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**Development of Improved Procedures for Business
Accommodation on Transportation Construction
Projects**

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16. Abstract Recognizing that transportation construction project can adversely impact adjacent businesses the Florida Department of Transportation sponsored this research project with two primary objectives: <ul style="list-style-type: none"> To determine the business accommodation needs and priorities for different types of businesses To develop strategies for improving business accommodation during transportation construction projects Business managers of businesses located within highway construction work zones were interviewed concerning their experiences and needs. Focus group meetings of business representatives were conducted. Current planning, design and construction management processes were reviewed with regard to business accommodation issues. Strategies for improving business accommodation were developed. This research resulted in the development of a Business Survey Specification and Survey Document.			
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The opinions, findings and conclusions expressed in this publication are those of the authors and not necessarily those of the State of Florida Department of Transportation, or the US Department of Transportation.

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CHAPTER ONE INTRODUCTION AND LITERATURE REVIEW

PROBLEM STATEMENT

The mission of the Florida Department of Transportation is described as follows:

The Department will provide a safe, interconnected statewide transportation system for Florida's citizens and visitors that ensures the mobility of people and goods, while enhancing economic prosperity and sustaining the quality of our environment.

Support for this mission requires an aggressive engineering and construction program to maintain and upgrade the state's transportation infrastructure system. Construction is necessary, however, construction operations can adversely impact motorists and adjacent businesses. Motorists are concerned with congestion and the resultant travel delays, and their safety while traveling through and adjacent to construction areas. In recent years much attention has been given to minimizing the construction effects on motorists. Maintenance of Traffic plans are now specifically designed to provide for efficient and safe passage of motorist through and around construction work zones.

Adjacent businesses are also affected by highway construction operations. Highway construction can cause significant economic loss to local businesses. Current FDOT Maintenance of Traffic designs and construction procedures attempt to address business concerns. Access to businesses is recognized as a critical need. However, the subject of Business Accommodation is a relatively new area. It is likely that different types of businesses have different concerns with regard to the impact of adjacent highway construction operations. Business accommodation is a complex subject. All business problems may not be solved by simply providing motorist access from the through traffic lanes in the work zone. Much more information is needed concerning the specific needs of different types of businesses with regard to adjacent highway construction operations.

RESEARCH OBJECTIVES

Learning Business Needs

The first objective of this research was to learn the critical needs and priorities of different types of businesses, which may be impacted by FDOT construction operations. This will involve in depth surveys and interviews with many businesses involved with FDOT construction projects.

Developing Business Accommodation Strategies

The second objective was to develop engineering and management strategies to address the business concerns, which have been identified. These solutions include standardized guidelines for incorporating business access in maintenance of traffic designs. Additionally, strategies will be developed to handle other identified needs. The FDOT will be able to utilize the results of this research to formalize design standards and management practices within its operations to provide for improved accommodation of businesses.

RESULTS OF LITTERATURE REVIEW

Project Case Studies

Dallas North Central Expressway

The project was a \$450M, 18 km reconstruction of the Dallas North Central Expressway. The North Central Expressway is the second oldest freeway in Dallas, affecting 25% of Dallas's residents. The research performed by the University of Texas focuses on the following three topics: The simplification of the plans and schedule, traffic flows through the critical areas, and the impacts of construction on businesses. The article reports the research performed on the impacts of construction on businesses. The following steps were taken during the research. A survey is given to businesses along the construction site. An analysis of sales data before, during, and after construction is conducted. Births and deaths of businesses and occupancy rates for multi-tenant office space in the construction area are observed.

The article concludes that the impacts of construction on businesses are short term; therefore, the goal of a planner is to help the business overcome the short-term costs to take advantage of the long-term benefits. Communication is necessary to make sure that the needs of a business are addressed; and, design is important to ensure that proper access is available to businesses during construction. It is also important to separate the businesses that are negatively affected by construction, and the businesses that are negatively affected by a downturn in the city's economy.

State Highway 21, Caldwell, Texas

The project was to widen a two-to-four lane undivided highway into a four lane divided highway with a two-way left turn lane, curbs, and gutters. The construction dates were between January of 1991 and July of 1993. No right of way is taken. This report is the summary of data collected concerning the impact of construction on surrounding businesses profits, property valuation, traffic volumes, travel times, and accident rates. In this research, a survey of business managers is conducted, property values are analyzed, and a user cost analysis of construction impacts is performed.

The article concludes that the main concerns of businesses are changes in the number of parking spaces, the ability to turn safely into businesses and residences, land value, and business sales. Though no right of way is taken, there are 7% fewer parking spaces during construction. Two-thirds of the managers surveyed thought that customers decreased. The actual gross sales decreased by 5%, with the exception of those businesses frequented by construction workers or businesses that are easily accessible. Seventy-one percent of the actual property values did not change. Business managers believed that noise, pollution, and the general appearance was worse during construction. Generally, businesses believed that conditions were worse than they actually were. A suggestion was made by the researchers to conduct personal interviews rather than mailing written surveys to businesses. In addition, warnings were given pertaining to the difficulty in acquiring land appraisal data.

US Highway 80, Longview, Texas

This paper discusses the impact to businesses resulting from a project that widened Highway 80 in Longview, Texas. This article is the second of two studies

performed on Highway 80 in Longview, Texas, one in 1987 and one in 1992.

Unfortunately, the 1987 article was unavailable. Information gathered includes number of parking spaces, customers per day, full and part time employees, gross sales, net profits, and land valuation. The research took the following steps. Surveys were mailed and businesses fronting the construction were interviewed, land and property values were analyzed, and construction spending was looked at to evaluate the overall impact of the project on the surrounding areas.

The article concludes that the 1987 respondents were more negative than the 1992 respondents. However, it must be noted that mailed surveys were used in 1992 and only 12% of surveys sent to businesses were completed. This result influences the decision to perform in person interviews with shopkeepers on other projects. Parking was not affected as much in 1992, but in 1987, many illegal spots that business depended on were lost when the road was widened. Property value decreased; but this may have resulted from the condition of surrounding buildings and a trend for business to be located in another part of town. The economic impact to the town and the state are positive and are still being felt in the town today. This is partially due to an early completion of the project, keeping the short-term negative impacts to a minimum. The main thing that can be taken from this project is that the results are only as good as the data they are based on. It is difficult to get a good sense of the impact to the project's surrounding businesses when only 12% return surveys.

Review of Standard Maintenance of Traffic Specifications

Introduction

MOT Standard Specifications for 24 states including Florida were gathered. The MOT Specifications were then summarized and filtered to include only MOT information within the project limits. Therefore, subjects such as detours or haul routes were left out of the summaries. It is understood that detours represent no access for customers to business; however, this report focuses on business access while traffic is still allowed through a construction area. These summaries are included in Appendix A.

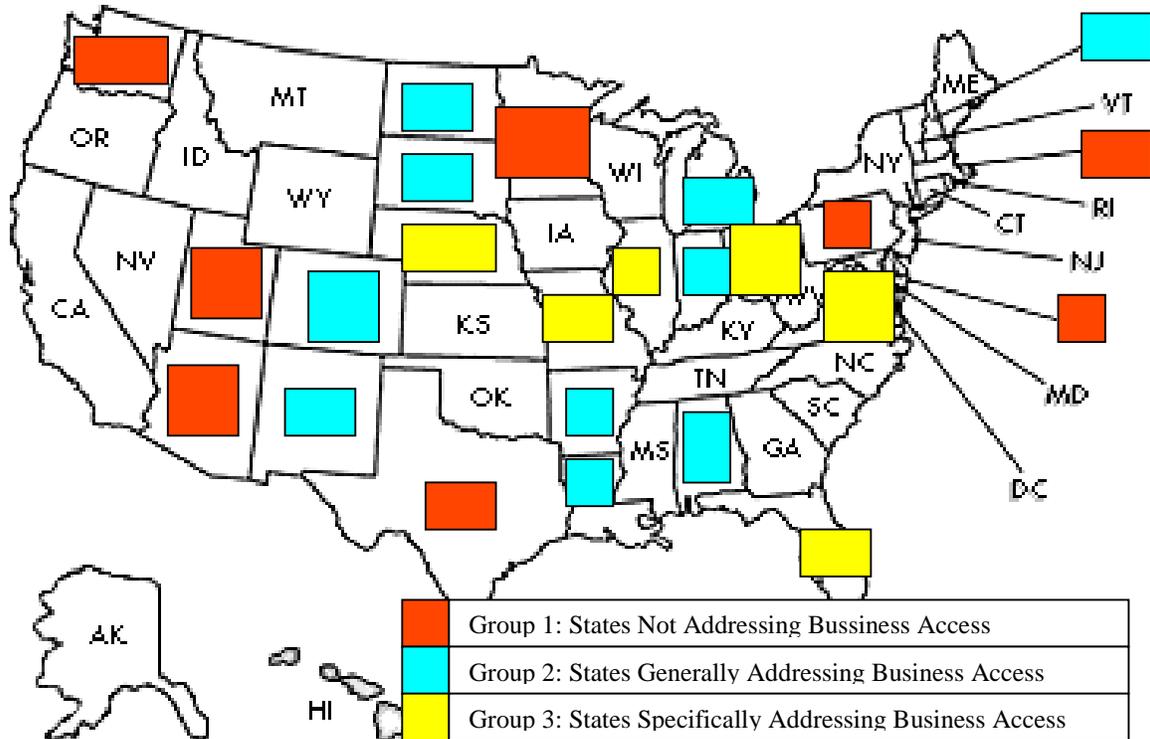


Figure 1.1 State MOT Standard Specifications Reviewed

Based on the level of detail addressing business access the review of the State’s MOT Standard Specifications produced three groups: States that do not address access to businesses, states that use a general statement to address access to businesses, and states that specifically address access to businesses. States that specifically address access to business are Florida, Illinois, Missouri, Nebraska, Ohio, and Virginia.

Florida

Business access is addressed in two places in the Florida Standard Specifications for Road and Bridge Construction 2000 Section 102 Maintenance of Traffic. Section 102-2.4: Access for Residences and Businesses. The contractor shall provide access to all residences and all places of business. Section 102-6: Materials for Driveway Maintenance. The Contractor shall place material in driveways to residences and businesses, to provide safe, stable, and reasonable access. The contractor shall provide material, of the type typically used for base, and having stability and drainage properties

that will provide a firm surface under wet conditions. The Contractor shall place, level, manipulate, compact, and maintain the material, to the extent appropriate for the intended use.

Illinois

Business access is addressed in Section 107.09: Public Convenience and Safety, of the Illinois Standard Specifications for Road and Bridge Construction Adopted January 1, 2002. When directed by the Engineer, the Contractor shall provide and maintain an acceptable surface aggregate for temporary roads, and approaches for access to driveways, houses, buildings or other property abutting the highway, or street being improved. The cost incurred by the Contractor for providing temporary roads will be paid for as extra work. The Engineer may require the Contractor, to finish a section on which work is in progress, before work is started on any additional sections, if the opening of such section is essential to public convenience.

Missouri

Business access is addressed in Section 104.8: Surfacing for Temporary Use, of the Missouri Standard Specifications for Highway Construction. When directed by the Engineer, the Contractor shall apply temporary surfacing, to provide proper ingress and egress to private property, across the project or along the roadway, where the Contractor maintaining a reasonably smooth and drainable earth surface, cannot handle the traffic properly.

Nebraska

Business access is addresses in Section 104.5: Maintenance of Traffic and Shooflies, in the Nebraska Standard Specifications for Highway Construction. Accommodations shall be made to ensure all local traffic that has its origin or destination within the limits of the project has access to all private dwellings, commercial properties, businesses, and public facilities.

Ohio

Business access is address in Section 614.02: Traffic Facilities, in the State of Ohio Department of Transportation Construction and Material Specification 1/1/97. The Contractor shall provide and maintain in safe working condition, drives, intersections,

crossings, temporary approaches, temporary roads, run-arounds, walks, temporary structures, and other facilities as may be necessary to provide safe pedestrian and vehicular ingress and egress for all property adjacent to the improvements.

Virginia

Business access is addressed in Section 104.04 E: Connections and Entrances, in the 2002 Specifications Book. Entrances shall be graded concurrently with the roadway with which they intersect. Once an entrance has been disturbed, it shall be completed as soon as practical. If the entrance must be constructed in stages, the surface shall be covered with a temporary aggregate stabilization course, until the entrance can be completed, and the required base and surface stabilization course can be placed. The Contractor shall schedule construction operations, so that approved continuous access is provided for all property adjacent to the construction, when property is shown on the plans to require access, unless other approved access is provided, and is acceptable to the property owner.

Conducting Focus Group Sessions

One of the survey techniques contemplated by the research team for this project was to hold focus group sessions with local businesses. Therefore a review of best practices with regard to focus group meetings was performed. Focus groups consist of 6 to 8 customers and a facilitator. The sessions are two hours long, located at a neutral site, and recorded or videotaped. To conduct focus groups, the organizers need to be able to recruit the group, select the venue, and run the session. For a detailed summary of best practice with regard to focus groups see Appendix B.

CHAPTER TWO RESEARCH APPROACH

INTRODUCTION

Following a comprehensive literature review as reported in Chapter One, the first phase of the study focused on obtaining information on three critical subject areas:

- What business accommodation activities are other DOTs currently undertaking?
- What are the current FDOT practices with regard to business accommodation?
- What are the business accommodation needs of the different businesses that are located adjacent to FDOT highway construction projects?

The second phase of the study consisted of synthesizing the phase one information and developing candidate strategies to improve the FDOT's business accommodation practices.

A third phase is planned, which will involve field trials of the candidate strategies on Pilot Projects.

SURVEYS OF INDUSTRY PRACTICE

Survey of State AASHTO Committee Members

A survey was conducted of State DOTs to determine current practice with regard to the use of customer satisfaction surveys and business accommodation activities. A copy of the survey form is included in Appendix C. The survey was distributed both by Email, fax and postal mail.

Survey of State Public Information Officers

A list of Public Information Officers (PIOs) for the 50 states was compiled and a similar survey was sent to the PIOs as was sent to the AASHTO committee members.

SURVEYS OF BUSINESS MANAGERS IN FDOT WORK ZONES

Introduction

Four construction projects were studied to determine how road construction impacts businesses. The four projects were San Jose Blvd. between Sunbeam Rd.

and just south of the 295 overpass in Jacksonville, Mahan Dr. between Dempsey Mayo Rd. and Capital Circle in Tallahassee, SR 121 in MacClenney, which included SR 121 between I-10 and just south of US 90, and SR 228 from South Boulevard to just north of McIver Street, and US 192 from Michigan Ave. to Aeronautical Blvd. in Kissimmee. San Jose Blvd. and Mahan Drive were studied after construction was completed. SR 121 was studied in the beginning stages of construction. US 192 was studied in the middle of construction.

Interviews of Business Managers

A two-person went door-to-door conducting a structured interview with each business located in the work zone for each of the four case study projects. With approval from the interviewee, the conversations were recorded and latter transcribed.

Surveys of Business Managers

In addition to the interviews, business managers were asked to complete a written survey document. The research team found that the best approach was to either complete the document during the interview or to leave the document and return latter to collect the results. A copy of the survey document is provided in Appendix F.

Focus Group Meetings

Focus group meeting were held at each of the project sites. Invitations were delivered to each business in the work zone. In most cases the FDOT PIO and project personnel attended the meeting in addition to the research team. With approval of the attendees, the conversations were recorded and latter transcribed. Business attendees were asked to complete a written survey form and then invited to comment on their experience with the construction project.

REVIEW OF FDOT CURRENT PRACTICE

Site Visits

The research team made numerous visits to the each of the four project sites. When possible, project progress meetings were attended. Observations were made of the business access and signage situations on each project. Copies of the project plans, specifications and Maintenance of Traffic (MOT) plans were obtain and reviewed.

Discussions with FDOT PIOs

The research team held discussion with several of the FDOT's current PIOs both FDOT employees and private consultant PIOs. Subject of the conversations concerned the FDOT's current practices and the PIO's role in business accommodation.

Review of FDOT Design Standards with Regard to Business Accommodation

The research team performed a detailed review of FDOT's current design guidelines and standards with regard to business accommodation issues. This included a review of the following design references:

- FDOT Plans Preparation Manual (PPM), January 2003, (Vol. I, English Units)
- FDOT Design Standards, 2002
- Manual on Uniform Traffic Control Devices (MUTCD), 2000, FHWA
- A Policy on Geometric Design of Highways and Streets ("Greenbook"). AASHTO, 2001

CHAPTER THREE RESEARCH RESULTS AND FINDINGS

SURVEYS OF INDUSTRY PRACTICE

Survey of State AASHTO Committee Members

A review of the 27 survey replies received from State AASHTO committee members indicate that 67% of states do not use customer satisfaction surveys. While 9 states representing the remaining 33% indicated they conduct some form of customer satisfaction surveys.

Approximately 30% of states reported that they survey business customers while 31% reported surveying road users. When states survey business at a rate of approximately 4% of the projects, the most common methods of surveying customers were.

- Mail
- Door
- Telephone
- Website

The methods used by states to select which business-oriented project to review are listed below in decreasing frequency of use.

- Location (also described as prominence)
- Complexity
- ADT
- Type
- Size

When states survey road users approximately 2% of drivers, the most common methods of surveying customers were.

- Telephone
- Mail
- Website
- Door
- Roadside

The methods used by states to select which traveler-oriented projects to review are listed below in decreasing frequency of use.

- ADT
- Location (also described as prominence)
- Complexity
- Type
- Size

The most commonly reported use for the surveys was for the modification of specifications. A slightly less common reply was the use of surveys to serve public relations activities with legislative and consumer groups.

Survey of State Public Information Officers

Only 4 replies were received all of which indicated the use of some form of customer satisfaction surveys. However, no meaningful conclusion should be developed given the poor reply rate.

SURVEYS OF BUSINESS MANAGERS IN FDOT WORK ZONES

San Jose Blvd.

Overview

The project included widening San Jose Blvd. from 4 to 6 lanes from Plummer's Cove to Sunbeam Rd., widening a traffic signal just north of the I-295 overpass, adding new sidewalks throughout the project area, providing right turn lanes in both directions, providing a third lane from Kori road to Hartley Road, and building four foot bike lanes.

The job was constructed by J.B. Coxwell Construction Inc., of Jacksonville and originally was estimated to take 2.5 years to complete at a cost of 11.7 million dollars. The project was 2.3 miles long. The Project start date was November 15, 1999. The actual project cost a total of 15.0 million dollars, but required 2 years to complete finishing on November 16, 2001, although final acceptance was not until March 18, 2002.

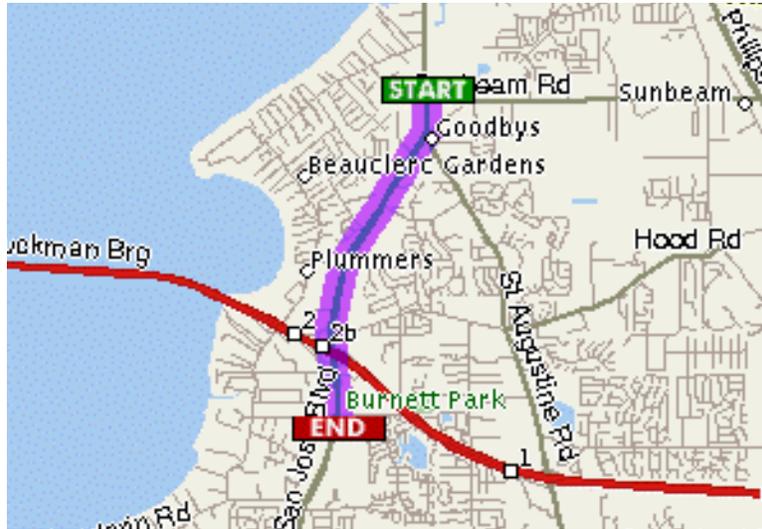


Figure 3.1 Map of San Jose Blvd. Project Site

Summary of Business Interviews

Twenty-seven businesses in total were interviewed along San Jose Blvd. on Thursday June 30, 2002. Eighteen of twenty-six businesses surveyed had a negative impression of the project. One business had a positive impression. Five businesses had a neutral impression and two businesses were not able or did not care to state their opinion. Table 3.1 presents a summary of the interview response.

Table 3.1 Summary of Business Manager Satisfaction, San Jose Blvd Project

Response	Number	Percent
Positive	1	3.8%
Negative	18	69.2%
Neutral	5	19.2%
Did not Answer	2	7.7%
Total	26	100.0%

The results are also presented graphically in Figure 3.2, which follows.

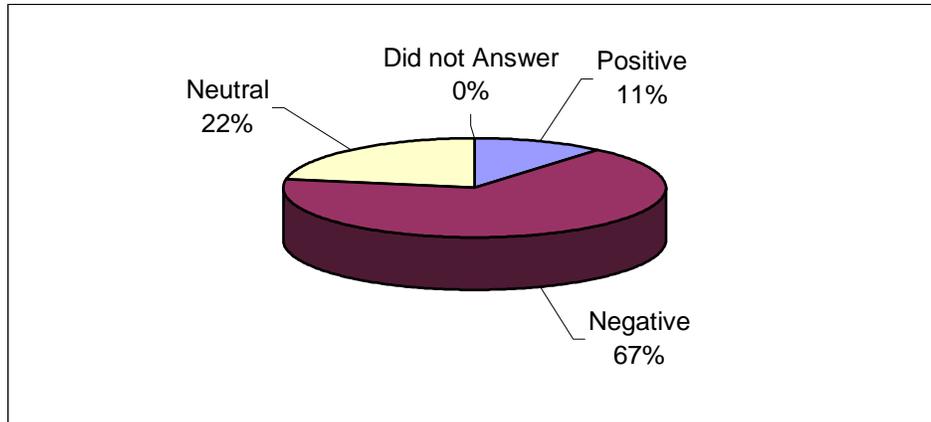


Figure 3.2 Graphical Results of San Jose Blvd. Interviews

The major problems reported by businesses are summarized as follows:

- The project was too long.
- Access to their business would be cut off without warning.
- Utilities would be cut off with out warning.
- There was poor communication from project management.
- No signs were posted to direct customers into their entrance, or to inform people that their business was still open.

The following suggestions for improvement were received:

- Better communication
- Fewer access closures
- Fewer utility interruptions
- More night work

A detailed summary of the comments from businesses interviewed on San Jose Blvd. is included as Appendix D.

Focus Group Meeting

The San Jose Blvd. Focus Group Meeting was held on Thursday, May 22, from 2:30pm to 5:30pm at the Ramada Inn Mandarin. Invitations were passed out on Thursday, May 16. Along with the invitations, a survey document was distributed.

These documents can be found in Appendix E and F respectively. Unfortunately, there was no response to the invitation, or the survey document. Fortunately however, also present at the focus group meeting was Mike Goldman, Public Information Manager/ Jacksonville for the Department of Transportation. Mike Goldman was the FDOT contact person for the San Jose Blvd. construction project. The time set aside for the focus group meeting was instead spent interviewing Mike Goldman about the recently completed project.

Mike Goldman stated that the biggest concern for through traffic was lane closures and that the biggest concern for business owners was access. A major problem he stated was that people avoid construction zones by traveling alternate routes to their destination. This was one of the problems concerning businesses on San Jose Blvd. He went on to state that another problem with the San Jose project was the design. The new turning lane that was being constructed was at a higher elevation than the existing roadway. In order for cars to access businesses on San Jose, they had to cross this lane. Gravel was placed to provide an access over the new turning lane, but because of the steep grade, cars would bottom out on the gravel. Mike Goldman stated this problem should have been picked up in the design process and the road should have been constructed differently.

SR 121 Macclenny, FL

Overview

The project consists of SR 121 from I-10 to just south of US 90 and SR 228 from South Boulevard to just north of McIver Street, approximately 1.6 miles. The total cost of the project is 5.8 million dollars. J.B. Coxwell Contracting Inc., of Jacksonville is the contractor. The job began on May 6, 2002, and should take 400 days to complete, summer 2003. The scope of work includes widening the road, adding a turning lane, reconstructing a bridge on the project, improving drainage structures, and resurfacing the road.

Summary of Business Interviews

Thirty-six businesses in total were interviewed along SR 121 on Wednesday June 27, 2002. Businesses were asked a series of yes/no questions and then asked for any additional comments. Answers were either “yes”, “no”, or “do not know”. Also, additional comments were taken at the end. The questions and results are given as follows in Table 3.2. Figure 3.4 presents the graphical results of the interviews.

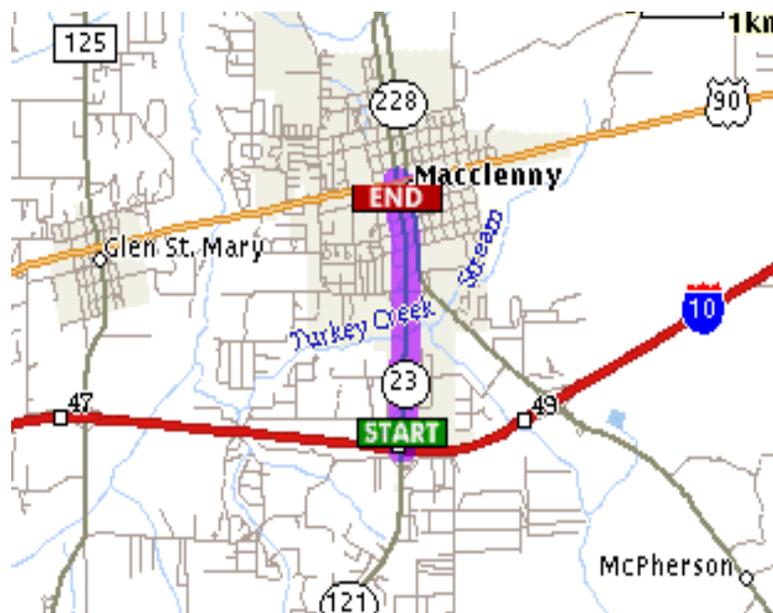


Figure 3.3 Map of SR 121 Project Site

At the end of each interview, businesses were asked to add any additional comments. Businesses have experienced losses in business due to the construction. Businesses have seen a problem with communication. One business complained about utilities, specifically phone lines that were cut off a whole day. Another problem is that construction workers personal vehicles, and construction trucks, are blocking entrances to business. The temporary access driveways that have been built are very confusing, awful, bumpy, and nasty. Some suggestions that have been made by business owners are

to first, put an police officer at the Lowder Street and SR 121 light to help direct traffic that needs to turn left onto Lowder Street from SR 121, to halt work during lunchtime when the traffic on SR 121 is the busiest, and to work more at night. A detailed summary of the businesses interviewed on SR 121 can be found in Appendix G.

Table 3.2 SR 121 Business Interviews Numerical Results

Count	Q1	Q2	Q3	Q4	Q5	Q6
Yes (1)	23	23	1	18	18	25
No (2)	11	11	33	16	15	11
Did not know (~)	2	2	2	2	3	0
Percentage	Q1	Q2	Q3	Q4	Q5	Q6
Yes (1)	63.9%	63.9%	2.8%	50.0%	50.0%	69.4%
No (2)	30.6%	30.6%	91.7%	44.4%	41.7%	30.6%
Did not know (~)	5.6%	5.6%	5.6%	5.6%	8.3%	0.0%
Questions	<ol style="list-style-type: none"> 1. Did you receive preconstruction information? 2. Were you aware of the preconstruction open house? 3. Did you attend the preconstruction open house? 4. Are you aware of the scope and duration of this project? 5. Have you been affected by the project so far? 6. Are you concerned about future business? 					

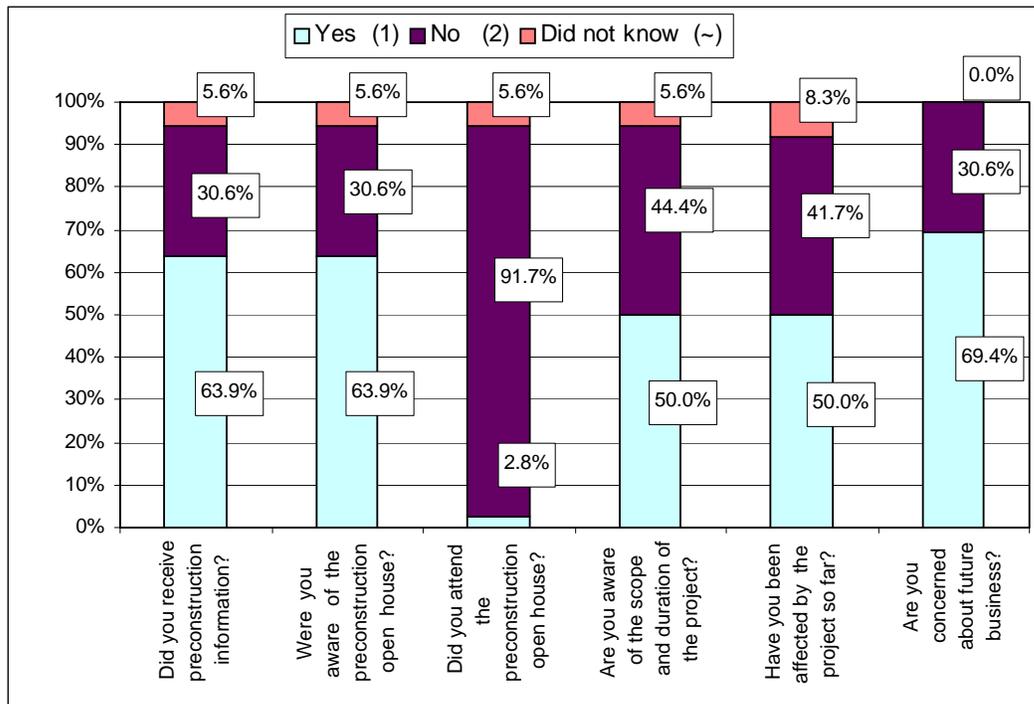


Figure 3.4 Graphical Results of SR 121 Interviews

Focus Group Meeting

The SR 121 Focus Group Meeting was held on July 31, from 2:30pm to 5:30pm at the Agricultural Extension Office in Macclenny. Invitations were passed out to each business three days prior to the meeting. Along with the invitations, a survey document was distributed. Two business representatives attended the meeting. Both persons were generally satisfied with the business accommodation aspects of the construction project. However, both were concerned about the deterioration of the level of service on SR 121 through the work zone. Much of the problem was attributed to the loss of left turn lanes and a heavy left turn component. A summary of the interviews is included in Appendix I.

Mahan Drive Tallahassee, FL

Overview

Project included widening Mahan Drive between Mayo Rd. and Capital Circle from two lanes to four lanes with a median and left turn access points. The project

improved drainage structures, added bike lanes, and installed a traffic light at Weems road. The project was 1.16 miles long. Work began on September 29, 2000 and was complete in May of 2002. The contractor hired for the job was Sanco Inc. of Tallahassee. The total cost of the project was 5.1 million dollars.

Summary of Business Interviews

Eighteen businesses in total were interviewed along Mahan Drive on Thursday June 23, 2002. Twelve of the eighteen businesses surveyed had a negative impression of the project. Two businesses had a positive impression and four businesses had a neutral impression. Table 2.1 presents a summary of the interview response.

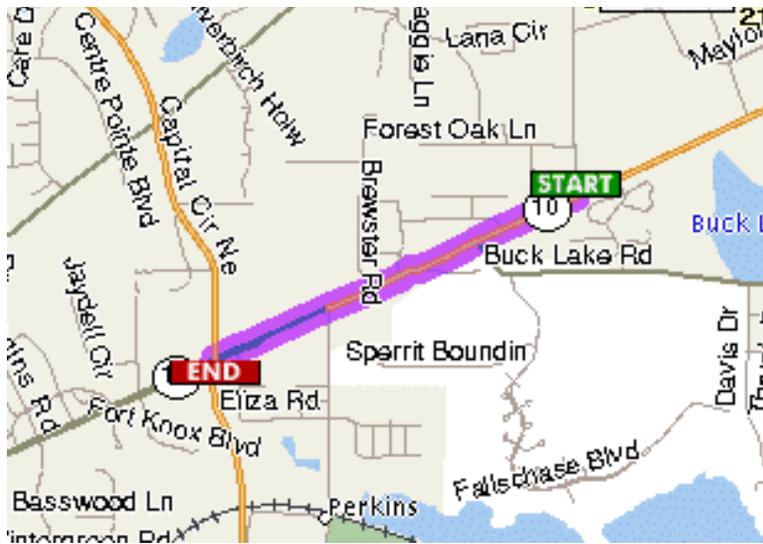


Figure 3.5 Map of Mahan Drive Project Site

Table 3.3 Summary of Business Manager Satisfaction, Mahan Drive Project

Response	Number	Percent
Positive	2	11.1%
Negative	12	66.7%
Neutral	4	22.2%
Total	18	100.0%

Figure 3.6 provides a graphical view of the interview results. A detailed summary of the businesses interviewed on Mahan Drive can be found in Appendix H.

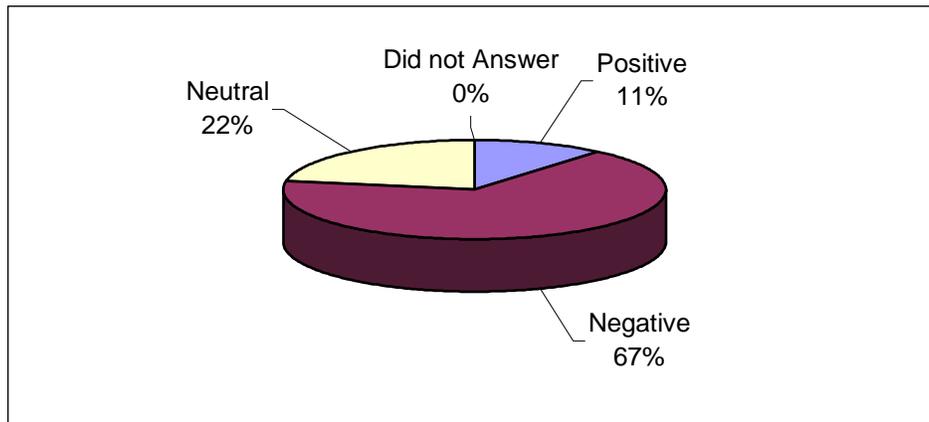


Figure 3.6 Graphical Results of Mahan Drive Interviews.

Focus Group Meeting

The Mahan Drive Focus Group Meeting was held on Wednesday, May 29, from 2:30pm to 5:30pm at the Tallahassee Hilton Garden Inn. Invitations were passed out on Thursday, May 23. Unfortunately, response was limited to one individual, Theo Proctor, of Proctor and Proctor, a car dealership fronting on Mahan Drive.

The most significant problem recognized by Proctor was the absence of a traffic light at the entrance to the Publix shopping center on one side of Mahan Drive, and Proctor and Proctor's entrance on the other side of Mahan Drive. Six accidents occurred in May and one person was killed. The steep grade of one of his entrances is also a concern, which since construction has been unusable. Drainage is his final concern. Proctor and Proctor is permitted to allow water from their parking lot, drain into the right of way. However, the post construction grade of the road is higher at that spot. Now water drains back into the lot, and pools, until it slowly drains into the right of way.

Proctor was also asked other questions regarding the project. He was asked how day-to-day communication was. He stated that if construction was going to directly affect his business someone from the project would stop by and notify him. He was asked if he would rather have a project built in stages that would affect smaller sections of the road, but would take longer, or would he rather have a project that was finished

faster, but affected a larger area. Proctor thought that since the majority of the businesses for this project are between Capital Circle and Weems Road, that this section should have been finished quickly so that businesses would be affected minimally. He was asked how access was to his business during the project. He stated that he thought the contractor made the best of a bad situation. He was asked about any preconstruction information or meetings that might have taken place before the project. He stated that there was a meeting at a church on the corner of Mahan Drive and Capital Circle, and he remembers a preconstruction pamphlet that contained the project dates, but he does not believe that it came on a regular basis. Finally, he was asked if he might have done anything else to improve the project. He stated that night work might have helped.

US 192, Kissimmee, FL

Overview

Project consists of six-laning three miles of US 192 from Michigan Ave. to Aeronautical Blvd. Work began October 8, 2001. The Contractor hired for the job is Martin K. Eby Construction. The total cost of the project is 16.5 million dollars.

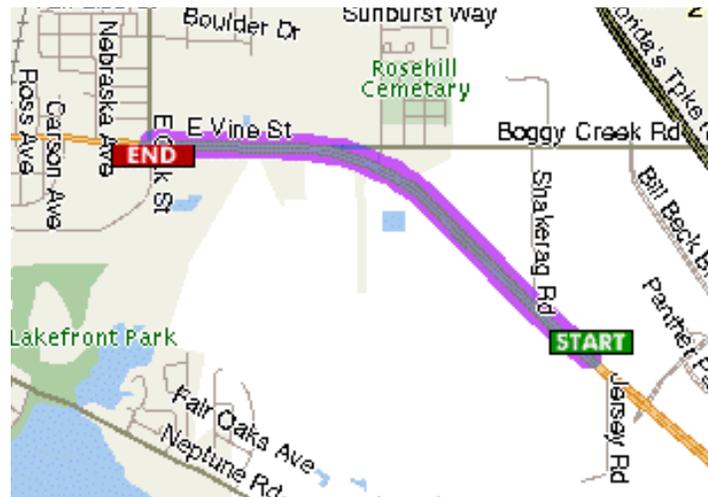


Figure 3.7 Map of US 192 Project

US 192 Focus Group Meeting

The US 192 Focus Group Meeting was held on Wednesday, July 24, 2002, from 3:00pm to 5:00pm, at the University of Florida Osceola County Extension Agriculture Center. Response was average, three businesses were represented: Motorsports International, Yamaha Global Golf Carts, and Discover Wireless: Kissimmee Bytes Internet Café.

Major problems businesses have are the following. Access to businesses is closed without warning. Business access signs are taken down without warning. Entrances to businesses are small and do not provide an adequate turning radius. Entire entrances are blocked off completely for long periods. Dust and debris are costing businesses 300 to 500 dollars per week in cleaning expenses. Business sales have decreased as much as 70% in some cases. Trucks and equipment use entrances as turn a rounds without permission. Temporary concrete barriers block vehicles taking a left hand turn into businesses. Equipment and materials are staged in front of businesses. Utility interruptions occur on average once a week.

Suggestions businesses gave on how to improve the project were the following. Business access signs should be provided and maintained at business entrances. Business names should be included on business access signs. Business access warning signs should be posted 500 ft before a business entrance. A progress report, written or electronic, or a project website should be provided for day-to-day information on the project. Businesses should be provided with a 24-hour information number. More night operations should be used.

SYNTHESIS OF BUSINESS ACCOMMODATION NEEDS

A careful review of the information obtained from the business surveys and site visits was used to create the following list of business accommodation needs. These needs are listed from highest concern to lowest concern based on interviews, surveys and focus group meetings. It should be noted that not all businesses have or experience the same needs. For example, a pizza delivery shop has different access needs than a bank. It is likely that the bank is closed in the evening and would prefer nighttime operations while the pizza business might experience heavy demand for access at night. The following business concerns were identified.

- 1. Customer Access and Parking, and Delivery Access**
- 2. Business Visibility and Signage Issues**
- 3. Utility Outages and Disruptions**
- 4. Congestion and Traffic Pattern Changes**
- 5. Construction Information**
 - **Final Project Configuration**
 - **Construction Schedule and Events**

Customer Access and Parking, and Delivery Access

The typical effected business is located in a shopping center adjacent to the work zone. The business may have one or more alternative entrances. However, almost all business managers expressed similar concerns with respect to construction activates along side their businesses. Most felt that customers had a difficult time getting to their businesses. The following case studies may suggest areas that need improvement.

The first is a pizza shop located on in a shopping center direct adjacent to one of the road reconstruction projects. The business rarely had all of its access ways closed at the same time, but was still adversely affected. The contractor for this project closed the main entrance to the “U” shaped strip center for extended periods. The shopping center had more than one entrance a main entrance which include the signage for the businesses in the shopping center and a smaller service entrance which led around the back of the businesses.

During the periods of time when the main entrance was closed, customers were expected to use the service entrance. The service entrance was not marked with any

identification and the opening was often obscured by the presence of construction vehicles or materials staged along side the roadway.

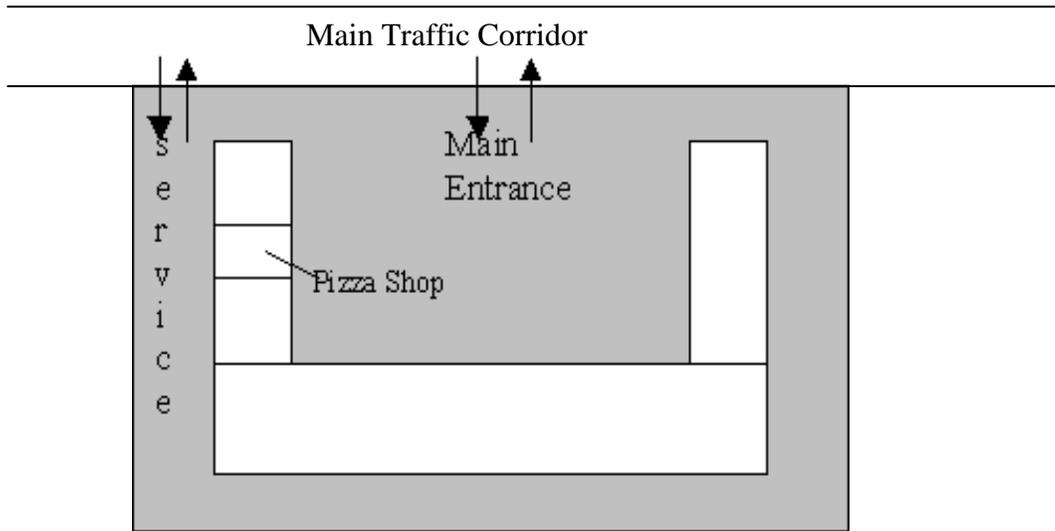


Figure 3.8 Sketch of Pizza Shop Access

The second example of a business with access issues is the Golf Cart dealer located adjacent to a road widening project. The business is a freestanding unit with a single entrance fronting on the project road. As can be seen in Figure 3.9 the area near the entrance to the business is being used to stage drainage pipes. The entrance is separated from the main travel lane by a curb (see upper third of the right edge of figure.) There is no business access sign visible from the travel lane. It has apparently been taken down to allow for the staging of the pipes for the drainage work.



Figure 3.9 Photo of Entrance to Golf Cart Dealer

Business Visibility and Signage Issues

On many of the interviews and focus group meetings, business managers reported concerns with the visibility of their business and with the usefulness of contractor provided signs. Business Entrance Signs were also often blocked by construction equipment or materials. As can be seen in Figure 3.10 the construction vehicle appears to be blocking the traveler view of the pole mounted business entrance sign. In the right edge of the figure, a second vehicle is present. The business sign is in the middle of an excavation activity and was taken down shortly after the photo was taken. Many of the business interviews indicated that access signs were regularly taken down and not always put back up after the work had been completed. The business entrance sign shown in Figure 3.11 is also very difficult for the motorist to see because of the barrels and the construction equipment.

In some occasions business report that entrance sing were also left up when no longer helpful to customers. Figure 3.12 is a photo of a signed business entrance that is obstructed by parked construction equipment. Businesses also often indicated that they would prefer business specific signs such as the one seen in Figure 3.13.

Business entrance signs were also often placed directly at the at the entrance drive way with approximately a 90 degree turn required. This situation makes it difficult for motorists to make the turn and as a consequence traffic is obstructed because the motorist practically has to stop to make the turn.



Figure 3.10 Photo of Pole Mounted Business Entrance Sign



Figure 3.11 Photo of Business Entrance



Figure 3.12 Photo of Business Specific Entrance Sign

Utility Outages and Disruptions

Another common complaint from businesses concerned disruptions caused by utility outages. Currently, although utility outages may be a direct consequence of the construction, the utility work is likely to be performed by the utility and not the FDOT construction team. Therefore providing coordination and notice to businesses is problematic. Even though the FDOT may not be responsible, businesses associate any utility disruption with the adjacent road construction.

Congestion and Traffic Pattern Changes

Businesses feel that traffic congestion affects their business activity. Congestion induces many motorists to choose alternative routes and reduces the number of drive by customers. Some businesses interviewed indicated that construction pattern changes were the primary reason for declines in sales. The businesses most effect by these changes are those that would generally not be considered “destinations” for example, the pizza shop was not a lunch destination as a consequence the owner went from three employees needed to only one employee working lunch. Other businesses, which would be affected, include business like fast-food retailers.

Conversely, destination business indicated that they suffered little effect related to construction. A few examples of these businesses would include banks, insurance agencies, specialty retailers. In general, business owners who owned destination locations indicated they suffered less adverse effects related to construction when compared to non-destination businesses in the same construction corridors.

In one project studied, the elimination of a left turn lane during the Maintenance of Traffic (MOT) phasing resulted in severe traffic congestion. The traffic backup clearly affected access to businesses in the work zone.

Construction Information

Another concern identified through the interviews and focus group meetings is the communication and participation of businesses in the construction process. In figure 3.13

below we see the answers to survey question asked on businesses on SR 121 MacClenny, Fl. The results are depicted as stacked bars.

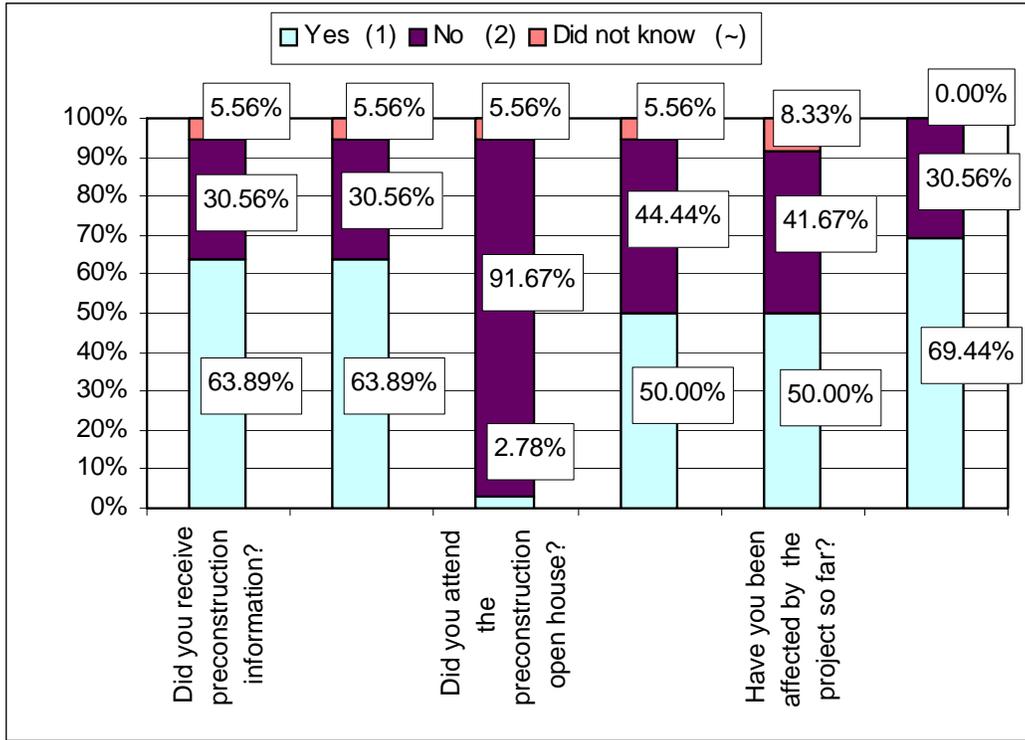


Figure3.13 Results of the Information Questions from the Business Survey on SR 121 Project

Based on this survey it appears that 2/3 of all businesses are aware of construction before the project is begun. However, less than 3% of businesses attend the preconstruction open house. The low turn out might be attributed to a variety of causes but a lack of understanding the importance of the preconstruction meeting might be the primary cause. One business owner indicated that he did not attend the San Jose Blvd. project preconstruction meeting because it was too late at that time to affect the project plan.

Businesses indicated that they wanted to be informed about the project events and status. Many said that they would utilize an Internet project website to obtain project information.

REVIEW OF CURRENT DESIGN REFERENCES

A summary of the review results is presented in Table 3.7. The above-mentioned documents and references do not give specific information relating to business access during construction projects. The emphasis is primarily on dealing with *through* traffic in the construction zone. There are several references to addressing business issues during construction, particularly in the MUTCD and PPM, but no guidance (or references to guidance) on just how this should be done.

Bottom line is...it seems to be recognized that addressing business access and traffic operations needs during construction is important, there just is not any good guidance currently available for these documents to provide or make reference to.

Table 3.7 Results of Reference Reviews

Reference	Requirement/Commentary
<p>A Policy on Geometric Design of Highways and Streets (“Greenbook”). AASHTO, 2001 Chapter 3: Elements of Design Section: Maintenance of traffic through work areas</p>	<p>Nothing specifically mentioned about business accommodation during construction and around construction areas.</p> <p>Emphasis only on traffic flow on roads.</p>
<p>FDOT Plans Preparation Manual (PPM), January 2003, (Vol. I, English Units) Chapter 10: Work Zone Traffic Control Section 10.3: Comprehensive work zone traffic control planning</p>	<p>It mentions that public input may need to be considered “on very large and complicated projects”. It states a little later that “citizen and business advisory committees may be established as sources of input.” Thus, it implies that the concerns of businesses should be considered, but does not state anything explicitly to that effect.</p>

<p>Section: Traffic Control Through Work Zones (Index Sheets 600 – 665)</p>	<p>No consideration given to ‘business access’ on any sheet</p> <p>Adjacent businesses issues not addressed in the design standards</p>
<p>Reference: Manual on Uniform Traffic Control Devices (MUTCD), 2000, FHWA</p> <p>Section: Temporary Traffic Control, Part 6</p> <p><u>6A – General</u></p> <p><u>6B – Fundamental Principles of Temporary Traffic Control</u></p> <p><u>6C – Temporary Traffic Control Elements</u></p> <p><u>6G – Type of Temporary Traffic Control Zone Activities</u></p>	<p>Recognizes adjacent businesses to be part of urban streets and that access to properties and utilities should be maintained.</p> <p>(p. 6B-4) “Good public relations should be maintained by applying the following principles:”</p> <p>“The needs of abutting property owners,..., and businesses should be assessed and appropriate accommodation made.”</p> <p>p. 6C-2) “Provisions for...acceptable access to abutting property owners and businesses should also be incorporated into the temporary control planning process.”</p> <p>(p. 6G-11) “In urban temporary traffic control zones, decisions are needed on how...to maintain access to businesses...areas.”</p>

<p>Section: Signs, Part 2</p> <p><u>2F – Specific Service Signs</u></p>	<p>p. 2F-1) “Specific service signs shall be defined as guide signs that provide road users with business identification and directional information for services...”</p> <p>No discussion specific to signs for business access during construction</p>
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RECENT EFFORTS BY THE FDOT TO IMPROVE BUSINESS ACCOMMODATION DURING CONSTRUCTION

Introduction

Clearly the FDOT recognizes the importance of business accommodation and minimizing the impact of construction on local businesses. This research study demonstrates that commitment. Concurrently with this research study the FDOT has undertaken several business accommodation efforts, some of which are described in the following sections.

Customer Satisfaction Surveys

The FDOT has conducted customer satisfaction surveys to identify areas of concern to local businesses. For example, FDOT District 4 recently performed business impact surveys on five of its construction projects in May 2003. Two of the projects were located in Ft. Pierce, FL and three were located in West Palm Beach, FL. The projects were typical urban reconstruction projects. The survey contained 25 questions: 13 positively worded and 12 negatively worded. There were 165 respondents to the survey.

The results of the surveys are provided in Table 3.7. Figure 3.14 presents a graphical summary of the survey questions that received a negative response. Figure 3.15 presents a graphical summary of the survey questions that received a positive response

Based upon the survey results, District 4 believes that the following areas need improvement:

Indicated by Positive Questions

1. Business Signage – Even though there is a standard practice, there is apparently still some problems with implementation.

2. Updated Project Information – Businesses still want to know about upcoming project activities, traffic phase shifts, scope issues and progress. Interim updates need to be distributed to businesses.
3. Clear Path for Pedestrians – Pedestrian access through the work zone should be resolved during project design. Construction project managers and engineers need to monitor the project condition to insure pedestrian access and safety. Pedestrians are customers to the businesses.

Indicated by Negative Questions

1. **Too Many Projects in One Area** – There are too many projects in one local area. Current work programs tend to concentrate and overlap project along a corridor. The result is a seemingly endless disruption to the adjacent businesses. Better planning is required to stagger projects and reduce the continuous impact to businesses.
2. **Decreased Traffic Volumes** – The FDOT often encourages motorist to avoid construction work zones and to choose alternative routes. The result is a reduction in customers for the adjacent businesses. The FDOT should consider developing ways to encourage motorist to support local businesses.
3. **Loss of Revenue More Than 20%** - The response indicates that the businesses were approximately evenly divided on this issue. One explanation is that there are two types of businesses: “Destination Businesses” that have a stable customer base such as doctors or insurance brokers, and “Non-Destination Businesses” that depend mainly on drive by customers. The destination businesses are relatively immune to the impact of road construction.
4. **Projects Are Too Long** – Businesses strongly agree that the construction projects take too long to complete. Methods to reduce construction time need to be developed. Pilot projects with night work only and double shift crews should be tried.
5. **Work Program Planning** – Project selection, project location to other projects, and scope of work issues should be addresses in the planning phase. These issues have a direct effect on the construction situation.

Table 3.7 Summary of Results for Business Impact Survey by FDOT District 4

Question #	Question	Percent	Positive ?
6	6. Objects Block View	44	no
7	7. Ldscg Block View	26	no
8	8. Too Many Projects	76	no
9	9. Decreased Traffic	59	no
10	10. Vibration Damage	24	no
11	11. Const Equip Damage	18	no
12	12. Loss of Utility	35	no
15	15. Loss of Revenue > 20%	46	no
16	16. Temp Loss of Parking	39	no
21	21. Rise in Accidents	49	no
24	24. Proj too Large	56	no
25	25. Time too Long	66	no
1	1. Dust Control	59	yes
2	2. Median Access	62	yes
3	3. Maintain Driveway	61	yes
4	4. Blue Sign	45	yes
5	5. QualityTemp Driveway	64	yes
13	13. Grass Replaced	65	yes
14	14. Business Entrance Smooth	64	yes
17	17. Updated Proj Info	52	yes
18	18. Notice of Lane Closure	60	yes
19	19. Begin Notice	66	yes
20	20. Continuous St Ltg	79	yes
22	22. Driving Room	51	yes
23	23. Path for Peds	48	yes

D4 CONSTRUCTION
Business Impacts Survey 05/03
5 Projects

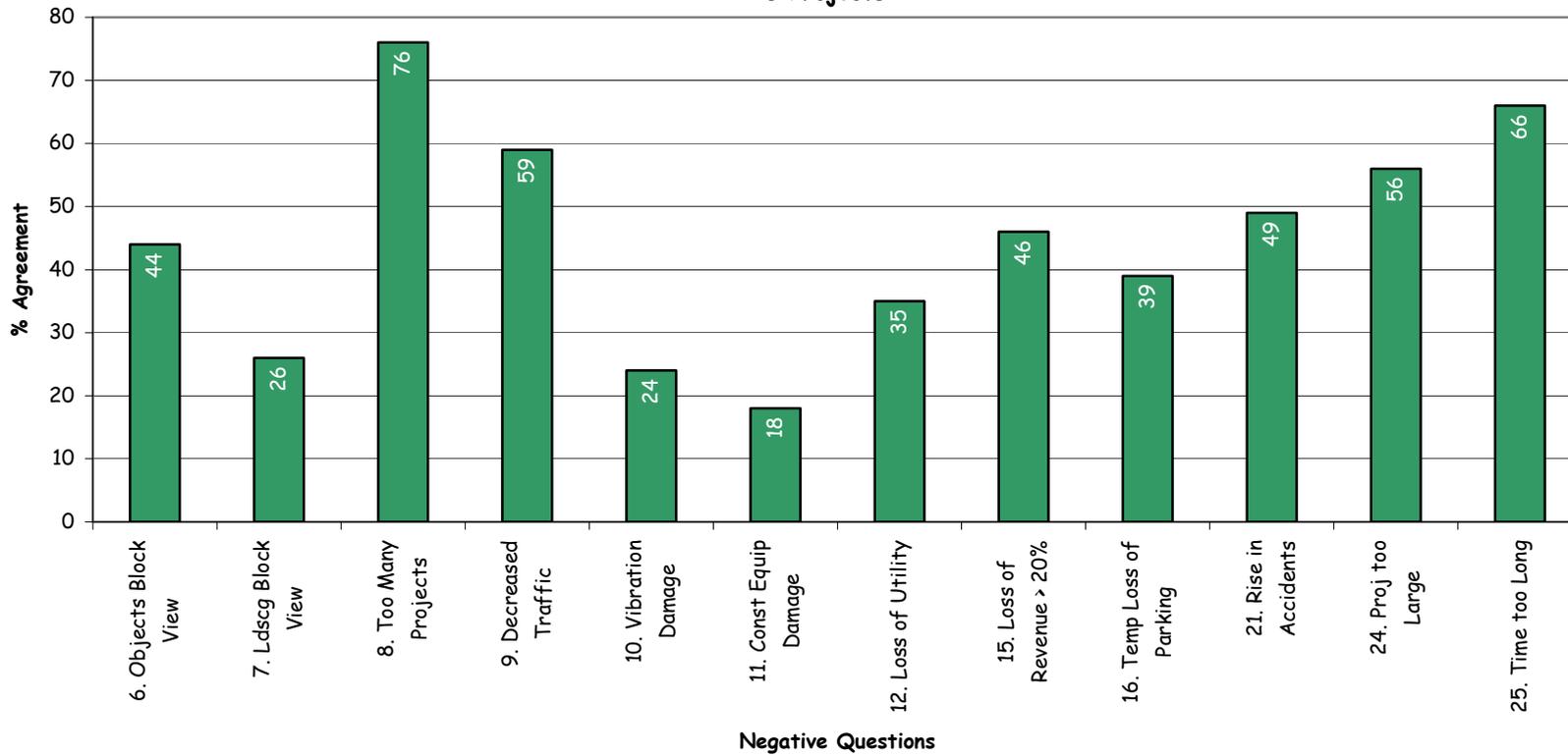


Figure 3.14 Business Impact Survey Results: Negative Questions

D4 CONSTRUCTION
Business Impacts Survey 05/03
5 Projects

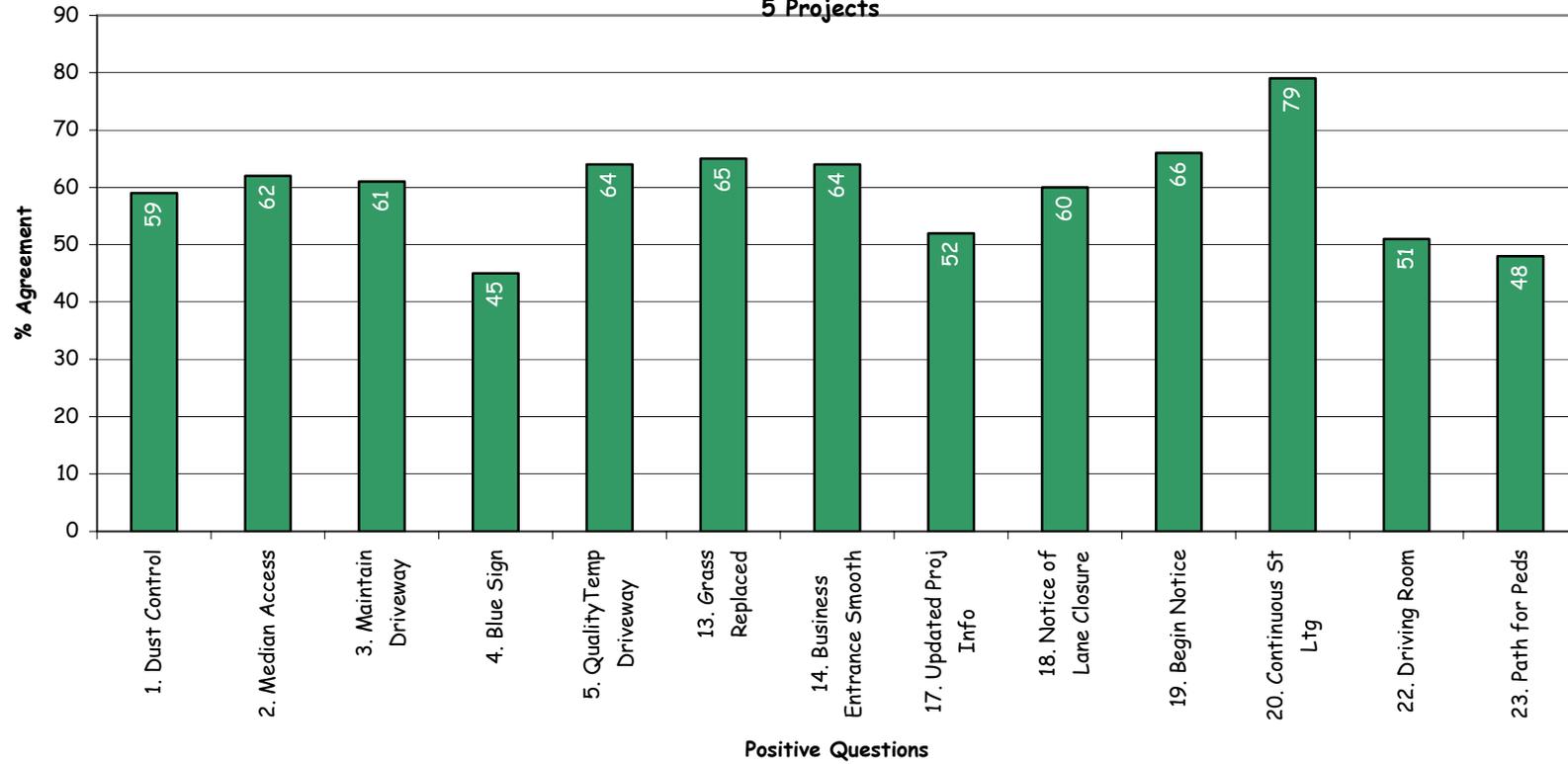


Figure 3.15 Business Impact Survey Results: Positive Questions

Revised Standard for Business Signage

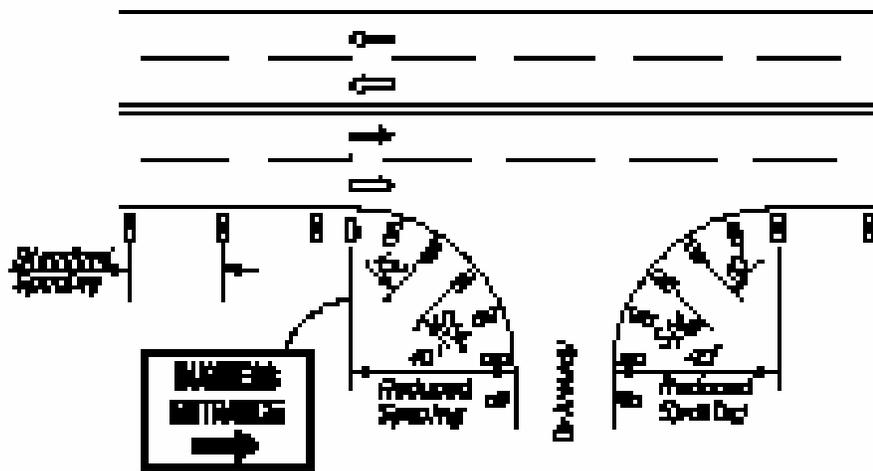
The FDOT is currently developing a revised standard for providing business access signs. In the past business access signs were often mounted on Type II barricade frame. Motorist can have difficulty in seeing the signs at a sufficient distance in advance of the business entrance. Figure 3.16 is a picture showing a typical business sign placement using a type II barricade frame on an FDOT project. The revised standard requires post mounting of the signs. Figure 3.10 is a picture showing a business access sign with a post mount on an FDOT project. Figure 3.17 is the proposed new sign standard being considered by the FDOT. Note that the minimum mounting height is 7 feet.



Figure 3.16 Photo of a Typical Business Access Sign Mounting on Type II Barricade Frame

BUSINESS ENTRANCE SIGNS

1. Sign height shall be 7' maximum. Sign offset from edge of travel way should be between 8' and 12' and horizontally consistent through the project phase.
2. Place one business sign for each driveway entrance affected. When adjacent businesses share a common driveway entrance, place one sign per common driveway entrance.
3. Channelizing devices should be placed at a minimum spacing on each side of the driveway entrance.



PLACEMENT OF BUSINESS ENTRANCE SIGNS AND CHANNELIZING DEVICES AT BUSINESS ENTRANCE

Figure 3.17 Proposed Business Sign Standard Under Consideration

CHAPTER FOUR PRELIMINARY RECOMMENDATIONS ON STRATEGIES TO IMPROVE BUSINESS ACCOMMODATION

INTRODUCTION

The strategies suggested in this chapter are based upon a synthesis of the information collected by the research team and include the input from experienced FDOT and consultant personnel. Each strategy is focused on strengthening a weakness in the FDOT's current business accommodation practices. The strategies are considered to be practical and implemental. However, the research team recommends that these strategies be tested in a pilot project prior to general implementation.

SUGGESTED STRATEGIES

Strategies to Improve Communication with Businesses

Pre construction Meeting

Hold a pre-construction business information meeting introducing the project to the local businesses and presenting the specific business accommodation efforts to be implemented in the project. Introduce project personnel. Provide contact information.

Project Sign

Install a project sign at an appropriate location on the site in advance of construction. Sign will advise of the upcoming project and provide contact information for further information. Current right of way and planning activities focus on property owners. Tenant businesses are often unaware of upcoming construction activities. This is not a sign to be viewed by motorist. This is a project sign placed in a common location on the site such as at a shopping center or local meeting center. Establishing a practice of providing a project sign will help insure that everyone is aware of the project and can make appropriate business plans. The sign should contain basic information about the project.

Routinely Distribute Information Flyers to Businesses

Information flyers are an efficient way of keeping local businesses up to date on project information. First editions should provide in addition to basic project information,

information on the project personnel. Photographs of the individuals that businesses may have contact with should be provided. Figure 4.1 is a copy of an information flyer developed by Alachua County as advance notice on an urban redevelopment project. Figure 4.2 is a copy of the cover page from information flyer developed by the New Mexico Highway and Transportation Department (MNHTD). This unique document was developed to assist businesses with dealing with the impact of construction. A complete copy of the document is provided in Appendix I.

Project Website

Establish a project website prior to beginning construction to facilitate communication with businesses and other interested parties. The website will provide important information about the project and advise of upcoming events. Many of the business managers that were interviewed said that they would definitely utilize a project website to receive current information on the project. Project websites can provide a large range of project information including live digital camera views of the project. The FDOT should develop a standard format for a standard FDOT construction project website. Contents can be adjusted to match the project requirements but the appearance and format should be the same on all FDOT construction websites. An example of a very good project website for a New Mexico DOT project can be visited at <http://www.thebigi.com/trafficcam/default.asp#start> . Figures 4.3, 4.4 and 4.5 present views of some of the web pages found on the New Mexico Big I site.

Business Signage

The revised standard for post mounted business signs should be implemented. The research team recommends that the proposed standard be added to the FDOT Index of Standard Drawings and be incorporated in future MOT designs and project site operations.



Big I Reconstruction



Building Community Connections



Commuter Info	Project Info	What's News	Milestones	FAQs	Trivia
Traffic Cam	Traffic Reports	Week At A Glance	Phasing	Merchant Discounts	Links



Project Information

MOBILIZATION/PREPARATORY PHASE:

From March through June 30, 2000, the **Big I** Reconstruction team prepared surface streets around the Big I Reconstruction project to function as maximum capacity once construction began. Streets such as Manual, Dr. Martin Luther King Jr., Edith Boulevard and others were widened, re-stripped, and had new sanitary sewer, water and other lines installed.

RECONSTRUCTION:

Phase I (July 2000 - March 2001)

Other Project Related Information

[The New Big I Map \(pdf file\)](#)

[Final Big I On/Off Ramp & Frontage Road Configuration](#)

[Exit Ramp Numbers](#)

[Big I Halfway Milestones](#)

Figure 4.3 Information Page from the Big I Project Website



Big I Reconstruction



Building Community Connections



Commuter Info	Project Info	What's News	Milestones	FAQs	Trivia
Traffic Cam	Traffic Reports	Week At A Glance	Phasing	Merchant Discounts	Links



Milestones

Throughout the Big I Reconstruction, we will provide updates on "milestones," or important events in the life of the project.

July 6, 2001

After reaching the halfway point in the project timeline last week, the New Mexico State Highway & Transportation Department and the Big I Team announced today the latest milestones approaching on the massive highway reconstruction project.

The last of the "old Big I" bridges in the core of the intersection of Interstates 25 & 40 will disappear today, tomorrow and Monday when crews finish demolition of the old I-25 Southbound mainline over I-40 Eastbound.

Figure 4.4 Milestone Page from the Big I Project Website



Big I Reconstruction



Building Community Connections

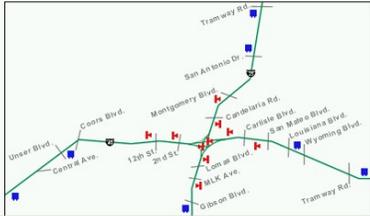


Commuter Info	Project Info	What's News	Milestones	FAQs	Trivia
Traffic Cam	Traffic Reports	Week At A Glance	Phasing	Merchant Discounts	Links



Traffic Cam

Click any Camera Icon to view current image... Or select a camera location from the list.



Select a Camera from the Following Locations ▼



Please Choose a Camera Location by either Clicking one of the Red Camera Icons, or Selecting the Location from the Drop-down List.

Figure 4.5 Traffic Cam Page from Big I Project Website

Business Access, Parking and Traffic Congestion

Improved Project Planning and Design

The development of a traffic control plan (TCP) for an impending major construction project on an urban arterial should be predicated upon a comprehensive traffic study of the affected area. It is important to determine the critical movement needs for each significant mode, and to design a plan that will not impact these movements too negatively. Additionally, the determination of minimum adjacent business access needs is essential to a successful traffic control plan. The best way accomplish this is through a traffic study that examines all transportation related activities in the construction area.

While traffic control plans have historically focused on maintaining the flow of through traffic, it is important to consider the other purposes that are served by the roadway corridor. In developed areas, business access needs to be a major consideration in the development of a traffic control plan. Additionally, it is becoming increasingly important to consider construction impacts on modes other than the automobile.

Existing Auto and Truck Traffic Volumes and Patterns

The determination of whether the arterial serves primarily through traffic, business traffic, or both will significantly impact the development of the construction traffic control plan. Intersection, driveway, and median opening turning movement and classification counts can be performed to make this determination. Additionally, an origin-destination study should be considered if more detailed information needs to be obtained about the travel patterns of vehicles along the corridor.

Intersections immediately adjacent to the boundaries of the construction project should also be included. Since travel demand patterns will likely be altered by the construction project, these intersections will serve as a gauge to the change in travel patterns.

The traffic handling capabilities of adjacent major roadways should also be generally assessed, in order to determine to what extent they could be factored into the traffic control plan for the roadway in question.

Presence of Other Modes and Their Travel Patterns

A common condition during roadway construction projects is the removal of sidewalks and shoulders (see Figure 4.6). Additionally, any remaining shoulder may be anything but paved. This can often leave nowhere for pedestrians and bicyclists to travel. This can also impact bus accessibility and ridership. Thus, it should be determined if pedestrian, bicycle, and/or bus activity is significant along the construction corridor. If so, this travel demand needs to be accommodated in the traffic control plan.

For example, if pedestrian activity is significant, sidewalks and crosswalk connectivity must be provided for the full length of the corridor. Specific pedestrian patterns should also be determined and specifically addressed to reduce the possibility of pedestrians making dangerous street-crossing maneuvers. If bicycle and pedestrian traffic are both significant, it may be necessary to maintain a paved shoulder in addition to a sidewalk. As for transit activity, it is important to look at the number of boardings and unboardings along the corridor, and not just the frequency of buses traveling along the corridor. An examination of adjacent roadways to the construction site should also be made to determine if any of these can accommodate diverted bicycle, pedestrian, and/or transit activity.

Business Access Evaluation

For business accommodation, it is essential to maintain a reasonable level of accessibility. The turning movement counts conducted at the driveways and median openings will provide an indication of the demand levels for adjacent businesses. The general composition of the types of businesses should also factor into the TCP as it relates to the provision of business site access. For example, corridors that contain a large percentage of businesses dependent on pass-by trips (e.g., gas stations, fast-food restaurants) are going to be much more impacted by access reductions/restrictions than

those corridors with a large percentage of businesses dependent on primary trips (e.g., dentist's office).



Figure 4.6 Photo of Sidewalk and Shoulder Area During Construction

Additionally, the elimination or restriction of existing median openings can result in a significant percentage of diverted business traffic. While this might be part of an overall access management strategy for the completed project, the staging of this in combination with reduced business driveway access during the construction project must be carefully considered. If a certain movement needs to be temporarily or permanently eliminated, alternate ways of accommodating that movement without making it too onerous on the driver (such that they abandon that trip) should be investigated. This will help to minimize impacts to local business. Impacts to large delivery vehicles also need to be considered. Median and/or driveway closures/restrictions that lead to more difficult turning movements for these vehicles with their much larger turning radii can significantly impact traffic operations.

Parking Availability/Utilization

While the primary concern is with the movement and business access of traffic along the corridor, parking impacts should also be paid some attention. Besides poor access, lack of adequate parking can also negatively impact the number of trips made to local businesses. With the likely elimination of any on-street parking and the occupation of large portions of parking lots by construction equipment and materials, the construction plan must ensure that adequate levels of parking availability are maintained.

Accident Analysis

An accident analysis of the corridor should be performed to determine if there are any existing accident-prone locations. If so, this must be taken into account so that these problems are not exacerbated, and preferably even reduced. Examining crash frequencies, rates, and severities at the intersections and roadway segments will allow for the identification of any specific problem locations. Special attention will also have to be paid to any high crash locations that involve motorized vehicles and pedestrians or bicycles.

A safety evaluation of a developed traffic control plan should also be conducted before construction begins. For example, entering and exit sight distances should be checked for locations where large machinery will be parked next to driveways (see Figure 1). Roadside sight obstructions at driveways can lead to increased right-angle crashes (for vehicles leaving the driveway) and rear-end crashes (for vehicles performing sudden breaking to either yield to driveway exiting traffic or to make their own turning movement into the driveway).

Level of Service Analysis

A level of service (LOS) analysis should be conducted for the entire corridor as a standard procedure. This would include signalized intersections, unsignalized intersections (e.g., driveways), and the arterial as a whole. LOS analysis will provide an indication of any current critical movements. These critical movements must be carefully considered in the development of the TCP. If any of these critical movements are made

any worse, the general operational level of the entire corridor will be very negatively impacted. The pre-construction LOS analysis will also allow for a direct comparison of traffic operations before and after the construction project. The LOS analysis should be conducted according to the methodologies and procedures of the Highway Capacity Manual 2000.

Contractor Business Accommodation Incentive

Clearly the contractor is mainly in direct control of the construction activity. Consequently the contractor can contribute significantly to improving business accommodation during construction. Business accommodation can be given the same level of attention as other project priorities such as safety and maintaining MOT.

One of the key strategies for improving business accommodation is to provide the contractor with the motivation to do a better job. Incentives have been very effective in obtaining the desired performance. For example incentives have been shown to be a good tool for achieving shortened project delivery times. The concept is for the FDOT to offer a financial incentive that would be tied to the business accommodation performance of the contractor. The details of this incentive plan must be developed in collaboration with the FDOT. A draft Specification and survey document has been developed with input from the FDOT and is included as Appendix J. The research team suggests that the contractor's business accommodation performance be measured by a performance survey to be completed by the businesses adjacent to the project. The survey results would be used to develop a business satisfaction score. Depending upon the duration of the project, this survey of businesses might be done every two months during construction and at a minimum of three times during the project. Of course the amount of the incentive must be decided based upon the nature of the project and its potential impact to businesses.

Pilot Project

Experience has shown that it is difficult to see in advance all of the relevant issues when introducing a new way of doing things into an existing process. Trials are the only true way of knowing what works and what needs to be modified. Given the complexity of the construction process today, conducting a pilot project to try new ideas is a good strategy. The demonstration project provides valuable information for fine-tuning the new processes and subsequent implementation is facilitated by the demonstration success. Therefore, it is particularly important that the concepts developed here be tried in a pilot project.

The research team recommends that the strategies suggested in this report be tried in not less than two pilot projects. A lessons-learned assessment should be made of the results of the pilot projects. The strategies and implementation details should then be revised accordingly prior to general implementation. Likewise, the details and results of the pilot projects should be included in the Final Report on this research study.

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APPENDIX A DETAILED SUMMARY OF MOT SPECIFICATIONS BY STATE

Alabama

Standard Specifications for Highway Construction 2002

104.04 Sequence Of Construction For Handling Traffic Through The Work And Construction And Maintenance Of Detours

(A) General

No highway or section of highway or bridge shall be closed to traffic and no construction operations that will for any reason render the roadway generally unsuitable for use of the traveling public shall be started until adequate provisions have been made to detour or by-pass the traffic in safety and comfort.

Where mail delivery service is to be maintained during construction, the Contractor shall remove mailboxes within the limits of operations before work is begun and set temporarily where they will be accessible to both the mail carrier and the patron. As soon as the state of the work permits and the Engineer directs, the contractor will reset all mailboxes.

(B) Signs and Warning Lights

All signs, barricades, etc used along the project shall be in accordance with the provisions of part VI of the MUTCD, the plan details and the following: Posts shall be appropriately sized for the sign of either timber of not less than 4 inch by 4 inch cross section or metal so spaced to rigidly support the sign.

All signs, barricades, drums, or other devices shall be kept clean, legible, and in their proper position at all times.

Damaged, defaced, or dirty barricades, drums, signs, and other devices shall be repaired or replaced immediately.

The engineer will insure compliance by periodic inspections and require replacements or repair as deemed necessary.

Where there is serious interference from extraneous light sources and a reflector sign is not likely to be effective, the Engineer may require any or all signs and barricades to be illuminated. Illumination shall be accomplished by a 100 watt or greater incandescent or equivalent fluorescent electric light.

(C) Sequence of Construction

Unless otherwise provided by plan details or special provisions included in the contract the sequence of construction for the project shall be the contractors provided the following requirements are met to the satisfaction of the Engineer.

Provide orderly construction of the project.

Provides preparation of any bridge sites as a first order of work.

Provides the handling of traffic through the work in accordance with the details found in sub article (d).

Provides for the working out of minor drainage problems and details of temporary or permanent access as they are encountered.

Provides for the continuous prosecution of all paving work through the final wearing layer, once planning operations, surface treatment operations, or paving operations have begun.

(D) Handling of Traffic

Unless otherwise provided the Contractor shall keep the road open to all traffic while performing the required improvements.

The Contractor shall keep the portion of the project being used by public traffic in such condition that traffic will be adequately accommodated.

The Contractor shall provide and maintain in safe condition temporary approaches, crossings, and intersections with trails, roads, streets, businesses, parking lots, residences, garages, and farms.

The Contractor shall furnish, erect, and maintain barricades, warning signs, delineators, flagmen, and pilot cars in accordance with Part VI of the MUTCD.

The Maintaining of traffic may restrict the movement of construction equipment, and make necessary the use of flagmen for directing the traffic and protecting the work.

Flagmen shall wear either an approved uniform or vest of fluorescent orange and an orange hardhat and be equipped with a stop/slow paddle.

Construction adjacent to the existing pavement will require the use of portable barricades, drums, signs, vertical sign panels, delineators, or other approved traffic control devices.

Traffic control devices shall be supplemented as necessary with warning lights of the kind and type indicated by the plan details, the proposal, or the Engineer.

Equipment working adjacent to traffic lanes should also be equipped with warning lights when deemed necessary by the engineer.

Lights should be amber or orange and should be mounted so that they can be readily seen by traffic at a safe distance.

Arizona

ADOT 2001 Construction Manual

104.04 Maintenance of Traffic

The Contractor is obligated to maintain a safe, smooth, and stable road for the traffic and to install and maintain required traffic control devices.

The Engineer is responsible for verifying that the design of the traffic control plan is appropriate and that the plan is being followed.

Traffic must be able to quickly distinguish the correct path when traveling at a reasonable speed.

Pedestrian access and safety is included in traffic control.

Dust, loose material, and objects too close to the lane of traffic should be kept to a minimum.

Road width, shoulder area, relation of curves, height of driver's eye, and night time visibility should be considered when placing traffic control devices.

The Contractor is responsible for maintenance of existing roadways under construction once the Contractor's equipment uses the road for construction purposes. The Contractor is not responsible for maintaining existing roads, which does not include detours or temporary roadways that deteriorate due to normal wear and tear from ordinary traffic.

(A) Detours

(B) Winter Work Suspension

The Engineer should arrange for the district maintenance staff or the responsible superintendent to review the site prior to release of the Contractor for the winter season.

ADOT crew should leave the project where possible in a condition as close to as possible to that when the suspension started.

Arkansas

Standard Specifications for Highway Construction 2002

104.05 Maintaining Traffic

Unless otherwise provided, the road, while undergoing improvements, shall be kept open by the Contractor to all traffic.

The Contractor shall keep the portion of the project being used by public traffic, whether it is through or local traffic, in such condition that will permit the safe continuous flow of two-way traffic at all times.

When a part of the plans or when approved by the Engineer, areas where the nature of work restricts two-way traffic, one-way operation may be maintained by using flaggers or timed signalization.

The Contractor shall also provide and maintain in a safe condition temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, garages, farms, etc.

The contractor shall bear all expense of maintaining traffic over the section of road undergoing improvement, and construction and maintaining approaches, crossings, intersections, and other features that may be necessary, without direct compensation, unless a pay item for this work is included in the contract.

The Contractor is not required for general snow and ice removal, which will be performed by the state, county, or city forces for the entire length of the project.

Work required other than the normal blading of snow and ice, salting or application of grit necessary to make passable the main roadway shall be accomplished by the Contractor.

Colorado

Standard Specifications for Road and Bridge Construction and Related Special Provisions 1999

104.04 Maintaining Traffic

Unless otherwise provided the Contractor shall keep the road open to all traffic in accordance with the traffic control plan during the progress of the work.

The Contractor shall schedule construction operations so that only one side of the existing roadbed is denied to traffic at any time.

The contractor shall also provide and maintain in a safe condition temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, garages, and farms.

The road and intersections of the access points shall be maintained in a manner that will safely and adequately accommodate traffic.

The Contractor shall not store materials or equipment on the highway except in designated areas.

The Contractor shall not have materials or equipment in traffic lanes open to traffic at any time unless directed.

The Contractor will be responsible for all work included in the contract and maintaining approaches, crossings, intersections, and other features as may be necessary to accommodate traffic.

The department will maintain portions of the Roadway that are not included in the contract.

Snow removal will be the responsibility of the department.

(A) Approved Detours

(B) Maintaining Traffic During Suspension of Work

During any suspension ordered by the Engineer the Contractor shall open to traffic the portions of work as directed.

Prior to allowing traffic on to the project, the Contractor shall prepare the roadbed so that it will safely and adequately accommodate traffic.

During a suspension period, the maintenance of the roadway will be the responsibility of the Department. However, when the suspension is the result of a failure by the Contractor, the Contractor shall pay all costs for maintenance of traffic during the suspension period.

When the suspension is lifted the Contractor shall renew any work, or replace materials lost or damaged on the project and shall remove as directed work or materials used during the suspension and complete the project as though the work was continuous.

All additional work caused during the suspensions for reasons beyond the Contractors control will be paid for according to 104.02 and 104.03

(C) Maintaining Traffic During Free Time

The Contractor shall be responsible for maintaining traffic control items as long as construction operations interfere with traffic.

When construction operations no longer interfere with traffic, the Contractor shall notify the Engineer in writing and shall adhere to the same procedures as in (B).

The Contractor shall notify in writing the Engineer when construction operations that interfere with traffic will resume.

(D) Maintenance Directed by the Engineer

If the Engineer directs special maintenance for the benefit of the traveling public that is not part of the Contract, then the Contractor will be paid in accordance to 104.02 or 104.03.

Delaware

Standard Specifications for Road and Bridge Construction Aug 2001

105.13 Maintenance During Construction

The Contractor shall maintain the work during construction until the project is accepted.

Maintenance shall be performed continuously with adequate equipment and forces to keep the roadwork structures in satisfactory condition.

The Engineer will notify the Contractor if there is failure to comply with these provisions.

If the Contractor fails to remedy unsatisfactory conditions within 24 hours, the Engineer may proceed to maintain the project. The entire cost of maintenance will then be deducted from the monies owed to the Contractor.

If the contract involves the placement of material on or the use of a previously constructed sub grade, base course, pavement or structure, the contractor shall maintain the previously constructed work during construction operations.

The cost of maintenance during construction and before the Project is accepted shall be incidental to the Contract.

In the event that the Contractor's work is ordered shut down for failure to comply with the provisions of the contract, the Contractor shall maintain traffic, protect and maintain the roadway and structures, and provide ingress and egress for local residents as may be necessary during the period of suspended work or until the contract has been declared in default.

Florida

Standard Specifications for Road and Bridge Construction 2000

Section 102 – Maintenance Of Traffic

102-1 General Provisions

102-1.1 Description

Maintain traffic within the limits of the project for the duration of the construction period.

Construct and maintain any detour facilities

Provide access to residences and businesses along the project.

Furnish, install, and maintain traffic control and safety devices during construction.

Furnish and install work zone pavement markings for maintenance of traffic in construction areas.

Furnish and apply calcium chloride on the subgrade, unsurfaced base, or other unsurfaced traveled ways in order to control dust during construction operations.

Provide any other special requirements for safe and expeditious movement of traffic as may be specified in the plans.

Maintenance of Traffic includes all such facilities, devices, and operations required for the safety and convenience of the public as well as for minimizing public nuisance.

102-1.2 Sections Not Requiring Traffic Maintenance

Do not maintain traffic over those portions of the project where no work is to be accomplished or where construction operations will not affect existing roads.

Do not obstruct or create a hazard to any traffic during the performance of the work and repair damage to existing pavement or facilities caused during the work.

102-1.3 Detours

102-1.4 Contractors Responsibility

Maintain traffic starting the day work begins on the project or on the first day the Contract Time is charged, whichever is earlier.

Continually and adequately review traffic control devices to ensure proper installation and working order, including monitoring of lights.

Provide an individual responsible for this review who is certified as an American Traffic Safety Services Association Certified Worksite Supervisor.

102-1.5 Operation of Existing Movable Bridges

102-2 Specific Requirements

102-2.1 Maintenance of Roadway Surfaces

Maintain all lanes that are being used for the maintenance of traffic including those on detours and temporary facilities, under all weather conditions.

Keep lanes reasonably free dust.

Provide lanes with drainage facilities necessary to maintain a smooth riding surface under all weather conditions.

102-2.2 Number of Traffic Lanes

Maintain one lane of traffic in each direction.

Maintain two lanes of traffic in each direction at existing four lane cross roads.

Construct each lane used for maintenance of traffic at least as wide as the traffic lanes existing in the area prior to commencement of construction.

Do not allow traffic control and warning devices to encroach on lanes used for maintenance of traffic.

Engineer may allow Contractor to restrict to one-way operation for short periods of time provided that the Contractor employs adequate means of traffic control and does not unreasonably delay traffic.

During one-way operations, locate flaggers with view of each other. If visual contact is not possible equip flaggers with two-way radios, use flag-carrying, official or pilot vehicles, or use traffic signals.

102-2.3 Crossings and Intersections

Provide and maintain adequate accommodations for intersecting and crossing traffic.

Do not block or unduly restrict any road or street crossing the project unless approved by the Engineer.

102-2.4 Access for Residences and Businesses

Provide access to all residences and all places of business.

102-2.5 Protection of the Work from Injury by Traffic

Where traffic would be injurious to a base, surface course, or structure constructed as part of the work, maintain all traffic outside the limits of such areas until the potential for injury no longer exists.

102-2.6 Alternative Traffic Control Plan

Contractor may propose an alternative Traffic Control Plan to the plan presented in the Contract Documents.

Contractor must obtain written approval from the Engineer before beginning work using an alternate plan.

The Engineer will only allow changes to the plan in an emergency.

Perform daily inspections, including weekends and holidays, with some inspections at nighttime, of the installations on the project.

Replace all equipment and devices not meeting the approved standards during that inspection.

Regardless of the Traffic Control Plan used, maintain the work zone in safe condition.

102-2.7 Law Enforcement Services

Where specified in the Traffic Control Plan, provide uniformed off-duty law enforcement officers, including marked law enforcement vehicles, to assist in controlling and directing traffic in the work zone.

102-3 Traffic Control

102-3.1 Standards

FHWA MUTCD (Manual on Uniform Traffic Control Devices) is the minimum standard for Highway Construction, Maintenance, and Utility Operations.

Follow the basic standards contained in this manual for the design, application, installation, maintenance, and removal of all traffic control devices, all warning devices, and all barriers that are necessary to protect the public and workers from hazards within the project limits.

The standards in the aforementioned manual constitute the minimum requirements for normal conditions. The Engineer will require will require additional traffic

control devices, warning devices, barriers, or safety devices, where unusual, complex, or particularly hazardous conditions exist.

102-3.2 Traffic Control Devices, Warning Devices and Barriers

102-3.2.1 – Installation

Install and maintain adequate traffic control devices, warning devices and barriers to protect the traveling public, safeguard the work area, prevent any hazardous conditions in conjunction with traffic re-routing.

Use only devices that are included on the Qualified Products List (QPL). Use construction signs meeting the requirements of 700-2.5 and 700-5.5. Other specific requirements for the Maintenance of Traffic devices are contained in the 600 series of Roadway and Traffic Design Standards.

Immediately remove, turn, or cover any devices or barriers that do not apply to existing conditions.

Notify Engineer of any scheduled operation that will affect traffic patterns or safety, sufficiently in advance of commencing such operation to permit his review of the plan for the proposed installation of traffic control devices, warning devices or barriers.

Assign an employee the responsibility of maintaining the position and condition of all traffic control devices, warning devices, and barriers throughout the duration of the contract. Keep the Engineer advised at all times of the identification and means of contacting this employee on a 24-hour basis.

102-3.2.2 Maintenance of Devices and Barriers

Keep traffic control devices, warning devices, and barriers in the correct position, properly detected, clearly visible, and clean at all times.

102-3.2.3 Temporary Impact Attenuators

102-3.2.4 Flagger

Provide trained flaggers to direct traffic where one-way operation in a single lane is in effect.

The worksite Traffic Supervisor or others approved by the department will provide training for flaggers using department-approved training materials.

102-3.2.5 Existing Pavement Markings

Remove all pavement markings that will conflict with the adjusted vehicle paths.

Remove existing pavement markings using a method that will not damage the surface texture of the pavement and which will eliminate the previous marking pattern regardless of weather and light conditions.

102-3.2.6 No Waiver of Liability

The procedures and policies described herein in no way act as a waiver of any terms of the liability of the contractor or his surety.

102-3.3 Work Zone Pavement Markings

102-3.3.1 General

Provide centerlines, lane lines, edgelines, stop bars, and turn arrows in work zones in accordance with section 6D of the MUTCD.

Install edgelines when a paved shoulder 4 feet or greater exists along the edge of a lane.

Place edgelines on all detours, where vehicles paths are altered from normal operations and where a lane narrows from its normal width for any reason.

Apply work zone pavement markings, including arrows and messages determined by the Engineer to be required for safe operation of the facility prior to the end of the day if the highway is open to traffic.

The Engineer or the plans will designate work zone pavement markings as removable or non-removable. The contractor may substitute removable pavement markings for non-removable pavement markings. If so, the department will make payment under removable pavement markings.

102-3.3.2 Materials

102-3.3.2 Construction Methods

102-4 Detours

102-5 Calcium Chloride For Dust Control

102-5.1 General

The engineer will direct the locations and the time of using calcium chloride for dust control

Regardless of the quantities that may be shown in the proposal, consider this work as being entirely contingent.

102-5.2 Materials

102-5.3 Equipment

102-5.4 Application

102-6 Materials for Driveway Maintenance

Place material in driveways to residences and businesses to provide safe, stable, and reasonable access.

Provide material of the type typically used for base and having stability and drainage properties that will provide a firm surface under wet conditions.

Place, level, manipulate, compact, and maintain the material, to the extent appropriate for the intended use.

As permanent driveway construction is accomplished at a particular location, the Contractor may salvage and reuse previously placed materials that are suitable for reuse on other driveways.

102-7 Method of Measurement

Illinois

Standard Specifications for Road and Bridge Construction Adopted January 1, 2002

104.04 Maintenance of Detours

107.09 Public Convenience and Safety

The Contractor shall notify the Engineer at least 3 days before starting any construction work that might in any way inconvenience or endanger traffic.

The Contractor shall at all times conduct the work in such a manner as to ensure the least obstruction to vehicular and pedestrian traffic.

When directed by the Engineer, the Contractor shall provide and maintain an acceptable surface aggregate for temporary roads and approaches for access to driveways, houses, buildings or other property abutting the highway or street being improved.

The cost incurred by the Contractor for providing temporary roads will be paid for as extra work.

The Engineer may require the Contractor to finish a section on which work is in progress before work is started on any additional sections if the opening of such section is essential to public convenience.

No broken pavement, open holes, trenches, barricades, cones, or drums will remain on or adjacent to the traveled way and all lanes shall be opened to traffic during any legal holiday.

When any construction work is performed on structures over pavements that are open to traffic, the Contractor shall protect the traffic from falling objects.

When construction work will create horizontal or vertical clearance reductions, the contractor shall notify the Engineer in writing one week in advance of performing the work involved.

If vertical clearance is reduced to less than 4.42m, the Contractor shall in addition to notifying the Engineer furnish "LOW CLEARANCE" signs and possibly advanced warning signs.

Except for the cost of providing temporary roads and approaches, all costs shall be considered in the contract bid price and no extra compensation will be allowed.

107.14 Maintenance of Traffic

Contractor shall protect the workers and provide for safe and convenient public travel by providing adequate traffic control.

The traffic control shall conform to the Traffic Control Plan, included in the contract, and to the requirements of Section 701.

107.15 Dirt on Pavement or Structures

The contractor shall clean the pavement of all dirt and debris at the end of each day's operations, and at other times as directed by the Engineer.

The Contractor shall furnish, erect, and maintain "SLIPPERY WHEN WET" signs at such locations when required during wet weather.

107.20 Protection and Restoration of Property

If corporate or private property interferes with the work, the contractor shall notify, in writing, the owners of such property, advising them of the nature of the interference.

The Contractor shall take all necessary precautions for the protection of corporate or private property.

The Contractor shall protect and preserve all official survey monuments.

The Contractor shall be responsible for the damage or destruction of property of any character resulting from neglect, misconduct, omission, defective work, or defective materials.

Whenever public or private property is damaged or destroyed the Contractor shall restore such property to a condition equal to that existing before such damage was done.

The Contractor shall remove all mailboxes that interfere with construction and erect them at temporary locations. Once permitted by the Engineer the Contractor shall return the mailboxes to their original positions.

All costs associated with the protection and restoration of property are considered included in the unit bid prices of the contract and no additional compensation will be allowed.

107.25 Protection and Restoration of Traffic Signs

All traffic signs within the limits of construction that interfere with construction shall be removed by the Contractor once instructed by the Engineer.

Any signs the Engineer determines are essential to the safe and orderly flow of traffic shall be re-erected immediately by the Contractor at temporary locations.

Signs shall be erected in a straight and neat condition for the duration of their temporary mounting.

Signs that are not to be re-erected shall be stored off the ground in a covered area and returned to their original locations as soon as construction operations permit it.

Any sign or post that the Engineer determines has been damaged shall be replaced by the contractor.

Indiana

Standard Specifications for Road and Bridge Construction 1999

Effective on or after March 1, 2003

104.04 Maintenance of Traffic

Unless otherwise provided, the road shall be kept open to all traffic while undergoing improvements.

Maintenance of traffic shall be in accordance with the details shown on the plans or as directed.

If an alternate plan for maintaining traffic is requested it shall be submitted in writing as soon as possible for consideration.

The plan shall include the complete details of the alternate maintenance of traffic plan including all traffic control devices that will be included.

The alternate plan shall not increase the cost of maintaining traffic to the department.

The Portion of the roadway to be used by public traffic shall be kept in such condition that such traffic will be adequately accommodated.

Temporary approaches to businesses, parking lots, residences, garages, farms, and crossings and intersections with trails roads and streets shall be provided in a safe condition.

Regulatory controls shall not be changed by the contractor without prior approval.

The cost of maintaining traffic shall be included in the contract unit price bid for maintenance of traffic bid items.

(A) Special Detours

(B) Maintenance Directed by the Engineer

The Engineer will be sole judge on whether special maintenance shall be performed.

Unless otherwise stated in the contract existing public roads shall be kept open to two-way traffic between the dates of December 1 and April 1.

Public roads, commercial and private drives, and mailbox approaches which are disturbed on partially completed roads shall be maintained in a condition that is satisfactory for use during the time work is suspended.

During suspension of work where approaches have not been constructed to grade, a satisfactory temporary surface shall be provided with no additional payment.

(C) Blank

(D) Traffic Control for Patching on a Two-Lane Roadway

Only one lane may be closed at a time.

Traffic restrictions will be permitted during daylight hours only.

Louisiana

Standard Specifications Manual 2000

104.03 Maintenance of Traffic

The Contractor shall make reasonable provisions for local traffic through the length of the project and the life of the contract.

The Contractor may also be required to provide for through traffic over the entire project.

The Contractor shall keep the portion of the project being used by public traffic, whether through or local traffic, in such condition that traffic will be adequately accommodated.

The contractor shall furnish, erect, and maintain barricades, warning signs, and delineators, and shall provide flaggers and pilot cars in accordance with the plans and the MUTCD.

The Contractor shall provide and maintain in a safe condition all temporary approaches or crossings and intersections with roads, streets, businesses, parking lots, residences, garages, and farms.

The Engineer may require contractor to perform additional measures for the benefit of the traveling public and will therefore compensate the Contractor additionally.

107.07 Public Convenience and Safety

The Contractor shall conduct the work to assure the least possible obstruction to traffic.

The project site and haul route should be kept reasonably free from dust and in such a condition that the public can travel safely

Safety and convenience of the public and the residents along the work and protection of persons and property shall be a primary responsibility of the Contractor.

Adequate artificial lighting, signs, flaggers, or other traffic controls shall be provided by the Contractor for night work.

Contractor shall submit a Traffic Control Plan for night work when work affects traffic safety.

The Contractor shall cease operations if instructed by the Engineer if the TCP proves to be inadequate or the work appears to be too hazardous.

Massachusetts

Standard Specifications for Highways and Bridges 1995

104.07 Maintenance of Detours

107.09 Public Safety and Convenience

The Contractor shall be responsible for the protection of the work and shall take all precautions for preventing injuries to persons or damage to property on or about the project.

Where the contract involves dredging, excavation or other construction work in navigable waters, the work shall be constructed to cause no obstruction to vessels.

The Engineer will make the decision for routing traffic through or around work.

Special detours will be provided for truck and bus traffic where advisable.

On major projects and projects in urban areas traffic patterns and schedules will be studied in the design stage and included in special provisions.

Temporary closings of highways should be kept to a minimum, but the Contractor upon approval from the Engineer and after speaking to the Police Chief and Fire Chief of the municipalities concerned may temporarily close highways.

The Contractor shall conduct work in a manner acceptable to the Engineer so that reasonable safe uninterrupted traffic flow is maintained through the project during the entire construction period over traffic lane patterns approved by the Engineer.

The Contractor shall provide and maintain in a reasonably safe condition the temporary approaches and the crossings of intersecting highways.

The Contractor shall maintain all temporary roadways in a manner that will provide reasonably safe and convenient travel.

The Contractor shall conduct the work at all times so that abutters have reasonable access to their property.

When public or private property is isolated by the closure of a road the Contractor shall be responsible for providing such reasonably safe means of access to a public way as the Engineer deems essential. The Contractor shall be compensated for such work at the unit price for those types of work and materials involved.

Trenches shall not be opened in traveled ways until all materials and equipment required for the work are at the site and available for immediate use.

When work is not in progress and trenches are subject to public travel the trenches shall be covered with steel plates. Work in trenches shall be practically continuous.

Pending installations of castings, all structures in travel ways or deemed hazardous by the engineer shall be protected with suitable covers.

107.10 Barricades and Warning Signs

The Department may furnish, erect, and maintain, regulatory, warning, and guide signs, traffic control signals, markings, safety lighting and any other traffic devices as it deems necessary for the safe flow of traffic during construction.

The Contractor shall erect acceptable or as directed barricades, barrier fences, traffic signs, and all other traffic devices to protect the work from traffic pedestrians and animals.

All barricades, barrier fences, traffic signs, and other traffic devices must conform with the departments manual on Uniform Traffic Control Devices.

107.11 Traffic Officers and Railroad Flagging Service

The Contractor shall provide such police officers as the Engineer deems necessary for the direction and control of traffic within the site of the improvement.

Officers shall wear regulation policemen's uniforms and they may be reserve or special officers either being paid by the contractor or by the municipality.

The rate of pay for the Officers will be equal to the rate of pay for police officers working on special detail.

107.13 Protection and Restoration of Property

The contractor shall preserve and protect from injury all property either public or private along and adjacent to the proposed work.

The Contractor shall be responsible for and repair all damage and injury thereto, arising out of or in consequence of any act of omission, neglect, or misconduct in the execution of work or in consequence of the non-execution of work.

Michigan

2003 Interim Standard Specifications for Construction

103.06 Maintenance During Construction

When through traffic is maintained the Contractor shall perform routine maintenance on that portion of the roadbed surface on which construction operations have begun.

The Contractor may not perform any routine maintenance work without written approval from the Engineer.

The contractor shall be responsible for routine maintenance on all temporary roads constructed by the contractor.

The Contractor shall provide at the Contractors expense reasonable access for local traffic to property along the project.

The contractor shall make all repairs or renewals required due to defective materials, faulty workmanship, to operations, to operations of the Contractor, and to work not protected properly from natural causes.

All traffic control devices required to warn and protect traffic from Contractor damaged facilities and repair operations shall be furnished, installed, and operated at the Contractors expense.

107.07 Protection and Restoration of Property

The Contractor shall restore at the Contractor's expense all public and private property damaged or destroyed by the contractor.

If the Contractor fails to make a restoration within 24 hours, the Engineer may after 48 hours proceed to make the property restoration, at the cost of the Contractor.

Minnesota

MN/DOT Standard Specifications for Construction 2000 Edition

1514 Maintenance During Construction

The Contractor shall maintain the project and construction work until expressly relieved of this obligation by the Department.

Maintenance during construction shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces to the end that all roadways and structures are kept in satisfactory condition at all times.

If the Contractor fails to comply, the Engineer will notify the Contractor of the default. The Contractor then has 24 hours to remedy the situation after receipt of written notice. After 24 hours the Department may proceed to maintain the work and deduct the entire cost from money owed to the Contractor.

Missouri

Missouri Standard Specifications for Highway Construction

104.7 Maintenance of Traffic Operations During Construction

The Contractor shall maintain a safe and uninterrupted traffic flow for local traffic and through traffic at all times during construction.

The Contractor shall maintain the roadbed substantially free of ruts, holes, and detrimental surface conditions.

The Contractor shall control vegetation height and provide and maintain in a safe condition approaches, crossings and intersections, with abutting property to the highway, railroads, trails roads and streets.

104.8 Surfacing for Temporary Use

When directed by the Engineer, the Contractor shall apply temporary surfacing to provide proper ingress and egress to private property, across the project or along the roadway where the Contractor maintaining a reasonably smooth and drainable earth surface cannot handle the traffic properly.

104.10 Mailboxes Signs and Markers

Mailboxes within the project limits shall be removed by the Contractor before the work is begun and set where they are accessible to both the carrier and the patron.

Signs and markers within the limits of operations shall be removed by the contractor before work is begun.

All signs required for safe control of traffic shall be temporarily reset.

If the nature of the construction makes temporary relocation impractical, the signs may be placed on movable supports.

Stop signs and yield signs shall be maintained where they are readily visible to traffic at all times.

All required sign and markers must be properly located to control traffic at all times.

Nebraska

Standard Specifications for Highway Construction

104.05 Maintenance of Detours and Shooflies

The Contractor shall at all times at to the extent possible provide private dwellings, commercial properties, businesses, and public facilities access to and from the nearest intersecting public road or street.

Accommodations shall be made to ensure all local traffic that has its origin or destination within the limits of the project has access to all private dwellings, commercial properties, businesses, and public facilities.

Temporary approaches and crossings constructed for the public use shall be maintained in a safe condition by the contractor.

The contractor shall not close any road without the permission of the Engineer.

Although a road is closed, limited access must be maintained for authorized local traffic.

New Hampshire

NHDOT Standard Specifications for Road and Bridge Construction

104.07 Maintenance of Traffic

The Contractor shall keep all roads open to all traffic during construction.

The Section of the project being used by the public traffic shall be kept in a condition that safely and adequately accommodates traffic.

The Contractor shall furnish, erect and maintain barricades, warning signs, delineators, striping, flaggers, and pilot cars in accordance with the MUTCD.

(B) Maintenance of Traffic During Suspension of Work

The Contractor shall make passable and open to traffic the sections of the project and temporary roadways as agreed upon between the Contractor and the Engineer.

During the suspension period the maintenance of the temporary roadway and sections of the project will be the responsibility of the department.

When work is resumed the Contractor will replace and restore any work or materials lost and complete the project as though work had been continuous and without interference.

(C) Maintenance Directed by the Engineer

If the Engineer directs special maintenance for the benefit of the traveling public not otherwise included in the contract, payment will be based on unit price of work.

107.06 Public Convenience and Safety

Construction shall be conducted in a manner so that obstructions to traffic are minimized.

No footways, gutters, sewer inlets, or portions of highways adjoining the highway shall be obstructed more than necessary.

The Contractor shall be responsible for proper and timely notification to local residents prior to any interruptions of their access or services.

If all or part of the highway is officially closed the Contractor shall provide and maintain safe and adequate traffic accommodations for residences and businesses along and adjacent to the highway closed.

107.07 Barricades and Warning Signs

The Contractor shall provide, erect, and maintain barriers, barricades, lights, signals, signs, and other traffic control devices, and shall take all necessary precautions for the protection of the work and safety of the public.

Highway sections closed to traffic shall be protected by effective barriers. Obstructions shall be illuminated. Warning signs shall be provided to control and direct traffic.

The Contractor shall erect warning signs in advance of operations that may interfere with the use of the road by traffic and where new work crosses or coincides with an existing road.

Warning signs shall be placed according to the traffic control plan and maintained in accordance with the contract and may not be removed without the authority of the Engineer.

The Contractor will be held responsible for all damage to the Work from traffic due to lack of protective devices.

New Mexico

Standard Specifications for Highway and Bridge Construction

104.5 Maintenance of Traffic

The Contractor shall furnish, erect, and maintain barricades, warning signs, flaggers, and pilot cars in accordance with the MUTCD, the Traffic Control Plan, and the Requirements of Division 700 Traffic Control Devices.

The Contractor shall take all steps necessary to either keep the existing roadway open with a minimum of inconvenience to the traveling public or provide an approved alternate route.

The Contractor's equipment shall enter and exit the traveled way only in the direction of public traffic. All movements on or across the traveled way shall be performed in a manner that will not endanger the traveling public.

When directed by the engineer the Contractor will maintain the pavement surface of the lanes open to traffic adjacent to the work zone within the limits of the project traffic control.

107.9 Public Convenience and Safety

The Contractor shall provide for the safety and convenience of the general public and the residents along the highway and the protection of person's and property.

North Dakota

Standard Specifications for Road and Bridge Construction

(A) Maintaining Traffic

(1) General

Construction work shall be conducted to minimize obstructions to traffic. The safety and convenience of the public and residents along the highway and the protection of persons and property shall be provided for by the contractor.

The roadway shall be kept open to all traffic during progress of the work.

The portion of the roadway being used by public traffic shall be kept in a condition that safely and adequately accommodates traffic.

The Contractor shall also provide and maintain in a safe condition temporary approaches or crossings and intersections with trails, roads, streets, businesses, parking lots, residences, garages, and farms.

The Contractor shall furnish, erect, and maintain all necessary barricades warning signs, lights, and traffic control devices to protect the work and safety of the public and the workers.

(3) Maintenance of Traffic during suspension of work

The contractor shall make passable and shall open to traffic the portions of the project and temporary roadways as agreed upon during anticipated periods of suspension.

During suspension, maintenance of temporary work will be the obligation of the department.

When work is resumed, the Contractor will complete the project as though work was continuous.

(5) Parking of Equipment, Vehicles, and Stored Materials

The parking of equipment, vehicles, and storing of materials in the median on a divided highway is not permitted. Equipment, vehicles, and materials must be at least 60 feet from outside edge of driving lane.

(6) Urban Work

Where work is to be performed in a city, the Contractor shall give the Chief of the Fire Department and the Chief of Police at least 24 hours written notice before blocking any street.

No Material or other obstruction shall be placed closer to a fire hydrant than permitted by ordinances, rules, or regulations or within 5 feet in the absence of any ordinances.

If dust from construction operations becomes a hazard to traffic or a nuisance to the public, a vacuum or a pickup sweeper shall be available for controlling dust.

Ohio

State of Ohio Department of Transportation Construction and Material
Specification 1/1/97

104.04 Maintenance of Traffic

For local traffic facilities local pedestrian and vehicular ingress and egress shall be provided at all times for the property adjacent to work.

For through traffic the special provisions or plans will designate whether the highway will be closed with detours, temporary roads, and run-arounds provided, or whether traffic will be maintained through all or portions of the project.

614 Maintaining Traffic

614.02 Traffic Facilities

Facilities for vehicular and pedestrian traffic including temporary wks, roads, bridges, culverts, and traffic control devices shall be constructed and maintained by the contractor.

Local Traffic – Contractor shall provide and maintain in safe condition, drives, intersections, crossings, temporary approaches, temporary roads, run-arounds, walks, temporary structures, and other facilities as may be necessary to provide safe pedestrian and vehicular ingress and egress for all property adjacent to the improvements.

Through Traffic – Contractor shall maintain that portion of the highway being used, that is smooth, free from holes, ruts, ridges, bumps, and dust. The highway being used shall be provided with the necessary outlets for drainage.

The department will be responsible for maintenance of public highways that are used as a detour beyond the work limits of the contract as well as snow removal and placing abrasives. The Contractor will be responsible for removing abrasives.

614.04 Work Zone Marking Signs

The Contractor shall furnish, install, maintain, and subsequently remove work zone marking signs and their supports within the work limits in accordance with the following requirements.

Contractor shall erect a “NO EDGE LINES” sign in advance of any section of roadway lacking standard edge line markings. These signs shall be removed when they no longer apply.

The contractor shall erect a “DO NOT PASS” sign at the beginning and a “PASS WITH CARE” sign at the end of each no passing zone lacking standard centerline markings.

614.06 Traffic Maintained

Contractor shall furnish and maintain pavement markings, lights, construction signs, barricades, temporary guardrail, temporary sign supports and such other traffic control devices, law enforcement officers, watchmen and flaggers as may be necessary to maintain safe traffic conditions within the work limits.

Existing signs and traffic control devices within the work limits shall remain in use during the construction period unless otherwise specified on the plans.

The function of existing "STOP" or "YIELD" signs shall be retained at all times although their position may be adjusted with the approval of the Engineer.

Signs that are relocated shall be restored to where they existed prior to construction as directed by the engineer.

When an existing signal operation must be interrupted for a period, the Contractor shall provide a temporary traffic control method approved by the Engineer.

Contractor shall mark clearly the channel that traffic is being diverted into with cones, drums, barricades, vertical panels, pavement markings, or flashing arrow panels.

The Contractor shall obtain the approval of the Engineer before closing a traffic lane or establishing a one-way traffic operation.

614.07 Flaggers

Whenever one-way traffic is established, at least two flaggers shall be used unless otherwise authorized by the Engineer.

The Contractor shall maintain positive and quick means of communication between the flaggers at the opposite ends of the restricted area.

While flagging, flaggers shall not perform other work activities.

The Contractor may in lieu of flaggers install and operate a temporary traffic signal or signals for the purpose of regulating traffic in accordance with a written agreement approved by the Engineer.

614.08 Law Enforcement Officer

When specified in the plans, the Contractor shall provide for the services of a **law** enforcement officer and a patrol car equipped with flashing lights.

Pennsylvania

Commonwealth of Pennsylvania Department of Transportation Specifications Pub
408/2000

105.13 Maintenance of Performed Work

(A) Maintenance of Performed Work

The Contractor shall maintain performed work, making continuous and effective efforts with adequate equipment and forces to keep the roadway or structures in satisfactory condition at all times during construction.

(B) Maintenance During Temporary Suspension of Work

The Contractor shall satisfactorily store all materials and take every precaution to prevent damage or deterioration of performed work.

The Contractor shall provide suitable drainage for the roadway by constructing temporary shoulders, by opening culverts, inlets, and parallel ditches and by erecting temporary drainage structures where necessary.

The entire project under contract, or any section, may be opened to traffic, as directed. If opened to traffic, the Contractor shall maintain the roadway in satisfactory condition and maintain local traffic.

The Contractor shall satisfactorily protect the ends of any sections of ridged-type base course, pavement, or wearing surface opened to traffic.

The Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established planting, seeding, and sod furnished under the contract.

107.12 Care of Public and Private Property

The Contractor shall not damage overhead or underground utilities and structures or property within or adjacent to the project.

Protect all land monuments and property markers, which are to be affected by the construction until the Department has correctly referenced them.

Promptly make restitution for or repair or restore damaged public or private property.

South Dakota

Standard Specifications for Roads and Bridges

104.4 Maintenance of Traffic

The Contractor shall keep the road open to traffic in accordance with the required Traffic Control Provisions. The Contractor shall keep the portion of the project being used by public traffic in a condition that will adequately and safely accommodate traffic.

The Contractor shall provide and maintain in a safe condition temporary approaches or crossings and intersection with trails, roads, streets, businesses, parking lots, residences, garages and farms.

The Contractor shall be required to maintain the entire project from the time that the work begins to the time that the project is accepted.

(B) Maintenance of Traffic During Suspension of Work

Contractor shall prepare the project as directed by the Engineer to provide for the accommodation of traffic during the anticipated period of suspension.

Until an order for resumption of construction operations is issued, the maintenance of the project for traffic, to the extent specified in writing by the Engineer will be by the Department.

When the project is resumed the Contractor shall be responsible for maintenance of traffic and shall repair work or materials lost or damaged during the period of suspension.

107.7 Public Convenience and Safety

The Contractor shall conduct his work to minimize obstruction to traffic. The Contractor shall provide for the safety and convenience of the general public and the residents along the highway and the protection of persons and property.

The Contractor shall be required to eliminate dust, which causes a hazard or nuisance, by the application of water or other acceptable measure in the amounts directed by the Engineer.

Texas

1993 Standard Specifications Book

Item 502 Barricades, Signs, and Traffic Handling

This Item shall govern for providing, installing, moving, replacing, maintaining, cleaning, and removing upon completion of work, all barricades, signs, cones, lights, and other such type devices and of handling traffic as indicated on the plans or as directed by the Engineer.

Item 510 One Way Traffic Control

The Contractor shall furnish a pilot vehicle, driver, and flaggers for expediting the safe and efficient passage of traffic through the work zone under one-way controls. The flaggers shall have the qualifications and meet the requirements set forth in the MUTCD.

Flaggers shall be stationed at each entry point to the work zone to stop all oncoming traffic and to instruct the drivers to follow the pilot vehicle and not pass the cars ahead.

Utah

2002 English CSI Standards

Scope of Work

1.8 Maintaining Traffic – General

Keep roads open to traffic during the work or provide and maintain detour roads as specified or directed.

Keep publicly or privately used roadways in a state of construction that safely and adequately accommodates traffic 24 hours a day 7 days a week.

Provide traffic control in compliance with the current edition of the MUTCD, the Traffic Control provisions of the Specifications and the Traffic Control Plans.

Maintain the sections of road undergoing improvement.

Do not park equipment and vehicles or store materials in the median on divided roadways within 10 feet from the outside edge of the driving lane.

Install guardrail so that uncompleted guardrail ends are not exposed to oncoming traffic.

Snow removal is not required during periods of winter shutdown or when the Department suspends construction operations.

1.10 Maintaining Traffic – During Suspension of Work

Keep sections of the project and temporary roadways passable and open to traffic during work suspensions

During suspensions ordered by the Engineer, the Department maintains temporary roadways and portions of the project. The Contractor shall resume maintenance for the entire project once work proceeds. Replace or restore any work or materials lost or damaged. Complete the project as if work was continuous.

During other Suspensions of work including seasonal or climate conditions, failure to correct defects, failure to carry out orders of the Engineer, or any other reasons caused by the Contractor, the Contractor shall maintain the roadway at no additional charge.

1.11 Maintaining Traffic – As directed by the Engineer

Department pays for special maintenance directed by the Engineer that is not included in the original plans for the benefit of the traveling public per unit prices.

The Engineer determines the work to be classified as special maintenance.

Legal Relations and Responsibility to Public

1.10 Public Convenience and Safety – Traffic and Pedestrians

Perform construction with minimal obstruction to traffic

Follow safety provisions of all applicable laws, rules, codes, and regulations, to ensure the safety and convenience of the public and property.

Provide, erect, maintain all traffic control devices such as barriers, barricades, and warning signs to protect the work and the public safety.

Use barriers and barricades to delineate highway sections closed to traffic.

Illuminate obstructions during darkness and provide warning signs to control and direct traffic.

Erect warning signs before work that may interfere with traffic or where work crosses or coincides with an existing road.

For pedestrians place and maintain warning signs under project traffic control plans and provide pedestrian access in area where construction interferes with existing sidewalks.

Virginia

2002 Specifications Book

104.04 Maintenance During Construction

The Contractor shall maintain the work from the beginning of construction operations until final acceptance.

The road shall be kept open to all traffic while undergoing improvements. The contractor shall keep open the portion of the project being used by the public, pedestrian, and vehicular traffic in such condition that traffic will be adequately accommodated.

The Contractor shall bear all costs of performing maintenance work before final acceptance and of constructing and maintaining necessary approaches, crossings, intersections, and other features without direct compensation.

The Contractor shall keep the portions of the road being used by the public free from irregularities and obstructions that could present a hazard to traffic.

(B) Maintenance of Traffic During Suspension of Work

During any suspension of work, the Contractor shall temporarily open to traffic such portions of the project and the Contractor and Engineer may agree temporary roadways as on.

(C) Flagging Traffic

Certified flaggers shall be provided for control and protection of vehicular and pedestrian traffic in accordance with the requirements of the MUTCD.

(D) Delays

Unless otherwise approved, two-way traffic shall be maintained at all times.

If one-way traffic is approved, the Contractor shall provide flaggers to direct the traffic or a approved traffic signal for the control of one way traffic.

(E) Connections and Entrances

Connections with other roads and public and private entrances shall be kept in a reasonably smooth condition at all times.

The Contractor shall not disturb connections or entrances until necessary.

Once connections or entrances have been disturbed the Contractor will maintain them.

Connections

Connections that had an original paved surface shall be brought to final grade through the intersection.

At least two lanes shall be paved as soon as possible after connections are disturbed.

Other connections shall be brought to final grade through the intersection, and the required material or temporary aggregate stabilization course shall be placed as soon as possible after connections are disturbed.

If there are delays in prosecution of work for connections, connections that were originally paved shall have at least two lanes maintained with a temporary paved surface. Those that were not originally paved shall be maintained with a temporary aggregate stabilization course.

Entrances

Entrances shall be graded concurrently with the roadway with which they intersect.

Once an entrance has been disturbed, it shall be completed as soon as practical.

If the entrance must be constructed in stages the surface shall be covered with a temporary aggregate stabilization course until the entrance can be completed and the required base and surface stabilization course can be placed.

The Contractor shall schedule construction operations so that approved continuous access is provided for all property adjacent to the construction when property is shown on the plans to require access unless other approved access is provided and is acceptable to the property owner.

(F) Grading Operations

When the surface is to be widened on both sides of the existing pavement construction operations involving grading or paving shall not be conducted simultaneously on sections directly opposite each other.

The surface of pavement shall be kept free from soil and other materials that might be hazardous to traffic.

(G) Hydraulic Embankment

Where the Contractor's suction or discharge pipes cross the surface of an existing traveled highway, they shall be bridged as directed by the Engineer. Traffic shall be protected by the display of warning signals both day and night.

(H) Patching Operations

Where existing hydraulic cement concrete pavement is to be patched, the operation of breaking and excavating old pavement shall extend for distance no more than 2 miles and should be coordinated with excavating so that not more than ½ mile is left unpatched at the end of the day.

(I) Temporary Structures

The Contractor shall construct, maintain, and remove temporary structures and approaches necessary for use by traffic.

After new structures have been opened to traffic, temporary structures and approaches shall be removed.

(J) Failure to Maintain Roadway or Structures

If the Contractor fails to remedy unsatisfactory maintenance immediately after receipt of a notice by the Engineer, the Engineer may proceed adequate forces, equipment, and material to maintain the project.

104.05 Removing and Disposing of Structures and Obstructions

(A) Signs

The Contractor shall relocate street name signs, no parking signs, and other traffic signs within the construction limits that conflict with construction work as approved by the Engineer.

Signs that are not needed for the safe and orderly control of traffic during construction as determined by the Engineer shall be removed and stored at a designated location within the project limits.

Removed signs shall be reinstalled in the permanent locations prior to final acceptance.

(B) Mailboxes and Newspaper Boxes

When removal of mailboxes and newspaper boxes is made necessary by construction operations, the contractor shall place them in temporary locations so that access to them will not be impaired.

Prior to final acceptance, boxes shall be placed in their permanent locations as designated by the Engineer.

107.07 Public Convenience and Safety

The Contractor shall conduct his work so as to ensure the least possible obstruction to traffic.

The Contractor shall provide for the safety and convenience of the general public and residents along the highway and the protection of persons and property as specified in section 104.04

Washington

2002 Standard Specifications

1-10 Temporary Traffic Control

1-10.1 General

The Contractor shall provide flaggers, signs, and other traffic control devices not otherwise specified as being furnished by the Contracting Agency.

The Contractor shall erect and maintain all construction signs, warning signs, detour signs, and other traffic control devices necessary to warn and protect the public at all times from injury or damage.

No work shall be done on or adjacent to the roadway until all necessary signs and traffic control devices are in place.

The Contractor shall be liable for injuries and damages to persons and property suffered by reason of the Contractor's operations or any negligence in connection therewith.

1-10.2 Traffic Control Management

The Contractor shall designate an individual or individuals to perform the duties of Traffic Control Manager (TCM) and Traffic Control Supervision (TCS).

The Contractor shall maintain 24-hour telephone numbers at which the TCM and TCS can be contacted and be available upon the Engineer's request at other than normal working hours.

1- Duties of the TCM

Discussing proposed traffic control measures and coordinating implementation of the Contractor-adopted traffic control plan's with the Engineer.

Coordinating all traffic control operations, including those of subcontractor, suppliers, and any adjacent construction or maintenance operations.

Coordinating the project's activities with appropriate police, fire control agencies, city or county engineering, medical emergency agencies, school districts, and transit companies.

Overseeing all requirements of the contract which contribute to convenience, safety, and orderly movement of vehicular and pedestrian traffic.

Having a copy of the MUTCD on hands at all times.

Attending all project meetings where traffic management is discussed.

Review TCS's diaries daily and be responsible for knowing field and traffic control operations.

2- Duties for the Traffic Control Supervisor

Inspecting traffic control devices and nighttime lighting for proper location installation, message, cleanliness, and effect on the traveling public.

Preparing a daily traffic control diary including, when signs and traffic control devices are installed and removed, location and condition of signs and traffic control devices, revisions to the traffic control plan, lighting utilized at night, observations of traffic conditions.

Ensuring that corrections are made if traffic control devices are not functioning as required.

Attending traffic control coordinating meetings or coordination activities as authorized by the engineer.

The traffic control plan or plans appearing in the contract plans show a method of handling traffic. The Contractor shall designate and adopt in writing the specific traffic control plan or plans required for their method of performing the work.

Flagging, Signs, and All Other Traffic Control Devices

The Contractor shall furnish all personnel for flagging and for the setup and removal of all temporary traffic control devices and construction signs necessary to control traffic during construction operations.

All construction signs required by the approved traffic control plan as well as any other appropriate signs prescribed by the Engineer will be furnished by the contracting agency.

The Contractor shall provide the posts or supports and erect and maintain the sign in a clean, neat, and presentable condition until the necessity for them has ceased.

When the bid proposal includes an item for "Temporary Traffic Control Devices" the work required for this item shall be furnishing barricades, flashes, cones, traffic safety drums, and other temporary traffic control devices, unless the contract provides for furnishing a specific temporary traffic control device under another item.

The Contractor shall be responsible for protection of the work at all times regardless of flagging and pilot car services furnished by the Contracting Agency, and the Contractor shall be liable for damages and injuries suffered by reason of the Contractor's operations or any negligence in construction therewith.

State of Florida Department of Transportation Specifications Package

SR 121 from I-10 to just south of US 90 and SR 228 from South Boulevard to just north of McIver Street

December 18, 2001

Supplemental Specifications

Section 102 – Maintenance of Traffic

102-1.4 Contractors Responsibility

Maintain traffic starting the day work begins on the project or on the first day Contract Time is charged, whichever is earlier.

Continually and adequately review all traffic control devices to ensure proper installation and working order, including monitoring of lights.

102-1.4.1 Worksite Supervisor

Provide a Worksite Traffic Supervisor who is responsible for initiating, installing, and maintaining all traffic control devices as described in this section and in the contract documents.

Ensure that the Worksite Traffic Supervisor has at least one year of experience directly related to worksite traffic control in a supervisory or responsible capacity and is certified by a department approved training agency which meets the Departments maintenance of traffic training requirement for advanced training.

Ensure that the worksite traffic supervisor is available on a 24-hour per day basis, participates in all changes to traffic control and reviews the project on a day-to-day basis.

Ensure that Worksite Traffic Supervisor is present to direct the initial setup of the traffic control plan and any changes.

Provide the Worksite Traffic Supervisor immediately corrects all safety deficiencies. Do not allow minor deficiencies that are not immediate safety hazards to remain uncorrected for more than 24 hours.

Ensure that the Worksite Traffic Supervisor is available to be on site within 45 minutes after notification of an emergency.

The Department may disqualify and remove from the project a Worksite Traffic Supervisor that fails to comply with the provisions of this sub article.

Ensure the Worksite Supervisor performs a drive through inspection and observes traffic flow as soon as the work zone is activated and in each subsequent phase of work as they are opened to traffic.

Ensure that the Worksite Supervisor conducts weekly, daytime and night time inspections within the limits of the project, of all traffic control devices, traffic flow, pedestrian, bicyclist, and business accommodations.

Submit a comprehensive weekly report to the Engineer and include condition of all traffic devices being used.

The inspection report will also include assurances that pedestrians are accommodated with a safe travel path around work sites and safely separated from mainline traffic.

That existing or detoured bicyclist paths are being maintained satisfactorily throughout the project limits.

That existing businesses in work areas are being provided with adequate entrances for vehicular and pedestrian traffic during business hours.

The Worksite Traffic Supervisor will sign the report and certify that all of the above issues are being handled in accordance with the Contract Documents.

If deficiencies are noted, the Worksite Traffic Supervisor is to note such deficiencies and include the proposed corrective actions.

APPENDIX B BEST PRACTICE TECHNIQUES FOR FOCUS GROUP MEETINGS

Recruiting Focus Groups

It is important to pre-qualify individuals for the focus group. Members should have knowledge of the subject and the ability to express their views to the group. The group should also be diverse so that people speak from different angles.

Focus groups often have a high number of no shows and withdrawals. For this reason, invite more individuals than necessary and contact individuals prior to the meeting to confirm their attendance. This allows for time to arrange for more people if necessary. Another technique is to plan for two focus groups, if everyone shows the two groups will meet as planned; but, if there is a small turnout, only one group will meet with two facilitators. This way the participants will not know there is a low turnout.

Arranging the Venue

The site should be neutral and convenient. The atmosphere must be relaxing and comfortable. Hotels are often used for focus groups because they can provide rooms and food. Refreshments may help to break the ice. Also, the time should accommodate work schedules.

Conducting Focus Groups

Before the focus group meets, brief all individuals on what to expect. The types of questions and the types of responses they will be asked to give. This can be verbal or written. Beverages and food should be provided upon entry. Once everyone is seated and ready to begin, introductions take place. The agenda is outlined and the participants are told the focus of the meeting. The facilitator should make the group aware that a representative from the organization is going to be available after the session to answer any individual concerns. This does two things, first, it keeps people from spending the entire time griping about individual problems, and second it lets people know that only after the session will a representative be available. Therefore, no one will hold back his or her concerns during the session. The first half of the session should address easy topics, topics that everyone holds a strong view on. A general question should be asked such as “What do you like and dislike about the project to repave highway 207”. By starting out

general, you allow all participants' views to be heard and prioritized before introducing who it is that is requesting their opinion.

Techniques to Initiate Discussion

To get the most from focus groups, the facilitator must allow individuals to express their views without the facilitator having to ask a direct question. A good facilitator can often sit back and only interject when a topic is exhausted and a new topic must be introduced. One technique to initiate discussion is called the Martian Technique. This is when the facilitator asks a question to the group as if he or she was a Martian and did not know anything about the potential problems associated with a construction project. Another technique to initiate discussion is to promote creativity in order to gather opinions from the group by drawing pictures, using creative comparisons, or using role-play.

APPENDIX C STATE DOT SURVEY FORM

Dear AASHTO Committee on Construction member:

The FDOT has asked the University of Florida to develop recommendations for the accommodation of businesses effected by highway construction projects. We are interested in knowing what practices you have established for the accommodation of businesses in you roadside construction zones. The following is a short survey. It should take you only a few minutes to complete. When completed you may fax it to 352-392-8487 or email your reply to bguertin@con-eng.com. Thank you for taking the time to assist us in our efforts, when our research is completed we would be happy to make the results available to your organization.

Respectfully:

Dr. Ralph D. Ellis Jr.

1. What kinds of activities do you perform to let business owners know about projects that might impact them prior to construction?

- Public Meetings
- Project Websites
- Distributed Notices and Project information sheets
- Other Media Advertising and Notices
- Information Signs and the Proposed Site
- Others Please list

2. What specific accommodations do you engage in during construction to help with the following potential concerns?

- Complaint Contact Point and Response_____
- Access to the Business_____
- Scheduled Outages_____
- Construction Dust_____
- Construction Noise_____
- Others (Please Elaborate)_____

3. When planning projects for execution that impact seasonal businesses (such as tax prepares) in what way are their needs considered?

4. Which person within your organization is the designated contact for businesses with questions or concerns?

Name _____

Phone Number _____

Email Address _____

5. Whom should we speak with for more information about your organization's business accommodation practices and policies?

Name _____

Phone Number _____

Email Address _____

APPENDIX D SUMMARY OF COMMENTS RECEIVED FROM BUSINESS MANAGERS, SAN JOSE BLVD, JACKSONVILLE, FL PROJECT

1	<p>Access was cut off a couple of days here and there. 25% drop in business during construction. People avoided road all together. Business has returned to original level and increased by \$230,000 annually. Ample time and warning before access was cut off. <i>Post Construction: Design of turning lane very dangerous. Six car accident one month ago (May-02). Blind turn if both directions have cars in turning lane.</i></p>
2	<p>No access to Corey Rd. Post Construction: Business has picked up since. Suggestions: None. Just took to long.</p>
3	<p>"All access was messed up for a long time." Contact could not do anything. <i>Suggestions: Work more at night. Build bridges. Poorly designed.</i></p>
4	<p>Access was blocked up for a long time. Machine operators "paid you no mind" and were not safe to the public or conscious of their existence. Lost most of their older customers because it was so dangerous. Contact could not do anything. However, did replace all signs and grass. <i>Suggestions: Work more at night. Build bridges. Poorly designed.</i></p>
5	<p>"Almost put them out of business, and put a lot of businesses out of business." Two weeks before Christmas both accesses were torn up (two Christmas in a row). They were tearing up the area then leaving it for a while then coming back later. Lane changes had no markings, were very dangerous, there were several accidents. Sealed off the bridge exit on a Saturday and no one could exit the interstate. Was very messy and signage was not very adequate. No contact to call, no voice, no control over anything. Said it would be an 18 month project but ended up being about 40 months. Made them move back the sign because it would interfere with the new road, now there is less visibility. People were literally afraid to come there because it was so dangerous. "No one with any sense running the project." <i>Suggestions: Timing, better signage (there were times when they really needed, but didn't put it up until they needed it), give businesses a schedule so that they can better plan and let their customers know.</i></p>
6	<p>No sign when access was blocked about where to enter, people thought that the businesses were closed. No contact to call but someone did come by to tell them they would be doing every once in a while. If someone did come by with information, it was usually accurate. Suggestions: More/better signs.</p>

7	Took way too long. Would shut off most of the access, and there were no signs. Did not even think that more signs would help for southbound traffic, still would not have been able to turn in because of traffic.
8	Ordered by their corporate office to say NO COMMENT after reviewing the survey given to them prior to this date.
9	The contact said that they would do night work, and they did not. Could have made the accesses to businesses easier, with better direction. Should have been a reimbursement plans for businesses in the way of a tax cut or something like that. Had a 15%-20% decline in sales. Should have made a better effort for the Christmas season. Were fortunate compared to the businesses on the other side of the road near Corey Rd, those people were the ones who should have "a lot of bitching to do." Had "1/2 assed" information, "here's a piece of paper, here's are website, go in," website information was not updated or specific enough. <i>Suggestions: "Three simple things:" Do as much night work as you can, have the greatest access to businesses that you can, and recognize the holiday season for businesses.</i>
10	Consider themselves to be a "Destination Location" and that there business only declined 8% to 10%. The finished product is great, the notices were accurate, and there was good information in the meetings and from the contacts.
11	Well informed about pre-construction information but then never had anyone come by to update them on information. Jack-hammering cracked the building, when she approached the supervisor at the site, the supervisor said that they would "send someone by," but no one ever came. Had a 35% drop in sales. Traffic was very dangerous and people did not travel along the road. People are now starting to travel on the road again and business is getting better. Accidentally shut off water. <i>Suggestions: Notify door to door about access shut offs (so that they can adjust the amount of staff needed to run the restaurant), work more at night, and took way too long.</i>
12	Consider themselves to be a "Destination Location" and sales were not affected.

13	80% of business is delivery business, and construction considerably hurt delivery times. Business has not picked up yet. Got notice once to shut off water but water was shut off several times without notice. Cut off phone lines, lost a whole days business because of it. In a restaurant they need to know for staff and food prep reasons, when these utilities would be shut off. (Also let me know that he did not really want to comment on the issue and that he refused a survey the first time around).
14	Contact information was adequate. Consider themselves a destination location and do a lot of delivery work so they were not affected that much.
15	Most people knew the roads were being worked on and avoided the area. His sales were down but his service department was still good. Are now back to where they were before, but can't make up the money that they lost. Happy with the finished product.
16	"They were at least trying." Busiest during lunch hours and would block Corey Rd. during these times. Had to ask them to put up signs in there area because they were up down the road from them. Realized it was tough on them but it was also "tough on us." Website was a little helpful, but way too general and not updated enough. Took way too long. Tried to let them know about utility outages but still cut off water and phones on accident. Asked them not to store machinery in their lot, and they did not. <i>Post construction: Light sequence is too short, need a left turn yield. Walk signal does not work, it is way too dangerous to cross. Second lane dangerous for turning because of the new turn lane confusion with drivers. Suggestions: By letting them know what they were doing, that was the best thing that they could have done, don't want them to change that and if they could improve it, it could be better.</i>
17	10-12% drop in sales. 22% drop in sales during worst time. Slowly business has recovered. Access was blocked for 1.5 days after business was told that access would only be blocked for 2 hours. Two entrances to the business were both blocked at the same time. Workers came back to site to finish work left undone. Customers did not use gravel road for access, instead they used the paved road and cut over at the time they needed to make a turn. No DOT contact, all information received came from the general contractor on site. No warning about when access would be blocked off. Debris on site was a problem. Every day workers would leave trash in front of business.

18	Access blocked off for a few hours in the morning. Important time for the cleaning business. Concrete Box 5'x5'x40" left outside cleaners. It is still sitting there today. Information provided was good
19	Project almost put them out of business. Business lost important walk-in customers. Business has not returned to levels equaling pre construction. People avoided area altogether during construction. Business did receive DOT flyer and attended meetings. 2nd San Jose project that the business has gone through, the last, 18 years ago, was much better. <i>Suggestion: Night work.</i>
20	Carry out business dropped. Delivery business dropped as well as time to deliver increased. Business is slowly returning. <i>"Info was on project was good, but there was no way to know that it would be this bad."</i> Business was aware of the construction meetings, but did not attend. Thought level of traffic through the area during construction was about the same, but slow. Access completely shut off on a couple of Saturdays, business was warned but it still affected them a lot.
21	Sales dropped by 30-35%. 50% of lost business has returned. No contact at DOT. People avoided the area altogether. Utilities were shut off once a month 4-5 hours at a time with no warning. <i>Suggestions: Signs to let people know that the businesses are still open, detour signs so that people can tell how to get into the shopping center, and night work.</i>
22	Late night customers. Business was not affected. Informed in advance about the project.
23	30% drop in sales. Has not returned completely. Elderly customer base got confused about how to access the business. Utilities were often shut off. Dust was the only debris problem. Business knew in advance about the project coming, however, during construction business was not made aware of when access would be blocked off. Business did not attend project meetings but knew they were going on. <i>Post Construction: Light backs up traffic into shopping center parking lot so that people are unable to get in and out of parking spaces.</i>

APPENDIX E INVITATION LETTER FOR FOCUS GROUP MEETING

MAY-15-2002 09:02

D O T

904 360 5519 P.02



Florida Department of Transportation

JEB BUSH
GOVERNOR

THOMAS F. BARRY, JR.
SECRETARY

May 15, 2002

RE: Invitation to attend project meeting
Project: San Jose. Blvd.
Date: Wednesday, May 22, 2002 at 2:30p.m. to 5:00p.m.
Location: Ramada Inn Mandarin
3130 Hartley Rd.
Jacksonville, FL 32257

Dear Business Manager:

The Florida Department of Transportation (FDOT) is concerned with the needs of businesses adjacent to its construction projects. The FDOT needs to find out what business managers like you think of our services in order to better understand how we can meet your needs. In order to learn more about business needs a project focus group meeting has been scheduled. The format for the meeting will be an informal discussion of your businesses adjacent to the project have been invited. Your input is important and we hope that you will attend. Please complete the enclosed survey form and bring it to the meeting. This research project is being conducted by the University of Florida.

Your input will combined with those of other businesses to provide a summary of what businesses think about FDOT's accommodation of business needs during the construction project. This information will be reported to the FDOT leadership for their use in improving services to businesses during construction projects. If you have any questions please call me at (904)360-5457.

Sincerely,

A handwritten signature in black ink that reads "Mike Goldman".

Mike Goldman
FDOT Public Information Officer

www.dot.state.fl.us



TOTAL P.02

APPENDIX F CUSTOMER SURVEY FOR BUSINESSES

Customer Satisfaction Survey of Businesses Affected by Florida Department of Transportation Construction Projects

This is a survey of the opinions of business managers whom have recently experienced a Florida Department of Transportation (FDOT) construction project in the vicinity of their business location. The FDOT needs to find out what business managers like you think of our services in order to better understand how we can meet your needs.

Your answers will be combined with those of other businesses to provide a summary of what businesses think about FDOT's accommodation of business needs during the construction project. This information will be reported to the FDOT leadership for their use in improving services to businesses during construction projects.

The following contact information is optional, however it would be helpful in the future to follow up on any problems/complaints you might have.

BUSINESS NAME:	
ADDRESS:	
CONTACT NAME/POSITION:	
CONTACT NUMBER:	
BUSINESS TYPE:	

NUMBER OF YEARS AT CURRENT LOCATION:	
NUMBER OF MONTHS PROJECT AFFECTED BUSINESS:	

Questions below deal with advance notification of the recently completed construction project adjacent to your property or business. Please indicate your level of agreement with the following statements.

Preconstruction	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	NO OPINION
Contact Information:					
FDOT Contact information was provided in advance					
FDOT Contact information was accurate					
FDOT Contact was helpful in answering questions					
FDOT Contact was prompt in response to questions/problems					
FDOT Contact worked to resolve any concerns					
FDOT provided good level of service					
Project Information:	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	NO OPINION
Information provided describing project plan was accurate					
Information provided describing project plan was easy to understand					

We are interested in your experience with FDOT construction zones on the recently completed project adjacent to your property or business. Please indicate your level of agreement with the following statements.

During Construction	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	NO OPINION
Pedestrian access to my business was accurately marked and visible					
Pedestrian access to my business was safe					
Pedestrian access to my business was available					
Pedestrian access did not affect business					
Vehicle access to my business was accurately marked and visible					
Vehicle access to my business was safe					

Vehicle access did not affect business					
Construction zones were safe to travel through					
During Construction	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	NO OPINION
Lane lines were clearly marked in construction zones					
Roads in construction zone were free of debris					
Debris levels in construction zone did not affect business					
Noise levels of construction were reasonable					
Noise levels of construction did not affect business					
Advanced notification of outages was given					
Utility outages were scheduled at convenient times					
Construction work on the project was performed continuously without unnecessary delays.					
I was aware that work on FDOT projects is suspended during holiday periods.					

Please indicate your level of agreement with the statements below based on your experiences with the roadway adjacent to your property or business.

Post Construction	STRONGLY AGREE	AGREE	DISAGREE	STRONGLY DISAGREE	NO OPINION
Construction was completed within original dates specified					
Construction was completed in accordance with information provided					
The amount of time that the project took to complete was appropriate considering the amount of work to be done.					
Project improved pedestrian access					
Project improved vehicle access					
Overall I was satisfied with this project					

Please indicate your overall opinion.

General Questions

This project (circle one)	Hurt business	Helped business	Did not affect business

APPENDIX G SUMMARY OF COMMENTS RECEIVED FROM BUSINESS MANAGERS, SR 121 MACCLENNY, FL PROJECT

1	Concerned that repaving on the roadway will be tracked into the building by shopping carts and ruin floors. Access is also a concern but people have to eat and therefore business won't be hurt too much.
2	Concerned small town is growing too fast even if it is good for business.
3	Concerned of a drop in business due to construction.
4	Mud is being tracked into parking lot. Sales down slightly since construction but it probably won't get worse.
5	Wedding planning clients are by appointment, not drop in, not affected. Party shop business down slightly. Insurance down slightly
6	Concerned about the effect of the construction when they begin to rip up the east side of the street.
7	Concerned with loosing 17' of parking lot. Business not affected so far, clients come from word of mouth and phone, not drop in.
8	Not affected at this point.
9	As long as lauder street stays open they will be ok. Back entrance used by customers. Only notification received from the DOT was a letter which explained what they should remove from the right of way.
10	Very little competition. Repeat customers. Traffic upsetting customers. Access may be a problem, single entrance to business
11	Business mostly by appointment. Access not an issue yet, construction is opn the other side of the street.

12	Business has already slowed since construction started. Manager not in.
13	Losing \$300-\$400 dollars a day. Traffic from light at Lauder street backs up to store. Suggested solution, have a traffic cop at the light directing traffic and allowing people to make a left hand turn.
14	Don't know when anything is going to happen until it does. Sales are down. Would like more notice of what is going on so that they can better adjust to their labor costs.
15	Sales are down. No suggestions or specific complaints.
16	Not a very busy time as far as sales go anyway, can't really tell if construction is affecting the business. No customer complaints so far.
17	Off season, so not very busy anyway. No customer complaints so far.
18	Have kept the project very neat so far. Slow season, not directly related to construction. "Someone came by and gave us an orange flyer, so if it was on there, then yes I received the information."
19	Thinks the duration, scope and invitation were "on the flyer." No drop in business. Business access is good, and no customer complaints so far.
20	No business drop and no problems or customer complaints so far.
21	Phone lines were cut off several times, once for a whole day without notice.
22	Requests to stop the work during lunch hours. Sometimes the construction trucks would block all accesses to business.
23	No one came by to let them know anything about the project, but someone did come by and tell them they had only two days to move the signs in front of their business. Huge drop in sales, are contemplating closing. Entry way is really, really bad. Can see cars come by and people turn off their

	blinker and keep going b/c of the torn up entry way. Suggestions would be to do more night work and to clean up construction and stop during lunch b/c that is when traffic is the worst.
24	Access in front of building is very confusing and sometimes completely blocked. The construction workers park in front of the business and leave their cars there for the day and also park their big bulldozers and trucks their completely sealing off access. Officer would sometimes not let people in at all. Desperate drop in sales b/c she is open late and also feels the hit b/c of the night work. Also guys in the big trucks are "whipping" through the parking lot making it very, very dangerous for pedestrians.
25	Access is "aweful, bumpy, and nasty." Business has dropped considerably.
26	Has seen a drop in sales. Requests that the bad entries be either fixed or replaced.
27	Sometimes cut off access, but usually okay.
28	Have been drastically affected in sales. No specific comments or suggestions.
29	Only information has been through the local newspaper. Sales are down from this time last year. Suggest to not work during lunch and clean up access.
30	Would like compensation for drop in sales and requests for more night work.
31	Down 64 cars for the month from previous sales records. Thinks that construction is okay and that people are just taking alternate routes.
32	Are appointment oriented so sales are not affected that much. Workers are parking in front of building and going to work.
33	Business has dropped just a little. No complaints or suggestions

34	Business has dropped just a little. No complaints or suggestions
35	Destination Location. Not really affected.

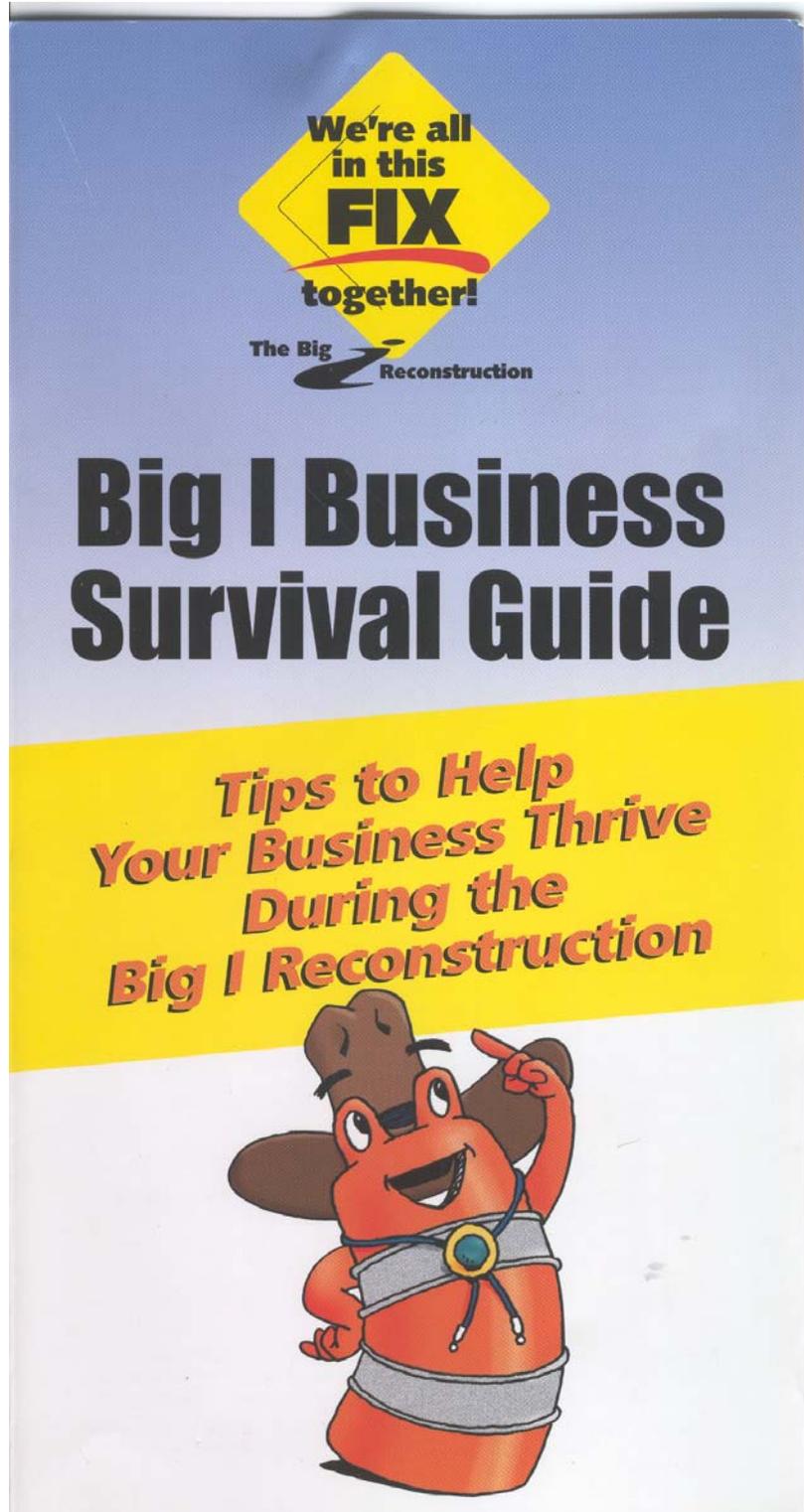
**APPENDIX H SUMMARY OF INTERVIEW COMMENTS, MAHAN DRIVE,
TALLAHASSEE PROJECT**

No.	Overall	Comments
1	Pos	Not in business at the time of construction. Did not have any problems with access during road construction. "No U-Turn" sign was a problem, but since the sign has been removed.
2	Neg	business open 7:30AM - 8:30PM. At 5:00PM the traffic going out of town was bad. People couldn't take a left into shopping center. People would take a tour of the facility and then not join because of traffic. 30% drop in memberships during construction. Average of 10 new memberships a week fell to 10 a month. Recovering slowly since construction finished due to extremely low membership rate. No problem with noise during construction. A couple of times a truck or a pile of dirt would be blocking entrance to shopping center, had to call to get obstruction moved. Grade of gravel entrance was originally too steep to get into parking lot, had to call to get entrance leveled so that access was available.
3	Neu	Customers are loyal mothers who have scheduled appointments weeks in advance to have their babies photographed, therefore nothing is going to stop them from accessing the business, and therefore no business was lost. There was a period of time when people could not cross the median. Paving could have been done at a better time, possibly at night. There was no warning of when the access would be shut off. Post construction, Major problem with the light at Weems and Mahan. No turning light for the weems direction, northbound cars on Weems taking a left onto Mahan are cutting off southbound cars on Weems. Potential for an accident.
4	Neg	Problem with access. Water was shut off during Valentines day. No warning about when the asphalt would be laid, cars got stuck in shopping center for a period of time. Gravel driveway temporarily used during construction got washed out making access difficult. Weems and Mahan stop light problem (See Dina Ivory Photography). Grade of gravel entrance was originally too steep to get into parking lot. Lost practically all walk in sales. No business sign for a year, people thought they were closed. Not allowed to put a temporary sign up.

5	Neg	Contact - General Manager. One of two entrances blocked off during the project. Post construction problem with design. Too steep of grade at the entrance, cars are bottoming out. Main entrance of on Mahan across from the mall entrance is dangerous. Numerous accidents since project finished, including one death. During rush hour 4:30PM to 7:00PM it is very dangerous. Light at intersection in the plans but the city has not permitted the light yet. Meanwhile one person has died. Light would solve 90% of the problem. Lots of U Turns now.
6	Pos	Access shut off for two days during project, but they were warned in advance of closing. Sales dropped 2% to 3% during construction. Sales has since returned to normal levels if not higher. Business has recieved couple of complaints from customers about post construction access due to the median.
7	Neg	Biggest problem was lack of communication. Business recieved two flyers during the entire project and never had a specific contact. No access for a couple of days for paving, no warning. No problems with utilities. Lost some customers but have begun to get all customers and more back because of the new road.
8	Neg	Business was terrible during construction but has picked up considerably since.
9	Neg	Business was terrible during construction but has picked up considerably since.
10	Neg	Business was terrible during construction but has picked up considerably since.
11	Neu	Not a lot of business problems because it is not a store, people who are coming to this establish are only coming for a reason and have to come to that business for their agent.
12	Neu	Not a lot of business problems because it is not a store, people who are coming to this establish are only coming for a reason and have to come to that business for their appointments.

13	Neu	Business was terrible during construction but has picked up considerably since. Post Construction: "People almost die everyday" The access, entries to the shopping center are very dangerous. People making left turns are almost constantly causing accidents.
14	Neg	Business was terrible during construction but has picked up considerably since.
15	Neg	Business was terrible during construction but has picked up considerably since.
16	Neg	Business was terrible during construction but has picked up considerably since. Post Construction: "Would be better if they would stop repairing it."
17	Neg	Problem with access: Blocked entry for long periods, and would not let anyone in. One customer actually went to get a police officer to make the construction crew let her enter the parking lot. Even if they would let the cars through, the entry grade was so bad that cars were bottoming out trying to get in. They said that there was no preconstruction meeting, no information on plans/designs, and no contact for them to call from the DOT (all of their information came from the crew working outside of their store). Once the driveway was complete, it was so bad they had to confront the crew and demand that it be fixed. And also complained about the crew hitting a waterline and creating a geyser in front of their store. Suggestions: Make better signs to let people know that there is an alternate entrance to the shopping center and that the businesses are still open, notify before they are going to shut down power, give everyone a contact to call. Post Construction: Speeding on the road is very bad, cannot make left turns where needed (have to go way down the road and make a U-turn), cannot see oncoming traffic when making turns because of shrubbery.

18	Neg	<p>Problem with access: Blocked entry for long periods, and would not let anyone in. Would close entries from 10 a.m. to 3 p.m., eliminating any lunch business. Did not have a preconstruction meeting... got a flyer from the DOT with a contact name on it but every time he called, he got "the run around." DOT has "no concern" for the businesses, someone should come by and notify them of plans and ask them if they need anything, "when you work and have a business you don't have time to go and track them down to tell them every time you need something." Had someone come by and ask him when it would be convenient to shut access down and he gave then a specific date and they did not adhere to the date. Could see people drive by with their blinkers on, then just keep going because they could not get in to the parking lot. Made his own entrance into the parking lot through grass and trees. Took down several signs by the road and did not replace them, when he contacted the DOT they told him he would have to file a claim to get them back, and he said he was just too tired of the hassle, if they removed the signs, they should put them back without him having to file a claim. Were not supposed to park equipment in the driveway, but did and took up entire lot so no one could park. Suggestions: Put up better signs, get a better contact, have someone come by frequently to see how things were going, "doesn't see any reason not to do night work on this project." Post Construction: Same as Elite Repeats. Also business has not picked up at all since the project has finished because people are just taking different routes.</p>
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Meeting the Challenges of the Big I Reconstruction

There is no doubt highway projects such as the Big I Reconstruction positively impact economic development in our community. According to a study by the National

Highway Users Alliance, Albuquerque drivers will realize an estimated \$1,370 per year in time, fuel and safety savings for a typical commuter over the 20-year useful life span of the project. This amounts to more than \$10 billion. Also, the project will create 400-600 jobs during the two years of construction, contributing an estimated \$44 million in wages and benefits to the New Mexico economy.

It is human nature; however, to avoid the barriers, detours and other inconveniences that highway construction can cause. The challenge for our community is to minimize the impact of construction on our daily lives.

That is why the New Mexico State Highway & Transportation Department and the Big I Reconstruction Team are committed to the following:

- 1) Completing the Big I in 24 months.** Under this ambitious schedule, all work on the Big I is scheduled to be completed by June 30, 2002 - making this the largest project of its kind in U.S. history to be constructed in such a short time.
- 2) Doing the majority of work when it least inconveniences the public.** The majority of the work on the Big I will take place at night - when it is the least disruptive to the most businesses and residents. Two lanes of I-40 and I-25 will remain open during daylight hours to facilitate travel through Albuquerque and central New Mexico.
- 3) Responding to input from the community.** Through the Big I Information Center at 298-5240 or 1-877-843-2444 and the website, www.thebigi.com, the Big I Reconstruction Team encourages comments, suggestions and questions from the general public and the business community. Each suggestion is passed on to our Management of Traffic Committee (MOT), and concerns and complaints are investigated and resolved as quickly as possible.

Despite all the planning and preparation that has gone into the Big I Reconstruction, there is no way to completely predict how businesses will be impacted during the two years the interchange is being rebuilt. This brochure is designed to help you minimize that impact.



The key to not just surviving, but thriving, during Big I Reconstruction Project. Businesses and other stakeholders will have to work together. The Big I Team has formed partnerships with public and private organizations throughout the community to share ideas, experiences and resources.

Leaders are being identified to represent the business community, to channel questions or concerns to project management and to keep other business owners informed of project developments. Some smaller groups have also been formed to represent those businesses

most affected by the construction. Working as a team has advantages, and working together saves time and money in the long run.

How Can You Keep Your Customers Coming?

The Big I Team has created a checklist of tried-and-true suggestions and handy tips to help your business thrive. Consider these suggestions:

- **Join the Merchant Discount Program** by calling 1-877-TheBigI. This program allows you to reach current and new customers who belong to the Commuter's Club and are taking the Big I challenge to reduce their use in and around the Big I during peak hours; you can reward them with discounts on the product(s) or service(s) you choose. Free marketing materials and support are available.
- **Create a simple map** to direct your customers on how to best access your business. Post the map on your door and bulletin boards, and insert maps into billings, newsletters and other mailings to your customers.
- **Remind your customers that you are OPEN for business.** Develop ads for newspaper, radio or television. Pool your resources for group advertising, which can be very cost effective.
- **Post and promote the closest bus route** to your businesses and encourage your customers to take city transit. (For information, call 843-9200 or visit www.cabq.gov/transit on the web).
- **Brainstorm** with your business associates, area businesses, friends and family to help develop innovative ideas for promotion.
- **Run special promotions** such as sales, giveaways or discounts.
- **Develop shopping incentives** such as free hot dogs or a raffle/drawing for prizes.
- **Sell "hard hat" or "nail bag" lunches** or have a special promotion to do so.
- **Print placemats, posters or any other specialty items that offer directions to alternate routes.** Use alternate route maps provided by the Big I Team.
- **Recommend your staff, customers and visitors to make one day a week "errand day."** Suggest they go to one location—preferably near your business—to do their errands and shopping. This allows your customers to save time and reminds them to shop in your business neighborhood.
- **Hold meetings and presentations outside the Big I project area** and give your members, business customers and associates the opportunity to avoid commuting through the project.
- **Change your hours of business** so customers do not travel during peak travel times (7-8 a.m. and 3-6 p.m. weekdays).
- **Be patient and contact the Big I Team if you are having problems.**



CONTACT THE PROJECT TEAM:

The Big I Reconstruction Team
c/o Cooney, Watson & Associates, Inc.
2201 San Pedro, NE
Building 3, Suite 240
Albuquerque, NM 87110
505-298-5240
1-877-TheBigI (843-2444) statewide
www.thebigi.com

Remember the Basics

Below are some basic actions and tips used in other states that business owners can take to help survive roadway construction:

- Plan ahead as much as possible.
- Form an alliance with other businesses in your area to do group advertising.
- Voice your concerns to project staff.
- Hold regular meetings with other business owners to generate support and strategies.
- If construction is moving to your area, schedule a meeting with the project team to find out how long the project will take, what to expect, etc.
- Establish a direct line of communications with the project team.

What to Expect From the Big I Team

The following are just some of the ways that the Big I project team is committed to helping businesses and the community by pledging to:

- Keep business owners informed on project developments.
- Remind the public that “businesses are open.”
- Be open and available to listen and respond to business owners’ concerns.
- Respond quickly to concerns.
- Ensure that project construction moves quickly and on time.
- Keep two lanes open in all directions during the hours of 5:30 a.m. - 9 p.m.
- Keep traffic flowing as smoothly as possible.
- Post good signage for business access.
- Encourage workers to patronize businesses on the construction route.

Traffic Tips

Traffic is an important consideration in any highway construction project. Businesses and the project team walk a fine line together, seeking to keep traffic flowing smoothly so contractors can complete their work efficiently, quickly and safely, while maintaining a traffic stream so customers and employees can reach businesses as easily as possible.

To keep traffic flowing, we have to reduce the number of vehicles on the Big I and city streets by 20% during peak hours: 7-8 a.m. and 3-6 p.m. weekdays. Otherwise, traffic becomes congested not only on the Big I, but also on major city streets being used as alternative routes. There are several ways in which your business can help with traffic control and reduction:

- Tell customers and employees about traffic restrictions and strategies for commuting.
- Inform your customers about construction developments through fliers, mailers, ads or other communication pieces.
- Encourage your suppliers, vendors and delivery vehicles to plan deliveries during off-peak hours.
- Inform the project team about any bottleneck or trouble spots.
- Encourage employees to car pool, van pool, bike, walk or bus.
- Be flexible with staff by allowing variable work schedules or teleworking to reduce travel during peak hours.

Keeping Everyone Safe: Work Zone Safety Tips

1. **Stay alert.** Dedicate your full attention to the road.
2. **Pay close attention.** Signs and work zone flaggers save lives.
3. **Turn on your headlights.** Workers and other motorists can see you easier.
4. **Don't tailgate.** Many of the crashes in work zones are rear-enders.
5. **Don't speed.** Note the posted speed limits in the construction zone.
6. **Keep up with the traffic flow.**
7. **Don't weave or change lanes in the work zone.**
8. **Be courteous and allow other drivers to merge.**
9. **Minimize distractions.** Avoid changing radio stations or using a cellular phone.
10. **Be patient.** The work zone crew is working to improve your future rides.

Keeping You Informed

Each day, the Big I impacts an estimated 600,000-700,000 people. So, it is important to keep everyone up-to-date on construction activities on a daily basis. The Big I Reconstruction Team provides information through:

- **The Big I Information Center**
298-5240 or 1-877-TheBigI (843-2444) statewide
- **Web Site:** www.thebigi.com
- **Project Brochure with map (in English and Spanish)** E-mailed or faxed from NMRoads@aol.com or available on line at: <http://members.aol.com/nmroads>
- **Weekly Interstate Ernie Traffic Reports**
- **Reports on your radio dial at 530 AM**
- **Alternative Commute Transportation Options-ACT Now**
City of Albuquerque customer service center 843-9200
- **Carpool information at 243-RIDE**
- **City of Albuquerque Transit's Web Site at www.cabq.gov/transit**

Other Activities

- Display and booths at public events
- A 20 x 20 detailed scale model of the completed project open for viewing at the New Mexico State Highway and Transportation Department District 3 office. Viewing dates vary, call (505) 841-2700.
- An "open door" policy for citizens and business owners to discuss concerns with engineers and project managers at Maintenance of Traffic Public Advisory Group community meetings
- Meetings and presentations scheduled on request

Knowledge is Power

Drivers who are well informed about road construction tend to be more supportive and willing to get to your business despite any inconvenience. They understand why the work is necessary and desirable. They also know about the construction before they leave home or work and they have given themselves additional drive time to reach their destination. They may choose alternative routes to get to your business.

The New Mexico State Highway and Transportation Department and the Big I Reconstruction Team are committed to providing free public information throughout the project. In addition, the contractor, Twin Mountain Construction II, is dedicated to providing appropriate signage in and around the freeway and any closed ramps. This will allow your customers to plan alternative routes as needed.

How Can You Keep Up-To-Date?

FOLLOW THIS CHECKLIST:

- **Invite project representatives to discuss the project at your business association or group meetings.**
- **Establish a line of communication with the project team. Call if you have questions. You may identify one individual as the key point of contact to collect questions and concerns, take them to the project team and bring back responses and other critical information.**
- **Identify key businesspeople to whom the project team can mail, e-mail or fax news releases and project updates.**

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Special Thanks

This guide was prepared in cooperation with:



APPENDIX J DRAFT CONTRACTOR BUSINESS ACCOMMODATION INCENTIVE SPECIFICATION AND SURVEY

8-13.2 Access Accommodation Bonus

8-13.2 Bonus Payment

The Department will pay the Contractor a bonus in accordance with the following schedule based upon the Contractor’s average Access Accommodation Performance Score. The maximum bonus payment shall not exceed \$152,000.

Average Access Accommodation Performance Score (AAAPS)	Payment \$
Less than or equal to 38	\$ 0.00
39 to 76	Payment = (AAAPS - 38) x \$4000.00

The Contractor’s average Access Accommodation Performance Score will be determined in accordance with section 8-13.2. The Contractor shall have no rights under the Contract to make any claim arising out of this bonus payment except as is expressly set forth in this Specification. In the event that a dispute arises relating to the scoring of the survey, the Contractor shall have the right to appeal the decision to the Disputes Review Board.

8-13.3 Survey

The purpose of the survey is to measure access accommodation and satisfaction. The Department will be responsible for conducting the access accommodation survey using the survey document attached to this specification package. The survey document will be distributed to all businesses and residences within the project limits immediately adjacent to the project construction zone, compiled from a list of Property Owners and Occupants prepared by the Department. The survey shall be conducted a minimum of three times during the project duration in accordance with the following schedule:

Once during the first three months of project work.

Once when approximately 50% of the work is complete.

Once during the final three months of project work.

The average of all scores of all surveys completed and returned will be the Contractor’s Access Accommodation Performance Score. Only completed surveys from businesses and residences on the official list of property owners and occupants list

will be included in determining the Contractor's Access Accommodation Performance Score.

The Department will report the results of the survey to the Contractor within two weeks of receipt of survey results. Survey respondents will be requested to reply within two weeks of receipt of survey forms. The surveys will be scored in accordance with the following point values:

- “Strongly Agree”, 4 points
- “Agree”, 3 points
- “Neither Agree nor Disagree”, 2 points
- “Disagree”, 1 point
- “Strongly Disagree”, 0 points

Access Accommodation Survey

The Florida Department of Transportation would like to thank you for completing this survey. Your answers will enable us to better meet the needs of businesses, residents and the traveling public.

Your answers to the questions will be used to evaluate our performance and the performance of our contractors on the project named above.

Your Name or name of Business			
Your address			
Your name (if Business Location)			
Your phone number			
Your email address			
May we contact you?	YES	NO	Today's Date
If Business, What are your hours of operation			

		Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
1	Visitors/Customers were always able to reach my location when desired					
2	My driveway was easy to drive across					
3	Construction vehicles did not park on my property without my permission					
4	Construction materials were not stored on my property without my permission					
5	Delivery trucks were able to enter into my property easily					

		Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
6	Traffic had an easy time using my entrance					
7	Traffic had an easy time leaving my location					
8	Detours seemed convenient to travelers					
9	I was notified before all utility outages					
10	Utility outages were scheduled to minimized disruptions					
11	Utilities were turned back on as quickly as possible					
12	Dust was not a problem at my location					
13	Vibrations were not a problem for my location					
14	Drivers felt safe entering my property					
15	Pedestrians & Bicyclists felt safe coming to my location					
16	There did not appear to be an increase in traffic accidents					
	VISIBILITY AND SIGNAGE (For Businesses Only)					
17	My "Blue" sign was always visible					
18	My business sign was down no longer than required					
19	"Blue signs leading to my entrance were correctly located					