

# Long-Term Impacts of Access Management on Business and Land Development along Minnesota Interstate 394

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## ABSTRACT

Understanding the relationship between changes in transportation infrastructure and the surrounding commercial economy is important for completing improvement projects successfully. Owners of businesses located along major highway corridors considered for improvements often suggest that changes to the existing street network will reduce property values, reduce retail sales, or cause the business to fail. This is particularly true when direct access between the roadway and commercial land parcels is modified and controlled. Little information exists about the economic impacts of roadway improvements, though studies in Iowa, Texas, and Kansas have indicated that there are few or no adverse economic impacts to most businesses.

Recently, the Minnesota Department of Transportation (Mn/DOT) comprehensively and systematically analyzed the economic impacts associated with converting arterial US Highway 12 to freeway-standard I-394, between Minneapolis and Wayzata in the Twin Cities metro area. The I-394 study first developed an overview covering both the transportation and business conditions in the entire corridor before and after conversion. The second step focused on the details (travel times/distances, land use/values, business turnover) of a representative sample of parcels in the corridor. The selected parcels represent a cross section of corridor business types, including offices, auto dealerships, retail, hospitality, restaurants, and gas stations. Secondary data were gathered and in-depth interviews of business owners were conducted.

The I-394 study found that all transportation performance measures improved when US 12 converted to a limited-access interstate freeway, though traffic volumes almost doubled due to regional and corridor growth. The business performance measures also improved: the amount of vacant land in the corridor has significantly declined, new businesses have been added, business turnover was below statewide and national averages, and employment and adjacent commercial land values are up. Interviews with 14 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 access control 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.

**Key words: access management—business performance measures—land development impact—traffic performance measures**

## **PROBLEM STATEMENT**

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 conducted in Minnesota and showed roughly a 50% reduction in crash rates on well-managed highways.

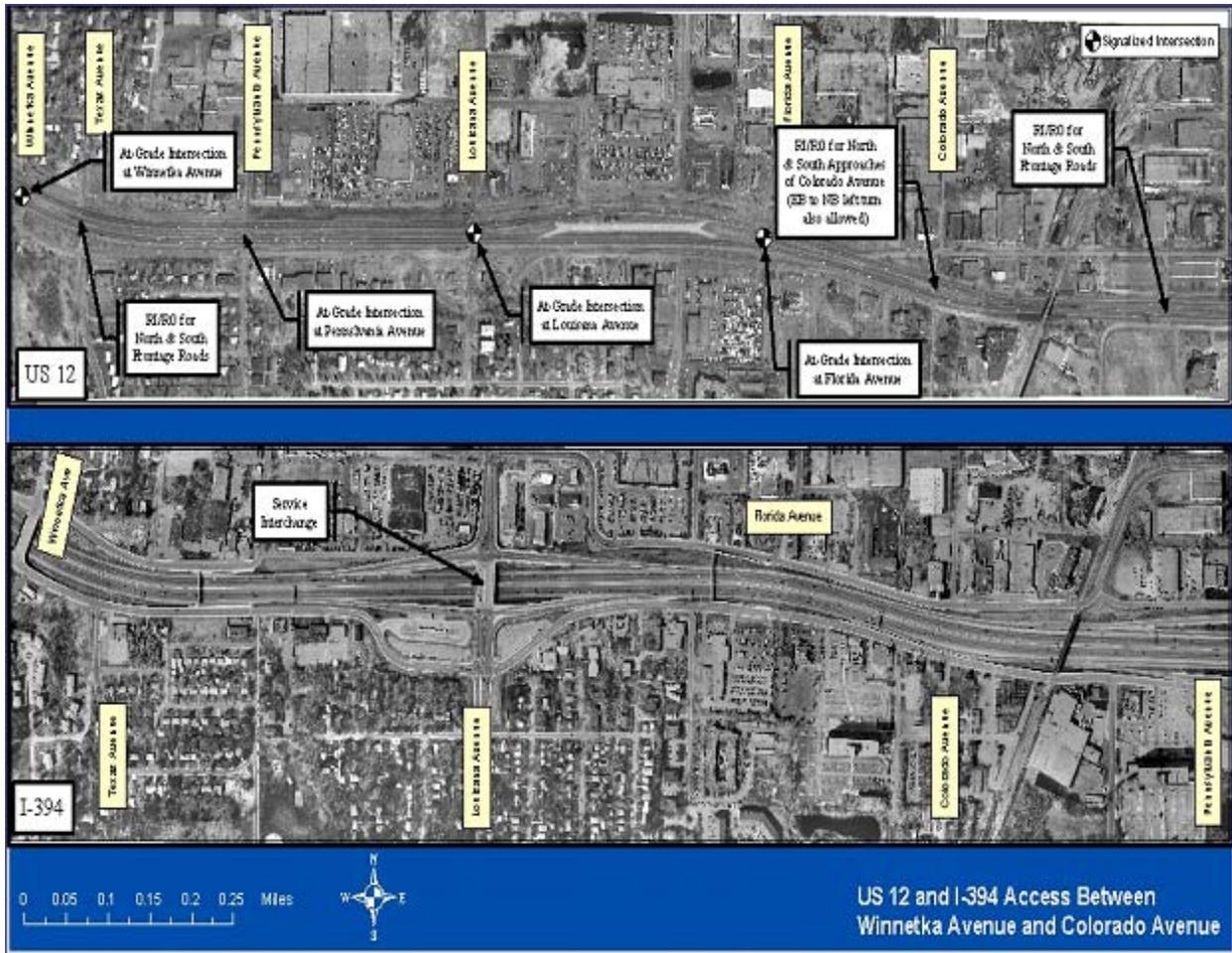
Although the safety and traffic flow benefits of access management have been well-documented and are well-known, the literature on the impacts of access management projects on adjacent commercial businesses and land parcels is much less abundant. There are very few previous research projects of this 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. 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 interstates in major metropolitan areas.

Because of the scarcity 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 the 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 resulting from a major access management project in the Twin Cities metropolitan area in Minnesota.

## **INTERSTATE 394 CORRIDOR BACKGROUND**

Interstate 394 is a major east-west freeway facility running between downtown Minneapolis and the western suburbs of the Twin Cities metro area in Minnesota. Prior to the mid-1980s, the highway serving this corridor was a high-speed, at-grade arterial designated as Trunk Highway 12 (TH 12, also called US 12) and locally known as Wayzata Boulevard. This facility had at-grade intersections with major public roadways 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 freeway standards with interchanges.

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. See Figure 1.



**Figure 1. 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 included Mn/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 the 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 higher level of land access control. Collected parcel data 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 conditions, although some newer businesses were interviewed as well.

## **KEY FINDINGS**

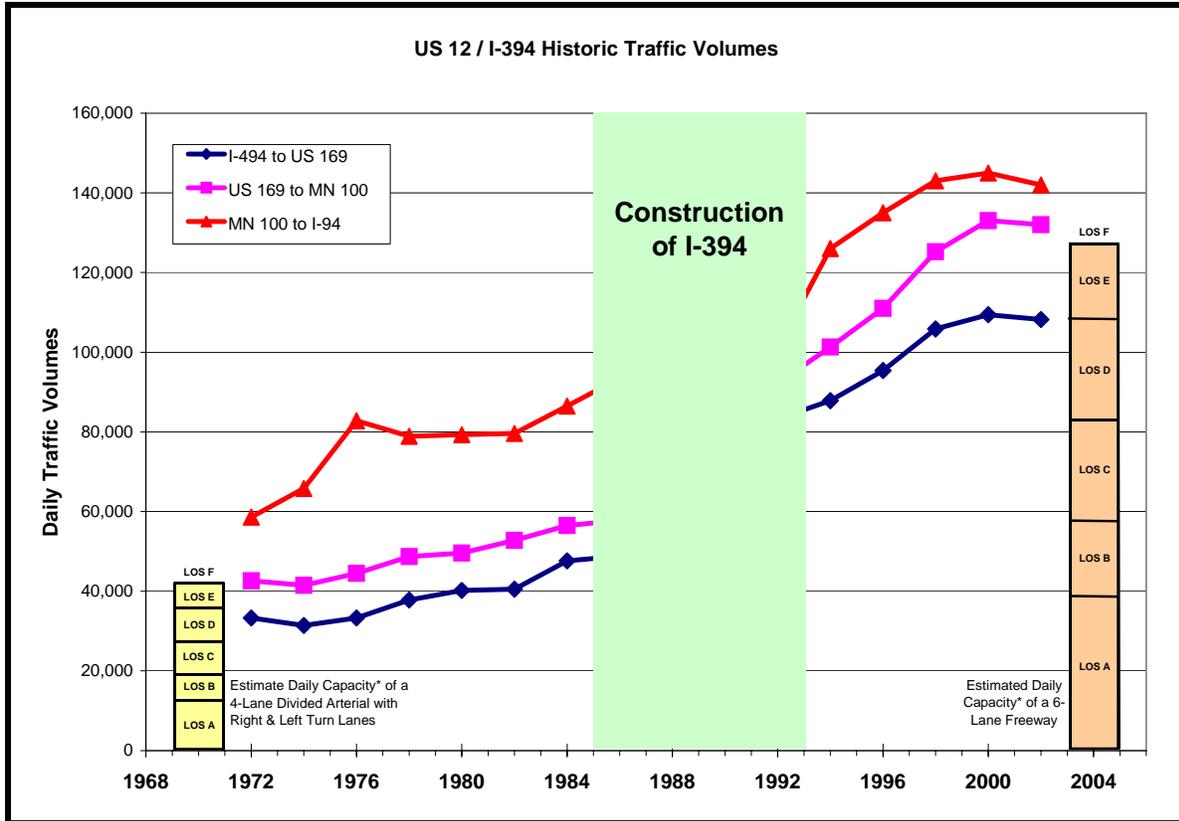
The key research findings for the I-394 corridor study are presented below. The results are presented by topic for the overall corridor trends and by business type for the detailed parcel studies. The findings are consistent with previous research literature about the impacts of access management on business and land development. Overall, the I-394 project was a success in meeting its objectives of adding traffic capacity, preserving traffic flow, and 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. 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 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 confuse business customers, particularly first-time customers.

### **Key Findings at the Corridor Level**

#### *Traffic Volumes*

In 1990, TH 12 carried 40,000 to 80,000 vehicles per day. By the year 2000, I-394 carried 109,000 to 145,000 vehicles per day, essentially double the traffic volume (see Figure 2). Handling this anticipated increase in traffic was one of the main motivations for the highway upgrade.



**Figure 2. US 12/I-394 historic traffic volumes**

*Travel Speeds and Traffic Flow*

Peak hour travel speeds along I-394 are from 2 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 upgrade, 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). This analysis is shown below in Table 1.

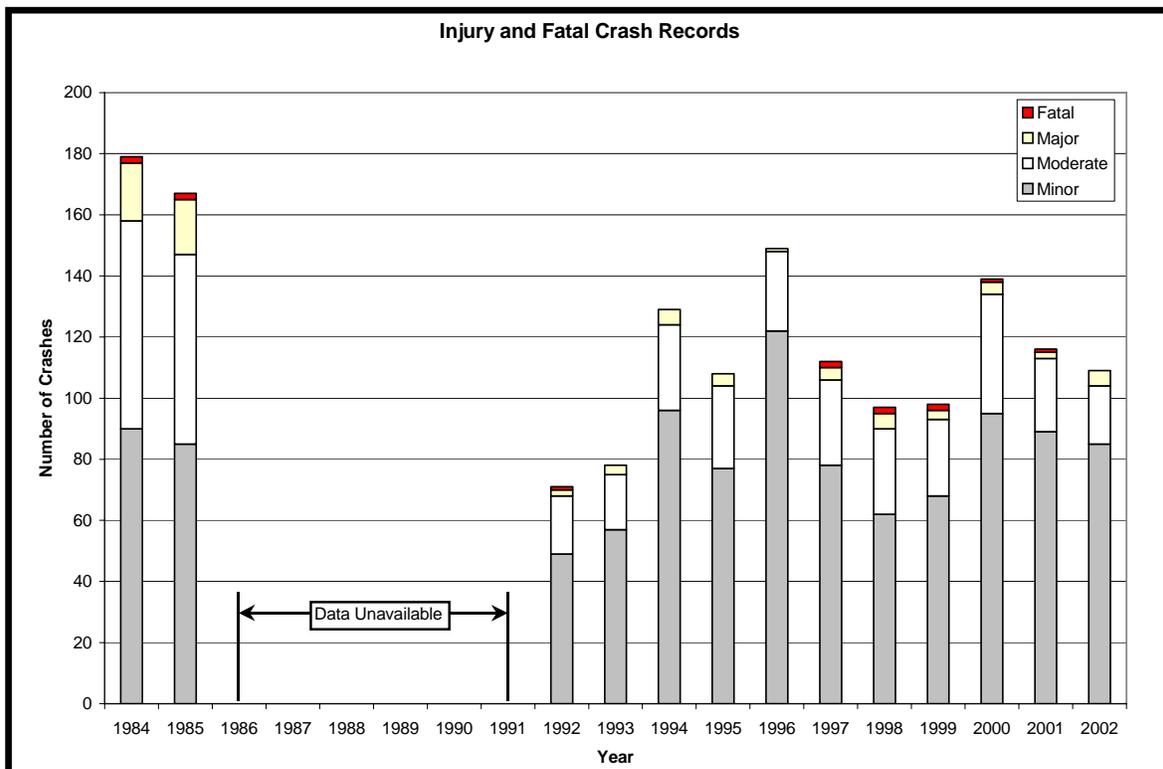
**Table 1. Total travel time analysis before and after project for 17 sampled locations (1980 vs. 2000)**

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

*Traffic Safety*

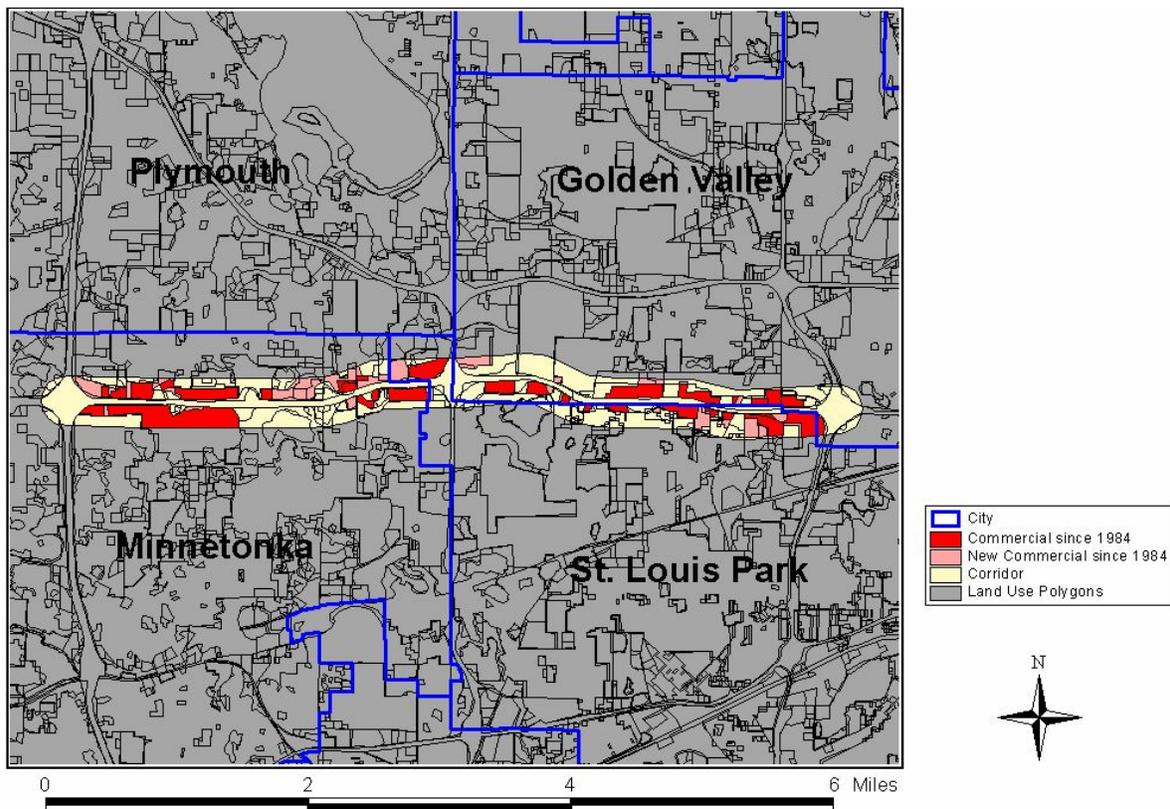
The I-394 corridor has significantly fewer fatal and injury crashes than TH 12 had, even though traffic volumes have doubled. Average annual fatal crashes have declined from two to one. The rate of fatal and injury crashes (crashes normalized by traffic volume) has declined considerably. Clearly, the I-394 project was very beneficial in terms of traffic safety. See Figure 3.



**Figure 3. US 12/I-394 traffic safety trend**

## Land Use

There are roughly 1,300 acres (525 hectares) of developable land immediately adjacent to the I-394 corridor. Land use was compared for this quarter-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. Commercial land uses now make up 40% 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 before I-394 was constructed.



**Figure 4. Commercial land use change along the study corridor, 1984–2000**

## 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 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 that is becoming more services-oriented.

### Employment

Employment in the area immediately surrounding the I-394 corridor grew by almost 30% 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 5.

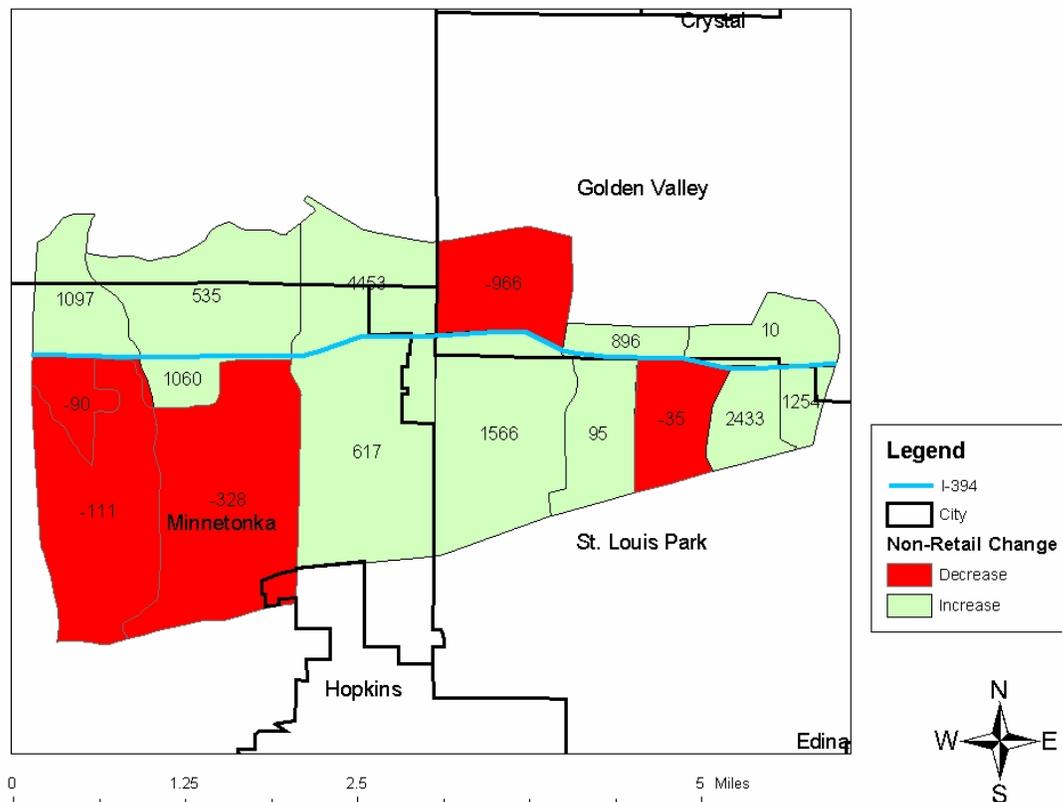
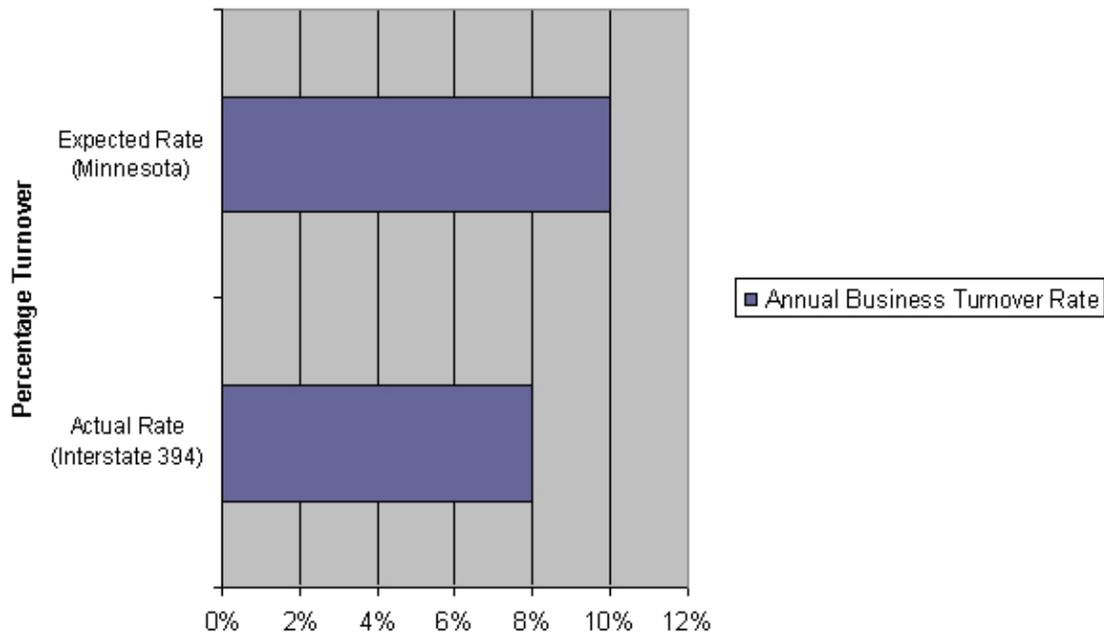


Figure 5. Change in non-retail employment on I-394 by traffic analysis zone, 1990–2000

## Business Turnover

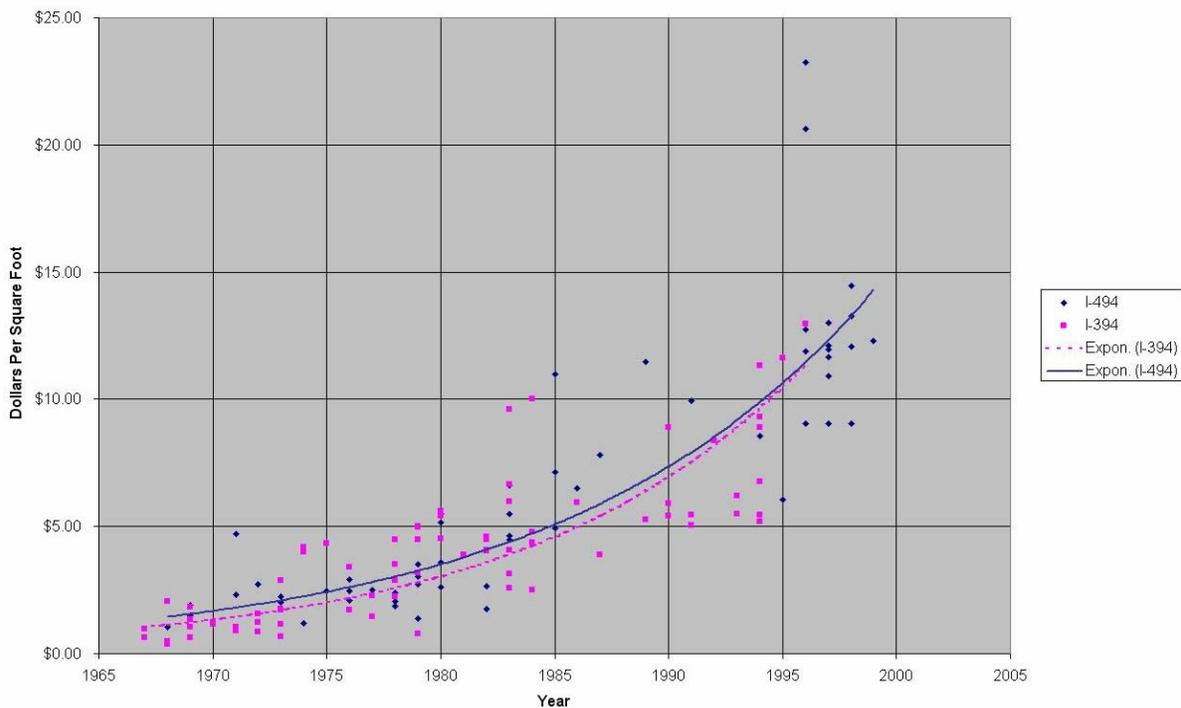
An analysis of business turnover was conducted using published business directories for the period between 1980 and 2003 for addresses along Wayzata Boulevard. (Wayzata Boulevard is the local street name for TH 12 and the frontage road system that now serves businesses along I-394.) For this analysis, 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 analysis indicated that there has been substantial new development; there are now many more commercial postal addresses, while vacant addresses have declined dramatically. The 2003 commercial vacancy rate along the corridor was very low. The most significant change that has occurred in business activity over time is a large increase in multi-tenant buildings, including strip malls and office buildings. These properties are now often leased by service sector businesses. The overall rate of business turnover for the corridor has been lower than typical annual rates for Minnesota and the nation as a whole. The highest turnover rates have been for service and office businesses rather than retail businesses, which include all types of restaurants.



**Figure 6. Annual business turnover rate, I-394 study corridor vs. 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 per square foot (0.09 square meters) in 1970 to about \$15.00 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 metropolitan area for which comparable data are available, I-494 through Bloomington near the airport and the Mall of America, which is the largest shopping mall in North America.



**Figure 7. I-394 raw commercial land value trend vs. I-494 corridor**

## Key Findings at the Business and Parcel Level by Business Type

### *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 has been completed, the results from travel time studies, assessor data analysis, and interviews 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

direct access restrictions and losses in visibility. Although auto purchases would not appear to be impulse purchases due to 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, both dealerships currently 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 dealerships. One of the dealers is now somewhat positive about the highway project. A key to keeping these types of businesses healthy appears to be their ability to transition during the construction project when customer access is complicated and visibility is hindered.

### *Sit-Down Restaurants*

Five sit-down 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 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 travel-time access similar to their condition prior to the upgrade. 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 the restaurant 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 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 that access can be circuitous and that the frontage roads are far enough away from the freeway to limit their visibility. Clearly, sit-down restaurants depend 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 before completion of the I-394 upgrade. Similar to office buildings, fast food restaurants were the business type that experienced the most positive results. Both restaurants have had excellent sales activities, partly as a result of the great increase in employment and traffic along the corridor since 1980. Both businesses were in locations such that travel times have improved or stayed stable and where visibility remained very good. As with office buildings, fast food restaurants find the I-394 corridor a nearly ideal location. Although efficient access and visibility are very important to fast food restaurants, what really seems to matter for them is a strong customer base, which 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 centers have been developed along the corridor.

### *General Retail*

Two specialty retailers were studied in this category. Both were in place prior to the construction project. One was involved in condemnation proceedings. Both remain highly successful businesses today, although one changed its marketing strategy to make the store more of a “destination” business (one less dependent on drive-by customers). Both businesses are clearly taking advantage of the prosperous customer base found along 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 primarily seek them out rather than impulsively decide 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. This store noted it benefits overall from the 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 the 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 gas station remains in business today.

## **CONCLUSIONS**

The results of the I-394 research indicate that the economic impacts of upgrading the highway from an arterial facility to a freeway were largely positive. Clearly, additional traffic capacity, improved travel speeds, and improved traffic safety resulted. 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 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 trend was in line with a comparable high traffic volume corridor, I-494.

As has been shown in the literature, 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 to land is controlled more tightly. Some individual businesses do not fare as well as others. However, the impacts of the I-394 project that business persons expected have proven to be much greater than the actual impacts (and often in the opposite direction). Statements made in condemnation proceedings, that locations would no longer be viable for business, turned out to be wrong in all cases. There are two reasons for this. First, the overall economic environment of the corridor improved greatly after the project was put in place. 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.

Certain types of businesses studied along I-394 appear to have greatly benefited 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 macro-level economic trends following the project seem to have been very important. These businesses have thrived because the corridor is a healthy environment in general, with abundant customers and buying power. For other business types, the project was more of a mixed blessing, although on the whole the positives have outweighed the negatives. Table 2 summarizes the research results by indicator and by business type.

**Table 2. Summary of impact by indicator**

<b>Indicator</b>	<b>Direction of impact</b>	<b>Comments</b>
<b>Transportation</b>		
Traffic volume	Positive	Traffic doubled
Travel speed	Positive	Peak travel speeds up
Traffic safety	Very positive	Large decline in serious crash rate
<b>Economic and demographic</b>		
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
<b>Business type</b>		
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 centers	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

## REFERENCES

- Maze, T. and D. Plazak. 1997. *Access Management Awareness Program: Phase II Report*. Project TR-402. Ames, Iowa: Center for Transportation Research and Education, Iowa State University.
- Preston, H., D. Keltner, R. Newton, and C. Albrecht. 1998. *Statistical Relationship Between Vehicular Crashes and Highway Access*. St. Paul, MN: Minnesota Department of Transportation.
- Williams, K. 2000. *Economic Impacts of Access Management*.  
[http://www.cuttr.usf.edu/research/access\\_m/ada70/economic%20impacts.pdf](http://www.cuttr.usf.edu/research/access_m/ada70/economic%20impacts.pdf).