



64/5TH STREET DIVERGING DIAMOND INTERCHANGE PROJECT SCOPE DEVELOPMENT AND COST ESTIMATE

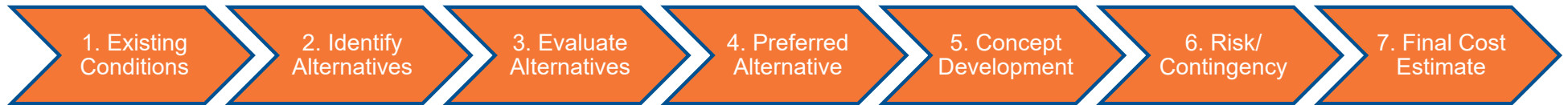
MPO Tech

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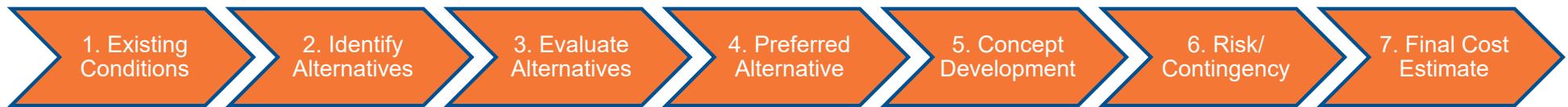
Outline

- **Application Development Process Overview**
- **Process Constraints**
- **Alternative Selection**
- **Cost Estimate**
- **Application Timeline**
- **Next Steps**



Application Development Process

- 1. Assess Existing Conditions**
- 2. Identify Alternatives**
- 3. Evaluate Alternatives**
- 4. Select Preferred Alternative**
- 5. Develop concept/base cost estimate/application materials**
- 6. Identify risks/contingencies**
- 7. Final Cost Estimate**



Application Development Constraints

- **Compressed schedule due to SMART SCALE program review process**
- **Additional project readiness requirements introduced**
- **Conceptual design development iterative process involving multiple disciplines**

Planning	Environment	Structure & Bridge
Location & Design	Traffic	Estimator
Utilities	Right of Way	Consultants
- **Concepts developed in-house or by consultants**
 - Consultant-developed work reviewed/approved by VDOT
- **Limited time/resources to conduct pre-scoping activities**
 - Competing priorities for VDOT staff impacts review turnaround
- **Cost estimates have limited shelf lives**
 - Estimates have to be re-developed each round



- **Issues identified during the 5th Street Corridor Study/updated in late 2023/early 2024:**
 - High crash volumes
 - Long queues
 - Operational concerns
 - Lack of multimodal connections
- **Project goals:**
 - Improve interchange operations and safety
 - Enhance multimodal accessibility and connectivity for pedestrians, bicyclists, and transit users
- **Identified alternatives included:**
 - Optimized Diamond Interchange
 - Single Point Urban Interchange
 - Diverging Diamond Interchange
 - Existing Condition + Sidewalk



Intersection Improvement Alternatives							
Interchange		Measure of Effectiveness	Existing Condition	Optimized Diamond	DDI	SPUI	Sidewalk-Only Concept
1	Exit 120 - I-64 at 5th Street	VJuST Volume-to-Capacity (V/C) Analysis	1.18	0.89	0.74	0.67	---
		Crash Modification Factor (CMF)	---	0.97	0.37	0.60	0.12*
		Relative Cost	---	1-2	3-4	5	1

*Sidewalk-Only CMF value specifically for bike/pedestrian crashes



Optimized Diamond Interchange

- Negligible safety benefits
- Minor operational improvements
- Low relative cost

Diverging Diamond Interchange

- Substantive safety benefits
- Moderate operational benefits
- Moderate-high relative cost

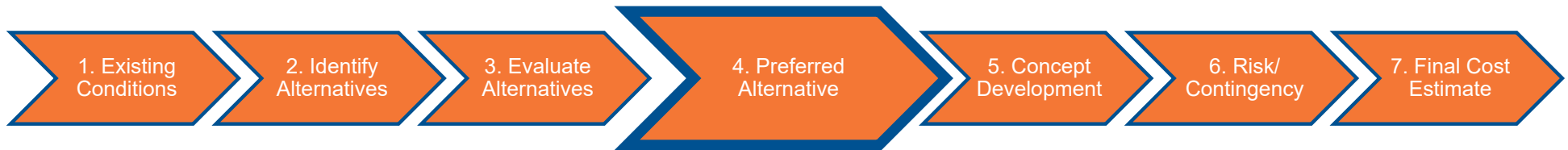
Single Point Urban Interchange

- Limited safety benefits
- Highest operational benefits
- Highest relative cost

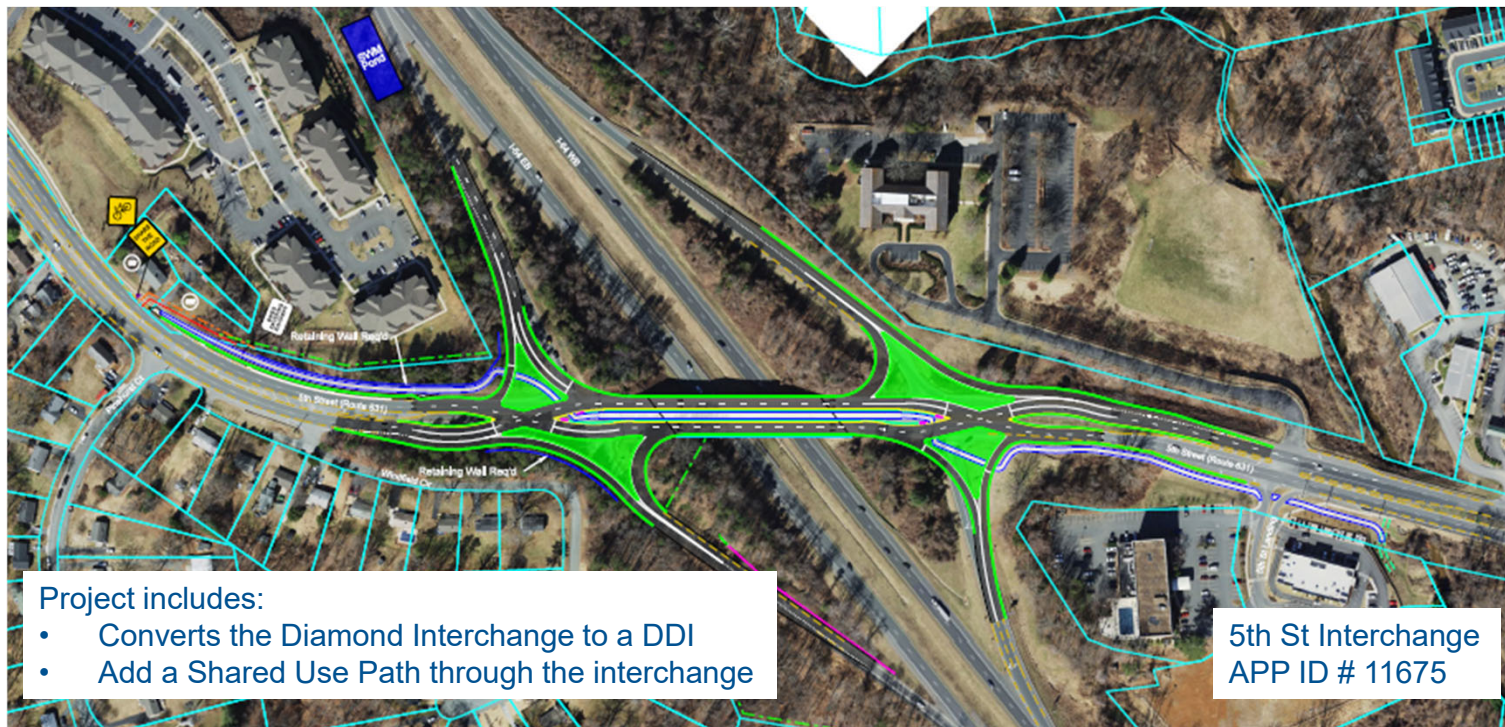
Existing Condition + Sidewalk

- Not eligible MPO/PDC application
- Safety benefits only apply to pedestrian-related crashes

Factor	Safety	Congestion Mitigation	Accessibility	Land Use	Economic Development	Environmental Quality
Category B – Round 5	20%	15%	20%	15%	20%	10%
Category B – Round 6	20%	25%	25%	Multiplier	20%	10%



- Public feedback favored DDI
- DDI selected as preferred alternative





PROPOSED ESTIMATE					PROPOSED SCHEDULE	
Phase	Base	% Cont.	Uninflated Total (2024)	Inflated Total	Phase (Task)	Target Date
PE	\$6,270,000	12%	\$7,022,400	\$8,207,079	PE Start (12)	9/1/2027
RW/UT	\$510,000	41%	\$719,100	\$954,318	RW Start (52)	5/8/2031
CN (Cont)	\$31,600,000	38%	\$49,612,000	\$69,848,735	CN Start (80)	7/13/2032
CN (CEI)		19%			CN End (91)	5/1/2034
Total Estimate			\$57,353,500	<u>\$79,010,131</u>		

SCOPE DESCRIPTION
• Convert existing traditional diamond interchange to a Diverging Diamond Interchange. • Include a shared use path across the interchange to tie into existing pedestrian facilities to the northeast and southwest. • A bridge replacement is likely required due to the proposed changes to the superstructure.

Bridge specific line items (uninflated):

- **PE: \$3,203,829 (51% of uninflated total)**
- **CN: \$16,571,606 (52% of uninflated total)**

5th Street/64 DDI Application Development Timeline



Round 5/Round 6* Comparisons (Statewide)

Round 5

- 285 HPP-eligible applications
- 81 HPP-only applications
- HPP-only average project cost:
 - \$21,708,311
- 71.6% of HPP-only applications were requests for less than \$20 million

	All HPP Eligible Projects		Only HPP Eligible Projects	
	Request	Total Cost	Request	Total Cost
>\$100 million	4.6%	5.6%	2.5%	3.7%
>\$50 million	7.0%	8.8%	4.9%	6.2%
>\$20 million	30.9%	34.7%	28.4%	30.9%

Round 6*

- 147 HPP-eligible applications
- 40 HPP-only applications
- HPP-only average project cost:
 - \$64,962,528*
- 20% of HPP-only applications were requests for less than \$20 million

	All HPP Eligible Projects		Only HPP Eligible Projects	
	Request	Total Cost	Request	Total Cost
>\$100 million	5.4%	10.2%	15.0%	15.0%
>\$50 million	17.7%	22.4%	40.0%	40.0%
>\$20 million	55.1%	63.3%	80.0%	85.0%

*Round 6 funding data is preliminary and subject to change

Round 5/Round 6* Comparisons (Culpeper District)

Round 5

- **38 applications submitted total**
 - 20 HPP-eligible applications (52.6%)
 - 30 DGP-eligible applications (78.9%)
 - 8 HPP-only applications (21.1%)
- **Average project cost**
 - All projects: \$14,233,759
 - DGP-eligible: \$12,896,717
 - HPP-eligible: \$15,538,578
 - HPP-only: \$19,247,666
- **50% of HPP-only applications were requests for more than \$20 million**
 - 1 application >\$23 million

Round 6*

- **24 applications submitted total**
 - 5 HPP-eligible applications (20.8%)
 - 19 DGP-eligible applications (79.2%)
 - 4 HPP-only applications (16.7%)
- **Average project cost**
 - All projects: \$30,926,488
 - DGP-eligible: \$21,623,973
 - HPP-eligible: \$67,202,261
 - HPP-only: \$77,439,063
- **100% of HPP-only applications were requests for more than \$20 million**
 - 1 application <\$34 million

*Round 6 funding data is preliminary and subject to change

Next Steps

- **Wait on SMART SCALE funding award announcements**
 - Difficult to predict likely funding outcomes due to SMART SCALE program changes
- **If not funded, can evaluate other alternatives**
 - Build off of information discovered during Round 6 application development
 - **DDI provides best safety outcomes and improves operations**
 - Safety improvements more than double compared to next best alternative (SPUI, Optimized Diamond, Sidewalk-Only)
 - Had strongest public support
 - **Submitted concept required significant changes to deck configuration due to addition of shared use path**
 - Reconfigure bridge to DDI without the shared use path on existing structure
 - Add a second bike/ped structure adjacent to existing bridge

Questions?



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