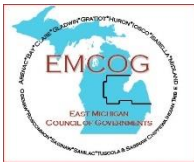


# Safety and Economic Development Challenges on US-127 between Ithaca and St. Johns, Michigan



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# 1 INTRODUCTION

## 1.1 Purpose of Study

The purpose of this study is to document economic and safety challenges associated with US-127 in Central Michigan. The study focuses primarily on impacts in Clare, Gratiot, and Isabella counties, but also presents findings from Clinton County and other surrounding counties. Specifically, this study documents issues stemming from the segment of US-127 connecting the cities of Ithaca and St. Johns. This stretch of highway has received considerable attention in the region because unlike the remainder of US-127, it is not a limited-access highway and has lower speed limits and therefore represents a “gap” in the highway network.

This study assembles insights derived from interviewing 17 stakeholders throughout Central Michigan that included members of government and business in all three study area counties. The appendix contains a full list of interviewees. Additional findings draw on published transportation and economic data.

## 1.2 Study Region Profile

### Regional Demographics

Clare, Gratiot, and Isabella counties are in the center of Michigan’s lower peninsula, and together the three counties have a population of 142,842 (Table 1). Clare and Gratiot counties have both lost residents since 2010 while Isabella has grown. Rates of population decline in Clare and Gratiot counties have exceeded the rate of Michigan’s loss. Each county has a labor force that is between 39-50 percent of its total population. Median household income ranges from less than \$38,000 in Clare County to nearly \$43,000 in Isabella County. This compares to a state median of approximately \$50,800. Isabella County is the most well-educated among the study region counties, with a high school attainment rate of approximately 91 percent and college attainment rate of 27 percent—around the same as Michigan’s. The presence of Central Michigan University in Mt. Pleasant, Michigan, could explain Isabella’s higher college attainment rate.

**Table 1. Demographic Overview of Study Region Counties and Michigan**

Demographic Indicator	Clare County	Gratiot County	Isabella County	State of Michigan
Population (2016)	30,358	41,202	71,282	9,928,300
Population Growth, 2010-2016	-1.8%	-3.0%	1.4%	-0.5%
Labor Force (2016)	11,927	18,254	35,432	4,897,398
Median Household Income (2016)	\$37,646	\$42,642	\$42,924	\$50,803
Percent of Adults with High School Diploma or More (2015)	84.2%	88.9%	91.1%	89.9%
Percent of Adults with Bachelor’s Degree or More (2015)	11.6%	14.1%	27.3%	27.4%

Source: American Community Survey Annual Estimate and 5-Year Estimate. Note: For the educational attainment statistics, adults represent those 25 years of age and older.

## Industry Employment

Clare, Gratiot, and Isabella counties together have about 69,000 full- and part-time jobs (Table 2). Approximately 4 percent of these jobs are in agriculture and 9.3 percent are in manufacturing. Across the state, about 1 percent of jobs are in agriculture and 11 percent are in manufacturing. Manufacturing contributes a greater share of gross regional product (GRP) to the study region than it does employment—18 percent (agriculture accounts for 2 percent of GRP).<sup>1</sup>

In the three study region counties, slightly over 22 percent of jobs are in government, 10 percent are in retail trade, and 7.7 percent are in food and accommodations. Statewide, about 11 percent of jobs are in government, 10 percent are in retail, and 7 percent are in food and accommodations. The health care and social assistance sector also provides a significant share of regional jobs (its exact share cannot be determined because of data suppression at small sample sizes).

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<sup>1</sup> Moody’s Analytics, 2016.

**Table 2. Employment by Industry Sector in Study Region Counties and Michigan, 2016**

Description	Clare	Gratiot	Isabella	Michigan
Total employment (number of jobs)	11,068	18,237	39,362	5,611,718
Farm employment	481	1,247	1,004	69,534
Nonfarm employment	10,587	16,990	38,358	5,542,184
Forestry, fishing, and related activities	(D)	(D)	90	16,871
Mining, quarrying, and oil and gas extraction	(D)	(D)	918	20,580
Utilities	(D)	(D)	(D)	20,929
Construction	847	660	2,507	255,153
Manufacturing	1,012	2,489	2,914	626,937
Wholesale trade	314	828	(D)	200,900
Retail trade	1,346	1,718	3,779	574,305
Transportation and warehousing	(D)	(D)	1,011	165,992
Information	54	80	318	73,462
Finance and insurance	284	529	1,465	239,566
Real estate and rental and leasing	389	579	1,802	250,828
Professional, scientific, and technical services	497	(D)	1,018	416,284
Management of companies and enterprises	(L)	(D)	491	64,547
Administrative and support and waste management and remediation services	431	944	869	371,683
Educational services	70	(D)	427	114,837
Health care and social assistance	878	(D)	3,266	678,424
Arts, entertainment, and recreation	186	238	532	103,685
Accommodation and food services	863	700	3,737	400,329
Other services (except public administration)	924	1,035	1,701	336,956
Government (includes military)	1,752	2,529	10,902	609,916

Source: U.S. Bureau of Economic Analysis

## Industry Clusters

The study region has several prominent industry clusters. Industry clusters are agglomerations of business activity that grow the economy by selling goods and services to consumers outside the region. We identify industry clusters by calculating a location quotient (LQ). If a single industry accounts for the same share of employment in the study region as it does nationally, the industry's local LQ is 1.0. If an industry has an LQ greater than 1.0, it means that the region specializes in that industry.

Clare, Gratiot, and Isabella counties all specialize in various industries in the manufacturing sector (Table 3). Clare County has clusters in manufacturing, wood products, mining, higher education, and transportation and logistics. Gratiot County has several of the same clusters plus agribusiness and food processing, chemical manufacturing, and life sciences. Isabella has clusters in manufacturing, mining, higher education, life sciences, and arts, entertainment, recreation, and tourism.

**Table 3. Industry Clusters in Study Region Counties, 2012**

Clare County	LQ	Gratiot County	LQ	Isabella County	LQ
Primary Metal Mfg.	5.0	Transportation Equipment Mfg.	3.5	Machinery Mfg.	7.2
Machinery Mfg.	4.9	Chemical Mfg.	3.5	Arts, Entertainment, Recreation, and Tourism	4.0
Transportation Equipment Mfg.	2.5	Higher Education	3.0	Mining	3.4
Fabricated Metal Product Mfg.	2.1	Agribusiness and Food Processing	2.9	Higher Education	1.7
Forest and Wood Products	1.5	Machinery Mfg.	2.6	Life Sciences	1.1
Mining	1.4	Advanced Materials	2.4		
Higher Education	1.3	Life Sciences	1.6		
Transportation and Logistics	1.2	Forest and Wood Products	1.4		
Advanced Materials	1.2				

Source: U.S. Bureau of Labor Statistics, Quarterly Census of Employment & Wages (QCEW) and Purdue Center for Regional Development (cluster definitions).

Lists of top employers in each of the study region counties bear out the findings of our LQ analysis.

Top employers in Clare County include the following<sup>2</sup>:

- Lear (automotive parts manufacturing)
- The Rogers Group (sports equipment manufacturing)
- Northern Logistics (trucking)
- Federal Broach (metalworking machinery)
- JD Metalworks, Inc. (steel fabrication)

Top employers in Isabella County include the following (according to Middle Michigan Development Corporation):

- Saginaw Chippewa Tribe (casino)
- Central Michigan University
- Delfield (food equipment manufacturing)
- Bandit (wood chipper manufacturing)
- Morbark (wood chipper manufacturing)

Top employers in Gratiot County include the following (according to Greater Gratiot Development):

- IAC Group (automotive parts manufacturing)
- Alma College (higher education)
- Masonic Pathways (senior care facility)
- Avalon and Tahoe Manufacturing (boat manufacturing)
- MidMichigan Medical Center-Gratiot (hospital)

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<sup>2</sup> Middle Michigan Development Corporation

## **1.3 Role of US-127**

### **Overview**

US-127 is a 215-mile highway and main north-south route through the center of Michigan's lower peninsula. The highway's southern terminus is in Ohio, just one mile from the Michigan border, and its northern terminus is the juncture with Interstate 75 in Crawford County, Michigan. The majority of US-127 is a four-lane, limited-access highway. The exception is a 16-mile stretch between Ithaca and St. Johns that has at-grade intersections with east-west local roads approximately every mile, and several commercial and residential driveways. An active freight rail line also intersects this stretch of highway. The Ithaca-St. Johns stretch is four lanes and has several "Michigan lefts," or U-turns.

US-127 is critical for travel in Michigan because it is the only highway that travels directly through the center of Michigan's lower peninsula. US-127 connects Lansing, the state capital, to Central Michigan's larger cities including Jackson (pop. 33,000) and Mt. Pleasant (pop. 26,000). The highway also connects Central Michigan to the Roscommon State Forest Area, Houghton Lake, and other forest and recreation areas in the northern part of the peninsula.

### **Traffic Counts**

Parts of US-127 accommodate over 20,000 vehicles per day (known as AADT), including stretches between Jackson and Lansing (a portion immediately south of Lansing sees 38,000 vehicles daily).<sup>3</sup> Most of the Ithaca-St. Johns stretch carries between 15,000-20,000 vehicles per day, although a 7-mile portion between St. Johns and the US-127 intersection with W Maple Rapids Rd carries over 21,000 vehicles daily. The remainder of US-127 has less than 20,000 AADT and sometimes as little as 6,000 AADT.

### **Importance for Goods Movement**

US-127 plays a critical role in supporting Central Michigan's manufacturing cluster and its agricultural sector. Several interviewees attest to the accessibility the highway provides to supplier and customer markets. MLT Transport in Mt. Pleasant is one example of this. While MLT is a trucking company, their business involves transporting raw milk and other agricultural commodities from farms in the region to food processing facilities throughout the Midwest and elsewhere in the U.S. The company also transports recycled materials like scrap metal, and kitchen and restaurant equipment manufactured by the Delfield Company in Mt. Pleasant and Unified Brands in Weidman, Michigan. Almost all trips made by MLT trucks use US-127. This is because dairy farm customers are located along the US-127 corridor, typically a few miles east or west of the highway. Most trucks head south after pickups, meaning that US-127 between Ithaca and St. Johns is heavily used. Trucks travel south to Lansing where they connect to I-69 and I-96.

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<sup>3</sup> MDOT Traffic Volumes. [http://www.michigan.gov/mdot/0,4616,7-151-11151\\_11033-22141--00.html](http://www.michigan.gov/mdot/0,4616,7-151-11151_11033-22141--00.html)

Local economic development officials note that connections to interstate highways via US-127 are “extremely important” to manufacturers because high shipping costs limit their competitive advantage. US-127 is the only major north-south route and the region needs to offer it as a low-cost transportation option because anything that creates delays costs companies money. (Rail is available in the region, but service is limited and key industries in the area are not as dependent on rail as they are on highways.)

Another company that will soon rely on US-127 is Zeeland Farm Services (ZFS). ZFS’s newest location will be in Ithaca, where the company is building a facility for grain receiving and storage, soybean processing, and feed ingredients transloading. The company is currently constructing its grain elevator facility and will start accepting grain in fall 2018. The new facility will be on a 435-acre site with rail access, just across US-127 from downtown Ithaca. An on-site transloading facility will transfer products from train to truck. Being in Central Michigan and having highway and rail access were principal factors driving ZFS’s decision to locate its new facility in Ithaca. Being by a major roadway is “always a benefit,” according to a company representative. ZFS has 125 trucks based in Zeeland and will have 50-60 trucks based in Ithaca once the new facility opens. Once operational, ZFS anticipates 300 daily truck trips to/from the facility, and about 70 percent of truck trips will use US-127 to access the facility. Tanker trucks will constantly travel between Ithaca and Zeeland, and some trucks will use US-127 to travel between the two locations. The fastest route (according to Google Maps) involves driving south from Ithaca through the Ithaca-St. Johns stretch of US-127.

### **Importance to Commuters**

US-127 is also critical for commuters in Central Michigan, especially for Central Michigan University (CMU) and other large employers. Many of CMU’s several thousand students commute to Mount Pleasant to attend classes, with some traveling as far away as the Detroit metropolitan region (approx. 150 miles) because it can be less costly than living on campus. US-127 via I-96 is the primary way students from southeast Michigan travel to Mount Pleasant. The largest feeder counties for CMU students are in southeast Michigan. Even students who do live on or near campus often still rely on the corridor for easy travel home on weekends and during breaks. In addition, few faculty and staff live in Mount Pleasant, often because a partner works in the Lansing area or elsewhere. This means that many employees commute from points south along US-127. The university also regularly receives visitors, job candidates interviewing for positions, and contract workers, many of whom use US-127 to reach the campus.

Once it opens, Zeeland Farm Services will generate 80 passenger vehicle trips daily from employees commuting to and from the facility. MLT Transport trucking employees commute to Mt. Pleasant from the St. Johns area and northern Michigan. Many commute just once a week using US-127, when they pick up a truck and travel for several days before returning. Legend Manufacturing, a company that builds trailers, employs about 100 workers at its Alma facility, nearly all of whom use US-127 to commute to work. Avalon & Tahoe, a boat manufacturer located in Alma, has 320 employees, 10 percent of whom commute using US-127 or use it for business travel. The company also has many vendors located south of Ithaca that use US-127 to reach their facility.



# 2 SAFETY ISSUES

Safety issues are the dominant theme of the interview findings. Because the Ithaca-St. Johns stretch of US-127 is not limited-access, safety concerns center around: (1) highway crossings where side roads intersect; (2) the speed limit differential between segments; and (3) specific problem spots where crashes and near-crashes occur most frequently. Interviewees attribute many of the crashes and near-crashes along the Ithaca-St. Johns segment of US-127 to the highway's design features.

## 2.1 Highway Crossings

Nearly all interviewees cite the hazards of crossing and merging onto US-127 between Ithaca and St. Johns. The absence of acceleration lanes means that vehicles traveling at highway speeds must sometimes slow significantly to accommodate vehicles entering the highway at a slow acceleration rate. Because US-127 between Ithaca and St. Johns also lacks deceleration lanes, drivers exiting the highway along this stretch must slow down within an active lane of traffic to make a turn.

Drivers who are merging onto or crossing US-127 find it difficult to judge how far away oncoming cars are because of the high traffic speeds. This creates conditions that Doug Wright, Gratiot County Sheriff, describes as "so, so dangerous." This represents a functional conflict between high speed through traffic and low speed local traffic. According to interviewees, local drivers get impatient and therefore take risks trying to cross the highway. Heavy tourism traffic on weekends exacerbates this problem, and during spring and fall harvest periods farmers struggle to cross with large equipment and are forced to wait for extended periods of time.

Buses belonging to Ithaca Public Schools sometimes make longer trips specifically to avoid having to cross US-127. Similarly, large semi-trucks must adjust their routes based on where they can safely exit and cross US-127. For example, trucks coming from Grand Rapids may exit US-127 early and travel north to Ithaca using two-lane roads rather than risk delays and unsafe conditions traveling along this section of US-127.

## 2.2 Speed Limit Change

The speed limit on the Ithaca-St. Johns segment of US-127 was recently raised from 55 to 65 miles per hour (compared with 75 MPH on the limited-access portions). The Michigan Department of Transportation reports reviewing crash data before and after the speed limit change and finding no change in crash rates or severity. Raising the speed limit from 55 to 65 MPH has reduced complaints about the route from travelers using it to pass through the area, but has also made emergency management more difficult and dangerous according to regional first responders.

Gratiot County Sheriff Doug Wright states that the speed limit increase along the Ithaca-St. Johns section of US-127 has exacerbated existing safety issues. He observes that people typically drive up to 10 MPH above the posted speed limit, so an increase from 55 to 65 MPH means some people now drive 75 MPH on this stretch of the highway.

## **2.3 Problem Spots**

There are several specific spots along the Ithaca-St. Johns stretch of US-127 that multiple interviewees describe as being problematic. These spots could merit more targeted analysis to identify opportunities for improvement.

### **Bagley Road**

The intersection of Bagley Road and US-127 is a hotspot for crashes. The City of Ithaca Fire Department has received 30-40 calls there over the last five years, according to Dave Nelson, Ithaca Fire Chief. He recalls no fatalities but does know there have been “real serious” crashes at that intersection.

Multiple interviewees describe plans in the works for the Michigan Department of Transportation (MDOT) to close/modify this intersection. Currently, the road intersects with the highway at a sharp angle and has a configuration that requires cars traveling south along Bagley Road to cross the northbound lanes of US-127 and merge on the left southbound lane using a short acceleration lane. Additionally, cars exiting US-127 to travel north on Bagley Road immediately encounter an active train line. While the Bagley Road intersection is similar to other intersections along the Ithaca-St. Johns segment in that it faces the basic challenge of slow and fast traffic intersecting, its unique curved configuration makes it more dangerous.

MDOT confirmed plans to convert Bagley Road into a cul-de-sac by 2020, a project the region successfully secured with State Representative Tom Leonard’s help. The proposal is expected to help alleviate some of the challenges associated with the new Zeeland Farm Services (ZFS) operation opening approximately two miles north.

Until the Bagley Road intersection is closed, it will likely become busier, and even with the closure US-127 is still likely to experience heavier truck volumes in the future. ZFS will generate significant truck traffic and a long-term goal for the area is to develop other commercial/manufacturing activities as part of an agriculture cluster.

### **Buchanan Road**

Interviewees also mention a potential interchange or overpass at the intersection of Buchanan Road and US-127 as a way of addressing some of the challenges on the corridor. This would allow large trucks traveling north to Ithaca to safely exit and use State Road rather than continue along US-127 adding to congestion and increasing the potential for crashes.

ZFS is advocating for this interchange because it will take pressure off the existing interchange at Washington Road located just west of their new facility. Dave Nelson of the Ithaca Fire department has also expressed support for this, stating it could improve emergency response times. In general, Bill Mayhew at MDOT agrees that a few more separated crossings (overpasses/interchanges) along this segment of US-127 could be beneficial, but there are no specific plans currently in the works.

## Other Reported Problem Spots

The North Star Golf Course access point five miles south of Ithaca was also reported by interviewees for being dangerous when large volumes of people drive in and out. Additionally, MLT Transport suggests acceleration lanes at the intersections of US-127 and Maple Rapids Road and US-127 and Hyde Road, both about seven miles north of St. Johns. Nathan Beck, President of Legend Manufacturing, would like to see an interchange installed at Maple Rapids Road.

## 2.4 Safety Analysis

### Summary of Safety Data and Social Costs of Crashes

Table 4 presents a summary of documented persons involved in crashes by degree of injury on the Ithaca to St. Johns non-access-controlled segment of US-127, as generated by the *Michigan Traffic Crash Facts Data Query Tool*.<sup>4</sup> Over the past five years, the corridor has experienced two fatalities from crashes, 25 suspected serious injuries, 52 suspected minor injuries, and another 1,270 persons involved in crashes that resulted in either a possible injury or no injury. Overall, the approximately 16-mile corridor saw upward of 1,300 persons involved in crashes for the years 2012-2016.<sup>5</sup>

**Table 4. Persons Involved in Crashes by Degree of Injury, 2012-2016 - Ithaca to St. John**

Person Degree of Injury	2012	2013	2014	2015	2016	5-Year Total
Fatal injury (K)	0	0	0	0	2	2
Suspected serious injury (A)	8	3	1	2	11	25
Suspected minor injury (B)	8	6	19	5	14	52
Possible injury (C)	18	18	20	11	26	93
No injury (O)	203	223	283	210	258	1,177
Uncoded and errors	6	11	1	4	2	24
<b>TOTAL</b>	<b>243</b>	<b>261</b>	<b>324</b>	<b>232</b>	<b>313</b>	<b>1,373</b>

Source: Michigan Traffic Crash Facts Data Query Tool, Accessed October 2017.

Addressing safety as a primary goal of transportation improvements, U.S. Department of Transportation (USDOT) provides guidance on monetized values that can be used to calculate the benefit of reducing fatalities, injuries, and property damage from transportation incidents. These values represent the social cost of crashes and are based on estimates of the Value of a Statistical Life (VSL), defined by USDOT as “the additional cost that individuals would be willing to bear for improvements in safety (that is, reductions in risks) that, in the aggregate, reduce the expected

<sup>4</sup> Michigan Traffic Crash Facts. <https://www.michigantrafficcrashfacts.org>

<sup>5</sup> Note: This data was reviewed with Bill Mayhew of MDOT over the phone and he confirmed that reported magnitudes generally align with his past experience with the corridor and state safety data.

number of fatalities by one.”<sup>6</sup> Non-fatal crashes are valued based on a fraction of the VSL. Table 5 presents the monetized values recommended by USDOT using the same person degree of injury scoring system as in the available crash statistics in Table 4 (the KABCO scale, a measure of the observed severity of the victim’s functional injury at the crash scene).

Applying these value factors to the crash statistics for this segment of US-127 yields a general estimate of the social costs of crashes observed, as shown in Table 6. Over the past five years, the total social cost of documented crashes from Ithaca to St. Johns on US-127 was **\$46.9 million**. Note that 40 percent of this value is a function of fatalities, which are lower probability and more sporadic events.

While the values in Table 6 provide a general sense of the scale of the safety problem, it is not necessarily indicative of the potential benefit available from improvements. Estimating this requires an understanding of differential crash rates between this segment of US-127 and other segments that benefit from access control.

**Table 5. USDOT Recommended Monetized Values for Safety**

KABCO Level	Monetized Value
O – No Injury	\$3,200
C – Possible Injury	\$63,900
B – Non-incapacitating	\$125,000
A – Incapacitating	\$459,100
K – Killed	\$9,600,000
U – Injured (Severity Unknown)	\$174,000

Source: USDOT Benefit-Cost Analysis Guidance for TIGER and INFRA Applications<sup>7</sup>

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<sup>6</sup> USDOT. Revised Departmental Guidance 2016: Treatment of the Value of Preventing Fatalities and Injuries in Preparing Economic Analyses.

<https://www.transportation.gov/sites/dot.gov/files/docs/2016%20Revised%20Value%20of%20a%20Statistical%20Life%20Guidance.pdf>

<sup>7</sup> Accessible at: [https://www.transportation.gov/sites/dot.gov/files/docs/mission/office-policy/transportation-policy/284031/benefit-cost-analysis-guidance-2017\\_1.pdf](https://www.transportation.gov/sites/dot.gov/files/docs/mission/office-policy/transportation-policy/284031/benefit-cost-analysis-guidance-2017_1.pdf)

**Table 6. Total Cost of Crashes, 2012-2016, Ithaca to St. Johns, in Millions of Dollars**

Person Degree of Injury	2012	2013	2014	2015	2016	5-Year Total
Fatal injury (K)	\$0.00	\$0.00	\$0.00	\$0.00	\$19.20	\$19.20
Suspected serious injury (A)	\$3.67	\$1.38	\$0.46	\$0.92	\$5.05	\$11.48
Suspected minor injury (B)	\$1.00	\$0.75	\$2.38	\$0.63	\$1.75	\$6.50
Possible injury (C)	\$1.15	\$1.15	\$1.28	\$0.70	\$1.66	\$5.94
No injury (O)	\$0.65	\$0.71	\$0.91	\$0.67	\$0.83	\$3.77
<b>Total Social Cost of Crashes:</b>	<b>\$6.47</b>	<b>\$3.99</b>	<b>\$5.02</b>	<b>\$2.92</b>	<b>\$28.49</b>	<b>\$46.89</b>

Source: EDR Group Analysis.

## Comparative Crash Statistics and Potential Benefits from Improvement

For this analysis, crash statistics were pulled from the *Michigan Traffic Crash Facts* for another segment of US-127 that is full access controlled: the segment between Lansing and Jackson (see Table 7).

**Table 7. Persons Involved in Crashes by Person Degree of Injury, 2012-2016, Lansing to Jackson**

Person Degree of Injury	2012	2013	2014	2015	2016	5-Year Total
Fatal injury (K)	2	2	1	0	1	6
Suspected serious injury (A)	8	2	3	3	6	22
Suspected minor injury (B)	14	16	11	10	10	61
Possible injury (C)	30	37	30	46	38	181
No injury (O)	436	388	428	427	408	2,087
Uncoded and errors	9	12	15	6	26	68
<b>TOTAL</b>	<b>499</b>	<b>457</b>	<b>488</b>	<b>492</b>	<b>489</b>	<b>2,425</b>

Source: Michigan Traffic Crash Facts Data Query Tool. Accessed November 2017.

However, because this segment is of a different length and carries a higher volume of traffic relative to the segment between Ithaca and St. Johns, the observed data needs to be normalized before it can be compared instructively. Table 8 shows the calculation of a normalization factor for each segment equal to the length of each segment multiplied by the volume and divided by 1 million.

**Table 8. Volume and Length-Based Normalization Factors**

Metric	Ithaca to St. Johns	Lansing to Jackson
Length (miles)	15.6	28.6
Volume (AADT)	18,209	26,363
<b>Normalization factor</b>	<b>0.28</b>	<b>0.75</b>

Source: EDR group calculations. Length calculated using Google Maps. Volume is an average of volumes on segments as derived from MDOT Traffic Volumes (<http://arqg.is/1PivZWw>). Normalization = (Length x Volume / 1,000,000).

After using the normalization factor to control for exposure, Table 9 shows an overall rate of persons involved in crashes that is about 1.5 times higher for the Ithaca to St. Johns segment than it is for the Lansing to Jackson segment. Note that the biggest difference is in serious injuries, whereas fatality rates appear lower on the Ithaca to St. Johns segment. This may reflect the fact that while conditions on the Ithaca to St. Johns segment of US-127 are made less safe by the intersections along the corridor, the segment does still have a lower speed limit and operating speeds than on a limited access highway. Lower speeds are known to ameliorate the severity of crashes. It is also possible that residents take extra precautions because of known dangers on the roadway.

**Table 9. Comparison of Persons Involved in Crashes by Degree of Injury, 2012-2016, Ithaca to St. Johns vs. Lansing to Jackson**

Person Degree of Injury	Ithaca to St. Johns		Lansing to Jackson		Ratio - I to SJ / L to J	
	5-Year Total	Normalized	5-Year Total	Normalized	5-Year Total	Normalized
Fatal injury (K)	2	7	6	8	0.33	0.88
Suspected serious injury (A)	25	88	22	29	1.14	3.02
Suspected minor injury (B)	52	183	61	81	0.85	2.26
Possible injury (C)	93	327	181	240	0.51	1.36
No injury (O)	1177	4143	2087	2768	0.56	1.50
Uncoded and errors	24	84	68	90	0.35	0.94
<b>TOTAL</b>	<b>1373</b>	<b>4833</b>	<b>2425</b>	<b>3216</b>	<b>0.57</b>	<b>1.50</b>

Source: EDR group calculations.

Using the observed differences in crashes between these segments, Table 10 shows the number of persons who might have been involved in crashes on US-127 from Ithaca to St. Johns over the past five years if the rate of crashes by degree of injury were in line with what is observed from Lansing to Jackson.

**Table 10. Adjusted Crash Numbers, US-127 from Ithaca to St. Johns**

Person Degree of Injury	Observed Ithaca to St. Johns	Adjusted Comparable Rate to Lansing to Jackson
Fatal injury (K)	2	2
Suspected serious injury (A)	25	8
Suspected minor injury (B)	52	23
Possible injury (C)	93	68
No injury (O)	1,177	786

Source: EDR group calculations. Note that the ratio between the observed and the adjusted is the same as the ratio between the normalized crash figures in Table 9. E.g. for serious injuries: (25/8=3.02)

Using this adjusted number, Table 11 calculates the difference between the observed and adjusted number of persons involved in crashes over a five-year period, which represents an estimate of the number of persons who could potentially have avoided being involved in a crash if US-127 were access controlled. This can then be monetized as shown in the second column of Table 11. Based on these calculations, the estimated value of potential crash reduction through improved design could approach \$14.28 million over a five-year period—representing more than a 30 percent reduction in

the social costs currently associated with crashes on the highway. Note that these benefits are derived by comparing the current condition to an existing fully access controlled corridor but are not derived from detailed design or engineering analysis. As such they are only indicative of potential benefits.<sup>8</sup>

**Table 11. Potential Benefit Available from Improvements in Access Control**

Person Degree of Injury	Difference between Observed and Adjusted (5-years)	Monetization of Potential Avoidable Crashes (5-years)
Fatal injury (K)	0	\$0.00
Suspected serious injury (A)	17	\$7.80
Suspected minor injury (B)	29	\$3.63
Possible injury (C)	25	\$1.60
No injury (O)	391	\$1.25
<b>Total social cost of potentially avoidable crashes:</b>		<b>\$14.28</b>

Source: EDR group calculations.

## Safety Analysis Conclusions

In summary, the above analysis indicates the following:

1. The US-127 corridor between Ithaca and St. Johns experiences safety challenges that result in both fatalities and injuries, accounting for \$46.9 million in social costs over the five-year period from 2012-2016.
2. Based on the comparative analysis, the Ithaca-St. Johns corridor experiences higher crash rates—particularly higher rates of serious injury crashes—relative to the segment of US-127 between Lansing and Jackson that is fully access controlled.
3. If the safety situation of the Ithaca-St. Johns corridor were more like that observed between Lansing and Jackson, an estimated 17 serious injuries from crashes and 29 minor injuries (and more possible injury or no injury crashes) would have been avoided from 2012-2016.
4. These potentially avoided crashes can be valued at \$14.3 million over a five-year period, which indicates the scale of benefit achievable if the Ithaca-St. Johns corridor were access-controlled.

It is important to note that these results, while indicative of the safety challenges experienced on US-127, cannot substitute for full safety analyses of specific proposed improvements.

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<sup>8</sup> Additionally, highway improvements could yield increases in usage of the corridor that could erode some of the benefits by increasing the overall exposure and thus the possibility of more crashes.

# 3 ECONOMIC DEVELOPMENT ISSUES

Interviewees express a range of opinions regarding the importance of US-127 to economic development in the region.

## 3.1 Site Selection

### Business Attraction

Many of the interviewees describe a general sense that US-127 keeps development sites in the region out of consideration by site selectors. Matt Felan, President & CEO of the Great Lakes Bay Regional Alliance, describes this specifically in terms of companies having policies against drivers using highways that are not limited access or having requirements in requests for proposals about minimum travel time to an expressway. Jane Fitzpatrick, Program Manager at the East Michigan Council of Governments, also thinks US-127 precludes companies from locating in the region because site selectors have checklists with strict requirements.

Dave Nelson, Ithaca Fire Chief, says that both fire trucks and commercial trucks do their best to avoid using the Ithaca-St. Johns stretch of US-127. Trucks that serve businesses in Ithaca often cannot avoid it because alternate routes run through the middle of town. Existing businesses in Ithaca must tolerate this, but Mr. Nelson does think it may affect decisions of businesses considering locating in the area.

From conversations with site selectors, Brian Smith from the Saginaw Chippewa Tribe believes that US-127 causes the Tribe's Makawa Industrial Park to not "show up" in a typical site search. According to Brian, the issue with US-127 is not so much the lower speed but the multiple intersections that are not ideal or safe for commercial truck traffic.

For Mid Michigan Community College (MMCC) in Mt. Pleasant, economic development around the interchanges of US-127 is important because the college's students need access to part-time jobs to fund their education. Almost all students work while in college, meaning the availability of work opportunities close to MMCC is very important. The college is engaged in efforts to promote economic development and remove barriers including the Ithaca-St. Johns segment of US-127. Interviewees report that site selection processes for retailers and restaurants often eliminate communities north of St. Johns because US-127 is not access controlled for that stretch, and this is a problem for the college.

### Business Expansion

Feedback from Nathan Beck of Legend Manufacturing, who owns two businesses situated right on US-127, highlights the tension between wanting a local-serving road and wanting a safe corridor for



high-speed through traffic. Like other interviewees, he is concerned about crashes caused by highway crossings and merging, but he also says that his customers have trouble accessing his businesses because of a lack of driveways and access roads. He says that issues related to US-127 influenced his decision to locate a facility in Alma instead of at his existing property north of St. Johns, and his decision to soon open a new facility outside of Michigan. He also acknowledges that other factors played a role, and it is therefore difficult to single out the influence of US-127.

MLT Transport recently expanded to St. Johns, building a million-dollar facility that will be used for staging. US-127 and Business US-127 in St. Johns are critical to the company's operations and reliable travel from farms in Central Michigan to destinations throughout the Midwest and elsewhere. The company does not explicitly consider the condition of US-127 in its business planning, but states that the Ithaca-St. Johns stretch clearly must remain safe and reliable.

## **3.2 Business Productivity**

Several interviewees make a general connection between delays on US-127 and less cost-effective business operations. Brian Sheets of Avalon & Tahoe Manufacturing mentions this, referring to the Ithaca-St. Johns stretch of US-127 as a "constraint." Existing companies have learned to work around the US-127 issues. For example, while MLT Transport described operational challenges on US-127, these have not translated into delivery delays. Safety rather than on-time performance is the company's primary concern on the corridor. Delays related to US-127 and nearby Washington Road in Ithaca may affect Zeeland Farm Service's bottom line once their new facility opens, according to a company representative. Delay causes wear and tear on trucks, and any time a truck must stop it affects its fuel efficiency.

Loss prevention is on the mind of at least one manufacturer. Mr. Sheets says that because some roads that connect with US-127 are gravel, trucks traveling in front of his trucks kick up rocks and debris that sometimes damage the expensive boats Avalon & Tahoe transports.

The Ithaca-St. Johns segment is problematic and sometimes causes delays because the speed limit drops and trucks accelerate slowly after having to decelerate for stop lights, vehicles crossing the highway, or the occasional farm equipment. When crashes on US-127 occur, it is not uncommon to have to close the highway, leading to prolonged backups in traffic. In Dave Nelson's experience, it can take 15 minutes to reach a crash once it occurs, 30-50 minutes to re-open the highway, and another 20-30 minutes for traffic to return to normal.

## **3.3 Attracting College Students and Faculty**

It is very important for Central Michigan University (CMU) in Mt. Pleasant to be able to attract new students and keep them. CMU officials have told Mt. Pleasant officials that parents want a community that is easy to reach. Parents ask, "Is it an arduous journey to visit [my child] and have them travel home?" Flying is not really an option, according to Bill Mrdeza, and there is no passenger rail or public transportation. US-127 is a marketing tool because it represents an easy, direct way to reach CMU without many stoplights. (Parents of K-12 school children also complain

about the added time it takes to use US-127 because of local traffic and farm equipment that uses the highway, especially during spring and fall.)

US-127 sometimes affects Mid Michigan Community College's ability to attract and retain faculty. For example, the college has a talented biology faculty member who lives in Lansing because his wife teaches at Michigan State University. MMCC knows they are at higher risk for losing him, in part because of the commute (implying a need for higher travel speeds). The college also does not get the benefit of him staying late for events because of concern about being able to get back home in a timely fashion. People at MMCC and CMU often find themselves needing to travel downstate to Lansing, and the conditions along Ithaca-St. Johns stretch of US-127 impede travel times.

# 4 WAYS FORWARD

## 4.1 Targeted Analysis Along the Corridor

In the context of broader state priorities, Bill Mayhew, the manager of MDOT's Mt. Pleasant Transportation Service Center (TSC), states that the concept of developing this segment into a full limited access freeway is "not on the radar" largely because of the cost of such a major improvement effort. However, he does understand the nature of the existing safety challenges along the corridor. Bill describes MDOT's usual process toward developing projects as starting with intersection-level safety and traffic movement analysis. This points toward more targeted analysis at key locations as a way forward for those interested in improvements along the corridor.

## 4.2 Acceleration/Deceleration Lanes

Acceleration and deceleration lanes could improve safety for merging traffic along the Ithaca-St. Johns segment of US-127 and prevent crashes. The interviews point to the US-127 intersections with Hyde Road and Maple Rapids Road as potential target spots for acceleration lanes going north and south. Curt LaLone of MLT Transport cites service roads in Arkansas, Oklahoma, and Texas as best practices. These roads run parallel to highways and allow trucks to accelerate and merge with traffic. (He acknowledges that service roads would be difficult to build because of the need to acquire private property.) Mr. LaLone also feels that no additional "Michigan lefts" (U-turns) are necessary.

## 4.3 Buchanan and US-127 Intersection

Currently, the most direct way to access Zeeland Farm Service's new facility from US-127 is by exiting US-127 at Washington Road. The company has spoken with MDOT about building a road that would connect Bagley Road to the facility. This combined with an interchange at Buchanan Road and US-127 would allow trucks to exit before getting to Ithaca when coming from the south. This would relieve pressure on the Washington Road exit and limit safety issues related to trucks turning left into the new facility when cars are quickly approaching after exiting a gas station several hundred yards away. Widening Washington Road to either four lanes or two lanes with a turn lane may also help.

## 4.4 Driveway Closures

There were some past improvements to the Ithaca-St. Johns corridor resulting from the state buying up parcels in preparation for the formerly planned conversion of US-127 to a limited access freeway. Currently, MDOT has a small revolving fund that can be used to purchase real estate along this segment as it comes up for sale. If a property is put on the market and MDOT has the funds, they will buy adjacent property as a way of reducing the number of access points on the corridor. Closing access is often accompanied by an elimination of a median crossover. In the past three years, MDOT

has eliminated approximately 10-12 median crossovers. This is an easy way to improve safety by reducing points of intersection between different directions of traffic.

Importantly, interviews expose a tension between keeping the Ithaca-St. Johns stretch local-serving or making it more like a limited-access highway. Driveway closures figure prominently in this debate because they could improve safety and reduce travel delays but could also negatively affect local businesses along the corridor.

## **4.5 Full Service Interchange**

One interviewee points to a transportation challenge that is not directly related to the Ithaca-St. Johns stretch of US-127 but nonetheless affects economic development along the corridor. Bill Mrdeza with the City of Mt. Pleasant describes inefficiencies for trucks stemming from the fact that Exit 144 has no northbound exit and Exit 139 has no southbound exit.

Some manufacturers consider locating in Mt. Pleasant because of its proximity to US-127, but only one of three Mt. Pleasant exits is “full service” with both north and south access. Most manufacturing happens on the north and south sides of Mt. Pleasant, meaning that depending on which direction trucks are headed they sometimes must drive to the other side of town to enter or exit US-127 in the right direction. For example, trucks headed for the north side of Mt. Pleasant need to exit at the full-service interchange at Exit 143 and drive through town because there is no northbound exit at Exit 144. Similarly, trucks headed for the south side of Mt. Pleasant must also exit at the full-service interchange because there is no southbound exit at Exit 139. Mr. Mrdeza thinks that having two exits providing access in only one direction is a “detriment” because it is inconvenient and time consuming for companies shipping their products in either direction.

# 5 CONCLUSION

US-127 plays a crucial role in north-south travel through Central Michigan. Commuters use the highway for travel to and from work and school, and manufacturers use it to receive supplies and ship their products. It also supports heavy tourism traffic, particularly during peak periods for outdoor recreational activities. US-127 is the only highway that travels directly through the center of Michigan's lower peninsula, connecting Lansing to Central Michigan's larger cities and the northern part of the lower peninsula. Sections of US-127 accommodate over 20,000 vehicles per day.

Interviews with business and safety experts reveal that the 16-mile stretch of US-127 between Ithaca and St. Johns as currently configured is problematic for several reasons. While the majority of US-127 in the rest of the state is a four-lane, limited-access highway, this stretch has at-grade intersections with east-west local roads approximately every mile, and several commercial and residential driveways. These conditions make travel dangerous, particularly because of cross traffic and slow-moving vehicles. Not surprisingly, the Ithaca-St. Johns corridor experiences higher crash rates when compared to the segment of US-127 between Lansing and Jackson that is fully access controlled.

Some members of Central Michigan's business community feel that the current conditions of US-127 and the fact that it is not a fully limited access highway eliminate development sites in the region from consideration by site selectors. There is also evidence that challenges related to safety and merging traffic on US-127 influence the truck routing decisions of local businesses, negatively impact their productivity, and reduce the recruiting and retention of faculty at some colleges in the area.

For the reasons described above, Greater Gratiot Development and the Middle Michigan Development Corporation would like the Michigan Department of Transportation to consider moving the 16-mile stretch of US-127 between Ithaca and St. Johns up its list of priorities and develop the types of access control and safety design that address the issues raised in this report.

# **APPENDIX: LIST OF INTERVIEWEES AND ACKNOWLEDGMENT**

1. Beth Westemeyer, Edible Oils Merchandiser, Zeeland Farm Services (ZFS)
2. Bill Mayhew, Manager, Michigan Department of Transportation (MDOT) Mt. Pleasant Transportation Service Center
3. Bill Mrdeza, Director, City of Mt. Pleasant Community Services & Economic Development
4. Boyd Schwarting, Engineering Manager, Bandit Industries
5. Brian Sheets, Executive Manager of Employee Development and Quality Assurance, Avalon & Tahoe Manufacturing
6. Brian Smith, Economic Development Director, and Erik Rodriguez, Interim Public Relations Director, Saginaw Chippewa Indian Tribe
7. Christine Hammond, President of Mid Michigan Community College
8. Curt LaLone, Owner, MLT Transport, LLC
9. Dave Nelson, Fire Chief, City of Ithaca Fire Department
10. Doug Wright, Sheriff, Gratiot County
11. Jan Amsterburg, Superintendent, Gratiot-Isabella Regional Education Service District (RESD)
12. Jane Fitzpatrick, Program Manager, East Michigan Council of Governments (EMCOG)
13. Kathy Wilbur, Vice President for Government Relations & Public Affairs, Central Michigan University (CMU)
14. Ken Hibl, City Manager, City of Clare
15. Kevin Cotter, Government Sales Manager, Morbark, LLC
16. Matt Felan, President & CEO, Great Lakes Bay Regional Alliance
17. Nathan Beck, President, Legend Manufacturing

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