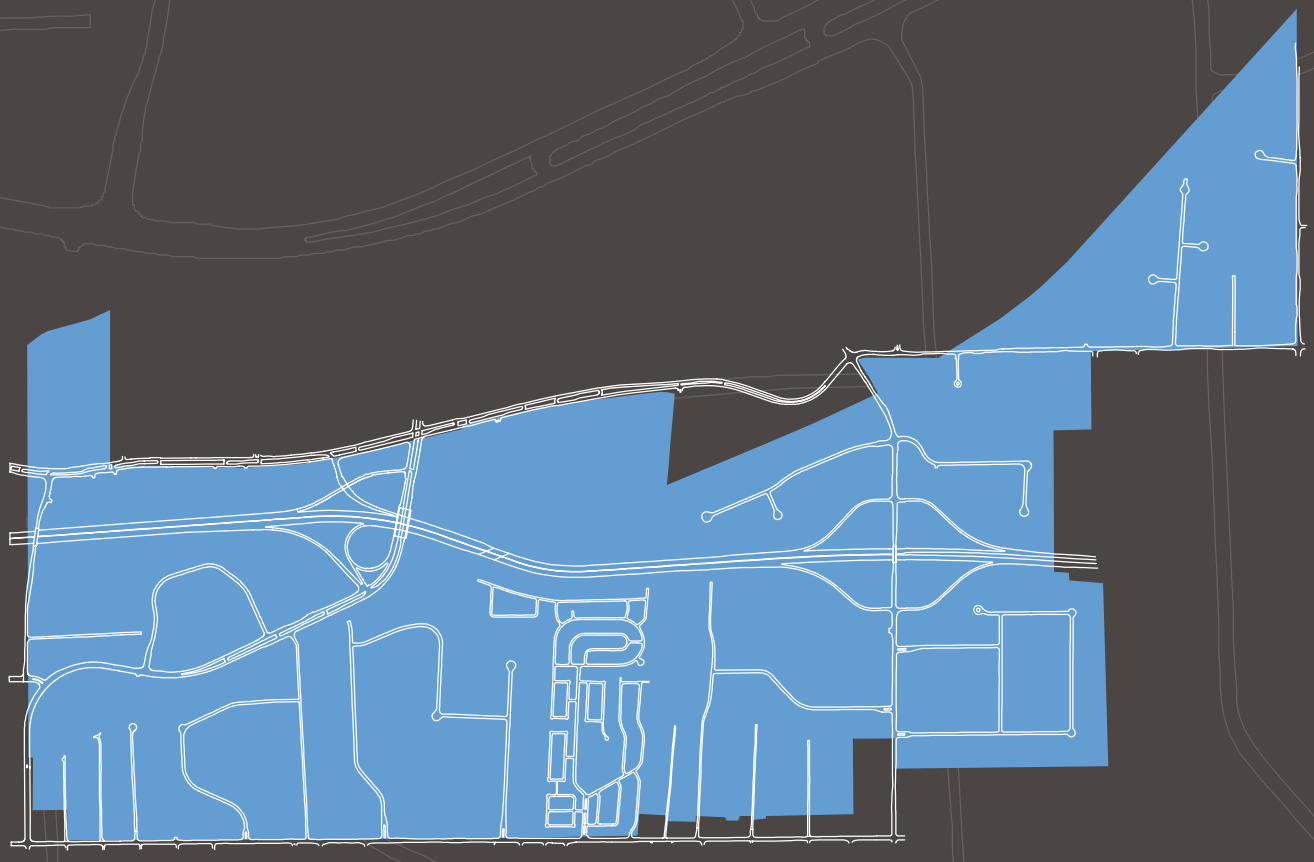
M 59

Corridor Study

CITY OF ROCHESTER HILLS, MICHIGAN

APRIL 12, 2012



M-59 CORRIDOR PLAN

City of Rochester Hills, Michigan

Adopted by LDFA:
April 12, 2012

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City of Rochester Hills LDFA

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1. INTRODUCTION

A. Introduction

The City of Rochester Hills was incorporated in 1984, including all of the land area that was previously Avon Township. Rochester Hills is a third-tier suburb of Detroit, located in Oakland County. The area experienced high rates of growth during the 1970 – 2005 time period, with growth slowing significantly in recent years due to regional and national economic conditions.

Today, the City of Rochester Hills has a population of approximately 71,000 and features high quality schools, parks, neighborhoods, cultural and historic resources, shopping, dining, and entertainment. These factors combine to create a high quality of life and position Rochester Hills as one of the premier residential communities in the region.

The City is principally known as a bedroom community, and its residential image is valued by the community, During 1970's through the early 2000's the City experienced high rates of residential growth which provided ample tax revenues, meaning that there was no immediate need to embrace non-residential growth.

However, the City does contain a significant core of non-residential uses and activities which are concentrated primarily within the boundaries of this study. For many years these non-residential uses were tolerated, but not embraced by the community.

However, as residential growth slowed and first-generation infrastructure aged and began to require increasing maintenance or replacement, community leaders realized that the value of office, industrial, research and development, and commercial activities were significant contributors to the City's bottom line and a critical component of a fiscally sustainable community. The City's business base is and will be an important source of revenues to keep residential neighborhoods strong and well-serviced.

For many years the City of Rochester Hills had a reputation as being business-unfriendly and difficult to work with for non-residential uses. The City has been working arduously over the past decade to refashion itself as a business-friendly place and to change regional perceptions of the City.

B. Summary of Past Planning Activities in the Study Area

In the mid 1980's, the City of Rochester Hills was part of a regional strategy to develop Oak Tech Park as an opportunity for major businesses to locate in the general area. Oak Tech Park is best known as the location of Chrysler's World Headquarters. Oak Tech Park is located in Auburn Hills, immediately to the west of Rochester Hills.

As part of the strategy to develop Oak Tech Park, three new interchanges were planned to provide better access. One interchange is located on I-75 and provides direct access to Chrysler World Headquarters. The other two interchanges are located along M-59 at Squirrel Road (in Auburn Hills) and at Adams Road (in Rochester Hills).

In 1993-1994 Rochester Hills formed a Local Development Finance Authority (LDFA) to enable the use of tax increment financing to generate the monies needed to pay for the costs associated with the Adams Road/M-59 interchange, including a realignment of Adams Road. Due to the passages of the Headlee Act and Proposal A, the LDFA had a smaller capture than was initially forecast and thus the Adams Road realignment and interchange was not able to be completed until 2006.

The LDFA is scheduled to remain in existence until 2025 and continues to capture tax increment funds. However, the amount of annual capture is shrinking due to declining property values.

C. Summary of Recent City-Wide Planning Activities Impacting the Study Area

The need to conduct an economic development strategy was first introduced for consideration in the early 2000's. After some consideration, the economic development strategy was included as an element in the City's Master Land Use Plan update, begun in 2005 and completed in 2007. The Master Land Use Plan examined how the City could do better in its role supporting and promoting additional or more intensified uses and activities.

The M-59 corridor area was identified as the economic engine of the City, and planned for Regional Employment Uses. This strategy recognized that the study area contains numerous industrial parks that were developed and occupied by small to medium sized manufacturing and assembly uses. These industrial parks were separated from each other, creating a patchwork character to the study area. Further, there are numerous legacy residential streets that extend north from Auburn Road in the study area. These residential areas are typically 70+ years old, and are a remnant of the community's past as a rural Township.

The Master Land Use Plan recommended a thorough analysis be completed for the Regional Employment Center to identify the potential of and a shared vision for the area. This study is that analysis, and the major purposes of this study are to:

- Create a master physical development plan for the study area
- Create a shared vision for the appearance of the area
- Enhance the City's tax base
- Identify desired company types
- Provide flexibility in use, while creating attractive, functional, and timeless development character.

This plan will also serve as an updated LDFA Master Infrastructure Plan. The LDFA's initial infrastructure plan was completed in 1996, and most of the projects in that plan have been completed or abandoned. The new infrastructure plan will help implement the overall development vision for the M-59 corridor study area.

2. EXISTING CONDITIONS

A. Area Profile and Regional Position

HOUSEHOLDS AND POPULATION

Table 2.1 lists household and population characteristics for residents of the study area, Rochester Hills, and Oakland County. Rochester Hills and the County have reasonably similar demographic characteristics, but study area residents are older, less educated, and have lower median incomes than the City or County.

Table 2.1. Household and Population Characteristics

	Study Area	Rochester Hills	Oakland County	Comments
Population	1,588	70,978	1,223,804	The study area has a relatively small population in proportion to its land area.
Households	882	27,525	489,023	
Average Household Size	1.80	2.58	2.50	Study area households are smaller than the City or County.
Median Age	58.5	40.7	39.3	Study area residents are older than the City or County.
Median Household Income	$50,312	$88,791	$77,586	The study area lags both the City and the County in household income.
Employed Population	566	31,790	529,438	The study area population is characterized by a higher percentage of blue collar and service workers than the City or County.
White Collar	*54.5%*	*79.7%*	*73.0%*	
Blue Collar	*22.0%*	*10.8%*	*14.6%*	
Service	*23.6%*	*9.6%*	*12.4%*	
Unemployment Rate	16.0%	8.6%	11.8%	
Educational Attainment (age 25 and older)				Study area residents have lower educational attainment than the City or County.
High School or Less	56.4%	23.1%	29.9%	
Some College, No Degree	29.2%	26.0%	28.1%	
Bachelor's Degree	9.6%	29.7%	25.0%	
Graduate Degree	4.8%	21.1%	16.9%	

Source: ESRI,U.S. Census Bureau, 2010

HOUSING

Table 2.2 lists housing characteristics for the study area, Rochester Hills, and Oakland County. Rochester Hills and the County have reasonably similar housing profiles, but the study area's housing stock is heavily influenced by the manufactured home park.

Table 2.2. Housing Characteristics

	Study Area	Rochester Hills	Oakland County	Comments
Housing Units	997	29,670	529,328	The study area contains a small, but still notable number of housing units.
Owner Occupied	*83.1%*	74.2%	69.2%	
Renter Occupied	*9.3%*	19.9%	23.7%	
Vacant	*7.7%*	5.9%	7.1%	
Housing Units in Structure				The majority of housing units are located within the manufactured housing park that bisects the southern portion of the study area.
1-family Detached	28.2%	66.2%	68.5%	
1-family Attached	1.6%	9.2%	5.5%	
2+ Units	5.9%	19.4%	22.3%	
Manufactured Home	64.3%	5.2%	3.7%	
Median Home Value	$53,594	$188,393	$154,301	The median home value is much lower than the City or County, which is most likely due to the high proportion of manufactured housing units.

Source: ESRI, U.S. Census Bureau, 2010

BUSINESS AND INDUSTRY

The following Table 2.3 presents the number of businesses and employees in the Study Area, Rochester Hills, and Oakland County classified by NAICS code. Note that the percentages listed for each business sector in each column is that business sector's percentage of the total number of businesses or employees for the geographic area. The percentages allow comparison of the economic structure of the three geographic areas.

The study area business and employment structure is made up of a large proportion of manufacturing businesses, which account for nearly 50% of study area employees. Professional services employees and businesses such as educational services, finance and insurance, health care, professional and technical services, and real estate businesses and employees are proportionally under-represented in the study area. However, the study area does contain a notable number of professional and service businesses, which points to the increasingly flexible use of light industrial buildings for other business purposes.

Refer to the appendix on page 1 for the NAICS code description of each business sector listed in Table 2.3.

Table 2.3. Business and Employee Summary, 2010

Business Sector (by NAICS code)		Study Area	Rochester Hills	Oakland County	Comments
TOTAL	*Businesses*	566	2,505	59,888	Study area businesses are 22% of all businesses in the City, and also employ a larger number of employees per business.
	Employees	12,193	32,991	725,665	
	Employees per Business	21.5	13.2	12.1	
Accommodation and Food Services					
	Businesses	4.4%	5.7%	5.3%	
	Employees	3.5%	8.7%	7.2%	
Administration, Etc.					
	Businesses	4.2%	4.6%	4.9%	
	Employees	1.9%	1.6%	3.1%	
Construction					Construction businesses employ 7.7% of all study area employees, double the County-wide rate.
	Businesses	11.5%	9.0%	8.4%	
	Employees	7.7%	5.0%	3.9%	
Educational Services					
	Businesses	1.9%	2.3%	2.4%	
	Employees	1.2%	6.3%	5.4%	
Finance and Insurance					Finance and insurance employees are underrepresented in the study area and the City
	Businesses	2.5%	4.6%	7.3%	
	Employees	0.3%	1.1%	5.9%	
Health Care and Social Assistance	*Businesses*	4.8%	12.6%	8.5%	Health care and social assistance businesses and employees are proportionally lower in the study area.
	Employees	4.3%	15.3%	12.1%	
Information					
	Businesses	1.6%	1.7%	2.2%	
	Employees	0.1%	0.3%	2.3%	
Manufacturing					The study area contains a majority of Rochester Hills' manufacturing businesses
	Businesses	18.8%	6.8%	4.9%	
	Employees	47.5%	20.8%	14.5%	
Other Services					
	Businesses	5.3%	8.3%	9.9%	
	Employees	1.5%	4.0%	5.2%	
Professional, Technical and Scientific Services	*Businesses*	8.7%	10.3%	12.7%	
	Employees	6.9%	6.1%	11.6%	
Public Administration					
	Businesses	0.9%	1.1%	1.7%	
	Employees	2.1%	2.2%	3.5%	
Real Estate, Rental and Leasing	*Businesses*	1.9%	4.2%	5.0%	
	Employees	0.3%	1.5%	2.8%	
Retail Trade					
	Businesses	13.1%	15.5%	13.4%	
	Employees	6.9%	17.5%	12.3%	
Transportation and Warehousing					
	Businesses	1.1%	1.5%	1.3%	
	Employees	0.1%	1.4%	1.0%	
Wholesale Trade					The study area contains a concentration of wholesale trade businesses.
	Businesses	12.6%	5.9%	5.6%	
	Employees	13.3%	6.0%	6.3%	

Source: Infogroup, 2010

INDUSTRIAL PARKS

The following table lists the industrial parks located in the study area. As noted in the above tables, the study area is still characterized by industrial and manufacturing firms, so its industrial parks are the backbone of the local economy. Most industrial park development activity took place in the second half of the 1980's.

Industrial areas developed during the later 1990's and 2000's have lower average values than do the older industrial parks.

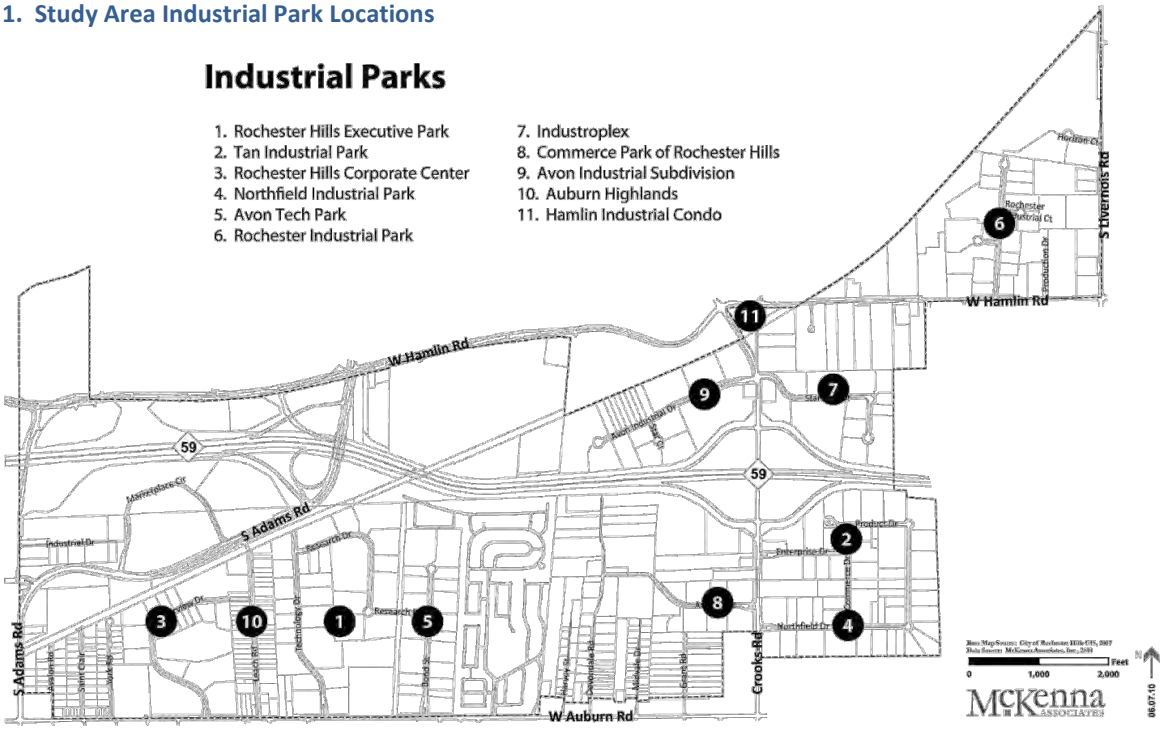
The following Table 2.4 does not include industrially used parcels that are located outside of industrial parks.

Table 2.4. Study Area Industrial Parks

Name	Parcels	Avg. Parcel Area	Total Park Area	Median Year Built	Average Assessed Value	Total Assessed Value
1. Rochester Hills Executive Park	27	3.05	82.25	1988	$1,213,777	$32,771,970
2. Tan Industrial Park	21	2.68	56.30	1987	$1,099,410	$23,087,610
3. Rochester Hills Corporate Center	18	2.63	47.32	1988	$1,189,134	$21,404,420
4. Northfield Industrial Park	29	2.10	60.76	1984	$725,059	$21,026,720
5. Avon Tech Park	19	2.25	42.67	1987	$831,369	$15,796,010
6. Rochester Industrial Park	18	2.26	40.64	1984	$650,324	$11,705,830
7. Industroplex	9	3.07	27.61	1985	$971,782	$8,746,040
8. Commerce Park of Rochester Hills	8	2.27	18.14	1990	$853,708	$6,829,660
9. Avon Industrial Subdivision	14	1.91	26.73	1980	$322,996	$4,521,940
10. Auburn Highlands	29	0.54	15.75	1995	$107,748	$3,124,700
11. Supervisor's Plat No. 9	14	3.19	44.70	1997	$138,849	$1,943,880
12. Hamlin Industrial Condo	4	1.28	5.11	2007	$358,313	$1,433,250

Source: Rochester Hills Assessor

Figure 1. Study Area Industrial Park Locations



Industrial Park Character. The following photographs are examples of occupied or well-maintained industrial park development in the study area.

B. Business Clusters and Emerging Sectors

This section describes existing business clusters and emerging sectors which will likely drive economic growth in the region and the study area in coming years. The purpose of this section is to identify which emerging sectors will be most likely to locate in the study area based on the needs of those emerging sectors and the presence of existing clusters.

This section first identifies regional and local clusters, then identifies the characteristics of emerging sectors and which ones are most likely candidates to locate within the study area.

BUSINESS CLUSTERS DESCRIBED

Business clusters, which are a geographic concentration of interconnected businesses, suppliers, and associated institutions, can help increase productivity and help businesses compete nationally and globally. Often, businesses within a particular sector will cluster together. The most notable local example is the clustering of automotive companies that occurred in Southeast Michigan at the beginning of the 20th century.

Clusters can be *horizontal* where businesses sharing access to complimentary services or resources, or *vertical* such as a supply chain cluster.

Cluster types include:

- *knowledge-based clusters* that are located around research centers (e.g. silicon valley, or research triangle)
- *competence clusters* that develop over time based on the skill and know-how of companies and workers (e.g. Detroit automotive or New York financial clusters), and
- *factor clusters* that grow due to a comparative advantage offered by a geographic location (e.g. the cherry and wine agriculture industries in Northern Michigan or mining/forestry industries)

SOUTHEAST MICHIGAN BUSINESS CLUSTERS

Identifying existing clusters within the broad Southeast Michigan region is the first step in identifying likely businesses that will

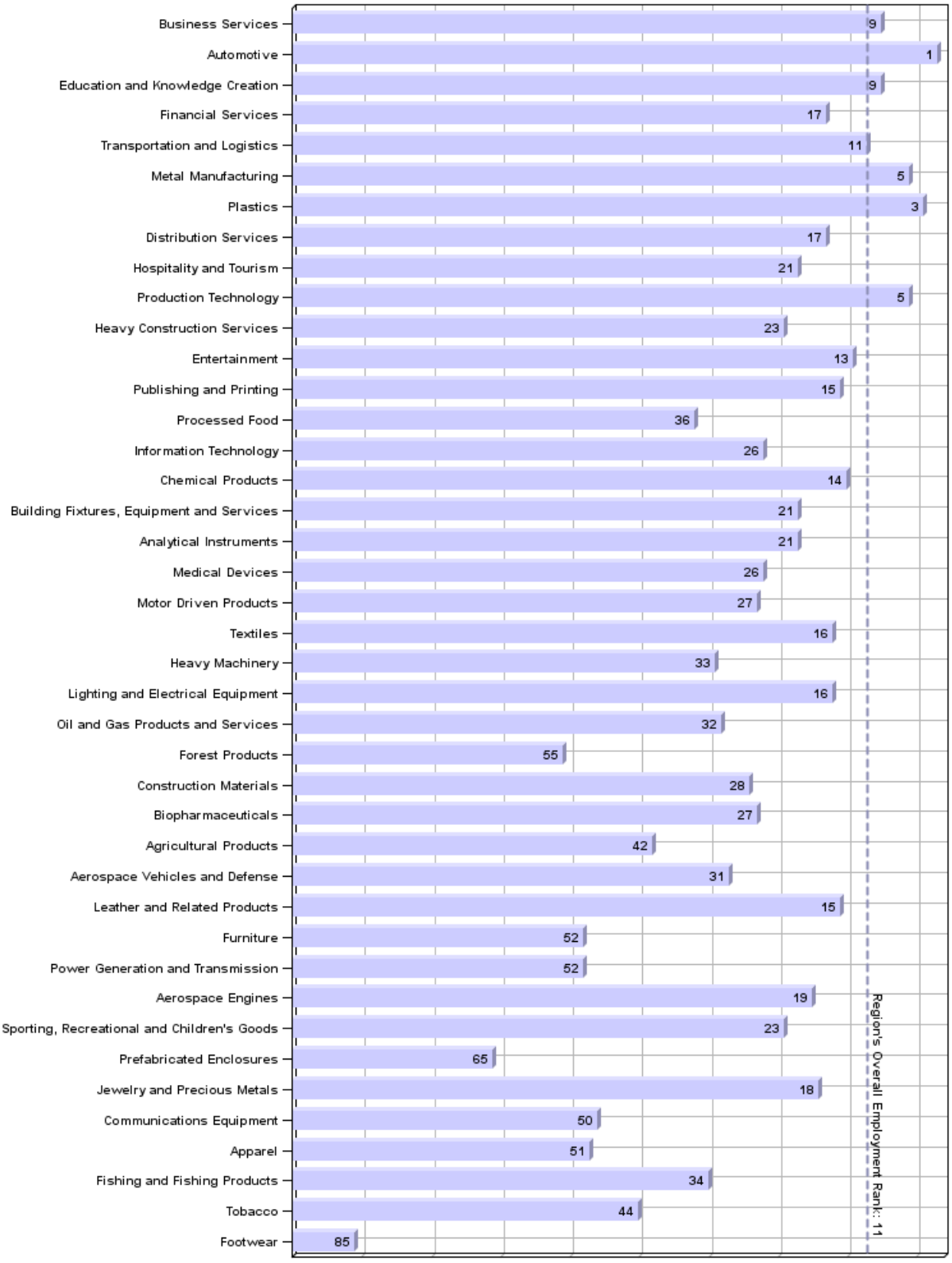
Figure 2 on the following page indicates the major employment clusters for the Detroit-Warren-Flint economic area. In the following figure, the region's national rank in terms of employment is indicated at the end of each bar. The dashed line shows the region's overall employment rank, which is 11th in the nation.

This means that any industry category that is higher than 11th nationally represents a local cluster. For instance, our region is ranked first for automotive-related employment. Not surprisingly, other important clusters are in some way related to the manufacture of automobiles which are large, complex machines – metal manufacturing, plastics, and production technology are all within the top-5 nationally.

Therefore, on a regional basis the most notable strengths are in the design and manufacture of complex machinery. Production technology and the skills and abilities to create highly precise components for complex machines are important competence clusters upon which the region can build.

There are a number of business clusters where the region has employment commensurate with its overall employment ranking. These clusters are also potential areas of competitive advantage, although it is more likely that these employment clusters will support the production technology clusters rather than become significant clusters in an of themselves.

Figure 2. National Employment Rank by Cluster, Detroit-Warren-Flint Economic Area



Source: Cluster Mapping Project, Harvard Business School with Data from 2007 U.S. Economic Census - http://www.isc.hbs.edu/econ-clusters.htm

STUDY AREA CLUSTERS

The study area is a small area within the larger regional context, and therefore it is inappropriate to use the traditional location quotient approach to identifying clusters. Instead, we have obtained employment and sales data from Infogroup which identifies businesses based on geographic location. Using this data we have identified existing companies with 20 or more employees and/or annual sales exceeding $4 million. We then classified those companies by their North American Industrial Classification System (NAICS) code to identify what kinds of business are prevalent in the study area.

Table 2.5. Study Area Busines Types - 2 Or More Businesses By NAICS Code

NAICS Code	NAICS Description	Businesses
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers	7
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing	6
334419	Other Electronic Component Manufacturing	5
336399	All Other Motor Vehicle Parts Manufacturing	3
541330	Engineering Services	3
423830	Industrial Machinery and Equipment Merchant Wholesalers	3
332710	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	3
333319	Other Commercial and Service Industry Machinery Manufacturing	3
423690	Other Electronic Parts and Equipment Merchant Wholesalers	3
326199	All Other Plastics Product Manufacturing	2
441310	Automotive Parts and Accessories Stores	2
443120	Computer and Software Stores	2
423210	Furniture Merchant Wholesalers	2
335312	Motor and Generator Manufacturing	2
424110	Printing and Writing Paper Merchant Wholesalers	2
711310	Promoters of Performing Arts, Sports, and Similar Events with Facilities	2

Source: Infogroup USA

Table 2.5 indicates that the study area contains a skilled manufacturing and wholesaling cluster. Concentrations of manufacturing and production businesses include specialty tool and die shops, electronic component manufacturing, other motor vehicle parts manufacturing, machine shops, plastics product manufacturing, and motor and generator manufacturing.

Wholesalers are also prevalent in the study area. Prevalent wholesalers include motor vehicle supplies, industrial machinery and equipment, electronic parts and equipment, furniture, and printing and writing paper wholesalers.

EMERGING SECTORS

Oakland County Planning and Economic Development have identified ten emerging sectors as targets for economic development efforts in the County. Those sectors represent are anticipated growth industries which could be the foundation for the County's future economic makeup. Rochester Hills will benefit from the County's economic development efforts, and accordingly we identify the emerging sectors that have the most potential to succeed in the study area given business clusters and the characteristics of the area.

The emerging sectors are listed below, along with comments on each sector's appropriateness for the study area.

Table 2.6. Emerging Sector Prioritization

Sector	Description	Comments	Priority
Advanced Electronics & Control Systems	Advanced transportation technologies, simulation, telematics, mechatronics, and navigation systems	The study area contains existing businesses engaged in and supportive of this sector. Existing buildings are well-suited to accommodate these kinds of uses.	Target sector
Advanced Materials & Chemicals	Chemical engineering, thermal management, composites and coatings	The study area contains existing businesses engaged in and supportive of this sector. Existing buildings are well-suited to accommodate these kinds of uses.	Target sector
Aerospace	Military & civilian aircraft, components, simulation and design	Aerospace is a cyclical industry, and the study area is not well situated. Other areas within the region are better positioned for the aerospace industry, such as the western Wayne County area proximate to Detroit Metropolitan and Willow Run airports, and the defense cluster located in Macomb County. There are elements of automobile production that can be repurposed for the aerospace sector, so companies in this sector should be opportunistically pursued rather than being a focus industry.	Opportunistic
Alternative Energy & Power Generation	Advanced battery technology, fuel cells, hydrogen, solar/wind/wave energies	The study area contains existing businesses engaged in and supportive of this sector. Existing buildings are well-suited to accommodate these kinds of uses.	Target sector
Communications and Information Technology	Wi-Fi and Bluetooth, sensor networks, microwave technology, knowledge systems	Businesses in this sector are not an exact fit for the prevalent type of building space available in the study area.	Opportunistic
Defense/Homeland Security	Computer network security, weapons and vehicle systems, advanced recognition systems	An emerging defense/homeland security cluster is developing along the Mound Road corridor in Macomb County, centered around and leveraging the U.S. Army Tank-Automotive Command (TACOM) facility in Warren.	Opportunistic
Film & Digital Media	Digital content, filmed entertainment, digital effects processing, video games, publishing, advertising	Southeast Michigan is benefiting from the recently enacted tax credits, which are the highest in the nation. A few communities, notably Allen Park and Pontiac have large studio spaces under development. However, the study area does not have the large, vacant warehouse spaces that are being converted to studio space, and does not contain digital media businesses. Given the uncertainty over the political survivability of the tax credit and the physical characteristics of the area, this is not a likely growth sector.	Low
Health Care/Life Sciences	Medical equipment, pharmaceuticals, medical records	The approved Madison Park project, located north of M59 between Crooks and Adams Road contains a significant medical office and medical research component. It is likely that this area, if developed, will be the focus for medical development in the study area. Spin-off uses should be opportunistically pursued for other areas within the sub-area, but should not be a priority for general recruitment efforts.	Target sector for Madison Park; opportunistic elsewhere
Robotics & Automation	Automated manufacturing, computer aided design, computer architecture, robotic systems engineering, nanotechnology	The study area contains existing businesses engaged in and supportive of this sector. Existing buildings are well-suited to accommodate these kinds of uses.	Target sector

C. Land Use and Development Age

LAND USE

The study area's existing land use is predominantly industrial and commercial, with the exception being a few residential neighborhoods located along cul-de-sac streets that extend north from Auburn Road, and a large manufactured housing park in the center of the study area.

There is a developing regional commercial area – the Marketplace of Rochester Hills, located north/west of Adams Road and south of M59. A research and development cluster exists on the north side of M59 west of Adams Road.

Figure 3. Existing Land Use

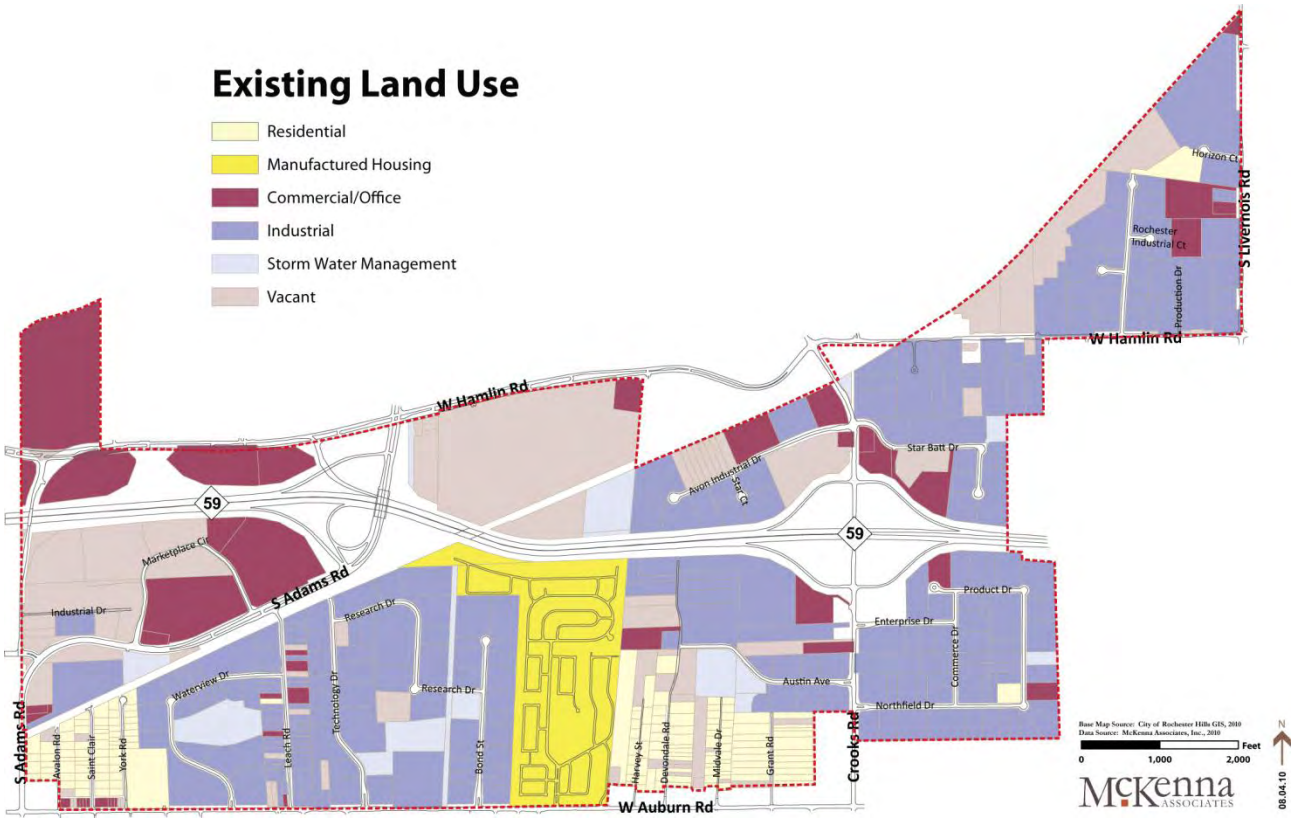


Table 2.7 shows the number, area, and aggregate assessed value of the land use categories shown in Figure 3, with the exception that vacant parcels are classified according to the assessor's use classification in Table 2.7. The table shows that industrially used land accounts for approximately 40% of the total study area. The second largest land area is for business vacant parcels, indicating that the potential exists for new commercial and retail development in the study area. There is a relative lack of industrial vacant land – just 55 acres.

Table 2.7. Parcel Characteristics by Use Description

Use	Parcels	Acres	Aggregate Assessed Value
Apartment Improved	1	20	$ 6,349,130
Apartment Vacant	2	3	$ 169,240
Business Improved	51	171	$ 61,979,610
Business Vacant	41	225	$ 22,081,340
Manufactured Housing	2	106	$ 7,152,480
Industrial Improved	226	601	$ 183,369,700
Industrial Vacant	29	55	$ 2,642,120
Residential Improved	153	107	$ 11,477,980
Residential Vacant	43	196	$ 586,310
Utility Improved	1	0	$ 23,750
Utility Vacant	3	10	$ 272,030
TOTAL:	**552**	**1,495**	**$ 296,103,690**

Source: Rochester Hills Assessor

Table 2.8 shows the number of buildings and the total floor area of buildings by occupancy. The number of buildings in Table 2.8 is greater than the number of parcels in Table 2.7 because many parcels contain more than one building. The purpose of Table 2.8 is to provide an indication of the types of uses that exist in the study area.

- Industrial uses as a whole account for 87% of all floor area in the study area, while engineering and light manufacturing industrial uses specifically account for 81.5% of all floor area in the study area.
- Medical and professional office uses account for 3.1% of all building space in the study area.
- Retail and commercial uses account for 9.9% of all occupied building space in the study area.

Table 2.8. Building Characteristics by Occupancy

Building Occupancy	Buildings	Total Floor Area
INDUSTRIAL		
Garage, Service/Repair	6	17,866
Garage, Storage	13	19,653
Industrial, Engineering	85	3,023,217
Industrial, Light Manufacturing	196	5,202,655
Warehouse, Mini	5	91,350
Warehouse, Storage	15	415,904
Warehouse, Transit	1	10,500
INDUSTRIAL TOTAL:	**321**	**8,781,145**
OFFICE		
Hospital, Veterinary	1	3,484
Medical Office Building	11	116,296
Professional Office Building	16	194,629
OFFICE TOTAL:	**28**	**314,409**

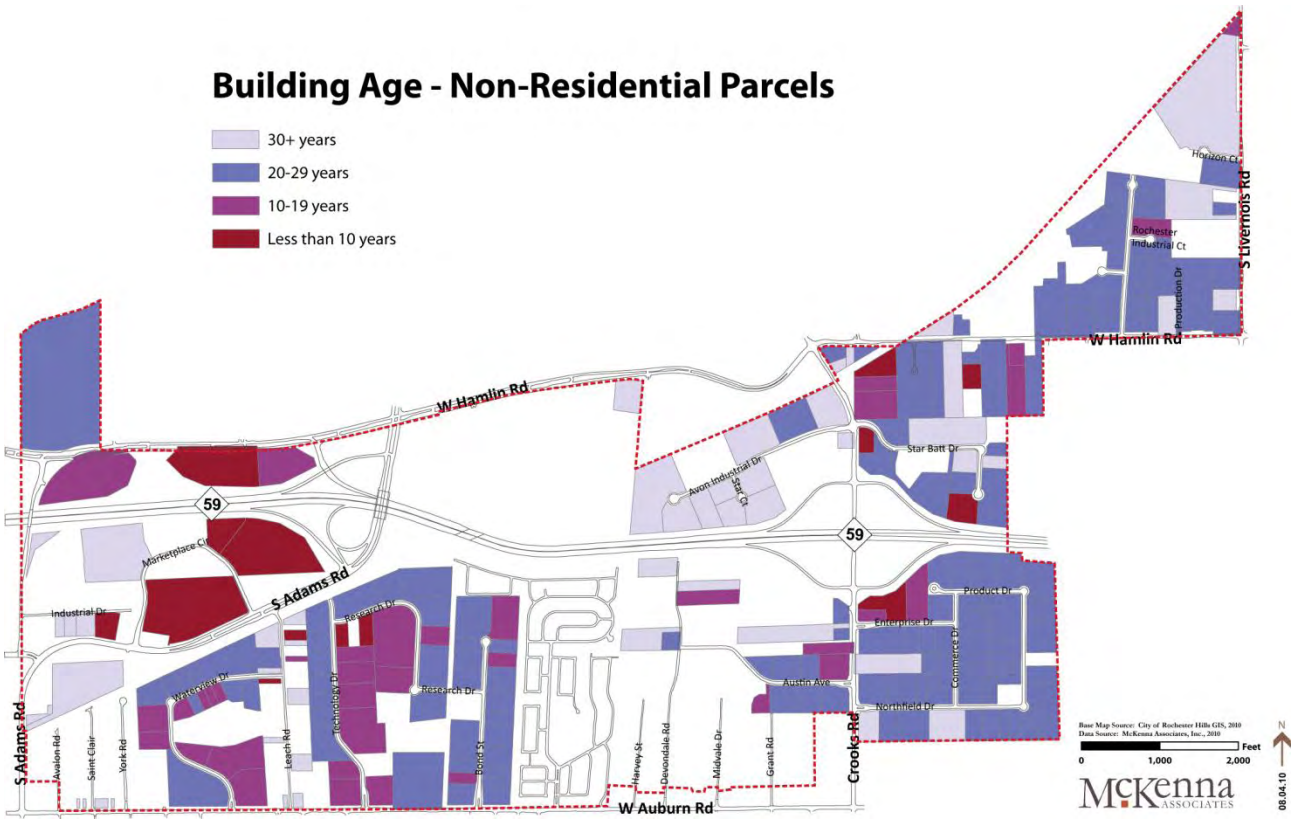
Building Occupancy	Buildings	Total Floor Area
RETAIL/COMMERCIAL		
Bank	1	1,600
Barber - Beauty Shop	1	468
Commercial Recreation	3	58,082
Convenience Market	5	11,107
Day Care Center	1	7,512
Health Club	3	32,190
Motel	3	181,800
Restaurant	6	34,878
Restaurant, Fast Food	6	19,814
Shopping Center, Neighborhood	6	111,772
Store, Discount	3	391,514
Store, Retail	10	152,696
RETAIL/COMMERCIAL TOTAL:	**48**	**1,003,433**

Source: Rochester Hills Assessor

BUILDING AGE

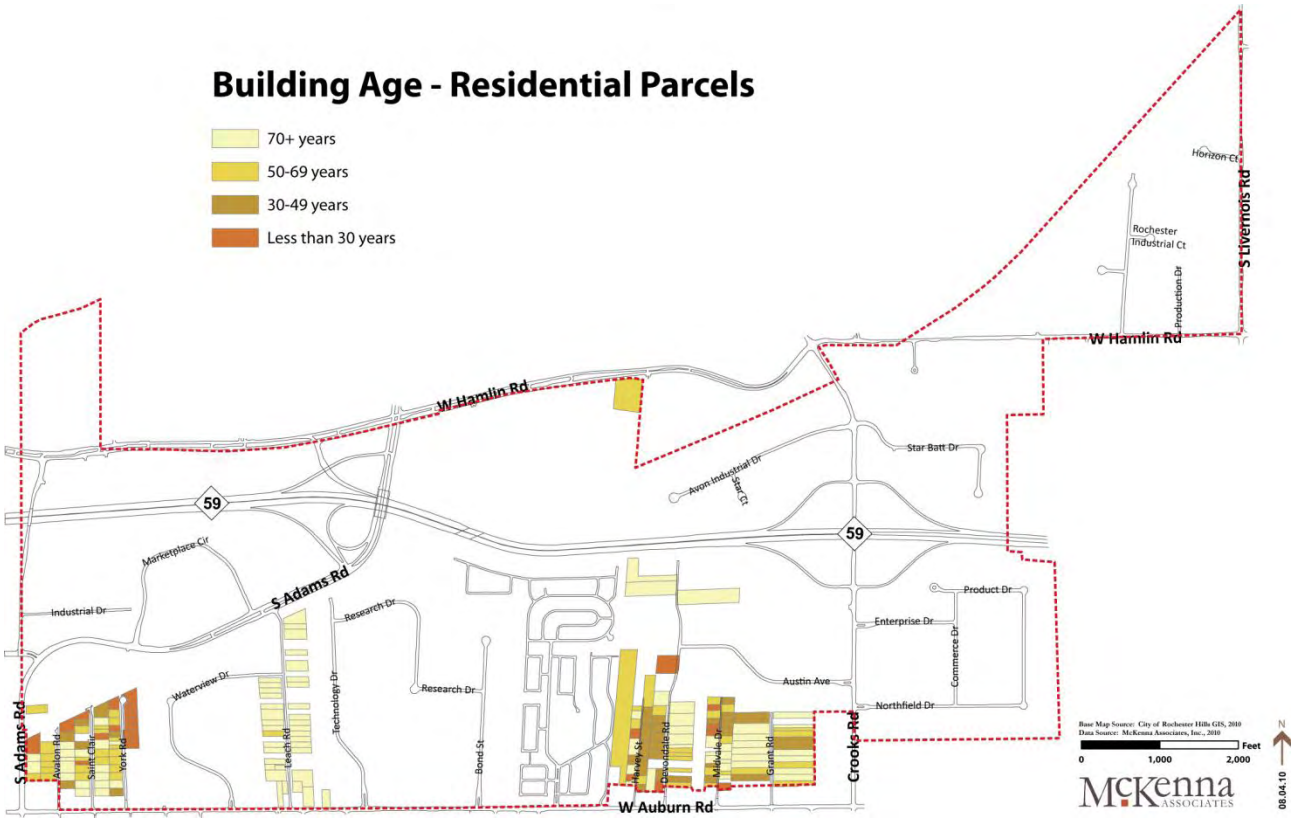
Non-residential buildings in the study area are generally older than 20 years old, with most of the buildings that are less than 20 years old being located in the western part of the study area. Building age is important for non-residential buildings because they have a shorter usable life span than do residential buildings.

Figure 4. Building Age – Non-Residential Parcels



Residential buildings are nearly all older than 30 years of age, with a sizeable percentage of residential buildings being older than 70 years of age. Leach Road in particular has older residential housing stock, indicating that it may be a likely area of change in the coming years.

Figure 5. Building Age – Residential Parcels



D. Physical Conditions

STREETS AND CIRCULATION

Figure 6 shows the regional and local street and circulation network. In the figure, the network of regional streets are denoted by the arrowheads where the exit the study area. Perhaps the most notable characteristic of the street network in the study area is the lack of connecting local streets. In fact, the only local streets that connect to more than one of the regional streets are Leach Road and Devondale Road/Austin Drive, and it was only recently that these connections were made.

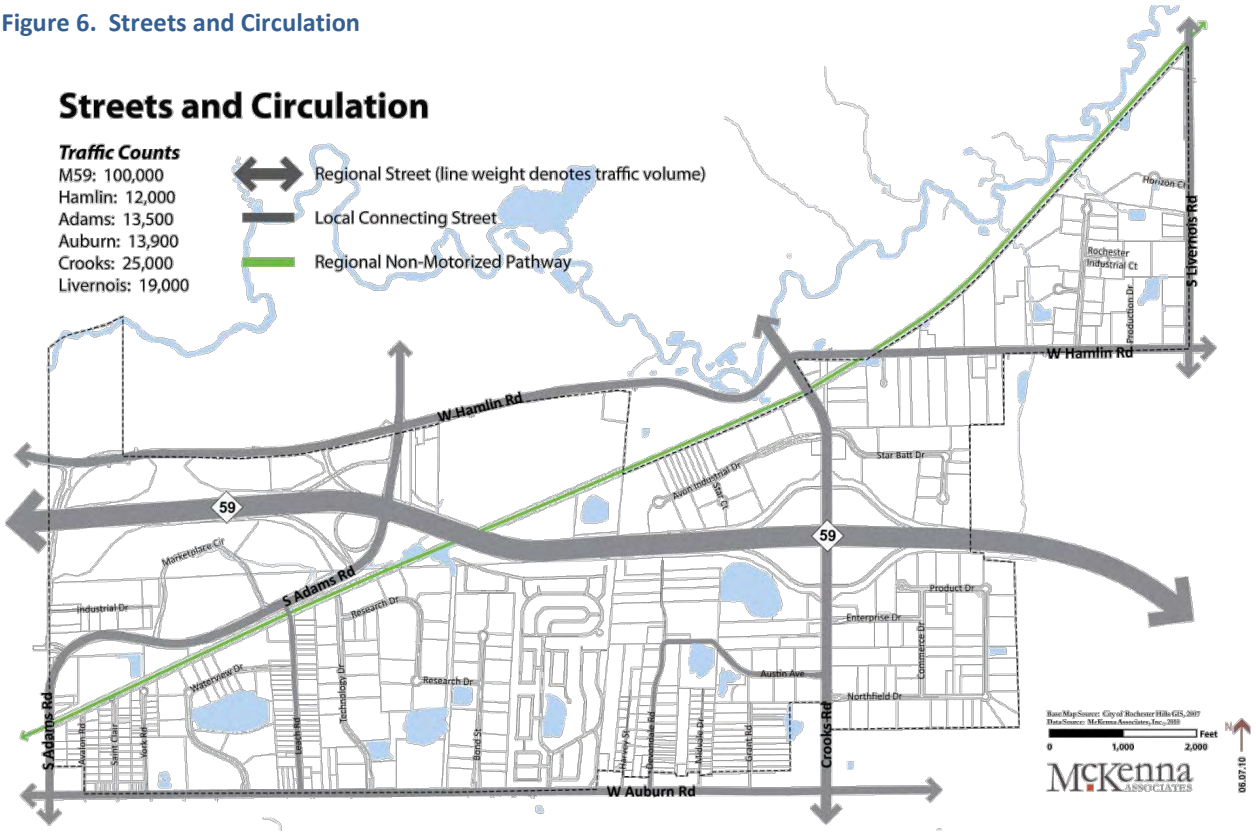
All other local streets in the study area are cul-de-sac streets or loop roads that serve a single development. This lack of connectivity prevents the study area from having a cohesive nature, with each development standing on its own. This lack of connectivity will serve as a barrier to the study area reaching its full potential.

The **area north of M59** is constrained to the north by the non-motorized pathway and the Clinton River, so it is unlikely that an integrated street network can be developed in this area. Hamlin Road connects the east and west sides of the study area.

The **area south of M59** has Auburn Road as its spine and primary connecting street. Recently the South Adams Road realignment has provided Leach Road with a secondary access. However, the only major east-west connecting street is Auburn Road. The study area south of M59 can be tied together with a common internal street network in the future by developing a local east-west street in between Auburn road and M59 to connect the various north-south culs-de-sac and loop roads.

Developing an internal local street network will improve the overall function of the area by removing local trip pressures from the arterial street network, and by allowing for uses in adjacent developments to better take advantages of clustering opportunities.

Figure 6. Streets and Circulation



Street Design. Internal streets in the study area are consistently designed with clear priority given to vehicle traffic. No pedestrian amenities are provided, and most streets do not have a tree canopy. Buildings are set back from the street, with main entrances typically being located on the side of the building facing the visitor parking lot that extends along a side property line.

The street design in the study area was intended to facilitate vehicle movement. This may have been appropriate when the primary use of the study area was for light assembly and manufacturing, but as the study area transitions to alternate and more parking-intensive uses, a complete streets design policy should be implemented. Complete streets consider the needs of pedestrians, non-motorized traffic, and vehicle traffic equitably. While truck traffic will remain a reality and will drive the design of streets to some extent, other design elements such as sidewalks, on-street parking, and street trees will help to create a more hospitable street environment that is more amenable to the range of uses found in the study area today. See Section 5.E on page 68 for detailed street design guidelines.

Image 1. Existing Street Design

PARKING

The study area developed under light industrial zoning, and as such, the minimum parking requirements that were applied when most existing sites were developed were industrial standards. However, as buildings and uses evolve in the study area, parking requirements can be a problem. When a building is converted from light industrial uses to office, R&D, or technology uses the parking requirement often increases. The requirement to provide additional parking can be a significant barrier to the continued evolution of buildings and uses in the study area.

Image 2. Rochester Hills Corporate Center

Parking Supply. In order to provide a better understanding of the scale of the parking deficit in the study area, we examined existing parking conditions the Rochester Hills Corporate Center (RHCC) industrial park.

Following are the key attributes of the RHCC industrial park:

Total parcels: 18

Aggregate building floor area: .....488,169 sq. ft.
Office floor area (20% of total): .....97,634 sq. ft.
Industrial floor area (80% of total): .....390,535 sq. ft.

Required office parking (1/200 sq. ft.):..... 488 spaces
Required industrial parking (1/550 sq. ft.): ..... 710 spaces
Total required parking:.....1,198 spaces

The parking requirements in the above list are those that were in place when the RHCC was first developed. The office and industrial floor area percentages were calculated based on empirical measurements of a sample of buildings in the industrial park. Based on an empirical sample of sites in the RHCC, we found that sites provided the minimum number of spaces required for that site, so it is assumed that the current parking supply in the RHCC equals the minimum parking required or 1,198 spaces.

Parking Required for Office Uses. In order to determine the minimum number of spaces that could be required in the RHCC if all of the buildings were to convert to office uses, we must divide the aggregate floor area by the current Zoning Ordinance's minimum parking requirement of 1 space per 350 square feet of office floor area. This results in a potential minimum parking requirement of 1,395 spaces.

Parking Gap. The parking gap in the RHCC is 1,395 spaces required minus 1,198 existing spaces = 197 parking spaces. This equates to a deficit of one space per 2,478 square feet of aggregate building area, or 11 spaces per parcel in the RHCC.

Additional On-Street Parking Spaces. Little or no developable land remains on most all of the parcels in the RHCC. The only remaining land in the RHCC (indeed, in all of the industrial parks in the study area) is located in the front yard between the building and the street. However, this area is typically 50 or fewer feet deep, so just one single-loaded row of parking could be provided. Developing these front yards for parking would result in minimal parking gain and would come at significant aesthetic cost. Thus, providing additional parking will require the construction of parking decks, demolition of buildings to provide parking spaces, or allowing on-street parking.

On-street parking could be provided within the study area's industrial parks. Most industrial streets are 36 feet wide, which provides 18 foot travel lanes when no parking is provided. By comparison, travel lanes on most public streets (such as Auburn, Hamlin, and Adams Roads) are 12 feet wide. Parking lanes are usually 8 feet wide, meaning that that it is feasible to provide parking on one or both sides of streets in industrial parks. If parking is allowed on one side of the street, it results in one parking lane and two 14-foot wide travel lanes. If parking is allowed on both sides of the street, it results in two parking lanes and two 10-foot side travel lanes.

To gain some perspective on the ability of on-street parking to meet the projected parking gap, we measured the total linear road distance, the number of driveway openings, and a typical driveway approach width where it meets the road cross-section. On-street spaces are assumed to be 24 feet in length. The results follow:

	Parking One Side	Parking Both Sides
Linear Feet	2,800 ft.	5,600 ft.
Driveway Openings	11	21
Driveway Opening Width	75 ft.	75 ft.
Total Driveway Openings:	825 ft.	1,575 ft.
Effective Parking Lane Length	1,975 ft.	4,025 ft.
Parking Space Length	24 ft	24 ft.
On-Street Parking Spaces:	82	168
Percentage of Total Parking Gap	41.6%	85.3%

Additional Off-Street Parking Spaces. A potential solution to the parking gap would be for the LDFA or other public entity to provide communal off-street parking lots. Doing so would in most cases require the acquisition of an existing site and demolition of a building due to the largely built-out nature of the study area's industrial parks. In order to estimate the land area required to provide necessary off-street parking, we use an assumed 350 square feet of land area per parking space to account for the parking space, maneuvering aisles, landscaping, and other setbacks. Thus, to provide 197 spaces, a communal parking lot in the RHCC would have to have an area of approximately 69,000 square feet or 1.58 acres.

In the RHCC there are four parcels with areas between 0.5 and 0.76 acres, 5 parcels with areas between 1.03 and 1.47 acres, 5 parcels with areas between 1.89 and 2.98 acres, and 4 parcels with areas of 4.47 acres or greater. This means that providing a community off-street parking lot would require the acquisition of one of the 9 parcels that are over 1.89 acres or two contiguous parcels in a central location in the industrial park. These requirements mean that it is possible, but not probable that the LDFA or other public entity could provide communal off-street parking lots in industrial parks.

Parking Conclusions. Based on the above analysis, the total parking gap can be reduced by 40% to 85% in industrial parks by allowing on-street parking on one or both sides of the street. This is a significant proportion of the overall parking gap, and would help eliminate a significant obstacle to the continued evolution of buildings and uses in the study area. However, there are a few existing barriers to the effective provision of on-street parking spaces in the study area. These include:

- Lack of sidewalks to facilitate parking space to workplace foot travel
- Hostile pedestrian environment
- Revised street design must allow for effective truck circulation which could reduce the on-street parking yield
- On-site parking requirements do not take on-street parking spaces into account
- Low probability of LDFA or other public entity being able to provide community off-street parking at a reasonable cost

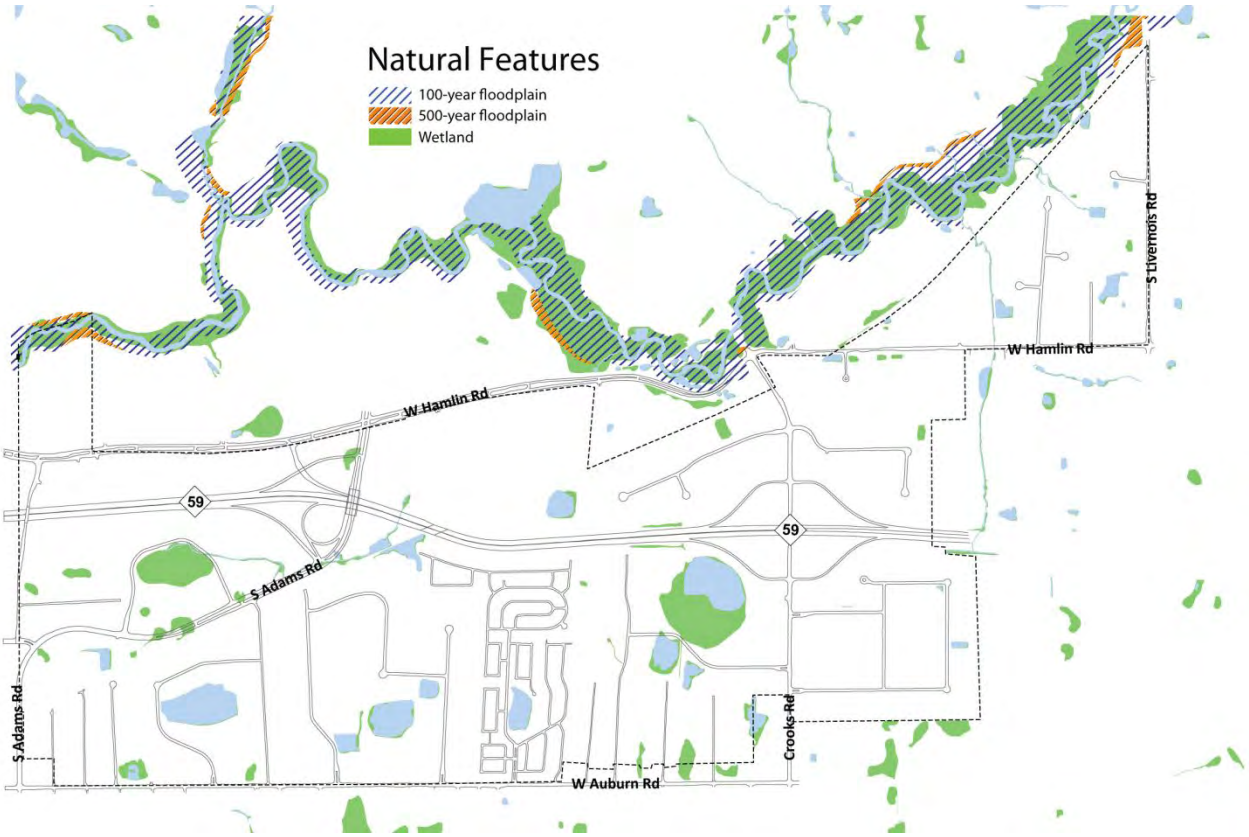
All of the above barriers can be addressed, with varying degrees of cost. Acquiring developed sites and converting them to community parking lots represents a significant and likely prohibitive cost. Constructing sidewalks and installing other elements to create a more pleasing pedestrian environment to facilitate on-street parking would represent a substantial, but likely reasonable cost (estimated at $55,000 to construct sidewalks on one side of the street or $110,000 on both sides of the street at $20/linear foot). Revising the Zoning Ordinance to reduce the minimum parking requirement where on-street parking is available would represent a minimal cost.

NATURAL FEATURES

Figure 7 shows the location of natural features that limit the development potential of land – the 100 and 500 year floodplains, and wetlands. The figure indicates that there are few substantial natural features located within the study area, with the most notable ones being a wetland along Marketplace Drive north of South Adams Road, and a wetland/pond area just to the southwest of the Crooks/M59 interchange.

Wetlands are not a permanent feature, and can be developed upon provided that they are mitigated. The costs of mitigation will increase the development cost for parcels that contain wetlands.

Figure 7. Natural Features



E. Value

VALUE BY PARCEL AREA

Parcel value is a usable metric when land is being assembled for redevelopment and when existing buildings will be demolished or significantly altered to accommodate the new use. Areas with lower values per acre are more likely candidates for change than are areas with higher value per acre. The following map indicates that the eastern and western thirds of the study area have higher land values per acre than does the central third.

Leach Road may be a likely candidate for change given the relatively lower parcel values per acre along its length, and its recent connection to South Adams Road. Based on value per acre, other parcels that have the potential for change include the manufactured housing park and the parcels along Haney, Devondale, Midvale, and Grant Roads. Devondale in particular may be a candidate for change due to the recent connection of Austin Avenue which provides a second point of access to Devondale.

Figure 8. Parcel Value Per Acre

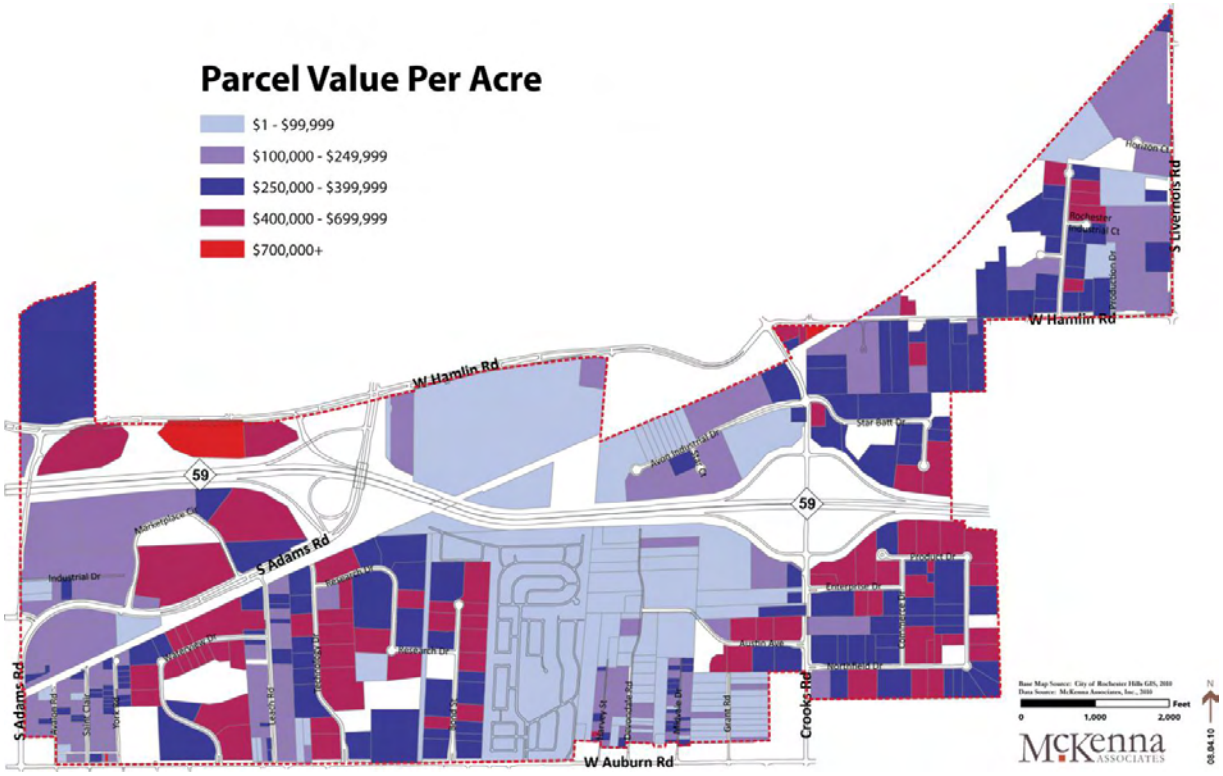
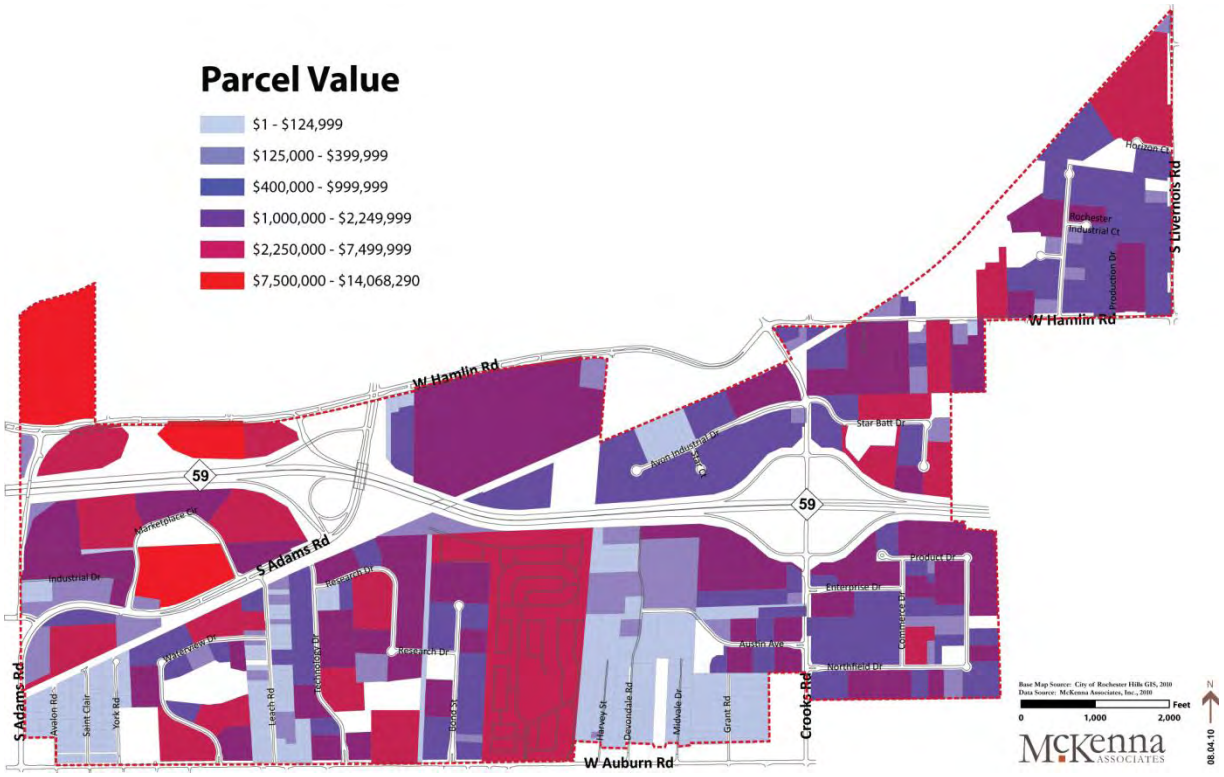


Figure 9 shows absolute parcel values.

Figure 9. Parcel Value



HIGHEST VALUE PROPERTY OWNERS

The following Table 2.9 shows property owners with the highest aggregate assessed values in the study area. The location and ownership of the high-value parcels in the study area indicates areas where significant investment has been made, and where the developed or planned character is unlikely to change.

Table 2.9. Highest Aggregate Land Value by Ownership

Owner	Aggregate Value	Owner	Aggregate Value
1. The Marketplace of Rochester Hills	$16,678,640	9. Star-Batt Inc.	$6,131,420
2. Fanuc Robotics Corporation	$14,068,290	10. Commerce Park Associates L.L.C.	$5,900,130
3. First Industrial Realty Trust, Inc.	$13,424,030	11. K & F Land Company IV L.L.C.	$5,224,340
4. Nosanchuk, Joel	$12,960,320	12. Dana Corporation	$4,348,030
5. Wal-Mart	$9,210,320	13. Exhibit Enterprises Inc.	$3,537,450
6. Volkswagen of America, Inc.	$8,510,150	14. American Axle & Manufacturing, Inc.	$3,174,220
7. Chateau Estates (Avon)	$7,152,480	15. Rochester Commerce Commons	$3,010,790
8. Lake Village of Rochester Hills L.L.C.	$6,349,130		

Source: Rochester Hills Assessor 2010

VALUE BY BUILDING AREA

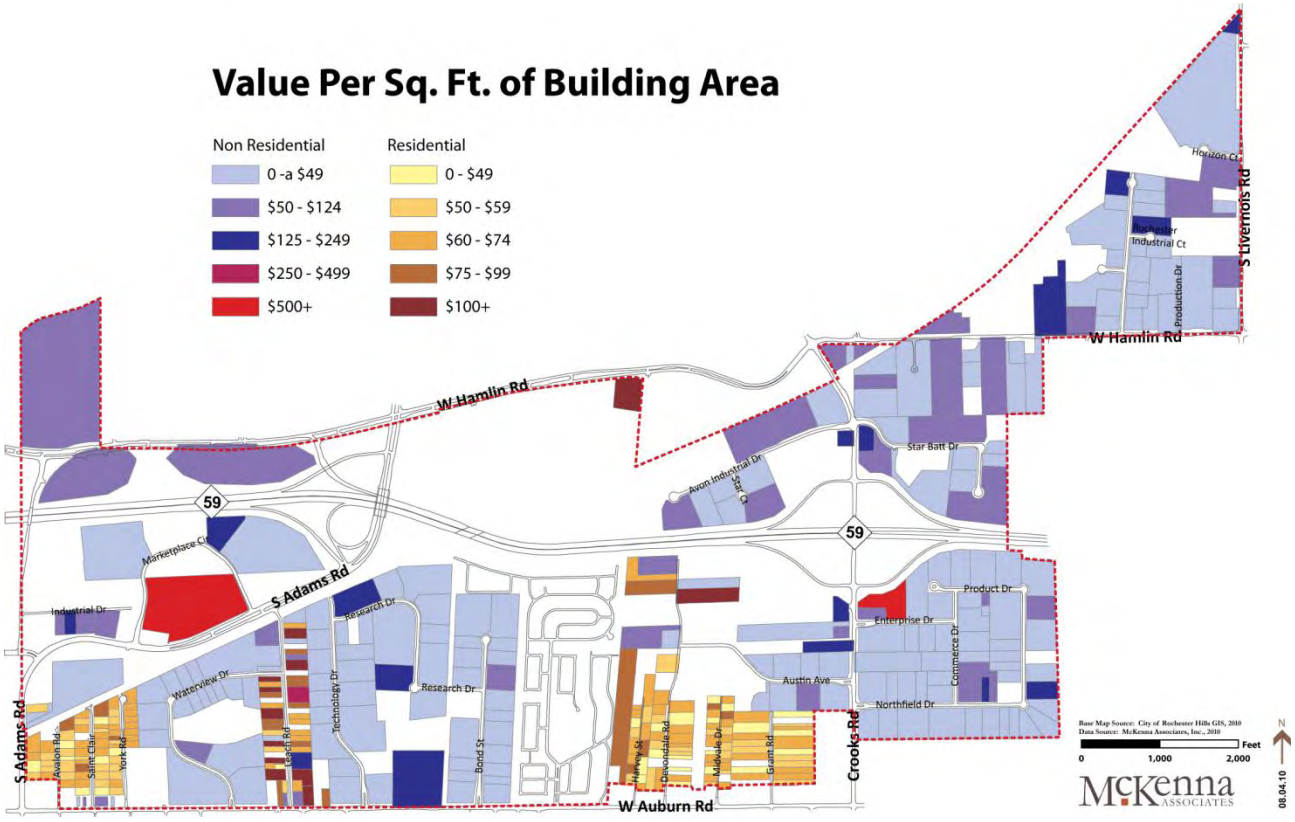
Value by building area is an indicator of value when a parcel or parcels is purchased with the intent to use the existing building in a substantially unchanged manner. The following maps show value by square foot of building area for non-residential and residential parcels.

Non-residential values are generally less than $124 per square foot, with isolated parcels having higher land values. This indicates that there is the opportunity for further intensification within the study area, as parcels have somewhat low values per square foot of building area. Office uses have higher values per square foot of building space than do industrial parcels, and so a shift towards office uses within the study area would increase non-residential property values as measured by square foot of building space.

Residential values are mostly in the $60 - $99 per square foot range, which is not exceptional in this market. This indicates that residential property values are stable and in many instances unlikely to change. However, most of the parcels along Leach Road are valued at higher than $100 per square foot. Given the age of buildings and lower values per acre along this stretch of road, the higher values per square foot indicate that Leach Road property values anticipate their future conversion to non-residential uses.

Given the recent connection of Devondale Road and Austin Avenue, it is likely that property values on Devondale Road will also increase in the foreseeable future.

Figure 10. Value Per Square Foot of Building Area



F. Market Conditions and Trends

MARKET OVERVIEW

The southeast Michigan industrial market appears to have stabilized and begin recovery through the end of 2011. Industrial vacancy rates reached a high of 17% in 1Q 2011, but dropped to 14.5% by the end of 2011. Office vacancy rates dropped by 0.5% to 27.4%. These market signals indicate that economy as a whole is slowly recovering from the recent deep recession.

In what is clearly good news, the Bureau of Labor Statistics reports than Michigan had about 499,000 employees in the manufacturing sector in 2011, which is the highest since 2008 and up from 454,000 workers in the middle of 2009.

While the economic recovery is expected to continue to be slow, these broad market indicators are positive indications that the worst may be over for Michigan's economy. There is still a large amount of excess office and industrial space on the market which will take time to absorb, but lease rates are likely at or near a bottom.

INDUSTRIAL MARKET CONDITIONS AND TRENDS

Rochester Hills and the study area are located within the I-75 Corridor submarket, as reported by brokerage firm CB Richard Ellis. The I-75 corridor includes Troy, Bloomfield Township, Pontiac, Rochester, Rochester Hills, Auburn Hills, and the northern Oakland County Townships that straddle I-75. The I-75 corridor submarket contains about 15% of the Detroit region's industrial space, but the large land area size of the submarket means that there is variation in industrial character and performance of specific communities within the subarea.

Table 2.10 summarizes industrial market conditions for the Detroit region's major industrial submarkets. To this table we have added the results of our Study Area survey.

Table 2.10. Industrial Market Conditions

Submarket	Market Size	Availability Rate %	Vacancy Rate %	3Q 2011 Net Absorption	12-Month Absorption	Construction	Avg. Asking Lease Rate
STUDY AREA:	*9,900,000*	*12.1*	--	--	--	--	*$5.47*
Detroit	88,381,152	15.6	12.5	194,800	556,876	0	$3.53
Downriver	60,251,431	16.1	15.8	-64,457	352,187	0	$4.12
I-75 Corridor	79,477,210	15.3	14.4	517,853	1,179,687	0	$5.08
Macomb	103,025,931	12.2	11.4	316,235	1,620,195	0	$4.13
Northwest Suburbs	58,193,972	18.8	17.9	141,477	564,895	0	$6.09
SE Oakland	14,152,972	14.0	13.2	61,231	138,442	0	$3.79
Washtenaw	22,244,162	10.9	9.6	57,930	7,859	0	$5.15
Western Wayne	97,499,139	12.4	12.0	572,472	835,516	0	$4.35
TOTAL:	**524,255,969**	**14.5**	**13.3**	**1,797,541**	**5,255,657**	**0**	**$4.47**

Source: CBRE MarketView Detroit Industrial Report, Fourth Quarter 2011

In order to assess the specific industrial market conditions in the M-59 corridor study area, we surveyed available industrial buildings in the study area. This survey was completed in mid-June of 2010 and indicated that approximately 1,200,000 square feet of building space was available for lease out of a total industrial floor area of 9,900,000 square feet – an availability rate of approximately 12.1%. Asking lease rates ranged from $3.50 to $6.00 per square foot, with the average asking lease rate being $5.47.

Finally, there was positive absorption during 2011 equaling roughly 1% of total floor space within the market. Still, to return to a more normal 7.5% availability rate, the market will have to absorb an additional 42,000,000 square feet of industrial space. At a rate of 5.25 million square feet per year it would take 8 more years to return to a

7.5% availability rate. While absorption rates will vary with the economic rebound, it is clear that speculative new building will not resume for some time while the market absorbs today's excess capacity.

Table 2.11. Industrial Property Type

Property Type	Market Size	Available S.F.	Availability Rate %	Avg. Asking Lease Rate
Manufacturing	276,216,111	32,227,825	11.7	$4.25
R&D/Flex	47,219,055	8,485,196	18.0	$7.35
Wholesale/Distribution	177,241,318	33,100,999	18.7	$4.05
Other	23,549,485	1,936,028	8.2	$4.07

Source: CBRE MarketView Detroit Industrial Report, Fourth Quarter 2011

Table 2.11 shows the different types of industrial space within the market area. Manufacturing space is performing relatively well compared to R&D/flex space and wholesale/distribution space.

OFFICE MARKET CONDITIONS AND TRENDS

Rochester Hills and the study area are located in the Rochester office submarket, as reported by brokerage firm CB Richard Ellis.[1] The Rochester office submarket consists of Rochester Hills and Rochester, and is a very small portion of the overall Metropolitan Detroit office market, representing less than 1% of all office space. Rochester's proximity to two of the three largest office submarkets in the region – Southfield and Troy – will impact the office development potential for the M-59 corridor area. Those large suburban-style office submarkets still have higher than average vacancy rates which will dampen demand.

On the other hand, two nearby smaller submarkets that are performing well above regional averages are Auburn Hills and Birmingham/Bloomfield. Auburn Hills is likely benefitting from the resurgence of Chrysler, while Birmingham/Bloomfield is a one of the few markets within the region in that it offers a walkable, urban-style setting (Ann Arbor and Detroit being the others). It is notable that that Birmingham/Bloomfield has the highest average asking rates, and Ann Arbor has the lowest vacancy rate. The Detroit office market has underperformed for quite some time, but even it is rebounding back to the regional average.

The Rochester market area is not appreciably different than the rest of the Metro Detroit office market. Vacancy rates and asking lease rates are in-line with the overall regional market. Observed asking lease rates in the M-59 corridor study area average about $16.50 a square foot, which is somewhat lower than those reported by CB Richard Ellis for the overall Rochester submarket.

Table 2.12. Office Market Conditions by Submarket

Submarket	Market Size	Availability Rate %	Vacancy Rate %	4Q 2011 Net Absorption	2011 Net Absorption	Avg. Asking Lease Rate
Ann Arbor	4,915,805	15.6	15.1	-14,611	27,067	$18.67
Auburn Hills	1,595,154	20.3	12.7	4,972	51,746	$20.82
Birmingham/Bloomfield	4,168,715	20.7	19.5	6,312	103,223	$21.89
Dearborn	4,023,401	36.4	36.3	-5,546	-94,887	$15.86
Detroit	15,612,626	27.9	25.7	304,170	239,785	$18.60
Farmington Hills/W. Bloomfield	5,493,668	24.5	22.5	2,093	88,773	$18.12
I-275 Corridor	5,152,356	24.4	24.1	-7,909	-5,567	$18.09
Macomb	1,251,637	28.5	28.5	-26,791	-26,630	$17.36
Other	3,247,445	26.5	26.0	-5,474	50,458	$13.26
Rochester	524,519	23.9	23.9	5,940	32,183	$16.69
Southfield	15,515,284	33.4	32.2	94,530	139,324	$16.84
Troy	12,902,759	35.1	33.9	85,114	253,130	$16.97
SUBURBAN TOTAL:	**58,790,743**	**29.0**	**27.9**	**138,630**	**618,830**	**$17.21**
DETROIT:	**15,612,626**	**27.9**	**25.7**	**304,170**	**239,785**	**$18.60**
METRO TOTAL:	**74,403,369**	**28.8**	**27.4**	**442,800**	**858,615**	**$17.51**

Source: CBRE MarketView Detroit Office Report, Fourth Quarter 2011

[1] Note that CBRE tracks for-lease office properties. Their reported data does not include corporate or owner-occupied office space. The M-59 corridor study area contains a higher proportion of these kinds of owner-occupied office spaces than do the large office submarkets such as Southfield, Troy, and Detroit.

Table 2.13. Office Market Conditions by Class

Submarket	Market Size	Availability Rate %	Vacancy Rate %	4Q 2011 Net Absorption	2011 Net Absorption	Avg. Asking Lease Rate
Class A	28,648,735	21.5%	19.5%	10,219	348,196	$20.29
Class B	38,229,052	34.9%	33.9%	392,590	342,355	$16.72
Class C	7,525,582	27.0%	24.8%	39,991	168,064	$13.83

Source: CBRE MarketView Detroit Office Report, Fourth Quarter 2011

It is unlikely that the region will support the development of another large concentration of professional office space in the forseeable future, given the high regional availability rate of 28.8%. Office development in the M-59 corridor study area will most likely be build-to-suit development, or smaller-scale office development that serves businesses and clients from the local area. Examples of this style of development include medical offices, modest office buildings that provide space for firms that serve nearby businesses, or corporate offices.

3. STAKEHOLDER INPUT

A. Overview

The M-59 Corridor Plan is a specific area planning effort that will impact a specific area of the City. Further, the general character of the area as the City's economic engine was determined during the City's recently completed Master Land Use planning process. The questions of what the future character of this area will be and how it fill function have already been answered. The purpose of this planning process is to determine the best way to achieve the broad vision established in the Master Land Use Plan.

For the above reasons, the public input process for this study consisted of focused stakeholder interviews and a design workshop.

The **stakeholder interviews** were conducted by in person, over the phone, and by survey with Oakland County businesses, real estate and development professionals, and important local area stakeholders such as Oakland University and Crittenden Hospital leadership. The purpose of these interviews was to determine what community characteristics are attractive to companies, what market forces will affect the study area in the short to medium term future, and how the City of Rochester Hills can best work with important local stakeholders to create the best possible future for the study area and the City as a whole.

The **design workshop** was held on November 9, 2010 with 20 participants representing the City Council, Planning Commission, and Local Development Finance Authority. The purpose of the workshop was to review work completed to date during the Master Land Use Plan process, along with existing conditions and stakeholder interview results. The design workshop was held at Oakland University's collaboratorium, a state of the art facility that provides each participant with a computer allowing for anonymous voting and commenting. The workshop included brainstorming and prioritization exercises to identify the most important development priorities and implementation projects. The workshop also featured an image preference survey where participants were shown a series of 100 images and asked to rate how much they liked or disliked each image. Higher-scoring images are used to identify how future development in the study area should look and function.

Following is a summary of input received from the design workshop and the stakeholder groups, along with important conclusions that can be drawn from the input process.

B. Design Workshop

DEVELOPMENT PRIORITIES

The first activity at the design workshop was a development priorities exercise where participants brainstormed a list of priorities for the future of the study area and then prioritized the list based on how important they thought the priorities were.

In this exercise, a score of 1 means low priority, while a score of 5 indicates a high priority.

Table 3.1. Development Priority Scoring

	Development Priority	Vote Distribution 1	2	3	4	5	Average Score	Std. Deviation
1	Tapping into emerging sectors like the new medical school at OU	0	0	0	7	10	4.59	0.51
2	Building appearance	0	1	1	4	10	4.44	0.89
3	Maintain dedicated funding sources	0	0	2	6	9	4.41	0.71
4	Expedite the permitting and approval process	0	1	0	7	9	4.41	0.80
5	Building new infrastructure necessary to attract new investment	0	0	4	6	7	4.18	0.81
6	Number of jobs created	1	0	3	5	8	4.12	1.11
7	Businesses that will bring additional investment, spin-offs	0	1	4	5	7	4.06	0.97
8	Site landscaping	0	1	3	8	5	4.00	0.87
9	Attract blue chip clients with ability to expand within the area in the near future	0	2	2	7	6	4.00	1.00
10	District appearance from M-59	1	1	3	4	8	4.00	1.22
11	Stable political environment	1	0	6	2	8	3.94	1.20
12	Focus on specific sectors - to be unique to the region	0	1	5	6	5	3.88	0.93
13	Aesthetics	0	1	5	6	5	3.88	0.93
14	Economic incentives	0	2	4	5	6	3.88	1.05
15	Green space incorporated into development	0	1	6	6	4	3.76	0.90
16	Local grant programs for building appearance	2	1	3	5	6	3.71	1.36
17	Building height limits increased	2	0	3	9	3	3.65	1.17
18	Maintaining existing infrastructure	1	4	1	5	6	3.65	1.37
19	Buildings to attract the businesses on our target list	1	1	5	8	2	3.53	1.01
20	Strong connection of lifestyle to business	2	1	4	6	4	3.53	1.28
21	High profile marketing opportunity	0	1	8	7	1	3.47	0.72
22	Economy and what areas should be developed first	0	3	5	7	2	3.47	0.94
23	Energy efficiency/LEED compliance	0	2	7	5	2	3.44	0.89
24	Zones for small/entrepreneurial and larger businesses	1	2	5	7	2	3.41	1.06
25	Create template for how to convert existing buildings to more of an office/R&D type	1	4	5	5	2	3.18	1.13
26	Non-motorized transportation improvements	2	2	7	3	3	3.18	1.24
27	Develop/establish social networking/communication	2	4	5	2	4	3.12	1.36
28	Hotel and dining	2	2	7	6	0	3.00	1.00
29	Funding to tear down structures	3	2	7	3	2	2.94	1.25
30	Public transportation options	2	6	4	4	1	2.76	1.15
31	Parking structures	3	5	5	2	2	2.71	1.26
32	Allow on-street parking	3	7	5	1	1	2.41	1.06

IMAGE PREFERENCE SURVEY

The image preference survey presented 100 images of different kinds of development in three categories. Participants were asked to rate how much they liked each image on a scale of 1 to 5, with 1 being the lowest score and 5 being the highest score.

The following pages show the best and least liked images within each of the three categories. Please refer to the appendix for the full results of the image preference survey.

Public Realm, including public or semi-public areas outside of buildings. These are places where people gather, travel, or appreciate from afar. These areas can be publicly or privately owned, urbane or natural, active or passive. The public realm supports the private realm by improving quality of place and making a statement about the values of the community.

Table 3.2. Best Liked Public Realm Images

1.

Average Score: 4.29
Standard Deviation: 0.77

Vote Distribution

1	2	3	4	5
--	--	3	6	8

The best liked public realm image was also most likely the most expensive one. This is an example of a wonderful outdoor amenity and its high rating indicates that providing outdoor amenity space should be a priority in the study area (within economic reason).

2.

Average Score: 4.18
Standard Deviation: 1.01

Vote Distribution

1	2	3	4	5
1	--	1	8	7

This outdoor seating area is adjacent to a green, and includes a tree canopy.

3a.

Average Score:.....4.12
Standard Deviation:.....0.70

Vote Distribution

1	2	3	4	5
--	--	3	9	5

This image shows a wide pedestrian pathway in front of older workplace buildings.

3b.

Average Score:.....4.12
Standard Deviation:.....0.78

Vote Distribution

1	2	3	4	5
--	--	4	7	6

This is a well-regarded example of a plaza in a more urban area. Note that most buildings are 5-8 stores in height.

4.

Average Score:.....4.06
Standard Deviation:.....0.75

Vote Distribution

1	2	3	4	5
--	--	4	8	5

This image shows a “complete street” that accommodates vehicles, bicycles, and pedestrians. Contrast this street with the least liked images in Table 3.3, below.

Table 3.3. Least Liked Public Realm Images

1.

Average Score: 2.00
Standard Deviation: 0.87

Vote Distribution

1	2	3	4	5
5	8	3	1	--

This image shows an existing condition in the study area. The lack of sidewalks and other street elements combined with on-street parking creates a displeasing image.

2.

Average Score: 2.31
Standard Deviation: 1.25

Vote Distribution

1	2	3	4	5
5	5	3	2	1

This image shows the same kind of street as above, but without on-street parking. This images' scores are very similar to the above images', with just a few additional 4 and 5 votes. This indicates that, on-street parking or no, existing streets in the study area could stand for some image improvements.

3.

Average Score: 2.71
Standard Deviation: 1.05

Vote Distribution

1	2	3	4	5
3	3	7	4	--

This image shows an outdoor eating area that has been retrofitted outside of an older industrial building. Participants likely were reacting to the lack of tree cover, the chain link fencing, and the patio area's proximity to a parking lot.

Major Streets, which in the study area are Hamlin, Adams, Crooks, Auburn, and Livernois. These streets border and traverse the study area, and nearly all workers, visitors, and residents of the study area travel along these streets. As such, the character of development along and characteristics of the streets have an immense impact on the character and perceived quality of the study area as a whole.

Table 3.4. Best Liked Major Street Images

1.

Average Score: 4.47
Standard Deviation:..... 0.51

Vote Distribution

1	2	3	4	5
--	--	--	9	8

This image is remarkable for being consistently highly rated - every participant rated it as a 4 or 5. This image shows a 3-story building located at the intersection of two major streets (at Van Dyke and 24 Mile Road in Shelby Township). The building is set back approximately 15 feet from a major street right-of-way, with parking located in the rear of the building. This image can serve as a template for new commercial or mixed-use development along major streets in the study area.

2.

Average Score: 4.12
Standard Deviation:..... 0.70

Vote Distribution

1	2	3	4	5
--	--	3	9	5

This image is another example of a taller 4-story building with a smaller front setback. Importantly, this image shows a plaza area adjacent to the building which serves to reduce the feeling of density.

3.

Average Score: 3.88
Standard Deviation:..... 0.93

Vote Distribution

1	2	3	4	5
--	2	2	9	4

This image features a substantial landscape buffer between the building and the street, which provides separation for the townhouse units from the sidewalk and softens the appearance of the building.

4a.

Average Score: 3.65
Standard Deviation:..... 0.79

Vote Distribution

1	2	3	4	5
--	--	9	5	3

This image is another example of a taller 4-story building with a smaller front setback. Importantly, this image shows a plaza area adjacent to the building which serves to reduce the feeling of density.

4b.

Average Score:.....3.65
Standard Deviation:.....0.79

Vote Distribution

1	2	3	4	5
--	1	6	8	2

Another 2-3 story building located closer to the front property line with notable green space between the building and the street.

Table 3.5. Least Liked Major Streets Images

1.

Average Score: 2.00
Standard Deviation: 0.79

Vote Distribution

1	2	3	4	5
5	7	5	--	--

The building in this image, while 4 stories tall and similar to the buildings in some of the best liked major streets images, does not incorporate any significant green or public spaces. This is notable in that it indicates that green or public spaces are critical to help soften the appearance of development along major streets.

2.

Average Score: 2.24
Standard Deviation: 1.25

Vote Distribution

1	2	3	4	5
4	7	4	2	--

This image is one of the more divisive major streets images, as indicated by its higher standard deviation score. This image includes ample green elements, so it is likely that participants were reacting to the more contemporary design of the building. Along major streets, traditionally-styled architecture appears to be the preference.

3.

Average Score: 2.41
Standard Deviation: 0.80

Vote Distribution

1	2	3	4	5
3	4	10	--	--

This image shows zero-lot line development with little green or public space. This street is also 5-lanes wide, which contrasts with the 2-3 lane width of the streets in the best liked images. While some participants found this image tolerable, it certainly is not a model for development along major streets.

Workplaces, which are the dominant building type within the study area. Currently, the major kind of wokplace building in the study area is the 1980s vintage light industrial box. The character and quality of new and evolved older buildings is critical to the future success of the study area.

Table 3.6. Best Liked Workplace Images

1.

Average Score: 4.29
Standard Deviation:.....0.85

Vote Distribution

1	2	3	4	5
--	--	4	4	9

This image creates an airy feel from within the building by virtue of the large glass curtain wall. Additionally, the reflecting pool outside of the window adds interest to the scene.

2.

Average Score: 4.18
Standard Deviation:.....0.73

Vote Distribution

1	2	3	4	5
--	--	3	8	6

This building combines traditional proportions with a glass atrium feature in the middle of the building. This is an interesting blend of old and new.

3.

Average Score: 4.12
Standard Deviation:.....0.86

Vote Distribution

1	2	3	4	5
--	--	5	5	7

This building has horizontal proportions, despite being 3-4 stories in height. It also uses glass as a primary building material.

4.

Average Score: 3.94
Standard Deviation:.....0.90

Vote Distribution

1	2	3	4	5
--	2	1	10	4

This image also shows 4 story buildings with a horizontal aspect.

5.

Average Score:.....3.94
Standard Deviation:.....0.83

Vote Distribution

1	2	3	4	5
--	--	6	6	5

Again, this 3-4 story building incorporates glass as a primary material, and has a horizontal aspect.

6.

Average Score:.....3.94
Standard Deviation:.....0.97

Vote Distribution

1	2	3	4	5
--	1	5	5	6

This modern building also has a high proportion of glass and a horizontal aspect, and is set upon a green area.

7a.

Average Score:.....3.82
Standard Deviation:.....1.29

Vote Distribution

1	2	3	4	5
1	2	3	4	7

This image is of the recently-constructed Karmanos Cancer Center in the study area. The building uses stone and glass as its primary exterior building materials, and is a good example of contemporary architecture.

7b.

Average Score:.....3.82
Standard Deviation:.....0.95

Vote Distribution

1	2	3	4	5
--	2	3	8	4

This image shows relatively modern architecture, with a high proportion of glass on the facades. It is unclear from this picture if the building has a vertical or horizontal aspect.

8.

Average Score: 3.76
Standard Deviation: 1.15

Vote Distribution

1	2	3	4	5
1	1	4	6	5

This image shows a 2-story office building with a relatively small parking area, generous landscaping, and sidewalks along the roads.

9.

Average Score: 3.65
Standard Deviation: 0.93

Vote Distribution

1	2	3	4	5
–	2	5	7	3

An example of a suburban office building, this image scored well. The building incorporates horizontal definition lines with recessed windows and modest overhangs to help provide solar shading. The building also incorporates a slight curve and an arcaded first floor to add interest.

Table 3.7. Least Liked Workplace Images

1.

Average Score: 1.53
Standard Deviation: 0.80

Vote Distribution

1	2	3	4	5
10	6	--	1	--

This image shows a very modern retrofit of an old, small concrete block industrial building. The retrofit did not appreciably improve the green quality of the site, and this image was almost universally disliked by participants.

2.

Average Score: 1.59
Standard Deviation: 0.87

Vote Distribution

1	2	3	4	5
10	5	1	1	--

This is another example of a retrofit of an older building. The overhead bay openings of the older building serve as a skin under which a new building façade has been constructed. Nonetheless, this image did not score well.

3.

Average Score: 1.65
Standard Deviation: 0.93

Vote Distribution

1	2	3	4	5
10	4	2	1	--

This image shows an energy-producing wall that uses solar converting building materials to generate electricity for the building. However, the appearance is rather stark, and was disliked by participants.

4.

Average Score: 1.71
Standard Deviation: 0.77

Vote Distribution

1	2	3	4	5
8	6	3	--	--

This trucking-related industrial building incorporates somewhat more contemporary design and materials compared to standard distribution industrial box buildings. However, it was disliked by participants.

PROJECT PRIORITIZATION

The final exercise in the workshop asked participants to brainstorm and prioritize projects. These projects represent specific actions or improvements that the LDFA and other implementing bodies should undertake in the coming years.

Participants were asked to rate each project as being low (1), medium (2), or high (3) priority. Thus, the higher the average score received by a project, the more important it is considered.

Table 3.8. Project Prioritization Scoring

	Project	Vote Distribution			Score	STD
		Low	Medium	High		
1	Road maintenance	0	6	11	2.65	0.49
2	Image improvements	1	5	11	2.59	0.62
3	Road construction	1	7	9	2.47	0.62
4	Pursue public/private partnerships	1	7	9	2.47	0.62
5	Streetscape improvements	1	8	8	2.41	0.62
6	Marketing plan	2	6	9	2.41	0.71
7	Street lighting	0	11	6	2.35	0.49
8	Region marketing	3	6	8	2.29	0.77
9	Create connections between industrial parks	2	9	6	2.24	0.66
10	Park entryway improvements	3	8	6	2.18	0.73
11	Non-motorized transportation improvements (bike lanes, sidewalks, pathway connections to Clinton River trail)	4	6	7	2.18	0.81
12	Create a walkable community	5	5	7	2.12	0.86
13	Green infrastructure	4	8	5	2.06	0.75
14	Continue round-abouts	3	11	3	2.00	0.61
15	Assemble land to catalyze/support development	5	7	5	2.00	0.79
16	Boulevards for higher traffic areas	4	10	3	1.94	0.66
17	Small public areas/green spaces	6	6	5	1.94	0.83
18	Expand parking supply in industrial parks	5	9	3	1.88	0.70
19	Pursue master developer relationship to catalyze development	6	7	4	1.88	0.78
20	Incorporate complete streets	6	7	4	1.88	0.78
21	Parking decks to increase density	8	5	4	1.76	0.83
22	Wetland pre-mitigation	7	8	2	1.71	0.69

C. Stakeholder Interviews

OAKLAND COUNTY BUSINESS STAKEHOLDERS

In cooperation with Automation Alley, we surveyed Oakland County manufacturing and technology businesses to discover the most important factors that influence their location decisions, as well as the best and worst things about their current location. Our intent in conducting this survey was to discover strengths and weaknesses of the study area.

When there were multiple responses, we have indicated the number of responses in parentheses at the end of the entry.

Important location factors include:

- Reasonable costs (6)
- Good location – easy ingress/egress and access to freeways (4)
- Close to amenities like restaurants, stores, etc. (2)
- Proximity to clients/customers (2)
- Regulatory environment – we need to move quickly
- Clean, professional, well-managed lease space
- Diverse demographics

Companies cited the following as being the best thing about their current location:

- Ease of transportation access/proximity to freeways (3)
- Location (2)
- Within walking distance of Royal Oak
- Low rent
- Build-to-suit building

Companies cited the following as being the worst thing about their current location:

- Old building (2)
- Affordability
- Few nearby restaurants
- Bad roads
- Location is across the street from a cemetery

REAL ESTATE AND DEVELOPMENT STAKEHOLDERS

We completed a series of phone interviews with real estate and development professionals to determine the study area's competitive situation within the region, and to discover market trends that are influencing the demand for building space.

- **Area Amenities**
    - The Marketplace of Rochester Hills is changing the image of the west side of the study area. It is a benefit.

- Big Boxes are a benefit to the industrial parks. They are an amenity – and they're located well because they're away from residential areas and have some similar characteristics.
- Highly educated community, which is important.
- Chrysler, Oakland University, and the City's quality of life benefits are the primary attractors.
- The WalMart & Meijer helps the image from M59. Everything else is pretty marginal.
- The City is a well managed, well maintained community. Strong residential and community quality of life are the big attractors for Rochester Hills.
- Rochester downtown is a phenomenal downtown for residential – attract business owners to the area.

- Community Interaction with Business/Developers
  - The client/user is dealing with a much shorter cycle time. The City needs to prepare options to get folks in the ground ASAP. Dealing with the process in the City was "a pain in the ass." The City should spearhead "redevelopment-ready." This could mean picking areas to concentrate on and perhaps the City buying property and making it available.
  - The City should consider a Master Developer process: choose master-developer partners to facilitate dealmaking: City can assemble land which the master developer will market. Development agreements are put into place to pay back the City when a deal comes along. Agreements are entered guiding how the developer deals with the City and potential users to protect the fiduciary interest. The Master Developer's interests are then aligned with the City.
  - Reputation – business unfriendly. That will take 20 years to overcome.

- Image
  - Higher 5-ish story development along M-59 would be a benefit. The City should embrace it b/c it offers good visibility.
  - The image from M-59 and at the Crooks interchange need to be upgraded.
  - Parts of Auburn Road are not attractive. Most trips into the study area south of M-59 must travel along Auburn Road at some point.
  - The connection of Adams and Leach Road is important. It is already transforming the image of that area.

- Trends and Market Forces
  - Chrysler and Oakland U are the drivers – their continued success is key.
  - Industrial growth is occurring around airports. The pull of airports is important.
  - The pull is west now, not north. Ann Arbor, I-275, and the airport are huge attracters. M14 is a better corridor right now.
  - The study area is located at the periphery of SE Michigan industrial/office development. Hyndai and Toyota are in Ann Arbor, Ford is in Dearborn, and GM is downtown/Warren. This leaves Rochester Hills on the edge close to just one automaker.
  - Businesses that are in the area are there because of Chrysler or the decision makers live nearby. Those without ties go west.
  - Troy office market has an impact on the study area – and there is a lot of vacancy there now.
  - In the past, cheap land prices pulled users to R.H.

  - Cost is a key driver for site selection. It doesn't matter how nice the community is, cost is a huge driver.
  - 10,000 sq. ft. old tool and die shops are over.
  - TACOM – at Mound & I-696 is a big driver.
  - The introduction of green space into industrial parks, particularly down in Florida and other states. Usable green space that is walkable and an amenity to users within the park as opposed to purely passive green space has helped property values and resales.
  - Flexibility of buildings is critical (from an interior perspective). Madden Companies Industrial Park in Denver – they built many of the buildings speculatively and added in a lot of flexibility. Maximized windows and pushed sustainability as a building asset.
  - Technology spin-offs (alt. energy, biomass, etc.) are opportunities for the region. High-skill labor is important here.

- Potential Improvements
  - Road system is tough. Connectivity to Adams and Crooks is difficult. Connections need to be made.
  - Acquire cheap buildings and turn them into public parking lots to serve the entire park is a good idea. Priceline.com recently located in Grand Rapids, partly because they took an unused pad and turned it into a parking lot to allow Priceline to locate.
  - Buy back properties for streets, open space, parking.
  - The bowling alley site is a prime opportunity, but it would help if the City could prep redevelopment-ready sites.
  - Crooks/Star Batt – some kind of retail/office/residential with some height would be good…start to move down Star Batt & redevelop where there is M59 visibility
  - R&D/Tech – good opportunity for image around RayConnect.

LOCAL AREA STAKEHOLDERS

We also conducted in-person interviews with important area stakeholders to discover their perceptions of the study area.

- The superior quality of life offered by the Rochester Hills community is an important benefit of the study area.
- Relax the height limit along M59.
- Buildings can be adapted.
- Interactions with local government are important. Permitting processes need to be streamlined, and inspections should be fair and timely.
- Roads are in need of repair – particularly Crooks Road at M59.
- The Mayor's Business Council is a positive direction and is moving the City in a good direction.
- The LDFA should consider targeting a business cluster and providing supportive services, such as providing low-cost building space.

D. Conclusions

GENERAL STUDY AREA CHARACTER

- The LDFA should consider **proactive actions to support redevelopment and expansion**. These can include creating redevelopment-ready areas, or expanding parking supply in existing parks to facilitate the evolution of uses.
- Connectivity within the study area is not good. Each park is designed and acts as its own pod. All traffic is routed to Auburn Road. **Developing a connected interior street network would improve the cohesiveness of the study area.**
- Location is important. **The study area is not in the top-tier of business locations within the region, but it does have access to important economic drivers such as Chrysler and Oakland University.**
- **All streets should be designed as complete streets.** Where possible, on-street parking should be accommodated, sidewalks should be provided along all streets, street trees should be required along all streets, and decorative streetscape elements should be provided where appropriate.

DEVELOPMENT ALONG MAJOR STREETS

- **New development along major streets should be located close to the street.** Parking should be in side or rear yards. Modest 5 foot front yard setbacks are appropriate when parking is located in side or rear yards.
- **Community amenities are important – restaurants, green space, and quality of life were oft-cited examples.** There is opportunity to improve the image of the area and providing additional amenities along existing major roads.
- The study area image from M-59 needs to be upgraded. **Taller buildings would provide more presence from M-59**, and the Crooks Road/M-59 interchange has potential to grow into an important image entrance.

DEVELOPMENT ALONG INTERIOR STREETS

- Workplace building design standards should emphasize a **horizontal building aspect** and should give primacy to the use of **transparent, non-reflective glass as a primary building façade material**.
- **Building heights should not exceed 3 stories in height** in workplace areas.

4. POTENTIAL CHANGE AREAS

A. Overview

The purpose of the potential change areas analysis is to identify areas within the M-59 Corridor that are likely to experience physical change in the near to mid-term future (0-10 years). The corridor area has undergone a few significant periods of development which have shaped its physical character.

PAST DEVELOPMENT

Initial Devleopment. The area initially developed with a few residential neighborhoods, which are still to a greater or lesser extent intact today. These residential areas are located primarily on streets that extend north from Auburn Road. Leach Road started out as a residential road, but industrial and commercial uses have succeeded many of the original residential uses. Other streets, such as Harvey, Devondale, Midvale, and Grant are still primarily residential in character, although it is likely that Devondale will begin to experience change due to the recent extension of Austin Avenue to connect with Devondale.

Strip Commercial Development. The next areas to develop were the road corridors, specifically the Auburn and Crooks Road corridors. These areas developed with commercial and retail uses. The design and layout of this development was simple, and today most of the surviving development from this era is somewhat worn down. Some of the initially developed parcels have been redeveloped over time.

Industrial Park Development. An industrial park development boom began in the mid 1980's and continued through the 1990's. The area's current character was in large part determined during this period. These industrial parks developed according to the standard model of the time, with generous building setbacks, green spaces between the building and the street, and no sidewalks. While the uses in these industrial parks are undergoing change, the character of the buildings and the built environment has not changed significantly.

Regional Commercial/Office Development. The northwest portion of the study area has been the most recently developed, spurred in part by the recently completed Adams Road realignment/interchange improvements. The office areas on the north side of M-59 and west of Adams are the most significant areas of office development in the study area. The developing Marketplace of Rochester Hills development west of Adams and south of M-59 is becoming a regional retail destination.

POTENTIAL CHANGE INDICATORS

To anticipate areas of change within the study area, we have identified change indicators that identify where change is more or less likely to occur over time. Parcels that are impacted by more than one factor will be more likely change over time.

While the intent of the potential change analysis is to determine which parcels are more or less likely to experience some sort of change over the coming years, it is important to note that **every parcel within the study area is a candidate for change**. The change analysis is intended to indicate the *likelihood* that a particular type of change will occur on a parcel. Every parcel has some probability of redevelopment, intensification, or evolution. The purpose of this analysis is to establish which parcels have a higher probability of redeveloping, intensifying, or evolving.

The change factors used in the analysis include:

Land Value/Acre. Lower land values per acre indicate land that is not being used for its highest or best use, or parcels where only a portion of the parcel is developed. Land with a lower value per acre is more easily acquired,

assembled, and repurposed and as such is a stronger candidate for redevelopment. Land with higher values indicate that investment has already occurred, and therefore intensification or evolution is more likely.

Building Coverage. Building coverage is an indicator of how much open, and presumably developable land exists on a parcel. Parcels with low building coverage are candidates for redevelopment; parcels with higher building coverage are more likely candidates for evolution.

Land Use. Residentially used lands and vacant lands are considered to be more likely candidates for redevelopment, while non-residentially used lands are more likely candidates for intensification or evolution.

Natural Features. The final change factor is natural features. While the other change factors are positive indicators, the presence of natural features is a negative indicator that reduces or eliminates the potential for change or new development on parcels where natural features are present.

The following table lists the specific indicators used for the change analysis. Any parcel that meets the criteria for a positive change indicator is assigned a value of 1, and each parcel receives a total score for each type of change. For instance, a parcel with a land value of $275,000 per acre, lot coverage of 16%, and non-residential land use would score 3 points towards intensify, 2 points towards evolve, and no points towards redevelop. This indicates that the parcel has a higher probability of intensifying, a moderate probability of evolving, and a lower probability of redeveloping. It **does not** mean that there is no probability that the parcel will redevelop, only that there is a lower probability.

Table 4.1. Potential Change Indicators

Change Indicator	Redevelop Indicators	Intensify Indicators	Evolve Indicators
Parcel Value/Acre	Strong: < $100,000/acre Weak: $100,000 - $250,000/acre	$250,000+	$250,000+
Parcel Coverage	0-10%	10-20%	20%+
Land Use	Vacant or Residential	Non-residential	Non-residential
Natural Features	Limitation where present	Limitation where present	Limitation where present

Note that there are a strong and a weak indicator for parcel value/acre under the redevelop category indicators. In this instance a parcel that meets the strong indicator receives 2 points, while a parcel that meets the weak indicator receives 1 point.

B. Potential to Redevelop

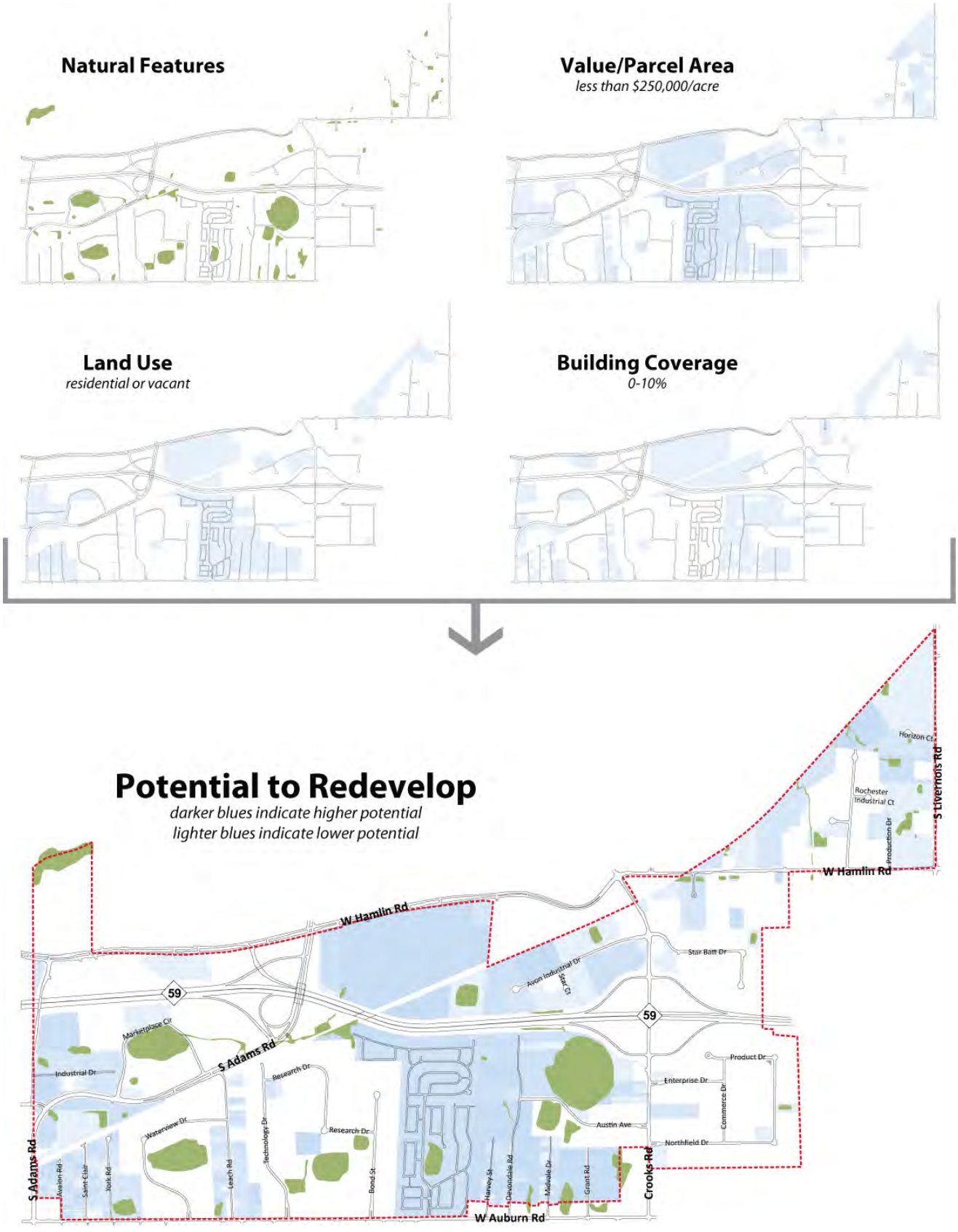
Potential redevelopment change areas are concentrated in the central portion of the corridor. A PUD project has been approved for the large vacant site on the north side of M-59. The PUD has been approved, but not built, and it is unclear if the development will proceed. Other notable redevelopment parcels include:

- The mostly vacant parcel at the northwest corner of the Crooks/M-59 interchange. This parcel has excellent visibility and location due to its proximity to M-59, and has the potential to improve the study area's image at an important gateway entrance.
- The residential streets running north from Auburn Road. The potential for these streets to redevelop will increase if they are connected. The recent connection of Devondale and Austin and the Leach Road/Adams connections are examples.
- The manufactured housing park meets the selection criteria, and therefore is considered a redevelopment possibility. However, it is unlikely that redevelopment at this site will not occur until a number of other redevelopment or improvements have been made in the study area. This site is an unlikely catalyst site.
- The area along the realigned Adams Road to the west and south of the Marketplace of Rochester Hills retail development has the potential for redevelopment. This area benefits from access and visibility along a newly constructed road.

Areas identified as redevelopment sites are candidates for assembly, either by public, private, or public/private entities. No effort is made to prioritize areas for assembly, as this can artificially distort land values. Rather, the City should opportunistically support redevelopment activities as they become apparent or feasible.

Finally, redevelopment will occur in areas that are not identified as likely redevelopment areas on the map on the following page. This will happen due to the unforeseeable choices or needs or private entities, or because changing land values in the study area will alter the value equation and present new opportunities.

Figure 11. Potential to Redevelop



C. Evolve or Intensify

Parcels that are the most likely candidates for both intensification and evolution are located in the existing industrial parks, along with the office/research uses along Hamlin Road at the northwest corner of the study area. Evolution or intensification change have related causes, and thus, areas where such change may occur are correlated. It is not possible to predict what buildings contain uses that will be successful and expand, or what buildings contain uses that will grow or contract and thus move to a different location leading to a change of use in the building itself.

The purpose of the evolve/intensify analysis is to demonstrate where changes to existing development will occur.

EVOLVE

Parcels that evolve will most likely be those where a building use change occurs, and therefore the new building user's requirements will necessitate some change in how the building and/or site is configured and functions.

INTENSIFY

Intensification will occur where a building or a parcel continues to be used for the same or a similar use, but operating requirements of the use require additional building space. Intensification allows existing users to grow their business in place without requiring a move to a different building that meets their needs. Allowing existing buildings to grow and intensify will require creative approaches to accommodate increased parking needs, and will also require the City to adopt a new vision for the appearance and function of the built industrial parks.

Figure 12. Potential to Evolve

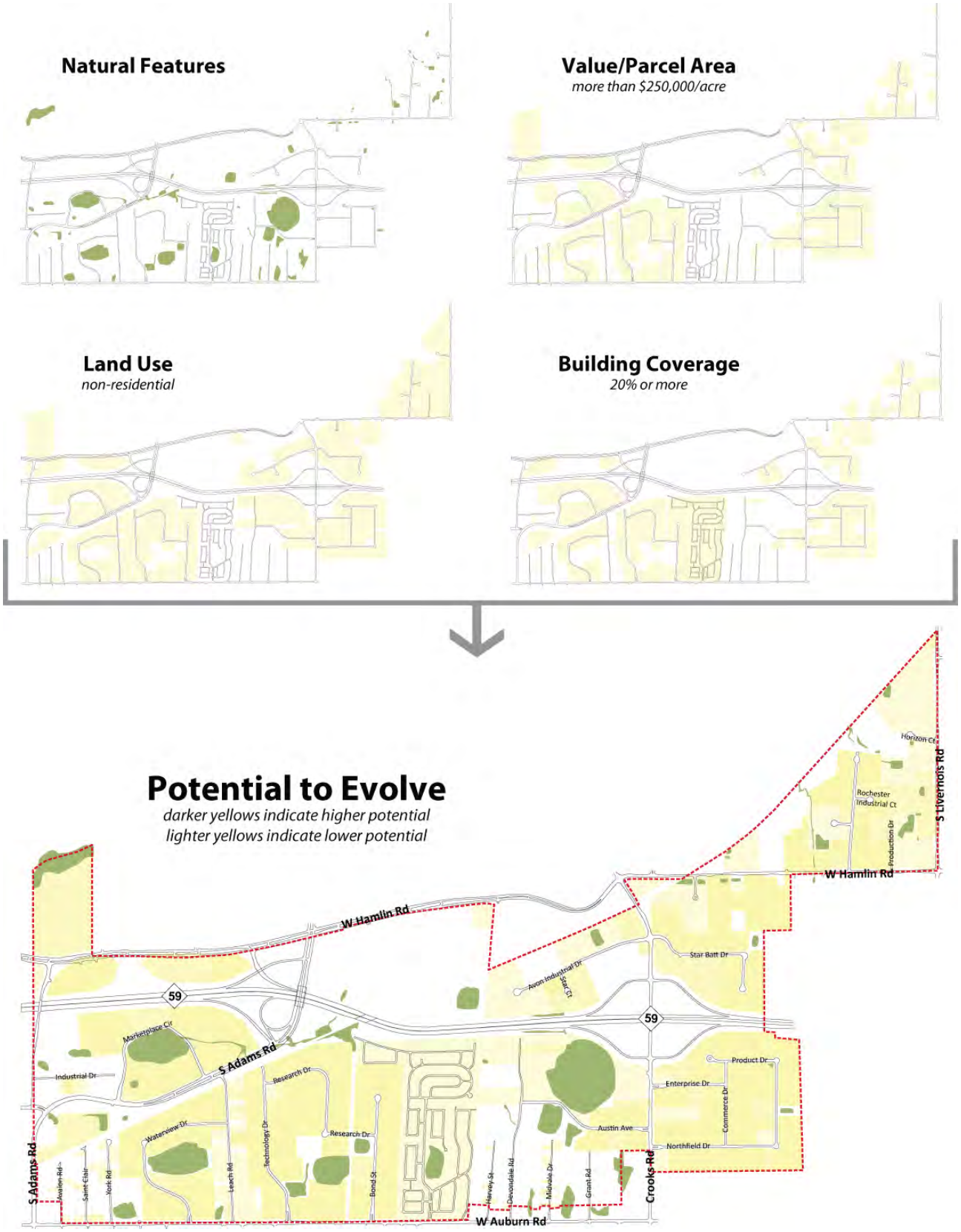


Figure 13. Potential to Intensify

5. MASTER DEVELOPMENT PLAN

A. Rochester Hills Land Use Plan Considerations

The Master Land Use Plan establishes the overall vision for the Regional Employment Center, which coincides with the boundaries of this study's area. The following considerations from the Master Land Use plan influence the recommendations of the M59 Corridor Study Development Plan.

USES

The master land use plan calls for a mixture of uses in the study area. These uses can include light manufacturing, research and development, office uses, and retail uses. The purpose of the master development plan is to further refine the Master Plan's vision for the study area, and to identify appropriate locations and intensities for the aforementioned uses.

BUILDING HEIGHT

The master land use plan states that buildings in the study area "may be up to 6 stories or 80 feet in height. The tallest buildings should be located at the interior of the area, close to M-59. Building height should transition downward extending out from the center of the area. In particular, buildings located within 500 feet of the perimeter of the REC should not exceed 2 stories or 35 feet in height to ensure compatibility with residential land uses located around the edge of the REC.

Development Plan

- Workplace
- Technology and Office Image Corridor
- Interchange
- Corridor Mixed Use
- Regional Commercial
- Gateway Entrance
- Future Road Connection (1)

To: Rochester Hills Env. Ed. Center
Downtown Rochester
Rochester College

To: City Hall
Crittenton Hospital

Horizon Court

Rochester Industrial Ct

Production Dr

S Livernois Rd

W Hamlin Rd

To: Oakland University
Village of Rochester Hills

W Hamlin Rd

Clinton River Trail

To: Chrysler HQ
Oak Tech Park
OCC

To: I-75
Oak. Int. Airport

59

Star Batt Dr

Avon Industrial Dr

Star Ct

59

Marketplace Cir

Industrial Dr

S Adams Rd

Research Dr

Product Dr

Enterprise Dr

Commerce Dr

Waterview Dr

Research Dr

Austin Ave

Northfield Dr

S Adams Rd

Avalon Rd

Saint Clair

York Rd

Leach Rd

Technology Dr

Bond St

Harvey St

Devondale Rd

Midvale Dr

Grant Rd

Crooks Rd

W Auburn Rd

Footnotes:

(1) Road connections shown on the development plan may be altered based on field conditions.

(2) Conversion of residential areas should occur in a coordinated manner. Rezoning from residential to non-residential districts should only occur as described on page 7.9 of the Master Land Use Plan.

(3) Mitigation or replacement, as applicable, is recommended for existing wetlands and storm-water management facilities.

Base Map Source: City of Rochester Hills GIS, 2010
Data Source: McKenna Associates, Inc., 2011

0 1,000 2,000 Feet

N

McKenna Associates

04.01.11

5. Master Development Plan

A. Rochester Hills Land Use Plan Considerations

B. Development Areas

INTERCHANGE

Description

General. The interchange development area is located near the M-59/Crooks Road interchange. This area is an important gateway into the study area, and therefore has the opportunity to create a lasting first impression. Existing development in the interchange development area consists of strip retail along Crooks Road, older or underused parcels along Avon Industrial and Star Batt Drives, older industrial uses along Enterprise Drive and newer industrial uses along Austin Drive.

Uses. Appropriate uses include office, research, and/or retail. Multiple family residential uses are appropriate on the upper floors of a mixed use building.

Building Character. Buildings in the Interchange development area should have street presence. They should display a high degree of aesthetic interest, and should create a memorable first impression for the visitor to the area. To create this presence, buildings must relate to the street, so they should be taller buildings with small front setbacks.

Public Realm Improvements. The purpose of the Interchange development area is to create a stronger first impression for the study area. As such, new development should include public realm improvements that create a modern and high-quality image for the study area. These public realm improvements can include landscaping, streetscape improvements, well-appointed outdoor gathering spaces, and the like.

Development Standards

Blocks	
Maximum Block Perimeter	2,400 ft.
Maximum Block Length	600 ft.
Lot Dimensions and Density	
Minimum Lot Width	n/a
Minimum Lot Area	n/a
Maximum FAR	0.8
Building Setbacks	
Front (minimum)	5 ft.
Front (maximum)	80 ft.
Side (minimum)	10 ft.
Rear (minimum)	40 ft.
Maximum Building Height	
Feet	80
Stories	6
Parking	
On-Street Parking	Encouraged on B and C streets
Off-Street Parking	One double row allowed in front yard, remainder located in side/rear yards

Development Examples

This building incorporates quality materials and is properly sited to create street presence.

Note also the public realm improvements next to the building.

Outdoor seating areas and public spaces create a more vibrant and people friendly atmosphere.

These areas also create a sense of quality and signal to visitors that this is a high quality community.

This is an example of a smaller-scale mixed-use or residential building with interesting street presence.

Improvements to streets to make them more pedestrian and bicycle friendly can also improve their appearance and contribute to an upgraded public image.

Interchange Development Area Example Site Plans

The following example site plans show potential development options for the parcel at the southwest corner of Avon Industrial Drive and Crooks Road.

LEGEND
+/ 5 acres

Option 'A'
Building Typology
(3) 4-Story buildings
Residential Units : 48 units
Retail : 14,400 s.f.
Office : 42,000 s.f.
Parking
141 car required @ 1car/400s.f.
96 car required @ 2car/unit (48 garage & 48 open)

Option 'B'
Building Typology
(2) 2-Story buildings
(1) 3-Story building
Retail : 36,000 s.f.
Office : 56,000 s.f.
Parking
230 car required @ 1car/400s.f.

Site Concept 1"=100'-0"
Mixed-Use 10-01-10
M-59 Corridor

Alexander V. Bogaerts + Associates, P.C.
Architecture • Planning • Interior Design
2445 Franklin Road
Bloomfield Hills, MI 48302
248•334•5000
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LEGEND
+/ 5 acres

Option 'C'
Building Typology
(1) 3-Story building
(2) 4-Story buildings
Retail : 36,000 s.f.
Office : 112,000 s.f.
Parking
370 car required @ 1car/400s.f.
- includes 1-Story parking deck in motor court

Site Concept 1"=100'-0"
Mixed-Use 10-01-10
M-59 Corridor

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TECHNOLOGY AND OFFICE IMAGE CORRIDOR

Description

General. Technology and office corridor development areas are located adjacent to M-59 and Adams Road. These areas are located along high-visibility corridors, and are physically separated from existing residential land uses. These location characteristics make these lands suitable for more intense non-residential development.

Development in these areas is further intended to establish the future identity of the study area as a premier business, commerce, and industry area. Towards that end, buildings should be taller and should feature quality design characteristics that reflect the high-tech research and development target industries.

Uses. Appropriate uses include office, industrial, research and development, medical, supporting ground floor retail, and potentially multiple family residential uses on upper stories in some locations. The purpose of this development area is to accommodate a wide range of uses by minimizing any potential external negative impacts. Therefore, performance standards must be established and enforced.

Building Character. Buildings in the technology and office corridor development area should visibility and presence along M-59, Hamlin, and Adams. They should display a high degree of aesthetic interest, and will be key elements of the study area's image. To create this presence, buildings should be taller with small front setbacks.

Public Realm Improvements. New development should include public realm improvements that support the modern and high-quality image for the study area. These public realm improvements can include landscaping, streetscape improvements, well-appointed outdoor gathering spaces, and the like.

Development Standards

Blocks	
Maximum Block Perimeter	2,800 ft.
Maximum Block Length	900 ft.
Lot Dimensions and Density	
Minimum Lot Width	n/a
Minimum Lot Area	n/a
Maximum FAR	0.8
Building Setbacks	
Front (surface street)	15 ft.
Front (M-59)	50 ft.
Side (minimum)	20 ft.
Rear (minimum)	30 ft.
Maximum Building Height	
Feet	80
Stories	6
Parking	
On-Street Parking	Encouraged on B and C streets
Off-Street Parking	Two double rows allowed in front yard, remainder located in side/rear yards.

Development Examples

This building is the most notable "image" building existing along M-59 in the study area.

Outdoor public spaces add aesthetic interest and contribute to the study area's image.

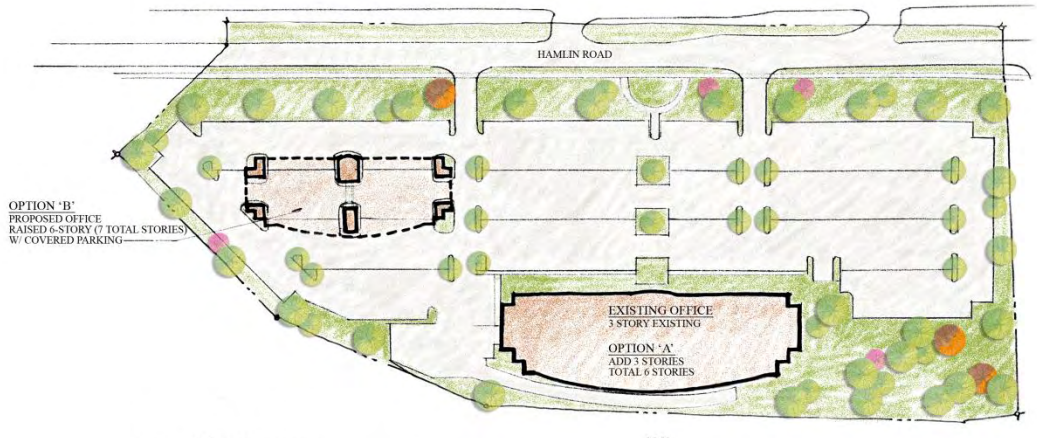
These areas also create a sense of quality and signal that this is a high quality community.

Buildings that incorporate contemporary design features such as the example at right scored very well at the planning workshop, and serve as examples for the future development of the study area.

Improvements to streets to make them more pedestrian and bicycle friendly can also improve their appearance and contribute to an upgraded public image.

Technology and Office Image Corridor Development Area Example Site Plan

The following example site plan shows potential development options for the parcel on the south side of Hamlin Road west of Adams Road. This site is the best example of an image office building along M-59 in the study area. The following site plan demonstrates how the existing site can be expanded or redeveloped while meeting parking and landscaping requirements.



Site Concept 1"=100'-0"
Corporate Office - Volkswagon, Audi 10-01-10
M-59 Corridor

Option 'A' (Add 3 Stories to Existing Office)

Existing Building (3 Stories)
3 Stories @ 37,500 s.f. = +/- 112,500 s.f. *(Verify w/ City)*
112,500 s.f./ 400 = 281 cars required

Existing Parking +/- 610 cars
610 cars- 281 cars = 329 cars surplus *(Verify w/ City)*

3 New Additional Stories = Total 6 Stories
Total +/- 225,000 s.f./400 = 562 cars required

Option 'B' (New Raised 6-Story | 7 Total)

New Building (7 Stories)
+/- 131,000 s.f. Office Building
131,000 s.f./ 400 = 327 cars required

Existing Building (3 Stories)
+/- 112,000 s.f. Office Building
112,500 s.f. / 400 = 281 cars required

Total Required Parking = +/- 608 cars required
Existing Parking = +/- 610 cars *(Verify w/ City)*

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WORKPLACE

Description

General. Employment development areas are generally located coincident with existing industrial development. This development area is intended to support the continued evolution and re-use of existing industrial buildings for a range of industrial, research, and office uses.

Lands along Avalon, Saint Clair, York, Harvey, Devondale, Midvale, and Grant Roads are currently zoned and used for residential purposes. The long-term plan is for these areas to convert to workplace uses, however, this conversion must occur in an orderly and coordinated fashion. To that purpose, a rezoning to a non-residential district should only be approved if it will not result in isolated residential parcels.

Uses. Appropriate uses include office, industrial, research and development. The purpose of this development area is to accommodate a wide range of uses by minimizing any potential external negative impacts. Therefore, performance standards must be established and enforced.

Outdoor use storage and loading areas are only appropriate in the side and rear yards, and must be screened from view from public streets, and residential and commercial zoning districts and uses.

Building Character. Buildings in the workplace development area should continue to evolve and expand. Front facades should incorporate a high degree of aesthetic interest, while less visible side and rear facades may be economically designed.

Public Realm Improvements. Public realm improvements in workplace areas need only be modest. Examples of appropriate improvements include upgraded site fixtures and generous landscaping.

Development Standards

Blocks	
Maximum Block Perimeter	2,800 ft.
Maximum Block Length	900 ft.
Lot Dimensions and Density	
Minimum Lot Width	n/a
Minimum Lot Area	n/a
Maximum FAR	0.4
Building Setbacks	
Front (minimum)	10 ft.
Side (minimum)	25 ft.
Rear (minimum)	30 ft.
Maximum Building Height	
Feet	42
Stories	3
Parking	
On-Street Parking	Encouraged on B and C streets
Off-Street Parking	Not permitted in the front yard.

Development Examples

Example of a two-story workplace building with a well-landscaped site.

Upgraded site fixtures add interest to workplace areas.

Pedestrian scale improvements are encouraged to make the workplace development area hospitable to walking and non-motorized travel.

This is an example of an older industrial park building that has been improved with a new front façade.

Buildings in the study area can be expanded in a similar manner, and may extend closer to the street.

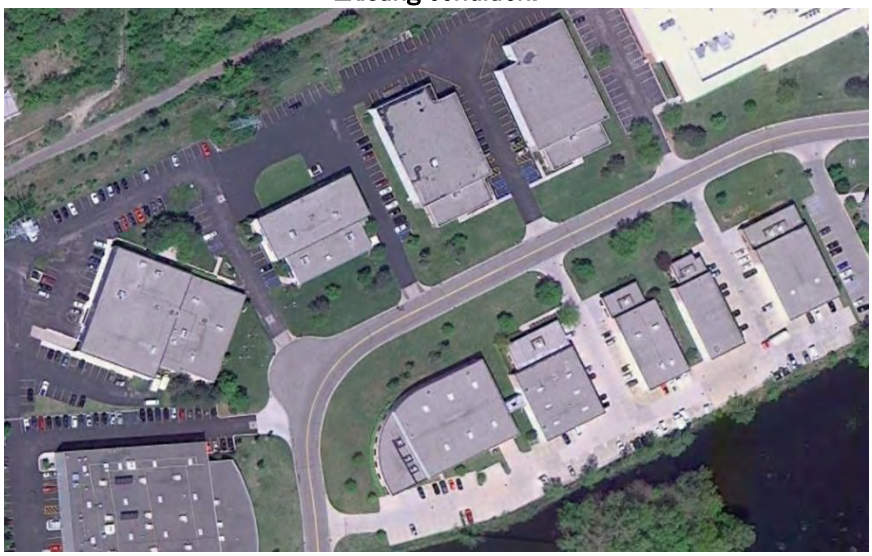
Improvements to streets such as sidewalks and street trees can make them more pedestrian and bicycle friendly, improve their appearance, and contribute to an upgraded public image.

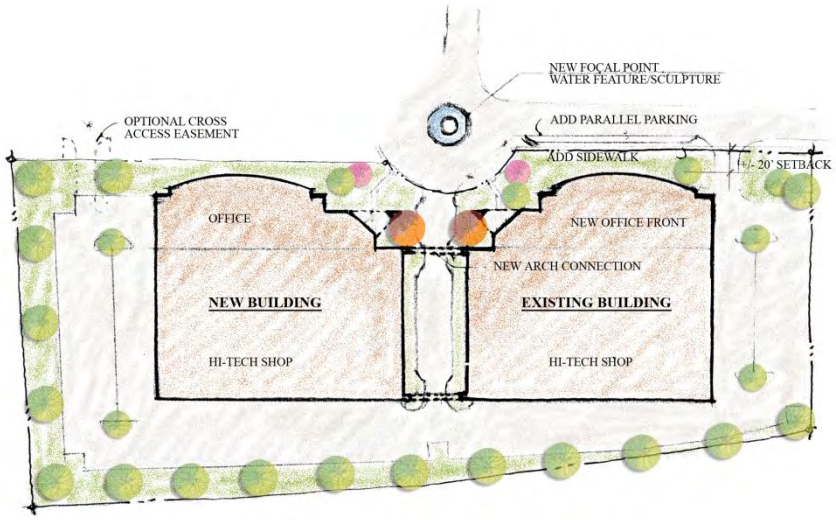
Workplace Development Area Example Site Plans

The following example site plans demonstrate how existing buildings in the workplace development area can be expanded or redeveloped.

The example on this page shows how existing buildings can be evolved. Note how sidewalks and street trees have been added along the existing street.

Existing condition:





Site Concept
Industrial Expand
M-59 Corridor

1"=100'-0"
10-01-10

LEGEND

2 Buildings
Office : 17,225 s.f./building
Shop : 46,750 s.f./building
Total : +/- 63,975 s.f./building

Parking
17,225s.f. / 400 = 43 cars
46,750s.f. / 1,000 = 47 cars

Total
90 cars x 2 buildings = 180 cars required
+/- 220 cars shown

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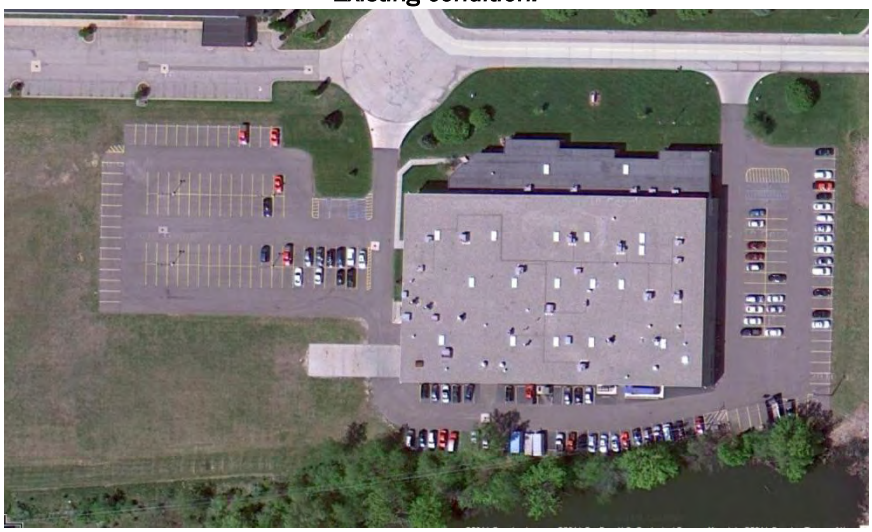
Architecture • Planning • Interior Design
2445 Franklin Road
Bloomfield Hills, MI 48302
248-334-5000

Existing condition:



REGIONAL COMMERCIAL

Description

General. The regional commercial development area is bounded by M59 and Adams Road. This area has recently developed, and as such no significant change is expected to occur over the life of this plan.

Uses. Appropriate uses include retail and service uses that cater to customers arriving by automobile.

Building Design. Buildings in the regional commercial area should use quality materials and display a level of design quality found in contemporary premier commercial developments.

Development Standards

Blocks	
Maximum Block Perimeter	n/a
Maximum Block Length	n/a
Lot Dimensions and Density	
Minimum Lot Width	n/a
Minimum Lot Area	n/a
Maximum FAR	0.25
Building Setbacks	
Front (minimum)	75 ft.
Side (minimum)	25 ft.
Rear (minimum)	75 ft.
Maximum Building Height	
Feet	30
Stories	2
Parking	
On-Street Parking	Not permitted
Off-Street Parking	Permitted in all yards with a minimum 5-10 foot buffer

Development Examples

Recently constructed development in the regional commercial development area.

Example of an upgraded corporate-format store

Example of LEED-compliant retail store design.

CORRIDOR MIXED-USE

Description

General. Corridor mixed-use areas are located along major roads at the perimeter of the study area. These development areas are intended to upgrade the image of the study area along these perimeter streets, while accommodating mixed uses.

Uses. Appropriate uses include office, service, retail, and residential. The purpose of this development area is to accommodate a wide range of uses by minimizing any potential external negative impacts. Nonresidential uses must be located on the first floor, and residential uses are to be located on upper floors.

Building Character. Buildings should conform to traditional design proportions, scaled to the pedestrian rather than the automobile. Building materials should be quality, natural materials.

Public Realm Improvements. Public realm improvements in corridor mixed-use areas need only be modest. Public realm improvements will primarily be found between the building and the street, and will contribute to creating a strong streetscape.

Development Standards

Blocks	
Maximum Block Perimeter	2,000 ft.
Maximum Block Length	600 ft.
Lot Dimensions and Density	
Minimum Lot Width	--
Minimum Lot Area	--
Maximum FAR	0.4
Building Setbacks	
Front (minimum)	10 ft.
Front (maximum)	80 ft.
Side (minimum)	0 ft.
Rear (minimum)	30 ft.
Maximum Building Height	
Feet	40
Stories	3
Parking	
On-Street Parking	Encouraged on B and C streets
Off-Street Parking	One double row allowed in front yard, remainder located in side/rear yards

Development Examples

Example of mixed use development found along major arterial roads. The building is set back 20 feet from the right-of-way, allowing for an outdoor patio area between the building and the street.

Example of an appropriately scaled office/service building.

Example of residential over office along a major arterial road.

Example of simple streetscape improvements that add interest along a major street.

C. Building Design Guidelines

New and remodeled non-residential buildings in the study area should comply with the following building design guidelines:

MATERIALS

Exterior building materials used for buildings in the study area should generally fall into two categories, primary and accent building materials. Primary building materials should cover a minimum of 60% of the exterior wall surface area, while accent materials should be used on no more than 40% of the exterior wall surface area.

Primary Building Materials include: Durable natural building materials such as brick, stone, and other similar materials; exposed logs, timbers, or wood trim or any material that convincingly matches the appearance of the above natural building materials. Architectural glass is also considered a primary building material.

Accent Building Materials include: Decorative precast concrete block, metal panels and trim. Vinyl siding and non-durable building materials such as EIFS are acceptable as accent materials, but generally should not be used on more than 10% of any exterior building façade's wall area.

Non-recommended Building Materials include: Plain concrete block (both painted and unpainted); plywood or T-111 panels; and aluminum siding.

BUILDING ENTRANCES

Buildings should be designed with at least one pedestrian entrance facing a street or a pedestrian walkway that is connected to a public sidewalk. When parking areas are located behind buildings, functioning building entrances should be provided facing the street and the parking lot or lots serving the building.

Where sites and buildings have Clinton River Trail frontage, building facades facing the trail should be treated as front facades, preferably with functioning building entrances on the façade facing the trail.

FAÇADE ARTICULATION

Long stretches of flat, unarticulated building wall are discouraged. Projections, recesses, or reveals with a minimum change of plane of 6 inches should be provided at regular intervals along building walls, and human scale detailing such as reveals, belt courses, recessed windows or doors, color or textural differences, and canopies or awnings are encouraged to break up long stretches of building.

GREEN BUILDING CERTIFICATION

The Zoning Ordinance should offer incentives for green building certification (i.e. LEED, Energy Star). These incentives could consist of reduced review periods or density bonuses. The Zoning Ordinance could require that all buildings taller than 3 stories be certified, or that certification be required in exchange for reduced setback requirements.

D. Parking

Currently, parking requirements in the study area are calculated based on building use. When constructed, many buildings in the industrial parks provided parking at the rate of one space per 550 square feet. However, as buildings transition to a mixture of office/research/industrial uses, the Zoning Ordinance is requiring a higher parking requirement. The parking analysis on page 20 found that in one industrial park, if all buildings converted to office uses at a minimum parking requirement of one space per 350 square feet, there is a 16.4% parking deficiency.

Note that one space per 350 square feet is somewhat of a low parking standard for suburban office uses, so the actual parking gap will likely be greater if all buildings convert to office use. However, it is unlikely that all buildings will convert, and it is more likely that some buildings will continue to be used for industrial or research uses that generate lower parking demand. Therefore, a requirement of one space per 350 square feet is assumed to be a reasonable blended parking standard.

The following recommendations are intended to address the existing parking deficiency and to remove parking as an obstacle to the continued evolution of the study area.

RECOMMENDATIONS

On-Street Parking. As noted in the existing conditions section, allowing on-street parking on one side of the street can meet approximately 40% of the parking deficiency. The street design standards in the following section incorporate on-street parking and other improvements necessary to make on-street parking viable in the study area.

Bicycle Parking. The Clinton River Trail traverses the study area, providing non-motorized access to nearly all parts of the study area. This makes non-motorized travel possible for employees who live in Rochester Hills or nearby in other adjacent communities. Providing bicycle infrastructure at destinations will help encourage non-motorized travel during temperate months. It is recommended that:

- Bicycle Parking. One secure, enclosed bicycle storage space for employees should be provided for 10% of the planned occupancy of the building. Visitor bicycle racks with one space for every 30 vehicle parking spaces should be provided.
- Support Facilities. On-site showers and changing facilities should be provided in any building or development with 75 or more new workers. An additional shower should be provided for each 100 additional workers.
- Location of Bicycle Parking. Visitor's bicycle parking must be clearly visible from a main entrance into the building, located within 100 feet of the door, served with night lighting, and protected from damage from nearby vehicles.

Parking Requirements. In order to remove obstacles to the repurposing of buildings, it is recommended that a few broad parking standards be adopted in the Zoning Ordinance, rather than many use-specific standards. The following minimum parking standards are recommended:

Use	Minimum Parking Requirement
New Office/Industrial/Research space	1 space per 450 square feet
Conversion of existing industrial space to office/research	1 space per 500 square feet
Retail	1 space per 300 square feet

Carpool/Shared-Use Parking Spaces. The Zoning Ordinance should offer parking requirement reductions for carpool/shared-use parking spaces. Each carpool-restricted space should count as 1.5 parking spaces towards meeting the minimum parking requirements.

E. Streets and Circulation

CIRCULATION PLAN

The circulation plan establishes a three-level hierarchy of streets in the study area:

- **A-Streets** are major arterial roads that connect to M-59 and for the regional road system. A-Streets include Hamlin, Auburn, Adams, Crooks, and Livernois.
- **B-Streets** are collector streets within the study area that connect to two or more A-Streets. Existing B-Streets include Leach Road, Technology Drive, and Austin/Devondale. Avon Industrial Drive is planned to eventually connect to Hamlin Road, at which point it would be a B-Street.
- **C-Streets** are local streets that distribute traffic from A and B-Streets to individual parcels. C-Streets are any street not specifically identified as an A or B Street.

The circulation plan also designates locations for new streets to be constructed. The purpose of the new streets is to better connect the various parts of the study area to allow for secondary access through the study area as an alternative to the arterial road system. The location of the proposed new streets are based on the location of existing buildings and lot lines, and seek to minimize the potential disruption of existing development.

NON-MOTORIZED CIRCULATION

Non-motorized circulation improvements, consistent with recently adopted Complete Streets legislation, are recommended at varying levels along streets within the study area. The circulation plan identifies major non-motorized routes, along which grade separated non-motorized pathways or on-street bike lanes are appropriate.

The purpose of the major non-motorized routes is to distribute non-motorized users from the regional trail system to sites within the study area.

Any street not identified as a major non-motorized circulation route should have 5-foot wide sidewalk improvements. This will connect all parts of the study area to a major route, which in turn connects to the regional trailway system via the Clinton River trail.

STREET DESIGN GUIDELINES

The following Table 5.1 lists recommended design guidelines for streets in the study area. The intent of the design guidelines is to provide a template for creating new streets and retrofitting existing streets to be complete streets. Complete streets accommodate varied modes of transportation (motorized and non-motorized), and also project a more pedestrian-friendly image. Given the stated goal of this plan to connect the study area to the Clinton River Trail, it is important that streets within the area accommodate non-motorized transportation improvements.

The design guidelines are intended to provide a baseline for complete street design, recognizing that actual road design will have to be adjusted based upon field conditions.

Table 5.1. Street Design Guidelines

Design Element	A-Street	B-Street	C-Street
ROW width	90+ ft.	66-86 ft.	60-66 ft.
Vehicle travel lanes	2-4	2-4	2
On-street parking	not recommended	one side or both sides (where feasible)	one side
Curb type	roll or vertical	roll or vertical	roll or vertical
Sidewalk width	8 ft.	6 ft.	5 ft.
Minimum tree lawn width	8 ft.	8 ft.	8 ft.
Complete streets improvements	separated non-motorized pathway	separated non-motorized pathway or on-street bike lanes & pedestrian sidewalks	sidewalks

Following is a potential before and after of an existing industrial park street in the study area. The before photograph shows the existing condition:

BEFORE

The following "after" image has been modified to show how the above street could appear if buildings are brought closer to the street, street trees are added, sidewalks are built, and one row of on-street parking is permitted:

AFTER

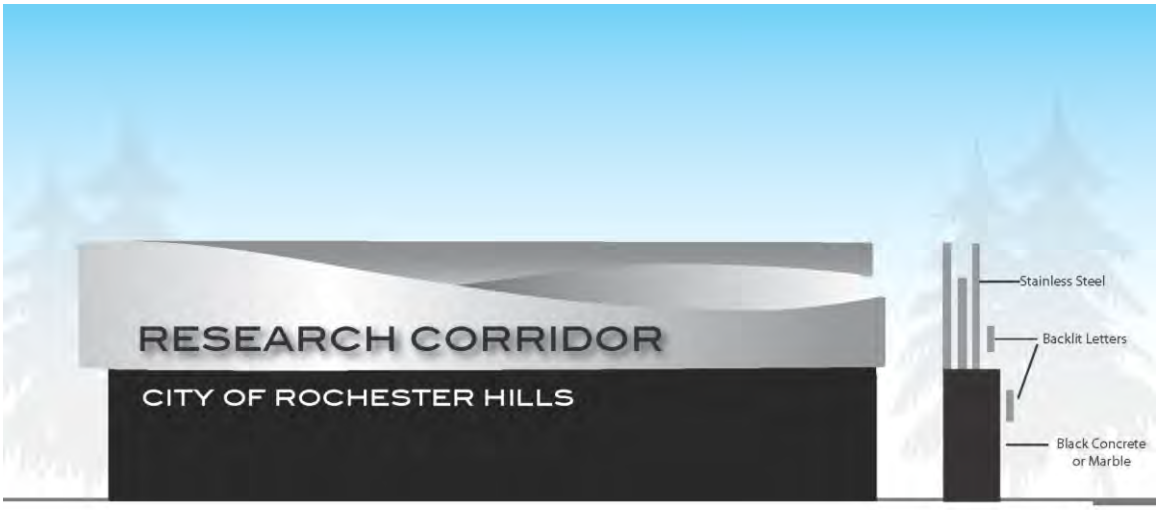
F. Gateway Improvements

Locations for gateway signs are shown on the development plan. Gateway improvements along M59 are most important for the purposes of this study, as the City has an established gateway program that will locate signs at most major surface streets.

The gateway signs should announce entrance into the study area somewhere along M59 between the west City boundary and the Adams Road interchange, and somewhere between the east study area boundary and the Crooks Road interchange. The exact location of the signs can be opportunistically determined in the future, but potential locations for signs include in the right-of-way, or even suspended from the Adams or Crooks Road overpasses.

Following are three potential gateway sign design options:

Gateway Sign Concept 1



Gateway Sign Concept 2

Gateway Sign Concept 3

6. INFRASTRUCTURE IMPROVEMENT PLAN

A. Introduction

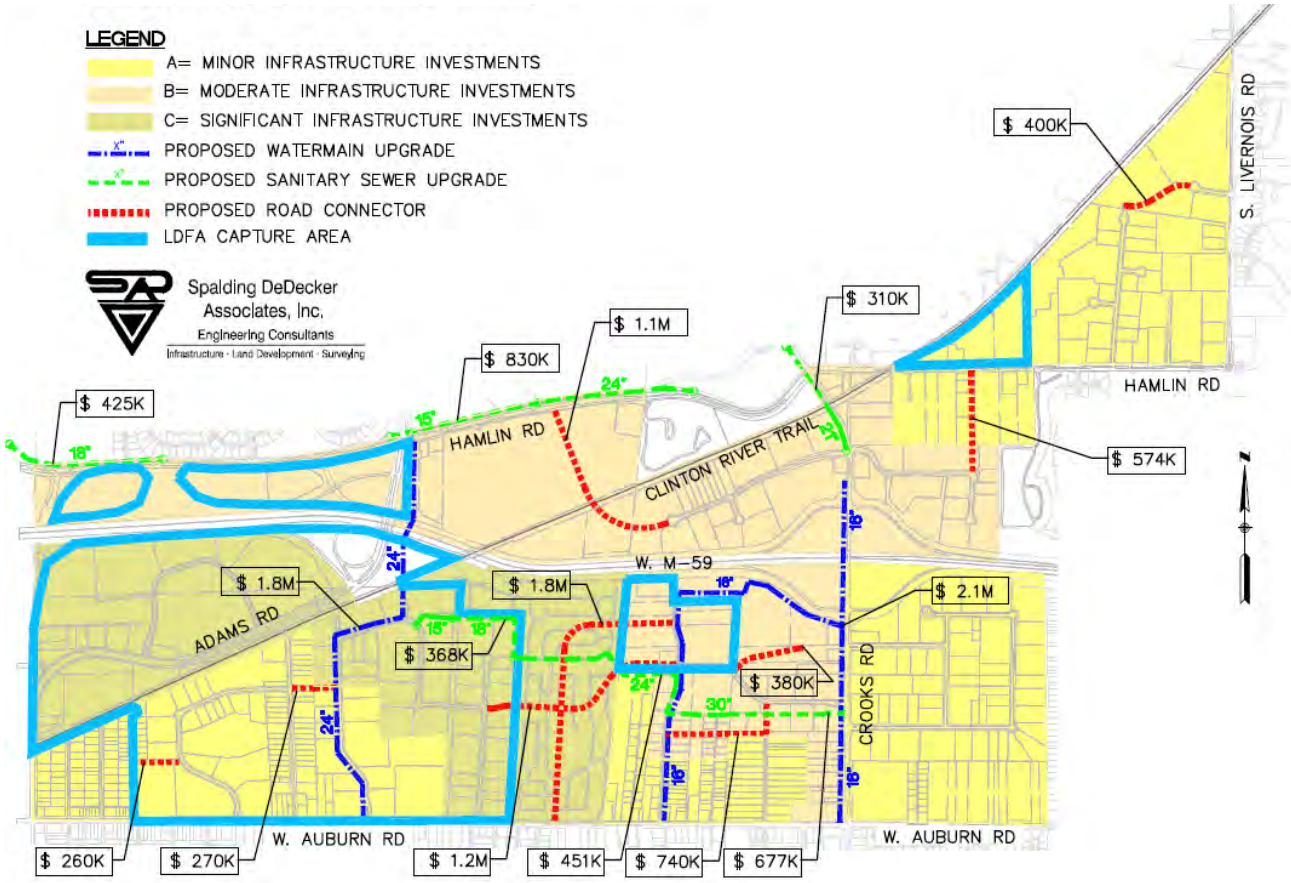
Spalding DeDecker Associates, Inc., has compiled and reviewed all available existing infrastructure data for the area within the Local Development Finance Authority (LDFA) boundaries. Consideration for each infrastructure element is summarized herein for use in the overall master planning of the LDFA, including:

- Roadways
  - *Proposed cross sections and costs*
  - *Proposed new roadway alignments*
  - *Access management techniques*

- Utilities
  - *Storm and sanitary sewer*
  - *Water main*

Figure 14 (on the following page) illustrates the areas of development within the LDFA that require minor, moderate, or significant infrastructure improvement costs to achieve full densification as permitted by the development plan. The timing for implementing each improvement may vary based on the sequence of actual development and demand imposed on the systems.

Figure 14. Development Areas Based on Required Infrastructure Improvements



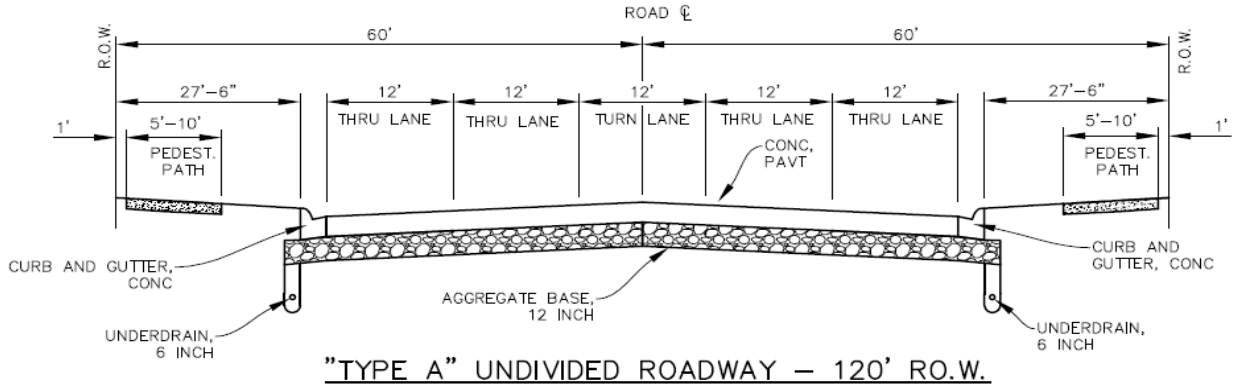
B. Roadways

Roadways within the LDFA can be classified as Type A, Type B and Type C, based on functionality:

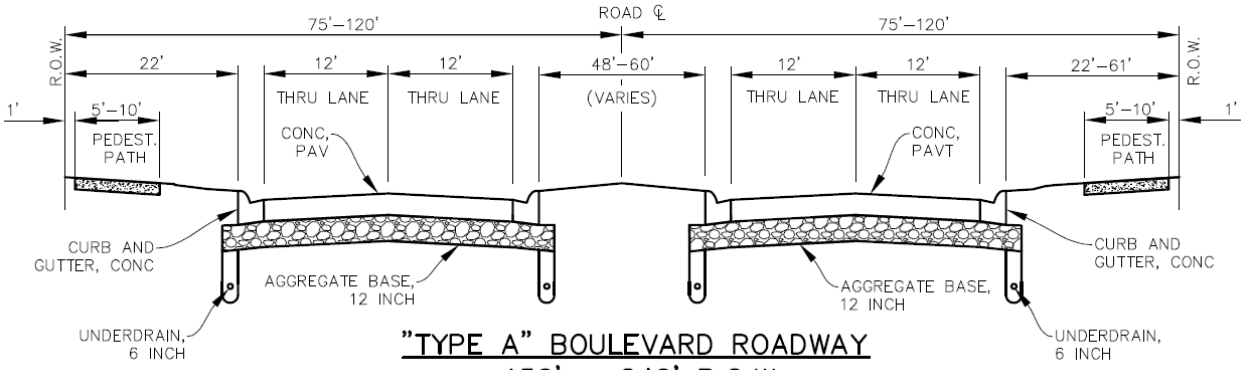
TYPE A ROADS

Type A roads serve as major primary or arterial roads serving local and regional needs. Examples may include Crooks, Hamlin, Adams or Livernois roads. It should be noted that Livernois, Crooks and Adams roads are under the jurisdiction of the Road Commission for Oakland County (RCOC). Auburn Road is under the jurisdiction of the Michigan Department of Transportation (MDOT) and is considered a primary road; its existing pavement section should be planned for reconstruction to current standards. Type A roads may be divided boulevards or undivided roadways, depending on the available Right of Way and other geometric constraints.

For planning purposes, the estimated cost of constructing a Type A road will range from $730.00 for a 5-lane undivided roadway to $810.00 per linear foot for a 4-lane boulevard section. Both options include a pathway for non-motorized transportation and landscaping.



"TYPE A" UNDIVIDED ROADWAY – 120' R.O.W.

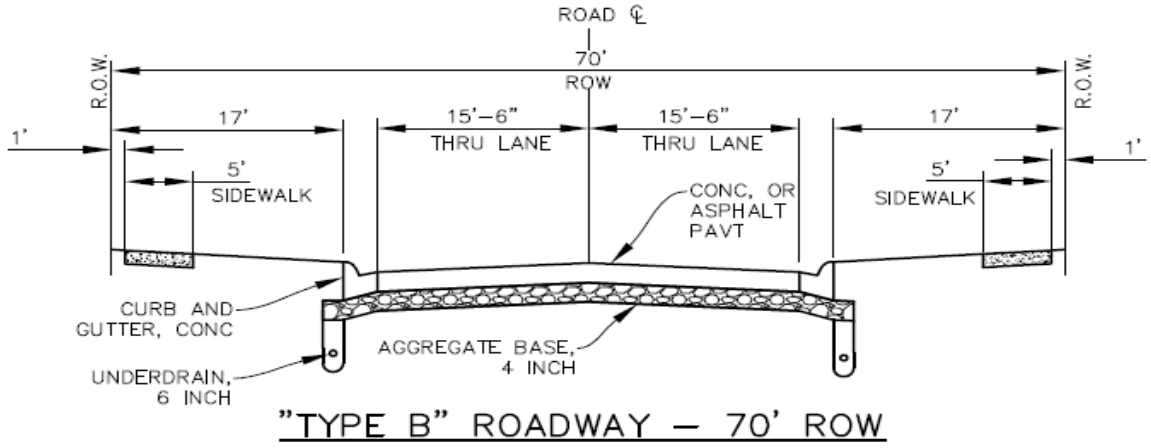


"TYPE A" BOULEVARD ROADWAY
150' – 240' R.O.W.

TYPE B ROADS

Type B roads serve industrial parks and other commercial access routes that frequently carry commercial vehicles (trucks). Examples may include Austin Avenue, Technology Drive, Leach Road or Avon Industrial Drive.

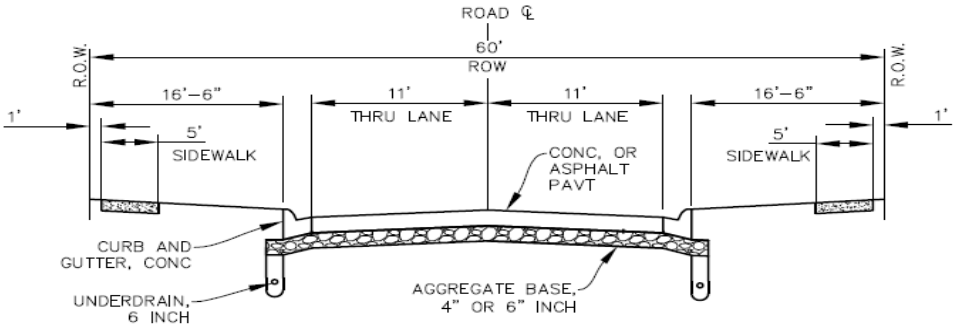
For planning purposes, the estimated cost of constructing a Type B road is $440.00 per linear foot, which includes a sidewalk for pedestrian access and landscaping.



"TYPE B" ROADWAY – 70' ROW

TYPE C ROADS

Type C roads are intended to carry lower traffic volumes, provide local access, and occasionally carry commercial vehicles. For planning purposes, the estimated cost of constructing a Type C road is cost $330.00 per linear foot, which includes a sidewalk for pedestrian access and landscaping.



"TYPE C" ROADWAY – 60' ROW

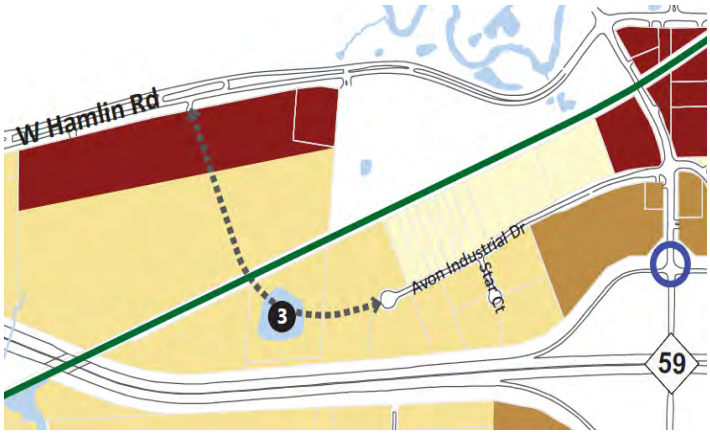
Existing gravel roads may be reconstructed into Type B or C roadways as actual development dictates the volume and demand for the improvements.

SUMMARY OF ESTIMATED ROAD CONSTRUCTION COSTS

Road Type	ROW Width	Lanes	Est. Cost per Linear Foot
Type A (undivided)	120 feet	5	$730
Type A (boulevard)	150 – 240 feet	4	$810
Type B	70 feet	2	$440
Type C	60 feet	2	$330

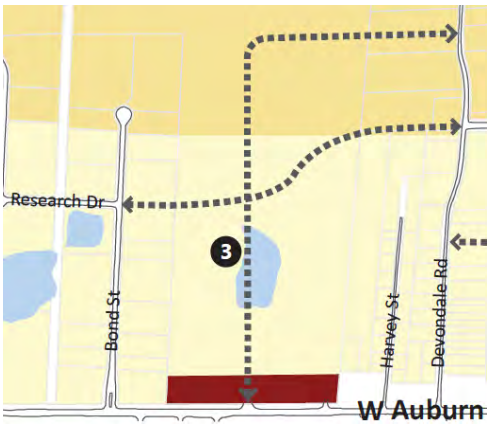
PROPOSED ROAD CONNECTIONS

Hamlin Road to Avon Industrial Drive
Connecting Hamlin Road to Avon Industrial Drive will require 2,475 ft. of new Type B roadway at a cost of approximately $1.1 million, exclusive of real estate purchase costs. Special consideration must be given to the intersection with the Clinton River Trailway when determining the actual alignment and geometrics to ensure that safe stopping sight distance and appropriate signing is provided.

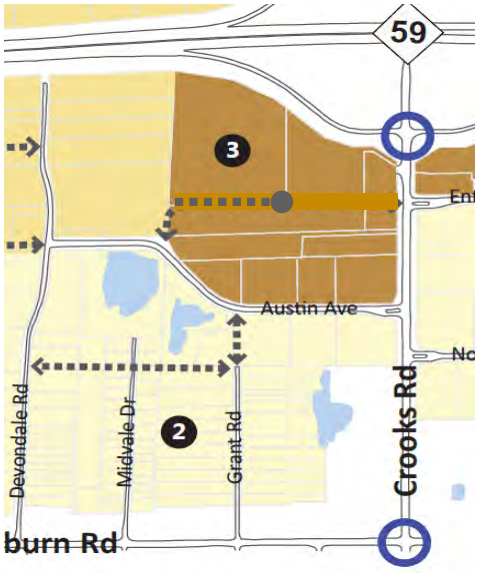


Waterview Drive to York Road and to Technology Drive
Constructing two short segments of Type B roadway between York Road and Waterview and extending Waterview to Technology Drive will improve connectivity for proposed development. The cost of the the 618 ft. segment between York and Waterview is approximately $260,000. The cost of the 650 ft. segment extending Waterview to Technology Drive is approximately $270,000. These costs are exclusive of any real estate purchase costs. These connections serve as effective access management tools helping to reduce unnecessary trips on Auburn Road.

Research Drive connection to Austin Avenue and new roadway from Auburn Road northerly to Devondale
This 2,887 ft. segment of Type B roadway extending Research Drive to Austin will cost approximately $1.2 million, exclusive of real estate acquisition costs. A new Type B roadway alignment from Auburn Road northerly will cost approximately $1.8 million and may require signalization with Auburn Road, which is not included in the estimated construction cost.



Connectors to Austin Avenue
A 900 ft. segment of Type B roadway from Austin Avenue to provide access to sites in the southwest quadrant of the Crooks Road interchange is estimated at $380,000. Providing access within the quadrant via Austin Avenue is an excellent access management strategy for Crooks Road. A 1,339 ft. connector between Devondale and Grant roads with a 393 ft connector to Austin Avenue is estimated at approximately $740,000.



Connector between Star Batt Drive and Hamlin Road
A 1,300 ft. Type B roadway connector that connects Star Batt Drive to Hamlin Road is estimated to cost $574,000. Constructing the roadway will offer alternative access to Hamlin Road for the numerous properties within the northeast quadrant of the interchange eliminating trips on Crooks Road and diverting vehicles from the Crooks-Hamlin intersection.

Connector between Rochester Industrial Drive and Horizon Court
A 939 ft. Type B roadway connector that extends Rochester Industrial Drive to Horizon Court is estimated to cost $400,000. Much of this segment replaced a private driveway serving the properties at 1111 Horizon Court and 1400 S. Livernois. Constructing the roadway will provide public access and create an alternative route that diverts vehicles from the Hamlin/Livernois intersection and provides more direct access to businesses in this area.

ACCESS MANAGEMENT

By applying basic Asset Management principals to both the site planning process as well as local ordinances, access can be safer and more effective within the LDFA area. In general, the higher the traffic volume on the adjacent roadway, the greater the effort should be to implement Access Management techniques.

When planning an individual site plan, consider design features that support access management principals, such as:

- Minimizing the number of driveways accessing the site or providing alternative access
- Sharing driveway access among adjacent properties, using internal service drives
- Keeping driveways away from intersections
- Removing turning vehicles from through lanes
- Providing adequate on-site circulation to prevent vehicle delays entering the site
- Use appropriate driveway geometrics to define permitted movements

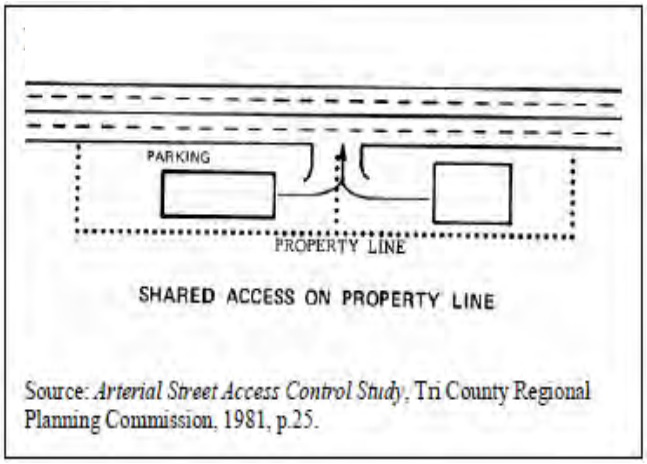
When establishing ordinances or overlay zones, include guidelines that support Access Management principals such as:

- Limiting the number of driveways permitted per lot
- Establish minimum distances between driveways and from intersections
- Require alternate rear or side access driveways where possible
- Require trip generation estimates and traffic studies for large developments or changes in land use
- Establish coordinated site plan review processes with local agencies and road authorities

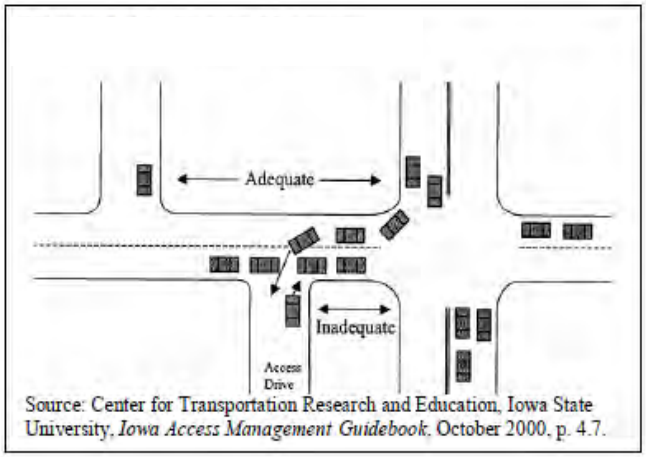
Auburn Road Corridor

Access Management techniques may be applied along the Auburn Road corridor now and as redevelopment occurs. Throughout the corridor where narrow lots are likely to remain, shared access drives that straddle property lines should be established to help eliminate multiple driveways.

Also, existing driveways should be relocated as far as possible away from intersections to provide adequate "corner clearance". Adequate corner clearance assures that there is sufficient stacking space for vehicles at the intersection without blocking the driveway OR the intersection. With a posted speed limit of 50 mph on Auburn Road, the minimum corner clearance distance for a driveway is recommended at 430 feet. Where this distance is not achievable other mitigating effort is recommend, such as signage or prohibiting turn movements.



Source: *Arterial Street Access Control Study*, Tri County Regional Planning Commission, 1981, p.25.



Source: Center for Transportation Research and Education, Iowa State University, *Iowa Access Management Guidebook*, October 2000, p. 4.7.

Auburn Road Between Adams and York Roads

For the roadway segment between Adams and York roads, where commercial driveways are most concentrated, the narrow lot widths, shallow building setbacks, and lack of delineated driveways currently hinder the ability to manage access to and from the roadway effectively. Furthermore, many properties within this area currently use the roadway right of way for parking or to provide on-site circulation within the site. To fully implement effective access management principals these encroachments should be eliminated. However, with cooperation from the property owners and permit approval from MDOT it may be possible to implement minor improvements such as adding curbed islands, installing drainage structures, and delineating driveway access points at the following locations:

Figure 15. Auburn Road Access Management Improvements between Adams and York Roads

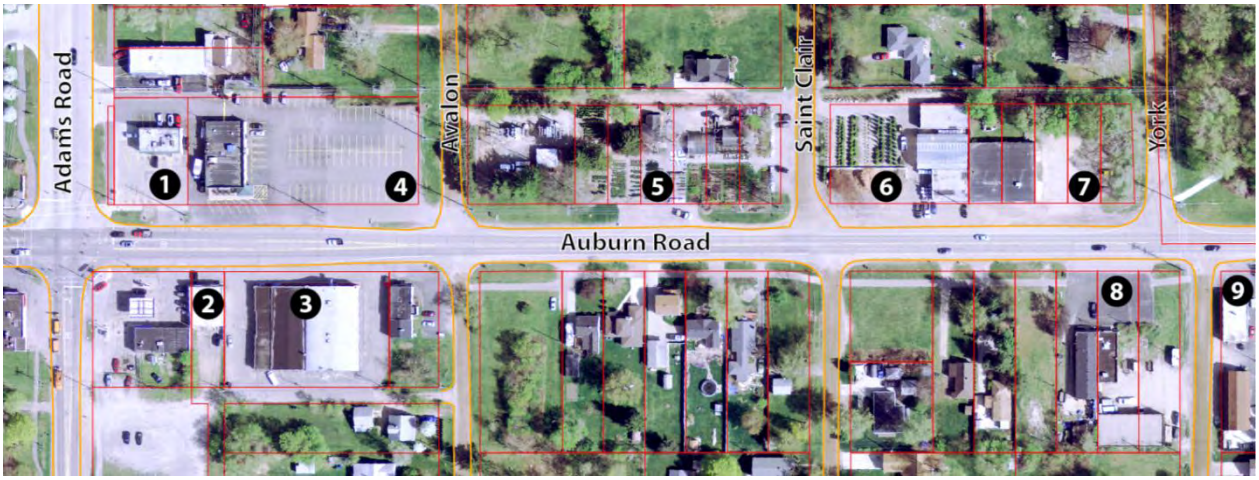


Table 6.1. Auburn Road Access Management Improvements between Adams and York Roads

Map Key	Address	Improvement
1	3990	Continue sharing access with adjacent parcels
2	3965	Share driveway access with adjacent properties
3	3931	Construct additional curb to define driveway access points; recommend “in” only at west driveway
4	3982	Relocate easternmost driveway to the north along Avalon Road, farther away from Auburn Road
5	3820	Add curb in front of property, permitting only parallel parking; retain parking on the east side of property along St. Clair
6	3776	Add curb in front of property, permitting “enter only” from Auburn Road and delineate driveway access on St. Clair
7	3760	Add curb along front property line to delineate “exit only” driveway at the westernmost property line. Allow entrance access from York Road only.
8	3737	Construct curb to define driveways
9	3675	Construct curb, permitting entrance access only from York

These types of access management improvements must be implemented by permits issued by MDOT. A comprehensive list of potential Access Management techniques is presented and detailed in the Michigan Access Management Guidebook, published by MDOT.

NON-MOTORIZED PATHWAY SYSTEM IMPROVEMENTS

To improve pedestrian connectivity to the Clinton River Trail throughout the LDFA area, easements may be acquired outside of roadway rights of way to permit construction of pedestrian pathways. Construction cost of concrete pathways (between 8-10 feet wide) is estimated at $4.25 per square foot and asphalt pathways are estimated at $3.00 per square foot. Construction of concrete sidewalks (5 feet wide) is estimated at $3.00 per square foot.

ROAD MAINTENANCE

Reconstruction or rehabilitation of existing roadway alignments may be required in areas where the condition of the road is too poor to carry increased traffic generated by a new development. See Figure 16 and Figure 17. Also, existing gravel roads may be paved as either Type B or Type C roadways, depending on the forecasted development adjacent to the roadway.

Figure 16. Pavement Rehabilitation Costs

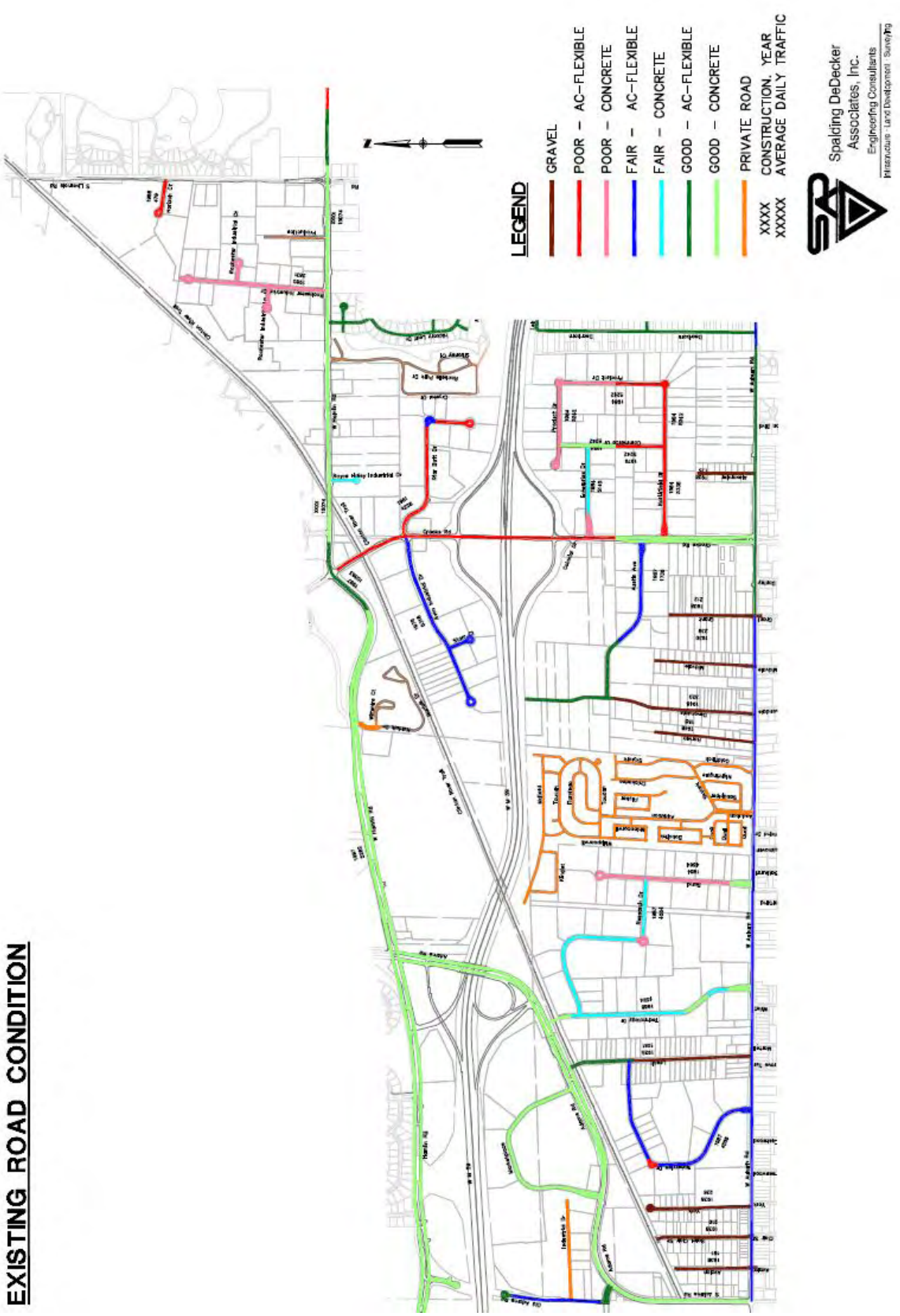
Asphalt

Treatment Description	Type	Cost per Lane Mile
Crack Seal	Preventative Maintenance	$29,040.00
Microsurfacing	Preventative Maintenance	$55,176.00
Overlay < 1.5"	Preventative Maintenance	$89,056.00
Mill & Overlay - 3" Thick	Rehabilitation	$290,400.00

Concrete

Treatment Description	Type	Cost per Lane Mile
Joint Seal	Preventative Maintenance	$14,520.00
Joint Repair and Grind	Preventative Maintenance	$25,080.00
Concrete Patching	Preventative Maintenance	$71,280.00
Full Depth Overlay	Rehabilitation	$250,800.00
Full Depth Slab Replacement	Rehabilitation	$538,120.00

Figure 17. Existing Road Condition



C. Utilities

Public and private utilities within the LDFA boundary include:

- City water main and sanitary sewer
- Comcast
- Consumers Energy
- DTE Energy
- Lightcore
- WideOpenWest
- AT&T
- MCI

For the numerous private utility companies currently servicing the LDFA area, each facility owner must be engaged to determine actual capacity and what infrastructure improvements would be required to meet the demand of a new site-specific development.

STORMWATER CONVEYANCE

The LDFA falls within two watersheds: the Rouge Main 1-2 Subwatershed and the Clinton Main Subwatershed. The area north of M-59 and part of the adjacent land along the south side of M-59 flows northerly into the Clinton Main Subwatershed, Approximately half of the LDFA area south of M-59 flows southerly into the Rouge Main 1-2 Subwatershed.

The stormwater conveyance through the LDFA area includes both enclosed storm sewer and open-ditch facilities. Ownership of the system varies among the City, RCOC, MDOT, and the Oakland County Water Resources Commissioner. Design for the enclosed sewers typically supports a 10-year rainfall event, with open-channel ditch designs accommodating at least a 10-year event. It is expected that properties developed in accordance with current standards should not create an undue burden on the overall stormwater system. Localized improvements and on-site stormwater management should be expected for any proposed development and will require complete hydraulic analysis and design of conveyance and detention, as necessary. New site development should implement Low Impact Development techniques as much as possible, such as use of pervious surfaces, natural filtration methods, bioswales and other best management practices.

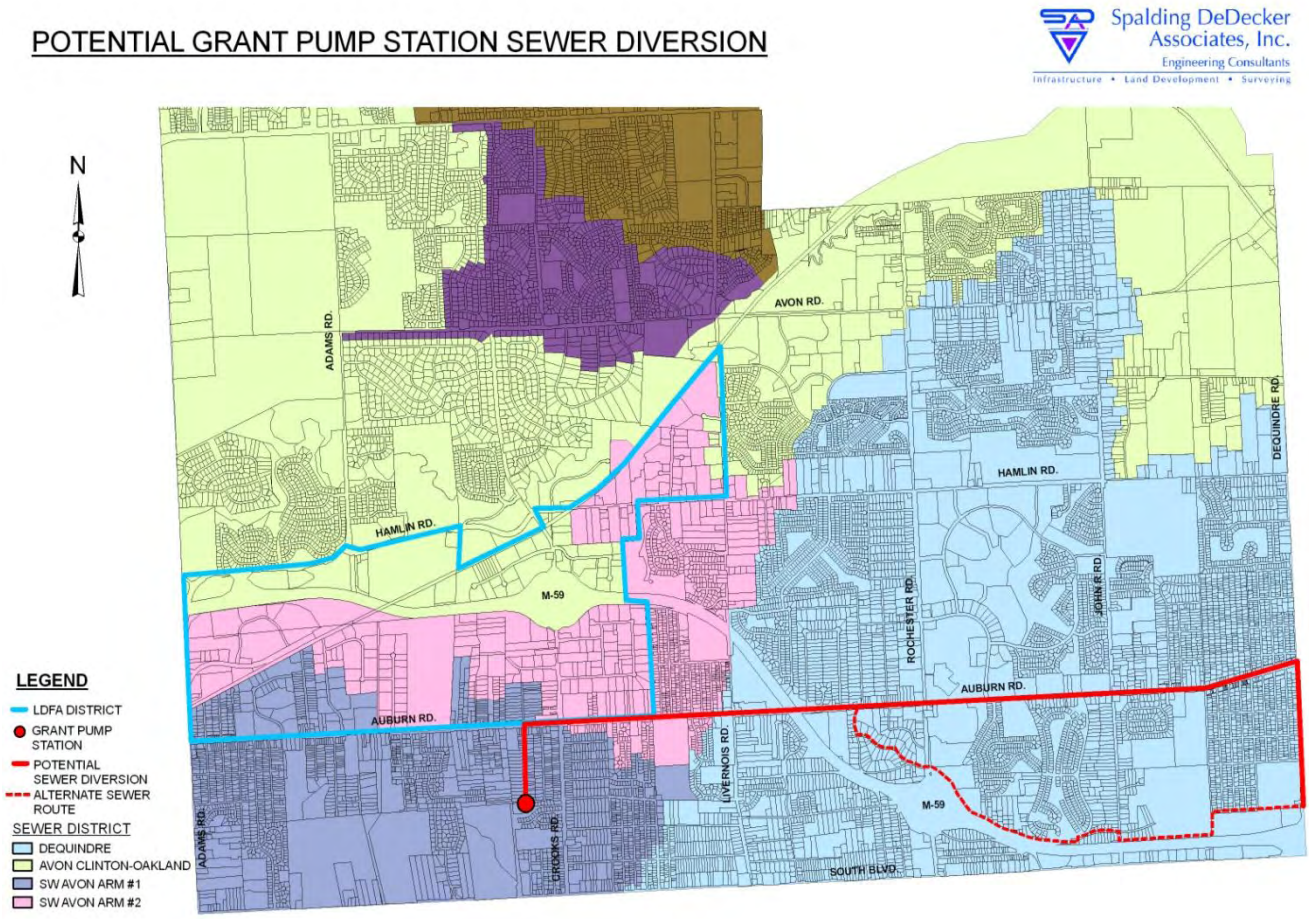
SANITARY SEWER SYSTEM

The sanitary sewage from the LDFA area is currently served by the Clinton–Oakland interceptor. Historic data indicates that average dry weather peak daily flows are approximately 14 cubic feet per second (cfs). With a purchased capacity of 19.6 cfs, development within the sewer district may generate an additional 5.6 cfs peak daily flow without subjecting the City to penalties. Furthermore, the 1996 Management Agreement executed by the Oakland County Water Resources Commissioner's Office and the affected communities affords Rochester Hills the ability to exceed sewage purchased capacity and only pay a per instance penalty to other Clinton-Oakland communities without enforcement action by the Michigan Department of Environmental Quality, as long as the City is also under the maximum assignment capacity of 37.50 cfs. It should be noted that Rochester Hills did not exceed its purchase capacity at any time during 2010. Occasionally exceeding the purchased capacity and paying an imposed penalty is a viable option for allowing development to occur without incurring significant sewer infrastructure improvement costs. See Figures 6 & 7 illustrating the existing sanitary sewer system.

The City will need to monitor the flows as development progresses (within the entire sewer district, not limited to only the LDFA boundary area) to determine when the frequency of penalty costs for exceeding purchase capacity is no longer justifiable and permanent alterations should be made to the sewer system. The likely solution to

increase capacity within the Clinton-Oakland district is to divert flow to the adjacent Gibson-Avon interceptor, which currently has approximately 10 cfs additional capacity. The diversion will reroute flows from the Grant Pump Station Service Area and portions of the Southwest Avon Arm #2 into the Gibson-Avon interceptor. The cost to upgrade the Grant Pump Station facility is estimated at $5.1 million which includes construction of 28,000 feet of force main and upgrading to a 4500 gallons per minute pump station. Figure 18 illustrates the potential routes which the Grant Pump Station diversion may follow.

Figure 18. Potential Grant Pump Station Sewer Diversion



The order in which areas develop within the LDFA and within the Oakland-Clinton Sewer District will play a large part in what infrastructure improvements are mandatory at the time of construction and what can wait to be improved until further development puts additional demands on the systems.

WATER MAIN SYSTEM

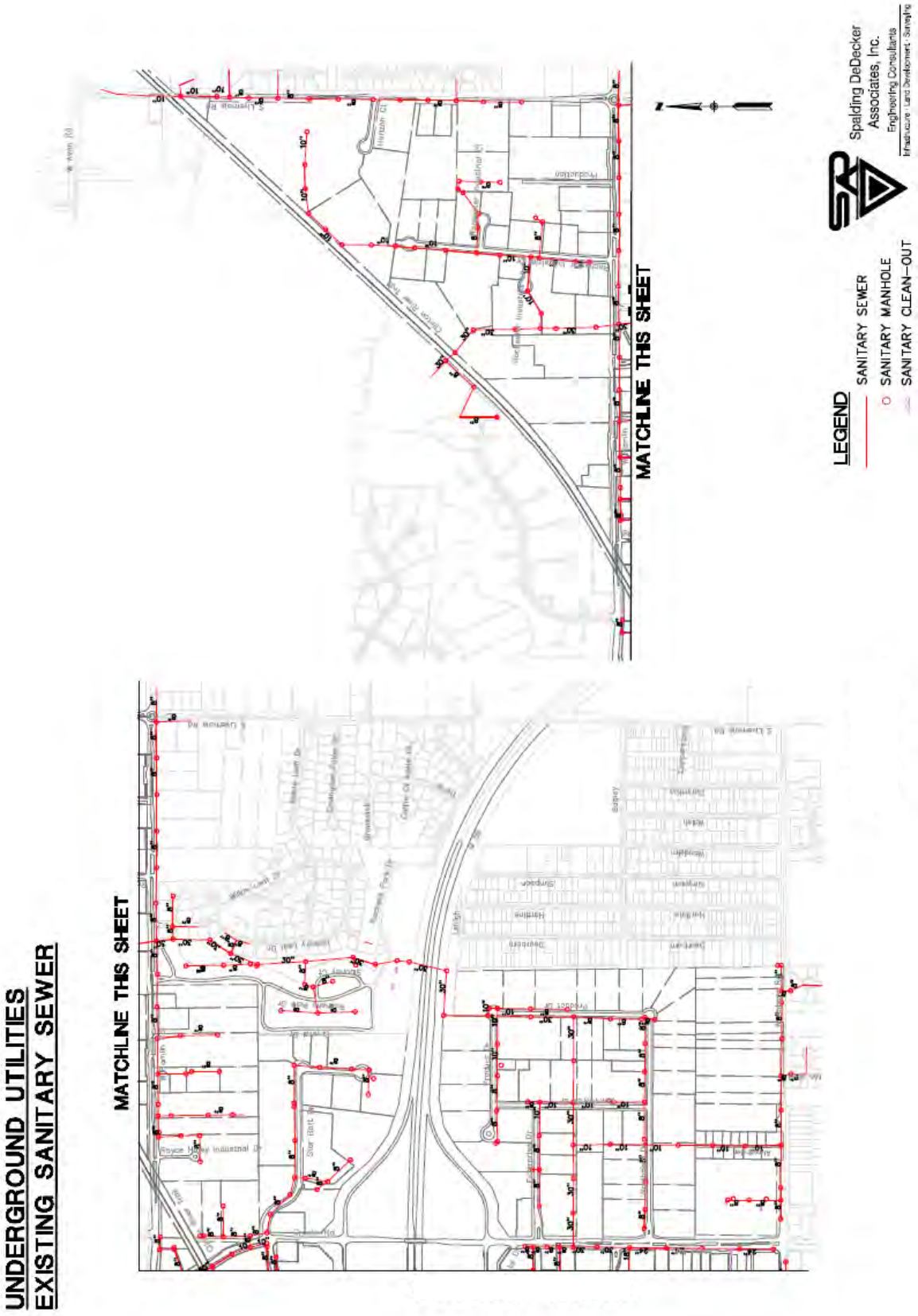
The LDFA falls within two water pressure districts which are controlled by flow control valves. Unlike the City's sanitary system, the water distribution network can be affected more broadly when a single development creates additional demands on the system. As a pressurized system, the water system reacts both "upstream" and "downstream" when demands are increased. The location and demand generated by a development will determine how the surrounding network behaves, therefore the water system model should be evaluated every three to five years or when a significant user is added to the system. Based on results of each evaluation, modifications to the system may be required, such as adjusting pressure reducing valves, pipe sizes, or the addition of pipes and appurtenances to maintain an acceptable level of service. Also, it is assumed that the Detroit Water and Sewerage Department sustains the current pressures and level of service to the City of Rochester Hills during the course of development. See the figures on the following pages illustrating the existing water main system.

Figure 19. Underground Utilities – Existing Water Main (west section)

Figure 20. Underground Utilities – Existing Water Main (east section)

Figure 21. Underground Utilities – Existing Sanitary Sewer (west section)

Figure 22. Underground Utilities – Existing Sanitary Sewer (east section)



7. IMPLEMENTATION PLAN

A. Introduction

Potential implementation projects are summarized in the following table, and as illustrated in Figure 14 on page 74 of this report. The proposed projects are necessary to provide sufficient utility capacity at full development of the LDFA district. Actual pipe sizes and the demand for each project will vary based on the order of areas being developed as well as the percent of build out achieved. That is, improvements may not be warranted or pipe sizes may be decreased if full development is not achieved. Finally, the construction of some infrastructure projects may obviate the need for other projects.

B. Projects

The list of implementation projects on the following page is intended to provide the LDFA with a comprehensive list of potential infrastructure improvements from which it can opportunistically choose projects that will support the overall development of the LDFA district. Note that most, but not all of the infrastructure projects are located within the existing boundaries of the LDFA.

The LDFA could also choose to adopt a policy of providing matching funds for private improvements. For instance, a long-term goal should be to provide sidewalks and street trees to improve the pedestrian and non-motorized transportation environment in the study area, and also to connect all parcels to the regional pathway and trail system which is such an asset to the study area.

There are a number of methods by which the ultimate build-out of the pedestrian and non-motorized transportation system may occur:

1. The LDFA bears the entire cost of construction of sidewalks and streetscape improvements.

2. The city creates special assessment districts to share the cost of improvements between property owners and the LDFA.

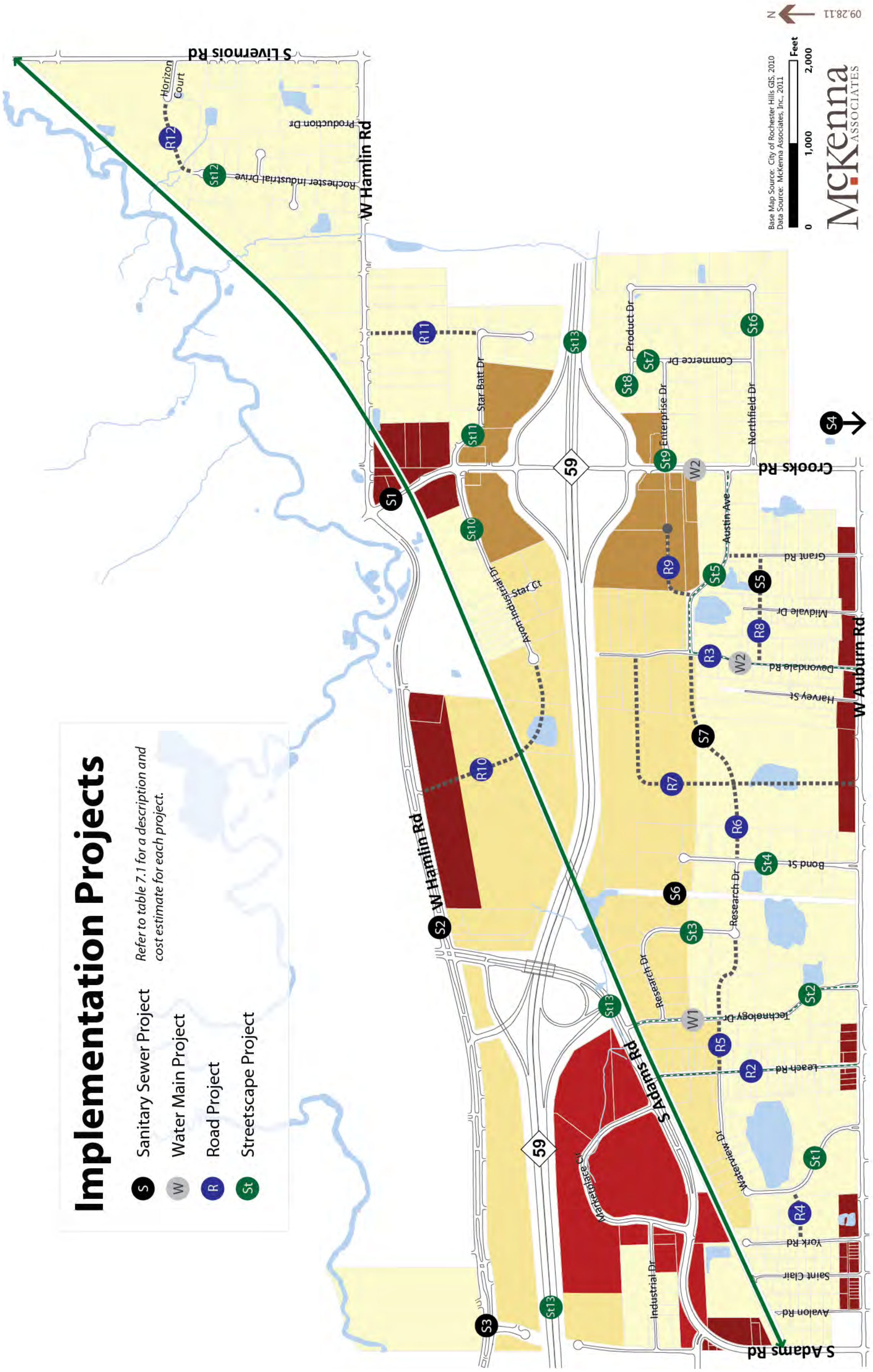
3. Require property owners to construct sidewalk and street tree improvements whenever other improvements to the property are made, but adopt a policy whereby the LDFA will share a portion of the cost of such improvements.

4. Some combination of the above.

The LDFA could also partner to share costs for other improvements listed in Table 7.1, such as water, sanitary sewer, or road construction costs.

Table 7.1. Implementation Projects

	Map Key	Project Description	Estimated Cost
Sanitary Sewer	S1	Upgrade existing 10" sanitary sewer to 21" sewer along Crooks between Avon Industrial to North of Hamlin Road	$310,000
	S2	Construct 15" and 24" sanitary sewer along Hamlin Road from Adams Road easterly 4,100 feet	$830,000
	S3	Upgrade existing 10" sanitary sewer to 18" sewer along Hamlin Road east and west from Old Adams Road 2,200 feet	$425.000
	S4	Divert flow from Clinton-Oakland tributary to the Gibson-Avon tributary via the Grant pump station. Upgrade pump station to 4,500 gpm & construct 16" force main	$5,100,000
	S5	Upgrade existing 15" and 18" sanitary sewer to 30" sewer south of Austin Avenue between Devondale and Crooks	$677,000
	S6	Upgrade existing 10", 12", and 15" sanitary sewer to 15" and 18" sanitary sewer near Research Drive and Bond Street	$368,000
	S7	Upgrade existing 15" sanitary sewer to 24" sewer from Austin Avenue westerly 2,200 feet	$451,000
Water Main	W1	Upgrade existing 16" water main to 24" main along Technology and Research Drives between Auburn and Hamlin Roads	$1,800,000
	W2	Upgrade existing 12" water main to 16" main from Auburn Road along Devondale and Crooks Roads	$2,100,000
Road	R1	Re-stripe C-streets with on-street parking	
	R2	Pave Leach Road from Auburn Road to Waterview Drive	$740,000
	R3	Pave Devondale Road from Auburn Road to Austin Avenue	$910,000
	R4	Construct roadway connector from York Road to Waterview Drive	$260,000
	R5	Construct roadway connector from Leach Road to Technology Drive	$270,000
	R6	Construct roadway connector from Research Drive to Austin Avenue	$1,200,000
	R7	Construct roadway connector from Auburn Road north and easterly to Devondale	$1,800,000
	R8	Construct roadway connector from Devondale to Austin Avenue	$740,000
	R9	Construct cul-de-sac access road from Austin Avenue into southwest quadrant of Crooks Road interchange	$380,000
	R10	Construct roadway connector from Hamlin Road to Avon Industrial Drive	$1,100,000
	R11	Construct roadway connector from Star Batt to Hamlin Road	$574,000
	R12	Construct roadway connector from Rochester Industrial Drive to Horizon Court	$400,000
Streetscape	St1	Construct sidewalk and plant street trees along Waterview Drive	$138,000
	St2	Construct sidewalk and plant street trees along Technology Drive	$115,000
	St3	Construct sidewalk and plant street trees along Research Drive	$122,000
	St4	Construct sidewalk and plant street trees along Bond Street	$88,000
	St5	Construct sidewalk along Austin Avenue (north side from Crooks to Devondale, south side 1,100 feet westerly from Crooks)	$46,000
	St6	Construct sidewalk and plant street trees along Northfield Drive	$141,500
	St7	Construct sidewalk and plant street trees along Commerce Drive	$55,000
	St8	Construct sidewalk and plant street trees along Product Drive	$50,000
	St9	Construct sidewalk and plant street trees along Enterprise Drive	$49,000
	St10	Construct sidewalk and plant street trees along Avon Industrial Drive	$95,000
	St11	Construct sidewalk and plant street trees along Star Batt Drive	$115,000
	St12	Construct sidewalk and plant street trees along Rochester Industrial Drive	$107,000
	St13	Construct gateway entrance signs	$60,000 (each)



Implementation Projects
S Sanitary Sewer Project
W Water Main Project
R Road Project
St Streetscape Project
Refer to table 7.1 for a description and cost estimate for each project.
Base Map Source: City of Rochester Hills GIS, 2010
Data Source: McKenna Associates, Inc., 2011
0 1,000 2,000 Feet
McKenna ASSOCIATES
09.28.11
N
S Livernois Rd
W Hamlin Rd
Crooks Rd
W Auburn Rd
S Adams Rd
59
Rochester Industrial Drive
Production Dr
Horizon Court
Star Batt Dr
Avon Industrial Dr
Star Ct
Product Dr
Commerce Dr
Enterprise Dr
Northfield Dr
Austin Ave
Grant Rd
Midvale Dr
Devondale Rd
Harvey St
Bond St
Research Dr
Technology Dr
Leach Rd
Waterview Dr
York Rd
Saint Clair
Avalon Rd
Marketplace Ct
Industrial Dr

APPENDIX

A. Business Sector Descriptions

Following is a description of the business classes listed in Table 2.3 on page 5. Businesses are categorized according to NAICS code.

Accommodation and Food Services. Establishments providing customers with lodging and/or preparing meals, snacks, and beverages for immediate consumption. Excluded from this sector are civic and social organizations; amusement and recreation parks; theaters; and other recreation or entertainment facilities providing food and beverage services.

Administration/Support/Waste Management/Remediation Services. Establishments performing routine support activities for the day-to-day operations of other organizations. Activities performed include: office administration, hiring and placing of personnel, document preparation and similar clerical services, solicitation, collection, security and surveillance services, cleaning, and waste disposal services.

Construction. Establishments primarily engaged in the construction of buildings, engineering projects, the preparation of sites for new construction, developers, and maintenance and repair contractors. This category includes general contractors, construction managers, specialty trade contractors, merchant builders, and infrastructure contractors.

Educational Services. The Educational Services sector comprises establishments that provide instruction and training in a wide variety of subjects. This instruction and training is provided by specialized establishments, such as schools, colleges, universities, and training centers. These establishments may be privately owned and operated for profit or not for profit, or they may be publicly owned and operated. They may also offer food and accommodation services to their students.

Finance and Insurance. The Finance and Insurance sector comprises establishments primarily engaged in financial transactions (transactions involving the creation, liquidation, or change in ownership of financial assets) and/or in facilitating financial transactions. Three principal types of activities are identified:

1. Raising funds by taking deposits and/or issuing securities and, in the process, incurring liabilities. Establishments engaged in this activity use raised funds to acquire financial assets by making loans and/or purchasing securities. Putting themselves at risk, they channel funds from lenders to borrowers and transform or repackage the funds with respect to maturity, scale, and risk. This activity is known as financial intermediation.

2. Pooling of risk by underwriting insurance and annuities. Establishments engaged in this activity collect fees, insurance premiums, or annuity considerations; build up reserves; invest those reserves; and make contractual payments. Fees are based on the expected incidence of the insured risk and the expected return on investment.

3. Providing specialized services facilitating or supporting financial intermediation, insurance, and employee benefit programs.

Health Care and Social Assistance. The Health Care and Social Assistance sector comprises establishments providing health care and social assistance for individuals. The sector includes both health care and social assistance because it is sometimes difficult to distinguish between the boundaries of these two activities. The industries in this sector are arranged on a continuum starting with those establishments providing medical care exclusively, continuing with those providing health care and social assistance, and finally finishing with those providing only social assistance. The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector share this commonality of process, namely, labor inputs of health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry.

Information. Establishments engaged in the following processes: (a) producing and distributing information and cultural products, (b) providing the means to transmit or distribute these products as well as data or communications, and (c) processing data. The main components of this sector are the publishing industries, including software publishing, and both traditional publishing and publishing exclusively on the Internet; the motion picture and sound recording industries; the broadcasting industries, including traditional broadcasting and those broadcasting exclusively over the Internet; the telecommunications industries; the industries known as Internet service providers and web search portals, data processing industries, and the information services industries.

Manufacturing. Establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. Establishments in the manufacturing sector are often described as plants, factories, or mills and characteristically use power-driven machines and materials-handling equipment. However, establishments that transform materials or substances into new products by hand or in the worker's home and those engaged in selling to the general public products made on the same premises from which they are sold, such as bakeries, candy stores, and custom tailors, may also be included in this sector.

Other Services. Establishments engaged in providing services not specifically provided for elsewhere in the classification system. Establishments in this sector are primarily engaged in activities, such as equipment and machinery repairing, promoting or administering religious activities, advocacy, and providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

Professional, Scientific, and Technical Services. Establishments that specialize in performing professional, scientific, and technical activities for others. Activities performed include: legal advice and representation; accounting, bookkeeping, and payroll; architectural, engineering, and specialized design services; computer services; consulting; research; advertising; photographic; translation and interpretation; veterinary; and other professional, scientific, and technical services. This sector excludes establishments primarily engaged in providing a range of day-to-day office administrative services, such as financial planning, billing and recordkeeping, personnel, and physical distribution and logistics.

Public Administration. Establishments of federal, state, and local government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area. These agencies also set policy, create laws, adjudicate civil and criminal legal cases, provide for public safety and for national defense.

Real Estate, Rental and Leasing. The Real Estate and Rental and Leasing sector comprises establishments primarily engaged in renting, leasing, or otherwise allowing the use of tangible or intangible assets, and establishments providing related services. The major portion of this sector comprises establishments that rent, lease, or otherwise allow the use of their own assets by others. The assets may be tangible, as is the case of real estate and equipment, or intangible, as is the case with patents and trademarks.

This sector also includes establishments primarily engaged in managing real estate for others, selling, renting and/or buying real estate for others, and appraising real estate. These activities are closely related to this sector's main activity, and it was felt that from a production basis they would best be included here. In addition, a substantial proportion of property management is self-performed by lessors.

Retail Trade. Establishments engaged in retailing merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The retailing process is the final step in the distribution of merchandise; retailers are, therefore, organized to sell merchandise in small quantities to the general public. This sector comprises two main types of retailers: store (retailers who operate fixed point-of-sale locations, located and designed to attract a high volume of walk-in customers) and non-store retailers (retailers, like store retailers, are organized to serve the general public, but their retailing methods differ).

Transportation and Warehousing. Industries providing transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation. Establishments in these industries use transportation equipment or transportation related facilities as a

productive asset. The type of equipment depends on the mode of transportation (air, rail, water, road, and/or pipeline).

Wholesale Trade. Establishments engaged in wholesaling merchandise, generally without transformation, and rendering services incidental to the sale of merchandise. The wholesaling process is an intermediate step in the distribution of merchandise. Wholesalers sell merchandise to other businesses and normally operate from a warehouse or office. These warehouses and offices are characterized by having little or no display of merchandise. In addition, neither the design nor the location of the premises is intended to solicit walk-in traffic.

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