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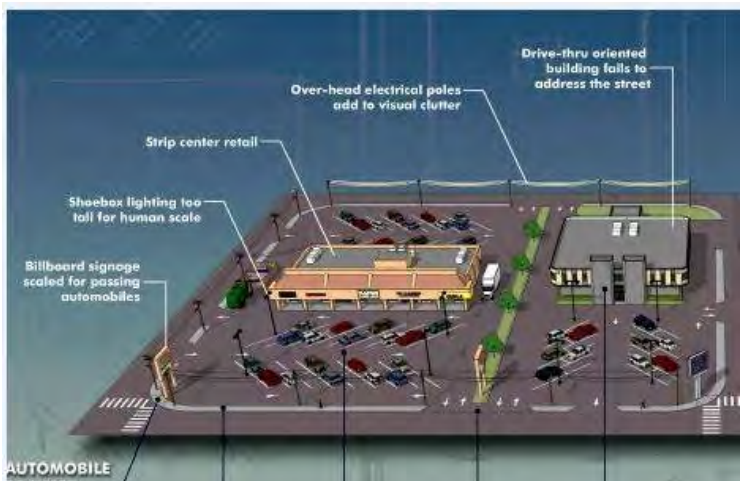
There is growing interest in reexamining transportation networks and envisioning the road right-of-way as more than just a means for moving vehicles. Many urbanists and planners are rediscovering the connection between community and transportation and how that impacts the livability of a community.

"*Over the last several decades, Michigan's built environment has followed a pattern of auto dependency often at the expense of natural resources, social equity, public health, accessibility, and quality of life. Local, state, and federal policies resulted in…separation of land uses dictated by zoning codes; a transportation system that carried city residents with the means far from urbanized areas to burgeoning suburbs; a dependency on the automobile that would leave those without the means to remain in cities that were disinvested in for decades; and suburban development patterns that made non-motorized transportation difficult or impossible, and turned the automobile from an option to a necessity. . .Communities were built that were inaccessible except by the automobile, and which were often non-descript, character-less places. But the tide is now shifting."* (Above PAR Guidebook, Michigan Association of Planning. 2013.) An example of an auto-centered development is depicted below.

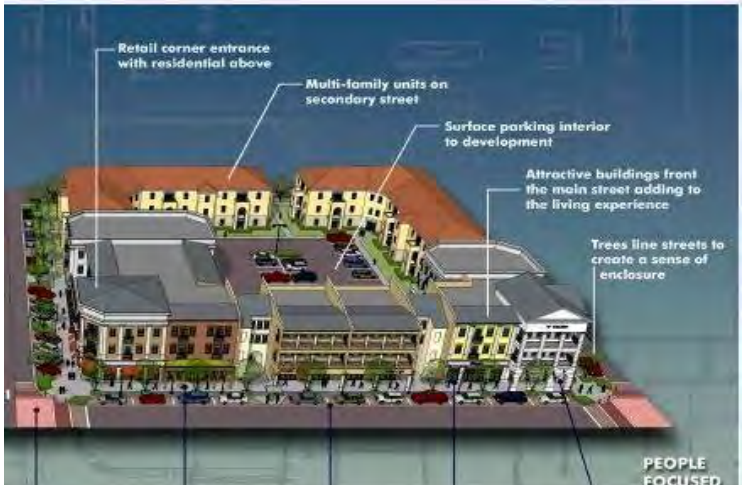
Graphic source (this page): Walkable & Livable Communities Institute.

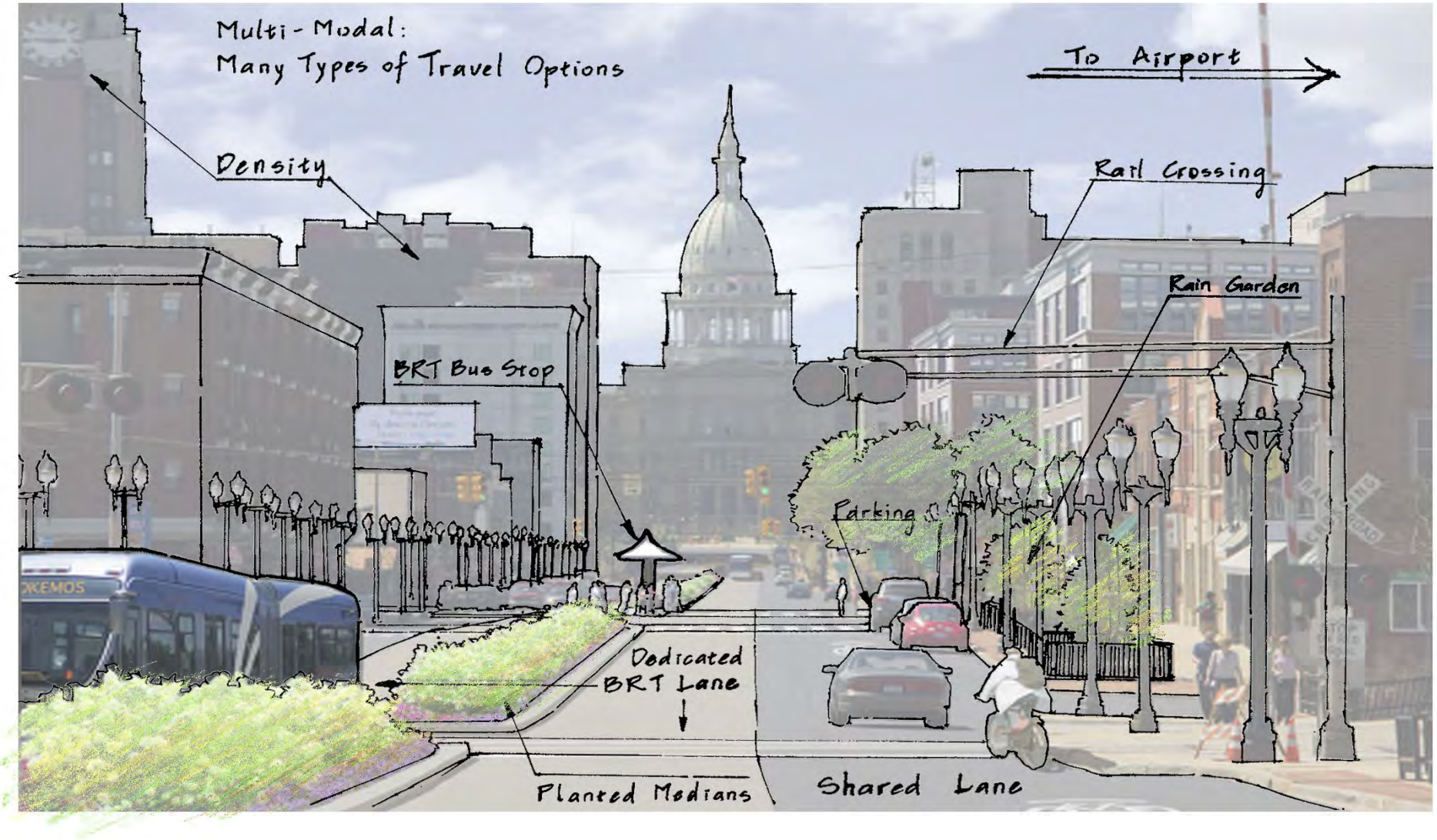


The value of more people-oriented networks and places is clear. Complete Streets and Placemaking provide tools for communities to refocus on creating human-scaled environments. A development that is more focused on people and human scale is depicted below.

The road right-of-way (ROW) has always been, but is increasingly being viewed as a public commodity that can do much more than carry vehicles and utility lines. Communities are looking to enhance the built environment by providing for pedestrians, bicyclists, transit, landscaping, parking, and outdoor seating in the ROW to create more people-focused Places. Many of the techniques covered in this section are focused on enhancing the transportation system beyond the movement of vehicles into one that services the entire community's wide range of needs. They focus on improving existing roadway form and offer strategies to accommodate bicyclists, pedestrians, transit, and other modes of transportation. On the facing page is an illustration depicting some of the characteristics that are associated with a street that accommodates many types of transportation modes and that is also green.

Image source (opposite page): Dover Kohl and Associates, under contract to the Tri-County Regional Planning Commission, reproduced with permission. Overlay illustration by Na Li, Land Policy Institute, Michigan State University.




Multi-Modal:
Many Types of Travel Options
To Airport
Density
Rail Crossing
Rain Garden
BRT Bus Stop
Parking
Dedicated
BRT Lane
Planted Medians
Shared Lane

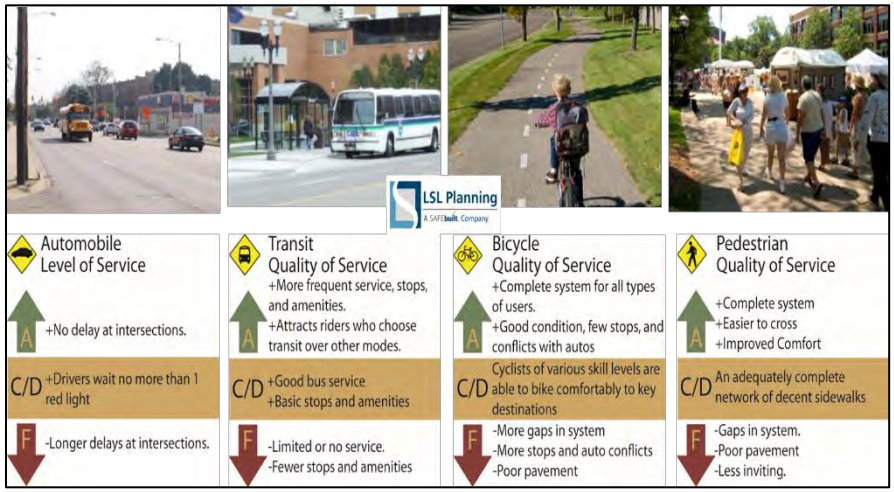
Level of Service

Level of service (LOS) is a term first used by transportation engineers in 1965 to describe the speed of traffic flow on a road. It assigns roads a letter grade between A and F—with A (free flowing traffic) being the best, and F (stop-and-go) being the worst. It historically has been used to apply to a road's LOS for single-occupancy vehicles, in particular, on highways.

More recently, LOS has been used to describe a quality of service for other modes of transportation, particularly on urban streets. For example, the level of service for bikes on Main Street between First and Third Streets is LOS "D" while the level of service for cars is a "B." Using LOS for multiple types of transportation can create tension between goals of different transportation modes (freight, car, emergency vehicle, bicycle, pedestrian) that often compete for roadway priority and consideration.

"*Urbanists and livable streets advocates criticize the use of LOS grades for traffic studies of urban streets, where the implied goal of maximizing throughput for single-occupancy cars is in competition with other goals like pedestrian safety, buffered lanes for transit vehicles and bikes, and mixed-use infill development. Some street changes like buffered bus lanes—which slow down individual cars, while speeding up higher-capacity buses—can land a street with a "failing" grade, even as the street moves more people faster.*" ("Explain that Term: Level of Service." July 16, 2014. Jon Geeting. PlanPhilly.)

Assigning a letter grade to a roadway can be a contentious matter, especially when those grades are analogous to grades on a report card. Nonetheless, it is done based on engineering standards and can be a useful tool in evaluating proposed changes to a road and communicating alternatives to stakeholders. See also Complete Streets (p. 1-89) and Street Typology (p.1-83).



	Community Arterial	Rural	Suburban Neighborhood	Suburban Corridor	Suburban Center
Roadway	Lane Width	11' to 12'	10' to 12' (14' outside lane if no shoulder or bike lane)	11' to 12' (14' to 15' outside lane if no shoulder or bike lane)	10'to 12' (14' outside lane if no shoulder or bike lane)
	Paved Shoulder Width	8' to 10'	4' to 8' if no parking	8' to 10'	4' to 6' (if no parking or bike lane)
	Parking Lane	NA	7' to 8' parallel	NA	8' parallel
	Bike Lane	NA	5' to 6' (if no shoulder)	5' to 6' (if no shoulder)	5' to 6'
	Median	4' to 6'	12' to 18' for LT, 6' to 8' for pedestrians	12' to 18' for LT, 6' to 8' for pedestrians	12' to 18' for LT, 6' to 8' for pedestrians
	Curb Radius	25' to 50'	25' to 35'	25' to 50'	20' to 40'
	Travel Lanes	2 to 4	2 to 4	2 to 4	2 to 4
	Clear Sidewalk Width	NA	5'	5' to 6'	6'
Roadside	Buffer	NA	6'+	5' to 10'	4' to 6'
	Shy Distance	NA	NA	NA	0' to 2'
	Total Sidewalk Width	NA	5'	5' to 6'	10' to 14'
Speed	Desired Operating Speed	35-55	30-35	35-50	30

Each mode of transportation receives a "grade" or Level of Service for the point or segment of roadway being examined. Level of Service is a tool that can be used to evaluate different treatments. For example, a LOS analysis can be performed to forecast how the levels of service for each travel mode would be affected by a bike lane installation.

Source: LSL Planning, Inc.

LOS software is available that takes into account many variables to determine the LOS for each travel mode. This table shows typical variables included in software analysis and their impact on volume.

Source: Quality/Level of Service Handbook. P. 75. 2013. Florida Department of Transportation.

Traffic Variables	Sensitivity on Service Volumes
Annual Average Daily Traffic	High
Planning Analysis Hour Factor	High
Directional Distribution Factor	High
Peak Hour Factor	Medium
Base Saturation Flow Rate/ Base Capacity	Medium
Percent Heavy Vehicles	Low
Local Adjustment Factor	Medium
Percent Left Turns	High
Percent Right Turns	Medium

This table displays four out of seven development zones on a transect and describes the road design attributes appropriate for each.

Source: Highway Functional Classification Concepts, Criteria and Procedures. Section 5. Applications. Planning Processes: Statewide Transportation Planning. U.S. Department of Transportation. Federal Highway Administration.

RESOURCES

1) *Quality/Level of Service Handbook*. 2013. Florida Department of Transportation.
2) Designing Walkable Urban Thoroughfares: A Context Sensitive Approach. 2010. Institute of Transportation Engineers and Congress for the New Urbanism.
3) *Highway Capacity Manual*. Transportation Research Board of the National Academies. 2010.

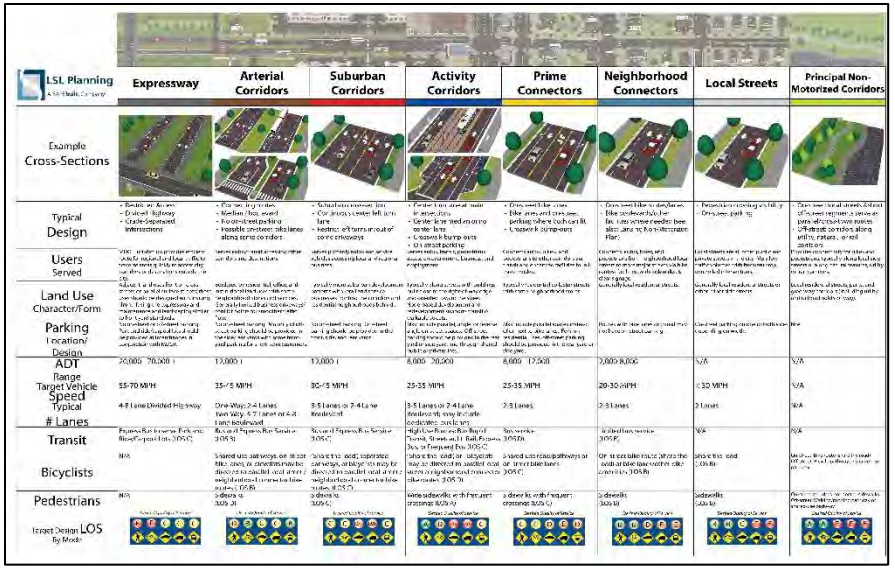
Street Typology

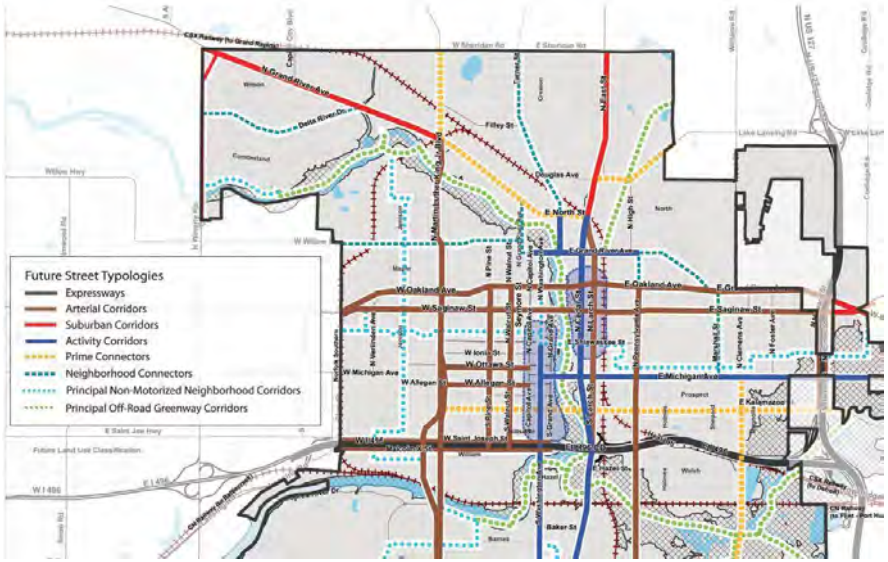
When considering different parts of a region or community it is often more manageable to consider areas with similar characteristics together. Historically, transportation engineers and planners used a *functional classification* system to define and design streets. This system was primarily focused on cars and buildings along the roadway. *"Streets were designated as arterial, collector, or local based on their function, traffic volume, and travel speed. Arterials are intended to move higher volumes of traffic at relatively high speeds to major destinations in the city. Local streets include the neighborhood streets that form most of the city's network, designed for low volumes and low speeds. Collectors move traffic from the local streets to the arterials, generally at moderate speeds and volumes."* *Source: City of Lansing. Design Lansing Master Plan. 2012. P. 137.*

More contemporary classification systems known as street typologies are based on land use and consider a variety of transportation modes on the road. There are different typologies depending on the portion of the built environment that is being examined. Street typologies are used to describe road attributes that are appropriate for a certain area.

Typologies for streets include elements such as movement type (free or slow), speed, pedestrian crossing (sidewalks, times), right-of-way widths, curb widths, type of traffic lanes (vehicle, parking, transit, bike, median), users, edge types (curbs and curb radius, planter, landscape, walkway), and land use. They often contain an illustration of a cross- section of the roadway and/or an image of an example.

Typologies are sometimes synonymous with design standards, although design standards may provide more elements and provide more in-depth specifications, descriptions, and measurements than typologies.





The *Design Lansing* master plan provides street typologies for future streets. These standards balance the needs of various roadway users by using Level of Service (see p. 1-81) analysis and takes into account the adjacent land use and development patterns (see Complete Streets, p. 1-89). Typologies may be included as part of a form-based code (see p. 2-31).

Source: Design Lansing: 2011 Master Plan. 2012. P. 140. City of Lansing.

The Capitol Corridor plan utilizes street typologies to guide the design of new streets and the redesign of existing ones.

Source: [The Capitol Corridor: A Regional Vision for Michigan Avenue/Grand River Avenue. Pg. 4.52. 2014. Tri-County Regional Planning Commission](#).

The *Design Lansing* master plan also provides a future street typology map showing which streets in the City are targeted for each typology.

Source: Design Lansing: 2011 Master Plan. 2012. P. 140. City of Lansing.

type	main street / neighborhood street B
application	
Movement Type	slow
Design Speed	25 mph
Pedestrian Crossing Times	10.3 seconds
overall widths	
Right-of-Way (ROW) Width	60' - 70'
Curb Face to Curb Face Width	36'
lanes	
Traffic Lanes	two 10' lanes
Parking Lanes	2 sides at 8 feet marked
Bicycle Lanes	shared lane with sharrow markings
Medians	none
edges	
Curb Types	6" raised curb or swale
Planter Types	4' minimum continuous planter or 4'x4' planters
Landscape Types	Trees at 30' o.c. average
Walkway Types	12'-17' sidewalk
edges	
Curb Radius	10' - 15'

RESOURCES

1) [“Chapter 2, Typologies: Complete Networks through Places, Modes, and Links.” *Complete Streets Complete Networks*. Active Transportation Policy](#).
2) [Context Sensitive Solutions. Institute of Transportation Engineers](#).
3) [“Sustainable Transportation Planning: Tools for Creating Vibrant, Healthy, and Resilient Communities.” January 24, 2012. Jeffrey Tumlin](#).

Vehicle Miles Traveled

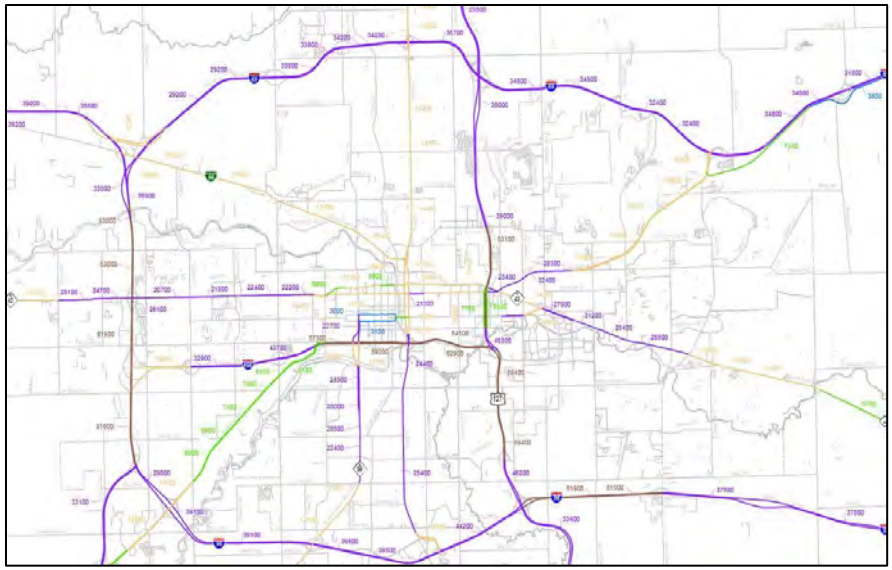
"Vehicle Miles Traveled (VMT) is the total number of miles driven by all vehicles within a given time period and geographic area. It is a measure used by regional transportation and environmental agencies for planning purposes. The VMT is influenced by factors, such as population, age distribution, the number of vehicles per household, and by how land uses are arranged."

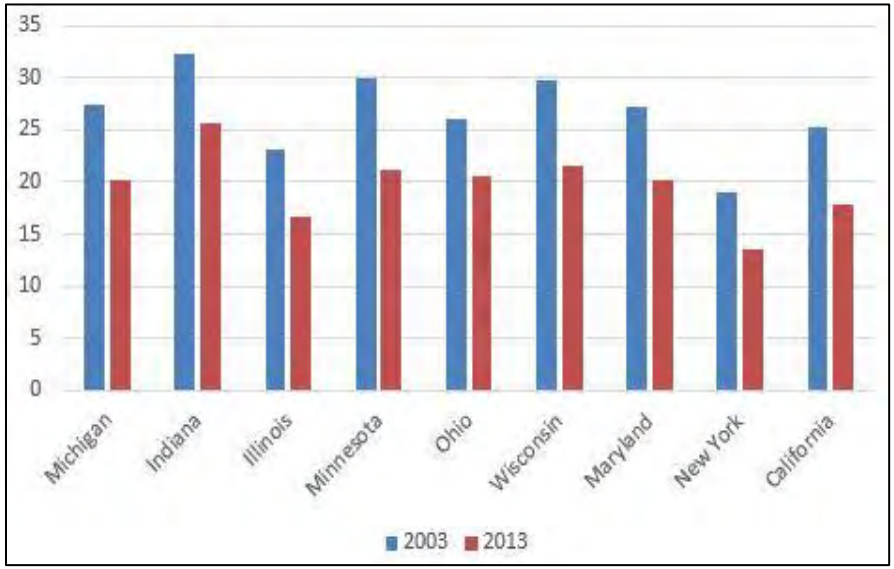
A 2007 Urban Land Institute study *"concluded that sprawling communities that require car trips to meet most daily needs exhibit 20–40% higher VMT than more compact, mixed-used, and walkable neighborhoods."*

Studies have shown that the following land use and transportation attributes can significantly reduce VMT, by reducing trip lengths, and encouraging alternatives to driving:

- *Placing new development in already developed areas, close to population centers, rather than on the suburban fringe or in exurban (rural) areas.*
- *Higher residential densities.*
- *Higher retail densities.*
- *Connectivity – direct, rather than circuitous, driving and walking connections.*
- *A variety of walking-distance destinations, such as groceries, other retail and services, and civic uses.*
- *Reduced parking supply, and parking located to the rear of buildings.*
- *Frequent, reliable, and comfortable transit service."*

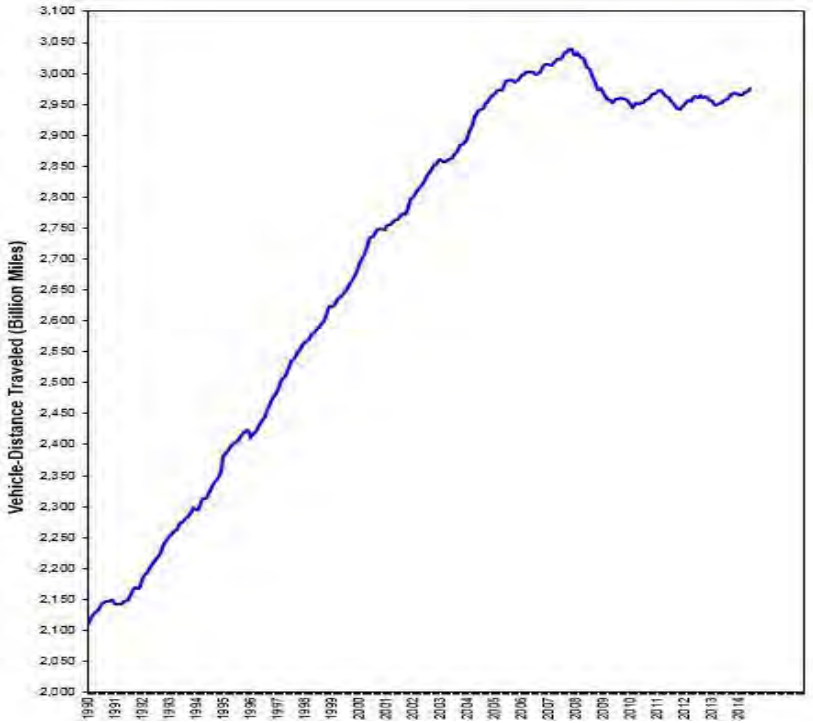
Source: *StreetsWiki. (http://streetswiki.wikispaces.com/Vehicle+Miles+Traveled); accessed August 22, 2014.*





The VMT coupled with traffic volume counts, as shown here for the Lansing region, help transportation planners and engineers address concerns and plan for future changes. They are also metrics that are factored into measuring air quality.

Source: Average Daily Traffic (ADT) Maps. 2013. Michigan Department of Transportation.



National, annual vehicle-distance traveled in billions of miles peaked in 2007.

Source: Traffic Volume Trends. 2014. U.S. Department of Transportation. Federal Highway Administration.

This graph shows the per capita VMT for Michigan and select states. The per capita VMT is the number of miles driven per person per day.

Source: Land Policy Institute, Michigan State University.

RESOURCES

1) Average Daily Traffic (ADT) Maps. 2013. Michigan Department of Transportation.
2) Traffic Volume Trends. 2014. U.S. Department of Transportation. Federal Highway Administration.
3) *Growing Cooler: The Evidence on Urban Development and Climate Change.* 2007. Ewing, Reid. Chicago: Urban Land Institute.
4) The Road Less Traveled: An Analysis of Vehicle Miles Traveled Trends in the U.S. December 16, 2008. Puentes, Robert and A. Tomer. Brookings Institute.

Regional Transportation Planning

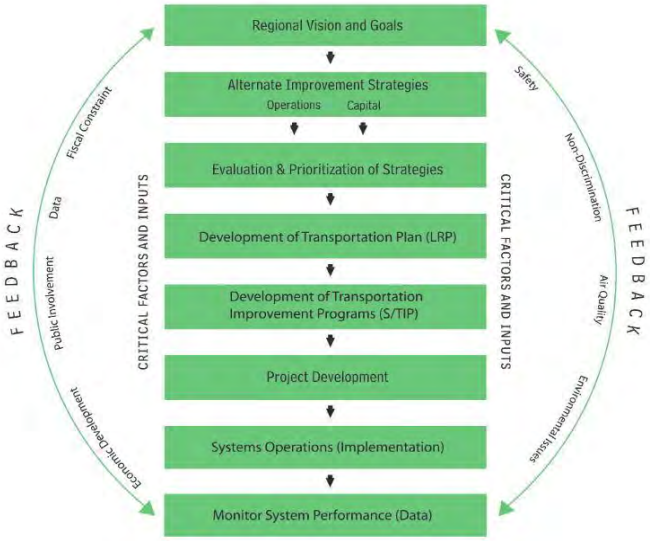
Metropolitan Planning Organizations (MPOs) are responsible for fulfilling all federally required transportation planning requirements within their boundaries, and in cooperation with the state department of transportation and publicly-owned transit service operators. They are required to prepare and maintain:

1. A long-range, regional transportation plan (RTP) that includes goals related to accessibility, safety, climate change and energy sustainability, land use, financial considerations, transit, parking, efficiency, non-motorized, intermodal, and community and environmental impacts;
2. A transportation improvement program (TIP) with an annual element and that includes specific projects, funding sources, responsible parties, and an implementation schedule; and
3. A unified planning work program (for areas of 50,000 or greater in population) that supplies a description of the planning work and resulting products, along with who will perform that work, when it will be completed, associated costs, and funding sources.

They are also required to implement a regional Congestion Management System (CMS) that identifies actions and strategies to reduce congestion, improve air quality, and increase mobility in urbanized areas over 200,000 population.

Source: Association of Metropolitan Planning Organizations (AMPO) and the Transportation Planning Process Key Issues. Federal Highway Administration. Federal Transit Administration.

Metropolitan Planning Organization	State	Major City	Area (Sq. Miles)	2010 Census Population	Designation Year
Battle Creek Area Transportation Study (BCATS)	MI	Battle Creek	169	91,083	1974
Bay City Area Transportation Study (BCATS)	MI	Bay City	201	87,959	1974
Genesee County Metropolitan Planning Commission (GCMPC)	MI	Flint	648	425,788	1963
Grand Valley Metropolitan Council (GVMC)	MI	Grand Rapids	1,010	692,019	1990
Kalamazoo Area Transportation Study (KATS)	MI	Kalamazoo	579	250,331	1979
Macatawa Area Coordinating Council (MACC)	MI	Holland	212	119,125	1991
Midland Area Transportation Study	MI,	Midland	563	90,645	2013
Region 2 Planning Commission (R2PC)	MI	Jackson	723	160,253	1968
Saginaw Metropolitan Area Transportation Study (SMATS)	MI	Saginaw	259	149,863	1965
Southeast Michigan COG (SEMCOG)	MI	Detroit	4,608	4,703,593	1974
Southwest Michigan Planning Commission (SWMPC)	MI	Benton Harbor	338	127,004	1974
Tri-County Regional Planning Commission (TCRPC)	MI	Lansing	1,712	464,036	1973
West Michigan Shoreline Regional Development Commission (WMSRDC)	MI	Muskegon	657	225,014	1973



The MPOs were created in the 1970s to ensure that existing and future expenditures for transportation projects and programs were based on a continuing, cooperative, and comprehensive (3-C) planning process for urbanized areas with a population greater than 50,000.

Source: A Brief History. About AMPO. Association of Metropolitan Planning Organizations (AMPO).

There are many steps involved in adopting and updating a Regional Transportation Plan.

Source: A Citizen's Guide to Transportation Planning in Southeast Michigan.

Public involvement is a critical component of the regional transportation planning process. This diagram shows the whole process with public involvement included throughout.

Source: Transportation Planning Process Key Issues. 2007. Federal Highway Administration. Federal Transit Administration.

RESOURCES

1) Planning. U.S. Department of Transportation. Federal Highway Administration.
2) MI Transportation Plan. Michigan Department of Transportation.
3) Transportation Planning. Tri-County Regional Planning Commission.
4) Transportation. Southeast Michigan Council of Governments.

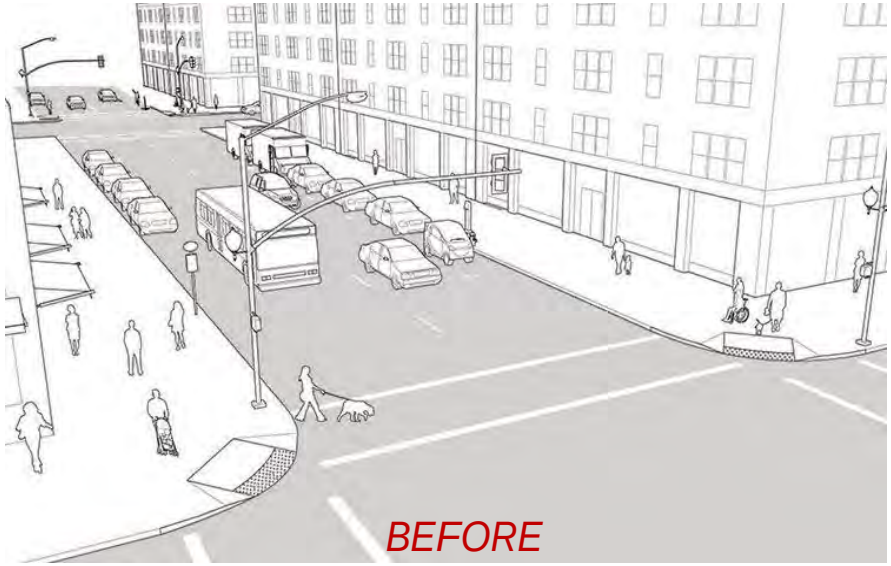
Complete Streets

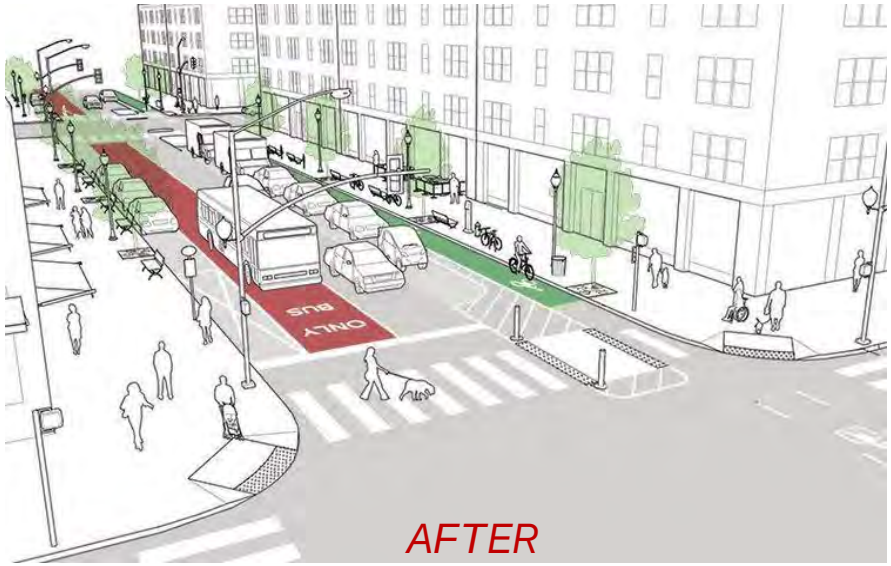
According to Michigan Public Act 135, 2010, a Complete Street provides "appropriate access to all legal users in a manner that promotes safe and efficient movement of people and goods whether by car, truck, transit, assistive device, foot, or bicycle." PA 135 requires five-year plans and inter-jurisdictional cooperation on non-motorized projects, and enables inter-jurisdictional maintenance. Complete Streets include a mixture of destinations that are directly linked together by the transportation network and are characterized by a wide-range of transportation modes. Complete Streets is a concept for street design that provides safe, efficient, destination-oriented travel for all modes of transportation, including cars, delivery trucks, transit, pedestrian, and bicycling.

Many communities are requiring Complete Street designs in all street renovations and newly built roads in their zoning ordinances. Over time and because these communities will have institutionalized Complete Streets via their ordinances, they will provide access for all types of commuters.

Complete Street designs take a community-wide approach to addressing the transportation needs of everyone in a community by adapting existing road right-of-way into a new design that includes many types of transportation uses. Many examples are illustrated in this portfolio.

The benefits of Complete Streets include reducing vehicle emissions, less dependency on oil-based transportation options, increased mobility and recreation options, increasing safety by raising awareness of bikes and pedestrians, and creating more attractive and useful streets. Often, low-cost measures such as striping or bollards can realize the benefits of a full reconstruction in the short term, while allowing a city to test and adjust a proposed redesign.



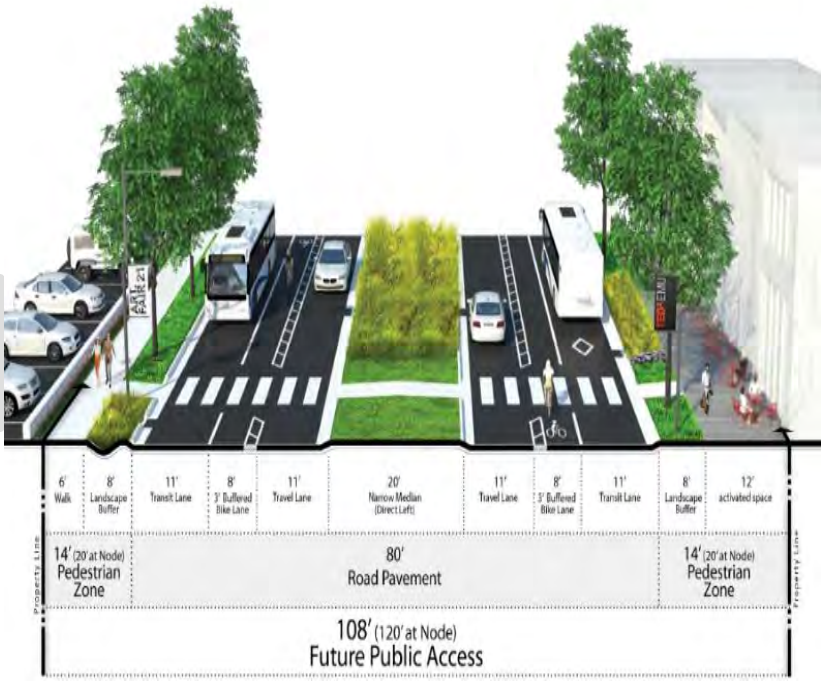


Existing conditions demonstrate how traditional design elements, such as wide travel lanes and undifferentiated street space, have had an adverse impact on how people experience the streetscape.

Source: Nacto. Urban Street Design Guide.

Image of a potential Complete Streets design.

Source: Third Street Corridor Sustainable Development Plan Project. 2013. City of Marquette.



This redesign includes a dedicated bus lane, buffered bike lane, crosswalks, pedestrian refuge islands, tree plantings, outdoor seating, bike parking, and additional lighting.

Source: Nacto. Urban Street Design Guide.

RESOURCES

1) Michigan State Transportation Commission Policy on Complete Streets. 2012. Michigan Department of Transportation.
2) Complete Streets Policy Request for Applications. 2010. Michigan Department of Community Health.
3) Michigan Complete Streets Coalition.

Green Streets

By design and function, urban areas are filled with impervious surfaces: roofs, roads, sidewalks, and parking lots all contribute to stormwater runoff. Roads and travel surfaces present perhaps the largest flow and urban pollution sources. However, they also present one of the greatest opportunities for green infrastructure use.

Urban transportation right-of-ways integrated with green techniques are called "green streets." Green Streets achieve multiple benefits by using natural processes and landscaping to treat stormwater right at the roadway. Green Streets can incorporate a wide variety of design elements including narrower street widths, swales, bioretention curb extensions and sidewalk planters, permeable pavement, and sidewalk trees and tree boxes. Although the design and appearance of Green Streets varies, the functional goals are the same: provide source control of stormwater, limit its transport and pollutant conveyance to the collection system, and provide environmentally enhanced roads. Green Street goals are complementary to the goals of Complete Streets (see p. 1-89).

Green Streets provide multiple benefits along the street right-of-way including a reduction in stormwater discharge into receiving waters, aesthetic enhancements, improved local air quality by intercepting airborne particulates and providing shade for cooling, enhanced economic development, and an improved pedestrian experience.

Source: Low Impact Development Center.

With minimum soil additions, turf grass, and trees, a “bioswale boulevard” on Linden Grove Avenue in Lansing provides surface water storage, improved infiltration, and drainage for the entire right-of-way section. U.S. EPA Region 5 and FHWA Webinar. Green Streets as a Community Revitalization Strategy.

Source: Jeff Keesler, Planning & Zoning Center at MSU.

Bioretention facilities along Michigan Avenue in Lansing span a four-block length and help manage stormwater runoff through vegetation.

Source: Jeff Keesler, Planning & Zoning Center at MSU.

Permeably-paved parking lanes on a moderate volume road, Barnes Avenue, in Lansing have a 153,000 gallon capacity (2.64 inch runoff depth from impervious area). They also provide traffic calming on this residential road. U.S. EPA Region 5 and FHWA Webinar. Green Streets as a Community Revitalization Strategy.

Source: Jeff Keesler, Planning & Zoning Center at MSU.

RESOURCES

1) Greening Mid-Michigan.
2) Great Lakes Green Streets Guidebook. 2013. Southeast Michigan Council of Governments.
3) City of Portland Green Streets Program.
4) Center for Environmental Excellence by AASHTO.
5) Sustainable Highways Initiative. U.S. Department of Transportation. Federal Highway Administration.

Road Diet

The "*road diet*" involves narrowing traffic lanes and reallocating the space for transit, biking, or pedestrians. Road diets work best on streets that have daily traffic volumes between 8,000 and 20,000 vehicles.

A common example is converging an undivided four-lane roadway into three lanes made up of two through lanes and a center left turn lane. The reduction of vehicular lanes allows the roadway to be reallocated for other uses such as bike lanes, pedestrian crossing islands, and/or parking.

Road diets can be low cost improvements that supply multiple safety and operational benefits for vehicles as well as pedestrians, such as:

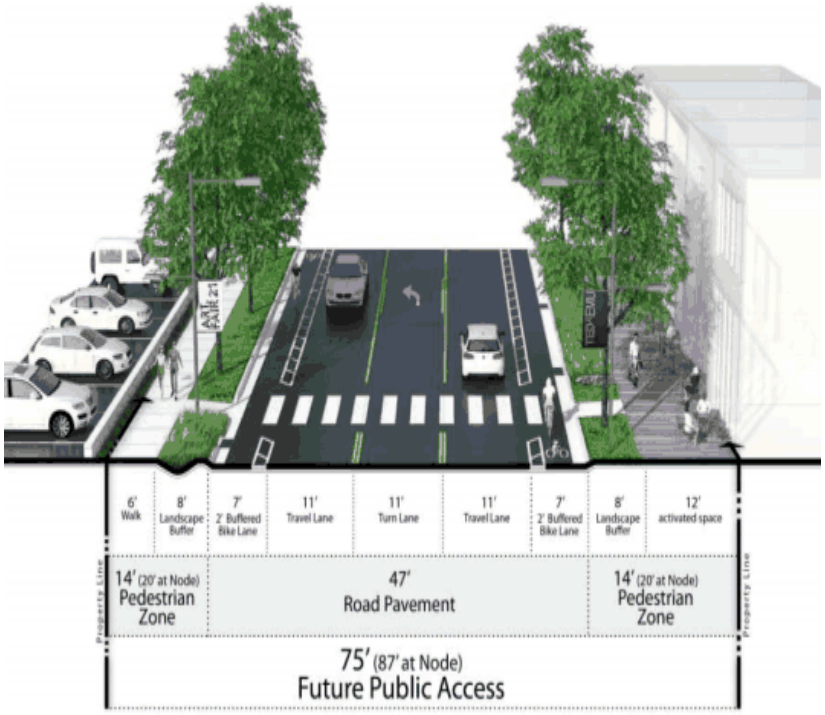
- Decreasing vehicle travel lanes for pedestrians to cross, therefore reducing the multiple-threat crash (when one vehicle stops for a pedestrian in a travel lane on a multi-lane road, but the motorist in the next lane does not, resulting in a crash) for pedestrians;
- Providing room for a pedestrian crossing island,
- Improving safety for bicyclists when bike lanes are added (such lanes also create a buffer space between pedestrians and vehicles);
- Providing the opportunity for on-street parking (also a buffer between pedestrians and vehicles);
- Reducing rear-end and side-swipe crashes; and
- Improving speed limit compliance and decreasing crash severity when crashes do occur. Source: "Road Diet" (Road Configuration). FHWA-SA-12-013.

Existing conditions on Grand River Avenue in a residential neighborhood of Williamston.

Source: Dover-Kohl Associates, under contract for the Tri-County Regional Planning Commission, reproduced with permission.

Image of a road after a road diet creates protected lanes for bicyclists and more space for pedestrians.

Source: Washtenaw Avenue, SmithGoupJJR, Parsons Brinkerhoff.



A proposed road diet for Grand River Avenue in Williamston shows the four lane road becoming three lanes, with a marked bike lane added. The travel lanes are narrowed visually to make traffic move at the right speed for a neighborhood. A tree island is added in the third lane at points where it won't inhibit traffic movements.

Source: Dover-Kohl Associates, under contract for the Tri-County Regional Planning Commission, reproduced with permission.

RESOURCES

1) *Safety and Operational Analysis of 4-Lane to 3-Lane Conversions (Road Diets) in Michigan*. 2012. Richard Lyles, et al. Department of Civil and Environmental Engineering, Michigan State University.
2) Rightsizing Streets. Project for Public spaces.
3) *Evaluation of Lane Reduction "Road Diet" Measures on Crashes, Summary Report*. U.S. Department of Transportation. Federal Highway Administration.

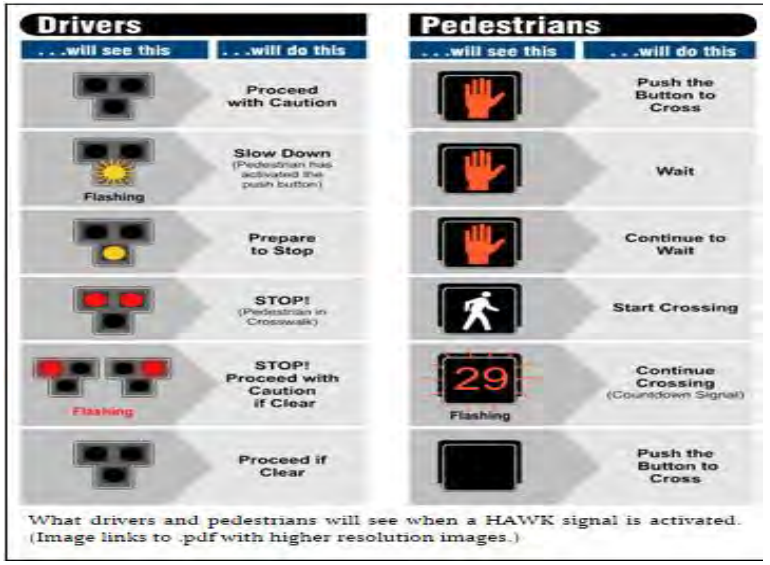
HAWK Signals

HAWK signals are pedestrian safety enhancements that draw motorist's attention to pedestrian crosswalks. They are elevated above an intersection and utilize different lighting arrangements than other traffic signals. HAWK signals are not enabled unless a pedestrian is present and triggers them. Most HAWK signals are not timed intentionally so they won't stop vehicular traffic when pedestrians are absent.

HAWK signals are designed for individuals with hearing, visual, and ambulatory impairments. Most modern pedestrian signals use oral countdown to the next signal change. Other signals use lighted icons to instruct pedestrian actions. HAWK signals are more elaborate.

The signals range from no signal when pedestrians are not present, to yellow caution lights when pedestrians are present and activate the signal, to red signals when pedestrians are in the crosswalk. HAWK signals are a coordinated process between pedestrians and motorists that enhances safety at crossing for both modes of transportation.

Because motorists and pedestrians alike may be unfamiliar with the HAWK signal, an educational campaign timed when a new signal is installed is ideal.



What drivers and pedestrians will see when a HAWK signal is activated. (Image links to .pdf with higher resolution images.)

Image of a HAWK Signal at an intersection showing the lighted signals a motorist would see.

Source: "Pedestrian Hybrid Beacons (HAWK Signals) Explained." November 26, 2013. Michigan Complete Streets Coalition.

Pedestrians cross a street with a HAWK Signal.

Source: Imagine Flint: Master Plan for a Sustainable Flint. 2013. City of Flint.

A robust education campaign should accompany any new road treatment and should target all potential users.

Source: HAWK Pedestrian Signal. 2010. Dave Askins. The Ann Arbor Chronicle.

RESOURCES

1) Walkable Communities, Inc.
2) Pedestrian and Bicycle Information Center.
3) Michigan Complete Streets: How does a HAWK Signal Operate?
4) Walk Score.

Yield to Pedestrian Ordinances

While Michigan law requires vehicles to give the right-of-way to pedestrians ***in*** crosswalks at *all* intersections (Section 257.612, ii), communities are developing more stringent, local, traffic ordinances to improve pedestrian safety. They are requiring motorists to yield to pedestrians as they ***approach*** a crosswalk. Two communities in Michigan have tested this method to increase safety for pedestrians.

Crosswalks on Traverse City's main commercial street (Front St.) have signs warning drivers to stop for pedestrians as they approach the crosswalk. There are no electronic traffic signals at the crosswalks, but clear signs that warn drivers that they need to yield to pedestrians.

Ann Arbor has also experimented with a yield-to-pedestrians ordinance with varying degrees of success. Ann Arbor has been successful with the implementation of this ordinance, but only on streets within the downtown area or neighborhood areas. One-year after implementation however, it was clear that the same success was not being had on larger, main arterial roads (Stanton, 2011). In Ann Arbor, it has been documented that drivers on large arterial roads are not stopping for pedestrians who are waiting to cross the crosswalk, even with clear signage above the street to yield to approaching pedestrians. (*"One Year After Passage of Ann Arbor's Pedestrian Safety Ordinance, Most Motorists aren't Following Law. 2011. Ryan Stanton. The Ann Arbor News.*)

(f) Rule 702. Pedestrians; right-of-way in crosswalk; violation as a civil infraction. (Amended)

1. When traffic-control signals are not in place or not in operation, the driver of a vehicle shall stop and yield the right-of-way to every pedestrian within a marked crosswalk.
2. When traffic-control signals are not in place or not in operation, the driver of a vehicle shall yield the right-of-way, slowing down or stopping if need be to so yield, to every pedestrian within an unmarked crosswalk when the pedestrian is on the half of the roadway on which the vehicle is traveling or when the pedestrian is approaching so closely from the opposite half of the roadway as to be in danger
3. A pedestrian shall not suddenly leave a curb or other place of safety and walk or run into the path of a vehicle that is so close that it would be impossible for the driver to stop and yield.
4. Every pedestrian crossing a roadway at any point other than within a marked or unmarked crosswalk at an intersection shall yield the right-of-way to all vehicles upon the roadway.
5. A person who violates this rule is responsible for a civil infraction.

Image of a pedestrian at a marked crosswalk. A yield-to-ordinance would require a motorist to yield to a pedestrian approaching a crosswalk, not just while in it.

Source: "One Year After Passage of Ann Arbor's Pedestrian Safety Ordinance, Most Motorists aren't Following Law. 2011. Ryan Stanton. The Ann Arbor News.

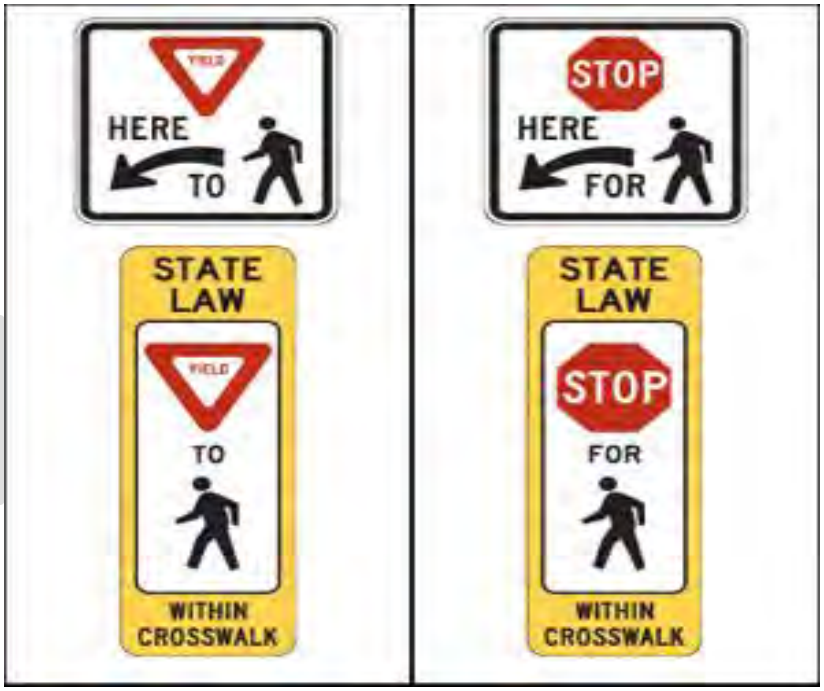


Image of signage for yielding to pedestrians in crosswalks.

Source: My Wheels are Turning.

Traverse City amended its uniform traffic code (410.03) to require vehicles to yield to pedestrians within marked crosswalks.

Source: Traverse City.

RESOURCES

1) How Can My Community Improve Yield-to-Pedestrian Compliance? Pedestrian and Bicycle Information Center.
2) Walk. Bike. Drive. City of Ann Arbor.

Mid-Block Crossings

Many street designs incorporate pedestrian crossings at the corners of each block, usually at intersections. In some cases, long blocks with few access or crossing points for pedestrians can be an impediment to foot travel. Mid-block crossings are designated areas where pedestrians can cross streets between intersection access points. This allows pedestrians to have quick and easy access without crossing illegally. Mid-block crossings can also help create activity and multiple access points throughout a corridor.

Mid-block crossings can be especially effective in commercial corridors where an individual may need access to businesses or transit stops on opposite sides of the street. Rather than having to make a long square-shaped walking pattern, individuals can walk through the middle of the block and connect with other businesses in the corridor more efficiently. Mid-block crossings provide quick and safe access a long way from a signalized intersection. This prevents pedestrians from being tempted to cross without a signal.

Most mid-block crossings are well marked so that pedestrian safety is not compromised. In many cases, mid-block crossings have lighted signals, signs, and other visual or auditory cues that demark the crossing to motorists. There may also be refuge islands in their centers.

East Lansing installed several mid-block crossings, some with pedestrian shelters, along Michigan Avenue/Grand River Avenue to increase pedestrian safety.

Source: Jeff Keesler, Planning & Zoning Center at MSU.

Image of a raised, well-marked mid-block pedestrian crossing with a refuge in the center.

Source: Michigan Complete Streets Coalition.

Lansing installed mid-block crossings along Washington Street in its busy business district to allow easier crossing for pedestrians between blocks.

Source: flickr/League of Michigan Bicyclists.

RESOURCES

1) "Mid-Block Pedestrian Crossings Explained." January 21, 2014. Michigan Complete Streets Coalition.
2) Best Design Practices for Walking and Bicycling in Michigan. Michigan Department of Transportation.

Crosswalk Flags

In areas with large volume roadways, crosswalk flags can be used to provide greater pedestrian safety. Crosswalk flags are brightly-colored nylon flags that pedestrians can carry through a crosswalk, to make themselves more visible to vehicle traffic. In most cases, a bin or receptacle is placed on each end of the crosswalk where a flag can be picked up when entering the crosswalk, and dropped off after they leave the crosswalk safely.

Crosswalk flags provide many of the benefits that signs at crosswalks do, but at a fraction of the cost of installing and maintaining HAWK signals, and other pedestrian safety devices like signs. Another benefit of crosswalk flags is that they move with the pedestrian across the street, creating greater visibility. Movement draws visual attention. Drivers of vehicles will be able to easily spot a bright orange-colored flag that is moving through the crosswalk better than a permanent sign that may or may not draw their attention to pedestrians who are present.

Another benefit to crosswalk flags is that they provide a fun and unique safety tool for pedestrians to use. Children and adults will enjoy this crosswalk aide and it can add to the uniqueness of an area.

In this image, a pedestrian uses a crosswalk flag to cross in a striped crosswalk.

Source: "Beach Launches Novel Flag System for Crosswalk Safety." Jennifer Edwards. 2011. The St. Augustine Record.

Education is an important component of installing a new technique. This is a poster explaining how to use crosswalk flags.

Source: Crosswalk Flags on Lincoln. 2013. Greg Barr. Willow Glen Charm.

This image of crosswalk flags shows a receptacle along with the signage for use.

Source: Steve's Software Trek. Steve Kargs. 2008.

RESOURCES

1) Crosswalk Flags and the Adopt-a-Crosswalk Program. The Pedestrian and Bicycle Information Center.
2) Case Studies. Context Sensitive Solutions.org. U.S. Department of Transportation. Federal Highway Administration.

Bike Garages and Bike Parking

Bike lanes, bike racks on buses, and dedicated bike paths increase transportation options in a community. However, bicycle commuters necessitate a place for bikes to be stored safely and efficiently. One such place is a bicycle garage. Bike garages are popular in places with dedicated parking lots or ramps. Bike garages are usually small areas in parking ramps, or the corners of surface parking lots, that are dedicated to bike parking and in some cases motorized scooters. Bike garages can be locked and accessed only with a personal identification number, key, or key card access. This provides owners of bicycles added assurance that their bike won't be stolen or vandalized, which can be an impediment to bicycle commuting.

Dedicated bike parking is a less expensive way to provide bike parking infrastructure in a community. Bike parking can be accomplished in many different and creative ways including:

- Bike parking trees, which stack bikes vertically to preserve space;
- A bike parking corral, which repurposes a vehicle parking space into space for several bikes to park; and
- Traditional sidewalk bike parking racks at key locations.

Communities are beginning to include bike parking in their zoning ordinances as a requirement for new construction, signaling the importance of developing bike infrastructure as a part of the overall transportation strategy. By improving infrastructure for bike parking, communities can encourage this healthy and enjoyable transportation option.

This Bike Garage at Michigan State University in East Lansing.

Source: Jeff Keesler, Planning & Zoning Center at MSU.

Image of a bike locker at a transit stop. Bike lockers provide long-term bike shelter.

Source: Bike Lockers.

Creative bike parking racks.

Source: Third Street Corridor Sustainable Development Plan Project. 2013. City of Marquette.

RESOURCES

1) League of Michigan Bicyclists.
2) Bicycle Friendly America. The League of American Bicyclists.
3) Pedestrian and Bicycle Information Center.

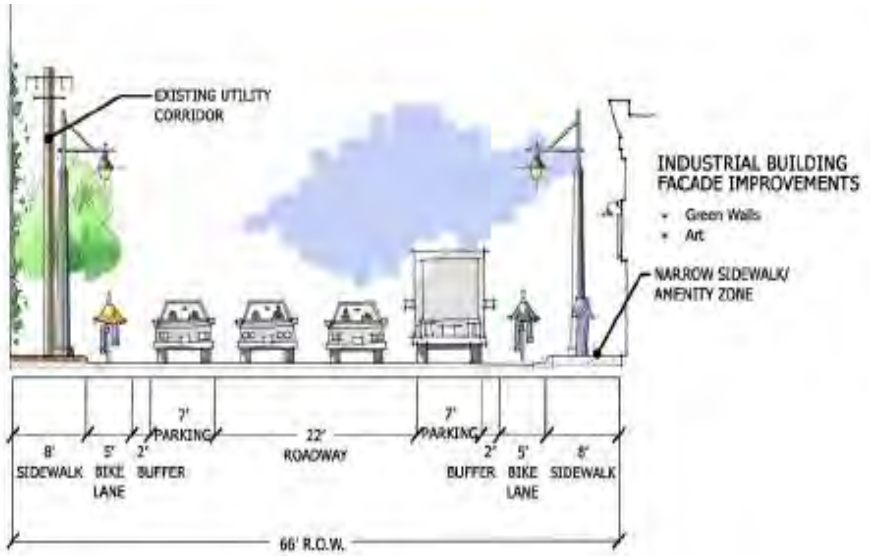
Buffered Bike Lanes

Bike lanes are a way for a community to encourage safe bicycle commuting and non-motorized recreation. Dedicated bike lanes can be painted lines on the sides of streets where only bikes and other non-motorized commuters have the right-of-way. Or, they can be separated from the roadway completely by placing them at the side of a street. Dedicated bike lanes are well-marked to distinguish them from vehicle traffic and are highly visible. This permits bicyclists to travel safely and efficiently along roadways.

Bike lanes may also be buffered, or separated, from vehicle traffic. Buffering is accomplished with on-street parking, providing extra-wide bike lanes or blank space, streetscaping, or bollards.

Sidewalks are often used by bikers who are intimidated by riding alongside vehicle traffic. But research indicates that biking on sidewalks is not safer for the bicyclist, when compared to riding on the street with well-marked bike lanes. Sidewalk riding also can be unsafe for pedestrians unless the sidewalk is 8–10 feet wide. Crossing intersections is another potential safety hazard for bicyclists. Clear, well-marked bike lanes and dedicated off-road bike lanes are the safest way to provide bike infrastructure for bicycle commuters.

Creating a transportation network with various routes and destinations is an important component to a community's overall transportation plan. Providing signage indicating direction and distance to destinations is a part of the network.



This illustration displays a typical 66 foot right-of-way with dedicated bike lanes that enjoy a two-foot buffer. On-street parking offers further buffer from vehicle travel lanes. In this case, the buffer and on-street parking offer a nine-foot buffer for bikes. If the bike lane were elevated to the level of the sidewalk as with a "cycle track," even greater separation from motorized vehicles would occur.

Source: GR Connections. 8. 2012. OCBA Landscape Architects and City of Grand Rapids.

This Lansing River Trail runs along the Grand River in Lansing, providing complete separation from vehicular traffic for both pedestrians and bicyclists.

Source: Design Lansing Master Plan. 2012. City of Lansing.

Other dedicated bike lanes can be completely separate from roadways and even meander through wooded or natural areas, or follow old rail lines, such as this one in Detroit. The Dequindre Cut is a 1.35-mile urban greenway sitting below street level that connects Detroit's Riverfront, Eastern Market, and many neighborhoods.

Source: Eastern Market Detroit.

RESOURCES

1) League of Michigan Bicyclists.
2) Bicycle Friendly America. The League of American Bicyclists.
3) Pedestrian and Bicycle Information Center.

Bike Boulevards

A bike boulevard is a low-speed street that has been prioritized for bike travel by discouraging (through bollards, plantings, signage, etc.) cut-through vehicular traffic. They still may allow local vehicular traffic, but give bicyclists priority as through-going traffic. A local street may be dedicated in part or in while as a bike boulevard.

Well marked signs or painted roadways demark bike boulevards and help to increase the visibility and safety of bike riders. Road diets (see p 1-93) and other traffic reducing designs can also enhance bicycle safety by discouraging vehicle traffic on the roadway. Safety designs are vitally important for a safe bike boulevard.

Bike boulevards are best implemented in low-traffic neighborhoods that have become pathways that bicyclists naturally use and provide safe, alternative routes around busy streets. Bike boulevards encourage people to pursue biking as a transportation option because they are often more inviting than sharing the roadway with vehicle traffic on traditional streets with or without bike lanes.

Bike boulevards can be a great way for a community to plan for bicycle infrastructure and encourage safe, efficient non-motorized transportation. By implementing bike boulevards, many communities may see a reduction in vehicle traffic and an increase in bike traffic. This street design technique can be a great way for communities to encourage safe, efficient non-motorized travel.

Bike boulevards co-exist on low-vehicle-volume, neighborhood streets and create a network with other bike infrastructure. This plan shows how bike boulevards, multi-use trails, and bike lanes form a network of access throughout Portland, Oregon.

Source: BikePortland.org.

Wayfinding signage is an important component in the transportation network.

Source: City of Burbank Bicycle Master Plan Update. 2009. City of Burbank, CA.

This Bike Boulevard clearly limits vehicle traffic by placing a barrier at its entrance.

Source: "Mayor Adams Finds $20 Million for Bike Boulevards." 2010. Oregon Live.

RESOURCES

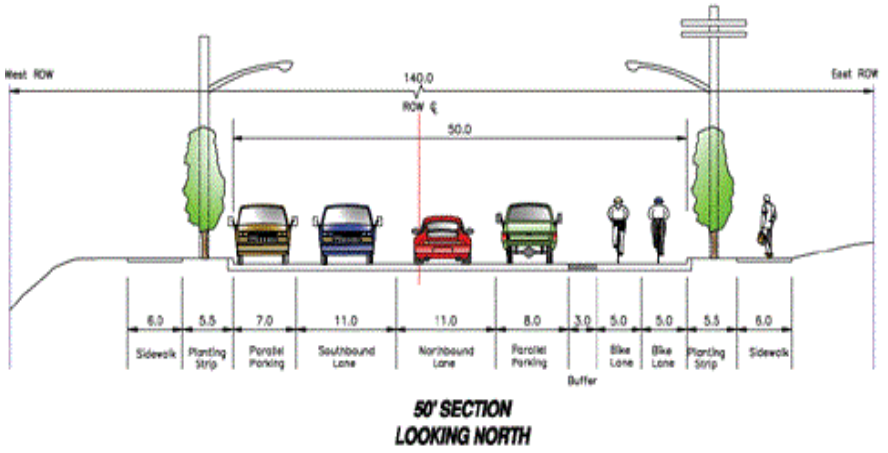
1) League of Michigan Bicyclists.
2) Bicycle Friendly America. The League of American Bicyclists.
3) Pedestrian and Bicycle Information Center.

Cycle Tracks

Cycle tracks are a form of dedicated bike lane that is separated from the roadway. A part of the sidewalk can be dedicated to a cycle track. Cycle tracks can also be placed on the street and use curbs or other physical barriers to keep auto traffic separate. Cycle tracks are popular bicycle infrastructure in European cities and are starting to be implemented in large cities in the U.S., such as Long Beach, CA, Washington, D.C., and other cities in the Pacific Northwest.

One advantage of cycle tracks is that they are completely separated from vehicle traffic, enhancing bike safety. They are also not used by pedestrians, alleviating conflict between cyclists and pedestrians.

Appropriate bicycle infrastructure will increase the possibility of bicycling being a principal mode of transportation. A study in the *Journal of Transport and Land Use* found that intersections in Montreal, with protected bike lanes, saw a 61% increase in bike traffic (Strauss, 2013). Dedicated cycle tracks are one way to transform streets to be safer, more user friendly, and an important aspect of the overall transportation plan in communities. (Spatial Modeling of Bicycle Activity at Signalized Intersections.)



50' SECTION
LOOKING NORTH

A raised cycle track is separated from the one-way vehicle traffic by on-street parking and a curb. It is separated from pedestrians by an "amenity zone" containing trees and lighting.

Source: Dover-Kohl and Associates, under contract to the Tri-County Regional Planning Commission, reproduced with permission.

Image of bicyclists using a two-way cycle track.

Source: Sustainable Transportation in the Netherlands.

This image shows a proposed street plan that includes a two-way cycle track (five feet for each lane) on one side of the street. It includes a three-foot buffer between vehicular traffic.

Source: "SDOT Purposes Linden Cycle Track to Complete Interurban." September 9, 2010. Seattle Bike Blog.

RESOURCES

1) League of Michigan Bicyclists.
2) Bicycle Friendly America. The League of American Bicyclists.
3) Facility Design. Pedestrian and Bicycle Information Center.

Bike Boxes

Bike boxes are dedicated areas at key intersections designed to integrate bicyclists with vehicle traffic on city streets. They are designed to prevent bike/car collisions, especially between drivers turning right and bicyclists going straight. When a light turns green, bicyclists have the right-of-way through the intersection. Motorists then follow with right turns, reducing the risk of “right-hook” accidents, and through travel.

Bike boxes are often painted bright colors like green or yellow to draw the attention of motorists and ensure safety for bikers. They are squares at intersections where painted linear pathways (bike lanes) on city roadways permit bike and other non-motorized transport only. Motorized traffic is prohibited from using bike boxes, which enhances safety for bicyclists. Motorists are also prohibited from making right-hand turns on red lights when bike boxes are present.

Bike boxes have become particularly popular in large cities where bicycle commuting is a main form of transportation. Cities with high density incorporate bike commuting into the overall transportation plan.

Communities in Michigan are starting to incorporate bicycle infrastructure like bike boxes into their transportation plans. In the Third Street Redesign Report from 2013, the City of Marquette suggested implementing bike boxes to raise the visibility of bicyclists at key traffic intersections and increase bike safety.

The bike box is used at intersections to queue cyclists in front of vehicles at traffic signals. Bike boxes increase the visibility of bicyclists and give them a head-start when the light changes to green. They are also a visual reminder that bicyclists may be traveling straight through an intersection.

Source: Streetsblog USA.

This graphic from an informational brochure explains how bike boxes should be used.

Source: Get Behind it: The Bike Box Brochure. City of Portland.

Bike boxes are designed to enhance cyclists' safety by reducing "right-hook" collisions, which occurs when the vehicle turns right and the cyclists goes straight. Education is an important element of successful implementation.

Source: Get Behind it: The Bike Box Brochure. City of Portland.

RESOURCES

1) Bicycling in A2. City of Ann Arbor, Transportation.
2) League of Michigan Bicyclists.
3) Bicycle Friendly America. The League of American Bicyclists.
4) Pedestrian and Bicycle Information Center.

Integrating Bikes with Transit

Bicycling and transit work very well together to take more motorized vehicles off of the roadways and provide a safe, efficient, and enjoyable means of transport.

For many individuals who regularly use transit for commuting, biking to the nearest train or bus station can enhance the public transit experience for most riders. The reality of many transit riders is that few live next door to a station. Stations and even the main transit lines are in certain high-density areas of cities. There can occasionally be gaps in the service that is provided by a transit system and individuals who may live or work between transit lines are not necessarily able to use the system as efficiently as individuals who live near a line, station, or stop. For this reason, many individuals use bikes to get themselves to the nearest station quicker. If not for bikes, people would have to catch a bus to the nearest transit station, which costs a little more and is not necessarily faster than biking.

When public transit infrastructure is planned appropriately for bikes, it can create a seamless system of connections to the larger transportation network. Planning for bikes at transit stops can be a great way to encourage non-motorized transport within a community, but it can also encourage the use of transit, due to making it easier to access from all points within a community quickly and efficiently. When planning the transportation scheme for a region, planners should integrate bikes as a part of the system as much as possible.

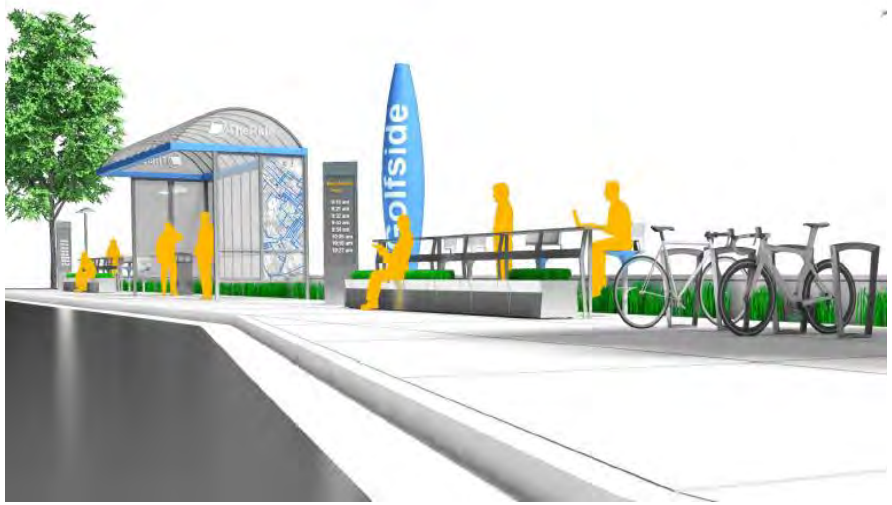


Image of a proposed “Super Stop” being planned for the Washtenaw Corridor.

Source: Smith Group JJR/ Parsons Brinkerhoff. 2013. Reimagine Washtenaw. 22.

Image of a bicyclist loading his bike onto the front of a CATA bus in Lansing.

Source: Vorderman Photography.

Up to 50,000 people per year use RTA’s Rack-N-Roll system. All buses have racks that hold either two or three bikes. On BRT lines, bikes can be rolled on to the bus and the owner stands with the bike.

Source: Greater Cleveland Regional Transit Authority.

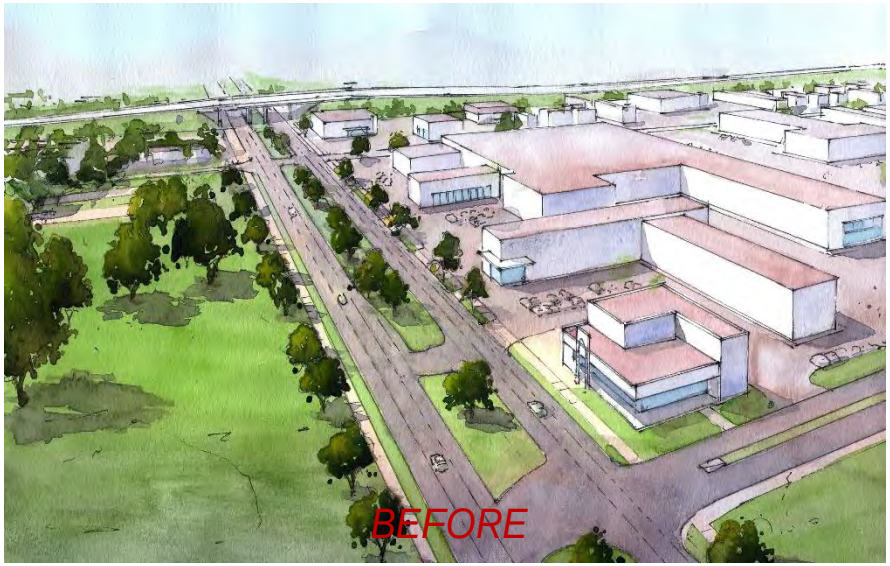
RESOURCES

1) American Association of State Highway and Transportation Officials.
2) Using Bike Racks and Bike Lockers in the CATA Bus System. CATA.
3) Bicycles and Transit. U.S. Department of Transportation. Federal Transit Administration.

Transit-Oriented Development

Transit-Oriented Development (TOD) is a type of design that creates walkable, compact, mixed-use nodes, based around mass transit and other modes of transport. The TODs generally have a mass transit station as their main focal point. Ideally, dense, quality developments are within a 10-minute walk of the transit station. The TODs are situated around multi-modal transit stations that have a mix of transportation types using one central station. The TODs often accommodate individuals who drive and park at the station from farther away destinations, as well as being a central location for individuals within biking or walking distance from the station. Whether driving from a distance to the station, or walking just a mile, all individuals could reach the station and then be connected to all other parts of the transit network.

The TOD stations are ideally the center of development in a particular area. Commercial zones, residential neighborhoods, and service industries might all be located within a 10-minute walk from the center of the station. This provides density to the area and a mix of uses, which would increase use of the district and a need to be located as close as possible to the center of activity.

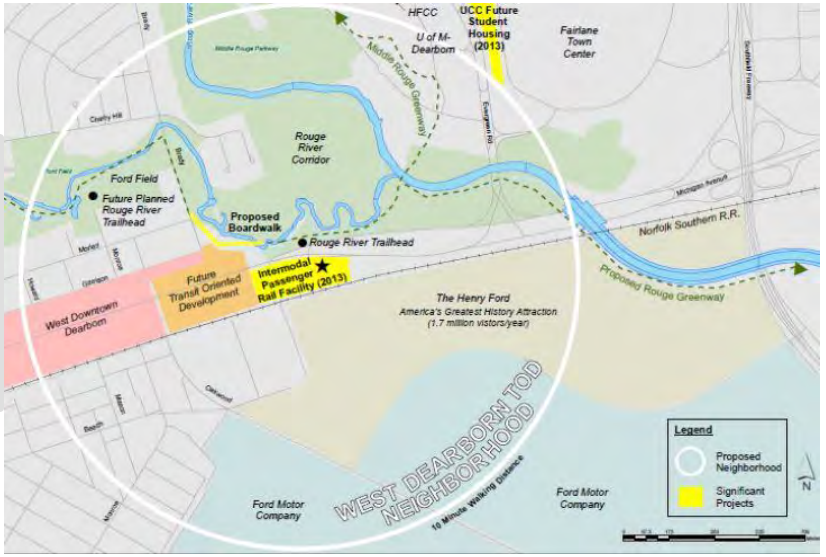


A rendering of existing conditions on Michigan Avenue in Lansing at the Frandor Shopping Center.

Source: Dover-Kohl Associates, under contract for the Tri-County Regional Planning Commission, reproduced with permission.

The City of Dearborn has planned for a TOD in their community along a new passenger rail line between Detroit and Ann Arbor.

Source: West Dearborn Transit-Oriented Development Graphic. Pg. 8. 2013. Dearborn Transit-Oriented Development Project. PlacePlan Concept Report. Michigan Municipal League, Michigan State University Extension, and the Michigan State University School of Planning, Design and Construction.



This rendering of proposed changes to Michigan Avenue in Lansing includes a TOD at the Frandor Shopping Center.

Source: Dover-Kohl Associates, under contract for the Tri-County Regional Planning Commission, reproduced with permission.

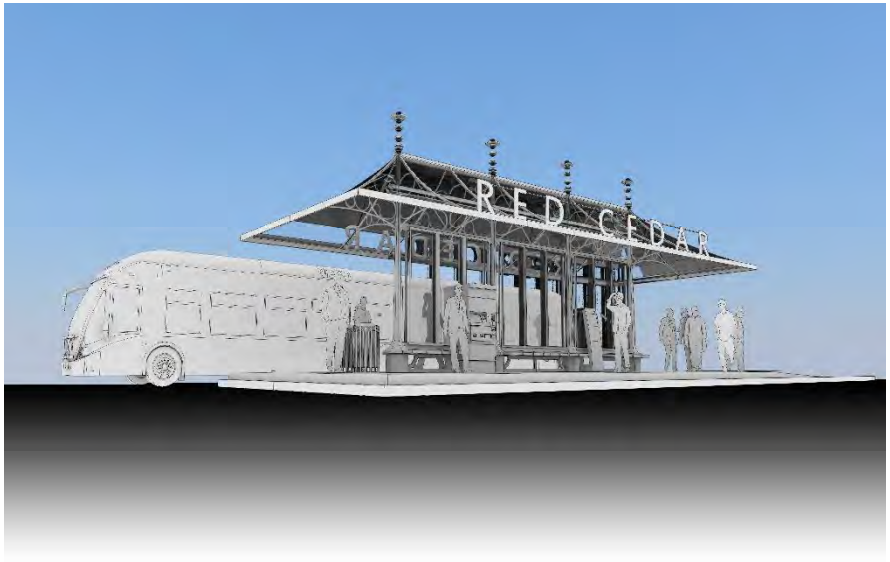
RESOURCES

1) Transit-Oriented Development. U.S. Department of Housing and Urban Development.
2) Reconnecting America: What is TOD?
3) Transit-Oriented Development.

Bus Rapid Transit

Bus Rapid Transit (BRT) is a type of mass transit that uses buses in dedicated lanes to mirror the efficiency of train and light-rail. The BRT has many advantages over traditional bus transit, train, and light-rail transit. The BRT installations can be far less expensive to construct than building traditional subway trains or above ground light-rail trains, and still retain most of the efficiency and safety of the trains. The BRT lanes are often near other vehicle traffic and can be placed on the side of a roadway, or in the median of the roadway, if feasible. A BRT installation also has transit stops with covered platforms, similar to above-ground light-rail or commuter trains. Passengers are able to board the BRT from a barrier- free and universally accessible platform.

Most BRT installations require riders to pay their fare before they board the train, further minimizing the amount of time at each stop and increasing efficiency. Once onboard a BRT bus, riders can travel without stopping for other vehicle traffic and there are very few interactions with other vehicles, so safety is greatly enhanced and crashes are relatively few. For many communities, BRT installations are a great way to have fast and efficient mass transit without the huge expense of building and maintaining train-based mass transit. BRTs retain all of the efficiency of a subway or light-rail system without being cost prohibitive to construct.



This rendering of a Chicago bus rapid transit line displays a dedicated, center BRT lane allowing only buses to use the dedicated lane. It also shows a station in the median.

Source: Chicago Transit Authority.

This BRT bus stop on the Silver Line servicing the Grand Rapids area is located in the outer most lane.

Source: City of Grand Rapids.

Drawing of potential bus stop along the Michigan Avenue corridor in Lansing.

Source: Dover-Kohl Associates, under contract for the Tri-County Regional Planning Commission, reproduced with permission.

RESOURCES

1) *Advanced Network Planning for Bus Rapid Transit: The "Quickway" Model as a Modal Alternative to "Light Rail Lite."* 2008. Alan Hoffman. National Technical Information Service (NTIS).
2) The National Bus Rapids Transit Institute.

Dial-A-Ride

Many rural communities in the U.S. have limited transportation options. Most individuals in rural communities are auto dependent for all of their trips. Many rural communities have dispersed populations around a very small town. In most rural communities, low-density development has not necessitated any form of public transit system, due to what would be low ridership and a lack of a dense population to support it. In its place, many rural communities have developed a form of on-demand public transit called dial-a-ride. Dial-a-ride buses are much smaller than traditional transit buses, but they are accessible to all populations of riders. The system operates on a call-in basis, which requires the rider to call for the bus approximately 60 minutes before their appointment. Dial-a-rides also provide standing order service to individuals who need bus service at the same time on given days of the week. For example, if a person needed dial-a-ride service to get to work every day, they wouldn't have to call every morning to arrange the ride, they could just make a standing order for a ride every morning. However, dial-a-ride transit generally does not run much later than 7:00 p.m. in many communities, making traveling late at night difficult for many people who rely on this service.

Certain populations in rural communities benefit greatly from this service. Individuals who are elderly and cannot drive, adults with special needs, adults with ambulatory problems, and those individuals who need transport but don't have a personal vehicle are all users of this type of service in a rural community. Riders can be taken to shopping areas, medical appointments, church, or other community events, and be dropped at the door, rather than at a bus stop. While most individuals in rural communities rely on their own personal vehicles, many would not be able to move around the community, if not for dial-a-ride transit.

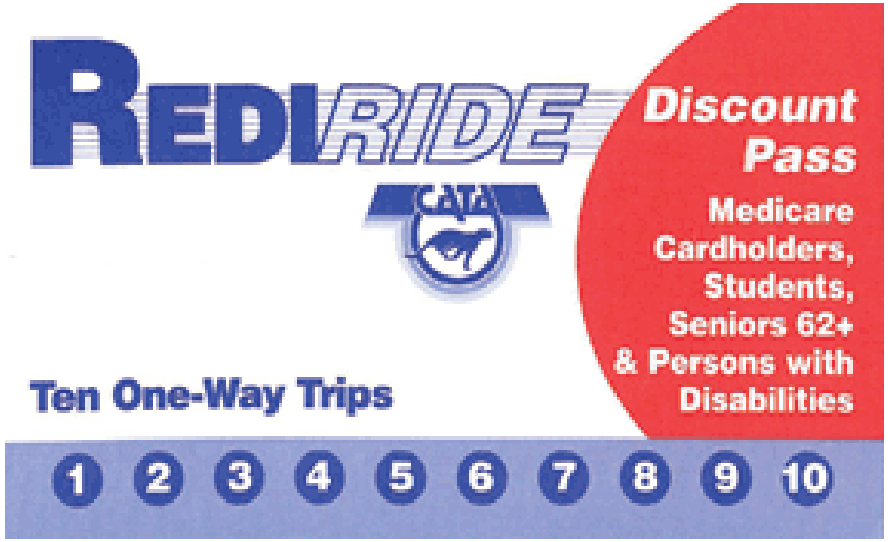


Image of a Thunder Bay Transit Authority bus in Alpena.

Source: Thunder Bay Transit Authority.

Image of a CATA Redi-Ride bus in Lansing.

Source: The Mason Times.

Image of a dial-a-ride 10-ride pass from CATA in Lansing.

Source: RediRide Discount Pass. CATA.

RESOURCES

1) Federal Transit Administration. U.S. Department of Transportation.
2) National Urban Transit Institute.

Standard Fixed-Route Buses

Fixed-route buses are a basic mass transit option that exist in nearly every urban area in the U.S. that is of a significant size to support it. In the U.S., fixed-route buses replaced electric streetcar systems as the de facto public transit system in most cities. Buses did not have to follow the fixed-routes that streetcars did and, at the time, provided a faster and more efficient form of public transit.

Fixed-route buses are still the predominant form of mass transit in the U.S., but streetcars on fixed-rails are starting to rise in popularity once again. Along with light-rail trains and streetcars, Bus Rapid Transit (BRT) is also becoming a popular transit option for some communities (see p. 1-117). The BRT buses are given a dedicated lane to travel in where only buses are allowed to travel. The BRTs stop at fewer stops than traditional buses and there is no waiting or slowing down for excess traffic. They are free to travel the speed limit unimpeded, which makes BRTs more efficient than fixed-route buses.

For many communities though, BRTs, light-rail, and other forms of mass transit are simply far too expensive to implement realistically. For these communities, a fixed-route bus transit system is still a very effective mass transit system that would be relatively inexpensive, when compared to light-rail and BRT options.

Image of The Ride bus transit in Ann Arbor.

Source: Washtenaw Area Transportation Study: 2040 Long range Plan for Washtenaw County. 51. 2013. Southeast Michigan Council of Governments.

Transit can be an important economic and workforce development tool.

Source: "How We Can Create Jobs by Investing in Transit, Explained in Pictures" July 2, 2014. Ariella Cohen. Next City.

Image of a CATA fixed-route bus in Lansing.

Source: Choices for Our Future. 1. 2005. Tri-County Regional Planning Commission.

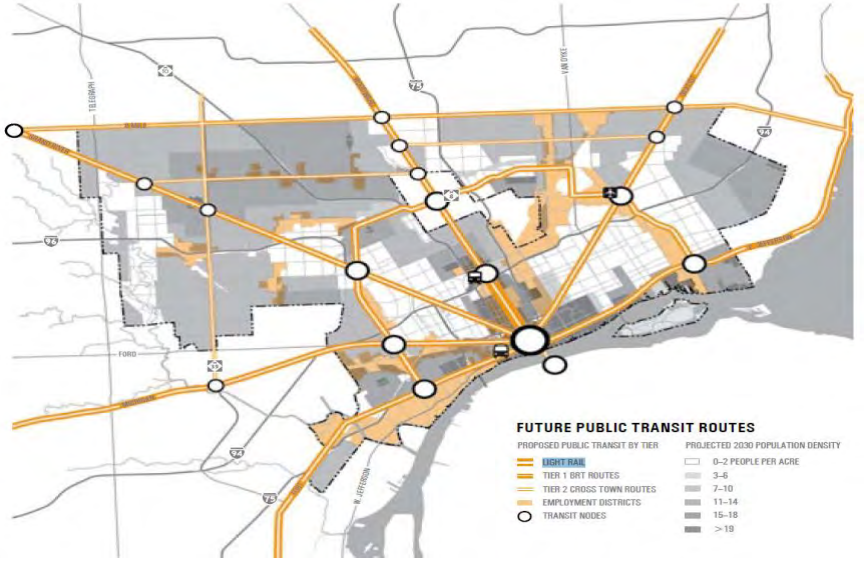
RESOURCES

1) CATA Services. Fixed-Route Service. Capital Area Transit Authority.
2) Transit Service Planning Guidelines and Resources. 2012. KFH Group and Michigan Department of Transportation.
3) Michigan Public Transit Association.
4) Rail and Public Transit. Michigan Department of Transportation.
5) American Public Transit Association.

Fixed Rail

Cities and metropolitan regions can benefit greatly from installing a fixed-rail transit system. Fixed-rail transit is incredibly efficient because it does not have to mingle with other traffic, like buses, and can move large volumes of people in and out of destinations. While fixed rail is not as expensive to build as most underground subway systems, it is significantly more expensive than traditional bus transit or most BRT lines. Therefore, fixed-rail systems are generally found in large urban centers that have high densities, limited parking infrastructure, and the need to move large numbers of people quickly. Efficient light-rail systems have low-cost parking for a large number of cars, at the ends of the line. This allows individuals to drive to a central parking place at the end of a line, and leave their car and use the train to move into the urban core.

Two different types of fixed-rail transit used to be common in large cities in Michigan. One was trolley cars, the others were called inter urban lines. An inter urban line from Detroit to Ann Arbor is under development, along with a trolley car system in downtown Detroit, which has a plan for a light rail train (M-1) on Woodward Avenue, the City's main north and south arterial roadway. This corridor has the necessary density to support a light-rail project, and it also has key destination nodes and centers such as the New Center, Wayne State University, and Detroit's business center at Woodward and Jefferson Avenues. The M-1 train will shuttle people back and forth along this roughly 3-mile stretch of Woodward Avenue in an efficient and timely manner. Riders will also be able to pay a small fare and travel to other parts of downtown, without having to move their car.



The People Mover, shown here at the Renaissance Center Station, in downtown Detroit is an elevated one-way fixed-rail system in place since 1987.

Source: The People Mover Thread. Skyscraperpage.com.

Image of the style of light-rail transit being proposed for downtown Detroit.

Source: Land Policy Institute, based on City of Detroit. Detroit Future City. Detroit Works Project. 2012.

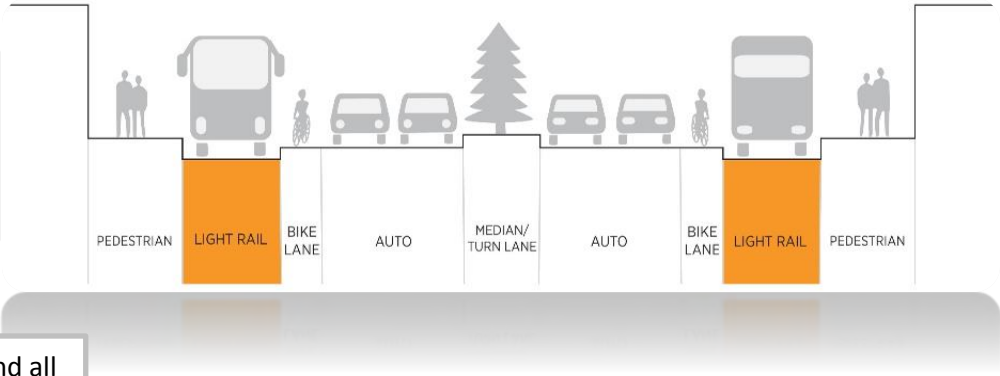


Image for a proposed plan to include light rail trains in downtown Detroit and all the other major connecting transit lines.

Source: Detroit Future City: Detroit Strategic Framework Plan. Pg. 24. 2012. City of Detroit.

RESOURCES

1) This is Light Rail Transit. 2000. The Transportation Research Board.
2) Michigan Public Transit Association.
3) Rail and Public Transit. Michigan Department of Transportation.
4) American Public Transit Association.

Shared Vehicles

Auto dependency varies greatly depending on the area where someone lives. In rural communities, there are few options for travel other than by personal vehicle. In large urban centers, there are a variety of transportation options for people to choose from, including non-motorized travel like biking and walking; transit options like buses; and newer market ideas such as shared vehicles.

Shared vehicles such as Zipcars are a newer idea in more urban centers where individuals pay a membership fee for access to a car, when they need one. Often, paying for parking in a city can be cost prohibitive for many individuals. However, where the need to have access to a vehicle is occasional, a short time car rental is a desirable option. For many, Zipcars are the perfect mixture of gaining access to a car when they need one, without the hassle of maintenance and the added expense of paying for parking.

Another sharing program are bike share programs. Bike share programs are similar business models to Zipcars, in that they rent bicycles to individuals with a membership. Bike shares have specific bike parking racks at key locations around cities and provide individuals without a bike with access to one. Bike and car shares like Zipcars can be a very valuable resource in communities that are looking to add more to their transportation options. However, they are not without risks. One bike share station with 11 docks that can serve 6 bikes costs $35,000-40,000 in equipment and installation and $12,000-15,000 in maintenance per year.

Source: St. Clair County Bike Share Feasibility Analysis. P. 34. 2013. Pam Brushaber, Nash Clark, Jacob Maurer, Jonathan Sharp. Michigan State University Urban & Regional Planning Program, Planning Practicum for St. Clair County Metropolitan Planning Commission.

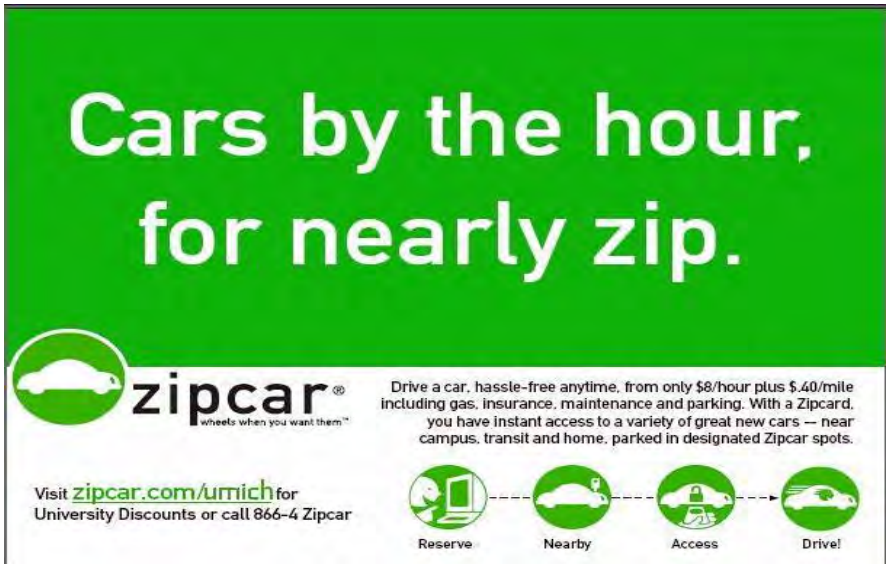


Image of a Zipcar advertisement in Ann Arbor.

Source: About Zipcar. Taubman College of Architecture and Urban Planning. University of Michigan.

Image of bike share bikes in Lansing.

Source: "Lansing Becomes a Pioneer in Michigan, Launching a Bike Share Program." 2013. Capital Gains.

Image of a Zipcar.

Source: "Zipcar Puts Six Cars on the Campus of Michigan State University." 2011. Capital Gain.

RESOURCES

1) Map of Statewide Carpool Parking Lots. Michigan Department of Transportation.
2) Zipcar.
3) *St. Clair County Bike Share Feasibility Analysis*. P. 34. 2013. Pam Brushaber, Nash Clark, Jacob Maurer, Jonathan Sharp. Michigan State University Urban & Regional Planning Program Practicum for St. Clair County Metropolitan Planning Commission.

Parking

Parking is an oft overlooked element of a transportation system mainly because it is often associated with a particular use, site, or building. But without providing some measure of parking, communities and businesses have difficulty attracting individuals to use services and buy goods. Parking comes in a number of forms, including on-street parking, surface parking lots, underground garages, and multi-storied parking decks. Parking varies in duration from shorter-term (minutes, hours) to long-term parking (hours, days). There are also expanding methods to pay for parking from free to permits, meters, and electronic payment.

Many communities are beginning to view parking and parking structures as more than simply vehicle storage. Some communities are allowing for mixed uses on the ground floor of parking garages. Others allow for the entire exterior of a parking garage to contain a residential, office, or commercial use while parking remains on the interior of the structure. On-street parking is sometimes used as a buffer to separate transportation modes (e.g., vehicular traffic lanes from bike lanes). Communities have used demolished buildings and vacant lots for surface parking lots for years but those surface parking lots are now being repurposed for infill development. Parking surfaces are also experiencing a renaissance with many newer ones being made with pervious surfaces to assist with on-site stormwater management and employing solar-powered payment kiosks. Parking facilities also offer clean-vehicle plug-in charging stations.

Changes to parking in a community are often met with resistance. Even with the evolution of thinking about parking and parking structures, it is difficult for citizens to accept different types of parking (from surface lot to deck) and possible reductions in its availability. Many people resist walking extra distances to their destinations and paying for parking. Public engagement and educational campaigns may be necessary to usher in changes to a community's parking system.

Image of the pedestrian entrance to a parking garage in the Gaslight Village of Grand Rapids.

Source: flickr/Brandon Bartoszek.

A well landscaped surface parking lot in Lansing that also offers plug-in stations and pervious pavement.

Source: Jeff Keesler, Planning & Zoning Center at MSU.

This parking garage in Philadelphia offers ground floor commercial space and 616 parking spaces on upper floors.

Source: Parkway Commercial Properties.

RESOURCES

1) Parking Management and Best Practices. 2006. Todd Litman. American Planning Association.
2) On-street Parking Management and Pricing Study. 2009. San Francisco County Transportation Authority.
3) *The High Cost of Free Parking*. 1997. Donald C. Shoup. Department of Urban Planning. University of California, Los Angeles, CA.
4) Donald Shoup, PhD. Distinguished Professor of Urban Planning. UCLA.

Airports

Ranging in size from small airports with self-serve runway and fuel operations to large airports with multiple runways, air traffic control towers, and terminals, airports connect regions to the entire world and are vital to communities for trade and commerce. Just as roads form a transportation network for vehicles, airports form a transportation network that provides service for business and tourism.

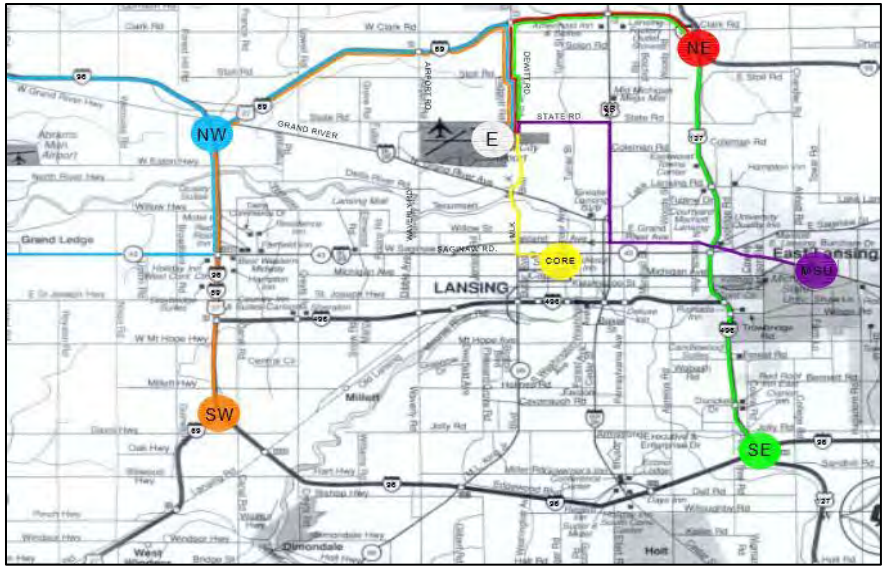
Michigan has 235 public-use airports that contribute $19 billion annually to its economy, and the aviation sector is expected to expand rapidly over the next 25 years. Michigan has 18 air carrier airports serving more than 36 million passengers per year, more than 520 million pounds of cargo and mail, over 16,000 active pilots, and 6,500 registered aircraft. (MDOT: Office of Aeronautics.)

Airport compatible land uses are uses that can coexist with a nearby airport without either constraining the safe and efficient operation of the airport or exposing people living and working nearby to unacceptable levels of noise, vibrations, annoyances, or hazards. Determining the level of compatibility of land uses around an airport is affected by the type and intensity of the use, and associated concerns. It is dependent on the individual airport and its surrounding community therefore collaborative planning is key to compatibility.

Table 1.2-3. Land use compatibility chart for residential activities.

Land Uses	Noise Sensitivity	Concentration of People	Tall Structures	Visual Observations	Wildlife & Bird Attractants
Single-Family Uses (attached and detached)	I	P	N	P	P
Multi-Family Uses (i.e. two or more principal dwelling units within a single building on the same parcel, apartments such as condominium, elder, assisted living, townhouse-style)					
Low-Rise (1-3 Levels)	I	P	N	P	P
Mid-Rise (4-12 Levels)	I	I	P	I	P
High-Rise (13+ Levels)	I	I	I	I	P
Group Living Uses (i.e. assisted living, group care facilities, nursing and convalescent homes, independent group living	I	I	P	I	P
Manufactured Housing Parks	I	I	N	P	I

I=Impact P=Possible Impact N=No Impact Source: Mead & Hunt, Inc.



This table lists specific examples of residential development types and the areas of potential concern associated with each. It provides a general overview from which to begin an evaluation of compatible land use on a case-by-case basis for individual communities.

Source: Enhancing Airport Land Use Compatibility. P. 1.42. 2010. Mead & Hunt, Inc. ACRP Report 27. Transportation Research Board of the National Academies.

The Detroit Metro Airport is the largest airport in Michigan, providing a hub for many major airlines.

Source: Wayne County Airport Authority.

Within its airport master plan, the Capital Region Airport Authority considers an integrated transportation network when examining vehicle access routes.

Source: Capital City Airport Master Plan Update. 2006. Capital Region Airport Authority.

RESOURCES

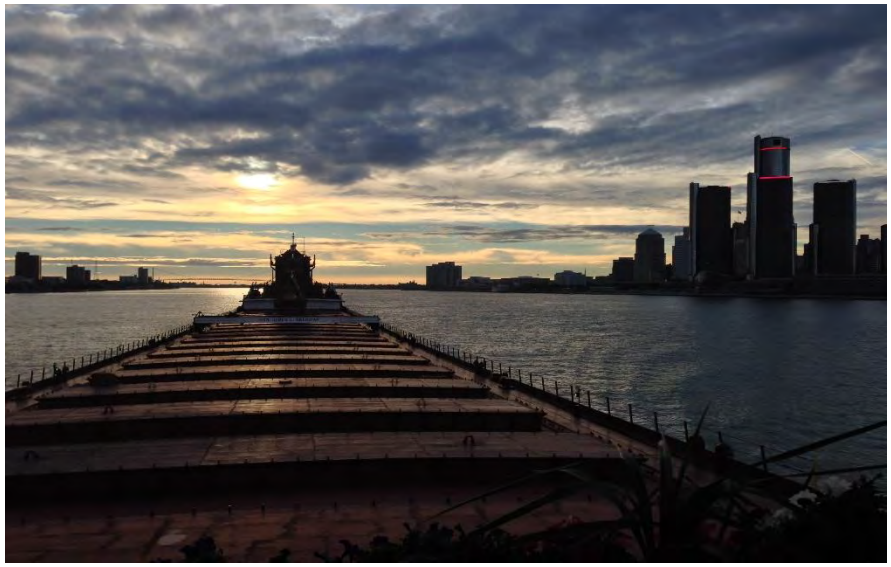
1) U.S. Federal Aviation Administration.
2) Port Lansing.
3) Michigan Department of Transportation: Aeronautics.
4) Enhancing Airport Land Use Compatibility. 2010. ACRP Report 27. Transportation Research Board of the National Academies.

Ports

Michigan is bordered by four of the five of the Great Lakes (i.e., Superior, Huron, Michigan, and Erie) and has over 3,000 miles of Great Lakes coastline. Michigan has dozens of port cities of varying sizes.

The Michigan Port Collaborative categorizes ports into four uses; commercial, cargo, ferry, and recreational. Michigan has over 40 commercial ports, which is more than any other Great Lakes state (Detroit/Wayne County Port Authority). Many ports provide access for all of these functions, but others only offer one or two of these functions. For example, the port of Detroit offers all four shipping functions in its port, but the smaller port of Pentwater is only a commercial and recreational port. (Detroit/Wayne County Port Authority.)

With 22 federally-authorized harbors, Michigan has more ports than any other Great Lakes state, shipping a variety of commodities including iron ore for steel making, limestone for construction, coal for electric power generation, and steel for automobile manufacturing. Michigan and American products gain access to global markets through Michigan ports. "*A 2011 economic impact study determined that maritime commerce through Michigan ports supports more than 26,000 jobs and $3.8 billion in business revenue.*" (American Great Lakes Ports Association. Reopen Michigan Ports!) Eighty percent of all Great Lakes shipments are of limestone and gypsum. Of all Great Lakes shipments, Michigan's ports handle 80% cement, 25% iron ore, and 30% coal.



Muskegon Lake is the largest deep-water port on the western coast of Michigan and is multi-purpose. It allows for coal deliveries, ferry access, and recreational activities, such as sailboat races and charter fishing.

Source: "Muskegon Lake's Transformation Draw Praise and the Attention of Officials from Other Michigan Ports." Marge Beaver/Mlive.com.

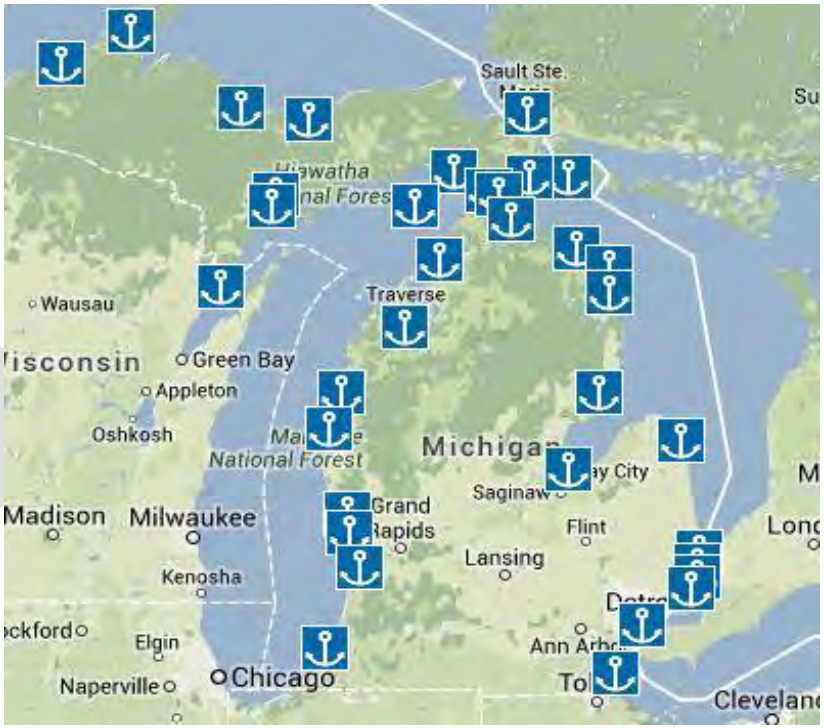


Image of the Michigan Port Collaborative partner communities.

Source: The Michigan Port Collaborative.

The Detroit River is responsible for moving approximately 80 million tons of cargo annually. Michigan is home to more than 40 commercial ports, eight more than the other seven Great Lakes states combined.

Source: Detroit Port Authority.

RESOURCES

1) Michigan Port Collaborative.
2) I-69 International Trade Corridor.
3) The Detroit/Wayne County Port Authority.
4) GLIN (Great Lakes Information Network).
5) American Great Lakes Ports Association.

HISTORIC PRESERVATION

Placemaking emphasizes building upon unique assets in the community to create a sense of place and form a local identity. Focusing efforts on the preservation, restoration, and revitalization of historic structures and sites within a community establishes a groundwork for maximizing the value of such treasured assets. These historic spaces offer an established architectural form with design guidelines that provide a unifying standard and street aesthetic for a downtown, main street, or business corridor. Common design standards within historic downtowns involve:

- Building height.
- Ratio of building size to width of street.
- Setback and building façade.
- Building materials, architectural features.
- Pedestrian scale.

These elements (some depicted in the image on the opposite page) help guide any further development or renovations within a historic district to align with the aesthetics and sense of place already established by the existing historic structures. Successful historic downtowns and main streets that properly apply these elements achieve a balance in form that creates engaging, pedestrian-friendly urban settings. By embracing its heritage and focusing on the preservation of key historic assets, a community reinforces its local identity and ensures the continued presence of dynamic civic spaces for residents to take pride in and share with the surrounding region. The techniques presented focus on identifying historic structures and the mechanisms available to support historic preservation.

Hotel Durant in downtown Flint closed in 1972. The Genesee County Land Bank purchased the property with tax increment financing bonds in 2005, and was able to renovate the historic property through public-private partnerships with local foundations and state agencies. Along with commercial tenants on the first floor, the property now boasts 93 urban-style lofts for nearby University of Michigan-Flint and Mott Community College communities.

Image source (this page): MLive.com (top left and top right), Michigan State Historic Preservation Office (bottom left and bottom right).

Image source (opposite page): Dover Kohl and Associates, under contract to the Tri-county Regional Planning Commission, reproduced by permission. Overlay illustration by Na Li, Land Policy Institute, Michigan State University.

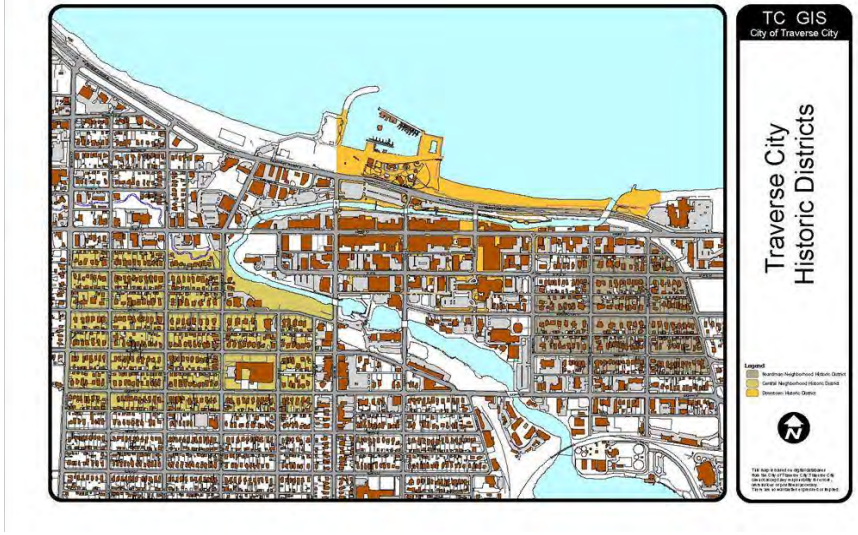

Facade
Building Material
Architecture Style
Uniform Lampposts
2 HOUR PARKING 6AM - 6PM
Walkabi
Banners

Indentification of Historic Structures in Key Places

In determining potential placemaking opportunities through historic preservation, communities must first take inventory of any historical assets in the area and their importance to local heritage. To this end, Michigan's Local Historic District Act, Public Act 169 of 1970, requires an historic resource survey be completed to create a photographic record of a community's proposed historic resources. An historic district study committee conducts fieldwork and relevant research to create this survey, which is then passed to the local planning body and State Historic Preservation Office (SHPO) staff to use in their review procedures. The historic resource study is based upon the Secretary of the Interior's Guidelines that assess:

- Location (geography), Setting (surrounding environment);
- Feeling (aesthetic expression), Association (historical linkage); and
- Design, Materials, and Workmanship.

PA 169 also enables local governments to adopt historic district ordinances and to appoint historic district commissions to assist in implementation. While National and State Register designations for individual buildings or locations may already be in place in some instances, the creation of local historic districts are valuable in ensuring protection of these key assets. A local historic district is a concentrated area of contiguous buildings, which represent a specific period of development, are related by their history, and/or are architecturally significant (MHPN, 2011). They tell a story of the historic themes, significant time periods, key events, and colorful characters associated with a community's past. Embracing these historical assets and preserving their charm creates opportunities for revitalized downtowns and main streets that strengthen community identity. But they also create the form for many downtown streets that make those spaces such warm, inviting, and desirable places to be.

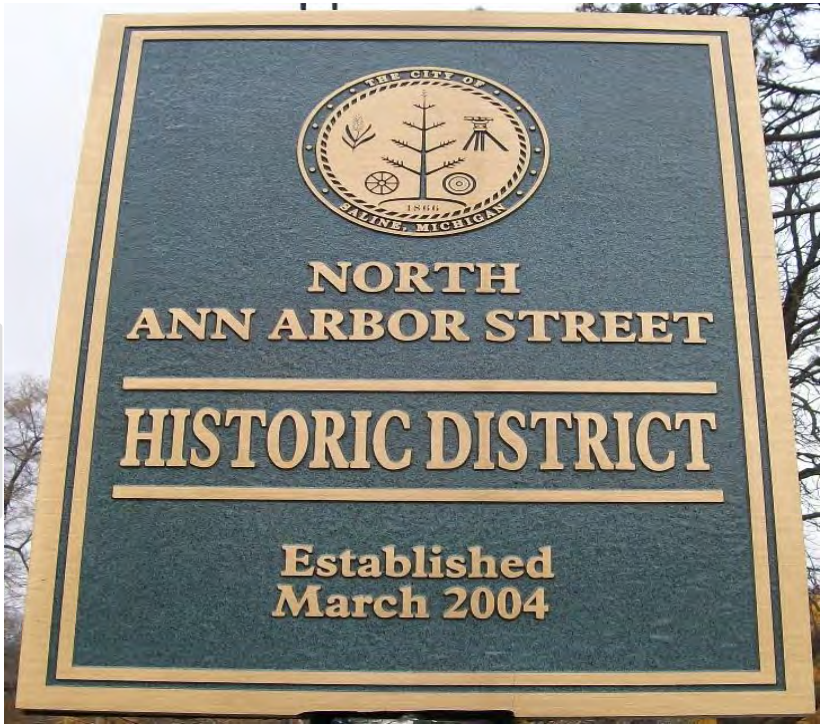


Antique shops and other retailers reside in historic buildings surrounding the courthouse square in Mason, home of the majestic Ingham County Courthouse. Downtown Mason features many preserved historic structures that have been redeveloped for office and commercial spaces, such as the Vault Delicatessen, which is in the former Dart Bank.

Source: Mason Antiques District.

This marker designates the historic district established by the City of Saline in 2004.

Source: Distinctive Saline: Michigan Real Estate.



Many municipalities include maps in their master plans and/or zoning ordinances that detail the locations and boundaries of historic districts, such as this map for Traverse City.

Source: Traverse City Historic Districts. City of Traverse City.

RESOURCES

1) Local Historic Districts in Michigan. State Historic Preservation Office.
2) Public Act 169 of 1970. Michigan Legislative website.
3) Working on the Past in Local Historic Districts. USDOI National Park Service.
4) Model Historic District Ordinance. State Historic Preservation Office.

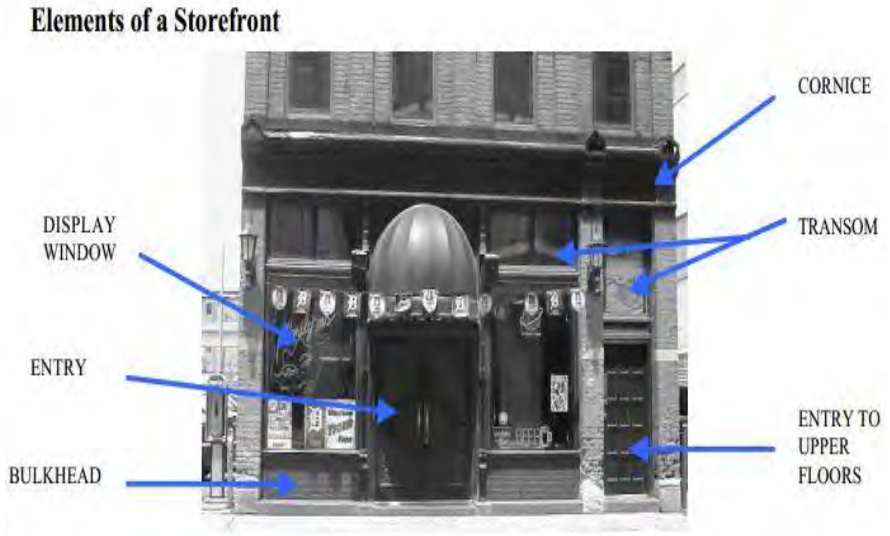
Establish a Historic Preservation District Commission

Once communities complete an historic resource survey (see Identify Historic Structures in Key Places, p. 1-135), establishing an Historic District Commission is the first step in protecting and preserving concentrations of historic structures. Under PA 167 of 1970, commission members serve three-year terms following appointment by local government officials. Commission size ranges from 5-9 members depending on the size and population of the community. Members are residents of the community chosen for their knowledge in history, architecture, and historic preservation.

Historic District Commissions serve to protect a community's historic resources, and ensure all property owners within an historic district are given equitable treatment. The commission reviews any proposed development or exterior changes to an historic site or structure, applying the *Secretary of the Interior's Standards for Rehabilitation* and related design guidelines, while assessing historical context.

After project review, the commission may make the following decisions:

- *Certificate of Appropriateness (COA):* Work meets the Secretary's Standards for Rehabilitation and any other guidelines adopted by the commission, and the project is approved for implementation.
- *Denial:* Commission does not approve project, but provides recommendations to modify project in order to meet standards.
- *Notice to Proceed:* Commission approves work despite being inappropriate for historic district, on grounds that work is needed to correct safety hazards, or work is of substantial economic benefit to the community.



The Ranney Building on Washington Avenue in Downtown Lansing is in a local historic district. Renovations and restoration efforts conducted around 2007 were coordinated with approval from the historic district commission. Two floors of residential lofts are located above first floor commercial space.

Source: Studio Intrigue Architects. Studiointrigue.com.

Manistee's Downtown District is one of many in Michigan listed on the National Register of Historic Places.

Source: Kurt Schindler, Michigan State University Extension.

Historic District Commissions utilize diagrams and models such as these defined Elements of a Storefront to help convey guidelines for alterations and rehabilitation work on structures within the historic district.

Source: Design Guidelines for Commercial Buildings. Detroit Historic District Commission. Draft.

RESOURCES

1) Public Act 167 of 1970, Section 399.204.
2) Michigan State Historic Preservation Office.
3) Michigan Historic Preservation Network.
4) Local Historic Districts in Michigan. State Historic Preservation Office.

Main Street Program

Communities with historic properties in their traditional downtowns or neighborhood commercial districts are eligible to apply for the state-funded Michigan Main Street program to help maximize the potential of these local assets. This community-driven program encourages placemaking opportunities and local economic development through historic preservation. The program is offered at different levels:

- *Associate* (one year): No-cost training designed to provide technical assistance and the basics of Main Street Four-Point Approach;
- *Select* (five years): Further guidance and support in developing, implementing, and sustaining community's Main Street program;
- *Master* (six or more years): Further implementation practices beyond Select Level, opportunities to mentor other Main Street communities.

The Main Street Four-Point Approach utilized by the program focuses on community development through four areas:

- *Design* – Capitalizing on historical assets while applying consistent design standards that create attractive streetscapes and facades;
- *Economic Restructuring* – Strengthening existing assets while identifying gaps in market to expand and diversify economic base, and determine efficient uses for vacant main street property;
- *Promotion* – Marketing the unique charm of the downtown district to potential residents, visitors, investors, and business owners; and
- *Organization* – Coordinating all community stakeholders to strive towards a common vision for the main street, and developing structure of governing board and committees for implementation.

Lansing's Old Town provides an example of a successful Michigan Main Street project. Once crime-stricken and facing high vacancy rates, Old Town has been revitalized over 20 years into a vibrant district near downtown that features unique art galleries, locally owned restaurants, and multiple cultural and music festivals through the year, such as the pictured annual Jazz Fest.

Source: Jazz Fest 2010. Old Town, Lansing. Message Makers: Creators of Experiences that Transform.

Boyne City, with events such as Stroll the Streets, started their Main Street program in 2003 and continues to expand activities, now as a Master Level community in the program.

Source: Boyne City, Michigan Main Street Center.

Lansing's downtown district became an Associate Level Main Street community in July 2008, and was awarded Select Level status in February 2013.

Source: Lansing Downtown. Omicron Photography. Omicronphoto.com.

RESOURCES

1) Michigan Main Street Program.
2) National Main Street Center.
3) National Trust for Historic Preservation.

Federal Historic Preservation Tax Program

To help a community promote its historic structures as key assets for placemaking opportunities, state and federal tax programs are in place to encourage restoration and redevelopment of historic downtowns and commercial districts. Providing incentives for local investment that embraces a community's existing architecture and heritage can bring new activity and energy to these key public spaces.

The Tax Reform Act of 1986 established guidelines for federal tax incentives related to historic properties:

- Twenty percent tax credit for certified rehabilitation of certified historic structures, and
- Ten percent tax credit for rehabilitation of non-historic, non-residential buildings built before 1936.

To register as a certified historic property, the owner submits an application to the State Historic Preservation Office (SHPO). The state review board at SHPO has appellate jurisdiction under the Local Historic Districts Act, and is a governor-appointed board comprised of members with professional backgrounds in architecture, history, cultural geography, archaeology, historic preservation, and related disciplines. The review board oversees historic designations in Michigan and makes National Register of Historic Places nominations to the National Park Service of the U.S. Department of the Interior.

The restoration of the six-story Art Deco Knapp's Building in downtown Lansing in 2013-2014 was made possible, in part, through federal historic tax credits and a Michigan Historic Special Consideration credit award, a 15% state historic tax credit. The revitalized Knapp's Centre will feature a mix of offices, retail space, apartments, and a small business incubator. It was originally built as a department store in 1937–1938.

Source: Knapp's Building, Lansing, MI. Capital Gains.

Built in 1920, the historic Durant Hotel near downtown Flint was revitalized through historic preservation tax incentives, and now features contemporary urban lofts for lease.

Source: Durant Hotel, Flint, MI. MLive.com.

Grand Traverse Commons is an ongoing adaptive reuse project made possible through state and federal historic preservation tax credits and additional funding sources. The historic, former psychiatric asylum in Traverse City now features retail shops and local businesses, a variety of residential units, restaurants and cafes, and a weekly farmers market in the renovated basement level.

Source: The Village: Grand Traverse Commons. Traverse City, MI.

RESOURCES

1) Federal Tax Credits for Historic Properties. MSHDA.
2) Michigan Historic Preservation Network.
3) Historic Preservation Tax Incentives. 2012. National Park Service.
4) National Trust for Historic Preservation.