

## A. Introduction

Investment in the transportation network is intended to ensure a comprehensive motorized and non-motorized system that preserves the quality of life for residents and also facilitates a successful business climate. Over the years, the City of Portage has invested heavily in the transportation network to meet changing needs. Many planned improvements to address street capacity, traffic operations and safety have been accomplished. The City also monitors traffic volumes, crashes, and other statistics and on annual basis and the data are evaluated to develop further improvement projects for inclusion in the 10-year Capital Improvement Plan.

Past Comprehensive Plans and Capital Improvement Plans focused on increasing traffic volumes through roadway widening and intersection improvements. Though there remain some congested roadway segments and intersections, many critical capacity and safety needs have been addressed. In this regard, transportation needs within the community have shifted from expansion to preservation. Transportation funding has also changed, with less money available for capacity improvements and more local competition for limited resources. In response to these changes, this Plan has refined the City's approach as follows:

- A focus on preservation of the existing roadway system rather than capacity expansions.
- Attention to improvements to intersections or street segments with congestion or crash problems, rather than entire corridors. Improvements may involve use of new types of intersection or road design.
- Continue an emphasis on safety, but with increased consideration of safety for pedestrians, bicyclists and transit users. This is consistent with Michigan's new "Complete Streets" legislation.
- Consider a reduction in the number of lanes for certain streets where the current and projected daily traffic volumes are below the design capacity and expected to remain so in the future. A reduction in travel lanes may be appropriate where the city desires to slow down vehicle speeds to make a street more pedestrian and/or bicycle friendly.
- Planning for streets in consideration of both their transportation purpose, but also to complement the current or desired character of the immediate area.
- Meeting the needs for people of all ages and abilities, including senior drivers, a growing segment of the population.
- The relationship between transportation and community health – communities that promote walking and biking often have less obesity, chronic illness, and healthcare costs.
- Greater fiscal consideration to long term "return on investment" of transportation improvements.

### Did you know?

As noted in the Community Snapshot Report and as presented at the Open House, the following information is notable in regard to transportation within the community.

- The I-94/South Westnedge Avenue interchange reconstruction, completed in 2011, was the first "shovel-ready" project in Michigan through the

## Transportation-related Opportunities

- Continue the investment to expand and/or enhance city parks, bikeways and multi-use trails with emphasis on connecting areas not served to the central/existing system.
- Utilize Eliason Nature Reserve to its fullest potential and create connecting non-motorized links
- Enhance gateways to the city, fully utilizing the new brand “A Natural Place to Move” to contribute to a strong sense of community
- Create a complete streets policy that addresses multi-modal transportation elements including sidewalks, shared shoulder bike lanes, multi-use trails and connections to public transit
- Continue to improve non-motorized connections throughout the city that appeal to varied skill levels of existing and potential bicyclists through additional bike ways and trail connections
- Retain South Westnedge as a regional business anchor but continue efforts to improve traffic flow and safety
- Provide transportation guidance for locations identified as problematic such as intersections/crossings at Centre, Old Centre, Vincent, Oakland, among others
- Lake Center Area: Enhance Portage Road to be a vibrant, commercial corridor that is walkable and safe.

### American Recovery and Reinvestment Act.

- Over \$26 million in major street improvements and over \$8 million in local street improvements are planned over the next 10 years.
- Major and local street projects will incorporate where feasible “complete street” components including pedestrian refuge islands, sidewalks, crosswalk sign and pavement markings, improved lighting.
- Over the next 10 years, nearly \$1 million of bikeway and sidewalk improvements are scheduled.
- Portage has over 17 miles of non-motorized multi-use trails and over 38 miles of paved shoulder bikeways are available throughout the community.
- The most recent project involved a 1.5 mile extension of the Northwest Portage Bikeway funded by a federal grant in 2010.
- Portage was one of only 21 cities nationwide to receive the Bicycle Friendly Bronze Award in 2010 League of American Bicyclists.
- All city streets are considered “urban” within the Kalamazoo/Portage metropolitan area for purposes of planning and funding street improvements. These streets are also classified by function and include the following categories: Interstates/Expressways; Major Arterials; Minor Arterials; Collector Streets; and Local Streets. The Community Snapshot Report provides a detailed description of these street categories and includes a Transportation Existing Conditions map illustrating streets by classification, including traffic volumes and other data.

## In this Chapter:



Complete Streets



Context Sensitive Streets



Corridor Management



Operation Improvements

A complete documentation of existing conditions is included in the Community Snapshot Report.



Based on the Community Snapshot Report, public input and prior Comprehensive Plans, these Vision, Goals and Objectives were established related to transportation.

While Portage has control over most streets within the city, cooperation from other agencies is needed.

- Sections of Kilgore Road are under the jurisdiction of the City of Kalamazoo.
- South 12<sup>th</sup> Street and Sprinkle Road are under the jurisdiction of the Kalamazoo County Road Commission (KCRC).
- US-131 and I-94 are under the jurisdiction of the Michigan Department of Transportation (MDOT).
- Kalamazoo Area Transportation Study (KATS) coordinates federal and state funds in the Kalamazoo/Portage metro area and develops an annual list of transportation projects eligible for funding. KATS also maintains a simulation model that projects future traffic volumes based on land use.
- Public transportation is provided by Kalamazoo Metro Transit and the Kalamazoo County Transit Authority, which provides fixed-route and demand-response bus service within the community.

**Vision: Create a safe, balanced and coordinated multi-modal transportation system adequate to accommodate the ongoing growth and (re)development of Portage.**

### **Transportation Goals and Objectives:**

**Goal T1: Support a "Complete Streets" approach: transportation for all types of travelers of all ages and abilities**

- T1.1: Provide a transportation network that meets the needs of and promotes safety for people that drive, walk, bicycle, or use transit. Give greater priority to pedestrians and bicyclists as a way to improve residents' health, mobility, and vitality.
- T1.2: Provide a network with different types of facilities to meet the needs of bicyclists from beginners to advanced users.

**Goal T2: Maintain context sensitive streets that are designed to complement the desired character of a district or neighborhood or as a catalyst for change**

- T2.1: Improve aesthetics within the right-of-way and in the private property along it to emphasize the city's image as a vibrant place. This also includes views from I-94.
- T2.2: Use appropriate traffic calming measures so traffic speeds fit the character of the surroundings.

**Goal T3: Provide effective corridor management optimizing the existing system through management of access, coordinated traffic signals, and intelligent traffic systems.**

- T3.1: Use access management standards to improve safety and traffic flow. This includes techniques to reduce the number of access points, regulate their design and placement and require shared access through easements to help preserve capacity and improve safety along arterial roads.
- T3.2: Maximize the lifespan of roadways through transportation system management techniques (such as intersection signalization, intersection improvements, and access control), transportation demand management techniques (such as ride-sharing, preferential parking for multiple-occupancy vehicles, and removal of physical access barriers to alternative modes), and technology (such as traffic signal coordination, information sharing, and wayfinding).

**Goal T4: Prioritize new transportation projects to ensure preparedness for future needs and innovative means to meet them**

- T4.1: Set aside adequate financial resources to preserve transportation facilities as a priority before funds are allocated for capacity expansion.
- T4.2: Evaluate capital investments on the basis of capacity needs, safety, pavement condition, relationship to other transportation improvements, planned land use and impacts on the environment and community character.

## B. Complete Streets

Planning the city transportation system involves more than just moving vehicles efficiently and safely. A transportation system needs to meet the needs of all types of users – motorists, pedestrians, bicyclists, and transit users. In some cases, this can be accomplished with lower vehicle speeds to be more supportive of bicycles and pedestrians, while in other places, wider vehicle lanes and higher speeds may be needed for vehicle and goods movement. The design of the transportation system also needs to reflect the context of adjacent land uses. Nationally, this approach is often referred to as “complete streets”, harmonizing streets with their surroundings while interlacing transportation networks to meet the mobility needs of all users.

Portage has an extensive non-motorized transportation system that is a leading example in Michigan. The facilities associated with the non-motorized transportation system within Portage include those noted in side bar.

Continuing to provide and invest in a non-motorized transportation system is a priority for residents and city leaders, and includes many benefits, such as:

- Provides connections between homes, schools, parks, public transportation, offices, and retail destinations.
- Improves pedestrian and cyclist safety by reducing potential crashes between motorized and non-motorized users.
- Encourages walking and bicycling that improves health and fitness.
- Provides options to make fewer driving trips, saving money.
- Research demonstrates pedestrian and bike-friendly cities have more economic vitality.

The following text provides guiding principles for the non-motorized transportation system within the community.

### Non-Motorized Facility Types

- **Sidewalks.** Five-foot wide concrete surfaces on both sides of a major thoroughfare for the purpose of providing pedestrian circulation. Four-foot wide concrete sidewalks on both sides of all local residential streets. Sidewalks are normally separated from the curb of a street or paved road shoulder by several feet of grass or brick pavers.
- **Paths.** A path generally a minimum of four-foot wide and constructed of bark/wood chips, crushed stone or floating platform and used within environmentally sensitive and wooded areas.
- **Multi-Use Trails.** An 8-12 foot wide asphalt or concrete surface within a park, public space or along a public street for the purpose of providing both pedestrian travel and for use by people with non-motorized wheeled equipment/gear.
- **Bikeways.** A bikeway includes a paved facility specifically for bicycle travel. Such facilities consist of a variety of design types including 1) an on-road bicycle lane, 2) a paved shoulder where bikes share use of the shoulder with pedestrians, 3) a lane in a street where bikes “share the road” with vehicles (and may be designated with a “sharrow” symbol), or 4) a bike route, which is a street designed as part of the bike system but with no special design features (often a local neighborhood street).

**Goal T1:**  
Support a  
“Complete Streets”  
approach: transportation  
for all types of travelers  
of all ages and abilities



sidewalk



path



multi-use trail



bike lane



sharrow: remind motorists bikes are permitted to “share the road”

## Pedestrians

Sidewalks have many benefits. When sidewalks exist, people walk more frequently which contributes to public health and neighborhood cohesion. In addition, sidewalks provide an alternative mode of transportation. Finally, while experienced bicyclists prefer to ride in the street, sidewalks may be used as a bike route by children and less confident bicyclists. Recent studies have also demonstrated that subdivisions with sidewalks tend to better sustain higher property values. Connections between neighborhoods and nearby activity nodes like schools, parks and commercial nodes also contribute to the city's quality of life. The Non-Motorized Transportation map illustrates the location of existing sidewalks. While many areas of the community have a complete sidewalk network, there are many developed areas that lack a complete sidewalk network or lack sidewalks in general. As new development and redevelopment occurs, opportunities to construct sidewalks should be pursued, especially in close proximity to schools, parks and activity nodes and along major thoroughfares.



### *Sidewalks within new residential subdivisions.*

Sidewalks are required within all new residential subdivisions. This practice should continue and exceptions should be granted only in unique circumstances. Where exceptions may be granted, internal path systems and/or pedestrian connections to schools, parks or other activity nodes that are known to generate pedestrian traffic should be otherwise be provided.

### *Sidewalks within existing residential subdivisions*

As noted above, in many developed neighborhoods, sidewalk installation is inconsistent (i.e. no sidewalks, sidewalks on only one side of the street or installed in one phase of development and not the next adjacent phase). In such areas, the following efforts should be made:

- Fill gaps in the sidewalk system where they exist as redevelopment may occur.
- Concurrent with capital improvement planning, construction of sidewalks along primary pedestrian routes to schools, parks or other activity nodes should be evaluated and implemented where feasible.
- Where concerns regarding pedestrian safety exist and have been documented (such as pedestrian and vehicular accidents and/or re-occurring vehicular speeding) construction of sidewalks and other appropriate safety improvements should also be considered.

### *Sidewalks along major thoroughfares*

Sidewalks should be required along both sides of major thoroughfares concurrent with new development and redevelopment projects. Exceptions should be limited to sites with unique circumstances. Where exceptions may be granted, one or more of the following public facilities should be in existence adjacent to the site, which are listed in order of preference as an alternative route for pedestrians:

- Existing multi-use trail(s) in the immediate vicinity that provides an alternative route for non-motorized transportation;
- A widened shared-shoulder bikeway for bicycle and pedestrian use; or
- A shared-shoulder bikeway adjacent to the roadway.

In addition to the above efforts, pedestrian enhancement planning is also recommended concurrent with (re)development and/or capital improvement



planning to provide improvements such as: 1) pedestrian refuge islands at key intersections where practical with collector and/or major thoroughfares, 2) pedestrian connections between neighborhoods and/or to schools, parks and other activity nodes; and 3) improved crosswalk pavement marking, signage and street lighting at local and/or major street intersections.

## Bicyclists

Designing bicyclist infrastructure to meet the mobility and safety needs of people using non-motorized, wheeled equipment needs to be multi-faceted in order to adequately address the skill levels and interests of a diverse population. No single type of "bicycle" facility will meet all user-type needs (see sidebar).

As noted above, the non-motorized transportation system includes sidewalks, paths, multi-use trails, and bikeways. Advanced and basic bicyclists tend to utilize shared road bikeways, which are safer than sidewalks because motorists are more aware of riders at intersections. The more casual, recreational bicyclist usually prefers riding on multi-use trails, sidewalks and local neighborhood streets with low traffic volumes.

Since having bikeways on every street is not practical given cost, right-of-way limitations, and other factors, a priority is to provide connections between key destinations like schools, parks, cultural institutions, and activity nodes. Another priority is to link existing non-motorized facilities inside the city with trails and linkages outside the city. Given the diversity of street characteristics and land use densities in the city, a variety of non-motorized bikeway facilities exist and are planned to meet the various user needs and situations in the city. In this regard, the Non-Motorized Transportation Map shows existing and future planned bikeways and multi-use trails.

## Different Classes of Bicyclists

The non-motorized system in Portage needs to be designed for a variety of bicyclists:

A - "Advanced" riders include the more experienced or commuter bicyclists who often travel where those with less confidence or experience will not travel, such as streets with higher vehicle volumes and speeds.



B - "Basic" bicyclists comprise the highest percentage of bicyclists or potential bicyclists. This group may choose to use a bicycle if there is a convenient and comfortable route available, but generally avoid bad weather and perceived unsafe conditions.



C - "Children and families" and the least confident bicyclists that typically use sidewalks but may travel in the street where volumes and speeds are low.



## Complete Streets Implementation Strategies

- Pursue local, state and federal funding to continue implementation of the Non-Motorized Transportation system.
- Pursue the installation of planned walkway and bikeway facilities in conjunction with scheduled road improvements projects.
- Work with organizations and advocacy groups such as bicycle users, seniors, and schools to develop Safe Routes to School Programs, identify priority needs for walking and bicycling.
- Adopt a Complete Streets policy/plan consistent with the MDOT program for continued nonmotorized transportation planning efforts to provide alternative modes of transportation to promote sustainability, ensure all modes are considered for MDOT projects, and provide consistency with the Natural Place to Move placemaking effort.
- Ensure transit-friendly features such as sidewalks to bus stops, pads or shelters in areas that are currently, or have the potential to be served by public transit.
- Encourage safe and efficient non-motorized circulation between public sidewalks and businesses, between businesses and also between businesses and residential neighborhoods during site plan review and City capital projects.
- Complete gaps in the sidewalk system and work towards a non-motorized system especially around parks and schools.
- Promote walking, bicycling, and use of alternative fuel vehicles through appropriate site design techniques, such as allowing for bike amenities to replace a required parking space.



# Non-Motorized Transportation Map

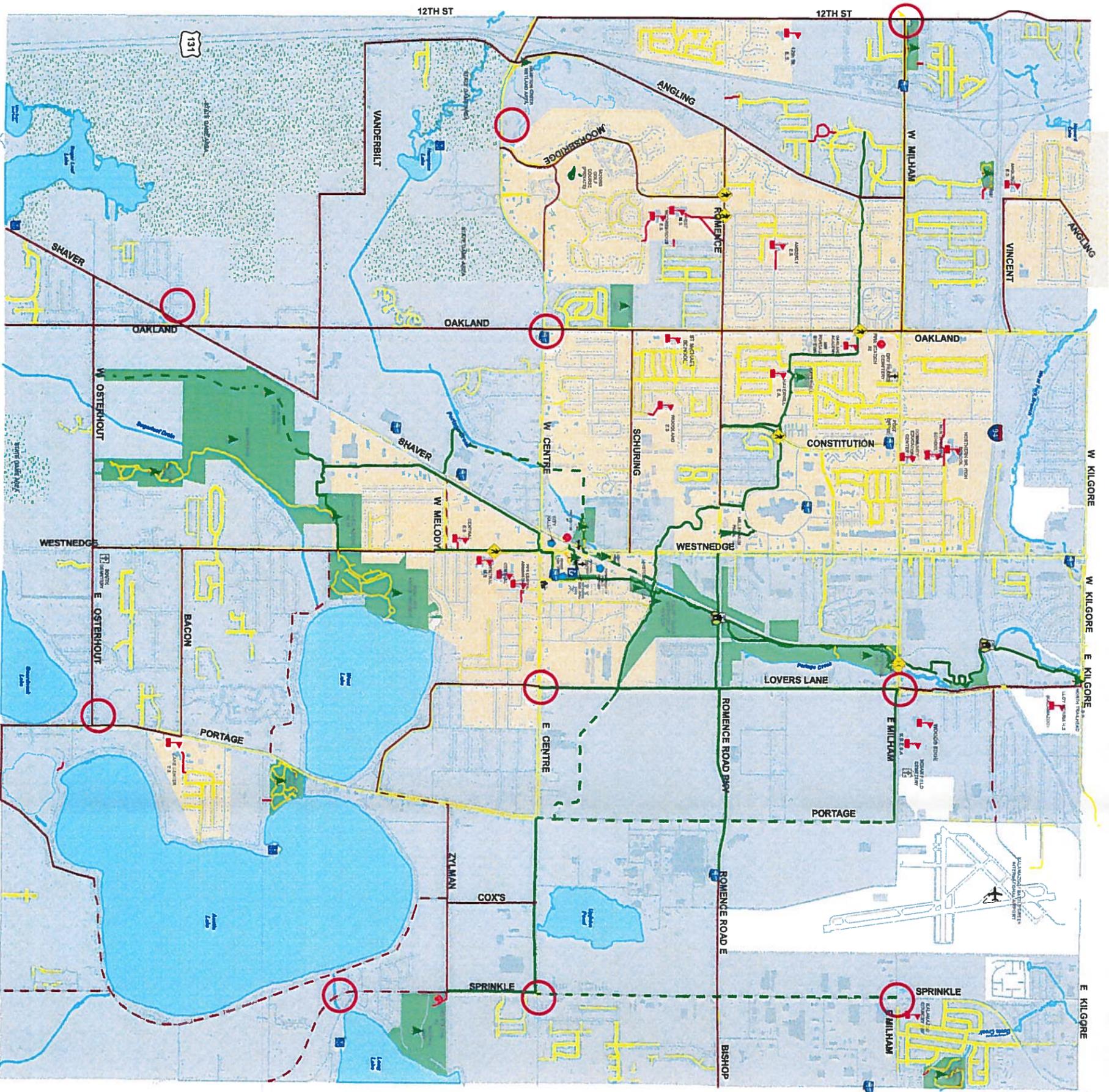
Date: 3/28/2014

## Legend

- Pedestrian Refuge Island
- Pedestrian Bridge
- Pedestrian Tunnel
- Metro Bus Shelters
- Airport
- Public Access
- Golf Course
- Cemetery
- Fire Station
- Library
- City Park
- School
- Police
- Municipal
- P.C.O.C.
- Paved Shoulder Bikeway
- Paved Shoulder Bikeway Proposed
- Multi-Use Trail
- Multi-Use Trail Proposed
- Other Pedestrian Trails
- Sidewalk/Trail Connectors
- Sidewalks
- City Parks
- School - Non Transportation Area
- State Game Area
- City Boundary
- Commercial Node



1 inch = 3,200 feet



## C. Context Sensitive Streets

Historically streets were designed to meet expected traffic volumes at a selected speed. Streets or intersections were widened to meet needs provided right-of-way was available. That traditional process has been modified in recent years in response to emerging “best practices” in street design, which recognize that many factors along the street influence the speed of traffic, accidents, and how a street can be in harmony, or in conflict with its surroundings. The city has made a concerted effort in past plans to consider the impact a street has on surrounding land uses within various areas of the community. A continued focus on context sensitive streets is again recommended as part of this Plan.

### Street and Corridor Character

Street width, presence of on-street parking and sidewalks, block length, building setbacks, design speed, street trees and even pavement markings and signs all contribute to how the street functions. Driver perceptions can affect vehicle speed and care used in driving. These elements can also affect how people view a corridor and their impression of Portage in general. A street designed in tandem with its surroundings can foster an inviting place to live, work and visit.

Successful commercial corridors should be free of unsightly clutter and easy to navigate. Streets in residential areas should intuitively encourage a lower speed. In some cases, the road design elements in the city reinforce the desired image: In other cases, improvements need to be considered. This Plan relies on a wide range of concepts to help ensure the future transportation system operates safely and efficiently, but also in context with the character of the city.

### Expressway Corridor Views

Nearly 120,000 vehicles a day pass through Portage along U.S. 131 and I-94. Motorist perceptions of Portage are largely created from views along these expressways or from their experience exiting at interchanges. A number of techniques are recommended to help promote a quality image for the city:

- Within the right-of-way, continue to work with the MDOT to ensure ongoing widening and improvements to I-94 and U.S. 131, including the use of diverse materials for bridges and medians (not just standard concrete), landscaping and appropriate lighting.
- Adjacent to the right-of-way, treat uses located along the expressway as a “front door” to the community. Sites and buildings should be designed to project a quality image. This may involve special setbacks, requirements for building wall design, and specific expressway frontage landscaping. Loading, storage, and parking areas should only be permitted within this front door area if well screened or landscaped.

### Entryways

Entryway features are used to announce key gateways into the city. Key gateways include the expressway interchanges and entrance points at select major streets near the city corporate limits. Entryway features may also be associated with certain natural features such as Portage Creek or the lake areas. Centers of activity in the city such as Portage Commerce Square, City Centre Area, the Lake Center business area, or the industrial corridors could also incorporate entryway features for those districts. Current entryway features include welcome to Portage signs with landscaping and/or sculptures



### Goal T2:

*Maintain context sensitive streets that are designed to complement the desired character of a district or neighborhood or as a catalyst for change*



or other structural elements. The standard design has been developed and is used consistently, though not every element must be used at every entryway. The existing entryway feature network should be continued and enhanced and, when appropriate, expanded to include other gateways into the city.

### **Major Street Corridors**

Using the “character” approach, the major corridors were classified into five categories, (refer to the **Corridor Character map**) which may vary as a street runs through different parts of the city.



- **“Residential Conservation Corridors”** are streets which are generally lower-intensity and residential in character, even though there may be some non-residential uses along the street. The quality and capacity of these streets need to be conserved through regular maintenance. Improvements to these corridors should include aesthetic features to complement the adjoining residential area such as landscaping, streetscape amenities, and pedestrian crossings at key locations. Land use or other changes which would alter the current balance of activity and/or physical characteristics by increasing the intensity of use should be discouraged.

Residential Conservation Corridors typically should have two travel lanes with a left-turn lane at major intersections and higher volume access points. These streets should have some type of bikeway and at a minimum five foot wide walkways along both sides, wider at locations that warrant more activity such as schools or parks. Where traffic volumes or turning movements support more lanes, three lanes are preferred.

- **“Preservation Corridors”** are streets which pass through areas not yet fully developed, or where potential for significant redevelopment or conversions from one land use to another exists or is expected. These parcels should be reviewed with an eye toward preventing land use and thoroughfare conflicts through application of zoning and access management standards. These corridors are in need of minor improvements to preserve existing capacity and improve safety, such as access management, intersection improvements or installation of pedestrian refuge islands at certain crossings.
- **“Limited Access Boulevards”** are designed to ease through traffic capabilities with some limited access medians within residential, commercial or industrial areas. A boulevard design provides the capability to enhance traffic safety by separating opposing traffic through the use of raised median islands, provide controlled turning movements at designated locations and eliminate the crash potential associated with a continuous left turn lane. In addition, limited access boulevards encourage higher quality development activities such as technology/business park type uses.
- **“Correction Corridors”** are streets bounded primarily by non-residential uses. These street segments and/or intersections are complex, may exhibit peak-hour traffic congestion, a higher incidence of, or potential for, crashes due to traffic volumes and/or design, and may lack desired multi-modal transportation features. Corrective actions may include select street segment widening, intersection improvements, or replacement of center turn lanes with median islands at key locations. Attention to road design elements also needs to be considered with construction projects to improve the appearance of these corridors such as mast arm traffic



signals, street trees, wayfinding signs, ornamental lighting, an improved environment for pedestrians and bicyclists and attractive public signs.

Corrective actions also include improvements to sites that line the street. These may include access management such as closure or redesign of driveways and connection of uses through service drives, addition of landscaping, replacement of signs and lighting, on-site pedestrian improvements, screening of waste receptacles and loading areas and so forth. Some of these corrective actions will occur gradually over time as land uses change. The zoning ordinance should assure site plans are reviewed when uses change or expand so that upgrades to the site features can be applied.

- **“Transformation Corridors”** have current and projected traffic volumes that are below the street’s capacity. A reduction in lanes (e.g. four travel lanes to three) to reduce speeds and improve safety with the addition of a center turn lane and/or to provide non-motorized transportation options may be considered. Re-purposed roadway space could be used for bike lanes, on-street parking, wider sidewalks, and/or low-impact storm water design features.

### Neighborhood Traffic Calming

Related to corridor character and context sensitive streets, traffic calming, particularly within residential neighborhoods is also an important factor for consideration. Residents expect low volumes of traffic and low speeds within neighborhoods. The width of streets, the existence or absence of street trees, on-street parking, sidewalks and other factors influence how fast people drive through neighborhoods. Traffic calming is a way to visually and physically impede speeding in residential areas.

Traffic calming measures may be appropriate where there is a demonstrated need, such as when traffic speeds are five or more miles per hour over the design speed or posted speed limits. In those cases, changes to the local street may include new pavement markings, narrowing lanes or using curb bump-outs at pedestrian crossings, medians, pedestrian refuge islands, traffic circles, or speed tables/humps.

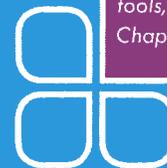
Residential developers should be encouraged to incorporate traffic calming measures during the planning and design phases of new residential areas. Where appropriate, these concepts greatly reduce future problems and will help maintain the value of the neighborhood. With regard to existing neighborhoods, “retrofitting” traffic calming measures may also be appropriate.



#### Context Sensitive Streets Implementation Strategies

- *Ensure all transportation projects, including expressways and city streets, are designed in consideration of the defined corridor or area character and the needs and safety for all types of expected travelers.*

For a complete listing of implementation strategies, tools, and timeframes, see Chapter 7: Implementation



# Corridor Character Map

Date: 3/25/2014

## Corridors

**Residential Conservation Corridor**  
Residential in character and appropriate for moderate improvements consistent with predominant residential neighborhood features.

**Preservation Corridor**  
Corridors in need of minor improvements to preserve existing capacity, such as access management, intersection improvements or installation of medians.

**Limited Access Boulevards**  
Limited Access Boulevards are roadways through traffic capabilities and/or limited access within residential, commercial or industrial areas or a combination thereof. Limited Access Boulevards are also designated as Preservation Corridors.

**Correction Corridor**  
Correction Corridors are streets bounded primarily by non-residential uses. These street segments and/or intersections are complex, and may exhibit traffic congestion, intensive activity or lack a complete multi-modal transportation network. These areas may be in need of multiple actions to correct problems that resulted from cumulative change over time.

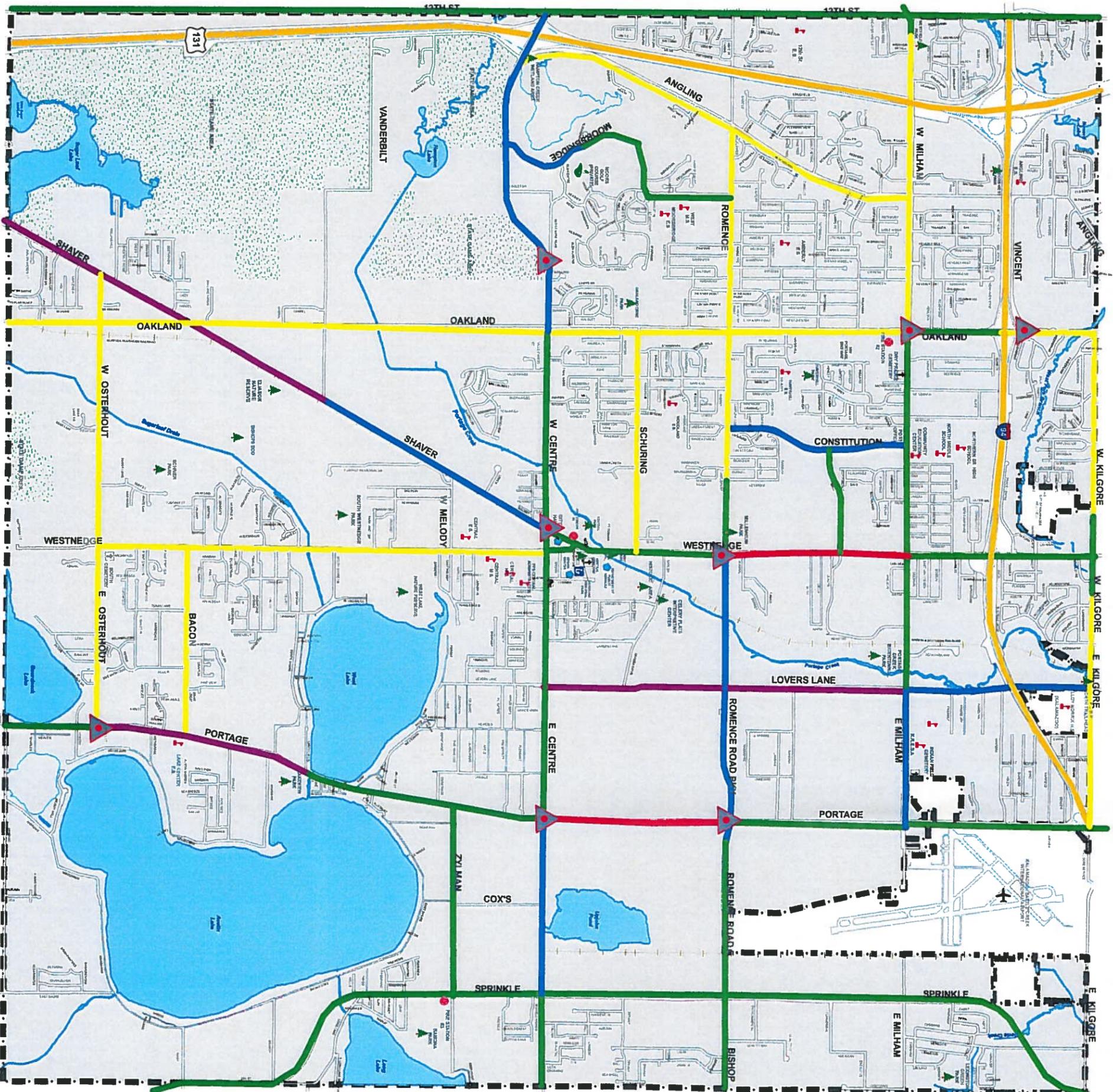
**Correction Intersections:**  
Includes top 5 crash rate intersections, intersections with alignment challenges and/or planned for potential roundabouts.

**Transformation Corridor**  
Corridors with current and projected traffic volumes below street capacity. Transformation corridors may have a reduction in lanes to reduce speeds, and an addition of a center turn lane, and/or improved non-motorized transportation options.

**Expressway Corridor**  
Interstate corridors to be treated as a "Front Door" for the community to create more aesthetic views by utilizing high quality road design and materials.

City Boundary

1 inch = 3,200 feet



## D. Corridor Management

### Driveway/Access Management

Widening and intersection improvements are not the only way to improve traffic operations along a street. One technique to help preserve capacity and promote safety while delaying or avoiding the need for widening is access management. Access management involves comprehensive controls to minimize conflict points, reduce the potential for crashes and help preserve the street's ability to carry traffic.

Portage has adopted an access management ordinance that applies to new development projects, but is also used concurrent with road improvements and to correct existing access that does not meet the current requirements. A general review of access management concepts is provided below, which serves as a foundation for the ordinance.

#### Number of Access Points

The number of driveways allowed along major streets affects traffic flow, ease of driving and crash potential. Reasonable access will be provided for each site and the number of access points should be limited to one where possible. Certain developments may generate enough traffic or have sufficient frontage to consider allowing more than one driveway where traffic volumes warrant such access. Where possible, these second access points should be located on a side street or shared with adjacent uses.

#### Alternative Access

Alternative access should be encouraged along arterials, such as shared driveways, rear service drives or frontage roads. Commercial developments and parking lots should be connected through front or rear service drives.

In areas within one-quarter mile of existing or future signal locations, access to individual properties should be provided via these alternative access methods rather than by direct connection to a major arterial.

In areas where frontage roads or service drives are proposed or recommended but adjacent properties have not yet developed, the site should be designed to accommodate a future drive, with access easements provided.



#### Goal T3:

*Provide effective corridor management optimizing the existing system through management of access, coordinated traffic signals, and intelligent traffic systems*

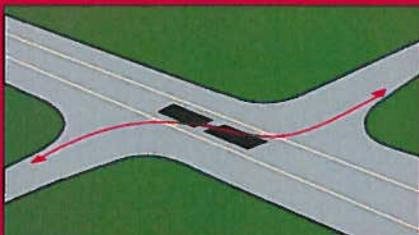
### Basic Principles of Access Management

Six basic principles are used to achieve the benefits of access management:

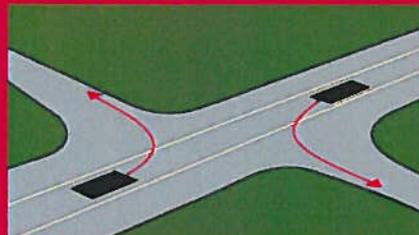
- Limit the number of conflict points,
- Separate conflict points,
- Separate turning volumes from through movements,
- Locate traffic signals to facilitate traffic movement,
- Maintain a hierarchy of roadways by function, and
- Limit direct access on higher speed roads.

Source: MDOT

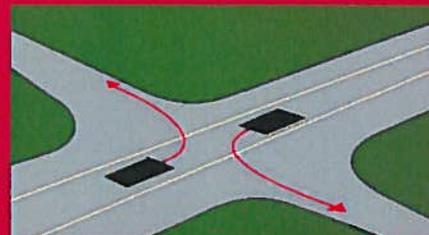
### Access Offsets



worst



better



best

## Benefits of Access Management

- Reduce crashes and crash potential,
- Preserve roadway capacity and the useful life of roads,
- Decrease travel time and congestion,
- Improve access to properties
- Coordinate land use and transportation decisions,
- Improve air quality, and
- Maintain travel efficiency and related economic prosperity.

Source: MDOT

### *Driveway Spacing from Expressway Ramps, Public Street Intersections and Other Driveways*

The latest edition of Policy on Geometric Design of Highways and Streets published by American Association of State Highway and Transportation Officials, Transportation and Traffic Engineering Handbook published by the Institute of Transportation Engineers and/or the Access Management Guidebook published by the Planning and Zoning Center and Michigan Department of Transportation should be consulted for the applicable standards and guidelines.

## Medians

Medians can also be used to restrict left turns into and from driveways or side streets. That, combined with the separation of opposing traffic flow, results in a significant reduction in crashes when comparing a median to a non-median roadway. There are several variables that need to be considered in median design, especially along corridor with heavy truck volumes, many individual driveways, and limited right-of-way. Circulation and special needs (i.e. lack of alternate routes) for emergency vehicles is also a consideration in determining if a median is appropriate and what specific design elements should be incorporated.

## Transportation Management Techniques

Transportation management techniques provide another method to improve roadway function. There are many tools available which are focused on reducing the number and length of trips, or managing the flow of traffic through the community. Certain land use arrangements in close proximity to each other can shorten the length of vehicle trips, while alternative transportation choices such as transit, walking or biking can reduce vehicle trips. Another tool to reduce vehicle trips, especially during peak travel hours when congestion is most prevalent, is called demand management. This method may involve working with major employers to revise shifts or offer flexible hours to reduce peak demands. Other ideas could be to encourage use of transit for employees by working with the transit agency on scheduling and to ensure site plans are designed in a "transit friendly" way.

With regard to managing the flow of traffic through the community, current streets can operate more optimally with new technology, such as interconnected signalized intersections, and signals that respond to actual traffic conditions and/or informing motorists of alternate routes when there is congestion or a crash. All of these ideas collectively can help address the city's transportation needs in the future.

## Transportation Impact Analysis

Another tool to help ensure that traffic impacts are properly evaluated is to require a traffic impact study concurrent with development project review. A well prepared traffic impact study will also address site access issues, such as the potential to share access or use service drives. The study should analyze options to mitigate traffic impacts, such as changes to access or improvements to the roadway. Such a study should also evaluate how a site or the management of an operation can improve the system for pedestrians and bicyclists. In some cases, the developer may assist in funding improvements to help offset the impacts of the project.

## Roundabouts

One option for challenging signalized intersections or four-way stops is a modern roundabout. Roundabouts have been shown to reduce delay and the number and severity of crashes by replacing traffic signals and turn lanes with a constant-flow circular intersection. Roundabouts may also be a suitable option where intersections are too close for both to be signalized. Incoming traffic yields to pedestrians and bicyclists crossing the street and to vehicles already in the roundabout before proceeding around to the desired street. Because of the many benefits, dozens of modern roundabouts have been constructed in Michigan in just the last few years and hundreds nationally.

Portage's first roundabout was recently installed at 12<sup>th</sup> Street and West Milham Avenue. As part of the Lake Center subarea plan, another possible location for a roundabout may be the East Osterhout Avenue and Portage Road intersection. Any potential future roundabouts will be dependent upon further study of intersections identified as needing improvements in the CIP.

## Corridor Management Implementation Strategies



- For new development, ensure roadway capacity can accommodate site-generated traffic at the time of occupancy. This may require participation by the developer to fund improvements to address impacts of a proposed project.
- Pursue access management techniques (restricting the number of access points, regulating placement, promoting driveway consolidation, using raised medians, etc.) along major thoroughfares to improve traffic flow and safety. Where appropriate, encourage joint access and parking opportunities.
- Consider landscaped medians on three- or five-lane roads where possible to improve traffic safety by controlling left-turn lanes or using refuge for pedestrians crossing the street.
- Consider roundabouts as an intersection design alternative or an alternative to traffic signals to improve traffic flow and reduce the severity of crashes.

## E. Street Capacity and Operation Improvements

Street capacity refers to the capability of a roadway to accommodate the expected traffic flow with an acceptable amount of delay, i.e. minimal congestion. Traffic engineers measure this capacity through a comparison of the volumes, usually during the peak hour, to the designed capacity. This determines the amount of average delay per vehicle. This statistical analysis is then translated into a "level-of-service" from A-F or a "volume-to-capacity ratio" (V/C).

A V/C ratio of 0.90 to 0.99 indicates the facility is approaching capacity and improvements should be examined in the immediate future. A V/C ratio of 1.00 to 1.20 means that the facility is operating at capacity, has little capability of handling future traffic growth, is highly congested during the peak hours, and should be considered for capacity improvement. A V/C ratio over 1.20 indicates that the facility will likely break down during peak hours and capacity improvements should be in the planning or later stages.

## Roundabout Pros:

- More capacity and fewer crashes than signalized intersections

## Roundabout Cons:

- Needs more room, not considered bike- or pedestrian-friendly for a high volume location where two lanes are needed, public not accustomed to them

*insert photo of 12 and Milham roundabout*

## Goal T4:



*Prioritize new transportation projects to ensure preparedness for future needs and innovative means to meet them*

## Street Capacity

Capacity is primarily measured at intersections.

V/C Ratio	Design
below .50	may be eligible for lane reduction
.50-.90	volumes match capacity
.90-.99	approaching capacity, improvements should be examined
1.00-1.20	operating at capacity, highly congested during peak hours
over 1.20	will likely break down during peak hours, needs capacity improvements

Streets with current or projected poor traffic operations are designated for improvements. Actual traffic conditions, including crashes, will also need to be frequently monitored to adjust the list of recommended projects in the Capital Improvement Program. Data for V/C ratios and crashes is included in the Community Snapshot Report.

Based on the statistical analysis, street improvement projects fall into three major categories: Capacity Expansion Projects, Capacity Preservation Projects, and Transformation Enhancements. As indicated in the Introduction and discussion of Corridor Character above, there remain few capacity expansion projects within the Capital Improvement Plan, but there are roadway segment and intersections that require corrective action to improve roadway function. Capacity Preservation Projects include reconstruction without addition of lanes, but include access management, median island installation, signal improvements and/or enhancement actions such as bikeways, walkways and landscaping. Pavement management, bridge maintenance and many types of safety improvements are included in the Preservation category. The final category, Transformation Enhancements, is where the street may be modified to reduce the number of lanes to improve safety and/or to provide non-motorized transportation options. For example, a four lane road may be converted to a three lane roadway with a center turn lane, which improves left turn vehicle movement, provides the same level of capacity and adds non-motorized transportation such as a bikeway and/or sidewalk.

Projects that need federal or state funding must be included in the KATS Long Range Plan. Eligible projects must meet certain physical or traffic criteria, and also demonstrate there is funding available for the local match. Major planned transportation improvements are included in the Capital Improvement Plan and new or revised projects are evaluated on an annual basis.

## Operations Improvements Implementation Strategies

- Coordinate transportation planning, project priorities, and funding for streets and non-motorized systems that extend into other municipalities with area communities and road agencies through the Kalamazoo Area Transportation Study (KATS) organization.
- Require traffic impact studies for intensive use projects to determine direct impacts, improvements needed and data for future planning.
- Continue to monitor traffic counts, pedestrian and bicycle use, and crash data in conjunction with proposed transportation improvement projects.
- Annually prepare the Transportation/Major Thoroughfare Plan Status Report using the recommendations of this plan as a foundation.
- Continue to pursue alternatives for improved traffic flow and safety such as new signal technology, "real time" traffic monitoring and reporting. Embrace emerging communication media to provide instantaneous traffic information.



