

Evaluating the Appropriate Level of Service for Michigan Rest Areas and Welcome Centers Considering Safety and Economic Factors

Executive Summary

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EXECUTIVE SUMMARY

The Michigan Department of Transportation (MDOT) currently operates and maintains 81 rest areas, including 14 welcome centers, along freeways and other major roadways. Public rest areas in Michigan serve a broad range of travelers, including vacation/recreational travelers, commercial vehicle operators, commuters, motorcyclists, bus tours, and others. A majority of travelers stopping at rest areas desire a restroom break or simply a stretch or short break. Other patrons utilize rest areas for picnicking, vending machines, relief for children or pets, vehicle maintenance, to change drivers, obtain travel information, or even sleep. Rest areas provide the distinct advantage of quick access and facilities that are open 24 hours per day.

Recent economic challenges have forced MDOT to reassess the functional value of rest areas, particularly those near commercial service facilities, such as gas stations, fast-food restaurants, or truck stops, as these locations typically provide services similar to or above those provided at rest areas. However, commercial service facilities do not provide the level of convenient access provided by most rest areas and do not possess many of the unique intrinsic benefits present at rest areas. Although MDOT has closed rest area facilities in the past due to various reasons, there were several issues related to rest area closure that required thorough investigation before such decisions could be made. As MDOT was scheduled to update the *Strategic Rest Area/Welcome Center Plan* in 2012, it was necessary to perform research to investigate these issues.

Although it is generally acknowledged that rest areas possess many intrinsic benefits to motorists, the safety and economic impacts associated with Michigan rest areas and welcome centers have remained largely unknown. As such, it was necessary to determine the value of rest areas to both users and MDOT. The overall goal of this research was to determine the value of rest areas and welcome centers, both individually and as a system, to determine the appropriate level of service for rest areas on MDOT roadways. Consideration was given to both the economic value of rest areas, in addition to the functional value provided by rest areas. Several tasks were performed as part of this research to help achieve this goal.

The research began with a comprehensive state-of-the-art review of rest area management and operations in the United States. From there, a comprehensive inventory of MDOT's existing rest areas and alternative commercial service facilities, including gas stations, fast food restaurants, and truck stops, was performed. Fatigue-related crash data were collected

and analyzed to determine potential safety impacts that are impacted by the presence or absence of rest areas. Face-to-face user surveys were performed at both rest areas and selected commercial service facilities to better understand why travelers select one type of facility over another and to provide insight as to how users value the services utilized during a rest area stop. Telephone surveys of truck stop operators were also performed along with nighttime truck parking utilization surveys to identify parking capacity issues along the major trucking routes. Data were collected regarding utilization characteristics of each rest area in order to determine usage trends and patterns for the rest area network. Economic data associated with rest areas, including benefits and costs, were also either obtained or estimated. These data were utilized to calculate the benefit/cost ratio for MDOT rest areas – both individually and as a system – according to the following equation:

$$\frac{B}{C} = \frac{\text{Vehicle Operating Benefits} + \text{Excess Travel Time Benefits} + \text{Comfort and Convenience Benefits} + \text{Tourism Benefits} + \text{Safety Benefits}}{\text{Amortized Construction Costs} + \text{Annual Operating Costs} + \text{Annual Maintenance Costs}}$$

The results of the economic analysis showed that nearly all but three MDOT rest areas and welcome centers currently possess B/C ratios that exceed 1.0, with values for the 81 individual facilities ranging between 0.78 and 11.66. Thus, with few exceptions, each of the 81 facilities may be considered economically viable. The total systemwide benefits for 2011 totaled \$88.65 million, compared to total costs of \$19.43 million. The systemwide B/C ratio was found to be 4.56. This overall B/C value fell within the range of 3.2 to 7.4 reported in previous research. A majority of the benefits originated from a combination of comfort/convenience (i.e., the “value” to users), reduction of targeted fatigue-related crashes (estimated at 3.37 crashes per facility per year) and tourism benefits (welcome centers only).

Many of the monetary benefits associated with a facility were calculated based largely on traffic or visitor volumes and the subsequent B/C ratios were strongly correlated with facility utilization. Accordingly, the facilities with the highest economic value included the large, heavily utilized welcome centers in the Lower Peninsula (due to tourism, comfort/convenience, and fatigue crash reduction benefits) along with heavily utilized rest areas along major freeways in the southern Lower Peninsula (due to comfort/convenience and fatigue crash reduction benefits). The least economically viable facilities were those with the lowest utilization rates –

particularly facilities located in the North and Superior Regions and especially those that are closed during winter months.

In addition to assessment of the various economic related components that are associated with rest areas, it was also important to consider other factors that could not be monetarily quantified when determining the relative value of each rest area and welcome center facility. Such non-economic factors included those related to the availability of alternate facilities, including other rest areas, commercial truck stops, fast food restaurants, and gas stations, along with several facility-related features. An overall value index score was calculated with equal consideration given to economic and non-economic factors. The three top scoring facilities based on the value index were the Clare, New Buffalo, and Monroe Welcome Centers. These facilities were clearly separated from the others in terms of overall value scores and were followed by the Coldwater Welcome Center and the Portland, Belleville, Northfield Church, Potterville, Glenn, Turkeyville, and Battle Creek Rest Areas.

Although the economic and functional values were computed for each rest area and also systemwide, they only represent a “snapshot” based on current data and assumptions. To provide flexibility for future forecasting and planning, the economic, functional, and overall value assessment methodologies were embedded into an Excel spreadsheet, allowing the user to update any data, weights, and/or other assumptions, as necessary. This also makes it possible to experiment with the addition of a new rest area – or removal of an existing rest area – and receive an estimate of the resulting impacts, both on the nearby facilities and systemwide. This software tool has been provided to MDOT in Excel format as a companion to this report.

As all but three current facilities possess B/C ratios greater than 1.0, implementation of new rest area facilities would likely prove to be economically viable for MDOT. This is particularly true if the facility was to fill an existing gap on the limited access freeway system in southern Michigan, particularly within the Grand or Southwest Region along eastbound I-94 or northbound US-131 or along M-6. Consider also that the availability of commercial service facilities is especially sparse in northeast and northwest Lower Peninsula, and the northern Thumb area, suggesting the potential need for a facility along US-23, M-25, US-31, or M-115 in those areas. Other candidate roadways for additional rest areas or expansion of existing truck parking facilities include the section of I-94 from the Indiana border to Detroit and I-75 from the Ohio border to Saginaw as severe nighttime truck parking capacity issues were noted at both rest areas and commercial truck stops.