Managing the Indirect Impacts of Bypasses on Small- and Medium-sized Communities in Florida

Karen Seggerman, AICP, CNU-A*
Center for Urban Transportation Research
University of South Florida
4202 E Fowler Ave., CUT 100
Tampa, FL 33620-5375
(813) 974-5723
(813) 974-5168
seggerman@cutr.usf.edu

Kristine Williams, AICP
Center for Urban Transportation Research
University of South Florida
4202 E Fowler Ave., CUT 100
Tampa, FL 33620-5375
(813) 974-9807
(813) 974-5168
kwilliams@cutr.usf.edu

Submitted: November 2013

Word Count: 7393

*Corresponding author

ABSTRACT

In Florida, consideration of a bypass alternative is increasing in small- and medium-sized communities that contain roadways on Florida's Strategic Intermodal System (SIS)—roadways critical to the statewide movement of people and goods. These are often the primary roadway into and through smaller communities. Local governments sometimes seek SIS designation to achieve funding for increasing the capacity or improving the function of the major roadway leading to consideration of a bypass. Observed issues with these bypasses include: 1) the SIS designation assigns level of service and design criteria that increase pressure for a bypass alternative; 2) misconceptions abound regarding potential positive and negative impacts of a bypass; 3) inadequate consideration is given to evaluating the potential indirect impacts of a bypass on land use and related issues (e.g., livability, local mobility); 4) without local roadway network planning in impacted areas, many local trips will likely rely on the new bypass; 5) access management is critical not only for the bypass, but also along major roadways accessing the bypass and their interchanges; 6) the bypassed roadway may be oversized in relation to local mobility needs and could benefit from multimodal enhancements; and 7) proactive attention is needed to address the potential indirect land use and mobility impacts to aid in determining appropriate plans, strategies, and mitigation measures. This paper examines these issues and offers practical enhancements to current policy and practice to assist the Florida Department of Transportation and local governments in achieving a multidimensional approach to bypass planning and impact mitigation.

AKNOWLEDGEMENTS

Research for this paper was sponsored by the Florida Department of Transportation (FDOT), Systems Planning Office.

Keywords: bypass, indirect impacts, livability, growth management, mobility, access management, small- and medium-sized communities, road diet

INTRODUCTION

In Florida, bypassing small- and medium-sized communities is commonly considered to relieve traffic congestion and improve travel time for through vehicles and freight movement. Consideration of a bypass alternative is increasing in such communities for roadways that are part of Florida's Strategic Intermodal System (SIS), due to the role of these roadways in the statewide movement of people and goods. In small communities, the roadway to be bypassed may be the only one providing access to, from, and through the area. Bypassing such roadways results in impacts, both direct and indirect, on land use and related considerations, such as livability, community character, and local mobility.

This paper reports on a study conducted for the Florida Department of Transportation (FDOT) relative to bypass planning in Florida, its implications for small- and medium-sized communities, and potential enhancements to policy and current practice. It identifies the need for greater attention to assessing the potential indirect impacts of bypass construction on land use and related considerations in collaboration with impacted communities. The results can then be weighed in selecting an alternative and in determining appropriate plans, strategies, and mitigation measures to proactively address anticipated impacts of a bypass.

METHODOLOGY

The study began with a detailed knowledge search of existing bypass impact studies, as well as state transportation agency policies and procedures, to document the state of the practice. Numerous state and national research reports, as well as guidance documents relative to evaluating and mitigating the impacts of bypasses, were reviewed. In 2000, for example, the Texas Department of Transportation funded a series of four studies on the economic effects of highway "relief routes" on small- and medium-sized cities in Texas of particular relevance to this research (1-4). The first of the four reports summarized current literature and included a thorough discussion of studies prior to 1993 (1).

The Texas literature review was used as a baseline and supplemented with a detailed review of bypass studies published after 1993 (5). The list of pending and recently completed bypass projects for small- to medium-sized cities in Florida was identified in the FDOT Work Program and from anecdotal knowledge. FDOT guidelines, policies, and procedures were also reviewed as they pertain to bypass construction, along with bypass policies in other states.

A working definition of "small-" or "medium-sized" communities was developed for purposes of this study through review of the literature on bypasses, federal metropolitan planning rules, Census Bureau definitions, and current population characteristics of Florida communities where bypasses have been built or proposed. For the 2000 census, urban areas were defined by the Census Bureau as a cluster of block groups with a population density of at least 500 people per square mile and a total cluster population of 1,000. This is the smallest geographic unit with readily available information on commonly studied economic factors (i.e. job type, housing mix, etc). Traffic analysis zones used in travel demand modeling are also fashioned to have approximately 1,000 people. The literature includes few communities with populations below 1,000 and the lowest community population for planned bypasses in Florida is 1,400. Therefore, the lower population limit for "small" communities in this study was 1,000.

The FDOT Quality/Level of Service Handbook notes that an urban area includes places with a population between 5,000 and 50,000 (6). When the urban area population reaches 50,000 people, a metropolitan planning organization (MPO) takes primary responsibility for planning and programming regional transportation facilities. In areas less than 50,000 people, the state transportation agency has primary responsibility. Most bypass studies from the literature and FDOT work program involved communities with populations well under 50,000 people. Therefore, for purposes of this study, small- and medium-sized communities are considered those with populations with a lower limit of 1,000 and an upper limit of 50,000.

Next, a proposed roadway bypass affecting a small- or medium- sized community was randomly selected from the FDOT five-year work program to capture the general level of analysis and information made available to the public regarding project impacts. The focus of the case study was on treatment of land use, local mobility, and related considerations. Project information reviewed included descriptions

from public involvement websites and sociocultural impacts identified in Florida's Efficient Transportation Decision Making (ETDM) process online database. FDOT initiated the ETDM process in 2006 to facilitate early involvement of other affected agencies in transportation planning and environmental review.

The findings were synthesized and possible enhancements to current evaluation methods were identified. Policy options were also examined and a series of enhancements to policy and practice were suggested for consideration by FDOT (7). The goal of this effort was to assist the agency and stakeholders in achieving a more complete understanding of potential indirect impacts of bypass construction on small- and medium-sized communities as a basis for more effective community planning and mitigation of bypass impacts.

FINDINGS

Numerous bypasses have been constructed in the US and abroad since the early 1950s. In some cases, research was conducted to identify and quantify the impacts of these roadways – primarily from an economic perspective. Since the late 1990's, there has been a growing body of work on the indirect land use impacts of highway projects. Much of this work was oriented toward providing guidance to transportation professionals on assessing secondary and cumulative impacts per NEPA requirements. Below are some key findings.

Bypass Impact Studies

Many bypass impact studies were reviewed for this research and most focused on the potential economic impacts of bypassing small- and medium-sized communities. Most of these bypass studies were located in the middle- to upper-band of the United States--mainly Kansas, Oklahoma, Iowa and Wisconsin. Econometric models, case studies, and before and after studies were the key methods for investigating bypass impacts. The key topic of economic impacts was investigated through labor data, retail sales data, U.S. Census data, and field visits to provide mixed-methods economic analyses. The methodologies varied from highly quantitative to qualitative, and study limitations or gaps in knowledge appear to be related more to data availability, local concerns (or desired emphasis), and available resources, than to any technical deficiencies in the study methodologies.

Overall, the samples, methodologies, and data sources reviewed reveal study designs that can be generalized and adapted for Florida. However, study findings varied according to context, and were sometimes contradictory. Studies also used varying data sets and variables and often focused only on those issues of importance to key stakeholders. Therefore, findings from past studies are not necessarily generalizable to the Florida context or even from community to community. Anecdotal and case study observations have yielded several preconceptions about the effects of bypasses. Multiple studies have tested these preconceived notions—some were supported, others found to be false, and many had mixed findings (see Table 1).

TABLE 1. Bypass Effects Preconceptions and Findings

Congestion	*Preconception: Bypasses reduce traffic congestion on the original route through the CBD* Finding: In all cases, peak hour traffic through the CBD was reduced. Difference in travel time between the old facility and bypass determines how many vehicles will divert to the bypass (8).
Freight Movement	*Preconception: Bypasses improve the speed and reliability of freight movement* Finding: Because the bypass circumvented traffic congestion and traffic control devices, trucks tended to choose the bypass over the original route. Thus, travel time and reliability of freight movement improved. The removal of trucks from the CBD tended to improve quality of life in the CBD by reducing noise and allowing the road to be redesigned in a more aesthetic fashion (1).
Economic Development	*Preconception: Bypasses provide an opportunity for economic development and increased tax base* Finding: Actual impacts of bypasses on the economy of small communities is mixed, although

	"…from a local officials point of view the combination of enhanced mobility…and newly accessible land provides an opportunity for growth" (9). The economies of smaller communities (<2000 population) are more likely to be adversely impacted by a bypass (10).
Sprawl	*Preconception: Bypasses encourage urban sprawl and adversely impact community character* Finding: Some bypasses induced urban sprawl, while others seemed to have no impact. The likelihood of sprawl depended on the region's growth rate, the functional class of the roadway, the comprehensive plans in place before the bypass was constructed, and the scale of development permitted near the bypass (11). Faster growing areas experienced some development pressure along the bypass (12).
Population Loss	*Preconception: The bypass route will draw away population from the bypassed CBD* Finding: Bypassed cities did not experience universal population loss. The smallest communities (less than 500) were the most prone to population loss. Larger communities were the least likely to lose population, and some even showed moderate gains (13). In areas with no or slow population growth, little residential development chose to build next to the bypass.
Business Activity	*Preconception: There will be a decline in sales and loss of business activity along the bypassed route, particularly among highway-oriented businesses (gasoline, fast food, etc)* Finding: Travel-related businesses tend to relocate to the bypass. Total sales for the sector often increased (14). Downtown business districts in communities with a well-developed local customer base are less adversely impacted than communities highly dependent on drive-by traffic (15). Perceptions of bypass impacts on business activity varied by industry. Babcock (16) found that convenience stores and the motel industry perceived bypasses as negative to their business, whereas truck, auto and restaurant establishments perceived bypasses as positive.
Business Relocation	*Preconception: Businesses will relocate out of the CBD to the bypass route, incurring relocation costs and reducing local tax base* Finding: Regional retail (big box) and travel-related businesses usually relocated to the bypass route (12). Service industries were the least affected by the presence of a bypass, and tended to stay in the CBD (14). CBDs with a strong identity as a destination for local shoppers were strengthened due to a reduction in traffic delays, and exhibited little retail flight (17).
Property Values	*Preconception: Property values and occupancy rates will decline along the bypassed route* Finding: No clear consensus was reached in the literature. The overall tax base increased in virtually every circumstance, but the reasons for the increase differed. In some cases the property values in the CBD rose, while in others the CBD stagnated but the loss was offset by increased value adjacent to the bypass (18).
Community Support	*Preconception: Residents of the CBD will oppose a bypass due to concerns relating to economic and quality-of-life factors* Finding: Although pre-construction opposition was not uncommon, community opinions on bypasses tended to be more supportive after construction. In a recent study of Iowa bypasses, Pettit (13) noted: "Overall the communities do not blame the bypass for much of anything and instead praise them for having removed traffic, congestion, and pollution from their towns."

The literature review further indicated that some bypasses induce urban development while others seem to have no effect. The likelihood of growth inducement depended on the region's growth rate, the functional class of the roadway, the comprehensive plans in place before the bypass was constructed, and the scale of development permitted near the bypass (11). However, experience indicates that comprehensive plans and other growth management policies can and often do change once vacant land is made more accessible due to market demand and political influences.

Overview of Florida Bypasses

Table 2 lists the pending and recently completed bypass projects for small- to medium-sized cities in Florida. Most Florida bypasses fall into the category of small- or medium-sized city

(1,000 to 50,000 people). Most of the existing bypasses fall within the upper population limit of this category, while proposed bypasses trend toward the lower end.

Characteristics of recently completed bypasses include:

- They tend to circumvent communities with populations ranging from 10,780 to 94,406, with a median population of 21,015.
- The bypassed town may be from 25 to 60 miles away from the central city of the nearest Metropolitan Statistical Area (MSA).
- Project development websites consistently cite the following as reasons for the bypass: a) redirecting commercial and industrial traffic, b) reducing congestion, and c) alleviating existing or anticipated travel demand.
- The length of recently completed bypasses ranges from 2.3 to 10.9 miles, with a median length of 4.1 miles.

Characteristics of planned bypasses include:

- They will circumvent communities having populations ranging from 1,427 to 82,500 with a median population of 5,141.
- The bypass location may be 11 to 50 miles away from the nearest major city.
- Project websites for future bypasses cite the following as reasons for the bypass: a) redirecting commercial and industrial traffic, b) reducing congestion, c) enhancing hurricane evacuation, and d) alleviating existing or anticipated travel demand.
- The length of a proposed bypass ranges from 1.5 to 21.738 miles with a median length of 9.8 miles.

154 **TABLE 2. Characteristics of Florida Bypasses**

Location	FDOT District	County	Town	Population of Central City	CBD→Major CBD Distance (mi)	Length of Bypass (mi)	Objectives of Bypass and Alternatives
Planned Florida Bypasses							
SR 29	1	Collier	Immokalee	19,763	50	17+**	ADT
SR 29	1	Hendry & Glades	Labelle	4,480	32	15+**	ATD; RCIT; HE; RC
SR 70	1	Okeechobee	Okeechobee	5,784	40	13**	RCIT; HE; RC; ATD
SR 26*	2	Alachua	Newberry	3,360	20	21.738	ATD; RCIT
SR 26*	2	Gilchrist	Trenton	1,722	30	21.738	ATD; RCIT
US 301	2	Bradford	Starke	5,769	30	16+**	RCIT; RC; ATD
US 301	2	Duval	Baldwin	1,634	22	n/a	ES; ATD; RC
SR 12	3	Gadsen	Quincy	6,975	24	1.5+**	RCIT
US 19	3	Jefferson	Monticello	2,572	30	n/a	RCIT; RC; ATD
SR 85	3	Okaloosa	Crestview	82,500	0	n/a	RCIT; RC; ATD
SR 87	3	Santa Rosa	Milton	8,044	25	5.6-10.5**	RCIT; HE; RC; ATD
US 331*	3	Walton	Freeport	1,427	36	5.6	RCIT; RC; ATD
US 331*	3	Walton	Defuniak Springs	5,141	45	5.6	RCIT; RC; ATD
SR 710	4	Okeechobee & Martin	Indiantown	5,588	28	9.8	RCIT; RC; ATD
SR 25	5	Marion	Belleview	3,856	11	9.2	RCIT; RC; ATD
Recently Completed Florida Bypasses							
US 98	1	Polk	Lakeland	94,406	0	2.3	RCIT; RC; ATD
US 41	1	Sarasota	Venice	21,015	25	3.1	RCIT; RC; ATD
US 27	1	Highlands	Sebring	10,780	50	4.1	RCIT; RC; ATD
SR 19	2	Putnam	Palatka	10,796	60	5.3	RCIT; RC; ATD
SR 15A	5	Volusia	DeLand	24,375	25	10.9	RCIT; RC; ATD

155 * Multi-City Bypass
156 ATD: Alleviate Travel Demand; HE: Hurricane Evacuation; RCIT: Redirect Commercial and Industrial Traffic; ES:
157 Enhance Safety; RC: Reduce Congestion
158 ** Per proposed alternatives
159 n/a Proposed without information

Pertinent FDOT Plans and Policies

Certain FDOT plans and policies may lead to the consideration of bypass construction. For example, Florida's Strategic Intermodal System (SIS) comprises transportation facilities deemed critical to interregional mobility and, therefore, the economic vitality of the state. Florida's SIS Strategic Plan "sets policies to guide decisions about which facilities are designated as part of the SIS, where future SIS investments should occur, and how to set priorities among these investments given limited funding" (19). The SIS Strategic Plan and investment policies direct FDOT to spend 75% of all discretionary capital funds on SIS facilities by 2015 (20). As a result, local government officials often push for SIS designation of roadways in their community that meet SIS criteria to ensure federal and state funding for improvements on those roadways.

All SIS roadways must currently meet, or be brought up to, FDOT design and level of service (LOS) standards. Maintaining a high level of service (LOS) standard is the primary requirement for SIS projects to receive funding. Roadway LOS standards play a crucial role in the consideration of bypass construction, because congestion in urban areas may cause a SIS facility to fall below the required LOS. Florida's LOS requirements for the SIS vary based on the area and type of a roadway segment, as established in Rule 14-94, Florida Administrative Code (F.A.C.) and described in the FDOT 2009 Quality/Level of Service Handbook (5). LOS B is the minimum standard in rural areas and LOS C in urban areas. Rural two-lane facilities are also set at LOS C. If additional roadway capacity through a small- or medium-sized community cannot be achieved by adding lanes, a bypass may be considered to improve SIS operating conditions by diverting traffic away from the congested area. FDOT does have an active exemptions process where local governments can get relief from some of the standards (LOS and design speed) for reasons of community character, lack of right of way, or other compelling reasons.

According to the *Adopted SIS Criteria and Thresholds*, "to be designated as a SIS highway corridor, a roadway must meet minimum size criteria and community and environment screening criteria." (21) The SIS Highway criteria address vehicle volume, truck percentage of traffic, and connectivity of segments between SIS corridors. Roads providing major connections to Georgia or Alabama are also part of the SIS. Emerging SIS facilities–defined as those roads that may become part of the SIS in the future–also have specific thresholds which are generally lower than SIS Highway Criteria thresholds. A non-FIHS facility that is on the State Highway System (SHS) may be considered an emerging SIS facility if, among other criteria, it is an interregional corridor that connects rural areas of critical economic concern (Ch. 288.0656 [7], F.S.) to the SIS.

Community and environment screening criteria for SIS facilities address community livability and environmental quality. Notably, one criteria specifies (21):

> "Corridors and connectors should be designated, designed, and constructed in such a way as to avoid or minimize negative impacts and preserve the function and character of local communities, using processes such as the Efficient Transportation Decision-Making process as a tool beginning in early planning phases of a project. SIS corridors serving high volumes of freight traffic should consist of facility types designed to accommodate freight movements, and **should not pass through residential and commercial areas with high levels of pedestrian activity or other activities sensitive to the noise, vibration, emissions, and safety impacts associated with freight movement**. Except where supported by local community plans or necessary for connections to transit hubs, through passenger trips should be accommodated by major arterials and

limited access facilities, and should be discouraged from using streets primarily intended to serve local vehicular, bicycle and pedestrian traffic…." (*emphasis added*)

An implication of this policy is that a limited access bypass is indicated where the SIS is also the "Main Street" of a small- or medium-sized community. Many Florida main streets have been designated as a SIS or Emerging SIS facility. As growth occurs in these areas, traffic volume–particularly freight–also increases on the roadway. The resulting traffic conflicts with the residential, commercial, and pedestrian activity of the community's Main Street, leading to a degradation of LOS and quality of life. When physical and policy constraints limit the feasibility of widening the roadway, a bypass becomes an attractive alternative.

Roadway design standards can also influence the decision to build a bypass. Roads that are part of the FIHS (and therefore by definition the SIS) have roadway design specifications of 50 mph in urban areas and 65 mph in rural areas. Since small communities are too small to be considered "urban," the differing design speeds allow for wide, high speed roads through town which adversely impact pedestrian activity and increase the appeal of a bypass.

FDOT Sociocultural Effects Analysis Process

Although mobility and safety are a primary focus of FDOT in determining the need for a bypass, the potential for these facilities to promote sprawl development, harm local economies, or adversely impact the livability of smaller towns are also of concern. The National Environmental Policy Act (NEPA) and related Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* require consideration of secondary and cumulative effects of transportation projects, including land use, community character and aesthetics. Florida's Efficient Transportation Decision Making (ETDM) process was developed by FDOT in the early 2000s to accomplish NEPA requirements.

In general, land use impacts are considered during the Sociocultural Effects (SCE) Evaluation of the ETDM process, which involves: a) defining the required study area boundary; b) ensuring compatibility with local comprehensive plans; and c) ensuring that aesthetics and open space are not negatively affected. Sociocultural Effects (SCE) Evaluations are thoroughly described in the FDOT *Social Cultural Effects Handbook, 2005* (22) the FDOT *Public Involvement Handbook* (23), and the *Project Development and Environmental (PD&E) Handbook* (24).

Land use considerations noted include urban form, sprawl, local plan consistency, and open space preservation (24, p. 2). SCE evaluation objectives relative to land use include (22):

- Assess foreseeable project effects that could transform the aesthetic character of the study area;
- Assess potential for changes in recreation/open space acreage in conjunction with the project;
- Assess potential for sprawl;
- Determine project consistency with local growth management plans; and,
- Determine consistency with adopted land use plans.

Existing and future land use is to be used to define the study area for the ETDM process, although the default initial study area is 500 feet from the project's proposed alignment.

Florida U.S. 301 Case Study

The proposed bypass of U.S. 301 in Starke, Florida (population of 5,449) was randomly selected for the case study analysis. U.S. 301 is part of the National Highway System (NHS), the Florida Strategic Intermodal System (SIS), and Florida Intrastate Highway System (FIHS). The *Starke U.S. 301 Corridor Study* website (25) highlights the need for additional highway capacity and upgrades to meet FIHS design criteria, and notes numerous challenges to widening US 301 along the existing and modified alignments. The bottom of the web page provides links to additional information about the project, described as follows.

- *Need for Project* – Attributes additional capacity need due to failure to meet local government adopted level of service standards requiring an increase in capacity and upgrades to meet FIHS criteria and the mobility objectives of the SIS. States the additional capacity and upgrades are needed "…in order to address the heavy congestion that prevents the corridor from functioning efficiently as part of a regional transportation link for freight, emergency vehicles, emergency evacuation, and the traveling public." Also noted are high percentages of freight and through traffic.
- *Project Analysis* – Discusses three basic alternatives including the "no project alternative," the "urban alternative," and the "rural alternative." The rural alternative, a four-lane limited access freeway, is identified as the preferred alternative. It is noted that, "the No Project Alternative was considered along with other "Build" alternatives for comparison purposes, even though it does not meet the FIHS criteria with regards to access control, typical section, level of service, and travel speed." This statement highlights the effect of the FIHS criteria on the consideration of a bypass.
- *Public Information* – Notes past public meetings and includes section maps of the rural alternative. Interchanges with the bypass route are shown at SR 16 and SR 100.
- *Rural Alternative Description* – This alternative is described as a four-lane limited access facility that will: "1) afford increased safety; 2) have a higher average travel speed; 3) have a greater lane capacity; and 4) reduce the potential of urban sprawl in the rural areas." The four-lane bypass is 7.3 miles in length beginning and ending north and south of the Starke city limits.
- *Urban Alternative* – This alternative is described as a 4- to 6-lane controlled access facility that in one section would include bike lanes, and a median, while another section would have a continuous left-turn lane. Some realignment of the roadway from the existing U.S. 301 is included in this alternative.

The website indicates that the rural alternative alignment avoids sensitive wetlands. However, the potential of the proposed bypass to impact land use, livability, community character, and local mobility beyond the proposed project boundaries is not addressed. In addition, there is no discussion regarding whether or not the proposed bypass is consistent with the local government comprehensive plans of the City of Starke or Bradford County – both impacted by the proposed alignment.

Florida's ETDM website includes descriptive project information similar to that found on the bypass project website. The Rural (Bypass) Alternative is supported by statements, such as it would remove through traffic from the central business district of Starke, ease the bottleneck caused by the at-grade rail crossing and school crossing zone, and "ensure greater safety for the residents, businesses, and visitors in Starke, by providing a more livable community, and by providing alternate routes for evacuation and emergency services" (26).

Consistency with the Florida Transportation Plan and local government comprehensive plans is also addressed on the ETDM website. Information on local comprehensive plans indicates that the impacted local governments are planning for increased development along U.S. 301, which "is expected to create increased traffic and access demands." The City of Starke plan, last updated in October 2004, recommends that FDOT widen U.S. 301 to 6 lanes or an equivalent action be taken to remedy level of service deficiencies (26). The plan also indicates that six lanes may not be feasible due to limited right-of-way and the amount of commercial activity along the right-of-way, and recognizes that FDOT is considering an alternate rural route (26).

The draft Environmental Impact Statement (EIS) for the US 301 bypass project was reviewed to ascertain the degree of analysis and discussion regarding the indirect land use and related impacts of the proposed bypass (27). The EIS follows the transportation project from official discussions in early 1993 through the proposed action, the rural alternative or bypass. Drawing heavily from the ETDM process, the EIS discusses proposed transportation project alternatives to alleviate growing traffic congestion, meet future traffic volume requirements, and meet FIHS design criteria including limiting access and accommodation of high-speed, high-volume traffic.

The EIS discussion of indirect land use impacts is limited to the future land use plans of Starke and Bradford County in their respective comprehensive plans. According to the EIS, Bradford County added the bypass to its transportation element in 2009. However, the Bradford County Future Land Use Map shows little planned land use intensification between the developed area of Starke and the proposed bypass alternative. Given the increase in accessibility, development pressure is very likely to occur in this area – particularly along S.R. 100 and S.R. 16 where interchanges are planned. In addition, the bypass would increase accessibility to the area west of Starke in the planned Urban Service Boundary of Bradford County. If urban services are provided to this area, the likelihood of development increases. The City of Starke extended its boundaries out along S.R. 100 and the Future Land Use map indicates an area of high density residential land use, as well as a commercial node, at the planned interchange with the bypass.

The EIS fails to address the potential for indirect land use impacts beyond a simple statement that future land development in the area will be subject to compliance with the local government comprehensive plans and other state and local regulations. Also missing in the report is any discussion of future mobility in the area between the developed area of Starke and the proposed bypass alternative. There is no mention of whether the local government comprehensive plans include additional local roadways or development policies to enhance the supporting network. In the absence of an improved local roadway network throughout the area, many local trips will likely rely on the new bypass.

The EIS did, however, include a variety of concerns expressed by residents and business owners throughout the process. Residents expressed concern about the amount of traffic going through Starke and felt the bypass would help to alleviate some congestion and divert noisy truck traffic. Some expressed concern that the bypass would decrease farmland, split family-owned farms, and impact numerous wetlands. Many were concerned that the diversion of traffic would have a negative impact on downtown businesses. However, keeping traffic through town on the proposed six to seven lane urban alternative was not considered acceptable. An economic impact analysis was performed of the rural alternative that anticipates a short-term negative impact on

downtown businesses (e.g., loss of business activity), but a long-term positive economic impact on the *overall* area (e.g., increase in commercial development and tax base).

OBSERVATIONS

Information regarding impacts of bypass projects in Florida is provided in increasing detail from project websites to the ETDM website and, finally, the Environmental Impact Study. Review of this information and consideration of the broader knowledge search resulted in the following observations:

1) Transportation project alternatives on the SIS focus mainly on mobility, level of service, design criteria. This sometimes results in a defined need for capacity projects much larger in scale (6 to 8 lanes) than can reasonably be accommodated within a small or medium sized community. This can lead to a recommended bypass alternative.

2) Much of the information available for public review focuses on direct project impacts within defined project boundaries (near the proposed bypass). This fails to address the important need to study indirect impacts beyond these boundaries (such as sprawl and impacts to the bypassed downtown).

3) To assess indirect land use impacts, analysts rely on future land use as identified in local government comprehensive plans and local development review requirements and processes. What may be missing from this review is a critical analysis of the potential of the proposed bypass to influence area land use and development patterns. Proactively managing such development would be of benefit both to the long term safety and efficiency of the bypass investment and surrounding state highways, as well as to the economy and livability of the affected communities, and the surrounding natural environment.

4) If a bypass alternative is chosen, the bypassed route may receive little or no corrective treatment to return community character and aesthetics to the bypassed roadway. The bypass may result in less traffic (truck and otherwise) through the community. This may be an excellent opportunity for a road diet, as well as sidewalk, bike-path, and landscaping enhancements. Such enhancements could go far in improving the downtown business environment and are consistent with FDOT's Transportation Design for Livable Communities policy and Chapter 19 of the Florida Greenbook.

5) More technical assistance should be provided to the community on methods for addressing potential negative indirect land use impacts. Such issues may be anticipated and addressed throughout the planning and development of a transportation project, particularly through FDOT's Sociocultural Effects Evaluation process and FDOT policy Small communities and rural counties, in particular, would benefit from such assistance.

Potential impacts of bypasses are currently examined by FDOT through the ETDM process. This process examines impacts on land use, community cohesion, aesthetics, mobility, livability, civil rights, and the economy. Guidance is provided in various Department handbooks and manuals relative to assessment of secondary and cumulative effects of highway projects. However, additional state-specific step-by-step guidance would likely be beneficial for topics such as evaluation of indirect land use effects of bypasses. Such guidance has been prepared in Oregon, Wisconsin, California, Maryland and North Carolina. Additional considerations in

developing a methodology for use in Florida in evaluating the indirect land use impacts of bypasses on small and medium sized communities include:

1) Assessments of bypass alternatives should include development and testing of future land use scenarios. Although it is not possible to determine precisely how a transportation project will affect growth patterns, the assessment effort will uncover information that could be of significant value to the decision-making process.

2) Impact assessments of highway bypasses can be data intensive and costly. Guidance on how these assessments may be accomplished should be practical and strategic, given limited agency time and resources. In light of these considerations, three approaches seem particularly appropriate to forecast indirect land use effects of a proposed bypass of small and medium sized communities - planning judgment, collaborative judgment, and elasticities (7).

3) Both qualitative and quantitative methods should be employed.

Florida may also benefit from new state policies or modification of existing policies influencing the consideration and construction of bypass roadways. Some specific policy considerations include:

1) Bypass construction is often proposed by FDOT to return state highway operation to established LOS standards. These standards call for no less than LOS C on SIS highways in rural and small urban areas. The result is that even short periods of peak hour congestion may trigger an LOS deficiency in these areas, calling for major transportation improvements or a potential bypass. A more flexible approach to LOS in small communities was recommended.

2) In areas where a bypass would pose unacceptable community and environmental impacts, it is recommended that FDOT policy require coordination with small- and medium-sized communities in establishing a corridor management plan. These plans could address local network expansion, truck rerouting plans, transportation demand management strategies, and multimodal transportation alternatives. Such alternatives should be accompanied by strategies to support and fund mobility enhancements and be supported by intergovernmental agreements between FDOT and impacted communities.

3) In some cases, travel demand on highways that traverse small- and medium-sized communities could be alleviated by improvements on parallel facilities that are not part of the SIS or the SHS. It is recommended that FDOT consider a policy change to allow SIS funding to be spent off-SIS on facilities/projects that would relieve demand on SIS facilities.

4) Florida has no specific policy in place guiding the construction of bypass routes. Rather, bypasses are driven by state-mandated level of service standards, particularly in rural areas. It is recommended that FDOT consider drafting a bypass policy for the state.

5) It is recommended that once a bypass alternative is chosen, FDOT and local governments with jurisdiction over land in the vicinity of the planned bypass should enter into various agreements. These agreements could include plans and strategies to address land use and transportation considerations along the bypass corridor, such as interchange management

plans, access management plans, and master plans and/or overlay zones for the bypass corridor.

RECOMMENDED POLICY AND PRACTICE ENHANCEMENTS

The solution to transportation capacity needs on Florida's Strategic Intermodal System roadways in small- and medium-sized communities is increasingly a bypass. However, a bypass may open up areas of undeveloped land leading to sprawl and redistribution of the area's economic activity. Indirect impacts of potential bypass construction should be thoroughly analyzed and understood by the community, stakeholders, and FDOT so that issues are resolved or other alternatives are chosen.

A few enhancements to FDOT's existing Sociocultural Effects Evaluation process may result in a more comprehensive analysis that helps all stakeholders more thoroughly understand potential bypass impacts on small- and medium-sized communities. Strategies to resolve the impact-related issues can then be addressed through coordinated agency efforts. It is recommended that FDOT consider the following enhancements to the SCE Evaluation:

1) Share information regarding potential bypass impacts during all project phases. Stakeholders, community residents, and planning analysts will all have pre-conceptions regarding bypass impacts on the community. Many of these preconceptions are addressed in available literature and should be shared with interested parties throughout the process.

2) Expand the recommended EST buffer, specifically for land use and mobility, when a bypass is proposed. Indirect land use and mobility impacts of bypass construction that occur near the bypass, the bypassed roadway, and throughout the transportation network of the community are rarely captured in the EST buffer. An expanded study area is necessary to capturing indirect land use impacts.

3) Consider growth inducement potential during all phases with more detailed analysis during the PD&E phase. Determining the potential for growth inducement provides information on which future planning decisions can be based regardless of which transportation alternative is chosen.

4) Determine bypass consistency with local comprehensive plans. Identification of all relevant policy issues related to consideration of a bypass alternative will help to determine if the project is aligned with the community's vision.

5) Analyze potential change in business customers. Perhaps more telling than an economic impact analysis that is by nature more regionally accurate, an analysis of the potential change in business customers may reveal the amount of local interaction from travelers on the existing facility that may be diverted to a bypass.

The SCE Evaluation requires the community analyst to suggest methods to avoid, minimize, mitigate, or enhance potential transportation project impacts. Strategies for addressing potential project impacts should be identified and pursued, regardless of the lead agency involved in implementation. The following recommended measures offer possible methods for addressing issues potentially resulting from bypass construction.

1) Develop and implement a multimodal mobility plan. Through a mobility plan, a local government can adopt land use and transportation strategies to address the many potential bypass impacts (28).

2) Control interchange access to the bypass. A bypass with no interchanges provides no new access to areas of undeveloped land and is, therefore, unlikely to contribute to sprawl.

3) Plan for maintaining economic viability of bypassed area. Bypassed areas, such as small downtowns, can experience economic difficulties as the area adjusts to a decline in business from traffic that has been diverted to a bypass. It is important for the community to have a detailed plan in place to encourage continued growth and development.

During the PD&E phase, consideration of the costs and benefits of alternative land use scenarios and mobility options will offer decision-makers more information for consideration. It is recommended that FDOT consider modifications to certain policies including the Florida Statewide Minimum Level of Service (LOS) Standards and Strategic Intermodal System (SIS) Criteria and Thresholds, and the Florida Intrastate Highway System (FIHS) criteria may foster more deliberate consideration of bypass construction. The report recommends that FDOT consider a new statewide policy that outlines when a bypass is considered appropriate. Such policies have been adopted in some states, such as California, Texas, and Vermont (5). Recommended existing policy modifications include:

1. Level of service standards
    a. Revise recommended SIS LOS standards, particularly within defined areas (i.e., small- and medium-sized communities, particularly urban core and activity areas).
    b. Require development and implementation of a corridor access management plan as a first step in managing congestion and improving level of service.
2. Strategic Intermodal System
    a. Establish parameters for the amount and frequency of freight movement and through trips within a given context that creates an adverse impact.
    b. Modify the Community and Environment Screening Criteria for SIS facilities addressing community livability.
    c. Where SIS corridors pass through small- and medium-sized communities and serve as the “main street,” a corridor study should be performed to analyze impacts and identify potential solutions.
3. Florida Intrastate Highway System
    a. Include lower speed limits and curvilinear alignments as appropriate Transportation Design for Livable Communities techniques on SIS/FIHS facilities that pass through small- and medium-sized communities.
    b. A lower speed limit may be considered when the facility serves as the main street of a small-or medium-sized community.

CONCLUSION

Indirect impacts of bypasses may include land use and related considerations such as livability, community character, and local mobility. Construction of a roadway bypass provides improved accessibility (ease of getting to and from an area in terms of time and cost) to the land surrounding it. Increased accessibility also occurs via interchanges to a limited access bypass. Increased accessibility, particularly when paired with the provision of urban services and land access, generally increases development pressure in an area.

Additionally, indirect impacts may occur to land use, livability, community character, and local mobility surrounding the bypassed roadway. Often, this roadway has undergone

incremental changes prior to bypass construction designed to maximize vehicular capacity and accommodate large freight vehicles. These changes tend to rob the corridor of its community aesthetic – such as natural and cultural features ranging from street trees to historic structures. After bypass construction, the bypassed roadway is likely to have excess vehicular capacity and a wide crossway unfriendly to pedestrians and bicyclists. Plans to mitigate indirect impacts of a bypass, therefore, may include steps to identify and address the character and livability of the bypassed roadway.

This study uncovered numerous sources of information on evaluating bypasses, ranging from economic factors to indirect land use impacts. The methodologies varied from highly quantitative to qualitative, and limitations or gaps appear to be related more to data and resource availability than to technical deficiencies. In addition, extensive guidance is available on impact assessment methodologies that could be adapted for use by FDOT and other state transportation agencies. Nonetheless, an exploratory review suggests that more specific guidance on evaluating and addressing indirect land use impacts would be beneficial. Given limited time and resources, any approach to bypass impact assessment should be both practical and cost effective. In addition, different approaches to bypass impact assessment may be needed at different points in the planning and project development process.

This paper provides some initial suggestions for accomplishing a more comprehensive, yet practical approach to bypass impact assessment. Many of these findings and suggestions are also of value to other state transportation agencies in updating their bypass analysis procedures and practices. Implementation of these recommendations will result in a more comprehensive understanding of the potential impacts of a bypass on small- and medium-sized communities and provide for more integrated transportation land use solutions. Additional research and comparative review of plans and studies prepared for Florida bypasses would provide further insight as to strategies to enhance the depth and quality of these assessments.

REFERENCES

1. Handy, S. L., J. Jarrett, and S. Vanka. *Planning for the Impacts of Highway Relief Routes on Small- and Medium-Size Communities: Literature Review and Identification of Issues.* Research Project 0-1843-1**.** 2000.

2. Kockelman, K.M., S. Srinivasan, and S.L. Handy. *Planning for the Impacts of Highway Relief Routes on Small- and Medium-Size Communities: An Econometric Analysis.* Research Project 0-1843-2. 2000.

3. Handy, S. L., S. Kubly, D. Larsen, J. Sralla, S. Vanka, and M. Oden.*Planning for the Impacts of Highway Relief Routes on Small- and Medium-Size Communities: Case Studies*. Research Project 0-1843-3. 2000.

4. Jarrett, J., S.L. Handy, and S. Vanka. *Planning for the Impacts of Highway Relief Routes on Small- and Medium-Size Communities*. Research Project 0-1843-3. 2000.

5. Seggerman, K., K. Williams, A. Bond, V. Stover, S. Concas, J. Penrod-Krause. Impacts of Bypass Highways on Small and Medium Size Cities in Florida: Knowledge Search and Evaluation of Past Studies, prepared for the Florida Department of Transportation, December 2010.

6. Florida Department of Transportation. *2009 Quality/Level of Service Handbook.* http://www.dot.state.fl.us/planning/systems/sm/los/pdfs/2009FDOTQLOS_Handbook.pdf.

Accessed July 2010. NOTE: The Handbook was updated in 2013, subsequent to this research; however, the urban area population guidelines remain unchanged.

7. Seggerman, K. and K. Williams. *Impacts of Bypass Highways on Small and Medium Size Cities in Florida: Enhancing Existing Evaluation Methods*, prepared for the Florida Department of Transportation, December 2011.

8. System Metrics Group, Inc. *California Bypass Study, the Economic Impacts of Bypasses, Vol. 1: Planning Reference*. Prepared for the California Department of Transportation, 2006.

9. Mills, J. B. & Fricker, J. D. *The Economic Impacts of Bypasses on Communities: An Integrated Approach*. School of Civil Engineering, Purdue University: West Lafayette, IN, 2009.

10. Leong, D., & Weisbrod, G. *Summary of Highway Bypass Studies. In Economic Impact Analysis: St. Croix River Crossing—Minnesota TH 36/ Wisconsin STH 64*. Prepared by the Economic Development Research Group for the Minnesota Department of Transportation and the Wisconsin Department of Transportation, 2000.

11. Oregon Department of Transportation. *Bypass Study 2002: An Analysis of Oregon's Existing Bypasses*. Prepared for the Oregon Transportation Commission, 2002.

12. Weisbrod, G. *Highway Bypasses of Small Communities: Review of Findings on Their Economic Impacts.* Boston: Economic Development Research Group, Inc., 2001.

13. Pettit, R. Economic Impacts of Highway Bypasses on Communities in Iowa. Presented at the Midwest Transportation Consortium at the Transportation Scholars Conference in Ames, Iowa. 2007.

14. Srinivasan, S., & Kockelman, K. M. The Impacts of Bypasses on Small and Medium-Sized Communities: An Econometric Analysis. *Journal of Transportation and Statistics, 5*(1), 57-69, 2002.

15. Gillis, W. & Casavant, K.L. Lessons from Eastern Washington: State Route Mainstreets, Bypass Routes and Economic Development in Small Towns (EWITS Research Report Number 2). Prepared by the Eastern Washington Intermodal Transportation Study at Washington State University, 1994.

16. Babcock, M. W., & Davalos, J. A. Case Studies of the Economic Impact of Highway Bypasses in Kansas. Journal of the Transportation Research Forum, 43(1), 57-77, 2004.

17. Leong, D., & Weisbrod, G. Summary of Highway Bypass Studies. In Economic Impact Analysis: St. Croix River Crossing—Minnesota TH 36/ Wisconsin STH 64. Prepared by the Economic Development Research Group for the Minnesota Department of Transportation and the Wisconsin Department of Transportation, 2000.

18. Otto, D., & Anderson, C. The Economic Impact of Rural Highway Bypasses: Iowa and Minnesota Case Studies (Final Report). Prepared by the Midwest Transportation Center at Iowa State University, 1995.

19. Florida Department of Transportation. *Florida's Strategic Intermodal System Strategic Plan*. Adopted January 29, 2010.

596 20. Florida Department of Transportation. *Original SIS Strategic Plan Implementation Guidance*
597 *with Changes Noted*, *4.0 Finance Strategy*.
598 www.dot.state.fl.us/planning/sis/strategicplan/implementguide/. Accessed November 15, 2010.

599 21. Florida Department of Transportation. *Adopted SIS Criteria and Thresholds*. 07/20/08.
600 www.dot.state.fl.us/planning/sis/strategicplan/criteria.pdf. Accessed July 2010.

601 22. Florida Department of Transportation. *Socio Cultural Effects Handbook*, 2005.
602 www.dot.state.fl.us/emo/pubs/public_involvement/pubinvolve1.shtm

603 23. Florida Department of Transportation. *Public Involvement Handbook*, October 2003.
604 www.dot.state.fl.us/emo/pubs/public_involvement/pubinvolve1.shtm

605 24. Florida Department of Transportation. *Project Development and Environment (PD&E)*
606 *Handbook*. www.dot.state.fl.us/emo/pubs/pdeman/pt2ch9_110909-current.pdf.

607 25. *Starke 301 Project Website*. http://www.us301starke.com/us301/need/. Accessed June 2010.

608 26. FDOT ETDM Website. https://etdmpub.fla-etat.org/est/#. Accessed June 2010.

609 27. *Draft Environmental Impact Statement: Starke U.S. 301 Corridor Study*, ETDM Number:
610 7640, Florida Department of Transportation, for the U.S. Department of Transportation, Federal
611 Highway Administration (n.d.)

612 28. Williams, Kristine and Seggerman, Karen. *Mobility Review Guide.* Florida Department of
613 Transportation, 2011.