Environmental

The 2005-2030 *Environmental Technical Report* (August 2007) identified key environmental resources, characteristics trends, and implications of statewide environmental and historic resources relative to the transportation system in Michigan. The purpose of this white paper is to identify any significant changes in Michigan's environmental and cultural resources, policies and procedures, and strategies since the 2005-2030 MI Transportation Plan (MITP) was completed.

Key Environmental Resources

Wetlands

MDOT continues its stewardship efforts to protect and preserve wetlands in Michigan. Since 2005, a total of eight wetland bank sites have been constructed by MDOT. These bank sites provide mitigation for projects located in the eight represented watersheds. However, for those watersheds not having a bank site, MDOT continues to build individual mitigation sites to compensate for impacts from specific transportation projects. Given the program emphasis on preservation of the existing transportation system, wetland impacts have been greatly reduced compared to 10 years ago. For that reason, no new wetland bank sites are planned.

Research continues on invasive species control as well as restoration techniques for Northern White Cedar swamps.

Water Resources

MDOT complies with the National Pollutant Discharge Elimination System (NPDES) permit program administered by the Michigan Department of Environmental Quality (MDEQ). The NPDES permit issued to MDOT in 2004 is still valid. However, MDOT will be working with MDEQ to review the permit for compliance and reauthorization during 2013.

MDOT also has developed a process to determine the impacts of road and bridge projects on receiving waters in Michigan. In addition, MDOT is committed to using Best Management Practices to mitigate for impacts. A description of these "Best Practices" can be found at http://michigan.gov/stormwatermgt/0,4672,7-205-30102---,00.html.

Threatened, Endangered, and Special Concern Species

Michigan recognizes the importance of preserving and protecting its biological diversity and listed species. The state has implemented a number of programs to preserve, protect, and enhance natural communities and associated flora and fauna. In addition, federal and state government has enacted laws to protect threatened and endangered species and special concern species that may inhabit these communities. Figure 7 in the *Environmental Technical Report* (2005-2030) indicated the location and concentration of

threatened, endangered, and special concern species known to occur in the state. Many of these species are located in the southern portion of Michigan's Lower Peninsula. However, a statewide comprehensive, systematic survey has yet to be completed; most of the survey work performed to date has occurred in the southern part of the state. As the transportation system in Michigan changes to meet demands over the next 25 years, it is likely that potential impacts to threatened, endangered, and special concern species and their habitats will occur.

In recent years, MDOT has emphasized system preservation over the construction of new highways. This has resulted in a decrease in the number of overall impacts typically associated with larger projects to threatened and endangered species and their habitats. MDOT's emphasis on system preservation is expected to continue for the foreseeable future.

MDOT's goal is to plan for and design transportation improvements that respect sensitive communities and mitigate impacts. MDOT is committed to implementing this goal by reviewing designs for environmental impacts; proposing effective mitigation and monitoring measures; ensuring compliance with local, state, and federal laws and permit regulations; and investigating public and agency complaints. MDOT has several on-going efforts to protect endangered plants and animals within state right-of-way. These efforts include the following:

- Review of permit applications requesting use of state right-of-way for other activities, such as utility work. MDOT biologists advise MDOT permit agents and permit requestors on ways to avoid, minimize, or mitigate damages to listed species;
- Creation of guidance and training materials for maintenance staff to assist them in the proper management of listed species and their habitats;
- Systematic surveying of MDOT right-of-way for endangered species so that project managers and maintenance staff can be advised on ways to avoid negative impacts to these species.
- Implementation of the protected areas program, creating plans that protect roadside habitats containing endangered plants and animals throughout the state; and
- Implementation of a Prescribed Burn Program in cooperation with the Michigan Department of Natural Resources to manage unique plant communities and restore and maintain critical habitat for listed species.

Air Quality

The Federal Clean Air Act of 1970 and subsequent amendments established national ambient air quality standards (NAAQS) for seven "criteria air pollutants": ozone, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, coarse and fine particulate matter (PM-10 and PM-2.5, respectively), and lead. These standards are meant to protect the

health of people and the environment. Ozone, carbon monoxide, and particulate matter are the most important pollutants to consider for transportation projects. A geographic area is known as an "attainment" area if it meets the standards or a "non-attainment" area if it fails to meet the standards. A non-attainment area proven to meet the NAAQS for that pollutant is re-designated to be in "maintenance." An area in maintenance is required to include activities in the plan that maintains attainment in the area for that pollutant, for at least 10 years after re-designation. Figures 1 and 2 depict attainment, maintenance, and non-attainment counties in Michigan for 1997 eight-hour ozone, CO, PM-10, and PM-2.5. Michigan is in compliance with the other criteria air pollutants.

Ozone is a pollutant of particular concern to people with lung and respiratory problems such as asthma. It is not created directly by cars and trucks, but rather by chemical reactions in the atmosphere involving sunlight and precursor emissions such as volatile organic compounds and oxides of nitrogen. These precursors are emitted by motor vehicles and industrial sources. Ozone precursors can be transported by wind for long distances from where they are initially emitted. Consequently, ozone is a regional concern and not just a localized issue. The U.S. Environmental Protection Agency (EPA) published the Final Rule for the air quality designations for the 2008 eight-hour ozone standard in the May 21, 2012 Federal Register. The Final Rule states that all Michigan counties are designated to be in attainment for the 2008 eight-hour ozone standard effective July 20, 2012. The EPA also published, in the same Federal Register, the revocation of the 1997 8-hour ozone standard for transportation conformity purposes one year after the effective date for the rule of July 20, 2012. Figure 1 illustrates the maintenance areas for the 1997 eight-hour ozone standard.

PM-10 (inhalable particles between 10 and 2.5 microns) are found near roadways and dusty industrial sources. PM-10 poses a health concern because the particles can be inhaled, accumulating in the respiratory system and exacerbating asthma and other adverse respiratory conditions. Figure 2 illustrates the maintenance area for PM-10.

Figure 1 – Non-attainment and Ozone Maintenance Areas (Countywide)

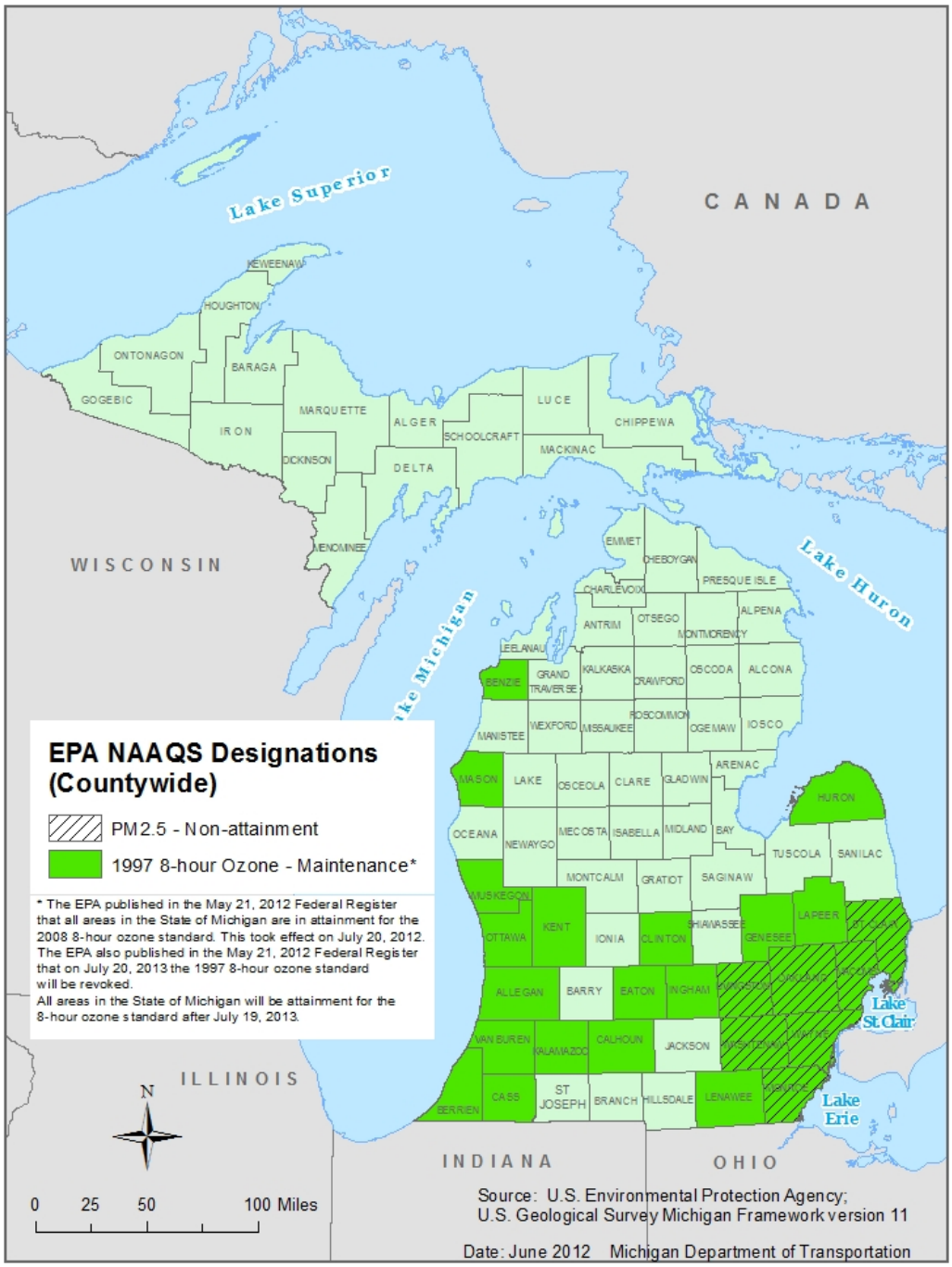
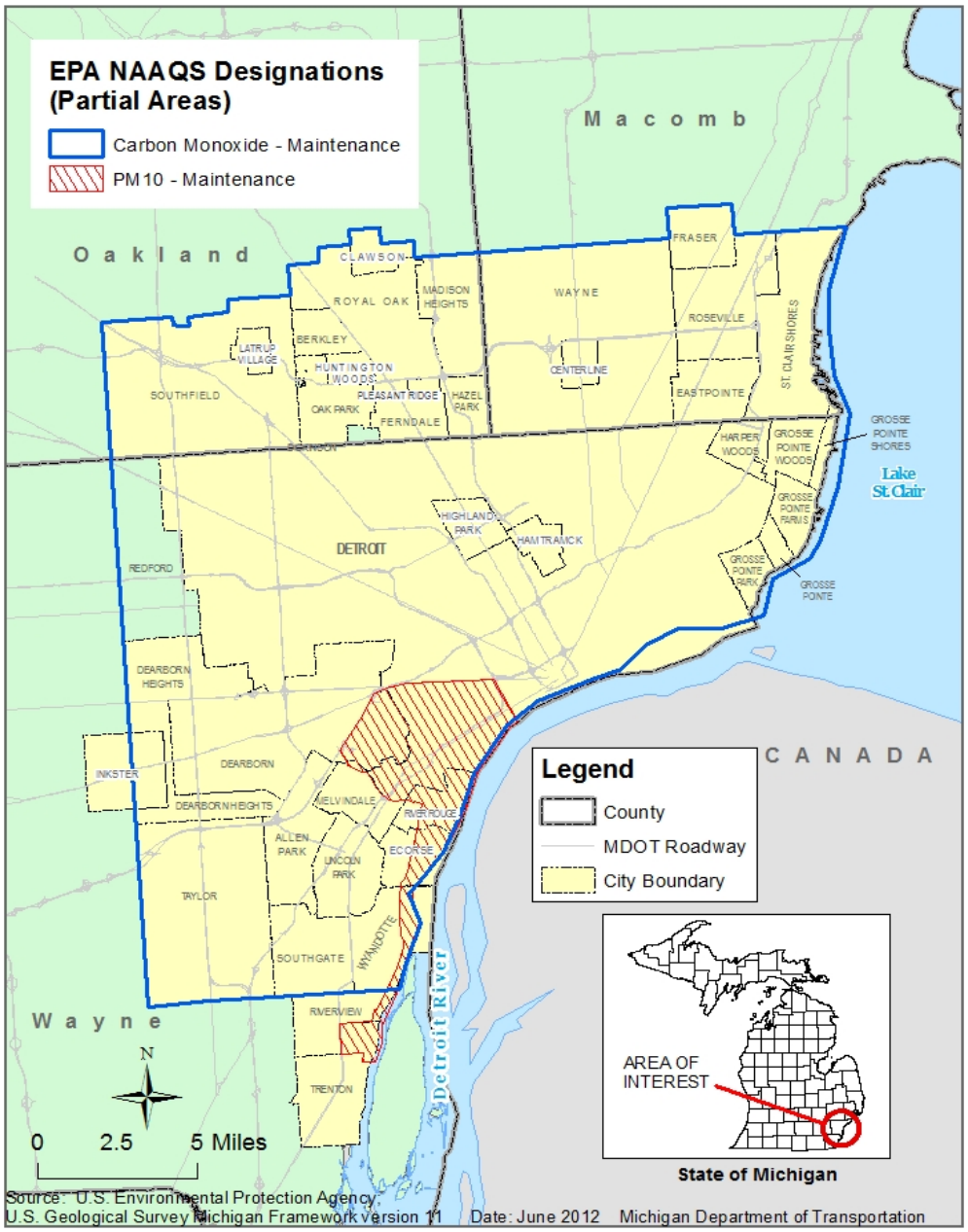


Figure 2- Carbon Dioxide and PM-10 Maintenance Areas (Partial Areas)



PM-2.5 (particulates 2.5 microns or smaller) are generally emitted from activities such as industrial and residential combustion and from vehicle exhaust. PM-2.5 is a health concern since fine particles can reach the deepest regions of the lungs. Health effects include asthma, difficult or painful breathing, and chronic bronchitis, especially in children and the elderly. Fine particulate matter associated with diesel exhaust also is thought to cause lung cancer. As shown in Figure 1, the standards for PM-2.5 are exceeded for a seven-county area comprising the Southeast Michigan Council of Governments (SEMCOG).

Carbon monoxide (CO) is a colorless, odorless gas emitted from combustion processes. Nationally and, particularly in urban areas, the majority of CO emissions to ambient air come from mobile sources. CO can cause harmful health effects by reducing oxygen delivery to organs (like the heart and brain) and tissues. At extremely high levels, CO can cause death. A "hot-spot" analysis of CO at the project level must be done under certain conditions as defined in 23 CFR 93.123. The last review of the CO NAAQS was completed in 1994 and the EPA chose not to revise the standards at that time. Hot-spot analyses of CO for transportation projects have shown that CO levels have not exceeded the standard for many years due to cleaner engines and fuels. As shown in Figure 2, the maintenance area for CO includes the City of Detroit and its inner suburbs.

A conformity analysis is required at a regional level for projects in non-attainment areas. The regional transportation plan for a non-attainment area must demonstrate conformity with planned reductions for PM-2.5 and maintenance of 1997 8-hour ozone (until revocation), CO, and PM-10 per the State Implementation Plan. Future transportation projects will be compared to the regional plan used in the most recent air quality conformity analysis to determine compliance. Mitigation measures are required for temporary construction impacts to air quality, as well as traffic-generated impacts that do not conform to the adopted plans.

Historic and Archaeological Resources

Michigan's historic, archaeological, and natural resources give the state a unique identity. Historic and archaeological resources are publicly or privately-owned buildings, structures, sites, objects, features, or open spaces that are significant in history, architecture, archaeology, engineering, or culture at the local, state, or national level (National Park Service). These cultural resources are found across the state; although, the vast majority of both above and below-ground sites remain unidentified. Due to the intensive nature of archaeological survey work, below-ground surveys have been performed on only roughly four percent of Michigan's land area. Archaeological sites are fragile and are often found in the top 12 to 18 inches of soil. These sites are under constant threat from ground disturbance activities such as road construction, utility installation, and housing developments. While above-ground surveys are less intensive, they require regular updating as resources age, change, or are lost. Two of the biggest threats to above-ground historic resources are neglect and new construction.

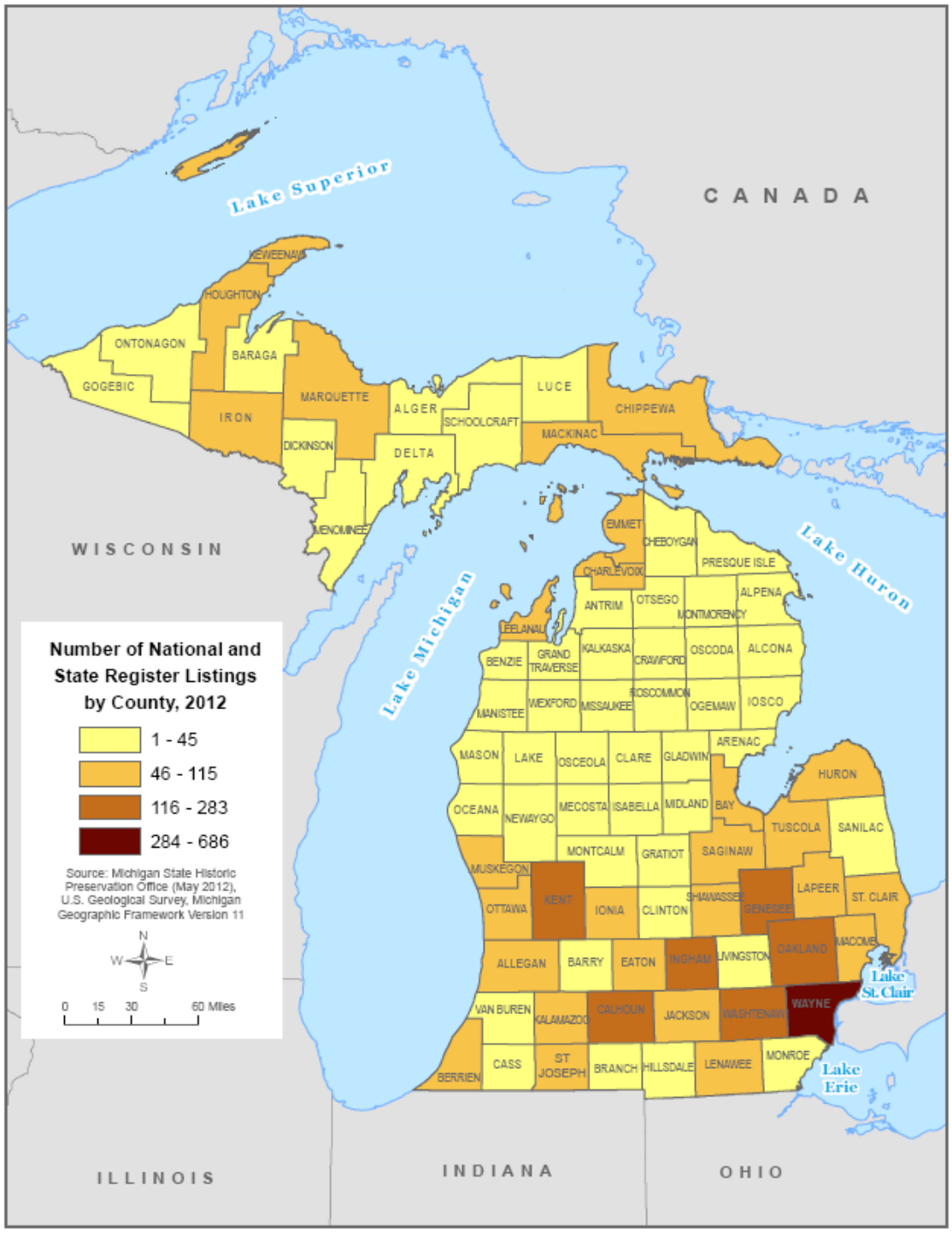
The Michigan State Historic Preservation Office (SHPO) maintains data about known historic and archaeological resources throughout the state. Figure 3 shows the geographical distribution of national and state register listings by county. There are 1,776 historic resources listed on the National Register of Historic Places and 35 National Historic Landmarks. At the state level, there are 2,913 historic resources listed on the State Register of Historic Sites and 1,621 Michigan Historical Markers. In addition, the archaeological files include 21,693 land sites and 1,527 shipwrecks. SHPO will update the statewide Historic Preservation Plan in 2013 to provide a framework for preservation activities around the state.

Future transportation systems can have a positive or negative effect on these historic and archaeological resources. Land use policies that promote sprawl and unchecked growth will increase the likelihood of new road systems directly or indirectly affecting historic resources. Adopting transportation strategies that slow sprawl and encourage the reuse of existing infrastructures and resources will lower the potential impact on historic resources, preserve historic farmland, and strengthen tourism and agriculture-related industries.

MDOT initiatives that involve the protection and enhancement of historic resources include:

- Ongoing identification of historic and archaeological resources
- Utilizing digital spatial data to map resources in coordination with SHPO
- Exploring the use of new techniques for historic bridge preservation
- Expanding coordination efforts with Michigan's tribes over various planning and environmental topics
- Continuing publication of an Environmental Research Series

Figure 3: National and State Register Listings by County 2012



Policies and Procedures
MDOT continues to follow state and federal laws and regulations listed in Appendix B in the *Environmental Technical Report* (2007). Since the publication of the *Environmental Technical Report*, the Federal Highway Administration (FHWA) has revised 23 CFR 772, *Procedures for Abatement of Highway Traffic Noise and Construction*. The revision to 23 CFR 772 took effect on July 13, 2011.

Environmental Goals and Objectives
MDOT continues to take steps in implementing the goals and objectives identified in the *Environmental Technical Report* (2007).

The Environmental Committee (EC) continues to ensure that MDOT complies with environmental laws in a focused, effective manner, fostering an environmental ethic throughout the department. The EC is supported by six technical teams that provide environmental analyses and recommendations.

MDOT's Environmental Services Section in the Bureau of Highway Development is responsible for NEPA-related compliance and ensuring that MDOT is a good steward of environmental resources.

MDOT continues to use Context-Sensitive Solutions (CSS) for transportation projects. CSS is a collaborative interdisciplinary approach to developing transportation projects. MDOT is committed to using CSS in its planning, design, construction, operations, and maintenance programs and projects. Under CSS, MDOT solicits dialogue with local governments, road commissions, industry groups, land use advocates, state agencies and the public early in a project.

The following is a list of CSS initiatives that MDOT has undertaken:

- Providing educational opportunities for staff to learn more about CSS and how to integrate CSS in transportation programs and projects;
- Provide opportunities for stakeholders and public engagement, including visioning sessions to ensure public views are represented in the project development process;
- Developing strategies for providing project visualizations to promote public understanding of projects and their impacts;
- Working with local agencies to promote CSS on local projects;
- Partnering with stakeholders in planning and developing multi-modal transportation infrastructures;
- Using a corridor approach to planning, including aesthetics, multi-modal, heritage routes and environmental analysis undertaken by an interdisciplinary team working in conjunction with local authorities; and
- Integrating CSS into MDOT's planning, development, and delivery processes.

MDOT incorporates CSS into transportation projects whenever possible, including working with stakeholders to identify Complete Street initiatives. Complete Streets is a more recent approach to transportation planning and design incorporating CSS principles. Michigan Public Act (PA) 135 of 2010 defines Complete Streets as "roadways planned, designed, and constructed to provide appropriate access to all legal users...whether by car, truck, transit, assistive device, foot or bicycle."

Strategies

Promoting transportation solutions that will minimize impacts to the environment remains a top priority. The Safe, Accountable, Flexible, Efficient, Transportation Equity Act – A Legacy for Users (SAFETEA-LU) has expanded the focus of eligible Congestion Mitigation and Air Quality (CMAQ) project types. The focus places more priority on diesel engine retrofits, cost-effective emission reductions, and congestion mitigation projects that provide air quality benefits.

MDOT has partnered with local groups to take advantage of eligible CMAQ funds to retrofit diesel trucks and utility vehicles, replace switch engines, install electrical reefer units at a historic produce terminal in southwest Detroit, install auxiliary power units and engine repowers for local trucking operations. The benefits from implementing these projects will help reduce the negative air quality impacts of congestion.

Integrating Planning and Environmental

The consideration of the environmental resources during the early stages of planning will allow planners, environmental specialists and stakeholders the opportunity to avoid or minimize impacts to these sensitive environmental resources. A digital spatial analysis of environmental data in a specific study area, or along a corridor, is a valuable planning tool in identifying sensitive environmental resources.

A digital spatial analysis of environmental data was prepared for the 11 corridors of international and national significance in Michigan. Figure 4 shows the locations of the significant corridors and their labels; while Figure 5 is a close-up view of the analysis area to illustrate that analyses can be done at multiple scales when characterizing the environmental constraints of any single area within the corridor. The results are summarized in Table 1. This summary shows how data may be compiled to cumulatively estimate environmental constraints on a corridor-wide basis. This same approach can be applied to specific areas within the corridor.

Figure 4 – Corridors of Significance

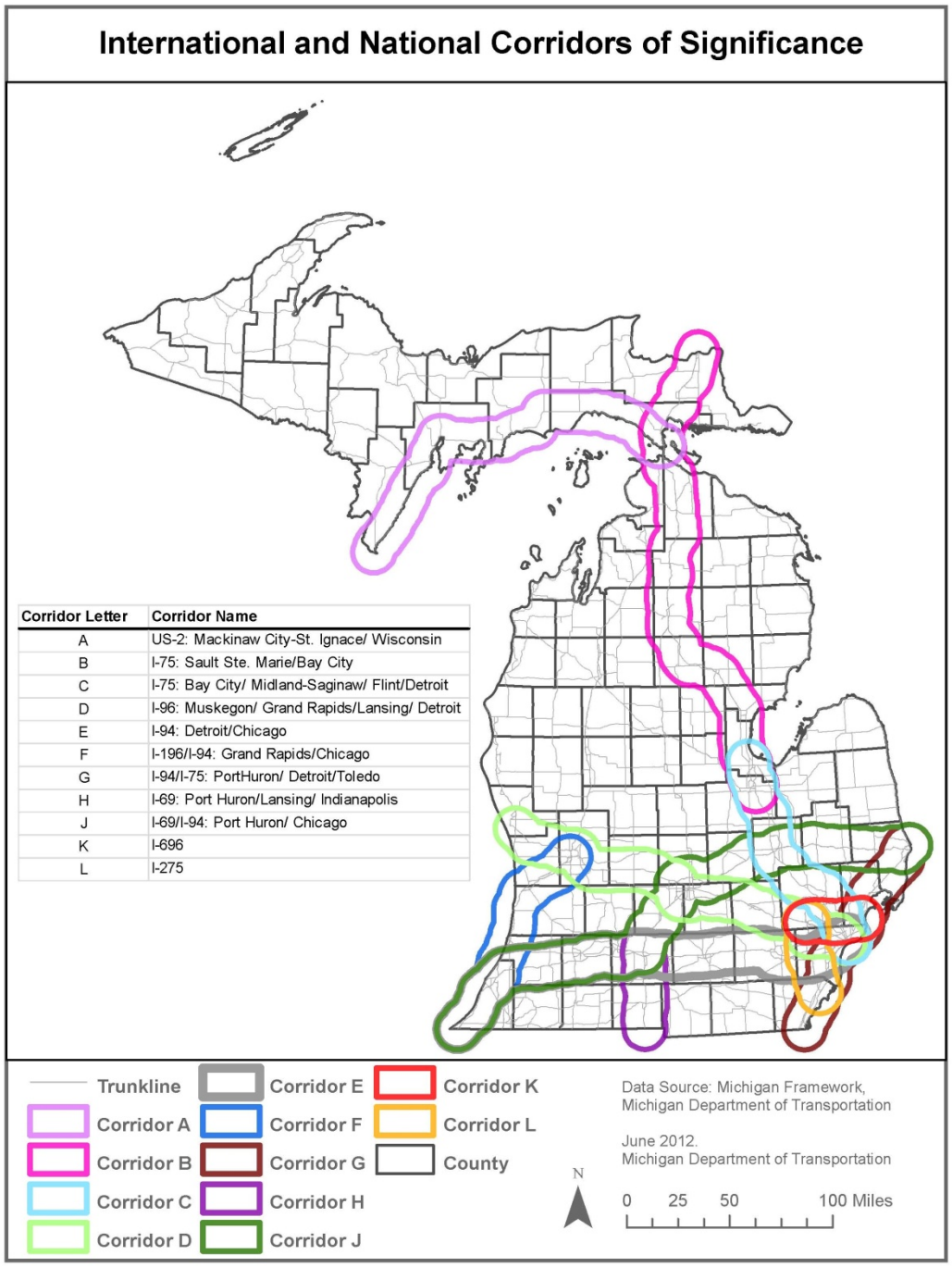


Figure 5 – Analysis Area Characterizing Environmental Constraints

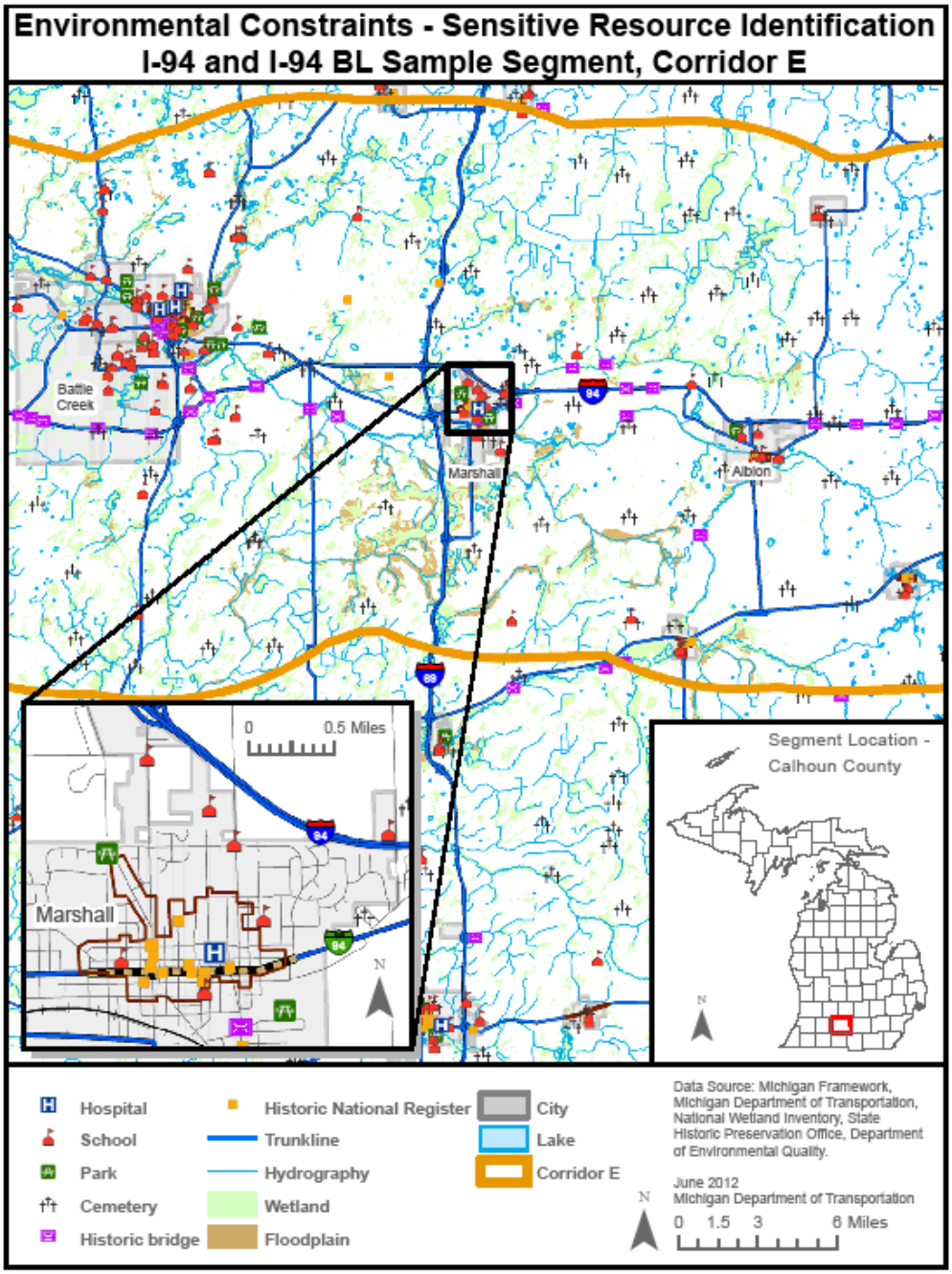


Table 1. Environmental Constraints - Sensitive Resource Identification

National/International Corridors of Significance	Corridor A - Mackinaw City-St. Ignace/ Wisconsin	Corridor B - Sault Ste. Marie/Bay City	Corridor C - Bay City/ Midland-Saginaw/ Flint/Detroit	Corridor D - Muskegon/ Grand Rapids/Lansing/ Detroit	Corridor E - Detroit/Chicago	Corridor F- Grand Rapids/Chicago
Resources within the 10 mile corridor buffer						
Cemeteries	85	214	311	474	509	186
Hospitals	3	16	49	52	49	13
Schools	50	266	1,511	1,803	1,479	495
Parks	27	56	318	406	345	65
Historic bridges (Eligible/NR Listed)	13	46	78	106	104	16
Historic National Register	28	75	372	381	434	58
Historic districts	12	40	202	232	222	42
Heritage Routes	2	3	4	2	4	1
Acres of wetlands within 500 ft of Trunkline	~ 1,130,879.25	~ 691,461.352	~ 39,065.847	~ 49,319.485	~ 114,808.882	~ 81,970.365

National/International Corridors of Significance	Corridor G - PortHuron/ Detroit/Toledo	Corridor H - Port Huron/Lansing/ Indianapolis	Corridor J - Port Huron/ Chicago	Corridor K - I-696	Corridor L - I-275
Resources within the 10 mile corridor buffer					
Cemeteries	259	407	509	138	166
Hospitals	41	19	25	40	13
Schools	1,204	597	819	1,126	635
Parks	268	142	187	243	87
Historic bridges (Eligible/NR Listed)	158	113	145	121	72
Historic National Register	280	202	249	203	51
Historic districts	160	100	126	120	28
Heritage Routes	3	4	4	2	2
Acres of wetlands within 500 ft of Trunkline	~ 45,528.804	~ 39,923.806	~ 116,763.355	~ 9,336.843	~ 7,139.078

Notes: Approximately 75 data layers are commonly utilized for environmental review; only a subset of those layers are shown here.
The 10 mile corridor buffers overlap so that some sensitive resources are included in more than one buffer.

Outreach Efforts with Resource Agencies, Tribal Governments, and Stakeholders
MDOT held a series of Webinars in June 2012 to engage Resource Agencies, Tribal Governments, and Stakeholders. The Webinars provided a brief overview of the existing 2005-2030 State Long Range Plan (SLRP) and the proposed revision of the plan. Participants also learned how to provide input into the development of the new 2035 MI Transportation Plan by completing an online survey.

The Resource Agencies, Tribal Governments, and Stakeholders were given the opportunity to complete an online survey that asked questions about organizational changes, including new legislations, goals and objectives, outreach efforts between MDOT and their organization, and other interests such as CSS, stewardship, environmental justice (minority and low-income populations), people with disabilities, and the elderly to name a few topics. For more information on the Webinars and survey results, refer to the Resource Agency and Tribal Government Consultation Report (Available in August 2012).

Environmental Mitigation
The *Environmental Mitigation Technical Report* (May 2007) provided an overview of mitigation measures, which are necessary to mitigate any potential adverse impacts that may occur as a result of proposed projects. Mitigation measures may include avoidance, minimizing impacts by limiting the scope of the proposed project, rehabilitating or restoring the affected environment, and compensating for the impact by replacing or providing substitute resources. They also include both temporary and permanent measures to minimize impacts during and after project construction. The purpose of this white paper is to provide an update on projects that have gone through the NEPA process since the publication of the *Environmental Mitigation Technical Report* (2007).

MDOT continues to work closely with federal, state and local agencies and with the 12 federally-recognized Tribes throughout the NEPA Process. Coordination with these agencies is vital in order to properly assess the impacts and to determine mitigation measures that are needed. Since the publication of the Environmental Mitigation Technical Report (2007), several studies have received a Record of Decision (ROD) or a Finding of No Significant Impact (FONSI). The following projects were issued a ROD: Blue Water Bridge Plaza Study, Detroit Intermodal Freight Terminal Study, the Detroit River International Crossing Study, US-131 Constantine Study, US-31 Holland to Grand Haven (M-231) Study, and the M-15 (in Oakland and Genesee Counties) Study. Several

studies were issued a FONSI: the Dearborn-to- Kalamazoo Rail Study, the M-85 (Fort Street) Bridge Replacement, the Otsego County Airport near Gaylord and the Tulip City Airport in Holland. MDOT continues to pursue implementation of mitigation commitments established in all of these environmental decision documents.

In 2011, MDOT classified 654 highway and rail projects. This means the projects received a Class I (Environmental Impact Statement), Class II (Categorical Exclusion), or Class III (Environmental Assessment) designation under National Environmental Policy Act (NEPA) procedures established by FHWA, the Federal Rail Administration, and the Federal Transit Administration. MDOT also certified 589 Categorical Exclusion project plans and specifications to ensure these documents contained appropriate environmental mitigation measures prior to being advertised for construction. During the same time period, 80 airport projects were classified as categorical exclusions.

In 2012-2013, MDOT and FHWA will be reviewing and updating MDOT's mitigation follow-up process.