

Long-Term Business and Land Development Impacts of Access Management: Minnesota Interstate 394 Case Study

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Synopsis

Understanding the relationship between changes in transportation infrastructure systems and the surrounding commercial economy is important to the successful completion of improvement projects. Owners of businesses located along major highway corridors being considered for improvements often suggest that any change to their existing street network will result in one or more of the following adverse impacts – reduction in property values, reduction in retail sales or failure of their business. This is particularly true when direct access between the roadway and commercial land parcels is modified and controlled. Highway agency staff may be faced with these comments at any point in the project development process ranging from early (corridor planning or environmental documentation) to late (real estate acquisition or condemnation proceedings). However, no matter when these comments are made, project staff has often not been able to provide a strong response because there is very little actual information regarding the economic impacts associated with roadway improvements and none of this information is was developed in an area near the project.

In the United States, Iowa has documented the effects on retail sales and business turnover associated with access management projects. Texas has documented changes in property values in a limited number of improved urban arterial corridors and Kansas has conducted before and after studies of a very limited number of parcels. This information is consistent and is intriguing because of what is indicated (little or no adverse economic impacts to most individual businesses.) This literature is certainly a good start in defining expected business impacts. In order to expand the literature, the Minnesota Department of Transportation (Mn/DOT) has recently conducted a comprehensive and systematic analysis of the economic and business effects associated with the conversion of arterial US Highway 12 (also called TH 12) to freeway-standard Interstate 394, between Minneapolis and Wayzata in the Twin Cities metropolitan area in the Midwestern United States.

The I-394 study process involved two key steps. First an overview was developed covering both the transportation (volumes, speed and traffic operations) and business conditions (property values, employment, business turnover and property development trends) in the entire corridor before and after conversion. The second step, similar to the previous work done in Iowa and Kansas, focused in on the details (travel patterns/times/distances, land use, property values, business turnover, etc.) associated with a non-scientific, representative sample of parcels in the corridor. Individual parcels were selected by a panel of Mn/DOT staff and the State of Minnesota Attorney General's staff. The selected parcels represent a cross section of business types in the corridor, including, office, auto dealerships, retail, hospitality, sit-down and fast-food restaurants, and

convenience/gas stations. Secondary data were gathered and in-depth interviews of business owners were conducted.

Key findings of the I-394 study are as follows. All transportation performance measures including mean travel speed and crash rate improved as a result of the conversion of US 12 to a limited access Interstate freeway, even though traffic volumes almost doubled due to growth in both the corridor and the region. The business performance measures also improved – the amount of vacant land in the corridor has significantly declined, new businesses have steadily been added, business turnover was below statewide and national averages; employment is up as are adjacent commercial land values. Interviews with fourteen of the selected business owners/managers indicated that most are doing well and most agreed that the I-394 corridor is a good place to do business even after much greater control of direct land access was put in place. These results are consistent with the findings of the previous research and indicate that the dire predictions of a few of the business owners prior to construction about long term adverse economic impacts associated with the conversion of US Highway 12 to I-394 did not prove to be true.

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Access management is a process that involves carefully designing and controlling direct access from adjacent land parcels to major highway transportation facilities, such as arterials. A freeway is a fully access-controlled facility in that there are no direct driveway accesses or at-grade public road intersections. All access to adjacent land parcels occurs indirectly via grade separated interchanges and other roadways, including a comprehensive system of frontage and backage roads.

Literature on the safety and operational benefits of managing access is extensive, with consistently positive results. Managing access leads to significantly lower highway crash rates and is one of the best ways to preserve traffic flow and travel speeds on highways, particularly in urban areas with high levels of traffic volume. One of the most thorough studies of the impact of access management on safety was in fact conducted in Minnesota and showed roughly a 50 percent reduction in crash rates on well-managed highways.

Although the safety and traffic flow benefits of access management have been well-documented and are well-known, the literature on the impacts of access management projects on adjacent commercial businesses and land parcels is much less abundant. There are very few previous research projects of this sort although, as in the case of safety studies, they do have similar findings. Access management projects do not seem to cause inordinate damage to either business vitality or commercial land values.² A study conducted in Iowa in the 1990s is the most relevant to Minnesota conditions, although the facilities it examined were urban and small city arterials with traffic volumes far lower than those found on Interstate freeways in major metropolitan areas.³

Because of the relative lack of research, the long-term impact of major access management projects on commercial development and land remains a controversial issue. Business owners and managers and property developers often oppose access management projects due to their perceived impact on business activity and potential future revenues from land development. Legal disputes involving loss of property value and business activity are often the result of such projects. This research is intended to provide a comprehensive long-term evaluation of the transportation, business and land development impacts of a major access management project in the Twin Cities Metropolitan area in Minnesota.

Interstate 394 Corridor Background

Interstate 394 is a major east-west suburban freeway facility running between downtown Minneapolis and the western suburbs of the Minneapolis/St. Paul metropolitan area in Minnesota, USA. Prior to the mid-1980s, the highway serving this corridor was a high-speed, at grade urban arterial street designated as Trunk Highway 12 (TH 12, also called US 12) and locally known as Wayzata Boulevard. This urban street facility had at-grade intersections with major public roadways, several traffic signals, and a number of slip ramps that provided nearly direct accesses to some adjacent land parcels and commercial businesses. At this time on TH 12, there were short sections built to urban freeway standards with grade-separated interchanges.

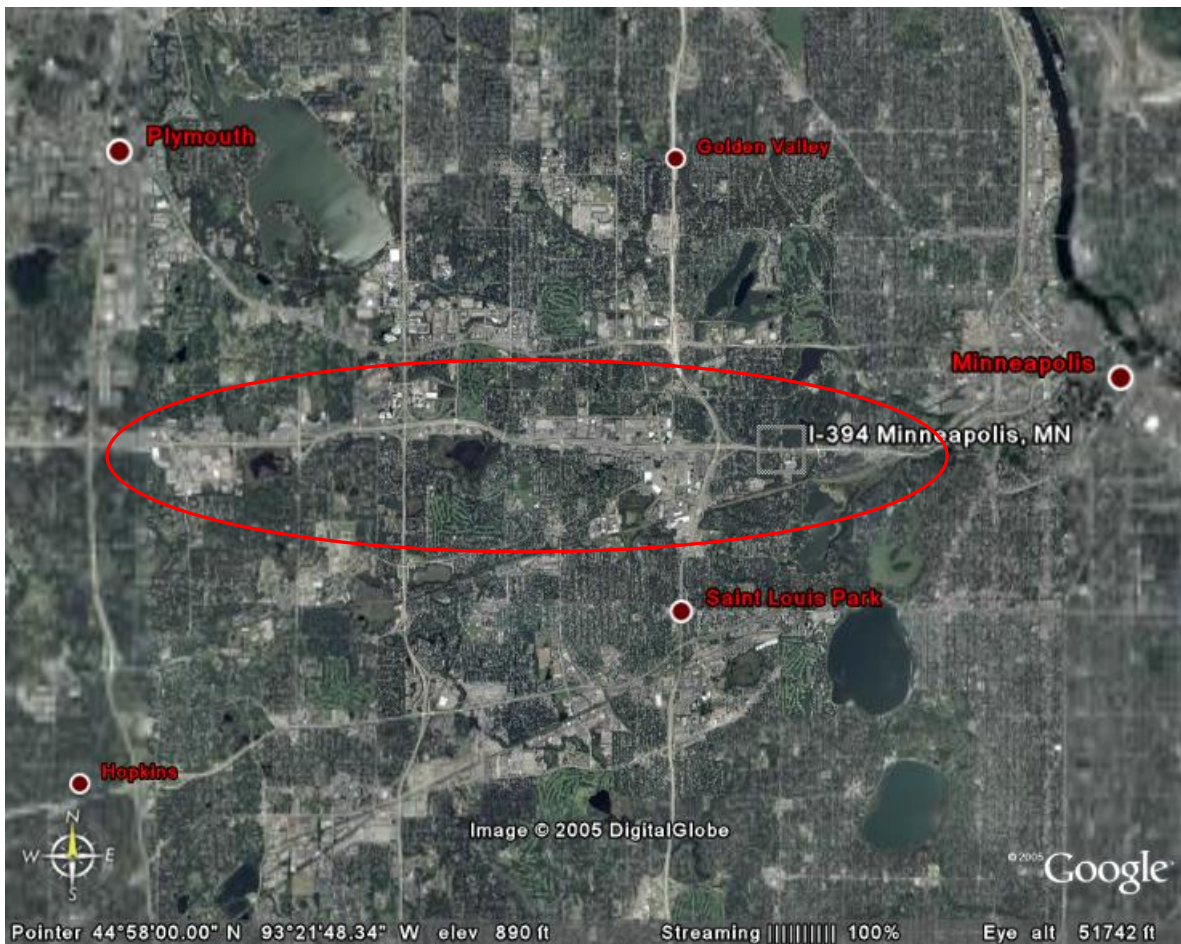


Figure 1: General Location of I-394 Corridor, Western Suburbs of Minneapolis

Between 1985 and 1993, the corridor was extensively reconstructed as a freeway built to urban Interstate standards with no at-grade intersections and no direct driveway accesses or slip ramps. All interchanges with other public roadways were grade-separated. Figure 2 shows the before and after condition for a portion US 12/I-394 with “before” on the top and “after” on the bottom of the figure.

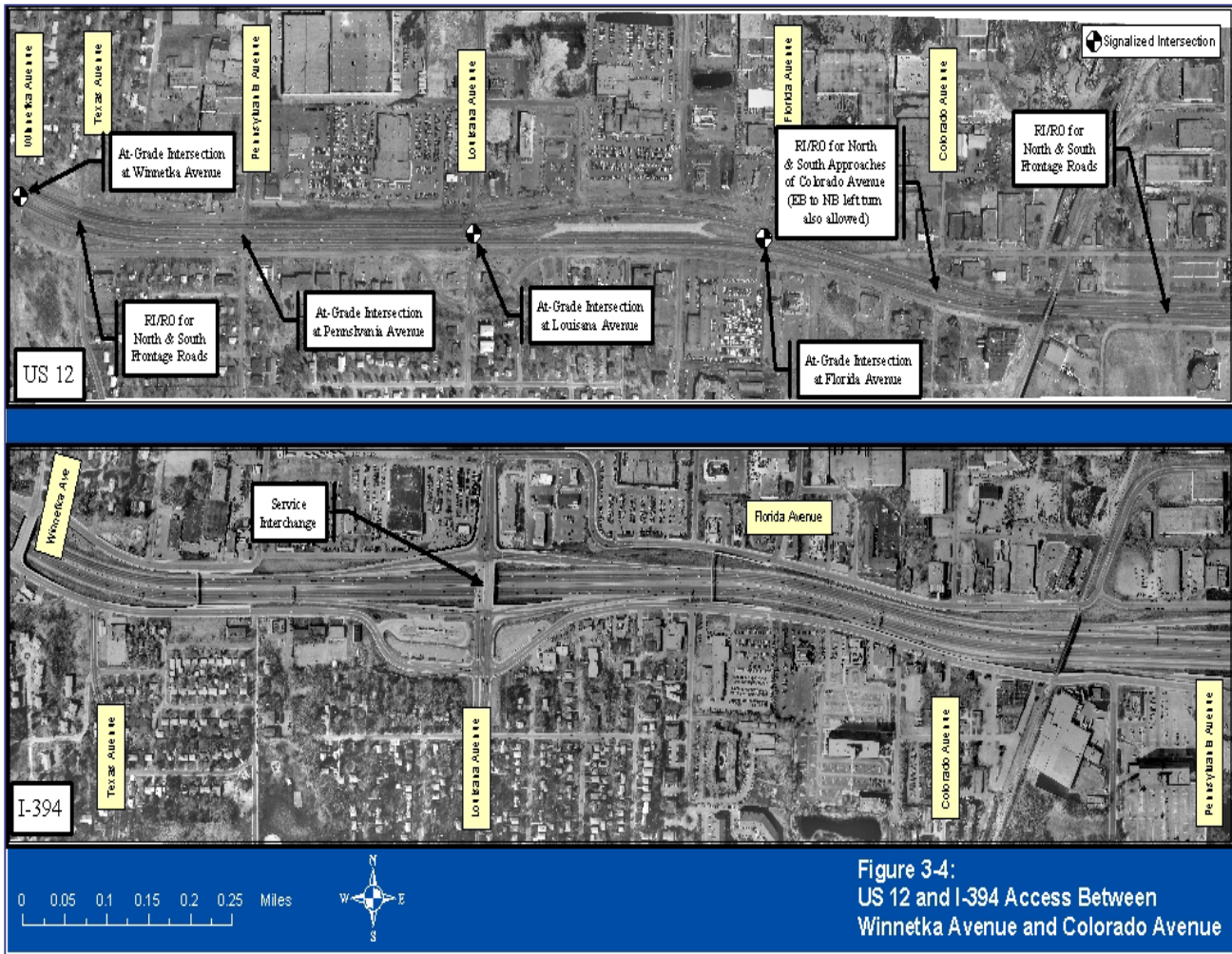


Figure 3-4:
US 12 and I-394 Access Between
Winnetka Avenue and Colorado Avenue

Figure 2: TH 12 (Top) and I-394 (Bottom) Aerial Views Before and After Construction

Research Methodology

The research for this study was conducted on two levels. First, overall transportation land use, demographic, and economic trends along the I-394 corridor were assessed for the time period between 1980 and the early 2000s using a variety of secondary data sources. Major data sources used included the Minnesota DOT, the Metropolitan Council regional planning agency, the Minnesota Department of Revenue, the United States Census Bureau, several private business directories, and the archives of a local commercial real estate brokerage and appraisal firm. All of these data paint of picture of the transportation, land use, and business environments for a corridor as a whole before, during, and after the I-394 reconstruction project.

The second line of research was conducted at the individual land parcel and business level to gain more insight regarding how individual firms fared during the transition from arterial roadway to Interstate with its associated much higher level of land access control. Parcel data collected included information from condemnation hearing transcripts, property tax assessment databases, and in-depth interviews with selected business owners and managers. The business interviews were selected by the research project advisory committee to represent a cross-section of business types found in the corridor. The interviews concentrated on businesses that have been in the corridor long enough to have experienced both the “before” and “after” highway condition, although some newer businesses were interviewed as well.

Key Research Findings

The key research findings for the I-394 corridor study are presented below. The results are presented by topic for the overall corridor trends and by business type for the detailed parcel studies. The findings are quite consistent with previous research literature on the impacts of access management on business and

land development. Overall, the I-394 project was a success in meeting its objectives of adding traffic capacity and preserving traffic flow, as well as improving traffic safety dramatically. Overall economic trends along the corridor have also remained very positive throughout the study period. Business and land development have continued at a good pace and business turnover rates have been relatively low. Over the past two decades, there has been a noticeable shift in the corridor from residential development to retailing and then to office and service sector development. Commercial land values have also appreciated quickly along the I-394 corridor.

As has been found in previous studies, the experiences of individual businesses have varied but largely positive; most businesses interviewed were positive about the results of the I-394 project. Others needed to make a transition or change their business practices as a result of the project. Some businesses studied in detail have failed, although the failures appear to be mainly unrelated to the highway project and changes in access. Other businesses are still in place but have specific complaints about the design of the project, in particular the system of frontage roads along the south side of I-394. These roads are significantly confusing to business customers, particularly first-time customers, to cause concern among some business owners.

Key Findings at the Corridor Level

Traffic Volumes. In 1990, TH 12 carried 40,000 to 80,000 vehicles per day at a poor peak hour level of traffic service. By the Year 2000, I-394 carried 109,000 to 145,000 vehicles per day, essentially double the traffic volume. Handling this anticipated increase in traffic was one of the main motivations for the highway upgrade and the conversion of the facility to a freeway accomplished this goal. Figure 3, below, indicates the traffic and traffic flow history for the project.

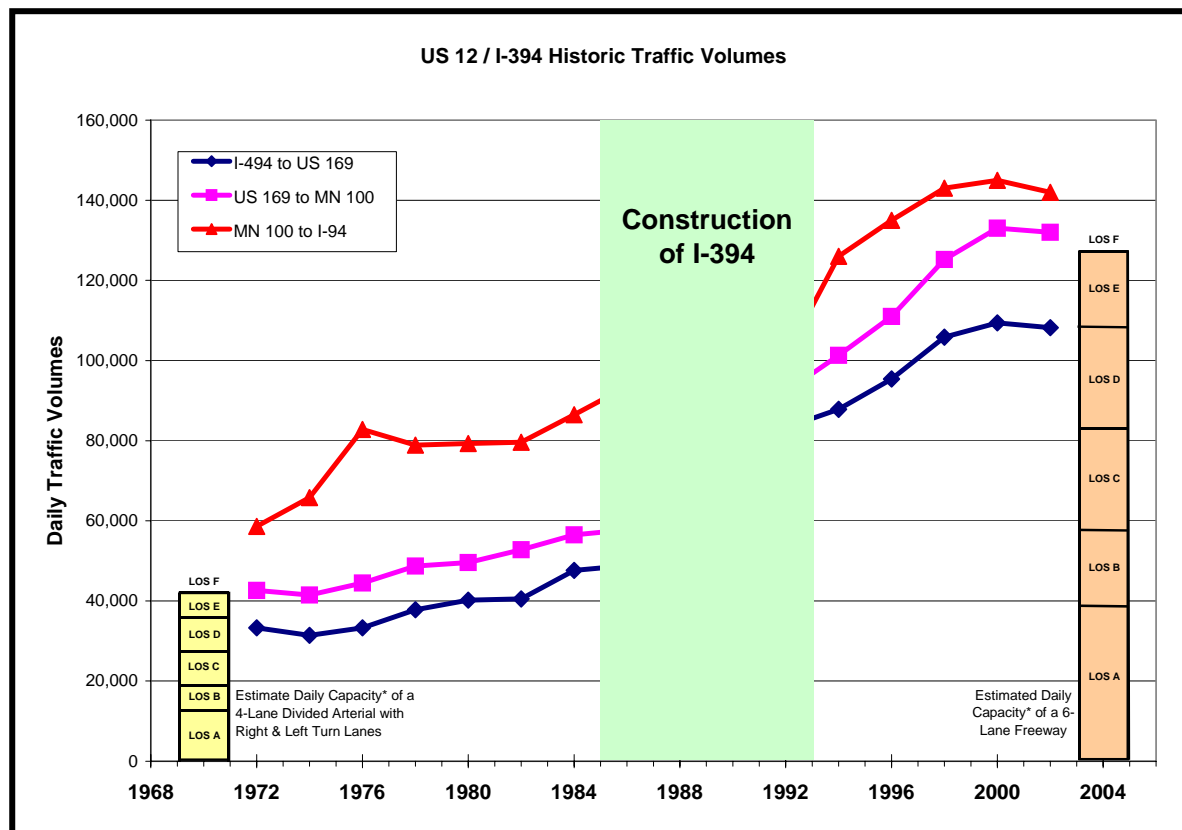


Figure 3: US 12/I-394 Historic Traffic Volumes

Travel Speed Change and Traffic Flow. Peak hour travel speeds along I-394 are from two to 25 miles per hour (3.2 to 35.4 kilometers per hour) **faster** along I-394 today than they were along TH 12 before the project was constructed, even with the doubling of traffic. Travel times for typical-length trips along the route have generally

dropped even when more indirect access to commercial properties is factored in. The upgrade from an arterial to a freeway clearly maintained the level of service for traffic in the corridor even under conditions of high traffic growth. However, peak travel speeds on some parts of the current I-394 corridor are now beginning to drop below the Mn/DOT minimum performance level target of 45 miles per hour (72.4 kilometers per hour). The parcel travel time analysis is shown below in Table 1. Estimated travel time changes to and from selected land parcels are shown. Times include both an estimated line haul component from trip origin and an access time component at the destination parcel. The I-394 project is currently (1995) being converted to a high occupancy toll (HOT) facility to provide further improvements in traffic capacity, flow, and travel speeds.

**Total Travel Time Change Analysis For 17 Selected Parcel Locations
(Year 1980 Versus 2000)**

Indicator	To/From East	To/From West	Typical Total Travel Time Change
Mean Change	-6%	-5%	About 1 minute faster
Median Change	-7%	1%	About 1.5 minutes faster to 10 seconds slower
Improved	12	8	
Worse	4	9	
No Change	1	0	
Large Positive Change	6	3	Over 2 minutes faster
Large Negative Change	2	4	Over 2 minutes slower
Small Changes (LT 10%)	9	10	Within 2 minutes faster or slower
Note: Typical total trip lengths in the I-394 corridor are between 15 to 20 minutes.			

Table 1: Total Travel Time Analysis Before and After Project

Traffic Safety. The I-394 corridor has significantly fewer fatal and injury crashes than TH 12 even though traffic volumes have doubled. Average annual fatal crashes have declined from two to one. The rate of fatal and injury crashes (crashes normalized by traffic volume) has declined considerably. Clearly the I-394 project was very beneficial in terms of traffic safety. Figure 4 shows the crash history for the I-394 corridor.

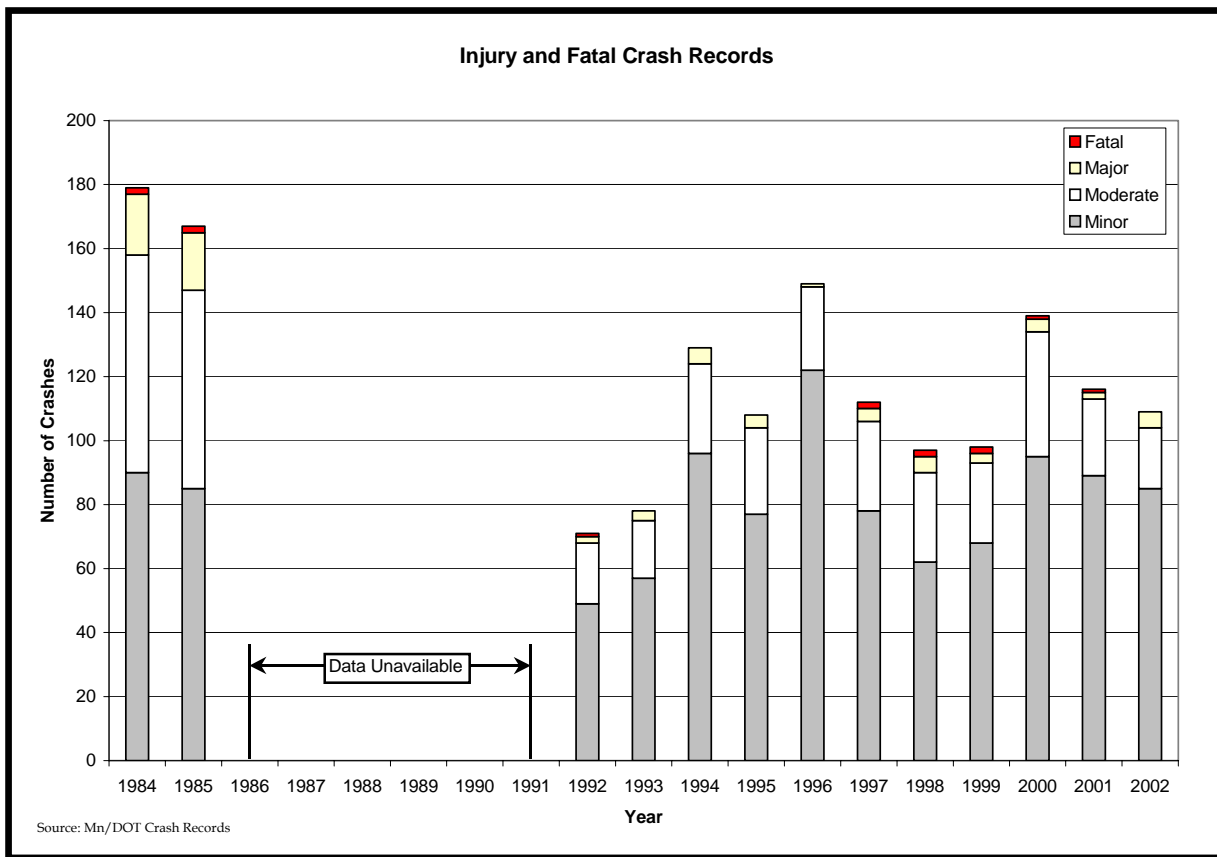


Figure 4: US 12/I-394 Traffic Safety Trend

Land Use. There are roughly 1300 acres (525 hectares) of developable land immediately adjacent to the I-394 corridor. Land use was compared for this ¼ mile (400 meter) buffer zone for the period between 1984 and 2000 using remote sensing data obtained from the Metropolitan Council. The results show that land use along the corridor has become more intensive, with significant decreases in residential and agricultural/vacant land and significant increases in commercial and industrial land. (See Figure 5) Commercial land uses now make up about 40 percent of the land adjacent to the corridor. Land use change was most pronounced in the middle of the corridor near the interchanges with US 169 and TH 100. These are locations with high levels of accessibility, traffic, and visibility. This land is now being used far more intensively than was the case before the I-394 freeway upgrade was completed.

I-394 Commercial Land Use Change, 1984-2000

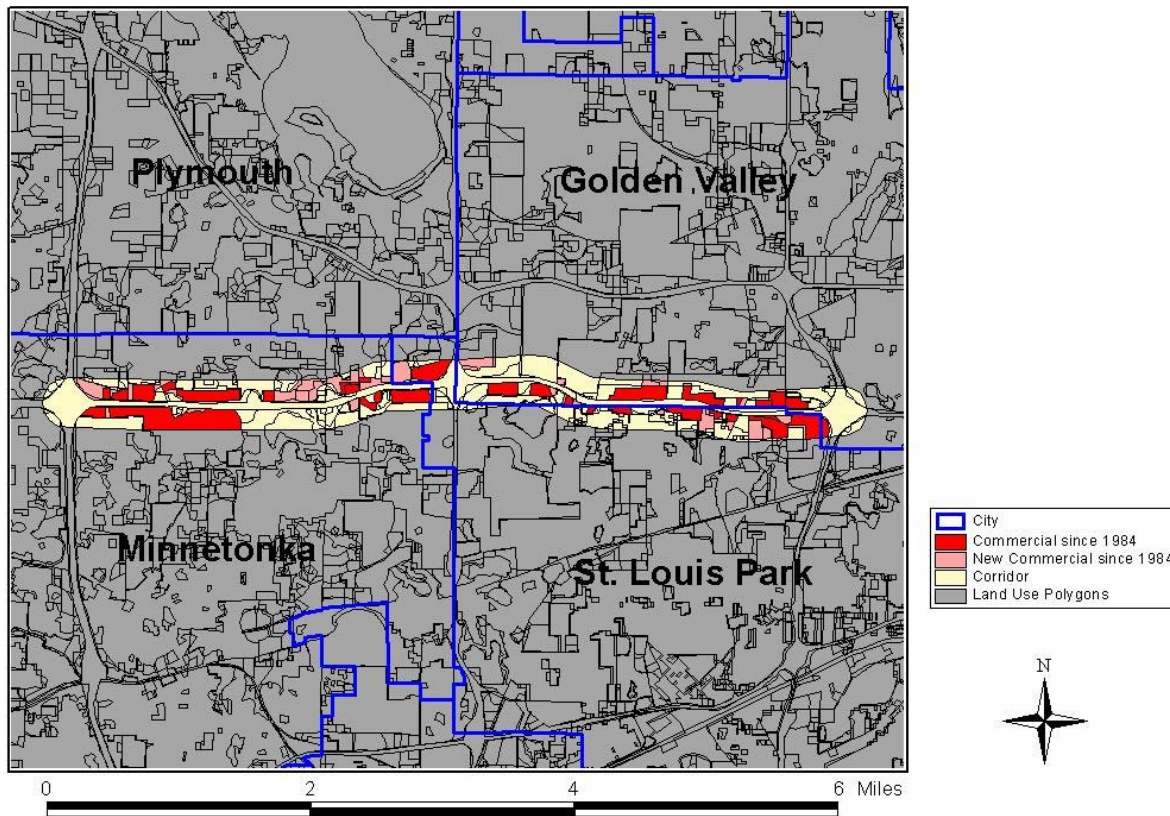


Figure 5: Commercial Land Use Change Along the Study Corridor

Population and Income. As the I-394 corridor has transitioned from residential land use to commercial/industrial land use the population of the census tracts along the corridor have declined somewhat. However, the population that remains has become more affluent as measured by statistics such as median household income. The area has a relatively high median household income by Minnesota standards, which makes the area an attractive market for both retailers and service businesses.

Retail Trade Activity. The number of retail firms located in the cities that surround the I-394 corridor has fluctuated over time; this sort of ebb and flow is commonplace in retailing and is mostly related to overall economic conditions. The three suburban cities that include the I-394 corridor have become somewhat less dependent on retail businesses for their commercial development base over the past few decades; there has been a rise in service businesses, including services for households and other businesses. Gross retail sales in the corridor (which includes taxable services) grew substantially in the area, suggesting an overall healthy business climate, but one which is becoming more services-oriented and less retail-oriented over time.

Employment. Employment in the area immediately surrounding the I-394 corridor grew by almost 30 percent between 1990 and 2000. Unfortunately, comparable data were not available for 1980. The density of employment (employees per acre of land) also grew, reflecting the growing intensity of land use along the corridor. The composition of employment along I-394 changed dramatically as direct employment in retailing declined while employment in service and office sectors grew. These changes were most pronounced in the middle of the corridor, the same area where the most significant changes in land use occurred. (See Figure 6)

I-394 Total Change in Non-Retail Employment, 1990-2000

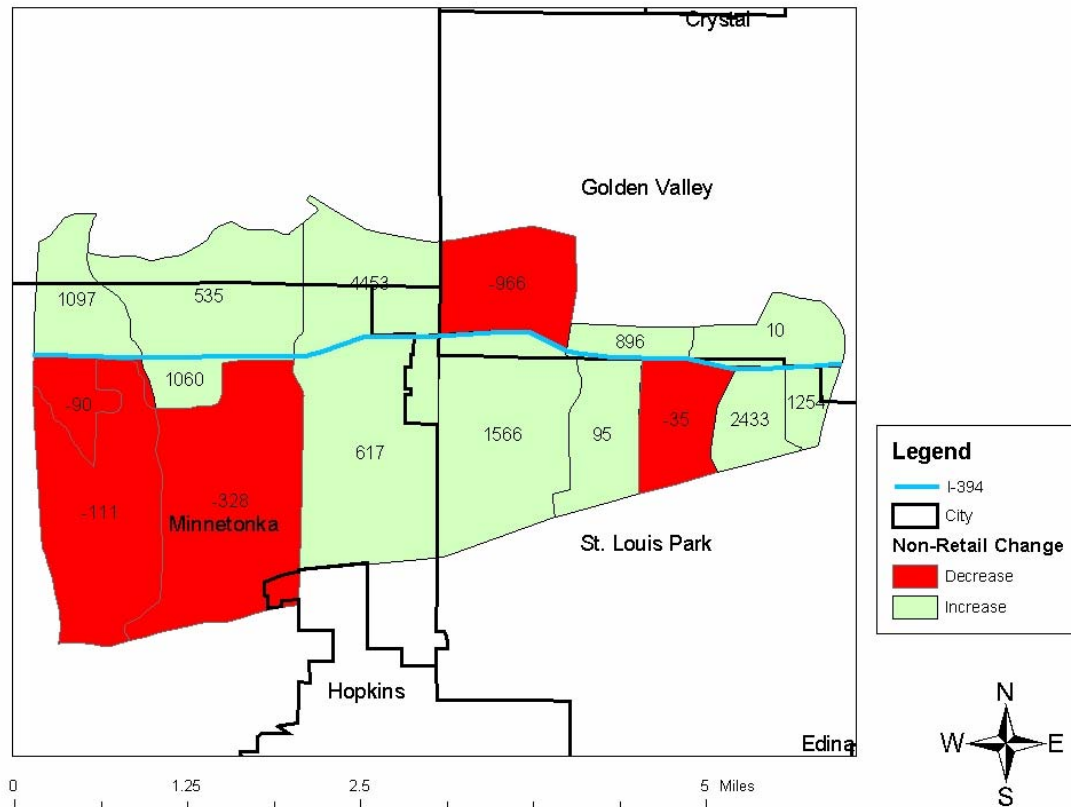


Figure 6: Change in Non-Retail Employment By Traffic Analysis Zone, 1990-2000

Business Turnover. An analysis of business turnover (defined as the annual rate of businesses leaving the corridor either through failure or relocation) was conducted using published business directories for the period between 1980 and 2003 for addresses along Wayzata Boulevard. (Wayzata Boulevard is the local street name for TH 12 and the frontage road system that now serves businesses along I-394.) For this analysis, a business was considered to have turned over if it went out of business, moved out of the study corridor, or changed its name such that it could not be positively identified as the same business. The overall rate of business turnover for the corridor has been lower than typical rates for Minnesota and the United States. The highest turnover rates have been for service and office businesses rather than retail businesses, which include all types of restaurants. (See Figure 7)

The analysis also indicated that there has been substantial new development; there are now many more commercial postal addresses while vacant addresses have declined dramatically. The most significant change that has occurred in development activity over time is a large increase in multi-tenant buildings, including strip malls and office buildings. These properties are now most often leased by service sector businesses. Vacancy

rates for business addresses declined from over 50 percent in 1980 to around 10 percent by 2003.

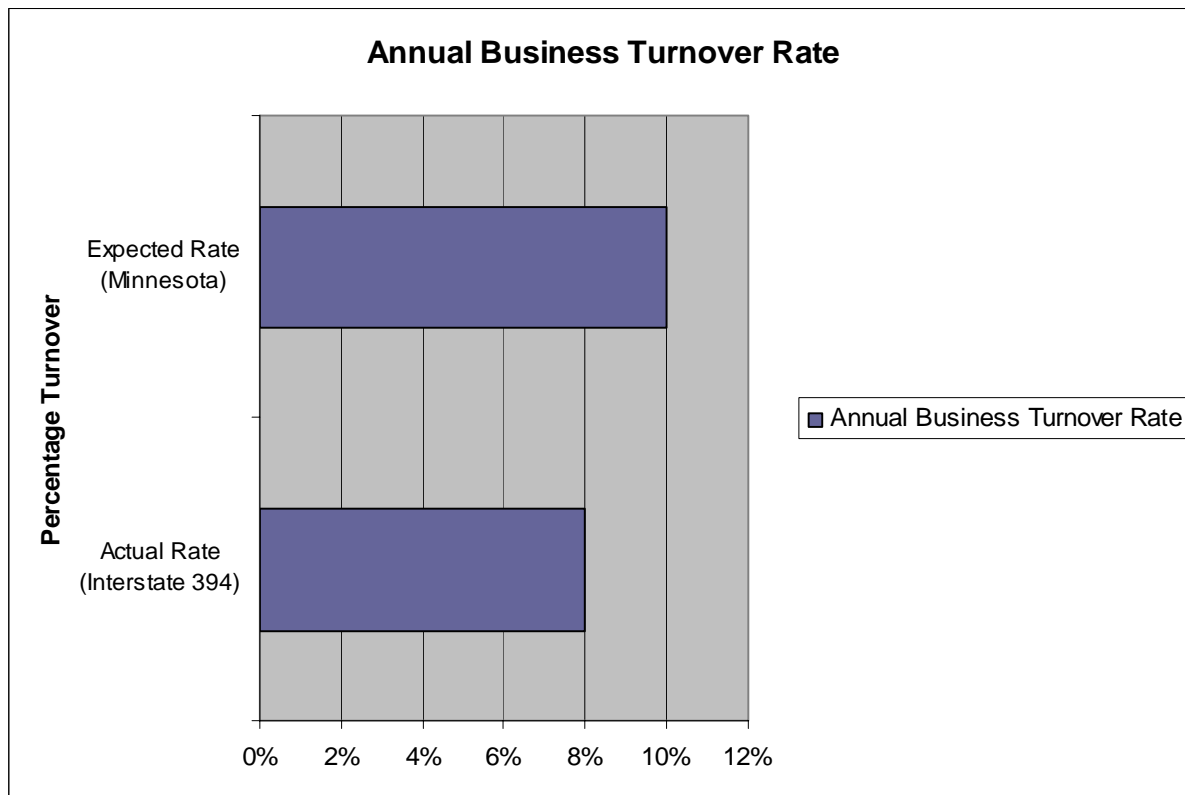


Figure 7: Business Turnover Rate, I-394 Study Corridor Versus All of Minnesota

Commercial Land Values. Raw commercial land values in the I-394 corridor were assessed over a three decade period (roughly 1970 through 2003) using sales transaction records from a local commercial realty and appraisal company. Land values along I-394 have grown substantially, from about \$2.00 US per square foot (0.09 square meters) in 1970 to about \$15.00 US per square foot today. The price trend for the I-394 corridor has been very similar to that for another highly developed commercial corridor in the Twin Cities, Minnesota metropolitan area for which comparable data are available, I-494 through Bloomington near the airport and Mall of Americas, which is the largest shopping mall in North America.

Freeway Corridor Land Value Trends

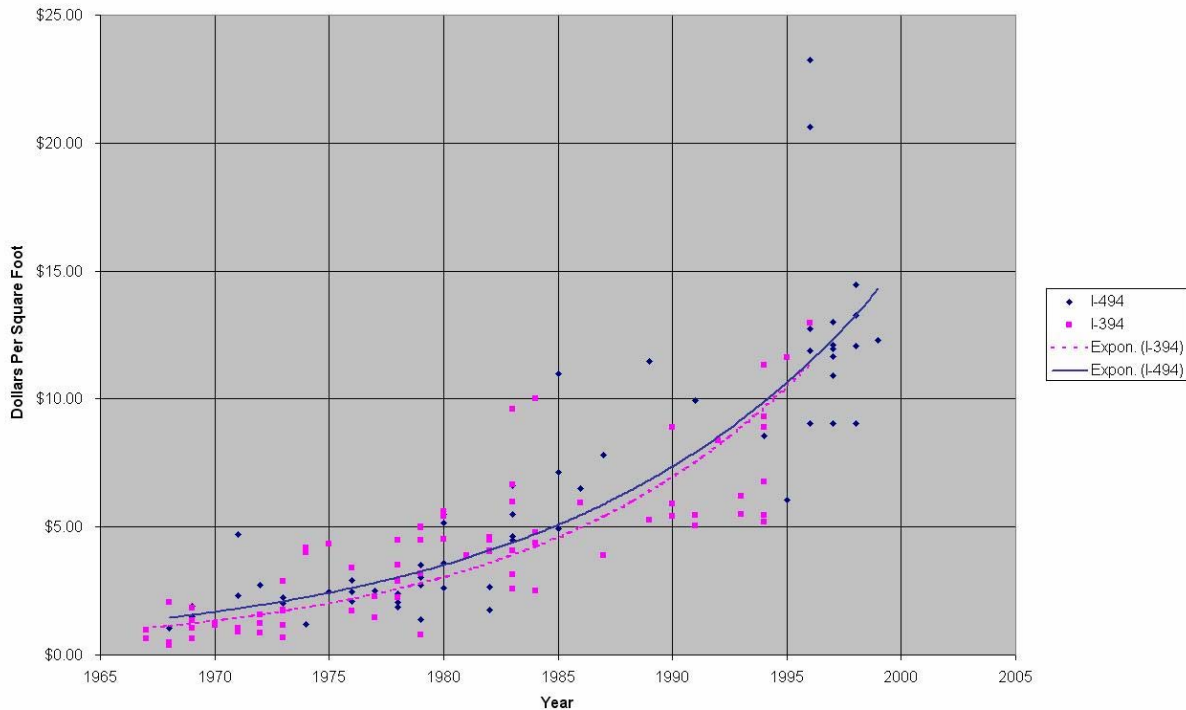


Figure 8: I-394 Raw Commercial Land Value Trend Versus I-494 Corridor

Key Findings at the Business and Parcel Level by Business Type

The results of the corridor-level economic analysis indicate that the area immediately around the I-394 corridor has thrived even after virtually all direct land access from the roadway was eliminated. In addition, the access management project was a great success in terms of both traffic operations and traffic safety. This section provides information on the economic impacts to specific commercial property/business types along the project corridor. These conclusions are largely based upon interviews with businesspersons conducted during 2005. The businesses surveyed were selected by the project advisory committee and should not be construed to represent a scientific sample of all corridor businesses.

Office Buildings. Four office developments were studied in detail for this research. Several of the locations studied were in place at the time of reconstruction and noted difficulties during the time the project was underway. Several were involved in condemnation proceedings for the project. Since the project was completed, the results from travel time studies, assessor data analysis and interviews that could be completed with building owners and managers indicate that this business type has fared extremely well along I-394. Travel times to these buildings have mainly declined, property values have risen, and managers were very positive about the I-394 corridor as a place to do business. In many ways, the I-394 corridor has become an ideal location for offices in that it is close to the Minneapolis Central Business District but without its problems of congestion, high costs, and limited parking. The attractiveness of the corridor for offices and office employment has helped other business categories, especially fast food restaurants. Office land uses appear to be much less dependent on access and visibility factors than many other uses and are more dependent on the overall economic characteristics of the corridor and its overall location.

Automobile Dealerships. Two auto dealerships were studied in detail. Many of the parcels owned by these dealers were involved in condemnation proceedings during the I-394 construction project and the dealers that could be interviewed were adamant that the project would be damaging to them while it was in progress and afterward due to restrictions in direct access and losses in visibility. Although auto purchases would not appear to "impulse purchases" be by their expensive nature, dealers maintain that a significant percentage of these purchases are made quickly and depend greatly on visibility from the highway. One dealer went so far as to

state that an auto dealership would no longer be viable at its current location due to changes in access and visibility. However, at present, both dealerships remain at the same location along I-394. Also, travel times have declined or remained fairly stable at these locations. Property values continue to increase and the I-394 location is still a good location for auto dealerships. One of the dealers is now somewhat positive about the impacts of the highway project. A key to keeping these types of businesses healthy appears to be in their ability to make the transition during the construction project when customer access is complicated and visibility may be hindered.

“Sit-Down” Restaurants. Five such restaurants were studied in depth. Two of these were in business along old TH 12. One went out of business for reasons that appear to be unrelated to the highway project. The other two are new to the corridor. Like many of the older businesses along TH 12, the two oldest sit-down restaurants studied were very opposed to the I-394 upgrading project at the time due to the perceived impact it could have on their business. Both were involved in right-of-way condemnation proceedings. Both argued that their restaurants would no longer be viable once the I-394 project was completed and direct accesses were no longer available. Today, both properties are prosperous restaurants in the same chain. Both parcels have similar access in terms of travel times to their before condition. Both of the current managers are fairly positive about I-394 as a location today, although one has made adjustments in the type of customer it caters to (now local rather than “drive by” customers) and the other has significant concerns about the confusing system of frontage roads that customers need to navigate to reach these particular restaurants.

The sit-down restaurant studied along the corridor that went out of business (when the entire chain of restaurants failed) was replaced on the same site by two new sit-down restaurants. Managers of these two restaurants were positive about the I-394 location in general but were also frustrated by the complex frontage road system on the south side of I-394. They noted access can be circuitous and that the frontage roads are far enough away from the freeway so that there is a limited benefit to them in terms of visibility. Clearly sit-down restaurants are dependent both on efficient and straightforward access *and* the overall economic health of the corridor.

“Fast Food” Restaurants. Two fast food restaurants were studied in detail. Both existed prior to the completion of the I-394 upgrading project. Fast food restaurants were the business type (along with office buildings) where the most positive results occurred. Both restaurants have become excellent performers in terms of sales activities, partly as a result of the great increase in employment and traffic along the corridor since 1980. Both these businesses were in locations such that travel times have improved or stayed stable and where visibility remained very good. As with office buildings, the I-394 corridor has become a nearly ideal location for this business type. Although efficient access and visibility are very important to fast food restaurants, what really seems to matter for them is a strong customer base such as that that has grown in the many new offices along I-394 since reconstruction.

Strip Commercial (Small Shopping Centers). The detailed information gathered regarding this business category through interviews and other means was very limited and does not indicate either negative or positive impacts of the I-394 project. However, the I-394 corridor does appear to be a hospitable environment for such businesses since many new strip shopping center buildings have been developed along the corridor.

General Retail. Two specialty retailers were studied in this category. Both were in place prior to construction of the highway project. One was involved in condemnation proceedings. Both remain highly successful businesses today, although one needed to change his marketing strategy to make his store more of a “destination business”—one less dependent on drive-by customers. Both businesses are clearly taking advantage of the prosperous customer base that is found along and near the corridor today. This is the most important factor for businesses in the general retail category.

“Big Box” Retail. Two parcels were studied in detail. These large, specialty retailers are clearly “destination businesses” (meaning that customers mainly seek them out rather than make impulse decisions to patronize them.) One of them has seen small increases in travel time for typical trips after project completion. One owner declined to be interviewed while the other noted that peak period congestion on I-394 is a much greater concern for his customers than is additional access distance or time. This store noted it benefits from the overall I-394 corridor location, its prosperous customer base, and the visibility the freeway creates.

Hospitality. Two hotels were studied in detail. One went out of business for reasons unrelated to the highway project. (Its convention-based business went elsewhere when new convention facilities were constructed away from the study corridor.) It was replaced by several restaurants. The other is still in business at the original location, but the management chose not to participate in the interview process. As with strip commercial properties, it is difficult to draw any conclusions from studying these two businesses.

Convenience Stores and Gas Stations. One such parcel was studied in detail. Travel time to and from this location was largely unchanged by the I-394 project and the gasoline station remains in business today.

Overall Conclusions

The results of the I-394 research indicate that the corridor economic impacts of upgrading the highway from an arterial facility to a freeway were largely—in fact almost entirely—positive in nature. Thriving commercial businesses can and do co-exist with high levels of access management. Clearly, additional capacity to carry traffic and improved travel speeds resulted. Safety improved greatly. The overall economy of the corridor improved, as measured by such indicators as employment, income, business turnover, and retail sales taxes. A considerable amount of new land development occurred and developed land transitioned from “lower uses” such as agriculture and residential to “higher uses” such as commercial/office. Commercial land values increased significantly and the land value growth trend was in line with a comparable high traffic volume in the same metro area, freeway corridor, I-494.

Even though the overall business turnover rate in the corridor has been relatively low, the experience of individual businesses and land parcels does vary when projects such as I-394 are constructed and direct access between highways and commercial land is controlled more tightly. Some individual businesses that were interviewed did not fare as well as others. However, business persons’ perceptions of the potential negative impacts of the I-394 project have been shown by the passage of time to be much greater than the actual impacts (and very often in the opposite direction). Statements made during right-of-way condemnation proceedings that certain locations would no longer be viable for business turned out to be wrong in all cases. Businesses whose owners made these statements all remain in place today along the corridor.

There are two reasons for this. First, the overall economic environment of the corridor improved greatly after the project was put in place. This is probably due to the fact that traffic along the highway corridor increased greatly, bringing many more potential customers to the area. Second, travel times for typical trips to and from parcels along the corridor generally declined because travel speeds along the mainline of I-394 increased. Business owners appear to have only considered the access portion of the travel time calculation when making their estimates of future travel times, not considering that the line haul portion of trips to their businesses might improve dramatically. Finally, land use change toward commercial/office uses generated more daytime customers for many commercial businesses, particularly restaurants.

Certain types of businesses studied along I-394 appear to have benefited most from the highway project and the resultant increase in traffic along the corridor. These include office buildings, fast food restaurants, and “big box retailers”. For these businesses, the positive macro-level economic trends following the project seem to have been very important. These businesses have thrived because the corridor improvements supported a healthier economic environment in general with abundant customers and buying power. For other business types of businesses, the project was more of a mixed blessing, although on the whole the positives have outweighed the negatives. The table below summarizes the research results by indicator and by business type.

Although this research represents a single case study, it may be hypothesized that similar results would be found if other highway corridors where traffic operations and capacity have been greatly improved through access management were studied. Improvements in traffic capacity and travel speed appear to simply overwhelm any minor increases in access time and circuitry for business customers.

Table 2: Research Results Summary Table

Indicators	Direction Of Impact	Comments
<u>Transportation</u>		
Traffic Volume	Positive	Traffic doubled
Travel Speed	Positive	Peak travel speeds up
Traffic Safety	Very Positive	Large decline in serious crash rate
<u>Economic and Demographic</u>		
Land Use	Positive	Land developed more intensively
Population	Neutral to Negative	Slight population loss due to land use changes away from residential
Income	Neutral to positive	Area consumers more affluent
Retail Trade Activity	Neutral	Mixed trends
Employment	Positive	Large office jobs gain
Business Turnover	Neutral to Positive	Below state turnover rate
Commercial Land Values	Neutral	Trend similar to I-494 corridor
<u>Business Types</u>		
Office Buildings	Very Positive	Large increase in activity
Automobile Dealerships	Neutral	Remained viable after transition
Sit-Down Restaurants	Neutral	Remained viable with adjustments
Fast-Food Restaurants	Very Positive	Large increase in business
“Strip Commercial”	Neutral to Positive	Attractive location
General Retail	Neutral	Remained viable with adjustments
“Big Box Retail”	Very Positive	Very attractive customer base
Hospitality	Neutral	Insufficient data
Convenience Stores and Gas Stations	Neutral	Remained viable

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