FINAL REPORT

CITY OF WYOMING
2035 THOROUGHFARE PLAN

Prepared For:

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GRAND RAPIDS – SOUTHFIELD – TRAVERSE CITY

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1.0 INTRODUCTION

1.1 Background

The City of Wyoming, Michigan, which adjoins the City of Grand Rapids, created its first Thoroughfare Plan in 1970. The Plan was updated and amended in 1976, 1987 and 1998. Each of these plans have been important community planning tools which have assisted City officials with decisions related to traffic demands placed upon the City's thoroughfare system.

The preparation of this 2035 Thoroughfare Plan incorporates traffic data collected by the City of Wyoming and the Michigan Department of Transportation (MDOT) in 2008 and 2009. The Plan utilized the latest version of the transportation planning model developed by the Grand Valley Metropolitan Council (GVMC)—the local Metropolitan Planning Organization (MPO) for the Grand Rapids metropolitan area. The GVMC is responsible for organizing transportation improvement projects and allocating funds to complete such projects. The GVMC planning model guided the development of Average Daily Traffic projections for city thoroughfares. The traffic projections in turn were used to determine areas of need.

1.2 Report Organization

This report is organized into the following sections:

2.0 *Existing Conditions* – This section provides an inventory of current physical conditions and an analysis of the existing operational quality of the City's thoroughfares.

3.0 *Future Conditions* – This section contains an operational analysis of the City's thoroughfare system under traffic conditions projected to the year 2035. The need for future changes and enhancements to the current thoroughfare system was studied and analyzed utilizing the GVMC transportation planning model.

4.0 *2035 Thoroughfare Plan* – The results of the future conditions analysis were used to develop the updated Thoroughfare Plan. The Plan contains recommendations regarding the expansion of existing thoroughfares to provide the needed capacity for future years.

All analyses documented in this report were performed in accordance with MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards, including the 2000 Highway Capacity Manual (HCM), A Policy on Geometric Design of Highways and Streets (AASHTO, 2004) and the Michigan Manual of Uniform Traffic Control Devices (MMUTCD, 2005).

2.0 EXISTING (2009) CONDITIONS

This section contains an inventory of current physical conditions and an analysis of the existing operational quality of the City's thoroughfare system. The inventory includes presentations of functional classification, existing traffic volumes, crash analyses, on-street parking, existing number of lanes and pavement widths, and existing right-of-way widths. These data are used to determine the operational characteristics and existing Level-of-Service of each of the City's thoroughfares.

2.1 Functional Classification

Any street in a roadway network can be classified as to the character of service it is intended to provide. Its functional classification is necessary for communication purposes. Each thoroughfare in the City of Wyoming has been assigned to the following hierarchical system of functional classes by the Grand Valley Metro Council (GVMC):

- *Principal Arterials*
  The function of principal arterials such as M-11 (28th Street), 44th Street, Wilson Avenue, and Byron Center Avenue are to provide regional travel capabilities as well as to serve the City's major activity centers. Principal arterial streets typically carry large volumes of traffic over long distances.

- *Minor Arterials*
  Minor arterial streets such as Burlingame Avenue and 52nd Street augment the principal arterial system by distributing traffic to smaller geographical areas within the City. Mobility is emphasized less on minor arterial streets than on principal arterials, while access to abutting land is emphasized more. Minor arterial streets can provide access between communities, but they do not typically enter specific neighborhoods.

- *Collectors*
  The function of collector streets such as 40th Street and De Hoop Avenue is to funnel traffic from the arterial system to local streets and other destinations. Collector streets typically provide access to neighborhoods as well as commercial and industrial areas within the City.

- *Local Streets*
  The function of local streets is to provide access to abutting land; mobility is minor as local streets carry minimal traffic at low speeds over short distances.

Figure 2-1 depicts the functional class of each thoroughfare in the City of Wyoming as defined by the Grand Valley Metro Council.

2.2 Existing Traffic Volumes

The City of Wyoming and MDOT maintain annual traffic count programs. This data was used to determine the existing traffic volumes on each of the City's thoroughfares, including those streets owned and maintained by MDOT (M-11 and I-196BS). The I-196 and US-131 freeways are not included as they are not deemed as city thoroughfares for the purposes of this Plan. A bandwidth plot of the existing Average Daily Traffic (ADT) on each of the City's thoroughfares is presented in Figure 2-2. The 2-way, 24-hour traffic counts shown in Figure 2-2 were collected in 2008 and 2009. The counts were collected at intersection approaches during various calendar months. Seasonal adjustments to the counts were not made.

As shown in Figure 2-2, the highest traffic volumes occur on 54th Street, 44th Street, 36th Street, and M-11 which are the principal east-west arteries. 54th Street carries the highest volume of traffic in the city, with more than 40,000

ADT west of Division Avenue. In general, the north-south streets do not carry as much traffic as the east-west corridors.

Existing (2009) ADT values were compared to the 1996 ADT values as presented in the previous Thoroughfare Plan. The comparisons are shown in Table 2-1 for selected approaches along selected corridors.

TABLE 2-1
TRAFFIC VOLUME COMPARISON ON VARIOUS THOROUGHFARES (1996 TO 2009)

Thoroughfare	Location	ADT (1996)*	ADT (2009)	% Change
56th Street	Just west of Byron Center Avenue	1,500	12,100	+707 %
Byron Center Avenue	Just south of 52nd Street	6,500	19,700	+203 %
Wilson Avenue	Just south of 52nd Street	6,000	16,600	+177 %
Ivanrest Avenue	Just north of 52nd Street	6,000	11,500	+92 %
54th Street	Just east of US-131	35,000	43,400	+24 %
52nd Street	Just west of Clyde Park Avenue	10,500	10,000	-5 %
36th Street	Just east of US-131	32,000	29,800	-7 %
Division Avenue	Just south of 36th Street	27,000	22,900	-15 %
Clyde Park Avenue	Just south of 44th Street	19,000	14,500	-24 %
Byron Center Avenue	Just north of 36th Street	21,000	14,300	-32 %
M-11	Just west of Byron Center Avenue	37,000	24,000	-35 %
44th Street	Just east of US-131	53,000	33,000	-38 %
Eastern Avenue	Just south of 36th Street	23,000	13,500	-41 %
Burlingame Avenue	Just north of M-11	22,000	12,800	-42 %

* - as presented in the previously-adopted 2020 Thoroughfare Plan.

As shown in Table 2-1, the traffic on some of the City's thoroughfares has decreased in the last ten to fifteen years. The economic slowdown beginning in 2008 has played a part in reducing vehicular travel (e.g. closure of the Wyoming Stamping Plant on 36th Street). Road construction may also have impacted traffic volumes along some of the corridors depicted in Table 2-1 and in Figure 2-1. For instance, traffic volumes along 44th Street may be lower than normal due to the construction at the US-131 interchange in 2009, while traffic volumes along 54th Street may be higher than normal as a result of the 44th Street construction.

The opening of the M-6 freeway has resulted in increased travel in the southwest corner of the city, particularly along the Byron Center Avenue and Wilson Avenue corridors which have interchanges along M-6. The completion of Gezon Parkway several years ago has reduced travel on 52nd Street and increased traffic on 56th Street. The Metropolitan Hospital complex along Byron Center Avenue between M-6 and Gezon Parkway has likewise increased travel in the southern part of the city.

2.3 Number of Lanes

In addition to traffic volume, the number of travel lanes is an important factor in determining thoroughfare Level-of-Service because it greatly impacts the capacity of a street. The number of travel lanes for each thoroughfare in the City of Wyoming is presented in Figure 2-3.

As shown in Figure 2-3, some streets are 4-lane undivided facilities (Gezon Parkway, Burton Street, Burlingame Avenue) while other 4-lane streets are divided (boulevard) facilities (44th Street, Clyde Park Avenue, Wilson Avenue, Byron Center Avenue). Boulevard thoroughfares generally have raised center medians which separate opposing traffic flows. Whereas 4-lane undivided streets are free-access facilities, boulevard facilities have more access control by allowing access to side streets at selected locations only. The presence of a center median provides a pro-

tected queuing area for left-turn movements and increased access control. As a result, boulevard facilities are typically able to operate more efficiently.

Some streets in the City of Wyoming are 5-lane undivided facilities (M-11, Division Avenue, Eastern Avenue). Instead of having a center median like a boulevard facility, a continuous two-way center left-turn lane separates opposing traffic flows. Streets with 5-lane cross-sections are typically found on heavy-volume roads with numerous driveways, or where right-of-way may be limited preventing the construction of a boulevard facility.

2.4 Level-of-Service

Level-of-Service is a qualitative measure of how well (or poorly) a street operates. The quality of service is dependent on many factors including peak-hour traffic volumes, traffic composition (percent heavy-vehicles), vehicle speeds, the number of travel lanes, traffic control (signs and signals), and on-street parking. Chapter 21 (*Multilane Highways*) of the 2000 Highway Capacity Manual (HCM) defines each of the levels as shown in Table 2-2.

TABLE 2-2
PEAK-HOUR LEVEL-OF-SERVICE RANGES

Level-of-Service	Definition
A	Free-flow conditions. Drivers travel at speeds at which they feel comfortable.
B	Slightly reduced maneuverability due to presence of other vehicles. Delays at intersections are not bothersome.
C	Stable operation. Drivers feel appreciable tension as maneuverability becomes more restricted, and vehicular queues form behind any traffic disruption.
D	Maneuverability severely restricted as small increases in traffic flow may cause significant increases in delay.
E	Unstable operations which are at or near the capacity of the roadway; significant delays occur at intersections.
F	Forced Flow. Vehicles arrive at a faster rate than is serviceable creating stop-and-go traffic conditions with extensive queuing and high delays.

Source: 2000 Highway Capacity Manual

Level-of-Service "C" is considered desirable for urban and suburban arterial streets during peak traffic hours, while Level-of-Service "D" is typically deemed acceptable. The methods of Chapter 21 of the 2000 HCM were used to determine the peak-hour Level-of-Service for each thoroughfare in the City of Wyoming. Chapter 21 of the HCM utilizes "maximum service flow" to quantify the boundaries of each Level-of Service for peak-hour conditions. These maximum peak-hour service flows and the approximate ADT values are shown in Tables 2-3a thru Table 2-3d for various types of thoroughfare facilities present within the city.

Caution is advised when using the information displayed in Table 2-3a thru Table 2-3d. It should be noted these tables do not constitute a standard but should be used for general planning purposes only. The methods of Chapter 15 (Urban Streets) of the 2000 HCM offers a more detailed analysis of Level-of-Service for signalized arterial streets; however, detailed intersection turning movement counts and delay information, which are required for the analysis, were not available.

The values shown in Table 2-3a thru Table 2-3d should be reduced by approximately 30 percent for those thoroughfares with more than three major signalized intersections per mile. Streets exhibiting this characteristic are Burton Street, M-11 east of Burlingame Avenue, 36th Street east of Clyde Park Avenue, 44th Street east of Clyde Park Avenue, and 54th Street. Existing (2009) Average Daily Traffic on each thoroughfare were used to determine its Level-of-Service based on the maximum values contained in Table 2-3a thru Table 2-3d. The results of the Level-of-Service analysis are displayed in Figure 2-4.

TABLE 2-3a (45 MPH)
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 Undivided	270	5,444	446	9,000	644	13,000	853	17,222	1,045	21,111
3-lane Undivided	449	9,074	743	15,000	1,073	21,667	1,421	28,704	1,742	35,185
4-lane Undivided	539	10,889	891	18,000	1,287	26,000	1,705	34,444	2,090	42,222
4-lane Divided	719	14,519	1,188	24,000	1,716	34,667	2,273	45,926	2,787	56,296
5-lane Undivided	719	14,519	1,188	24,000	1,716	34,667	2,273	45,926	2,787	56,296
6-lane Undivided	809	16,333	1,337	27,000	1,931	39,000	2,558	51,667	3,135	63,333
6-lane Divided	988	19,963	1,634	33,000	2,360	47,667	3,126	63,148	3,832	77,407

*pcph = passenger cars per hour in peak direction

Note: Table 2-3a has been developed from Table 21-2 of the 2000 Highway Capacity Manual. The above table assumes turn lanes have two thirds the capacity of through lanes, g/C = 0.55, k-factor = 0.09, and free-flow speed = 45 mph.

TABLE 2-3b (40 MPH)
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 Undivided	237	4,778	396	8,000	572	11,556	759	15,333	990	20,000
3-lane Undivided	394	7,963	660	13,333	953	19,259	1,265	25,556	1,650	33,333
4-lane Undivided	473	9,556	792	16,000	1,144	23,111	1,518	30,667	1,980	40,000
4-lane Divided	631	12,741	1,056	21,333	1,525	30,815	2,024	40,889	2,640	53,333
5-lane Undivided	631	12,741	1,056	21,333	1,525	30,815	2,024	40,889	2,640	53,333
6-lane Undivided	710	14,333	1,188	24,000	1,716	34,667	2,277	46,000	2,970	60,000
6-lane Divided	867	17,519	1,452	29,333	2,097	42,370	2,783	56,222	3,630	73,333

*pcph = passenger cars per hour in peak direction

Note: Table 2-3b has been developed from Table 21-2 of the 2000 Highway Capacity Manual. The above table assumes turn lanes have two thirds the capacity of through lanes, g/C = 0.55, k-factor = 0.09, and free-flow speed = 40 mph.

TABLE 2-3c (35 MPH)
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 Undivided	204	4,111	347	7,000	501	10,111	660	13,333	935	18,889
3-lane Undivided	339	6,852	578	11,667	834	16,852	1,100	22,222	1,558	31,481
4-lane Undivided	407	8,222	693	14,000	1,001	20,222	1,320	26,667	1,870	37,778
4-lane Divided	543	10,963	924	18,667	1,335	26,963	1,760	35,556	2,493	50,370
5-lane Undivided	543	10,963	924	18,667	1,335	26,963	1,760	35,556	2,493	50,370
6-lane Undivided	611	12,333	1,040	21,000	1,502	30,333	1,980	40,000	2,805	56,667
6-lane Divided	746	15,074	1,271	25,667	1,835	37,074	2,420	48,889	3,428	69,259

*pcph = passenger cars per hour in peak direction

Note: Table 2-3c has been developed from Table 21-2 of the 2000 Highway Capacity Manual. The above table assumes turn lanes have two thirds the capacity of through lanes, g/C = 0.55, k-factor = 0.09, and free-flow speed = 35 mph.

TABLE 2-3d (30 MPH)
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 Undivided	171	3,444	297	6,000	429	8,667	556	11,222	880	17,778
3-lane Undivided	284	5,741	495	10,000	715	14,444	926	18,704	1,467	29,630
4-lane Undivided	341	6,889	594	12,000	858	17,333	1,111	22,444	1,760	35,556
4-lane Divided	455	9,185	792	16,000	1,144	23,111	1,481	29,926	2,347	47,407
5-lane Undivided	455	9,185	792	16,000	1,144	23,111	1,481	29,926	2,347	47,407
6-lane Undivided	512	10,333	891	18,000	1,287	26,000	1,667	33,667	2,640	53,333
6-lane Divided	625	12,630	1,089	22,000	1,573	31,778	2,037	41,148	3,227	65,185

*pcph = passenger cars per hour in peak direction

Note: Table 2-3d has been developed from Table 21-2 of the 2000 Highway Capacity Manual. The above table assumes turn lanes have two thirds the capacity of through lanes, g/C = 0.55, k-factor = 0.09, and free-flow speed = 30 mph.

As shown in Figure 2-4, existing Levels-of-Service of most roadway segments within the city are acceptable (LOS "D or better). Only one roadway operates in the Level of Service "E" or "F" area—54th Street between US-131 and Division Avenue. It should be noted that peak-hour Levels of Service at individual intersections may be worse than what is depicted in Figure 2-4.

2.5 Existing Right-of-Way

The ability to add lanes and increase the capacity of a thoroughfare is dependant upon many factors. One important factor is the availability of right-of-way. Without right-of-way, property must be purchased before a lane can be constructed; however, the added expense may make capacity increases financially infeasible. Figure 2-5 contains the basic existing right-of-way widths for corridors throughout the City of Wyoming. As shown in Figure 2-5, the existing right-of-way varies from road to road. The right-of-way widths shown in Figure 2-5 may vary slightly along each route, particularly near intersections where additional space is needed to construct turn lanes and provide clear vision corners.

2.6 Traffic Signals and Roundabouts

Traffic signals are needed at intersections with high volumes of traffic; however, they reduce the capacity of a street by frequently stopping traffic. There are a total of 71 signalized intersections in the City of Wyoming. The majority of these signals are located at major intersections. One (1) signal is located at factory/business entrances which have heavy traffic for short durations during peak traffic hours (Eastern Avenue / 40th Street). Other traffic signals are located at intersections with a higher concentration of pedestrians (Godfrey Avenue at Joosten Street). The location of each traffic signal in the City of Wyoming is shown in Figure 2-6.

Some of the traffic signals shown in Figure 2-6 have actuated features. Actuated traffic signals utilize traffic detectors, inductance loops imbedded into the pavement or video cameras that sense the presence of vehicles. Actuated traffic signals respond to demand and apportion green time more efficiently than pre-timed traffic signals. Most of the traffic signals in the City of Wyoming have detectors in left-turn lanes which allow the traffic signal controllers to apportion more green time to the heaviest-volume turning movements during peak periods.

The reduction of capacity caused by traffic signals can be diminished somewhat by interconnecting and coordinating the timing schemes of multiple traffic signals. Coordination of traffic signals provides efficient progression of the traf-

fic stream through the street network. With efficient progression, vehicles can be served by a series of traffic signals without being stopped. The traffic signals in the City of Wyoming, including the traffic signals along state trunkline roadways, are a part of a master system coordinated by the City of Grand Rapids. The City of Grand Rapids has optimized the timings of several key corridors in Wyoming, including the east-west corridors of 54th Street, 44th Street, 36th Street, and Burton Street, and the north-south corridors of Wilson Avenue, Byron Center Avenue, and Division Avenue. MDOT optimized the traffic signal timings along 28th Street (M-11) in 2009.

Modern roundabouts are becoming more popular across the United States as an alternative method for controlling traffic at an intersection. The modern roundabout involves a circular roadway with entry and exit points. Approaching vehicles must yield at the roundabout entry and circulate counterclockwise until reaching the desired exit point. The modern roundabout has been shown to reduce crash severity, since vehicles are required to slow down in order to enter the roundabout. Crashes that occur at roundabouts are typically slow-speed sideswipe crashes. Modern roundabouts, if designed properly, can also serve high volumes of traffic at Levels of Service equal to or better than traffic signals.

The City of Wyoming constructed its first roundabout at the intersection of Jacob Street and Maple Tree Court, just west of Canal Avenue in the southwest corner of the city. Modern roundabouts at major intersections could also be considered at intersections such as the Burton Street/Burlingame Avenue/Lee Street intersection and at the I-196BL (Chicago Drive)/Godfrey Street intersection. These intersections may be good candidates for the modern roundabout, given the 6-legged nature of the Burton Street location and the skewed north approach at the I-196BS location. Additional study would be required, as standards of practice are still evolving for how best to handle pedestrians at both single-lane and multi-lane roundabouts.

2.7 On-Street Parking

The existence of on-street parking can impact the capacity of a street, as the presence of parked vehicles directly adjacent to the traffic stream tends to restrict the flow of traffic. The location of all on-street parking areas in the City of Wyoming is shown in Figure 2-7. When compared with Figure 2-2 and Figure 2-4, it can be seen that those streets which allow “on-street” parking are all low-volume streets without any existing capacity problems.

2.8 Crash Analysis

Crash records from January 1, 2007 through December 31, 2009 were analyzed for all thoroughfare intersections. A summary of the results are shown in the following tables:

Table 2-4a	I-196BS, Burton Street, and Porter Street (10 intersections)
Table 2-4b	M-11, Prairie Parkway, and 32nd Street (18 intersections)
Table 2-4c	36th Street and 54th Street (17 intersections)
Table 2-4d	44th Street, 52nd Street, 56th Street, and Gezon Parkway (16 intersections)

The tables include the three (3) most common crash types at each intersection as well as crash severity and crash rate statistics. Two (2) fatalities occurred during the 3-year period. Both of the fatal crashes took place in 2009.

Intersection crash rates were evaluated to determine which intersections had higher-than-average crash rates when compared to intersections with similar entering ADT. Table 2-5 lists intersections with higher-than-average crash rates and Figure 2-8 depicts the locations of these intersections. 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 total of 14 intersections (of 61 intersections studied) had higher-than-average crash rates. The following five (5) intersections were more than 50% above the average crash rate:

- M-11 @ Burlingame Avenue
- M-11 @ Michael Avenue
- M-11 @ Clyde Park Avenue
- M-11 @ Division Avenue
- 44th Street @ Clyde Park Avenue

These intersections as well as the other intersections with higher-than-average crash rates should be examined more closely to determine if any intersections have correctable crash patterns.

TABLE 2-4a
INTERSECTION CRASH ANALYSIS (I-196BS, BURTON STREET, AND PORTER STREET)

Intersection	Top 3 Crash Types		Total Crashes	% Injury Crashes	# of People Injured	ADT Entering Intersection	Average Crash Rate (per MEV*)	Actual Crash Rate (per MEV*)
	Crash Type	%						
I-196BS (Chicago Dr) @ Byron Center Avenue	Fixed Object	23.1	6	17.0	1	16,900	1.70	0.32
	Rear-End Straight	23.1						
	Side-Swipe Same	23.1						
I-196BS (Chicago Dr) @ Burlingame Avenue	Head-On Left-Turn	35.0	20	25.0	5	24,050	1.43	0.76
	Angle	35.0						
	Rear-End	15.0						
I-196BS (Chicago Dr) @ Godfrey Avenue	Rear-End Straight	33.3	24	29.2	10	20,000	1.70	1.10
	Head-On Left-Turn	20.8						
	Angle	20.8						
I-196BS (Chicago Dr) @ Clyde Park Avenue	Rear-End Straight	29.2	24	16.7	4	33,500	1.21	0.65
	Angle	16.7						
	Bicycle	12.5						
Burton Street @ Burlingame Avenue	Rear-End Straight	61.1	18	11.1	3	29,400	1.43	0.56
	Angle	11.1						
	Side-Swipe Same	5.6						
Burton Street @ Cleveland Avenue	Angle	25.0	8	50.0	4	22,900	1.43	0.32
	(6 Types)	12.5						
Burton Street @ Godfrey Avenue	Rear-End Straight	50.0	16	18.8	3	27,300	1.43	0.54
	Side-Swipe Same	18.8						
	Angle	18.8						
Burton Street @ Clyde Park Avenue	Rear-End Straight	37.3	59	20.3	14	42,300	1.14	1.27
	Angle	30.5						
	Head-On Left-Turn	10.2						
Porter Street @ Burlingame Avenue	Head-On Left-Turn	40.0	15	20.0	5	17,300	1.70	0.79
	Angle	26.7						
	Rear-End Straight	13.3						
Porter Street @ Byron Center Avenue	Angle	50.0	8	25.0	2	11,250	1.70	0.65
	(4 Types)	12.5						

*MEV – million entering vehicles

TABLE 2-4b
INTERSECTION CRASH ANALYSIS (M-11, PRAIRIE PARKWAY, AND 32ND STREET)

Intersection	Top 3 Crash Types		Total Crashes	% Injury Crashes	# of People Injured	ADT Entering Intersection	Average Crash Rate (per MEV*)	Actual Crash Rate (per MEV*)
	Crash Type	%						
M-11 (28th Street) @ Byron Center Avenue	Rear-End Straight	33.3	60	31.7	22	36,650	1.21	1.50
	Angle	33.3						
	Head-On Left-Turn	11.7						
M-11 (28th Street) @ Burlingame Avenue	Rear-End Straight	51.2	84	14.3	12	40,250	1.14	1.91
	Angle	13.1						
	Side-Swipe Same	10.7						
M-11 (28th Street) @ Michael Avenue	Rear-End Straight	43.8	73	15.1	13	36,800	1.21	1.81
	Angle	20.5						
	Side-Swipe Same	17.8						
M-11 (28th Street) @ Clyde Park Avenue	Rear-End Straight	43.9	98	26.5	33	44,800	1.14	2.00
	Angle	22.4						
	Side-Swipe Same	11.2						
M-11 (28th Street) @ SB US-131	Rear-End Straight	57.8	45	22.2	11	42,200	1.14	0.97
	Side-Swipe Same	13.3						
	Angle	11.1						
M-11 (28th Street) @ NB US-131	Rear-End Straight	69.4	36	19.4	8	44,100	1.14	0.75
	Angle	8.3						
	Rear-End Right-Turn	8.3						
M-11 (28th Street) @ Buchanan Avenue	Rear-End Straight	45.8	72	22.2	26	47,350	1.14	1.39
	Side-Swipe Same	16.7						
	Angle	16.7						
M-11 (28th Street) @ Division Avenue	Rear-End Straight	48.6	111	21.6	27	56,500	1.18	1.79
	Angle	18.2						
	Side-Swipe Same	13.5						
Prairie Parkway @ Byron Center Avenue	Angle	38.1	21	23.8	6	23,850	1.43	0.80
	Rear-End Straight	19.0						
	Side-Swipe Same	14.3						
Prairie Parkway @ Burlingame Avenue	Angle	58.6	29	24.1	10	24,000	1.43	1.10
	Rear-End Straight	20.7						
	Head-On Left-Turn	17.2						
Prairie Parkway @ Michael Avenue	Angle	40.0	10	10.0	1	18,350	1.70	0.50
	Fixed Object	20.0						
	(4 Types)	10.0						
32nd Street @ Michael Avenue	Side-Swipe Same	33.3	6	16.7	1	15,350	1.70	0.36
	(4 Types	16.7						
32nd Street @ Clyde Park Avenue	Head-On Left-Turn	38.1	21	33.3	7	21,500	1.43	0.89
	Angle	28.6						
	Side-Swipe Same	19.0						
32nd Street @ Buchanan Avenue	Angle	60.0	5	40.0	2	28,950	1.43	0.16
	Rear-End Straight	20.0						
	Side-Swipe Opp	20.0						
32nd Street @ Division Avenue	Angle	41.9	43 (1 fatal)	41.9	25	40,100	1.14	0.98
	Rear-End Straight	30.2						
	Head-On Left-Turn	14.0						
32nd Street @ Jefferson Avenue	Angle	28.6	7	57.1	5	12,700	1.70	0.50
	Head-On Left-Turn	14.3						
	Side-Swipe Same	14.3						
32nd Street @ Madison Avenue	Head-On Left-Turn	33.3	6	33.3	2	15,050	1.70	0.36
	Angle	33.3						
	Rear-End Straight	33.3						
32nd Street @ Eastern Avenue	Rear-End Straight	35.7	14	35.7	7	24,450	1.43	0.52
	Head-On Left-Turn	21.4						
	Angle	21.4						

*MEV – million entering vehicles

TABLE 2-4c
INTERSECTION CRASH ANALYSIS (36TH STREET AND 54TH STREET)

Intersection	Top 3 Crash Types		Total Crashes	% Injury Crashes	# of People Injured	ADT Entering Intersection	Average Crash Rate (per MEV*)	Actual Crash Rate (per MEV*)
	Crash Type	%						
36th Street @ Byron Center Avenue	Head-On Left-Turn	27.6	29	31.0	13	26,900	1.43	0.98
	Rear-End Straight	27.6						
	Angle	20.7						
36th Street @ Burlingame Avenue	Rear-End Straight	38.1	42	33.3	15	35,000	1.21	1.10
	Angle	23.1						
	Head-On Left-Turn	11.9						
36th Street @ Michael Avenue	Angle	28.6	28	39.3	18	29,000	1.43	0.88
	Rear-End Straight	25.0						
	Head-On Left-Turn	21.4						
36th Street @ Clyde Park Avenue	Rear-End Straight	34.6	52	26.9	20	37,350	1.21	1.27
	Angle	28.8						
	Head-On Left-Turn	13.5						
36th Street @ SB US-131	Rear-End Straight	37.5	40	15.0	9	35,400	1.21	1.03
	Angle	27.5						
	Side-Swipe Same	17.5						
36 Street @ NB US-131	Rear-End Straight	32.1	28	17.9	8	33,700	1.21	0.76
	Head-On Left-Turn	25.0						
	Angle	14.3						
36th Street @ Clay Avenue	Rear-End Straight	50.0	12	33.3	4	30,700	1.21	0.36
	Bicycle	16.7						
	Angle	16.7						
36th Street @ Buchanan Avenue	Rear-End Straight	24.0	25	44.0	15	35,900	1.21	0.64
	Head-On Left-Turn	24.0						
	Side-Swipe Same	20.0						
36th Street @ Division Avenue	Rear-End Straight	51.1	47	25.5	17	48,050	1.14	0.89
	Angle	23.4						
	Head-On Left-Turn	17.0						
36th Street @ Jefferson Avenue	Angle	46.1	13	46.2	10	23,400	1.43	0.51
	Head-On Left-Turn	30.8						
	Side-Swipe Same	7.7						
36th Street @ Madison Avenue	Angle Straight	40.0	20	20.0	5	27,700	1.43	0.66
	Rear-End Straight	25.0						
	Rear-End Right-Turn	10.0						
36th Street @ Eastern Avenue	Rear-End Straight	34.8	23 (1 fatal)	21.7	5	34,500	1.21	0.61
	Head-On Left-Turn	21.7						
	Angle	17.4						
54th Street @ Gezon Parkway / Clyde Park Avenue	Rear-End Straight	52.5	59	23.7	15	44,100	1.14	1.22
	Side-Swipe Same	16.9						
	Angle	11.9						
54th Street @ SB US-131	Rear-End Straight	60.1	46	13.0	7	47,700	1.14	0.88
	Angle	15.2						
	Side-Swipe Same	8.7						
54th Street @ NB US-131	Rear-End Straight	58.6	29	20.7	8	47,800	1.14	0.55
	Side-Swipe Same	13.8						
	Angle	10.3						
54th Street @ Clay Avenue	Rear-End Straight	85.7	28	17.9	6	47,900	1.14	0.53
	Other	7.1						
	Head-On Left-Turn	3.6						
54th Street @ Division Avenue	Angle	32.9	82	24.4	25	59,000	1.18	1.27
	Rear-End Straight	26.8						
	Side-Swipe Same	14.6						

*MEV – million entering vehicles

TABLE 2-4d
INTERSECTION CRASH ANALYSIS (44TH STREET, 52ND STREET, 56TH STREET, AND GEZON PARKWAY)

Intersection	Top 3 Crash Types		Total Crashes	% Injury Crashes	# of People Injured	ADT Entering Intersection	Average Crash Rate (per MEV*)	Actual Crash Rate (per MEV*)
	Crash Type	%						
44th Street @ Byron Center Ave	Rear-End Straight	45.6	90	28.9	32	50,800	1.18	1.62
	Head-On Left-Turn	17.8						
	Angle	15.6						
44th Street @ Burlingame Avenue	Rear-End Straight	56.7	60	30.0	22	42,900	1.14	1.28
	Angle	10.0						
	Head-On Left-Turn	6.7						
44th Street @ Clyde Park Avenue	Rear-End Straight	44.2	86	18.6	18	44,800	1.14	1.75
	Angle	19.8						
	Side-Swipe Same	16.3						
44th Street @ SB US-131	Rear-End Straight	43.1	51	19.6	13	42,600	1.14	1.09
	Angle	21.6						
	Side-Swipe Same	13.7						
44th Street @ NB US-131	Rear-End Straight	45.0	40	15.0	9	36,100	1.21	1.01
	Angle	30.0						
	Head-On Left-Turn	10.0						
44th Street @ Clay Ave	Rear-End Straight	40.0	45	13.3	11	35,000	1.21	1.17
	Side-Swipe Same	24.4						
	Angle	17.8						
44th Street @ Buchanan Avenue	Angle	38.9	18	33.3	6	34,400	1.21	0.48
	Rear-End Straight	27.8						
	Head-On Left-Turn	11.1						
44th Street @ Division Avenue	Rear-End Straight	48.8	84	29.8	29	49,700	1.14	1.54
	Side-Swipe Same	15.5						
	Angle	14.3						
44th Street @ Roger B Chaffee Blvd	Rear-End Straight	44.4	18	44.4	8	26,300	1.43	0.63
	Side-Swipe Same	16.7						
	Fixed Object	11.1						
52nd Street @ Wilson Avenue	Rear-End Straight	40.0	10	10.0	1	23,150	1.43	0.39
	Side-Swipe Same	30.0						
	Angle	10.0						
52nd Street @ Ivanrest Avenue	Angle	42.9	14	21.4	4	17,050	1.70	0.75
	Rear-End Straight	21.4						
	Head-On Left-Turn	14.3						
52nd Street @ Byron Center Avenue	Head-On Left-Turn	31.8	22	36.4	11	28,550	1.43	0.70
	Rear-End Straight	27.3						
	Angle	27.3						
52nd Street @ Burlingame Avenue	Angle	45.5	11	45.5	6	14,550	1.70	0.69
	Rear-End Straight	18.2						
	(4 Types)	9.1						
56th Street @ Wilson Avenue	Rear-End Straight	44.4	9	11.1	2	21,400	1.43	0.38
	Fixed Object	22.2						
	Head-On Left-Turn	11.1						
56th Street @ Gezon Parkway	Rear-End Straight	25.0	44	13.6	6	34,950	1.21	1.15
	Angle	25.0						
	Head-On Left-Turn	9.1						
Gezon Parkway @ Burlingame Avenue	Rear-End Straight	38.5	13	23.1	3	22,600	1.43	0.53
	Head-On Left-Turn	23.1						
	Angle	15.4						

*MEV – million entering vehicles

TABLE 2-5
INTERSECTIONS WITH HIGHER-THAN-AVERAGE CRASH RATES (2007-2009)

Entering ADT Range	Intersection	ADT Entering Intersection	Average Crash Rate (1)	Actual Crash Rate*
30,000– 40,000 ADT	M-11 @ Michael Avenue	36,800	1.21 *	1.81
	M-11 @ Byron Center Avenue	36,650		1.50
	36th Street @ Clyde Park Avenue	37,350		1.27
40,000– 50,000 ADT	M-11 @ Clyde Park Avenue	44,800	1.14 *	2.00
	M-11 @ Burlingame Avenue	40,250		1.91
	44th Street@ Clyde Park Avenue	44,800		1.75
	44th Street @ Division Avenue	49,700		1.54
	M-11 @ Buchanan Avenue	47,350		1.39
	54th Street @ Gezon Parkway/ Clyde Park Avenue	44,100		1.32
	44th Street @ Burlingame Avenue	42,900		1.28
	Burton Street @ Clyde Park Avenue	42,300		1.27
Over 50,000 ADT	M-11 @ Division Avenue	56,500	1.18 *	1.79
	44th Street @ Byron Center Avenue	50,800		1.62
	54th Street @ Division Avenue	59,000		1.27

(1) Source: Southeast Michigan Council of Governments (SEMCOG), Traffic Safety Manual, 2nd Edition.
* crashes per Million Entering Vehicles (MEV)

2.9 Existing Speed Limits, Truck Routes, Transit Routes, and Non-Motorized Network

The City of Wyoming is modifying the speed limits on its major thoroughfares to comply with Public Act 85 of 2006 and is reviewing the adequacy of its system of truck routes, transit routes, and non-motorized facilities.

Speed Limits

Figure 2-9 shows the speed limit of each of the City's thoroughfares, as modified to comply with Public Act 85 (Michigan Compiled Law, Chapter 257 (Motor Vehicles), Section 627, modified in 2006). Public Act 85 describes new criteria for how speed limits can be established. The prima facie speed limit is based on the number of access points (driveways and intersections), but can otherwise be set higher or lower if an engineering study determines it is appropriate to do so. Most drivers will drive at a speed that enables them to safely respond to potential roadside hazards, so engineering studies typically use the 85th-percentile speed (the speed such that 85% of motorists drive at that speed or lower) to determine what a reasonable speed limit should be. There are various exceptions that allow for fixed lower speed limits (such as in platted residential areas or in the vicinity of schools).

The City of Wyoming posts the speed limit on each city thoroughfare based on engineering studies that determine the 85th-percentile speed.

Truck Routes

Figure 2-10 shows the City's truck route system.

Transit Routes

Figure 2-11 shows the City's current transit route system, which is a fixed-route transit service.

The City of Wyoming is a partner in the Interurban Transit Partnership (ITP) through which the city receives transit bus service called *The Rapid*. In early 2007, the Rapid completed a preliminary study that involved a review of numerous transportation corridors in the Grand Rapids area for application of major public transportation investment. Division Avenue from 60th Street in Wyoming/Kentwood border northerly into downtown Grand Rapids surfaced as the preferred route for application of Bus Rapid Transit (BRT) to connect a highly-transit-dependent population with major employment centers in downtown Grand Rapids. BRT is a system of buses traveling on a corridor in such as way as to emulate the speed, comfort, and convenience of a rail transit system.

Division Avenue BRT would allow "buses only" in the outside lane of Division Avenue during certain peak hours (AM and PM). Passenger cars and trucks would be able to use the outside lane only to turn right at key intersections. Studies are currently ongoing in order to determine what impact the use of "bus only" lanes will have on the capacity of Division Avenue.

Each bus and a handful of signalized intersections along Division Avenue would be outfit with "transit signal priority" technology which would allow the extension of the green signal phase in order to ensure that the bus makes it through the cross-street intersection. The extra green time would be taken from the side street green time. The intersections at Burton Street, 28th Street (M-11), 36th Street, 44th Street, and 54th Street would likely be excluded from using transit signal priority due to the heavy volumes of traffic on these east-west thoroughfares which lack any excess green time during peak hours.

The Division Avenue BRT project is included in the Rapid's Regional Long Range Plan. The Rapid has applied for federal funding from the Federal Transit Administration (FTA), since the Division Avenue BRT meets the requirements of the FTA's Very Small Starts Program. The total project cost (minus the cost of BRT vehicles) is $36.3 million. An Environmental Assessment for Division Avenue BRT is currently being completed, which will be closely followed by preliminary design.

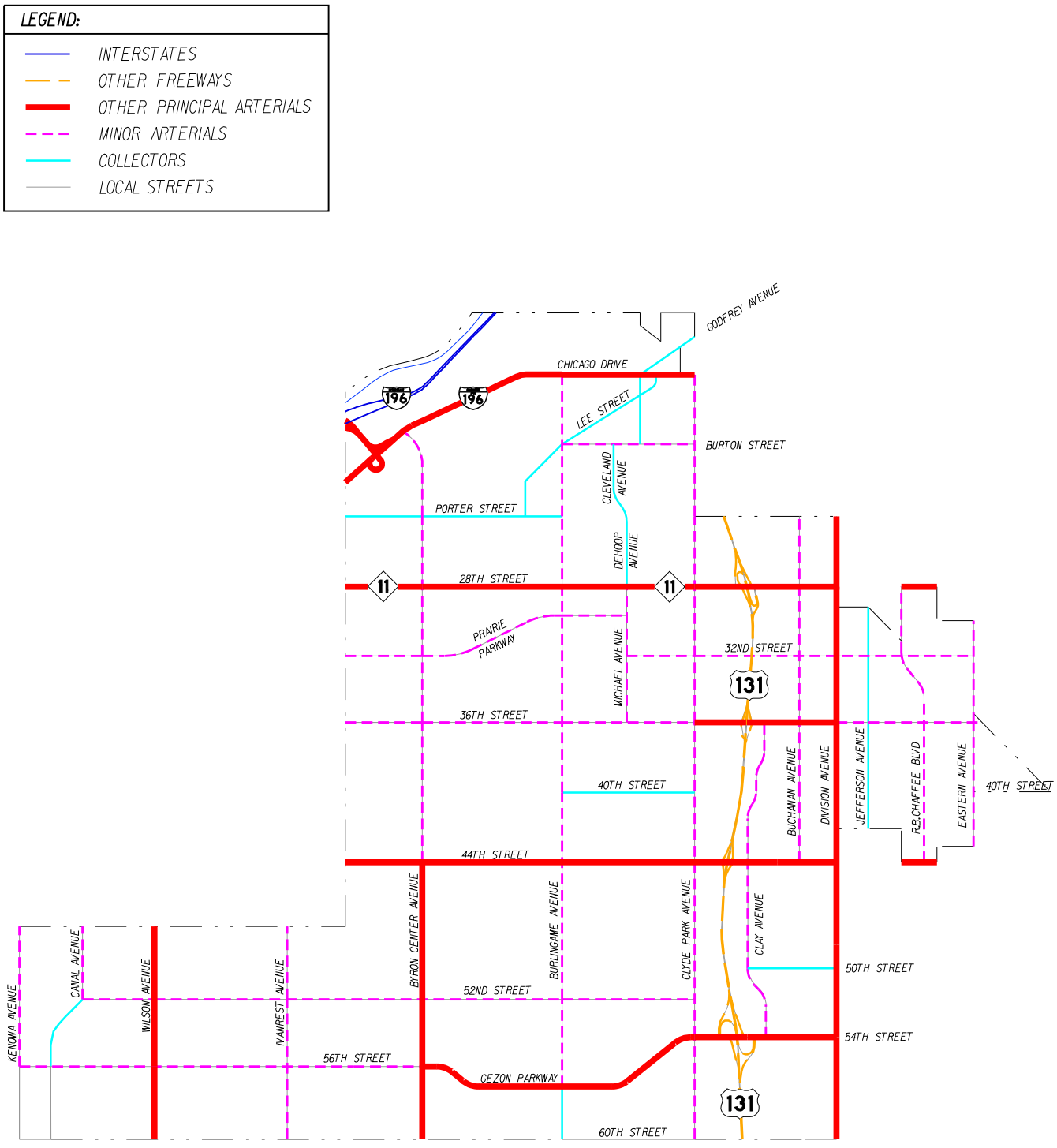
Non-Motorized Network

Like many cities, the City of Wyoming has been built to accommodate mobility patterns that are best supported by the automobile. Additional non-motorized connections within and through the City are desirable. Based on feedback from City personnel, there are a substantial number of non-motorized users that are primarily recreational in nature. Non-motorized users that do not have other available mobility alternatives are more prevalent in the dense, urban portion of Wyoming, and less common in the suburban and rural areas of the City. While there is typically a sociological and economic relationship that influences the number of non-motorized users who have no other mobility options, more households may choose to use non-motorized facilities if and when future improvements are made to the non-motorized network.

The City has not completed a formal process of detailing the long-term non-motorized needs; however, the City has capitalized on several opportunities to provide recreational facilities, including the Kent Trails, the Interurban Trail, and Buck Creek Trail.

Figure 2-12 shows the existing non-motorized facilities within and nearby the City. Most of the City's residential streets and major thoroughfares are lined with sidewalks.

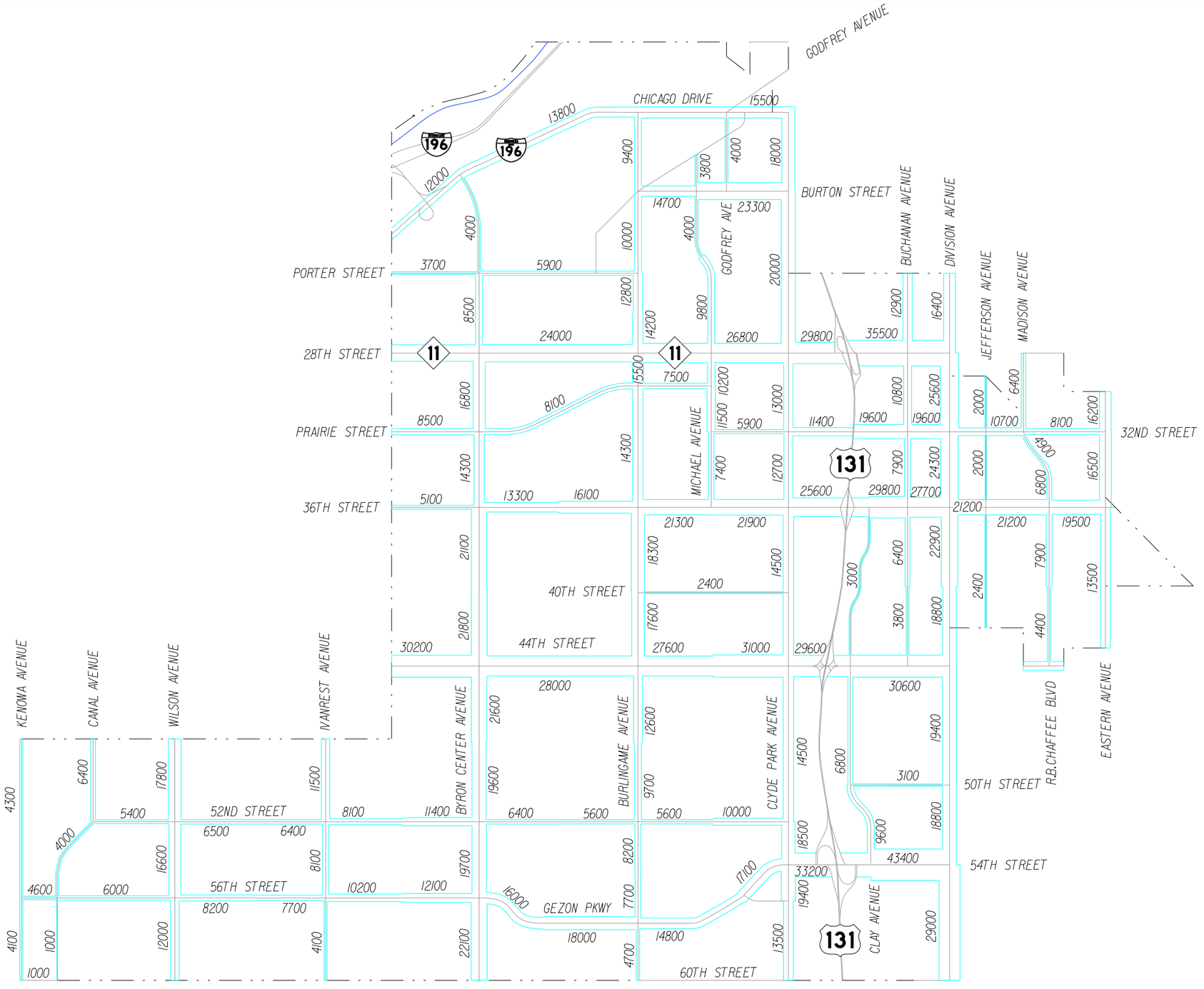
The State of Michigan became the fourteenth state to enact "complete streets" legislation when Public Acts 134 and 135 of 2010 were signed into law in August. The legislation requires the needs of pedestrians, bicyclists, people with disabilities, and transit users to be considered in all roadway projects. The legislation also acknowledges that road planning needs vary depending on the setting (rural, urban, suburban) and that cost factors must also be considered.



CITY OF WYOMING 2035 THOROUGHFARE PLAN

EXISTING FUNCTIONAL CLASSIFICATION

FIGURE 2-1



NOTES

1) 2008 ADT DATA USED IN PLACE OF 2009 ADT DATA ON 44TH STREET DUE TO MAJOR CONSTRUCTION AT THE US-131/44TH STREET INTERCHANGE
2) 2008 ADT DATA USED WHERE 2009 ADT DATA NOT AVAILABLE

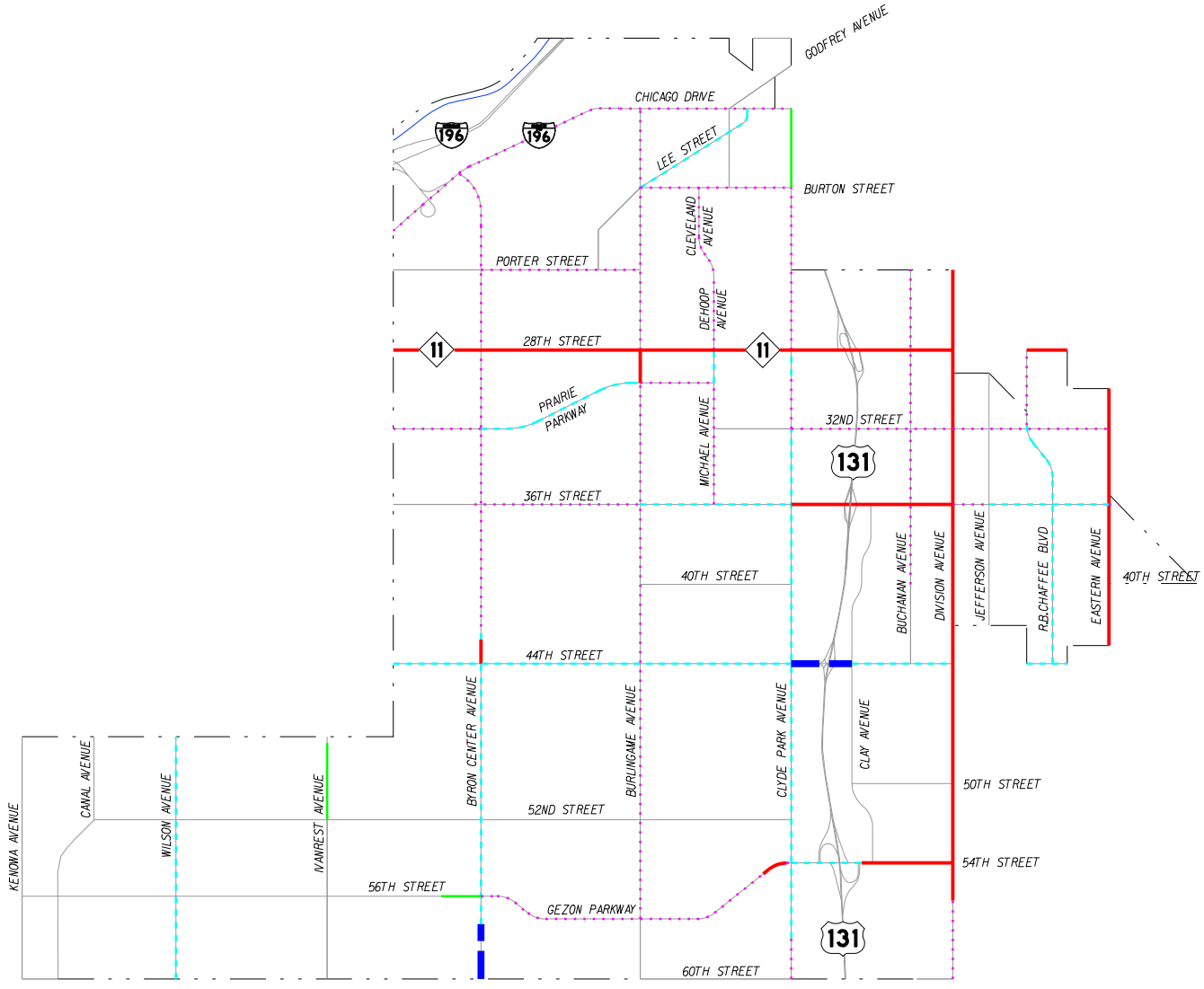
DATA SOURCES:
CITY OF WYOMING, MDOT, URS CORPORATION

CITY OF WYOMING 2035 THOROUGHFARE PLAN

URS

EXISTING (2009) AVERAGE DAILY TRAFFIC

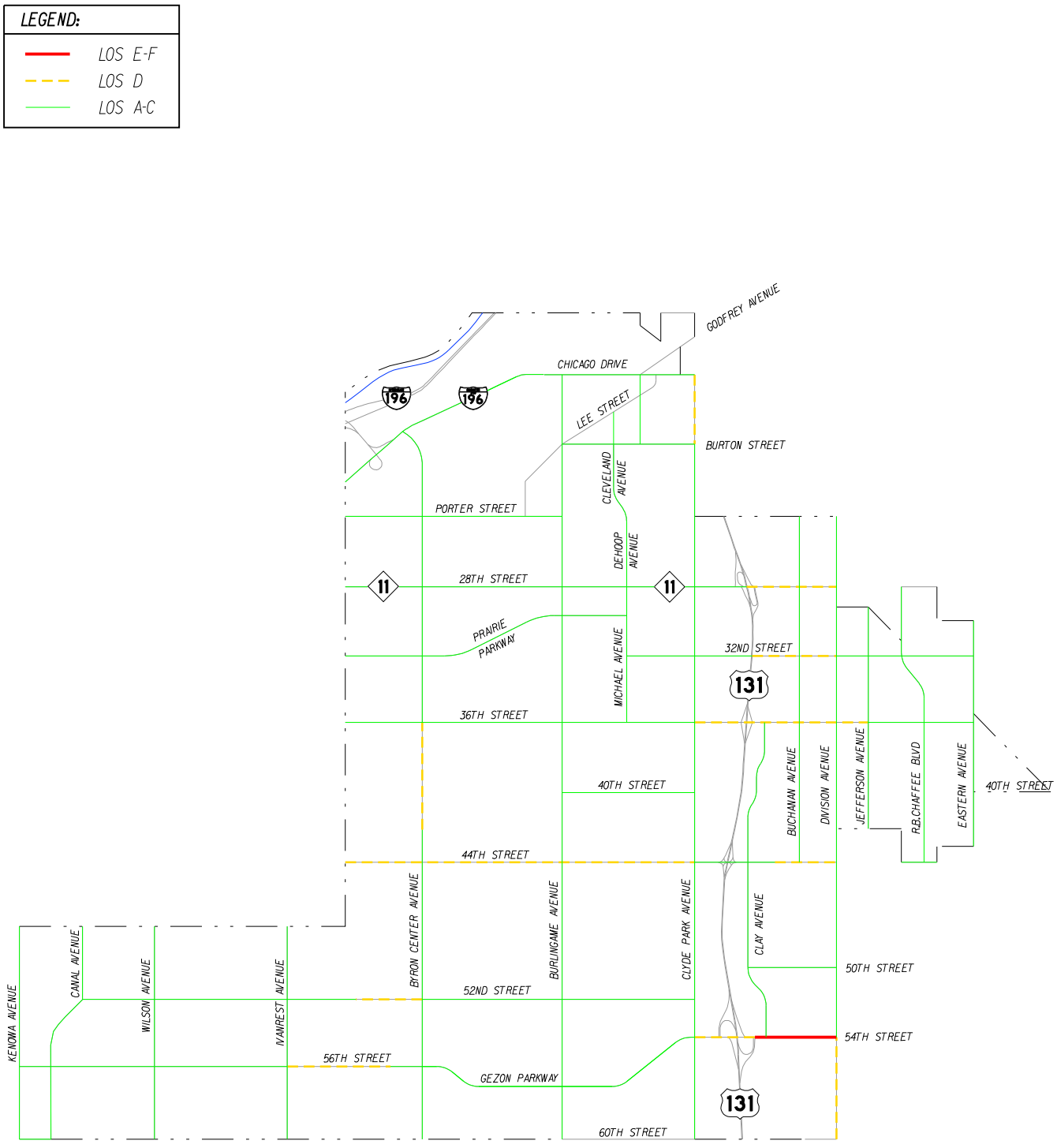
FIGURE 2-2



CITY OF WYOMING 2035 THOROUGHFARE PLAN

EXISTING NUMBER OF LANES

FIGURE 2-3

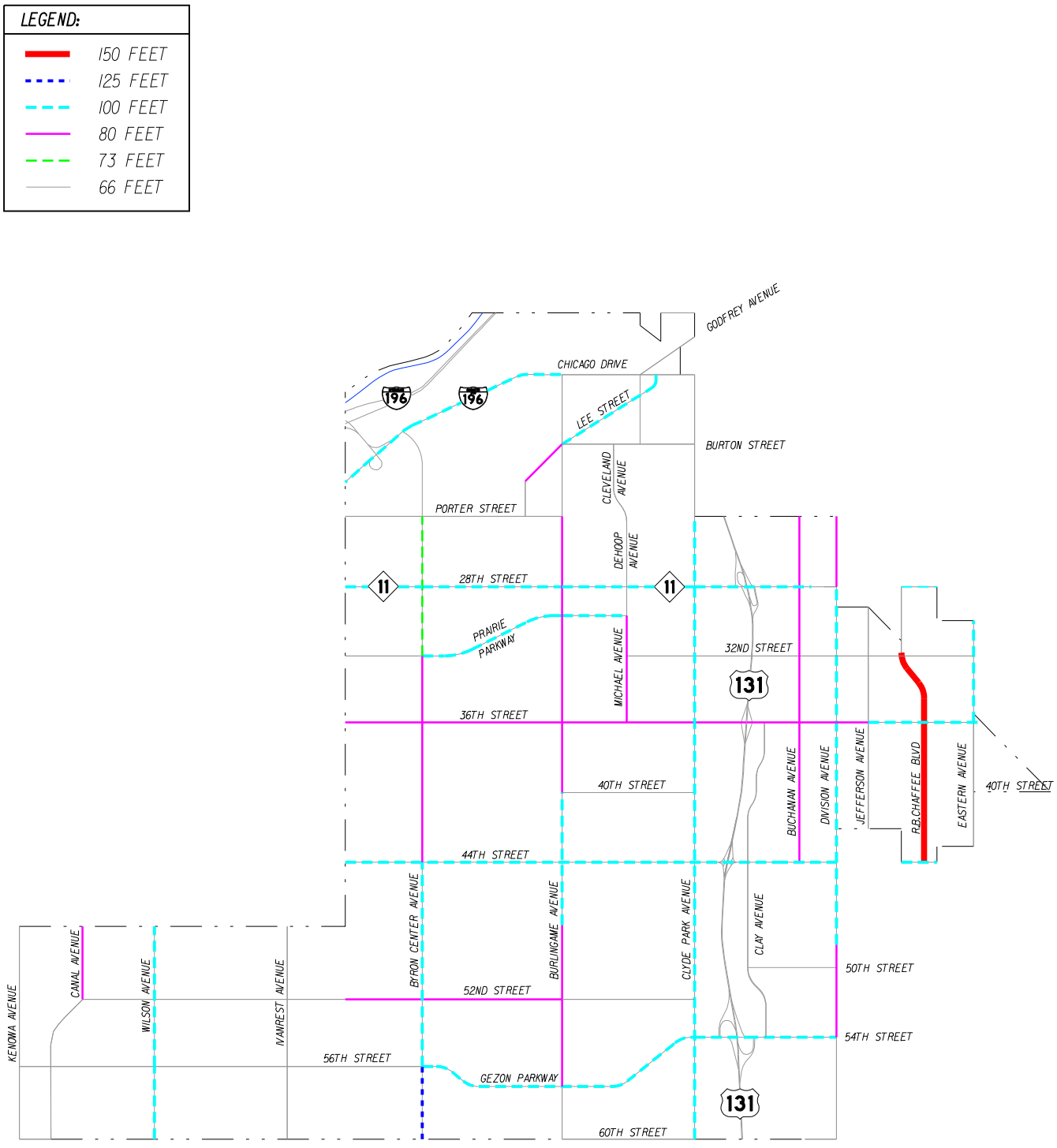


CITY OF WYOMING 2035 THOROUGHFARE PLAN

URS

EXISTING (2009) PEAK-HOUR LEVEL OF SERVICE

FIGURE 2-4



CITY OF WYOMING 2035 THOROUGHFARE PLAN

WYOMING MICHIGAN CITY OF VISION AND PROGRESS

URS

EXISTING RIGHT OF WAY

FIGURE 2-5

LEGEND:

- SIGNALIZED INTERSECTION
- SIGNALIZED 4-WAY STOP

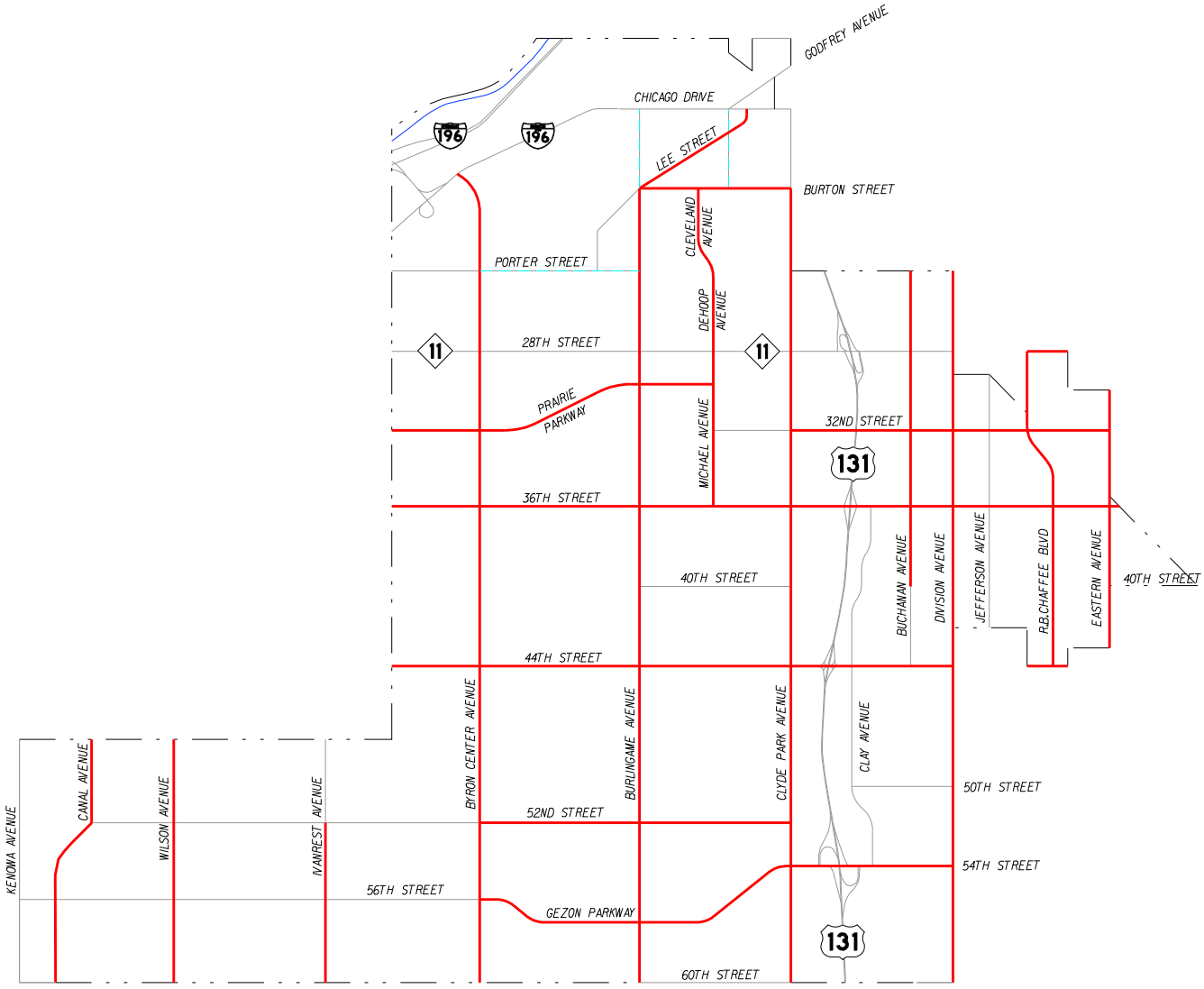
CITY OF WYOMING 2035 THOROUGHFARE PLAN

EXISTING TRAFFIC SIGNALS

FIGURE 2-6

LEGEND:

- NO PARKING AT ANY TIME
- NO PARKING (6-9AM,3-6PM,M-F)
- PARKING RESTRICTIONS ARE NOT POSTED

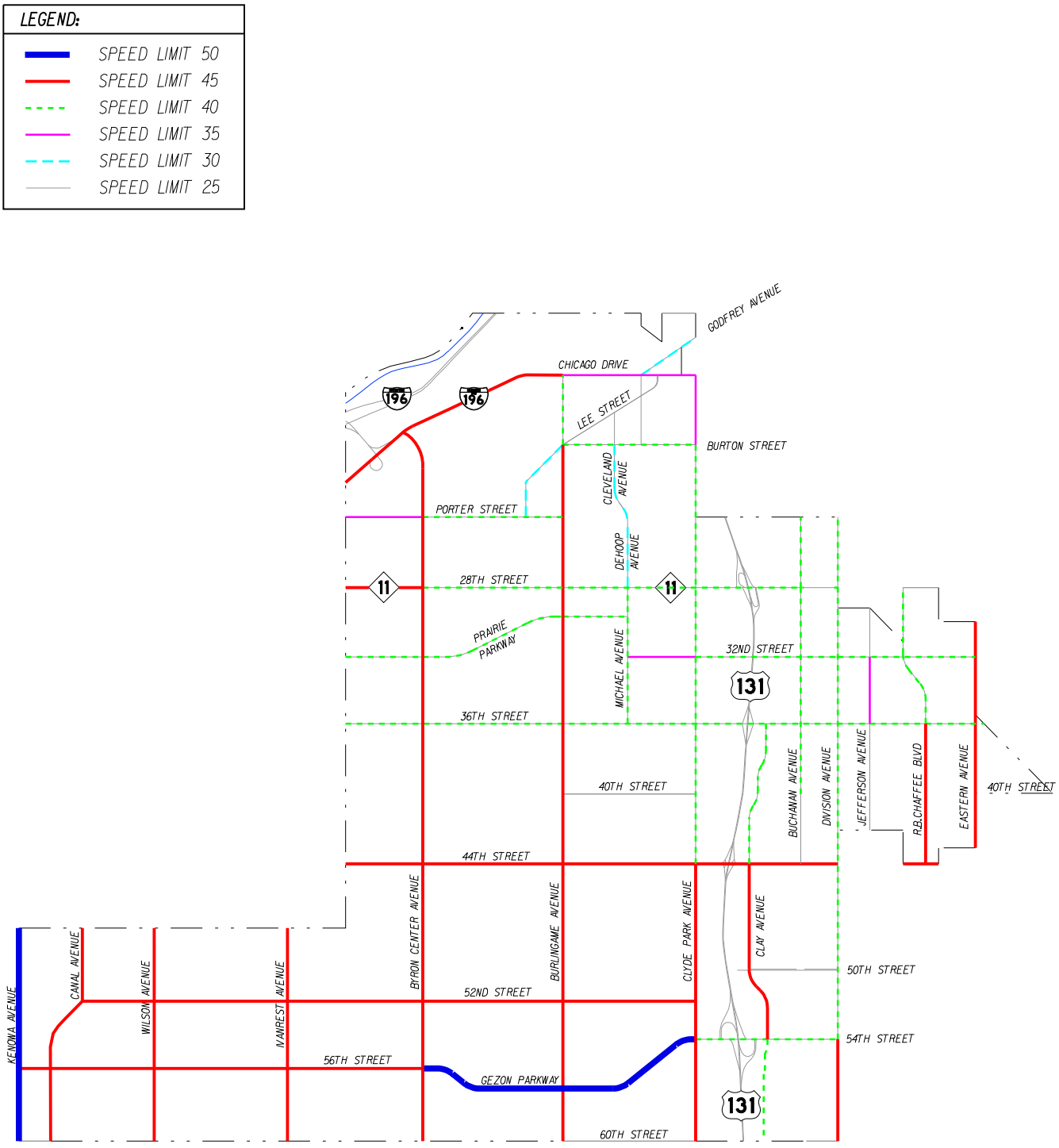


CITY OF WYOMING 2035 THOROUGHFARE PLAN

EXISTING PARKING RESTRICTIONS

FIGURE 2-7

LEGEND:
● SIGNALIZED INTERSECTION
■ SIGNALIZED 4-WAY STOP
○ HIGHER-THAN-AVERAGE CRASH RATE (SEE TABLE 2.5)

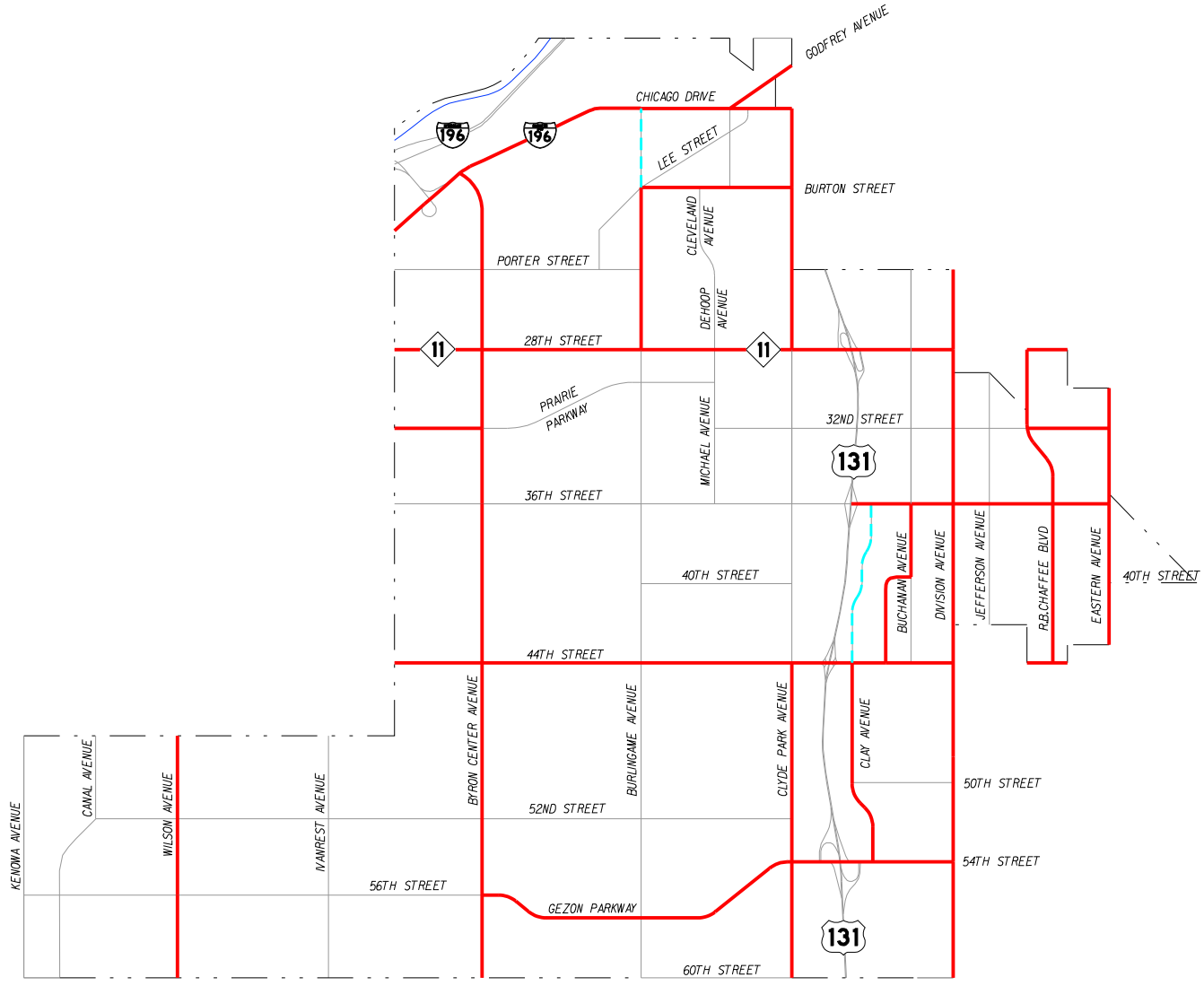


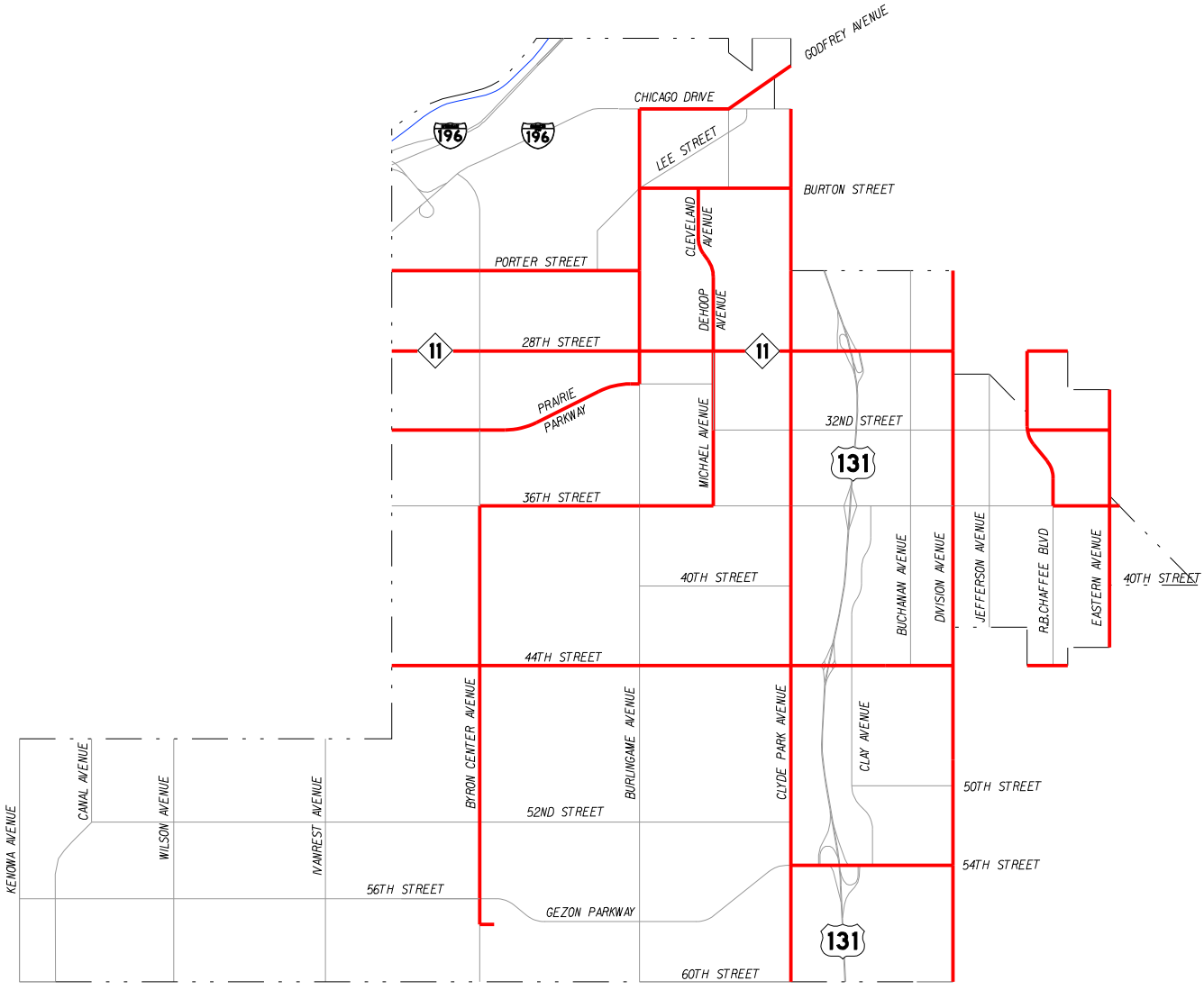
NOTE:
I-196 AND US-131 SPEED LIMIT IS 70 MPH.

CITY OF WYOMING 2035 THOROUGHFARE PLAN

EXISTING SPEED LIMITS

FIGURE 2-9


LEGEND:
TRUCK ROUTE
TRUCK ROUTE (6AM - 7PM)
GODFREY AVENUE
CHICAGO DRIVE
196
196
LEE STREET
BURTON STREET
CLEVELAND AVENUE
DEHOOP AVENUE
PORTER STREET
11
28TH STREET
11
PRAIRIE PARKWAY
MICHAEL AVENUE
32ND STREET
131
36TH STREET
40TH STREET
BUCHANAN AVENUE
DIVISION AVENUE
JEFFERSON AVENUE
R.B.CHAFFEE BLVD
EASTERN AVENUE
40TH STREET
44TH STREET
BYRON CENTER AVENUE
BURLINGAME AVENUE
CLYDE PARK AVENUE
CLAY AVENUE
50TH STREET
KENOWA AVENUE
CANAL AVENUE
WILSON AVENUE
IVANREST AVENUE
52ND STREET
54TH STREET
56TH STREET
GEZON PARKWAY
131
60TH STREET



LEGEND:

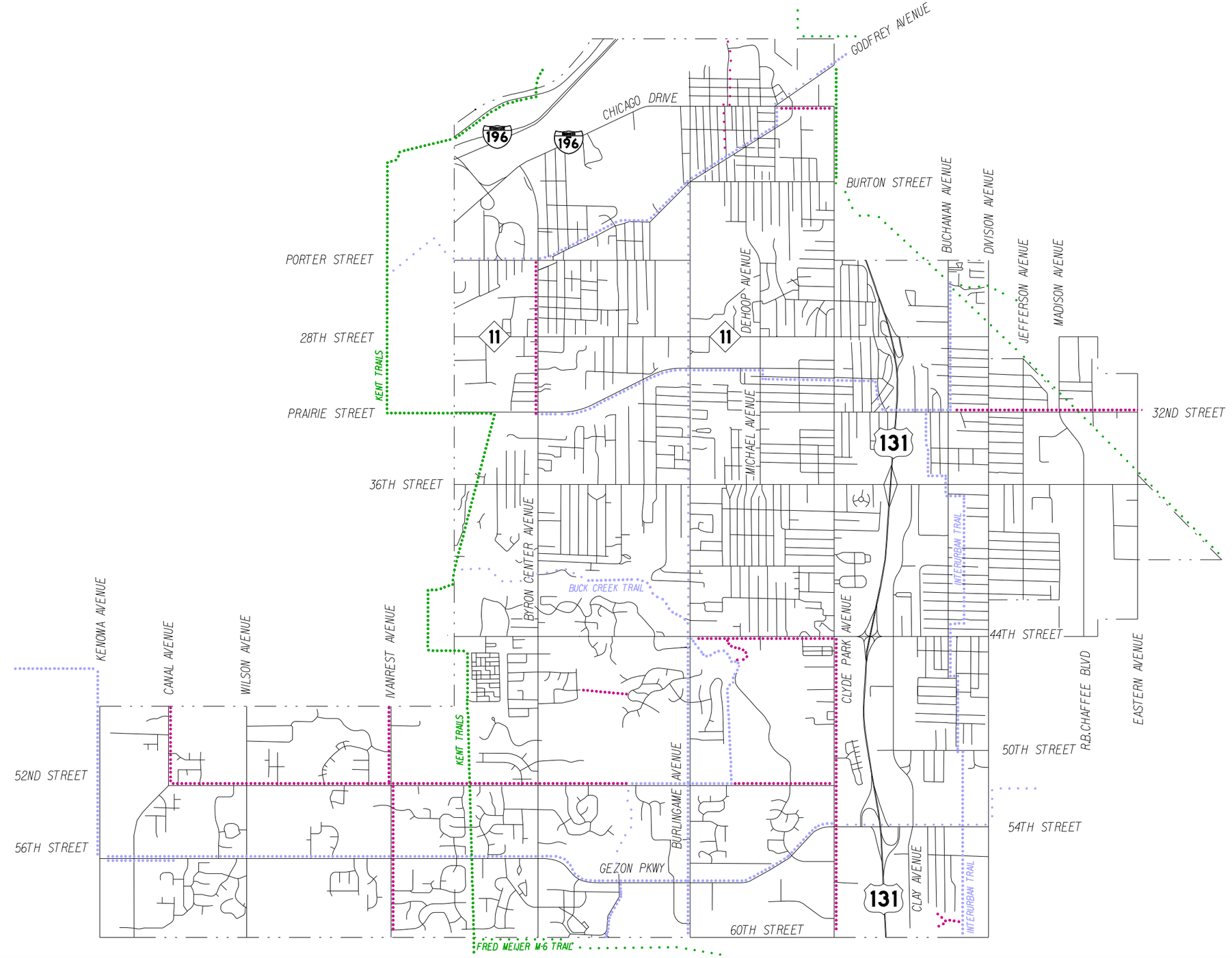
TRANSIT ROUTE (THE RAPID)

SOURCE: INTERURBAN TRANSIT PARTNERSHIP

CITY OF WYOMING 2035 THOROUGHFARE PLAN

EXISTING TRANSIT ROUTES

FIGURE 2-11



LEGEND

REGIONAL EXISTING
REGIONAL PROPOSED
LOCAL MAJOR EXISTING
LOCAL MAJOR PROPOSED
LOCAL MINOR EXISTING
LOCAL MAJOR PROPOSED

DATA SOURCES: CITY OF WYOMING, URS

CITY OF WYOMING 2035 THOROUGHFARE PLAN

WYOMING MICHIGAN

URS

EXISTING NON-MOTORIZED FACILITIES

FIGURE 2-12

M:\PROJECTS\ 12942550\CADD\TRAFFIC\EXISTING PEDESTRIAN FACILITIES.DGN

SEPTEMBER 2010

3.0 FUTURE (2035) CONDITIONS

This section contains an analysis of design year (2035) traffic operations and Level-of-Service on City of Wyoming thoroughfares. The transportation planning model developed by the Grand Valley Metro Council (GVMC) for the Grand Rapids metropolitan area was used to project traffic volumes in the City of Wyoming for the year 2035. The GVMC planning model utilizes future land-use projections and socioeconomic data to estimate the number of trips generated on each link in the roadway network. The GVMC planning model projections are calibrated against a network containing actual 2009 traffic volumes.

3.1 Future Year (2035) Traffic Projections

The GVMC planning model network analysis of Base Case conditions assumes that the laneage of all city thoroughfares is the same as existing (2009) laneage. The model also assumes implementation of Bus Rapid Transit along the Division Avenue corridor as discussed on page 2-6. Future land use data for the City of Wyoming was supplied to GVMC by the City prior to calibration of the planning model by GVMC. The Average Daily Traffic (ADT) projections on City of Wyoming thoroughfares for the analysis of Base Case conditions are shown in Figure 3-1. Projections were developed by comparing base (2009) model and future (2035) model ADT volumes and applying the percent change in model ADT to actual (2009) traffic volumes.

Table 3-1 depicts a comparison of existing (2009) ADT values against projected (2035) ADT values for a variety of thoroughfares in the city. A review of Table 3-1 indicates that much of the growth in traffic volumes is anticipated in the southern and western parts of the city where residential, commercial, and industrial development is ongoing. Traffic volumes along thoroughfares such as Wilson Avenue, Ivanrest Avenue, Byron Center Avenue, Gezon Parkway, and 56th Street are projected to experience the greatest levels of traffic growth. Thoroughfares in the already-urbanized sections of the city are anticipated to experience much lower growth in traffic volumes, with the exception of Division Avenue. Traffic volumes on Division Avenue are anticipated to increase due to the presence of BRT and the associated transit-oriented development which is anticipated along the Division Avenue corridor.

TABLE 3-1
TRAFFIC VOLUME COMPARISON ON VARIOUS THOROUGHFARES (2009 TO 2035)

Thoroughfare	Location	Actual ADT (2009)	Projected ADT (2035)*	% Change
Wilson Avenue	Just south of 52nd Street	16,600	22,200	34%
56th Street	Just west of Byron Center Avenue	12,100	16,100	33%
Ivanrest Avenue	Just north of 52nd Street	11,500	14,100	23%
Gezon Parkway	Just east of Byron Center Avenue	16,000	19,200	20%
36th Street	Just east of US-131	25,600	30,600	20%
Division Avenue	Just south of 36th Street	22,900	27,100	18%
Byron Center Avenue	Just south of 52nd Street	19,700	22,800	16%
54th Street	Just east of Clay Avenue	43,400	50,000	15%
Eastern Avenue	Just south of 36th Street	13,500	15,500	15%
M-11	Just west of Byron Center Avenue	24,000	27,200	13%
44th Street	Just east of US-131	29,600	33,400	13%
Clyde Park Avenue	Just south of 44th Street	14,500	16,200	12%
Byron Center Avenue	Just north of 36th Street	14,300	15,400	8%
52nd Street	Just west of Clyde Park Avenue	10,000	10,700	7%
Burlingame Avenue	Just north of M-11	14,200	14,400	1%

*Source: Grand Valley Metropolitan Council traffic demand model.

3.2 Future Year (2035) Volume-to-Capacity Ratio

The ADT projections shown in Figure 3-1 were used to estimate future year (2035) peak-hour "volume-to-capacity" ratios for each thoroughfare in the City of Wyoming. The volume-to-capacity (v/c) ratio is a measure that can be used to determine whether a thoroughfare is able to service the traffic demand. Ratios of v/c that are greater than 1.0 are indicative of roadways that experience traffic demand that is greater than the road's capacity. Such roads are in need of capacity improvements (construction of additional through lanes, intersection improvements, etc.). A v/c ratio in the range of 0.8 to 1.0 indicates a roadway that is approaching the need for additional through-lane capacity. Ratios less that 0.8 describe roadways with sufficient capacity. The projected (2035) v/c ratios for the various thoroughfares in the city are displayed in Figure 3-2.

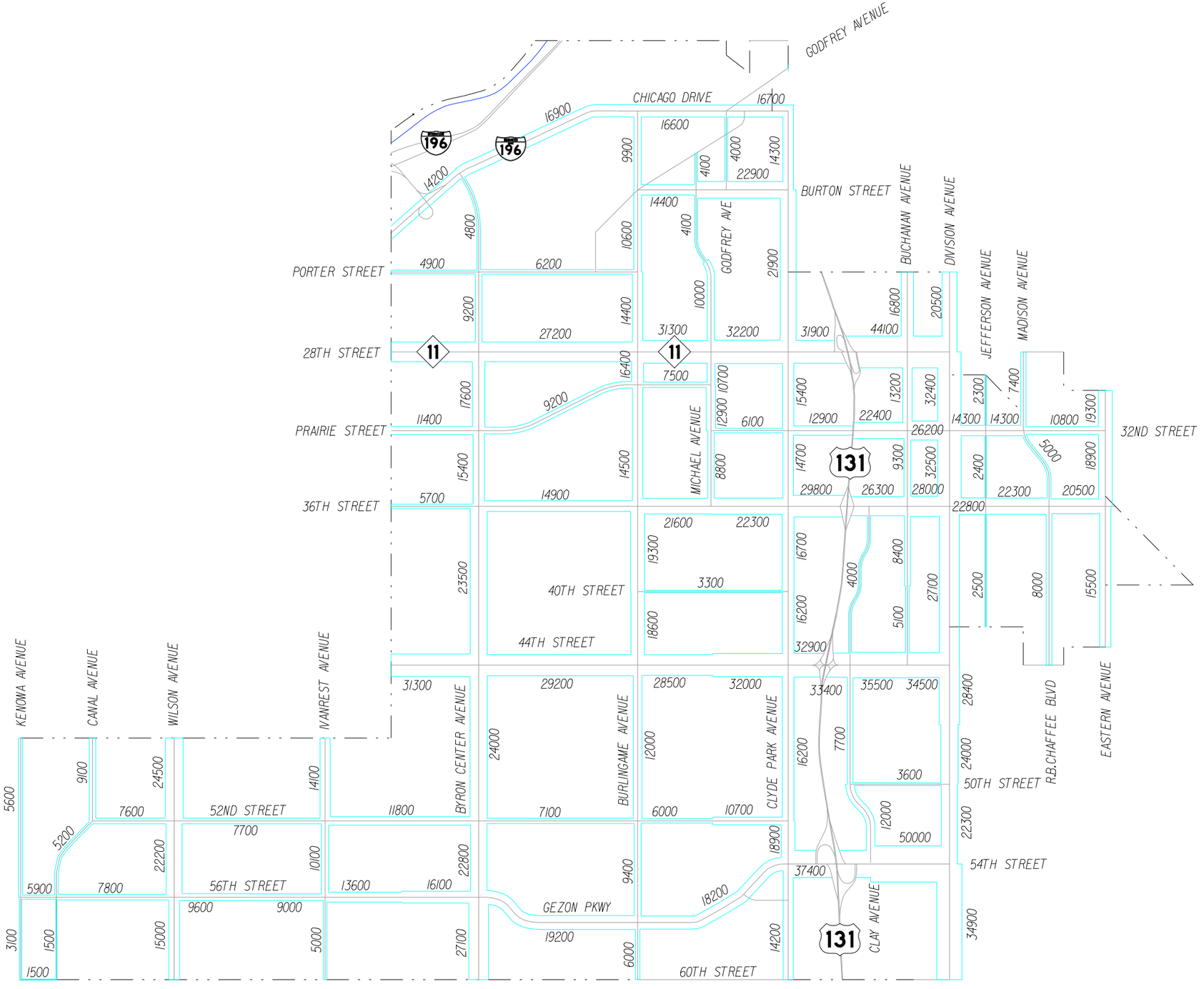
Roadway segments projected to operate with v/c ratios greater than 0.9 are also listed in Table 3-2. Segments with a v/c ratio exceeding 1.0 are shaded and bolded in Table 3-2. The roadway segments with projected v/c ratios greater than 1.0 are in the greatest need of capacity improvement.

TABLE 3-2
ROADWAY SEGMENTS WITH PROJECTED (2035) v/c RATIOS GREATER THAN 0.9

Thoroughfare	Segment	Roadway Type*	ADT (2035)	v/c ratio
EAST – WEST THOROUGHFARES				
M-11 (28th Street)	Michael Avenue to Clyde Park Avenue	5L-U	26,800	0.93
	Clyde Park Avenue to US-131		29,800	0.92
	US-131 to Buchanan Avenue		35,500	1.27
	Buchanan Avenue to Division Avenue		35,700	1.27
32nd Street	Buchanan Avenue to Division Avenue	4L-U	26,200	0.99
44th Street	Burlingame Avenue to Clyde Park	4L-D	32,000	0.92
	Clay Avenue to Buchanan Avenue		35,500	1.02
	Buchanan Avenue to Division Avenue		34,500	0.99
52nd Street	Ivanrest Avenue to Byron Center Avenue	2L-U	11,800	0.98
54th Street	Clyde Park Avenue to US-131	4L-D	37,400	1.07
	US-131 to Clay Avenue	5L-U	37,400	1.07
	Clay Avenue to Division Avenue		50,000	1.44
56th Street	Ivanrest Avenue to Byron Center Avenue	2L-U / 3L-U	16,100	1.33
NORTH – SOUTH THOROUGHFARES				
Ivanrest Avenue	52nd Street to North City Limit	3L-U	14,100	1.16
Clay Avenue	54th Street to 50th Street	2L-U	12,000	0.99
Division Avenue	60th Street to 54th Street	5L-U / 4L-U	34,900	1.32
	36th Street to 32nd Street	5L-U	32,500	0.93
	32nd Street to 36th Street		32,400	0.93

*L = Lane, D = Divided, U = Undivided (5L-U = 5-Lane Undivided)

As shown in Table 3-2, various segments of M-11 (28th Street), 44th Street, 54th Street, 56th Street, Ivanrest Avenue, and Division Avenue are need of some form of capacity improvement in order to reduce the projected (2035) v/c ratio to something below 1.0.



NOTES

1) 2035 ADT PROJECTIONS WERE DEVELOPED BY COMPARING BASE (2009) AND FUTURE (2035) MODEL ADT VOLUMES AND APPLYING THE PERCENT CHANGE IN MODEL ADT TO ACTUAL (2009) TRAFFIC VOLUMES.

CITY OF WYOMING 2035 THOROUGHFARE PLAN

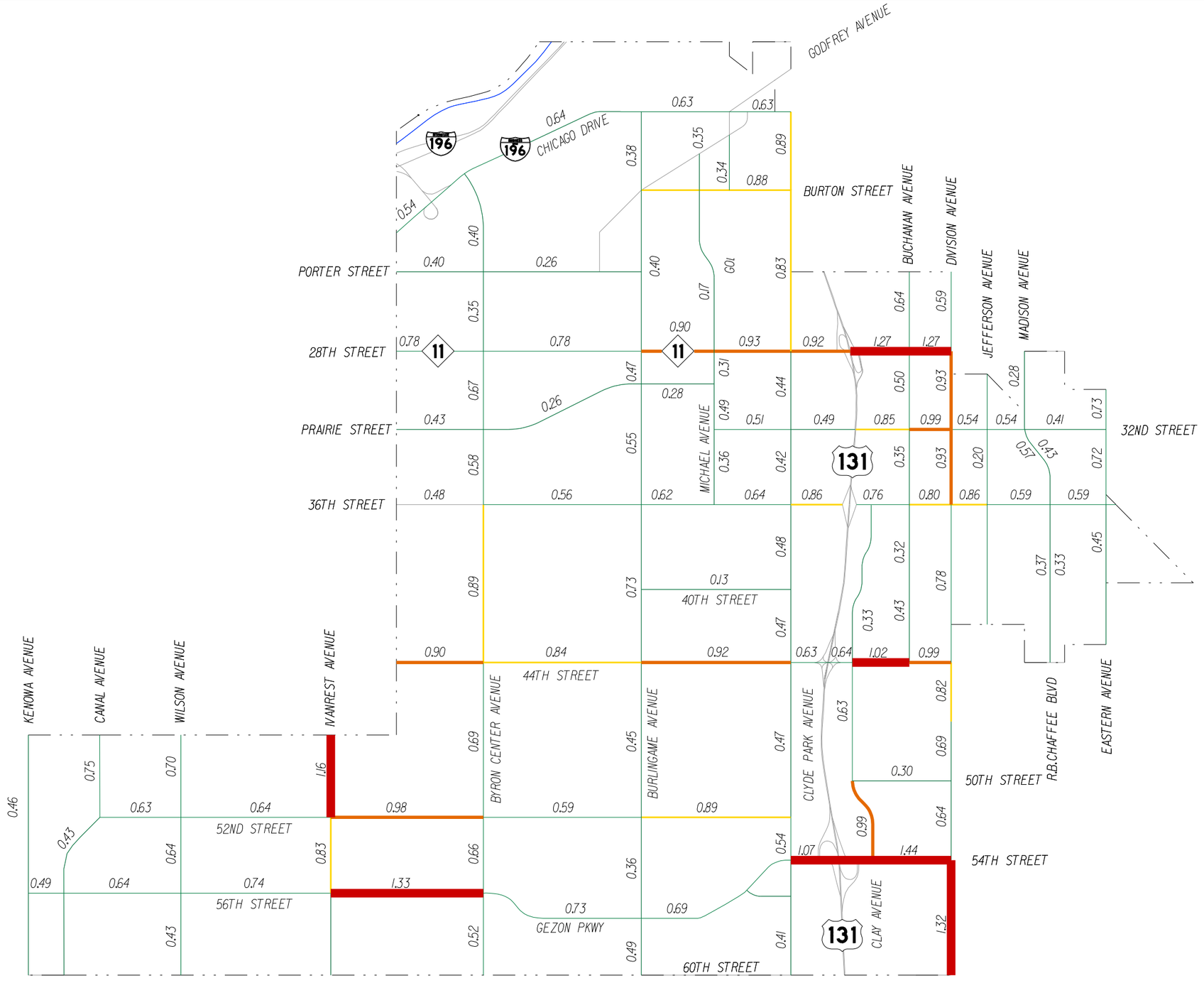
URS

DESIGN YEAR (2035) AVERAGE DAILY TRAFFIC

FIGURE 3-1

V/C RATIO LEGEND:

- >= 1.00
- 0.90 - 1.00
- 0.80 - 0.90
- < 0.80



NOTES

CITY OF WYOMING 2035 THOROUGHFARE PLAN

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DESIGN YEAR (2035)
V/C RATIO MAP

FIGURE
3-2

4.0 2035 Thoroughfare Plan

This section contains the recommended improvements for the City of Wyoming *2035 Thoroughfare Plan*. The items included in the *2035 Thoroughfare Plan* are a result of the existing conditions and future conditions analyses included in previous sections of this document. The Plan includes the expansion of some thoroughfares to increase capacity and improve Level-of-Service. The Plan also includes recommendations for development of a more comprehensive non-motorized plan. The recommended 2035 Thoroughfare Plan is depicted in Figure 4-1 and is discussed herein.

4.1 Recommended Expansion of City Thoroughfares

The City desires to plan for the expansion of those thoroughfares that would otherwise operate at poor Levels-of-Service during the year 2035. Those thoroughfares which require additional capacity are discussed herein.

56th Street

56th Street should be considered for widening as a 4-lane undivided roadway from Ivanrest Avenue to Byron Center Avenue, matching the existing 4-lane undivided roadway cross-section of Gezon Parkway east of Byron Center Avenue. Projected (2035) ADT along 56th Street is anticipated to exceed 16,000 vehicles per day.

Ivanrest Avenue

Ivanrest Avenue should be considered for widening as a four-lane undivided roadway north of 52nd Street in order to serve the projected (2035) ADT of 14,100 vehicles per day. Widening into a 3-lane undivided section between 56th Street and 52nd Street may also be needed if traffic grows at a greater rate than projected by the GVMC model, which is possible considering the recommended widening of 56th Street between Ivanrest Avenue and Byron Center Avenue.

54th Street

54th Street is the city's highest volume thoroughfare and is projected to have the greatest ADT under future year (2035) conditions. The congested intersection at 54th Street/Clay Avenue reduces the overall capacity of the 54th Street corridor, as it acts as a bottleneck during peak hours. The close proximity of the intersection to the northbound US-131 ramps exacerbates the situation.

54th Street should be considered for widening from some point east of Clay Avenue to the northbound US-131 ramps. Specifically, a third westbound through lane is recommended with additional turn-lane capacity at the 54th Street/Clay Avenue intersection. Interconnection of the traffic signals along 54th Street at Clay Avenue and the northbound US-131 ramp signal is recommended as part of this effort. Widening of 54th Street between Haughey Avenue and Division Avenue is not recommended, nor is widening of 54th Street recommended west of US-131.

44th Street

Traffic volumes have fallen or stabilized along the 44th Street corridor due to the opening of the M-6 freeway in 2004 and with completion of Gezon Parkway in the late 1990's. While the previous Thoroughfare Plan included widening of 44th Street as a 6-lane boulevard within the city limits, that improvement no longer appears necessary. The most heavily-traveled section of 44th Street occurs within the vicinity of the US-131 interchange. The city and MDOT recently completed a project to reconstruct and modernize the interchange at US-131, a project that included widening of 44th Street in order to carry three lanes in each direction from west of Clyde Park Avenue to east of Clay Avenue.

Roadway capacity along 44th Street is expected to increase in the future, as the City of Wyoming plans to close the median and remove the signal at the Buchanan Avenue intersection. Left-turns between 44th Street and Buchanan Avenue would be completed at median crossovers along 44th Street on each side of Buchanan Avenue. The improvements at the 44th Street/Buchanan Avenue intersection are expected to increase roadway capacity so that the projected (2035) v/c ratio is reduced below 1.0.

No additional capacity improvements along 44th Street are contemplated.

M-11 (28th Street)

Projected (2035) v/c ratios are greater than 1.0 between US-131 and Division Avenue. M-11 is under the jurisdiction of MDOT, as M-11 is a state trunkline highway. MDOT reconstructed M-11 as a 5-lane undivided pavement between Buchanan Avenue and Division Avenue in 2008. The M-11 bridge over US-131 was replaced by MDOT in 2006. The signal timings along the M-11 corridor were optimized in 2009, which has improved traffic signal progression and marginally increased capacity.

MDOT has no plans to widen the M-11 corridor, so only Transportation System Management (TSM) improvements are feasible. It is recommended that MDOT modify the left-turn signal phasing for the eastbound and westbound left-turn movements at Buchanan Avenue by providing permissive/protected phasing (instead of protected-only phasing). Such a phasing change would undoubtedly increase the capacity for the eastbound and westbound left-turn movements. The eastbound and westbound through movements could potentially be given additional green time to improve overall roadway capacity if the amount of protected green time given to the eastbound and westbound left-turn movements could be reduced.

The Downtown Development Authority is beginning to consider changes to the operation of 28th Street in downtown Wyoming (Clyde Park Avenue to Burlingame Avenue). One conceptual cross-section being considered is a unique five-lane section in which the outside lanes are separated from the middle three and provide access to some form of on-street parking. Theoretically, motorists would use the outside lane if they had destinations within the downtown zone, while motorists within the middle three lanes would be for motorists with no mid-block driveway destination. Impacts to capacity and Level of Service would need to be considered as the study moves forward. Approval from MDOT would also be required.

Division Avenue

Major capital improvements to Division Avenue are not recommended to be included in the Thoroughfare Plan, despite what the projected (2035) v/c ratios indicate. The proposed Bus Rapid Transit (BRT) system along Division Avenue and elsewhere will undoubtedly impact traffic operations along Division Avenue during peak-hour drive times. The long-term impact of BRT is difficult to project, given the few operating BRT corridors in the United States and the present state of the economy. While BRT is intended to spur economic growth, which would mean additional trips along Division Avenue, it remains to be seen what the demand for BRT along Division Avenue will be and how BRT will impact the passenger car mode.

The City of Wyoming will continue to work with the Interurban Transit Partnership (ITP) to ultimately launch and operate BRT along Division Avenue. Once the impacts of BRT are more fully recognized, the city will be able to develop a plan for any future capacity improvements along Division Avenue. Given that Division Avenue is primarily a five-lane undivided roadway with commercial land uses running up and down the corridor, it is unlikely that Division Avenue will ever be widened in the future. The City of Kentwood intends to widen the last remaining four-lane undivided segment of Division Avenue north of 60th Street in 2014.

If the proposed BRT system does not move forward, it is anticipated that Division Avenue will maintain sufficient capacity as a five-lane undivided roadway to serve future travel demands.

4.2 Non-Motorized Considerations

Non-motorized planning is particularly important along major corridors where the right-of-way is limited and in high-speed environments. A conscious and deliberate effort to either incorporate non-motorized users within a corridor or to provide an alternative parallel route is important to ultimately provide a practical, safe, comfortable, and functional non-motorized transportation network.

Providing adequate non-motorized facilities will reduce the need for non-motorized users to use traffic-oriented facilities which were not intended to support non-motorized users, particularly in high-speed environments. Pedestrian and bicycle safety varies based on a number of factors, including non-motorized user compliance with the rules of the road and situations when driver expectancy is violated. While the perception of user safety is a critical part of non-motorized facility planning and implementation, user comfort and convenience are equally important aspects of how and why the community may choose to use non-motorized facilities.

Non-Motorized Benefits

A well-conceived non-motorized transportation system may provide the community with the following benefits:

- Improved community sustainability by enhancing transportation options beyond the automobile, particularly for the population segment which is eligible to drive an automobile.
- A transportation network that provides improved connections to common destinations, such as employment, shopping, schools, and places of worship.
- Improved connections to local and regional recreational facilities, which promote healthy lifestyle opportunities.
- Improved walkability and neighborhood connectivity, which increases social interaction and strengthens sense of community.
- Reduced need for parking spaces and vehicle-oriented roadway improvements.
- Reduced air pollution, stormwater pollution, and carbon emissions.

Non-Motorized Planning

Due to the discretionary nature of many non-motorized trips, it is challenging to estimate the latent demand for non-motorized facilities. Adding non-motorized facilities will almost always increase the number of non-motorized users, particularly if the facilities meet specific needs.

A planning process is recommended to identify the corridors that would best serve the non-motorized needs of the community. Once these corridors are identified, then appropriate improvements can be considered with future roadway improvement projects. In general, a non-motorized planning process should include the following steps:

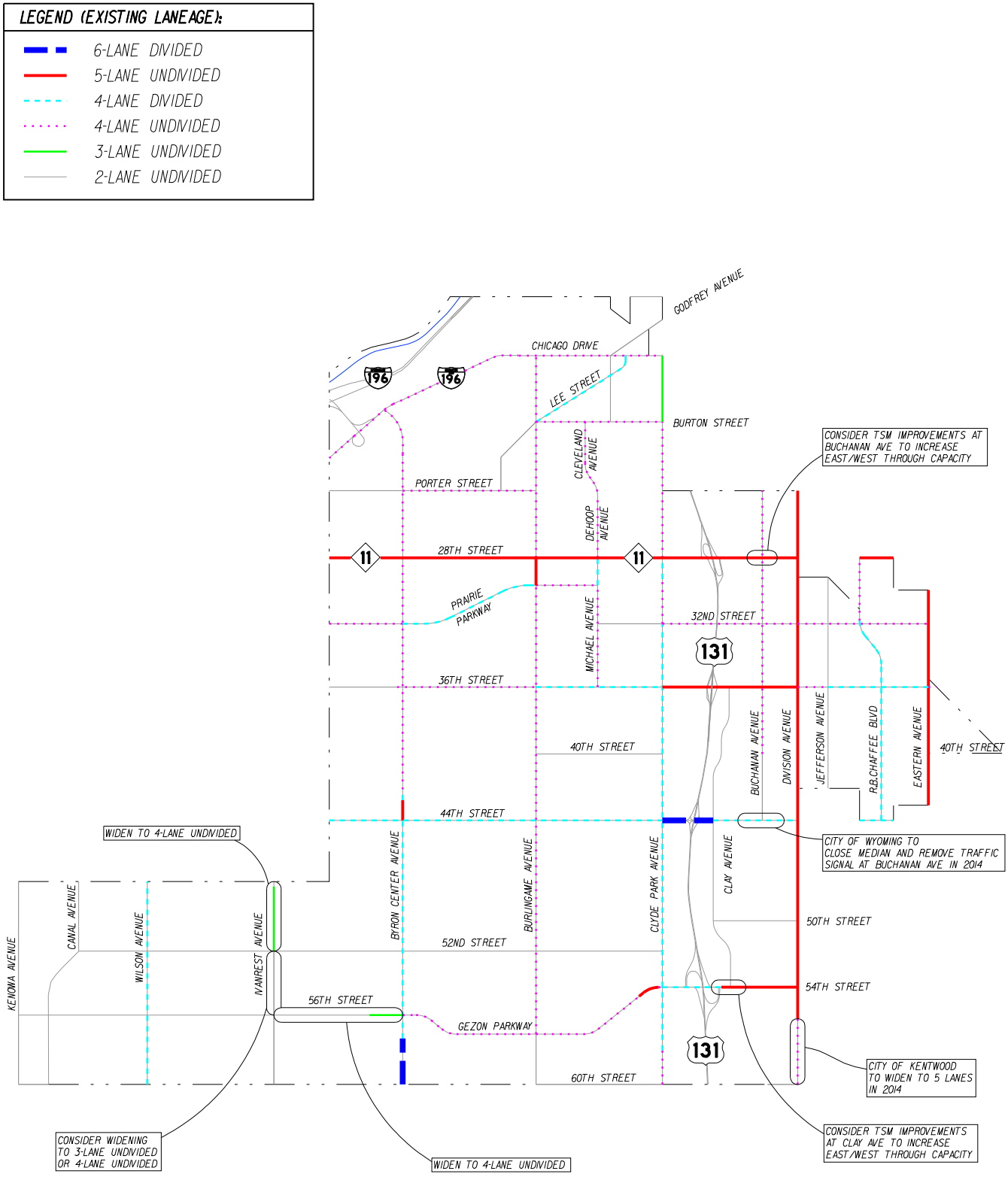
- Engage community stakeholders to determine the destinations and areas that should be particularly served by non-motorized facilities.
- Conduct a field survey to inventory the available right-of-way, existing street width, and evidence of non-motorized users.
- Gauge community preferences about non-motorized facility options, such as on-street bike lanes, shared lanes, and off-street paths.
- Identify corridors that best match the travel paths between destinations that are likely to be accessed by non-motorized users.
- Identify corridors that connect with existing and future recreational paths, such as the Kent Trails.
- Review other non-motorized plans developed by other peer communities and the standard non-motorized design practices.

- Identify standard applications for a range of non-motorized facilities that might apply to future projects, such as those projects identified in Section 4.1.

Areas for Consideration

Based on the existing network of non-motorized facilities, the following areas are likely to be the subject of future non-motorized planning:

- Routes to schools.
- Routes to fixed transit routes such as Bus Rapid Transit along Division Avenue.
- North-south connectivity north of 44th Street, which is currently limited to the far east and west edges of the City.
- East-west connectivity across US-131, which is primarily limited to the interchange bridges (there is only one US-131 crossing that is not an interchange—at 32nd Street).
- Connectivity between Prairie Parkway and Chicago Drive.
- Connectivity between 44th Street and Prairie Parkway.



CITY OF WYOMING 2035 THOROUGHFARE PLAN

WYOMING MICHIGAN CITY OF VISION AND PROGRESS

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POTENTIAL CAPITAL IMPROVEMENT PROJECTS

FIGURE 4-1