quality Level D.

Quality Level B - Information obtained through the application of appropriate surface geophysical methods to determine the existence and approximate horizontal position of subsurface utilities.

Quality Level A - Precise horizontal and vertical location of utilities obtained by the actual exposure and subsequent measurement of subsurface utilities, usually at a specific point.



Utilities



PROJECT A

Base + Adds Cost:	\$1,375,000
Utilities:	\$ 30,000
Adjusted Cost:	\$1,405,000

Design Schedule:	13 Months
Utilities:	-
Adjusted Schedule:	13 Months

PROJECT B

Base + Adds Cost:	\$2,255,000
Utilities:	\$ 100,000
Adjusted Cost:	\$2,355,000

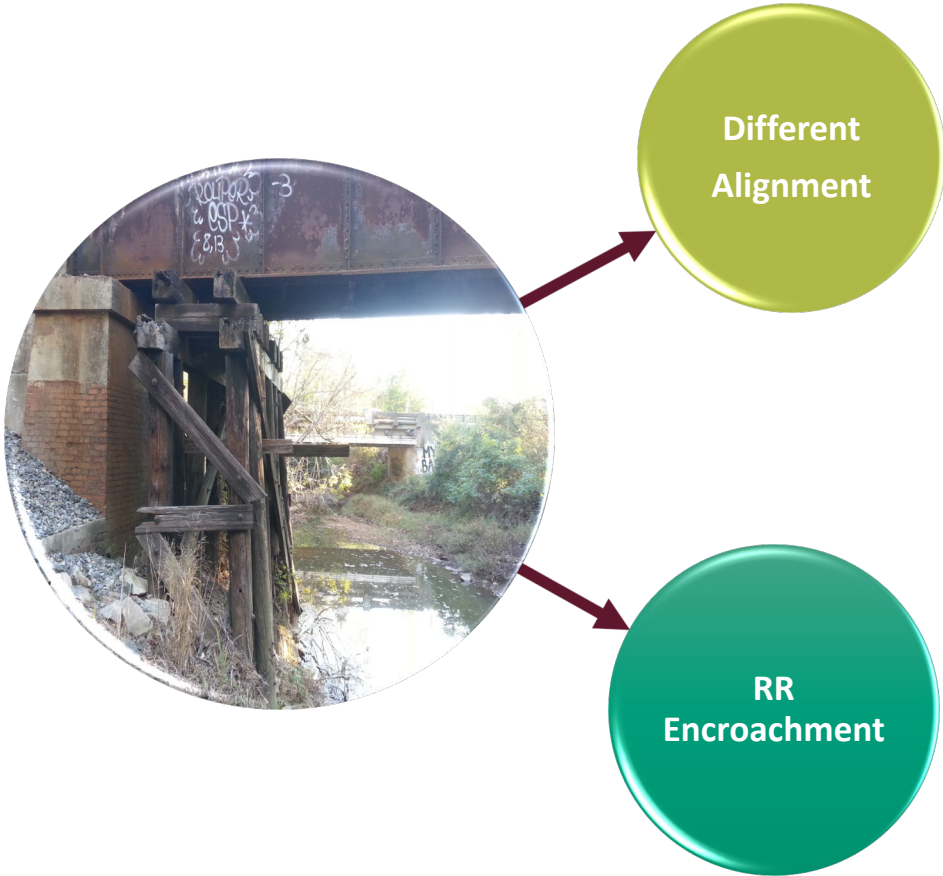
Design Schedule:	16 Months
Utilities:	-
Adjusted Schedule:	16 Months



Railroads



Railroad Considerations



- Include fee for railroad to review plans \$8,000-\$15,000
- Schedule delays will occur
- Construction specifications include insurance and flagman requirements

PROJECT A

Base + Adds Cost:	\$1,405,000
RR:	-
Adjusted Cost:	\$1,405,000
Design Schedule:	10 Months
RR:	-
Adjusted Schedule:	13 Months

PROJECT B

Base + Adds Cost:	\$2,355,000
RR:	\$ 250,000
Adjusted Cost:	\$2,605,000
Design Schedule:	16 Months
RR:	6 Months
Adjusted Schedule:	22 Months

Construction Services



- Need clear commitment from owner and agreement on costs
- A mix of CA by Owner and CMT by Consultant is Common
- 10-12% of Construction Cost

PROJECT A

Base + Adds Cost:	\$1,405,000
Mixed CA:	\$ 140,500
Adjusted Cost:	\$1,545,500
Adjusted Schedule:	13 Months

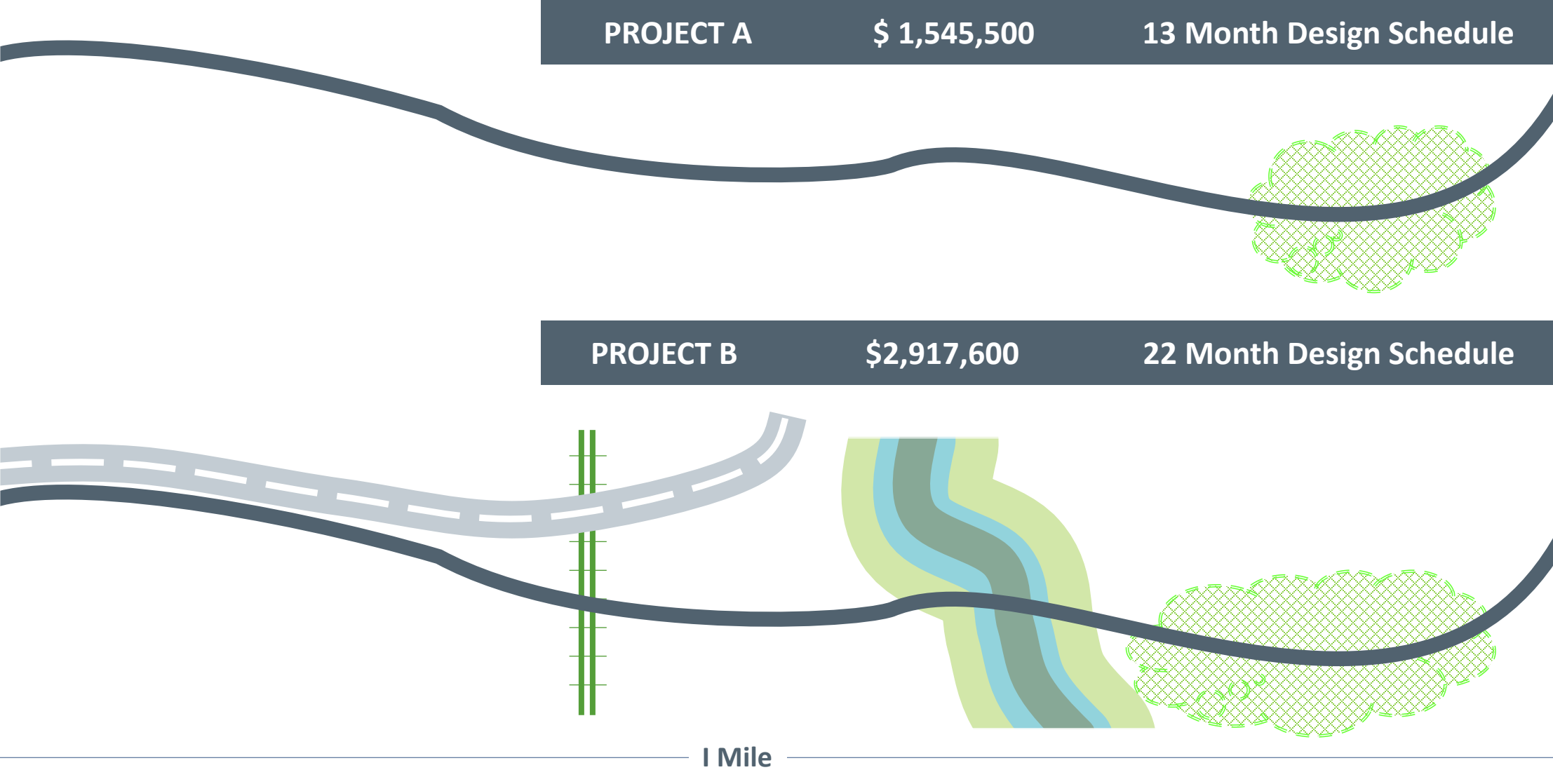
PROJECT B

Base + Adds Cost:	\$2,605,000
Full CEI:	\$ 312,600
Adjusted Cost:	\$2,917,600
Adjusted Schedule:	22 Months

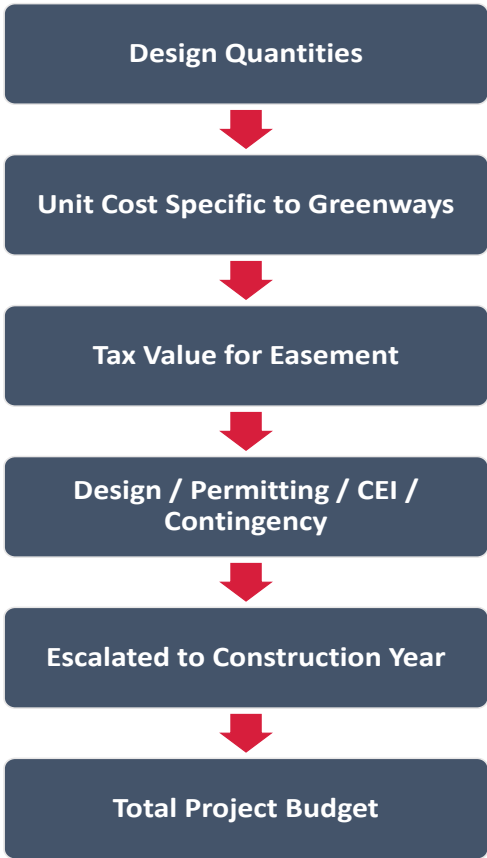
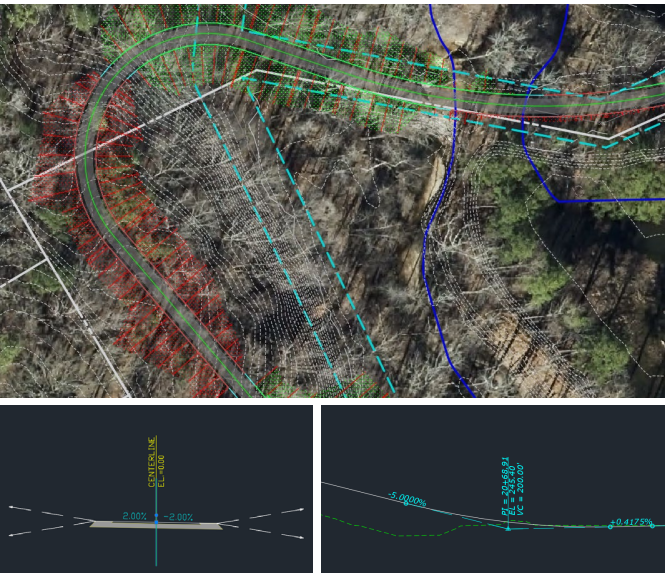
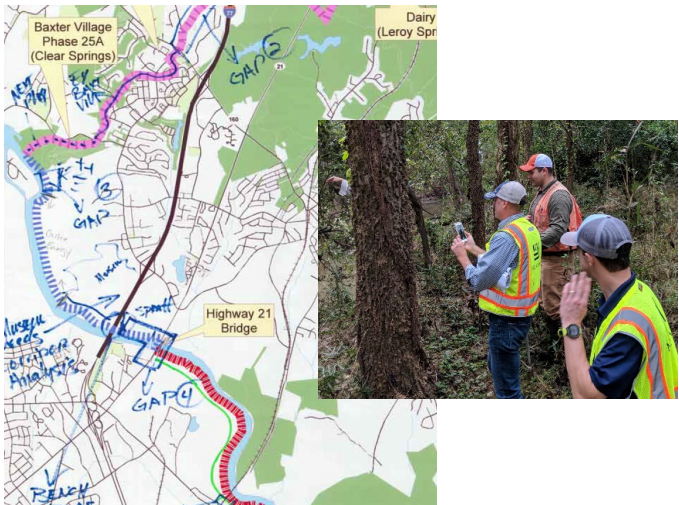
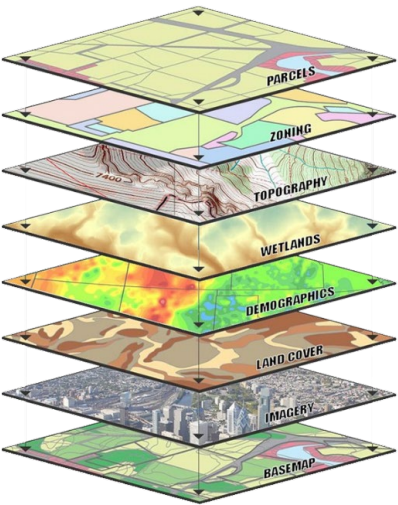




TALE OF TWO TRAILS



Feasibility Analysis



Base Mapping

Field Investigations

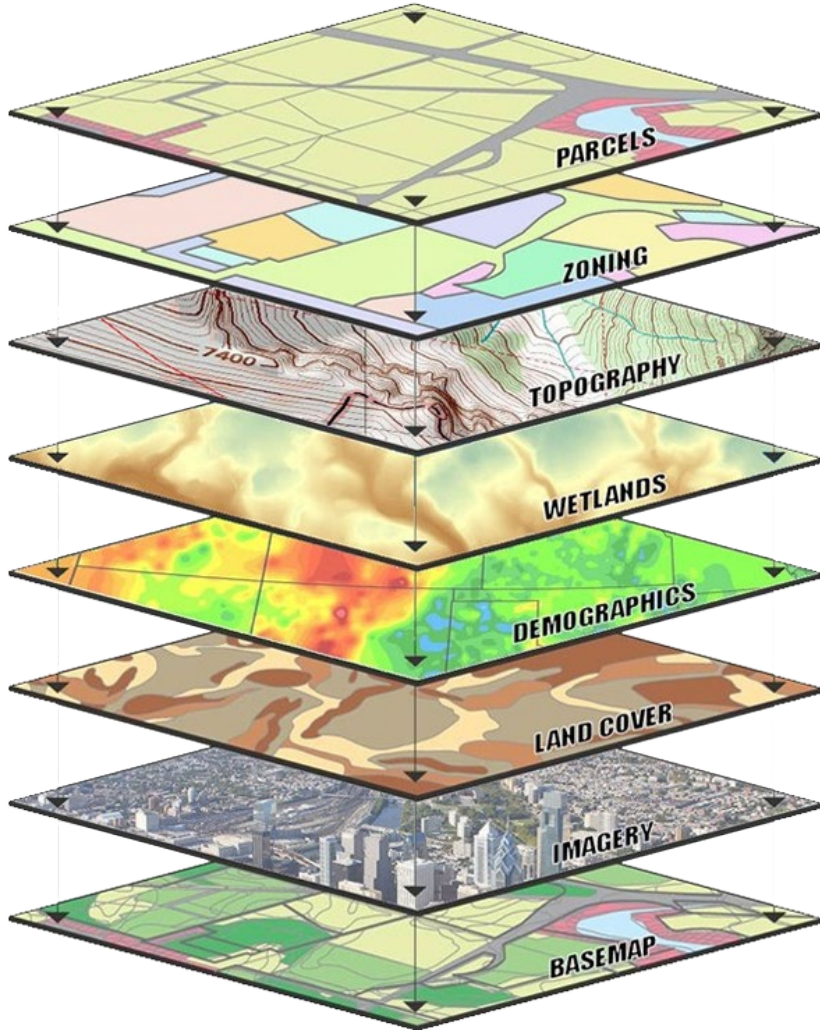
CAD Modeling

Cost Estimating



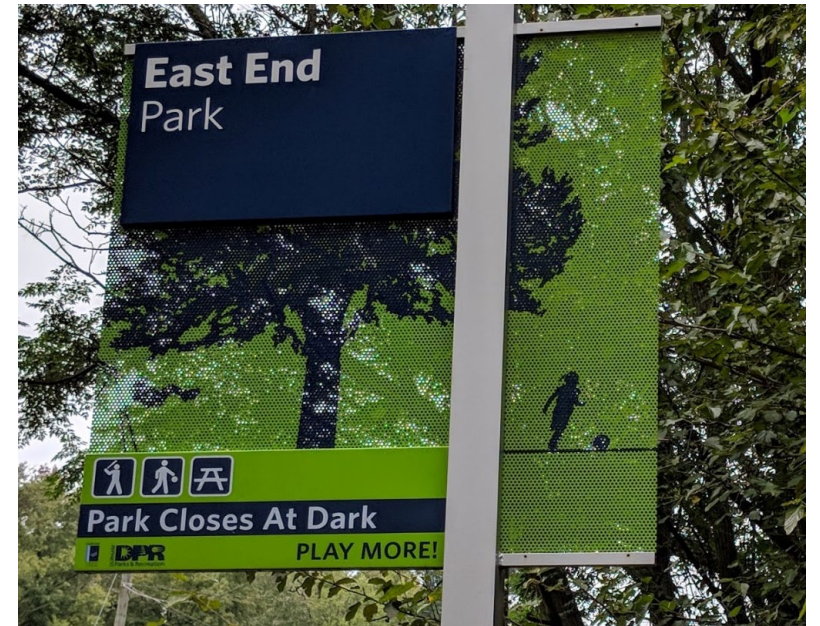
Feasibility Analysis

Data sources to build base model:



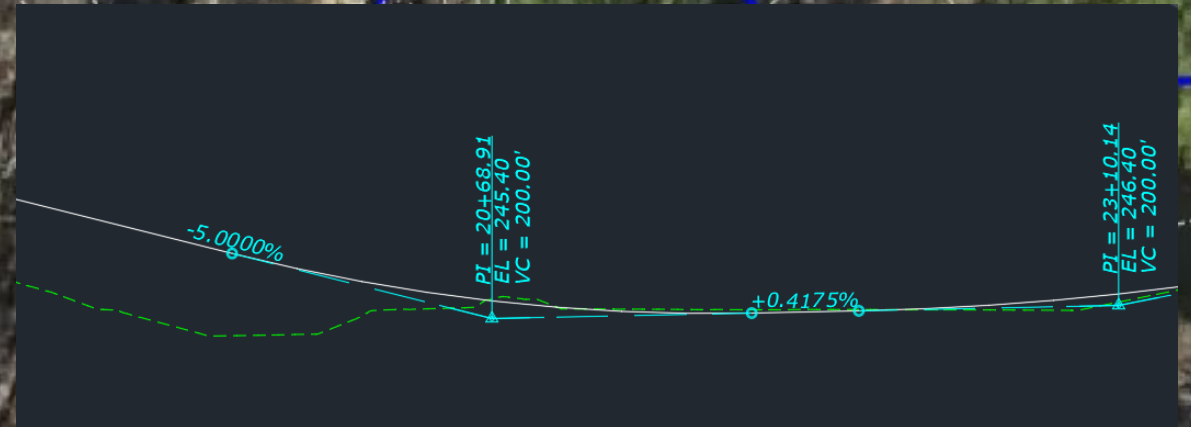
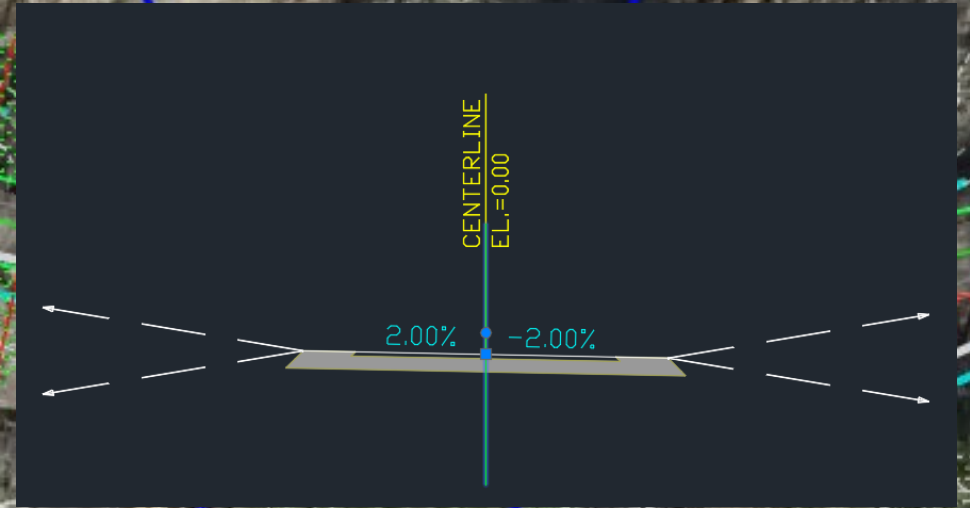
- > Current and past plans
- > Available GIS data
 - > Aerial Photography
 - > Property lines
 - > Roads
 - > Existing greenways and trails
 - > Easements, Zoning, Land Use
 - > Etc.
- > North Carolina Spatial Data Download – QL2
LiDar data to build existing ground surfaces
- > NCFRIS for flood plain mapping data

Feasibility Analysis



Feasibility Analysis

CAD MODEL CORRIDORS

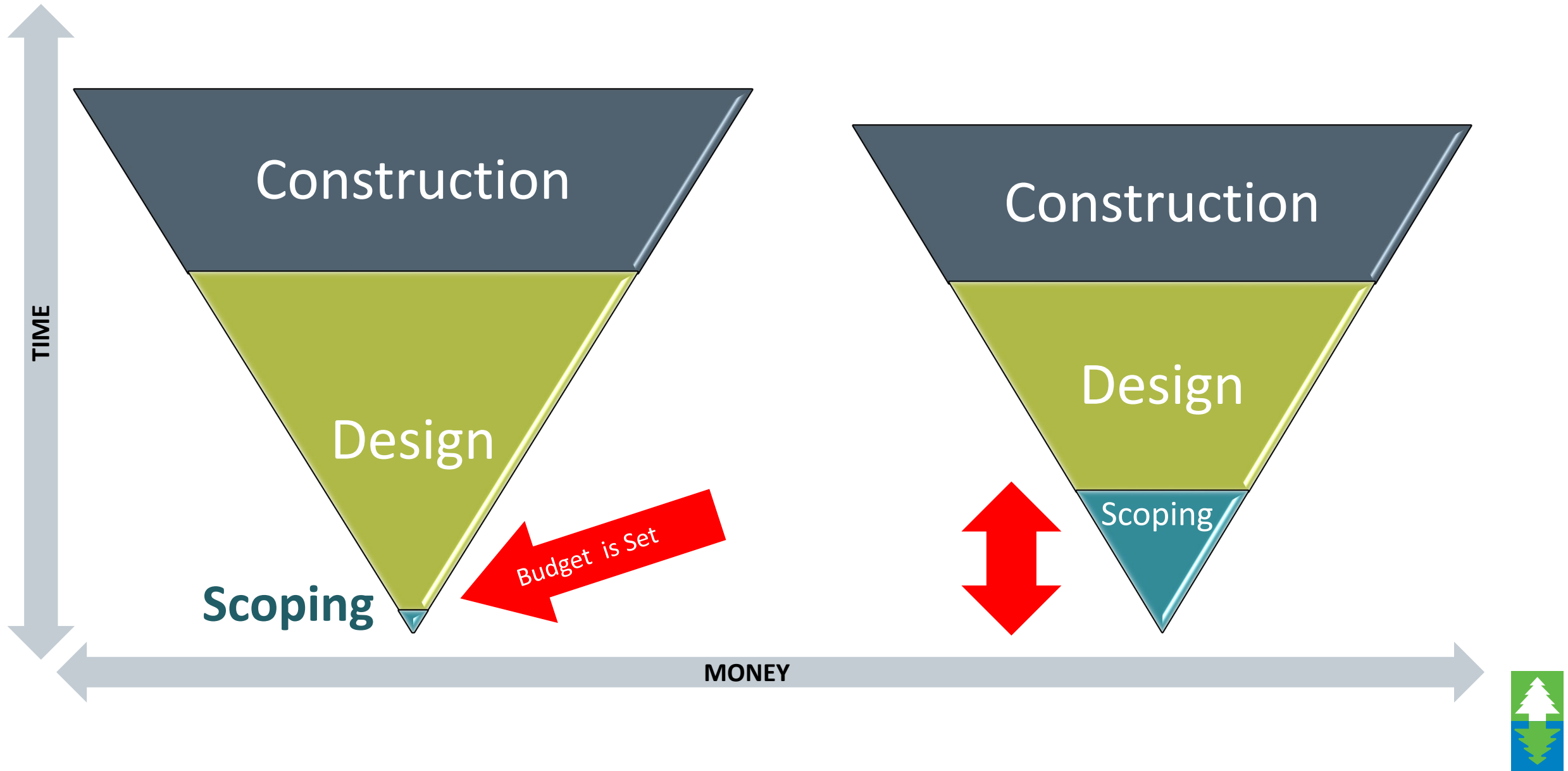


Feasibility Analysis

- > Quantities Generated from Design Model
- > Linear Foot Costs and Unit costs based on bid averages from 10 comparable greenway projects over the last 4 years.
- > Base maps and models are from County GIS data.
- > Easement costs based on Tax land valuations. Applied as a per square foot basis.
- > Escalate costs to future construction year



Scoping is the Foundation



Collect Data

- What kind of data?
 - User counts
 - Economic Surveys
 - Property value trends
- Partner
 - Universities
 - NCDOT
 - MPO/RPOs
- Standardization
- Share your data



User data tells the story of the return on investment on bicycle and pedestrian projects.

Questions?

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