Crescent Beach Road

Green Stormwater Infrastructure & Non-Motorized Transportation Study

Sand Point Association, September 3, 2022

HURON CO. ROAD COMM. Est. 1919

fishbeck

Engineers | Architects | Scientists | Constructors

Agenda

- General Info – County Road Assets & Funding
- Study Overview
- Concept Alternatives
- Cost Estimates
- Questions & Discussion

Huron County Road Commission - Assets

- 1,633 Miles of Roadway
- 165 Bridges
- 4,432 Culverts

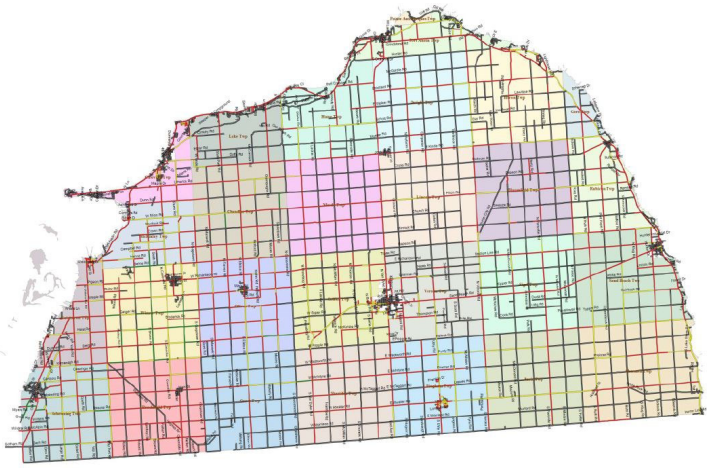
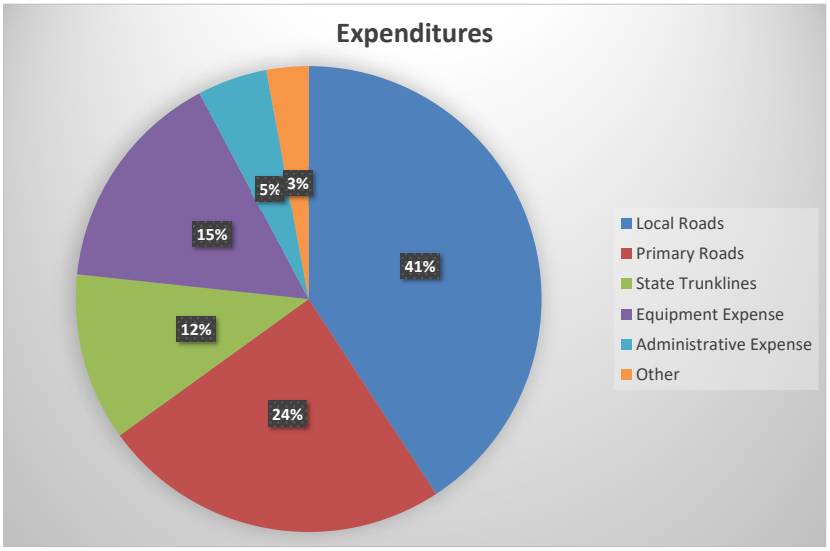


Figure 1: Map showing location or roads managed by HCRC and the current condition for paved roads in green for good (PASER 10, 9, 8), yellow for fair (PASER 7, 6, 5), and red for poor (PASER 4, 3, 2, 1) and for unpaved, unrated roads in gray.

Huron County Road Commission - Expenses



This is a pie chart showing expenses. Being good stewards of the taxpayer's dollars includes making decisions that leverage the revenue we have into providing a high quality, reliable, and well-maintained network of roads and bridges. The budget does not contain or allow for non-motorized transportation or other special projects ancillary to the road and bridge program.

Crescent Beach Road - History

- 1966 – Paving from M-25 to Betty Street (22 ft width)
- 1970 – Paving from Betty Street to Private Drive (22 ft width)
- 1986 – Overlay and Widening to 28 ft width
- 2002 – Overlay at 28 ft width

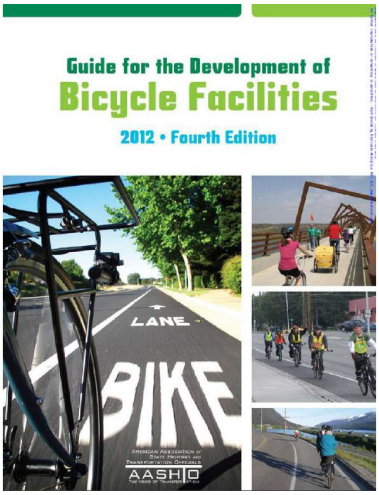
Crescent Beach Road – Study Purpose

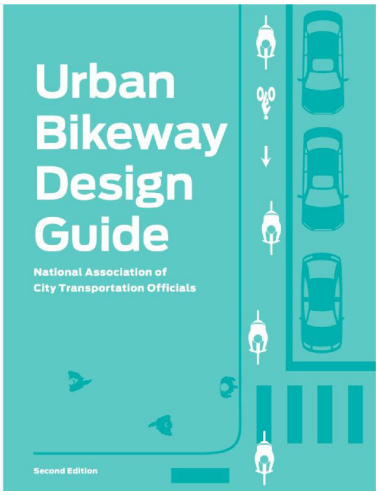
- Project Purpose:
  - Evaluate conceptual design alternatives for the redevelopment of the Crescent Beach Rd ROW incorporating enhanced non-motorized uses and green stormwater infrastructure (GSI) including projected cost estimates
- Critical Success Factors:
  - A safe roadway that residents enjoy using
  - An economical project that is appealing to potential partners and grantees

In general, wanted to evaluate all possibilities along with price points of different options.

Safety was the number one factor when evaluating alternatives.

Roadway Cross-Section Development

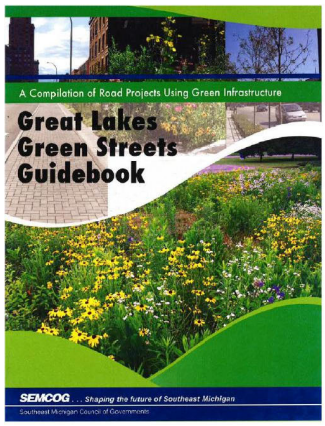


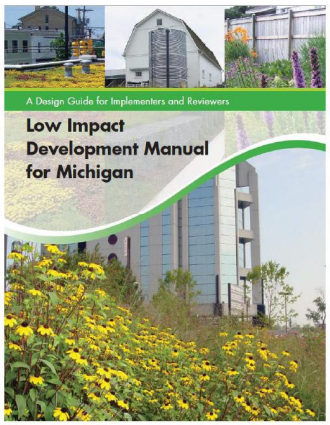


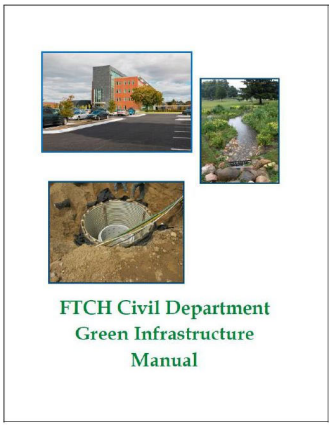
What would a non-motorized path look like? There are guides for this.

American Association of State Highway Transportation Officials (AASHTO) – guides developed on studies and actual performance of existing facilities.

Green Infrastructure

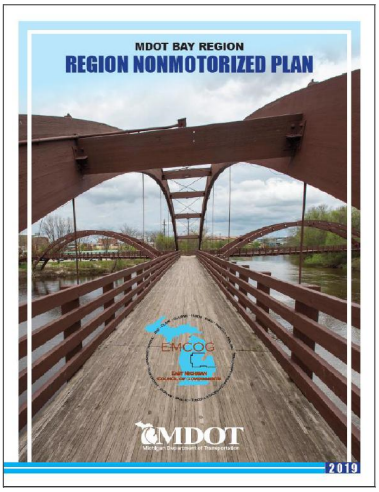


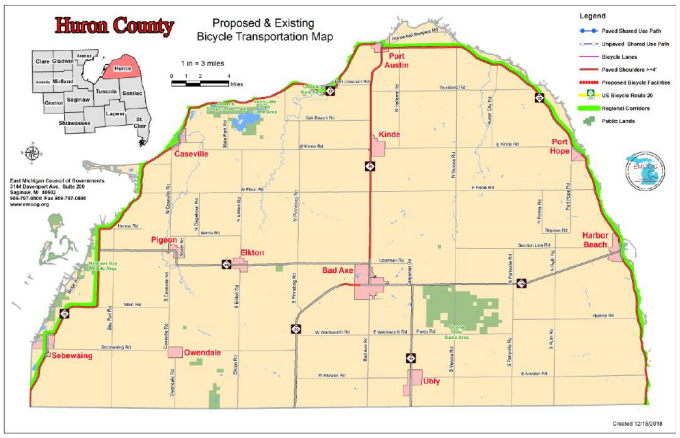




Our consultant reviewed different options for green infrastructure to help improve water quality and obtain grants in this sensitive area.

Regional Planning





Our consultant also looked at how the state and county viewed non-motorized transportation in their respective improvement plans.

Potential Partnerships

- Sand Point Nature Preserve
- 220 Acres owned by Saginaw Basin Land Conservancy
- Interested in partnering to expand and connect trails
- Support green infrastructure initiatives and maintenance along Crescent Beach Rd



Investigation into potential partners was also made. When applying for grants, showing that multiple partners are interested helps to make a more complete application.

Concept Alternatives

- Alternative A (Baseline) – 4’ Paved Shoulders
- Alternative B – On-Street Bike Lanes
- Alternative C – Raised Shared-Use Path
- Alternative D – Raised Shared-Use Path w/ Permeable Paver Parking
- All Alternatives – Green Stormwater Infrastructure

Alternative A is the baseline because it is the minimum requirement for hard surfaced shoulder area proposed for non-motorized use.

4’ Paved Shoulders



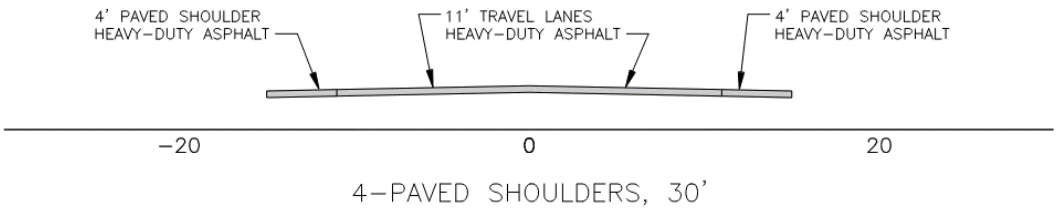
Painted Bike Lane on a Paved Shoulder
Source: AASHTO Guide for the Development of Bicycle Facilities



Paved Shoulders along M-25 in Huron County *Source: Google Streetview*

Photos of full-width paved shoulders.

4’ Paved Shoulders



4–PAVED SHOULDERS, 30’

On-Street Bike Lane



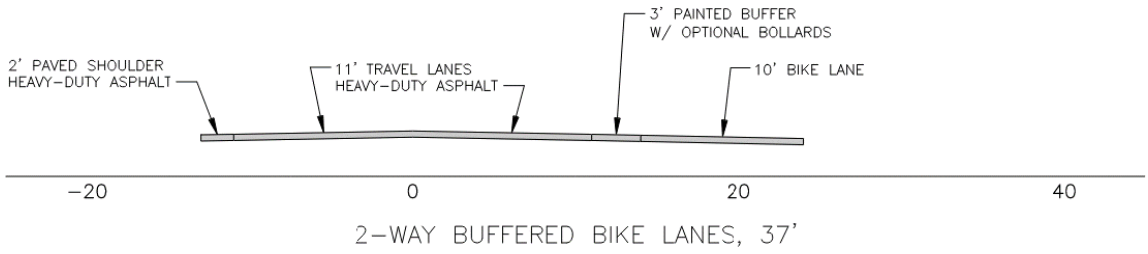
Painted Bike Lane w/ Buffers & Protective Bollards *Source: PEXCO*



Buffered Bike Lane, Seattle, WA *Source: NACTO Urban Bikeway Design Guide*

There are options within this option. Some areas paint the entire bike lane a different color, some add protective bollards. Either way, a buffer area needs to be provided.

On-Street Bike Lanes



2-WAY BUFFERED BIKE LANES, 37'

Raised Shared-Use Path



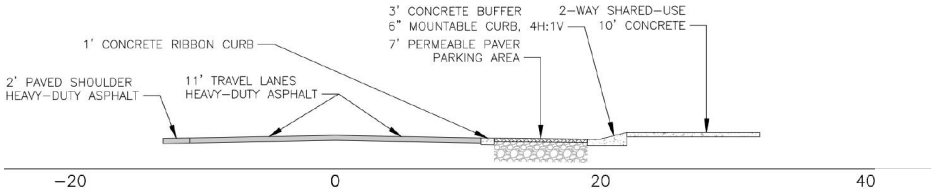
Raised Shared-Use Path in Hillsboro, OR
Source: NACTO Urban Bikeway Design Guide



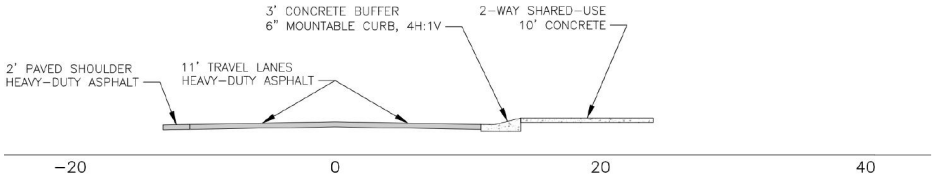
Raised Shared-Use Path w/ Parking Protection, Portland, OR
Source: NACTO Urban Bikeway Design Guide

The advantage of a raised shared use path is even higher visibility than the on-street bike lanes. There is added delineation value as because it is raised from the driving surface.

Raised Shared-Use Path

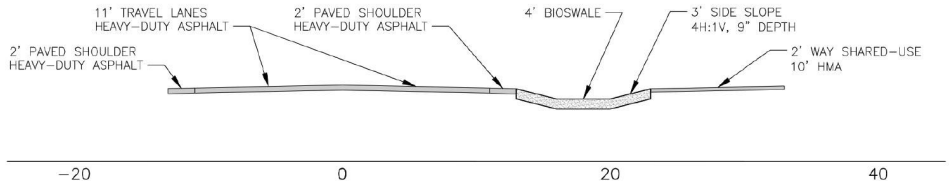


2-WAY SHARED-USE PATH W/ PARKING PROTECTION, 45'

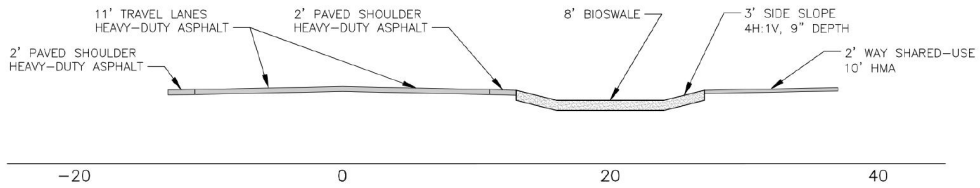


2-WAY SHARED-USE PATH W/ NO PARKING, 37'

Shared-Use Path w/ Bioswale Buffer



2-WAY SHARED-USE PATH W/ 4' BIOSWALE BUFFER, 46'



2-WAY SHARED-USE PATH W/ 8' BIOSWALE BUFFER, 50'

Cost Estimate Methodology

1. Develop unit costs for each X-Section per linear foot by category
   - Road resurfacing
   - Driveway removal and replacement
   - Non-motorized use
   - Green stormwater infrastructure
2. Apply X-Section by station for length of project
   - Road alignment stays the same – Cold mill HMA overlay
   - Road alignment shifts – Crush and Shape w/ 2-course HMA overlay
3. ID problem areas and apply add'l green infrastructure as necessary

Unit Cost Summary

Sections	Cost per Lineal Foot (LF) Total	Path	Bioswale	Pavers
Section 1: 4' -Paved Shoulder, 30'	$ 16.42	$16.42	$ -	$ -
Section 2: 2- Way Shared-Use Path w/Parking Protection 45'	$240.61	$117.67	$ -	$ 122.95
Section 3: 2- Way Shared-Use Path w/No Parking, 37'	$ 89.67	$89.67	$ -	$ -
Section 4: 2- Way Buffered Bike Lanes, 37'	$ 41.39	$41.39	$ -	$ -
Section 5: 2- Way Shared-Use Path w/ 4' Bioswale Buffer, 46'	$ 43.58	$34.38	$ 9.20	$ -
Section 6: 2- Way Shared-Use Path w/ 8' Bioswale Buffer, 50'	$ 47.26	$34.38	$ 12.88	$ -

Roadway Resurfacing Costs from HCRC	Unit Cost
Cold mill and HMA overlay (at 180#/SY)	Mile $ 150,000
	LF $ 28.41
Crush and Shape w/ 2-course HMA Overlay	Mile $ 240,000
	LF $ 45.45

Alternative A: 4' Paved Shoulders	Estimated Cost
HMA Overlay	$ 658,843.75
Crush and Shape	$ -
Driveway Removal	$ 18,172.00
Driveway Replacement	$ 109,276.02
Paved Shoulder Expansion	$ 326,436.96
Exterior Bioswales	$ 143,501.00
12" Perforated Pipe; 1,200 LF @ $30.00/LF	$ 36,000.00
Leaching Basins; 10 @ $6,0000/Ea	$ 60,000.00
Roadway Sub-Total	$ 658,843.75
Driveway Sub-Total	$ 127,448.02
Non-Motorized Use Sub-Total	$ 326,436.96
Green Infrastructure Sub-Total	$ 239,501.00
Overall Sub-Total	$ 1,352,229.73
15% Contingency	$ 202,834.46
Total	**$ 1,555,064.19**

Alternative A

- Baseline scenario
- Match north pavement edge, minimize driveway impacts
- Exterior bioswales located on south side of road, outside of paved section but within ROW
- North side drainage left as is, leeching basins and perforated pipe used to route runoff from problem areas to bioswales

For just paved shoulder expansion without grants, if we spread out $500,000.00 over 15 years at 3% (conservative) and over 459 parcels abutting Crescent Beach Road, annual payment for each parcel is $90.27. Over 20 years, this would be $72.50 annually.

Alternative A: 4' Paved Shoulders	Estimated Cost
ROAD COMMISSION WORK	
HMA Overlay	$ 757,670.31
Engineering & Administration (10%)	$ 75,767.03
ROAD COMMISSION TOTAL	**$ 833,437.34**
NON-MOTORIZED WORK	
Driveway Removal	$ 20,897.80
Driveway Replacement	$ 125,667.42
Paved Shoulder Expansion	$ 375,402.50
12" Perforated Pipe; 1,200 LF @ $30.00/LF	$ 36,000.00
Leaching Basins; 10 @ $6,0000/Ea	$ 60,000.00
Construction Subtotal	$ 617,967.72
Engineering & Administration (15%)	$ 92,695.16
NON-MOTORIZED TOTAL	**$ 710,662.88**

Alternative A

- Baseline scenario
- Match north pavement edge, minimize driveway impacts
- Exterior bioswales located on south side of road, outside of paved section but within ROW
- North side drainage left as is, leeching basins and perforated pipe used to route runoff from problem areas to bioswales

For just paved shoulder expansion without grants, if we spread out $500,000.00 over 15 years at 3% (conservative) and over 459 parcels abutting Crescent Beach Road, annual payment for each parcel is $90.27. Over 20 years, this would be $72.50 annually.

Alternative B - On-Street Bike Lanes	Estimated Cost
HMA Overlay	$ 392,281.25
Crush and Shape	$ 426,500.00
Driveway Removal	$ 26,684.00
Driveway Replacement	$ 162,361.18
Bike Lane/Shared-Use Path	$ 775,475.25
Bike Lane Markings 24 @ $750/Ea	$ 18,000.00
Pavement Marking at Intersections	$ 15,000.00
Interior Bioswales	$ 94,226.40
12" Perforated Pipe; 1,200 LF @ $30.00/LF	$ 36,000.00
Leaching Basins; 10 @ $6,0000/Ea Exterior	$ 60,000.00
Bioswales; 5,320 LF @ $9.20/LF	$ 48,944.00
Roadway Sub-Total	$ 818,781.25
Driveway Sub-Total	$ 189,045.18
Non-Motorized Use Sub-Total	$ 808,475.25
Green Infrastructure Sub-Total	$ 239,170.40
Overall Sub-Total	$ 2,055,472.08
15% Contingency	$ 308,320.81
Total	**$ 2,363,792.89**

Alternative B

- Match north pavement edge where possible
- Where alignment shifts for space constraints, crush and shape existing roadway
- Exterior bioswales located on south side of road, outside of paved section but within ROW
- North side drainage left as is, leeching basins and perforated pipe used to route runoff from problem areas to bioswales

For this option with leaching basins, the cost is $1.16m. Over 15 years is $210.02. Over 20 years is $168.65.

Alternative C - Concrete Shared-Use Path, No Parking	Estimated Cost
HMA Overlay	$ 392,281.25
Crush and Shape	$ 426,500.00
Driveway Removal	$ 27,104.00
Driveway Replacement	$ 171,484.77
Bike Lane/Shared-Use Path	$ 1,321,995.42
Pavement Marking at Intersections	$ 15,000.00
Interior Bioswales	$ 94,226.40
12" Perforated Pipe; 1,200 LF @ $30.00/LF	$ 36,000.00
Leaching Basins; 10 @ $6,0000/Ea	$ 60,000.00
Exterior Bioswales; 5,320 LF @ $9.20/LF	$ 48,944.00
Roadway Sub-Total	$ 818,781.25
Driveway Sub-Total	$ 198,588.77
Non-Motorized Use Sub-Total	$ 1,336,995.42
Green Infrastructure Sub-Total	$ 239,170.40
Overall Sub-Total	$ 2,593,535.84
15% Contingency	$ 389,030.38
Total	**$ 2,982,566.21**

Alternative C

- Similar X-section width and alignment as Alternative B
- Raised concrete SUP provides higher level of safety and service for ped/bikes but at higher cost
- Raised path and different surface material would discourage parking in ped/bike-way

Cost is $1.8m for non motorized and leaching basins. $324.98 over 15 years and $260.99 over 20 years.

Alternative D - Concrete Shared Use Path, w/ Parking	Estimated Cost
HMA Overlay	$ 342,906.25
Crush and Shape	$ 505,500.00
Driveway Removal	$ 27,104.00
Driveway Replacement	$ 171,484.77
Bike Lane/Shared-Use Path	$ 1,472,390.83
Pavement Marking at Intersections	$ 15,000.00
Interior Bioswales	$ 94,686.40
12" Perforated Pipe; 1,200 LF @ $30.00/LF	$ 36,000.00
Leaching Basins; 10 @ $6,0000/Ea	$ 60,000.00
Exterior Bioswales; 2,880 LF @ $9.20/LF	$ 26,496.00
Permeable Pavers	$ 672,521.31
Roadway Sub-Total	$ 848,406.25
Driveway Sub-Total	$ 198,588.77
Non-Motorized Use Sub-Total	$ 1,487,390.83
Green Infrastructure Sub-Total	$ 889,703.71
Overall Sub-Total	$ 3,424,089.56
15% Contingency	$ 513,613.43
Total	**$ 3,937,702.99**

Alternative D

- Most expensive alternative
- Permeable paver on-street parking in higher density residential areas
  - Lois to Shoshone
- By providing on-street parking hope to discourage illegal parking in other areas

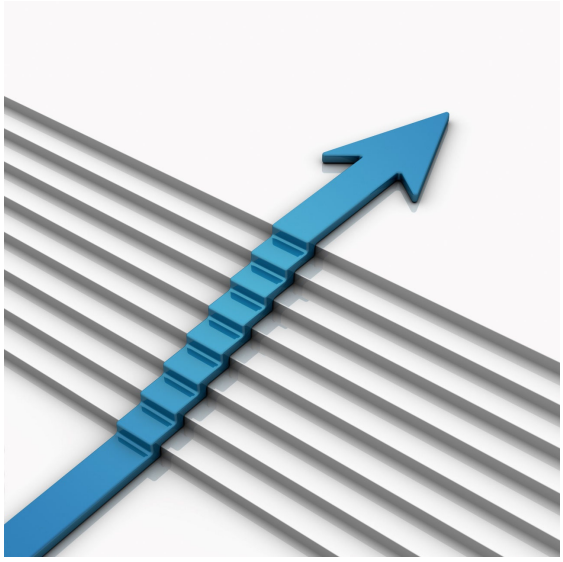
$2.66m total – mainly because of permeable pavers. $480.25 for 15 year term, $385.68 for 20 year term.

Cost Estimate Summary

	Road Resurfacing	Driveway Replacement	Non-Motorized Use	Green Stormwater Infrastructure	Overall Sub-Total	15% Contingency	Total
Alt A: 4' Paved Shoulders	$ 658,844	$ 127,448	$ 326,437	$ 239,501	$ 1,352,230	$ 202,834	**$ 1,555,064**
Alt B: On-Street Bike Lanes	$ 818,781	$ 189,045	$ 808,475	$ 239,170	$ 2,055,472	$ 308,321	**$ 2,363,793**
Alt C: Concrete Shared-Use Path	$ 818,781	$ 198,589	$ 1,336,995	$ 239,170	$ 2,593,536	$ 389,030	**$ 2,982,566**
Alt D: Concrete SUP w/ Parking	$ 849,406	$ 198,589	$ 1,487,391	$ 889,704	$ 3,424,090	$ 513,613	**$ 3,937,703**

Next Steps

- Partnership with Caseville Township to identify revenue source. This could include a Special Assessment District.
- HCRC can help facilitate project development and grant submittal.



Questions?

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