User's Manual

NCDOT

2023 BICYCLE & PEDESTRIAN COST ESTIMATION TOOL PRIORITIZATION 7.0

Prepared for:

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Prepared by:

AECOM

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1.0 Introduction

1.1 Purpose

The primary purpose of the Bicycle & Pedestrian Cost Estimation (BPCE) Tool is to provide Prioritization 7.0 submitters (Metropolitan Planning Organizations, Rural Planning Organizations, and NCDOT Divisions) a quick and easy tool to develop reasonable and comparable bicycle and pedestrian project cost estimates for submittal through the Prioritization 7.0 process.

1.2 Goals

- Be intuitive for submitters to use
- Be able to accommodate those who are unfamiliar with the project design and construction processes
- Be transparent in the calculations it runs
- Produce estimates broken into components to match the inputs needed for SPOT Online
- Produce estimates in a format appropriate for easy explanation to elected and appointed officials
- Be easy to maintain by NCDOT personnel

1.3 Methodology

The BPCE Tool represents a combination of computational technology and cost estimation philosophy. In order to leverage these two areas of expertise, the tool was developed by simultaneously coordinating the technical development of an advanced Microsoft Excel-based tool and the transportation project (theory-based) development of bicycle and pedestrian project cost estimation formulas. Critical in the development of the tool was the desire to take complex computations and simplify them using assumptions based on a minimized number and complexity of user inputs in a format that matched the business needs of the Prioritization 7.0 process.

1.4 Tool Usage and Disclaimers

All costs are based on 2023 prices and cost components are rounded up to the next $1,000.

This tool assumes a project impact area for ROW and environmental mitigation calculations based on chosen SIT, facility type, project length, and project facility width.

This tool assumes the availability of established ecoregion typologies, construction market regions, and average land values specific to North Carolina. They are determined within the tool based on user inputs for project location. This location-based information is used in ROW, construction, and environmental mitigation calculations.

This tool is limited in accuracy by user inputs and the complexity of questions presented for each project. If the inputs are incorrect, the tool's accuracy will be diminished. This tool does not estimate

costs associated with the purchase or taking of buildings within its ROW estimate calculations. It is assumed that projects would require land acquisition only.

Estimates for the construction of new and/or the modification of existing structures (bridges or tunnels) have been simplified to estimate an assumed width of each structure based on the type of feature crossed and other factors. The construction of new and/or modification of existing structures can be exponentially complex based on project specifications. A separate feasibility study is highly recommended to address the high variability associated with structure costs.

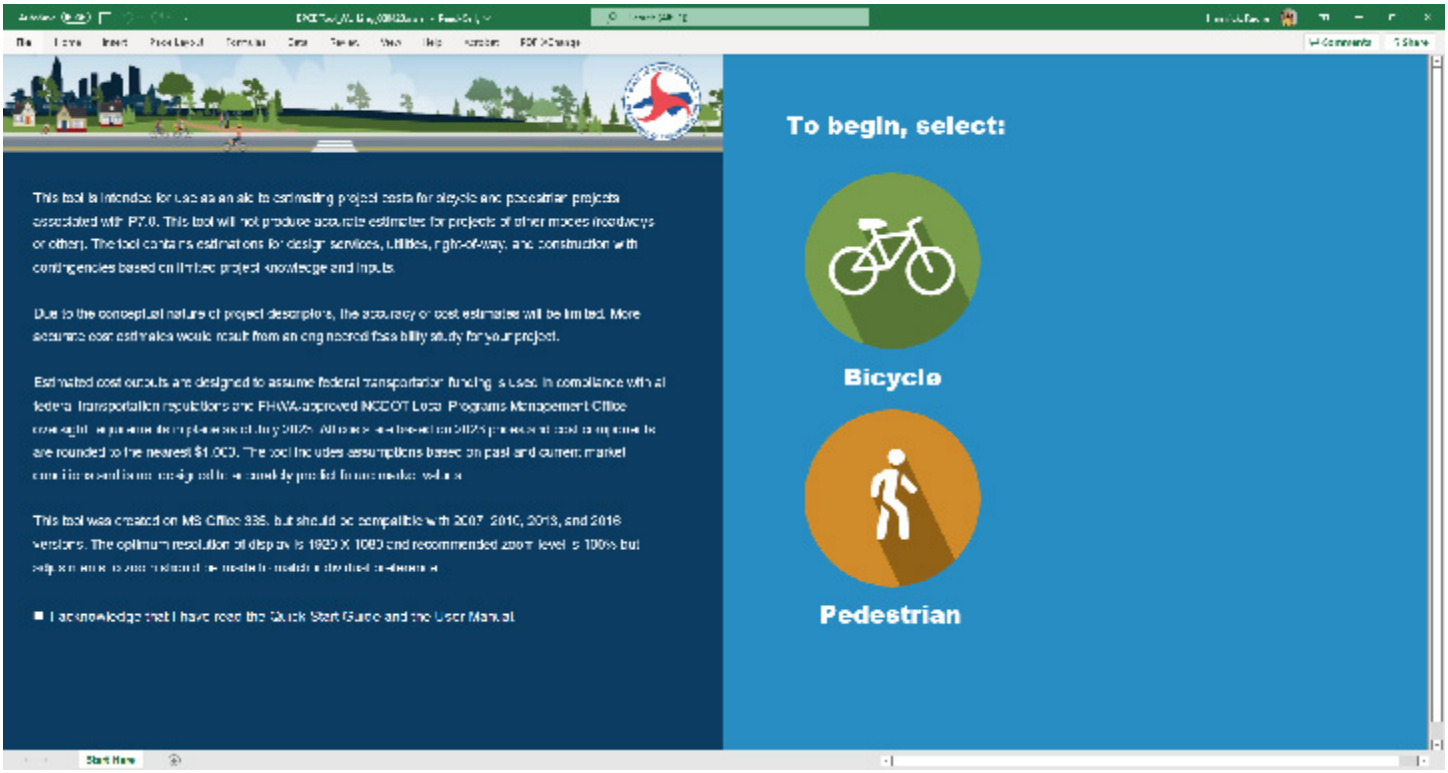
1.5 Assumptions

- Cost estimates for bike lanes (SIT 3) include the cost of re-paving.
- Structure estimates (bridges or tunnels) are ONLY included in SIT 1 or SIT 6. Default widths and lengths will populate in relation to the feature that is being crossed. If there is a situation where you will be crossing more than one feature or the default lengths or widths are incorrect, the defaults can be over-written. If you have a structure that you need estimated as part of your project, you must input the bridge separate from the rest of the project (see FAQ #3).
- The tool does not include calculations for projects requiring substantial grading or retaining walls because of their complexity and varying costs. If your project requires these elements, a detailed engineering estimate is recommended.

2.0 User Manual

The BPCE Tool has been developed with the final user in mind, providing a set of tabs that are intuitive and user friendly. The user interaction is limited to two main tabs where the user provides all the information related to the project:

a. The Start Here tab is used to select the type of project the user needs to cost out. The facility types are based on the Specific Improvement Types (SIT) developed as part of the Prioritization 7.0 process.

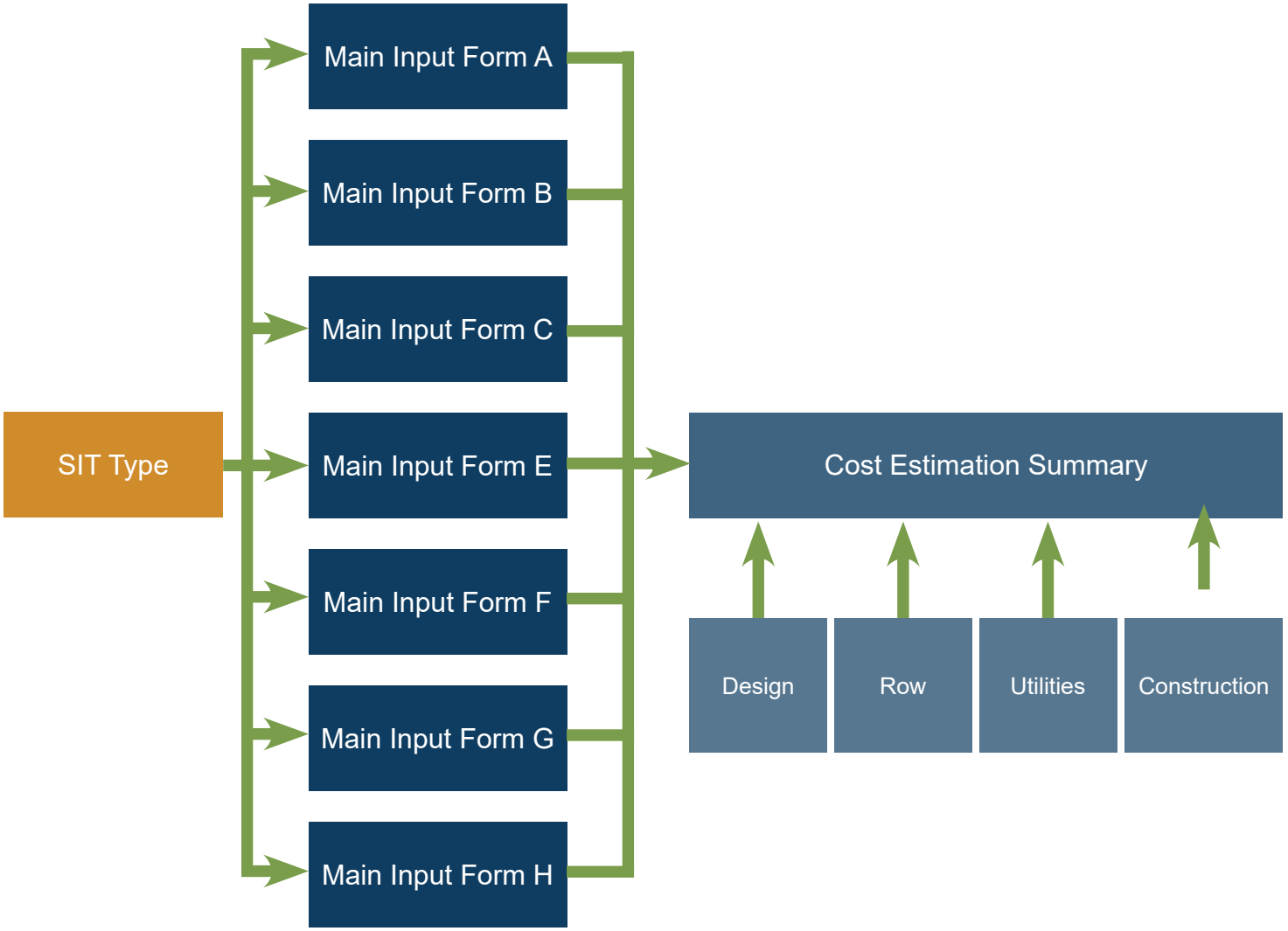


b. The Main Input Form tab, prompted when the user selects a SIT and facility type, where the user provides specific project information required to perform the cost estimation. The Main Input Form tabs are specific to the SIT type.

Main Input Form	SIT	SIT Sub-Category
A	1	New Bicycle Bridge; New Bicycle Tunnel
	6	New Pedestrian Bridge; New Pedestrian Tunnel
B	2	Shared Use Path / Multi-Use Path / Rail-Trail / Sidepath; Contra-Flow Bicycle Lanes / Separated Bicycle Lane; Buffered Bicycle Lane
	3	Bicycle Lane
	4	Paved Shoulder
	7	Shared Use Path / Multi-Use Path / Rail-Trail / Sidepath
C	4	Shared Lane Marking "Sharrow"
D	4	Signage
E	5	Multi-Site Bicycle Facility
F	8	Multi-Site Pedestrian Facility
G	9	Trail Improvement; Sidewalk Widening
H	9	Streetscape / Corridor Improvements

After providing the information requested in the Start Here and Main Input Form tabs, the tool performs all of the calculations in the background and produces a cost estimate for the project.

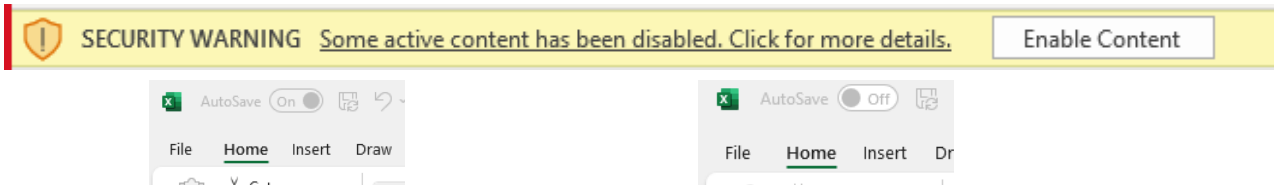
A summary of this process is shown in the graphic below.



Step-by-step guidance to estimate costs is provided on the following pages.

1 Step 1: Enable Content

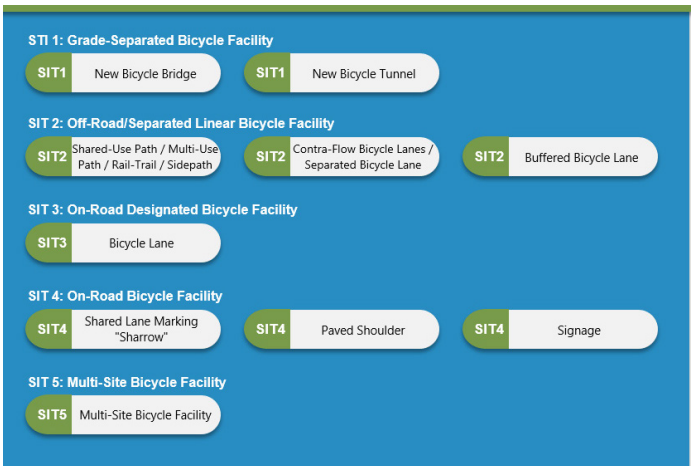
After opening the tool, select "Enable Content" and Turn Auto-Save off



2 Step 2: Choose whether your project is a bicycle or pedestrian project

3 Step 3: Determine the appropriate Specific Improvement Type (SIT) and Facility Type using the tables below, select the appropriate option on the screen, then click 'Proceed with the Current Selection'

All bicycle projects will display in green and all pedestrian projects will display in orange.



Proceed with the Current Selection

The table below describes each one of the SITs and Facility Types included in the tool.

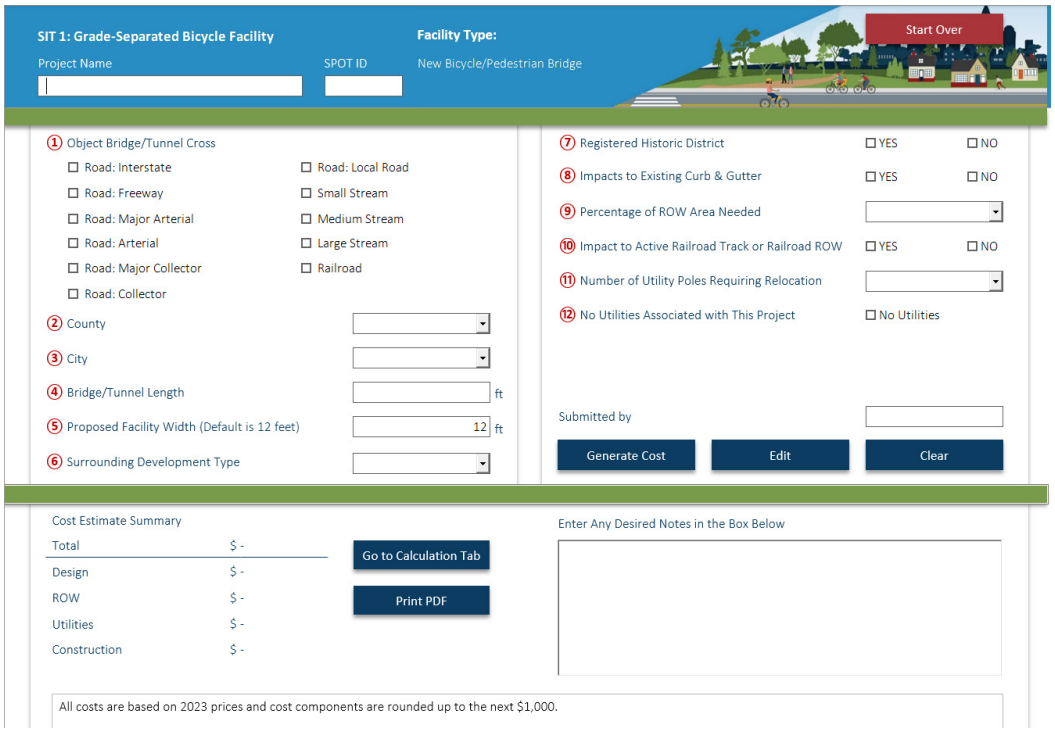
Bicycle Specific Improvement Type (SIT)	Facility Type	Definition
SIT 1: Grade-Separated Bicycle Facility	**New Bicycle Bridge**	An overpass that provides continuity of access. They prevent significant detours for bicyclists due to unsurpassable natural or built barriers. Should be used for standalone bridge projects only.
	New Bicycle Tunnel	An underpass that provides continuity of access.They connect shared use paths across a built or natural barrier. Should be used for stand alone tunnel projects only.
SIT 2: Off-Road/ Separated Linear Bicycle Facility	**Shared-Use Path / Multi-Use Path / Rail-Trail / Sidepath**	A shared-use path is physically separated from motor vehicle traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Most shared-use paths are designated for two-way travel. A rail trail is a shared-use path either paved or unpaved, built within the right-of-way of a former railroad. A sidepath is a shared-use path located immediately adjacent and parallel to a roadway.
	Contra-Flow Bicycle Lanes / Separated Bicycle Lane	Contra-Flow bicycle lanes are lanes designated to allow bicycles to ride in the opposite direction of motor vehicle traffic. Separated bicycle lanes are exclusive bicycle facilities that combine the user experience of a separated path with the on-street infrastructure of a conventional bicycle lane. A separated bicycle lane is physically separated from motor vehicle traffic and distinct from the sidewalk, and may be one-way or two-way.
	Buffered Bicycle Lane	A buffered bicycle lane are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane and/or parking lane.
SIT 3: On-Road Designated Bicycle Facility	**Bicycle Lane**	A bicycle lane is a portion of the roadway that has been designated for preferential or exclusive use for bicyclists by pavement markings and, if used, signs. It is intended for one-way travel, usually in the same direction as the adjacent travel lane, unless designated as a contra-flow lane.

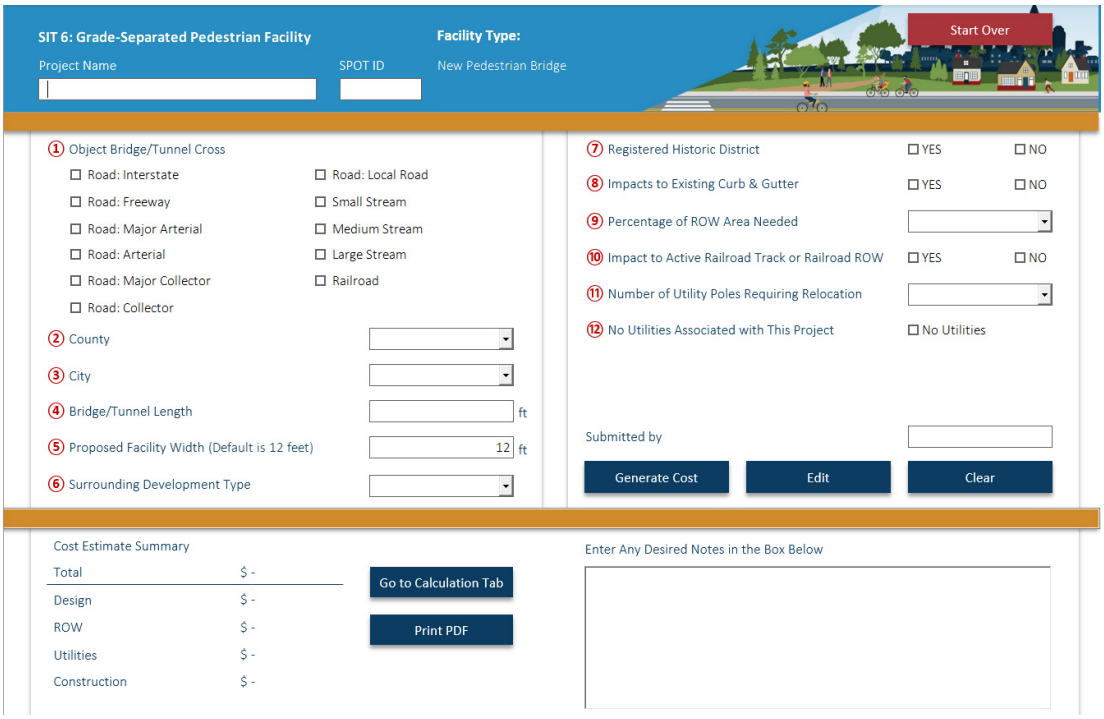
SIT 4: On-Road Bicycle Facility	**Shared Lane Marking "Sharrow"**	A pavement marking symbol that indicates an appropriate bicycle positioning in a shared lane. To maintain a high quality of service in shared-lane markings, "Share the Road" signs or "Bicycle May Use Full Lane" signs should be present.
	Paved Shoulder	The portion of the roadway contiguous with the traveled way that, where paved, are often used by bicyclists. In rural areas, 4-foot-wide paved shoulders are the typical treatment. Where speeds are 55mph and above, 5-foot-wide paved shoulders should be used.
	Signage	A roadway or bikeway designated by the jurisdiction having authority, either with a unique route designation or with bike route signs, along which bicycle guide signs may provide directional and distance information.
SIT 5: Multi-Site Bicycle Facility	**Multi-Site Bicycle Facility**	Improvements to the bicycle infrastructure in terms of parking, lighting, wayfinding, signage, bicycle share, crossings, etc. that can enhance the bicycling experience.

Pedestrian Specific Improvement Type (SIT)	Facility Type	Definition
SIT 6: Grade-Separated Pedestrian Facility	**New Pedestrian Bridge**	An overpass that provides continuity of access. They prevent significant detours for pedestrians due to unsurpassable natural or built barriers. Should be used for standalone bridge projects only.
	New Pedestrian Tunnel	An underpass that provides continuity of access. They connect shared use paths across a built or natural barrier. Should be used for standalone tunnel projects only.
SIT 7: Protected Linear Pedestrian Facility	**Shared-Use Path / Multi-Use Path / Rail-Trail / Sidepath**	A shared-use path is physically separated from motor vehicle traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Most shared-use paths are designated for two-way travel. A rail trail is a shared-use path either paved or unpaved, built within the right-of-way of a former railroad. A sidepath is a shared-use path located immediately adjacent and parallel to a roadway.
	Sidewalk	The portion of a street or highway right-of-way, beyond the curb or edge of roadway pavement, which is intended for use by pedestrians.
SIT 8: Multi-Site Pedestrian Facility	**Multi-Site Pedestrian Facility**	Improvements to the pedestrian infrastructure in terms of accessible signals, crossings islands, wayfinding, crosswalks, etc. that can enhance the pedestrian experience.
SIT 9: Improved Pedestrian Facility	**Trail Improvement**	Improvement to the surface, signage, or crossing facilities along a rail-trail, shared-use path, or multiuse path.
	Sidewalk Widening	Sidewalks can be widened when space allows to improve pedestrian facilities. Recommended sidewalk widths range from 6-12 feet. Narrower sidewalks (5 feet) may be sufficient for local/ subdivision streets in areas with low to medium land use densities.
	Streetscape / Corridor Improvements	Improvements could include crossing islands, curb extensions, intersection markings, lighting, marked crosswalks, mid-block crossings, and sight distance improvements.

4 Step 4: Fill in project data on the Main Input Form

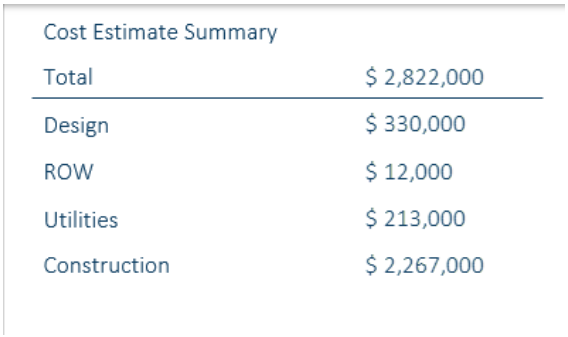
Please see the appendix for an explanation of the main input forms.





5 Step 5: Generate Cost

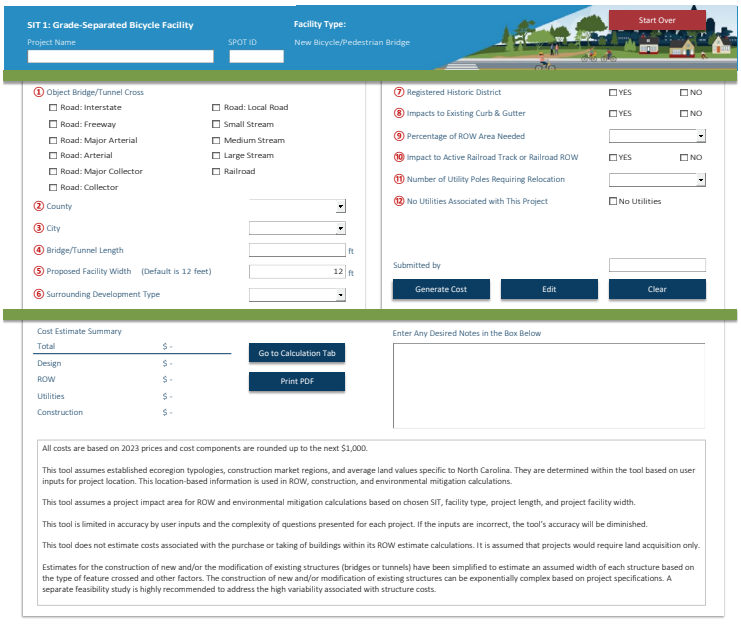
For more detail, please see step 6.



6 Step 6: Go to calculation tab

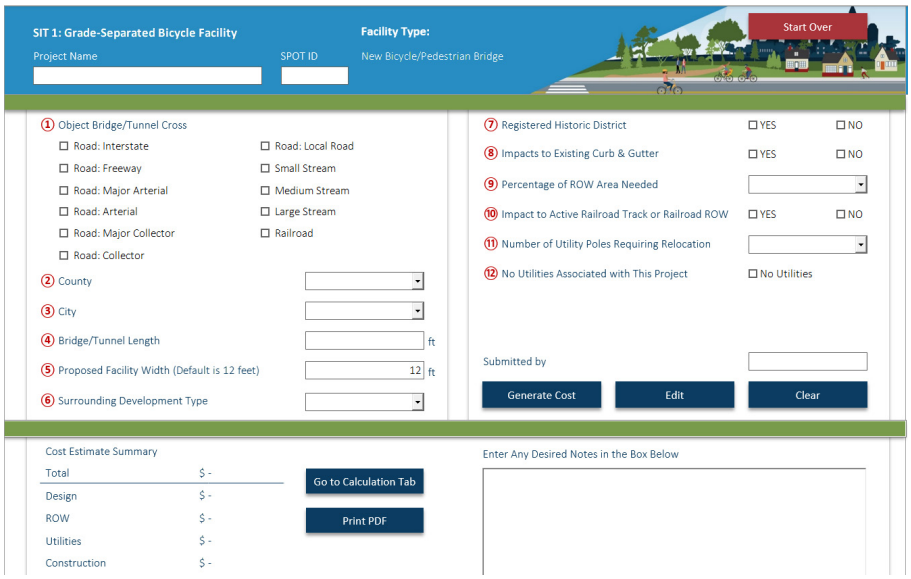
The calculation tab shows the inputs from the user and how they are used in calculations to compute estimated project cost.

7 Step 7: Print PDF



GUIDANCE

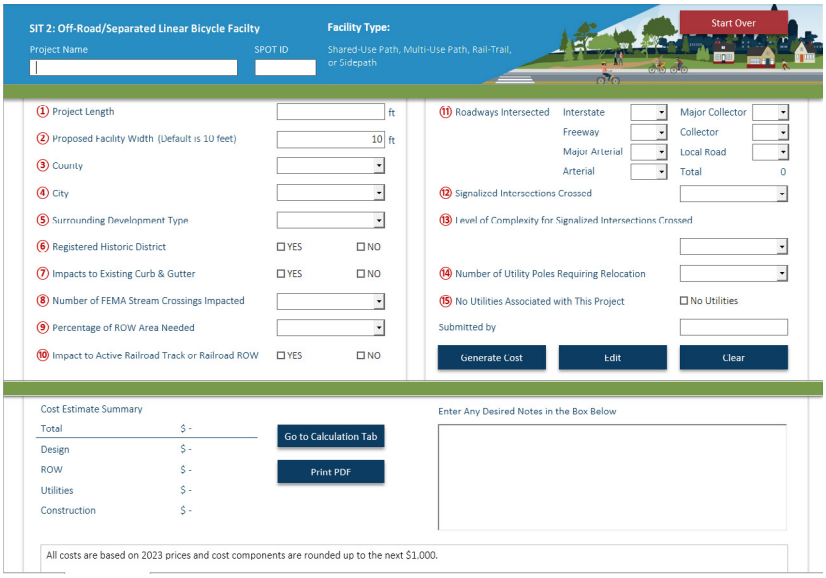
MAIN INPUT FORM A- SIT 1, SIT 6



1. **Object Bridge/Tunnel Cross** – Indicate what type of feature your project is crossing. If your project crosses more than one feature, choose all that apply. For this item, a small stream is considered less than 15 feet wide, a medium stream is 15-75 feet wide, and a large stream is greater than 75 feet wide.
2. **County –** Choose the county where the project is located.
3. **City –** Choose the city where the project is located.
4. **Bridge/Tunnel Length –** This is the length of your project. If there is more to the project than just the bridge or tunnel (for example, a connecting sidewalk or multi-use path), the portion of the project that is not grade-separated should be put into the tool separately and the costs combined for the total project cost. This input form is intended to calculate structure cost and will inflate your project cost significantly if portions that are not elevated or tunneled are included.
5. **Proposed Facility Width (Default is 12 feet) –** The tool will default to a 12-foot width for tunnels and bridges. The default width can be manually changed if needed.
6. **Surrounding Development Type –** The options for surrounding development type include forested, rural, industrial, commercial, urban, downtown, and suburban. This question is tied to multipliers within the calculation tab that generally increase with more intense development types (industrial, commercial, downtown, urban) and decrease for suburban, rural, and forested. The exception to that is in the case of environmental costs which increase in more rural, undeveloped areas.
7. **Registered Historic District –** Answer yes if your project is within a historic district listed on the National Register of Historic Places, or a local register of historic properties. If this is unknown, select 'no'.

8. **Impacts to Existing Curb & Gutter –** Answer 'yes' if there is an existing curb & gutter drainage system that will be impacted by your project. Impacts may include items such as changes to contributing drainage area, changes to roadway elevations, or addition/removal of drainage system components. If there is curb & gutter but it will remain undisturbed by your project (for example, sharrows, striping, placement of sidewalk on top of an existing system), select 'no'. Selecting 'yes' adds design and construction costs to your project.
9. **Percentage of ROW Area Needed –** The options for percentage of ROW area needed include none (0%), minimal (1%-15%), medium (15%-25%), large (25%-60%), significant (60%-80%), and total (80%-100%). Calculate the percentage of your total project area that would need to be acquired. For example, if you have a 500-foot-long project with a facility width of 10 feet, your total area is 5,000 square feet. If you know you need to purchase 1,000 square feet of ROW, that is 20% of ROW area that you need and you would select 'medium'. If there is no ROW acquisition required, select 'none' and if you need to purchase all the ROW needed for the project, select 'total'.
10. **Impact to Active Railroad Track or Railroad ROW –** If your project crosses an active track or ROW, select 'yes'. If your project is near a track or ROW but will not cross or touch the ROW or track, select 'no'. Selection of 'yes' to this question adds design and construction costs to your estimate.
11. **Number of Utility Poles Requiring Relocation –** Select the number of utility poles that would be relocated by your project. These may include transmission lines, distribution lines, street lighting and other poles. If unknown, resources such as Google Earth or Google Maps Street View may be helpful in determining the presence of utility poles along your project. Select '0' if no poles will be impacted.
12. **No Utilities Associated with this Project –** Check this box if you know that your project will have no utility impacts regardless of their presence. If left unchecked, the tool will assume costs associated with utility impacts based on the length and width of your project.

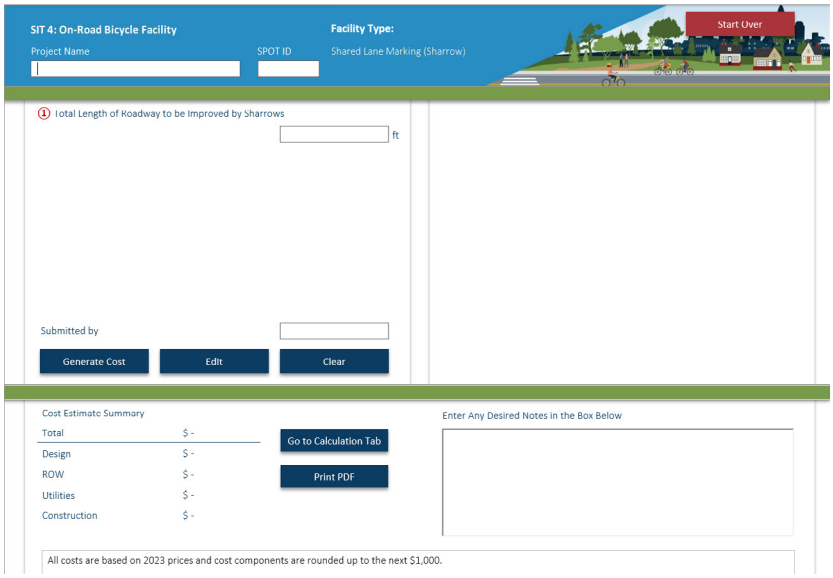
MAIN INPUT FORM B- SIT 2, SIT 3, SIT 4 (Paved Shoulder), SIT 7



1. **Project Length –** Input the length of your project in feet.
2. **Proposed Facility Width (Default is 14 feet) –** The tool will default to a 14-foot width for an off-road/separated linear bicycle facility. The default width can be manually changed if needed.
3. **County –** Choose the county where the project is located.
4. **City –** Choose the city where the project is located.
5. **Surrounding Development Type –** The options for surrounding development type include forested, rural, industrial, commercial, urban, downtown, and suburban. This question is tied to multipliers within the calculation tab that generally increase with more intense development types (industrial, commercial, downtown, urban) and decrease for suburban, rural, and forested. The exception to that is in the case of environmental costs which increase in more rural, undeveloped areas.
6. **Registered Historic District –** Answer yes if your project is within a historic district listed on the National Register of Historic Places, or a local register of historic properties. If this is unknown, select 'no'.
7. **Impacts to Existing Curb & Gutter –** Answer 'yes' if there is an existing curb & gutter drainage system that will be impacted by your project. Impacts may include items such as changes to contributing drainage area, changes to roadway elevations, or addition/removal of drainage system components. If there is curb & gutter but it will remain undisturbed by your project (for example, sharrows, striping, placement of sidewalk on top of an existing system), select 'no'. Selecting 'yes' adds design and construction costs to your project.

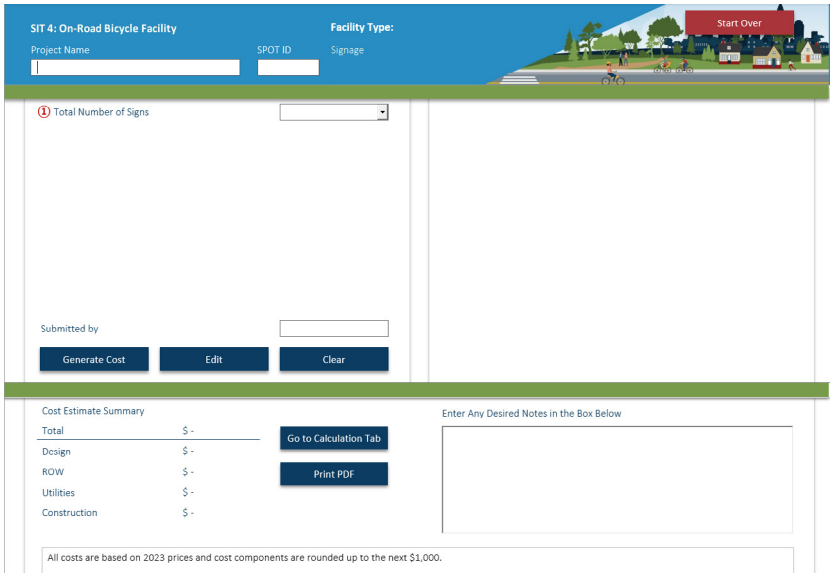
8. **Number of FEMA Stream Crossings Impacted –** Select the number of FEMA delineated streams your project will cross. FEMA delineation of a stream channel can be verified with the North Carolina Flood Risk Information System at https://fris.nc.gov/fris/Home.aspx?ST=NC. Select '0' if your project will not impact any stream or stream crossing structure on a FEMA delineated stream channel. If any impact to an existing FEMA stream or FEMA established floodway is anticipated, indicate the number of impacted crossings.
9. **Percentage of ROW Area Needed –** The options for percentage of ROW area needed include none (0%), minimal (1%-15%), medium (15%-25%), large (25%-60%), significant (60%-80%), and total (80%-100%). Calculate the percentage of your total project area that would need to be acquired. For example, if you have a 500-foot-long project with a facility width of 10 feet, your total area is 5,000 square feet. If you know you need to purchase 1,000 square feet of ROW, that is 20% of ROW area that you need and you would select 'medium'. If there is no ROW acquisition required, select 'none' and if you need to purchase all the ROW needed for the project, select 'total'.
10. **Impact to Active Railroad Track or Railroad ROW –** If your project crosses an active track or ROW, select 'yes'. If your project is near a track or ROW but will not cross or touch the ROW or track, select 'no'. Selection of 'yes' to this question adds design and construction costs to your estimate.
11. **Roadways Intersected –** Select the appropriate number of each type of roadway your project will cross. Options include interstate, freeway, major arterial, arterial, major collector, collector, and local road.
12. **Signalized Intersections Crossed –** If any of the intersections that your project will cross are signalized, indicate the number. Select '0' if none are signalized or if you have no intersections.
13. **Level of Complexity for Signalized Intersections Crossed –** The options for level of complexity for signalized intersections crossed include simple, complicated, and N/A. Simple intersections are typically 3 or 4 legged intersections with 1-lane in each direction and no separated left turn lanes (or something similar). Complex intersections include multiple through-lanes and separate right and left turn lanes with protected phase or protected turn/split phase signals. Reduced conflict intersections, or a superstreet configuration, would also be considered a complex intersection. Select N/A if there are no intersections associated with your project.
14. **Number of Utility Poles Requiring Relocation –** Select the number of poles that would be relocated by your project. If unknown, resources such as Google Earth or Google Maps Street View may be helpful in determining the presence of utility poles along your project. Select '0' if no poles will be impacted.
15. **No Utilities Associated with this Project –** Check this box if you know that your project will have no utility impacts regardless of their presence. If left unchecked, the tool will assume costs associated with utility impacts based on the length and width of your project.

MAIN INPUT FORM C- SIT 4 (Shared Lane Marking "Sharrow")



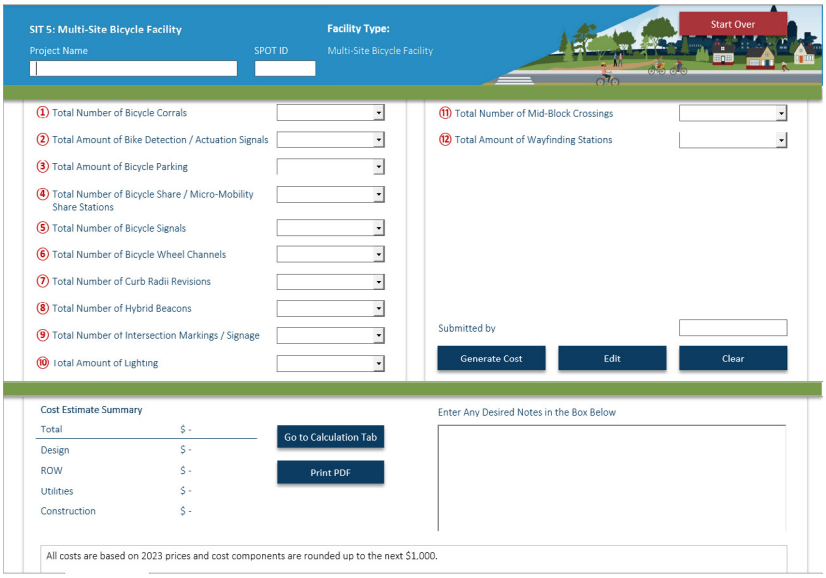
1. **Total Length of Roadway to be Improved by Sharrows –** Input the length of your project in feet. The tool will use the length to estimate sharrows at a standard spacing of 250 feet using a unit cost.

MAIN INPUT FORM D- SIT 4 (Signage)



1. **Total Number of Signs –** Indicate the total number of signs that your project includes. The tool will use a unit cost to provide an estimate.

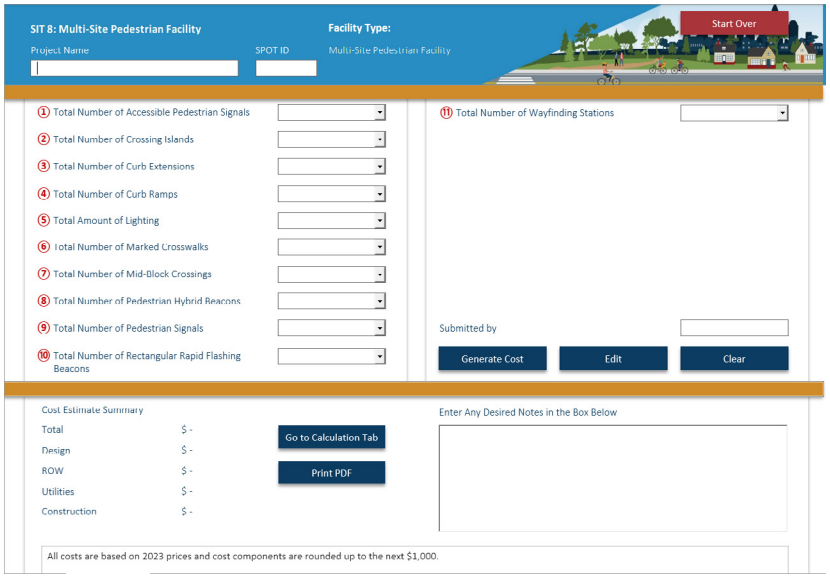
MAIN INPUT FORM E- SIT 5



1. **Total Number of Bicycle Corrals –** Enter the total number of bicycle corrals included in your project. The tool will use a unit cost to provide an estimate.
2. **Total Amount of Bike Detection/Actuation Signals –** Enter the total amount of bike detection/ actuation signals included in your project. The tool will use a unit cost to provide an estimate.
3. **Total Amount of Bicycle Parking –** Enter the total amount of bicycle parking included in your project. The tool will use a unit cost to provide an estimate for a bike rack accommodating six bikes.
4. **Total Number of Bicycle Share/Micro-Mobility Share Stations –** Enter the total number of bicycle share stations included in your project. The tool will use a unit cost to provide an estimate.
5. **Total Number of Bicycle Signals –** Enter the total number of bicycle head signals included in your project. The tool will use a unit cost to provide an estimate.
6. **Total Number of Bicycle Wheel Channels –** Enter the total number of bicycle wheel channels (runnels used to help cyclists walk the bikes up flights of stairs) included in your project. The tool will use a unit cost to provide an estimate. Example of a wheel channel: https://cyclesafe.com/wp-content/uploads/2019/01/bike-stair-ramp.jpg.
7. **Total Number of Curb Radii Revisions –** Enter the total number of curb radii (curvature along the curb line) revisions included in your project. The tool will use a unit cost to provide an estimate.
8. **Total Number of Hybrid Beacons –** Enter the total number of hybrid beacons included in your project. The tool will use a unit cost to provide an estimate.
9. **Total Number of Intersection Markings/Signage –** Enter the total number of intersection markings/signage included in your project. The tool will use a unit cost to provide an estimate.
10. **Total Amount of Lighting –** Enter the total amount of pedestrian level light poles included in your project. The tool will use a unit cost to provide an estimate.

11. **Total Number of Mid-Block Crossings –** Enter the total number of mid-block crossings included in your project. The tool will use a unit cost to provide an estimate.
12. **Total Amount of Wayfinding Stations –** Enter the total amount of wayfinding stations included in your project. The tool will use a unit cost to provide an estimate.

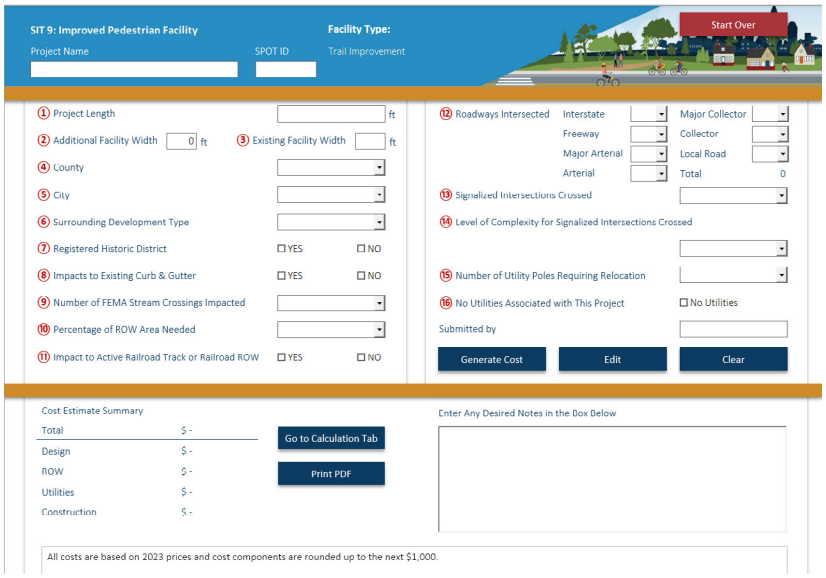
MAIN INPUT FORM F- SIT 8



1. **Total Number of Accessible Pedestrian Signals –** Enter the total number of accessible pedestrian head signals included in your project. The tool will use a unit cost to provide an estimate.
2. **Total Number of Crossing Islands –** Enter the total number of crossing islands (pedestrian refuges) included in your project. The tool will use a unit cost to provide an estimate.
3. **Total Number of Curb Extensions –** Enter the total number of curb extensions included in your project. The tool will use a unit cost to provide an estimate.
4. **Total Number of Curb Ramps –** Enter the total number of curb ramps included in your project. The tool will use a unit cost to provide an estimate. Each unit assumes the grading of the sidewalk and the installation of truncated dome pads.
5. **Total Amount of Lighting –** Enter the total amount of pedestrian level light poles included in your project. The tool will use a unit cost to provide an estimate.
6. **Total Number of Marked Crosswalks –** Enter the total number of marked crosswalks included in your project. The tool will use a unit cost to provide an estimate.
7. **Total Number of Mid-Block Crossings –** Enter the total number of mid-block crossings included in your project. The tool will use a unit cost to provide an estimate.

8. **Total Number of Pedestrian Hybrid Beacons –** Enter the total number of pedestrian hybrid beacons included in your project. The tool will use a unit cost to provide an estimate.
9. **Total Number of Pedestrian Signals –** Enter the total number of pedestrian signals included in your project. The tool will use a unit cost to provide an estimate.
10. **Total Number of Rectangular Rapid Flashing Beacons –** Enter the total number of rectangular rapid flashing beacons included in your project. The tool will use a unit cost to provide an estimate.
11. **Total Number of Wayfinding Stations –** Enter the total number of wayfinding stations included in your project. The tool will use a unit cost to provide an estimate.

MAIN INPUT FORM G- SIT 9 (Trail Improvement, Sidewalk Widening)

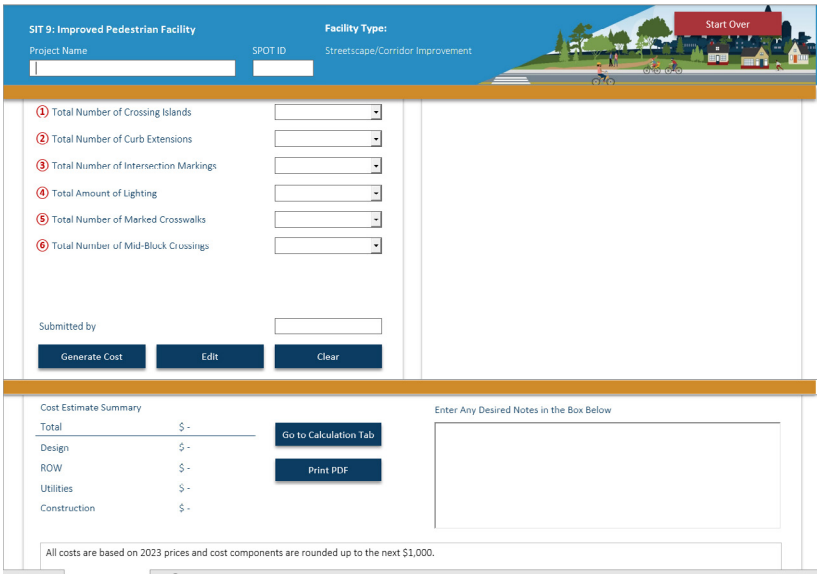


1. **Project Length –** Input the length of your project in feet.
2. **Additional Facility Width –** Input the added width in feet that is proposed (if applicable) to the existing width. This should be the total additional width (include both sides).
3. **Existing Facility Width –** Input the width of the existing facility in feet.
4. **County –** Choose the county where the project is located.
5. **City –** Choose the city where the project is located.
6. **Surrounding Development Type –** The options for surrounding development type include forested, rural, industrial, commercial, urban, downtown, and suburban. This question is tied to multipliers within the calculation tab that generally increase with more intense development types (industrial, commercial, downtown, urban) and decrease for suburban, rural, and forested. The exception to that is in the case of environmental costs which increase in more rural, undeveloped areas.
7. **Registered Historic District –** Answer yes if your project is within a registered historic district and will have impacts to the district. If this is unknown, select 'no'.
8. **Impacts to Existing Curb & Gutter –** Answer 'yes' if there is an existing curb & gutter drainage system that will be impacted by your project. Impacts may include items such as changes to contributing drainage area, changes to roadway elevations, or addition/removal of drainage system components. If there is curb & gutter but it will remain undisturbed by your project (for example, sharrows, striping, placement of sidewalk on top of an existing system), select 'no'. Selecting 'yes' adds design and construction costs to your project.
9. **Number of FEMA Stream Crossings Impacted–** Select the number of FEMA delineated streams your project will cross. FEMA delineation of a stream channel can be verified with the North Carolina Flood Risk Information System at https://fris.nc.gov/fris/Home.aspx?ST=NC. Select '0' if your project will not impact any stream or stream crossing structure on a FEMA delineated stream

channel. If any impact to an existing FEMA stream or FEMA established floodway is anticipated, indicate the number of impacted crossings.

10. **Percentage of ROW Area Needed –** The options for percentage of ROW area needed include none (0%), minimal (1%-15%), medium (15%-25%), large (25%-60%), significant (60%-80%), and total (80%-100%). Calculate the percentage of your total project area that would need to be acquired. For example, if you have a 500-foot-long project with a facility width of 10 feet, your total area is 5,000 square feet. If you know you need to purchase 1,000 square feet of ROW, that is 20% of ROW area that you need and you would select 'medium'. If there is no ROW acquisition required, select 'none' and if you need to purchase all the ROW needed for the project, select 'total'.
11. **Impact to Active Railroad Track or Railroad ROW –** If your project crosses an active track or ROW, select 'yes'. If your project is near a track or ROW but will not cross or touch the ROW or track, select 'no'. Selection of 'yes' to this question adds design and construction costs to your estimate.
12. **Roadways Intersected –** Select the appropriate number of each type of roadway your project will cross. Options include interstate, freeway, major arterial, arterial, major collector, collector, and local road.
13. **Signalized Intersections Crossed –** If any of the intersections that your project will cross are signalized, indicate the number. Select '0' if none are signalized or if you have no intersections.
14. **Level of Complexity for Signalized Intersections Crossed –** The options for level of complexity for signalized intersections crossed include simple, complicated, and N/A. Simple intersections are typically 3 or 4 legged intersections with 1-lane in each direction and no separated left turn lanes (or something similar). Complex intersections include multiple through-lanes and separate right and left turn lanes with protect phase signals. Reduced conflict intersections, or a superstreet configuration, would also be considered a complex intersection. Select N/A if there are no intersections associated with your project.
15. **Number of Utility Poles Requiring Relocation –** Select the number of poles that would be relocated by your project. If unknown, resources such as Google Earth or Google Maps Street View may be helpful in determining the presence of utility poles along your project. Select '0' if no poles will be impacted.
16. **No Utilities Associated with this Project –** Check this box if you know that your project will have no utility impacts regardless of their presence. If left unchecked, the tool will assume costs associated with utility impacts based on the length and width of your project.

MAIN INPUT FORM H- SIT 9 (Streetscape / Corridor Improvements)



1. **Total Number of Crossing Islands –** Enter the total number of crossing islands included in your project. The tool will use a unit cost to provide an estimate.
2. **Total Number of Curb Extensions –** Enter the total number of curb extensions included in your project. The tool will use a unit cost to provide an estimate.
3. **Total Number of Intersection Markings –** Enter the total number of intersection markings included in your project. The tool will use a unit cost to provide an estimate.
4. **Total Amount of Lighting –** Enter the total amount of pedestrian level light poles included in your project. The tool will use a unit cost to provide an estimate.
5. **Total Number of Marked Crosswalks –** Enter the total number of marked crosswalks included in your project. The tool will use a unit cost to provide an estimate.
6. **Total Number of Mid-Block Crossings –** Enter the total number of mid-block crossings included in your project. The tool will use a unit cost to provide an estimate.

FAQ's

1. What do I do for bicycle and pedestrian projects that occur on both sides of the road?

If your project occurs on both sides of the road, you should add the total linear feet on both sides and use that to input into the tool. For example, if you are building a sidewalk with 300 feet on one side of the road, and 200 feet on the other, you would use 500 feet as your project length. This will ensure that the appropriate design and construction costs are applied to the project. If you have features on both sides of the road that are not the same (sidewalk and multi-use path), see #2 below.

2. What do I do if I have a sidewalk on one side of the road and a multi-use path, or other feature (bike lane, etc.) on the other side or have a project with a varying width?

If your project occurs on both sides of the road and is a different SIT on each side, you should treat your project as two separate projects. Run the tool for each project individually and then add them together. If your project is the same SIT type, but varies in width, you can either run it as two separate projects, or you can develop an average width. For example, if you have 200 feet of a 5-foot sidewalk and 200 feet of a 4-foot sidewalk, you can add the total square footage and then divide by the length to determine an average width that can be used in the tool with the total project length of 400 feet. 1,000 ft^2 + 800 ft^2 = 1,800 ft^2 / 400' (total project length) = 4.5' wide sidewalk

3. What do I do if I have a bicycle or pedestrian bridge or tunnel as part of a larger project?

Cost estimates for structures (bridges or tunnels) are ONLY a part of calculations for SIT 1 and SIT 6. If you have a standalone bridge or tunnel as your project, you will choose one of these two SITs. However, if you have a larger project that contains a bridge or a tunnel, you will need to subtract the bridge or tunnel length from your total project length andcalculate it as two separate projects within the tool. For example, if you have a 2,000-foot-long multi-use path that contains a 200-foot-long bridge, calculate SIT 2 or SIT 7 (multi-use path) for 1,800 feet and SIT 1 or SIT 6 (bridge) for 200 feet.

4. What do I do if I have a road diet?

If you have a road diet project that includes widening the roadway, this tool should not be used, this tool is designed for bicycle/pedestrian projects only. If the road diet project consists of improvements across many SIT types, each SIT type should be calculated separately. For example, if the road diet includes bike lanes, sidewalks, and signage, you should be calculating three separate costs using SIT 3 (note that SIT 3 assumes repaving), SIT 7, and SIT 4.

5. What do I do if I am adding ADA features (ramps) to the corner of a sidewalk?

Each ramp should be considered a single item. For example, if you are adding two ramps on a single corner, two ramps should be input into the tool (SIT 8, input field #4).

6. What do I do about utilities if I need to split my project into more than one estimate?

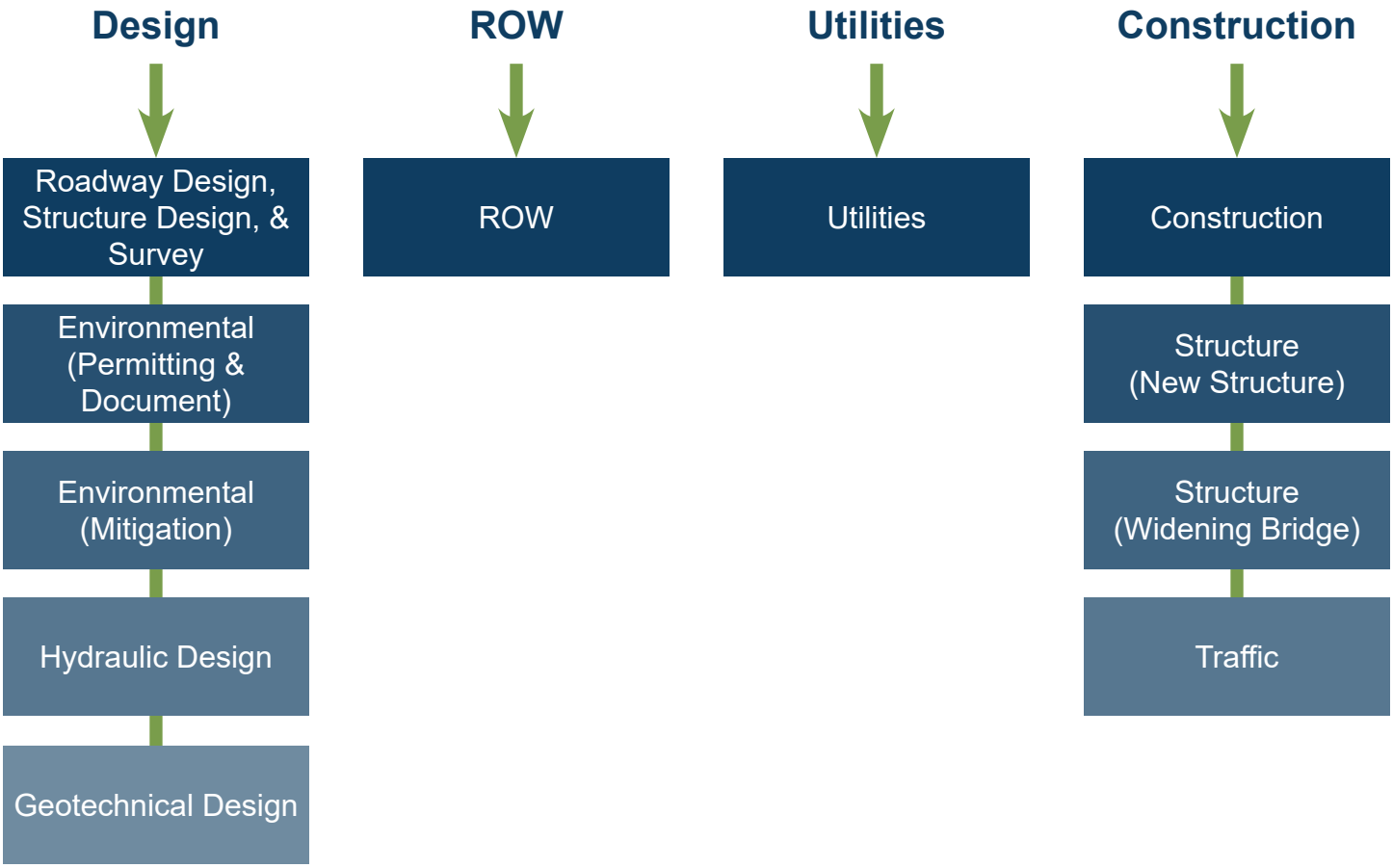
If your two (or more) project areas overlap or will impact the same utilities, only calculate utilities for one of the projects. If your project areas are consecutive or on opposite sides of the road, then calculate utilities within each estimate separately.

3.0 Calculation Tab

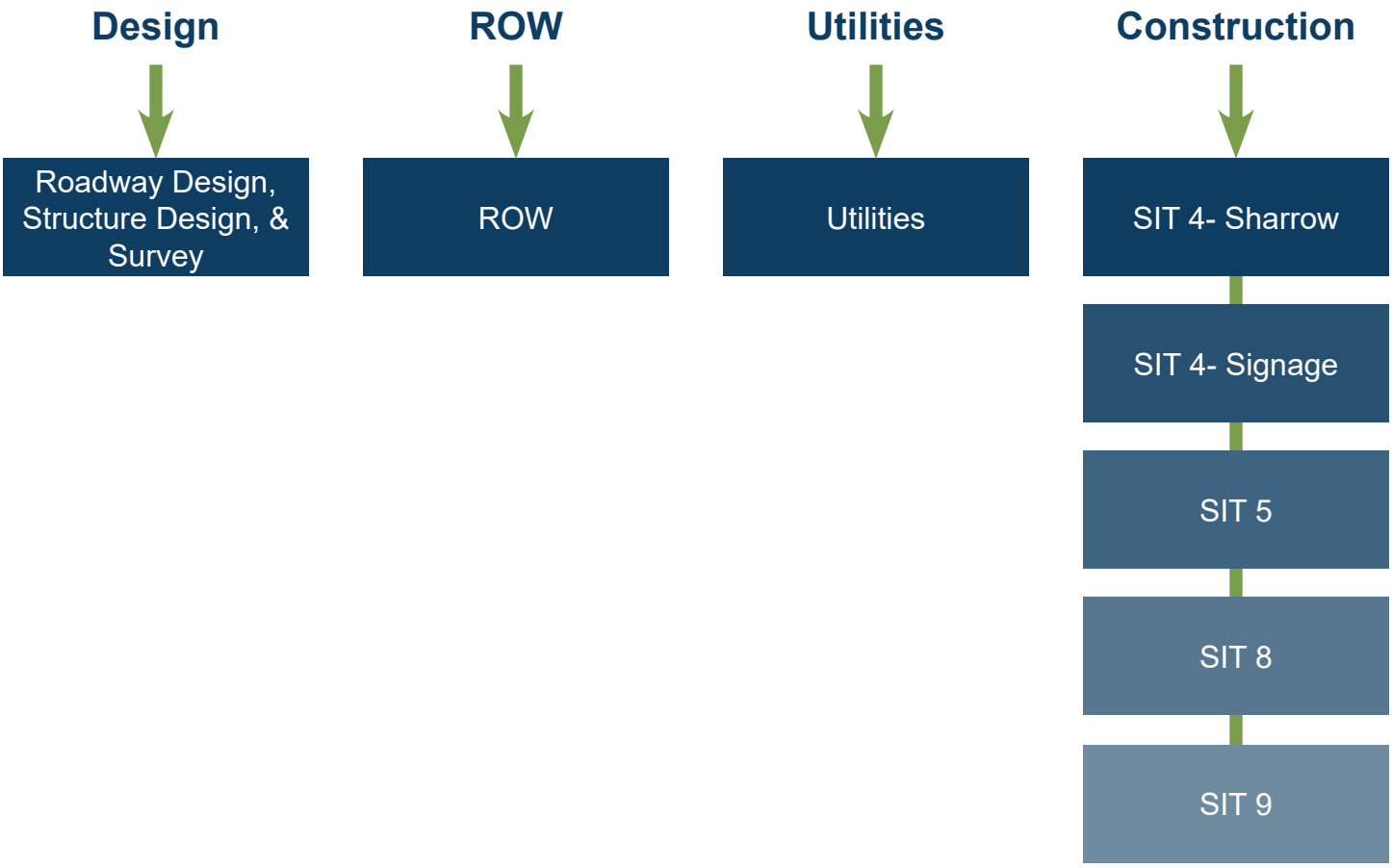
The tool features two Calculation tabs, Calculation I for SITs 1, 2, 3, 4, 6, 7 and 9, and Calculation II for SITs 4, 5, 8 and 9. The Calculation tabs detail the results of the calculations used to produce the Cost Estimate Summary shown on the Main Input Form. The Calculation tabs are for viewing only. All inputs must be modified in the Main Input Form tabs.

The Calculation tabs provide cost details for the following elements: Design, ROW, Utilities, and Construction. Each element is composed of disciplines needed to generate the total project cost and each discipline has an associated formula that determines the cost for that discipline.

Calculation I is composed of the following elements:

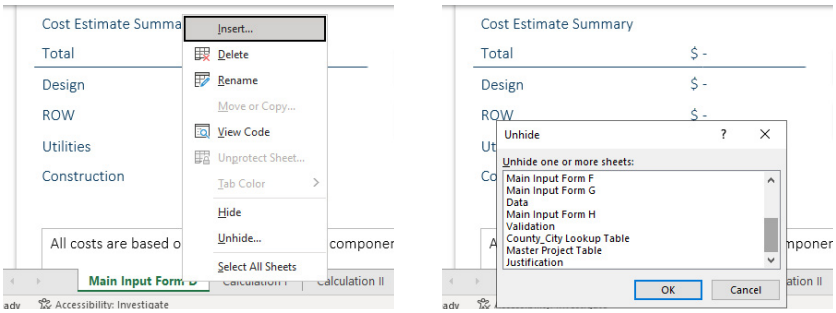


Calculation II is composed of the following elements:



4.0 Other Tabs (Background Elements Tabs)

The Background Elements Tabs will not be in view when the tool is opened by the user. These can be unhidden for viewing only (they cannot be changed or edited) by right clicking on any of the tabs at the bottom of the worksheet. All of the calculations in the tool are performed in the background. In order to help with this process, six additional tabs have been developed as part of the tool: Validation tab, Data tab, County Lookup Table tab, City Lookup Table tab, Master Project Table tab, and Justification tab.



Validation tab: this tab displays the values that define the selection for each one of the drop down menus. County, City, and Development Type will determine the assumptions associated with project location. Percentage of ROW Area Needed will trigger the ROW calculations.

Data tab: this tab contains all of the inputs the user enters in any of the Main Input Forms. Within this tab, all of the basic calculations begin.

County Lookup Table tab: this tab connects the counties with the ecoregions where they are located and their land value. For the purpose of this tool, four ecoregions have been considered: CAMA, Coastal Plain, Piedmont, and Trout.

Every county in the state of North Carolina is associated with an ecoregion and to a specific land value. Land values have been calculated based on the average land value in the county and have been assigned a High or Normal value. This helps the tool determine if additional considerations must be made regarding the cost of ROW acquisition.

City Lookup Table tab: this tab defines Construction Market Regions (CMR), and specifies distances from each city in North Carolina to those CMR centers. Based on those two elements, a CMR Factor and a Distance Factor are assigned to each city.

Master Project Table tab: this tab includes assumptions related to the Default Facility Width, Incremental Width, Construction Unit Cost, Environmental Mitigation, and Hydraulic Cost associated with each one of the SITs and the associated improvements, establishing linkages to each one of the SITs to a Main Input Form.

Justification tab: this tab is a matrix where the input-based elements are associated with each one of the components required to generate the cost estimate. The individual components contain the assumptions made to generate costs based on a number of factors, such as the region, the ROW area needed, project size, etc. for the different types of improvements.