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## RAISED MEDIAN ECONOMIC IMPACT STUDY

### Prepared For:

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16. Abstract <p>Raised medians offer a departure from more traditional two-way left turn lanes typically built on Utah collector and arterial streets and can offer advantages in terms of safety, capacity, and aesthetics. At the same time, individual business owners often oppose raised medians due to fear of business loss.</p> <p>The purpose of this study is to evaluate the Utah-specific effects of raised medians on retail sales. Using recent projects, this study evaluates retail sales both before and after the implementation of raised medians. Sales analysis used taxable sales data obtained from the Utah State Tax Commission. Sales data were requested for one full calendar year preceding the initiation of construction and one full calendar year following project completion. Sales analysis was also performed for corresponding control corridors in which a similar roadway project was completed that did not include the installation of a raised median.</p> <p>For all of the corridors in which raised medians were constructed there was an increase in corridor-area retail sales and sales per square foot. Analysis showed that in every case there was no evidence of a negative impact on corridor sales due to installation of a raised median.</p> <p>A business impact survey was administrated to qualitatively evaluate the perceived impacts of each road project in front of individual businesses. Business owners on corridors where the project included the installation of a raised median typically perceived the actual results of the project more negatively than corridors where the project did not install a raised median.</p>					
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## EXECUTIVE SUMMARY

Raised medians offer a departure from more traditional two-way left turn lanes (TWLTL) typically built on Utah collector and arterial streets. In certain applications, raised medians offer proven advantages in terms of safety, capacity, and aesthetics. Raised center medians are promoted by many transportation experts for their ability to reduce conflict points on roadways and appeal to local governments' desire to improve streetscape appearance. At the same time, individual business owners often oppose raised medians due to a fear of business loss.

The purpose of this study is to evaluate the Utah-specific effects of raised medians on retail sales. Using recent projects as examples, this study evaluates retail sales both before and after the construction of raised medians. Existing research has primarily examined the safety, design and operational aspects of raised medians; however, there are a growing number of studies that evaluate the economic impacts. Some aspects of this research study have been inspired by similar studies performed in other states.

Three study and three control corridor pairs (six total corridors) were selected from a larger set of Utah corridors that had undergone a recent road construction project. Study corridors included the installation of a raised median. A corresponding control corridor was paired with each study corridor. The control corridor was a nearby roadway with a construction project completed in a similar time frame but did not include the installation of a raised median.

Analysis was performed using taxable sales data obtained from the Utah State Tax Commission. Sales data were requested for one full calendar year preceding the initiation of construction and one full calendar year following corridor construction project completion.

Data showed that there was an increase in corridor-area retail sales and sales per square foot in each of the study corridors in which a raised median was constructed. Sales per square foot increased between 5 percent and 100 percent depending on the corridor. Analysis showed that in every case there was no evidence of a negative impact on corridor retail sales due to installation of a raised median. It is important to note that this does not mean that each and every business within the corridor did better following installation of the median.

A business impact survey was administered to qualitatively evaluate the perceived impacts of the study and control corridor projects. Though not statistically significant, the results help supplement the sales analysis and offer a brief look at business owner perspectives. Overall, study corridors typically yielded more negative perceptions about the transportation project and its impacts than their control corridor counterparts. Essentially, business owners on corridors where the project included the installation of a raised median did not expect the road project to improve conditions and typically perceived the actual results of the project more negatively than corridors where the project did not install a raised median.

Survey questions were grouped by categories regarding sales, customer activity, safety and access. Business owners on study corridors were most likely to report negative, pre-project, expected impacts and experienced post-project impacts regarding the ease of deliveries, business access, sales, and number of customers response categories. Meanwhile, the traffic congestion, number of traffic crashes, and overall impact question categories were more likely to elicit neutral or positive responses in terms of both expectations and experiences. Thus, it appears business owners had a more optimistic view of the raised median project's impact on traffic operations than business related factors.

## **2.0 LITERATURE REVIEW**

### **2.1 Background**

This study is intended to add Utah-specific findings to the existing body of research regarding the impacts of raised medians. Existing research has primarily examined the design and operational aspects of raised medians; however, there are a growing number of studies that involve the economic impacts. Some aspects of this research study have been inspired by similar studies in other states. This section contains summaries of particularly relevant work undertaken is presented in chronological order.

### **2.2 Transportation Research Board Research Results Digest**

Weisbrod and Neuwirth (1998) released a digest of research regarding the business impacts of restricting left-turn traffic. A diversity of road designs and economic settings were studied through the nine case study sites included in the report. Researchers measured business impacts by studying shifts in economic and traffic data following the altered road design. Surveys and interviews of local officials, real estate experts, business owners, and customers also helped measure business impacts. The study concluded with developing a predictive model to estimate the effects of left-turn restriction projects.

The major conclusions on the study include:

1. When left-turns are restricted, gas stations, non-durable goods retailers, and service businesses showed the largest sales declines and highest rates of business change; the opposite occurred for grocery stores and restaurants.
2. Overall business owner impressions of left-turn restriction projects were mixed.
3. Business owners at mid-block locations had a negative impression of left-turn restriction projects.
4. Prime commercial sites in some study areas shifted following the installation of a raised median.

5. Surveyed customers indicated that restricted access to a particular business does not impact the frequency of their patronage.

### **2.3 Iowa**

Maze et al. (1999) investigated the impacts of access management treatments to corridors in Iowa. Safety, traffic, and business data were used to measure impacts caused by raised medians in case study areas. Economic impacts were analyzed through sales tax data, business turnover data, and business owner/manager interviews.

The major conclusions on the study include:

1. Business success was not, for the most part, diminished when access is managed.
2. Access management projects increased safety, decreased crash severity, reduced number of crashes, and reduced property damage.
3. Benefits of access management also included reduced delays.

### **2.4 Texas**

Eisele and Frawley (2000) summarized several years of research study in a 2000 report. The study remains one of the most in-depth analyses of raised-median economic impacts. The research produced a methodology that was used to measure the impacts of raised medians on local businesses. Results were acquired via customer and business owner surveys, employment data, sales data, and property value data.

The major conclusions on the study include:

1. In-person survey methods yielded a higher response rate (62 percent) than a mail-back survey (9 percent).
2. Business owners ranked "accessibility" below customer service, quality, and value when asked what drives their customers to choose their business.
3. Total number of employees along several corridors constructed with raised medians remained unchanged.

4. Property values rose on average by 6.7 percent after the construction of a median.
5. The most significant negative business impacts occurred during construction.
6. After construction, gasoline station and auto repair businesses indicated a small negative effect on gross sales, and slightly fewer customers per day.
7. After construction there was a 17.7 percent increase in customers per day for all businesses present for the entire construction cycle and a reduction in gross sales of 0.03 percent.
8. Perceptions of business owners present before, during, and after median construction were more favorable towards the effects of medians than the perceptions expressed before construction.

## **2.5 Washington State**

Vu et al. (2002) produced a statistical study to understand the perceived business impacts of access management styles. Impressions were gathered from 280 businesses along six major commercial corridors in western Washington via a paper, mail-back survey. Business owners were asked in the survey to provide their perceptions about the impacts of access management on their clientele, business type, current access control treatments, existing traffic conditions, and preferred access management treatment. The second portion of the report used the survey data to develop a statistical framework for analyzing perceived economic impacts of raised medians. Nearly 21 percent of businesses surveyed had accesses with right-in/right-out, the most restrictive access control type; and 13 percent had consolidated driveways.

The major conclusions on the study include:

1. The majority of businesses had some degree of concern about the ability of vehicles to exit and enter their driveway, at 76 percent and 73 percent, respectively.
2. Similarly, for impacts on business revenue, just over half of businesses reported negative effects due to their current access management.
3. Perceived economic impact due to access management is correlated to a businesses' accessibility.

4. Statistically significant factors that impact perceptions include business type, business operational variables, street environment variables, and willingness-to-pay amounts.

## **2.6 Utah**

Saito et al. (2005) compared median design types through eight case studies: four roads with raised medians and four without. Changes in customer travel behaviors were measured by researchers through a survey conducted at select businesses along case study corridors. The study sought to develop a procedure for timing new raised median projects, develop a consensus on economic impacts and examine safety data.

The major conclusions on the study include:

1. Of customers surveyed, 83 percent said they were just as likely to visit a business despite an inconvenience caused by a raised median.
2. Customers ranked accessibility as least important when choosing a business.
3. Most managers did not perceive a change in the volume of business after the installation of a raised median.

## **2.7 Minnesota**

Preston et al. (2007) studied the economic impacts of the mid 1980s upgrade of the US-12 highway to the I-394 freeway. As a result of this change, all direct accesses onto US-12 were closed and routed onto frontage roads. The Minnesota study evaluated the business impacts caused by the upgrade. Indicators, such as land value changes, income trends of nearby residents, retail activity, employment trends, business turnover rate, historic estimated market values, travel time comparisons, access path comparisons, and interviews from a sample of businesses are included in that study.

The major conclusions on the study include:

1. Perceived negative impacts were generally worse than actual impacts.

2. Business climate along the corridor improved with more businesses in existence after the impacts, some increasing sales and others number of employees.
3. Business success along the corridor is connected to adaptability in changing conditions.
4. Overall impacts on business are described from “neutral” to “very positive.”

## **2.8 North Carolina**

Cunningham et al. (2010) performed the only economic access management study conducted since the 2008 economic crisis. A major focus of the study was to provide the results using local case studies because business owners in North Carolina were skeptical of research which used case studies from other states. The study used a perception-based survey of local business owners and managers of 789 businesses along eight corridors with access management treatments. These results were compared against a baseline derived from eight “control” corridors.

The major conclusions on the study include:

1. Business owners reported no significant revenue changes caused by the raised medians.
2. Perceptions about the reduced number of customers were more negative than reality.
3. Single-location businesses were negatively impacted; however, larger economic conditions were the likely cause.
4. High business turnover was possibly attributable to anticipatory moving before construction and new businesses opening after construction.

## **2.9 Summary**

Studies influencing this research utilized quantitative and qualitative data. Most studies also compared impacts experienced on study and control corridors. Studies usually utilized eight to 16 case study corridors. The quantitative data were often safety, property value, business turnover rates, employment, sales, and traffic. Qualitative data were gathered from business owners, managers, and customers through surveys. Surveys usually involved topics such as sales,

number of customers, perceptions, and ease of access. A clear consensus among the studies holds that in-person surveys resulted in the highest response rates. Business owner skepticism of research from other states seems to be another common feature.

In general, studies found that business owner expectations before the installation of a raised median were more pessimistic than experience revealed. Most businesses did not experience a negative impact caused by the raised median. However, different business types experienced negative impacts to varying degrees. Surveys also found that factors determining an individual business' level of impact were location on the block, quality of access management, and business model. Businesses with a single location or relying on pass-by customers were more likely to experience negative impacts. Customer's impressions, when surveyed, indicated that a businesses' ease of access was only a slight influence on their behavior.