Eco-Logical: I-75 Transportation Planning to Achieve Multiple Environmental Outcomes

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Project Overview

• FHWA SHRP2 Program
  • Address landscape-level environmental priorities during planning

• 20 year complete reconstruction
  • I-75 Monroe County, Michigan
Monroe County, Michigan

- **Corridor of Highest Significance**
  - Critical component of North American freight network

- **International connection**
  - Ambassador bridge
    - 40% of all trade with Canada transported through region
    - 2.5 million truck trips per year
    - 21% of all U.S. exports to Canada

- Opening of Gordie Howe Bridge
20 Year Reconstruction in Five Phases

- 20 year reconstruction of I-75 in 5 phases enables:
  - Partnerships
  - Data collection
  - Consider environment
    - Design
    - Engineering
    - Construction
  - Align transportation plans with watershed plans
  - Adaptive management
  - Cost savings
Conservation Action Planning

Identify Stakeholders & Create a Vision

Select Geographic Scope & Conservation Targets

Evaluate Viability of Targets & Establish Goals

Characterize Stressors

Develop Strategies & Objectives for Implementation

I-75 Corridor Conservation Action Plan
Identify Stakeholders & Create a Vision

**Technical Advisory Committee**
- Michigan Department of Transportation
- Michigan Natural Features Inventory
- Southeast Michigan Council of Governments
- Michigan Department of Natural Resources
- Michigan Department of Environmental Quality
- Michigan Department of Rural and Agricultural Development
- Michigan Sea Grant
- Federal Highway Administration
- The Nature Conservancy of Michigan
- Natural Resources Conservation Service
- US Army Corps of Engineers
- Monroe County
- U.S. Fish and Wildlife Service

**Local Implementation Partners**
- Monroe County Road Commission
- Monroe County Drain Commission
- Monroe County Conservation District
- Monroe County Business Development Corporation
- City of Monroe
- Detroit River-Lake Erie Cooperative Weed Management Area
- Green Ribbon Initiative
- Southeast Michigan Land Conservancy
- Oak Openings Cooperative Weed Management Area
- The Nature Conservancy of Ohio
- Detroit River International Wildlife Refuge
- IHM Sisters
“Develop and implement a collaboratively based, landscape-scale conservation plan, that facilitates rebuilding the I-75 corridor while maximizing conservation and restoration outcomes in the region”
Select Geographic Scope

Geographic Scope

- **Primary Zone:**
  - Defined by historic lake level fluctuation
  - 575 ft. elevation contour
  - US-24/ Historical Native American trail

- **Secondary Zone:**
  - HUC-12 subwatersheds – western boundary
  - Northern boundary: Lower Huron River Watershed

*Water Resources were considered from the beginning!*
Data collection for planning

- Landscape Level Functional Wetland Assessment (LLFWA)
- Water Quality Data
- Land Use/ Landcover Analysis
- Conservation Targets
Conservation Action Planning Process

- Identify Stakeholders & Create a Vision
- Select Geographic Scope & Conservation Targets
- Evaluate Viability of Targets & Establish Goals
- Characterize Stressors
- Develop Strategies & Objectives for Implementation

Conservation Targets:
- Coastal Tributaries - Fair
- Coastal Wetlands - Fair
- Migratory Fish - Good
- Herpetofauna Connectivity - Fair
- Globally Rare Natural Communities - Poor
- Aerial Migrants - Fair
Conservation Action Planning Process

Top Stressors & Strategies:
- Agricultural Drainage and Runoff
- Urban Development and Runoff
- Poorly Functioning Road Stream Crossings
- Invasive Species

- Identify Stakeholders & Create a Vision
- Select Geographic Scope & Conservation Targets
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I-75 Corridor Conservation Action Plan
Strategies

- **Agricultural Drainage and Runoff**
  - **Priority Action:** Develop a Smart Drain Assessment Project that incentivizes the implementation of Lake plain BMPs
Strategies

• Urban Development & Runoff
  – **Priority Action:** Create a new County initiative that takes an integrative approach to economic development and ecological enhancement.
Strategies

• **Invasive Species:**
  
  – **Priority Action:**
  Enhance the impact and capacity of existing Cooperative Weed Management Areas (CWMAs) in the I-75 Eco-Logical study area
Strategies

• Road Stream Crossings
  – Priority Action: Conduct a comprehensive needs assessment for road stream crossings in the I-75 Eco-Logical study area
Implementation
MDOT Implementation

- **Urban & Agricultural Runoff**
  - **To manage runoff:**
    - Widened ditches to install BMPs
    - Swales for water quality volume and conveyance
      - Small infiltration component
    - Check dams
MDOT Implementation

• Urban & Agricultural Runoff
  • Estimated annual volume and pollutant reductions*
    • Water quality volume: approx 1-inch over drainage area
    • Runoff Volume: 24% reduction
    • Total Phosphorous (TP): 44% reduction
    • Total Suspended Solids (TSS): 58% reduction

*Center for Watershed Protection Watershed Treatment Model
MDOT Implementation

- **Wetland Mitigation**
  - Coastal wetland restoration
  - Conversion of agricultural land to wetlands
  - Considered opportunities for Hibernacula
MDOT Implementation

- Invasive Species
  - MDOT joining local CWMA
  - Creating management plan for I-75 corridor
    - Prioritizing control locations
  - Work with partners who seek access to ROW for treatment
MDOT Implementation

**Native Plants**

- *Largest plant mitigation in MDOT history!*
  - 16,000 state-listed threatened plants in ROW
  - Relocated 1,550 Sullivant’s Milkweed to Sterling State Park
- Partnership with MDNR & Youth Corps
MDOT Implementation
• Road Stream Crossings
  • *Monroe County has over 2,000 RSXs!*
    • Most miles of county drain in Michigan!
    • Survey on culvert passability
    • Established priorities for migratory fish
MDOT Implementation

**Herpetofauna Survey**

- Evaluated connectivity
- Established priorities for Herpetofauna and wildlife
MDOT Implementation

- Improved Culvert Design
- Removal of Priority Flap Gates
- Extended Bridge Lengths
- Wildlife curbs and shelves
- Wildlife friendly erosion control

<table>
<thead>
<tr>
<th>Water Course</th>
<th>Previous size or span length (1952)</th>
<th>New size or span length (2016)</th>
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</thead>
<tbody>
<tr>
<td>I-75 over Sandy Creek</td>
<td>30 feet</td>
<td>80 feet</td>
</tr>
<tr>
<td><strong>I-75 over Stony Creek</strong></td>
<td>130 feet</td>
<td>167 feet</td>
</tr>
<tr>
<td>I-75 over Miller and Malosh Drain B</td>
<td>6 feet</td>
<td>10 feet</td>
</tr>
<tr>
<td>I-75 over Webb &amp; Reisdorf Drain</td>
<td>8 feet</td>
<td>10 feet</td>
</tr>
</tbody>
</table>
Benefits of improved culvert and bridge design:

- Reduces scour
- Reduces flooding
- Reduces velocity of flow
Maryland Department of Transportation (MDOT) Implementation

- Considering Recreation
  - Otter Creek Water Trail:
    - Planned to reduce bridge clearance, but now increasing to accommodate water trail use!
    - Added a bridge span and smaller beam to increase clearance
  - Bridge Clearance:
    - 8’11” to 6” → 8’11” to 7’11"
Migratory Fish Benefits

- **Improving water quality helps migratory fish**
  - **Western Banded Killifish**
    - Endangered in Ohio
    - No listing in Michigan
  - **Orangethroat Darter**
    - Species of Concern in Michigan
  - **Northern Pike**
    - Spawn in low gradient, vegetated, smaller tributaries
    - Benefit from removal of flap gates, increased culvert sizes
MDOT Implementation

• **Public Education**
  
  • **NOAA B-WET Grant**
    
    • **Year 1**: Piloting transportation and environment curriculum
      
      • Topics: water quality, invasive species, etc.
      
      • Monroe & Wayne County High School students creating interpretative material for MDOT Welcome Center
    
    • **Year 2**: Training more teachers on curriculum
MDOT Implementation

• **Cost Savings**
  - Saved $1,000,000 in land acquisition costs through MDNR partnership
    - 50% Transplant Sullivant’s milkweed to Sterling State Park
  - 50% from constructing 34 acres of coastal wetlands at Erie State Game Area
    - Partnership opened door for future MDOT/MDNR partnerships on wetland mitigation
Environment & Transportation

- Reconstruction continues
  - Adaptive management
  - Local implementation of Plan

- Water Resources Plan for Southeast Michigan
  - Regional policies on stormwater & transportation

- Roads Action Team on Stormwater
  - Discuss challenges related to managing road runoff

- Updating SEMCOG Long Range Transportation Plan
  - Environmental Sensitivity
  - Climate Resiliency
How else is SEMCOG Linking Watershed & Transportation Planning?
SEMCOG Long Range Transportation Plan

- **SEMCOG 2045 Long Range Transportation Plan (LRP)**
  - Complete early 2019
  - Guides transportation investments in SE Michigan
  - Improve quality and reliability of transportation system to:
    - Increase economic prosperity,
    - Achieve fiscal sustainability
    - Increase accessibility,
    - Protect the environment
    - Make communities desirable
Environmental Sensitivity Analysis

- **Updating Environmental Sensitivity Analysis for 2045 LRP**
  - Identify potential impact of planned projects on natural resources

- **Natural Resources**
  - Rivers, Lakes and Streams
  - Designated Trout Lakes/Streams & Natural Rivers
  - TMDLs
  - Location in watershed
  - T & E species
  - Wetlands
  - Floodplains
  - Parks and Recreation
  - Historic Sites & Heritage Routes
  - Cemeteries
DRAFT TRANSPORTATION POLICY #1: Support coordinated efforts to align water, natural resources and transportation priorities.

ACTIONS:

a. Enhance environmental considerations within the regional transportation planning process.

b. Utilize the environmental sensitivity analysis to inform transportation agencies of potential impacts.

c. Support and facilitate collaboration between road agencies and local jurisdictions regarding stormwater management opportunities that work towards water quality standards.
TRANSPORTATION POLICY #2: *Integrate multiple outcomes, including mobility, recreation and habitat, into road stream crossing and culvert designs.*

**ACTIONS:**

a. Inventory and conduct condition assessments of road stream crossings.

b. Categorize road stream crossings and prioritize improvements for multiple transportation modes, water trails, streamflow condition and fish migration.

c. Evaluate adaptive capacity of high priority road stream crossings.
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http://www.semcog.org/Plans-for-the-Region/Transportation/Environmental