TECHSUMMARY November 2019

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Economic Effect of Restricted Crossing U-Turn Intersections in Louisiana

INTRODUCTION

The restricted crossing U-turn (RCUT) aka J-turn intersection is an innovative alternative intersection design that displaces left turn and through movements from the minor street in order to serve through traffic on the major street. The J-turn is capable of providing a relatively high level of service (LOS) to major road through traffic over a wide range of demands and may be implemented as an access management treatment. In addition to operational benefits, there is sufficient evidence that these designs significantly reduce severe injury crashes. The FHWA includes the J-turn in its list of "proven safety countermeasures." Compared to a traditional four-leg intersection, the J-turn dramatically reduces the number of conflict points, i.e., any point where the paths of two road users cross, diverge, or merge. The design benefits are provided at a relatively lower-cost than traditional treatments; however, state DOTs tend to face resistance from businesses near locations where J-turns are planned who fear a potential loss of business due to a perceived reduction in customer-ease of access from left-turn restrictions. Since 2011, DOTD has deployed about a dozen J-turn intersections at strategic locations and along major corridors throughout the state. This research will provide insight into the economic impact (real and perceived) of J-turns on local businesses and will assess the extent to which (if at all) J-turns have had a negative (quantifiable) impact on business. In the end, this research will help clarify the impact of J-turns on traffic safety and the economic priorities of local businesses, which DOTD and other SHSP stakeholders can use for more effective deployment of access management in Louisiana.

OBJECTIVE

The overall goal for this project was to assess the economic impact J-turns have had on businesses in the corridors where these treatments have already been implemented in Louisiana. A secondary goal is to assess access-related perceptions of businesses near these J-turns, as well as patrons visiting businesses in these locations. The analysis in this study can be used by DOTD for more effective communication about access management impacts in Louisiana.

SCOPE

The scope of the project includes 10 J-turn intersection locations in Louisiana and a limited survey of businesses and their patrons at these 10 locations. Sales data for two years before and after construction of the J-turns were analyzed.

METHODOLOGY

The primary data used in the analysis came from the Louisiana Department of Revenue, who provided sales tax data for individual business locations surrounding the J-turns. In order to examine to what extent J-turns are associated with an economic impact on nearby businesses, mean sales among businesses near the J-turns were analyzed two years before and two years after project completion. These sales tax series were transformed into total sales using the tax

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rates in each time period, and these total sales figures were the primary subject of analysis. In some of the analyses, parish level data were used to provide comparisons to local level economic trends. Total wages, employees, and establishments were acquired from the Quarterly Census of Employment and Wages for each parish where a J-turn was installed. Parish-wide sales tax revenue was acquired from each parish's tax collection agency. These parishes include: East Baton Rouge, Lafayette, St. Tammany, and Jefferson. By analyzing all businesses as a group as well as businesses active throughout the study period, the effects of J-turns can be examined at varying levels of detail.

To gain insight into perceptions of access to businesses in these locations, businesses within a half-mile of existing J-turns constructed from 2011-2013 and their patrons were surveyed. With the exception of a handful of businesses who participated by telephone interview at a later date, participants were recruited on-site by the research team (one day at each location). All data were collected electronically on iPads and facilitated in-person by the research team, accompanied by field supervisors with prior experience to monitor effort, manage the distribution of interviewers across businesses, and answer any questions throughout the day. Questionnaires were tailored to each group of respondents, with the objective to identify any access-related issues businesses in the area and their patrons were currently experiencing.

CONCLUSIONS

Sales data analysis showed an increase in aggregate mean sales after the J-turn installation. There is no evidence the J-turns had a negative effect on business sales at a macro level. Rather than harming sales, J-turns appear positively correlated with growth in areas where they have been installed. Analysis by year of installation yielded no evidence the J-turns had a negative impact on business sales in any year. Mean sales remained stable or they increased, and in all cases, sales one year after installation were higher than the year before installation at statistically significant levels. Mean sales increased over the study period (2011-2013) for businesses classified as "affected" and "unaffected" (in terms of travel distance impact from the J-turn). It is unlikely the increase in business sales could be due to the J-turns alone, as the increase overall suggests other factors are involved (such as the business climate in the parish/neighborhoods, the impact of additional development and/or population growth, etc.). Analysis at the parish level shows no evidence of a decline in sales, but rather, an increase. One parish that has been undergoing considerable growth in the state appeared to have mixed findings: looking at only businesses that existed before and after the J-turns were completed, some showed a slight decline in sales while the overall sales volume of all businesses around the J-turns increased. The decline at some isolated locations was likely due to increased competition from a number of new businesses near the J-turns. Overall, these findings suggest the construction of J-turns is associated with an increase in sales among businesses in their vicinity. This finding is consistent with research examining the economic impact of access management treatments in other states.

The survey of businesses and patrons suggests that, in general, perceptions of access coincide with primary concerns about congestion, traffic/backups, and (in some locations) perceptions of ongoing construction impacts. Reported concerns tended to be similar among business and patron respondents at the same location, suggesting local context plays a role in perceptions. In general, respondents described access-related difficulties in terms of traffic, congestion, and/or traffic-impacting factors such as rush hour times, road work, driver behavior, etc. While it is not possible to make inferences to the general population or to the broader local population in these locations, these findings provide insight into individuals' preferences and opinions about access to businesses in a particular location, where traffic conditions as well as land use patterns are locally contextualized.

RECOMMENDATIONS

To the extent possible, proactively addressing the concerns of businesses and stakeholders in preliminary stages of development before any major decisions have been made is necessary to foster a more cooperative environment and encourage productive dialog between all parties. Most citizens do not have a sufficient background in traffic engineering or planning and are unlikely aware of the many complexities behind roadway operations and systems management. Businesses may not inherently possess a frame of reference for considering access in these terms, but they are likely well-aware of the problems of congestion, travel delay, and bottlenecks. Traffic problems such as these are associated with a host of adverse and undesirable impacts. Relating access management to congestion and mobility concerns that impact all road users can provide a meaningful frame of reference.