



Attachment 2

Cost Estimate Information

Note: This cost estimate is based on the Route 28 Environmental Study limits for Alternative 4 (from Liberia Avenue to North of Bull Run)

**VDOT PCES Documentation
Roadway and Bridge Estimates**

 **Project Cost Estimating System**
Draft Estimate 

ENTER PROJECT DATA REQUIRED TO COMPUTE A DRAFT ESTIMATE

District:	<input type="text" value="NORTHERN VIRGINIA"/>
Project Number:	<input type="text" value="N/A"/>
UPC:	<input type="text" value="N/A"/>
Project Manager:	<input type="text" value="Parsons"/>
Project Description:	<input type="text" value="Route 28"/>



Project Cost Estimating System SUMMARY PAGE

DISTRICT	NORTHERN VIRGINIA		
PROJECT NUMBER	N/A		
CONSTRUCTION END YEAR	FY2025	UPC	N/A
AD YEAR	FY2019	RATE OF INFLATION TO AD	N/A
ESTIMATE YEAR	FY2019	INFLATION RATE DURING CN	8.58%
Date of previous estimate	N/A		
PROJECT MANAGER / DESIGNER	Parsons		
Preliminary Engineering Estimate:	PCES		
Construction Estimate:	PCES		
Right-of-Way Estimate:	MANUAL		
Utilities Estimate:	MANUAL		
DATE	2/12/2020		

THE FOLLOWING DATA WILL BE PROVIDED UPON COMPLETION OF THE REMAINDER OF THE WORKBOOK, WHICH IS ACCESSED BY SELECTING THE CONST, RW, & UTIL TABS BELOW

Bridge PE ESTIMATE	\$0
Bridge CN ESTIMATE	\$0
Bridge RW ESTIMATE	\$0
PRELIMINARY ENGINEERING ESTIMATE (excluding Bridge PE)	\$4,894,996
CONSTRUCTION ESTIMATE (excluding Bridge CN)	\$66,440,123
RIGHT-OF-WAY & UTILITIES ESTIMATE(excluding Bridge RW)	\$0
TOTAL PROJECT ESTIMATE (excluding Bridge estimate)	\$71,335,119

Project No. **** MISSING DATA ****

Interstate Project ?

Route Number Primary Highway

	CONST-1	CONST-2	Total
Geometric Standard	GS-5		
Construction Base	\$54,388,842	\$0	\$54,388,842
Bridge Removal			\$0
CE	\$6,798,605		\$6,798,605
Construction Estimate (2019)	\$61,187,447		\$61,187,447
To AdYear Inflation			\$0
Mid-point construction Inflation			\$5,252,676
Total Construction Estimate			\$66,440,123
Preliminary Engineering Cost	\$4,894,996		\$4,894,996

CONSTRUCTION & PE TOTALS

Total Construction Estimate **\$66,440,123** **PCES**
 (Roadway plus Bridge)

Total Preliminary Engineering Estimate **\$4,894,996** **PCES**
 (Roadway plus Bridge)



Project Cost Estimating System
CONSTRUCTION / BRIDGE / PE



Project No. **** MISSING DATA ****

Interstate Project ?	<input type="text" value="No"/>	*	
Maintenance Project ?	<input type="text" value="No"/>	*	
Route Number	<input type="text" value="28"/>	*	Primary Highway
Geometric Standard	<input type="text" value="GS-5"/>	*	Urban Principal Arterial System
Ad Date	<input type="text" value="2019"/>		Design Year = 2041
Design Year ADT	<input type="text"/>	*	Project Terrain <input type="text"/>
OR			
Current (Recent) ADT	<input type="text"/>	*	Minimum
Enter Design Speed (MPH) (30, 40, 45, 50 or 60)	<input type="text" value="50"/>	*	Design Speed =
<i>Box Must Be Empty</i>	<input type="text"/>		
<i>Box Must Be Empty</i>	<input type="text"/>		
Project Length (mi.)	<input type="text" value="3.50"/>	*	Number of Additional Lanes:
Total Length - Adding or Building Two Lanes (mi.)	<input type="text"/>	*	<input type="text" value="None"/>
Total Length - Adding or Building Four Lanes (mi.)	<input type="text" value="3.50"/>	*	<input type="text" value="+ Two Add'l. Lanes"/>
Total Length - Building Ramps and Loops (mi.)	<input type="text"/>	*	<input type="text" value="None"/>
Shoulder or Curb & Gutter ? (Select S or C&G)	<input type="text" value="C&G"/>	*	Enter Lane Width (ft) > <input type="text"/>
Median Type - Graded, Raised, or None ?	<input type="text" value="R"/>	*	Normal Lane Width(ft) <input type="text" value="12"/>
Number of Crossovers (Divided Highways ONLY)	<input type="text"/>	*	
Length - Curb & Gutter - Left PLUS Right Side (ft.)	<input type="text" value="31,117"/>		Bike/Ped Construction Costs (Statewide Avg.)
Length - Sidewalk - Left PLUS Right Side (ft.)	<input type="text" value="15,560"/>	*	Length (ft) <input type="text" value="15,557"/>
<i>Bike / Pedestrian Type</i>	<input type="text" value="10' shared use"/>		CE Cost <input type="text" value="\$332,999"/>
Total Length - Raised Median (ft.)	<input type="text" value="15,315"/>		PE Cost <input type="text" value="\$213,000"/>
Number of Right Turn Lanes - Left PLUS Right Side	<input type="text" value="0"/>	*	Inflated Const.Cost <input type="text" value="\$2,996,989"/>
Number of Left Turn Lanes - (Undivided Only)	<input type="text" value="0"/>	*	NORTHERN VIRGINIA
			120% Cost Factor used
			Construction Costs
Signals, ITS, Signs and Lighting Costs*	<input type="text" value="\$5,968,841"/>		Base #1 (PCES) <input type="text" value="\$54,388,842"/>
Cost of Large Drainage Structures	<input type="text" value="\$0"/>		Base #2 <input type="text" value="\$0"/>
In-Plan Utility Costs*	<input type="text" value="\$0"/>		Enter Const CE Cost > <input type="text" value="\$0"/>
Adjustment for Unusual Construction Costs	<input type="text" value="\$10,251,440"/>		CE (12.5%) <input type="text" value="\$6,798,605"/>
<i>* Totals include district factor calculations</i>			
			Estimate (2019) <input type="text" value="\$61,187,447"/>

Additional (or Unusual) P. E. Costs	<input type="text"/>	
Select % of PE to be performed by Consultants	<input type="text"/>	PE Cost (PCES) <input type="text" value="\$4,894,996"/>

Note: Do Not Include Bridge P. E. Costs Here

Roadway P. E. / Roadway Const. = 8.0%

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Today's Date: 02/12/20

Version 8.11



Project Cost Estimating System
CONSTRUCTION / BRIDGE / PE



Project No. **** MISSING DATA ****

Select / Enter Data into All Applicable White Boxes (in order from Top to Bottom)

Interstate Project ? *

Route Number *

Geometric Standard *

Ad Date *

Design Year = 2041

Design Year ADT *

Project Terrain

OR

Current (Recent) ADT *

Minimum Design Speed =

Box Must Be Empty

Box Must Be Empty

Box Must Be Empty

Project Length (mi.) *

Number of Additional Lanes:

Length of Add'l. Lanes (mi.):

Total Length - Adding or Building Two Lanes (mi.) *

Total Length - Adding or Building Four Lanes (mi.) *

Total Length - Building Ramps and Loops (mi.) *

Shoulder or Curb & Gutter ? (Select S or C&G) *

Enter Lane Width (ft.)

Median Type - Graded, Raised, or None ? *

Normal Lane Width (ft.)

Number of Crossovers(Divided Highways ONLY) *

Length - Curb & Gutter - Left PLUS Right Side (ft.)

Length - Sidewalk - Left PLUS Right Side (ft.)

Bike / Pedestrian Type

Total Length - Raised Median (ft.) *

Number of Right Turn Lanes - Left PLUS Right Side *

Number of Left Turn Lanes - (Undivided Only) *

Construction Costs

Base #2

Project Cost Estimating System
Miscellaneous Cost Estimates

COST OF LARGE DRAINAGE STRUCTURES

Job#	Description	Cost ()
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
		\$0

ADJUSTMENT FOR UNUSUAL CONSTRUCTION COSTS

Type	Description	Cost ()
<input type="text"/>	Unsuitable Material Excavation / Backfill	<input type="text"/>
<input type="text"/>	MOT / Concrete Barrier / Temporary Pavement	\$3,633,920
<input type="text"/>	Soundwalls	<input type="text"/>
<input type="text"/>	Retaining Walls / MSE Walls	<input type="text"/>
<input type="text"/>	Unusual Borrow / Fill (Anything over 3ft of cut/fill)	<input type="text"/>
<input type="text"/>	Wetlands / Stream relocation / Nutrient Credits	<input type="text"/>
<input type="text"/>	Stormwater Management Costs	\$6,056,520
<input type="text"/>	Unusual Risks / Contingency for unknowns	<input type="text"/>
<input type="text"/>	Railway Flagger	<input type="text"/>
<input type="text"/>	Pavement Resurfacing / Buildup	<input type="text"/>
<input type="text"/>	Impacted Streams	\$105,000
<input type="text"/>	Impacted Wetlands	\$6,000
<input type="text"/>	Impacted Haz Mat	\$450,000
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
		\$10,251,440

SIGNALS, ITS, SIGNS and LIGHTING COST WORKSHEET

Stand Alone Traffic Project: No

UPC: ****

SIGNALS

Permanent Signals	New/Mod.	Intersection Type	Major				Cross				Poles	Detection	Pre-emption	Cost	
			Direction	Lanes	Direction	Lanes	Direction	Lanes	Direction	Lanes					
Location/Description															
1	Mod	Four-way	North	5	South	6	East	5	West	3	Mast Arm	Loop	No	\$211,115	
2	Mod	Four-way	North	6	South	6	East	5	West	3	Mast Arm	Loop	No	\$215,115	
3	New	Four-way	North	4	South	4	East	1	West	1	Mast Arm	Loop	No	\$175,115	
4	Mod	Four-way	North	4	South	5	East	1	West	3	Mast Arm	Loop	No	\$187,115	
5	Mod	Four-way	North	4	South	4	East	1	West	1	Mast Arm	Loop	No	\$175,115	
6	Mod	Offset	North	4	South	4	East	1	West	1	Mast Arm	Loop	No	\$188,853	
7	Mod	Four-way	North	4	South	5	East	1	West	2	Mast Arm	Loop	No	\$183,115	
8	Mod	Tee	North	3	South	4	East	0	West	1	Mast Arm	Loop	No	\$159,836	
9	Mod	Tee	North	5	South	5	East	4	West	0	Mast Arm	Loop	No	\$183,836	
10														\$0	

Temporary Signals - New Equipment	Quantity	Cost
Temporary Signals - Modified Equipment		\$0

MISCELLANEOUS SIGNAL WORK	1	Pedestrian Signals	Cost
	2		\$120,000

Signals Construction Subtotal \$1,799,214

ITS	1	Location/Description	Cost
ITS WORK	2		

ITS Construction Subtotal \$0

MAJOR SIGN STRUCTURES

Type of Sign	Comment	Quantity	Unit	Lighted Y/N	Cost/Sign	Extended Cost
1			Ea.			
2			Ea.			
3			Ea.			
4			Ea.			
5			Ea.			
6			Ea.			
7			Ea.			

MISCELLANEOUS SIGN WORK	1	Location/Description	Cost
	2	Minor Signs	\$60,000

Signs Construction Subtotal \$60,000

LIGHTING

Continuous Roadway			
Urban Type of Lighting	Comments	No. Lanes	Number of Miles
1	Conventional	6	3.31
			Cost
			\$3,114,820
Freeway Type of Lighting	Comments	No. Lanes	Number of Miles
1			
			Cost
			\$0
Interchange			
Interchange Type	Type of Lighting		Number of Interchanges
1			
2			
3			
			Cost
			\$0
			\$0
Miscellaneous			
Location/Description			Cost
1			
2			

Lighting Construction Subtotal \$3,114,820

CONSTRUCTION TOTAL \$4,974,034

District factor will be applied when the total cost is passed to the const-1 worksheet

PROJECT COMMENTS

Prepared by

Date Prepared/Modified:

Version 8.11

Proj. =

District =

UPC =

Proj. Mgr. =

BRIDGE CONSTRUCTION COSTS SUMMARY


	Bridge Constr. Est. (PCES)	Unit Cost	Fed. Str. ID =	Descr. =
=	<input type="text" value="\$ 34,918,000"/>	<input type="text" value="\$ 364.87"/> /SF	<input type="text"/>	<input type="text" value="oute 28 Alternative 4 Bridge over Bull Ru"/>

PCES BRIDGE ESTIMATE
BRIDGE NO 1

lease date 7/16

Bridge No. 1		
Bridge No.: <input style="width: 80%;" type="text"/>	Fed. Str. ID: <input style="width: 80%;" type="text"/>	Proj. No.: <input style="width: 80%;" type="text"/>
Description: <input style="width: 95%;" type="text" value="Route 28 Alternative 4 Bridge over Bull Run"/>		
Length = <input style="width: 40%;" type="text" value="725"/> ft.	Width = <input style="width: 40%;" type="text" value="132"/> ft.	Skew = <input style="width: 40%;" type="text" value="0"/> deg

<u>BRIDGE CONSTRUCTION AND PRELIMINARY ENGINEERING COSTS SUMMARY</u>		
Estimate Created =	2/12/2020	
Base Bridge Estimate =	\$ 11,412,000	
Sub-total Modifiers =	\$ 21,304,000	
Sub-total Base + Modifiers =	\$ 32,716,000	(A)
Base + Mod. (Adj'd District Modifier) =	\$ 32,716,000	
Aesthetics =	\$ 142,000	(B)
Bridge Construction Est. (PCES) =	\$ 32,858,000	(A + B)
Dismantle & Remove =	\$ 369,000	(C)
Mobilization =	\$ 1,691,000	(D)
Total Bridge Estimate (2020) =	\$ 34,918,000	(A + B + C + D)



Legend:	
<input style="width: 40px; height: 15px;" type="text" value="xxxx"/>	Denotes Input
<input style="width: 40px; height: 15px;" type="text" value="xxx"/>	Denotes Calculation
<input style="width: 40px; height: 15px;" type="text" value="xxx"/>	Denotes Explanatory Notes
<input style="width: 40px; height: 15px;" type="text" value="xxx"/>	Denotes Output
<input style="width: 40px; height: 15px;" type="text" value="xxx"/>	Denotes calculated value not included in total estimate



PCES BRIDGE ESTIMATE
BRIDGE NO 1

SHEET

denotes "YES"

BASE BRIDGE EST. = \$ 11,412,000

SUB-TOTAL MODIFIERS (EXCLUDING Aesthetic Treatment) = \$ 21,304,000 + \$ -

SUB-TOTAL BASE + MODIFIERS = \$ 32,716,000 (A)

DISTRICT MODIFIER = 1.00

SUB-TOTAL BASE + MODIFIERS (ADJUSTED FOR DISTRICT) = \$ 32,716,000

AESTHETICS:

DO YOU ANTICIPATE THE USE OF AESTHETIC TREATMENTS? \$ 142,000 \$ - (B)

BRIDGE CONSTRUCTION ESTIMATE = \$ 32,858,000 (A + B)

DISMANTLE & REMOVE: (adj'd for Dist. Mod.)

DO YOU NEED TO DISMANTLE & REMOVE AN EXISTING STRUCTURE? \$ 369,000 \$ - (C)

L= 240 ft W= 75 ft

MOBILIZATION based upon (A + B + C) = \$ 1,691,000 \$ - (D)

TOTAL BRIDGE ESTIMATE = \$ 34,918,000 (A + B + C + D)

BRIDGE MODIFIERS

FOUNDATIONS:

DO YOU ANTICIPATE ANY OF THE FOLLOWING: \$ 3,700,000 \$ -

- Are pre-boring or rock excavation anticipated? \$ -
- Are drilled shafts or micropiles anticipated? \$ 3,700,000

UTILITIES

PCES BRIDGE ESTIMATE

BRIDGE NO 1

DO YOU ANTICIPATE ANY OF THE FOLLOWING ATTACHMENTS TO THE BRIDGE?

\$	-
----	---

\$	-
----	---

- Gas lines*
- Water lines or Sewer lines*
- Telephone conduits*

\$	-
\$	-
\$	-

Please note: this does not include conduits located in the deck or parapet.

PCES BRIDGE ESTIMATE
BRIDGE NO 1

<input type="checkbox"/> REINFORCING: <i>(refer to Structure & Bridge II&M 81.5)</i> DO YOU ANTICIPATE THE USE OF CLASS III CRR IN THE DECK?	\$ -	\$ -
<input type="checkbox"/> TEMPORARY SHEETING/SHORING: DO YOU ANTICIPATE ANY OF THE FOLLOWING: <i>The use of temporary sheet piles?</i> <i>The use of temporary retaining structures?</i> <i>The use of temporary shoring?</i>	\$ -	\$ -
<input type="checkbox"/> COFFERDAMS: DO YOU ANTICIPATE THE USE OF COFFERDAMS? <i>If anticipated, how many?</i>	\$ -	\$ -
<div style="margin-left: 100px;"> <input type="text" value="0"/> </div>		
<input type="checkbox"/> CONSTRUCTION ACCESS: DO YOU ANTICIPATE ANY OF THE FOLLOWING? <i>The use of a causeway?</i> <i>A Construction Access bid item?</i> <i>A temporary work bridge?</i>	\$ -	\$ -
<input type="checkbox"/> TOOTH EXPANSION JOINTS: <i>(refer to Vol. V Part 3; BEJ 6-10)</i> DO YOU ANTICIPATE THE USE OF A TOOTH EXPANSION JOINT? (Such as with a Virginia Abutment). <i>If anticipated, how many?</i>	\$ -	\$ -
<div style="margin-left: 100px;"> <input type="text" value="0"/> </div>		
<input type="checkbox"/> VIRGINIA ABUTMENTS: <i>(refer to Vol. V Part 2; File 17-01.9)</i> DO YOU ANTICIPATE THE USE OF A VIRGINIA ABUTMENT? <i>If anticipated, how many?</i>	\$ -	\$ -
<div style="margin-left: 100px;"> <input type="text" value="0"/> </div>		
<input checked="" type="checkbox"/> APPROACH SLABS: <i>(refer to Vol. V Part 3; BAS)</i> DO YOU ANTICIPATE THE USE OF AN APPROACH SLAB?	\$ 165,000	\$ -
<input checked="" type="checkbox"/> RAISED SIDEWALKS/MEDIANS: DO YOU ANTICIPATE ANY OF THE FOLLOWING: <i>Sidewalks on the bridge?</i> <i>Raised median on the bridge?</i> <i>If yes, enter:</i> TOTAL width ALL SIDEWALKS & MEDIANS <i>(in feet)</i>	\$ 16,651,000	\$ -
<div style="margin-left: 100px;"> <input type="text" value="1450"/> </div>		
<div style="margin-left: 100px;"> AVG. HEIGHT of sidewalk/medians <i>(in inches)</i> </div>	<div style="margin-left: 100px;"> <input type="text" value="6"/> </div>	

PCES BRIDGE ESTIMATE
BRIDGE NO 1

DETOUR BRIDGE:

DO YOU ANTICIPATE THE USE OF A TEMPORARY
DETOUR BRIDGE?

\$ -

\$ -

STAGED BRIDGE CONSTRUCTION:

DO YOU ANTICIPATE STAGED BRIDGE CONSTRUCTION?

\$ 615,000

\$ -

PEDESTRIAN FENCE: *(refer to Vol. V Part 3; BPF-3)*

DO YOU ANTICIPATE PEDESTRIAN FENCE?

\$ 173,000

\$ -

Anticipated Length =

1450

PCES BRIDGE ESTIMATE
BRIDGE NO 1

- | | | |
|---|------|------|
| <input type="checkbox"/> <u>CURVED BRIDGE:</u>
DO YOU ANTICIPATE CURVED GIRDERS? | \$ - | \$ - |
| <input type="checkbox"/> <u>PREFABRICATED TRUSS:</u>
DO YOU ANTICIPATE THE USE OF PREFABRICATED TRUSS(ES)? | \$ - | \$ - |
| <input type="checkbox"/> <u>ASPECT RATIO > 1.5:</u>
MODIFIER NOT REQUIRED. YOUR CALCULATED ASPECT RATIO (W/L) OF THE BRIDGE <= 1.5 | \$ - | |

OTHER ITEMS NOT LISTED ABOVE:

DO YOU ANTICIPATE OTHER NON-STANDARD ITEMS, NOT LISTED ABOVE?

- | | | |
|---------------------------------------|---|--|
| <input type="checkbox"/> Description: | Roadway Approaches (Bridge only projects) | |
| <input type="checkbox"/> Description: | | |
| <input type="checkbox"/> Description: | | |
| <input type="checkbox"/> Description: | | |

SUB-TOTAL MODIFIERS	=	\$ 21,304,000	\$ -
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NOTE: The following items and considerations are not considered:

- | | |
|---|--|
| <i>Special Structures (e.g. pump stations)</i> | <i>Historic Structures</i> |
| <i>Culverts</i> | <i>Environmental Factors</i> |
| <i>Roadway lighting</i> | <i>Difficult site access</i> |
| <i>Navigation lighting</i> | <i>Accelerated Bridge Construction Methods</i> |
| <i>Use of non-standard items not listed above</i> | <i>Crash Walls</i> |
| <i>Fender System</i> | <i>Pier Protection Systems</i> |

This list is not meant to be all-inclusive. If you anticipate an item not listed here-in, the PCES estimate should be adjusted accordingly with use of the OTHER ITEMS below.

Right-of-Way Estimate

Alternative 4

Impact Type	Tallied Cost
No Take	\$0.00
Building Take	\$88,237,700.00
Percent Take	\$11,920,003.28
	\$100,157,703.28
FINAL TOTAL	\$144,276,553.28

Utilities Estimate

Alternative 4

Utilities

Number	Units	Price	Units	Total
3.5	<i>mi</i>	\$3,500,000	<i>per mile</i>	\$12,250,000
4	<i>poles</i>	\$1,000,000	<i>per pole</i>	\$4,000,000
			Total	\$16,250,000