

# **Analysis of the 2011 Michigan DOT Intercity Rail and Bus Passenger Surveys**

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# TABLE OF CONTENTS

	<b>Page</b>
<b>List of Figures</b> -----	<b>4</b>
<b>List of Tables</b> -----	<b>4</b>
<b>Chapter 1: Introduction</b> -----	<b>5</b>
Research Overview -----	5
Report Organization -----	5
<b>Chapter 2: Project Background</b> -----	<b>6</b>
Study Setting -----	6
Data Collection Summary -----	9
<b>Chapter 3: Intercity Passenger Rail Survey Analysis</b> -----	<b>10</b>
Intercity Rail Passenger Trip Information-----	10
Intercity Rail Passenger Demographic Profile-----	15
Intercity Rail Passenger Alternative Travel Modes -----	18
<b>Chapter 4: Bus Passenger Survey Analysis</b> -----	<b>20</b>
Bus Passenger Trip Information -----	20
Bus Passenger Demographic Profile -----	25
Bus Passenger Alternative Travel Modes -----	29
<b>Chapter 5: Conclusions</b> -----	<b>30</b>
Summary of Findings -----	30
Future Research -----	32
<b>References</b> -----	<b>33</b>
<b>Appendix A: Rail Passenger Survey Questionnaire</b> -----	<b>34</b>
<b>Appendix B: Bus Passenger Survey Questionnaire</b> -----	<b>36</b>
<b>Appendix C: Rail Survey Response Rate Analysis</b> -----	<b>38</b>

## LIST OF FIGURES

	<b>Page</b>
Figure 1: Amtrak Intercity Passenger Rail Routes and Stations in Michigan -----	7
Figure 2: Intercity Bus Routes and Stations in Michigan -----	8
Figure 3: Residential Location of Michigan Intercity Rail Passengers -----	16
Figure 4: Intercity Bus Passenger Boarding and Alighting Activity by County -----	20
Figure 5: Residential Location of Michigan Intercity Bus Passengers -----	26
Figure 6: Residential Location of Michigan Amtrak Thruway Bus Passengers-----	27

## LIST OF TABLES

	<b>Page</b>
Table 1: Michigan Amtrak Intercity Passenger Rail Ridership, 2011 -----	6
Table 2: Summary of Data Collection Activities -----	9
Table 3: Intercity Rail Passenger Boarding and Alighting Station-----	10
Table 4: Intercity Rail Passenger Mode of Access and Travel Time to Boarding Station-----	11
Table 5: Intercity Rail Passenger Mode of Egress and Travel Time from Alighting Station ----	12
Table 6: Intercity Rail Passenger Access and Egress Travel Time by Mode -----	12
Table 7: Intercity Rail Passenger Trip Purpose -----	13
Table 8: Intercity Rail Passenger Reasons for Deciding to Make Trip by Train-----	14
Table 9: Intercity Rail Passenger Additional Trip Characteristics -----	14
Table 10: Intercity Rail Passenger State of Residence-----	15
Table 11: Intercity Rail Passenger Demographic Characteristics -----	17
Table 12: Intercity Rail Passenger Alternative Travel Mode -----	18
Table 13: Rail Passenger Alternative Travel Mode by Vehicles, Age, and Income-----	19
Table 14: Amtrak Thruway Bus Passenger Boarding and Alighting Station-----	21
Table 15: Bus Passenger Mode of Access and Travel Time to Boarding Station-----	22
Table 16: Bus Passenger Mode of Egress and Travel Time from Alighting Station -----	23
Table 17: Bus Passenger Trip Purpose -----	23
Table 18: Bus Passenger Reasons for Deciding to Make Trip by Bus -----	24
Table 19: Bus Passenger Additional Trip Characteristics -----	25
Table 20: Bus Passenger State of Residence -----	25
Table 21: Bus Passenger Demographic Characteristics -----	28
Table 22: Bus Passenger Alternative Travel Mode-----	29

# CHAPTER 1: INTRODUCTION

## RESEARCH OVERVIEW

The Michigan Department of Transportation (MDOT) supports a statewide network of intercity passenger rail and intercity bus routes. Seeking a more comprehensive understanding of the needs and issues of travelers, MDOT periodically conducts surveys of passengers using the State's intercity rail and bus services. The most recent surveys of intercity rail and bus passengers were conducted by MDOT in Spring 2011. Surveys included passengers on the three Amtrak intercity passenger rail routes serving Michigan (the Pontiac-Detroit-Chicago *Wolverine* service, the Port Huron-Chicago *Blue Water* service, and the Grand Rapids-Chicago *Pere Marquette* service) as well as selected intercity bus and Amtrak Thruway Bus routes operated by Indian Trails, Metrocars, and Greyhound Lines. The 2011 rail and bus passenger surveys build upon previous surveys conducted by MDOT in 2000 (1) and 2007 (2).

The goal of the study was to provide high quality information so that MDOT can work with service providers and local communities to maximize the benefits of intercity rail and bus passenger services to Michigan citizens, businesses, and visitors. In pursuit of this goal, staff from the Intermodal Services Unit of the MDOT Bureau of Transportation Planning, Intermodal Policy Division coordinated with the passenger rail research staff from the Multimodal Freight Transportation Programs of the Texas Transportation Institute (TTI), a member of The Texas A&M University System, to conduct a formal analysis of the 2011 MDOT intercity rail and intercity bus passenger survey data.

## REPORT ORGANIZATION

This report describes the study background and full TTI analysis of the 2011 MDOT intercity rail and intercity bus passenger survey data. The remainder of this report is organized into four chapters, described as follows. Chapter 2 provides a brief background of the research setting and a summary of the data collection efforts undertaken by MDOT as part of these surveys. Although TTI researchers were not directly involved with the survey data collection process, this background is provided for informational purposes. Chapter 3 presents the TTI analysis of the MDOT intercity rail passenger survey data, including passenger trip information, passenger demographic profile information, and analysis of passenger alternative travel modes if the train service was not available. Chapter 4 reports similar analysis for the intercity bus passenger survey data and the Amtrak Thruway Bus passenger survey data. Selected comparisons between the intercity rail passenger survey results and the bus passenger survey results are also presented in Chapter 4. Although the Amtrak Thruway Bus is an extension of the Amtrak intercity passenger rail services, the Thruway Bus passenger survey data are presented in Chapter 4 to better facilitate comparisons across the three surveys. The final chapter, Chapter 5, summarizes the key survey findings and provides suggestions for future surveys and research.

## CHAPTER 2: PROJECT BACKGROUND

### STUDY SETTING

#### Michigan Intercity Passenger Rail Routes

Passenger surveys were conducted on the three Amtrak intercity passenger rail lines and selected intercity bus and Amtrak Thruway Bus routes within the State of Michigan. The three intercity passenger rail routes in Michigan, all operated by Amtrak, are as follows (3):

- **Wolverine:** The *Wolverine* route operates three daily round-trips between Pontiac, MI and Chicago, IL with intermediate stops in Birmingham, Royal Oak, Detroit, Dearborn, Ann Arbor, Jackson, Albion, Battle Creek, Kalamazoo, Dowagiac, Niles, New Buffalo, Michigan City (IN), and Hammond-Whiting (IN).
- **Blue Water:** The *Blue Water* operates a single daily round-trip between Port Huron, MI and Chicago, IL with intermediate stops in Lapeer, Flint, Durand, East Lansing, Battle Creek, Kalamazoo, Dowagiac, Niles, and New Buffalo.
- **Pere Marquette:** The *Pere Marquette* operates a single daily round-trip between Grand Rapids, MI and Chicago, IL with intermediate stops in Holland, Bangor (South Haven), and St. Joseph-Benton Harbor.

Figure 1 shows a map of the three Michigan Amtrak intercity passenger rail routes and the stations served by each route. The State of Michigan is one of 15 states which contract with Amtrak to operate intercity passenger rail routes, providing funding to support the operations of the *Blue Water* and the *Pere Marquette* routes (3). The *Wolverine* is a basic Amtrak system route and no state funds are used to support its operations. Table 1 shows the federal fiscal year (FFY) 2011 (October 1, 2010 through September 30, 2011) ridership data for the three routes.

**Table 1: Michigan Amtrak Intercity Passenger Rail Ridership, 2011**

Michigan Amtrak Route	FFY 2011 Ridership	Percent Change vs. FFY 2010
<i>Wolverine</i>	503,290	+4.9
<i>Blue Water</i>	187,065	+18.6
<i>Pere Marquette</i>	106,662	+4.7
<b>Total All Michigan Routes</b>	<b>797,017</b>	<b>+7.8</b>
Source (4)		

Total Amtrak ridership in Michigan was nearly 800,000 passengers in FFY 2011, 7.8 percent higher than FFY 2010. Ridership growth was realized on all three routes, with the FFY 2011 ridership on the *Blue Water* showing an increase of 18.6 percent over FFY 2010. This growth was the fifth-highest ridership growth among the 21 state-supported Amtrak routes in the U.S.

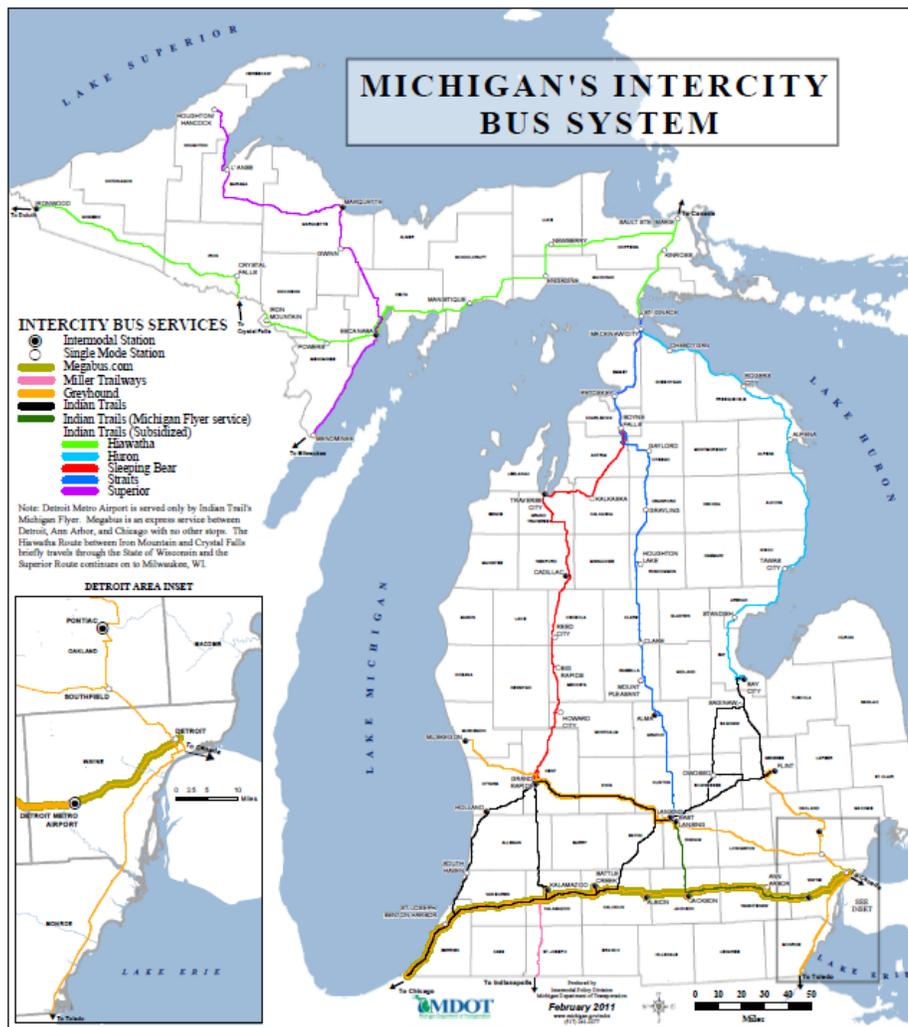


**Figure 1: Amtrak Intercity Passenger Rail Routes and Stations in Michigan (Map courtesy of the Michigan Department of Transportation)**

### Michigan Intercity Bus and Amtrak Thruway Routes

Intercity bus services in Michigan are operated by private companies including Indian Trails, Greyhound, Miller Trailways, and Megabus. Figure 2 shows the intercity bus routes operating within the state. The operations of intercity bus routes in the Upper Peninsula and the northern half of the Lower Peninsula are subsidized by the State of Michigan and are operated by Owosso-based Indian Trails. Daily frequencies on these intercity bus lines vary by route.

Detailed ridership information is not available for most of the routes, although the five state-subsidized bus routes have reported ridership increases in recent years (5).



**Figure 2: Intercity Bus Routes and Stations in Michigan  
(Map courtesy of the Michigan Department of Transportation)**

Amtrak Thruway Bus services (shown in Figure 1) provide a bus connection between the Michigan Amtrak routes and communities around the state. Many Amtrak Thruway Bus connections listed in the Amtrak timetable (3) are operated concurrently with scheduled Indian Trails routes. Additionally, the Detroit-area transportation provider Metrocars operates an Amtrak Thruway Bus connection between East Lansing, Ann Arbor, Dearborn, and Detroit to connect with Amtrak long-distance routes in Toledo, Ohio. In this report, findings from the Amtrak Thruway Bus passenger survey are presented in Chapter 4 side-by-side with the findings from the intercity bus passenger survey. It should be noted, however, that Amtrak Thruway Bus service is an extension of Amtrak’s rail services, and passengers can only use Amtrak Thruway Bus service in conjunction with an Amtrak rail trip.

## DATA COLLECTION SUMMARY

Survey design and data collection for this project was implemented by MDOT staff. Separate survey questionnaires were used for intercity rail and intercity bus passengers, but the overall content of the surveys was consistent between the two versions. Amtrak Thruway Bus service passengers received the intercity rail passenger survey form since the Thruway Bus trips are an extension of a rail trip. The survey was a self-completion survey and was designed to be filled out by the passenger during the rail or bus trip. The intercity rail passenger survey questionnaire contained 22 questions and was printed on both sides of a single letter-sized page. The intercity bus passenger survey had 23 questions. Questions on the survey included trip origin and destination information, passenger trip purpose, passenger alternative travel mode if the train or bus was not available, important factors considered when choosing to take the train or bus for the current trip, and passenger demographics. Appendix A contains a copy of the rail passenger survey and Appendix B contains a copy of the bus passenger survey.

Survey data collection took place in late March and early April of 2011. Surveys were distributed to passengers on-board all Michigan Amtrak trains on a weekday and a weekend day. Due to survey staffing limitations, multiple days of surveying were necessary to cover all three daily round-trips for the *Wolverine* route. Intercity bus passenger surveys were conducted only on Indian Trails and Greyhound routes, with some routes having multiple days of surveying and other routes having a single day of survey data collection. Surveys of Amtrak Thruway Bus passengers were conducted across multiple days for the Indian Trails routes and for a single day for each direction of the Metrocars route.

Table 2 reports the results of the data collection activities associated with the 2011 MDOT intercity rail and bus passenger surveys. A total of 2,363 surveys were collected from passengers on the three Michigan Amtrak intercity passenger rail routes, more than half of which were obtained from passengers on the *Wolverine* route. The overall participation rate for the rail passenger survey was estimated to be slightly less than 40 percent of all passengers. The participation rate achieved in the 2011 surveys was similar to the participation rate achieved in the 2000 Michigan Amtrak passenger on-board survey (1).

**Table 2: Summary of Data Collection Activities**

Survey Location	Total Surveys	Participation Rate
<i>Wolverine</i>	1,354	42.7%
<i>Blue Water</i>	512	30.1%
<i>Pere Marquette</i>	497	47.2%
<b>Total All Intercity Rail</b>	<b>2,363</b>	<b>39.9%</b>
<b>Total Intercity Bus</b>	<b>533</b>	<b>N/A</b>
<b>Total Amtrak Thruway Bus</b>	<b>94</b>	<b>N/A</b>

A total of 533 intercity bus passenger surveys were obtained, of which 322 (60 percent) were from Indian Trails routes and 211 (40 percent) were from Greyhound routes. A total of 94 Amtrak Thruway Bus passenger surveys were obtained, of which 51 (54 percent) were from Indian Trails routes and 43 (46 percent) were from the Metrocars route. No estimate of the participation rate for the intercity bus and the Amtrak Thruway Bus surveys could be made because the ridership counts for the specific routes were not available.

## CHAPTER 3: INTERCITY PASSENGER RAIL SURVEY ANALYSIS

This chapter reports the findings from the analysis of the 2,363 surveys obtained from passengers on the three Michigan Amtrak intercity passenger rail routes in Spring 2011. The analysis is presented in three sections as follows: rail passenger trip information, rail passenger demographic profile information, and rail passenger alternative travel mode information.

### RAIL PASSENGER TRIP INFORMATION

#### Boarding and Alighting Station

Table 3 shows the percent of passengers boarding (i.e. getting on the train) and alighting (i.e. getting off the train) at each station as reported by Michigan Amtrak passengers.

**Table 3: Intercity Rail Passenger Boarding and Alighting Station**

Station	<i>Wolverine</i>		<i>Blue Water</i>		<i>Pere Marquette</i>	
	Boarding	Alighting	Boarding	Alighting	Boarding	Alighting
Albion (%)	<1	<1	--	--	--	--
Ann Arbor (%)	21	16	--	--	--	--
Bangor (%)	--	--	--	--	<1	1
Battle Creek (%)	5	4	2	2	--	--
Birmingham (%)	2	3	--	--	--	--
Chicago Union Station (%)	36	50	35	57	44	55
Dearborn (%)	11	7	--	--	--	--
Detroit (%)	7	5	--	--	--	--
Dowagiac (%)	<1	<1	0	<1	--	--
Durand (%)	--	--	5	3	--	--
East Lansing (%)	--	--	28	15	--	--
Flint (%)	--	--	9	8	--	--
Grand Rapids (%)	--	--	--	--	35	25
Hammond-Whiting (%)	<1	1	--	--	--	--
Holland (%)	--	--	--	--	17	16
Jackson (%)	4	3	--	--	--	--
Kalamazoo (%)	5	5	7	8	--	--
Lapeer (%)	--	--	6	<1	--	--
Michigan City (%)	<1	<1	--	--	--	--
New Buffalo (%)	<1	<1	3	2	--	--
Niles (%)	2	1	2	1	--	--
Pontiac (%)	3	2	--	--	--	--
Port Huron (%)	--	--	4	4	--	--
Royal Oak (%)	5	3	--	--	--	--
St. Joseph-Benton Harbor (%)	--	--	--	--	3	3
Note: Columns may not sum to 100 percent due to rounding						
-- Signifies station not included on route						
Source: 2011 MDOT Intercity Passenger Rail Survey						

Chicago, Illinois Union Station had the highest boarding and alighting activity across the three Michigan Amtrak routes. This was not surprising, given Chicago's role as the economic and social center of the Midwest. Within Michigan, the stations located near the state's major

universities (Ann Arbor near the University of Michigan, East Lansing near Michigan State University, and Kalamazoo near Western Michigan University) reported the highest level of activity on their respective routes. In the Detroit area, boarding and alighting activity for the *Wolverine* route was distributed equally across the stations in Detroit, Dearborn, and the combined activity of the three stations north of Detroit – Royal Oak, Birmingham, and Pontiac. The station with the highest level of boarding and alighting activity on the *Pere Marquette* route was Grand Rapids.

### Station Access and Egress Trip Details

Table 4 shows the percentage distribution of travel mode and travel time for the rail passengers’ access trip to the rail station prior to boarding the train. Table 5 shows similar information for the egress trip to the passengers’ final destination after departing the train. Across the three routes, private vehicle was the preferred travel mode for the station access and egress trip. Taxi or shuttle service was also a commonly-used mode, particularly for egress trips. Approximately 10 percent of passengers reported the use of local transit bus or commuter train for the station access or egress trip. Passengers connecting to or from another Amtrak train accounted for 20 percent of the egress trips among *Pere Marquette* passengers.

**Table 4: Intercity Rail Passenger Mode of Access and Travel Time to Boarding Station**

Travel Mode/Travel Time	<i>Wolverine</i>	<i>Blue Water</i>	<i>Pere Marquette</i>
<b>Access Trip Travel Mode</b>			
• Private Vehicle (%)	64	66	59
• Walk/Bicycle (%)	5	5	5
• Connecting Amtrak Train (%)	6	5	6
• Taxi/Shuttle (%)	13	14	18
• Local Bus Service/Commuter Train (%)	9	9	11
• Intercity Bus (%)	2	1	1
<b>Access Trip Travel Time</b>			
• Median Access Travel Time (Minutes)	20.9	20.4	22.3
• 15 Minutes or Less (%)	39	42	38
• 16 – 30 Minutes (%)	29	21	25
• 31 – 45 Minutes (%)	15	12	13
• 46 – 60 Minutes (%)	8	6	7
• 61 – 120 Minutes (%)	4	8	5
• Over 120 Minutes (%)	5	11	12
Note: Columns may not sum to 100 percent due to rounding			
Source: 2011 MDOT Intercity Passenger Rail Survey			

Examining station access and egress travel times, most passengers reported traveling 15 minutes or less to connect to or from the rail station. The median access and egress travel times were estimated to be between 20 and 30 minutes, depending upon the route. The percentage of passengers traveling in each distance group decreased as the distance increased. Approximately one-third of the surveyed passengers on the *Pere Marquette* route reported an egress travel time of more than 2 hours. This was consistent with the previous finding that a large number of *Pere Marquette* passengers reported connecting to another Amtrak train in Chicago as their egress travel mode.

**Table 5: Intercity Rail Passenger Mode of Egress and Travel Time from Alighting Station**

Travel Mode/Travel Time	<i>Wolverine</i>	<i>Blue Water</i>	<i>Pere Marquette</i>
<b>Egress Trip Travel Mode</b>			
• Private Vehicle (%)	54	49	50
• Walk/Bicycle (%)	7	6	6
• Connecting Amtrak Train (%)	6	9	20
• Taxi/Shuttle (%)	22	25	16
• Local Bus Service/Commuter Train (%)	10	9	6
• Intercity Bus (%)	1	1	1
<b>Egress Trip Travel Time</b>			
• Median Egress Travel Time (Minutes)	21.3	24.1	29.9
• 15 Minutes or Less (%)	38	37	32
• 16 – 30 Minutes (%)	29	22	18
• 31 – 45 Minutes (%)	13	12	6
• 46 – 60 Minutes (%)	6	4	6
• 61 – 120 Minutes (%)	4	8	7
• Over 120 Minutes (%)	10	18	32
Note: Columns may not sum to 100 percent due to rounding			
Source: 2011 MDOT Intercity Passenger Rail Survey			

**Table 6: Intercity Rail Passenger Access and Egress Travel Time by Mode**

Travel Time	Private Vehicle	Taxi/ Shuttle	Walk/ Bicycle	Local Transit	Intercity Bus
<b>Total Mode Share</b>					
• Access Trips (%)	64	14	5	9	2
• Egress Trips (%)	52	21	7	9	1
<b>Median Travel Time (Minutes)</b>					
• Access Trips	21.5	9.9	13.3	33.5	95.0
• Egress Trips	25.0	11.3	13.0	32.7	85.0
<b>15 Minutes or Less</b>					
• Access Trips (%)	37	76	56	17	5
• Egress Trips (%)	31	66	58	20	22
<b>16 – 30 Minutes</b>					
• Access Trips (%)	30	20	29	28	7
• Egress Trips (%)	29	25	32	25	15
<b>31 – 45 Minutes</b>					
• Access Trips (%)	16	2	9	23	17
• Egress Trips (%)	15	3	6	24	4
<b>46 – 60 Minutes</b>					
• Access Trips (%)	8	0	3	20	12
• Egress Trips (%)	6	<1	3	19	0
<b>61 – 120 Minutes</b>					
• Access Trips (%)	5	1	1	12	15
• Egress Trips (%)	8	1	0	6	22
<b>Over 120 Minutes</b>					
• Access Trips (%)	4	0	2	1	44
• Egress Trips (%)	12	4	2	6	37
Access or egress trips via connecting Amtrak train are not shown					
Note: Columns may not sum to 100 percent due to rounding					
Source: 2011 MDOT Intercity Passenger Rail Survey					

Table 6 shows the estimated median station access and egress travel time and the distribution of reported station access and egress travel time by access and egress travel mode. A majority of passengers that traveled to or from the rail station in a personal vehicle traveled less than 30 minutes. The estimated median travel times for taxi/shuttle and walk/bicycle were similar at approximately 15 minutes. The estimated median access and egress travel time for transit users was longer, slightly greater than 30 minutes, and the distribution of travel times for transit users was fairly uniform up to 60 minutes. Intercity bus passenger access and egress times were the longest, with median travel times estimated at approximately 90 minutes.

### Passenger Trip Purpose

Table 7 shows the distribution of passenger trip purpose for the three Michigan Amtrak routes and all three routes combined. A majority of passengers were traveling for personal reasons, with Visiting Friends/Family/Relatives (40 percent) and Vacation (29 percent) being the two most frequent trip purposes across the three routes. Vacation travel was substantially higher among *Blue Water* and *Pere Marquette* passengers, as compared with *Wolverine* passengers. Business travel was more common on the *Wolverine* and the *Blue Water*. Also, trips going to/from a university or college were higher on the *Wolverine* and the *Blue Water*, not surprising given the numerous institutions of higher education located along those routes.

**Table 7: Intercity Rail Passenger Trip Purpose**

Passenger Trip Purpose	<i>Wolverine</i>	<i>Blue Water</i>	<i>Pere Marquette</i>	All Routes
Commuting to/from Work (%)	3	2	3	3
Going to/from Business Trip (%)	12	13	7	11
Going to/from School/University/College (%)	6	6	1	5
Going to/from Entertainment (%)	3	3	5	3
Visiting Friends/Family/Relatives (%)	47	30	33	40
Shopping (%)	3	3	3	3
Personal Business (%)	6	6	3	5
Vacation (%)	19	38	45	29
Note: Columns may not sum to 100 percent due to rounding				
Source: 2011 MDOT Intercity Passenger Rail Survey				

### Motivations for Train Use

Table 8 reports the considerations that most influenced the passengers' decision to use the train for their trip instead of other travel alternatives. Passengers were provided with a list of reasons and were permitted to select up to three. The percentages reported in Table 8 are the percentage of passengers that selected "Yes" for each reason. Total Cost of Trip was one of the major considerations in using the train instead of other modes, as this option was selected by approximately 60 percent of surveyed passengers. Comfort While Traveling, Convenience of Schedule, and Overall Travel Time were also frequently-cited reasons for choosing to make the trip by train instead of other alternatives. Factors related to personal safety, travel safety, and issues with automobile availability were less important among passengers.

**Table 8: Intercity Rail Passenger Reasons for Deciding to Make Trip by Train**

Reason for Making Trip by Train	<i>Wolverine</i>	<i>Blue Water</i>	<i>Pere Marquette</i>
Convenience of Schedule (%)	40	40	30
Overall Travel Time (%)	19	20	20
Comfort While Traveling (%)	44	42	49
Total Cost of Trip (%)	61	63	59
Personal Safety (%)	5	2	4
Travel Safety (%)	6	7	10
Can't Drive/Don't Drive (%)	7	6	7
Other Reason (%)	9	9	12
Note: Percentages displayed show percent of passengers responding "Yes" to each item. Columns may sum to greater than 100 percent because passengers were allowed to select up to three reasons.			
Source: 2011 MDOT Intercity Passenger Rail Survey			

### Additional Rail Trip Information

Table 9 displays additional trip characteristics as reported on the survey by intercity rail passengers. The *Pere Marquette* route had the highest percentage of passengers reporting that the surveyed trip was their first trip on Amtrak (38 percent), while the lowest percentage of first time train riders was on the *Wolverine* route (26 percent). Among all surveyed passengers on the three routes, the average number of rail trips in the 12 months prior to the survey period was between 6 and 8 trips. A small percentage of passengers, less than 10 percent across the three routes, had ever been denied a reservation by Amtrak due to seats being sold out. More than 98 percent of passengers across the three routes reported that they would use Amtrak again in the future. The average travel group size was about 2 persons for the *Wolverine* route and about 4 persons for the *Blue Water* and *Pere Marquette* routes. Approximately 90 percent of passengers reported that their travel group was able to sit together.

**Table 9: Intercity Rail Passenger Additional Trip Characteristics**

Trip Characteristics	<i>Wolverine</i>	<i>Blue Water</i>	<i>Pere Marquette</i>
First Trip on Amtrak (%)	26	32	38
Average Number of Rail Trips in Past 12 Months	7.2	6.3	7.4
Denied Reservation Due to Seats Sold Out (%)	10	8	8
Will Use Amtrak Again in Future (%)	98	99	99
Average Travel Group Size	2.2	4.5	4.2
Travel Group Able to Sit Together (%)	88	91	91
<b>Origin/Destination of Rail Trip:</b>			
• Within Michigan (%)	12	8	1
• To Origin/Destination Outside Michigan (%)	88	92	99
Source: 2011 MDOT Intercity Passenger Rail Survey			

Also shown in Table 9 is the percentage of passengers from each route that reported traveling within Michigan (i.e. boarding and alighting the train at a station within Michigan) or traveling to an origin or destination station outside of Michigan. A large majority of passengers surveyed were traveling to or from a station outside of Michigan. The percentage of "within Michigan" travelers was higher on the *Wolverine* and the *Blue Water* and lowest on the *Pere Marquette*. This was not surprising given the number of "within-Michigan" station pair options

for travelers on the *Wolverine* and *Blue Water* routes. It should be noted that this information does not reflect the location of the actual origin and destination of the passenger’s trip, but rather the station where the passenger reported boarding and alighting the train.

## INTERCITY RAIL PASSENGER DEMOGRAPHIC PROFILE

Demographic profile information collected on the intercity rail passenger survey included gender, age group, employment status, household vehicles, and household income. Also, passengers were asked to provide the five-digit zip code of their home residence. In an effort to capture a more realistic picture of the demographic profile of the ridership, college students were specifically requested to provide responses for their place of residence while attending school.

Table 10 reports the state of residence for Michigan Amtrak passengers, as estimated using the five-digit zip code responses provided on the survey. Approximately three-quarters of passengers on all routes reported a home residential zip code within Michigan, with the share of Michigan residents being higher on the *Blue Water* and the *Pere Marquette* than on the *Wolverine*. Illinois residents comprised approximately 16 percent of passengers on all routes and 22 percent of passengers on the *Wolverine* route.

**Table 10: Intercity Rail Passenger State of Residence**

State	<i>Wolverine</i>	<i>Blue Water</i>	<i>Pere Marquette</i>	All Routes
Michigan (%)	69	85	87	76
Illinois (%)	22	7	8	16
Wisconsin (%)	2	1	1	1
Indiana (%)	2	1	0	1
Other U.S. States (%)	6	7	3	6
Note: Columns may not sum to 100 percent due to rounding				
Source: 2011 MDOT Intercity Passenger Rail Survey				

Figure 3 shows the specific location of the home residential zip code for Michigan Amtrak passengers. Each marker on the map in Figure 3 represents a zip code in which at least one passenger reported a home residence, and multiple passengers were recorded within many of the zip codes shown. The passenger zip code locations shown in Figure 3 represent 93.9 percent of all the intercity rail passengers surveyed that provided a valid zip code response. Not surprisingly, a large number of passengers reported home residences around the state’s major urban areas: Detroit, Grand Rapids, Kalamazoo/Battle Creek, and East Lansing. Among passengers that reported a home residence in Michigan, just over half (53.3 percent) reported a home residence in one of the following six counties:

- Wayne County (11.6 percent of Michigan Amtrak passengers)
- Oakland County (10.2 percent)
- Washtenaw County (10.1 percent)
- Kent County (9.4 percent)
- Ingham County (6.7 percent)
- Kalamazoo County (5.3 percent)

The remaining 46.7 percent of passengers that reported a home residence in Michigan were distributed across a total of 62 Michigan counties. The wide distribution of passenger home residences (68 out of Michigan's 83 counties represented) demonstrates the popularity of Michigan's Amtrak services, particularly considering the fact that the three routes collectively travel through only 18 of the 83 counties in Michigan.



**Figure 3: Residential Location of Michigan Intercity Rail Passengers**

Table 11 reports the remaining demographic profile information for the three Michigan Amtrak routes and data for the three routes combined. A majority (62 percent) of all rail passengers were female, with the *Pere Marquette* having the lowest percentage of females (56 percent) and the *Blue Water* having the highest percentage (69 percent). Vehicle accessibility, as measured by the number of vehicles owned or leased by the passenger's household, did not appear to be an issue as approximately 92 percent of all passengers reported being from a household that owned or leased at least one vehicle. The percentage of zero-vehicle households was noticeably higher on the *Wolverine* route, with 11 percent of passengers reporting being from such a household. The median passenger age across the three routes was estimated at slightly less than 40 years. Passengers aged 18 to 24 years comprised approximately one-fifth of

the passengers for the *Wolverine* and *Blue Water* routes. These two routes also had a higher percentage of passengers that reported “University/College Student” as their employment status. These findings confirm the patronage of the *Wolverine* and the *Blue Water* services among the students of the numerous institutions of higher education that are located along these routes. Slightly less than half of passengers across the three routes reported full-time employment status, while approximately 10 percent of passengers reported being either employed part-time or retired. The *Pere Marquette* route had the highest percentage of “Student-Other than College” with 16 percent. The median household income among rail passengers was estimated between \$60,000 and \$70,000, with approximately 14 percent of passengers reporting annual household incomes less than \$20,000.

**Table 11: Intercity Rail Passenger Demographic Characteristics**

Characteristic	<i>Wolverine</i>	<i>Blue Water</i>	<i>Pere Marquette</i>	All Routes
<b>Gender (% Female)</b>	61	69	56	62
<b>Household Vehicles</b>				
• None (%)	11	6	4	8
• One (%)	27	22	21	25
• Two (%)	37	41	43	39
• Three or More (%)	25	30	32	28
<b>Age Group</b>				
• Median Age (Years)	38.7	37.3	38.3	38.3
• 12 to 17 years (%)	7	10	17	10
• 18 to 24 years (%)	20	21	15	19
• 25 to 34 years (%)	17	15	12	16
• 35 to 44 years (%)	17	16	17	17
• 45 to 54 years (%)	16	17	18	17
• 55 to 64 years (%)	13	11	16	13
• 65 to 74 years (%)	8	7	5	7
• 75 years and over (%)	2	2	<1	2
<b>Current Employment Status</b>				
• Employed Full-Time (%)	47	45	46	46
• Employed Part-Time (%)	10	11	13	11
• Retired (%)	11	10	9	11
• Homemaker (%)	5	3	5	4
• Student (Other than College, %)	8	12	16	10
• University/College Student (%)	14	13	5	12
• Unemployed (%)	6	5	5	5
<b>Annual Household Income</b>				
• Median Household Income	\$62,000	\$62,500	\$68,600	\$63,800
• Under \$10,000 (%)	10	13	6	10
• \$10,000 to \$19,999 (%)	4	5	3	4
• \$20,000 to \$29,999 (%)	10	9	8	9
• \$30,000 to \$39,999 (%)	6	4	7	6
• \$40,000 to \$49,999 (%)	11	9	9	10
• \$50,000 to \$74,999 (%)	17	21	25	19
• \$75,000 to \$99,999 (%)	13	14	17	14
• \$100,000 or More (%)	28	26	27	27
Note: Columns may not sum to 100 percent due to rounding				
Source: 2011 MDOT Intercity Passenger Rail Survey				

## INTERCITY RAIL PASSENGER ALTERNATIVE TRAVEL MODES

The survey included a question asking the passengers how they would typically make the trip if the train service were not available. Passengers were asked to consider four options – airplane, bus, motor vehicle, and would not make the trip – and rank the four options from the most preferred alternative to the least preferred alternative. However, most passengers did not comply with these directions and simply selected their preference rather than providing a rank for each of the four modes. Consequently, for this analysis, the passengers’ preferred alternative travel mode was assumed to be the mode provided in the response (if only one mode was selected) or the passenger’s first preference if the ranking was provided.

Table 12 shows the distribution of preferred alternative travel modes among passengers for the three Michigan Amtrak routes and for all three routes combined. A majority of Michigan Amtrak passengers would use a motor vehicle to travel if the train service were not available, with 63 percent of passengers preferring this option. This finding indicates that the Michigan Amtrak intercity passenger rail services help reduce vehicle congestion on the highways parallel to the rail routes. Airplane as an alternative to the train service was selected by 19 percent of passengers, while 10 percent of passengers would have used an intercity bus if the train service were not available. Only 8 percent of passengers responded that they would not make the trip if the train service was not available, indicating that the trips made by Michigan Amtrak passengers are of a high utility nature. In general, the distribution of rail passenger alternative travel mode was consistent across the three individual routes.

**Table 12: Intercity Rail Passenger Alternative Travel Mode**

Alternative Travel Mode	<i>Wolverine</i>	<i>Blue Water</i>	<i>Pere Marquette</i>	All Routes
Airplane (%)	20	14	21	19
Intercity Bus (%)	12	10	6	10
Motor Vehicle (%)	60	69	63	63
Would Not Make the Trip (%)	8	8	10	8
Note: Columns may not sum to 100 percent due to rounding				
Source: 2011 MDOT Intercity Passenger Rail Survey				

The demographic profile information collected on the rail passenger survey (described in the previous section) provide another lens through which to view the rail passenger alternative travel mode data. Specifically, some segments of the population may have limited or no access to other transportation options. In particular, access to the primary alternative to rail service, personal vehicle, may be limited for some population groups due to financial or physical constraints. Three such groups identified on the rail passenger survey were as follows:

- Passengers from zero-vehicle households – approximately 8 percent of passengers
- Elderly passengers (age 65 and over) – approximately 9 percent of passengers
- Low-income passengers (annual household income less than \$20,000) – approximately 14 percent of passengers

Examining the alternative travel mode responses among these groups allows for a better understanding of the role filled by Michigan Amtrak services in supporting the personal mobility needs of all citizens. Table 13 reports the alternative travel mode for Michigan Amtrak

passengers by household vehicles, age group, and annual household income. The trends shown in Table 13 were not surprising. Passengers from zero-vehicle households were more likely to use intercity bus or not make the trip and less likely to use a motor vehicle if the train service were not available. Propensity to use motor vehicle as an alternative to the train service increased and the propensity to use intercity bus or not make the trip decreased as the number of vehicles owned or leased by the passenger’s household increased. Elderly passengers did not exhibit preferences for alternative travel modes that were noticeably different than the average passenger. Propensity to use airplane or not make the trip as an alternative to train service increased with age while the use of intercity bus decreased with increasing age. Low-income passengers were more likely to use intercity bus and less likely to use airplane if the train service were not available. Consistent with other trends reported in Table 13, increasing annual household income decreased the probability of using intercity bus or not making the trip and increased the likelihood of using a motor vehicle if the train service were not available.

**Table 13: Rail Passenger Alternative Travel Mode by Vehicles, Age, and Income**

Passenger Segment	Airplane (%)	Intercity Bus (%)	Motor Vehicle (%)	Would Not Make Trip (%)
<b>All Passengers</b>	19	10	63	8
<b>Household Vehicles</b>				
• None	18	33	36	13
• One	19	13	58	10
• Two	19	6	67	7
• Three or More	17	7	68	7
<b>Age Group</b>				
• 12 to 24 years	16	16	61	7
• 25 to 34 years	16	13	61	9
• 35 to 44 years	18	7	67	7
• 45 to 54 years	19	6	67	8
• 55 to 64 years	24	7	60	10
• 65 years and over	23	7	58	12
<b>Annual Household Income</b>				
• Less than \$20,000	10	23	55	12
• \$20,000 to \$49,999	19	16	57	11
• \$50,000 to \$99,999	21	8	63	8
• \$100,000 or More	21	4	69	6
Note: Rows may not sum to 100 percent due to rounding				
Source: 2011 MDOT Intercity Passenger Rail Survey				

The results reported in Table 13 indicate that the Michigan Amtrak intercity passenger rail service is filling a critical transportation need in the state by supporting personal mobility for special population groups that might have difficulty accessing other transportation alternatives. The relationships between alternative travel mode and household income presented in Table 13 are consistent with findings from previous surveys of Michigan Amtrak passengers (1,2). The relationships among travel mode and household vehicles, age group, and household income are also consistent with findings from a similar analysis conducted on survey data obtained in 2011 from passengers on the Milwaukee-Chicago *Hiawatha Service* route (6).

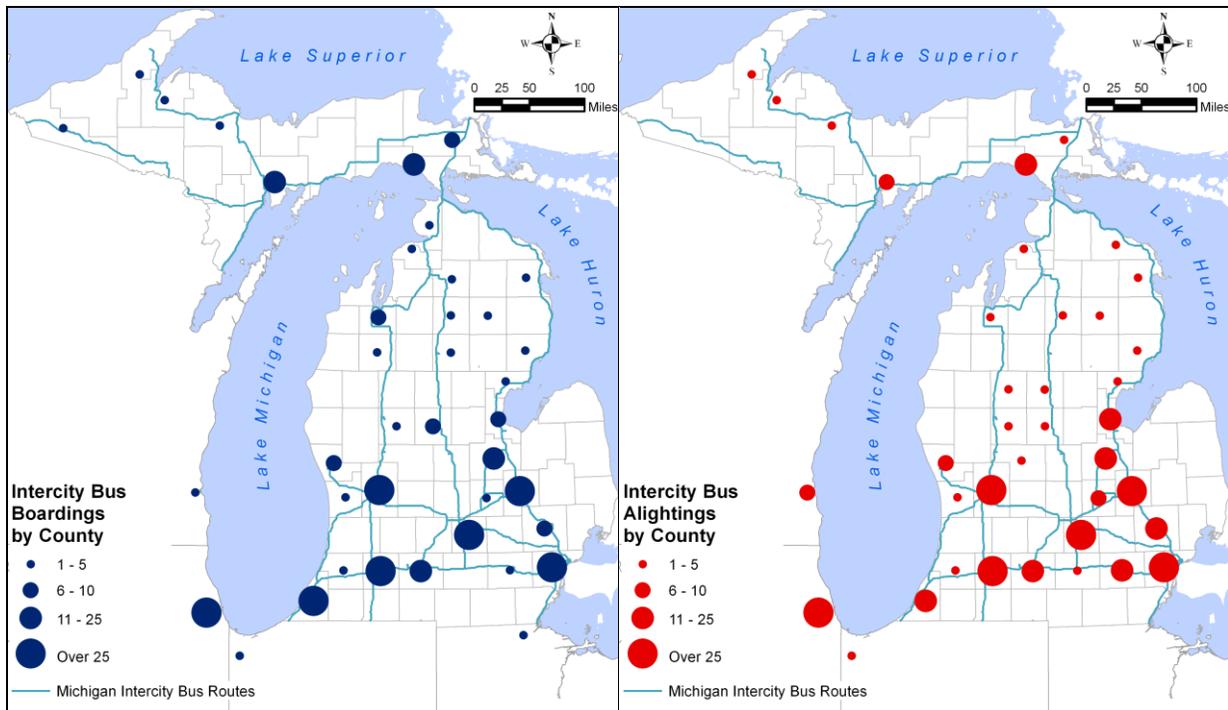
## CHAPTER 4: BUS PASSENGER SURVEY ANALYSIS

This chapter reports the findings from the analysis of the 533 surveys obtained from Michigan intercity bus passengers and the 94 surveys obtained from Michigan Amtrak Thruway Bus passengers in Spring 2011. The analysis is presented in a similar format as the intercity rail passenger with three sections as follows: bus passenger trip information, bus passenger demographic profile information, and bus passenger alternative travel mode information. Findings from the intercity bus passenger survey and the Amtrak Thruway Bus passenger survey are presented together in this chapter. Comparisons between the two bus surveys and the findings from the intercity rail passenger survey (combined all three routes) are also provided where applicable.

### BUS PASSENGER TRIP INFORMATION

#### Boarding and Alighting Station

Intercity bus passenger boarding and alighting data were compiled and reported by county rather than city because there were multiple intercity bus stops located in some counties. Figure 4 shows the total boarding and alighting activity by county for intercity bus passengers. The boarding and alighting activity shown in Figure 4 represent 100 percent of all intercity bus passenger boarding and alighting activity recorded in the intercity bus passenger survey data.



**Figure 4: Intercity Bus Passenger Boarding and Alighting Activity by County**

The highest levels of boarding and alighting activity were recorded in the more populated counties of Michigan, such as Genesee, Ingham, Kalamazoo, Kent, and Wayne Counties. Across the northern half of the Lower Peninsula, intercity bus passenger boarding and alighting activity was evenly distributed across the coverage area for the three state-subsidized routes that serve the region. Boarding and alighting activity was also strong in the eastern half of the Upper Peninsula. The density of boarding and alighting activity was lower across the counties of the more sparsely-populated western Upper Peninsula. Out-of-state boarding and alighting locations recorded by intercity bus passengers in this survey included Chicago, Illinois; Lake County, Indiana; Milwaukee, Wisconsin; and Toledo, Ohio.

The Amtrak Thruway Bus boarding and alighting activity is limited to certain Amtrak rail stations and other cities along the routes. Consequently, this activity for the Thruway Bus passenger survey data was compiled by station and reported in tabular format rather than in graphical format like the intercity bus passenger boarding and alighting data. Table 14 shows the distribution of boarding and alighting station among Amtrak Thruway Bus passengers. Battle Creek and Toledo were the most popular boarding stations for Amtrak Thruway Bus passengers, with approximately 30 percent of passengers boarding at each. East Lansing was a popular origin and destination for Thruway Bus activity, with 20 percent of all boarding and 24 percent of all alighting activity taking place at that station. Detroit was also a popular destination station, with 20 percent of Thruway Bus passengers alighting at that station.

**Table 14: Amtrak Thruway Bus Passenger Boarding and Alighting Station**

Station	Amtrak Thruway Bus – All Routes	
	Boarding	Alighting
Ann Arbor (%)	--	8
Battle Creek (%)	32	8
Bay City (%)	--	1
Dearborn (%)	8	1
Detroit (%)	--	20
East Lansing (%)	20	24
Escanaba (%)	--	2
Flint (%)	3	3
Kalamazoo (%)	1	9
Marquette (%)	--	2
Milwaukee (%)	4	--
Owosso (%)	--	2
Saginaw (%)	--	3
Toledo (%)	31	16
Traverse City (%)	--	1
Note: Columns may not sum to 100 percent due to rounding		
-- Signifies no boarding or alighting activity recorded at station		
Source: 2011 MDOT Amtrak Thruway Bus Passenger Survey		

## Station Access and Egress Trip Details

Table 15 shows the distribution of travel mode and travel time for the bus passengers' access trip to the station prior to boarding the bus. Table 16 shows similar information for the egress trip to the bus passengers' final destination after departing the bus. Most intercity bus passengers access the boarding station in a private vehicle. However, the use of local bus service/commuter train or another connecting intercity bus to access the boarding station was particularly high among intercity bus passengers, as compared to intercity rail passengers. Similar patterns were reflected in the station egress trip mode among intercity bus passengers. The finding that approximately one-quarter of intercity bus passengers were connecting to or from another intercity bus reflects the need for passengers to transfer between intercity bus routes in order to reach the desired destination. A majority of Amtrak Thruway Bus passengers accessed the Thruway Bus boarding station by way of a connecting Amtrak train. This was not surprising since the Thruway Bus service is designed to connect with the Amtrak train service. The distribution of station egress trip mode choice among Thruway Bus passengers was more diverse than the access trip mode choice.

**Table 15: Bus Passenger Mode of Access and Travel Time to Boarding Station**

Travel Mode/Travel Time	Intercity Bus	Thruway Bus	Intercity Rail
<b>Access Trip Travel Mode</b>			
• Private Vehicle (%)	42	29	64
• Walk/Bicycle (%)	6	0	5
• Connecting Amtrak Train (%)	3	69	6
• Taxi/Shuttle (%)	7	0	14
• Local Bus Service/Commuter Train (%)	15	2	9
• Intercity Bus (%)	27	0	2
<b>Access Trip Travel Time</b>			
• Median Access Travel Time (Minutes)	24.0	>120	21.1
• 15 Minutes or Less (%)	41	22	39
• 16 – 30 Minutes (%)	15	10	26
• 31 – 45 Minutes (%)	9	4	14
• 46 – 60 Minutes (%)	5	0	8
• 61 – 120 Minutes (%)	6	7	5
• Over 120 Minutes (%)	24	56	8
Note: Columns may not sum to 100 percent due to rounding			
Median access trip travel time for the Thruway Bus passengers could not be estimated from data.			
Source: 2011 MDOT Intercity Bus and Intercity Passenger Rail Surveys			

Examining station access and egress travel times, most intercity bus passengers reported traveling 15 minutes or less to connect to or from the bus station. This was consistent with the distribution of access and egress travel times among intercity rail passengers. However, the percentage of passengers traveling over 120 minutes to or from the station was higher among intercity bus passengers as compared to intercity rail passengers. The distribution of access and egress trip times among Amtrak Thruway Bus passengers reflected the distribution of mode choice for these trips by passengers. Specifically, most Thruway Bus passengers reported traveling over 120 minutes to access the service and there was a more uniform distribution of reported travel times for the egress trip among Thruway Bus passengers. The estimated median access and egress times among intercity bus passengers were approximately 24 minutes and 31

minutes, respectively, slightly greater than the estimated median access and egress times among intercity rail passengers. The estimated median access and egress times were highest among Amtrak Thruway Bus passengers. However, due to the method used to calculate the median access and egress travel times, the median station access travel time for Amtrak Thruway Bus passengers could not be estimated because more than 50 percent of passengers reported an access travel time in the “over 120 minutes” category.

**Table 16: Bus Passenger Mode of Egress and Travel Time from Alighting Station**

Travel Mode/Travel Time	Intercity Bus	Thruway Bus	Intercity Rail
<b>Egress Travel Mode</b>			
• Private Vehicle (%)	53	52	52
• Walk/Bicycle (%)	5	4	7
• Connecting Amtrak Train (%)	1	32	9
• Taxi/Shuttle (%)	7	4	21
• Local Bus Service/Commuter Train (%)	12	3	9
• Intercity Bus (%)	22	4	1
<b>Egress Travel Time</b>			
• Median Egress Travel Time (Minutes)	31.1	46.9	23.1
• 15 Minutes or Less (%)	32	23	36
• 16 – 30 Minutes (%)	17	12	25
• 31 – 45 Minutes (%)	11	14	11
• 46 – 60 Minutes (%)	8	9	6
• 61 – 120 Minutes (%)	9	9	6
• Over 120 Minutes (%)	25	34	16
Note: Columns may not sum to 100 percent due to rounding			
Source: 2011 MDOT Intercity Bus and Intercity Passenger Rail Surveys			

### Passenger Trip Purpose

Table 17 shows the distribution of passenger trip purpose for intercity bus and Amtrak Thruway Bus passengers. A majority of intercity bus passengers were traveling to visit friends, family, or relatives, with 59 percent of intercity bus passengers reporting this trip purpose. Personal Business was the second most-common trip purpose among intercity bus passengers (13 percent). A majority of Amtrak Thruway Bus passengers (63 percent) also reported visiting friends, family, or relatives as the primary trip purpose.

**Table 17: Bus Passenger Trip Purpose**

Bus Passenger Trip Purpose	Intercity Bus	Thruway Bus	Intercity Rail
Commuting to/from Work (%)	4	2	3
Going to/from Business Trip (%)	4	8	11
Going to/from School/University/College (%)	9	4	5
Going to/from Entertainment (%)	1	3	3
Visiting Friends/Family/Relatives (%)	59	63	40
Shopping (%)	1	1	3
Personal Business (%)	13	3	5
Vacation (%)	9	15	29
Note: Columns may not sum to 100 percent due to rounding			
Source: 2011 MDOT Intercity Bus and Intercity Passenger Rail Surveys			

Comparing the trip purpose of bus passengers with the trip purpose of intercity rail passengers, several trends are evident from Table 17. As compared with intercity rail passengers, the percentage of passengers visiting friends, family, or relatives was substantially higher among intercity bus and Thruway Bus passengers. More intercity bus passengers reported a trip purpose of personal business or going to/from school/university/college than Thruway Bus passengers or intercity rail passengers. Conversely, fewer intercity bus or Thruway Bus passengers reported a trip purpose of vacation than intercity rail passengers.

### Motivations for Bus Use

Table 18 shows the considerations that most influenced the passengers' decision to use intercity bus or Amtrak Thruway Bus for their trip instead of other travel alternatives. As with Table 8, the findings shown in Table 18 are the percentage of bus passengers that selected "Yes" for each reason. For the most part, the motivations for using the bus among bus passengers were consistent with the motivations for using intercity rail among rail passengers. "Comfort While Traveling" was selected as a major consideration by approximately 21 percent of intercity bus and Thruway Bus passengers, as compared with 45 percent of intercity rail passengers. "Can't Drive/Don't Drive" was reported as a major consideration by approximately 19 percent of intercity bus passengers, as compared with 5 percent of Thruway Bus passengers and 7 percent of intercity rail passengers.

**Table 18: Bus Passenger Reasons for Deciding to Make Trip by Bus**

Reason for Making Trip by Bus	Intercity Bus	Thruway Bus	Intercity Rail
Convenience of Schedule (%)	37	40	38
Overall Travel Time (%)	21	19	19
Comfort While Traveling (%)	21	21	45
Total Cost of Trip (%)	55	58	61
Personal Safety (%)	10	13	5
Travel Safety (%)	11	4	7
Can't Drive/Don't Drive (%)	19	5	7
Other Reason (%)	8	5	9
Note: Percentages displayed show percent of passengers responding "Yes" to each item. Columns may sum to greater than 100 percent because passengers were allowed to select up to three reasons.			
Source: 2011 MDOT Intercity Bus and Intercity Passenger Rail Surveys			

### Additional Bus Trip Information

Table 19 displays additional trip characteristics as reported on the survey by intercity bus and Thruway Bus passengers. Only 16 percent of intercity bus passengers reported that the surveyed trip was their first trip on an intercity bus. This compares to 20 percent of Thruway Bus passengers and 30 percent of intercity rail passengers reporting first-time trips on these modes when the surveys were being conducted. The average number of trips in the 12 months prior to the survey period was 5.7 trips for intercity bus passengers and 6.8 trips for Thruway Bus passengers, both lower than the average number of rail trips during the same period among intercity rail passengers. Approximately one-third of Thruway Bus passengers reported that they had been denied a reservation due to seats being sold out. Also, only 62 percent of Thruway Bus

passengers reported that their travel group was able to sit together during the surveyed trip, substantially lower than the comparable figure for intercity rail passengers. Travel group size for intercity bus passengers was approximately 1.5 persons per travel group or about one-half the group size for Thruway Bus passengers (2.7 persons per group). The travel group sizes for Thruway Bus was consistent with the travel group size for intercity rail passengers. More than 90 percent of passengers across the three modes surveyed would use their respective modes again in the future, suggesting a high level of overall satisfaction with existing services.

**Table 19: Bus Passenger Additional Trip Characteristics**

<b>Trip Characteristics</b>	<b>Intercity Bus</b>	<b>Thruway Bus</b>	<b>Intercity Rail</b>
First Trip on Bus/Thruway (% Yes)	16	20	30
Average Number of Trips in Past 12 Months	5.7	6.8	7.1
Denied Reservation Due to Seats Sold Out (%)	--	32	9
<b>Majority of Bus Trips:</b>			
• Within Michigan (%)	63	--	--
• To Origin/Destination Outside Michigan (%)	37	--	--
Existing Schedule Meets Needs (% Yes)	86	--	--
Will Use Bus Again in the Future (% Yes)	93	92	99
Average Travel Group Size	1.5	2.7	3.1
Travel Group Able to Sit Together (%)	--	62	90
Source: 2011 MDOT Intercity Bus and Intercity Passenger Rail Surveys			

Two questions specific to the intercity bus passenger survey form examined the usage patterns and schedule preferences among intercity bus passengers. Nearly two-thirds of intercity bus passengers reported that a majority of their intercity bus trips were within Michigan, while 37 percent of intercity bus passengers reported that a majority of their intercity bus trips were to an origin or destination outside of Michigan. A strong majority (86 percent) of intercity bus passengers agreed that the existing intercity bus schedule meets their needs.

## **BUS PASSENGER DEMOGRAPHIC PROFILE**

Demographic profile information collected on the intercity bus passenger survey was similar to that collected on the intercity rail passenger survey. Table 20 reports the state of residence for intercity bus and Amtrak Thruway Bus passengers. Michigan residents comprised approximately 84 percent of the intercity bus ridership, as compared with 76 percent of the intercity rail ridership.

**Table 20: Bus Passenger State of Residence**

<b>State</b>	<b>Intercity Bus</b>	<b>Thruway Bus</b>	<b>Intercity Rail</b>
Michigan (%)	84	55	76
Illinois (%)	3	12	16
Wisconsin (%)	2	1	1
Indiana (%)	1	0	1
Other U.S. States (%)	10	31	6
Note: Columns may not sum to 100 percent due to rounding			
Source: 2011 MDOT Intercity Bus and Intercity Passenger Rail Surveys			

Just 55 percent of Amtrak Thruway Bus passengers were Michigan residents. Approximately 31 percent of Amtrak Thruway Bus passengers were from Other U.S. States not specifically listed in Table 20, as compared with 10 percent of intercity bus passengers and 6 percent of intercity rail passengers. This difference was likely due, in part, to the connections between the Amtrak Thruway Bus service and Amtrak long-distance routes (via Toledo, Ohio), providing nearly-seamless travel between Michigan and the eastern U.S.

Figure 5 shows the specific location of the home residential zip code for Michigan intercity bus passengers. Figure 6 shows similar information for Michigan Amtrak Thruway bus passengers. As with Figure 3, each marker on the maps in Figure 5 and Figure 6 represents a zip code in which at least one passenger reported a home residence.



**Figure 5: Residential Location of Michigan Intercity Bus Passengers**

The passenger zip code locations shown in Figure 5 represent 89.2 percent of all the intercity bus passengers surveyed that provided a valid zip code response. Intercity bus passengers reported home residential locations clustered around the state’s major urban areas with an otherwise fairly uniform spread of passenger residential locations around the state,

including several passengers from communities in the Upper Peninsula area. The passenger zip code locations shown in Figure 6 represent 68.7 percent of all the Amtrak Thruway Bus passengers surveyed that provided a valid zip code response. Most Thruway Bus passengers were clustered around the East Lansing area. This was not surprising, as East Lansing is a major destination for Amtrak Thruway Bus routes from points east (via Toledo) and west (Chicago via connection with the *Wolverine* rail service in Battle Creek) (3).



**Figure 6: Residential Location of Michigan Amtrak Thruway Bus Passengers**

Table 21 reports the remaining demographic profile information for the intercity bus and Amtrak Thruway Bus passengers. Passengers from zero-vehicle households were more prevalent among intercity bus passengers than among Thruway Bus or intercity rail passengers. One-third of intercity bus passengers reported being in the 18 to 24 years age group, and the median age of the intercity bus passengers was estimated to be 31.5 years. The median age of the Thruway Bus passengers was estimated to be 34.5 years, older than intercity bus passengers but younger than intercity rail passengers. Approximately one-quarter of intercity bus and Thruway Bus passengers reported full-time employment status, as compared with nearly half of intercity rail passengers. By contrast, the percentage of students was higher among the intercity

bus and Thruway Bus passengers than among intercity rail passengers. The share of unemployed passengers was highest among intercity bus passengers (19 percent). Annual household income was lowest among intercity bus passengers, with more than half of intercity bus passengers reporting annual household incomes less than \$20,000. The median income among intercity bus passengers was estimated to be \$19,100, slightly more than half of the estimated median income of Thruway Bus passengers (\$37,900) and nearly \$45,000 less than the estimated median income for intercity rail passengers.

**Table 21: Bus Passenger Demographic Characteristics**

<b>Characteristic</b>	<b>Intercity Bus</b>	<b>Thruway Bus</b>	<b>Intercity Rail</b>
<b>Gender (% Female)</b>	53	66	62
<b>Household Vehicles</b>			
• None (%)	36	16	8
• One (%)	26	38	25
• Two (%)	25	31	39
• Three or More (%)	12	15	28
<b>Age Group</b>			
• Median Age	31.5	34.5	38.3
• 12 to 17 years (%)	5	15	10
• 18 to 24 years (%)	33	24	19
• 25 to 34 years (%)	17	11	16
• 35 to 44 years (%)	12	13	17
• 45 to 54 years (%)	18	18	17
• 55 to 64 years (%)	11	9	13
• 65 to 74 years (%)	3	8	7
• 75 years and over (%)	1	2	2
<b>Current Employment Status</b>			
• Employed Full-Time (%)	24	27	46
• Employed Part-Time (%)	14	6	11
• Retired (%)	12	14	11
• Homemaker (%)	6	7	4
• Student (Other than College, %)	8	18	10
• University/College Student (%)	17	21	12
• Unemployed (%)	19	7	5
<b>Annual Household Income</b>			
• Median Household Income	\$19,100	\$37,900	\$63,800
• Under \$10,000 (%)	36	21	10
• \$10,000 to \$19,999 (%)	15	9	4
• \$20,000 to \$29,999 (%)	16	6	9
• \$30,000 to \$39,999 (%)	11	18	6
• \$40,000 to \$49,999 (%)	6	8	10
• \$50,000 to \$74,999 (%)	9	21	19
• \$75,000 to \$99,999 (%)	4	8	14
• \$100,000 or More (%)	2	10	27
Note: Columns may not sum to 100 percent due to rounding			
Source: 2011 MDOT Intercity Bus and Intercity Passenger Rail Surveys			

## BUS PASSENGER ALTERNATIVE TRAVEL MODES

Table 22 shows the distribution of preferred alternative travel modes among intercity bus and Amtrak Thruway Bus passengers. As with the rail survey, bus passengers were asked to consider four options – airplane, bus, motor vehicle, and would not make the trip – and rank the four options from the most preferred alternative to the least preferred alternative. However, most passengers did not comply with these directions and simply selected their preference rather than providing a rank for each of the modes. Consistent with the rail survey analysis, the passengers’ preferred alternative travel mode for this analysis was assumed to be the mode provided in the response (if only one mode was selected) or the passenger’s first preference if the ranking was provided. Intercity bus was inadvertently included as an option for this question on the intercity bus survey; consequently, passengers were asked to disregard that option and only select from the remaining three options when filling out the survey.

Consistent with the alternative travel mode patterns of intercity rail passengers, personal vehicle was the preferred alternative travel mode among intercity bus passengers (59 percent) and Amtrak Thruway Bus passengers (43 percent). The use of airplane as an alternative travel mode was particularly high among Thruway Bus passengers, possibly reflecting the Thruway Bus trip being a segment of a longer-distance trip for which airplane would be a more practical alternative travel option.

**Table 22: Bus Passenger Alternative Travel Mode**

Alternative Travel Mode	Intercity Bus	Thruway Bus	Intercity Rail
Airplane (%)	19	27	19
Intercity Bus (%)	--	21	10
Motor Vehicle (%)	59	43	63
Would Not Make the Trip (%)	22	9	8
Note: Columns may not sum to 100 percent due to rounding			
Source: 2011 MDOT Intercity Bus and Intercity Passenger Rail Surveys			

Approximately 22 percent of intercity bus passengers reported that they would not make the trip if the intercity bus service was not available. This percentage was markedly higher than the percentage of Thruway Bus passengers or intercity rail passengers that would not make the trip if the respective modes were not available, 9 percent and 8 percent, respectively. The finding that approximately one out of every five intercity bus trips would not be made if the bus services did not exist suggests that Michigan intercity bus services play a critical role in supporting personal mobility for the passengers that use them.

## CHAPTER 5: CONCLUSIONS

Seeking a more comprehensive understanding of the needs and issues of travelers, MDOT conducted an on-board survey of passengers of its intercity passenger rail, intercity bus, and Amtrak Thruway Bus routes in Spring 2011. This report described the survey background and TTI analysis of the 2011 MDOT intercity rail and intercity bus passenger survey data. The analysis revealed valuable information about Michigan intercity rail and bus passengers that can be used by MDOT for intermodal planning and public outreach activities. This chapter summarizes the key findings from the three surveys and provides recommendations for future research projects on this topic.

### SUMMARY OF FINDINGS

A total of 2,363 surveys were obtained from intercity rail passengers on the three Michigan Amtrak routes (*Wolverine*, *Blue Water*, and *Pere Marquette*), achieving a participation rate of slightly less than 40 percent. Key findings from the TTI analysis of the intercity rail passenger survey data are as follows:

- Most intercity rail passengers traveled to or from the rail station in a private vehicle. The estimated median travel time for trips to or from the rail station was between 20 and 30 minutes, depending upon the route.
- Most intercity rail passengers on the three routes were traveling for personal reasons, such as visiting friends/family/relatives or vacation. Passengers traveling to/from a business trip were also common on the *Wolverine* and *Blue Water* routes.
- The percentage of passengers traveling to/from a school/university/college was higher on the *Wolverine* and *Blue Water* routes. These two routes also reported the highest percentage of passengers in the “18 to 24 years” age group and reporting “University/College Student” as their employment status. This finding indicates that Michigan Amtrak services support mobility for students traveling to or from the many institutions of higher education located along these two routes.
- Total cost of the trip was an important factor for passengers when choosing the train instead of other modes, with 60 percent of passengers citing this reason.
- Approximately 85 percent of passengers on the *Blue Water* and *Pere Marquette* routes reported a home residence within Michigan. By contrast, only 69 percent of *Wolverine* passengers reported a home residence in Michigan, with 22 percent of *Wolverine* passengers reporting a home residence in Illinois.
- Among all intercity rail passengers that reported a home residence in Michigan, slightly more than half reported a residence in six of the state’s larger counties: Ingham, Kalamazoo, Kent, Oakland, Washtenaw, and Wayne. In total, 68 of Michigan’s 83 counties were represented among the home residences of intercity rail passengers.
- Intercity rail passengers were mostly female with an estimated median age of 38 years. More than 90 percent of passengers had access to at least one vehicle in their household. Slightly less than half of intercity rail passengers reported full-time employment status, and the estimated median annual household income was approximately \$65,000.

Approximately 14 percent of intercity rail passengers reported an annual household income less than \$20,000.

- A majority of Michigan intercity rail passengers would drive a motor vehicle for their trip if the rail service was not available. Only 8 percent of passengers would not make the trip if the rail service was not available.
- Trends in passenger alternative travel mode by household vehicles and annual household income indicate that the Michigan Amtrak intercity passenger rail service is filling a critical transportation need in the state by supporting personal mobility for population groups that might have difficulty accessing other alternatives.

A total of 533 surveys were obtained from intercity bus passengers on the various intercity bus routes in Michigan. Key findings from the TTI analysis of the intercity bus passenger survey data are as follows:

- While private vehicle was the most-frequently used mode for travel to or from the bus station, approximately one-quarter of intercity bus passengers reported transferring to or from another intercity bus.
- Trip purpose among intercity bus passengers was generally consistent with the trip purpose for rail passengers, with most trips being taken for personal reasons. Personal Business was a trip purpose for 13 percent of intercity bus passengers, as compared with only 5 percent of rail passengers.
- Intercity bus passengers reported similar motivations for selecting the bus for the trip as intercity rail passengers did for selecting rail. However, the percentage of intercity bus passengers selecting “Can’t Drive/Don’t Drive” as a major consideration was 19 percent, as compared with 7 percent for intercity rail passengers.
- A majority of intercity bus passengers reported that most of their bus trips are within the State of Michigan and a strong majority of intercity bus passengers agreed that the existing intercity bus schedule meets their needs.
- The demographic profile of intercity bus passengers showed some contrast with the profile of intercity rail passengers. Notably, 36 percent of intercity bus passengers reported being from zero-vehicle households, as compared with only 8 percent of intercity rail passengers. 19 percent of intercity bus passengers reported being unemployed, as compared with 5 percent of intercity rail passengers. The estimated median income among intercity bus passengers was \$19,100, as compared with the median income among intercity rail passengers estimated at \$63,800.
- Approximately 60 percent of intercity bus passengers would use a personal vehicle for their trip if the bus was not available as an option. Twenty-two percent of intercity bus passengers reported that they would not make the trip if the bus was not available. By contrast, only 8 percent of rail passengers would not make the trip if the rail service was not available.

A total of 94 surveys were obtained from Amtrak Thruway Bus passengers. Key findings from the TTI analysis of the Thruway Bus passenger survey data are as follows:

- Not surprisingly, use of a connecting Amtrak train to travel to or from the Thruway Bus was high among Thruway Bus passengers.

- The distribution of passenger trip purpose among Thruway Bus passengers was similar to the trip purpose distribution among intercity rail passengers.
- Approximately one-third of Thruway Bus passengers reported that they had been denied a reservation because seats were sold out. It is recommended that MDOT investigate this issue further to determine if additional capacity is needed on Thruway Bus routes.
- Among Thruway Bus passengers, 31 percent reported a home residence in a U.S. state other than Illinois, Indiana, Michigan, or Wisconsin. By contrast, only 10 percent of intercity bus passengers and 6 percent of intercity rail passengers reported being from outside those states. This difference was likely due to the connections provided by the Thruway Bus between Michigan and states in the eastern U.S. via a connection with Amtrak long-distance trains in Toledo, Ohio.
- The demographic profile of Thruway Bus passengers reflected a strong presence of younger individuals who reported employment status as a student. The estimated median annual household income among Thruway Bus passengers was \$37,900, twice as high as the estimated median income for intercity bus passengers but \$25,000 lower than the estimated median income for intercity rail passengers.

## **FUTURE RESEARCH**

The comprehensive network of intercity passenger rail, intercity bus, and Amtrak Thruway Bus service in Michigan offers an ideal setting for future research on the mobility, social and economic impacts of a truly multimodal statewide transportation system. The survey questionnaire used in the 2011 rail passenger survey was two pages in length and contained significantly fewer questions than the survey questionnaire that was used in the 2007 survey, which was four pages in length and contained more detailed questions examining the passenger's attitudes and decision-making for intercity travel (2). Future surveys may wish to include some of these questions from the 2007 survey that were excluded from the 2011 survey in order to obtain more detailed passenger information. It is also recommended that future surveys separate the "Private Vehicle" category for the station access and egress trip into two categories, one for driving and parking at the station, and another for being dropped-off/picked-up at the station. This would provide more valuable information about station access/egress mode split and better-inform planning for new rail station facilities in the state. Another area of great importance is the economic impacts of the state investment in intercity rail and bus services. Future passenger surveys should consider adding one or more questions measuring these economic impacts so as to provide a more robust assessment of the state's return on investment in statewide multimodal passenger transportation. Studies incorporating a "direct measurement" approach to evaluating the economic impacts of intercity passenger rail service exist for the Amtrak *Heartland Flyer* (7) and *Downeaster* (8) services. Conducting a similar study on Michigan routes would complement an economic impact of intercity passenger rail stations study previously undertaken for MDOT by researchers at Grand Valley State University (9). Future surveys should also be sure to include questions related to any new MDOT rail planning and outreach needs that may arise.

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11) When you decided to make **this** trip by train, which of the following considerations was most important when making your choice? (Select up to three)

- |   |   |
|---|---|
| <input type="checkbox"/> A: Convenience of schedule | <input type="checkbox"/> E: Personal safety   |
| <input type="checkbox"/> B: Overall travel time     | <input type="checkbox"/> F: Travel safety     |
| <input type="checkbox"/> C: Comfort while traveling | <input type="checkbox"/> G: Can't/don't drive |
| <input type="checkbox"/> D: Total cost of trip      | <input type="checkbox"/> H: Other _____       |

12) Is this your first trip on Amtrak?  A: Yes  B: No

If No, not counting this trip, how many other trips have you made during the past 12 months on Amtrak?  
(count a round trip as two trips) \_\_\_\_\_

13) Have you ever been denied a reservation because seats were sold out?  A: Yes  B: No

14) Will you use Amtrak again in the future?  A: Yes  B: No

If No, why? \_\_\_\_\_

**The following questions will enable MDOT and Amtrak to better understand the travelers we are serving.**

15) Where do you live? *College students please answer for your place of residence while attending school.*

Zip code \_\_\_\_\_

16) What is your gender?  Male  Female

17) What is your age?

- |                                   |                                   |                                   |  |
|-----------------------------------|-----------------------------------|-----------------------------------|--|
| <input type="checkbox"/> A: 12-17 | <input type="checkbox"/> C: 25-34 | <input type="checkbox"/> E: 45-54 | <input type="checkbox"/> G: 65-74      |
| <input type="checkbox"/> B: 18-24 | <input type="checkbox"/> D: 35-44 | <input type="checkbox"/> F: 55-64 | <input type="checkbox"/> H: 75 or over |

18) Which of the following best describes your current employment status?

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> A: Employed full-time | <input type="checkbox"/> D: Homemaker                    | <input type="checkbox"/> G: Unemployed  |
| <input type="checkbox"/> B: Employed part-time | <input type="checkbox"/> E: Student (other than college) | <input type="checkbox"/> H: Other _____ |
| <input type="checkbox"/> C: Retired            | <input type="checkbox"/> F: University/college student   |   |

19) How many people (including yourself) are traveling in your group? \_\_\_\_\_

Were you able to sit together?  A: Yes  B: No

20) How many vehicles (cars, vans, trucks) do the people living in your household own or lease?

*College students please answer for your place of residence while attending school.*

- A: None  B: One  C: Two  D: Three or more

21) What is your current annual household income (the sum of all people who live in your household)?

- |   |   |   |   |
|---|---|---|---|
| <input type="checkbox"/> A: Under \$10,000    | <input type="checkbox"/> C: \$20,000 – 29,999 | <input type="checkbox"/> E: \$40,000 – 49,999 | <input type="checkbox"/> G: \$75,000-99,999   |
| <input type="checkbox"/> B: \$10,000 - 19,999 | <input type="checkbox"/> D: \$30,000 – 39,999 | <input type="checkbox"/> F: \$50,000 – 74,999 | <input type="checkbox"/> H: \$100,000 or more |

22) Please share any comments or suggestions you may have for improving passenger rail services.

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**If you have additional comments or suggestions for improving Michigan rail passenger services, please ask the MDOT representative for a contact card when they collect your survey.**



Prepared by: MDOT Graphic Design & Mapping Unit  
Planning/Intercity Surveys 2011 (03/11 rfd) 1000 copies printed @ \$0.08 each for a total cost of \$80



12) Is this your first trip on a bus?  A: Yes  B: No

If No, not counting this trip, how many other trips have you made during the past 12 months on the bus?  
(count a round trip as two trips) \_\_\_\_\_

13) Are the majority of your trips using the bus  A: Within Michigan  B: To an origin or destination outside of Michigan

14) Does the existing schedule meet your needs?  A: Yes  B: No

If No, why? \_\_\_\_\_

15) Will you use the bus again in the future?  A: Yes  B: No

If No, why? \_\_\_\_\_

**The following questions will enable MDOT and the bus company to better understand the travelers we are serving.**

16) Where do you live? *College students please answer for your place of residence while attending school.*

Zip code \_\_\_\_\_

17) What is your gender?  Male  Female

18) What is your age?

A: 12-17  C: 25-34  E: 45-54  G: 65-74  
 B: 18-24  D: 35-44  F: 55-64  H: 75 or over

19) Which of the following best describes your current employment status?

A: Employed full-time  D: Homemaker  G: Unemployed  
 B: Employed part-time  E: Student (other than college)  H: Other \_\_\_\_\_  
 C: Retired  F: University/college student

20) How many people (including yourself) are traveling in your group? \_\_\_\_\_

21) How many vehicles (cars, vans, trucks) do the people living in your household own or lease?

*College students please answer for your place of residence while attending school.*

A: None  B: One  C: Two  D: Three or more

22) What is your current annual household income (the sum of all people who live in your household)?

A: Under \$10,000  C: \$20,000 – 29,999  E: \$40,000 – 49,999  G: \$75,000-99,999  
 B: \$10,000 - 19,999  D: \$30,000 – 39,999  F: \$50,000 – 74,999  H: \$100,000 or more

23) Please share any comments or suggestions you may have for improving bus services.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**If you have additional comments or suggestions for improving Michigan bus services,  
please ask the MDOT representative for a contact card when they collect your survey.**



## APPENDIX C: RAIL SURVEY RESPONSE RATE ANALYSIS

**Table C-1: Response Rates for Intercity Rail Passenger Surveys**

Date	Train Number	Surveys Returned	Total Passengers	Response Rate
March 24, 2011	350	37	117	31.6%
	353	92	267	34.5%
	354	142	225	63.1%
	355	111	187	59.4%
March 26, 2011	350	86	203	42.4%
	353	205	269	76.2%
	354	100	164	61.0%
	355	36	129	27.9%
March 31, 2011	351	128	460	27.8%
	352	119	494	24.1%
	364	103	478	21.5%
	365	121	526	23.0%
	370	107	270	39.6%
	371	104	349	29.8%
April 2, 2011	351	214	442	48.4%
	352	84	212	39.6%
	364	101	250	40.4%
	365	187	445	42.0%
	370	117	186	62.9%
	371	169	248	68.1%
<b>Total Wolverine</b>	<b>350-355</b>	<b>1,354</b>	<b>3,169</b>	<b>42.7%</b>
<b>Total Blue Water</b>	<b>364-365</b>	<b>512</b>	<b>1,699</b>	<b>30.1%</b>
<b>Total Pere Marquette</b>	<b>370-371</b>	<b>497</b>	<b>1,053</b>	<b>47.2%</b>
<b>Total All Routes</b>	<b>All Trains</b>	<b>2,363</b>	<b>5,921</b>	<b>39.9%</b>