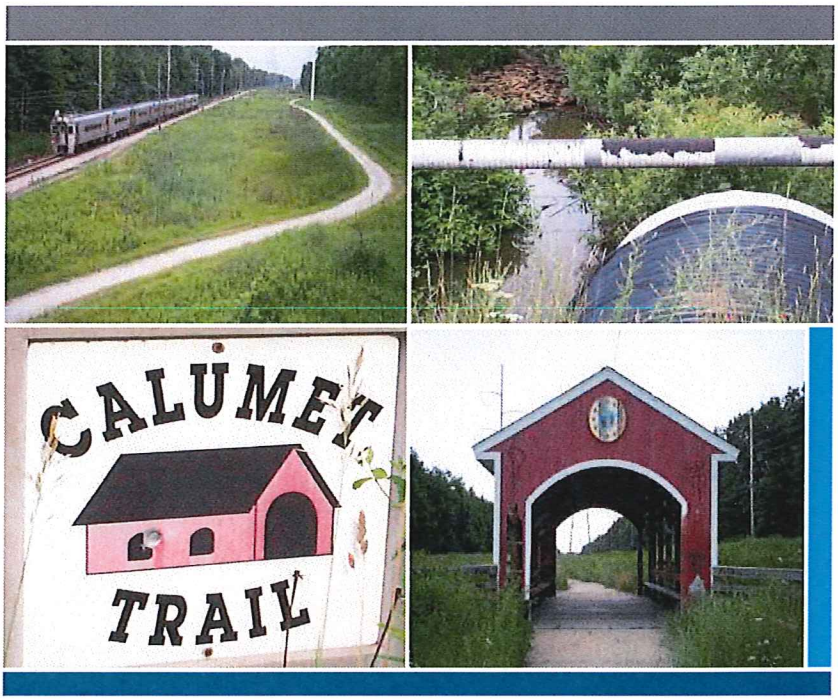
Calumet Trail Revitalization Feasibility Study

Porter County, Indiana

August 2009



Calumet Trail Revitalization
Feasibility Study

Prepared for:
Porter County
Porter County, Indiana

Prepared by:
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August 2009

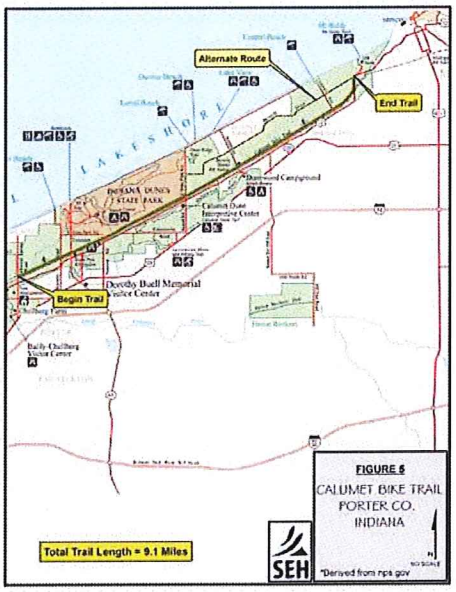
Feasibility Study

Calumet Trail Revitalization

Prepared for Porter County, Indiana

1.0 Trail History

The Calumet Trail, located in northern Porter County, is a 9.1 mile non-motorized recreational trail used by bicyclists and pedestrians. The trail begins near Mineral Springs Road, at its western terminus and continues east to USH 12, on its eastern terminus (see attached maps). This trail segment is the final "link" between the future Marquette Greenway/Brickyard Trail on the west and the proposed Michigan City Singing Sands Trail on the east. The trail also serves as a maintenance and access road for Northern Indiana Public Service Company (NIPSCO) for servicing their two parallel, overhead electric transmission power lines. The South Shore Railroad runs parallel to and along, the southern portion of this corridor.



The trail was originally constructed in 1976 utilizing the existing slag base NIPSCO had placed for its maintenance road. The slag base proved to be unstable and the trail was then surfaced with a chip and seal coat in 1979. The trail again fell into disrepair and was reconstructed under an Indiana Department of Transportation project in 2002. The cross section used during this reconstruction consisted of an 8 foot wide trail with geotextile fabric below a 10 inch compacted aggregate base and 2 inches of compacted calcium chloride (limestone) surface. Areas that were designated as "wet trail sections" had the same base, but were called out to have an 8 inch Portland Cement Concrete (PCC) surface.

The intent of this Study is to identify the existing concerns limiting use of the trail, recommend future trail improvements and estimate the costs of these improvements, in order to assist Porter County in applying for and receiving grant funding to plan for and complete future improvements to the trail, that will last for the next 20 years, and complete this segment of the northern Indiana trail-way corridor.

2.0 Existing Trail Conditions

A field review of the existing trail was completed via bicycles, by Bob Thompson, AICP Executive Director Porter Co. Planning Commission, and the consultant staff consisting of Kerry Keith, A.J. Monroe, AICP and Dan Penzkover, PE, from Short Elliott Hendrickson Inc. (SEH®), on July 8, 2009. The team rode the entire length of the trail, beginning at the access parking lot located on Mineral Springs Road and finishing at the parking lot at USH 12 on the east end of the trail. They observed existing conditions, drainage crossings and possible access and connecting routes for the trail. Their return trip followed Beverly Drive west, which parallels the Calumet Trail to the north, to its intersection with East State Park/Kemil Road, and again following the trail back to their starting point at Mineral Springs Road.

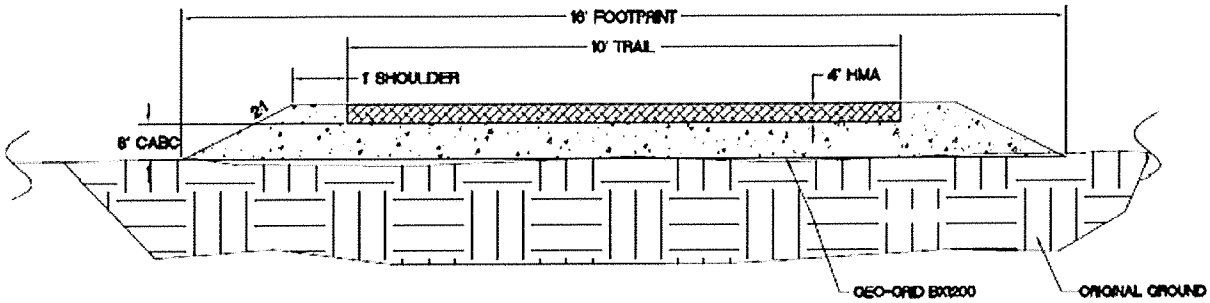
The team observed trail conditions ranking from adequate to very poor. The last improvements to the trail were constructed in 2002, and now only seven years later, the trail in some areas has severely deteriorated. Some portions of the trail have diminished to the point that only a "single track" width of gravel remains. The existing widths of the trail vary from 2 feet at the narrowest to 8 feet in the widest sections. As stated above, many wet trail areas show no evidence or remains of concrete surface that was proposed in 2002. These areas hold water during wet weather conditions and do not allow for proper drainage of the trail and surrounding area.

Maintenance of the trail appears to be minimal. It appears that NIPSCO is maintaining and replacing cross drainage pipes as needed, but erosion is still evident in some locations. The County performs mowing operations in some areas but weeds and other vegetation have overtaken the trail in many locations. It was observed that mowing outside of the trail edges caused severe rutting, caused by the tires on the tractor mower. Maneuvering the trail with "road bikes" would most likely prove very difficult in many areas.

Access to the trail is marked, but somewhat limited to the parking lots on each end of the trail and at the Beverly Shores Rail Station located between miles 5 and 6. Existing signage along the trail is adequate, but somewhat outdated and inaccurate, due to the abandonment of several cross roads. Improving access and signage would increase the trail's visibility and usage rates.

3.0 Proposed Trail Cross Sections

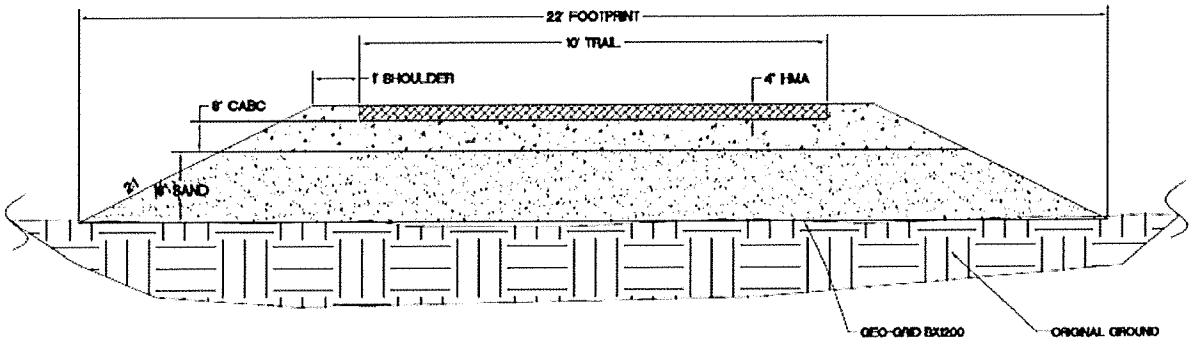
The trail location crosses a diverse landscape from west to east. The terrain is generally flat and varies from sandy upland soils, to heavy wetland soils. The trail elevation and profile varies from low-lying and un-drained to elevated and properly drained. Based on the evident poor performance of the existing trail sections and due to the extreme freeze-thaw climate in the region, the proposed new trail sections will be designed with a deeper cross section consisting of more sub-base material. This section will also be stable enough to support NIPSCO and other maintenance vehicles.



MAIN SECTION

The proposed trail section will be 10 feet wide, with 1 foot shoulders on each side and paved with asphalt. The cross section depth will consist of 4 inches of Hot Mix Asphalt (HMA), with 8 inches of a crushed aggregate base course (CABC) on top of a biaxial geo-grid/geo-textile material.

In areas of extreme moisture a heavier "frost-free" section will be needed. This section will consist of the same 10 foot wide paved trail with 1 foot wide shoulders, but the sub-base material depth will be increased to 12 inches of sand below the 8 inches of CABC. The geo-grid will be placed at the bottom of the section below the sand layer.



WET OPTION 1
(FROST FREE SECTION)

The Calumet Trail cross sections will have to be designed to withstand the harsh climate, while minimizing the adverse affects to the environmental surroundings, adjacent to the trail. The initial opinion of a geotechnical engineering expert, perform soil borings along the trail to evaluate the frost susceptibility of the sub-grade, prior to the start of any design work. In addition to borings, a Soil Penetration Test (SPT) should be completed and correlated with a California Bearing Ratio (CBR), or complete a Dynamic Cone Penetrometer test. These results will be necessary to properly design a trail cross section that withstands the extreme conditions. The existing conditions are too wet and soils too weak to make assumptions during design. Without this additional information, the proposed cross sections included in this report, are just a best estimation of need. It is the Engineer's opinion that a cross section should be designed to maximize the amount of base course and reinforcement being used. Maximizing the base will give the trail the strongest cross section for investment dollars and longevity.

A summary break down of the wet trail locations along with photos of the 2002 trail reconstruction can be found in **Appendix A**. The photos really show the necessity of using an elevated section that has a drained sub-base.

4.0 Drainage and Stormwater Runoff

The stormwater and drainage for the Calumet Trail is not a problem of culvert pipe capacity or stream flooding, but a problem of water pooling on the trail itself. To solve the water pooling problem and to improve the structural integrity of the trail a raised frost-free cross section should be used. This type of cross section could affect the drainage patterns adjacent to the trail. During design it will be important to identify existing drainage patterns and to preserve these patterns by installing cross culverts, drain tile or elevated trail sections that will allow for the normal surface water patterns to be maintained.

The existing stream crossings do not have a history of flooding or failure, however, some of the crossings will need to be extended to provide adequate room for the 10 foot wide trail which is replacing the existing 8 foot trail. In addition to extending culverts, several of the stream crossings need additional erosion control improvements, including geo-synthetic fabric and heavy stone rip-rap. Many of the stream crossings have an exposed gas main running along the south side, and parallel to the trail. The close proximity of this gas main and any other underground utilities need to be identified during the design phase.

A summary of the existing stream crossings and drainage ways, identified and located by stationing based on the 2001 construction plan, provided by Floyd E. Burroughs & Assoc., Inc., is provided is **Appendix B**. Photos of some stream and drainage crossings are also contained in **Appendix B**.

Identifying the existing surface water and hydraulic drainage patterns will be an important aspect of the trail design. Maintaining these drainage characteristics will be imperative to limiting affects and preserving the surrounding eco-system, including wetlands, stream crossings, and surface water flow.

5.0 Environmental Impacts

Environmental concerns and impacts will need to be minimized during the design and planning phases, to the maximum extent practicable, in order to maintain trail safety and structural integrity of the Calumet Trail. Substantial cost in construction will be incurred for building a stable trail section strong enough to support the NIPSCO vehicle traffic and more importantly the freeze-thaw cycles the region encounters. In low lying areas a "frost-free" cross section will be the preferred choice. Coordination with the Indiana DNR and other agencies will be important so the designer can best understand where it is appropriate to install these sections with the larger footprint area. Initial coordination has been established with the Indiana Department of Environmental Management (IDEM) local contact Elizabeth Pelloso, Indiana DNR local contact Joe Exl, and should be coordinated with the U.S. Army Corps of Engineers (USACOE) John Ritchey. An on-site review, with all involved agencies, should be completed prior to the start of any design work.

The proposed 10 foot wide trail increases the area needed for the trail, from 8.9acres to 19.2acres. The reason for this increase in trail width is widening from 8' to 10' to comply with American Association State Highway and Transportation Officials (AASHTO) recommended standards for a multi-use trail. The wider base for this trail cross section is necessary to ensure that the trail can withstand the freeze-thaw cycles of the region. Construction staging areas and material storage will be limited due to the sensitive upland and low areas. Erosions control measures will need to be installed prior to construction, in order to protect endangered plants and species.

Wetland delineations have previously been completed for the trail, but are outdated. Prior to design of the new trail, new delineations will be required. In addition to the wetland delineation, a survey of rare and endangered plant species will be necessary. A list of sensitive plant locations as shown in the 2001 construction plans is provided in **Appendix C**. It is essential that impacts to these areas during construction must be minimized.

6.0 Trail Access

As discussed previously in this report, the main access points to the Calumet Trail are located at paved parking areas on each end of the trail at the Beverly Shores Train Station, located between miles 5 and 6. See photos in **Appendix D.**

Full bathroom amenities are available at the Beverly Shores station and an outdoor portable toilet is available at the Mineral Springs Road parking lot.

Additional access points are located at the following cross roads: Waverly Road, SR 49 and the South Shore Rail Station, East State Park Road/Kemil Road, Broadway, Lake Shore County Road and Central Avenue. Extra parking could be provided at the Waverly Road location by coordinating with NIPSCO to access and improve their existing service lot and near Broadway, north of the trail.

Potential trail connections could be added at SR 49, linking the trail with the proposed Dunes State Kankakee Trail to the north, and at abandoned roadways: Tremont Avenue, South Shore Drive, Oxford Avenue and Carolina Street. An existing parallel route that could easily function as an Alternate route for the eastern two-thirds of the trail is Beverly Drive. See the location maps in Appendix F. These locations can also be extended south of USH 12, with future crossing and safety improvements to the highway and crossroads at State Park Road South, Lake Shore County Road South, Central Avenue South and Carolina Street South.

Easy access to a trail is important for users, but also sometimes counterproductive in allowing vandals and other access that is not desirable. The existing covered bridge, located over the Brown Ditch is one such example. It was a terrific structure, capturing themes from the surrounding area, when constructed, but is now just a shell of a structure that contains graffiti and is constantly vandalized. It is important to locate such amenities and structures to minimize such activities.

7.0 Cost Estimate

The preliminary costs estimates provided include reconstruction of the trail, replacement and/or extension of existing culverts, and costs for potential trail access and parking improvements. Additionally, costs were estimated for trail amenities such as signs, map kiosks and benches. Costs not included are land acquisition (if needed), design and construction engineering costs and any related permitting costs.

The major cost component for the Calumet Trail Project is construction of the trail itself. The trail is 48,210 lineal feet (9.13 miles) long. Approximately 10,855 feet (2.06 miles) of the trail is in wet and low lying areas, requiring the heavier recommended cross section. As discussed earlier in this report, two such sections are being proposed. The difficulty of accessing the trail along with the minimization of environmental impacts during construction will cause normal construction prices in the region to increase, causing the overall unit prices of the trail items to become higher than materials used on a more accessible project.

The main pavement section consists of 4 inches of Hot Mix Asphalt (HMA), 8 inches of crushed gravel and a biaxial geo-grid material. The cost for constructing the mainline section 37,355feet (7.07 miles) of trail is **$2,428,075** or approximately **$65.00 per lineal foot.**

The low lying cross section of the trail is being approached with two options. The primary option is a raised section which is paved and will result in a "frost-free" trail foundation. This is the preferred cross section from a rider's overall quality point of view. The section consists of 4 inches of HMA, 8 inches of crushed gravel, 18 inches of sand, and a geotextile separating fabric. The cost for constructing the trail in low lying areas with this cross section is approximately **$902,400.** The cost per lineal foot for this section is **$83.10.**

Numerous parking areas and alternate trail access locations have been identified earlier for the Calumet Trail. The cost of constructing these trail heads can vary greatly depending on how many amenities are desired. Mineral Springs trail head on the west is a major trail head and needs upgraded restrooms, additional parking, and street lighting. Costs for these upgrades are approximately $100,000. The east end trail head needs double the parking, street lighting, and toilette facilities, estimated to be approximately $150,000. Two additional areas identified as good trail head locations are off Waverly and Central Avenue. These trail heads would not need full amenities only parking space. The cost for constructing a curb and gutter parking lot is and street lighting is $200,000 each.

Below is a breakdown of the anticipated costs for construction, engineering design, and permitting costs.

Estimated Trail Construction Costs			
Trail construction (primary sections) =		$3,330,500	
Culvert and stream repair =		$250,000	
Trail signing and amenities =		$100,000	
Trail Heads			
Mineral Springs	Improvements	$100,000	
East End Access	Improvements	$150,000	
Waverly	Proposed New	$200,000	
Central Ave	Proposed New	$200,000	
Trail Connections		$500,000	
Subtotal =		$4,830,500	
15% contingency		$724,575	
Estimated Construction Costs =			**$5,555,100**

Engineering, Design, and Permitting Costs		
Wetland Delineation and Report	$10,000	
Threatened and Endangered Species Survey and Report	$5,000	
Environmental Permitting	$10,000	
Environmental Assessment (EA)	$12,000	
Trail Design and Bidding Documents	$475,000	
Construction Administration	$375,000	
Estimated Engineering Costs =		**$887,000**

Estimated Costs for Design and Construction = $6,442,100

8.0 Summary

The Calumet Trail is one piece of a very large and growing network of trails in the Northwest Indiana Trail Corridor. The Calumet Trail is the "final" link connecting to the future Marquette Greenway/Brickyard Trail on the west end and the proposed Michigan City Singing Sands Trail on the east end. These main trail segments are all components of a larger vision to connect Indiana to its neighboring States of Illinois and Michigan. These trails are not only a great asset to the regional and local communities, but provide an alternate method of transportation. The multi-use bike and pedestrian trails will provide additional access to the surrounding communities' businesses, parks, downtown districts and residential areas.

The Revitalized Calumet Trail would complete the chain of this important trail network. This only reinforces the need to seek and obtain grant funding for this important asset to the communities.

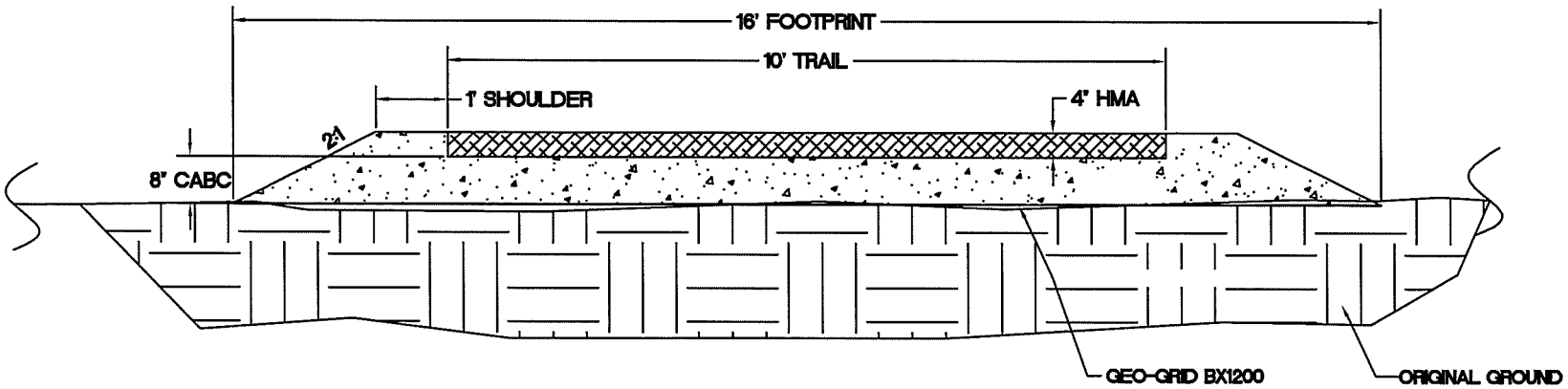
9.0 References

Feasibility Study for: Calumet Trail Renovation, by the Troyer Group- 1996, Indiana Department of Transportation Construction Plans, by Floyd E. Burroughs & Assoc., Inc- March 24, 2001.

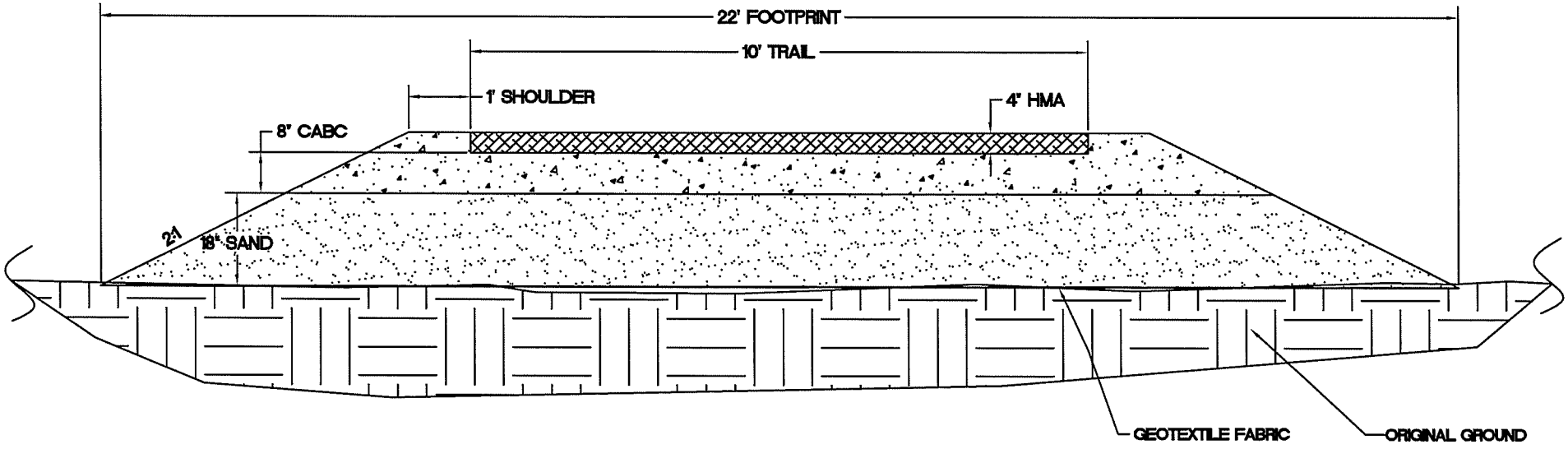
Guide for the Development of Bicycle Facilities, by American Association of State Highway and Transportation Officials - 1999.

Appendix A

Wet Trail Locations and Proposed Cross Sections



MAIN SECTION



WET TRAIL SECTION
(FROST FREE SECTION)

Photo 5 Stream crossing with exposed gas main.

Photo 6 Culvert at sta: 524+20 needs erosion control, excess fabric should be removed. Exposed gas main.

April 10, 2002 Construction Photo

April 10, 2002 Construction Photo

April 10, 2002 Construction Photo

April 10, 2002 Construction Photo

April 10, 2002 Construction Photo

Appendix B

Stream/Culvert Crossing Locations

SEH

Calumet Trail Stream Crossings
Calumet Trail Revitalization Feasibility Study
Porter County, Indiana
August 2009

STREAM CROSSINGS		
STATION	DIAMETER INCHES	DESCRIPTION
118+75	18-24	CORRUGATED HDPE CULVERT. NEEDS EXTENSION
142+00	DOUBLE BOX CULVERT	NEW CULVERT CROSSING GOOD CONDITION
157+20	24-36	CORRUGATED METAL PIPE
185+10	twin 36	TWIN CORRUGATED METAL PIPES. NEEDS EROSION CONTROL IMPROVEMENT
354+00	36	CORRUGATED METAL PIPE. NEEDS EROSION CONTROL IMPROVEMENT
456+40	COVERED BRIDGE	BRIDGE SUFFERS FROM GRAFFITI AND VANDALISM
524+15	96	NEW PIPE NEEDS EROSION CONTROL IMPROVEMENTS

Note: Many pipes crossings have an exposed gas main. The gas main does not pose a environmental or safety hazard, but is note worthy for this report. During construction coordination with the owner is recommended as some of the crossings may be buried.

Photo 1 Stream crossing at sta: 18+75. Crossing needs extension

Photo 2 Stream crossing with exposed gas main.

Photo 3 Culvert at sta: 524+20 needs erosion control, excess fabric should be removed. Exposed gas main.

Appendix C

Sensitive Plant Areas

SEH

Calumet Trail Sensitive Plant Areas

Calumet Trail Revitalization Feasibility Study
Porter County, Indiana
August 2009

Total Trail Length = 48,210ft
When stated "Starts" this designates west end of plant area and continues east.

SENSITIVE PLANT AREAS					
START STATION	END STATION	LENGTH (FT)	% OF PROJECT	SIDE OF TRAIL	LANDMARK LOCATION
59+60	61+55	95	0.20%	S	60' E OF TOWER E OF MEMORIAL SPRINGS ROAD
90+80	92+90	210	0.44%	N & S	700' E OF WAGNER RD (ABANDONED)
97+15	99+75	260	0.54%	N	START 1200' E OF WAGNER RD, END AT POWER LINE
100+20	100+40	20	0.04%	S	1500' E OF WAGNER RD BETWEEN 2 POWER LINE
103+20	103+35	15	0.03%	S	950' W OF WAVERLY RD BETWEEN 2 POWER LINES
104+95	106+15	120	0.25%	S	850' W OF WAVERLY RD
107+75	109+25	150	0.31%	N & S	STARTS 550' W OF WAVERLY ROAD
222+25	228+75	650	1.35%	S	STARTS 775' E OF TRAIL MARKER "3 MILES"
251+50	258+60	710	1.47%	S	STARTS 1570' W OF TRAIL MARKER "4 MILES" EAST OF CURVE IN TRAIL
259+85	269+20	935	1.94%	S	STARTS 735' W OF TRAIL MARKER "4 MILES"
270+50	275+75	525	1.09%	S	STARTS 330' E OF TRAIL MARKER "4 MILES"
276+30	277+90	160	0.33%	S	STARTS 910' E OF TRAIL MARKER "4 MILES"
280+50	282+20	170	0.35%	S	STARTS 800' W OF STATE PARK RD
286+75	287+75	100	0.21%	S	STARTS 175' W OF STATE PARK RD
290+50	295+75	525	1.09%	S	STARTS 150' E OF STATE PARK RD
296+60	300+15	355	0.74%	S	STARTS 30' E OF SOUTH LAKE SHORE DRIVE (ABANDONED)
301+40	309+50	810	1.68%	S	STARTS 515' E OF SOUTH LAKE SHORE DRIVE (ABANDONED)
364+65	368+85	420	0.87%	S	E OF BIG CURVE IN TRAIL EAST OF THE DEPOT
372+50	379+25	675	1.40%	S	STARTS 30' W OF TRAIL MARKER "6 MILES"
410+50	411+50	100	0.21%	N	STARTS 100' E OF BROWN'S RD
410+75	420+00	925	1.92%	S	STARTS 125' E OF BROWNS RD
		7930	16.45%		

Appendix D

Photographs

Photo 1 Existing trail narrowing to single track dirt trail. No evidence remaining of concrete surface. (Photo July 8, 2009)

Photo 2 Possible additional access point. (Photo July 8, 2009)

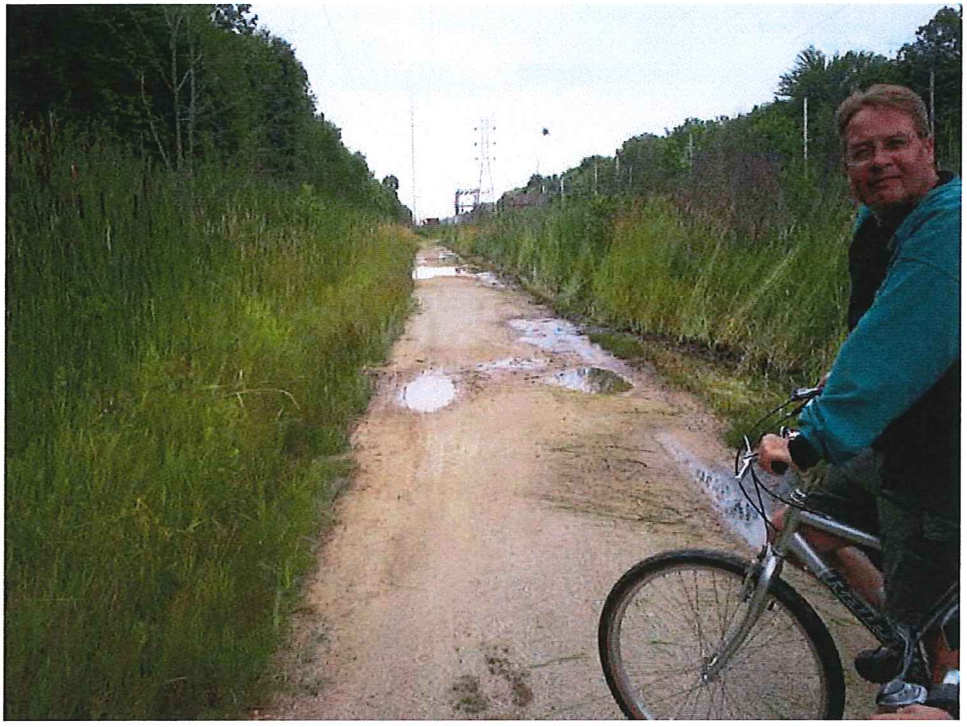


Photo 3 Existing trail is nearly impassable in low lying areas. (Photo July 8, 2009)

Appendix E

Cost Estimates

SEH

Calumet Trail Cross Section Estimate

Calumet Trail Revitalization Feasibility Study
Porter County, Indiana
August 2009

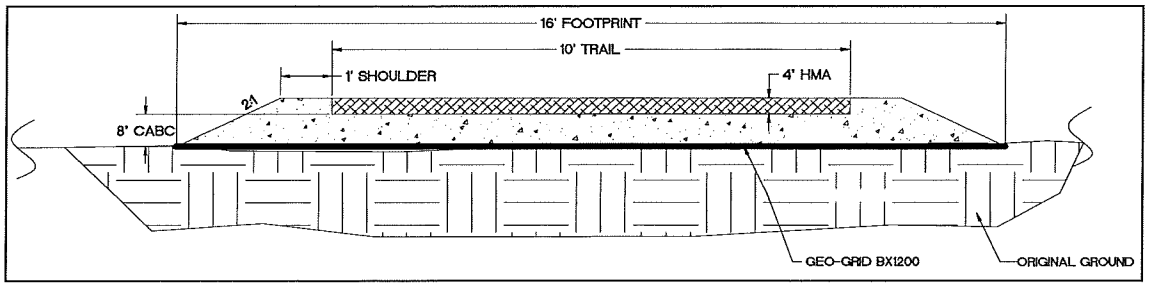
Total Trail Length = 48,210ft

Length of trail for standard cross section = 37,355ft
Length of trail for improved cross section = 10,855ft (estimated)

Main Section

length = 37,355

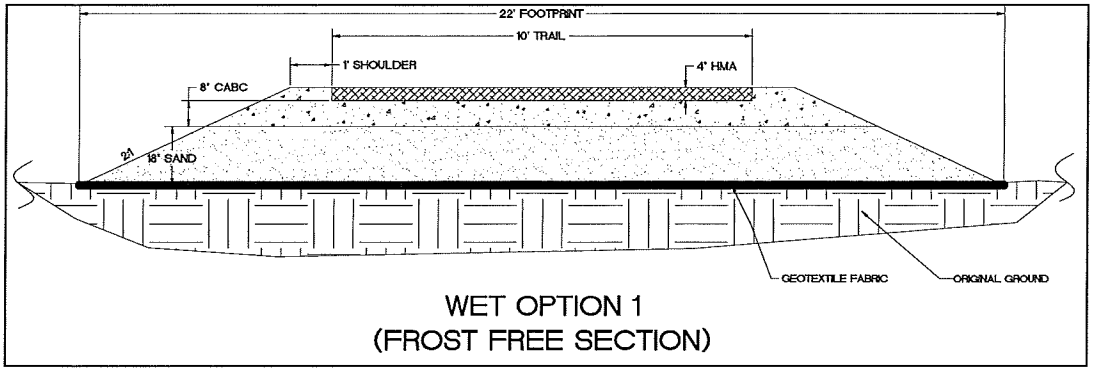
Material	Units	Quantity	Price	Estimate	Cost/ft
Asphalt 3"	TON	7346	$96.00	$705,262.40	$18.88
Asphalt 1"	TON	2449	$96.00	$235,087.47	$6.29
1-1/4" Base Course 8"	TON	25096	$35.00	$878,347.48	$23.51
Biaxial Geo-Grid	SY	66409	$5.00	$332,044.44	$8.89
Clearing and Grubbing	LUMP SUM	1	$5,000.00	$5,000.00	$0.13
Restoration	SY	24903	$5.00	$124,516.67	$3.33
				$2,150,741.80	**$65.00**



Wet Option 1 (frost free section)

length = 10,855

Material	Units	Quantity	Price	Estimate	Cost/ft
Asphalt 3"	TON	2135	$96.00	$204,942.40	$18.88
Asphalt 1"	TON	712	$96.00	$68,314.13	$6.29
1-1/4" Base Course 8"	TON	7293	$35.00	$255,239.24	$23.51
Sand (18")	CYD	11458	$28.00	$320,825.56	$29.56
Geotextile Fabric	SY	26534	$2.00	$53,068.89	$4.89
Restoration	SY	7237	$5.00	$36,183.33	$0.97
				$902,390.22	**$83.13**



WET OPTION 1
(FROST FREE SECTION)

Appendix F

Overview and Route Maps

FIGURE 1

2008 NAIP AERIAL

CALUMET BIKE TRAIL
PORTER CO., INDIANA

0 500 1,000 2,000
Feet

N

*NAIP 2008 aerial

Mineral Springs Road

Waverly Road

SR 49

To Dunes State Park

Begin Trail

T P

P

1

P

P

South Shore Rail Road Station

Wagner Road

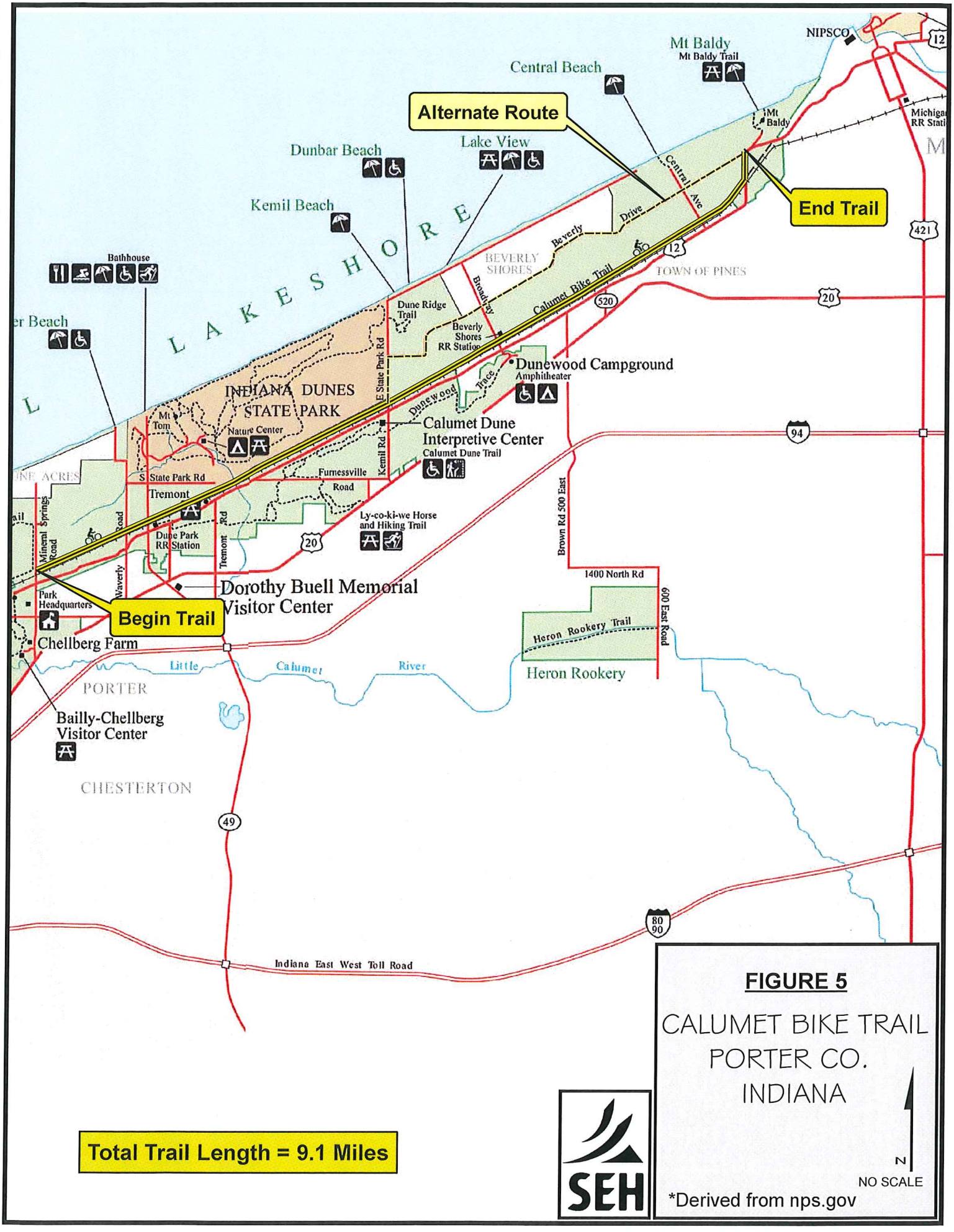
Legend

- P — Existing Parking
- T — Existing Toilets
- P — Future Parking
- 1 — Mile Marker
- Drainage Pipe


SEH
FIGURE 2
2008 NAIP AERIAL
CALUMET BIKE TRAIL
PORTER CO., INDIANA
0 500 1,000 2,000
Feet
N
*NAIP 2008 aerial
Abandoned Possible Route / Link
Approximate Town Line
Alternate Route
East State Park Road (Abandoned)
2
3
4
T
P
Visitor's Center
Tremont Road
Kemil Road
Approximate Town Line


Alternate Route
Alternate Route
Lake Shore County Road
Alternate Route / Connection
Broadway
Covered Bridge
Brown Ditch
Beverly Shores
Rail Road Station
P
T
5
6
7
8
Legend
P Existing Parking
T Existing Toilets
P Future Parking
1 Mile Marker
Drainage Pipe
SEH
FIGURE 3
2008 NAIP AERIAL
CALUMET BIKE TRAIL
PORTER CO., INDIANA
0 500 1,000 2,000
Feet
N
*NAIP 2008 aerial


Legend
Existing Parking
Existing Toilets
Future Parking
Mile Marker
Drainage Pipe
Porter County
Laporte County
Beverly Drive
Alternate Route
Central Avenue
Alternate Route / Connection
Alternate Route / Connection
Alternate Route
End Trail
Kinzeie Ditch
Porter County
Laporte County
SEH
FIGURE 4
2008 NAIP AERIAL
CALUMET BIKE TRAIL
PORTER CO., INDIANA
0 500 1,000 2,000
Feet
N
*NAIP 2008 aerial



Total Trail Length = 9.1 Miles

FIGURE 5

CALUMET BIKE TRAIL
PORTER CO.
INDIANA

N

NO SCALE

*Derived from nps.gov