

Interim Report

April 12, 2007

Tejon Street Conversion Study

Interim Report

April 12, 2007

Tejon Street Conversion Study

Prepared for

The Downtown Partnership
111 S. Tejon Street, Suite 309
Colorado Springs, CO 80903

Prepared by

BBC Research & Consulting
3773 Cherry Creek N. Drive, Suite 850
Denver, Colorado 80209-3868
303.321.2547

Felsburg Holt & Ullevig
102 S. Tejon Street, Suite 1050
Colorado Springs, CO 80903
719.314.1800

Table of Contents

ES. Executive Summary

Key Findings	ES-1
Methodology	ES-2

I. Introduction

II. Background Research

Literature Review	II-1
Selected Case Studies	II-8
Key Findings	II-15

III. Traffic Analysis

Methodology	III-1
Origin Destination Study	III-1
Parking Utilization Analysis	III-2
Traffic Modeling	III-3
Levels of Service	III-4

IV. Retail Sales Analysis

Research Goal	IV-1
Research Methodology	IV-1
Annual Sales Performance	IV-2
Vehicle Trips	IV-3
Sales per Trip	IV-4
Summary of Findings	IV-5

Executive Summary

The Colorado Springs Downtown Partnership retained BBC Research & Consulting (BBC) to examine the potential impacts from converting the one-way segment of Tejon Street to two-way traffic. BBC subcontracted the portions of this study related to evaluating changes in traffic movements along Tejon Street to Felsburg, Holt and Ullevig (FHU) – a transportation engineering firm with an office in Colorado Springs. The City of Colorado Springs Traffic Engineering division worked with FHU in developing traffic projections.

The segment of Tejon Street that is currently configured for one-way, southbound traffic is very close to the center of downtown Colorado Springs. Most of the properties along this segment are commercial—primarily retail stores, bars and restaurants, and financial and real estate establishments—along with some government office facilities. Consequently, the focus of this study is primarily on whether converting Tejon Street to two-way traffic would be likely to benefit or harm local businesses.

Key Findings

Using the analysis described in the methodology section below, the study team identified several key results.

Experiences in other cities. The literature review and case studies show that there is a wide variety of opinions surrounding conversions from one-way to two-way traffic flows. As an example, in one issue of the Institute of Transportation Engineers (ITE) Journal, two traffic engineers offered opposing viewpoints of two-way conversions, each with considerable supporting data.

However, most of the quantitative analyses do not focus on the question of impact on businesses. The evidence that shows how conversions specifically affect businesses is largely qualitative. Further, much of the anecdotal business impacts and traffic efficiency changes are specific to the case study locations and difficult to generalize or apply directly to Tejon Street.

Daily traffic volumes. Daily traffic volumes on Tejon Street between Platte Avenue and Vermijo Street are estimated to increase by an average of 50 percent. Increases on these five blocks would range between 19 percent (between Platte and Bijou) and 90 percent (between Bijou and Kiowa).

The heavier traffic volume will increase the drive time for this five-block section by just over one minute during the peak evening period and by up to two minutes during the afternoon peak period. The City of Colorado Springs Traffic Engineering Division Manager reports that a two-way Tejon Street would still have acceptable levels of service.

Parking. Parking is clearly important along this segment of Tejon Street, as it has an 80 to 90 percent utilization rate in most blocks. Retailers and other businesses in the area are dependent on these spots for visitors. Continued availability of most or all of these parking spots will be important if a two-way conversion is to be successful. The City of Colorado Springs Traffic Engineering Division Manager has determined that only a few parking spaces, if any, may have to be removed on Tejon next to the Colorado intersection if right and left-turning movements are to be accommodated. No other parking spaces would be removed on Tejon at the other four intersections for traffic flow purposes.

Retail sales. If Tejon Street is converted from a one-way to a two-way street, total annual sales could increase by nearly \$1.3 million—a 46 percent increase in annual sales compared to one-way street. Annual sales at bars and restaurants could increase by approximately \$518,500, annual sales at other retail establishments could increase by approximately \$725,000, and annual sales for service businesses could increase by approximately \$48,000.

Methodology

This interim study included four principal tasks:

- Review of available literature concerning the conversion of one-way to two-way streets and the advantages and disadvantages of each configuration;
- Case studies across the U.S. of conversions in similar sized cities. As part of this task, the study team interviewed local government and business representatives in each case study city to gather further insight into the success or failure of the conversion;
- Analysis of how two-way conversion would affect traffic along Tejon Street with traffic projections that identify how the volume of traffic and level of service might change with two-way conversion; and
- Estimation of how the sales of various types of retail establishments, along different blocks of Tejon Street, might change if the street is converted to two-way traffic.

An additional component of this study will be surveys of local businesses, property owners and pedestrians (customers) that use Tejon Street. The survey instruments have been developed and the surveys are expected to be fielded later in 2007.

SECTION I.

Introduction

The Colorado Springs Downtown Partnership retained BBC Research & Consulting (BBC) to examine the potential impacts from converting the one-way segment of Tejon Street to two-way traffic. BBC subcontracted the portions of this study related to evaluating changes in traffic movements along Tejon Street to Felsburg, Holt and Ullevig (FHU) – a transportation engineering firm officed in Colorado Springs. The City of Colorado Springs Traffic Engineering division worked with FHU in developing traffic projections.

The segment of Tejon Street that is currently configured for one-way, southbound traffic is very close to the center of downtown Colorado Springs. Most of the properties along this segment are commercial – primarily retail stores, bars and restaurants, and financial and real estate service establishments – along with some government office facilities. Consequently, the focus of this study is primarily on whether converting Tejon Street to two way traffic would be likely to benefit or harm local businesses.

This study included four principal tasks. First, the study team conducted a review of available literature concerning the conversion of one-way to two-way streets and the advantages and disadvantages of each configuration. Additionally, the study team and the Partnership selected a number of case studies across the U.S. The study team then interviewed local government and business representatives in each case study city to gather further insight into the success or failure of the conversion. Section II contains the literature review and case study research.

The second component of this research was the analysis of how two-way conversion would affect traffic along Tejon Street. Colorado Springs Traffic Engineering provided data on current traffic counts along Tejon Street, along with pedestrian counts and parking utilization. An origin destination study was conducted to identify how vehicles currently use the one-way segment of Tejon Street. Finally, traffic projections were developed to identify how the volume of traffic and level of service might change with two-way conversion. The results of this traffic analysis are found in Section III.

Third, the study team examined the implications of projected traffic changes for local businesses along Tejon Street. Section IV examines how the sales of various types of retail establishments, along different blocks of Tejon Street, might change if the street is converted to two-way traffic.

The fourth component of this study will be surveys of local businesses, property owners and pedestrians (customers) that use Tejon Street. The survey instruments have been developed and the surveys are expected to be fielded later in 2007.

SECTION II.

Background Research

Many downtowns adopted one-way street transportation networks in the 1950's to alleviate automobile congestion and improve circulation.¹ More recently, downtown economic development plans have included one-way to two-way street conversions to promote access to businesses, residences and recreational areas and improve pedestrian traffic.

The existing literature reports varying degrees of success with one-way to two-way conversions. There is general agreement that two-way streets carry traffic less efficiently than one-way streets.² It is less clear on how these conversions affect businesses. Street conversions are typically coordinated within a larger revitalization plan and occur with other improvement initiatives, thus making it difficult to determine the impact of street conversions alone. In addition, many of the conversions are too recent to report conclusive results.

The BBC study team conducted the following background research on recent one-way to two-way street conversions:

- Review of existing literature;
- Identification and analysis of relevant case studies; and
- Key person interviews with planners, traffic engineers, downtown partnership representatives and downtown businesses in the case study cities.

Literature Review

One-way to two-way street conversions are often controversial. This section provides an overview of the available literature. Few articles discuss the benefits of one-way streets in downtown areas and we were unable to locate any retrospective analyses that attempted to quantify success or failure in terms of business revenues. Recent studies vary widely in their findings and often contradict one another.

The study team summarizes the available literature under two opposing perspectives: two-way traffic is favorable for downtown streets versus downtown streets should remain one-way.

Perspective 1: Two-way traffic is favorable for downtown streets. Urban planners often seek a holistic approach to downtown development, incorporating the interests of businesses, tenants, pedestrians and drivers into planning activities. Many favor two-way transportation networks to benefit all facets of the downtown community.

¹ Forbes, Gerald. 1998. "Vital Signs: Circulation in the Heart of the City- An Overview of Downtown Traffic." *ITE Journal*. 26-29.

² Hart, Jeryl D. Jr. 1998. "Converting Back to Two-Way Streets in Downtown Lubbock." *ITE Journal*. 38, 45-46.

Planners generally support one-way to two-way street conversions using the following rationale:

- The efficiency of one-way streets encourages drivers to travel through downtown without stopping to visit local shops and eateries;
- Two-way streets calm traffic, attracting the visitors, shoppers and tenants that contribute to downtown development; and
- Development of freeway infrastructure in many cities has reduced the need for downtown surface streets to serve as efficient commuter routes.

Urban planners believe that a slower traffic is indicative of a healthy business climate. Transportation systems built exclusively in favor of automobiles may have negative consequences for businesses, pedestrians, and other groups. Urban planners suggest that converting downtown streets to allow two-way traffic flow will repair some of the unanticipated effects of one-way street networks and create a healthier climate for development.

Some traffic engineers see a different set of benefits from one-way to two-way conversions:

- Less confusing to motorists, especially visitors;
- Improved access to properties; and
- Reduced travel distance to destinations.³

Traffic engineers have also found two-way street conversions were beneficial to central business district businesses where adequate capacity existed to maintain acceptable levels of service.⁴

Business development. Business revitalization is the primary rationale for one-way to two-way street conversions.⁵ A study in Louisville reported, “Retailers express a strong preference for two-directional traffic in front of their establishments, with documentation available on the sales growth when such changes are implemented.”⁶

Conversion proponents claim that two-way streets reduce vehicle speeds and improve traffic circulation. These changes translate into increased business visibility, improved business access, a safer pedestrian environment and added residential comfort. Business development benefits are said to extend beyond downtown as high average rental rates significantly contribute to the city’s tax base.

Decreased vehicle speeds. One-way to two-way street conversions are often introduced as a “traffic calming” technique.⁷ The friction from opposing street traffic and changes in signal progression often results in slower vehicle speeds and increased congestion.

³ Hart, 1998. *ITE Journal*.

⁴ Hart, 1998. *ITE Journal*.

⁵ The City of Calgary, 2003. “10th, 11th and 12th Avenues South: Planning & Transportation Study. DRAFT REPORT.”

⁶ City of Louisville. 2002. “Louisville Downtown Development Plan.”

⁷ Black, Sinclair and Andrew Vernooy. “The Argument for Two-Way Streets.” *Architecture and Urban Design, Austin, Texas*.

Decreased speeds and frequent stops encourage drivers to take more notice of their surroundings.⁸ This attracts new customers and increases the chance of impulse purchases. A healthier business climate also attracts new businesses that, in turn, attract a new set of patrons to the downtown business district.

Business visibility and accessibility. One-way streets provide an efficient route for vehicles traveling through a city. Proponents of two-way traffic argue that solely focusing on efficient traffic flow is not in the best interest of downtown businesses:

“Operation of the street should be maximized for its use throughout the day, rather than for a relatively short period of time each morning and afternoon. A street flowing very quickly during AM and PM rush hours often means a dead street the remainder of the day.”⁹

In addition, the formation of two-way systems can increase the visibility of businesses located on cross streets. For example, drivers on Tejon Street only see north facing store fronts on cross streets while driving on the one-way stretch; traffic flowing both ways would also provide visibility to businesses with south facing store fronts.

Improved circulation. For visitors that are not familiar with downtown traffic flow, one-way streets can be confusing and intimidating.

Two-way streets provide better business access for automobiles, transit and pedestrians. Drivers can be forced to travel several blocks out of their way to reach a destination located on a one-way street, increasing travel time and fuel use.¹⁰ A property manager in downtown Lubbock expressed frustration with one-way streets, explaining that over 100 people in his building alone were affected daily by the direction of traffic on the street and were inconvenienced by the lack of direct routing opportunities.¹¹

Studies indicate that one-way systems require more turning movements and an increase in travel distance when compared to two-way systems.¹²

Transit operation. Two-way systems improve the transit user experience by:

- Decreasing the walk path to transit; and
- Reducing the total vehicular travel path.

Transit is dependent on a pedestrian friendly environment.¹³ People are often forced to walk further to access return bus service on a one-way street. On two-way streets, return bus service is generally on

⁸ Black, et al.

⁹ City of Louisville. 2002.

¹⁰ Stemley, John J. 1998. “One-Way Streets Provide Superior Safety and Convenience.” *ITE Journal*. 47-50.

¹¹ Hart, 1998. *ITE Journal*.

¹² Walker, G. Wade, Walter M. Kulash and Brian T. McHugh. 2000. “Downtown Streets: Are We Strangling Ourselves on One-Way Networks?” *Glattig Jackson Kercher Anglin Lopez Rinehart, Inc.*

the same street as the arrival stop, conveniently located directly across the street. Two-way streets are more intuitive to transit users, requiring less effort on their part to patronize downtown.

Rerouting unnecessary traffic. Increases in congestion on two-way streets are expected to redirect drivers that use downtown streets exclusively for commuting.¹⁴ As daily commuters find optimal routes, the composition of downtown traffic will be a higher concentration of shoppers, residents and visitors.¹⁵

Safety. Proponents of conversion argue that two-way streets provide a safer environment for pedestrians and thus encourage patronage by foot.¹⁶ Accidents may be fewer and less severe in traffic clamed areas:

“A vehicle moving 35 mph and one moving 25 mph can mean the difference between life or death to a pedestrian that is struck. The chance of a pedestrian fatality by an automobile accident increases from 5 percent in 20mph to 45 percent in 30 mph to 85 percent 40 mph.¹⁷”

Two-way conversion proponents also suggest that one-way systems are unsafe by design:

- Motorists entering one-way streets tend to look only in the direction of oncoming traffic and could easily hit a pedestrian traveling in the other direction;¹⁸ and
- One-way systems require more turning movements, creating more vehicle/pedestrian conflict possibilities than two-way systems.¹⁹

Two-way systems may also improve the operation of emergency response vehicles, as more route options are available on two-way networks because the number of streets carrying traffic in either direction increases. Multiple access routes are critical in downtown areas where streets are commonly blocked off for festivals, parades, or other events.²⁰

Safety and traffic-efficiency benefits vary depending on the amount of existing traffic at the time of conversion. For example, a street with a relatively low vehicle to capacity ratio is likely to experience less of a safety benefit than an extremely congested street.²¹

¹³ Cunneen, Michael and Randal O’Toole. 2005. “No Two Ways About It: One-Way Streets Are Better Than Two-Way.” *Center for the American Dream of Mobility and Homeownership*.

¹⁴ Cunneen, 2005.

¹⁵ City of Louisville. 2002.

¹⁶ Black, et al.

¹⁷ Black, et al.

¹⁸ Black, et al.

¹⁹ Walker, 2000.

²⁰ Black, et al.

²¹ Staff Report. “Two-way Traffic Flow Conversion Study: Market and Park Place (17th to 21st Street).” Wichita, Kansas.

Specific findings. The following outcomes were reported by cities that converted downtown streets to two-way operation. Findings are likely the result of conversions in combination with other downtown improvement initiatives.

- Streets are easier to monitor by police, increasing safety in downtown Louisville, KY.²²
- West Palm Beach, FL reported increased business exposure and accessibility.²³ Property values have increased and the area has attracted new retail shops, restaurants and residential development.²⁴
- People are staying out later in Albuquerque, NM to patronize local businesses.²⁵
- Street crime has decreased, traffic speeds have declined, congestion has increased and redevelopment has occurred in Ontario, Canada.²⁶
- Reduced vehicle speeds have improved the pedestrian environment in Edmonton, Canada. Collisions resulting from improper turns have decreased by 90 percent in the conversion area, though collisions have resulted from other factors.²⁷
- Letters from 38 out of 86 affected properties in Lubbock, Texas were received after the conversion: 33 were favorable.²⁸ Streets are reported to be less confusing to motorists, and access to properties has improved.²⁹ The city is experiencing minor growth after several years of decline.³⁰
- Charleston, South Carolina reported a dramatic increase in retail and service businesses after converting the one-way portion of a street that had two-way portions on either side.³¹
- In Des Moines, Iowa, a downtown street that did not serve as a commuter route was converted to two-way traffic, significantly improving access to retail establishments.³²

²² The City of Calgary, 2003.

²³ The City of Calgary, 2003.

²⁴ The City of Kelowna. 2003. "One Way Couplets Impact Analysis. DRAFT REPORT."

²⁵ The City of Calgary, 2003.

²⁶ The City of Calgary, 2003.

²⁷ Hassan, Howaida. 2001. "A Study of the One-Way to Two-Way Streets Conversion in Downtown Edmonton." *City of Edmonton Transportation and Streets Department Forecasting and Assessment*.

²⁸ Hart, 1998. *ITE Journal*.

²⁹ Hassan, 2001.

³⁰ Hart, 1998. *ITE Journal*.

³¹ The City of Kelowna, 2003.

³² Canter for Transportation Research and Education, Iowa State University. 2005. "City of Des Moines One-Way to Two-Way Traffic Study." *Prepared for the City of Des Moines Traffic and Transportation Division*.

Perspective 2: Downtown streets should remain one-way. Traditionally, traffic engineers are responsible for transportation planning. They create networks based on safety and travel efficiency, and track the success of their efforts by monitoring service levels and accident rates.³³

Many traffic engineers are skeptical of the claims of urban planners—specifically that the congestion from two-way traffic will result in downtown development. One group described the planner “traffic calming” rationale in the following statement:

“Popular places are congested, so if we can congest an unpopular place it will have the ambiance of popularity even if our actions actually reduce the number of people able to get to the area.”³⁴

Conversion opponents argue that converting streets to two-way traffic is often a poor investment, likely to foster more harmful than helpful outcomes. Costs associated with infrastructure set-up for two-way traffic activity may be high, and little evidence beyond reported “perceived preferences” is available to support the claimed benefits of two-way systems.³⁵

Additionally, opponents dispute claims that one-way streets are harmful to businesses, explaining, “The variables affecting customer purchases are so many that the effect of one-way streets cannot be isolated from other factors.”³⁶ Some studies indicate that businesses actually perform better on one-way streets compared to two-way due to significantly higher traffic flows.³⁷

Furthermore, investments in street conversions may result in negative outcomes to the downtown community. Some studies report that converting streets to two-way traffic flow results in increased:

- Vehicle emissions;
- Accidents;
- Emergency response time;
- Fuel consumption;
- Vehicle delay; and
- Traffic congestion.³⁸

³³ Cunneen, 2005.

³⁴ Cunneen, 2005.

³⁵ City of Austin Department of Public Works and Transportation, 1996. “Two-Way Traffic Downtown. DRAFT REPORT.”

³⁶ Stemley, 1998. *ITE Journal*.

³⁷ Cunneen, 2005.

³⁸ City of Austin Department of Public Works and Transportation, 1996.

Improved circulation. Studies support that one-way systems are comparatively better than two-way for downtown traffic circulation. Vehicles travel smoothly and streets experience fewer capacity issues.

One-way streets may reduce the number of stops, facilitate better signal progression, and have fewer turn delays than two-way streets.³⁹ In addition, turning is often less efficient on two-way networks, where left turn lanes may reduce the number of travel lanes and overflow into other lanes when cars are waiting for a break in oncoming traffic.⁴⁰

Reported measures indicate that compared to two-way streets, one-way networks provide a more efficient transportation system:

- With the same available lane miles, one-way systems can provide up to 50 percent more capacity than two-way systems;⁴¹ and
- One-way systems reduce driver stops by up to 66 percent.⁴²

One-way streets also prevent capacity issues that arise with the delivery of goods. Curbside loading and unloading often takes up a lane of traffic, causing little disruption on a one-way street. Loading on a two-way street can potentially hold up an entire direction of traffic.⁴³

Safety. Opponents of two-way conversion argue that one-way systems provide a safer environment for vehicles and pedestrians:

- One-way street intersections present fewer vehicle to vehicle and vehicle to pedestrian conflicts compared to two-way operation;⁴⁴
- It is safer for pedestrians to cross streets, as they only need to look in one direction for oncoming traffic; and
- Emergency response vehicles travel more efficiently on one-way networks—the continuous and efficient movement is critical in reducing response times.

Additionally, opponents of two-way conversion state that most severe accidents are the result of high top speeds, which are not captured in average speed and may not change in two-way networks. Two-way supporters may overstate safety benefits if top speeds go unchanged.⁴⁵

³⁹ Walker, 2000.

⁴⁰ Stemley, 1998. *ITE Journal*.

⁴¹ Hassan, 2001.

⁴² Stemley, 1998. *ITE Journal*.

⁴³ Walker, 2000.

⁴⁴ Stemley, 1998. *ITE Journal*.

⁴⁵ Cunneen, 2005.

Pedestrian environment. In addition to safety benefits, one-way streets may provide pedestrians with more route options for efficient travel and a cleaner environment. Unlike two-way systems, one-ways allow mid-block pedestrian crosswalks to be installed, which can reduce pedestrian travel time and distance.⁴⁶ In addition, efficient vehicle travel results in less pollution, creating a cleaner environment and enhancing the downtown pedestrian experience.⁴⁷

Specific findings. Some cities report that opposition became quiet after the conversion due to little changes in congestion and service levels. Complaints persisted in areas where the conversions reportedly compromised the safety of downtown streets.

- Two years after conversions were complete, Lubbock, TX reported a 12 percent decrease in traffic on converted routes, but 25 percent more accidents causing 34 percent more property damage.⁴⁸ Other complaints included high conversion construction costs, increased congestion and poorer two-way signal progression.⁴⁹
- While average traffic speeds decreased, traffic accidents increased after Vine Street was converted in Cincinnati, OH.⁵⁰
- Louisville, KY received complaints about increased traffic congestion and air pollution.⁵¹

Selected Case Studies

The BBC study team selected 10 relevant case studies for in-depth review.

Methodology and Caveats. The BBC study team began the case studies by identifying conversion locations comparable to the proposed Tejon Street conversion. Locations with similar city size, economic character and proximity of converted streets to downtown were considered.

It is important to interpret case study evidence with caution. Many of the cities reported taking on other projects, such as streetscape improvements and off-street parking structures, in conjunction with the street conversion. In most situations, economic impacts cannot be attributed to the street conversion alone.

⁴⁶ Stemley, 1998. *ITE Journal*.

⁴⁷ Stemley, 1998, *ITE Journal*.; Cunneen, 2005.

⁴⁸ Cunneen, 2005.

⁴⁹ Hassan, 2001.

⁵⁰ The City of Calgary, 2003.

⁵¹ The City of Calgary, 2003.

Tejon Street has a unique set of properties unmatched by other case studies. Unlike the majority of streets that are candidates for conversion in other cities, Tejon Street is:

- Not a major commuting arterial;
- Not part of a one-way “couplet;”
- Not part of a one-way grid; and
- Only one-way for a short distance between two-way sections.

Studies are primarily prospective and largely focused on traffic measures, with less emphasis on business impacts. To supplement the existing literature, the BBC study team interviewed representatives from the following groups:

- Downtown partnerships;
- Public works and transportation departments;
- Urban planners;
- Chambers of Commerce; and
- Local businesses.

Respondents were asked to provide background information on the converted streets, benefits sought from the conversion and impacts to the downtown community.

Overview of selected case studies. Below is a brief summary of the 10 case study conversions.

Albuquerque, New Mexico. Albuquerque converted the entire downtown grid, consisting of 12 streets, from 2001 to 2003. The interstate access points remained one-way. Development is primarily commercial, with a large convention center.

Austin, Texas. Cesar Chavez Street is located on the south perimeter of downtown. The portion of the street that will be converted in 2007 is five-blocks long and connects the freeway to downtown. One side of the street is a public park and lake; the other is commercial property. Plans to build a promenade by the park are also in place. Conversion plans are currently under review for federal funding.

Buffalo, New York. Downtown Buffalo started converting streets to allow two-way traffic in 2000. The conversion projects are ongoing throughout the downtown grid. Several streets are complete.

Chattanooga, Tennessee. A couplet in downtown Chattanooga was converted in 2003. The streets are 3 miles long and connect downtown and the University of Tennessee, Chattanooga to surrounding suburbs. Both streets contain residential and commercial development.

Cincinnati, Ohio. Vine Street was converted to two-way traffic in 1999 as part of a major revitalization effort. It runs through a large residential area and Uptown, where a hospital and university are located.

Denver, Colorado. Wazee and Wynkoop streets were a five-block one-way couplet in downtown Denver. The classification of these streets changed from “downtown access” to “local access” as part of the Lower Downtown Neighborhood Plan. The streets were converted to two-way as a result. Ground floor properties are primarily retail, with offices and residences above.

Ft. Collins, Colorado. Ft. Collins has plans to convert Mason and Howes streets. The streets were converted to one-way streets in the 1980s to provide an alternate north-south route to the busy College Avenue. The streets did not function as intended and will be converted to allow two-way traffic within the next year.

Lafayette, Indiana. Main Street was converted to two-way traffic in 1994. Main Street was a couplet with Columbia Street. After the conversion, Columbia remained one-way and was paired with another street. The converted section is under one mile and is home to specialty shops and offices.

Toledo, Ohio. Toledo began converting streets in 2002. Plans are in place to convert the entire downtown grid, 60 blocks, to allow two-way traffic. Development in this area is primarily retail and office property with some residential space.

West Palm Beach, Florida. Clematis Street runs through the heart of downtown West Palm Beach. The street runs east-west and creates a “K” intersection with Narcissus Avenue. It was converted in 1997 to revitalize the area and is referred to by many studies as a successful “traffic calming” example.

Positions of Conversion Supporters and Opponents. In interviews with the case study cities, supporters and opponents of the conversions noted many of the same arguments identified in the literature review.

Supporters of one-way to two-way conversions provided two main arguments:

- Two-way streets improve traffic circulation.
- Two-way streets benefit downtown communities by slowing traffic.

Opposition stems largely from expected increases in congestion. One traffic engineer stated, “Urban planners ignore the basics of traffic engineering: safety and efficiency.” Additional arguments suggest that two-way streets will increase vehicle emissions, accidents, emergency response time and fuel consumption. Opponents to two-way conversion argue that there will be little or no benefit from the change, citing the lack of evidence relating to two-way streets to economic development and neighborhood livability.

Outcomes. Respondents reported mixed results on the outcomes of conversions.

Positive feedback. Satisfied respondents reported increases in business development, residential tenancy and overall safety.

Business expansion and attraction. Some representatives reported positive business outcomes including increased business access, visibility and success. However, none of the cities reported conducting formal studies after the conversions to retrospectively assess positive or negative effects.

- “Retail success increased dramatically. It was a roaring success.” *West Palm Beach*
- “The conversion has spurred business development. People like that they can see the businesses they are driving to. Downtown is rebounding.” *Buffalo*
- “We’ve talked to business owners. Businesses are initiating renovations and new businesses are opening up due to the conversion. Access has improved dramatically.” *Chattanooga*
- “Downtown is more pedestrian- and shopper-friendly. It is easier to cross streets.” *Lafayette*
- “We noticed an immediate impact from the slowing traffic on businesses. Businesses were more visible and more noticed. As the traffic slowed the area became more pedestrian friendly.” *Albuquerque*
- “Two-way streets definitely did not hurt, and probably helped the business. The streets are less confusing and it is easier for people to access our business.” *West Palm Beach*
- “The two-way streets are more user-friendly; they lead pedestrians into retail, and provide better circulation.” *Chattanooga*
- “People are more familiar with this set-up; it is easier to get around and it is easier to access businesses.” *Toledo*

Some cases reported that business development did occur, but is not directly attributable to street conversions.

- “Occupancy rates have increased. This is not necessarily due to the conversion, however it didn’t hurt. The new parking structures help to accommodate the businesses parking demands.” *Albuquerque*
- “LoDo has been more successful over the years, but it is hard to ascribe to the street conversion alone.” *Denver*

Increased residential tenancy. Respondents indicated that two-way streets provide a calmer environment with a better community feel, thus encouraging more people to live downtown.

- “More housing is being developed.” *Buffalo*
- “In only a few years we’ve seen new residential development, which we didn’t see before because traffic was too fast.” *Chattanooga*
- “There has been gradual revitalization. Old buildings are now occupied with condos.” *Lafayette*
- “It is more pedestrian friendly, speeds have reduced and there is more of a community feel.” *Toledo*

Improved safety. Respondents reported increases in safety as a result of converting to two-way streets.

- “There is some reduction in collisions caused from people turning the wrong-way on one-way streets.” *Chattanooga*
- “Criminal activity decreased due to ‘natural surveillance’ from the slowed traffic and business revitalization.” *West Palm Beach*

Decreased opposition. Several cities reported that opposition became quiet after conversions were complete, primarily due to little changes in traffic congestion.

- “The conversion was really well received and had overwhelming support. People wrote complaints to the newspaper for about two weeks after the conversion, but all of that is gone.” *Albuquerque*
- “The motoring public was pleased because they did not experience the congestion that they expected. Traffic circulation actually improved.” *Buffalo*
- “The nay-sayers were less vocal because there were no massive traffic problems. The general public was satisfied with the change”. *Chattanooga*
- “The concerns were [unfounded]; there was little change to delay and circulation.” *Denver*
- “The opposition became quiet because they realized their fears were unfounded. It’s not taking longer to go places.” *Chattanooga*

Neutral feedback. Some respondents reported little to no change as a result of converting to two-way streets. A representative from Chattanooga reported, “There are no negative comments, but no one is doing back-flips either.”

Chamber of Commerce representatives from eight of the case study cities had little to say about one-way to two-way street conversions. As one respondent put it, “We haven’t received any negative feedback which is what we would have received if given any (feedback) at all.”

Business owners provided the following feedback regarding two-way street conversions in their cities:

- “When the streets were converted we noticed very little change. We can’t say if it helped or hurt our business because our businesses maintained itself.” *Chattanooga*
- “There were no changes to our business. It was neither good nor bad.” *Denver*
- “We haven’t seen any real effects on our business.” *Lafayette*
- “We did not see any real impact to our business.” *West Palm Beach*

Negative feedback. Some respondents complained that the conversion to two-way traffic did not result in expected business revitalization and created traffic problems.

“There is no real evidence of a success story. This project was a lot of work for marginal benefit. Other projects should have taken priority.” *Chattanooga*

Business development did not result. Business development is largely the rationale for converting streets to two-way. Several cases reported no positive outcomes from the conversion, and some reported negative impacts to their businesses.

- “There is no significant new development and some businesses have closed. It has been three years and the expected redevelopment has not occurred.” *Chattanooga*
- “The conversion was a joke. We saw our sales volume go down immediately; it was much better as a one-way street.” *Lafayette*
- “They wanted to slow traffic down, but as a business, we want traffic to be quick and smooth. The traffic engineers did not incorporate left turn lanes, which slows down traffic.” *West Palm Beach*
- “The conversion didn’t accomplish much. It created some confusion for people that were not used to it, and did not result in the revitalization expected in the area.” *Cincinnati*
- “The one-way was so much easier for parking because you could look at both sides of the street for parking rather than having to make a u-turn to get parking located across the street. This really hurt our business.” *Lafayette*

Two-way streets are bad for traffic flow and increase congestion. Some cities have found that managing traffic flow and congestion are difficult on two-way streets.

- “We are considering converting the street back to a one-way because the traffic flow on that street is important for travel between downtown and uptown.” *Cincinnati*
- “Some employees that work in the downtown area complained about congestion.” *Albuquerque*
- “The two-way works for existing volumes, but if there is an increase in volumes and economic development then the intersections will be inefficient and will need improvement.” *Chattanooga*

Suggestions from other cities. Respondents provided the following suggestions to a successful conversion.

Get feedback during the process. Communication is key for a successful conversion. It is likely that the general public does not have a clear understanding of why a conversion is taking place. Representatives from Lafayette and Chattanooga emphasize the importance of getting feedback from businesses. “If you don’t have support from the businesses, you shouldn’t do it.” *Lafayette*

Get a driving force. Getting started can often be difficult; disagreements between departments can leave the decision in gridlock. Albuquerque, Austin, West Palm Beach and Toledo all mentioned that the Mayor was the driving force behind getting the conversions done. Businesses and city council representatives were also mentioned.

Evaluate the anticipated benefits. Street conversions are costly. A representative from Chattanooga recommends hiring an objective traffic engineering firm to evaluate the prospective impacts of a conversion.

Incorporate other downtown improvements. Cities emphasize that street conversions have little effect on their own. To achieve the maximum benefit from a street conversion, it is important to implement other initiatives to improve the downtown environment. Suggestions included:

- Include streetscape improvements, such as trees and nice areas to sit;
- Raise intersections, remove signals, and change lighting to human-scale;
- Provide a downtown shuttle for pedestrians;
- Increase on-street parking and allow credit card payment;
- Build roundabouts;
- Create aesthetically pleasing street signs; and
- Provide programs that make it easy for people to build housing.

Key Findings

The literature review and case studies show that there is a wide variety of opinions surrounding conversions from one-way to two-way traffic flows. As an example, in one issue of the Institute of Transportation Engineers (ITE) Journal, two traffic engineers offered opposing viewpoints of two-way conversions, each with considerable supporting data.⁵²

However, most of the quantitative analyses do not focus on the question of impact on businesses. The evidence that shows how conversions specifically affect businesses is largely qualitative. Further, much of the anecdotal business impacts and traffic efficiency changes are specific to the case study locations and difficult to generalize or apply directly to Tejon Street.

⁵² *ITE Journal*, 1998, pp. 38 and 45 – 50.

SECTION III.

Traffic Analysis

Methodology

The City of Colorado Springs Traffic Engineering division along with Felsburg, Holt & Ullevig conducted a traffic analysis to estimate the impacts of a one-way to two-way street conversion on Tejon Street. The analysis used 2006 data. Research included:

- An Origin Destination study;
- Data on parking utilization;
- Traffic modeling; and
- Expected changes in service levels.

Origin Destination Study

The City of Colorado Springs conducted an Origin Destination study to look at current traffic patterns on the one-way segment of Tejon Street. Surveyors collected license plate numbers at intersections within a one-block radius of Tejon. Data was collected at morning, midday and evening peak periods, and then analyzed to determine the traffic flow on and around Tejon Street.

Through the Origin Destination study, the study team was able to analyze traffic circulating from Cascade and Nevada. Some of the circulation patterns reflect drivers looking for parking spots.

Parking Utilization Analysis

There are nearly 130 on-street parking spots along the one-way stretch of Tejon Street. Data was collected on current parking use to determine the role of on-street parking on Tejon. Exhibit III-1 illustrates on-street parking availability and use on the one-way segment of Tejon Street based on data collected.

Parking is clearly important along this segment, as it has an 80 to 90 percent utilization rate in most areas. Retailers and other businesses in the area are dependent on these spots for visitors. Continued availability of most or all of these parking spots will be important if a two-way conversion is to be successful. The City of Colorado Springs Traffic Engineering Division Manager has determined that only a few parking spaces, if any, may have to be removed on Tejon next to the Colorado intersection if right and left-turning movements are to be accommodated. No other parking spaces would be removed on Tejon at the other four intersections for traffic flow purposes.

Exhibit III-1. Parking utilization analysis

Note:

* Some spaces blocked due to construction.

Source:

City of Colorado Springs Traffic Engineering division, Felsburg, Holt & Ullevig and BBC Research and Consulting, 2007.

	Tejon St.
<i>Bijou St.</i>	
20 spaces 82% occupied	8 spaces* 83% occupied
<i>Kiowa St.</i>	
15 spaces 66%—80% occupied	12 spaces 79%—83% occupied
<i>Pikes Peak Ave.</i>	
12 spaces 76%—91% occupied	18 spaces 90%—92% occupied
<i>Colorado Ave.</i>	
29 spaces 85%—95% occupied	15 spaces 77%—89% occupied
<i>Vermijo St.</i>	

Traffic Modeling

The study team estimated the impacts of two-way conversion on traffic volume for each block of Tejon Street between Platte Avenue and Vermijo Street. Traffic on Tejon Street in this section is expected to increase if converted to two-way as drivers utilize northbound routing on Tejon for more direct access to some destinations. Southbound traffic is expected to decrease by 10 percent in a two-way configuration due to a decrease in available lane miles and increased delays at intersections. Some drivers that do not use Tejon to directly reach a destination will likely choose alternative routes for more efficient transportation.

Daily traffic on Tejon Street between Bijou to Vermijo is expected to increase by 60 percent. The largest increase (90 percent) is expected in the PM peak hour. A 74 percent increase is expected in the AM peak hour and during midday peak traffic. Exhibit II-2 shows existing daily traffic levels and estimates of traffic levels under a two-way traffic flow configuration.

Exhibit II-2. One-way and two-way daily traffic volumes

Source:
City of Colorado Springs
Traffic Engineering division,
Felsburg, Holt & Ullevig
and BBC Research and
Consulting, 2007.

	Cascade Ave.	Tejon St.	Nevada Ave.	
		5,700	6,800	19%
		5,750	10,900	90%
		6,050	9,400	55%
		6,900	10,000	45%
		7,800	10,800	38%

One-Way Daily Traffic Volumes	Two-Way Daily Traffic Volumes	Percent increase in Daily Traffic
-------------------------------	-------------------------------	--------------------------------------

Levels of Service

The efficiency of a street in moving traffic flows is measured in levels of service, or travel time. The study team collected current intersection delay times and modeled traffic flows to estimate changes under a two-way configuration.

During the morning peak hour, all intersections along the one-way segment of Tejon Street currently experience less than a 5 second delay with the exception of the intersection at Colorado, where the delay is slightly longer. Midday peak is nearly the same, with a slight increase at Kiowa as well. The PM peak hour has less than a 5 second delay at all intersections except for Colorado and Bijou.

Increased delays are expected at most intersections if Tejon Street is converted to two-way traffic flow.

- During the AM peak hour, delays on Tejon Street are expected to increase from less than 5 seconds to 15-25 seconds at Platte and Colorado, and 5-15 seconds at Bijou, Pikes Peak and Vermijo. No change is expected at Kiowa. This is an added increase of up to 90 seconds of drive time per vehicle along this segment. Increases are expected at all intersections at midday. The largest increases are expected to occur at Platte and Bijou. The drive time from one end of the current one-way stretch to the other segment could increase by up to 120 seconds.
- Increases will be relatively less during the PM peak hour, where service levels are expected to decline only at the Platte and Pikes Peak intersections. These PM changes could amount to a 70 second increase in evening drive times.

The Colorado Springs Traffic Engineering Division Manager stated in a public meeting on March 20, 2007 that while delays will increase if Tejon Street is converted to two-way, “levels of service will still be acceptable.”

SECTION IV.

Retail Sales Analysis

This section of the report discusses the potential increase in Tejon Street retail sales stemming from a change in street configuration from one-way to two-way traffic.

Research Goal

The study team's goal in the following analysis was to examine the effects on the sales revenues of local merchants of converting Tejon Street from a one-way to a two-way street. The study area includes the five blocks of Tejon Street from Platte Avenue to Vermijo Street.¹

Research Methodology

Using data provided by the Downtown Partnership of Colorado Springs and FHU, the study team determined the ratio of annual sales per daily trip for the existing one-way configuration on Tejon Street.² This ratio was then applied to the net increase in daily traffic caused by the conversion of Tejon Street from one-way to two-way, resulting in an estimate of potential new annual sales for the study area.

This analysis assumes that the traffic and shopping patterns (i.e., distribution of destination trips vs. pass-through trips) of a two-way Tejon Street will be similar to those of a one-way Tejon Street. However, it is possible that some of the new trips spurred by conversion of Tejon Street to a two-way street will be pass-through traffic rather than destination traffic. These pass-through trips would not result in additional sales revenue for local proprietors.

This methodology includes certain assumptions and limitations:

- The sales data used in these calculations was provided by the Downtown Partnership of Colorado Springs (Partnership) based on municipal sales tax records.
- The current (one-way configuration) and projected (two-way configuration) daily traffic volumes used in our calculations were provided by Felsburg, Holt and Ullevig.
- This analysis assumes the two-way daily traffic volume estimates represent traffic counts for a normalized two-way street. Interim estimates (such as during road construction) were not considered.
- All sales data for the 100-199 South Tejon block includes sales revenues for buildings located on the four blocks of 100-500 South Tejon (sales data for the 100-199 South Tejon block by itself were not available). However, excluding the 100-199 block, the buildings are primarily government offices; sales at these buildings are negligible and are assumed to have minimal effect on our analysis of the study area.

¹ The five blocks of the study area are 0-99 North Tejon, 100-199 North Tejon, 200-299 North Tejon, 0-99 South Tejon, and 100-199 South Tejon.

² Based on monthly sales data from 1998 – 2005 provided by the Pikes Peak Area Council of Governments.

Annual Sales Performance

Exhibit IV-1 below displays the total annual sales by year for the study area.

Exhibit IV-1. Annual Sales for Study Area, 1998-2007

Notes:

Annual sales for 2005 were inflated based on the Bureau of Labor Statistics CPI index to estimate 2006 and 2007 figures.

Source:

Downtown Partnership of Colorado Springs and BBC Research & Consulting.

Annual Sales	
1998	\$ 1,042,029
1999	1,155,094
2000	1,270,969
2001	1,255,417
2002	1,451,955
2003	2,011,395
2004	2,339,398
2005	2,661,279
2006	2,746,440
2007	2,773,355

As shown above, annual sales revenue in the study area have grown from \$1.0 million in 1998 to an estimated \$2.8 million in 2007. This represents a 166 percent increase in annual sales over the ten year period.

The study team then distributed annual sales for the study area by block based on detailed sales tax records provided by the Partnership. Exhibit IV-2 below displays annual sales for the study area by block.

Exhibit IV-2. Annual Sales by Block, 1998-2007

	0-99 North Tejon	100-199 North Tejon	200-299 North Tejon	0-99 South Tejon	100-199 South Tejon
1998	\$ 61,093	\$ 243,116	\$ 384,990	\$ 236,970	\$ 115,860
1999	70,328	253,666	405,777	299,494	125,830
2000	83,522	292,737	408,485	355,252	130,974
2001	111,208	271,143	392,954	349,314	130,799
2002	103,297	326,368	491,584	383,788	154,907
2003	143,098	452,118	680,992	531,662	214,593
2004	166,433	525,846	792,043	618,361	249,588
2005	189,333	598,198	901,022	703,442	283,929
2006	195,440	617,495	930,087	726,134	293,088
2007	197,281	623,311	938,848	732,974	295,848

Source: Downtown Partnership of Colorado Springs and BBC Research & Consulting, 2007

The 200-299 block of North Tejon Street has averaged the highest annual sales of the study area, with an estimated \$938,848 in annual sales in 2007. In comparison, the 0-99 North Tejon block has approximately \$198,000 in estimated annual sales in 2007.

The Partnership also provided sales tax data that allowed the study team to allocate each block's annual sales by type of merchant: bars and restaurants, other retail, and services. Using a weighted average of monthly sales data by type for each block in the study area, the study team calculated sales by type by block for 2007.³ The results of our calculation are shown in Exhibit IV-3.

**Exhibit IV-3.
Annual Sales by Block by Type, 2007**

	Bars and Restaurants		Other Retail		Services	
	Sales	Percent of Sales	Sales	Percent of Sales	Sales	Percent of Sales
0-99 North Tejon	\$ 98,871	50 %	\$ 88,205	45 %	\$ 10,205	5 %
100-199 North Tejon	196,742	32	419,518	67	7,051	1
200-299 North Tejon	221,440	24	702,844	75	14,564	2
0-99 South Tejon	433,310	59	299,664	41	-	0
100-199 South Tejon	130,214	44	78,973	27	86,661	29
Total	\$ 1,080,578	39 %	\$ 1,589,203	57 %	\$ 118,481	4 %

Source: Downtown Partnership of Colorado Springs and BBC Research & Consulting.

In 2007, 39 percent of all sales for the study area were at Bars and Restaurants, 57 percent were at Other Retail establishments, and 4 percent were for Service businesses. The exhibit above also indicates the 0-99 South Tejon block is heavily occupied by restaurants and bars, while the 200-299 North Tejon block is primarily composed of retail businesses, such as clothing stores.

Vehicle Trips

FHU provided estimated daily traffic volumes by block for both one-way and two-way traffic on Tejon Street, as discussed in Section III. This data is displayed below in Exhibit IV-4.

**Exhibit IV-4.
Traffic Volumes
for Tejon Street**

Source:
Felsburg, Holt and
Ullevig traffic study, 2006.

Block	One-Way Daily Traffic Volume	Two-Way Daily Traffic Volume	Net Increase in Traffic Volume
0-99 North Tejon	6,050	9,400	3,350
100-199 North Tejon	5,750	10,900	5,150
200-299 North Tejon	5,700	6,800	1,100
0-99 South Tejon	6,900	10,000	3,100
100-199 South Tejon	7,800	10,800	3,000
Total	32,200	47,900	15,700

Based on these projections, conversion of Tejon Street from one-way to two-way traffic could increase the daily traffic volume for all blocks in the study area. The 100-199 North Tejon block could experience the greatest increase in traffic volume (5,150 new daily trips), while the 200-299 North Tejon block could experience the smallest increase in traffic volume (1,100 new daily trips).

³ The weighted average included the distribution of sales by type from the months January 1998 to August 2002 and May 2003 to December 2005 (the only months where sales distribution by type data was available.)

Sales per Trip

Using data from Exhibit IV-2 and Exhibit IV-4, we determined a ratio of annual sales per daily trip by block. The results are shown in Exhibit IV-5 below.

Exhibit IV-5. Annual Sales per Daily Trip by Block, 2007

Source:
Felsburg, Holt and Ullevig traffic study, 2006; Downtown Partnership of Colorado Springs; and BBC Research & Consulting.

	Total Annual Sales	One-Way Daily Traffic Volume	Annual Sales per Daily Trip
0-99 North Tejon	\$ 197,281.08	6,050	\$ 32.61
100-199 North Tejon	623,311.20	5,750	108.40
200-299 North Tejon	938,848.04	5,700	164.71
0-99 South Tejon	732,973.90	6,900	106.23
100-199 South Tejon	295,848.38	7,800	37.93

The ratio of annual sales per daily trip ranges from \$32.61 for the 0-99 North Tejon block to \$164.71 for the 200-299 North Tejon block. Using the annual sales by type distributions from Exhibit IV-3, we then calculated the new annual sales per daily trip by block expected on a two-way Tejon Street. The results of the calculation are shown in Exhibit IV-6.

Exhibit IV-6. New Annual Sales per Daily Trip by Block, 2007

Notes:
(1) See Exhibit IV-5.
(2) See Exhibit IV-4.

Source:
Felsburg, Holt and Ullevig traffic study, 2006; Downtown Partnership of Colorado Springs; and BBC Research & Consulting.

	Annual Sales per Daily Trip ⁽¹⁾	New Daily Traffic Volume ⁽²⁾	New Annual Sales per Daily Trip
0-99 North Tejon	\$ 32.61	3,350	\$ 109,238
100-199 North Tejon	108.40	5,150	558,270
200-299 North Tejon	164.71	1,100	181,181
0-99 South Tejon	106.23	3,100	329,307
100-199 South Tejon	37.93	3,000	113,788
		Total	\$ 1,291,784

The increase in daily traffic volume caused by the conversion of Tejon Street from one-way to two-way could result in approximately \$1.3 million in new annual sales for the study area. This would represent a 46 percent increase in annual sales compared to those of a one-way Tejon Street.

Using the weighted average distributions of annual sales by type from Exhibit IV-3, we calculated the distribution of new annual sales per daily trip by type. The results are shown in Exhibit IV-7.

**Exhibit IV-7.
New Annual Sales per Block by Type**

	Bars and Restaurants		Other Retail		Services	
	Sales	Percent of Sales	Sales	Percent of Sales	Sales	Percent of Sales
0-99 North Tejon	\$ 54,747	50 %	\$ 48,841	45 %	\$ 5,651	5 %
100-199 North Tejon	176,212	32	375,742	67	6,315	1
200-299 North Tejon	42,734	24	135,636	75	2,811	2
0-99 South Tejon	194,676	59	134,631	41	-	0
100-199 South Tejon	<u>50,082</u>	44	<u>30,374</u>	27	<u>33,331</u>	29
Total	\$ 518,451	40 %	\$ 725,225	56 %	\$ 48,108	4 %

Note: Annual Sales by Block from Exhibit IV-6.

Source: Felsburg, Holt and Ullevig traffic study performed in 2006, Downtown Partnership of Colorado Springs and BBC Research & Consulting.

If Tejon Street is converted to a two-way street, annual sales at bars and restaurants could increase by approximately \$518,500, other retail annual sales could increase by approximately \$725,000 and services annual sales could increase by approximately \$48,000.

Summary of Findings

If Tejon Street is converted from a one-way to a two-way street, total annual sales could increase by nearly \$1.3 million, a 46 percent increase in annual sales compared to one-way street. Annual sales at Bars and Restaurants could increase by approximately \$518,500, annual sales at Other Retail establishments could increase by approximately \$725,000 and annual sales for Service businesses could increase by approximately \$48,000.