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FINAL REPORT

Business Impacts of Express Toll Lanes on Existing Facilities

November 2006

BBC Research & Consulting

Felsburg Holt & Ullevig

Research Branch

CDOT

Department of Transportation

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16. Abstract

This study examines the potential economic effects, business perceptions and impacts to firms from developing express toll lanes in existing highway corridors in the Denver Metropolitan Area.

The study team interviewed elected officials, economic development and chamber of commerce representatives, and key businesses in Denver and in five case study cities to identify potential key issues and perceptions associated with express toll lanes. The study team also conducted a review of recent literature. Based on this research, the following potential impacts to businesses were identified: customer access to businesses; ability to make calls on customers or make deliveries; ease of obtaining supplies; traffic on local arterials; economic development and other concerns.

The study team conducted interviews with 150 businesses in two Denver area highway corridors currently being examined for express toll lanes. These interviews gauged whether business owners and managers thought they would be positively or negatively affected by the proposed toll lanes.

In order to compare local perspectives with current experience and to gain a better understanding of the general economic implications of express toll lanes, the study team interviewed 50 businesses in each of the five case study corridors. Interview topics were similar to those in the interviews with Denver area businesses.

The study team analyzed the results of the interviews for trends across business type, business size, and business location. In analyzing the interview results for each of the case study corridors, the study team evaluated how each of the project's unique characteristics might apply to the express toll lanes CDOT has proposed for the Denver Metro Area.

Research findings indicate that express toll lanes generally benefit or have no impact on businesses located within the toll lane corridors. Denver area business people, on balance, expect that toll lanes will either help their businesses or have no effect on their companies. These findings can help to alleviate concerns over the potential business impacts of the express toll lanes proposed for the Denver Metro Area.

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BUSINESS IMPACTS OF

EXPRESS TOLL LANES ON EXISTING FACILITIES

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EXECUTIVE SUMMARY

The Colorado Department of Transportation (CDOT) is examining the potential for express toll lanes in existing highway corridors in the Denver Metropolitan Area. Some elected officials and other community leaders are concerned that toll lanes would hurt local businesses or discourage development in these corridors. CDOT retained BBC Research and Consulting (BBC), an economic research firm, and Felsburg Holt and Ullevig (FHU), a transportation engineering firm, to examine these issues.

Background

Some Denver area elected officials and other community leaders have voiced concerns about the effect new toll lanes might have on local businesses and future development prospects along the proposed toll lane corridors. This study examines whether Denver area businesses share these concerns. The study team also investigated the experiences of businesses located along toll lanes in other cities. Through primary and secondary research, the study team answers four questions:

- **What do available studies show about the business impacts of express toll lanes and other highway improvement projects?** An in-depth literature review helps to answer this question.
- **Do express toll lanes negatively impact businesses located in toll lane corridors in other cities?** To answer this question, BBC staff interviewed over 250 businesses along five express toll lane corridors in San Diego, CA; Orange County, CA; Minneapolis, MN; and Houston, TX.
- **What do Denver area businesses think will happen if toll lanes are added to local corridors?** Our findings come from interviews with 150 businesses located along the proposed C-470 and U.S. 36 corridors.
- **Do toll lanes negatively affect future business development along these corridors?** The study team conducted in-depth interviews with economic development and real estate professionals, as well as local business owners and managers, to address this question.

This research helps to sift through possible impacts to identify which concerns, if any, are valid. The study also explores perceptions of possible negative impacts on businesses so that CDOT and others may be prepared to address them.

Throughout the research, the study team was careful to compare conditions with new toll lane capacity to conditions with no new capacity (a future with toll lanes versus a future without toll lanes). The study team did not examine whether businesses would be better served by new express toll lanes versus new general-purpose highway lanes. Similarly, the study team did not examine new highways built exclusively as toll roads, only the addition of toll lanes to existing free highways. Case studies of toll lanes in other cities did not include roads that are exclusively tolled.

Concerns of Denver Area Officials, Community Leaders and Others

The study team interviewed elected officials and other community leaders in the Denver Metropolitan Area to identify local concerns and perceptions associated with proposed new express toll lanes. Most of these individuals expected new toll lane capacity to positively affect local businesses. Some identified potential negative impacts. The study team's own analysis and literature review of possible impacts on businesses added to this list of issues. They include:

- **Ability to attract employees**. Some interviewed individuals suggested that businesses along the toll lane corridors may have to pay more to attract labor due to the cost of using the toll lanes. Some of the people we interviewed were concerned that the express toll lanes would not permit HOVs to ride for free, thereby affecting employees commuting via public transportation or carpools.

- **Customer access to businesses**. Another concern is that retailers along the express toll lanes would face a competitive disadvantage if their customers perceive they have to pay to access these businesses. Other firms were worried that drivers on the toll lanes would not want to cut across many lanes of traffic to exit to access retail businesses along the highway. In some cities, toll lanes are a "tube" that may bypass highway access points. This could affect customer access to bypassed businesses. Finally, businesses may be negatively affected if their customers face more congestion on local arterials.

- **Ability to make calls on customers or make deliveries**. Businesses that have employees making sales calls or trucks making deliveries during the workday could be affected by any traffic congestion or other accessibility issues created by toll lanes.

- **Ease of obtaining supplies.** Toll lanes might affect supplier access when making deliveries to businesses located along toll lane corridors.

- **Traffic on local arterials.** If toll lanes cause further congestion on the general purpose lanes, some traffic might divert to local streets and through neighborhoods. Toll lanes could also increase local arterial traffic at the entrance and exit points of the toll lanes.

- **Economic development.** One economic development professional in the Denver area suggested that toll lanes may discourage certain types of businesses from locating to areas where it is difficult to exit from the toll lanes.

- **Other concerns.** Some of the people interviewed commented on the equity issues associated with the toll lanes. For example, will low-income workers be able to afford the express toll lanes? Are these just "Lexus lanes"?

Research Findings

The combined research indicates that express toll lanes generally benefit businesses located in the toll lane corridors, or have no impact on these businesses. Toll lanes also boost business development in these corridors or have no impact on development prospects. Even so, some businesses in potential Denver area toll lane corridors, and some companies along existing toll lanes, articulated concerns that the toll lanes have negative effects on businesses. This report highlights these concerns even though just a small portion of the businesses surveyed reported these effects.

Academic and other available research. Academic and other general research that examines business effects from adding transportation infrastructure finds that added transportation capacity usually helps businesses. Beyond this general finding, little research specifically examines business impacts from express toll lanes.

Interviews with businesses and others along existing toll lanes. Express toll lanes do not hurt businesses according to most business representatives in existing toll lane corridors in San Diego, Orange County, Minneapolis and Houston. Interviews with economic development and real estate professionals and other local experts indicate that business development prospects are not depressed by the toll lanes. Far more businesses and local experts believe that the toll lanes help businesses along these corridors than those who view the toll lanes as having negative impacts.

Some representatives of businesses had negative comments about certain aspects of toll lane operations. A few believed their firms were adversely affected by the toll lanes.

Interviews with Denver area businesses along proposed toll lane corridors. Most Denver area businesses interviewed along the C-470 and U.S. 36 corridors felt that the addition of express toll lanes would either have no effect on their businesses or would help their businesses. This view is shared by most economic development and real estate professionals interviewed as part of this study.

Some business interviewees identified concerns that companies along C-470 or U.S. 36 would be hurt in some way by the new toll lanes. Most of the business representatives holding this view were unfamiliar with the toll lane proposals prior to the interviews.

Types of impacts. Findings concerning each type of potential impact are summarized below:

- **Ability to attract employees.** Very few business representatives indicated that express toll lanes made it harder for them to recruit or retain employees. For many businesses, toll lanes helped employees get to work. Some businesses in other cities found it productive to pay for certain employees to use the toll lanes. (Almost one-third of respondents along U.S. 290 in Houston indicated that their firm paid tolls for some of their workforce or for their service trucks.) A few employers indicated that paying employees' tolls helps attract a better workforce.

- **Customer access to businesses.** Interviews with businesses suggest that toll lanes would have little effect on customer access to businesses. Of the small business representatives who expressed concern about impacts on customer traffic, most cited increased congestion on local arterials.

  A few businesses indicated that customers were unable to use the toll lanes because there was no exit near their establishment. For example, "It is really tough to get to the exit … this makes the toll lanes inconvenient [for customers]." Toll lanes that are long "tubes" bypassing local exits may exacerbate these potential impacts.

- **Ability to make calls on customers or make deliveries.** None of the businesses interviewed along existing toll lanes identified negative impacts on their ability to make sales calls or deliveries from their businesses.

- **Traffic on local arterials.** Most business representatives felt that the toll lanes improved congestion on local arterials or had no impact. Although only a few businesses identified negative impacts, traffic on local arterials was the most common concern from businesses that had any complaints about toll lanes. Most business representatives raising this concern were unable to identify the mechanism responsible for the increase in local arterial congestion.

- **Economic development.** The study team found little evidence that adding express toll lanes to highway corridors negatively affected local business development prospects. Economic development and real estate professionals interviewed in the Denver area and cities with existing express toll lanes indicated that express toll lanes would either have no impact on development or enhance business development along these corridors.

- **Other concerns.** Some toll lane proposals were negatively viewed before being eventually implemented. For example, the Minnesota Department of Transportation (MnDOT) tried to convert existing HOV lanes on I-394 to HOT (High Occupancy Toll) lanes in the 1990s, but the proposal failed due to lack of congestion on the general-use lanes as well as aversion and unfamiliarity with toll lanes by the people of Minneapolis. Representatives of MnDOT indicated that they did not do a good job of communicating the concept of HOT lanes to the public, and opponents successfully branded the lanes as toll-only lanes and "Lexus lanes." When MnDOT proposed the conversion to HOT lanes again in 2003, the Department employed a much more effective communications campaign, framing the HOT lanes as "congestion insurance." Some negative views remain: "It is just a tool for those with money," and "We did not like the idea of a fee … and feel the same way now."

  Other business representatives believed that toll lanes did not effectively address the congestion on local highways and that other solutions were needed. In some corridors, businesses observed that toll lanes were underutilized. Other respondents said that the toll lanes take space from the highway without providing much benefit. Referring to U.S. 290 in Houston, one businessperson said "There are still too many single drivers. They [the toll lanes] do not create an incentive to carpool or change driving habits drastically."

Other businesses indicated that entering and exiting the toll lanes was difficult and that crashes on the toll lanes could create other traffic problems.

Summary

Businesses located along express toll lanes in other cities do not appear to be negatively affected by the toll lanes. Nor have express toll lanes negatively affected business development prospects along these corridors. Many of the business representatives interviewed in cities with toll lanes said that the additional lanes had reduced highway congestion. Some representatives cited specific ways in which the toll lanes had helped their businesses.

Representatives of Denver area businesses located along C-470 and U.S. 36 generally believe that express toll lanes either would have no impact or would help their companies, with positive perceptions outweighing negative ones. For example, "Toll lanes will make our location better," said one representative, "[they] give people more options to travel … drawing more business to the area." Another respondent said, "Toll lanes would help shorten the time of the employee commute by offering the option to pay to skip traffic." Some business representatives indicated that the toll lanes would improve their ability to make deliveries or visit their customers. Economic development and real estate professionals interviewed in the Denver area believe that the proposed lanes would have no impact or would have a positive effect.

These findings do not mean that certain businesses will not raise issues concerning toll lanes if express toll lane proposals go forward in the Denver area:

- Express toll lanes that are "tubes" may limit use of the lanes by employees and customers of businesses served by exits that are bypassed by the lanes. Some business owners may mistakenly think that all express toll lanes are tubes.

- Some business people will incorrectly view express toll lanes as requiring employees and customers to pay to access their businesses. Hotels or other businesses serving out-of-town customers may worry that customers without transponders cannot access their businesses. Others may be concerned about effects on low-income employees or customers, or think it unfair that the toll lanes do not serve people who cannot afford tolls. Some may believe that toll lanes eliminate use by high-occupancy vehicles. These business owners and managers may not understand that express toll lanes give businesses, employees and customers another choice. They are not required to use the toll lanes.

- Although some businesses in other cities thought the toll lanes had improved congestion on local arterials, a few business representatives thought that congestion had increased on the local arterials. If new toll lanes increase highway traffic and capacity of local arterials feeding these highways is not addressed, increased congestion on arterials may affect local businesses.

In summary, research findings indicate that express toll lanes generally benefit or have no impact on businesses located within the toll lane corridors. Denver area business people, on balance, expect that toll lanes will either help their businesses or have no effect on their companies. These findings can help to alleviate concerns over the potential business impacts of the express toll lanes proposed for the Denver Metro Area.

1.0 INTRODUCTION

The Colorado Department of Transportation (CDOT) is currently examining the potential for express toll lanes in the Denver Metropolitan Area. Some elected officials and other community leaders are concerned that toll lanes would have negative economic impacts on local businesses or would discourage development in these corridors.

To examine these issues, CDOT retained BBC Research and Consulting (BBC), an economic research firm, and Felsburg Holt and Ullevig (FHU), a transportation engineering firm, to:

- Gain a better understanding of the economic effects of express toll lanes by reviewing similar projects in other cities; and
- Identify business perceptions and potential impacts to firms from developing express toll lanes in the Denver Metropolitan Area.

1.1 Background

In the face of growing urban congestion, transportation officials in the United States have increased the range of lane management strategies used to help maintain and improve highway services in metropolitan areas. The most common lane management strategy has been the use of High Occupancy Vehicle (HOV) lanes, which reserve existing or new highway lanes for the exclusive use of car pools and transit vehicles. Recently, transportation officials have become increasingly interested in the use of toll lanes to help pay for additional capacity and manage highway use. This concept allows vehicles to gain access to express lanes by paying a toll. The lanes are typically "managed" through pricing to maintain desirable traffic conditions even during the height of rush hours.

There are currently five managed toll facilities in the United States somewhat similar to the express toll lanes CDOT has proposed for the Denver Metropolitan Area. Although the concept has been limited in practice, express toll lanes have been the subject of much interest and research. Most of the research has focused on the financial, technical and public relations aspects of implementation and operation. Additional studies have addressed the public's willingness to pay for premium travel conditions and perceived equity of providing this service. The general economic implications of express toll lanes and their impacts on local businesses are still largely unknown.

1.2 Approach

The study team's general approach was to:

- Identify potential key issues and perceptions associated with express toll lanes through a review of recent literature and interviews with elected officials, economic development and chamber of commerce representatives, and key businesses;

- Examine what has occurred in other cities with toll lanes through key person and business interviews (five case study highway corridors);
- Through interviews with businesses in two potentially affected highway corridors, identify the perceptions of Denver area businesses regarding the potential impacts of the proposed express toll lanes; and
- Compare local perspectives with findings from the case study highway corridors.

Throughout the research, the study team was careful to compare conditions with new toll lane capacity to conditions with no new capacity (a future with toll lanes versus a future without toll lanes). The study team did not examine whether businesses would be better served by new express toll lanes versus new general-purpose highway lanes. Similarly, the study team did not examine new highways built exclusively as toll roads, only the addition of toll lanes to existing free highways. Case studies of toll lanes in other cities did not include new toll roads.

Study area definition. The study team evaluated potential impacts of the express toll lanes proposed for U.S. Highway 36 and C-470 in the Denver Metro Area. In coordination with CDOT, the study team defined the study area for each of these highway corridors based on the environmental assessments for each project, county assessor's data, zoning information and knowledge of traffic flow patterns.

The C-470 study area encompasses the entire 12.5 mile stretch of toll lane proposed to run from Kipling Road to I-25. The U.S. 36 study area follows the proposed toll lanes for the entire 19 mile stretch from Foothills Parkway to I-25. The study areas for each of the highway corridors include businesses within relatively close proximity to the highway.

Case studies. The study team identified five projects in other cities that are similar to the toll lanes proposed for implementation in the Denver area. These projects serve as "case study" highway corridors. They include:

- MnPass High Occupancy Toll (HOT) Lanes on Interstate 394 in Minneapolis, Minnesota;
- Express Toll Lanes on State Route 91 in Orange County, California;
- FasTrak HOT Lanes on Interstate 15 in San Diego, California; and
- QuickRide HOT Lanes on both Interstates 10 and 290 in Houston, Texas.

The study areas for these highway corridors were defined to include businesses within one mile of the respective toll lanes.

Literature review. The study team collected and reviewed available studies on the economic impacts of managed toll lane facilities and related highway infrastructure improvements. This review helped to identify some of the key issues for businesses in the proposed express toll lane corridors in the Denver area. The literature review focused on studies related to:

- Impacts to businesses from express toll lanes;
- Effects on businesses from highway demand management strategies such as congestion pricing;
- Business costs of congestion (which may be lessened by adding managed toll lanes); and
- The effects of transportation infrastructure and highway improvements on business location decisions and regional economic development.

The literature review included regional, statewide and national studies. It consisted of both peer-reviewed journal articles as well as studies performed for state departments of transportation and other groups.

Key person interviews. The study team identified the range of potential issues related to express toll lanes through key person interviews. BBC talked with elected officials serving areas along the potentially affected highway corridors. The study team also interviewed representatives of economic development councils and chambers of commerce in the Denver area and in cities where express toll lanes have been implemented. These interviews helped when designing the discussion guide for the larger business survey effort.

Denver highway corridor analysis. The analysis of potential impacts to businesses along U.S. 36 and C-470 consists of two components: a land use overview for each of the respective highway corridors and interviews with businesses in the corridors.

> **Land use overview.** The study team analyzed land use in the U.S. 36 and C-470 study areas using business listings from Dun & Bradstreet. This inventory included describing the most common industries in the study areas as well as the number of businesses by size. In addition, the study team determined the most common locations for businesses within each corridor.
>
> **Business interviews.** BBC conducted interviews with 150 businesses in the U.S. 36 and C-470 study areas. These interviews gauged whether business owners and managers thought they would be positively or negatively affected by the proposed express toll lanes. The study team selected businesses for interviews from Dun & Bradstreet—a business list provider—using a stratified random sample that considered employment size. The business interviews addressed negative and positive perceptions of the toll lanes in general and how they might affect different aspects including:

- Customers;
- Employees;
- Deliveries and calling on customers;
- Suppliers; and
- Congestion levels on local arterial roads.

The study team analyzed the results of the interviews for differences across business type, size and location.

Case study highway corridor analysis. In order to compare local perspectives with current experience and to gain a better understanding of the general economic implications of express toll lanes, BBC staff interviewed 50 businesses in each of the five case study corridors. Interview topics were similar to those in the interviews with Denver area businesses.

The study team analyzed the results of the interviews for trends across business type, business size, and business location. In analyzing the interview results for each of the case study corridors, the study team evaluated how each of the project's unique characteristics might apply to the express toll lanes CDOT has proposed on U.S. 36 and C-470.

1.3 Report Organization

The report is organized into five sections plus supporting appendices:

- Section I has introduced study objectives and methodology.
- Key issues researched in this study are summarized in Section II.
- Section III highlights findings from the literature on these topics.
- Corridor analyses are found in Section IV (case studies from other cities) and Section V (Denver Metro Area).

Several appendices support this report:

- **Appendix A** contains the case study interview guide, and **Appendix B** identifies quotes from key questions in the guide.
- **Appendices C and D**, respectively, provide the interview guide for businesses in the Denver area and quotes from key questions in the guide.
- **Appendix E** contains a list of research cited in the literature review.

2.0 KEY ISSUES

The study team interviewed elected officials and other community leaders in the Denver Metropolitan Area to identify local concerns and perceptions associated with proposed new express toll lanes. Most of these individuals expected new toll lane capacity to positively affect local businesses, while a few identified potential negative impacts. The study team's own analysis and literature review of possible impacts on businesses added to this list of issues. They include:

- **Ability to attract employees.** Some individuals interviewed suggested that businesses along the toll lane corridors might have to pay more to attract labor due to the cost of using the toll lanes. Some of the people interviewed were concerned that the express toll lanes would not permit HOVs to ride free, thereby affecting employees commuting via public transportation or carpools.

- **Customer access to businesses.** Another concern is that retailers along the toll lanes would face a competitive disadvantage if their customers perceive they have to pay to access these businesses. Other firms were worried that drivers on the toll lanes will not want to cut across many lanes of traffic to exit to access retail businesses along the highway. In some cities, toll lanes are a "tube" that may bypass highway access points. This could affect customer access to bypassed businesses. Finally, businesses may be negatively affected if their customers face more congestion on local arterials.

- **Ability to make calls on customers or make deliveries.** Businesses that have employees making sales calls or trucks making deliveries during the workday could be affected by any traffic congestion or other accessibility issues created by toll lanes.

- **Ease of obtaining supplies.** Toll lanes might affect supplier access when making deliveries to businesses located along toll lane corridors.

- **Traffic on local arterials.** If toll lanes cause further congestion on the general purpose lanes, some congestion might divert traffic to local streets and through neighborhoods. Toll lanes could also increase local arterial traffic at the entrance and exit points of the toll lanes.

- **Economic development.** One economic development professional in the Denver area suggested that toll lanes may discourage certain types of businesses, including those that depend heavily on ease of customer access, from locating in areas where it is difficult to exit from the toll lanes.

- **Other concerns**. Some of the people interviewed commented on the equity issues associated with the toll lanes. For example, will low-income workers be able to afford the express toll lanes? Are these just "Lexus lanes"?

The balance of this study examines each of these areas of concern.

3.0 LITERATURE REVIEW

The study team reviewed available studies on the economic impacts of managed toll lanes and related highway infrastructure improvements. The purpose of the literature review was to identify the business impacts and economic implications associated with adding highway capacity through managed toll lanes. However, few studies address this specific issue. Therefore, the study expanded the literature review to include the effects of investments that serve to reduce congestion and improve accessibility. Specifically, the literature review summarizes findings related to:

- Business impacts of current and planned express toll lane projects in the U.S.;
- Effects on businesses from highway management strategies such as congestion pricing;
- Business costs of congestion (which may be lessened by adding managed toll lanes); and
- Effects of transportation infrastructure and highway improvement projects on business location decisions and regional economic development.

3.1 Business Impacts of Managed Toll Lanes

Due to the limited number of projects currently in operation, few studies have addressed the impacts of managed toll lanes on local businesses.

SR 91 and I-15 studies. Section 4.0 presents the findings of two studies conducted in the SR 91 and I-15 case study corridors in Orange County and San Diego, as part of the federal funding requirements for the respective projects.

TTI toll roads study. The Texas Transportation Institute (TTI) recently studied the regional economic impacts of toll roads, with some consideration given to managed lanes (Clower and Weinstein, 2006). The study provides a comprehensive review of literature related to the economic impacts of toll roads (as opposed to managed lanes) and transportation infrastructure in general. TTI also conducted several stakeholder interviews with elected officials, city staff and businesses in areas that currently have toll roads and areas that do not have toll roads.

Although the authors were unable to find any supporting literature, they indicate that highway access characteristics could influence the location of business development. For example, development could cluster at ingress/egress points, especially for toll roads without continuous free frontage roads between access points. The extent to which development will concentrate at these points depends upon industry mix in the area. For example, the authors hypothesize that retail trade establishments catering to drive-by customers would prefer locations with comparatively easy access.

Business impacts of related highway management strategies. Although there are few studies specific to the impacts of managed toll lanes, several studies have evaluated the potential impacts of alternative management strategies, including highway congestion pricing. An important limitation of these studies is that they may have considered converting existing lanes to managed lanes rather than analyzing express toll lanes as additional capacity for a highway corridor.

Boulder, Colorado congestion pricing study. In a 1999 study conducted in Boulder, Colorado, Baskett and Ungemah found that many businesses expected to accrue net benefits from congestion pricing, as pricing improves overall travel time. However, downtown Boulder retail firms competing in a regional context might be adversely affected, as it would become less expensive for customers and employees to travel outside Boulder. Study results also indicate that congestion pricing might adversely affect businesses employing low-income workers.

Austin, Texas congestion pricing study. Gulipali et. al (2005) evaluated commercial users' perspectives about congestion pricing on local highways and predicted negative business impacts of credit-based congestion pricing in Austin, Texas. While some commercial users saw a benefit to less congestion, most reported having already shaped their business practices to cope with high levels of congestion. The study found that businesses that depend on timely product and service deliveries were the ones most interested in the congestion relief offered by congestion pricing. Additionally, study results indicated that there was very little interest in subsidizing employee-related congestion pricing costs. A common perspective seems to be that employees must plan to get to work on time, irrespective of where they live.

Most of the business representatives interviewed seemed to be uninterested in the potential benefits of congestion pricing for their region's transportation and distribution systems and instead primarily considered how these changes would personally affect them. The authors concluded that this response most likely reflected the growing reliance of businesses on outside companies, such as shippers and couriers, for transportation and distribution.

3.2 Other Research on Benefits of Transportation Improvements

Business costs of congestion. Express toll lanes allow commuters and businesses to weigh the costs associated with congestion in the general-purpose lanes with the cost of paying a toll to gain access into the express lanes where traffic is managed to maintain desirable traffic conditions. Presumably, businesses stand to gain from reduced costs associated with congestion.

In a 2001 study entitled the "Economic Implications of Congestion," the National Cooperative Highway Research Program (NCHRP) examined existing research concerning the economic costs of congestion beyond the direct value of travel time and vehicle operating costs. The review focused on business costs and income effects relating to customer and workforce market access, logistics, and overall productivity.

The NCHRP study found highway projects to alleviate congestion can have an important affect on the "market reach" of businesses (see McConnell and Schwab, 1990, cited in the NCHRP research). With better accessibility and less congestion, businesses can potentially realize efficiencies in serving broader markets. In addition, highway system improvements can also provide businesses with access to a greater variety of specialized labor skills and specialized input products, which can also help them become more productive (Evers et al., 1988). Improvements in the transportation system are seen as a way to increase producers' access to specialized inputs (Fujita, 1989; Krugman, 1995; Ciccone and Hall, 1996).

Highway infrastructure and economic development. The long-term benefits of highway system expansion have been an issue of continuing debate.

Studies finding a strong link between highway investment and economic development. Proponents of new highway investments often cite anticipated benefits such as local or regional job creation, business attraction, and income growth:

- Several studies have underscored the importance of highway infrastructure in relation to economic development and business location decisions (Sinha et. al., 1996; Hansen, 1998; Gillis, 1994); and
- A recent study by the Federal Reserve found that higher levels of per capita expenditures for highways corresponded to an increase in the number of businesses established over time (Wheeler, 2006). Studies at the national and regional levels have consistently found positive correlations between transportation investment and economic growth.

Studies finding little or no link between highway investment and economic development. Opponents often argue that new highway investments at best serve only to redistribute jobs and business activity, and at worst lead to more traffic generation without any real economic benefit to the local area or region (Economic Development Research Group, 2001):

- In a 1996 study entitled "Highways and Business Location Decisions," Forkenbrock and Foster measured the influence of investments in "high capacity highway systems" on business location decisions. The authors conclude that highway access has generally become less of a factor in business location decisions, especially given the extent of the existing options for business locations near highways.
- In a study on the economic development benefits of highways, the Victoria Transport Policy Institute, an independent transportation research firm in British Columbia, concludes that increasing highway capacity will at best attract some additional business activity that would otherwise locate elsewhere in the region, but is unlikely to significantly increase regional economic development. Additionally, new highway capacity tends to provide consumer benefits (such as the ability to work in a city and live farther out in rural areas); however, these benefits do not provide external

economic benefits such as increased productivity, economic development or employment.

- A 1999 study on the relationship between road infrastructure, economic productivity, and highway finance reform asserts that measures encouraging efficient use of existing roadway capacity are likely to provide greater economic benefits than increasing roadway capacity (Boarnet, 1999).

Studies finding mixed results. There is nearly universal agreement that the economic effects of investments in highway infrastructure can vary significantly from project to project, depending on the type of investment, where the project is located (rural, urban, population, etc.), the inherent "economic potential" of the area, and the project's affects on accessibility and system wide connectivity (Weiss, 1999; EDRG, 2001). Impacts to businesses have also been found to vary across different types of businesses (EDRG, 2001). These factors are particularly relevant for projects conducted at the local level.

In a literature review prepared for the Federal Highway Administration (FHWA), the Economic Development Research Group (EDRG) and Cambridge Systematics (2001) found that studies of certain types of transportation infrastructure have been able to establish common themes:

- Transportation impacts can vary considerably depending upon a variety of local circumstances. Important factors include the presence of other economic development programs or activities; area size and type; and proximity to a larger metropolitan area. Local economic characteristics are also important but are difficult to describe or quantify.

- Bypass and other access-restriction studies have generally found that net impacts to the community are neutral or positive in the long term. Some businesses that are heavily dependent on pass-by traffic can suffer negative impacts if the project reduces traffic on the bypassed roadway. However, the impact on "destination" retail is usually not significant. This finding is significant in that it relates to the concerns of many that the proposed toll lanes will make it more difficult for individuals to access certain businesses along the highway corridor.

3.3 Conclusions

Research specific to managed toll lanes is very limited. When examining the broader literature of how investments in highway infrastructure influence business location decisions and regional economic development, findings are mixed. Economic effects of investments in highway infrastructure can vary significantly from project to project, depending on the type of investment, where the project is located, current levels of congestion, the inherent "economic potential" of the area, and the project's affects on accessibility and system-wide connectivity. These factors are particularly relevant for highly-localized express toll lane projects.

4.0 CASE STUDY CORRIDOR ANALYSIS

To better understand business effects and general economic implications of express toll lanes, the study team analyzed similar projects currently in operation in the United States. The study team reviewed available studies and interviewed economic development agencies, local chamber of commerce representatives, and businesses within each of the respective highway corridors.

Five projects in other cities are somewhat similar to the toll lanes proposed for U.S. 36 and C-470. These projects include:

- MnPass High Occupancy Toll Lanes on Interstate 394 in Minneapolis, Minnesota;
- Express Toll Lanes on State Route 91 in Orange County, California;
- FasTrak High Occupancy Toll Lanes on Interstate 15 in San Diego, California;
- QuickRide HOT Lanes on U.S. Highway 290 in Houston, Texas; and
- QuickRide HOT Lanes on Interstate 10 in Houston, Texas.

The study team conducted key person interviews with economic development experts in each of the five case study corridors. BBC discussed the effects of toll lanes on businesses within the corridor and desirability of the corridor for prospective firms.

BBC also interviewed about 50 businesses from each corridor with roughly equal shares of small (1-19 employees), medium (20-99 employees) and large (100+ employees) establishments. The case study areas included businesses within one mile of the toll lanes. Within each size category, BBC randomly chose businesses for interviewing from lists of businesses maintained by Dun & Bradstreet. The study team analyzed the interview data for variation across business sizes and types. Results of this analysis demonstrated no clear trends or significant differences in business responses based on these categories. Interview findings from each corridor indicate a greater number of positive responses than negative ones. A majority of business representatives reported no impacts. The study team was careful to document the reported negative impacts of express toll lanes in order to identify issues and concerns that CDOT may need to address when planning for any future projects in Colorado.

Appendix A includes the interview guide used by the study team for the case study interviews. **Table A** shows the number of small, medium and large businesses interviewed by BBC in each case study corridor.

Table A. Number and Size of Businesses Interviewed in the Case Study Corridors

Case Study Corridor	Business Size			Total Interviewed
	Small	Medium	Large	
Minneapolis I-394	18	17	17	52
Houston U.S. 290	17	17	16	50
Houston I-10	17	17	17	51
Orange County SR 91	17	21	16	54
San Diego I-15	17	19	18	54

Note: Small businesses employ 1-19 individuals; Medium businesses employ 20-99 individuals; Large businesses employ 100+ individuals.

Source: BBC Research & Consulting

4.1 MnPass HOT Lanes on Interstate 394 in Minneapolis, Minnesota

The 11-mile MnPass High Occupancy Toll lane (HOT) facility opened in 2005. The I-394 HOT lanes are free for transit and carpools and are available to single-occupant vehicles for a toll, which varies depending on traffic volumes. The lanes are reversible and separated from the general-purpose lanes by a concrete barrier and road markings at different points along the route. The Minnesota Department of Transportation (MnDOT) originally built the I-394 HOT lanes as HOV lanes in the early 1990s. **Figure 1** shows a map of the I-394 HOT lane corridor.

Figure 1. Map of Interstate 394 Hot Lane Corridor in Minneapolis, Mn

Source: BBC Research & Consulting.

Since the MnPass program began in May 2005, more than 9,000 people have signed up to participate by leasing a transponder from MnDOT. The number of tolled trips on the highway increased from about 10,000 per week to 20,000 per week within the first seven months of project implementation (MnDOT, 2006). In a survey conducted in late 2005, the University of Minnesota found that more than 95 percent of MnPass holders like the program. The program has gained acceptance from the public at large. About 60 percent of Twin Cities residents surveyed stated that allowing drivers to pay to travel faster on the highway was a good idea, with little variation in support across income, education levels or gender (MnDOT, 2006).

BBC spoke with Kenneth Buckley of the Minnesota Department of Transportation (MnDOT). Mr. Buckley is the Program Manager for the Office of Investment Management and the MnPass HOT lane system in Minneapolis. He explained that MnDOT tried to convert the lanes from HOV to HOT in 1997, but the proposal failed due to lack of congestion on the general-use lanes as well as aversion and unfamiliarity with toll lanes by the people of Minneapolis.

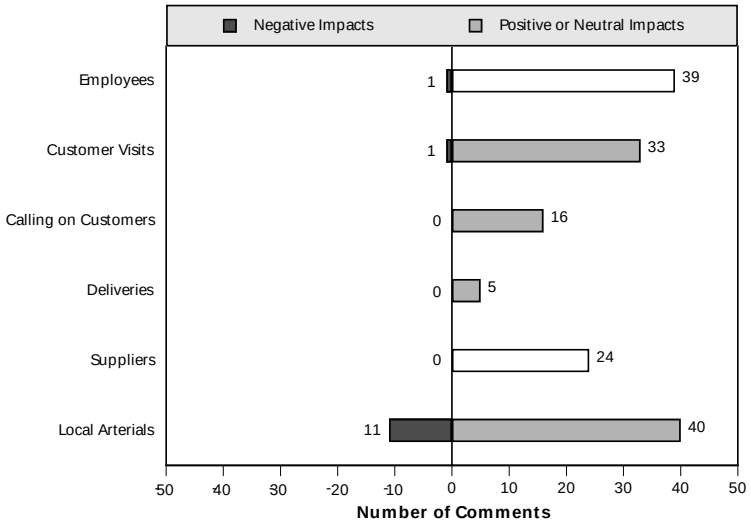
Mr. Buckley recalled that MnDOT did not do a good job of communicating the concept of HOT lanes to the public, and opponents successfully branded the lanes as toll-only lanes and "Lexus lanes." When MnDOT proposed the conversion to HOT lanes again in 2003, the department employed a much more effective communications campaign, marketing the HOT lanes as "congestion insurance."

What works about the I-394 toll lanes? About 40 percent of the business representatives interviewed along I-394 had positive comments about how the toll lanes function. Many indicated that the toll lanes helped traffic flow on the highway. Representatives from a few businesses specifically mentioned the benefits of using the lane for no fee as a carpool. One participant said, "The toll lanes work really well for people who work downtown." Approximately one-third of business representatives had no comment on the operation of the toll lanes.

What are the negative aspects of the I-394 toll lanes? Some business representatives reported confusion among employees and customers about entering and exiting the toll lanes. "The entrance bottlenecks as four lanes try to converge to one toll lane," said one manager. In addition, several business representatives said that the toll lanes were underutilized, and others stated that the lanes should be used as free lanes.

What are the impacts on businesses? Most business representatives stated that there was no impact or only a small positive impact on their business due to the toll lanes on I-394. Only two people interviewed said that the toll lanes had a negative impact on their employees or customers (see **Figure 2**).

Figure 2. Perceived Business Impacts on I-394 Due to MnPass Toll Lanes



Note: A total of 52 business representatives were interviewed. Non-responses include individuals who did not respond or did not know about impacts in the area.
Source: BBC Research & Consulting.

Eleven business representatives reported negative effects on their company from an increase in traffic on local arterials. For example, one respondent said, "The arterials are busier because people are using the toll lanes." Another business representative stated, "There has been an increase in local traffic because more people commute to the area." One of the business representatives indicated that this was only a problem in bad weather.

It is unclear whether there is any increase in congestion on local arterials due to the toll lanes compared to what congestion on local arterials would be without the lanes. The capacity of local arterials feeding the highway may not have expanded to meet the extra need created by the toll lanes on I-394. Additionally, the toll lanes may have increased the number of businesses locating to the area, bringing more local traffic.

Regardless of the cause of the negative perceptions about local arterial congestions, 36 respondents, or 73 percent, stated that the toll lanes had no impact on congestion on local arterial roads, while an additional four respondents stated positive impacts. Other businesses mentioned problems related to highway and arterial congestion, but did not associate these problems with the toll lanes.

Over 85 percent of the interviewed businesses that located to the corridor before the toll lanes, indicated that their current location is still good for their business. None of the business representatives felt that the toll lanes negatively affected business growth in the corridor. A few of the businesses in the corridor reported that the toll lanes helped attract businesses due to a decrease in traffic congestion.

Businesses that located to the corridor before the toll lanes reported some negative perceptions about the lanes prior to opening, including that "it is just a tool for those with money," and "we did not like the idea of a fee…and feel the same way now." While these perceptions remain among some business representatives, most did not report negative impacts from the toll lanes.

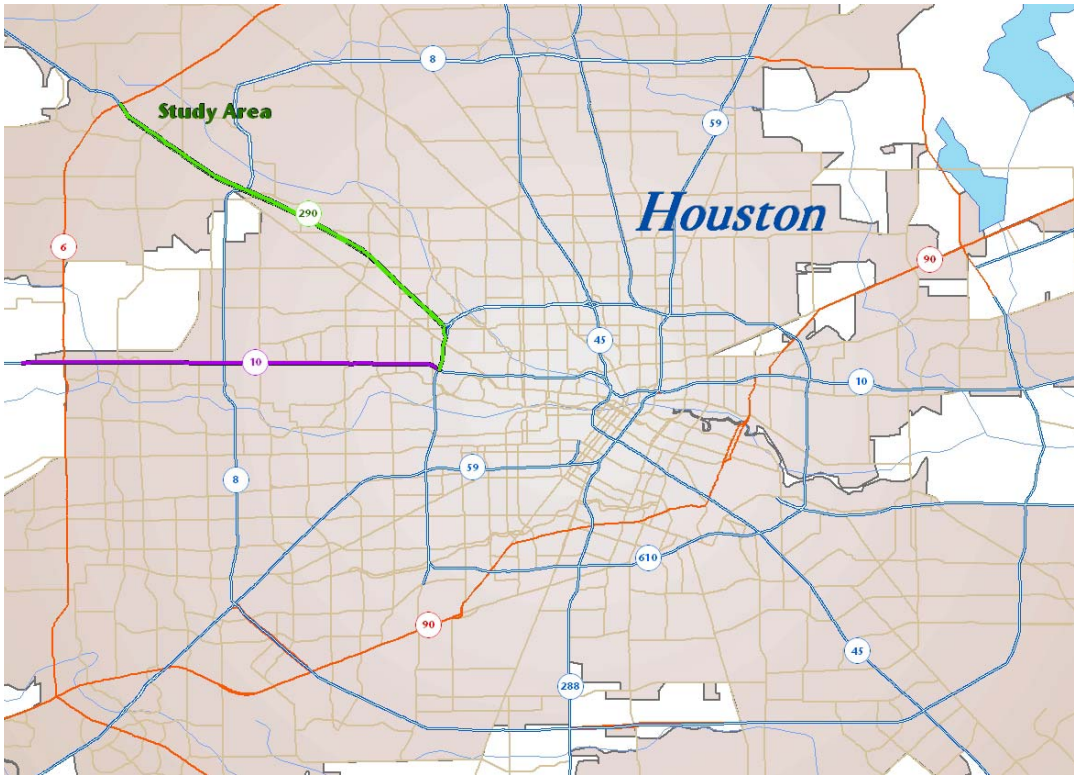
MnDOT has not heard of any opposition to the toll lanes from businesses. Residents and businesses seem to have accepted them as part of the city's transportation infrastructure.

Summary. Most business representatives see little or no impact from the I-394 toll lanes. The campaign against the first attempt at implementation left some interviewees with the idea that the toll lanes were only for the wealthy. The 2003 marketing campaign helped change these opinions. Confusion remains about how the lanes operate. Although positive comments about the operation of the toll lanes outnumbered the negative, most business representatives felt that mobility within the corridor was still a substantial problem and that the toll lanes did not alleviate much congestion.

4.2 QuickRide Pricing Program on U.S. Highway 290 in Houston, Texas

Houston implemented a "QuickRide" pricing program on existing carpool lanes on U.S. 290 in November 2000. The managed carpool lanes are reversible and restricted to vehicles with three or more persons during peak periods. The pricing program allows a limited number of two-person carpools to buy into the lanes during the peak hours. Participating two-person carpool vehicles pay a $2.00 per trip toll, while vehicles with higher occupancies continue to travel free. The pricing program is unique because it does not allow single-occupant vehicles to use the carpool lanes. The QuickRide project is completely automated and no cash transactions are handled on the facility. **Figure 3** on the following page shows a map of the U.S. 290 HOT lane corridor.

Figure 3. Map of the U.S. Highway 290 QuickRide Corridor in Houston, TX



Source: BBC Research & Consulting.

What works about the QuickRide program on U.S. 290? Many business representatives commented about the lack of congestion on the toll lanes. "They are so much nicer than having to sit in traffic," reported one respondent, "I use them whenever possible and enjoy the open road." The lanes provide easy access into Houston for carpools driving in from the northwest suburbs.

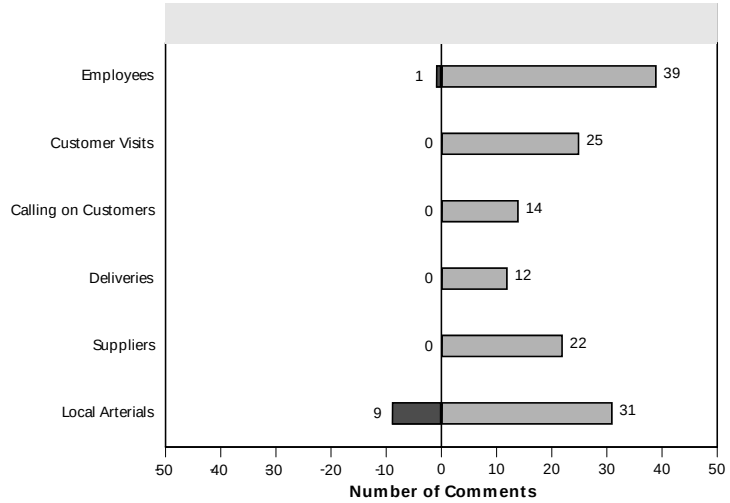
A large number of representatives from businesses located in the corridor were unaware of the HOT lanes on U.S. 290. Some individuals confused these toll lanes with the I-10 Katy Freeway or State Highway 8.

What does not work about the U.S. 290 HOT lanes? Most business representatives feel that the toll lanes do not effectively address the congestion on U.S. 290. "Traffic is insane," reported one, while another said, "There are still too many single drivers. They [the toll lanes] do not create an incentive to carpool or change driving habits drastically." A few representatives indicated that entering and exiting the toll lanes was not very easy. Some respondents said that the toll lanes take space from the highway without providing much benefit. One participant suggested converting the lanes to a rail system.

How do the HOT lanes on U.S. 290 impact businesses? The majority of business representatives felt that the toll lanes had no impact or a positive impact on employees commuting to work or on customer visits. A few representatives felt that the toll lanes reduced congestion for employees and customers, but many indicated that individuals were unwilling to pay the toll. Of all of the business representatives interviewed, only one felt that the toll lanes had a negative impact on their employees, customer visits or service calls, saying "sometimes it is more difficult to reach your destination."

Nine representatives cited negative impacts on local arterials from the toll lanes. One of these respondents said the increase in traffic coincided both with the opening of a new apartment complex and the introduction of the toll lanes. As in Minneapolis, the study team was unable to identify the mechanism respondents felt was responsible for the increase in local arterial congestion. "The tolls have made traffic [on local arterials] more difficult," said one respondent. Four respondents felt that the toll lanes improved congestion on the arterials. Most respondents indicated no impact. **Figure 4** shows the responses from business representatives regarding the impact of the U.S. Highway 290 toll lanes.

Figure 4. Perceived Business Impacts on U.S. Highway 290 Due to QuickRide Toll Lanes



Note: A total of 50 business representatives were interviewed. Non-responses include individuals who did not respond or did not know about impacts in the area.

Source: BBC Research & Consulting.

Many businesses reported using other strategies to avoid highway congestion including altering customer appointments, delivery times and employee start times. One respondent indicated, "People try to visit during the off hours." None of the businesses reported an increase in the use of public transportation due to the toll lanes, but a few businesses indicated that the HOT lanes encouraged some employees to carpool.

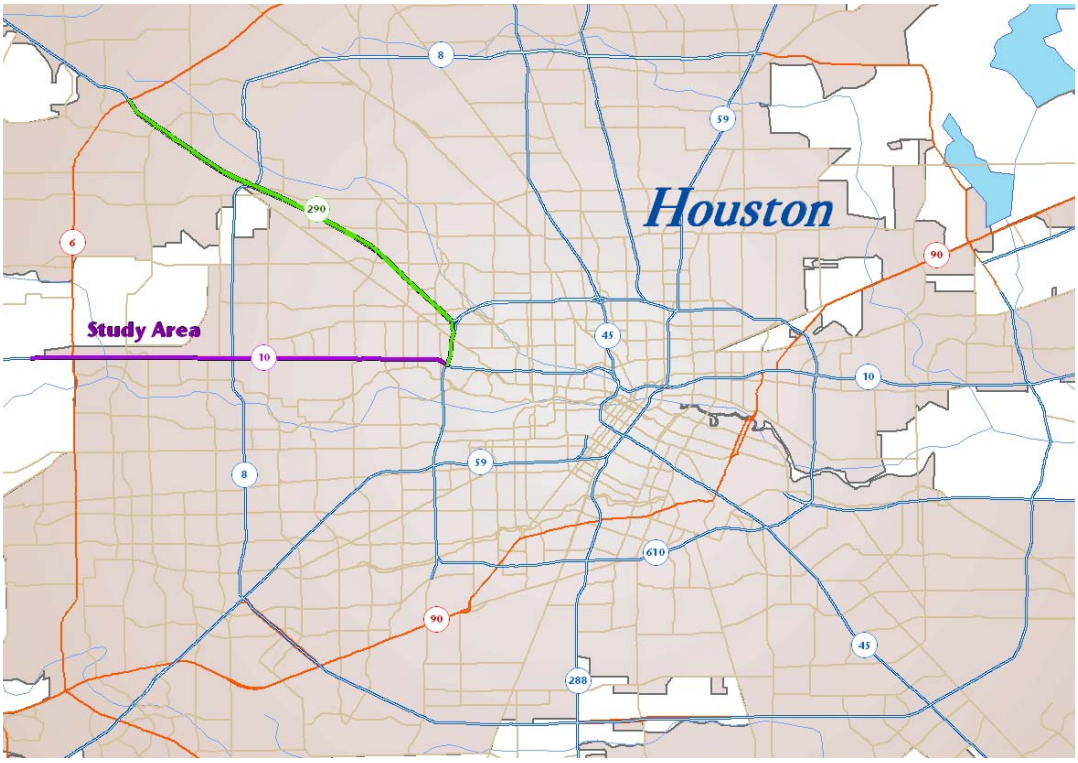
Over three-quarters of business representatives reported that the corridor was a "good" location for business. About 70 percent of the businesses interviewed located in the corridor before the HOT lane construction. Almost one third of respondents indicated that the firm paid tolls for some of their workforce, usually upper management or service trucks. A few employers indicated that paying employees' tolls helps attract a better workforce.

Summary. The majority of business representatives BBC interviewed reported a positive impact or no impact from the HOT lanes on U.S. Highway 290. A large number of interviewees were unaware of the toll option on the highway and confused the U.S. 290 corridor with other toll projects within Houston. Business representatives perceive that congestion on U.S. 290 is a major barrier to mobility in the area and that the HOT lanes are only a small part of the solution. Businesses seem to incorporate traffic into their daily operations by shifting travel times and routes. These lanes might not be significant for these businesses because they only affect two-person carpools. Single-occupancy vehicles cannot use the HOT lanes on U.S. 290.

4.3 QuickRide HOT Lanes on Interstate 10 in Houston, Texas

Before adding the HOT lanes on U.S. Highway 290, Houston implemented a "QuickRide" pricing program on existing carpool lanes on Interstate 10. This program dates from 1998. The I-10 lanes operate identically to the U.S. Highway 290 HOT lanes. The Metropolitan Transit Authority of Harris County (METRO) manages both projects and allows free travel on the lanes for cars with three or more people during all hours. During peak hours. METRO allows a limited number of two-person carpools on the lanes for a $2.00 fee. Single-occupancy vehicles are not allowed to use the lanes. All transactions are automated using transponders. Drivers obtain a transponder by visiting the "QuickRide" website, downloading a form and mailing it to the METRO offices. **Figure 5** shows a map of the QuickRide corridor on Interstate 10.

Figure 5. Map of the Interstate 10 QuickRide Corridor in Houston, Texas



Source: BBC Research & Consulting.

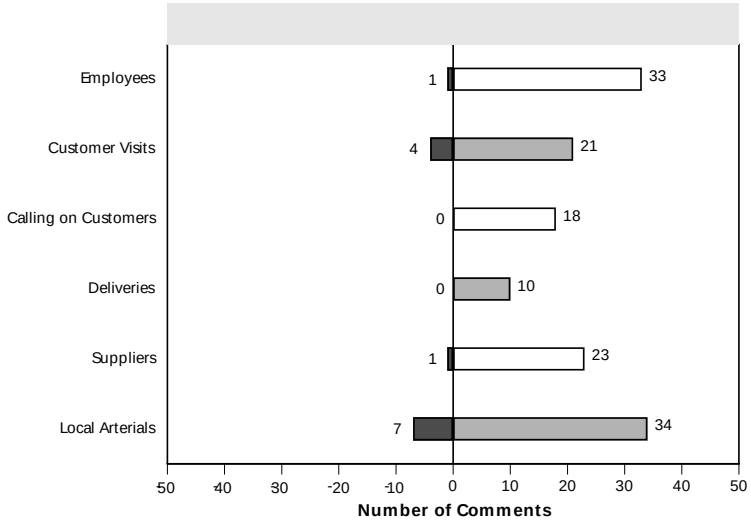
What works well about the I-10 QuickRide Corridor? About 40 percent of business representatives interviewed by BBC said that the HOV lanes on I-10 helped reduce congestion. "[Our business] has easy access to I-10," said one representative, "plus it reduces traffic." Of the remainder, the majority did not use the toll lanes or did not know how the toll lanes worked. Some of the respondents specifically mentioned that the usefulness of the lanes depended on having extra passengers in the vehicle.

What does not work well about the I-10 QuickRide Corridor? About 10 percent of business representatives felt that the toll lanes were underutilized and thus did not help traffic in the corridor. A few business representatives indicated that they did not like the HOV occupancy rules. Three business representatives expressed strong negative opinions about the toll roads such as "I don't like them, period." A few mentioned concerns such as traffic flow during construction or an accident and people driving on the HOT lanes with only one person in the vehicle.

What are the business impacts of the I-10 QuickRide HOT lanes? The majority of business representatives felt that the HOT lanes had no impact on their business. Eight respondents said it helped employee mobility by either improving their commute time or helping them visit more clients during the workday.

Most businesses thought that the toll lanes helped customer access to their locations, while a few saw negative effects on customers. For example, one business reported that 25 percent of their customers used the toll lanes. Some businesses indicated that customers were unable to use the toll lanes because there was no exit near their establishment. "It is really tough to get to the exit … this makes the toll lanes inconvenient [for customers]," said one business representative. **Figure 6** shows categorized responses from business representatives to questions about business impacts of Houston's I-10 QuickRide HOT lanes.

Figure 6. Perceived Business Impacts on Interstate 10 Due to QuickRide Toll Lanes



Note: A total of 51 business representatives were interviewed. Non-responses include individuals who did not respond or did not know about impacts in the area.

Source: BBC Research & Consulting.

Of the few negative impacts reported by business representatives, most were related to increased traffic on the local arterials. One business said of the local arterials, "When the roads are full, customers will not come." Two of the negative comments cited problems with the toll lanes when there are accidents. Approximately 83 percent of business representatives stated that the toll lanes had no impact on local arterial traffic within the corridor, "The toll lanes don't affect surrounding roads," said one representative, "they aren't used enough to impact traffic." No respondents indicated that toll lanes had a positive effect on local arterial congestion.

Summary. Unlike U.S. Highway 290, most businesses in the I-10 corridor were well informed about the toll lanes. Many business representatives viewed the lanes on I-10 as only a part of the solution to the congestion. As with the I-394 and U.S. 290 toll lane projects, congestion on the local arterials was the most frequently mentioned negative business impact within the corridor.

4.4 Express Toll Lanes on State Route 91 in Orange County, California

The State Route 91 (SR 91) express lanes in Orange County, California opened in December 1995 as a four-lane toll facility in the median of a 10-mile section of one of the most heavily congested highways in the U.S. The toll lanes are separated from the general purpose lanes by a painted buffer and plastic pylons.

In January 2003, the Orange County Transportation Authority (OCTA) took over ownership of the SR 91 Express Lanes. OCTA implemented a new toll policy based on congestion management pricing. Under this policy, toll prices change on the highway based on hourly traffic volumes to maintain desirable traffic conditions. Toll rates on the Express Lanes vary from $0.75 to $4.75 by time of day and day of the week. Customers must have a prepaid account and transponder to use the Express Lanes. HOV2+ vehicles pay only 50 percent of the toll rate.

The toll lane corridor cuts through Santa Ana Canyon and is therefore largely undeveloped. The toll lanes represent a "tube," with only one entrance and one exit at each end. The main highway adjacent to the ten-mile toll lane corridor has only three exit ramps that are not accessible from the toll lanes. **Figure 7** shows a map of the SR 91 corridor.

Past research on the SR 91 Express Toll Lanes. In 1998, Cal Poly State University surveyed a random sample of businesses located within the SR 91 Express Toll Lanes corridor. The survey addressed perceptions concerning travel conditions, variable toll pricing, and other innovative technical and institutional features of the SR 91 express lane project.

About one-half of area businesses agreed that the express lanes improved ease and reliability of travel, not only for their workers but also for customers, suppliers, and the firm's own work-related travel. Nearly two-thirds of companies contacted stated that the express lanes were "good for local business."

Figure 7. Map of Interstate 91 along the Santa Ana Canyon in Orange County, CA

Source: BBC Research & Consulting.

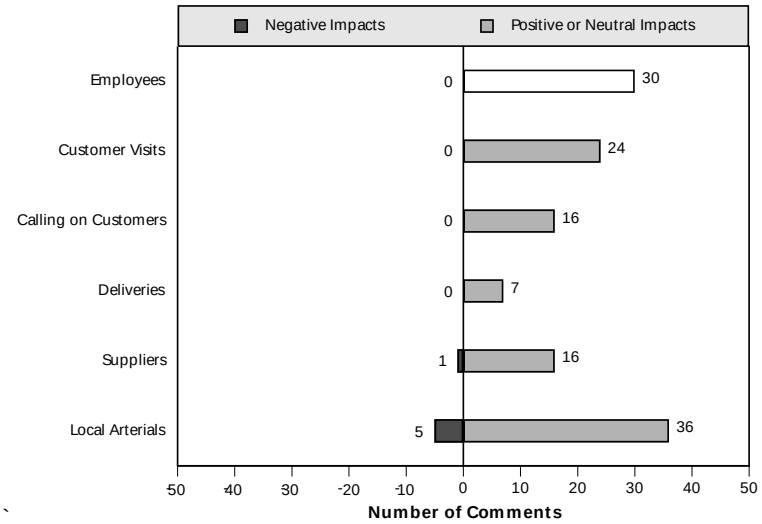
What works well about the SR 91 express toll lanes? In the surveys BBC conducted with local firms, business representatives commented on the improved travel time and travel time reliability provided by the toll lanes. "The drive time is better; they are faster and less congested," said one respondent. Another commented that, "[the] tube set-up works well because people from longer distances have a very easy commute." "They just work well. I use them all the time," said another interviewee. One representative commented on the tow trucks that patrol the toll lanes and move stalled vehicles away from traffic.

What does not work well about the SR 91 express toll lanes? Eight business representatives indicated that they would prefer more entrances and exits to the toll lanes. "Toll lanes make riders bypass this business by moving traffic quickly. The nearest toll lane exit is three miles down the road. On [SR] 91 toll drivers go straight through." Another common complaint was the cost of the toll roads. One representative complained about the transponder requirement and another found the constantly changing rates confusing.

What are the business impacts from the SR 91 express toll lanes? Business representatives along the SR 91 corridor reported few positive or negative effects on local businesses, with most reporting no impact. One reason the toll lanes may have a minimal impact along the corridor is the tube design of the highway.

Business representatives near the ends of the tube reported some employee use of the toll lanes and one reported that some employees find it worthwhile to back track to jump on the "tube." Other business representatives felt that the impact on employees was positive for some employees and negative for others, saying "the commute seems to be shorter and the time of commute more reliable for those employees who use the toll lane. However, the presence of toll lanes increases the overall traffic on [SR] 91 freeway, causing more traffic problems for [some] employees." **Figure 8** shows categorized responses of business representatives by the area of impact.

Figure 8. Perceived Business Impacts on State Highway 91 Due to FasTrak Toll Lanes



Note: A total of 54 business representatives were interviewed. Non-responses include individuals who did not respond or did not know about impacts in the area.

Source: BBC Research & Consulting.

As displayed in **Figure 8**, complaints about congestion on local arterials comprised the majority of the reported negative impacts of the toll lanes. Five firms thought the toll lanes had a negative impact on their businesses. One representative said that, "…cars get backed up that are trying to head north. They take detours (east, south, west) trying to get around and start heading north. This increases the local traffic." Four respondents stated that the toll lanes helped to relieve congestion on local arterial roads. Most respondents indicated that there were no impacts on the arterials. They often stated that the traffic was already congested or that the tube nature of the toll lane reduced the potential effects.

BBC spoke with Steven Schupak, SR 91 Express Toll Project Manager, in order to gain a better understanding of the express toll lanes. Mr. Schupak indicated that he had never heard any comments about the toll road, either positive or negative, from the local business community.

Summary. Few businesses interviewed by BBC reported any negative impacts from the SR 91 toll lanes. Some business representatives perceive the "tube" toll lane structure of the SR 91 express toll lanes as a benefit, while others view it as a detriment. When compared with the non-tube toll lanes in the case studies, there were fewer complaints about impacts on local arterial congestion in the SR 91 corridor. The 1998 Cal Poly State University study found that nearly two-thirds of businesses held positive views of the impact of the express toll lanes on local businesses.

4.5 Interstate 15 FasTrak Program in San Diego, California

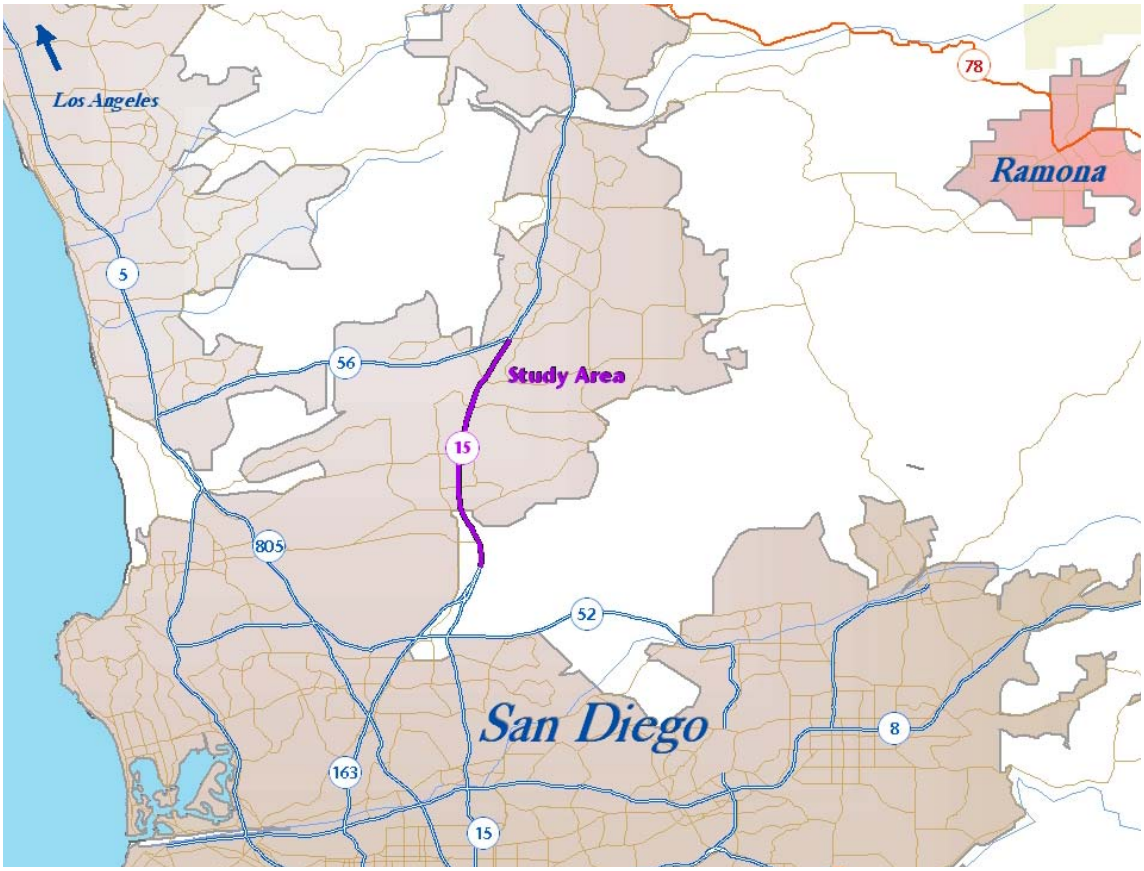
San Diego's Fastrak pricing program was implemented in April 1999. The I-15 FasTrak involved the conversion of an underutilized 2-lane HOV facility to a peak-period reversible HOT lane operation. The HOT lanes extend for eight miles. The FasTrak program allows single occupancy vehicles to pay a toll ranging from $0.50 to $4.00 to use the HOT lanes. There is no charge for HOV2+ vehicles. Fees can vary in 25-cent increments as often as every six minutes to help maintain free-flow traffic conditions on the carpool lanes. Similar to the SR 91 express toll lanes, the I-15 toll lanes have only one entrance and exit.

Non-HOV users must have a FasTrak account and transponder to use the HOT lanes. The FasTrak transponder used on the I-15 toll lanes can be used on many toll roads throughout California, including SR 91. San Diego Association of Governments (SANDAG), the local metropolitan planning organization, sponsors the project. SANDAG is currently expanding the project to include a 20 mile four lane corridor. The new managed lane facility will have multiple entry and exit points to the highway and will include a moveable center barrier to adjust for rush hour direction. **Figure 9** shows a map of the current I-15 FasTrak corridor.

BBC spoke with Derek Toupes, SANDAG I-15 Project Manager, regarding impacts to businesses that have resulted from the I-15 toll lanes. Mr. Toupes stated that any impacts have been positive. He does not believe that there was any significant opposition to the project when it was developed. The project team often does public outreach and customer satisfaction work, and the vast majority (70 percent) of users have positive reactions to the HOT lanes. Mr. Toupes said that one reason that reaction to the lanes is positive is because residents view the project as allowing them to "buy into" the HOT lane to get the lane's benefits without the cost (i.e., having additional vehicle occupants).

Mr. Toupes has not heard of any complaints from businesses along the route, and there has not been any disapproval of the project among local policy makers.

Figure 9. Map of the Interstate 15 FasTrak Corridor in San Diego, California



Source: BBC Research & Consulting.

Existing research on the I-15 FasTrak program. Evaluators in San Diego attempted to measure the extent to which businesses recognize and value the I-15 FasTrak Program based on:

- Awareness of the program;
- Use of the Express Pass/FasTrak by employees;
- Perceived importance of the FasTrak program; and
- Perceived impact of the FasTrak program.

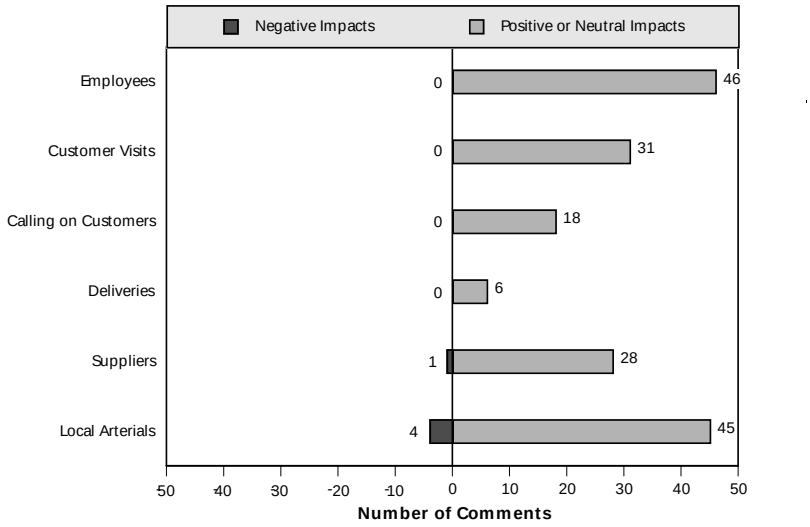
The study found relatively low awareness of the program and low employee use of FasTrak. Businesses also had a low assessment of the importance and overall impact of the FasTrak program to their business. Businesses that were highly dependent on the I-15 corridor were more likely to view the program as important and as having a positive impact on their business.

What works well about the I-15 FasTrak toll lanes? Turning to the business interviews conducted by BBC, business representatives in the FasTrak corridor reported that the toll lanes reduced congestion and helped traffic flow: "The general concept of toll lanes is fine," said one representative, "It is good that they have them open on the weekend. The tube structure makes sense for the location and the flow of traffic through the area."

What does not work well about the I-15 FasTrak toll lanes? Seven business representatives commented on the difficulty of navigating the corridor due to construction. "Traffic on lanes [doesn't work well]! It is a mess because of construction. Maybe in six years when they get the construction done, it will work great." Four business representatives expressed frustration with the limited access of the toll lanes including concern over emergency access and lack of accessibility for their customers.

What are the business impacts from the I-15 FasTrak toll lanes? There were very few negative or positive comments surrounding the FasTrak toll lanes in San Diego, with most respondents reporting no impact. One representative said, "In some ways it has helped, but it really has not made much difference in our business." Another respondent specifically pointed to the "tube" design of the express lanes saying, "if people are running late, they can always choose to take the tolls,[...]but the toll lanes aren't really convenient for our commuters because we are about 4 miles from an entry or exit point." **Figure 10** shows the responses for each area of impact included in the case study interviews.

Figure 10. Perceived Business Impacts on the I-15 Corridor Due to FasTrak Toll Lanes



Note: A total of 54 business representatives were interviewed. Non-responses include individuals who did not respond or did not know about impacts in the area.

Source: BBC Research & Consulting.

As with the other corridors included in the study, the majority of negative comments about business impacts were related to the impact of the lanes on the local arterials. Two of the negative comments specifically referred to times when the toll lanes had construction or accidents. Three representatives indicated that the toll lanes reduced congestion: "traffic on arterial roads has moved faster since the toll lanes went in." Forty-two respondents, or 86 percent, indicated no impact.

Summary. While many business representatives had positive comments about the traffic improvements from I-15 toll lanes, the most common complaints in this corridor were about the construction of the toll lanes. As with SR 91 in Orange County, there were fewer complaints about local arterial congestion when compared with the "non-tube" corridors. Interview findings are consistent with past research on the toll lanes, which found little impact, positive or negative, on local businesses.

5.0 DENVER AREA CORRIDOR ANALYSIS

This section outlines concerns of local officials with respect to toll lanes, describes the two Denver corridors analyzed by the study team and summarizes findings from key person interviews, project related studies and interviews with businesses.

5.1 Study Area Specification and Business Selection

The study area for the Denver portion of the study comprises two separate roadway corridors: U.S. 36 and C-470. These two corridors are important links in the regional traffic network north and south of Denver, in addition to serving local traffic. Both corridors are being considered for toll lane expansion.

The limits of the study area within each corridor were established through consideration of the adjacent local roadway network and the commercial land use patterns in the vicinity of the highway. Dun and Bradstreet provided business information from a sample of businesses in the corridor. The study team geographically coded each business into a GIS platform for analysis.

BBC interviewed more than 75 business representatives in each of the corridors. The study team interviewed roughly equal shares of small (1-19 employees), medium (20-99 employees) and large (100+ employees) businesses in each corridor. **Table B** shows the number of businesses interviewed in each size category.

Table B. Number and Size of Businesses Interviewed in Each Denver Corridor

Corridor	Business Size			Total Interviewed
	Small	Medium	Large	
C-470	26	30	19	75
U.S. 36	25	40	10	75

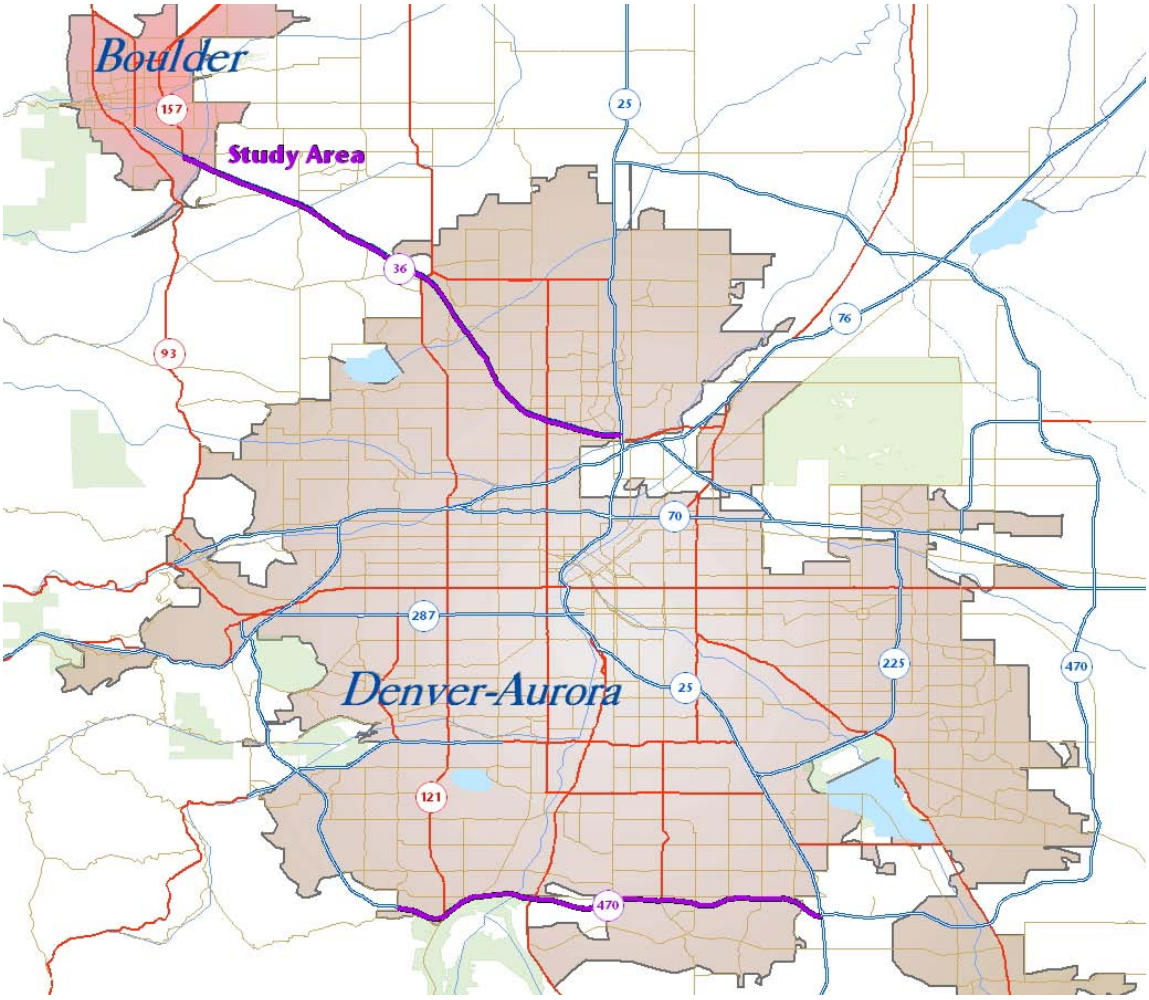
Note: Small businesses employ 1-19 individuals; Medium businesses employ 20-99 individuals; Large businesses employ 100+ individuals.
Source: BBC Research & Consulting.

Within each size category, the study team randomly chose businesses for interviewing. BBC analyzed the interview data for trends across business sizes and types. Similar to the case study analysis, the study team found no clear trends or differences across business categories. **Appendix C** includes the interview guide used for the Denver corridor interviews, and **Appendix D** includes responses to key questions by business representatives.

5.2 U.S. Highway 36 from Interstate 25 to Foothills Parkway

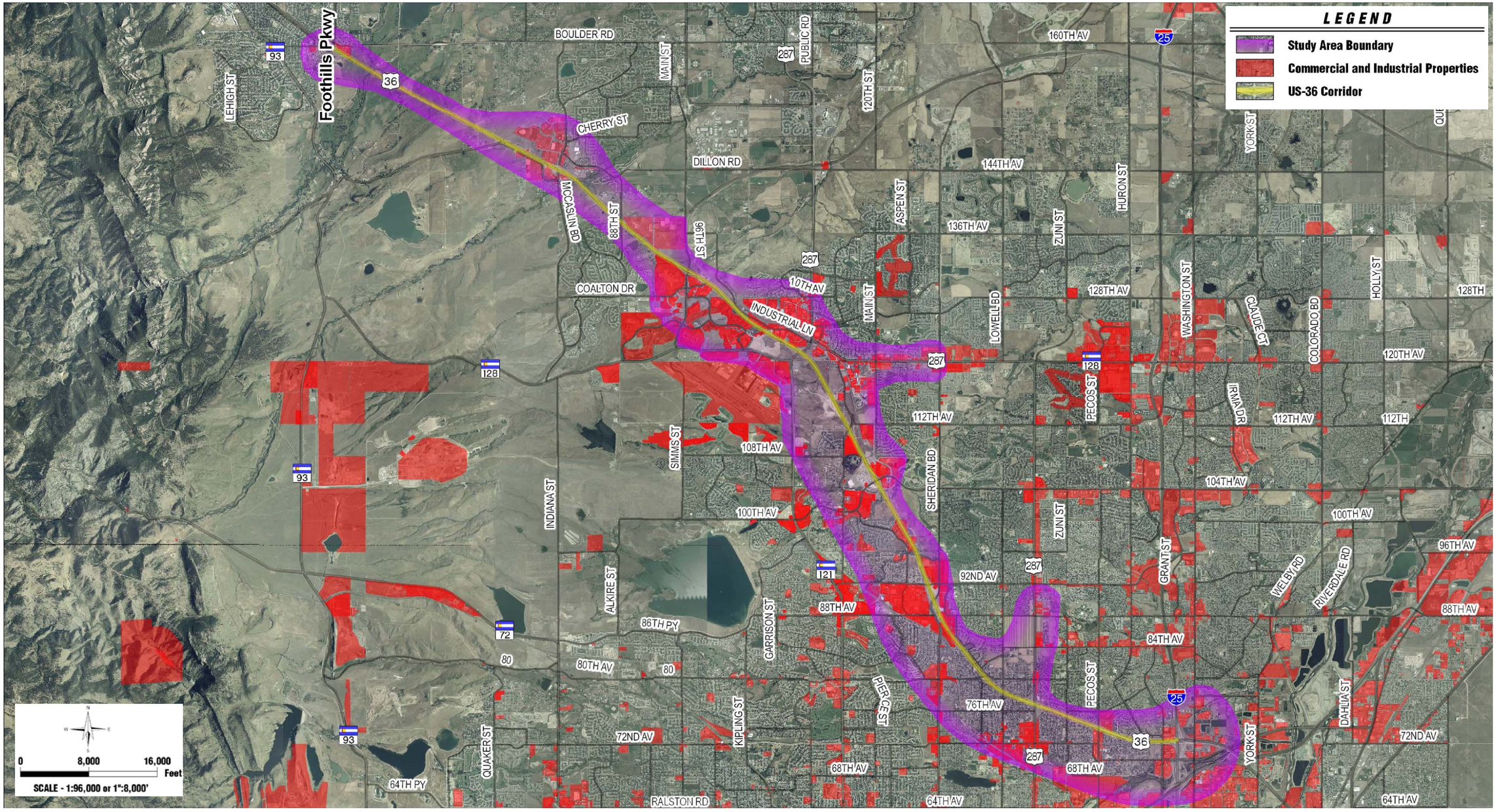
The U.S. 36 study area is 19 miles long, spanning from northern Denver (I-25) to the City of Boulder (Foothills Parkway). The corridor transects portions of Adams, Broomfield, Jefferson, and Boulder Counties. The entire study area along U.S. 36 is comprised of 26 square miles. This roadway carries approximately 76,000 vehicles per day near Boulder and about 122,500 vehicles per day as it nears I-25. **Figure 11** shows a map of the U.S. 36 corridor study area. The general land use of the study area is a mixed commercial, residential, and diminishing agricultural land use common to the urban fringe of major cities. Approximately 23 percent, or six square miles, of the study area is designated commercial. **Figure 12** shows a more detailed view of the corridor and highlights commercial and industrial areas.

Figure 11. Map of the U.S. 36 Study Area Corridor



Source: BBC Research & Consulting.

Figure 12. Map of U.S. 36 Study Area Commercial and Industrial Land Uses

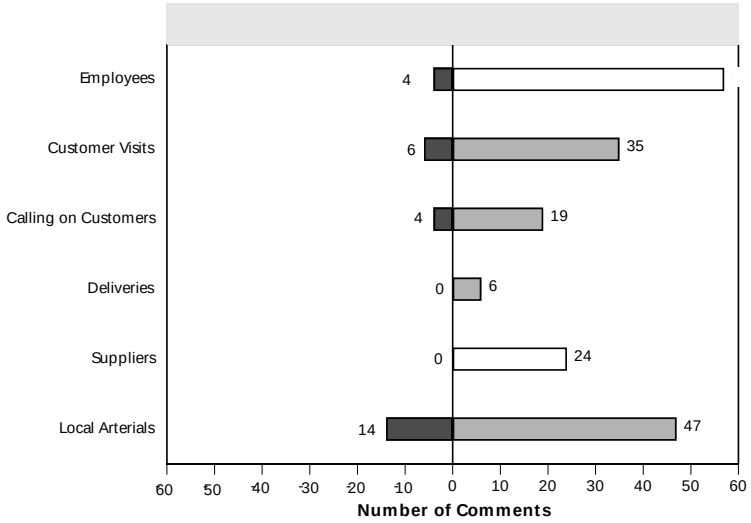


Source: Commercial parcel information obtained from land use values obtained from Adams, Boulder, Broomfield, and Jefferson Counties. Street and highway information provide by CDOT. Map produced August, 2006 by FHU.

A total of 1,220 businesses representing 71 different business types (4-digit SIC codes) were identified in the sample along U.S. 36. Over 30 percent of all business establishments within the sample from the corridor are categorized in only four business types, including business services; engineering, accounting and research; eating and drinking establishments; and health services. When considering this business sample, two-thirds of the mid- sized and 74 percent of the large businesses are found within one mile of interchanges at McCaslin Boulevard, Wadsworth Boulevard, and Sheridan Boulevard in the U.S. 36 corridor.

Interview results from the U.S. 36 corridor. As shown in **Figure 13**, most respondents felt that the toll lanes would have no impact or would have a positive impact on their business. Positive comments about the perceived impacts of the proposed toll lanes outnumbered negative ones.

Figure 13. Predicted Business Impacts Due to Proposed U.S. 36 Toll Lanes



Note: A total of 75 business representatives were interviewed. Non-responses include individuals who did not respond or did not know about impacts in the area.

Source: BBC Research & Consulting.

This section presents interview findings for each of the potential impact categories. Even though most respondents thought that the toll lanes would help their businesses or would have no impact on their businesses, the study team's analysis focuses on the few negative comments in order to identify potential issues and concerns that CDOT may need to address when planning for any toll lanes in Colorado.

Overall Impacts. Of the 75 business representatives interviewed in the U.S. 36 highway corridor, 31 were familiar with the project. When asked about the overall impact of the proposed toll lanes, more than one-half of total respondents stated that the proposed toll lanes would have no impact on their business. Most of the other respondents indicated that the toll lanes would have a positive impact. "Toll lanes will make our location better," said one representative, "[they] give people more options to travel [U.S.] 36, drawing more business to the area."

Approximately 15 percent of total respondents perceive negative impacts to their business as a result of the proposed toll lanes. Of these respondents, only two said that they were familiar with the potential project. Several of the negative comments were directed at the increased complexity of toll lane interchanges. Two comments specifically mentioned the inability of low-income customers to pay for the toll.

Employees. When asked about expected business impacts on employees due to the addition of toll lanes on U.S. 36, 33 business representatives indicated there would be no impact on their business while 24 perceived a positive impact.

As shown on **Figure 13**, only four business representatives felt that the toll lanes on U.S. 36 would negatively impact employees. Each of these comments focused on increased congestion of free lanes or increased interchange complexity. "Toll lanes make it more difficult for employees to get on and off the highway, because of the increased number of cars … causing more congestion," said one respondent. "Toll lanes will make the commute more difficult."

The business representatives who felt that toll lanes would positively affect their employees stated that the toll lanes would help decrease congestion on the highway, decrease commute time, and improve commute reliability. A representative of a medium-sized business in the corridor commented, "The toll lanes would help shorten the time of the employee commute by offering the option to pay to skip traffic. In addition, the extra toll lane will reduce the traffic congestion on Highway 36."

Customer visits. The study team asked respondents about perceived impacts from the toll lanes on customers visiting their establishment. Of the 75 business representatives interviewed, 25 felt that the toll lanes would have no impact, while ten perceived that the toll lanes would have a positive impact on customer visits.

Of the six negative comments about effects on customers, three centered on the ability of customers to pay the tolls. One respondent said, "we serve a primarily low-income clientele. They will not likely use the toll lanes and will be intimidated by the tolls." One hotel manager said that because the lanes required a Colorado-specific transponder, they would not be useful for out-of-town guests.

As noted previously, ten business representatives predicted positive benefits for customers from the toll lanes on U.S. 36. One respondent stated, "a certain quantity of people believe that saving time is worth their money and would opt to pay a small fee to avoid having to waste time sitting in traffic." One of the respondents said the toll lanes would allow easier access to businesses for individuals from Boulder and Denver.

Most of the business representatives felt the toll lanes would have no impact on their customers. "Toll lanes will probably decrease traffic," said one respondent, "but [the lanes] will not have much of an impact on customers."

Calling on customers and deliveries. Few business representatives felt that the proposed toll lanes on U.S. 36 would negatively impact on their ability to make customer calls or deliveries. Of 29 respondents, 13 stated that the toll lanes would have no effect on this aspect of their business. Twelve respondents thought that the toll lanes would have a positive impact. Four business representatives indicated that the toll lanes would help ease congestion and improve delivery reliability, while eight mentioned these benefits with respect to calling on customers.

Only four businesses had negative comments about the toll lanes in relation to calling on customers and none had negative comments about deliveries. "This business would not utilize the toll lanes," said one respondent, "… with more traffic in the remaining free lanes, traffic might be worse, taking more time to get out to customers to deliver services."

Suppliers. None of the business representatives interviewed felt that there would be negative impacts on their suppliers' ability to make deliveries to their business. Three respondents felt that the toll lanes might help suppliers complete the routes more quickly. More than 20 business representatives said that there would be no impact on suppliers due to toll lanes on U.S. 36. For the most part, respondents indicated that their suppliers did not travel during peak traffic times. "Suppliers come in the middle of the night when traffic is not an issue," said one respondent.

Local arterials. As with the case study corridors discussed in Section 4.0, the majority of business representatives felt that the proposed toll lanes would have no impact or would improve traffic flow on local arterials from existing conditions. Nearly 50 respondents indicated no impact or a positive impact, while only 14 thought the toll lanes would hurt their businesses by increasing arterial congestion.

One-half of the negative comments about local arterial congestion related to the perception that drivers will use local arterials in an attempt to avoid what they thought would be crowded free lanes. As one respondent reported, "Traffic on U.S. 287 [an arterial near Broomfield] will increase. If people cannot write off toll costs as a business expense, they are less likely to use the toll lanes. More people will use arterials and alternate routes to avoid either the cost of the toll lane on Highway 36 or the congestion on the free lanes."

Nearly all of the negative comments about effects on arterials were made by respondents who were unfamiliar with the toll lanes proposal (12 of 14 total).

Many business representatives projected no negative impacts of the toll lanes on arterial traffic. Twenty-two respondents felt that the lanes would decrease congestion on the arterials and improve overall traffic flow. About the same number of business representatives said there would be no impact from the addition of toll lanes on U.S. 36.

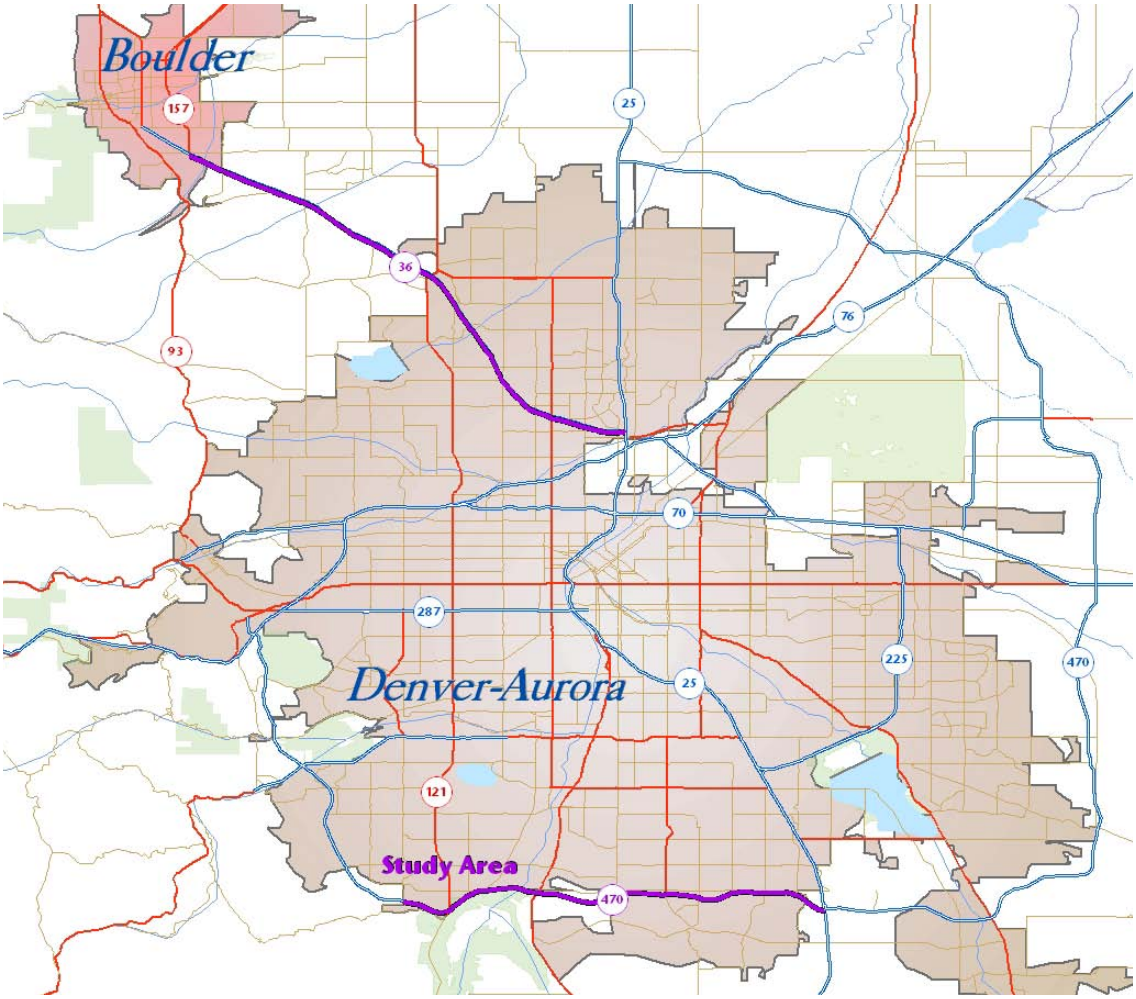
Conclusions. Most of the business representatives interviewed felt that the proposed toll lanes would have no impact or a positive impact on their business. Individuals familiar with the project had fewer negative comments about the overall impact of the toll lanes along U.S. 36. Business representatives interviewed in the U.S. 36 corridor expressed the most concern about increased congestion on local arterials. The results of the case study business interviews in Section 4.0 suggest that concerns about local arterials may translate into negative opinions about the project once the lanes become operational.

Positive comments about potential business benefits from the toll lanes outweighed negative comments in all areas. A majority of respondents felt that the lanes would have no impact on their business.

5.3 C-470 between I-25 and Kipling Boulevard

The C-470 study area is 14 miles long, spanning a portion of northern Douglas County, a portion of Arapahoe County, and Jefferson County. It is oriented in an east/west direction and extends from I-25 to Kipling Street. The entire study area along C-470 comprises 12 square miles, less than half the size of the U.S. 36 corridor study area. This roadway carries approximately 61,000 daily vehicles on the west end to as many as 101,000 vehicles per day on the east end. **Figure 14** shows a map of the study area.

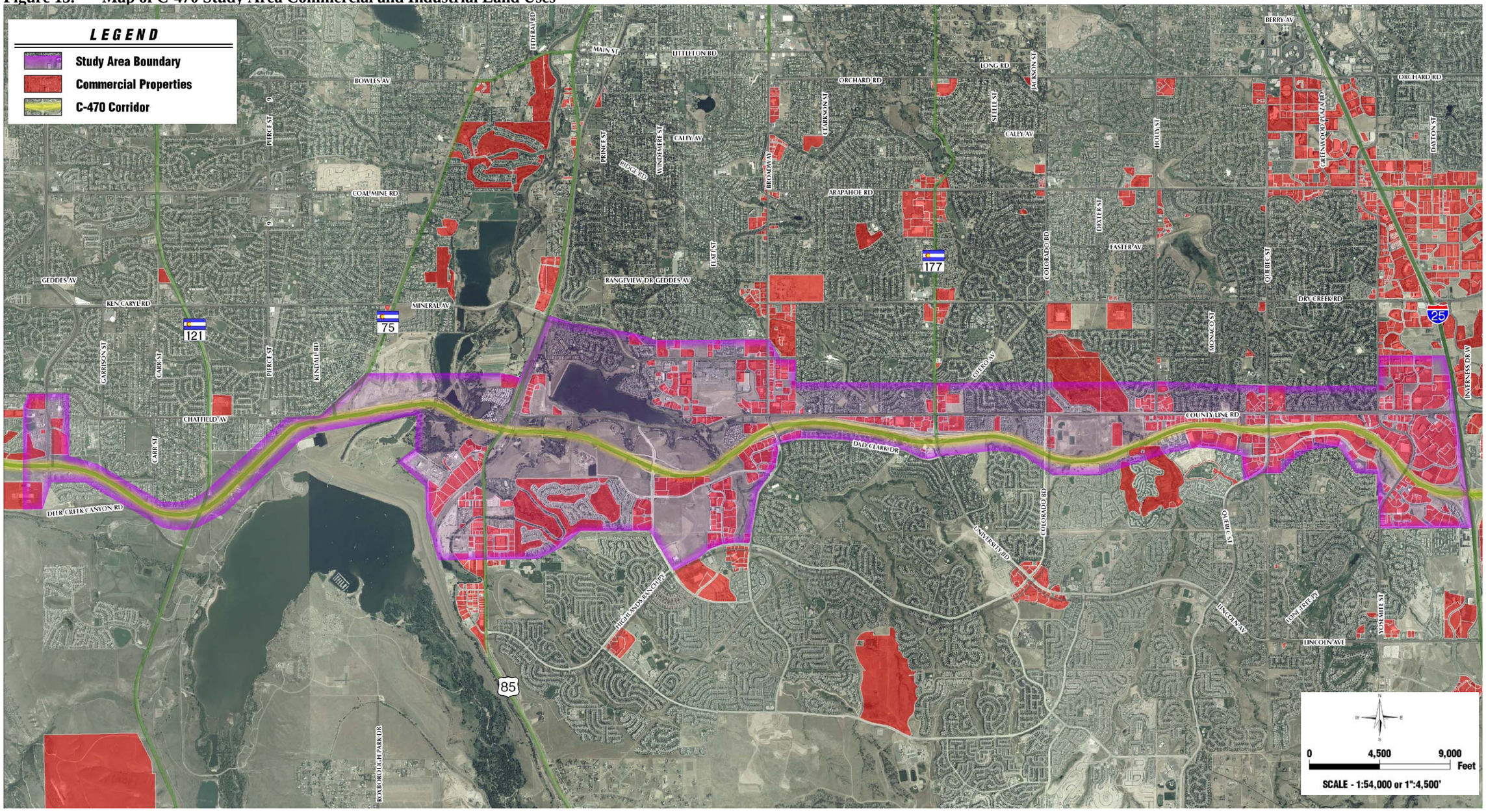
Figure 14. Map of the C-470 Study Area Corridor



Source: BBC Research & Consulting

The general land use of the study area is a mixed commercial and residential land use, with little to no agricultural uses. Approximately 22 percent, or two and a half square miles, of the study area are designated commercial. **Figure 15** on the next page shows a more detailed view of the corridor.

Figure 15. Map of C-470 Study Area Commercial and Industrial Land Uses



Source: Commercial parcel information obtained from land use values obtained from Jefferson, Douglas and Arapahoe County GIS. Street and highway information provide by CDOT. Map produced June, 2006 by FHU

The 1,009 businesses in the Dun and Bradstreet sample for the C-470 corridor represent 53 different business types (4-digit SIC codes). As with the U.S. 36 corridor, over 30 percent of the businesses are categorized as either business services; engineering, accounting and research; eating and drinking establishments; or health services. Based on the sample data, approximately 78 percent of the mid-sized and 70 percent of the large businesses are found within one mile of interchanges at Broadway Boulevard, Quebec Street, and I-25 in the C-470 corridor.

Project related studies. To address the concerns identified above, the study team reviewed the C-470 Environmental Assessment (EA) for the proposed express toll lanes. The C-470 Environmental Assessment evaluates both the implementation of express toll lanes and the addition of general-purpose lanes as compared to no capacity increase. The assessment found the economic effects of implementing the Express Lane Alternative to be positive. Findings are presented below.

Customer access to businesses. The C-470 EA indicates that the project would positively affect retail businesses within the study area, as congestion relief would provide shoppers a less-congested alternative to travel to shopping destinations. Because express lane access is provided to all three counties within the study area in response to forecasted travel demand, no one part of the study area would receive more or less economic benefit from access to the additional capacity.

The addition of T-ramps at two locations would block views across the highway for residents and businesses on either side, as well as create minor obstructions when viewing to and from the highway. Although not stated in the EA, decreased visibility may have negative implications for some businesses along the highway.

Traffic on local arterials. The EA indicates that travel patterns would change slightly due to the express lane ingress and egress locations. Increased traffic would likely occur in neighborhoods and around access ramps at several locations.

Economic development. The assessment states that improved transportation access may provide better market conditions as well as the opportunity for development to occur more quickly within the project area.

Highway conditions. Operations and travel times are expected to improve along the express lanes while general purpose lanes would operate at the same level as existing conditions. Additionally, safety on C-470 would be improved due to reduced congestion and geometric improvements for the express lanes.

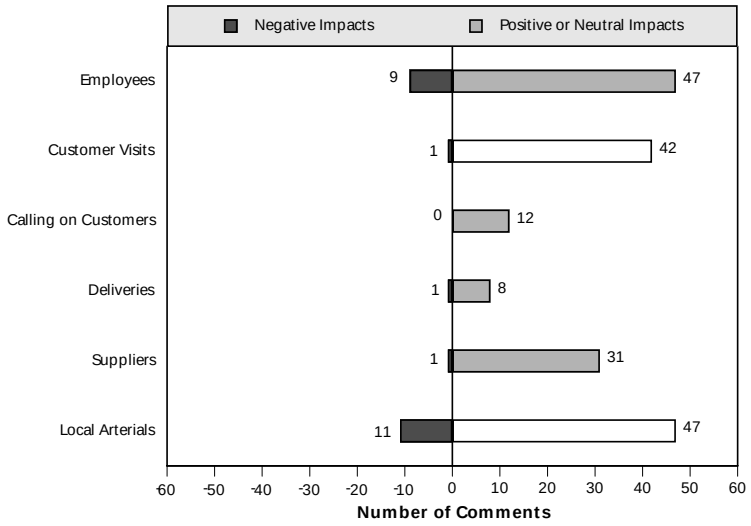
Interview results from the C-470 corridor. Consistent with findings from the U.S. 36 corridor, most C-470 respondents felt that the toll lanes would have no impact or a positive impact on their business (see **Figure 16**). Positive comments about the perceived impacts of the proposed toll lanes largely outweighed negative ones. Within each potential impact category, the greatest number of respondents indicated that that the toll lanes would not affect their business.

Overall impacts. Forty-six of the 75 businesses interviewed in the C-470 corridor were unfamiliar with the proposed express toll lanes. The study team found no substantial differences between the opinions of those familiar and unfamiliar with the project.

Most business representatives said the toll lanes would have no impact on their business. Nine interviewees reported that the lanes would have an overall negative impact on business. "The toll lanes would make the corridor worse for our business," said one business representative, "there would be more construction and congestion on C-470." One interviewee expressed concern about confusion on the lanes saying, "confusion or a lack of awareness that the free lanes are still available would have a negative effect."

Twelve business representatives predicted overall positive benefits to their companies due to reduced congestion and improved mobility. "The toll lanes would make C-470 better for business because of quicker access for people who can afford it," replied one business representative. Forty-six business representatives in the C-470 corridor stated that the toll lanes would have no overall impact on their business.

Figure 16. Predicted Business Impacts Due to Proposed C-470 Toll Lanes



Note: A total of 75 business representatives were interviewed. Non-responses include individuals who did not respond or did not know about impacts in the area.

Source: BBC Research & Consulting.

Employees. The majority of business representatives interviewed predicted either no effects or positive effects from the toll lanes for their employees. More than 30 business representatives predicted no effect from the toll lanes for their employees, while 14 felt that there would be a positive impact. Of the nine negative comments about toll lane effects on employees, two suggested that no one would use the toll lanes. Another business representative said, "Toll lanes will just add to the high cost of travel for employees, with gas prices being so high." One respondent advocated construction of more free lanes as an alternative.

Fourteen business representatives suggested that toll lanes would help employees through improved commute times and reduced congestion. One respondent said toll lanes might help improve timeliness due to less stress and congestion. Some business representatives said toll lanes would provide another alternative when traffic problems such as accidents occurred in the corridor.

Customer visits. The majority of business representatives in the C-470 corridor expect no effects on their business due to customer reactions to the toll lanes. Only one individual predicted negative effects on customer behavior due to toll lanes, while 11 respondents predicted positive business effects. "Adding toll lanes to C-470 will make for too many toll expenses," said the concerned business representative, "as many [of our] customers use E-470 to access our business."

Predictions of positive effects on customer visits related to improved travel time and access from the highway. "Tolls might give clients more options to avoid traffic and not run late on appointments," commented one respondent. Another predicated his response on the location of toll exits saying, "The toll lanes would help if there is an exit at Colorado Boulevard." More than 30 business representatives said the toll lanes would have no effect on customer visits to their businesses. While most gave no specific reason, one respondent said, "Most clients come in for appointments during off-peak traffic hours [when traffic is not as bad.]"

Calling on customers and deliveries. No business representatives suggested that toll lanes would negatively affect businesses' ability to make calls on customers or deliveries.

One respondent said the lanes would, "probably speed up" deliveries while another indicated that, "the toll lanes would help us fit in more appointments in a day because we can cut down on time spent in traffic." "If traffic is bad," added one representative, "employees will have the option of using the toll lanes, helping them to keep on schedule by not losing time to traffic." The majority of respondents felt that the toll lanes would have no impact on either calls on customers or deliveries.

Suppliers. Only one representative predicted negative impacts on suppliers, while eight respondents suggested suppliers would benefit from the toll lanes. "Suppliers might use the express toll lanes and pass the expense on to business," replied one interviewee, "in which case we would try to switch suppliers or find an alternative." Most business representatives said the toll lanes would have no impact on suppliers.

The positive effects predicted for suppliers included improved reliability and efficiency. "Toll lanes would give suppliers more options for avoiding major traffic congestion," suggested one interviewee. "Toll lanes might help improve timeliness if they choose to use the lanes," said another business representative.

Local arterials. Thirteen business representatives predicted positive effects on local arterial traffic, while eleven businesses suggested the toll lanes' effect on local arterials would hurt their business. The majority of business representatives stated that toll lanes would have no effect on their business related to traffic on local arterials.

About half of the respondents with negative comments predicted commuters would use local arterials to avoid the toll lanes and congested free lanes. "Congestion on local arterials will increase. People don't want to pay for tolls and will avoid them by taking the arterials," replied one respondent.

Other respondents predicted an increase in congestion on the arterials accessing the highway because of the increased capacity provided by the toll lanes. "Toll lanes will potentially increase arterial traffic," said one respondent, "they will likely increase the volume of cars on C-470. If the volume of cars getting on and off C-470 increases, they need to expand the arterials to accommodate the growth." This comment more closely echoes the concerns of interviewees in the case study corridors.

Thirteen respondents said toll lanes would decrease traffic on the arterials and improve business. "Traffic on the arterials will decrease," predicted one business representative, "business will improve due to less traffic and easy access."

When compared to the U.S. 36 corridor interviews, fewer individuals in the C-470 corridor predicted either positive or negative business effects due to the influence of the toll lanes on local arterials.

Conclusions. Positive comments about business effects from the proposed toll lanes outnumbered negative comments in every area of impact investigated by the study team. Most concerns pertained to a potential increase in local arterial congestion and a less desirable commute for employees. While the case study corridor interviews reflect the concern about local arterials, the effect on employee commutes reported by case study business representatives was neutral or positive in most cases.

As displayed in **Figures 13 and 16,** businesses representatives in the U.S. 36 corridor and along C-470 have similar reactions to the proposed express toll lanes. In both corridors, most business representatives expect no impact on business due to the implementation of express toll lanes. The response of business representatives in the case study corridors supports this prediction.

Appendices

Appendix A Case Study Business Interview Guide

Interview Guide for Case Study Businesses
These interviews will be conversational and the script will need to be adapted to fit the situation. We would like to conduct the interviews with individuals at the management/executive level. In many cases, this will be the contact person already listed in our records. However, with some phone calls, it may take some time and a little investigation to reach the appropriate person to interview.

Each interview should be recorded using the interview report form below. At the top of each report form, the interviewer will record a survey number in the space provided (the interviewer's initials followed by an interview number). Each completed report form will be entered into a Microsoft Access database.

The case study interviews are unique in that some of the businesses you talk to will have been located in the corridor before the toll lanes were there and some will have located within the corridor after the toll lanes were constructed. These groups may have different perspectives and questions should be phrased accordingly. Questions specific to businesses that located before or after are indicated by a {IF BEFORE] or [IF AFTER].

We are trying to stay specific to impacts to businesses. Many people might have a lot to say that may not be relevant to our study. Try to keep them on track as much as possible.

Explain what we're doing. Something along the lines of:

We are working with CDOT to better understand the potential business impacts of express toll lanes that have been proposed in the Denver Metro area. As part of this research, we are conducting interviews with businesses in other cities that are located in highway corridors with toll lanes similar to those being proposed in Denver.

The purpose of these interviews is to help us identify impacts to businesses that have occurred in other cities as a result of express toll lanes and to determine how similar impacts may affect Denver businesses. Would you be able to speak with me for a few minutes on this topic? (If they say that now is not a good time, ask to set up an appointment for a better time).

We will attempt to call back each business three times in order to obtain an interview. Please keep note of each business you have contacted and how many times you have contacted that business. Please provide me with a list of the businesses you have been unable to interview after three callbacks. I will provide you with additional businesses to contact.

BBC Research and Consulting
Interview Questions and Report Form

Date: _____
Survey Number: _____
Highway Name: _____
Business Name: _____
Contact Person/Position/Phone Number: _____
SIC Code: _____

Background. I'd first like to ask you some general questions about your business and its location:

- Business Description:
  - Number of employees (including owners/managers):
  - Business type - Circle one:

    Delivery-based Service-based Site-based Other (explain)
  - Service Area - Circle one:

    Local neighborhoods Multi-county area Metro area State and beyond
- Where are you located within the [HIGHWAY NAME] corridor? (proximity to highway, close to entry/exit, end of "tube", etc.)
- Did you locate your business within the highway corridor before or after the construction of the toll lanes?
- Why did you choose to locate along [HIGHWAY NAME]? Is your current location a good one? Why/why not?
  - (IF AFTER) Were the toll lanes a factor in your decision to locate within the corridor? Please explain.
    - Locating near toll lanes was an incentive:
    - Locating near toll lanes was a disincentive:

Using highways. I'd like to talk more specifically about the toll lanes in your city and how they affect your business.

- In general, what about the toll lanes on [HIGHWAY NAME] do you think works well? (entry/exit, reduced congestion, etc.)
- What does not work well?

Employees

- What percentage of your employees (including you) drive [HIGHWAY NAME] to get to and from work?
  - What percentage of your employees use the toll lanes on [HIGHWAY NAME] to get to and from work?
  - When in the day do your employees commute to work?
- What percentage of your employees carpool on [HIGHWAY NAME]?
  - Have/do the toll lanes encourage(d) carpooling among your employees?
- What percentage of your employees take the bus on [HIGHWAY NAME]?
  - Have/do the toll lanes encourage(d) bus riding among your employees?
- Do your employees have problems driving to work on [HIGHWAY NAME]?
  - If yes, does this affect your business? How?
  - If not, does this help your business? How?
  - How have/do the toll lanes impact(ed) this?
- Do you help pay toll costs for your employees? Yes / No
  - How does this affect your workforce?
- Do you help pay for bus passes for your employees? Yes / No
  - How does this affect your workforce?

Customers

- Do you have customers visit your business?
  - How important is this to your business? Circle one:

    Very High High Medium Low
  - When in the day do your customers visit your business?
- What percentage of your customers use [HIGHWAY NAME] to access your business?
  - What percentage of your customers use the toll lanes on [HIGHWAY NAME] to access your business?
- Is [HIGHWAY NAME] traffic a problem for customers coming to your business?
  - If yes, does this affect your business? How?
  - If not, does it help your business? How?
  - How have/do the toll lanes impact(ed) this?

Calling on Customers

- Do many of your employees leave your business during the day to visit customers or clients?
  - How important are these trips to your business? Circle one:

    Very High High Medium Low
  - When in the day do your employees visit customers or clients?
- What percentage of these customer visits require using [HIGHWAY NAME]?
  - What percentage of your employees use the toll lanes while making these trips on [HIGHWAY NAME]?
- Does traffic on [HIGHWAY NAME] affect your employees' ability to visit customers or clients?
  - If so, does this affect your business? How?
  - If not, does this help your business? How?
  - How have/do the toll lanes impact(ed) this?

Deliveries

- Do you make deliveries from your business?
  - How important are these deliveries to your business operations? Circle one:

    Very High High Medium Low
  - When in the day do you make these deliveries?
- What percentage of the delivery trips use [HIGHWAY NAME]?
- What percentage of the delivery trips use the toll lanes on [HIGHWAY NAME]?
- Does traffic on [HIGHWAY NAME] impact your deliveries?
  - If so, does this affect your business? How?
  - If not, does this help your business? How?
  - How have/do the toll lanes impact(ed) this?

Suppliers

- Do you have suppliers who visit this business location?
  - How important are these suppliers to operating your business? Circle one:

    Very High High Medium Low
  - When in the day do your suppliers come to your business location?
- What percentage of your suppliers use [HIGHWAY NAME] to access your business?
- What percentage of your suppliers use the toll lanes on [HIGHWAY NAME] to access your business?
- Does traffic on [HIGHWAY NAME] cause a problem with your suppliers?
  - If so, does this affect your business? How?
  - If not, does this help your business? How?
  - How have/do the toll lanes impact(ed) this?

Using Arterials

- How have/do the toll lanes impact(ed) traffic on local arterials (main roads around your business)?
- How does traffic on local arterials impact your business?
  - What are the effects on employees?
  - What are the effects on customers?
  - What are the effects on calling on customers?
  - What are the effects on deliveries?
  - What are the effects on suppliers?

Other Questions/Impacts

- Can you think of other ways the toll lanes (have) affect(ed) your business?

  [IF NOT PREVIOUSLY ADDRESSED—GO TO NEXT FIVE QUESTIONS]

- Do the toll lanes make it more or less difficult for customers/clients to access your business (i.e. due to having to reenter/exit the toll lane)? How does this impact your business?
- Have/do the toll lanes allow(ed) your business to expand service area/delivery routes? How has/does this impact(ed) your business?
- Have/do the toll lanes will allow(ed) you to draw from a larger pool of qualified employees? (expand geographic region) How has/does this impact(ed) your business?
- Have/do toll lanes improve(d) the reliability of travel time within the [HIGHWAY NAME] corridor (i.e. time it takes to get from one point in the corridor to another)? How has/does this impact(ed) your business?
- Have the express toll lanes provided an incentive for businesses to locate within the [HIGHWAY NAME] corridor? Why or why not?
  - (IF BEFORE) Was there an increase or decrease in the number of businesses locating within or leaving the corridor after the toll lanes were constructed?
- (IF BEFORE) What were the perceptions about the toll lanes among businesses before they were constructed? Did they turn out to be true? How were they dispelled?

Closing

- Have we missed any additional ways toll lanes on [HIGHWAY NAME] impact your business?

Thank you for your time.

Appendix B Case Study Business Interview Comments

Comments from business representatives interviewed in other cities are presented in this appendix.

Minnesota

How have the toll lanes impacted your employees' problems driving to work?

- There are fewer accidents.
- They have helped a little with traffic.
- The toll lanes helped with the traffic problem.
- There has been no impact because the carpoolers do not use it anymore now that they have to pay.
- Sometimes it seems expensive. $2.50 for a stretch of 5 miles.
- There are 2 husband/wife teams that carpool in together.
- The tolls and higher gas prices have encouraged more employees to take the bus.
- I take the bus.
- The number of tardiness occurrences has declined
- It has made travel more reliable.
- There is some impact, but not much.
- I do not use the toll lanes.

No impact (11).
Don't know (2)

How have the toll lanes impacted traffic for customers coming to your business?

- This is the lowest that traffic has been for quite a while. If the traffic can be anticipated, people here in Minnesota do learn.
- Our customers are not usually eligible.
- Clients don't usually visit office during rush hour.
- There has been some impact. However, the toll lanes are only useful if you are headed downtown.
- The toll use is low because those who use them are usually in groups of 2 or more using the lanes as an HOV for their social gatherings.
- Only a little bit, but the toll lanes don't make much difference.
- Nothing on a massive scale.
- If the toll lanes do not work, it is frustrating.

No impact (14)
Don't Know (1)

How have the toll lanes impacted your employee's ability to visit customers or clients?

- There is less congestion, so me employees are not stuck in traffic as much.
- The toll lane helps in judging how long it will take to visit customers.
- No impact because the sales reps use the free lanes on the highway to visit customers.

No impact (8)
Don't know (1)

How have the toll lanes impacted traffic for your deliveries?

- The toll lane has helped with the reliability of the travel time for their delivery trucks.
- No impact on deliveries because they do not take the toll lanes.

No impact (1)
Don't know (1)

How have the toll lanes impacted traffic for your suppliers?

- Suppliers experience less congestion because of the toll lanes.
- No real impact because trucks do not know how to use it.
- The toll lane does not impact the suppliers.
- The effects are probably pretty minimal.

No impact (11)
Don't know (3)

How have the toll lanes impacted traffic on local arterials?

- The bad weather will impact traffic.
- There is more local traffic.
- The main roads are very congested.
- They are always busy now.
- There is more traffic on the local arterials.
- There is more traffic on the arterials since the toll lane started.
- There is more congestion.
- There has been an increase in local traffic because more people commute to the area.
- The arterials are more busy because people are using the toll lanes.
- We have slight traffic problems on the main roads.
- The tolls help because it makes it easier to get on and off.
- I have noticed a small decrease in local traffic, which may be due to use of the toll lane to get out of downtown.
- Nothing affects us.
- Our arterial is in a location that doesn't get much traffic from 394.
- My business is too far from any main arterial roads for a direct effect.
- No impact because the toll lane does not exit near business.
- No impact because the office is in the hub of 94 and I-394.

No impact (18)
Don't know (1)
Yes (2)

Houston I-290

How have the toll lanes impacted your employees' problems driving to work?

- The HOV lane helps.
- The toll lanes reduce congestion.
- Depends on the time of day. Rush hour or not.
- If you use the toll lane during busy hours you can get there on time.
- They've had a positive impact and allow for employees to get to business faster sometimes.
- Easier to get to work.
- I think they have helped improve the time efficiency of our travels.
- Toll lanes have made it easier for us to conduct business trips around the city.
- Some people can reach their destination sooner, but the toll lanes are not a solution to the problem.
- Sometimes it is more difficult to reach your destination.
- Not everyone can use it, so it is of minimal use.
- I do not use it.
- Toll lanes have not impacted my business very much because they are more often used for personal reasons, not for business specific matters.
- The toll makes traveling easier for those who take it, but I don't think many employees utilize it.
- Employee does not use toll lanes, so it hasn't had much impact.
- No impact, if the toll lanes were used by employees it would perhaps make a difference.

No impact (17)
Unsure (1)

How have the toll lanes impacted traffic for customers coming to your business?

- Toll lanes probably help, but unsure.
- The tolls could facilitate airport traffic but they don't directly affect my business.
- Toll lanes have not changed our business much because most people come during the day.
- Most people on business trips and hotel-goers do not use the toll lanes.
- Toll lanes have made it easier for people to reach us from farther away.
- Toll lanes have not impacted the traffic too much, there is still a lot of congestion.
- Time is money in the construction industry, and any means they can use to make our time more efficient will benefit us and the city.

No impact (17)
Unsure (4)

How have the toll lanes impacted your employee's ability to visit customers or clients?

- I use it every time I get the chance.
- I believe that toll lanes have made employee visits easier.
- Toll lanes have made it easier for my sales people to reach the customers.
- Toll lanes have not impacted our service because most drivers do not use it.
- Salesmen do not usually use toll lanes, no impact.
- Do not think that my employees take the toll lanes.
- I doubt the tolls have any impact on us.
- No impact. 290 requires 2 or more people in the car to use the toll lane. I use Highway 8 also.

No impact (5)
Unsure (2)

How have the toll lanes impacted traffic for your deliveries?

- Toll lanes have not impacted deliveries significantly, but to a degree, they have made them easier.
- The delivery to San Antonio will use the Toll Lane.
- It depends on the time of day. But usually we schedule around.
- The transponders in the truck are used for other toll roads, not 290
- The toll lane does not help.
- You cannot access toll lanes with delivery vehicles usually.
- The HOV lane does not help deliveries because there is usually just the driver.
- Toll lanes have not really affected the deliveries.
- I can't see any visible impact of toll lanes on deliveries.

No impact (7)

How have the toll lanes impacted traffic for your suppliers?

- Makes it easier for companies such as UPS and Fedex to deliver to us.
- Think that toll lanes help suppliers but not totally sure.
- I'm not sure if toll lanes impact supply routes.
- Tolls lanes have not affected deliveries that much because most are before noon.
- Suppliers usually do not use the toll lanes.
- My suppliers can't use the toll lanes.
- Most of the supply shipments come in 18-wheeler trucks and they are not allowed to use the toll lanes. Traffic is still congested, so they do not deliver much faster.

No impact (15)
Unsure (2)

How have the toll lanes impacted traffic on local arterials?

- Believe that arterials are less congested.
- Arterial roads appear to be less congested.
- Arterial roads appear less congested during the rush hour periods.
- Sidestreets are less congested than before.
- The feed from the 290 is pretty smooth. The only time our company and the arterial are effected is during accidents or bad weather.
- With two points of entry to 529 our property, there is usually a way to get trucks in and out. I see a constant flow of eighteen wheelers on the property.
- Not too much difference. We are located off of a main street so we can avoid a lot of the other traffic in the area.
- We have pretty heavy traffic most of the time, but a light was installed 2 months ago, It helps our deliveries and employees get out.
- I'm not sure. There is more traffic in the area, but I don't think it is because of toll lanes.
- The toll lane has not impacted the local arterials. There is heavy traffic due to the population growth over the last 10 years.
- The area is more congested and crowded. Building dates for apartments and housing areas coincided with implementation date of Toll Lanes in the area. Maybe that's just a correlation.
- Traffic around here is heavy. It can take 10 minutes to go 1 mile.
- The toll lanes do not help at all. Heavy traffic is common, and we've just learned to take it slow.
- They create traffic on the local roads.
- Arterial roads are slightly more crowded.
- Our local road gets really congested around 5.
- If employees have to be somewhere in the early evening, they try to leave early to beat the traffic or stay late to avoid it.
- Heavy traffic during rush hour. The remainder of the time it is normal.
- The tolls have made traffic more difficult, but if my customers need to get here they'll get here.
- More activity on the service road near the hotel.
- There seems to be heavier rush hour traffic, also at lunch and at night.

No impact (16)
Unsure (1)

Houston Katy

How have the toll lanes impacted your employees' problems driving to work?

The tollway has reduced congestion.

- There is some impact in mobility.
- HOV will get a person to a point of destination a little faster.
- It helps my employees get to work on time.

- If you use the toll lanes, you can get to work faster.
- I take the toll lane to work in the morning. It makes my life quite a bit easier, because I can cut 30-40 min off my commute.
- My employees can see more clients.
- The toll lane is a great option to have.
- It does help you out if you have more people. I know that the sales department of [a multinational firm with a nearby corporate campus] uses it quite often.
- If you could get a van pool with a washer and dryer, working women would buy [a ticket or a pass] so they could do laundry in traffic.
- We cannot use the toll lanes because there is not an adequate exit to access our business. If we were to use the toll road a 10 mile drive becomes a 30 mile drive because we have to exit further down the interstate.
- The employees do not want to pay toll because they are paid such a low wage.
- The customer base does not use it.

No impact (20)
Unsure (2)
Don't know (2)

How have the toll lanes impacted traffic for customers coming to your business?

- Yes, if you use the toll you can get to places quicker.
- Usually, during the rush hour is when people use the HOV lane.
- The toll road can help them bypass traffic.
- The tolls allow students to have an easier commute to school, and makes it easier for students coming from farther points in the city to easily access the school
- The toll helps a little, but it is bad when a bus breaks down.
- The HOV does not impact this location.
- I'd say that only 25% of my customers use the tollway.
- The toll does not have an impact because the entry and exits are too far away. It is easier and quicker to take the regular freeway and use their exits.
- The customers cannot use the off ramp. They must go further.
- Customers avoid them, because it takes longer time wise because of the distance.
- It is really difficult to get to the exit. And the problem is that you need 2 or more people during rush hour. During slow times you still need more than one. This makes the toll inconvenient.
- It enables drivers to ability to show up on time. However, you need to have two people.

No impact (10)
Don't know (2)

How have the toll lanes impacted your employee's ability to visit customers or clients?

- The toll lanes are not convenient because I have only one agent.
- They do not help us much because of limited access.

- "Well, if it is the fastest lane, at least you won't get flooded out."

No impact (7)

How have the toll lanes impacted traffic for your deliveries?

- We utilize the tolls as much as possible with our easy tags. This helps us be more efficient on our deliveries.
- It's only an issue when the toll lanes back up, like when there are wrecks and people stop there for no reason.
- If you have more than one person it will help speed up the process. But then only in certain locations.

No impact (4)
Don't know (2)

How have the toll lanes impacted traffic for your suppliers?

- The toll lanes helps the suppliers arrive at our place of business on time.
- If our suppliers use them, we can get there on time.
- Most of the suppliers do not use the toll roads.
- If the suppliers were to use the toll lane, there might be more punctuality on the shipments.
- Our suppliers do not use the toll because the delivery is usually one driver. (2)
- Mostly, they haven't helped this kind of business because it takes more than 1 person.

No impact (11)
Don't know (2)

How have the toll lanes impacted traffic on local arterials?

- I'd say not much impact. Get rid of those entrance lights to the freeway.
- Except for rush hour, there is little impact if any after this construction.
- No, we are too far from the HOV. We are between the entrance and exit of the HOV.
- The toll road doesn't effect surrounding roads. People don't use our road.
- Arterial traffic is not bad.
- There's always quite a bit of traffic on our roads.
- During busy hours, the local streets are congested.
- You have to get back on the freeway to get out.
- When the roads are full, the customers will not come.
- The same traffic implications apply to the arterials as I-10.
- It produces the same effects as the traffic on I-10.
- It only affects the roads exiting and entering I-10.
- The only time there is congestion is if there is an accident.
- With major accidents, everyone scrambles. Memorial Dr. blocks up, and it takes my guys longer to get to work.

- The toll lanes have impacted the traffic on arterials. The feeder road onto the toll lanes goes in front of the school and causes traffic to back up.

No impact (15)
Don't know (4)
Maybe (1)
Yes (2)

Orange County

How have the toll lanes impacted your employees' problems driving to work?

- Employees who commute on 91 use the toll lane, so traffic generally is not a problem.
- Before there were a lot of complaints about the traffic, but now there are few or no complaints.
- They help in the evening.
- There is less traffic.
- There is a little less traffic than on the regular highway lanes.
- They have helped because the traffic is faster.
- The commute seems to be shorter & the time of commute more reliable for those employees who use the toll lane. However, the presence of toll lanes increases the overall traffic on 91 freeway, causing more traffic problems for my employees.
- None of them drive the toll lanes so I don't know what the effect of the toll lanes are.
- No impact. Only two employees tried the tolls but found them to be too expensive. Now no employees use them
- There is a small percentage of employees that have a transponder and pay to use the toll lane. However, the pay is so low that most employees cannot afford the charge.
- The cost of the toll lanes can be high if they are used everyday. So the employees don't use them all the time and are sometimes late due to traffic on the highway.
- There are some employees that take the time to back track to jump on the "tube" because they live farther away and they think it is worth the money.
- The toll lanes have had little effect on the traffic and problems getting to and from work because there is a lot of traffic on the toll lanes and the employees can't get off the toll lanes at the exit where the office is located.
- The lanes have had no impact because we're located in the middle of the "tube."
- The toll lanes stop short of connecting to other major roads & counties, making it less effective. They don't cover a great enough distance to do much of anything for reducing traffic congestion.
- No impact. There is no immediate access from the toll road to the store.
- It has not had a negative effect, but not much of an effect at all.

No impact (11)
Unsure (2)

How have the toll lanes impacted traffic for customers coming to your business?

- The tolls help some. They make the highway less congested.
- The toll lanes have helped with the traffic and timely pick up of the kids.
- The toll route is faster, so more customers come in.
- There were no negative impacts.
- I don't see any impact because there is no entry or exit at the Imperial Highway exit.
- At first, there was a positive impact, but now it is too expensive
- Toll lanes have caused more traffic.

No impact (11)
Don't know (1)

How have the toll lanes impacted your employee's ability to visit customers or clients?

- Travel time is reduced and more reliable for my sales force.
- Toll lanes offer a chance for employees to skip out on traffic, making it easier to get to the site.
- The toll lane makes it possible to travel faster and with a more reliable time frame.
- The transponder is also helpful on toll road 241.
- The toll lanes have little effect on the traffic on the highway, but if employees could be in the toll lanes it would be helpful.
- Sometimes the toll lanes can have an effect, but for the most part, they do not impact the driving conditions.

No impact (4)

How have the toll lanes impacted traffic for your deliveries?

- There is less traffic on the toll lanes than in the normal highway lanes.
- The firm provides transponders for the delivery trucks.
- Really no impact. There are other options for the delivery drivers to take.

No impact (1)

How have the toll lanes impacted traffic for your suppliers?

- The toll lanes cause increased traffic in the free lanes, and that produces more delays.
- The toll lanes have helped. (2)
- Suppliers deliver during off hours and do not use tolls.
- No impact because suppliers travel during non-peak hours

No impact (5)

How have the toll lanes impacted traffic on local arterials?

- There is less traffic on the arterials now.
- Probably less traffic now than before.
- There's very little traffic on the arterials.
- Traffic is not an impediment.
- The local roads have numerous wide lanes and are generally open. There is no visible impact from the toll road.
- There is a reasonable amount of traffic, but it is not due to the toll lanes.
- The traffic is still the same.
- The toll lane has not had an impact on local traffic because this area was already pretty built out.
- Our area is not effected because we are located in between the entrance and exit of the toll lanes.
- There is no impact on the arterials because the toll lanes do not have an entrance or an exit in this part.
- There is no entry or exit point nearby, so toll lanes have little to no impact on local traffic.
- There is no effect from the toll lanes on the highway SR-91 because they are in the middle of the entrance and exit of the toll lanes.
- There has been no impact since the store is located near the middle of the "tube" type toll lane.
- Since the store is located in the middle of the "tube," the toll has had no impact.
- There is no entry/exit point for the toll roads near their intersection, so the tolls have little impact on the flow of traffic in their area.
- No impact. The entrance to the toll lane is too far away.
- No exit at Imperial or Lakeview, so we haven't felt the impact from the toll lanes.
- No difference because the nearest exit is miles away.
- There is a lot of traffic on these roads, but I don't know what the impact of the toll lanes has been.
- Heavy traffic is normal, and I haven't noticed an impact from the toll lane
- The arterial roads have a lot of traffic.
- The roads and this intersection are always busy, but the traffic has had little affect on business.
- The toll road may increase traffic slightly.
- I'd say medium to heavy traffic now.
- The toll lanes do not really impact arterial traffic. Sometimes the traffic on the arterials is made heavier by people pulling off of the 91 to avoid freeway traffic.
- The office is near the Tustan Avenue exit and cars get backed up that are trying to head north. They take detours (east, south, west) trying to get around and start heading north. This increases the local traffic.
- Most of the time the arterial roads have little traffic. Only during rush hour are they busy.

- Industrial area has fairly heavy traffic. It's a hassle to get in and out, and there aren't too many places to go.

No impact (10)
Don't know (1)

San Diego I-15

How have the toll lanes impacted your employees' problems driving to work?

- We have faster commute times now.
- I think that they are beneficial because they carry more traffic.
- It seems to frees up traffic.
- In some ways, it has helped, but it has not really made much difference to my business.
- If people are running late, they can always choose to take the tolls. But the toll lanes aren't really convenient for employees normally because the office is about 4 miles from an exit.
- There might actually be less traffic on free lanes.

No impact (10)
Unsure (1)

How have the toll lanes impacted traffic for customers coming to your business?

- It has helped a little.
- The situation is maybe better.
- Most do not take the toll lanes because traffic is pretty light on Sundays.

How have the toll lanes impacted your employee's ability to visit customers or clients?

- Only helped a little.
- The impact has been slight.
- No impact. You know, there is no convenient exit from our location.

No impact (5)
Unsure (2)

How have the toll lanes impacted traffic for your deliveries?

- The toll lanes are used a lot, but because of the tube aspect, there is no effect on my business.

No impact (6)

How have the toll lanes impacted traffic for your suppliers?

- We are able to process more [products] because its easier to get here.
- Since everyone has to go both ways and the express lanes are only one way at a time, you have to allow for traffic no matter what direction you're headed.

No impact (3)

How have the toll lanes impacted traffic on local arterials?

- After the toll lanes opened, the roadways here flow better.
- Traffic on local arterials moves faster after the toll lanes went in.
- The toll lanes have reduced our traffic.
- There is no access to the toll lanes from here, so the toll lanes do not have any impact on local traffic.
- The arterial have had a lot of traffic because people wanted to avoid the construction from extending the toll lanes.
- Really no impact for us because the toll passes the exit.
- I've noticed big traffic problems if there is an accident on the highway.
- There's always a bottle neck where the toll lanes meet 56. That's exacerbated by the construction.
- Things have gotten more congested, and it just becomes inconvenient to drive around here.
- They are not beneficial.

No impact (4)
Unsure (2)

Appendix C Denver Case Study Business Interview Guide

Interview Guide for Denver Businesses

These interviews will be conversational and the script will need to be adapted to fit the situation. We would like to conduct the interviews with individuals at the management/executive level. In many cases, this will be the contact person already listed in our records. However, with some phone calls, it may take some time and a little investigation to reach the appropriate person to interview.

Each interview should be recorded using the interview report form below. At the top of each report form, the interviewer will record a survey number in the space provided (the interviewer's initials followed by an interview number). Each completed report form will be entered into a Microsoft Access database.

We are trying to stay specific to impacts to businesses. Many people might have a lot to say that may not be relevant to our study. Try to keep them on track as much as possible.

Explain what we're doing. Something along the lines of:

We are working with CDOT to better understand the potential business impacts of express toll lanes that have been proposed in the Denver Metro area. We are studying two corridors—C-470 between Kipling and I-25 and U.S. 36 between I-25 and Foothills Parkway.

As part of this research, we are conducting interviews with businesses in the affected corridors. The purpose of these interviews is to help us to identify the potential impacts to businesses associated with the proposed express toll lanes. Would you be able to speak with me for a few minutes on this topic? (If they say that now is not a good time, ask to set up an appointment for a better time).

We will attempt to call back each business three times in order to obtain an interview. Please keep note of each business you have contacted and how many times you have contacted that business. Please provide me with a list of the businesses you have been unable to interview after three callbacks. I will provide you with additional businesses to contact.

BBC Research and Consulting

Interview Questions and Report Form

Date: _____
Survey Number: _____
Highway Name: _____
Business Name: _____
Contact Person/Phone Number: _____
SIC Code: _____

Background. Are you familiar with the proposed express toll lanes on [HIGHWAY NAME]?

(If not familiar, briefly explain the project)
I'd first like to ask you some general questions about your business and its location:

- Business Description:
  - Number of employees (including owners/managers):
  - Business type - Circle one:
  - Delivery-based Service-based Site-based Other (explain)
  - Service Area - Circle one:
  - Local neighborhoods Multi-county area Metro area State and beyond
- Where are you located within the [HIGHWAY NAME] corridor? (proximity to highway, nearest arterial, etc.)
- How long has your business been at its current location?
- Why did you choose to locate along [HIGHWAY NAME]? Is your current location a good one? Why/why not?
- If toll lanes were already on [HIGHWAY NAME], do you think this would be a better or worse location for you? Why?

Using highways. I'd like to talk more specifically about how [HIGHWAY NAME] traffic currently impacts your business and how the proposed toll lanes may change that.

Employees

What percentage of your employees (including you) drive [HIGHWAY NAME] to get to and from work?

- What percentage of your employees carpool on [HIGHWAY NAME]?
- When in the day do employees commute to work?
- Have your employees had problems driving to work on [HIGHWAY NAME]?

- If so, does this affect your business? How?
- If not, does this help your business? How?

- How would the proposed toll lanes change this?

Customers

- Do you have customers visit your business?
  - How important is this to your business? Circle one:

    Very High High Medium Low
  - When in the day do your customers visit your business?
  - What percentage of your customers use [HIGHWAY NAME] to access your business?
  - Is [HIGHWAY NAME] traffic a problem for customers coming to your business?
    - If yes, does this affect your business? How?
    - If not, does it help your business? How?
    - How would the proposed toll lanes change this?

Calling on Customers

- Do many of your employees leave your business during the day to visit customers or clients?
  - How important are these trips to your business? Circle one:

    Very High High Medium Low
  - When in the day do your employees visit customers or clients?
  - What percentage these customer visits require using [HIGHWAY NAME]?
  - Does traffic on [HIGHWAY NAME] affect their ability to visit customers or clients?
    - If so, does this affect your business? How?

- If not, does this help your business? How?
- How would the proposed toll lanes change this?

Deliveries

- Do you make deliveries from your business?
  - How important are these deliveries to your business operations? Circle one:

    Very High High Medium Low
  - When in the day do you make these deliveries?
  - What percentage of the delivery trips would use [HIGHWAY NAME]?
  - Does traffic on [HIGHWAY NAME] impact your deliveries?
    - If so, does this affect your business? How?
    - If not, does this help your business? How?
    - How would the proposed toll lanes change this?

Suppliers

- Do you have suppliers who visit this business location?
  - How important are these suppliers to operating your business? Circle one:

    Very High High Medium Low
  - When in the day do your suppliers come to your business location?
  - What percentage of your suppliers use [HIGHWAY NAME] to access your business?
  - Does traffic on [HIGHWAY NAME] cause a problem with your suppliers?
    - If so, does this affect your business? How?
    - If not, does this help your business? How?
    - How would the proposed toll lanes change this?

Using Arterials

- How does traffic on local arterials (main roads around your business) affect your business (impacts to employees, customers, calling on customers, deliveries, suppliers)?
- What are the effects on employees?
- What are the effects on customers?
- What are the effects on calling on customers?
- What are the effects on deliveries?
- What are the effects on suppliers?
- Would express toll lanes increase or decrease congestion on local arterials? How would this affect your business?

Other potential business impacts of toll lanes.

- Can you think of other ways the proposed toll lanes might affect your business?

  [IF NOT PREVIOUSLY ADDRESSED—GO TO NEXT TEN QUESTIONS]

- Do you think the proposed toll lanes would make it more or less difficult for customers/clients to access your business (i.e. due to having to reenter/exit the toll lane)?
- Do you think that the toll lane will allow your business to expand service area/delivery routes? How would this impact your business?
- Do you think that the proposed toll lanes will allow you to draw from a larger pool of qualified employees? (expand geographic region) How would this impact your business?
- Do you think that the express toll lanes would improve the reliability of travel time within the [HIGHWAY NAME] corridor (i.e. time it takes to get from one point in the corridor to another)? How would this impact your business?
- Do you think that the express toll lanes would provide an incentive for businesses to locate within the [HIGHWAY NAME] corridor? Why or why not?
- Do you think that many of your employees would utilize the toll lanes? Why?
- As an employer, do you see a benefit in helping to pay toll costs for your employees? How would this affect your workforce? Would this be feasible for you?
- If buses drove on the toll lanes, do you think more of your employees would start taking the bus to work?

- As an employer, do you see any benefit in subsidizing bus passes for employees since buses will have access to toll lanes?
- If people could carpool (2 or more people in a vehicle) at no additional cost on the express toll lane, do you think this would encourage your employees to consider carpooling to get to work?

Closing

- Have we missed any additional ways toll lanes on [HIGHWAY NAME] might affect your business?

Thank you for your time.

Appendix D Denver Case Study Business Interview Comments

The following presents specific comments from business representatives interviewed in the Denver case studies.

US Hwy 36 Business Interview Comments

If toll lanes were already on US 36, do you think this would be a better or worse location for you? Why?

- We serve a low-income clientele who won't use the tolls.
- Our business is located right at the interchange of Hwy 36, I-25, and Hwy 270. Adding toll lanes and multiple entry and exit points will only add to the confusion of this already complex interchange.
- People take either Hwy 36 or Sheridan. If traffic has decreased on the highway from the toll lanes, people will drive on it more often. If people do not drive on Sheridan as much, our school will not get as much exposure.
- A toll lane would complicate things and make it confusing for people to travel through that area.
- My business would only use the free lanes, and I foresee that toll lanes will cause more traffic in the remaining free lanes.
- People avoid highways where they have to pay to drive.
- Prospective residents from Denver and Boulder would have easier access to the area via toll lanes.
- Toll lanes would make it a better location for our business because it would be another way to make us more accessible.
- Business people who commute to Denver may be more willing to stay in the Northwest suburbs if a toll lane provided an easier, faster commute.
- It might make it a worse location if people are not exiting the highway as much because they can go faster in the toll lanes.
- The only impacts would be to the convenience of our employees and no change for the rest.
- It would help make it a better location.
- Families that our organization works with are low-income and having tolls would affect them. People cannot afford to pay for tolls, so they would use the free lanes, causing more traffic on fewer open lanes.
- If we had adequate signage pointing people to our location from the highway, it might help…but the toll lanes probably would not have a huge impact on making it a better or worse location.
- Toll lanes would expedite the process for our customers to get to our store.
- Toll lanes give people more options to travel on Hwy 36, drawing more business to the area. (2)
- Extra lanes will ease traffic congestion, making it easier for our customers coming from our Flatirons store in Broomfield.

- The location would be better because it will ease up traffic. (3)
- It would be better for local commuters, but there would be no effect on our customers because they are not local and cannot use the toll lanes.

No impact. (18)
Better, easier travel. (6)
Worse. (3)
No opinion.
Do not know. (5)

Have your employees had problems driving to work on US 36? How would the proposed toll lanes change this?

- Would not affect employees' commute. (2)
- With fewer free lanes available, it may make for a longer commute.
- Will make it an easier, faster commute. (8)
- Toll lanes will give employees more options, so if traffic is bad, they can take the toll lanes to expedite the commute. (2)
- Toll lanes may help decrease traffic. (11)
- Toll lanes make it more difficult for employees to get on and off the highway because of the increased number of cars merging and exiting from the highway, causing more congestion. Toll lanes will make the commute more difficult.
- The toll lanes will be especially useful for any employees who may need to keep driving south on I-25 into downtown and continue on the existing express lanes.
- The proposed toll lanes will likely bring an increase in traffic to the remaining lanes dedicated free use. The increase in traffic will lead to increased frustration for an employees' commute.
- People would probably use the toll lane if there were heavy traffic due to an accident. (3)
- No change because employees will not use the toll lanes. If anything, adding toll charges will compel some employees to stop using the highway all together for their commute.
- Employees might be more compelled to carpool.
- Do not know.

No impact. (16)

Is US 36 traffic a problem for customers coming to your business? How would the proposed toll lanes change this?

- Toll lanes would help, providing easier access to the area for our customers from Denver and Boulder.
- Toll lanes would help move people faster along the highway, but people must be able to afford
  the toll.
- Toll lanes will make it more inconvenient.
- Toll lanes will help to ease traffic congestion overall on Highway 36, making sure our representative's commute to the corporate office go faster.

- A certain quantity of people believe that saving time is worth their money and would opt to pay a small fee to avoid having to waste time sitting in traffic.
- Toll lanes may draw people away from Sheridan, affecting marketing and exposure.
- The toll lanes will likely be too expensive for our low-income clientele, as well as the employees from other non-profits that they partner with. If people cannot afford the toll, and more people are driving on fewer free lanes, it will increase traffic.
- Clients visiting the office from out-of-town would not be able to utilize the toll lanes. (4)
- If enough locals used the toll lanes, it would free up space in the free lanes therefore making it easier for out-of-town customers to get around.
- The toll lanes may give people faster access to their offices. (2)
- Toll lanes may help decrease traffic. (2)
- It may benefit customers to be able to get to here to pick up products in less time, but that doesn't really impact us as a business.
- It depends. It will only make a difference for those families/individuals who choose to use the toll lanes.
- If toll lanes could ease the congestion on Hwy 36, it would indirectly ease the traffic on 120th and Hwy 287, making it easier for customers to get to our location.
- We serve primarily a low-income clientele. They will not likely use the toll lanes and will be intimidated by the fees. If we are paying to add extra lanes, everyone should get to use them for free.

No impact. (13)
Do not know.

Does traffic on US 36 affect their ability to visit customers or clients? How would the proposed toll lanes change this?

- Toll lanes will likely increase traffic and make it take more time to call on clients.
- Our business would not utilize the toll lanes, and with more traffic in the remaining free lanes, traffic might be worse, taking more time to get out to customers to deliver services.
- I would use the toll lane if I was in a hurry and needed to skip traffic.
- Employees know to not take the highway in the early morning or late afternoon to avoid traffic.
- It would be more inconvenient for employees.
- It would be worth the expense of a toll fee to reduce the costs of time lost to traffic. (7)
- Traffic is not a problem on Hwy 36, it moves pretty well. They should build toll lanes on roads that actually need it.

No impact. (6)
Do not know.

Does traffic on US 36 impact your deliveries? How would the proposed toll lanes change this?

- Toll lanes will have a positive impact on the deliveries. Although the trucks would not use the toll lanes (since they are large trucks and toll is charged per axle), the presence of toll lanes will likely cut down on traffic in the free lanes.
- I might use Hwy 36 more if I could get on around Broadway and then be able merge onto the I-25 toll lane tube from the proposed toll lanes.
- I see value in the express toll lanes on I-25, but do not think traffic on Hwy 36 is bad enough to merit use of the toll lanes.
- Very few of our deliveries merit the use of Hwy 36, so we will not be adding on the expense of tolls.
- It makes sense for us to avoid traffic and save time by paying toll costs for our delivery trucks.
- The toll lanes may free congestion on the highway and keep deliveries from being late.

No impact.

Does traffic on US 36 cause a problem with your suppliers? How would the proposed toll lanes change this?

- Toll lanes may make the suppliers' delivery routes go faster.
- Suppliers come in the middle of the night when traffic is not an issue.
- I go to pick up supplies at times when traffic is not too bad.
- Most of our suppliers are from Boulder or Golden, so a toll road would not have much of an impact.

Might make travel and delivery routes faster for suppliers. (2)
No impact. (11)

Would express toll lanes increase or decrease congestion on local arterials? How would this affect your business?

Traffic on arterials would remain about the same. (9)

- Traffic congestion on the arterials will likely decrease and that would not have much of an effect on business.
- Traffic congestion on Hwy 287 would increase. If people cannot write off toll costs as a business expense, they are less likely to use the toll lanes. More people will use arterials and alternate routes to avoid the cost of the toll lane on Hwy 36.
- Toll roads will increase congestion on the arterials. (12)
- The difficulty of entering and exiting the highway at this particular area of town makes arterials more congested.
- Toll roads on Hwy 36 would not affect the traffic on Hwy 93 or Hwy 72, because those arterials are too far off of the highway.

- Toll lanes would decrease congestion on Hwy 36 and indirectly ease the congestion on 120th and Hwy 287. Additionally, the new exit directly from Hwy 36 onto 120th will help decrease congestion on Hwy 287.
- Toll lanes will likely decrease arterial congestion. (15)
- This will have no effect on our business. We are at a good location…many people exit at Church Ranch already and will continue to be exposed to our business.
- Toll lanes may initially decrease congestion on local arterial roads, but over time, the growth in the area will exceed the capacity of the toll roads on the Highway, and arterials will become congested again.
- Toll lanes could help to ease the congestion, especially if new entry/exit points to Sheridan were constructed in conjunction with the toll lanes.

No opinion.
No impact. (4)

There would be an increase in congestion; however, this would not affect the library business. The toll lanes would decrease congestion and improve our customers' moods.

Do not know. (6)

The decrease in congestion may help our business by making our location easier to access from local arterials.

The toll lanes could decrease congestion if were are entry and exit points onto the toll lanes from 104th.

Congestion on arterials would decrease with toll lanes. This will have a positive impact on our business because it could help draw in more people for the 5-6 pm showings of movies.

People who need to use the Sheridan entry and exit point to the highway or travel down 88th will continue to do so regardless of the configuration of the lanes on the highway.

C-470 Business Interview Comments

If toll lanes were already on C-470, do you think this would be a better or worse location for you? Why?

- I think the location would be worse and that toll lanes are a bad idea and cost too much.
- The proposed toll lanes would cause more construction and more congestion on C-470.
- I am against anything you have to pay to use. I do not want to deal with the construction to build new lanes.
- I am concerned about traffic congestion making the location worse. (2)

Not sure. (4)
No Impact. (25)

My customers purchase my inventory on the internet and then they come by to pick up the merchandise. When the customer calls for directions, I have to make clear to them that C-470 does not have a toll, but E-470 does.

We are located just past where C-470 splits off from I-25. So our business does not use C-470. There would be a minimal effect. (2)

The location would be a little worse because of the traffic on existing lanes and construction.

If there were no added charges to people who regularly use the free lanes, then it would be a better location because of decreased traffic congestion and more options on how to travel.

If people had a choice (toll or free), I do not believe it would impact my parishioners. Confusion or a lack of public awareness that the free lanes are still available would have a negative effect.

The location would be better because tolls would help decrease traffic on C-470. (7)

The location would be better easier for customers to find you and get to you

Worse.

People would not want to pay tolls to access them.

If CDOT is just replacing a free lane and making it a toll lane, they will greatly increase traffic congestion

If CDOT is constructing new lanes, it is not worth the huge inconvenience of construction if the only outcome is a lane that only a few people are going to opt to pay to use.

The better solution is to just construct additional free lanes

Have your employees had problems driving to work on C-470? How would the proposed toll lanes change this?

Worse.

Toll lanes will make C-470 more congested and cause more problems for employees' commute. Toll lanes are a waste of space.

Toll lanes will just add to the high cost of travel for employees, with gas prices already being so high.

Toll lanes may help to speed up the rate of traffic.

Toll lanes may decrease traffic congestion, but will increase the volume of traffic on C-470. I don't know how the toll lanes will impact employees.

Toll lanes are not a good idea; most employees would not use them. (2)

There needs to be more lanes, but not toll lanes. There should be more free lanes. (2)

We would have saner employees who get to work faster.

Timeliness due to less stress and congestion on the freeway. (5)

Not sure.

No impact. (11)

Minimal. (3)

Maybe one employee would start using C-470.

May help employees avoid traffic congestion caused by accidents.

It might help ease the commute for those who do use the Highway.

I am very much against the toll lanes. I do not think they will help decrease traffic much at all. Construction is BAD.

Alternate route in case of traffic or an accident, but people take I-25 if they need an alternate route to avoid traffic.

It would help tremendously.

Is C-470 traffic a problem for customers coming to your business? How would the proposed toll lanes change this?

Do not know. (3)

It would help if there were an exit at Colorado Blvd.

I will be able to get to office sooner.

Tolls will help decrease traffic, making it easier for customers to commute. (3)

Some people may choose to take the tolls and avoid some of the congestion.

She believes there is no impact.

No impact. (15)

Most of our clients come in for appointments during off-peak traffic hours.

There would be more options for travel and increased convenience for customers.

We would have a more attractive location potentially.

Minimal.

It might improve once customers get used to them the toll lanes, but no immediate effect.

It might give clients more options to avoid traffic and not run late to appointments.

If they are willing to pay the toll, it might make it easier for customers to visit. (2)
If local people use the toll lanes, it will presumably make for less traffic on the main lanes for out-of-town customers who cannot enjoy the option of using the toll lanes along C-470.

Adding tolls to C-470 will make for too many toll expenses, as many customers use E470 to access their business.

Does traffic on C-470 affect their ability to visit customers or clients? How would the proposed toll lanes change this?

It will provide options to avoid traffic problems.

No impact. (4)

There would be no change because we they would not use tax dollars to pay for express toll. Local governments should be able to use express toll lanes for free.

Most client visits occur during off peak hours, so employees would not have a great need to use the toll lanes.

Minimal.

If traffic is bad, employees will have the option of using the toll lanes, helping them to keep on schedule by not losing time to traffic.

Employees can use the tolls to avoid congestion when needed.

The toll lanes might help us fit in more appointments in a day because we can cut down on time spent in traffic.

Does traffic on C-470 impact your deliveries? How would the proposed toll lanes change this?

It will not decrease traffic.

No change unless exempt from toll.

It might change slightly.

It would really help.

It would probably speed things up.

Does traffic on C-470 cause a problem with your suppliers? How would the proposed toll lanes change this?

Toll lanes will give suppliers more options for avoiding major traffic congestion.

Toll lanes might help suppliers have a more efficient use of time. (2)

Suppliers might use the express toll lanes and pass the expense us — in which case we would try to switch suppliers or find an alternative. We would not use tax dollars to pay for express toll.

Do not know (3)

No impact. (4)

It might make suppliers job easier. (4)

Would express toll lanes increase or decrease congestion on local arterials? How would this affect your business?

Tolls will not impact or change the congestion on arterials. (2)

Toll lanes will potentially increase arterial traffic because they will likely increase the volume of cars on C-470. If the volume of cars getting on and off C-470 increases, they need to expand the arterials to accommodate the growth.

Traffic on arterials will likely decrease. (9)

In the long-term, people will see the benefit of paying to use the toll lanes and this will help decrease traffic.

Do not know. (4)
No impact. (13)

There might be a decrease, which would affect business positively. (8)

People will want to avoid the toll lanes. If all CDOT does is cut down the number of available free lanes, people will use the arterials more to avoid the traffic on C-470.

Possibly an increase in congestion could have a negative impact on business.
Do not know. (3)

There might be an increase, which would affect business negatively.

Traffic on arterials will likely decrease and have minimal to no effect on business. (4)

There might be a decrease, which would affect business negatively.

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