

North Port Big Slough Flood Reduction Study



Presentation to the
North Port City Commission

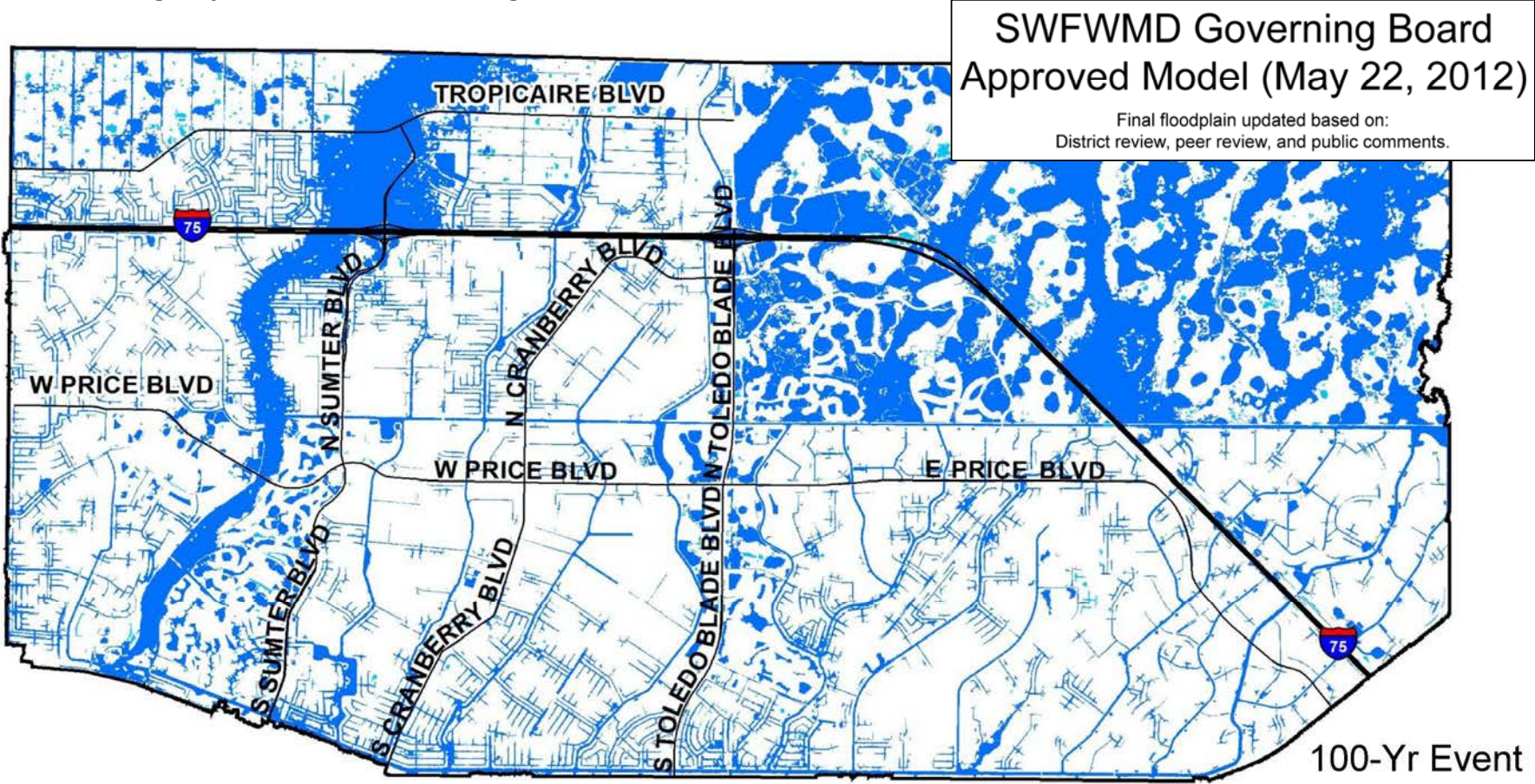
December 6, 2018

“Evaluate the feasibility and cost effectiveness of solutions to reduce flooding”

- City of North Port Department of Public Works, Agreement #2016-48
- Cooperatively funded by and between the City of North Port and the SWFWMD
- Part 1 – localized along Myakkahatchee Creek within I-75 and Jockey Club areas
- Part 2 – preliminary regional concepts to mitigate flooding throughout City

North Port Big Slough Flood Reduction Study

Project Plan – Using City of North Port’s Existing Available Model

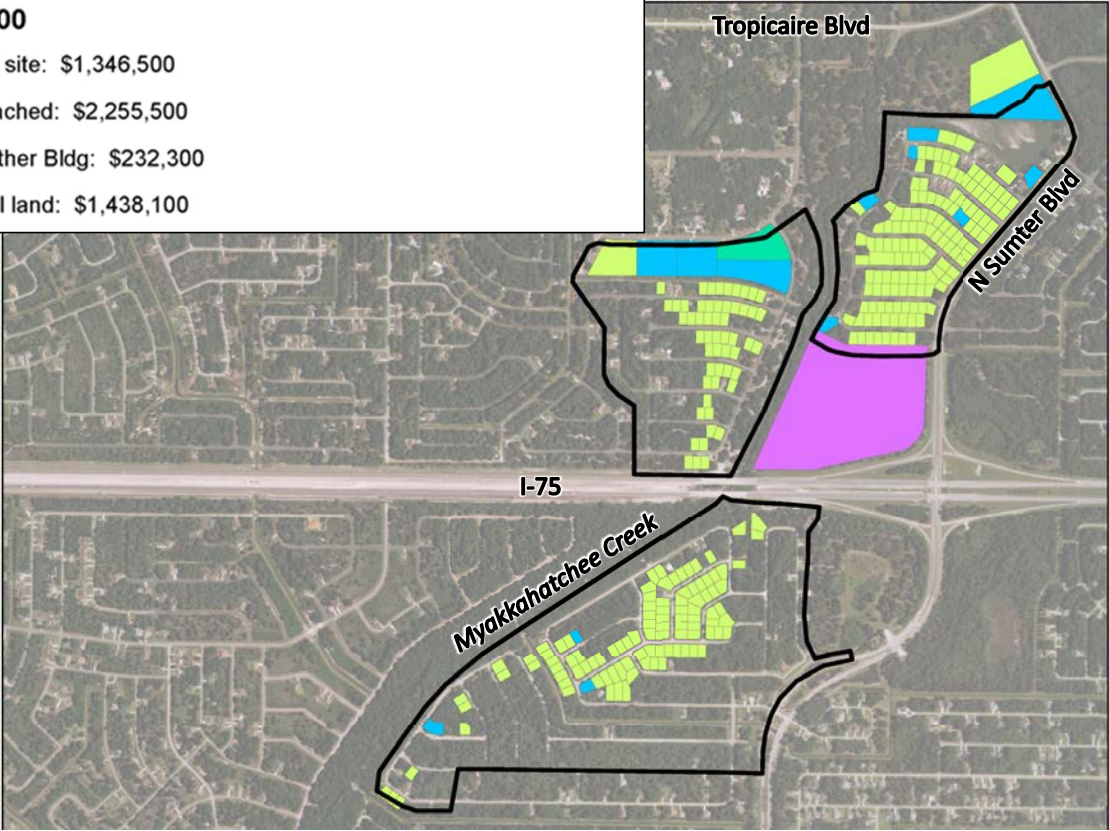


North Port Big Slough Flood Reduction Study

Project Plan – Focus on Local Areas of Recurring Flooding, I-75 Area

Parcels more than 50% inundated by a 1-day 10-year rainfall event
2017 Just Value: \$5,272,400

0000 - Residential vacant site:	\$1,346,500
0100 - Single Family Detached:	\$2,255,500
010X - Single Family & Other Bldg:	\$232,300
1000 - Vacant commercial land:	\$1,438,100



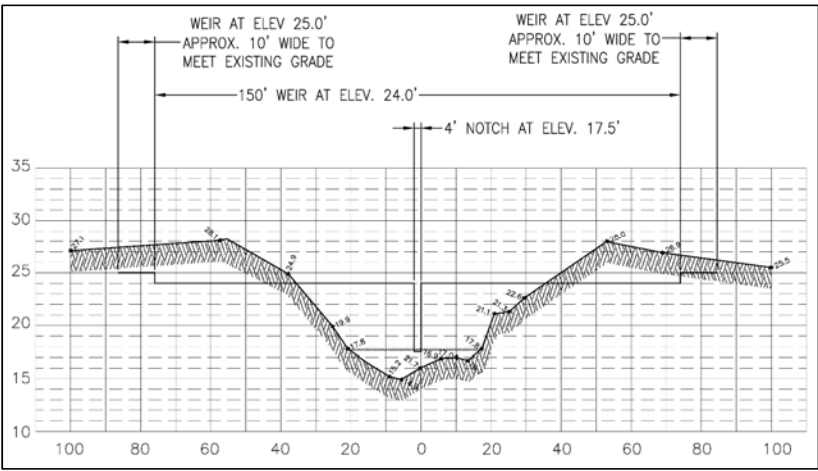
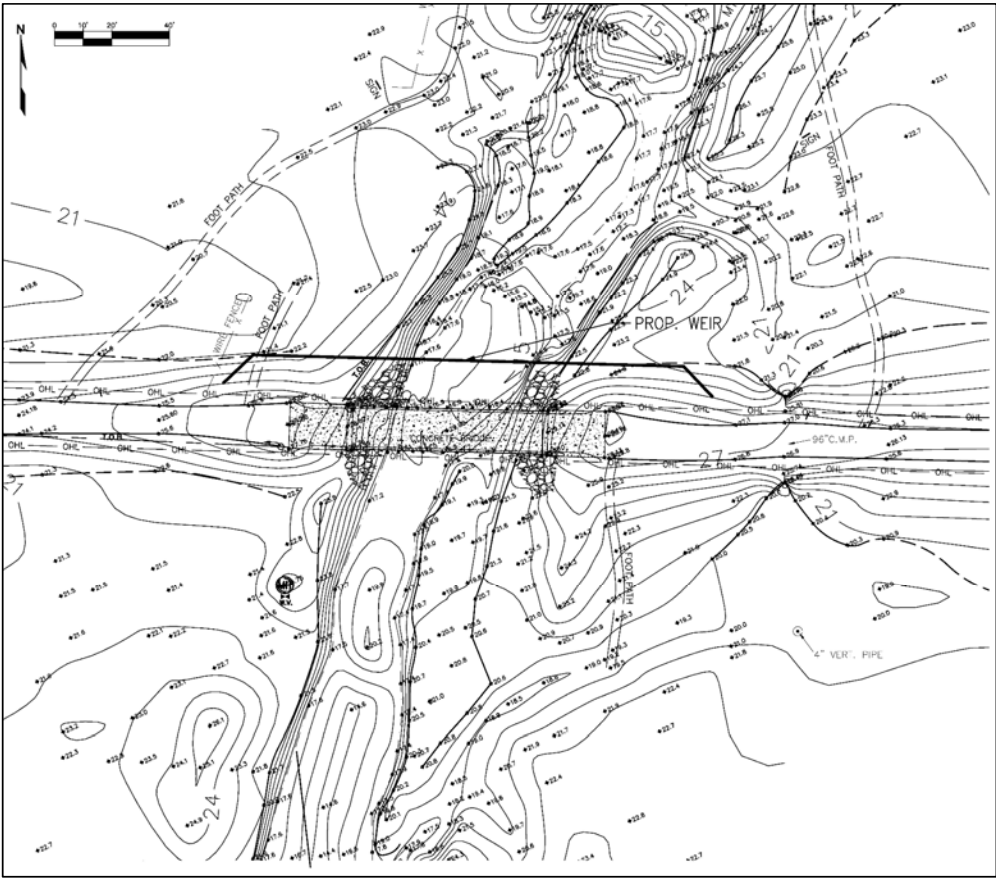
North Port Big Slough Flood Reduction Study

Project Plan – Focus on Local Areas of Recurring Flooding, Dorothy Avenue Area



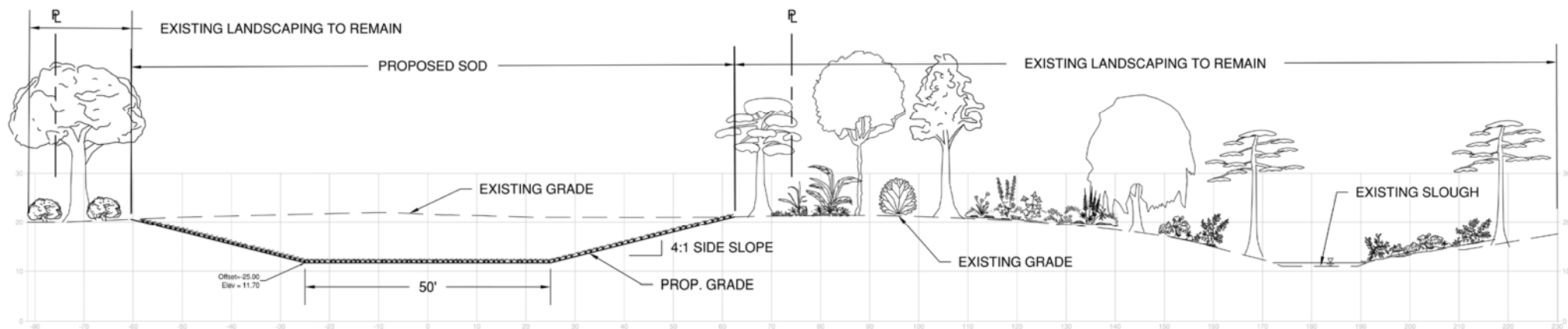
North Port Big Slough Flood Reduction Study

Regional Improvements (e.g., Reduce Offsite Inflows at FPL Easement North of City)



North Port Big Slough Flood Reduction Study

Local/Regional Improvements (e.g., Bypass Construction)

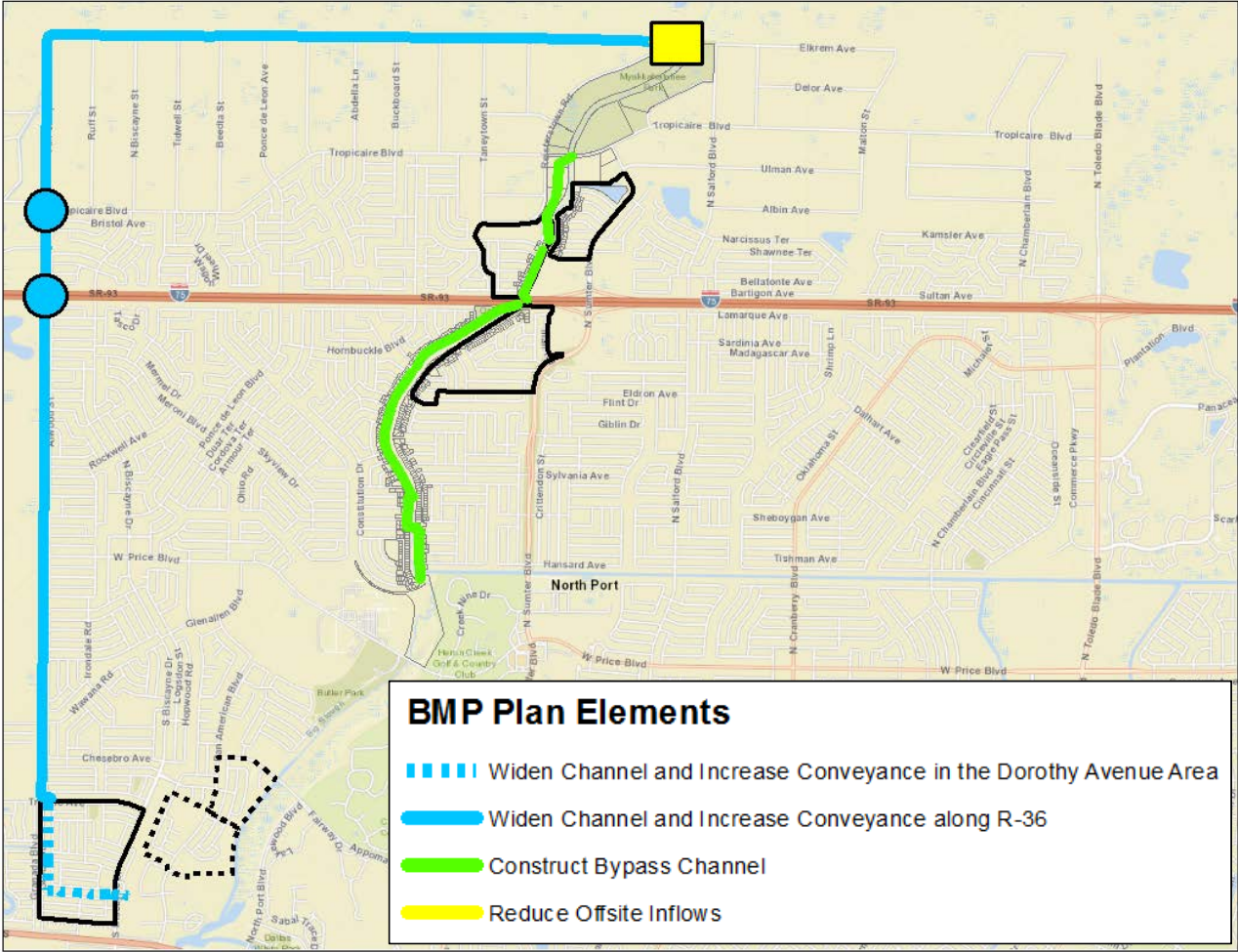


North Port Big Slough Flood Reduction Study

Recommended Plan – Plan Components

Project Components	105B
Existing Condition*	X
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	X
R-36 Improvements	X
Bypass (flowway, n = 0.040)	X
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	X
Other Planned Improvements	-

* Existing Condition model updated from 2012 version



North Port Big Slough Flood Reduction Study

Recommended Plan – Plan Components and Engineer’s Opinion of Probable Costs

	Existing	Phasing			"Full Plan"		Best BCR	
Project Components	101	102	103	104	105	105B	106	106A
Existing Condition*	x	x	x	x	x	x	x	x
Dorothy (Single Box Culvert)	-	x	x	x	x	-	x	x
Dorothy (Triple Box Culvert)	-	-	-	-	-	x	-	-
R-36 Improvements	-	-	x	x	x	x	-	-
Bypass (flowway, n = 0.040)	-	-	-	x	x	x	x	-
Bypass (wetland, n = 0.150)	-	-	-	-	-	-	-	x
Reduce Northern Inflows	-	-	-	-	x	x	-	-
Other Planned Improvements	-	-	-	-	-	-	-	-

<i>Estimated Combined Cost</i>	\$ -	\$ 1,299,000	\$ 12,156,000	\$ 29,422,000	\$ 31,922,000	\$ 32,771,594	\$ 18,565,000	\$ 22,018,200
<i>Estimated Annualized Cost</i>		\$ 94,125	\$ 880,822	\$ 2,131,914	\$ 2,313,063	\$ 2,374,625	\$ 1,345,217	\$ 1,595,435

Engineer's Estimate of Probable Construction Cost (by Component)

Existing Condition	\$ -
Dorothy (Single Box Culvert)	\$ 1,299,000
Dorothy (Triple Box Culvert)	\$ 2,148,594
R-36 Improvements	\$ 10,857,000
Bypass (flowway, n = 0.040)	\$ 17,266,000
Bypass (wetland, n = 0.150)	\$ 20,719,200
Reduce Northern Inflows	\$ 2,500,000

North Port Big Slough Flood Reduction Study

Recommended Plan – Cost and Benefits

		Existing	Phasing				"Full Plan"		Best BCR	
Project Components		101	102	103	104	105	105B	106	106A	
Existing Condition*		x	x	x	x	x	x	x	x	
Dorothy (Single Box Culvert)		-	x	x	x	x	-	x	x	
Dorothy (Triple Box Culvert)		-	-	-	-	-	x	-	-	
R-36 Improvements		-	-	x	x	x	x	-	-	
Bypass (flowway, n = 0.040)		-	-	-	x	x	x	x	-	
Bypass (wetland, n = 0.150)		-	-	-	-	-	-	-	x	
Reduce Northern Inflows		-	-	-	-	x	x	-	-	
Other Planned Improvements		-	-	-	-	-	-	-	-	
Estimated Combined Cost		\$ -	\$ 1,299,000	\$ 12,156,000	\$ 29,422,000	\$ 31,922,000	\$ 32,771,594	\$ 18,565,000	\$ 22,018,200	
Estimated Annualized Cost			\$ 94,125	\$ 880,822	\$ 2,131,914	\$ 2,313,063	\$ 2,374,625	\$ 1,345,217	\$ 1,595,435	
Road Flood Reduction (miles)	2.33-year	-	0.4	1.2	7.7	7.7	7.8	7.5	7.4	
	5-year	-	0.6	1.9	11.5	12.2	12.9	10.8	9.4	
	10-year	-	0.3	2.7	16.8	18.0	18.3	14.8	11.9	
	25-year	-	0.5	2.8	17.9	20.5	20.7	15.9	12.8	
	50-year	-	0.6	2.5	18.3	20.9	21.1	16.7	13.8	
	100-year	-	0.6	2.6	21.9	24.4	24.5	20.3	17.4	
Parcels Reduction (touch)	2.33-year	-	68	113	807	854	863	811	791	
	5-year	-	84	91	960	1024	1138	968	836	
	10-year	-	49	98	1022	1125	1161	996	891	
	25-year	-	58	90	1002	1138	1161	984	858	
	50-year	-	66	152	1073	1175	1207	1012	865	
	100-year	-	88	167	1170	1313	1313	1133	1000	
Parcels Reduction (centroid)	2.33-year	-	0	39	232	233	234	230	223	
	5-year	-	0	31	402	405	405	398	362	
	10-year	-	0	15	515	538	538	505	427	
	25-year	-	0	16	513	539	542	503	381	
	50-year	-	0	27	510	563	562	480	366	
	100-year	-	5	30	505	556	558	482	372	
Estimated Annualized Benefit			\$ 25,216	\$ 193,186	\$ 1,889,975	\$ 1,960,257	\$ 1,977,742	\$ 1,842,132	\$ 1,636,307	
Est. Benefit/Cost Ratio (BCR)			0.27	0.22	0.89	0.85	0.83	1.37	1.03	

North Port Big Slough Flood Reduction Study

I-75 Area - Scenario 105B, Mean Annual Storm Event Flood Reduction

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

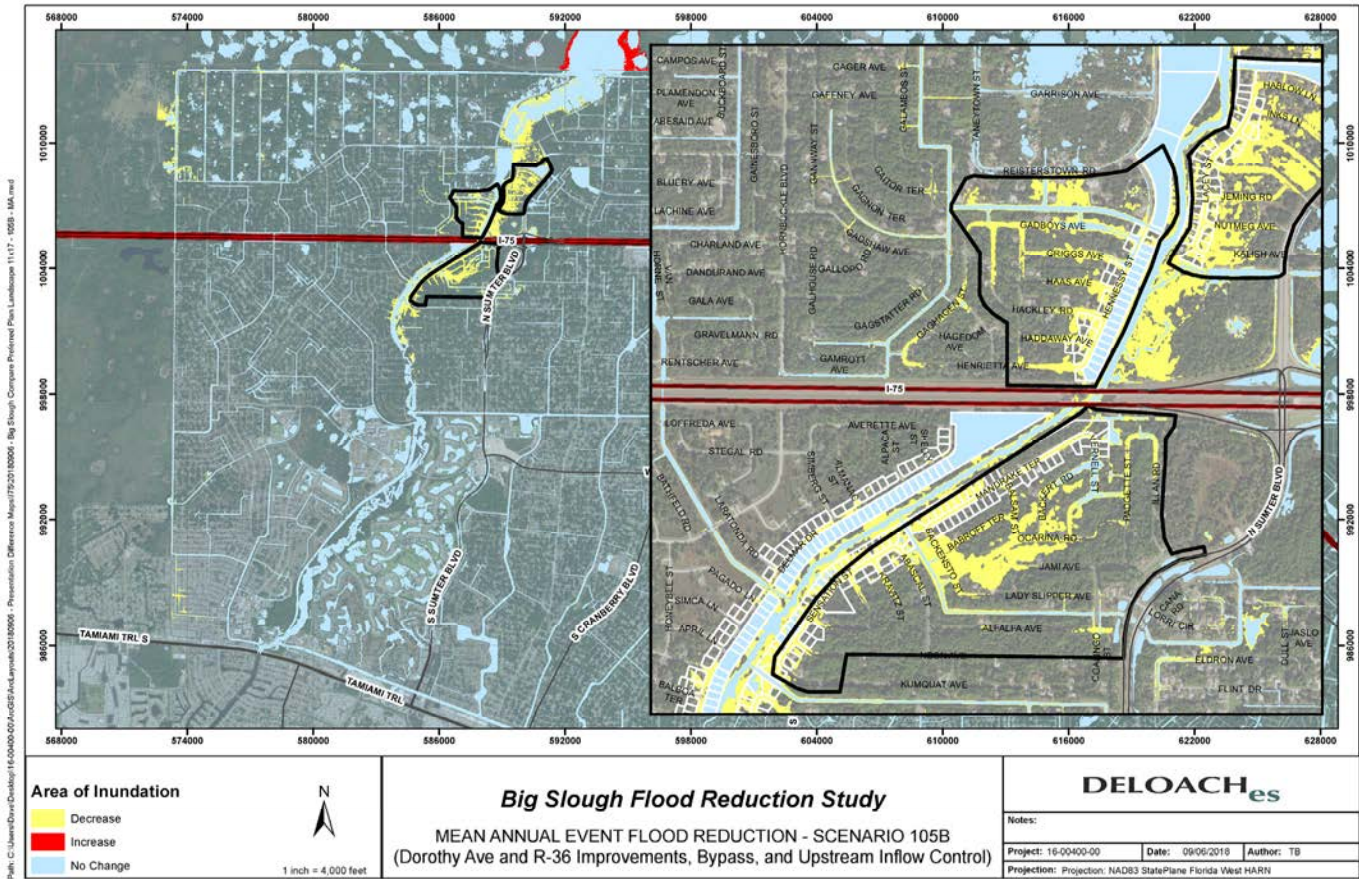
Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742

Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

Dorothy Avenue Area - Scenario 105B, Mean Annual Storm Event Flood Reduction

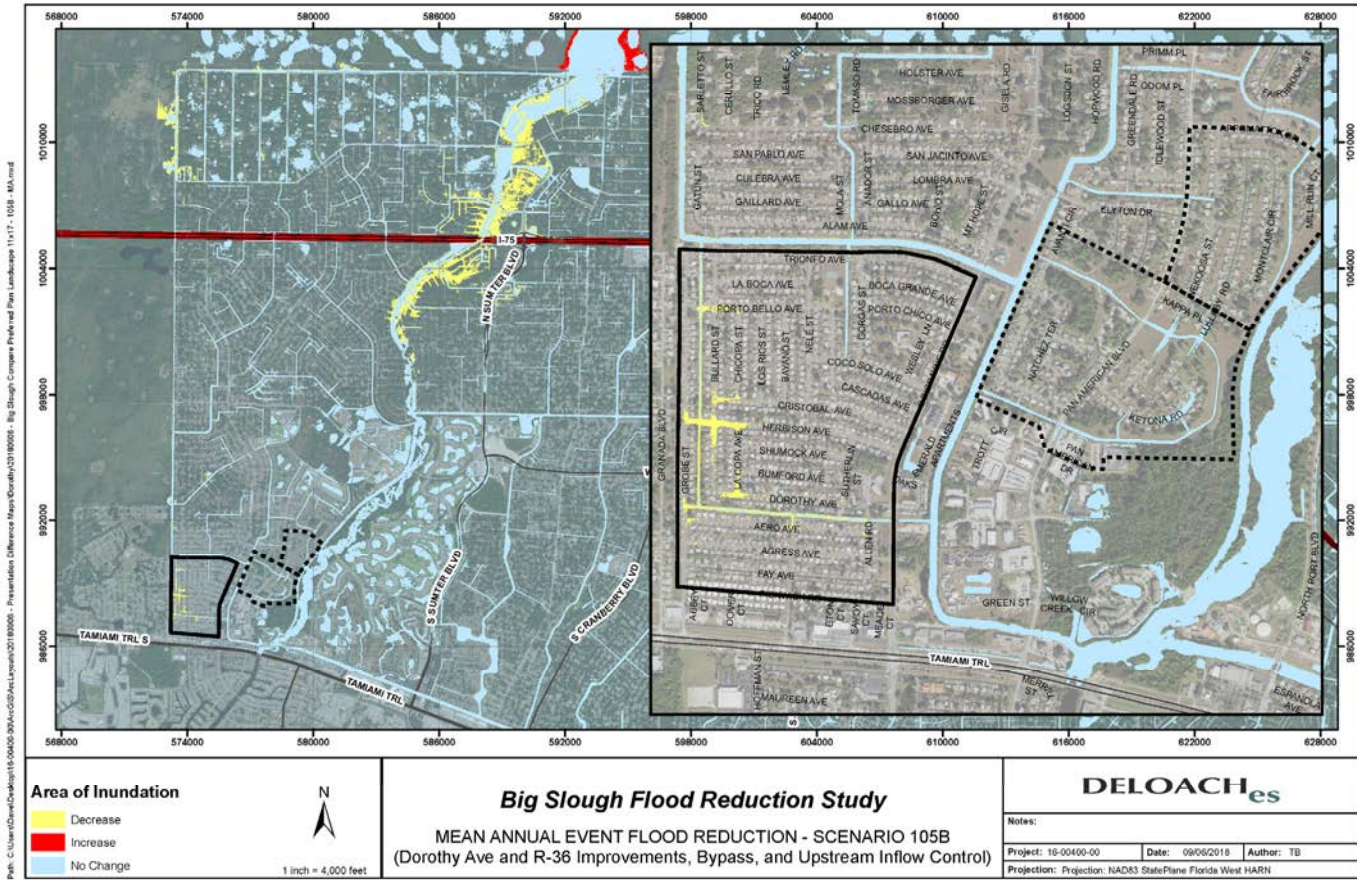
Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
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	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742
Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

I-75 Area - Scenario 105B, 10-Year Storm Event Flood Reduction

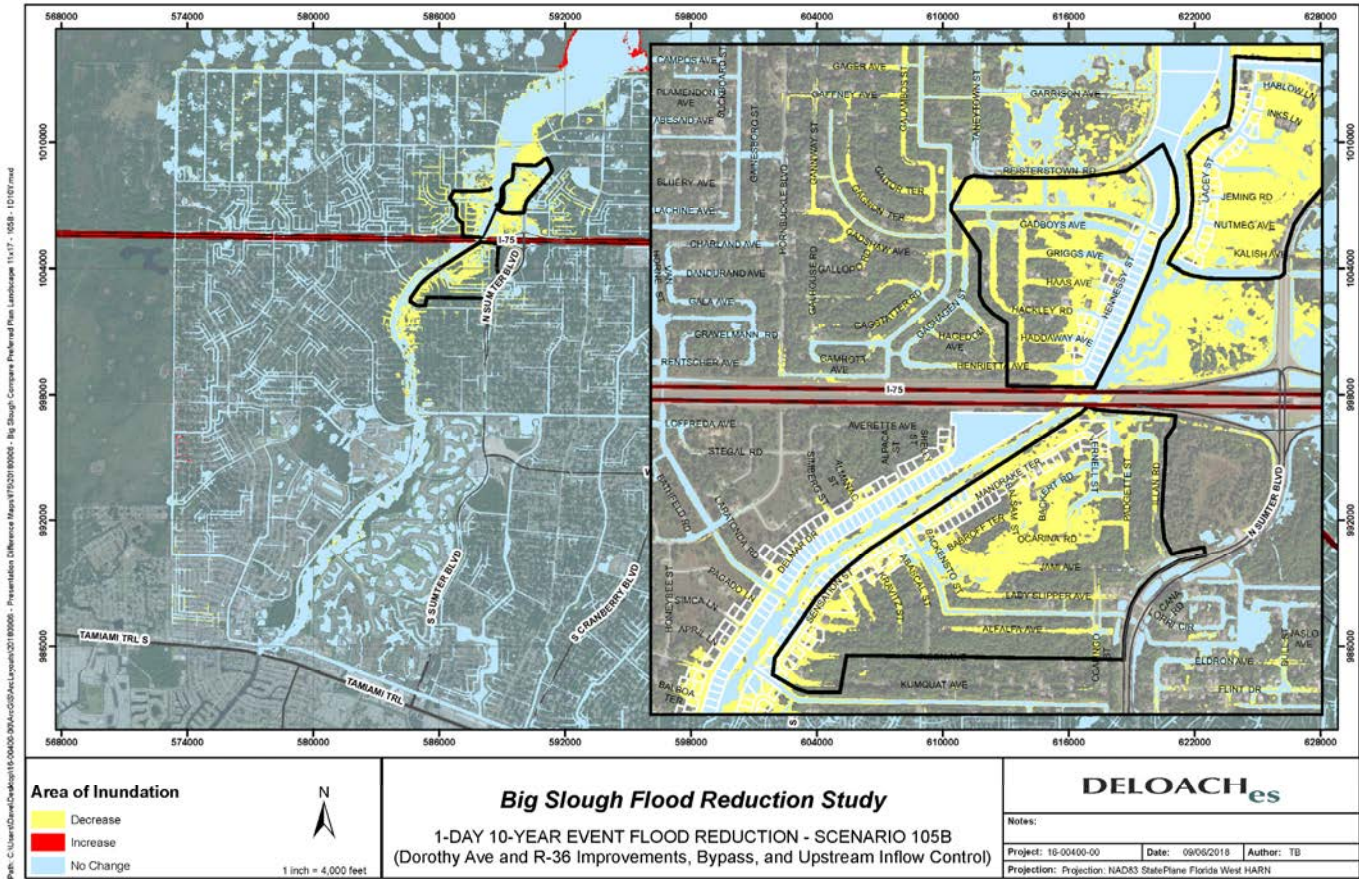
Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742
Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

Dorothy Avenue Area - Scenario 105B, 10-Year Storm Event Flood Reduction

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

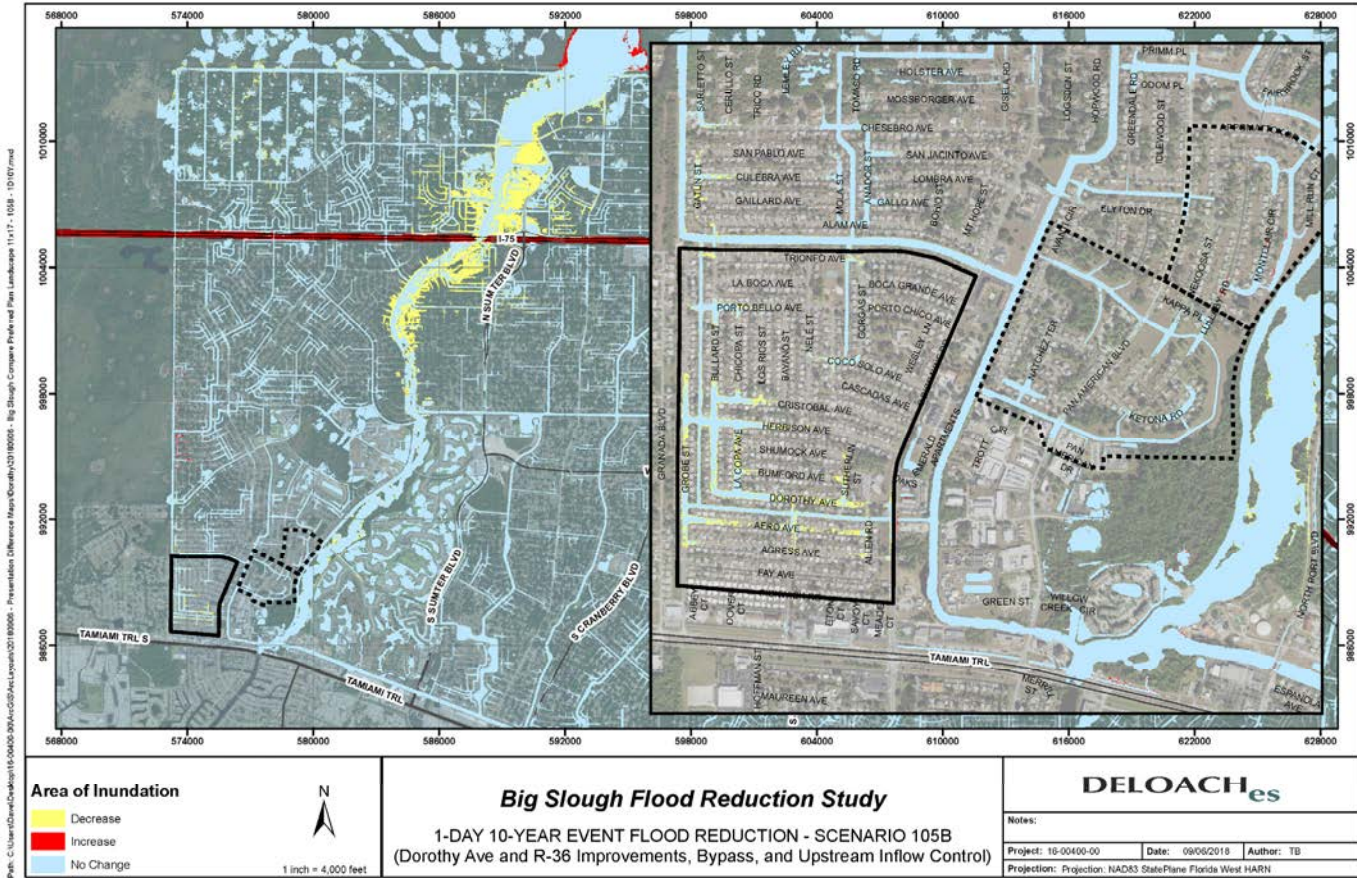
Estimated Combined Cost \$ 32,771,594

Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742

Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

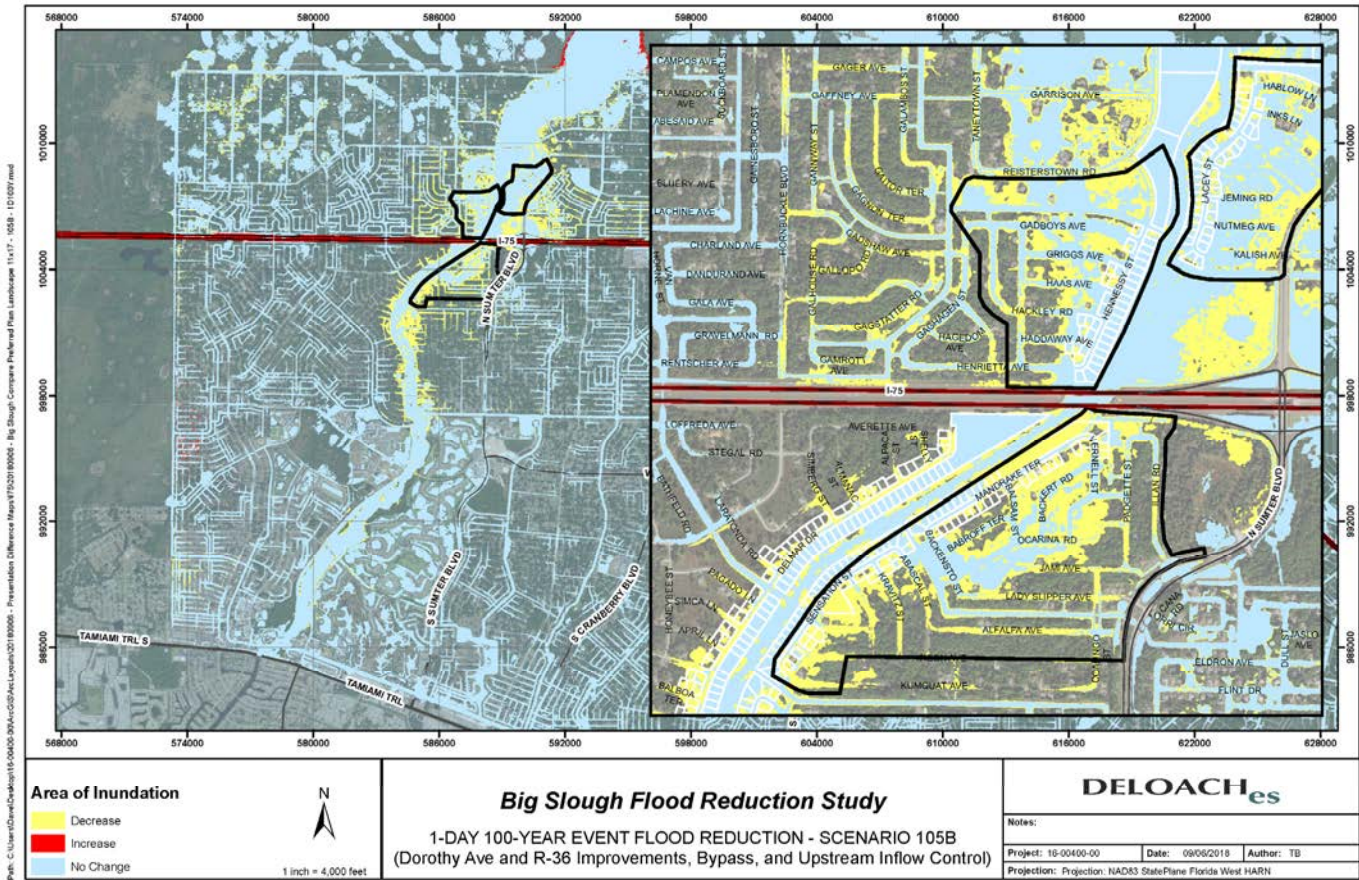
I-75 Area - Scenario 105B, 100-Year Storm Event Flood Reduction

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

Estimated Combined Cost \$ 32,771,594
Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742
Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

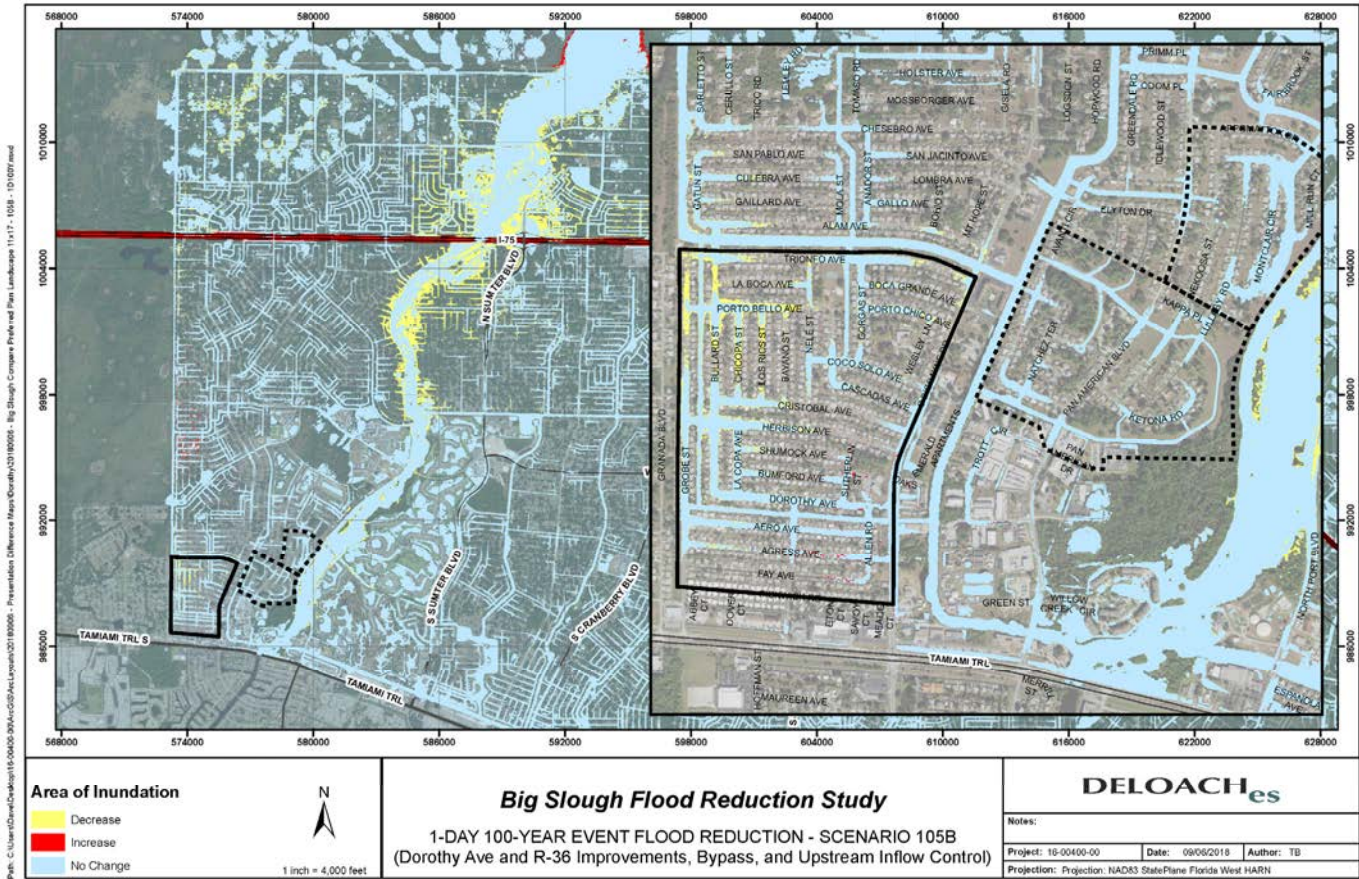
Dorothy Avenue Area - Scenario 105B, 100-Year Storm Event Flood Reduction

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

Estimated Combined Cost \$ 32,771,594
Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742
Est. Benefit/Cost Ratio (BCR) 0.83



North Port Big Slough Flood Reduction Study

North Port Big Slough Stormwater Management Master Plan – Apply for SWERP Conceptual Approval

Project Components	105B
Existing Condition*	x
Dorothy (Single Box Culvert)	-
Dorothy (Triple Box Culvert)	x
R-36 Improvements	x
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	x
Other Planned Improvements	-

Estimated Combined Cost \$ 32,771,594
Estimated Annualized Cost \$ 2,374,625

Road Flood Reduction (miles)	2.33-year	7.8
	5-year	12.9
	10-year	18.3
	25-year	20.7
	50-year	21.1
Parcels Reduction (touch)	100-year	24.5
	2.33-year	863
	5-year	1138
	10-year	1161
	25-year	1161
Parcels Reduction (centroid)	50-year	1207
	100-year	1313
	2.33-year	234
	5-year	405
	10-year	538
	25-year	542
	50-year	562
	100-year	558

Estimated Annualized Benefit \$ 1,977,742
Est. Benefit/Cost Ratio (BCR) 0.83

Project Components	106
Existing Condition*	x
Dorothy (Single Box Culvert)	x
Dorothy (Triple Box Culvert)	-
R-36 Improvements	-
Bypass (flowway, n = 0.040)	x
Bypass (wetland, n = 0.150)	-
Reduce Northern Inflows	-
Other Planned Improvements	-

Estimated Combined Cost \$ 18,565,000
Estimated Annualized Cost \$ 1,345,217

Road Flood Reduction (miles)	2.33-year	7.5
	5-year	10.8
	10-year	14.8
	25-year	15.9
	50-year	16.7
Parcels Reduction (touch)	100-year	20.3
	2.33-year	811
	5-year	968
	10-year	996
	25-year	984
Parcels Reduction (centroid)	50-year	1012
	100-year	1133
	2.33-year	230
	5-year	398
	10-year	505
	25-year	503
	50-year	480
	100-year	482

Estimated Annualized Benefit \$ 1,842,132
Est. Benefit/Cost Ratio (BCR) 1.37

