ECONOMIC IMPACT OF
BRICKELL AVENUE BRIDGE
OPENINGS

Final Report
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I. INTRODUCTION

The Center for Urban Transportation Research (CUTR) was retained by the Miami Downtown Development Authority (DDA) in May 2002 to conduct an economic impact analysis of the Brickell Avenue Bridge openings on downtown Miami.

The Brickell Avenue Bridge crosses the Miami River in downtown Miami where the river joins Biscayne Bay. This waterway is a major navigable artery for the city, carrying both commercial and recreational vessels. Miami’s downtown development encouraged the city to build several new bridges across the Miami River during the late 1920s to improve the movement of traffic generally in a north-south direction. As part of these new bridges, the Brickell Avenue Bridge opened in 1929. The bridge was renovated between 1993 and 1995 and reopened in December 1995. The new bridge is 50 percent higher than the original one. Curfews on bridge openings during the morning and afternoon rush hours during the week (7:30 AM to 9:00 AM and 4:30 PM to 6:00 PM) have been in place for all vessels until recently. In the beginning of October 2002, a new rule went into effect allowing tugboats with a tow to be exempt from the curfew. The bridge opens on demand during weekends and weekdays outside of the curfew periods. Given the adverse effects of bridge openings on traffic conditions in the area, the DDA requested a study that would measure the extent of these effects on downtown Miami.

Impacts addressed in this study include travel time delays and resulting loss of productivity, business relocation, environmental costs in terms of vehicle emissions, property values, business delivery costs, and other qualitative impacts.

This report provides the findings of our analysis. Primary steps in the analysis included:

- discussions and interviews with representatives of the DDA, area businesses, brokerage firms, city, county and state transportation officials, and others;
- fieldwork measuring the duration of trips in the study area when the Brickell Bridge was open versus when it was closed. Other data collected during the fieldwork included queue lengths, the number of vehicles crossing the bridge, and vehicle occupancy rates;
- secondary research on relevant variables including traffic counts, area demographic information, office space occupancy and rental rates, property values, and others; and
- literature search on the value of time, environmental costs, business delivery costs, and other related issues.

The primary purpose of this analysis is to obtain an understanding of to what extent Brickell Bridge openings are harmful to the business community in downtown Miami. It should be noted that impacts measured in this report are based on the current conditions in downtown Miami and do not take into account the potential effects of new developments that are under construction or are being planned/proposed.
II. VALUE OF LOST TIME

In order to quantify the dollar value of time lost due to Brickell Bridge openings, CUTR collected data on average vehicle delays when the bridge was open. In addition, based on secondary data sources and existing literature on the subject, these delays were converted to a dollar value of time lost. This section provides a summary of this research and analysis.

Fieldwork

The fieldwork involved collecting data on average delays experienced due to bridge openings and included the following steps.

- The measurement/study area boundaries included I-95 to the west, Biscayne Bay to the east, 15th Street to the south, and 1st Street to the north.

- Based on discussions with representatives from David Plummer and Associates, who are currently preparing a Downtown Transportation Master Plan, three routes/corridors within the measurement area that are heavily affected by bridge openings were identified.

- These routes were supplemented with eight “random” routes. Random routes were selected by following actual drivers in the study area. The purpose of including random routes was to ensure the representation of all areas within the study area boundaries and not to bias data by limiting the evaluation to heavily affected corridors. The map on the following page illustrates the study area and all 11 routes. A detailed description and individual map of each route can be found in Appendix A.

- The fieldwork was conducted over a two-day period, which took place in September 2002 on a Tuesday and a Wednesday. Holidays or other special days, vacation seasons (such as the summer), beginning and end of the week, etc. were avoided in an effort to collect data on “representative” days. In addition, per DDA’s request, the fieldwork was conducted between 9:00 AM and 4:30 PM to capture the effects of bridge openings on the business community. Given the bridge opening curfews during rush hours (from 7:30 AM to 9:00 AM and from 4:30 PM and 6:00 PM), the 9:00 AM to 4:30 PM time period reflects the hours during which business activities could be affected by bridge openings.
Economic Impact of Brickell Avenue Bridge Openings

All Routes

route 1
route 1 return A
route 1 return B
route 2
route 2 return A
route 2 return B
route 3
route 3 return
route 4
route 5
route 6
route 7
route 8
route 9
route 10
route 11
Economic Impact of Brickell Avenue Bridge Openings

- During the fieldwork, CUTR representatives collected several data items:
  - trip durations and timing on the 11 specified routes throughout the day. This information was then matched to bridge opening times to determine average trip duration on each route when the bridge was open versus when it was closed;
  - number of vehicles crossing the bridge in both directions;
  - vehicle occupancy rate (people per vehicle); and
  - queue lengths on Brickell Avenue, 2nd Avenue, and Bayshore Boulevard.

Upon collection of data, each trip was evaluated to determine whether it was affected by a bridge opening based on the location of the vehicle at the time of the bridge opening. Results of the fieldwork suggested that, on average, 15 percent of the trips that cross the Brickell Bridge are affected by bridge openings. The average delay experienced by these vehicles was approximately 5.5 minutes (five minutes and 30 seconds). The 5.5-minute delay represents doubling of travel time for affected vehicles. The average trip time for vehicles crossing the bridge increased from 5.5 minutes when the bridge was closed to 11 minutes when the bridge was opened, an increase of 100 percent.

Approximately 14 percent of the trips that did not cross the bridge were also affected by Brickell Bridge openings; however, the average delay experienced by these vehicles was only 1.6 minutes (one minute and 36 seconds). This delay represents a 47 percent increase in average trip time (from 3.5 minutes when bridge is down to 5.1 minutes when bridge is up). The margin of error for the average length of trips that took place when the bridge was closed is ± 14 seconds while for those that were affected by bridge openings is ± 58 seconds with a 95 percent level of confidence. The following table presents a summary of trip durations for each route. Routes 1 through 5 and Route 8 (indicated in bold) included trips that crossed the Brickell Bridge and therefore were more heavily affected by bridge openings.
Economic Impact of Brickell Avenue Bridge Openings

Summary of Trip Durations by Route

<table>
<thead>
<tr>
<th>Route</th>
<th>Affected by Bridge Openings</th>
<th>Unaffected by Bridge Openings</th>
<th>Avg. Delay Due to Bridge Openings</th>
<th>Avg. Delay Due to Other Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average*  Range*</td>
<td>Average*  Range*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Route 1</td>
<td>9.78  5.00  15.00</td>
<td>4.50  2.00  9.00</td>
<td>5.28</td>
<td>2.50</td>
</tr>
<tr>
<td>Route 2</td>
<td>9.69  6.00  16.00</td>
<td>4.25  2.00  8.00</td>
<td>5.44</td>
<td>2.25</td>
</tr>
<tr>
<td>Route 3</td>
<td>14.85 9.00  20.00</td>
<td>8.86  5.00  17.00</td>
<td>5.99</td>
<td>3.86</td>
</tr>
<tr>
<td>Route 4</td>
<td>10.80 9.00  13.00</td>
<td>7.18  5.00  10.00</td>
<td>3.62</td>
<td>2.18</td>
</tr>
<tr>
<td>Route 5</td>
<td>9.00  8.00  10.00</td>
<td>6.62  5.00  9.00</td>
<td>2.38</td>
<td>1.62</td>
</tr>
<tr>
<td>Route 6</td>
<td>7.00  7.00  7.00</td>
<td>4.33  3.00  6.00</td>
<td>2.67</td>
<td>1.33</td>
</tr>
<tr>
<td>Route 7</td>
<td>5.50  4.00  8.00</td>
<td>4.27  2.00  6.00</td>
<td>1.23</td>
<td>2.27</td>
</tr>
<tr>
<td>Route 8</td>
<td>9.33  8.00  11.00</td>
<td>6.29  4.00  10.00</td>
<td>3.04</td>
<td>2.29</td>
</tr>
<tr>
<td>Route 9</td>
<td>3.00  3.00  3.00</td>
<td>2.63  2.00  3.00</td>
<td>0.37</td>
<td>0.63</td>
</tr>
<tr>
<td>Route 10</td>
<td>5.40  4.00  8.00</td>
<td>4.35  3.00  6.00</td>
<td>1.05</td>
<td>1.35</td>
</tr>
<tr>
<td>Route 11</td>
<td>4.00  4.00  4.00</td>
<td>2.35  1.00  4.00</td>
<td>1.65</td>
<td>1.35</td>
</tr>
</tbody>
</table>

* In minutes. Please note that decimals represent percentage of a minute, not the total seconds. For example, 9.8 minutes means 9 minutes and 48 seconds.

Note: A total of 463 trips were completed. The distribution of trips among different routes vary.

As presented, the delay experienced due to bridge openings (measured in terms of the difference between the shortest trip taken in each route when the bridge was not open and the longest trip affected by a bridge opening) ranges from one minute on Route 9 to 15 minutes on Route 3.

The reason the average delay is not greater is partially because of other factors that create congestion in the area. CUTR observers experienced longer trip times even when the bridge was closed due to construction in the area, accidents, and other factors. Hence, at times, some of the trips taken when the bridge was closed were as long as those that took place when the bridge was open. The average delay caused by these factors is presented in the last column of the table on the previous page. Overall, the delay caused by bridge openings was greater than the delay caused by other factors on all of the routes that crossed the bridge and some of the routes that did not.

Annual Time Loss

The average vehicle delay was translated into annual vehicle delays by using traffic counts obtained from the Florida Department of Transportation and the Public Works Department of Miami-Dade County. The total vehicle count was again limited to those vehicles that travel in the area between 9:00 AM and 4:30 PM on a daily basis for 260 work days throughout the year.

The next step of the study was to convert vehicle delays to person delays. Based on results of our observations during the fieldwork and data obtained from the Southeast Florida Regional Travel Characteristics Study, the average vehicle occupancy was estimated to be 1.3 people.
Value of Time

CUTR also estimated the appropriate hourly wage figure used in this analysis. Because hourly wage rate data for workers in the Brickell area or downtown Miami were not readily available, several figures were used to reach the appropriate rate: the number of employees by industry sector in downtown Miami obtained from the Beacon Council, 2001 per capita income for various industry sectors in Miami-Dade County from the Bureau of Labor Statistics, and 2000 per capita personal income for the Miami PMSA from the Bureau of Economic Analysis. A weighted average per capita income figure for downtown workers was calculated based on the number of employees and average income in each industry. Figures were inflated to 2002 dollars using Miami’s Consumer Price Index (CPI) obtained also from the Beacon Council. Upon conclusion of this research, an average annual per capita earnings of $40,000 and a gross hourly wage rate of $19.23 were used for this analysis.

A review of literature on value of time issues revealed that in the past, researchers used anywhere from 20 percent to 100 percent of the hourly wage rate in estimating the value of travel time. The US Department of Transportation Office of the Secretary uses 50 percent of the wage rate for personal trips and 100 percent of the wage rate for business trips. Given this wide range, the lack of information on trip purpose of vehicles traveling in the Brickell area, and the fact that most trips that take place between 9:00 AM and 4:30 PM are likely to be business related trips (meetings, etc. instead of arriving/leaving work), the midpoint of 75 percent was used in estimating the portion of the gross wage rate to be used for travel value. This resulted in an hourly value of time of $14.42.

Total Value of Time Lost

Multiplying the annual time lost by the average hourly rate of $14.42 provided a total lost time value of approximately $1.1 million. The following table summarizes the impact of Brickell Bridge openings.

<table>
<thead>
<tr>
<th>Value of Time Loss</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(Due to Brickell Bridge Openings)</td>
<td></td>
</tr>
<tr>
<td>Annual vehicle delays</td>
<td>60,000 hours</td>
</tr>
<tr>
<td>Annual people delays</td>
<td>77,900 hours</td>
</tr>
<tr>
<td>Average value of travel time</td>
<td>$14.42</td>
</tr>
</tbody>
</table>

Annual Value of People Delays: $1,124,000

1 Rounded to the nearest 100.
2 Rounded to the nearest 1,000.
Economic Impact of Brickell Avenue Bridge Openings

Again, this amount represents the annual value of time lost due to Brickell Bridge openings during the weekdays between 9:00 AM and 4:30 PM under the current conditions. Impacts of new/future developments are not included in this estimate. In addition, impacts measured are based on the two-day fieldwork in September. Results may vary if fieldwork were conducted in a different week or month.

Finally, there may be additional losses due to individuals having to leave earlier to accommodate a potential bridge opening. However, measuring this additional impact would require an in-depth surveying of the workers in the area to understand their travel habits and is beyond the scope of this study.

Other Observations

Other observations regarding traffic conditions in the Brickell area during the fieldwork period are summarized below.

- Brickell Bridge openings tend to last approximately 10 minutes when a cargo/freight boat or multiple boats cross. The bridge stays open for about five minutes for individual recreational boats.

- In terms of queue lengths, the longest queues observed were those that went to SE 12th Street on the south side of the bridge and to NE 1st Street on the north side of the bridge. In addition, the I-95 off ramp also experienced back-ups.

- Fieldwork personnel noticed that drivers do become impatient quickly during traffic back-ups and start honking their horns, which creates a high noise level. In addition, drivers and pedestrians do not always follow traffic rules. Our observers noticed that pedestrians frequently jaywalked and cars and scooters/motorcycles ran through red lights.

- Two major factors that contribute to traffic congestion in addition to bridge openings are the construction activity in the Brickell area and accidents. The fieldwork personnel noted five separate accidents during the two-day period. Another factor that contributed to the congestion was occasional double-parked cars in certain streets.
III. SUMMARY OF INTERVIEWS

CUTR conducted surveys and interviews with various groups, including:

- representatives of businesses that relocated away from the Brickell area/downtown Miami;
- representatives of real estate companies/brokerage firms that are active in the Brickell area/downtown Miami;
- property owners;
- city/county/state transportation officials; and
- others as appropriate.

The contact names were obtained from the DDA and supplemented by interviewed parties and CUTR. These discussions focused on reasons for businesses to leave downtown Miami, traffic congestion in downtown, traffic congestion due to Brickell Bridge openings, and other issues. Survey responses are summarized in this section. It is important to note that these responses represent specific comments of various parties. In most cases, comments presented here are limited to those views that were shared by multiple representatives. They are neither, however, representative of all respondents, nor do they necessarily represent the opinions of CUTR. A list of organizations contacted is included in Appendix B.

Lost Businesses

CUTR completed interviews with eight major businesses that relocated away from downtown Miami to understand their reasons for leaving downtown. The list of businesses was provided by the DDA and supplemented by information provided by the lessors and managers of office space in the area. Of these eight businesses, seven moved to Coral Gables and one to the Airport West area. Approximately 75 percent of the respondents stated that lower rental rates in Coral Gables and the Airport West area were the primary reasons for their move. In addition, approximately 40 percent of the businesses moved because they needed larger space than what they had in downtown Miami and were not able to get it there. Finally, approximately 25 percent of the respondents stated that their new location was more convenient to their employees and/or clients.

All of the respondents stated that traffic congestion in the downtown area (either because of Brickell Bridge or otherwise) was not the driving factor for their move. Approximately 25 percent of respondents stated traffic congestion in downtown Miami was an additional benefit of leaving downtown while 63 percent stated that traffic is worse in Coral Gables or that they had more public transportation options in the Brickell area/downtown Miami.

The following table presents the office space rental rates for the Brickell area, Miami Commercial Business District (CBD), Coral Gables, and the Airport West area during the
Economic Impact of Brickell Avenue Bridge Openings

first quarter of 2002. Although these figures are quoted rates and do not reflect any discounts that may have been given to individual companies, rental rates in the Brickell area for all classes of office space are higher than Coral Gables and Airport West, which supports the experience of businesses interviewed. In addition, the rates quoted for the Miami CBD for Class A office space are higher than those in Coral Gables and the Airport West area.

<table>
<thead>
<tr>
<th>Office Space Rental Rates (per sf per year)</th>
<th>Quoted Rental Rates</th>
<th>Change Since 1Q 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Range</td>
<td>Mean</td>
</tr>
<tr>
<td>Brickell</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>$20.00 – $35.00</td>
<td>$31.03</td>
</tr>
<tr>
<td>Class B</td>
<td>$19.00 – $33.00</td>
<td>$24.90</td>
</tr>
<tr>
<td>Class C</td>
<td>$17.50 – $24.00</td>
<td>$22.56</td>
</tr>
<tr>
<td>All Office Space</td>
<td>$17.50 – $35.00</td>
<td>$27.42</td>
</tr>
<tr>
<td>Miami CBD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>$25.50 – $38.00</td>
<td>$31.39</td>
</tr>
<tr>
<td>Class B</td>
<td>$16.00 – $28.50</td>
<td>$21.93</td>
</tr>
<tr>
<td>Class C</td>
<td>$8.00 – $30.00</td>
<td>$15.72</td>
</tr>
<tr>
<td>All Office Space</td>
<td>$8.00 – $38.00</td>
<td>$24.84</td>
</tr>
<tr>
<td>Coral Gables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>$19.00 – $35.00</td>
<td>$28.78</td>
</tr>
<tr>
<td>Class B</td>
<td>$17.00 – $28.00</td>
<td>$23.83</td>
</tr>
<tr>
<td>Class C</td>
<td>$15.50 – $29.00</td>
<td>$21.33</td>
</tr>
<tr>
<td>All Office Space</td>
<td>$15.50 – $35.00</td>
<td>$25.52</td>
</tr>
<tr>
<td>Airport/West Dade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>$20.00 – $27.25</td>
<td>$24.47</td>
</tr>
<tr>
<td>Class B</td>
<td>$16.90 – $25.00</td>
<td>$20.80</td>
</tr>
<tr>
<td>Class C</td>
<td>$14.00 – $22.00</td>
<td>$17.17</td>
</tr>
<tr>
<td>All Office Space</td>
<td>$14.00 – $27.25</td>
<td>$21.87</td>
</tr>
</tbody>
</table>

Source: RealData Information Systems, Inc.
Office Space Owners, Leasors, and Managers

CUTR completed surveys with 17 owners, leasors and managers of office space located in Brickell and downtown Miami. The discussions addressed feedback/complaints received from tenants, issues related to overall traffic congestion in the area as well as that due to Brickell Bridge openings, trends in the office market in the Brickell area and downtown Miami, and other related issues. The following paragraphs provide a summary of these interviews.

- Approximately 30 percent of the respondents stated that they have not received any complaints about the area, traffic congestion, or any other issues from their tenants. This group explained that the Brickell address is very valuable and well known throughout Latin America. The remaining 70 percent indicated that their tenants do complain about the traffic in the area, Brickell Bridge openings, parking in downtown Miami (cost, surcharge, and availability), and other issues such as the presence of homeless, broken sidewalks, etc. in the area.

However, when asked about reasons for businesses to move out of Brickell and downtown Miami, only 12 percent of all respondents believed the traffic congestion was the primary reason. Approximately 35 percent of all respondents stated that lower rental rates in surrounding neighborhoods (Coral Gables, Airport West, etc.) as well as proximity to where decision-makers live are the primary reasons for businesses to relocate away from Brickell/downtown Miami. In addition, some buildings lost tenants to other buildings still within Brickell or downtown Miami (e.g., some businesses move further south on Brickell Avenue to avoid traffic from the bridge openings, etc.).

- Leasing agents were concerned about the possibility of losing potential tenants due to Brickell’s and downtown Miami’s image in terms of the traffic congestion. However, none of the parties who mentioned this concern conducted surveys with prospective tenants who visited the buildings, but decided not to rent.

- All of the respondents concurred that the traffic congestion is a problem in the area and bridge openings compound it. They describe the traffic congestion and bridge openings as “nuisance,” “more of a personal discomfort,” “consistent source of irritation,” “infuriating and frustrating,” and “small headache, not a migraine.” One respondent mentioned that he schedules his business meetings outside of his office at a location that is less likely to be affected by bridge openings not to inconvenience his clients. Some of the respondents stated that because the bridge opens on demand, they always have to plan for an opening if their destination requires crossing the bridge. This causes them to lose time even when the bridge does not open during their specific trip. Interviewed parties also indicated that openings and related traffic during the lunch period are some of the worst effects of the bridge openings. Some individuals defined the lunch period
Economic Impact of Brickell Avenue Bridge Openings

from 11 AM to 1 PM, while others defined it as noon to 2 PM.

- Respondents also expressed concern about the future traffic conditions once the developments that are currently under construction or being planned/proposed are completed. Some of the suggestions offered by this group included allowing two-way traffic on 8th Street, considering the possibility of a tunnel, adopting staggered work hours so that not all workers arrive and leave work and go to lunch at the same time; improving mass transit and increasing the public awareness about mass transit options; and placing a curfew on the bridge during lunch time.

As mentioned by the majority of the professionals in the office market industry, the Brickell area continues to be popular for businesses despite the traffic congestion. The following table compares office occupancy rates in various parts of Miami-Dade County during the first quarters of 2001 and 2002.
## Office Space Occupancy Rates
(First Quarter 2001 and 2002)

<table>
<thead>
<tr>
<th></th>
<th>Occupancy Rates First Quarter</th>
<th>Total Rentable Space First Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2002</td>
<td>2001</td>
</tr>
<tr>
<td><strong>Brickell</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>94.72%</td>
<td>94.32%</td>
</tr>
<tr>
<td>Class B</td>
<td>91.32%</td>
<td>95.55%</td>
</tr>
<tr>
<td>Class C</td>
<td>87.81%</td>
<td>91.29%</td>
</tr>
<tr>
<td><strong>All Office Space</strong></td>
<td>92.54%</td>
<td>94.67%</td>
</tr>
<tr>
<td><strong>Miami CBD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>91.93%</td>
<td>95.94%</td>
</tr>
<tr>
<td>Class B</td>
<td>92.28%</td>
<td>86.45%</td>
</tr>
<tr>
<td>Class C</td>
<td>82.16%</td>
<td>88.74%</td>
</tr>
<tr>
<td><strong>All Office Space</strong></td>
<td>89.67%</td>
<td>91.74%</td>
</tr>
<tr>
<td><strong>Coral Gables</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>84.20%</td>
<td>82.99%</td>
</tr>
<tr>
<td>Class B</td>
<td>89.91%</td>
<td>93.77%</td>
</tr>
<tr>
<td>Class C</td>
<td>83.09%</td>
<td>91.46%</td>
</tr>
<tr>
<td><strong>All Office Space</strong></td>
<td>86.18%</td>
<td>89.27%</td>
</tr>
<tr>
<td><strong>Airport/West Dade</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class A</td>
<td>70.06%</td>
<td>77.94%</td>
</tr>
<tr>
<td>Class B</td>
<td>85.12%</td>
<td>91.41%</td>
</tr>
<tr>
<td>Class C</td>
<td>85.66%</td>
<td>94.30%</td>
</tr>
<tr>
<td><strong>All Office Space</strong></td>
<td>78.96%</td>
<td>86.42%</td>
</tr>
</tbody>
</table>

Source: RealData Information Systems, Inc.

As illustrated, the Brickell area enjoys high occupancy rates. Further, in the first quarter of 2002, the occupancy rates for all classes of office space were higher in Brickell than competing neighborhoods. Although the increased supply of Class A office space in Coral Gables from 2001 to 2002 (15 percent increase) may partially be the reason for this area's relatively low Class A office occupancy rate (84 percent), the occupancy rates for Class A office space in Brickell (95 percent) and in Miami CBD (92 percent) were still strong in comparison to competing neighborhoods in the first quarter of 2002.
Other Interviews

CUTR also conducted interviews with other parties including operators of hotels/restaurants located close to the Brickell Avenue Bridge and city and state transportation officials. The results of these surveys are summarized in the following paragraphs.

- Operators of hotels that are proximate to the Brickell Bridge explained that their guests complain about noise levels (traffic, boats, bridge, etc.) and traffic congestion while getting in and out of the hotels. They mentioned that when the traffic backs up, drivers who are unsure about the reason become impatient and create a hazardous environment. One hotel manager and one restaurant operator felt that they lost business because of their proximate location to the bridge. However, this business was lost to hotels and restaurants in other parts of downtown.

Respondents provided the following suggestions for traffic improvements:

- placing signage at appropriate locations to let drivers know the reason for congestion is a bridge opening;
- synchronizing traffic lights with the bridge openings;
- scheduled openings (not on demand) for pleasure boats; and
- a tunnel connecting north and south sides of the bridge or raising the bridge height for fewer openings.

- CUTR also had discussions with representatives from the City of Miami Transportation Planning Office, Miami-Dade Metropolitan Planning Organization, and Coast Guard. Representatives of the City explained some of the initiatives that are being taken to relieve the congestion around Brickell Bridge. A list of these initiatives is provided in Appendix C.

Other issues emphasized during these interviews included revenues generated from the Miami River traffic and the difficulty of identifying recreational boats that are used for personal/pleasure purposes versus commercial purposes.
IV. OTHER IMPACTS

This section summarizes other impacts that may result from Brickell Avenue Bridge openings, including:

- Property Value Comparison
- Environmental Impacts
- Cost of Business Delivery

Property Values

One of the concerns regarding the impacts of the Brickell Avenue Bridge openings was the adverse effect on property values in downtown Miami. Based on information obtained from the Miami-Dade Property Appraiser’s Office, assessed property values for office buildings in downtown Miami are compared to those in Coral Gables’ business district and the Airport West area. The following table provides a summary of these values.

<table>
<thead>
<tr>
<th>Property Values for Office Space (2001 Assessment)</th>
<th>Property Value per sf of Office Space</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downtown Miami</td>
<td>$90</td>
</tr>
<tr>
<td>Airport West</td>
<td>$84</td>
</tr>
<tr>
<td>Coral Gables Business District</td>
<td>$73</td>
</tr>
</tbody>
</table>

Source: Miami-Dade County Property Appraiser Database

As illustrated, total property value per square foot of office space ranges from $73 in Coral Gables to $90 in downtown Miami. Although figures kept by the County Appraisers Office do not necessarily reflect the market value of a property, based on these available data, it appears that the property values in the downtown Miami area are higher than those in Coral Gables and the Airport West area. It should be noted that representatives of Miami-Dade County Property Appraiser’s Office stated that rental rates are better indicators of properties’ market values than assessed property values or recent sales, which could be lower or higher than the true market value. Recent rental rate information is presented in Section III (Summary of Interviews) of this report.
Environmental Impacts

Above certain concentrations, air pollutants (such as carbon-monoxide, nitrogen-oxide, etc.) caused by vehicle emissions can cause or exacerbate health problems and/or increase mortality rates. Emission rates are higher during idling, congested traffic conditions than at free flow conditions. The degree of damage from air pollution also depends on geography, weather conditions, and other factors.

When the Brickell Bridge is in the open position, the vehicles on either side are either idling or slowing down as they join the queue. After the bridge closes, the vehicles that were waiting travel more slowly than free-flow conditions as the queue clears. These slower traffic conditions result in an environmental impact via the release of additional volatile organic chemicals (vehicle emissions) into the air. Data from the fieldwork task of this study were used to determine the average vehicle speeds for trips that were affected by bridge openings and for trips that were unaffected by bridge openings. Using a tool called the Sketch Planning Analysis Spreadsheet Model (SPASM), vehicle emissions for three components of the volatile organic compounds (VOC) were determined for the average speeds of observed trips that were both affected and unaffected by bridge openings.

The SPASM framework provides emissions data for various vehicle-operating speeds in grams per mile for a single vehicle. The table below presents, based on the data collected during the fieldwork task of this study, the VOC emissions, in grams per mile, for a single vehicle making an average trip through the Brickell area. As the table shows, a vehicle making an average trip affected by an opening of the Brickell Bridge emits nearly 60 percent more volatile organic compounds when compared to the same trip not affected by a bridge opening. This result is based on a comparison of the average speeds for trips affected and unaffected by bridge openings. For the same trip, a vehicle affected by a bridge opening was found to travel at an average speed of 12 miles per hour, while a vehicle unaffected by the bridge was found to have an average speed of slightly more than 23 miles per hour.

<table>
<thead>
<tr>
<th>Single Vehicle Emissions for an Average Trip Through Brickell (Grams per Mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trip Unaffected by Bridge</td>
</tr>
<tr>
<td>---------------------------</td>
</tr>
<tr>
<td>Trip AFFECTED by Bridge</td>
</tr>
<tr>
<td>Trip AFFECTED by Bridge</td>
</tr>
<tr>
<td>Difference</td>
</tr>
</tbody>
</table>

Source: Sketch Planning Analysis Spreadsheet Model
Economic Impact of Brickell Avenue Bridge Openings

The following table shows how the additional vehicle emissions resulting from Brickell Bridge openings impact total annual vehicle emissions in the Brickell area on weekdays between 9:00 AM and 4:30 PM. If all trips in the Brickell area during this time could be completed without encountering the effects of a bridge opening, the result would be 280.4 tons of volatile organic compounds emitted into the air. However, as determined earlier in this study, 15 percent of the total trips are affected by the bridge opening and, as a result, 24 additional tons of volatile organic compounds are emitted. This represents a nine percent increase in vehicle emissions, overall.

<table>
<thead>
<tr>
<th></th>
<th>Hydro-Carbons</th>
<th>Carbon-Monoxide</th>
<th>Nitrogen-Oxide</th>
<th>Total VOC</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Trips Unaffected*</td>
<td>28.87</td>
<td>230.37</td>
<td>21.17</td>
<td>280.41</td>
</tr>
<tr>
<td>15% of Trips Affected**</td>
<td>31.39</td>
<td>251.80</td>
<td>21.24</td>
<td>304.43</td>
</tr>
<tr>
<td>Absolute Difference</td>
<td>2.52</td>
<td>21.43</td>
<td>0.07</td>
<td>24.02</td>
</tr>
<tr>
<td>Percent Difference</td>
<td>8.73%</td>
<td>9.30%</td>
<td>0.33%</td>
<td>8.57%</td>
</tr>
</tbody>
</table>

*The scenario with all trips unaffected represents a base case where no weekday trips between 9:00 AM and 4:30 PM are affected by bridge openings.

**The fieldwork found that, on average, 15% of weekday trips between 9:00 AM and 4:30 PM are affected by bridge openings; therefore, this represents the current scenario.

Source: Sketch Planning Analysis Spreadsheet Model

Business Delivery Costs

It is reasonable to assume that traffic congestion related to Brickell Bridge openings also affects business delivery to some extent. Business delivery includes the delivery of products and services by truck as well as automobile. Some studies were found in the literature relating to business delivery costs. One particular study, a National Cooperative Highway Research Program (NCHRP) report entitled Economic Implications of Congestion attempted to estimate congestion cost impacts on business delivery. However, it was determined that this information was not applicable to the Brickell area, because of the report’s emphasis on the mining, agriculture, and manufacturing industries. According to the Beacon Council, agriculture represents only 0.1 percent of the total business activity in downtown Miami and manufacturing represents 3.6 percent, while retail trade, finance, insurance, real estate, and other services account for 74.1 percent of the business activity in the area. For this analysis, it is assumed that any productivity loss or time delay related to business delivery in the Brickell area is accounted for in the average vehicle delays collected from the fieldwork and discussed in Section II (Value of Lost Time).
V. SUMMARY AND CONCLUSIONS

As mentioned previously, this study evaluated the negative economic affects of travel time delays due to Brickell Avenue Bridge openings. Several methods and approaches were used in this analysis. This section provides a summary of our findings.

- The analysis estimated the dollar value of lost time/productivity from travel delays at $1.1 million annually in 2002 dollars. This estimate represents the value of lost time under current conditions and does not take into account the effects of new developments. Further, additional time losses due to some individuals leaving their offices earlier because of the possibility of a bridge opening are not included in this estimate.

- Although most of the individuals and businesses complain about traffic congestion in the area and feel that Brickell Avenue Bridge openings are compounding the congestion, none of the businesses that moved away from downtown did so because of traffic congestion. Lower rental rates and larger office space availability in surrounding neighborhoods were cited as primary reasons for leaving.

Although none of the businesses moved away from downtown due to Brickell Bridge openings, some of the office buildings lost tenants to other buildings in the Brickell area/downtown Miami. Similarly, the loss of individual businesses due to bridge openings, such as hotels and restaurants nearby the bridge, are gains to other downtown businesses and do not represent net losses to downtown Miami.

- Interviews and surveys conducted also revealed that many parties are concerned about the image of the Brickell area and downtown Miami in terms of traffic congestion and that this negative image may cause loss of prospective tenants. These individuals pointed out reducing traffic congestion may be one way for downtown Miami to gain advantage over other neighborhoods such as Coral Gables and the Airport West area.

- Observations made during the fieldwork as well as input received during the surveys suggest that bridge openings do negatively effect the quality of life in the area. High noise levels, aggravation/irritation of drivers, impatience with the traffic, and not obeying traffic laws tend to create a hazardous environment. In addition, the congestion in the area may be limiting certain safety measures (such as access for emergency vehicles, etc.).

- An analysis of additional air pollution created due to bridge openings indicates that, on an average trip, an individual vehicle affected by the bridge emits 60 percent more pollution than if it were not affected. Overall, on weekdays between 9:00 AM and 4:30 PM, Brickell Bridge openings lead to a nine percent increase in vehicle emissions annually.
This appendix provides a description of 11 routes selected for the fieldwork as well as maps illustrating the routes. As mentioned previously, the first three routes were selected based on CUTR's observations and discussions with representatives of David Plummer and Associates while the remaining eight routes were selected by following random drivers in the area.

**Route 1:** Starts on 15th street and Brickell, heads north on Brickell going over the bridge, and makes an immediate right. The driver returns using the following two alternative routes:

- Follows Biscayne Blvd (US 1) until SE 2nd Street. Makes a left on SE 2nd Street, then heads south on Brickell until 15th Street.

- Makes a left on SE 3rd Avenue until Flagler. Makes a left on Flagler, goes to SE 2nd Avenue (Brickell) then heads south on Brickell until 15th Street.

**Route 2:** Starts at the Guard House in Brickell Key, goes westbound on SE 8th Street making a right on Brickell, goes over the bridge and makes an immediate right. Returns to Brickell Key using the following two routes:

- Follows Biscayne Blvd (US 1) until SE 2nd Street. Makes a left on SE 2nd Street, then heads south on Brickell until SE 8th Street. Makes a left on SE 8th Street and goes until the Guard House.

- Makes a left on SE 3rd Avenue until Flagler. Makes a left on Flagler, then heads south on Brickell until SE 8th Street. Makes a left on SE 8th Street and goes until the Guard House.

**Route 3:** Heads east on SW 8th Street from SW 2nd Avenue to Brickell Avenue. Makes a left on Brickell and goes over the bridge. Makes an immediate right.

Return route: Makes a left on SE 3rd Avenue and a left on Flagler, makes a left on SW 2nd Avenue, then makes another left on SW 1st Street. Continues until Brickell Avenue then heads south on Brickell until SE 7th Street. Makes a right on SE 7th Street; makes a left on SW 2nd Avenue.

**Random Routes:**

**Route 4:** Starts at 1420 Bayshore Drive and heads north on Bayshore Drive. Goes to SE 8th Street and takes a left. Goes to Brickell Avenue and takes a right. Goes over the Brickell Bridge, then makes a left onto SE 3rd Avenue. Heads north on SE 3rd Avenue to SE 1st Street, then east on SE 1st Street and the trip ends just before Biscayne Boulevard.
Economic Impact of Brickell Avenue Bridge Openings

**Route 5:** This route starts at the intersection of Biscayne Boulevard and Flagler Street, with the car heading west on Flagler. Goes west on Flagler until SE 2nd Avenue and takes a left. Continues south on SE 2nd Avenue and goes over the Brickell Bridge and makes a right at SE 7th Street and proceeds west to SW 3rd Avenue. The trip ends there.

**Route 6:** This route starts at SW 1st Avenue and 13th Street (Coral Way). The driver heads east on 13th Street, and makes a left at South Miami Avenue. Goes north on South Miami Avenue, then goes north for a block to SE 1st Street and makes a right, and goes about a block to 168 SE 1st Street.

**Route 7:** Route #7 starts at the intersection of SW 1st Street and SW 1st Avenue. The driver heads east on SW 1st Street and keeps going to Biscayne Boulevard. Takes a left at Biscayne Boulevard and goes north to Northeast 1st Street, where the route ends.

**Route 8:** This route starts at the intersection of NE 1st Street and NE 2nd Avenue, heads south on NE 2nd Avenue. Goes over the Brickell Bridge and makes a right on SE 7th Street. Goes west on SE 7th Street, and then takes a left at SW 2nd Avenue. Goes south on SW 2nd Avenue to 13th Street (Coral Way). Route 8 ends here.

**Route 9:** Route #9 starts at the intersection of 13th Street and SW 1st Avenue, heading east on 13th Street until Brickell Avenue. Takes a right onto Brickell Avenue and goes south to SE 15th Street. Takes a left on 15th Street and goes east (bending left at the water) to 1420 Bayshore Drive. Route #9 ends here.

**Route 10:** Route #10 starts in front of the guardhouse at Brickell Key, heading west. Goes west on the bridge until it becomes SE 8th Street. Continues heading west until Brickell Avenue. Takes a right on Brickell Avenue, and then makes a left on SE 7th Street, and goes west to SW 3rd Avenue. Route #10 ends here.

**Route 11:** This route starts at the corner of SE 6th Street and Brickell Avenue, with the car ready to take a right on Brickell Avenue. Proceeds south on Brickell to SE 15th Street. The route ends there.
Economic Impact of Brickell Avenue Bridge Openings

Route 1
Route 2
Economic Impact of Brickell Avenue Bridge Openings

Route 3

[Map of Route 3 showing various streets and bridges with labels like NW 2nd St, NE 2nd St, W Flagler St, E Flagler St, SW 4th St, SW 1st St, SW 2nd St, NW 1st St, NW 2nd St, and SE 1st St. Markings indicate routes and bridge openings.]
Economic Impact of Brickell Avenue Bridge Openings

Route 4
Economic Impact of Brickell Avenue Bridge Openings

Route 5

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Page 24
Route 6
Economic Impact of Brickell Avenue Bridge Openings

Route 7

[Map of Brickell Avenue Bridge Openings with various streets and roadways labeled.]
Economic Impact of Brickell Avenue Bridge Openings

Route 8
Economic Impact of Brickell Avenue Bridge Openings

Route 10
Economic Impact of Brickell Avenue Bridge Openings

Route 11
APPENDIX B

List of Businesses and Other Organizations Contacted

1. ABC Management Services
2. Allen Morris Company
3. American Ventures
4. Atlantic Security Bank
5. BAC
6. Bank of Boston International
7. Bank of Costa Rica
8. Brickell Area Association
9. CB Richard Ellis
10. City Club
11. City of Miami
12. Coast Guard
13. CRESA Partners
14. Cushman and Wakefield
15. David Plummer and Associates
16. Downtown NET
17. Dupont Plaza Hotel
18. Florida East Coast Realty
19. Grubb & Ellis
20. Hotel Intercontinental
21. Hyatt Regency Hotel
22. Insignia/ESG
23. International Bank of Miami
24. Italian Consulate
25. Jones Lang LaSalle
26. Kapustin Corporation
27. LaSalle Bank
28. L&B Property Managers
29. Miami-Dade Metropolitan Planning Organization
30. Miami Downtown Plaza Hotel
31. Orange Bowl Committee
32. Premisys Real Estate Services, Inc.
33. Rok Enterprises
34. Shorenstein Company
35. SunTrust International Center
36. Taylor and Mathias
37. Terremark Worldwide, Inc.
38. Ticketmaster
APPENDIX C

BRIEFING ON BRICKELL TRANSPORTATION ISSUES
(September 18, 2002)

Provided by the City of Miami

Two-Way Conversion – SW 8 Street

- SW 8 Street is presently one-way eastbound from I-95 to Brickell Avenue. It is “paired” with SW 7 Street, which is one-way westbound.
- East of Brickell Avenue, SW 8 Street is two-way, serving Brickell Key.
- When traffic on northbound Brickell Avenue is backed up due to Brickell bridge openings, it blocks traffic trying to exit from Brickell Key on SW 8 Street.
  - Because SW 8 Street is eastbound only to Brickell Avenue, the exiting Brickell Key traffic must turn north to SW 7 Street to access I-95. When the movement is blocked, the traffic can’t move.
  - This isn’t simply an inconvenience—emergency vehicles, if present, are blocked too, raising potential life/safety issues.
- The one-way pattern also restricts access to businesses along SW 8 Street. Because traffic can approach businesses in only one direction, it is often necessary to circle the blocks to gain access.
  - This is not only inconvenient, but creates traffic congestion at adjoining intersections. The problem is particularly acute between SW 2 Avenue and I-95, due to restrictions imposed by I-95 ramps.

Brickell Avenue to I-95 (Full implementation requires approval by Florida Department of Transportation, Miami-Dade County, or both):

- A study has been completed showing that converting SW 8 Street to two-way operation would facilitate traffic movement, increase access to adjoining businesses, improve access to I-95 and the Miami Avenue Bridge, and free the Brickell Key exiting movement.
  - The p.m. “rush hour” traffic would gain two westbound lanes to I-95, facilitating this movement.
  - Interchange modifications to I-95 access could split the 7 and 8 Street traffic for optimum efficiency.
- To achieve this conversion, a Project Development and Environmental (PD&E) study needs to be performed. Following its completion, the project can be designed and let for construction by the Florida Department of Transportation (FDOT).
  - By doing the PD&E itself, the City can save about three years toward completion of the project. Funds to do so are being sought from the Downtown DRI impact fees.
Economic Impact of Brickell Avenue Bridge Openings

Brickell Avenue to Miami Avenue (Full implementation requires approval by Florida Department of Transportation, Miami-Dade County, or both):

- An interim plan to relieve the Brickell Key situation is now being implemented by the City and FDOT. It will convert SW 8 Street to two-way operation for the single block between Brickell Avenue and Miami Avenue, allowing a 1-lane westbound movement on SW 8 Street from Brickell Avenue to Miami Avenue, where it can turn north to the Miami Avenue Bridge, or to SW 7 Street, where it can then go west to I-95.
  - This interim plan requires advance dedication of the zoned right-of-way along the north side of SW 8 Street between the Metromover and Miami Avenues. The dedication documents and deed are being prepared at the present time.
  - This plan will also require signalization, signage, pavement and curb changes to accomplish, and can be done within a year after right-of-way is secured.
  - Modification of signal timing to synchronize with Brickell Bridge openings has been accomplished; video surveillance for real-time adjustments is under consideration, and an alternative routes plan has been prepared and distributed by the Police Department.
  - Modification of signal timing to allow more “green time” to exit Brickell Key has been implemented. The change results in longer queues on northbound Brickell, but within acceptable limits considering the relief granted to Brickell Key traffic.
- Regulation of construction permits, hours of operation, and requirements for off-site parking for construction workers is being considered.

I-95 to SW 27 Avenue (Full implementation requires approval by Florida Department of Transportation, Miami-Dade County, or both):

- SW 8 Street, Calle Ocho, between I-95 and SW 27 Avenue, passes through the heart of Little Havana, and is the “Main Street” for that community.
- SW 8 Street is one-way eastbound over the entire distance from SW 27 Avenue to I-95.
  - Operating in a one-way configuration designed to facilitate inbound workday traffic from the suburbs to downtown, SW 8 Street moves high volumes of fast-moving traffic that seriously interferes with the street’s function as access to businesses and the Little Havana residential neighborhoods.
  - Moreover, morning inbound traffic rarely stops to do errands or other business. In the evening, the homeward-bound traffic travels along SW 7 Street, which is one-way westbound, and has virtually no businesses along it.
- Dedicating three lanes of the street to traffic, and allowing for parallel parking on each side (essential due to the high-density urban character of the business
area) reduces sidewalk width below the minimum desirable for pedestrian movement.

- A study to analyze conversion of SW 8 Street to two-way traffic, increasing the width of sidewalks and providing for beautification of the roadway, has been completed, and is under review by the City and FDOT. Because SW 8 Street is a State highway, FDOT approval will be required for any changes that are recommended.
- At the request of the City Commission, consultants have been selected and are preparing an economic and marketability study to evaluate the economic benefits and disadvantages of one-and-two-way operations in Little Havana.
- If it is not feasible to effect the two-way conversion at this time, an alternative presented by the study is reversing the flow of SW 8 Street to westbound one-way operation, to improve access to businesses during the afternoon homeward-bound trip.

Two-way Miami Avenue, both sides of Miami Avenue Bridge

- The Miami Avenue Bridge is underutilized, while Brickell and SW 2 Avenue bridges (currently being replaced) are heavily used.
  - Reason: traffic is diverted at each end of Miami Avenue Bridge, forcing it into a one-way street pattern that increases intersection congestion and makes access to adjoining properties difficult. Drivers choose SW 2 Avenue or Brickell bridges instead.
- More traffic would use Miami Avenue Bridge if it could continue directly north and south from the bridge to the street grid.
  - This would be especially true of northbound traffic, which is forced into some of the most congested downtown intersections.
  - (The same thing is true northbound on Brickell Bridge, where traffic is forced into the DuPont Plaza one-way pattern).

Miami Avenue North of River (Full implementation requires approval by Florida Department of Transportation, Miami-Dade County, or both):

- City of Miami has requested that the Miami-Dade County Public Works Department (MDPW) consider making Miami Avenue two-way northbound to S. 1 Street, so (1) a left-turn can be made at S. 3 Street and (2) traffic can access I-95 at S. 2 Street.
  - (This is the same traffic pattern that existed before the Miami Avenue bridge replacement many years ago).
  - MDPW agreed to (1), but not (2) without further study of traffic operations and signalization issues.
  - This would complement the planned two-way conversion of Flagler Street, wherein the one-way pair of S and N 1 Streets become the main east-west carriers.
Miami Avenue South of River (Full implementation requires approval by Florida Department of Transportation, Miami-Dade County, or both):

- Following conversion of the northbound movement, the City will request a similar action for the southbound Miami Avenue traffic, so that properties fronting on Miami Avenue will have the benefit of two-way access.
  - This pattern will reduce the amount of southbound traffic now using SW 1 Avenue between the river and SW 7/8 Streets, and set the stage for a future tunnel connecting SW 1 Avenue under the Miami River.

- When finally completed, the two-way conversion will result in this traffic pattern for the Miami Avenue bridge:
  - Two of the three northbound lanes over the bridge will turn east to SE 1 Avenue, as now, and one lane will continue north to SW 2 or SW 1 Street;
  - Two of the three southbound lanes over the bridge will turn west to SW 1 Avenue, as now, and one lane will continue south as part of a two-way Miami Avenue over its length.

Downtown Transportation Master Plan (DTMP) (Full implementation requires approval by Florida Department of Transportation, Miami-Dade County, or both)

- Initiative by Commissioner Winton, who stressed need for a comprehensive, long-range, detailed plan for future transportation in the downtown area.
  - Triggered by question of whether replacement of SW 2 Avenue Bridge would preclude any further consideration of a tunnel crossing of the Miami River between downtown and Brickell.
  - Answer: no, but a long-range plan that addresses all aspects of downtown transportation is essential to justify a tunnel (or any other public investment in major transportation projects).

- Study will cost up to $750,000, commenced early 2001; final report now in preparation.

- A major feature of the DTMP is a sophisticated computer model that can depict existing and future traffic conditions under varying developmental assumptions and scenarios, and can be continually updated as conditions change.
  - This will allow much more accurate forecasting of transportation conditions, and will permit evaluation of various alternatives to maximize efficiency of the system.
  - The technology that allows this type of modeling is quite new, and Miami will be demonstrating its effectiveness.
  - Brickell area is the critical test of the DTMP’s proposals:
    - Newest and most intensive downtown redevelopment is happening in Brickell
    - Many people moving to Brickell from suburbs to escape traffic congestion and long commutes.
Economic Impact of Brickell Avenue Bridge Openings

- Recommendations in the DTMP will require many years for full implementation, but many can be implemented in the near-term.
- Increased provision of mass transit service is the key to continued development and redevelopment downtown.

“Brickell Buildout” Study, Miami River to SW 25 Road

- Rapid development and redevelopment of the Brickell Avenue corridor between the Miami River and SW 25/SW 26 Roads (Rickenbacker Causeway) has raised concerns regarding traffic congestion in that area.
  - A question repeatedly asked is how much more development can take place before traffic congestion becomes intolerable.
- To address these concerns, the Downtown Transportation Master Plan (DTMP) will produce a computerized model that will simulate future traffic according to a variety of development assumptions and scenarios.
  - This will allow planners to test the effects of development, and update the database for the model as building occurs.
- To provide input to the DTMP, a detailed study is underway to forecast what traffic conditions might be expected if Brickell continues to build out at close to the maximum allowed by existing zoning, and what transportation alternatives to private passenger vehicles can be recommended. While this study cannot provide the variety of assumptions and developmental scenarios that the model can test, it will nonetheless estimate an “ultimate” buildout and identify the critical intersections where traffic congestion is likely to be problematical.

DuPont Plaza Two-Way Conversion (Full implementation requires approval by Florida Department of Transportation, Miami-Dade County, or both)

- The traffic circulation system now used in the DuPont Plaza area forces all traffic destined for I-95 or Brickell Avenue to pass through the intersection of NE 2nd Avenue and NE 2nd Street, creating a bottleneck that causes queuing for many blocks in both directions when the Brickell Bridge opens.
- An application for funding under the Transportation Outreach Program (TOPS) was filed November 7, 2000, and was awarded $480,000 for FY ’01-’02 to prepare the Project Development & Environment (PD&E) study to recommend a solution to the traffic circulation problem. Subsequently, a JPA with FDOT to prepare the PD&E has been authorized by the Miami City Commission, and the consultant contract was awarded to David Plummer & Associates by the City Commission on June 13, 2002. The project kickoff meeting was held September 18, 2002, and it is anticipated that the study will be completed by mid-2003.
- An additional $1.3 million funding from TOPS has been authorized for FY ’02-’03 for project design that will be based on the alternative selected in the PD&E. Subsequent funding has yet to be secured for construction of the preferred alternative.
**Economic Impact of Brickell Avenue Bridge Openings**

**Tunnel Under Miami River at S.W. 1st Avenue** (Full implementation requires approval by Florida Department of Transportation, Miami-Dade County, or both)

- Location is workable, according to preliminary field study.
- Project has been included in 2025 Long Range Transportation Plan.
- Study design will be completed as part of Brickell Traffic Congestion Mitigation District (TCMD) plan.