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# DRAFT REPORT

## 4 MILE ROAD CORRIDOR STUDY

Prepared For:

**GRAND VALLEY METROPOLITAN COUNCIL**



In Coordination with:

**ALPINE TOWNSHIP  
CITY OF WALKER  
KENT COUNTY ROAD COMMISSION  
MICHIGAN DEPARTMENT OF TRANSPORTATION**



Prepared By:

**URS**

GRAND RAPIDS – DETROIT – FARMINGTON HILLS – TRAVERSE CITY

**NOVEMBER 2006**

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# Table of Contents

<u>Section</u>	<u>Page</u>
<b>Executive Summary.....</b>	<b>E-1</b>
<b>Section 1 Introduction.....</b>	<b>1-1</b>
1.1 Background.....	1-1
1.2 Report Organization.....	1-1
<b>Section 2 Existing (2006) Conditions.....</b>	<b>2-1</b>
2.1 Study Area.....	2-1
2.2 Existing Conditions (2006) Capacity Analysis.....	2-2
2.3 Traffic Crash Analysis.....	2-4
<b>Section 3 Future-Year Analyses.....</b>	<b>3-1</b>
3.1 Land Use Plans .....	3-1
3.2 Orchard Park Town Center.....	3-1
3.3 Future-Year Traffic Projections (2015 and 2030).....	3-2
3.4 Future Cross-Section of 4 Mile Road.....	3-3
3.5 Future-Year (2015 and 2030) Capacity Analyses.....	3-3
3.6 Non-Motorized Facilities .....	3-5
<b>Section 4 Access Management.....</b>	<b>4-1</b>
4.1 What is Access Management ? .....	4-1
4.2 Existing Access Issues .....	4-1
4.3 Access Management Techniques.....	4-2
4.4 Applying Access Management to 4 Mile Road .....	4-5
4.5 Overlay Zoning District .....	4-6

## Appendices

Appendix A	Existing Conditions (2006) Capacity Analysis Worksheets
Appendix B	Future-Year (2015) Capacity Analysis Worksheets
Appendix C	Future-Year (2030) Capacity Analysis Worksheets

## List of Tables

<u>Table</u>	<u>Page</u>
2-1 Peak-Hour Level-of-Service Ranges – Highway Capacity Manual (2000).....	2-3
2-2 Existing (2006) Peak Hour Levels of Service – Signalized Intersections.....	2-3
2-3 Existing (2006) Peak Hour Movements at Level of Service “E” or “F” – Signalized and Unsignalized Intersections.....	2-3
2-4 Crash Analysis Summary (2002-2004).....	2-4
2-5 Crash Analysis Summary (2002-2004) – Intersections with Higher-than-Average Crash Rates .....	2-5

---

**Table (Continued)****Page**

3-1	Future-Year (2015 and 2030) Average Daily Traffic .....	3-2
3-2	Maximum Peak-Hour Service Flows and Approximate Maximum ADT Values For Various Levels-of-Service and Facility Types.....	3-3
3-3	Future-Year (2015 and 2030) Peak-Hour Levels of Service – Signalized Intersections .....	3-4
3-4	Future-Year (2015) Peak Hour Movements at Level of Service “E” or “F” – Unsignalized Intersections .....	3-4
3-5	Future-Year (2030) Peak Hour Movements at Level of Service “E” or “F” – Unsignalized Intersections .....	3-5
4-1	Recommended Minimum Driveway Spacing from Intersections.....	4-3
4-2	Recommended Minimum Driveway Spacing from Other Driveways.....	4-3
4-3	Minimum Values of Sight Distance .....	4-4
4-4	Recommended Driveway Offset Distance .....	4-4

## List of Figures

**Figure****Page**

1-1	Study Area .....	1-2
2-1	Existing Traffic Operations .....	2-6
2-2	Existing (2006) Peak-Hour Volumes and Level of Service .....	2-7
3-1	Alpine Township Master Plan (1998) .....	3-6
3-2	City of Walker Future Land Use Plan (1998) .....	3-7
3-3	City of Walker Future Land Use Plan Sub-Area #1 (2006) .....	3-8
3-4	Future-Year (2015) Peak-Hour Volumes and Level of Service .....	3-9
3-5	Future-Year (2030) Peak-Hour Volumes and Level of Service .....	3-10
3-6	Proposed Cross-Sections .....	3-11
3-7	Future-Year (2015 and 2030) Traffic Operations .....	3-12
3-8	Proposed Improvements (1 of 5) .....	3-13
3-9	Proposed Improvements (2 of 5) .....	3-14
3-10	Proposed Improvements (3 of 5) .....	3-15
3-11	Proposed Improvements (4 of 5) .....	3-16
3-12	Proposed Improvements (5 of 5) .....	3-17
4-1	Existing Access Issues (1 of 5) .....	4-7
4-2	Existing Access Issues (2 of 5) .....	4-8
4-3	Existing Access Issues (3 of 5) .....	4-9
4-4	Existing Access Issues (4 of 5) .....	4-10
4-5	Existing Access Issues (5 of 5) .....	4-11
4-6	Access Management Plan (1 of 5) .....	4-12
4-7	Access Management Plan (1 of 5) .....	4-13
4-8	Access Management Plan (1 of 5) .....	4-14
4-9	Access Management Plan (1 of 5) .....	4-15
4-10	Access Management Plan (1 of 5) .....	4-16
4-11	Proposed Site Plan Review Process for 4 Mile Road .....	4-17

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# Executive Summary

To be completed.



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# Section 1 INTRODUCTION

## 1.1 Background

The northwest side of the Grand Rapids metropolitan area is one of the more attractive communities in West Michigan. The northwest side is not only near to downtown Grand Rapids, but it also provides convenient access to Lake Michigan communities to the west. The 4 Mile Road corridor is a primary county route providing the boundary between the City of Walker and Alpine Township. The 4 Mile Road corridor parallels the regional interstate system, and three interchanges along I-96 provide a high level of mobility into the City of Walker and Alpine Township. Recent development proposals along 4 Mile Road—such as the 240-acre Orchard Park Town Center—are poised to potentially overburden the capacity of 4 Mile Road, which is primarily a two-lane rural road.

As traffic volumes grow, it is imperative that the interrelated issues of access management, land use development, and traffic operations along the 4 Mile Road corridor be comprehensively addressed. Coordinated land use decisions that balance access and mobility along 4 Mile Road are necessary to provide a safe and efficient roadway as development increases. In response to growing concerns regarding traffic along 4 Mile Road, the Grand Valley Metro Council (GVMC) has funded the completion of a “4 Mile Road Corridor Study” in cooperation with Alpine Township, the City of Walker, the Kent County Road Commission (KCRC), and the Michigan Department of Transportation (MDOT).

The purpose of the “4 Mile Road Corridor Study” is to provide a framework of access management standards and regulations to ensure that future development (and redevelopment) is part of the solution—not the problem. The “4 Mile Road Corridor Study” includes a detailed examination of existing and future traffic volumes in order to determine the future roadway cross-section and an implementation plan that will allow the GVMC and local agencies to plan for future capital expenditures, including aesthetic treatments and non-motorized facilities.

The existing corridor is depicted in **Figure 1-1** on the following page.

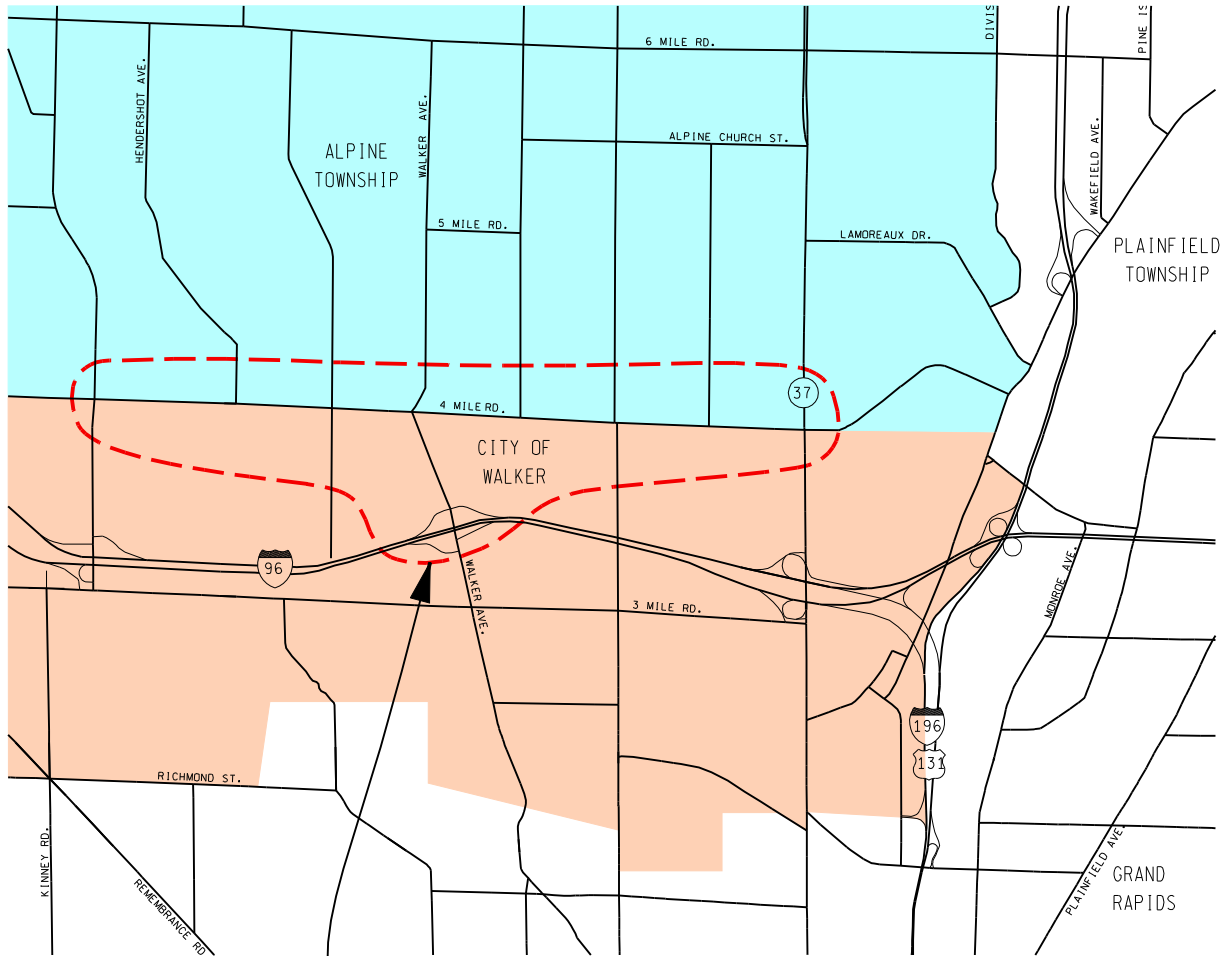
## 1.2 Report Organization

This report is organized into the following sections:

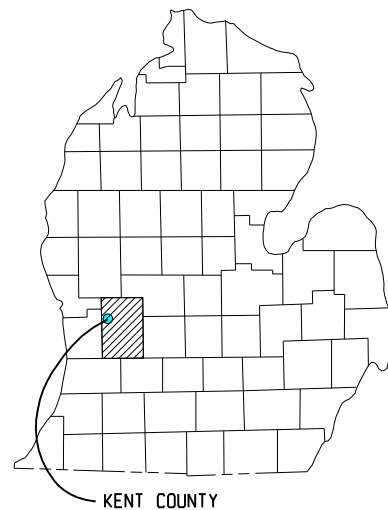
*Section 2. Existing Conditions* – This section provides an evaluation of existing (2006) traffic operations within the corridor from Fruit Ridge Avenue to M-37 (Alpine Avenue).

*Section 3. Future-Year Analysis* – This section provides an evaluation of traffic operations for two future-year scenarios: 2015 and 2030. The purpose of the analysis is to determine the proposed cross-section for 4 Mile Road between Fruit Ridge Avenue and M-37, accounting for Orchard Park Town Center and future land use plans.

*Section 4. Access Management* – This section provides a description of how access management can be utilized along 4 Mile Road to preserve safety and capacity while traffic volumes increase. A review of existing access issues are described as well as access management techniques. Proposed access management improvements are then depicted as an overlay to the proposed road improvements.



STUDY AREA



KENT COUNTY

#### 4 MILE ROAD CORRIDOR STUDY



PREPARED BY:

**URS**

STUDY AREA

**FIGURE  
1-1**

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## Section 2      EXISTING (2006) CONDITIONS

This section provides a description of the existing transportation system in the study area and a comprehensive analysis of existing traffic operations and crash history. The study area includes 4 Mile Road from Fruit Ridge Avenue to M-37 in Kent County.

### 2.1 Study Area

The study area includes the following primary facilities:

**4 Mile Road** is an east-west undivided county primary road in Kent County. The road parallels I-96 in the northwest Grand Rapids metropolitan area for several miles, extending from Ottawa County (as Hayes Street) and terminating at West River Drive in Alpine Township in Kent County. The road is a two-lane undivided road west of Cordes Avenue and a five-lane undivided road east of Cordes Avenue to M-37. 4 Mile Road provides the border between Alpine Township to the north and the City of Walker to the south. The speed limit of 4 Mile Road varies with a 55 mph limit west of Peach Ridge Avenue and from approximately Baumhoff Avenue to Cordes Avenue. The speed limit is 45 mph elsewhere within the study area. The Average Daily Traffic (ADT) of 4 Mile Road varies with volumes as high as 15,000 vehicles per day near M-37 and as low as 5,500 vehicles per day near Fruit Ridge Avenue.

**Fruit Ridge Avenue** is a north-south undivided county primary road and is the westerly limit of the study area. Fruit Ridge Avenue is a four-lane road south of 4 Mile Road and a two-lane road north of 4 Mile Road. Fruit Ridge Avenue begins at 3 Mile Road in the city of Walker and extends northward for 18 miles into northern Tyrone Township in northwest Kent County. Fruit Ridge Avenue interchanges with I-96 just north of 3 Mile Road, approximately 4,000 feet south of 4 Mile Road. The speed limit of Fruit Ridge Avenue is 45 mph south of 4 Mile Road and 55 mph north of 4 Mile Road. The ADT of Fruit Ridge Avenue is approximately 14,000 vehicles per day south of 4 Mile Road and approximately 8,000 vehicles per day north of 4 Mile Road. The intersection of 4 Mile Road and Fruit Ridge Avenue is under traffic signal control.

**Hendershot Avenue** is a north-south undivided local county road, running from 4 Mile Road to 6 Mile Road in Alpine Township. Two driveways along Hendershot Avenue just north of 4 Mile Road provide the primary access to Kenowa Hills High School. The road is a 3-lane cross-section north of 4 Mile Road, reducing to a two-lane road north of the middle school. The speed limit of Hendershot Avenue is 30 mph. The ADT of Hendershot Avenue is approximately 2,500 vehicles per day. The Hendershot Avenue approach to 4 Mile Road is under STOP-sign control.

**Peach Ridge Avenue** is a north-south two-lane undivided local road, running from 3 Mile Road in the city of Walker to 6 Mile Road in Alpine Township. Peach Ridge Avenue passes over I-96 between 3 Mile Road and 4 Mile Road. The speed limit of Peach Ridge Avenue is 55 mph with an ADT of approximately 1,000 vehicles per day north of 4 Mile Road. The Peach Ridge Avenue approaches to 4 Mile Road are under STOP-sign control.

**Walker Avenue** is a north-south two-lane undivided local road in the study area. Walker Avenue runs from 7<sup>th</sup> Street just east of Alpine Avenue in the city of Grand Rapids to 6 Mile Road in Alpine Township. The road is under the jurisdiction of the city of Walker from approximately one mile south of Waldorf Street to 4 Mile Road. The speed limit of Walker Avenue is 35 mph south of 4 Mile Road and 55 mph north of 4 Mile Road. Walker Avenue interchanges with I-96 approximately one-half mile south of 4 Mile Road. The ADT of Walker Avenue is approximately 11,000 vehicles per day south of 4 Mile Road and approximately 4,000 vehicles per day north of 4 Mile Road. The intersection of 4 Mile Road and Walker Avenue is under 4-way STOP sign control.

**Baumhoff Avenue** is a north-south two-lane undivided local county road, running from 4 Mile Road to M-37 in Sparta Township. The speed limit of Baumhoff Avenue is 55 mph. The ADT of Baumhoff Avenue is approximately 1,250 vehicles per day. The Baumhoff Avenue approach to 4 Mile Road is under STOP-sign control.

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**Bristol Avenue** is a north-south two-lane undivided local road, running from just north of Leonard Street in the city of Grand Rapids to 8 Mile Road in Alpine Township. Bristol Avenue passes beneath I-96 and is under the jurisdiction of Walker Avenue from approximately one mile south of Waldorf Street to 4 Mile Road. The speed limit of Bristol Avenue is 35 mph south of 4 Mile Road and 55 mph north of 4 Mile Road. The ADT of Bristol Avenue is approximately 5,000 vehicles per day south of 4 Mile Road and approximately 1,000 vehicles per day north of 4 Mile Road. The Bristol Avenue approaches to 4 Mile Road are slightly offset, with each Bristol Avenue approach operating under STOP-sign control.

**Cordes Avenue** is a north-south two-lane undivided local county road, running from 4 Mile Road to Alpine Church Road in Alpine Township. The speed limit of Cordes Avenue is 55 mph north of 4 Mile Road. The ADT of Cordes Avenue is approximately 1,000 vehicles per day north of 4 Mile Road. The Cordes Avenue approach to 4 Mile Road is under STOP-sign control.

**Alpine Avenue (M-37)** is a north-south five-lane undivided state trunkline route and is the easterly limit of the study area. The trunkline designation of Alpine Avenue (as M-37) begins at 3 Mile Road in the city of Walker and runs to Traverse City. M-37 interchanges with I-96 just north of 3 Mile Road. The speed limit of M-37 is 45 mph south of 4 Mile Road and 50 mph north of 4 Mile Road. The ADT of M-37 is approximately 50,000 vehicles per day south of 4 Mile Road and approximately 45,000 vehicles per day north of 4 Mile Road. The intersection of 4 Mile Road and M-37 is under traffic signal control.

**Northridge Drive** is an east-west two-lane city street in the city of Walker, running from a point west of Peach Ridge Avenue to Walker Avenue and providing access to numerous commercial and industrial properties.

The existing laneage configurations and speed limits for each of the above corridors is depicted in **Figure 2-1** at the end of this section of the report.

## 2.2 Existing Conditions (2006) Capacity Analysis

Peak-hour traffic counts were collected by URS in February 2006 and verified against daily and peak-hour traffic counts provided by the Grand Valley Metro Council (GVMC). The existing (2006) peak-hour traffic volumes for the study area are depicted in **Figure 2-2**.

The methods of the 2000 Highway Capacity Manual were used to perform a capacity analysis at the various intersections along 4 Mile Road from Fruit Ridge Avenue to M-37 and along Walker Avenue from 4 Mile Road to I-96. The analysis included all signalized and unsignalized intersections within this study area.

Conventional analysis of signalized and unsignalized intersections involves the determination of a “Level of Service” (LOS). Levels of Service range from “A” to “F”, similar to an alphabetic grading system, with each level describing a different set of operational characteristics. LOS “A” describes operational performance under light traffic volumes and with minimal delay at intersections. LOS “F” describes a high degree of congestion with extensive delays and long vehicular queues. LOS “C” or “D” is considered acceptable peak-hour traffic operations for intersections in suburban communities according to the American Association of State Highway and Transportation Officials (AASHTO).

The Level of Service criteria defined by the HCM is described in **Table 2-1** on the next page for signalized intersections and unsignalized intersections. As shown in Table 2-1, control delay is the performance measure used to define the limits of each Level-of-Service at signalized and unsignalized intersections. Control delay includes all delay caused by traffic control (signal or STOP-sign), including deceleration delay, time spent waiting at the traffic signal or STOP sign, and acceleration delay.

**TABLE 2-1**  
**PEAK-HOUR LEVEL-OF-SERVICE RANGES**  
**HIGHWAY CAPACITY MANUAL (2000)**

Level of Service	Signalized Intersections	Unsignalized Intersections
	Control Delay (sec/veh)	Control Delay (sec/veh)
A	≤ 10	≤ 10
B	10 – 20	10 – 15
C	20 – 35	15 – 25
D	35 – 55	25 – 35
E	55 – 80	35 – 50
F	>80	>50

Source: 2000 Highway Capacity Manual

The existing (2006) peak-hour Levels of Service for the signalized intersections within the project limits are depicted in **Table 2-2**. As shown in Table 2-2, each of the signalized intersections operates at an acceptable Level of Service (i.e. LOS “D” or better) during existing (2006) peak hours.

**TABLE 2-2**  
**EXISTING (2006) PEAK-HOUR LEVELS OF SERVICE**  
**SIGNALIZED INTERSECTIONS**

Signalized Intersection	AM-Peak Hour		PM-Peak Hour	
	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)
4 Mile Road / Fruit Ridge Avenue	B	14.7	A	9.8
4 Mile Road / M-37	D	41.1	D	49.2
I-96 WB Ramp / Walker Avenue*	B	12.3	A	8.5

\* - assumes completion of I-96 reconstruction project in 2006.

Source: URS Corporation, November 2006

Movement-by-movement Levels of Service are shown in Figure 2-2 for each signalized and unsignalized intersection in the study area. As depicted in Figure 2-2 and **Table 2-3** below, seven lane groups operate at Level of Service “E” or “F”. Capacity analysis worksheets for all existing (2006) intersection analyses are included in **Appendix A** of this report.

**TABLE 2-3**  
**EXISTING (2006) PEAK HOUR MOVEMENTS AT LEVEL OF SERVICE “E” OR “F”**  
**SIGNALIZED AND UNSIGNALIZED INTERSECTIONS**

Intersection	Movement	Peak	Volume	Level of Service	95% Queue Length (feet)	Traffic Control
4 Mile Road / M-37	SB Thru	AM	1,465	E	608	Signal
	NB Thru	PM	1,850	E	913	
	NB-to-WB Left	PM	140	E	221	
4 Mile Road / Walker Avenue	NB-to-WB Left	PM	230	F	*	4-Way STOP
	NB Thru/Right	PM	475	F	*	
EB I-96 Off-ramp / Walker Avenue	EB-to-NB Left	AM	35	E	101	2-Way STOP
	EB-to-SB Right	AM	160	E	101	

\* - HCS analysis does not provide queue length

Source: URS Corporation, November 2006

The queues in Table 2-3 were not provided for the 4 Mile Road/Walker Avenue intersection, however, field observations indicate queues of several vehicles on the northbound approach during existing afternoon peak hours.

## 2.3 Traffic Crash Analysis

Traffic crash data along 4 Mile Road was supplied by the Kent County Road Commission for the most recent three-year period (January 1, 2002 to December 31, 2004). The number of crashes and rate of crashes was determined for each intersection along 4 Mile Road from Fruit Ridge Avenue to M-37. The results are depicted in **Table 2-4**.

**TABLE 2-4  
CRASH ANALYSIS SUMMARY (2002-2004)**

Intersection	Traffic Control	Number of Crashes					Total Entering ADT*	Actual Crash Rate**	Average Crash Rate***
		2002	2003	2004	Total	Crashes per year			
Fruit Ridge Avenue	Signal	11	7	8	26	8.7	16,300	1.46	1.70
Hendershot Avenue	2-way STOP	3	4	0	7	2.3	8,000	0.80	2.15
Peach Ridge Ave	2-way STOP	1	1	2	4	1.3	7,100	0.52	2.15
Walker Avenue	4-way STOP	7	4	7	18	6.0	14,900	<b>1.11</b>	0.68
Baumhoff Avenue	2-way STOP	1	2	0	3	1.0	7,600	0.36	2.15
Bristol Ave (North)	2-way STOP	3	3	7	13	4.3	7,500	1.59	2.15
Bristol Ave (South)	2-way STOP	3	2	8	13	4.3	10,100	<b>1.18</b>	0.68
Cordes Avenue	2-way STOP	3	2	3	8	2.7	11,700	0.62	0.68
M-37	Signal	53	58	65	176	58.7	46,800	<b>3.43</b>	1.14
TOTAL		85	83	100					

\* - Entering ADT calculated as 10 times the afternoon peak-hour entering volume

Source: Kent County Road Commission

\*\* - Actual number of crashes per MEV (million-entering vehicles)

\*\*\* - Average rate of crashes for similar intersections (crashes per MEV)

Note: Shade and bolded values indicate higher-than-average crash rates as compared to crash studies conducted by SEMCOG.

As depicted in Table 2-4, three intersections have crash rates greater than the average crash rate for intersections with similar volumes. It should be noted that only limited data exists regarding the rate of crashes at intersections. The average crash rate data was supplied by the Southeast Michigan Council of Governments (SEMCOG), which is the Metropolitan Planning Organization (MPO) for the metropolitan Detroit area.

A more detailed breakdown of crashes was completed for the three intersections depicted in Table 2-4 that had a crash rate greater than the SEMCOG average. A breakdown by crash type is depicted in **Table 2-5** on the next page in order to determine if there is any pattern of crashes which may be contributing to crash experience.

As shown in Table 2-5, the Walker Avenue intersection experienced a total of 18 crashes in the three-year period from 2002-2004. A total of ten (10) of the crashes were rear-end crashes. Considering that the intersection is under 4-way STOP control, the rear-end crash experience may be a result of congestion at the intersection as motorists fail to stop in time at an unexpected queue. Rear-end crash experience may also be due to the intersection skew as the northbound and southbound legs are not at 90-degree angles with 4 Mile Road. Realignment of the intersection and construction of dedicated left-turn bays would assist in reducing crash experience at Walker Avenue.

The south leg of Bristol Avenue is offset from the north leg of Bristol Avenue by approximately 100 feet. The south leg carries a higher volume of traffic than the north leg (245 vehicles approaching 4 Mile Road during the afternoon

peak hour compared to 40 vehicles for the north leg). Table 2-5 does not reveal a pattern of crashes at the south leg of Bristol Avenue, but the intersection skew may be a contributing factor to crash experience.

**TABLE 2-5  
CRASH TYPE SUMMARY (2002-2004)  
INTERSECTIONS WITH HIGHER-THAN-AVERAGE CRASH RATES**

Intersection	Traffic Control	Crash Type						Total Crashes	Total Injuries
		Rear-End	Angle	Head-On LT	Side Swipe	Fixed Object	Other		
Walker Avenue	4-way STOP	10	4	0	0	1	3	18	5
Bristol Ave (South)	2-way STOP	3	3	0	1	3	3	13	4
M-37	Signal	78	41	19	17	6	15	176	41

Note: No fatalities occurred at the above intersections for the three-year study period.

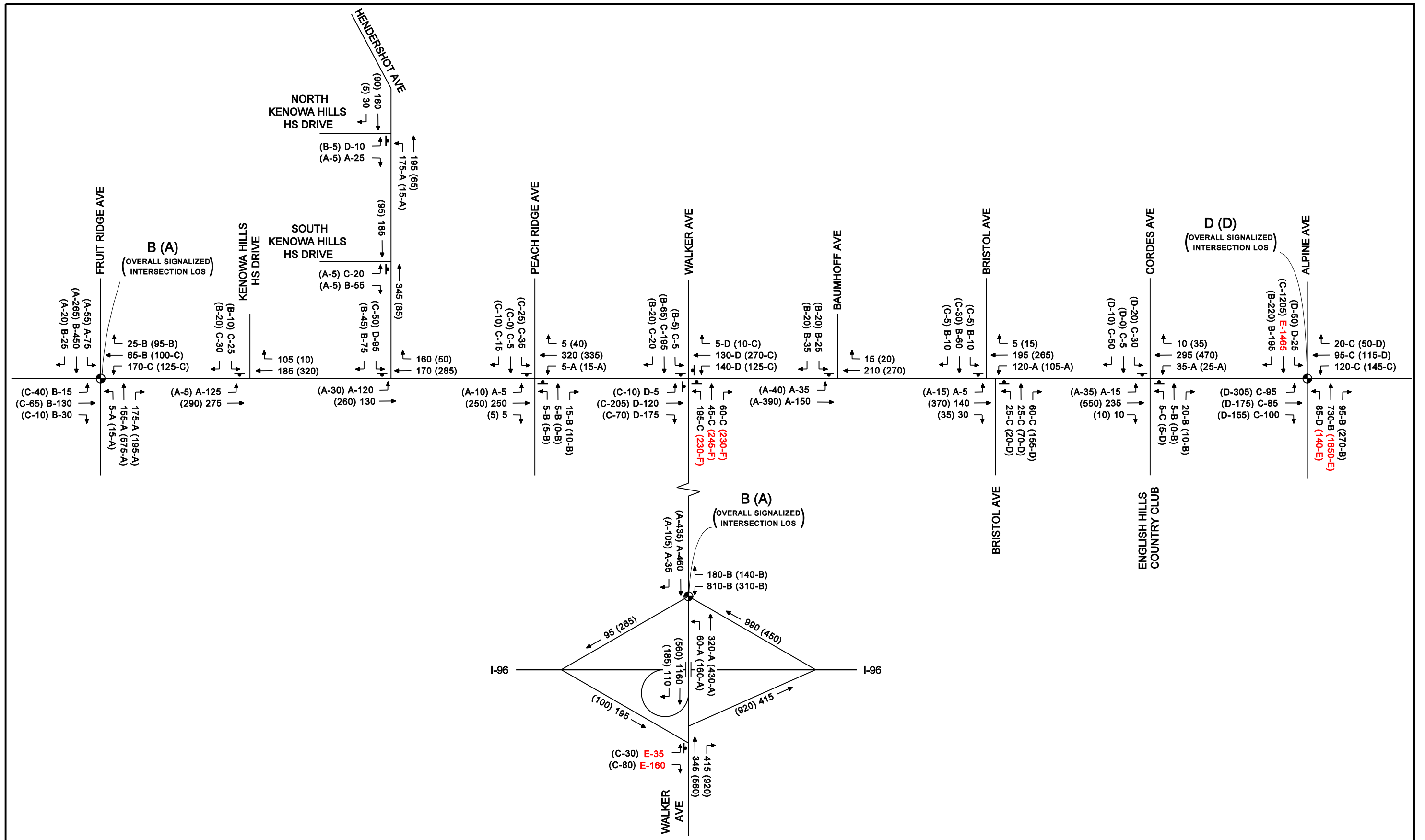
Source: Kent County Road Commission

The M-37 intersection is by far the most congested intersection along the 4 Mile Road corridor, serving almost 50,000 vehicles per day. The intersection is controlled by a traffic signal, which contributes to the rear-end crash experience (approximately 44% of all crashes at M-37). Of greater concern is the 41 angle crashes and 19 head-on left-turn crashes at M-37, which account for a combined 32 % of all crashes. Angle and head-on left-turn crashes are inherently more dangerous. Angle and head-on left-turn crashes increase as an intersection becomes more and more congested and are the primary reason why the M-37 intersection experiences a higher-than-average rate of crashes. Increasing the all-red clearance times for the various phase splits would reduce efficiency but increase safety at M-37.









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## Section 3 FUTURE-YEAR ANALYSES

This section provides an analysis of traffic conditions along 4 Mile Road for two future-year scenarios—2015 and 2030. The purpose of the analysis is to determine a future cross-section width of 4 Mile Road consistent with the volumes that are anticipated during these future years.

### 3.1 Land Use Plans

Developing traffic projections is an inexact science at best, and the further into the future that projections are made, the less reliable those projections become. Traffic projections for the 4 Mile Road corridor are based on the most-recently adopted land use plans of the city of Walker and Alpine Township. The generation of trips is most closely linked to land use.

The most recent Alpine Township Master Plan (from 1998) is depicted in **Figure 3-1**. As shown in Figure 3-1, the land use along the north side of 4 Mile Road is primarily zoned as residential uses. The majority of the township is zoned agricultural. Alpine Township is currently updating their 1998 Master Plan. Discussions with Alpine Township indicate that the zoning along 4 Mile Road and the large areas of agricultural zoning are not anticipated to change when the updated Master Plan is approved in the near future.

The most recent Future Land Use Plan (from 1998) for the City of Walker is depicted in **Figure 3-2**. Like Alpine Township, the city of Walker is currently in the process of updating their Future Land Use Plan for the entire city. Approval of the new (2006) Future Land Use Plan is being completed in phases with separate approvals in four (4) distinct sub areas. The Future Land Use Plan for only one sub area (Sub-Area #1) has been approved by the Planning Commission at this time. Sub-Area #1 is bounded by 4 Mile Road on the north, 3 Mile Road on the south, Fruit Ridge Avenue on the west and Bristol Avenue on the east. Sub-Area #1 will have the greatest traffic impact along 4 Mile Road compared to other yet-to-be-approved sub areas. The Future Land Use Plan for Sub-Area #1 is depicted in **Figure 3-3**. As shown in Figure 3-3, the approved Future Land Use Plan for Sub-Area #1 depicts primarily single-family residential uses along the south side of the 4 Mile Road corridor west of Walker Avenue and a “Village Center” use east of Walker Avenue.

### 3.2 Orchard Park Town Center

Traffic projections along 4 Mile Road are anticipated to be significantly impacted by the Orchard Park Town Center, currently being proposed by a developer as the “Village Center” use in the city of Walker. The Orchard Park Town Center is bounded by 4 Mile Road on the north, Walker Avenue on the west, I-96 on the south, and Bristol Avenue on the east. The proposed 240-acre multi-use development will contain a wide variety of residential, commercial, and retail uses.

A detailed traffic impact analysis corresponding to the Orchard Park Town Center is currently being completed for the city of Walker as part of the city’s site plan review process. The site is anticipated to generate approximately 2,400 new trips during a typical weekday morning peak hour, approximately 5,000 new trips during a typical weekday afternoon peak hour, and more than 6,000 trips during a typical Saturday peak hour (Orchard Park Town Center Traffic Impact Study, Metro Transportation Group, September 2006). The overall site would be constructed in phases with full build-out anticipated in 2011.

Because of the size of the Orchard Park Town Center, the results of the full build-out analysis (2011) for the Orchard Park Town Center Traffic Impact Study (September 2006) was used as a baseline for the development of the 2015 and 2030 traffic projections along 4 Mile Road. In each case (2015 and 2030), the infrastructure improvements recommended to mitigate traffic operations for the Orchard Park Town Center were assumed to be “in-place” for the

2015 and 2030 analyses contained herein for the 4 Mile Road corridor. The following is a synopsis of the infrastructure modifications that are anticipated to be constructed as part of the Orchard Park Town Center:

- Extension of Northridge Drive east of Walker Avenue into the Orchard Park Town Center site, terminating at Bristol Avenue.
- Capacity improvements at the Walker Avenue / Northridge Drive intersection. Exact design to be determined.
- Extension of Baumhoff Avenue south of 4 Mile Road into the Orchard Park Town Center site to Northridge Drive, including construction of left-turn lanes at the 4 Mile Road/Baumhoff Avenue intersection.
- Realignment of the Bristol Road approaches to 4 Mile Road, including construction of left-turn lanes on 4 Mile Road and signalization of the 4 Mile Road/Bristol Avenue intersection.
- Signalization of the eastbound I-96 off-ramp at Walker Avenue, including construction of a third northbound through lane on Walker Avenue that terminates as a right-turn lane at the eastbound I-96 on-ramp.
- Construction of a third southbound through lane on Walker Avenue from Northridge Drive through the westbound I-96 ramp terminal intersection, terminating as a right-turn lane at the eastbound I-96 on-ramp (loop).
- Realignment of the 4 Mile Road / Walker Avenue intersection, including signalization. Exact realignment and design to be determined.

In addition to the above-listed improvements, the city of Walker also plans to extend Northridge Drive further west to Fruit Ridge Avenue as part of its Master Plan. Following construction of the Orchard Park Town Center, the city of Walker also plans to extend Northridge Drive east of Bristol Avenue, curving northward to tie into 4 Mile Road opposite Cordes Avenue. If such an extension occurs (likely to be in conjunction with site development east of Bristol Avenue), the proposed signal at the 4 Mile Road/Bristol Avenue intersection may become unwarranted and may need to be moved to the 4 Mile Road/Bristol Avenue/Northridge Drive intersection.

### 3.3 Future-Year Traffic Projections (2015 and 2030)

The future-year traffic projections for the 4 Mile Road corridor were developed using the opening year (2011) traffic projections prepared for the Orchard Park Town Center as a base. The same 2.5 % annual compounded growth rate used to determine the 2011 traffic projections was used to generate the 2015 traffic projections. A smaller rate of growth—2 % compounded annually—was used to generate the 2030 projections from the 2015 projections. These rates of growth are consistent with historical growth, the existing land use plans in both the city of Walker and Alpine Township, and socio-economic data provided by the Grand Valley Metro Council. The projected Average Daily Traffic (ADT) volumes for 4 Mile Road are depicted in **Table 3-1** for the 2015 and 2030 horizons. Future-year (2015 and 2030) peak-hour volumes are depicted in **Figure 3-4** and **Figure 3-5** respectively.

**TABLE 3-1  
FUTURE-YEAR (2015 AND 2030) AVERAGE DAILY TRAFFIC**

Segment	Existing (2006) ADT	Future-Year (2015) ADT	Future-Year (2030) ADT
West of Fruit Ridge Avenue	2,600	3,300	4,300
East of Fruit Ridge Avenue	5,500	6,900	9,000
West of Walker Avenue	8,100	10,100	13,100
East of Walker Avenue	10,200	12,800	16,700
West of Bristol Avenue	9,400	11,800	15,400
East of Bristol Avenue	10,200	12,800	16,700
West of M-37	14,900	18,600	24,200

Source: URS Corporation, November 2006

## 3.4 Future Cross-Section of 4 Mile Road

The proposed cross-section of 4 Mile Road must be able to serve the projected 2015 and 2030 volumes at an adequate Level of Service. **Table 3-2** depicts the maximum value of ADT for each Level-of-Service for a variety of roadway cross-sections. The information in Table 3-2 was developed from information provided in the Highway Capacity Manual (2000) for multilane highways and adjusted for signalization. A comparison of the ADT values depicted in Table 3-1 and Table 3-2 reveals that a 3-lane cross-section along 4 Mile Road west of Cordes Avenue and a 5-lane cross-section east of Cordes Avenue would operate at Level of Service "C" under future-year (2015 and 2030) traffic volumes.

**TABLE 3-2**  
**MAXIMUM PEAK-HOUR SERVICE FLOWS AND APPROXIMATE MAXIMUM ADT VALUES**  
**FOR VARIOUS LEVELS-OF-SERVICE AND FACILITY TYPES**

Facility Type	Level-of-Service									
	A		B		C		D		E	
	MSF (pcph)*	ADT	MSF (pcph)*	ADT	MSF (pcph)*	ADT	MSF (pcph)*	ADT	MSF (pcph)*	ADT
2-lane Undiv.	245	4,455	405	7,364	585	10,636	775	14,091	950	17,273
3-lane Undiv.	408	7,424	675	12,273	975	17,727	1292	23,485	1583	28,788
4-lane Undiv.	490	8,909	810	14,727	1170	21,273	1550	28,182	1900	34,545
4-lane Div.	653	11,879	1080	19,636	1560	28,364	2067	37,576	2533	46,061
5-lane Undiv.	653	11,879	1080	19,636	1560	28,364	2067	37,576	2533	46,061
6-lane Undiv.	735	13,364	1215	22,091	1755	31,909	2325	42,273	2850	51,818
6-lane Div	898	16,333	1485	27,000	2145	39,000	2842	51,667	3483	63,333

\*pcph = passenger cars per hour in peak direction

Note: This table is developed from Table 21-2 of the Highway Capacity Manual (2000). The table assumes turn lanes have two-thirds the capacity of through lanes, g/C = 0.5, D-factor = 0.55, k-factor = 0.1, and free-flow speed = 45 mph.

The proposed cross-sections for 4 Mile Road are depicted in **Figure 3-6**. The cross-sections were developed in consultation with the Kent County Road Commission, using the geometric standards consistent with other county primary routes in Kent County. The proposed right-of-way width for 4 Mile Road is 100 feet for the entire study corridor (from Fruit Ridge Avenue to M-37) in anticipation of any future need to widen the proposed 3-lane section west of Cordes Avenue into a 5-lane section. It is possible that the construction of the Orchard Park Town Center may increase pressure to rezone residential properties adjacent to the Orchard Park Town Center into uses with greater trip-generating capability. Although the soon-to-be-approved Master Plan in Alpine Township and the Future Land Use Plan in the city of Walker do not currently envision this happening, acquiring right-of-way for a future 5-lane pavement west of Cordes Avenue appears prudent.

## 3.5 Future-Year (2015 and 2030) Capacity Analyses

Future-year (2015 and 2030) peak-hour volumes are depicted in Figure 3-4 and Figure 3-5 respectively. Future-year (2015 and 2030) peak-hour Levels of Service for the signalized intersections within the project limits are depicted in **Table 3-3** on the next page. The results depicted in Table 3-3 assume reconstruction of 4 Mile Road as a 3-lane cross-section west of Cordes Avenue and a 5-lane cross-section east of Cordes Avenue. The results also assume the mitigation improvements associated with Orchard Park Town Center (listed in Section 3.2) are also in place. **Figure 3-7** depicts the lane usage at each of the intersections in the study area upon which the results in Table 3-3 are based. **Figure 3-8** through **Figure 3-12** depicts the proposed improvements along 4 Mile Road from Fruit Ridge Avenue to M-37 in plan view.

**TABLE 3-3  
FUTURE-YEAR (2015 AND 2030) PEAK-HOUR LEVELS OF SERVICE  
SIGNALIZED INTERSECTIONS**

Intersection	Future Year	AM-Peak Hour		PM-Peak Hour	
		Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)
4 Mile Road / Fruit Ridge Avenue	2015	B	15.9	B	11.4
	2030	C	27.1	B	19.1
4 Mile Road / Walker Avenue	2015	B	14.9	B	14.6
	2030	C	24.6	B	19.0
4 Mile Road / Bristol Avenue	2015	B	16.6	C	19.5
	2030	B	18.2	C	30.5
4 Mile Road / M-37	2015	D	53.5	F	82.5
	2030	F	113.5	F	191.8
I-96 WB Ramp / Walker Avenue	2015	B	13.7	B	13.8
	2030	C	21.3	D	41.0
I-96 EB Ramp / Walker Avenue	2015	B	10.5	B	14.2
	2030	C	24.9	D	38.4

Note: Results assume laneage depicted in Figure 3-7

Source: URS Corporation, November 2006

As shown in Table 3-3, each of the signalized intersections operates at an acceptable Level of Service (i.e. LOS “D” or better) during future-year (2015 and 2030) peak hours, except for the 4 Mile Road / M-37 intersection which is anticipated to operate at Level of Service “F” during future-year peak hours. The analysis assumed no capacity improvements at the 4 Mile Road/M-37 intersection, so it is apparent that improvements will be required in the future.

Movement-by-movement Levels of Service are shown in Figure 3-4 (for 2015) and Figure 3-5 (for 2030) at each signalized and unsignalized intersection in the study area. Several unsignalized movements operate at Level of Service “E” or “F” as depicted in **Table 3-4** for future-year (2015) and in **Table 3-5** for future-year (2030).

**TABLE 3-4  
FUTURE-YEAR (2015) PEAK HOUR MOVEMENTS AT LEVEL OF SERVICE “E” OR “F”  
UNSIGNALIZED INTERSECTIONS**

Intersection	Movement	Peak	Volume	Level of Service	95% Queue Length (feet)	Traffic Control
4 Mile Road / Hendershot Avenue	SB-to-EB Left	AM	120	F	198	2-Way STOP
4 Mile Road / Cordes Avenue	SB-to-EB Left	PM	30	F	54	2-Way STOP
	NB-to-WB Left	PM	5	F	10	

Note: Results assume laneage depicted in Figure 3-7

Source: URS Corporation, November 2006

**TABLE 3-5**  
**FUTURE-YEAR (2030) PEAK HOUR MOVEMENTS AT LEVEL OF SERVICE “E” OR “F”**  
**UNSIGNALIZED INTERSECTIONS**

Intersection	Movement	Peak	Volume	Level of Service	95% Queue Length (feet)	Traffic Control
4 Mile Road / Hendershot Avenue	SB-to-EB Left	AM	140	F	418	2-Way STOP
4 Mile Road / Peach Ridge Avenue	SB Approach	AM	80	F	110	2-Way STOP
	SB Approach	PM	60	E	69	
4 Mile Road / Baumhoff Avenue	NB-to-WB Left	PM	40	F	49	2-Way STOP
	SB-to-EB Left	PM	25	E	28	
4 Mile Road / Cordes Avenue	NB-to-WB Left	AM	5	F	7	2-Way STOP
	SB-to-EB Left	AM	40	F	74	
	NB-to-WB Left	PM	5	F	25	
	SB-to-EB Left	PM	35	F	125	
	NB Thru/Right	PM	25	F	38	
	SB Thru/Right	PM	55	F	40	

Note: Results assume laneage depicted in Figure 3-7

Source: URS Corporation, November 2006

The queues depicted in Table 3-4 are not large, so it is not anticipated that signalization will be necessary at Hendershot Avenue or Cordes Avenue by 2015. But the 418-foot queue depicted in Table 3-5 for Hendershot Avenue indicates that a signal may be necessary by 2030 to service traffic safely to and from the Kenowa Hills schools on Hendershot Avenue.

Finally, the analysis assumes that a future connection of Northridge Drive from east of Bristol Avenue to Cordes Avenue is not in place. If the future connection of Northridge Drive to Cordes Avenue occurs, the resulting 4 Mile Road/Cordes Avenue/Northridge Drive intersection would become signalized and the proposed signal at the 4 Mile Road/Bristol Avenue intersection would be eliminated.

Capacity analysis worksheets for all future-year (2015 and 2030) intersection analyses are included in **Appendix B** and **Appendix C**, respectively, of this report.

### 3.6 Non-Motorized Facilities

A connection of the Musketawa Trail in Ottawa County and the White Pine Trail in Kent County has been proposed by the Kent County Parks Department. The proposed connection would follow 4 Mile Road through at least part of the study area limits. The details for the trail design, exact location, and trail crossing of M-37 have yet to be determined. However, the proposed 3-lane cross-section between Fruit Ridge Avenue and Cordes Avenue includes 5'-6" bicycle lanes in each direction to accommodate bicycles. (See Figure 3-6.)



# 1998 Future Land Use Plan As Amended

Alpine Township  
Kent County, Michigan  
Originally adopted June 18, 1998 by the  
Alpine Township Planning Commission

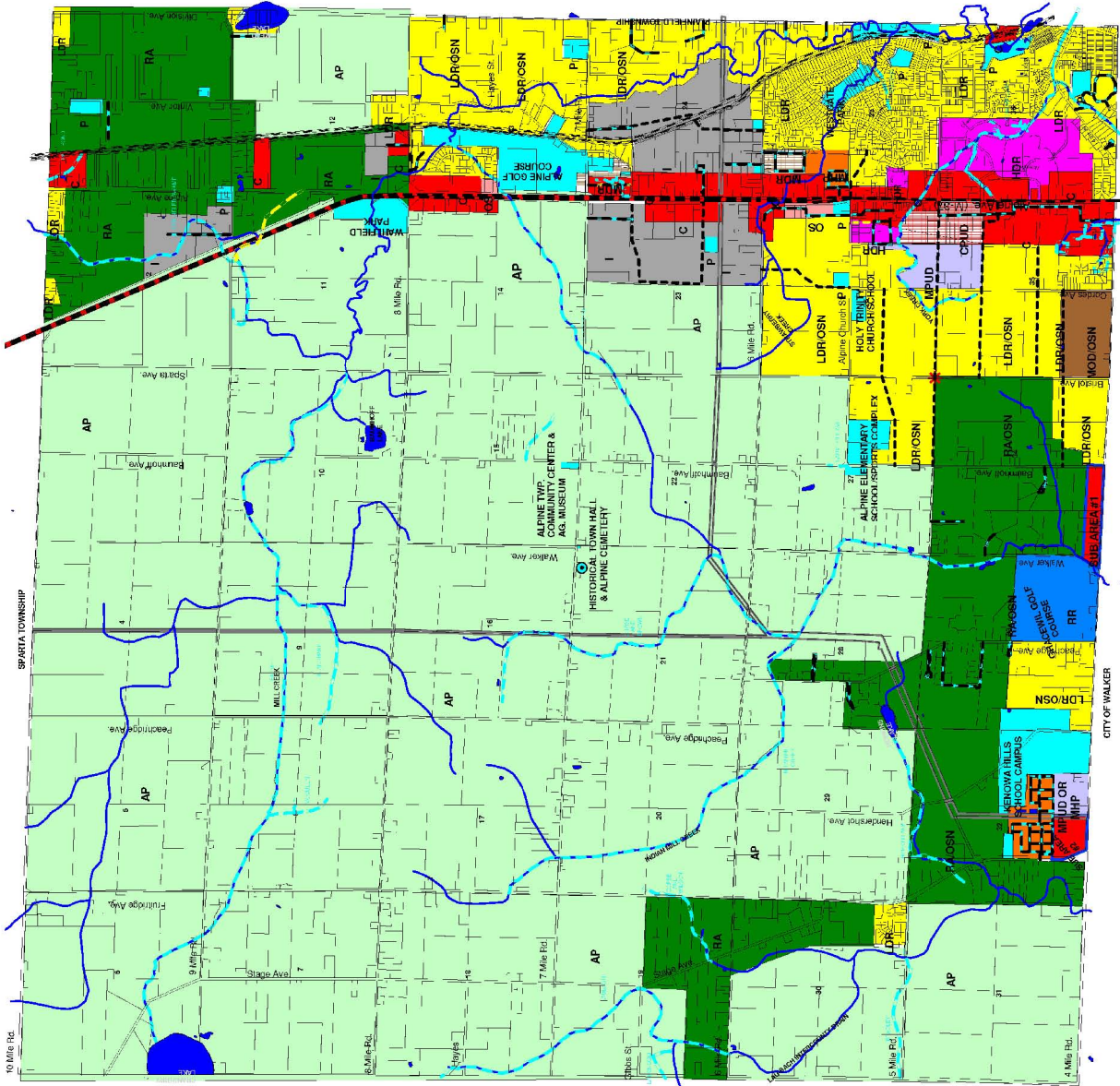
- Planned Neighborhood
- Shopping Center
- Future Roads
- Private Roads
- M-37 State Highway
- County Roads
- Creeks/Streams
- Lakes & Ponds
- Railways
- Consumers Power Utility Line

- AP AGRICULTURAL PRESERVATION
- RA RURAL AGRICULTURAL
- OSN OPEN SPACE NEIGHBORHOOD
- LDR LOW DENSITY RESIDENTIAL
- MOD MODERATE DENSITY RESIDENTIAL
- MBR MEDIUM DENSITY RESIDENTIAL
- HDSR HIGH DENSITY RESIDENTIAL
- MPUD MIXED USE PUD
- MAP MOBILE HOME PARK
- OS OFFICE/SERVICE
- C COMMERCIAL
- I INDUSTRIAL
- REC/RES RECREATION/RESIDENTIAL
- P PUBLIC/SEMI-PUBLIC
- SUB AREA PLAN



2 Miles

Map prepared by the Alpine Township  
Planning Department, with assistance from  
Mani Street Planning Company, Grand Rapids, Michigan



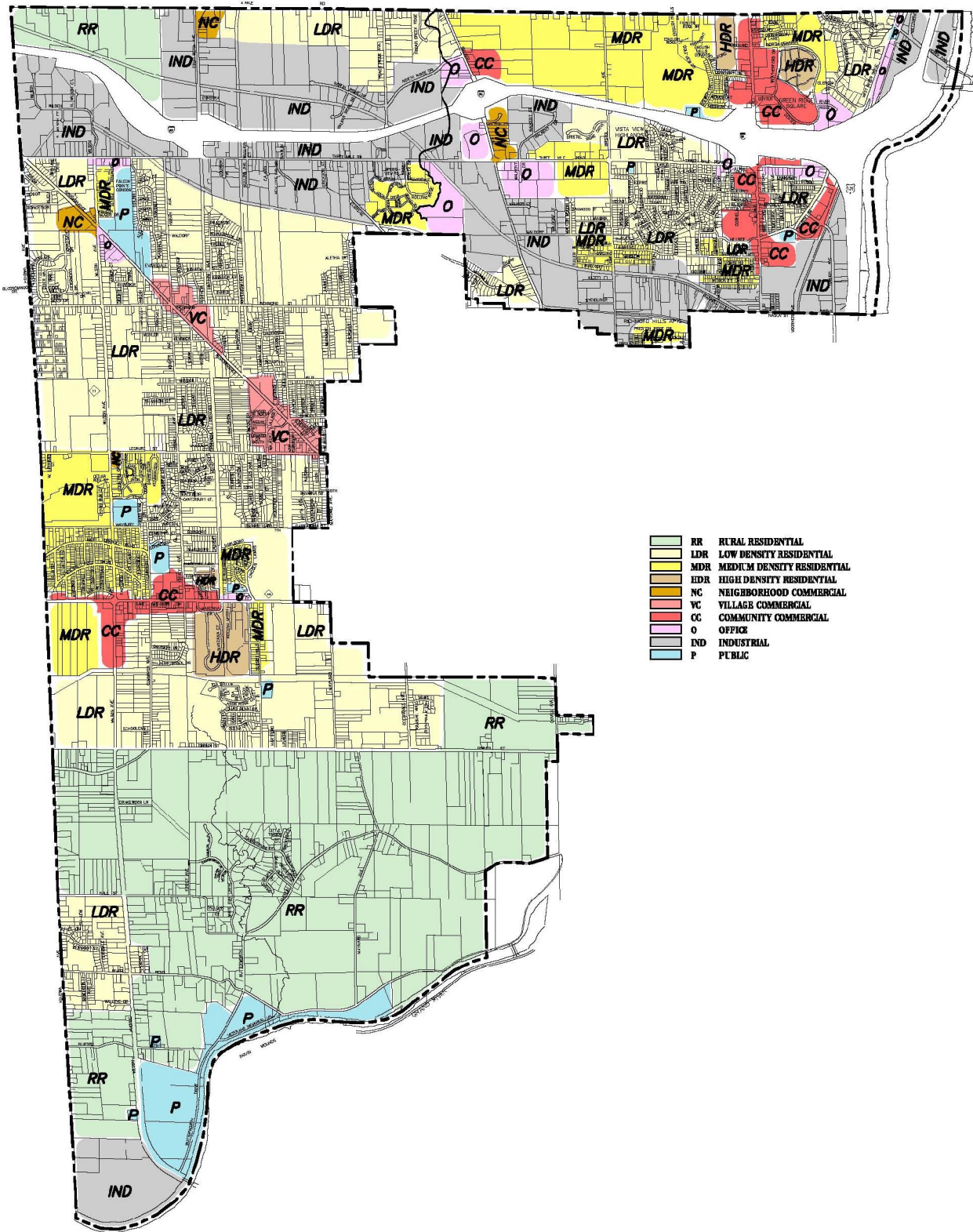
## 4 MILE ROAD CORRIDOR STUDY



PREPARED BY:  
**URS**

**ALPINE TOWNSHIP  
MASTER PLAN (1998)**

**FIGURE  
3-1**



# 4 MILE ROAD CORRIDOR STUDY



PREPARED BY:

**URS**

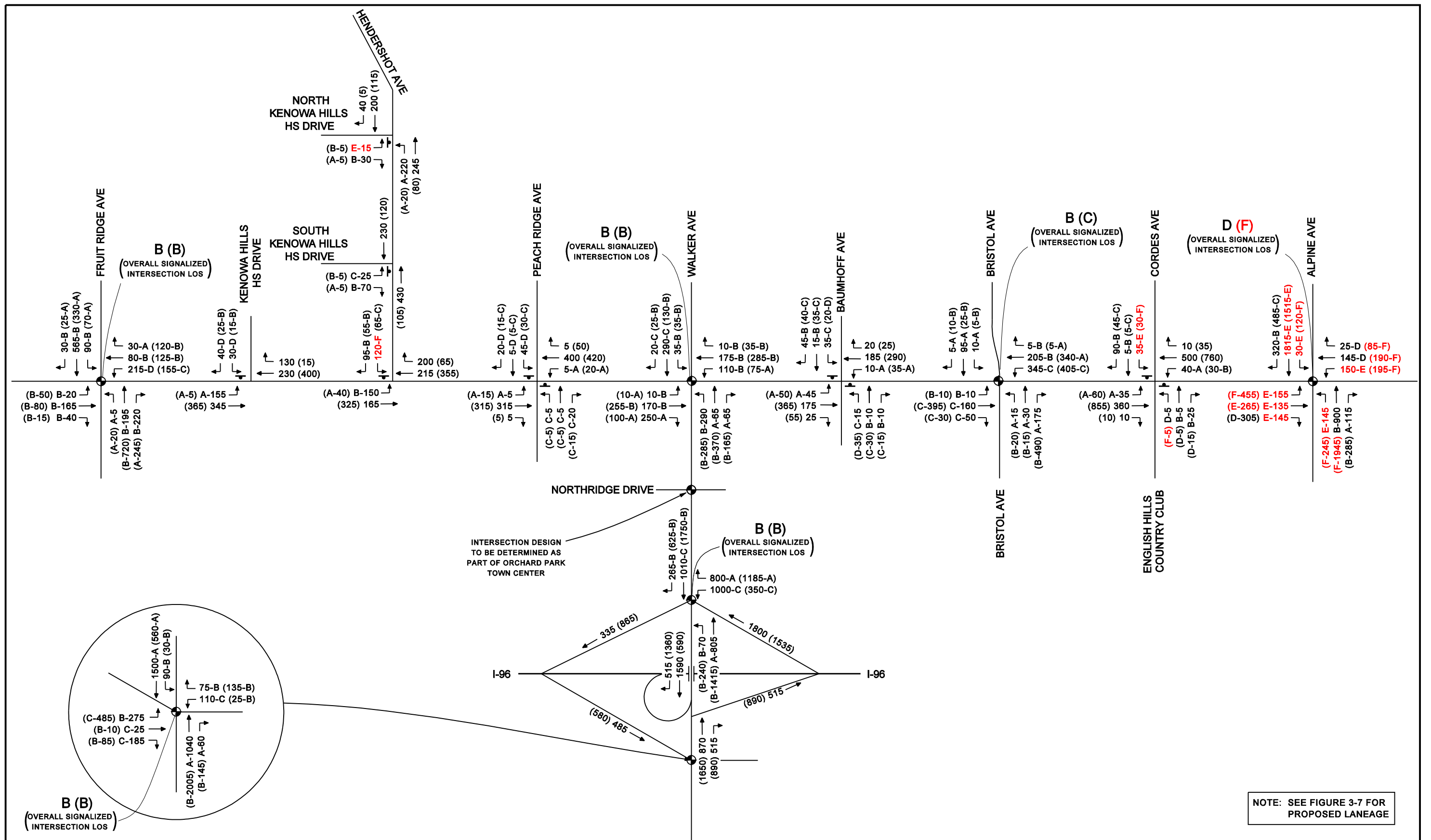
CITY OF WALKER  
FUTURE LAND USE PLAN (1998)

FIGURE  
3-2

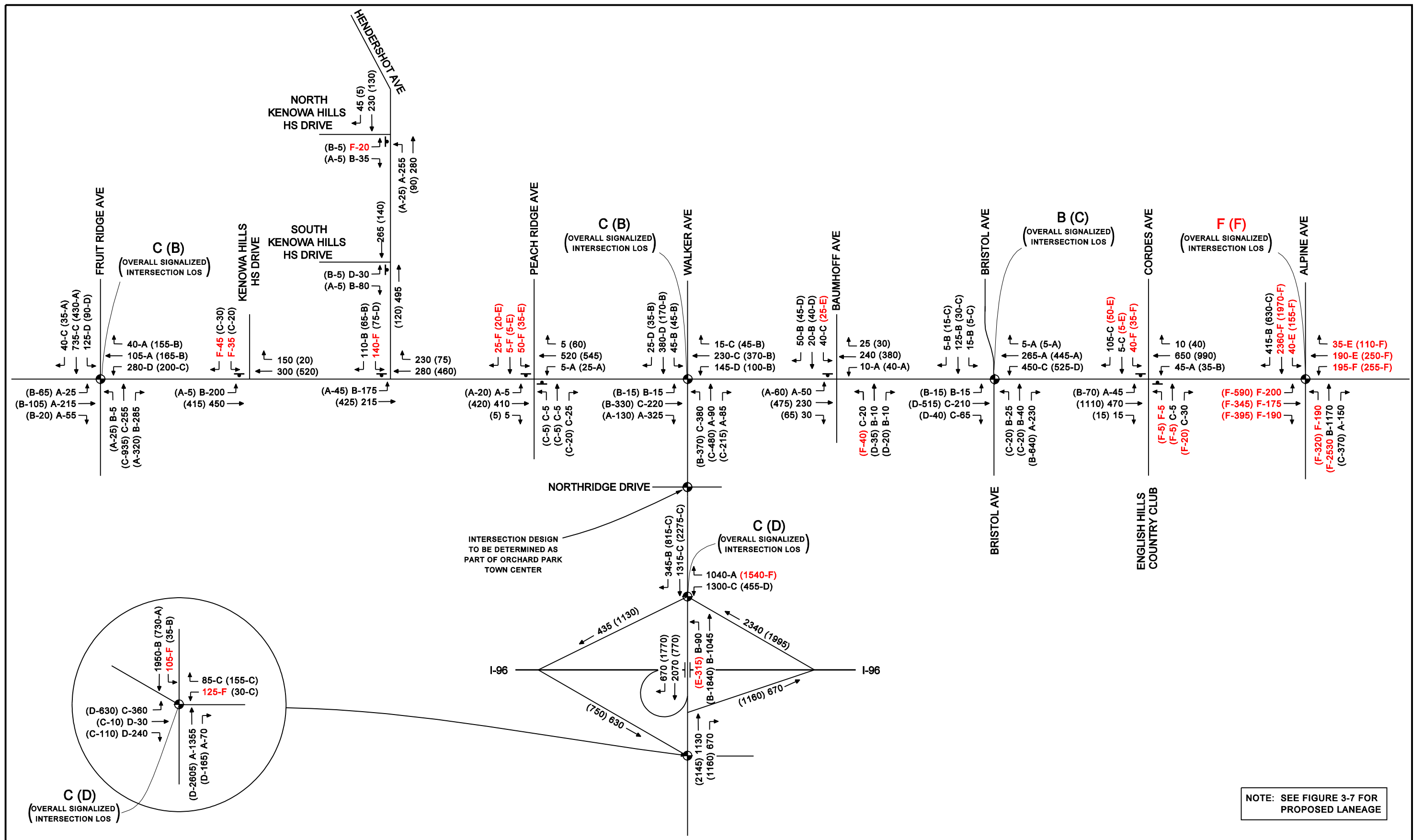




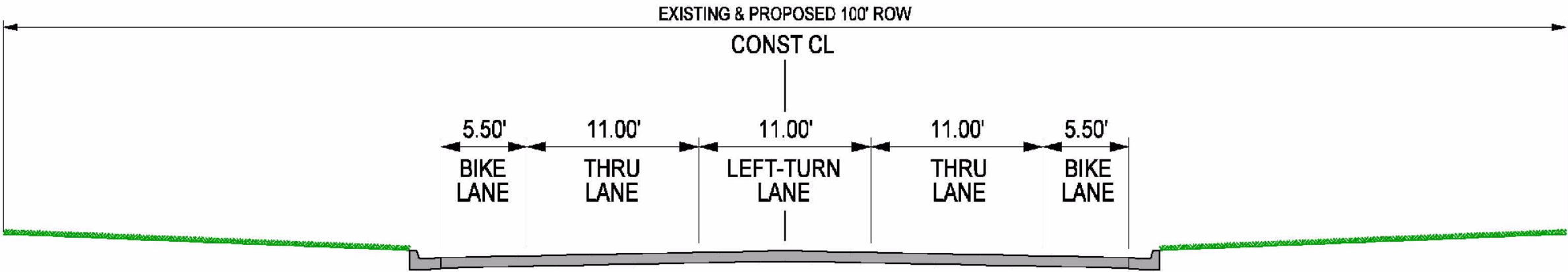
4 MILE ROAD CORRIDOR STUDY



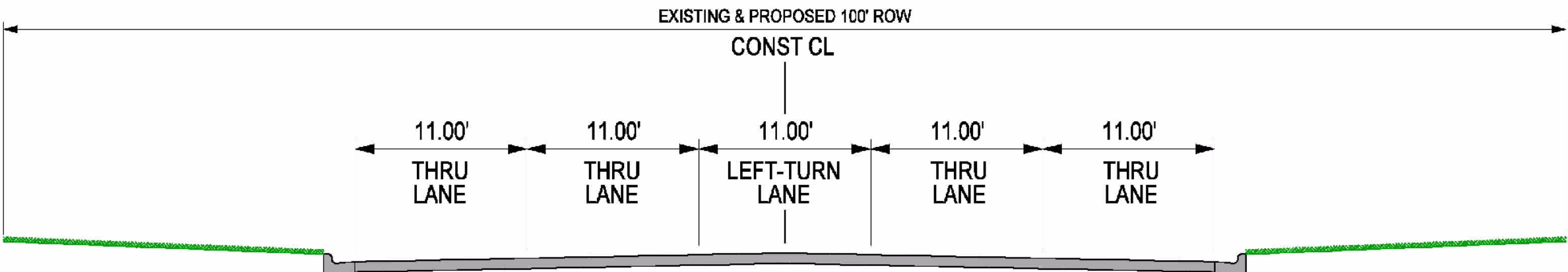
NOTE: SEE FIGURE 3-7 FOR PROPOSED LANEAGE



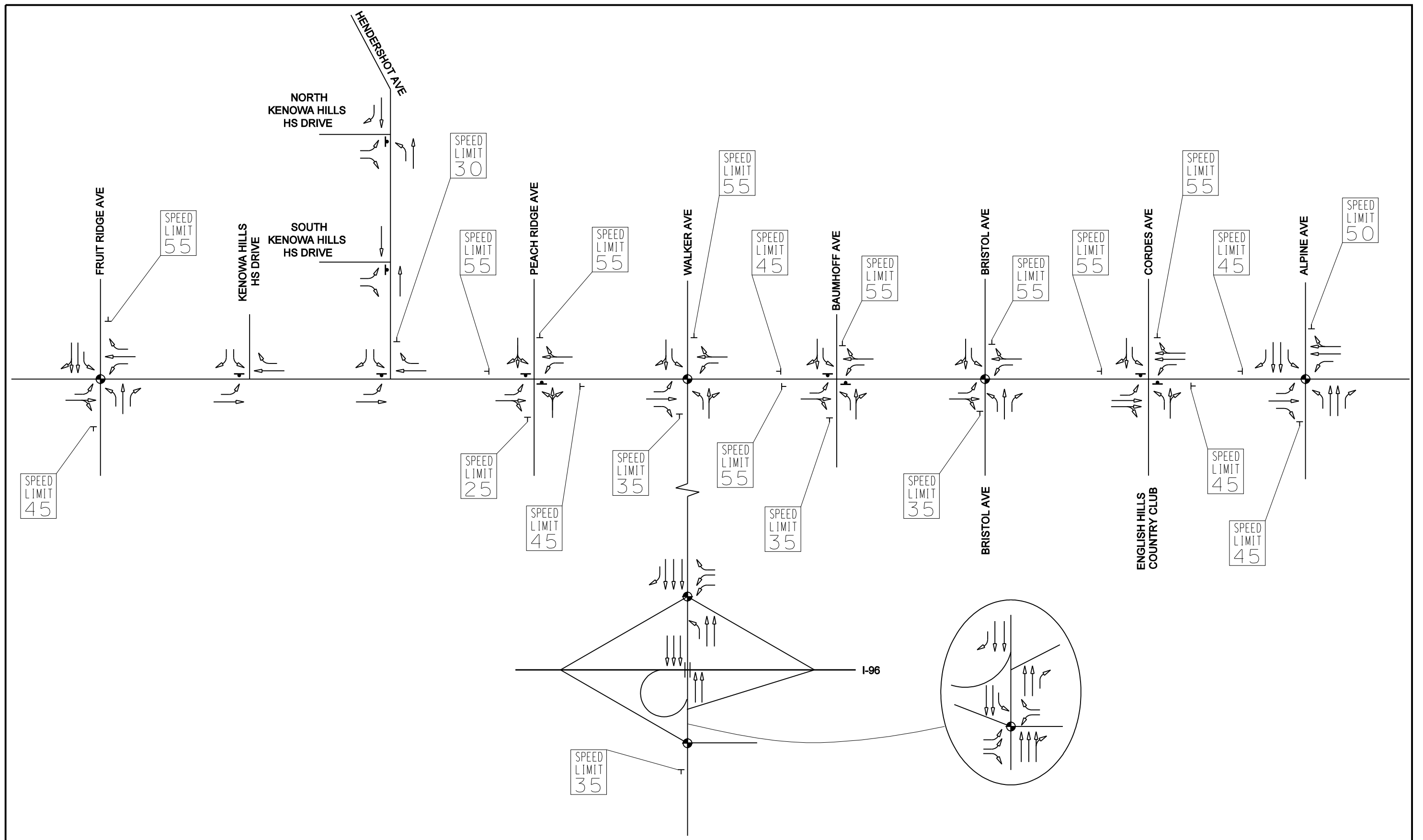
NOTE: SEE FIGURE 3-7 FOR PROPOSED LANEAGE



THREE LANE SECTION



FIVE LANE SECTION





Draft November 2006

Legend

Proposed Road Improvements

Proposed 100' ROW

Existing ROW

Existing Sidewalks

Parcel Lines

Existing Traffic Signals

N

0

250

500

Feet

GVMC

Prepared by:

4 MILE ROAD CORRIDOR STUDY

PROPOSED IMPROVEMENTS

FIGURE

3-8

3-13



Draft November 2006

Legend

- Proposed Road Improvements
- Proposed 100' ROW
- Existing ROW
- Existing Sidewalks
- Parcel Lines
- Existing Traffic Signals



0 250 500 Feet



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**URS**

**4 MILE ROAD CORRIDOR STUDY**  
**PROPOSED IMPROVEMENTS**

FIGURE  
3-9



Draft November 2006



0 250 500 Feet



Prepared by:  
**URS**

**4 MILE ROAD CORRIDOR STUDY**  
**PROPOSED IMPROVEMENTS**

FIGURE  
3-10



Draft November 2006

Legend

Proposed Road Improvements

Proposed 100' ROW

Existing ROW

Existing Sidewalks

Parcel Lines

Existing Traffic Signals

N


0


250


500


Feet

GVMC










Prepared by:



4 MILE ROAD CORRIDOR STUDY

PROPOSED IMPROVEMENTS

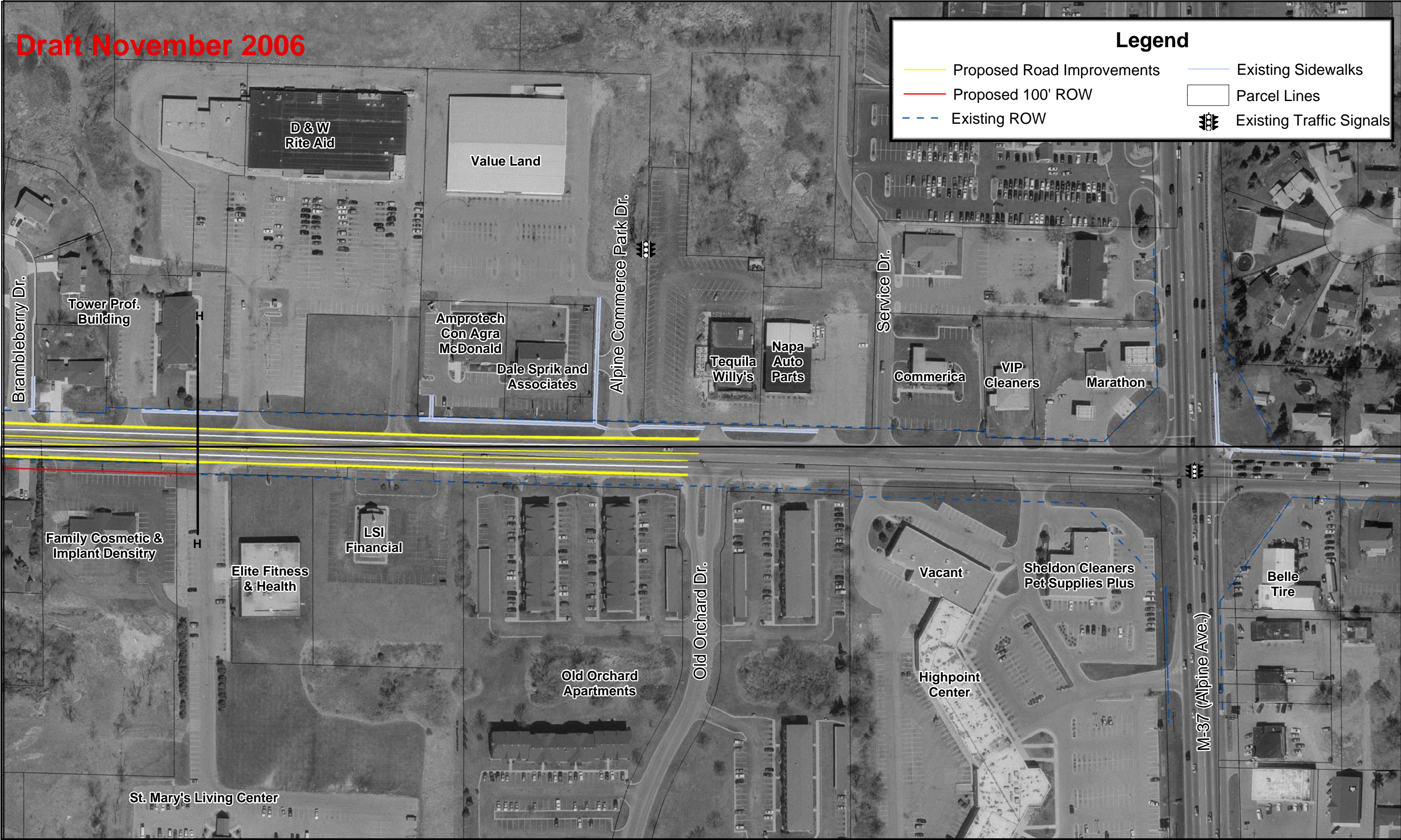
FIGURE

3-11

3-16



Draft November 2006



0 250 500 Feet



Prepared by:  
**URS**

**4 MILE ROAD CORRIDOR STUDY**  
**PROPOSED IMPROVEMENTS**

FIGURE  
3-12



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## Section 4      ACCESS MANAGEMENT

Because of the potential for traffic growth along 4 Mile Road, it is imperative that a proactive approach to maintaining road capacity and safety be undertaken through effective access management strategies and policies.

### 4.1    What is Access Management ?

The term “Access Management” describes a process that seeks to regulate access to land uses in order to improve traffic flow and safety, while simultaneously maintaining reasonable access to existing properties and future developments.

Access management involves a variety of techniques, including limiting the number of driveway access points, properly spacing driveways, consolidating driveways, construction of parallel service drives to service multiple adjacent land uses, and construction of low-capital road improvements such as turn lanes which separate turning traffic and through traffic.

It is well known that driveways create turbulence in the traffic stream which reduces road capacity. Numerous studies have also shown that the number of traffic crashes increase as the number of driveways increase. Access management strategies can reduce driveway-related crashes by as much as 50 percent by reducing the number of conflict points which lead to crashes.

Access management provides a myriad of benefits to the motoring public. Some of these benefits are listed below:

- Access Management preserves capacity and improves safety by strategically locating driveway access points to locations where they will least impact the flow of “through” traffic.
- Access Management reduces the potential for traffic crashes by limiting the number of driveway access points and improving driveway spacing.
- Access Management maintains reasonable access to homes and businesses, while improving safety for all drivers.
- Access Management increases communication and partnering between the roadway maintaining agency (Kent County Road Commission) and local jurisdictions (Alpine Township and City of Walker) in the review of site plans for proposed new developments and redevelopment of existing land uses.
- Access Management is cost-effective by extending the useful life of roads or requiring only minor capital outlays compared to the cost of constructing more travel lanes and the associated impacts to motorists during such construction.
- Access Management improves air quality and motorist costs by reducing overall travel time and congestion.

Specific recommendations to achieve the above-listed benefits along 4 Mile Road are presented herein.

### 4.2    Existing Access Issues

Field surveys were conducted to study existing access conditions along 4 Mile Road which could potentially be addressed when the road is widened or when adjacent land is developed or redeveloped. The corridor provides access to numerous residential driveways, Kenowa Hills High School, and various commercial businesses. Existing access-related issues are depicted in **Figure 4-1** through **Figure 4-5**. The figures depict various issues related to existing access along 4 Mile Road, including substandard driveway spacing, substandard intersection corner radii, inade-

---

quate intersection offset (and associated interlocking left-turn potential), and substandard road geometry. Examples of current deficient access along M-59 include:

- **Insufficient distance** between intersection and nearest driveway at Hendershot Avenue and Walker Avenue.
- **Unnecessary second driveways** at Neal Mast and Sons Greenhouse and Roth Trucking.
- **Substandard driveway spacing** and **poor driveway offset** along 4 Mile Road between Cordes Avenue and M-37.
- **Non-existent deceleration lanes** at most north-south county road intersections.
- **Undesirable roadway offset** at Bristol Avenue
- **Skewed intersection approaches** at Walker Avenue

Poor access management and substandard driveway spacing leads to traffic crashes. The traffic crash history of the 4 Mile Road corridor was presented in Section 2.

## 4.3 Access Management Techniques

The basic design standards for 4 Mile Road should meet the following general principles that make access management beneficial:

- Driveway design criteria must promote safe and efficient ingress and egress at driveways.
- Conflict areas can be reduced by eliminating driveways, improving driveway spacing, and providing better driveway alignment. Maintaining adequate space between a driveway and the nearest cross-street reduces congestion and traffic crashes, while proper driveway spacing simplifies the driving task by reducing the information the driver must process.
- Storage bays should be provided for turning traffic so as to reduce conflicts with through traffic (e.g. construction of right-turn deceleration lanes at major intersections).
- Reducing the number of conflict points at intersections by eliminating certain turn movements (e.g. converting a driveway to “right-in right-out” operation) improves safety.
- Reasonable access must be provided (albeit less direct access in some cases) with an understanding that all property owners must be allowed access to 4 Mile Road.

The following summarizes the basic design parameters involved with the implementation of access management.

### **Number of Access Points**

No more than one access point to a development should be provided, where possible. Reducing the number of driveways improves traffic flow, reduces the number of conflict points along 4 Mile Road and improves safety. Efforts to consolidate the driveways of multiple parcels into a single shared driveway should be pursued. Access to parcels from side streets (in lieu of access to 4 Mile Road) should also be implemented where possible.

Some developments generate sufficient traffic to warrant a second driveway, but additional driveways should only be considered based on the guidance of a formal traffic impact study that demonstrates the need for more access. Every effort should be made to provide this additional access from a side street or through shared access with adjacent parcels.

## Shared Driveways

Providing a single driveway for multiple parcels is highly encouraged. Shared driveways become valuable for parcels of narrow width that have no alternative access (such as from a side street). A written easement between each impacted property owner would be required during the site plan approval process.

## Driveway Spacing from Intersections

Driveways immediately upstream or downstream of an intersection must provide adequate distance from the intersection to prevent conflicts between driveway traffic and intersection traffic. The recommended spacing of driveways from intersections are based on MDOT guidelines and are depicted in **Table 4-1**. The shaded values in Table 4-1 apply to 4 Mile Road.

**TABLE 4-1**  
**RECOMMENDED MINIMUM DRIVEWAY SPACING FROM INTERSECTIONS**

Posted Speed (mph)	Minimum Upstream Drive (feet)*	Minimum Downstream Drive (feet)	Minimum Side Street Drive (feet)
<b>Signalized Intersection</b>			
25-35	230	230	230
<b>40-50+</b>	<b>460</b>	<b>460</b>	<b>460</b>
<b>Unsignalized Intersection</b>			
25-35	85	115	115
<b>40-50+</b>	<b>170</b>	<b>230</b>	<b>230</b>

\* - For undivided arterial like 4 Mile Road.

Source: Michigan Department of Transportation (T&S Division Note 7.9D)

As shown in Table 4-1, the minimum distance between a signalized intersection along 4 Mile Road and the nearest driveway should be 460 feet. The minimum distance between a stop-controlled intersection along 4 Mile Road and the nearest driveway is 230 feet in the downstream direction and 170 feet in the upstream direction. If the corner parcel size is too small and limits this distance, then the driveway should be located as far from the intersection as possible.

## Driveway Spacing from Other Driveways

The space between consecutive driveways should be of sufficient distance to limit turning conflicts. Based on MDOT guidelines, the recommended minimum driveway spacing is dependent on the speed limit as shown in **Table 4-2**. The shaded values in Table 4-2 apply to 4 Mile Road.

**TABLE 4-2**  
**RECOMMENDED MINIMUM DRIVEWAY SPACING FROM OTHER DRIVEWAYS**

Posted Speed (mph)	Minimum Driveway Spacing (feet)
25	130
30	185
35	245
40	300
<b>45</b>	<b>350</b>
<b>50+</b>	<b>455</b>

Source: Michigan Department of Transportation (T&S Division Note 7.9C, Table 1)

As shown in Table 4-2, the minimum distance between consecutive driveways should be 350 feet along 4 Mile Road. In retrofit areas along 4 Mile Road—particularly near M-37—where existing driveway spacing is much less than the desired spacing, shared driveways should be pursued.

### **Sight Distance**

There are two types of sight distance. Stopping Sight Distance (SSD) is the minimum amount of time necessary for a vehicle traveling at the design speed to stop before reaching a stationary object in its path. Intersection Sight Distance (ISD) is the minimum distance along the arterial road needed by side street drivers who are stopped at the arterial road to either enter or cross the arterial road. The minimum values of SSD and ISD are depicted in **Table 4-3**. The shaded values in Table 4-3 apply to 4 Mile Road.

**TABLE 4-3  
MINIMUM VALUES OF SIGHT DISTANCE**

Posted Speed (mph)	Stopping Sight Distance (feet)	Intersection Sight Distance (feet)
30	200	350
35	250	410
40	305	470
<b>45</b>	<b>360</b>	<b>530</b>
50	425	590
<b>55</b>	<b>495</b>	<b>650</b>
60	570	710
65	645	760

Source: AASHTO and Michigan Department of Transportation

As shown in Table 4-3, the minimum SSD along 4 Mile Road must be at least 360 feet while the minimum ISD must be at least 530 feet. Sight distance (or lack thereof) impacts the optimal location of driveways along 4 Mile Road. The issue of adequate sight distance should be coordinated between the Kent County Road Commission and the local unit of government during the site plan review process (either Alpine Township or the City of Walker).

### **Driveway Alignment**

Driveways on opposite sides of 4 Mile Road should also be aligned properly to reduce left-turn conflicts such as “lock-up” situations. The recommended offset distance between consecutive driveways on opposite sides of the road is depicted in **Table 4-4**. The shaded values in Table 4-4 apply to 4 Mile Road.

**TABLE 4-4  
RECOMMENDED DRIVEWAY OFFSET DISTANCE**

Posted Speed (mph)	Desirable Offset between Driveways on Opposite Sides of an Undivided Road (feet)
25	255
30	325
35	425
40	525
<b>45</b>	<b>630</b>
<b>50+</b>	<b>750</b>

Source: Michigan Department of Transportation (T&S Division Note 7.9C, Table 2)

---

As shown in Table 4-4, the recommended offset distance between consecutive driveways on opposite sides of 4 Mile Road is 630 feet. Maintaining a proper offset of driveways is more desirable than locating driveways directly opposite each other (i.e. no offset), because driveways opposite each other encourage cross-street movements between drives. But if maintaining proper offset is not practical, then locating drives opposite each other is more desirable than an inadequate offset that creates a left-turn “lock-up” scenario.

### **Restricted Turns**

In cases where existing driveway spacing and offset are poor, restricting certain turn movements can often improve safety by reducing the number of conflict points at the driveway. Proper channelization of the driveway, combined with appropriate signage, is recommended in order to encourage conformance.

### **Parallel Service Drives**

The number of driveways can be minimized (while maintaining reasonable access to properties) through construction of front or rear service drives parallel to 4 Mile Road that connect multiple parcels. Service drives provide particular safety benefits if applied to parcels closer than one-quarter mile to an existing or future signalized intersection.

If a service drive is planned for a currently-undeveloped area, all individual site plans in the area should accommodate the future service drive. Temporary access to 4 Mile Road could be provided to each parcel with an agreement to close the access after construction of the adjacent section of the service drive.

Providing sufficient internal driveway stacking between the service drive and 4 Mile Road would be key to successful operation of the service drive. The amount of internal stacking is dependent on the number of trips that are anticipated to be generated by the various land uses that the service drive connects. Rear service drives are preferred (compared to front service drives) because they typically provide for greater stacking.

Service drives should be constructed to the same design standards as a public road, but the easement for a service drive need not be as wide as the right-of-way for a public road.

## **4.4 Applying Access Management to 4 Mile Road**

The access management techniques described in Section 4.3 were applied to the proposed 3-lane and 5-lane cross-section along 4 Mile Road. The access management improvements for 4 Mile Road are depicted in **Figure 4-6** through **Figure 4-10**. As shown in these figures, the plan includes a myriad of recommendations for undeveloped parcels and “retrofit” improvements to existing substandard access.

The standards described in Section 4.3 can be directly applied to the undeveloped parcels along 4 Mile Road as site plans are submitted for review, while improvements to existing access problems are typically referred to as “retrofit” improvements. Considering the existing spacing of driveways along 4 Mile Road and existing parcel sizes, it is impossible to retrofit 4 Mile Road in such a way as to meet all the guidelines described in Section 4.3. Under these circumstances, the goal is simply to minimize the number of driveways as much as possible and improve driveway spacing and offset as much as possible. Many of the recommended access management improvements cannot be realized until an existing site is redeveloped and requires approval of the revised site.

It should be noted that the proposed access management improvements depicted in Figure 4-6 through Figure 4-10 are for planning purposes only. While the guidelines and parameters described in Section 4.3 do not change, the precise location of driveways, the implementation of service drives, and shared access may be adjusted as future developments and redevelopments come into better focus.

---

## 4.5 Overlay Zoning District

A common technique used to formally implement an Access Management Plan is to amend the existing local zoning ordinance with an “overlay zoning district”. An overlay zoning district would be placed “over” existing zoning regulations. The provisions of the overlay zoning district, together with the provisions of the zoning ordinance, would apply to all parcels fronting 4 Mile Road and along intersecting roads within 350 feet of the 4 Mile Road right-of-way.

For example, the zoning ordinance would continue to provide the necessary provisions for building setback, building size and building height, while the overlay zoning district would provide provisions along 4 Mile Road for driveway spacing and access design standards (described earlier).

The access management standards described in Section 4.3 would form the backbone of the overlay zoning district. The overlay zoning district allows the access management standards to be modified on a case-by-case basis during the site plan review process in order to address older sites that cannot satisfy all of the standards. In such cases, the intent would be to minimize the number of access points to the redeveloped site and provide the best driveway spacing possible.

The overlay zoning district includes a flow chart (**Figure 4-11**) that depicts a site plan review process containing the necessary coordination between the city of Walker, Alpine Township, and the Kent County Road Commission. The site plan review process depicted in Figure 4-11 insures that the review of the site plan by Alpine Township or the city of Walker and the Road Commission’s review of the driveway permit are coordinated processes that enforce the access management standards. The overlay zoning district and corresponding site plan review process provides the mechanism by which access management standards are applied to new developments and redeveloped properties along 4 Mile Road.



Beginning of Project

Fruit Ridge Ave.

George Hofacker  
Equipment

Legend

Existing Sidewalks

Existing ROW

Less than desired spacing between road and driveway

Less than desired spacing between driveways

Parcel Lines

Existing Traffic Signal

No Offset

Inadequate Offset

Left-Turn Lockup

A  
A

Kenowa Hills  
High School

Hendershot Ave.

Roth  
Trucking

B  
B



Prepared by:

4 MILE ROAD CORRIDOR STUDY

EXISTING ACCESS ISSUES

FIGURE  
4-1





**Legend**

Existing Sidewalks	Existing Traffic Signal
Existing ROW	No Offset
Less than desired spacing between road and driveway	Inadequate Offset
Less than desired spacing between driveways	Left-Turn Lockup
Parcel Lines	

N

0 250 500 Feet

Prepared by:  
**URS**

**4 MILE ROAD CORRIDOR STUDY**

**EXISTING ACCESS ISSUES**

FIGURE 4-2









**Legend**

Existing Sidewalks	Existing Traffic Signal
Existing ROW	No Offset
Less than desired spacing between road and driveway	Inadequate Offset
Less than desired spacing between driveways	Left-Turn Lockup
Parcel Lines	





0250500 Feet



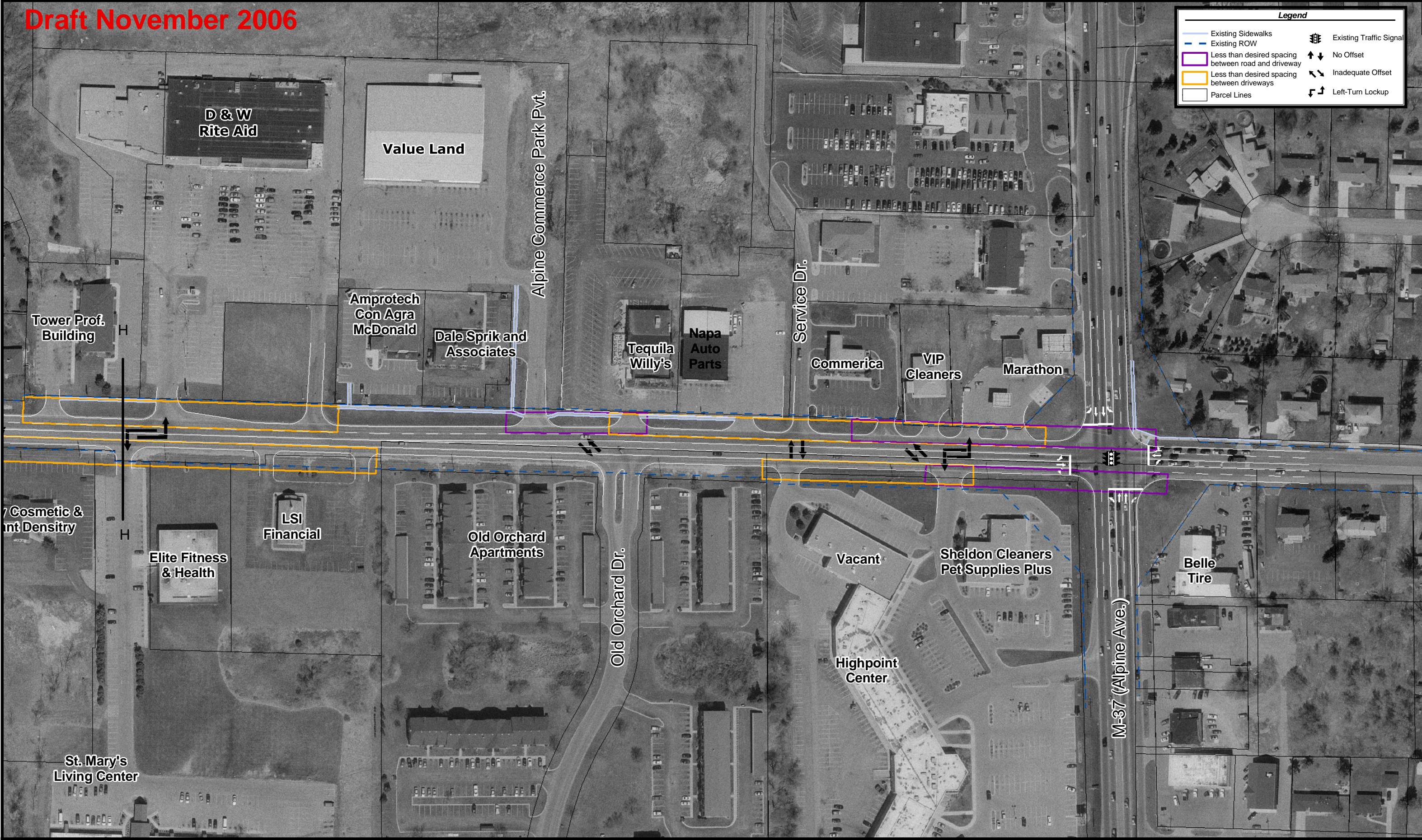
Prepared by:  


4 MILE ROAD CORRIDOR STUDY

**EXISTING ACCESS ISSUES**

FIGURE  
4-4



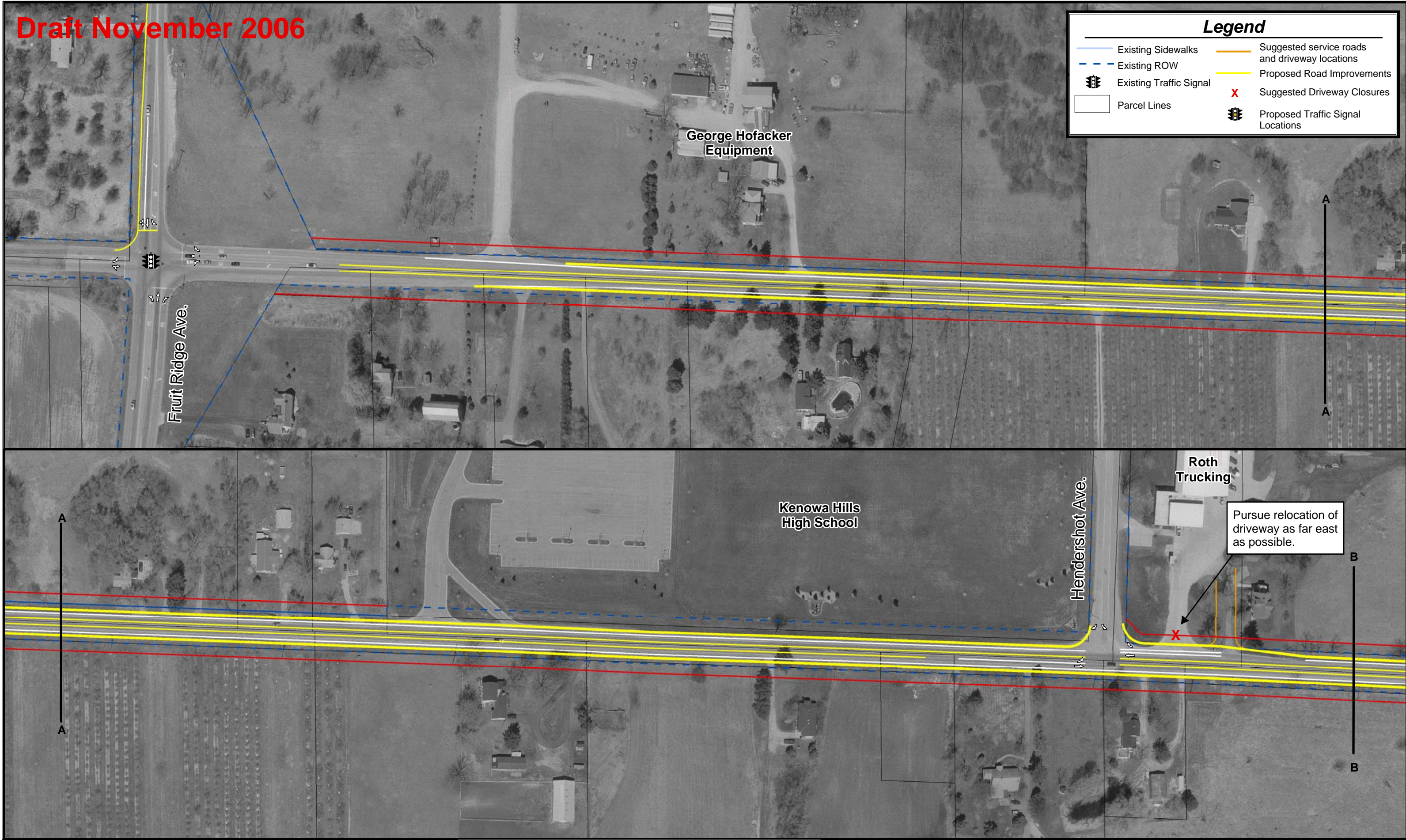




Draft November 2006

**Legend**

	Existing Sidewalks		Suggested service roads and driveway locations
	Existing ROW		Proposed Road Improvements
	Existing Traffic Signal		Suggested Driveway Closures
	Parcel Lines		Proposed Traffic Signal Locations





**Legend**

Existing Sidewalks

Existing ROW

Existing Traffic Signal

Parcel Lines

Suggested service roads and driveway locations

Proposed Road Improvements

Suggested Driveway Closures

Proposed Traffic Signal Locations







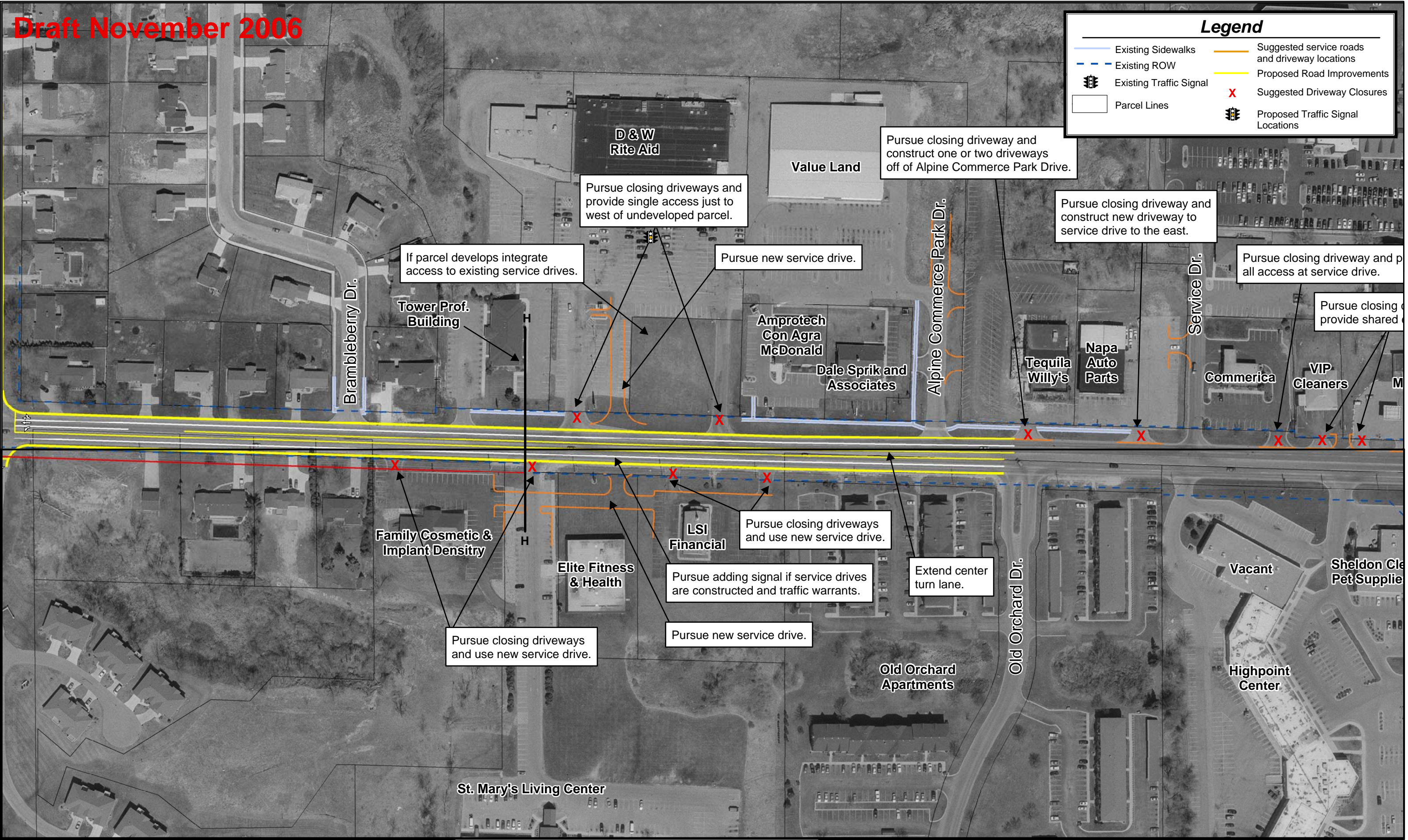
**Legend**

	Existing Sidewalks		Suggested service roads and driveway locations
	Existing ROW		Proposed Road Improvements
	Existing Traffic Signal		Suggested Driveway Closures
	Parcel Lines		Proposed Traffic Signal Locations



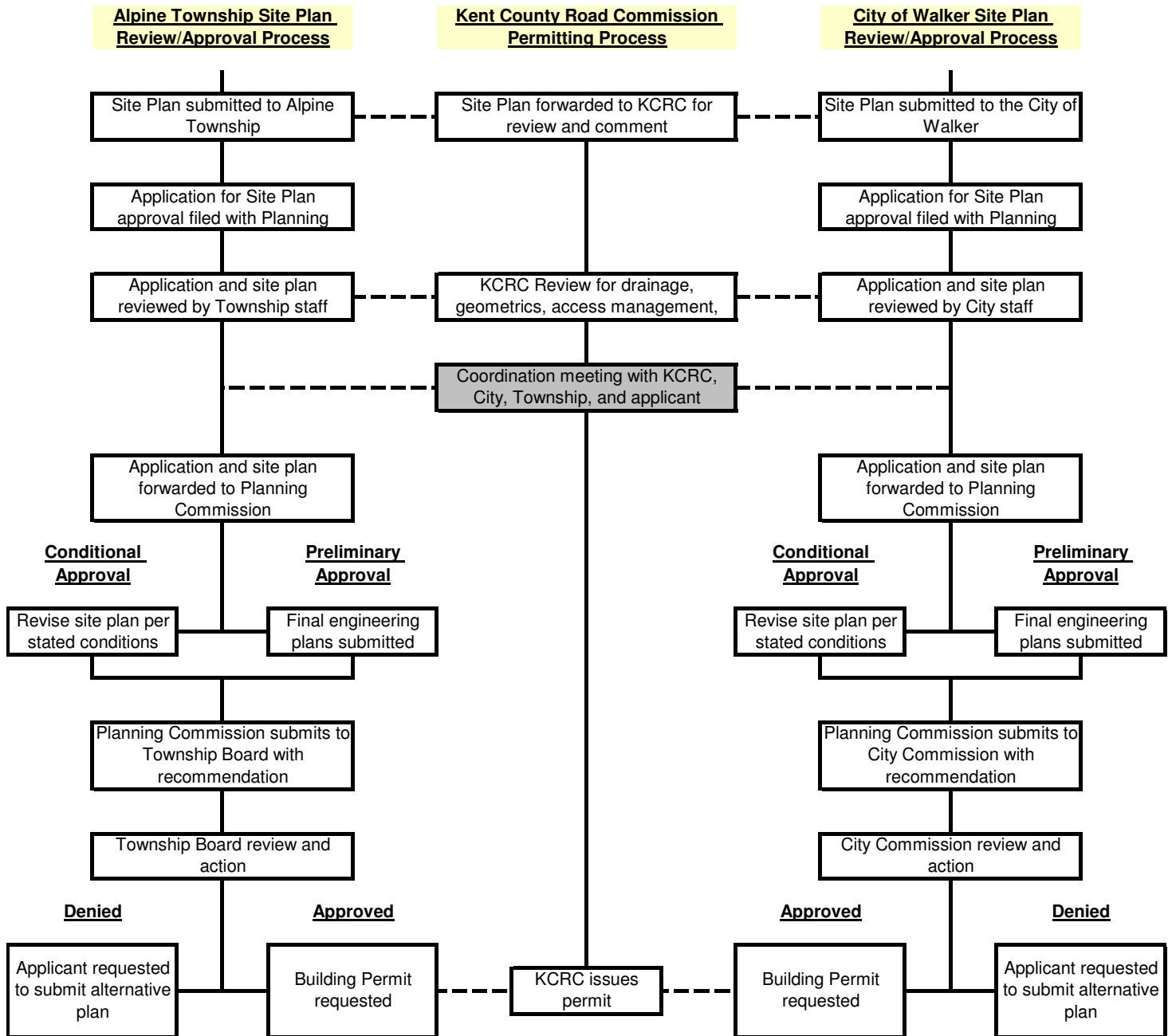








**FIGURE 4-11  
PROPOSED SITE PLAN REVIEW PROCESS FOR 4 MILE ROAD**



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# **Appendix A**

## **Existing Conditions (2006) Capacity Analysis Worksheets**



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## **Appendix B**

# **Future-Year (2015) Capacity Analysis Worksheets**

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## **Appendix C**

### **Future-Year (2030) Capacity Analysis Worksheets**