

## Using medians to support safety and local businesses

When installed as part of a toolkit of street design elements, medians can improve safety and support nearby businesses. Portland 10-year data indicate that multilane streets with medians experience crash rates that are 40 percent lower relative to similar streets lacking medians.<sup>1</sup> National data mirror these local safety benefits, and also indicate that businesses do as well or better following median installation.

### Safety impact: Medians make streets safer for all people

A median is a barrier between opposing lanes of auto traffic. Gaps in the median allow people to drive onto and off of a street, and to make U-turns.

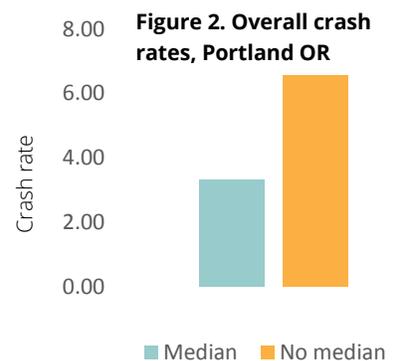
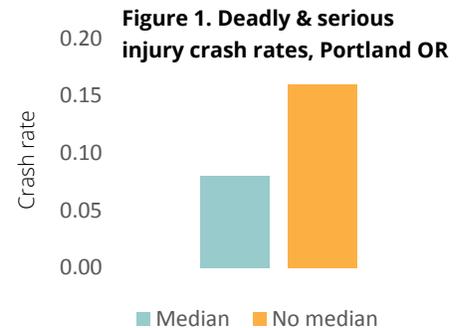
Streets featuring medians in Portland include large segments of SW Macadam Ave., NE Martin Luther King Jr. Blvd. and SE Powell Blvd.

Street segments with medians in Portland experience significantly lower crash rates relative to similar streets lacking medians. As Figures 1 and 2 show, the rate of deadly and serious injury crashes is 38 percent lower on Portland street segments with medians, while the overall crash rate is 40 percent lower.

Portland's experience with medians is backed by national findings. The Federal Highway Administration notes that medians may reduce crashes involving people walking by 46 percent and those involving people driving by 39 percent.<sup>2</sup>

The FHWA explains the crash reduction effect of medians by pointing to the following impacts:

- Reduce conflict points for people driving by helping people make turns safely
- Provide people walking with a safe place to stop at the midpoint of a street before crossing the remaining distance
- Enhance visibility of crosswalks, particularly at unsignalized crosswalks
- Can reduce the speed people drive when approaching crosswalks
- Provide space for safety signage



<sup>1</sup> Data is based on a comparison between 2000-09 crashes on nine High Crash Network multilane streets without raised medians and 2005-14 crashes on four multilane streets with raised medians.

<sup>2</sup> Medians and pedestrian crossing islands in urban and suburban areas, FHWA, FHWA-SA-12-011

In addition to enhancing safety, medians can make streets more attractive by providing a place to plant trees or other vegetation. While visibility can be a concern when adding vegetation, a Washington Department of Transportation study of 13 major urban arterials found that the presence of small trees in medians had no significant effect on crash rates.

**Economic results: Generally positive experiences from business owners & customers**

Studies have found that medians generally have neutral to positive economic effects on local businesses (see Table 1).

Based on before-and-after studies of medians from across the country, the Federal Highway Administration has found the following effects:

- **Higher sales:** The “vast majority of businesses do as well or better” after medians are installed.
- **Positive driving experience:** Business customers report that their drive became “quicker, easier, and safer.”
- **Easy U-turns:** “A majority of drivers have no problem making U-turns at median openings to get to businesses on the opposite side of the road.”
- **Continued deliveries:** “Truck deliveries may be inconvenienced, at worst, but may in fact benefit from improved opportunities resulting from a change in access.”

**Table 1.** Before and after median installation: Percent changes for customers per day, gross sales, and property values for businesses

	Customers per day	Gross sales	Property values
Durables retail	+5.0	+1.0	+17.5
Specialty retail	+7.8	+0.6	+3.7
Gas station	-5.0	-1.5	+30.0
Fast-food restaurant	+146.3	+0.2	+16.7
Sit-down restaurant	+1.3	+0.8	+0.0
Medical	+0.0	+0.0	+30.0
Auto repair	-6.3	-0.6	+3.3
Other services	-13.3	-0.7	+15.0

Source: Frawley, W.E. and W.L. Eisele (2000), Raised medians and economic impact on adjacent businesses

An Oregon Department of Transportation report summarized a number of studies examining the economic impact of medians. Among the findings:

- Ivey, Harris and Walls Inc. (1995) surveyed business operators following construction of medians, and found that more than half of the business owners reported no change or an increase in their sales after the median construction.
- Frawley and Eisele (1998) found that between 16 and 22 percent of business owners believed that their gross sales decreased following median construction. Eisele and Frawley (1999) later determined that those same corridors actually experienced an 18 percent increase in property values following median construction.
- Stover & Koepke (2000) found that 68 percent of business owners who participated in a survey reported little or no economic impact to their businesses following median construction, although 27 percent reported some type of loss following the closure of select median openings.

Research indicates that the economic effects of medians vary but are largely positive. For example, one study found that gas stations and auto-repair shops experienced slight declines in gross sales, but concluded that “in almost all cases, employment increased in businesses surveyed” following installation of a raised median (Frawley, W.E. and W.L. Eisele (2000)).

## References and notes

Matt Riffkin, Charles Allen, Michael Baker, Christine Richman, Jonathan Dorwart, **Raised median economic impact study**, Utah DOT, February 2013

- Evaluates retail sales both before and after the implementation of raised medians. Sales analysis was also performed for corresponding control corridors.
  - 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. 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. In some cases, the retail mix changed in response to the economy, new area competition and other contributing factors.
  - On study corridors, business owners reported neutral to negative perceptions of sales impacts. However, sales tax data shows an overall increase of 32 percent on the corridor.
  - 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.
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William Frawley, William Eisele, **Raised medians and economic impact on adjacent businesses**, 2000

- Analyzes data on adjacent businesses for the Texas Department of Transportation. 11 streets totaling 14 miles, 907 establishments. Suburban-type areas with shopping centers and strip retail development.
  - Installation of a raised median does not equate to economic losses by adjacent businesses.
  - Only two types of businesses (auto repair shops and gas stations) were found to generally experience losses in gross revenues. In almost all cases, employment increased in businesses surveyed.
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Priyanka Alluri, Albert Gan, Kirolos Haleem, Stephanie Miranda, Erik Echezabal, Andrew Diaz, Shanghong Ding, **Before-and-after safety study of roadways where new medians have been added**, 2012

- On-site interviews of businesses at 10 roadway segments. Responses from 151 businesses.
  - Majority preferred TWLTLs to raised medians for better access and ease of truck deliveries.
  - 2/3 of responding businesses thought that raised medians were safer than TWLTLs.
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Christopher M. Cunningham, Mike Miller, Daniel Findley, Bastian Schroeder, Donald Katz, Robert. S. Foyle, **Economic effects of access management techniques in North Carolina**, 2010

- Economic studies use three primary techniques to examine the economic effects of access management: 1) perception based surveys at retrofit median installation sites, 2) before-after survey based studies, and 3) empirical studies using quantitative data.
- Surveyed the perceptions of business owners and managers at various median installations across North Carolina. Sixteen total locations were surveyed: eight treatment locations and eight matched comparison locations. A total of 789 businesses were surveyed.
- There was no statistically significant difference in self-reported revenue changes between comparison (no median) and treatment (median) sites, even when looking at individual treatment/comparison pairs.
- Overall, business owners and managers believed that roadway modifications did not improve safety; however, treatment sites were much more likely to indicate positive safety benefits.

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TRB. (1998). **Economic effects of restricting left turns.** Washington, DC: NCHRP Research Results Digest #231 of National Cooperative Highway Research Program Project 25-4. Transportation Research Board.

- Examined the economic effects of restricting left turns on highways located throughout the US using empirical based sales and revenue data from 9,200 businesses. A large comparison group was used to account for increasing or decreasing trends in the case study areas.
- When left turn access into a gas station, non-durable goods retailer, or service business is restricted, these businesses were the most likely to be negatively affected with decreases in sales and an increase in failure rate. On the contrary, grocery stores and restaurants were most likely to be positively affected with increases in sales and a decrease in failure rate.

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Hongyun Chen, Aldo Fabregas, Pei-Sung Lin, **Landscaping of highway medians and roadway safety at unsignalized intersections**, Accident Analysis & Prevention, Volume 90, May 2016, Pages 63-72

- Florida Department of Transportation Standard Index (SI-546) is one of the more demanding standards in the U.S. for landscaping design criteria at highway medians near intersections.
- The purposes of this study were to (1) empirically evaluate the safety results of SI-546 at unsignalized intersections and (2) quantify the impacts of geometrics, traffic, and landscaping design features on total crashes and injury plus fatal crashes.
- Landscaping in highway medians near intersections can improve roadway environmental quality and maintain intersection safety.

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Mark E. Hallenbeck, Peter M. Briglia Jr., Zachary N. Howard, Anna St. Martin, **In-Service Evaluation of Major Urban Arterials with Landscaped Medians-Phase III**, June 2013,

- No significant difference was found when comparing median treatments with and without trees.
- Installation of medians and access control as part of a more general increase in access control generally result in a decrease in midblock crashes, but an increase in crashes occurring at intersections where turning movements are allowed, in large part because turns are concentrated at those locations. These increases are a fraction of the midblock gains, resulting in improved safety overall.