US-2 HIGHWAY CORRIDOR
ACCESS MANAGEMENT PLAN

PREPARED FOR:

GOGEBIC COUNTY ACCESS MANAGEMENT TEAM

WESTERN U.P. PLANNING & DEVELOPMENT REGION

MAY 2006

ACKNOWLEDGEMENTS

The Gogebic County Access Management Team served as the steering committee for the U.S 2 Corridor Access Management Study. The following persons provided review, local insight and coordination with the development of this plan.

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US - 2 Corridor

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INTRODUCTION

The U.S. 2 Corridor plays an important role in Gogebic County and the State of Michigan. The highway and communities along it provide the major western gateway to Michigan. U.S 2 serves an important role in the transportation of goods across the northern tier of states in the Midwest United States.

The U.S 2 Corridor also provides an important link in transportation across Canada, as many travelers and trucks enter the United States as a shortcut around the north shore of Lake Superior.

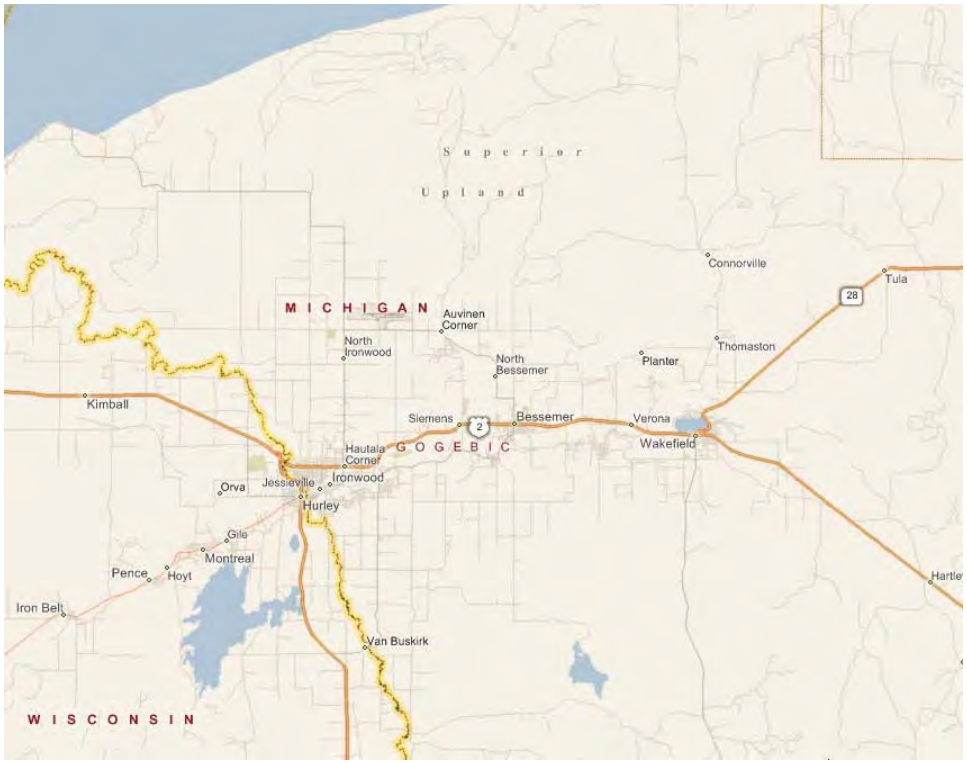
U.S 2 is a major transportation route in Gogebic County, providing the primary access and transportation route between the communities of the City of Ironwood, Ironwood Township, City of Bessemer, Bessemer Township and the City Wakefield, as well as the communities of eastern Gogebic County and Hurley, Wisconsin to the west.

Originally, U.S 2 followed a circuitous route through the cities and downtowns of Ironwood, Bessemer and Wakefield. Later, as automobile traffic increased, a new corridor route was planned and constructed, taking through-traffic away from the downtown areas. The corridor was later constructed to a five lane configuration in the rural area with four lane segments in Bessemer and Ironwood.

- A number of historical factors have influenced the development adjoining the U.S 2 Highway Corridor in Gogebic County:

- The segment was an important route for cross-Canada traffic before improvements were made to Canada Highway 17, along the north shore of Lake Superior.

Figure 1. US-2 from Ironwood to Wakefield



- A number of motels, restaurants and tourist-related businesses were developed in response to this traffic along the U.S. 2-Ironwood corridor.

- The U.S 2 Corridor provided access to and serviced the rapid growth in the 1960's of the "Big Snow Country" ski resorts. Lodging and service businesses already in existence along the corridor flourished with this new winter tourism development.

- In the cities of Ironwood and Bessemer, the new highway was routed through an existing residential area. Many of these homes had existing driveways, which has contributed to today's access management issues.

- Following the national trend toward highway-oriented strip development, the U.S. 2 Corridor provided good access and relatively cheap land for expansion of retail and other service business, particularly in the cities of Ironwood and Bessemer.

As the development of adjoining lands progressed, the primary functions of moving traffic safely at design speeds and linking the communities of the U.S 2 Highway Corridor has changed considerably. Separate driveways and access points to businesses and homes have created numerous turning movement opportunities that the highway was not designed to accommodate.

Figure 2. US-2 – City of Bessemer – Business District

Land use, if not properly coordinated and managed, can dramatically alter and diminish the primary functions of the highway. If the roadway segment becomes so congested that the primary functions become diminished, the highway corridor may be moved again with a "bypass" resulting in negative business impacts, property value, and tax consequences for the communities bypassed. In addition, the public cost of acquiring land and constructing a new bypass are enormous.

The purpose of the U.S 2-Ironwood Highway Corridor Access Management Plan is to identify solutions to existing traffic and access conflicts and issues. The plan will establish a process for managing future access.

This approach will improve safety, capacity, as well as allow for future economic development of adjacent properties while preserving the primary functions of the U.S 2 Corridor.

Figure 3. US-2 – City of Bessemer –Residential Area

THE VALUE OF ACCESS MANAGEMENT

When access to highway corridors is planned and managed, a number of benefits accrue to local communities, transportation agencies, and the public interest. The primary benefits are discussed below:

Access Management improves traffic safety.
Limiting the number and locations of driveways and access points minimizes the number of conflict points. MDOT traffic and safety statistics prove the relationship between access movements and crashes.

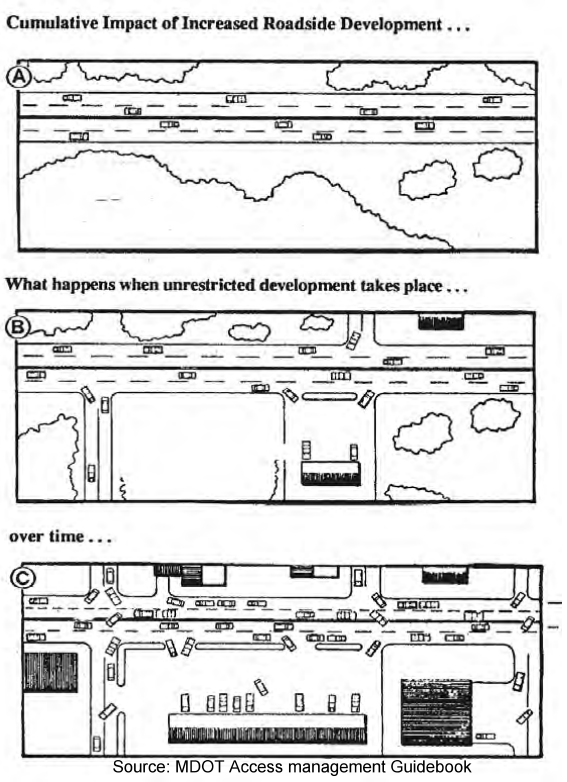
Access Management decreases travel time and reduces motorist costs.
Fewer delays resulting from good traffic flows reduces travel time.

Access Management maintains traffic capacity and roadway functions.
Appropriate access management preserves the road's capacity to move vehicles at the design speed and extends the life-cycle of the road.

Access management improves access and the value of private land development.
Managed site access results in better designed site plans that provide safe access to each property. These sites are more attractive to customers, as they are frequently easier and safer to access.

Access Management improves the attractiveness of a community.
A safe and pleasant driving experience through a community's highway corridor with clear and safe turning movements, more landscaping, and fewer stops adds to the perceived quality of life and attractiveness for economic development.

Figure 4. Value of Access Management over time



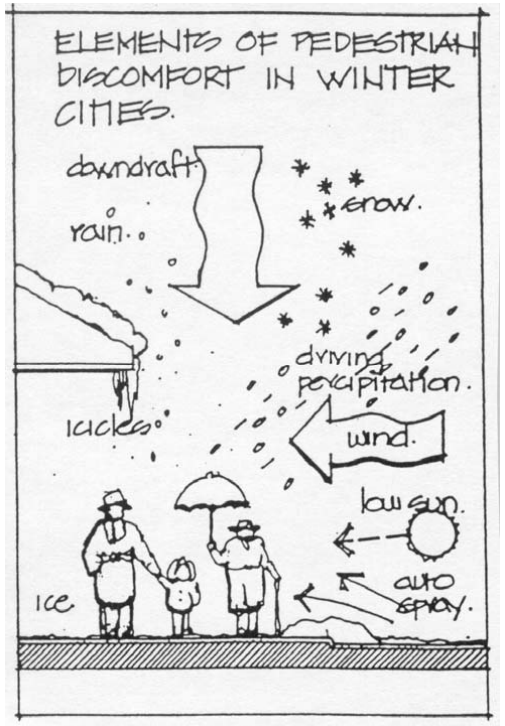
Source: MDOT Access management Guidebook

PROJECT GOALS

The following goals have been developed to guide the U.S. 2 Corridor Access Management Program.

- Improve the traffic safety of the U.S 2 Corridor.
- Maintain, enhance and/or improve the traffic carrying capacity of U.S. 2.
- Coordinate state and local infrastructure investments in the highway, intersecting roadways, communities and adjacent properties.
- Improve local government planning response to U.S. 2 corridor issues.
- Consider winter and snow management in access, site plan design and proposed highway improvements.
- Create and maintain a coordinated site plan review to ensure that access management principles are implemented along the U.S. 2 corridor.
- To develop a coordinated site plan review process among local governments and state and local road agencies.
- To promote appropriate economic development of the U.S. 2 Corridor while meeting the goals of the corridor plan.
- Provide for safe and adequate non-motorized access along the corridor.

Figure 5. Elements of pedestrian discomfort in Winter Cities

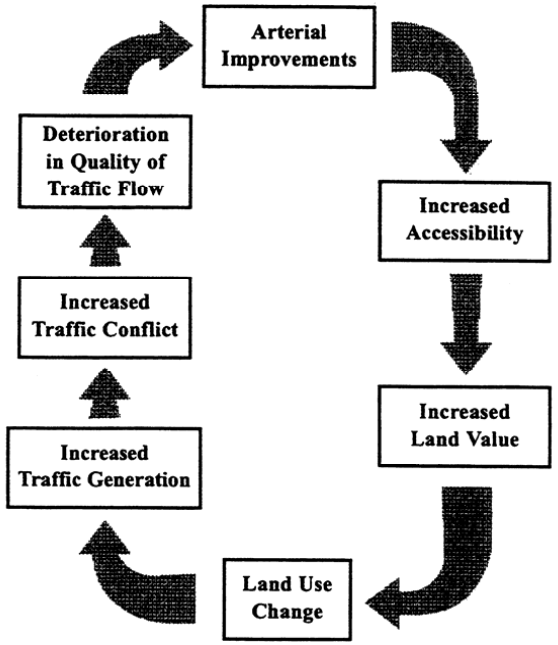


THE LAND USE AND TRANSPORTATION RELATIONSHIP

The relationship between the capacity and use of a transportation facility and the value and intensity of development is direct. As land develops and the road facility becomes congested, the safety of the facility begins to decline. To improve safety and traffic flow, the roadway is improved, perhaps with additional lanes, traffic signals, right/left turn lanes.

While these improvements will improve capacity and safety, the effect is to attract more traffic which attracts additional development. Over time, the cycle is repeated, the roadway becomes congested and is in need of improvements. Eventually, a maximum capacity is achieved and options for relocation of the highway and bypassing all the development are explored

Figure 6. The Transportation Land Use Cycle



The Transportation Land Use Cycle

Source: National Highway Institute, Course 15255, FHWA, 1998, p. 1-18.

LOCAL MASTER PLANS AND ZONING

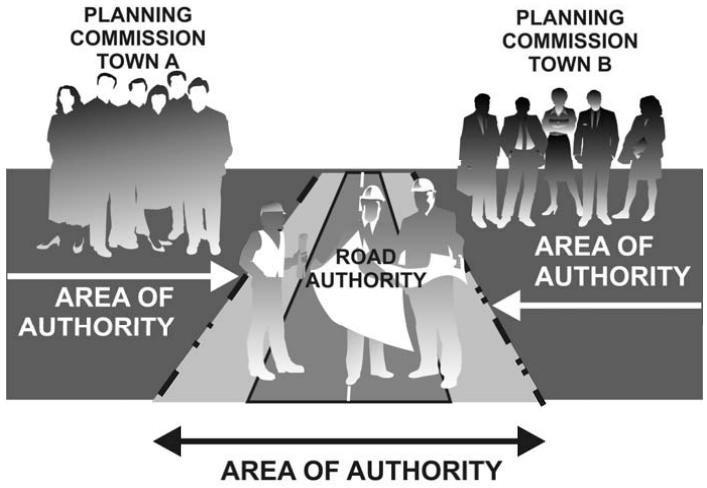
Local planning commissions, master or comprehensive plans and zoning ordinances provide the means upon which a community may exercise some management and control over access to properties adjacent to U.S 2. A major effort of this planning process will be to work with each local government to assist with the preparation of appropriate zoning, access management and site plan requirements. These tools are key to implement the ideas and planning strategies for the highway corridor.

Of the four local government units included within the study area, all have zoning ordinances. Only one has site plan review as part of the existing ordinance. Only the City of Ironwood has a Master Plan.

The table below summarizes existing planning and zoning frameworks in place for implementation of the Access Management Plan.

Local Unit	Master Plan	Zoning Ordinance	Site Plan Review
Ironwood City	Yes (1981)	Yes	Yes
Ironwood Township	No	Yes	No
Bessemer City	No	Yes	No
Bessemer Township	No	Yes	No

Figure 7. Teams of Local Management



Source: MDOT Access Management Guidebook

THE U.S. 2 CORRIDOR ACCESS MANAGEMENT PLANNING PROCESS

The development of the U.S 2 Corridor Access Management Plan involved a committee of local officials representing the local government jurisdictions of Ironwood City, Ironwood Township, Bessemer City and Bessemer Township. The Michigan Department of Transportation participated in committee meetings and provided funding for the project through the Western Upper Peninsula Planning and Development Region. Other representatives of the various city and township boards and planning commissions also attended meetings of the committee, which were open to the public.

A public and local official Access Management Training program was conducted on April 19, 2006. The purpose of this meeting was to receive public comment on the access management issues and the draft plan document, as well as provide educational information on the benefits of highway access management and how this will fit into the community's existing planning and zoning process.

Following the educational program, the consultant worked with each local government jurisdiction on developing the local ordinance modifications to enable the management of access along the U.S 2 Highway Corridor.

Figure 8. Tools for Public Involvement

U.S. 2 Highway Corridor
and
Access Management Plan

Wednesday, April 19, 2006, 6:30 p.m.

Bessemer City Hall Auditorium

The purpose of the meeting is to receive public comment on U.S. 2 safety and access management issues, as well as provide educational information on the benefits of highway access management and how this fits into a community's existing planning and zoning process.

U.S. 2 CORRIDOR DESCRIPTION

The study area for this plan is from the Wisconsin State line easterly to the west city limits of Wakefield. The next section will provide an overview of the physical characteristics of the US-2 corridor, as well as the traffic and safety issues in the study area. This roadway segment is designated by MDOT as Control Section 27021.

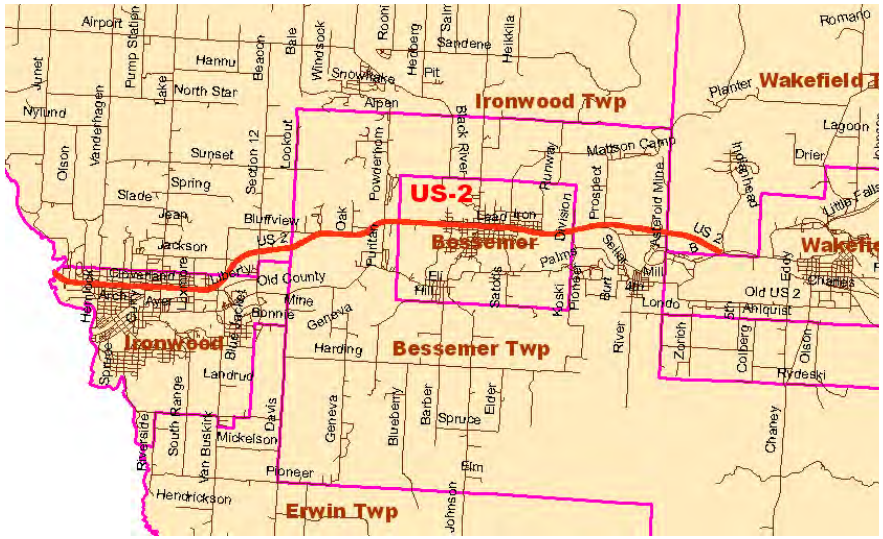
US-2 is classified as a state trunkline. It is also designated as a route on the National Highway System, previously the Primary Commercial Network. It is important to the Upper Peninsula as a through route from Wisconsin (Ironwood area) to the Mackinac Bridge.

Roadway Physical Characteristics

Roadway Geometry

Beginning at the state line (mile point 0.0), the westerly boundary of the study area, US-2 is a divided highway with two lanes in each direction. These lanes are constructed of concrete with full-width paved shoulders. The speed limit in this area is 55 mph. This section is a very short 0.33 miles in length before turning into a four-lane curb and gutter section at Superior Street, where the speed limit is 45 mph. The 35 mph speed limit begins at Walnut Street (mile point 0.64) and carries through to Lake Street (m.p. 1.77) where it increases to 40 mph. The speed increases to 50 mph at Wilson Street (m.p. 2.52), where the roadway becomes a five-lane cross-section to Crestview Road (m.p. 2.89), which is the east city limit of Ironwood and the Ironwood Township Line. The speed limit is decreased through Bessemer to 30 mph to Clayberg Street (m.p. 7.42), where it increases to 40 mph.

Figure 9. Location of Study Area



The four-lane section continues through Bessemer to Old US-2 (m.p. 7.65) where it widens to five-lane again. The speed increases to 55 mph at Tamarack Street (m.p. 7.79).
The five-lane, 55 mph roadway continues to the end of the study area, which is to the west limits of Wakefield Township.

Traffic Volumes

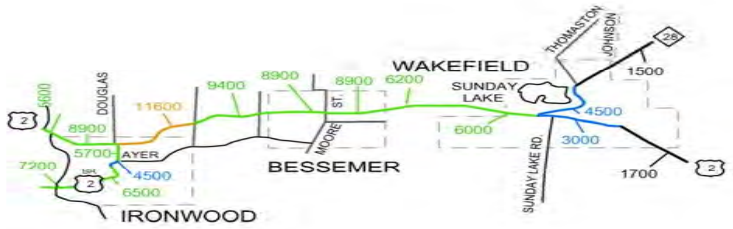
The Average Daily Traffic volumes from 1994 to 2004 are provided by the Michigan Department of Transportation for analysis of the corridor. US-2 in the city of Ironwood has the highest traffic volume in Gogebic County, with more than 11,600 daily vehicles recorded between the US-2 Business Route (Frederick Street) and Roosevelt Street.

As indicated in Figure 2, the highest traffic counts overall are found in the Ironwood business area. The percentage of commercial traffic in this area is approximately 4 percent, or 465 trucks per day. These counts are generally taken during the summer months and corrected for seasonality. It has been discussed that traffic in the city of Ironwood, unlike much of the Upper Peninsula, actually increases during the winter months. There is no substantial data to this effect at the time of this study.

As Figure 2 indicates, the traffic counts in the Ironwood-Wakefield corridor have been decreasing in most cases in the last 10 years. The two exceptions are in the Bessemer Township segment and the Wakefield Township segment, which are up slightly.

The traffic volumes have decreased in most areas in the last 10 years. This decrease could be due to the declining population of the county, reduced tourism rates in the area, or a combination of these and other factors.

Figure 10. US-2 Average Daily Traffic Year 2004



MDOT Average Daily Traffic Counts				
Location	1994	2004	Difference	Percent Change
State Line - Superior Street	7184	5578	-1606	-22.36%
Superior St. - US-2 BR	11980	9126	-2854	-23.82%
US-2 BR - Roosevelt St.	14702	11605	-3097	-21.07%
Roosevelt St. - Country Club Rd	11220	9427	-1793	-15.98%
Country Club - WCL Bessemer	8914	9366	452	5.07%
WCL Bessemer - Moore Rd	9371	8947	-424	-4.52%
Moore Rd - Anvil Hill Rd	9354	8915	-439	-4.69%
Anvil Hill Rd - Blackjack Rd	6966	6152	-813.5	-11.68%
Blackjack Rd - Lake Shore Dr	5940	5957	17	0.29%

Source: MDOT Crash Data

The increase in traffic in the vicinity of Country Club road is consistent with the increase in the number of homes constructed recently. This area is showing growth in the number of homes constructed and the number of businesses along the highway. This traffic is expected to increase further due to the proposed Walmart Supercenter that is currently being planned for the area west of County Club Road and South of US-2.

Accident Data

Crash data from 1994 to 2003 provided by the Michigan Department of Transportation shows a number of locations in which crash concentrations appear. The following table summarizes the number and types of accidents during this period within the study area.

Crash Analysis

Using the data provided by MDOT, the crash data is illustrated in Figures 5-8. In keeping with national statistics, intersection-related crashes represent a large number of crashes reported during the period from 1994 to 2004. Intersection crash data, in general indicates signalized intersections have a high number of right angle and head-on left turn crashes. The study area is no exception. These crashes are also responsible for a higher incidence of the crashes involving injuries. The driver behavior that results in these crashes often involves running the red light[1].

Additionally, a large number of side-swipe accidents and rear-end accidents are recorded in the study area. These types of accidents are inherent to the roadway cross-section due to traffic changing lanes and the frequency of left turns from the inside lane when no left turn lane is available. Many of these types of accidents are caused by excessive speed and inattentive drivers and are unlikely to be affected by Access Management.

Figure 11. US-2 Accident Data 1994 - 2003

Accident Type	Number
Misc	138
Overturn	24
Hit Parked Vehicle	13
Backing	77
Parking	32
Pedestrian	6
Fixed Object	85
Other Object	7
Animal	251
Bicycle	5
Head On	20
Angle Straight	242
Rear End Straight	275
Angle Turn	98
Side Swipe Same Lane	152
Rear End Left Turn	36
Rear End Right Turn	16
Other Drive	15
Angle Drive	53
Rear End Drive	34
Side Swipe Opposite	32
Head On Left Turn	100
Dual Left Turn	2
Dual Right Turn	2

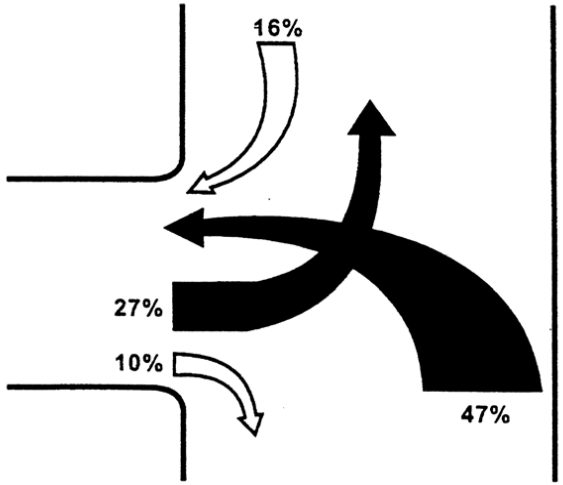
Source: MDOT Crash Data

Access Management can, however affect the numbers of angle crashes due to turning movements. If turning movements can be moved to intersections, the right turning movements which include slowing and turning from the main roadway, and the number of vehicles entering the main roadway, may be minimized eliminating many of these types of accidents.

Specifically, within the study area, the largest number of accidents overall, have occurred in the area between Hemlock Street and Roosevelt Street in Ironwood. A higher volume of crashes occurred at the Douglas Street/US-2 intersection, Lake Avenue Intersection/US-2 Intersection, and Luxmore Street/US-2 Intersection. Curry Road and US-2 has also experienced a series of rear end straight crashes.

The "angle" crashes are those often associated with pulling from drives into the path of an on-coming vehicle are characterized by tow vehicles perpendicular to one another. A total of 393 angle crashes have occurred during the nine-year period studied. These crashes appear at the major intersections of Hemlock Street, Douglas Street, Curry Street and Lake Avenue. A number of "angle straight" crashes are concentrated at the entrance to the shopping mall west of Roosevelt Street.

Figure 12. Driveway Crashes by Movement



Percentage of Driveway Crashes by Movement

Source: National Highway Institute Research Center

Figure 13. US-2 COLLISION DATA 1994 -2003 – CITY OF IRONWOOD

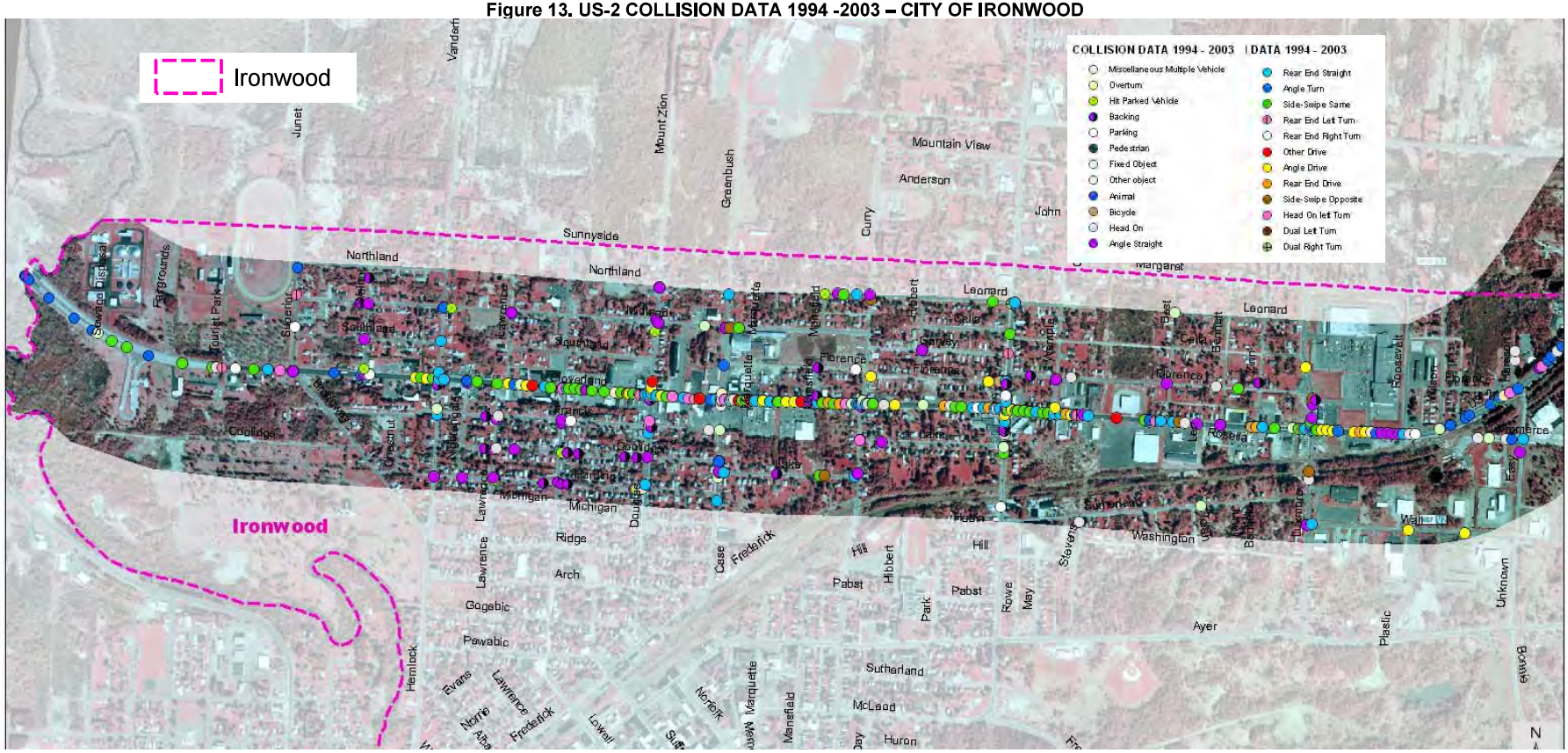


Figure 14. US-2 COLLISION DATA 1994 -2003 – FROM IRONWOOD THROUGH BESSEMER TWP.

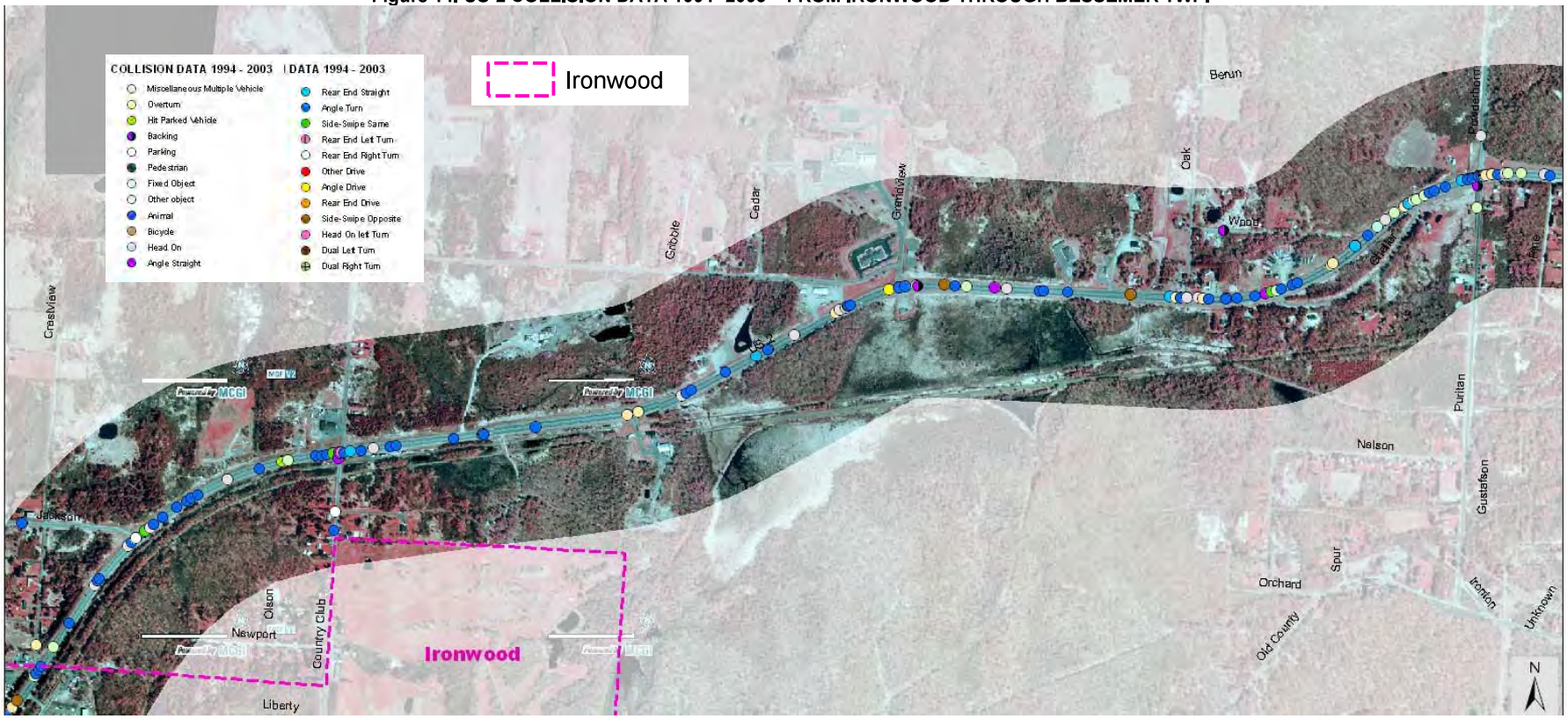


Figure 15. US-2 COLLISION DATA 1994 -2003 – CITY OF BESSEMER

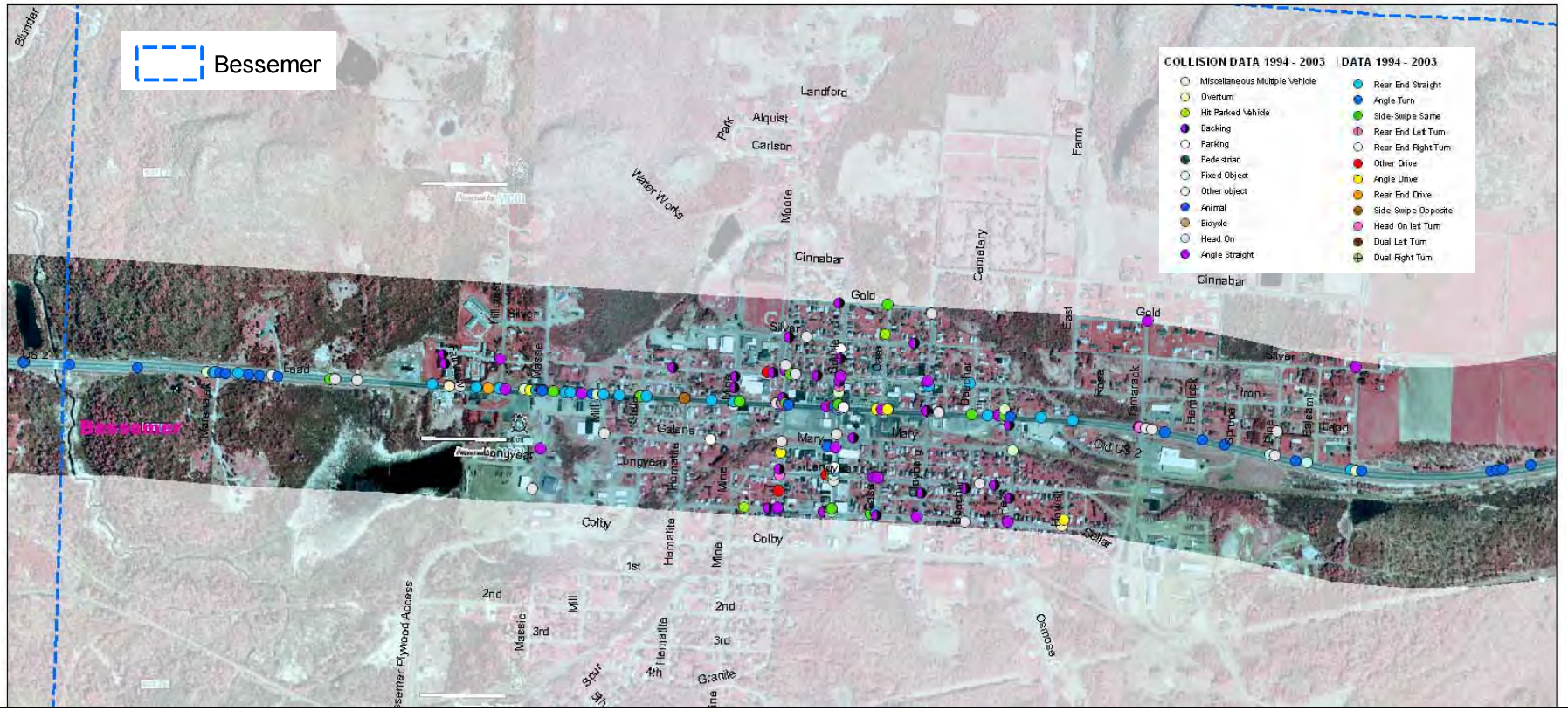


Figure 16. US-2 COLLISION DATA 1994 -2003 – FROM BESSEMER TO WAKEFIELD

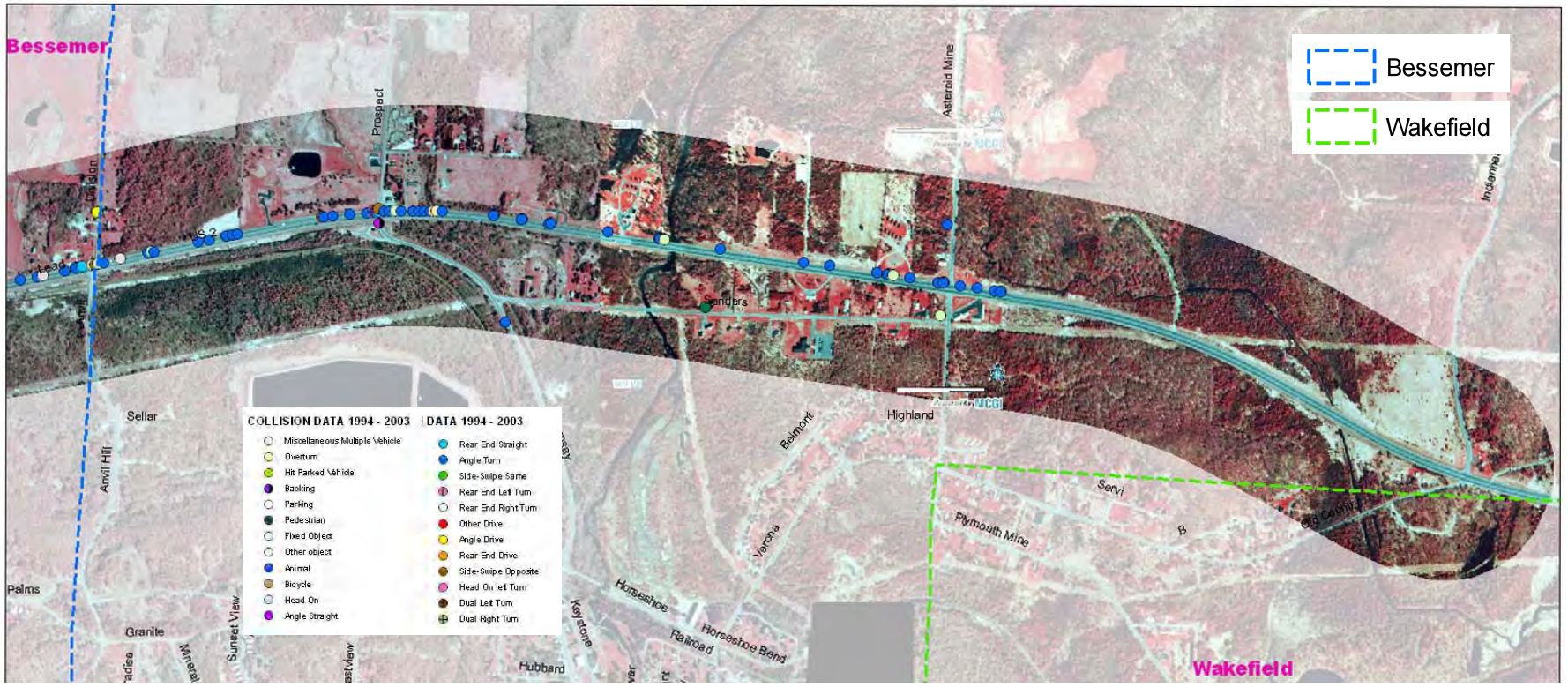


Figure 17. LAND USE - CITY OF IRONWOOD

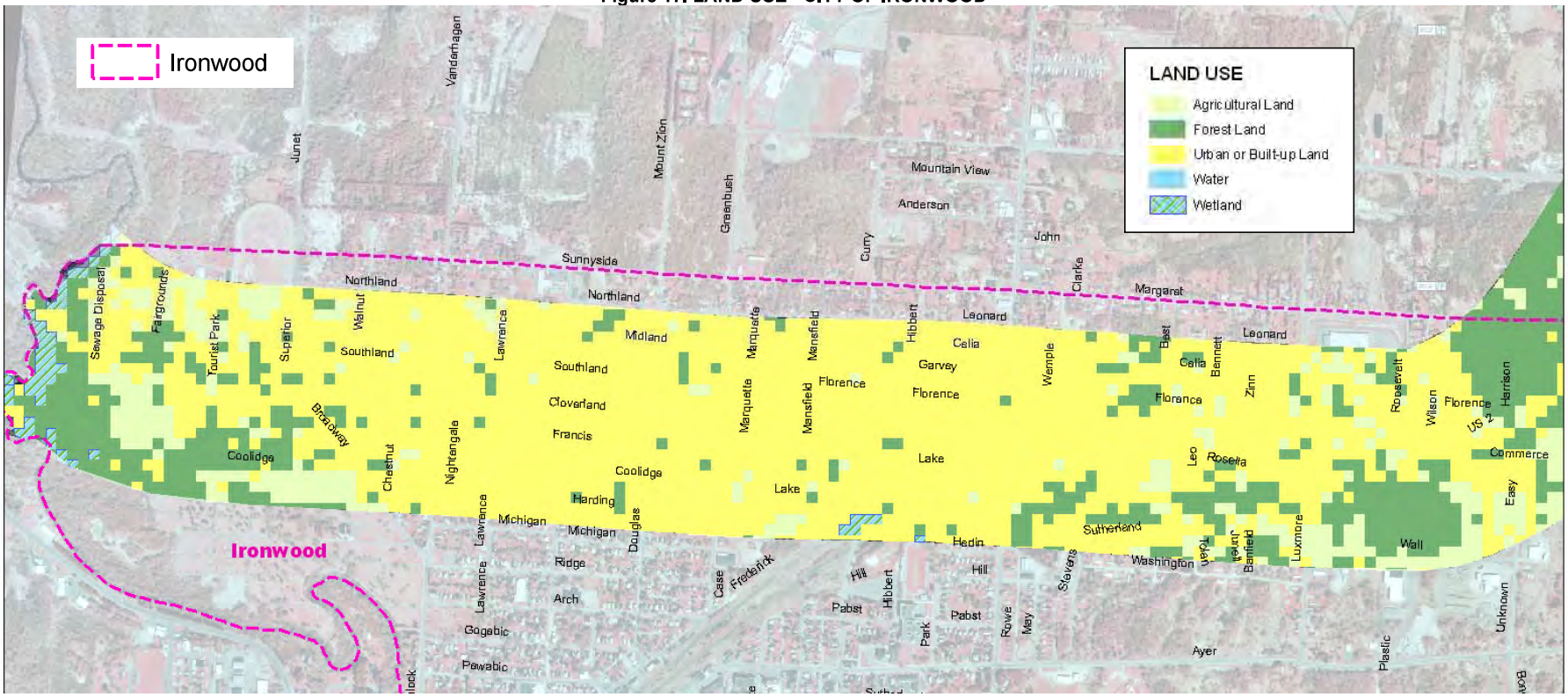


Figure 18. LAND USE - IRONWOOD TOWNSHIP

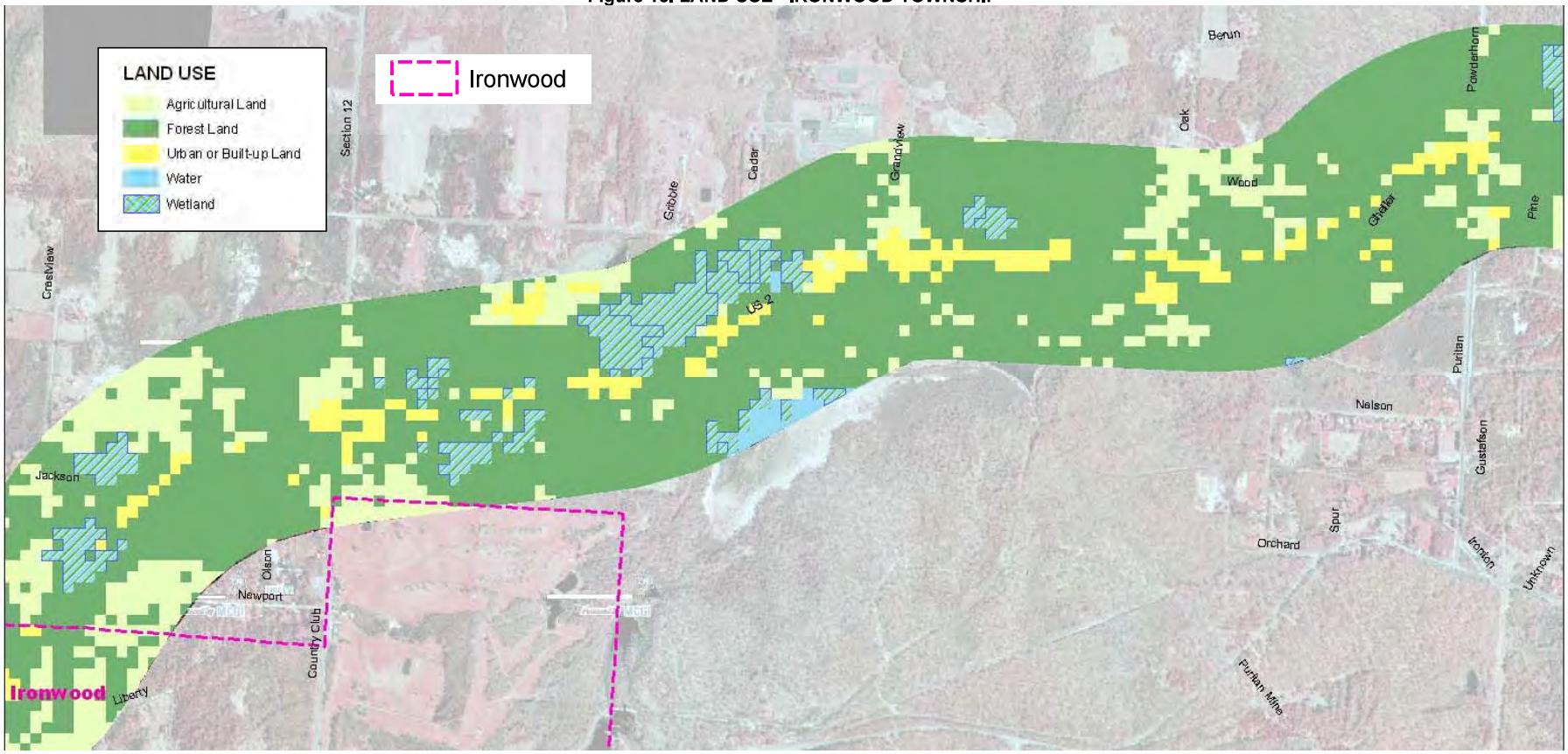


Figure 19. LAND USE - CITY OF BESSEMER

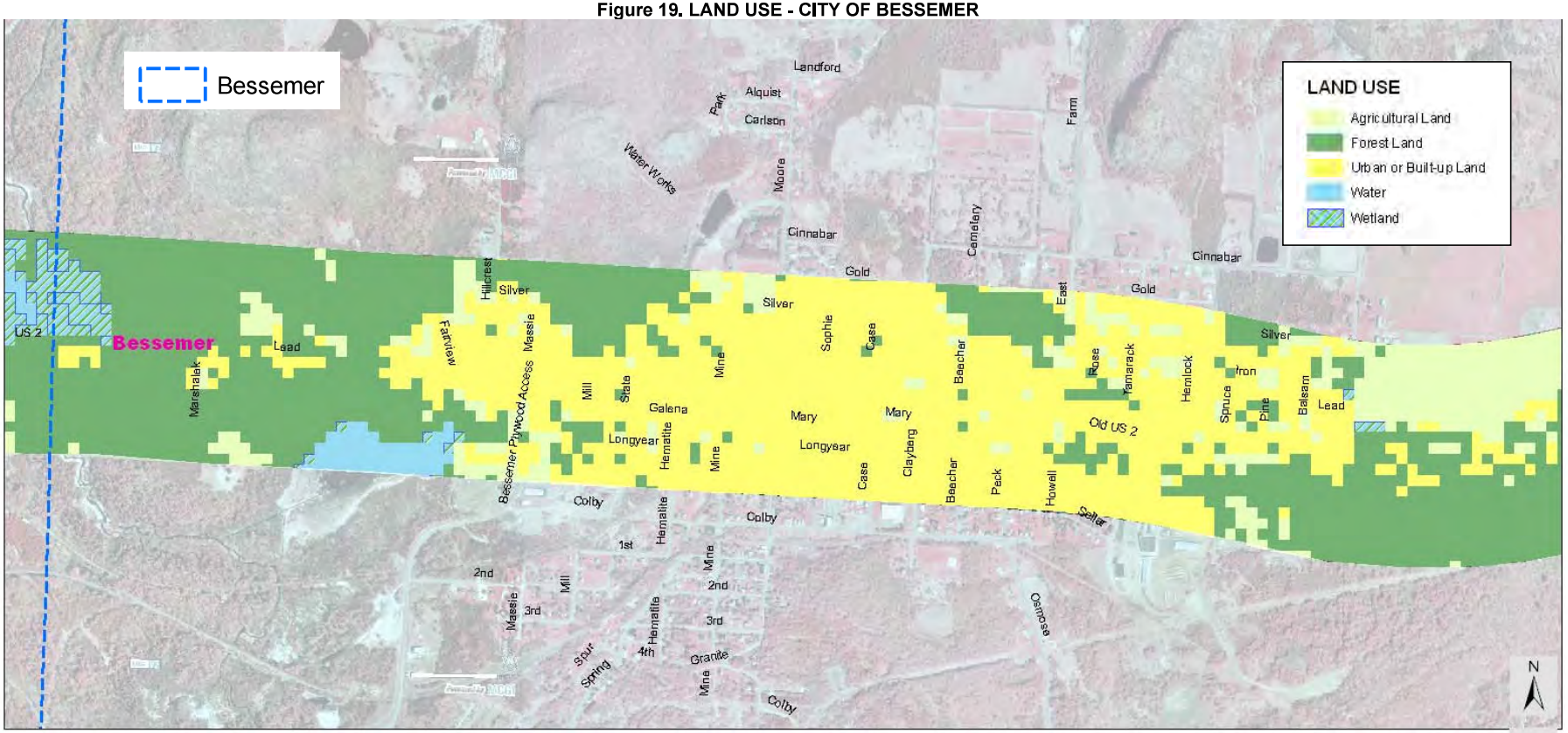


Figure 20. LAND USE – BESSEMER TOWNSHIP

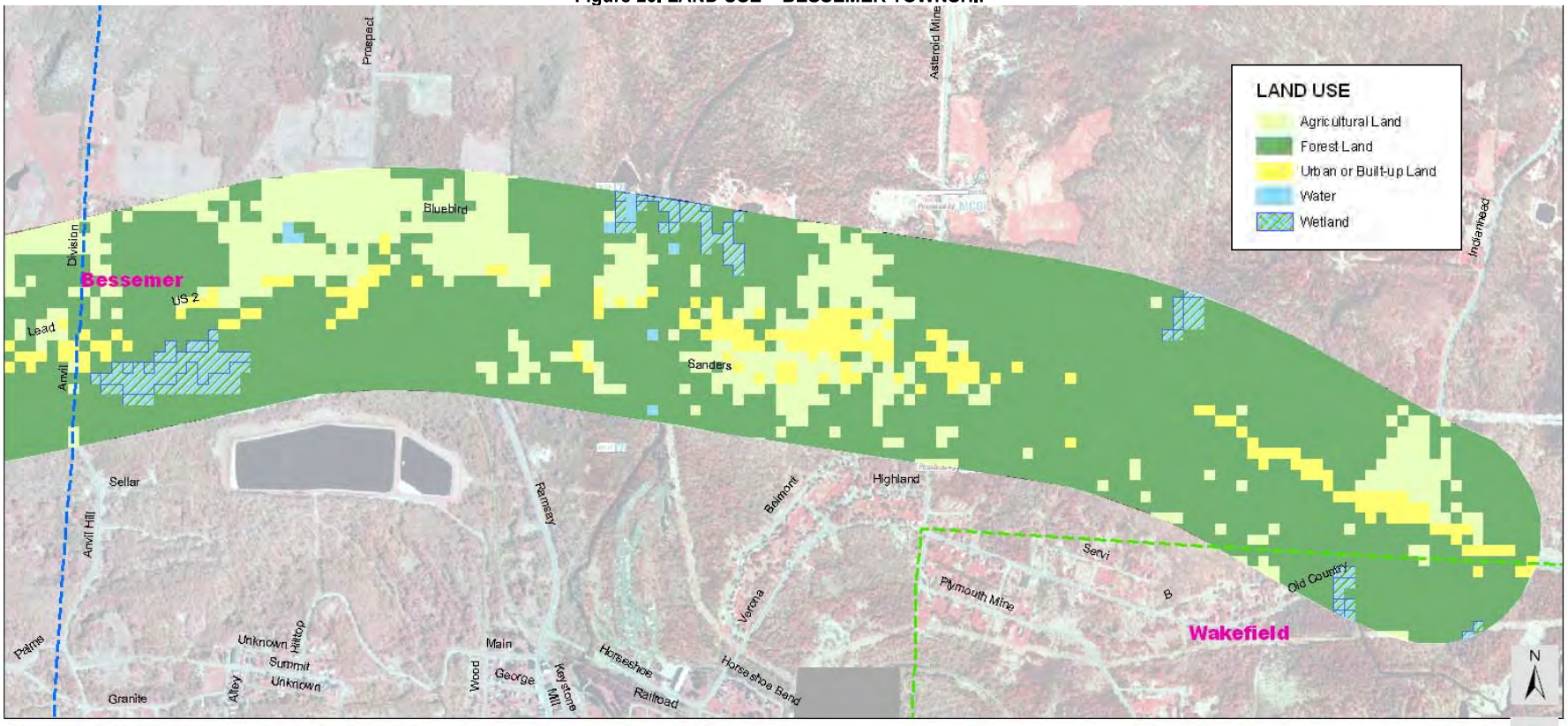


Figure 21. ACCESS POINTS – CITY OF IRONWOOD

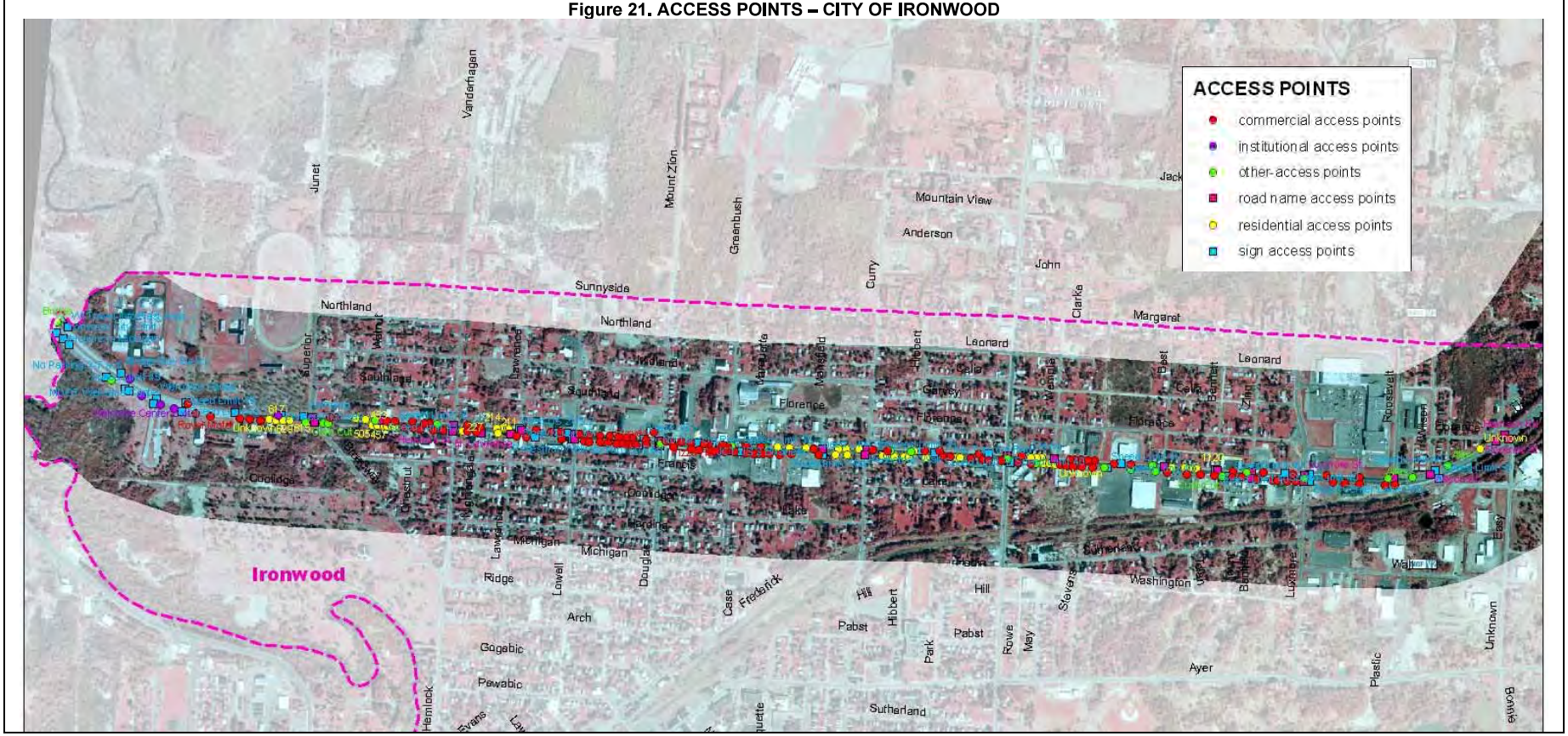


Figure 22. ACCESS POINTS – IRONWOOD TOWNSHIP

Figure 23. ACCESS POINTS – CITY OF BESSEMER

Figure 24. ACCESS POINTS – BESSEMER TOWNSHIP

ACCESS MANAGEMENT CONCEPTS

FOUR TO THREE LANE SECTION

As a part of this Access Management Study for the Ironwood to Wakefield corridor, U.P. Engineers & Architects, Inc. was asked to study the affects of replacing the current four lane cross-section with a three-lane section in the Cities of Bessemer and Ironwood. The following is information relating to case studies, along with discussion relating to this change. A recommendation can not be made at this time without additional traffic studies relating to the winter traffic conditions and specific turning movements at each of the key intersections within the heavier traffic locations along US-2.

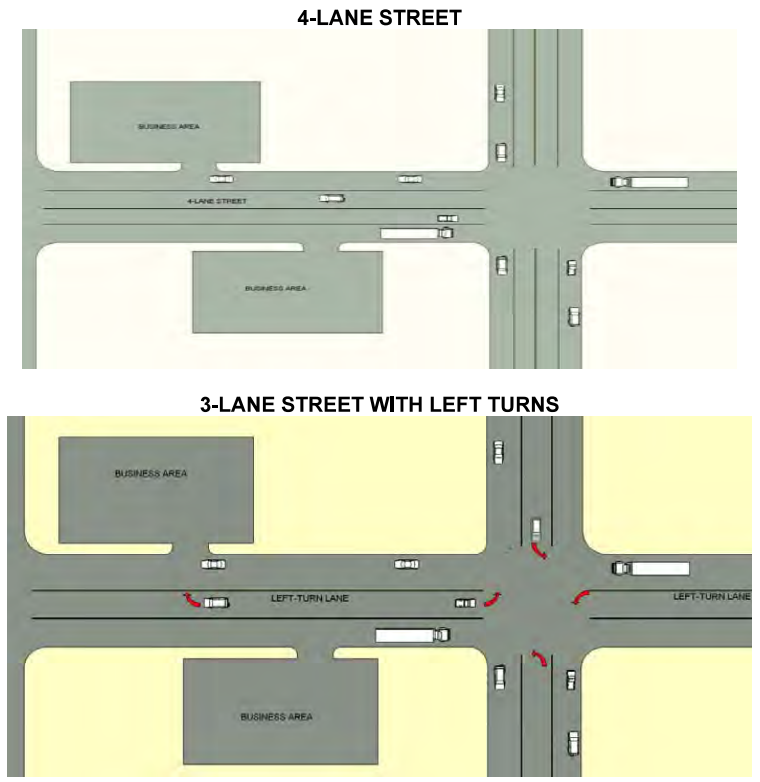
General Discussion Points

In recent years, many traffic engineers have advocated converting four-lane undivided urban streets to three-lane two-way left-turn facilities. A number of these conversions have been successfully implemented. Accident rates have decreased while corridor and intersection levels of service remained acceptable.

There are a number of potential benefits relating to the three-lane roadway section including:

- Improved Vehicle Safety
- Improved Pedestrian Safety
- Traffic Calming
- Improved Emergency Response Time
- Potential Bike Accommodation
- Relatively inexpensive

Figure 25. Alternate modification to a 3-Lane Traffic



Improved Vehicle Safety

This potential benefit is self explanatory. There is an elimination of drivers changing lanes to pass slower vehicles. Speeds are limited by the speed of the lead vehicle. This will reduce the number of side-swipes. Also reduced are the number of rear-end crashes, as vehicles are now using the left-turn lane. Studies have shown a reduction in the total number of crashes ranging from 17 to 62 percent[2]. The severity of the crashes has also decreased.

Improved Pedestrian Safety

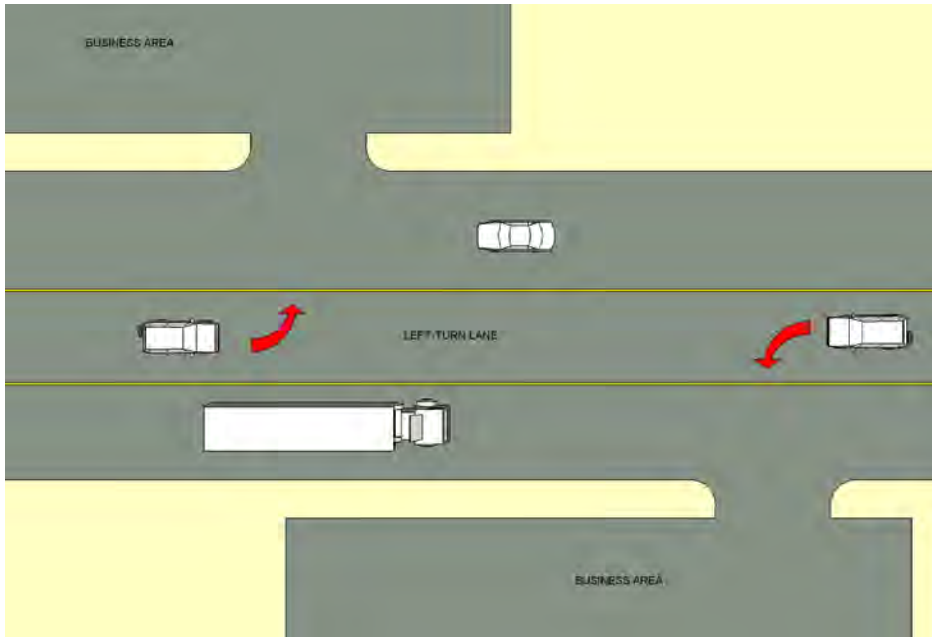
Pedestrian may benefit because they have fewer lanes of traffic to cross and because motor vehicles are likely to be moving more slowly. Currently there may not be room for placement of sidewalks within the vicinity of the roadway; by reducing the number of lanes, right of ways may have room to provide pedestrian facilities.

The three-lane configuration allows pedestrians to focus on one-lane of traffic at a time and medians or left-turn lanes can provide a refuge for pedestrians if needed. While the left-turn lanes are active lanes, they would have lower traffic volumes and slower speeds. Three-lane roadways create a more comfortable environment for pedestrians with less noise due to slower and more consistent traffic speeds.

Traffic Calming

Studies show that narrow roadways decrease the speed motorists feel comfortable traveling. In fact, studies found a dramatic reduction of excessive speeding (five miles per hour or faster). Another result of the three-lane configuration is lower speed variability which creates a more predictable and consistent travel environment.

Figure 26. Left-Turn Lane and Vehicle Safety



Improved Emergency Response Time

Emergency vehicles may use the left-turn lane as a means to travel unimpeded along a busy roadway.

Potential Bike Accommodation and Streetscape

The reduction in roadway cross section may provide additional room for use as a bike lane. In addition, the change could create opportunities for visual enhancements and streetscape improvements. Funding may be available through MDOT for these kinds of enhancements.

Relatively Inexpensive

This lane reduction does not require reconstruction of the existing roadway. Often the reduction can be accomplished with re-striping the roadway.

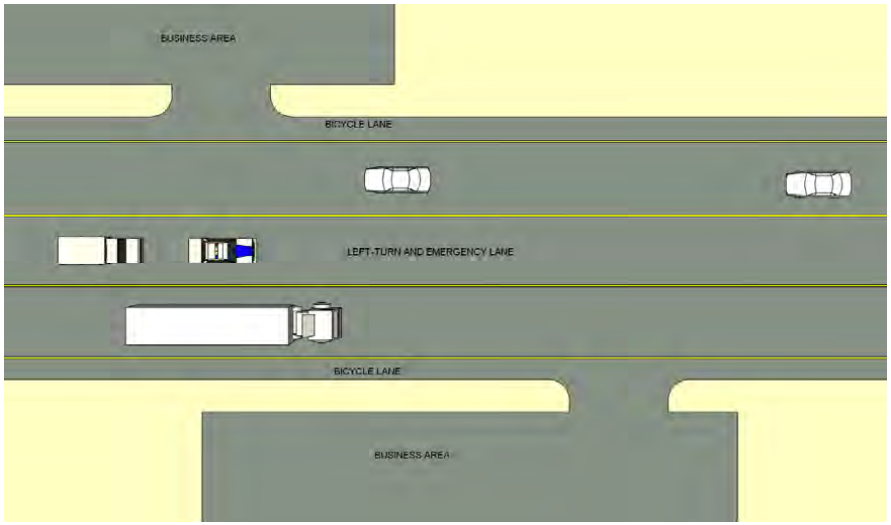
There are also potential disadvantages to the three-lane cross-section. Examples may be:

- Increased travel delay
- Frequent stop and/or slow moving vehicles
- Increased delays at driveways
- Loss of passing opportunities

Increased Travel Delay

Increased travel delay along the corridor is the primary concern many have with converting a four-lane roadway to a three-lane facility. Many assume there will be a 50% reduction in capacity because the number of "through lanes" is reduced by half. In reality the capacity of a three-lane facility is very near that of a four-lane undivided roadway.

Figure 27. Alternate Left-Turn / Emergency Lane and Bicycle Lanes



Drivers who want to travel through the corridor generally stay in the outside curb lane to avoid getting caught behind mid-block left-turning vehicles and very few through trips are made in those lanes. As such, only one lane in each direction is accommodating most of the through trips. The actual capacity of a corridor is controlled by the signalized intersections. These intersections generally have high volumes of left-turning traffic. As such, once again most of the through traffic is carried I one lane-the outside curb lane.

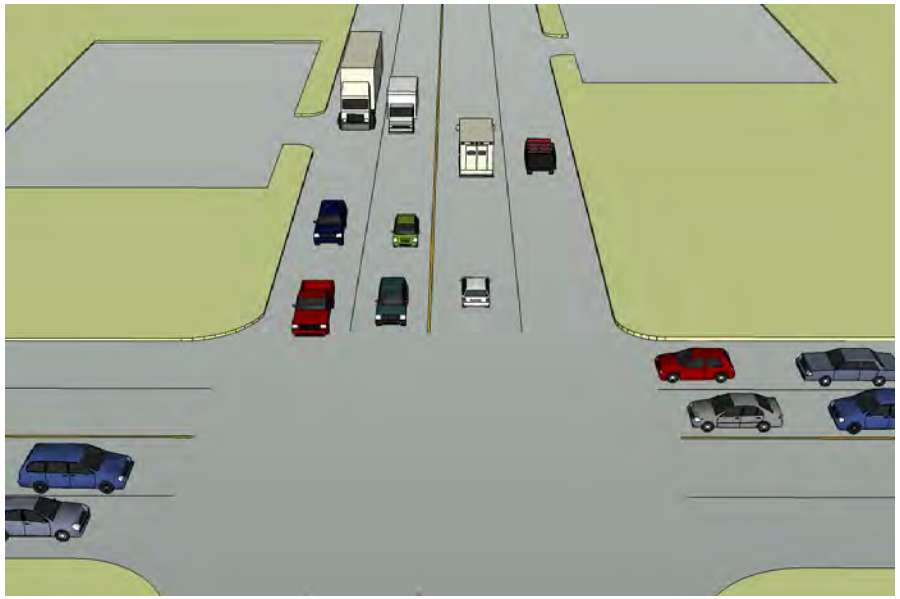
Loss of passing opportunities

This is a concern from aggressive motorists who do not want to lose the opportunity to pass along the corridor. As previously discussed, the disadvantage provides a benefit to pedestrians and other motorists trying to enter or cross the roadway. Some are of the opinion that aggressive drivers will use the center lane as a passing lane. While this does occur occasionally it is generally not a problem.

Specific Route Discussions

Prior to making a decision to reduce the number of lanes in a corridor, the primary question should be: What is the primary need in the corridor? Is the purpose of the corridor to move high volumes of traffic as quickly as possible? Or is it to improve corridor safety for motorists and pedestrians, while providing an acceptable level of service to corridor traffic? The answers to these questions will determine if converting to a three-lane facility is a viable alternative to include in the study.

Figure 28. High-volume traffic roadways

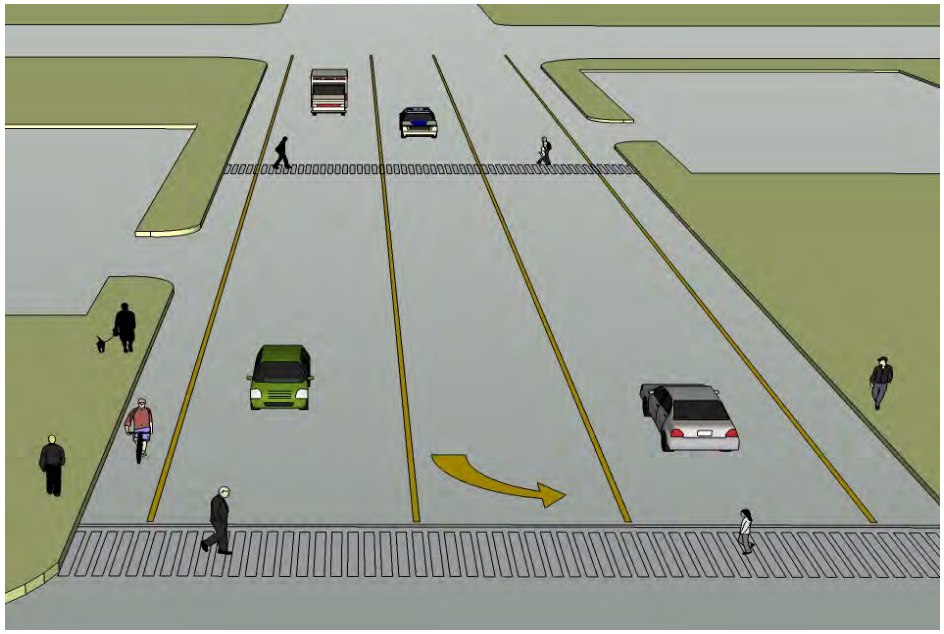


Prior to making a recommendation on this lane reduction for the Ironwood corridor, the following questions should be answered:

- Are the existing averages speeds appropriate given corridor land uses?
- Does speed variability create safety concerns and noise problems?
- Is the road near pedestrian activity areas, such as parks and schools or where improving the pedestrian environment is a priority?
- Is the road an existing or planned bicycle corridor
- Do high crash rates exist due to turning movements, excessive weaving, and /or stop and go traffic?
- How will this configuration affect the through truck traffic on US-2?
- What alternative routes may be affected by local traffic avoiding the corridor?

These questions will determine what the primary purpose of the corridor is.

Figure 29. Pedestrian-safe roadway



RECOMMENDATION

Based on the above discussion, the four-lane reduction to three-lane in the city of Bessemer would be beneficial. The low traffic counts, high pedestrian usage, low number of driveways and potential for bicycle traffic meet the criteria spelled out in the previous section(s).

As noted, the Ironwood corridor should be studied more thoroughly prior to making a recommendation.

REFERENCES

1. Michigan Intersection Safety Strategy and Near-Term Action Plan, Governor's Traffic Safety Advisory Commission, February 2004.
2. Urban Four-Lane Undivided to Three-Lane Roadway Conversion Guidelines, Knapp, Giese, and Lee, Iowa State University, 2003.

Figure 30. Ten Principles of Access Management

1. Determine roadway's type and function.
2. Identify main access points to major roads.
3. Define intersection hierarchy.
4. Locate signals to favor thorough traffic movement.
5. Preserve areas close to intersections as clear as possible.
6. Limit number of conflict points.
7. Increase the spacing between driveways and between access points.
8. Define turning lanes at intersections
9. Define turning lanes at mid block
10. Provide supporting or secondary roadways.

Source: Access management Manual RTB 2003

PROPOSED CORRIDOR AND ACCESS IMPROVEMENTS

The study has identified access, traffic and safety issues and problems of the U.S 2 Corridor. In this chapter, both general and specific improvements within the study area are recommended.

Service drives and shared access

Adjoining properties can consolidate driveways. This is especially effective on the narrow lots experienced in the cities of Ironwood and Bessemer. A number of driveways can be eliminated in Ironwood, by consolidating driveways, thereby reducing the number of conflict points and congestion. This will require a cooperative effort of property owners and existing businesses.

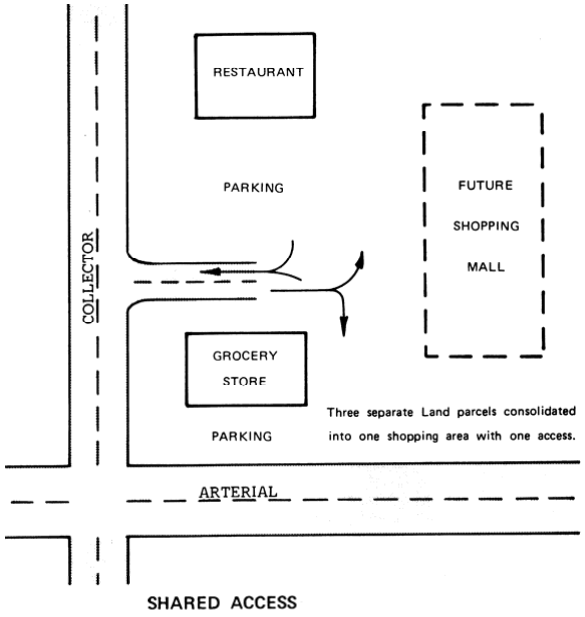
In addition to safety improvements, shared access has benefits for the businesses. Maintenance, snow plowing, and future reconstruction costs are spread among adjoining and benefiting property owners.

Service drives along the frontage or in the read of properties should be encouraged where possible.

Parking lot connections

Interconnecting parking lots is an easy way to improve access to businesses where a frontage road or service drive is not feasible. It is also effective along the intensely developed areas of the corridor. The benefit of parking lot connections is that customers can move between businesses without having to re-enter U.S. 2.

Figure 31. Shared Driveways and Connected Parking Lots



Source: *Arterial Street Access Control Study*, Tri-County Regional Planning Commission, 1981, p.24.

Limit new curb-cuts and driveways

Restricting the number and spacing of new driveways and curb-cuts is a local government decision that can greatly improve traffic safety and capacity of the roadway. This can be done through the local zoning ordinance and can be combined with other access management techniques including shared access points and access drives at the front or rear of properties. Generally, only driveway per lot should be allowed and access from an adjoining side street should be encouraged.

Restrict the number and size of new lots

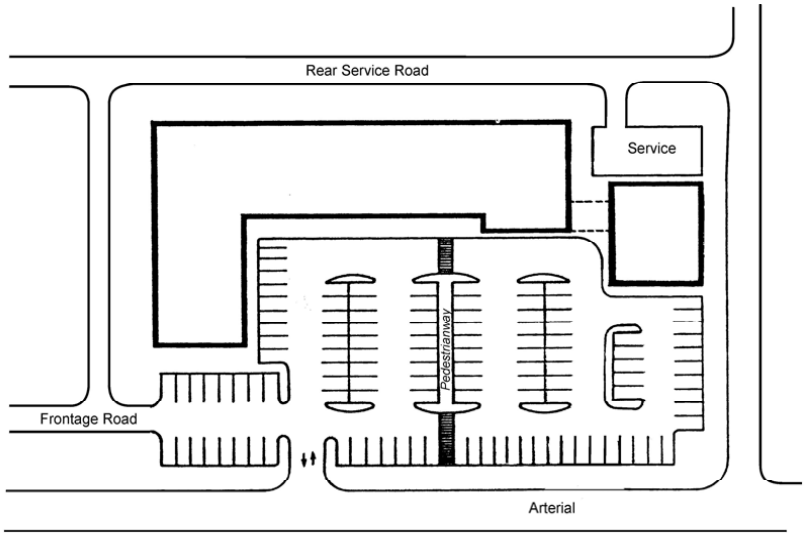
Larger lots can spread out the location of driveways in the rural segments of the U.S corridor. In existing developed areas, this may not be possible. Defining the allowable size of future land splits along the corridor can be done through the local zoning ordinance.

Table 3-2: Relationship of Driveway Density to Crash Rates

Driveways per Mile	Representative Crash Rate per Mile for a Multi-lane, Undivided Roadway	Increase in Crashes Associated with Higher Driveway Density
Under 20	3.4	-
20 to 40	5.9	+ 74%
40 to 60	7.4	+ 118%
Over 60	9.2	+ 171%

Source: MDOT Access Management Guidebook, 2001.

Figure 32. Frontage Roads and Rear Service Roads



Note: Rear access roads are usually safer and more effective than frontage roads and should be used whenever possible. Frontage roads should not be too close to the roadway or used where the volume of traffic is too great for safe vehicle use.

Convert existing center turn lane to grass median in the rural segments of corridor

Once outside the urbanized areas of Bessemer and Ironwood, the number of driveways and curb-cuts decreases dramatically and the spacing between access points increases. The existing center turn lane is virtually non-functional in these areas with little use except at existing driveways, as evidenced by the photo at right which was taken following a minor snow event.

The Gogebic County community and MDOT may wish to consider converting the existing center lane to a grass median in the future during the design of an overall reconstruction project. Combined with the other access management controls being recommended in this study, the grass median may have benefits that include:

- The better definition of a left turn lane where needed and necessary for driveways, access roads and county road intersections.
- The median can serve as a snow storage area and provide a snow barrier to prevent head-on crashes during winter and slippery conditions.
- U.S 2 between Ironwood and Wakefield has numerous scenic vies and vistas of the surrounding landscape, rock bluffs and hills. A grass median will improve visual context in this scenic area that serves as a gateway to Michigan for many visitors to the western Upper Peninsula.

Figure 33. US-2

Define the left turn lanes at Powderhorn and Grandview Roads

The intersections at Powderhorn and Grandview Roads have a higher incidence of crashes and safety problems than other rural intersections in the study area. It is recommended that the left turn lanes be better defined to improve safety.

Improve the Rail Grade Trail for Bicycles and Pedestrians

One of the two rail grades that parallel U.S. 2 through the study area should be considered for all season non-motorized use. Pedestrians and bicyclists would be attracted to this trail. This project could have dramatic economic development/tourism implications for Gogebic County.

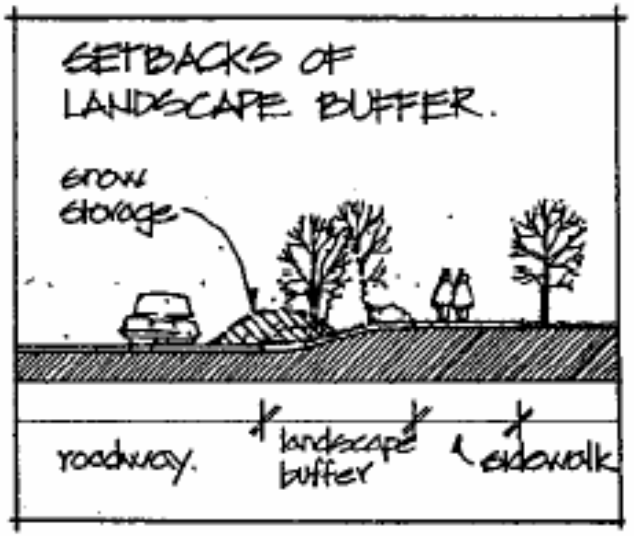
Sidewalks in urbanized areas

In the cities of Ironwood and Bessemer, sidewalks should be constructed and maintained along the U.S. 2 corridor. In both cities, U.S. 2 runs through the community and separates residential neighborhoods. More people are walking for exercise and to patronize businesses. Separation between the walkway and the street is desirable, particularly for winter maintenance and pedestrian comfort.

Maintain paved shoulder for bicycles and pedestrians in the rural U.S. 2 segments

A paved shoulder currently exists along the rural segments of U.S. 2. The paved shoulder is used by pedestrians and bicycling and should be maintained in future U.S 2 improvement projects.

Figure 34. Street Section



Site plan review

Each local government participating in this study should adopt site plan review provisions within their zoning ordinance for commercial and industrial projects. Currently, only the City of Ironwood has this tool. Through site plan review, cities and townships can greatly affect the site plan quality, appearance and traffic safety of individual development projects.

Access Management Ordinance

An Access Management Ordinance is proposed for adoption by each participating local government. Through this mechanism, coordination of the approval of driveway permitting is accomplished, as well as affecting the number of driveways allowed per parcel of land. The goal is to reduce the number of driveways and curb-cuts, their locations, and to coordinate the approval process between the community, a proposed intergovernmental committee, the Gogebic County Road Commission (local road authority) and the Michigan Department of Transportation.

Figure 35. US-2

Figure 36. US-2 IRONWOOD CORRIDOR ACCESS MANAGEMENT STRATEGIES – CITY OF IRONWOOD

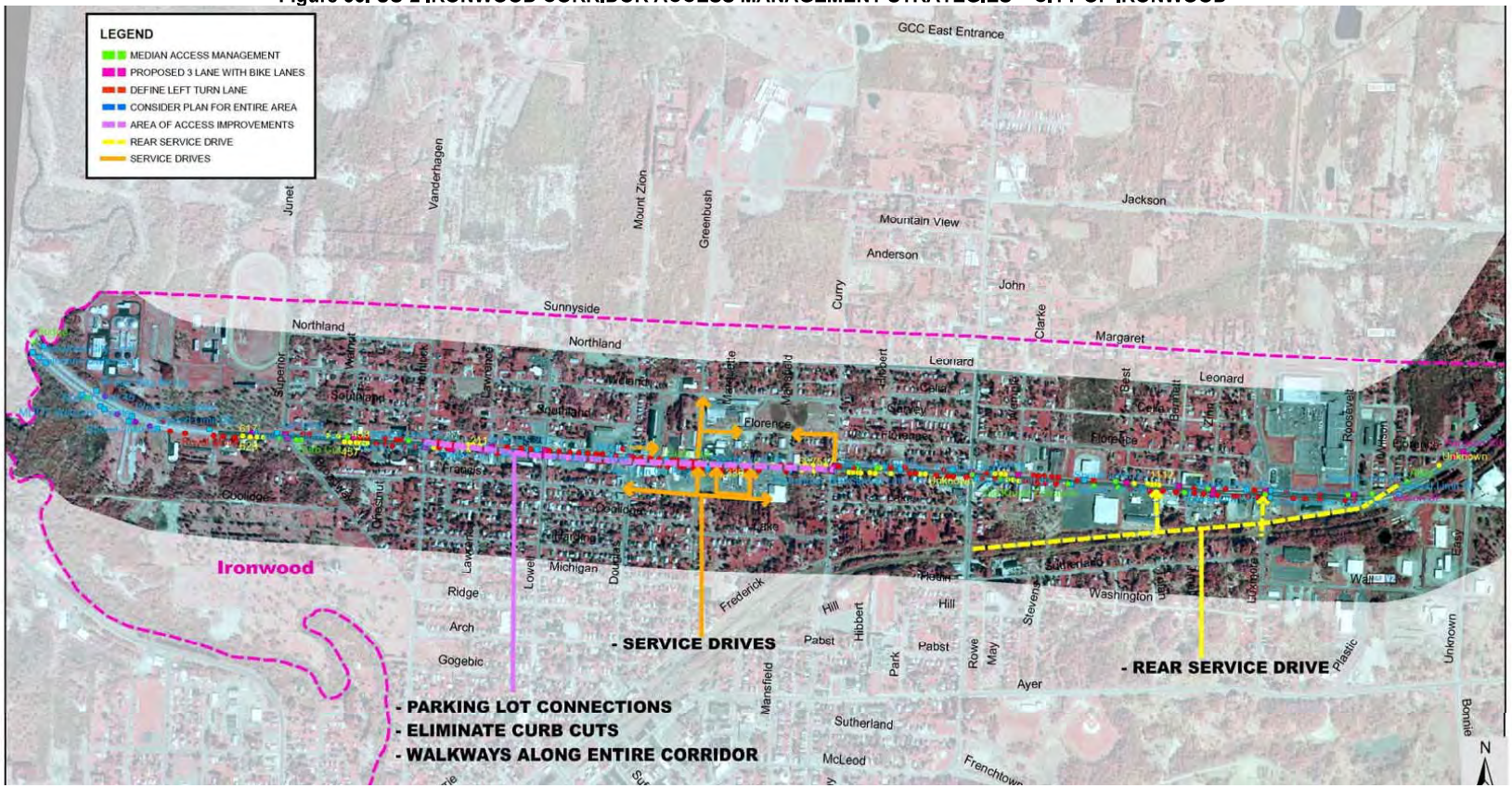


Figure 37. US-2 IRONWOOD CORRIDOR ACCESS MANAGEMENT STRATEGIES – IRONWOOD TOWNSHIP

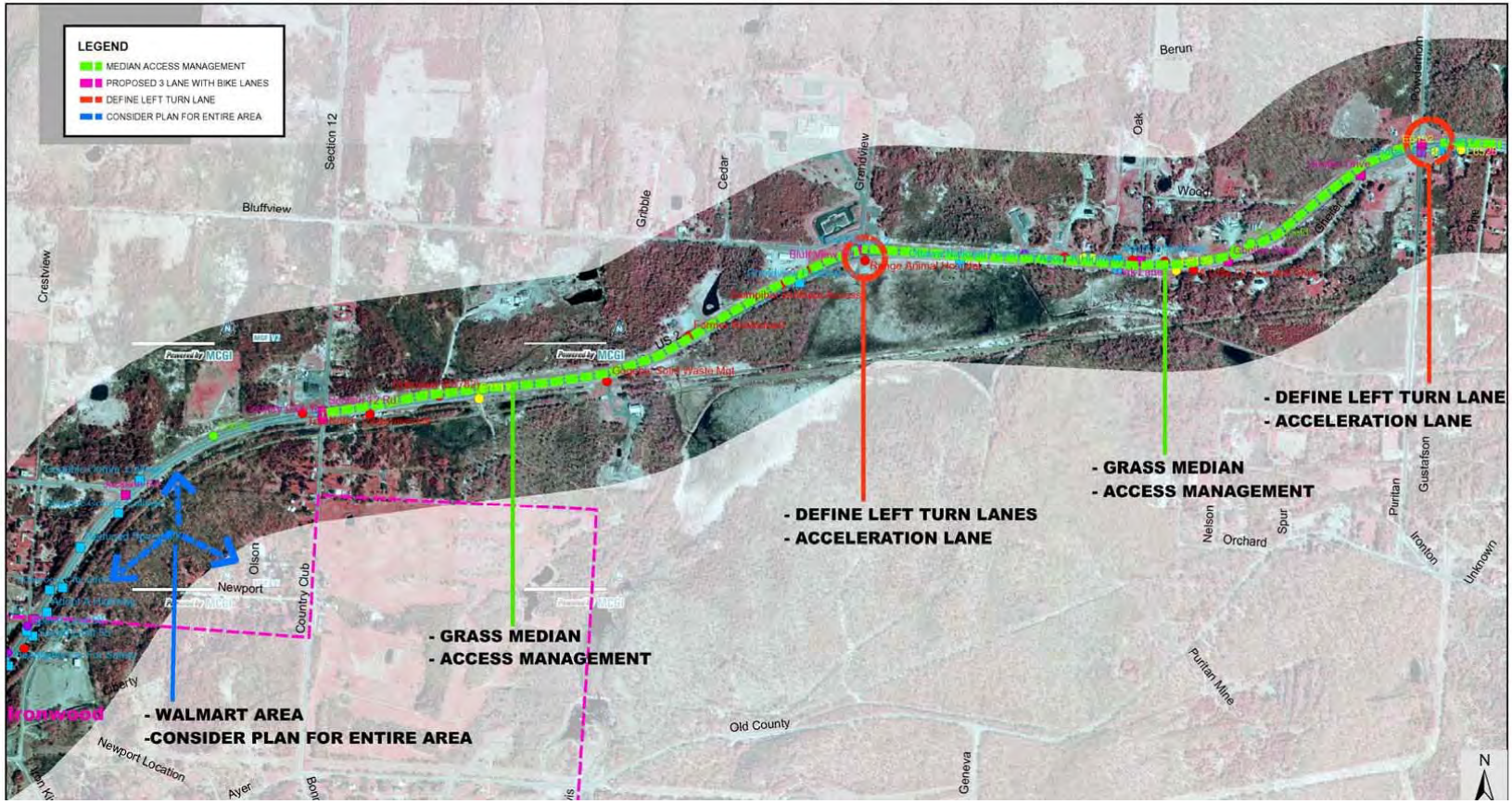


Figure 38. US-2 IRONWOOD CORRIDOR ACCESS MANAGEMENT STRATEGIES – CITY OF BESSEMER

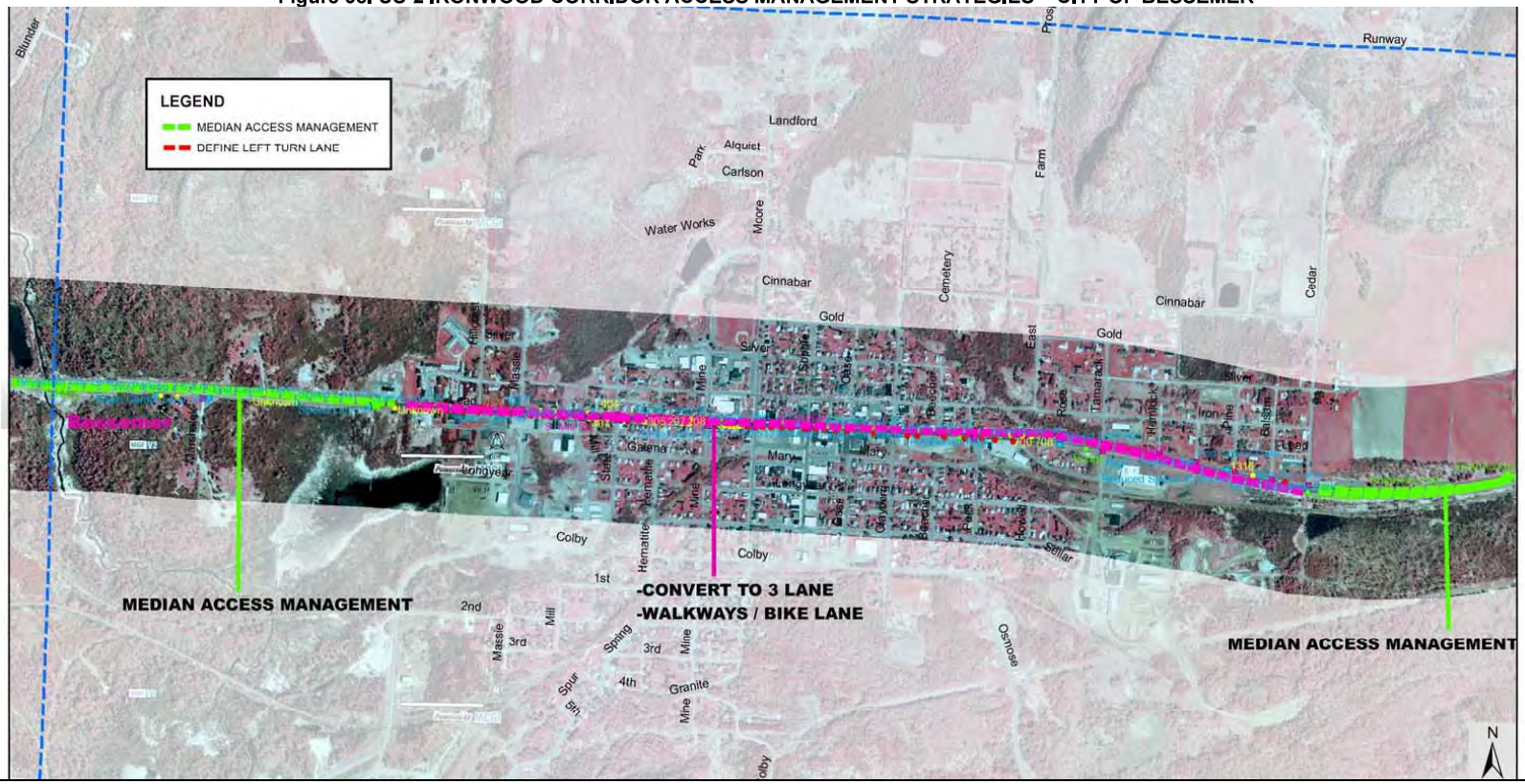
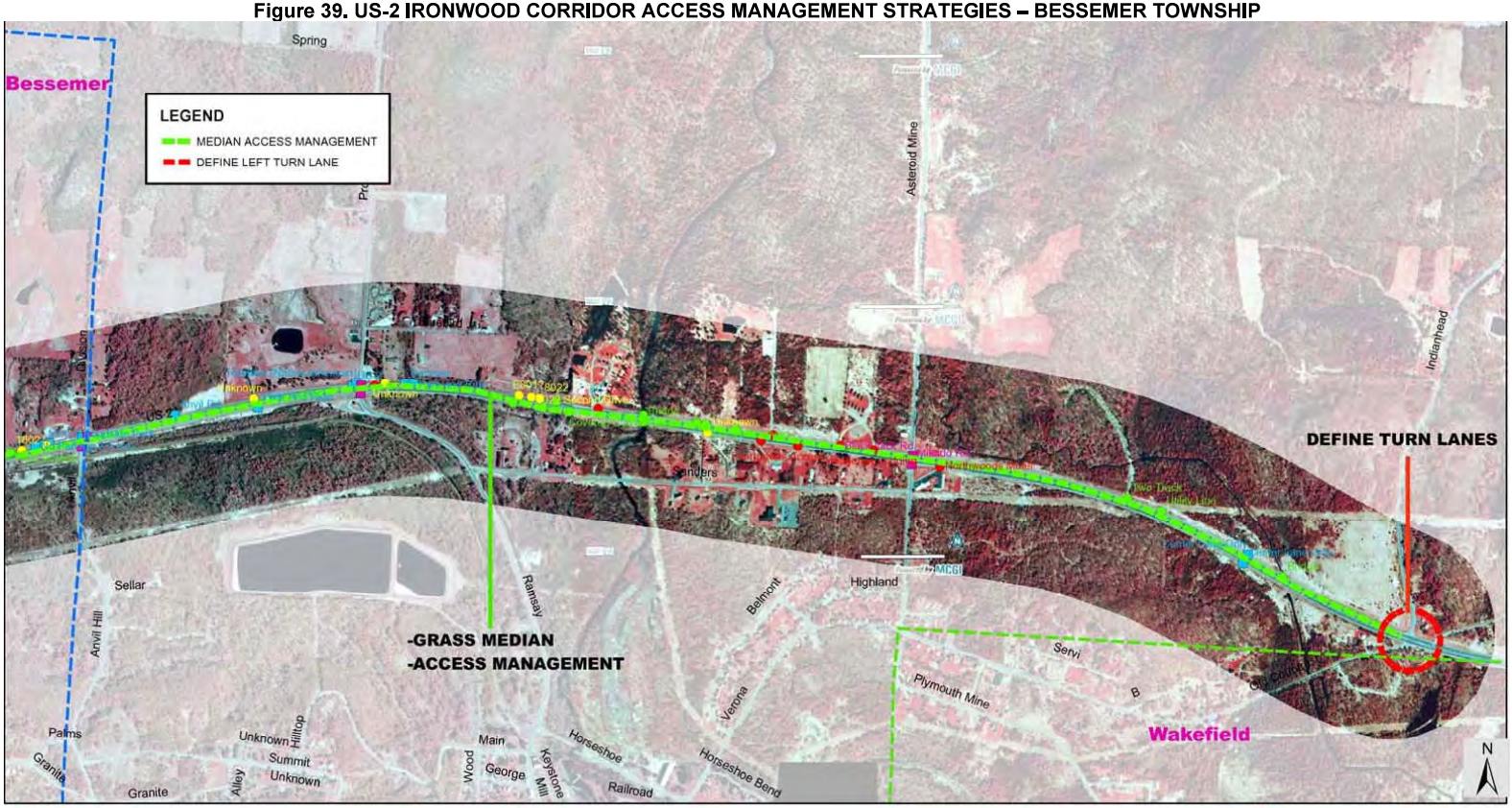


Figure 39. US-2 IRONWOOD CORRIDOR ACCESS MANAGEMENT STRATEGIES – BESSEMER TOWNSHIP



Access Management Ordinance

Section 0.1 – Intent

The provisions of this Article are intended to promote safe and efficient travel within the _____ *(name of jurisdiction)*; minimize disruptive and potentially hazardous traffic conflicts; ensure safe access by emergency vehicles; protect the substantial public investment in the street system by preserving capacity and avoiding the need for unnecessary and costly reconstruction which disrupts business and traffic flow; separate traffic conflict areas by reducing the number of driveways; provide safe spacing standards between driveways, and between driveways and intersections; provide for shared access between abutting properties; implement the U.S. 2 Access Management Plan (insert name of Plan if there is one) recommendations; ensure reasonable access to properties, though not always by the most direct access; and to coordinate access decisions with the Michigan Department of Transportation and/or the Gogebic County Road Commission, as applicable.

Section 0.2 – One Access Per Parcel

A. All land in a parcel or lot having a single tax code number, as of the effective date of the amendment adding this provision to the Ordinance (hereafter referred to as "the parent parcel"), that shares a lot line for less than _____ feet [AT LEAST 330 FEET, BETTER IS 660 FEET] with right-of-way on U.S. 2, shall be entitled to one (1) driveway or road access per parcel from said public road or highway.

1. All subsequent land divisions of a parent parcel, shall not increase the number of driveways or road accesses beyond those entitled to the parent parcel on the effective date of this amendment.

2. Parcels subsequently divided from the parent parcel, either by metes and bounds descriptions, or as a plat under the applicable provisions of the Land Division Act, Public Act 288 of 1967, as amended, or as a condominium project in accord with the Condominium Act, Public Act 59 of 1978, as amended, shall have access by a platted subdivision road, by another public road, by a private road that meets the requirements of Section ____, or by a service drive meeting the requirements of Section 0.40.

B. Parent parcels with more than _____ feet [AT LEAST 330 FEET] of frontage on a public road or highway shall also meet the requirements of A.1 and A.2 above, except that whether subsequently divided or not, they are entitled to not more than one driveway for each _____ feet [AT LEAST 330 FEET, BETTER IS 660 FEET] of public road frontage thereafter, unless a registered traffic engineer determines that topographic conditions on the site, curvature on the road, or sight distance limitations demonstrate a second driveway within a lesser distance is safer or the nature of the land use to be served requires a second driveway for safety. If the parcel is a corner lot and a second driveway is warranted, the second driveway shall have access from the abutting street unless that street is of a higher functional classification.

Section 0.3 – Application Review, Approval and Coordination Process

A. Standards of Road Authorities Apply All standards of the applicable road authority (either the Michigan Department of Transportation or the Gogebic County Road Commission, or both) shall be met prior to approval of an access application under this Article.

B. Application, Review and Approval Process Applications for driveway or access approval shall be made on a form prescribed by and available at _____ *(insert name of jurisdiction)* and/or the Gogebic County Road Commission and Michigan Department of Transportation as applicable. [IF THE COMMUNITY ALREADY HAS A SITE PLAN REVIEW PROCESS, THE FOLLOWING ITEMS CAN BE ADDED TO THE EXISTING LIST OF SUBMITTAL REQUIREMENTS, IF THEY AREN'T ALREADY INCUDED.]

1. Applications shall be accompanied by clear, scaled drawings (minimum of 1''=20') in triplicate showing the following items:

   a. Location and size of all structures proposed on the site.
   b. Size and arrangement of parking stalls on aisles.
   c. Proposed plan of routing vehicles entering and leaving the site (if passenger vehicles are to be separated from delivery trucks indicate such on drawing).
   d. Driveway placement.
   e. Property lines.
   f. Right-of-way lines.
   g. Intersecting roads, streets and driveways within 300' either side of the property on both sides of the street.
   h. Width of right-of-way.
   i. Width of road surface.
   j. Type of surface and dimensions of driveways.
   k. Proposed inside and outside turning radii.
   l. Show all existing and proposed landscaping, signs, and other structures or treatments within and adjacent to the right-of-way.
   m. Traffic analysis and trip generation survey results, obtained from a licensed traffic engineer for all developments with over 100 directional vehicle trips per peak hour.
   n. Design dimensions and justification for any alternative or innovative access design.
   o. Dumpsters or other garbage containers.

2. Applications are strongly encouraged to rely on the following sources for access designs, the National Access Management Manual, TRB, 2002; National Cooperative Highway Research Program (NCHRP), "Access Management Guidelines to Activity Centers" Report 348 and "Impacts of Access Management Techniques" Report 420; and the AASHTO "Green Book" A Policy on Geometric Design of Highways and Streets. The following techniques are addressed in these guidebooks and are strongly encouraged to be used when designing access:

   a. Not more than one driveway access per abutting road
   b. Shared driveways
   c. Service drives: front, rear and perpendicular
   d. Parking lot connections with adjacent property
   e. Other appropriate designs to limit access points on an arterial or collector.

3. Applications shall be accompanied by an escrow fee for professional review per the requirements of Section _____.

C. Review and Approval Process

The following process shall be completed to obtain access approval: [THE FOLLOWING PROCESS COULD BE INCORPORATED INTO THE SITE PLAN REVIEW PROCESS OF THE ZONING ORDINANCE IF THERE IS ONE, INSTEAD OF BEING LISTED SEPARATELY HERE.]

1. An Access Application meeting the requirements of Section 0.3.B.1 shall be submitted to the Zoning Administrator and on the same day to the Gogebic County Road Commission and/or the Michigan Department of Transportation, as applicable. [THE COMMUNITY COULD AGREE TO USE THE MDOT FORM FOR A STATE HIGHWAY OR THE COUNTY ROAD COMMISSION FORM FOR A COUNTY ROAD INSTEAD. SEE APPENDIX D FOR SAMPLE.]

2. The completed application must be received by the _____ Zoning Administrator at least ____ days (insert number, typically 14-30) prior to the Planning Commission meeting where the application will be reviewed.

3. The applicant, the Zoning Administrator and representatives of the Gogebic County Road Commission, the Michigan Department of Transportation and the Planning Commission may meet prior to the Planning Commission meeting to review the application and proposed access design. [SOME COMMUNITIES AND/OR ROAD AUTHORITIES MAY WANT THESE MEETINGS EVERY TIME, IF SO, CHANGE "MAY" TO "SHALL".]

4. The Planning Commission shall review and recommend approval, or denial, or request additional information. They shall also forward the Access Application (and other relevant project information) to the Gogebic County Road Commission and/or Michigan Department of Transportation for their review as applicable.

5. The Gogebic County Road Commission and/or the Michigan Department of Transportation, as applicable, shall review the access application and conclusions of the Planning Commission. One of three actions may result;

   a. If the Planning Commission and the Road Commission, and/or the Michigan Department of Transportation, as applicable, approve the application as submitted, the access application shall be approved.

   b. If both the Planning Commission and the Road Commission, and/or the Michigan Department of Transportation, as applicable, deny the application, the application shall not be approved.

   c. If either the Planning Commission, Road Commission, and/or Michigan Department of Transportation, as applicable, requests additional information, approval with conditions, or does not concur in approval or denial, there shall be a joint meeting of the Zoning Administrator, a representative of the Planning Commission and staff of the Gogebic County Road Commission, and/or the Michigan Department of Transportation, as applicable, and the applicants. The purpose of this meeting will be to review the application to obtain concurrence between the Planning Commission and the applicable road authorities regarding approval or denial and the terms and conditions of any permit approval.

6. No application will be considered approved, nor will any permit be considered valid unless all the above-mentioned agencies have indicated approval unless approval by any of the above-mentioned

agencies would clearly violate adopted regulations of the agency. In this case the application shall be denied by that agency and the requested driveway(s) shall not be constructed. Conditions may be imposed by the Planning Commission to ensure conformance with the terms of any driveway permit approved by a road authority.

7. The Zoning Administrator shall keep a record of each application that has been submitted, including the disposition of each one. This record shall be a public record.

8. Approval of an application remains valid for a period of one year from the date it was authorized. If authorized construction is not initiated by the end of one (1) year, the authorization is automatically null and void. Any additional approvals that have been granted by the Planning Commission or the Zoning Board of Appeals, such as Special Use Permits, or variances, also expire at the end of one year.

9. An approval may be extended for a period not to exceed _____ [TYPICALLY 6 MONTHS TO ONE YEAR]. The extension must be requested, in writing by the applicant before the expiration of the initial approval. The Zoning Administrator may approve extension of an authorization provided there are no deviations from the original approval present on the site or planned, and there are no violations of applicable ordinances and no development on abutting property has occurred with a driveway location that creates an unsafe condition. If there is any deviation or cause for question, the Zoning Administrator shall consult a representative of the Gogebic County Road Commission and/or the Michigan Department of Transportation, as applicable, for input.

10. Re-issuance of an authorization that has expired requires a new Access Application form to be filled out and processed independently of previous action.

11. The applicant shall assume all responsibility for all maintenance of such driveway approaches from the right-of-way line to the edge of the traveled roadway.

12. Where authorization has been granted for entrances to a parking facility, said facility shall not be altered or the plan of operation changed until a revised Access Application has been submitted and approved as specified in this Section.

13. Application to construct or reconstruct any driveway entrance and approach to a site shall also cover the reconstruction or closing of all nonconforming or unused entrances and approaches to the same site at the expense of the property owner.

14. When a building permit is sought for the reconstruction, rehabilitation or expansion of an existing site or a zoning or occupancy certificate is sought for use or change of use for any land, buildings, or structures, all of the existing, as well as proposed driveway approaches and parking facilities shall comply, or be brought into compliance, with all design standards as set forth in this Ordinance prior to the issuance of a zoning or occupancy certificate, and pursuant to the procedures of this section.

15. _____ (insert name of jurisdiction) and the Gogebic County Road Commission and/or the Michigan Department of Transportation, as applicable, may require a performance bond or cash deposit in any sum not to exceed $5,000 for each such approach or entrance to insure compliance with an approved application. Such bond shall terminate and deposit be returned to the applicant when the terms of the approval have been met or when the authorization is cancelled or terminated.

Section 0.4 – Service Drives and Other Shared Access Standards

A. The use of shared access, parking lot connections and service drives, in conjunction with driveway spacing, is intended to preserve traffic flow along major thoroughfares and minimize traffic conflicts, while retaining reasonable access to the property. Where noted above, or where the Planning Commission determines that restricting new access points or reducing the number of existing access points may have a beneficial impact on traffic operations and safety while preserving the property owner's right to reasonable access, then access from a side street, a shared driveway, a parking lot connection, or service drive connecting two or more properties or uses may be required instead of more direct connection to the arterial or collector street. However, where traffic safety would be improved, and the driveway spacing requirements of this ordinance can be met, then direct connection to the arterial or collector street may be allowed in addition to a required service drive.

1. In particular, shared access, service drives or at least a connection between abutting land uses may be required in the following cases:

   a. Where the driveway spacing standards of this section can not be met.
   b. Where recommended in the U.S. 2 Access Management Plan and/or other corridor or sub-area master plans of _____ (name of jurisdiction).
   c. When the driveway could potentially interfere with traffic operations at an existing or planned traffic signal location.
   d. The site is along a collector or arterial with high traffic volumes, or along segments experiencing congestion or a relatively high number of crashes.
   e. The property frontage has limited sight distance.
   f. The fire (or emergency services) department recommends a second means of emergency access.

2. In areas where frontage roads or rear service drives are recommended, but adjacent properties have not yet developed, the site shall be designed to accommodate a future road/facility designed according to the standards of this Section. The Planning Commission may approve temporary access points where a continuous service drive is not yet available and a performance bond or escrow is accepted to assure elimination of temporary access when the service road is constructed. (See Section 2.4 Temporary Access Permits).

B. Notwithstanding the requirements of the _____ (community name and ord. No.) Land Division Ordinance, the standards for all service drives shall be as follows:

1. Site Plan Review - The Planning Commission shall review and approve all service drives to ensure safe and adequate continuity of the service drive between contiguous parcels as part of the site plan review process in Section _____.

2. Front and Rear Service Drives - A front or rear service drive may be established on property which abuts only one public road. The design of a service road shall conform with national design guidelines such as those identified in the National Access Management Manual by TRB, the AASHTO "Green Book", and National Cooperative Highway Research Program (NCHRP), "Access Management Guidelines to Activity Centers" Report 348 and "Impacts of Access Management Techniques" Report 420.

3. Location - Service roads shall generally be parallel to the front property line and may be located either in front of, or behind, principal buildings and may be placed in required yards. In considering the most appropriate alignment for a service road, the Planning Commission shall consider the setbacks of existing and/or proposed buildings and anticipated traffic flow for the site.

4. Width and Construction Materials - A service drive shall be within an access easement permitting traffic circulation between properties. The easement shall be recorded with the County Register of Deeds. This easement shall be at least forty (40) feet wide. A service drive shall have a minimum pavement width of ____ (typically 26-36) feet, measured face to face of curb with an approach width of _____ feet (typically 36-39 feet) at intersections. The service drive shall be constructed of a paved surface material that is resistant to erosion and shall meet _____ (city or village, County Road Commission or MDOT -- depending on what road the service drive parallels) standards for base and thickness of asphalt or concrete, unless the community has more restrictive standards.

5. Snow Storage and Landscaping Area - A minimum of fifteen (15) feet of snow storage/landscaping area shall be reserved along both sides of the service drive. Frontage roads shall have a minimum setback of 30 feet from the right-of-way, with a minimum of 60 feet of storage at the intersection for entering and exiting vehicles as measured from the pavement edge (See Figure ____).

6. Distance from Intersection on Service Drives - Frontage road and service drive intersections at the collector or arterial street shall be designed according to the same minimum standards as described for driveways in Section _____.

7. Driveway Entrance - The Planning Commission shall approve the location of all accesses to the service drive, based on the driveway spacing standards of this Article (or Chapter). Access to the service drive shall be located so that there is no undue interference with the free movement of service drive and emergency vehicle traffic, where there is safe sight distance, and where there is a safe driveway grade as established by the applicable road authority (local, MDOT or CRC).

8. Driveway Radii - All driveway radii shall be concrete curbs and conform with the requirements of Section _____.

9. Acceleration Lanes and Tapers - The design of the driveway, acceleration, deceleration or taper shall conform with the requirements of Section _____.

10. Elevation - The elevation of a service drive shall be uniform or gently sloping between adjacent properties.

11. Service Drive Maintenance - No service drive shall be established on existing public right-of-way. The service drive shall be a public street (if dedicated to and accepted by the public), or a private road maintained

by the adjoining property owners it serves who shall enter into a formal agreement for the joint maintenance of the service drive. The agreement shall also specify who is responsible for enforcing speed limits, parking and related vehicular activity on the service drive. This agreement shall be approved by the _____ (municipal) attorney and recorded with the deed for each property it serves by the County Register of Deeds. If the service drive is a private road, the local government shall reserve the right to make repairs or improvements to the service drive and charge back the costs directly or by special assessment to the benefiting landowners if they fail to properly maintain a service drive.

12. Landscaping - Landscaping along the service drive shall conform with the requirements of Section ____ (reference applicable landscaping standards). Installation and maintenance of landscaping shall be the responsibility of the developer or a property owners association.

13. Parking Areas - All separate parking areas (i.e. those that do not use joint parking cross access) shall have no more than one (1) access point or driveway to the service drive.

14. Parking - The service road is intended to be used exclusively for circulation, not as a parking, loading or unloading aisle. Parking shall be prohibited along two-way frontage roads and service drives that are constructed at the minimum width (see B.4. above). One-way roads or two-way roads designed with additional width for parallel parking may be allowed if it can be demonstrated through traffic studies that on-street parking will not significantly affect the capacity, safety or operation of the frontage road or service drive. Perpendicular or angle parking along either side of a designated frontage road or service drive is prohibited. The Planning Commission may require the posting of "no parking" signs along the service road. As a condition to site plan approval, the Planning Commission may permit temporary parking in the easement area where a continuous service road is not yet available, provided that the layout allows removal of the parking in the future to allow extension of the service road. Temporary parking spaces permitted within the service drive shall be in excess of the minimum required under Article____, Parking and Loading Standards.

15. Directional Signs and Pavement Markings - Pavement markings may be required to help promote safety and efficient circulation. The property owner shall be required to maintain all pavement markings. All directional signs and pavement markings along the service drive shall conform with the current Michigan Manual of Uniform Traffic Control Devices.

16. Assumed Width of Pre-existing Service Drives - Where a service drive in existence prior to the effective date of this provision has no recorded width, the width will be considered to be _____ (typically 40-66) feet for the purposes of establishing setbacks and measured an equal distance from the midpoint of the road surface.

17. Pedestrian and Bicycle Access - Separate, safe access for pedestrians and bicycles shall be provided on a sidewalk or paved path that generally parallels the service drive unless alternate and comparable facilities are approved by the Planning Commission.

18. Number of Lots or Dwellings Served - No more than twenty-five (25) lots or dwelling units may gain access from a service drive to a single public street.

19. Service Drive Signs - All new public and private service drives shall have a designated name on a sign meeting the standards on file in the office of the Zoning Administrator.

20. In the case of expansion, alteration or redesign of existing development where it can be demonstrated that pre-existing conditions prohibit installation of a frontage road or service drive in accordance with the aforementioned standards, the Planning Commission shall have the authority to allow and/or require alternative cross access between adjacent parking areas through the interconnection of main circulation aisles. Under these conditions, the aisles serving the parking stalls shall be aligned perpendicularly to the access aisle, as shown in Figure 2-6c, with islands, curbing and/or signage to further delineate the edges of the route to be used by through traffic.