COMPLETE STREETS AND ROUTINE ACCOMMODATION AND ROUTINE ACCOMMODATION STATE LAWS:

A LEGAL MAPPING STUDY & A MULTI-METHOD POLICY PROCESS AND OUTCOME EVALUATION EXAMINING EFFECTS ON PEDESTRIAN INJURY

by

JAMILA MOSI CURRY PORTER

(Under the Direction of Joel M. Lee)

ABSTRACT

Introduction: Pedestrian injury is a significant public health problem in the U.S. Routine accommodation policies – commonly known as “Complete Streets” policies – have been adopted by local and state governments to improve the safety of non-motorized road users (e.g., pedestrians and bicyclists) by mandating their accommodation as a routine part of roadway planning, construction, operation, and maintenance. To date, there has not been a systematic review of these laws, nor has any study examined whether the adoption and implementation of a state Complete Streets law can be linked to changes in a public health outcome (e.g., pedestrian fatalities). The purpose of this research was to: (1) inventory state Complete Streets and routine accommodation laws; (2) determine whether Florida’s adoption of a Complete Streets state law (Statute 335.065) is associated with statewide decreases in pedestrian fatalities; and (3) identify factors that have supported or hindered the implementation of Florida Statute 335.065. Methods: A comprehensive survey of state statutes was

conducted using academic and legal databases, and a codebook and dataset were developed. To investigate the association between the adoption of Florida Statute 335.065 and decreases in pedestrian fatalities, a multi-method design was used, including an interrupted time-series quasi-experiment and semi-structured interviews with 10 current and former Florida transportation professionals. ARMA models compared Florida to two comparison groups. Interviews were conducted, recorded, transcribed, and analyzed. Results: Eighteen states adopted Complete Streets and routine accommodation laws from 1972 – 2015; over 70% (n=14) have been passed since 2007. Adjusting for log mortality rates in 13 regional states and all U.S. states and DC, Florida's pedestrian fatality rates decreased significantly more per quarter after Statute 335.065 was adopted (0.251% and 0.252%, respectively). Interviewees described supports and challenges associated with implementing Statute 335.065. Conclusions: This research: (1) describes an inventory of state Complete Streets and routine accommodation laws and their provisions; (2) confirms that state Complete Streets laws can be associated with significant reductions in pedestrian fatalities; (3) reveals factors that can influence the implementation and effectiveness of Complete Streets laws; and (4) affirms that transportation policies can have significant and quantifiable impacts on public health outcomes.

INDEX WORDS: Complete Streets policy, Complete Streets legislative statute, Routine accommodation, Pedestrian injury, Pedestrian fatalities, Legal mapping, Policy process evaluation, Policy outcome evaluation, Multi-method evaluation, Florida Statute 335.065, Florida transportation policy

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DEDICATION

This dissertation is dedicated to everyone who has ever been a pedestrian and to the many practitioners, professionals, and policymakers that work every day to make travel safer for pedestrians along roads and highways throughout the United States.

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I would like to sincerely thank my family, friends, professional colleagues, professors, dissertation committee members, and the staff in the College of Public Health for the exceptional help, support, input, and kindness they have bestowed upon me throughout my academic career. Without them, this research would not have been possible.

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CHAPTER 1: INTRODUCTION AND LITERATURE REVIEW

1.1 CONNECTIONS BETWEEN ROADWAYS AND HEALTH

United States transportation systems – vast networks that include roads, bridges, mass transit, airports, railroads, ports, waterways, and pipelines – have a significant impact on human activity. According to the United States Department of Homeland Security, U.S. transportation systems "connect cities, manufacturers, and retailers" and move both people and goods through "a complex network of approximately 4 million miles of roads and highways, more than 100,000 miles of rail, 600,000 bridges, more than 300 tunnels and numerous sea ports, two million miles of pipeline, 500,000 train stations, and 500 public-use airports."[1] Transportation systems have real impacts on the U.S. economy: In 2012, transportation goods and services accounted for 9% of the U.S. Gross Domestic Product (GDP) and transportation is the second largest expense for most households after housing.[2]

Figure 1.1. Pedestrians and bicyclists cross a street in New York City. *Source: New York City Department of Transportation, Dangerous by Design 2014, Smart Growth America and the National Complete Streets Coalition, May 2014.*

As the foundation of the U.S. transportation system, road-based transportation systems, in particular, have significant impacts on human populations. Roadways – which include highways, streets, and parkways, as well as the entire right-of-way, such as sidewalks, the road shoulder, medians, and in-street rails[3] – directly determine how and where communities are built and influence the location and accessibility of housing, schools, workplaces, recreational areas, goods, and services. In keeping, roadways – and the planning and land use decisions that influence their locations and structures – also impact human health, both indirectly and directly: indirect health impacts related to how roads connect people to essential aspects of life (e.g., jobs, medical care, and healthy food outlets); direct impacts include how roadways contribute to pollution-related asthma, obesity, mental health issues, and in particular, traffic crashes.[4]

Traffic crashes[*] – defined by National Highway Traffic Safety Administration (NHTSA) as incidents that "involve one or more vehicles where at least one vehicle is in transport and the crash originates on a public trafficway"[5] – are the second highest cause of death and disability in the U.S., and are the leading cause of death for children and adults ages 5 to 24.[6] Traffic crashes are closely related to vehicle-miles traveled, vehicle speed, and traffic volume, and the design of a transportation network plays a key role in these travel characteristics.[7] Research has found that wider roads that allow for motor vehicles to attain higher speeds increase both the likelihood and the severity of traffic crashes – especially for pedestrians and bicyclists that attempt to travel on or cross these roads.[8-11]

[*] North American injury prevention professionals generally do not use the term "accident," as it is perceived to reinforce public misconceptions that injuries are not preventable, avoidable, or scientifically predictable occurrences (Girasek DC. 1999. How members of the public interpret the word accident. *Injury Prevention*, 5:19-25). In 1997, NHTSA prohibited their employees from using the term "accident" in official communications, as they stated that the term "promotes the concept that these events are outside of human influence or control." (National Highway Traffic Safety Administration. 1997. "Crashes aren't accidents" campaign. NHTSA Now;3(11):1–2). As a result, the terms "crash," "collision," "incident," and/or "injury" were encouraged as substitutes for the word "accident."

Although the Centers for Disease Control and Prevention (CDC) has noted that "there is a growing awareness across communities that transportation systems impact quality of life and health,"[12] the National Surface Transportation Policy and Revenue Study Commission – created by the U.S. Congress in 2005 to examine the condition and needs of U.S. transportation systems – stated that "the nation's surface transportation network regrettably exacts a terrible toll in lost lives and damaged health."[13] However, the connections between transportation systems and health impacts are often complex, as there are often several steps between a transportation policy or planning decision, its impact on land use and travel behavior changes, and its ultimate health, economic, social, and environmental impacts such as traffic crash rates, pollution-related asthma rates, or physical activity levels (Figure 1.2).[14]

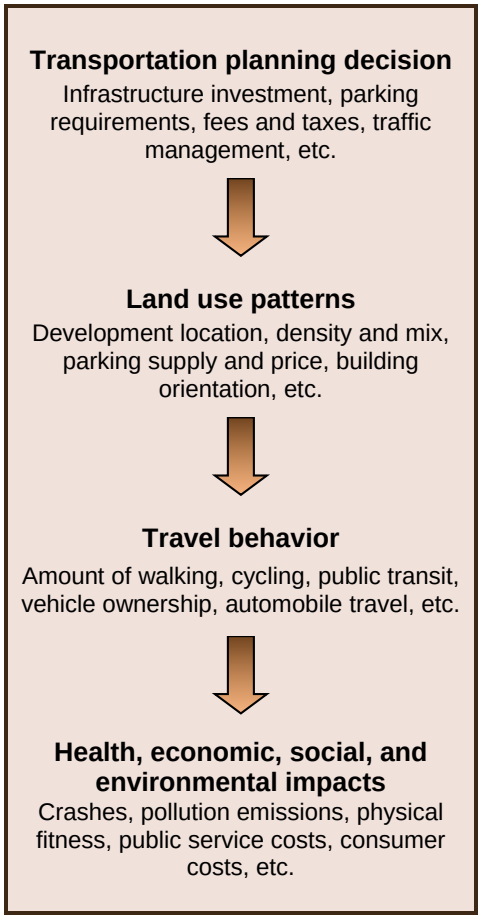


Figure 1.2. Steps between transportation planning decisions and impacts. *Source: Litman T (2013). Transportation and public health. Annu. Rev. Public Health. 34:217–33.*

It has been argued that fragmented public decision-making processes have exacerbated disjunctions between transportation and health-related decisions. According to Litman (2003), in a conventional reductionist paradigm, problems are assigned to separate, specialized organizations that have discrete, narrowly-defined responsibilities.[15]

Over previous decades, transportation agencies had exclusively addressed traffic problems (with limited consideration of public health impacts), while public health agencies had primarily focused on immediate health concerns (with limited consideration of broader, environmental impacts). However, in recent years, this reductionist view has been challenged by a growing body of evidence that has demonstrated strong interconnections between transportation decisions and community health. When transportation systems – and the roadways that are part of them – have been designed with health as a central guiding factor, research has shown that they have are repeatedly associated with: decreased rates of traffic injuries and fatalities[16]; decreased rates of air pollution[17]; increased walking, biking, and public transit use[18-20]; overall increases in physical activity and lower body weights[17,21-26]; and better mobility for non-driving populations.[27,28]

Furthermore, significant changes in national population demographics have made connections between transportation and health more apparent, and the consequences of ignoring them more precarious. As the largest generation in history – the baby boom generation – continues to age, it is estimated that the number of older adults in the U.S. will double to over 71 million by the year 2030.[29] Given that most of these older adults will likely choose to “age in place” (to independently live in their own homes and communities, rather than in a health care facility or nursing home) and will have higher life expectancies, these millions of older adults will require access to transportation modes and infrastructure that provide alternatives to driving in order to maintain their independence in advanced age.[30] Ultimately, transportation systems will need to be able to accommodate non-motorized transportation users of all ages and abilities using facilities that are developed on parity with those utilized by motorized transportation users.

1.2 WALKING IN THE UNITED STATES: PUBLIC HEALTH BENEFITS AND CONSEQUENCES

Non-motorized transportation – also referred to as "active" or "human-powered" transportation – includes walking and bicycling, as well as small-wheeled transport (e.g., skates, skateboards, scooters, etc.).[31] Non-motorized transportation is widely considered to be a "low-cost, low-polluting, calorie-burning, health improving alternative to driving."[32] Walking, specifically, has been regularly recommended by health professionals, given that it is a "free form of exercise that can be incorporated into everyday life and sustained into old age."[33] Moderately intense physical activity – which, at minimum, can be achieved by walking at a moderate pace of three miles/hour[34] – has been linked to reduced risk of chronic diseases, including cardiovascular disease, type 2 diabetes, and some cancers.[35] Furthermore, a population-level shift toward non-motorized transportation can reduce vehicle travel and decrease fossil fuel emissions that create air pollution (which has been linked to respiratory illness and impaired lung development and function[3]) and greenhouse gases (which have been linked to global warming and its many adverse health and environmental impacts[36]). Given its potential long-term benefits for both individual and population health, encouraging non-motorized transportation – walking in particular – has become a public health imperative. However, a significant barrier to achieving population-level increases in walking has been that of safety.

In the decade from 2003 through 2013, 50,369 pedestrians[†] were fatally injured while walking on roadways throughout the United States.[5] These fatal injuries were caused by collisions between pedestrians and motor vehicles, resulting in irreparable

[†] NHTSA defines a pedestrian as "any person on foot, walking, running, jogging, hiking, sitting or lying down who is involved in a motor vehicle traffic crash."

physical trauma, and ultimately death. According to NHTSA, 4,735 pedestrians died in traffic crashes in the U.S. in 2013 alone, and approximately 66,000 pedestrians were injured in traffic crashes in the same year. Based on these figures, a pedestrian was killed in a traffic crash nearly every two hours and injured every eight minutes.[5] After four years of consistent decreases, U.S. pedestrian fatalities began to climb steeply as of 2009 (Figure 1.3). While the total number of motor vehicle traffic fatalities has largely decreased since 2005, over that same period of time, pedestrian fatalities have become an increasingly larger proportion of all traffic fatalities. Pedestrians were 14.5% of all traffic fatalities in 2013 (Figure 1.4) and 15% of all traffic fatalities in 2014 (n=4,884). Preliminary data from the Governors Highway Safety Association (GHSA) indicate that pedestrian fatalities will increase by 10% nationally in 2015 compared to 2014.[37]

Figure 1.3. U.S. Pedestrian Fatalities, 2003-2013. *Source: National Highway Traffic Safety Administration (NHTSA), Fatality Analysis Reporting System (FARS)*

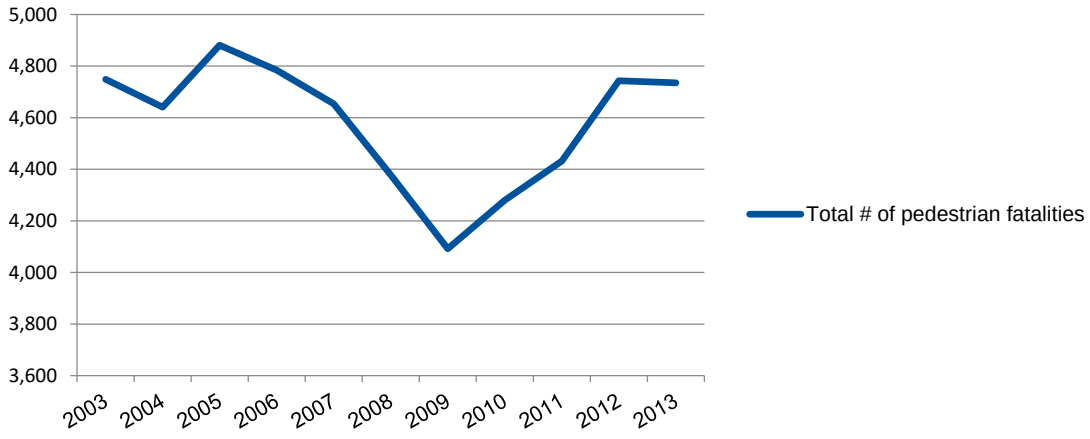
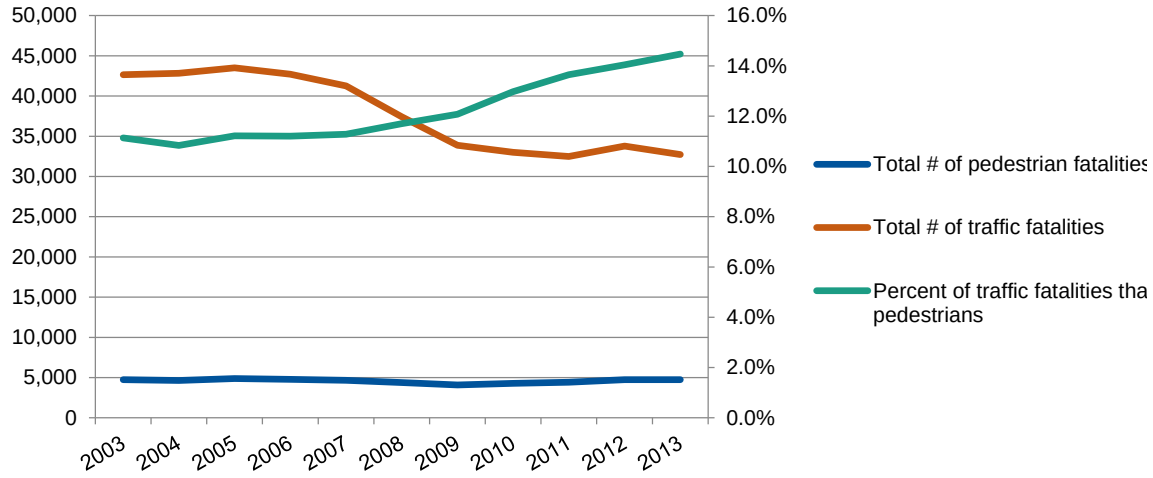


Figure 1.4. U.S. Traffic and Pedestrian Fatalities, 2003-2013. *Source: National Highway Traffic Safety Administration (NHTSA), Fatality Analysis Reporting System (FARS)*



Unfortunately, populations that could most benefit from the positive health outcomes associated with increased walking are also the most vulnerable to traffic dangers[32]; roadway infrastructure associated with safe, walkable[‡] environments – such as sidewalks on both sides of a road or streets with street and/or sidewalk lighting – are significantly less common in low-income areas, compared to middle or high-income areas.[38] Furthermore, low-income individuals may have an overall higher risk of being involved in a pedestrian-vehicle collision, given that low-income individuals are more likely to walk to work compared to their higher income counterparts.[39] Hence, a lack of non-motorized infrastructure in low-income communities, coupled with an overall increased risk of being fatality injured, may contribute to disproportionately higher rates of pedestrian fatalities in low-income areas compared to higher income areas. Furthermore, older adults and children are particularly at risk of being fatally involved in

[‡] "Walkability" is defined as a term "used to identify and measure features of the built environment that either enhance or impede an individual's willingness and ability to walk to local amenities" (Glicksman A, Ring L, Kleban M, and Hoffman C. (2013). Is "Walkability" a Useful Concept for Gerontology? *Journal of Housing for the Elderly*, 27:2AA-254).

pedestrian-related traffic crashes. In 2013, older adults (age 65+) accounted for 19% of all pedestrian fatalities, and 21% of children ages 14 and younger that were killed in traffic crashes were pedestrians.[5]

There can be many contributors to individual pedestrian-vehicle collisions, including weather, time of day, and driver or pedestrian distraction or impairment. However, a primary and systemic contributor to these collisions is road design. Road design "can increase crash risk by determining where and how traffic movements will occur"[3]; design elements ranging from the number of lanes and changes in speed to the existence of sidewalks or marked crossings contribute to road user attentiveness and how vehicles and pedestrians will interact on a given roadway. Given the influence of road design on pedestrian safety, achieving population-level increases in walking rates without further increasing pedestrian injuries and fatalities require a population-level intervention: policy adoption.

Figure 1.5. Pedestrians attempt to cross a multi-lane highway in South Fulton County, Georgia. *Source: Flickr/Stephen Lee Davis, Governing Magazine, "Pedestrians Dying at Disproportionate Rates in America's Poorer Neighborhoods," August 2014.*

1.3 TRANSPORTATION POLICY AND PEDESTRIAN SAFETY

Policy has long been the cornerstone upon which transportation systems have been built. According to Ross and Marcus (2009), "health is influenced by roads, but roads are influenced by infrastructure construction programs, public policy, and funding

practices."[3] Whether they are adopted at the federal, state, or local level, policies – including public, organizational, and administrative policies – primarily influence how roads are funded, designed, constructed, and maintained.

Federal Policy

At the federal level, transportation policy is principally informed and funded by the omnibus surface transportation spending bill. The first federal surface transportation bill, *Federal-Aid Highway Act of 1956* (also known as the *National Interstate Defense Highways Act*), authorized the Interstate Highway System. For the nearly four decades after the *Federal-Aid Highway Act of 1956* was signed into law, federal transportation bills focused on highways and motor vehicles as the primary modes of travel. However, in response to safety advocates, the U.S. Congress began to address the needs of non-motorized travelers with passage of the 1991 surface transportation bill titled, *Intermodal Surface Transportation Efficiency Act (ISTEA)*. ISTEA substantially shifted the focus of federal transportation policy by going beyond funding traditional highway and transit programs to also include funds for projects that improved air quality, reduced traffic congestion, and provided pedestrian and biking infrastructure.[40] Among other lauded provisions, ISTEA is credited with establishing new Federal-aid highway program funding categories that provided broad eligibility for bicycle and pedestrian facilities and requiring state departments of transportation fund a state bicycle and pedestrian coordinator.[41]

The 1998 federal surface transportation bill, *Transportation Equity Act for the 21st Century (TEA-21)*, went a step further. TEA-21 specifically stated that, "Bicycle transportation facilities and pedestrian walkways shall be considered, where appropriate, in conjunction with all new construction and reconstruction of transportation projects, except where bicycle and pedestrian use are not permitted" and "Transportation plans

and projects shall provide due consideration for safety and contiguous routes for bicyclists and pedestrians."[42] The federal surface transportation bill – *Moving Ahead for Progress in the 21st Century (MAP-21)* – was signed into law in July 2012 and went into effect in October 2012. MAP-21 eliminated a host of national core (or "formula") highway programs and consolidated remaining programs into six core programs (Figure 1.6).[43] The bill authorized $38.2 billion for federal transportation programs over two years.

Through MAP-21, pedestrian safety-related projects were primarily funded by the Highway Safety Improvement Program (HSIP) and the Transportation Alternatives Program:

- ***Highway Safety Improvement Program (HSIP)****:* HSIP is one of the core programs funded through MAP-21 whose purpose is to correct or improve hazardous roadway features "to achieve a significant reduction in traffic fatalities and serious injuries on all public roads"[44] and to increase traffic safety for all road users, which are defined as both motorized and non-motorized users. State and local projects funded through HSIP can include (but are not limited to) intersection safety improvements; traffic calming (a "combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users"[45]); safety improvements for pedestrians, bicyclists, and persons with disabilities; and the collection, analysis, and improvement of safety data.

- ***Transportation Alternatives****:* Prior to the advent of MAP-21, federal funding explicitly intended to enhance pedestrian and bicyclist safety was largely provided through three programs:

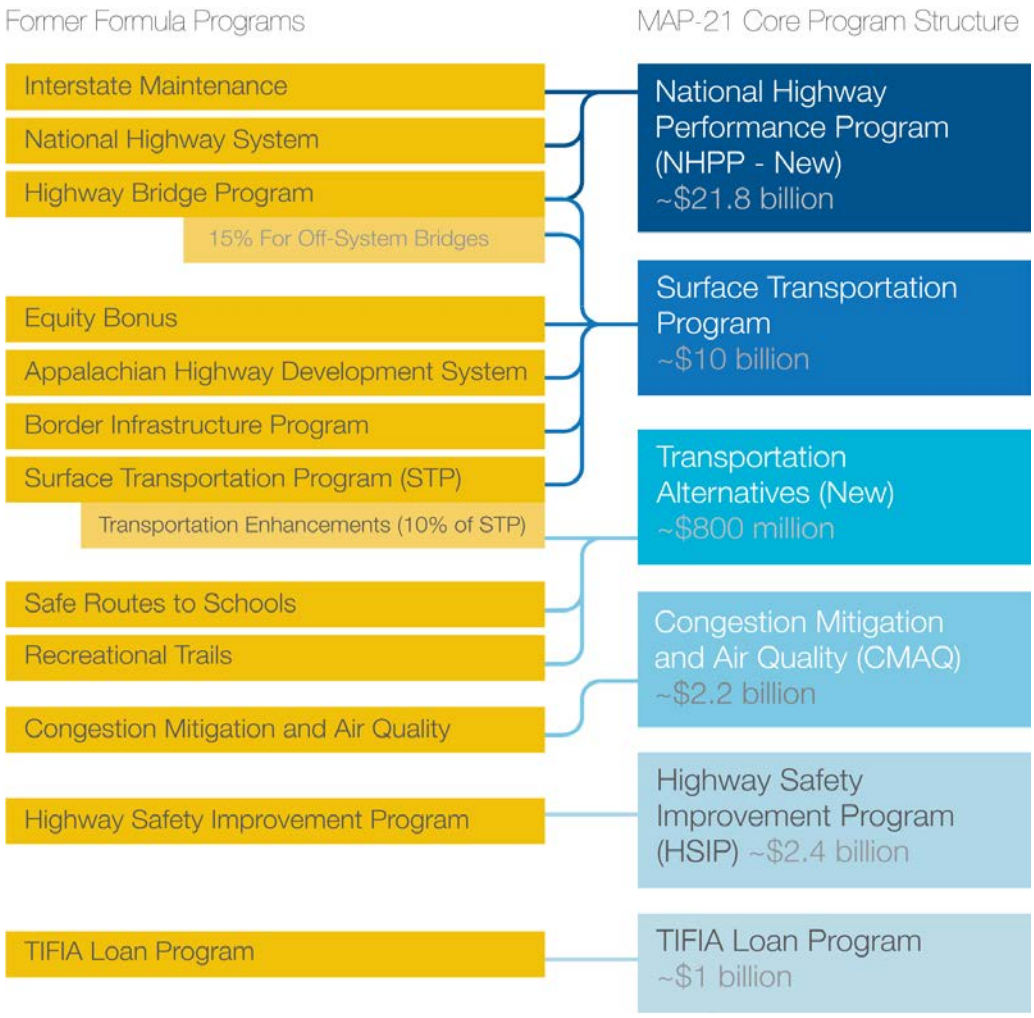
- Transportation Enhancements (TE) Program – A mandated set-aside of funds provided to states, which could be used to build pedestrian and bicycle facilities, as well as provide safety and education-related activities for pedestrians and bicyclists)[46]

- Safe Routes to School (SRTS) Program – A federal program established in the 2005 federal surface transportation bill titled, *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)*, SRTS was designed to "enable and encourage children, including those with disabilities, to walk and bicycle to school" and to "make walking and bicycling to school safe and more appealing" by funding roadway infrastructure projects at state and local levels.[47] Safe Routes to School also funds non-infrastructure projects, such as public awareness campaigns, traffic education and law enforcement, and evaluation activities.[48]

- Recreational Trails Program (RTP) – A federal program that "provides funds to the states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses."[49]

The adoption of MAP-21 consolidated these three programs into one titled, "Transportation Alternatives." Through the Transportation Alternatives program, local applicants can compete for funds to "provide transportation options, improve safety and enhance economic vitality" through programs similar to its three predecessor programs.[43]

Figure 1.6. Restructure of Core Highway Programs Under MAP-21. *Source: Transportation for America. Making the Most of MAP-21: A Guide to the 2012 Federal Transportation Law – And How to Use it for Positive Change in Your Community, 2012.*



In 2010, the U.S. Department of Transportation (U.S. DOT) released a policy statement in affirming that the motor vehicle would no longer be the prime consideration in federal transportation planning, recommending that walking and bicycling should be considered "equals with other transportation modes."[50] However, this policy was not reflected in MAP-21; passed two years later, the bill allocated only 2.1% of highway funding to states to accommodate the safety of non-motorized transportation users,[51] although bicyclists and pedestrians then represented 14% of all traffic fatalities.

On December 4, 2015, President Obama signed into law a new five-year federal transportation bill (*Fixing America's Surface Transportation Act* or the "FAST" Act) which was structured similarly to MAP-21. Among many other provisions, the FAST Act continues to include the Transportation Alternatives program to help support the development of safe routes for walking and biking in states and communities. Funding for the Transportation Alternatives program was capped at $850 million in the FAST Act – a 6.25% increase compared to the MAP-21 authorization level.[52]

State Policy

At the state level, departments of transportation have been required to create strategic highway safety plans (SHSPs) to receive federal transportation funds, and some of these plans include sections on pedestrian safety. Many states have gone beyond this to develop separate statewide pedestrian safety action plans. These organizational plans and internal policies can provide a statewide regulatory framework for accommodating pedestrians on roadways through engineering adjustments, while also outlining efforts to enhance pedestrian safety through educational campaigns, enforcement strategies, and evaluation efforts. State legislatures have generally addressed pedestrian safety through a variety of policy strategies, including adopting:

- *"Failure to Yield" or "Failure to Stop" laws,* which enforce the right-of-way of pedestrians by requiring drivers of motor vehicles to stop or yield to a pedestrian crossing at an uncontrolled crosswalk (a crosswalk where a traffic control device is either not in place or operational to manage pedestrian movement).[53]

- *Speeding laws*, which require motor vehicle users not to exceed certain speeds on various roadways. The enforcement of speeding laws is particularly important

on roadways that with pedestrian users, given that eighty percent of pedestrians struck by a car going 40 miles per hour will die. While the likelihood of death is reduced to 40% at 30 miles per hour, the fatality rate drops to just five percent at 20 miles per hour.[9]

- *"Vulnerable Users" laws,* which define "vulnerable roadway users" (e.g., pedestrians, bicyclists, persons operating a wheelchair, etc.) and prescribe increased penalties for motor vehicle drivers that endanger these users. States have passed measures to protect vulnerable roadway users from behaviors ranging from passing too closely to taunting and harassment.[54]

- *Laws that fund public education, driver education, and police enforcement* to increase awareness of and adherence to (through fines and penalties) existing laws related to pedestrian safety.

- *Mechanisms to fund pedestrian safety infrastructure near schools and transit stops*, often through the use of Safe Routes to School or Federal Transit Administration funds.

1.4 ROADWAY DESIGN FOR SAFETY: PEDESTRIAN COUNTERMEASURES

State and local agencies that are responsible for planning and designing roads – including state departments of transportation, metropolitan planning organizations (MPOs), and local planning and public works agencies – have long utilized transportation engineering standards and design guidelines from the U.S. DOT and professional organizations to guide and inform how they construct roadways. These

standards and design guidelines have been created by organizations such as the American Association of State Highway and Transportation Officials (AASHTO), the Institute of Transportation Engineers (ITE), and the National Association of City Transportation Officials (NACTO). Many of these standards and guidelines often include safety accommodations or "countermeasures" – infrastructural treatments intended to enhance the safety of motorists, bicyclists, and pedestrians. For instance, the Federal Highway Administration's (FHWA) "Pedestrian Safety Guide and Countermeasure Selection System" includes a total of 67 engineering, education, and enforcement countermeasures, ranging from treatments such as sidewalks, signals, and marked crosswalks for pedestrians; bicycle lanes for cyclists; and speed humps and roundabouts intended to slow and control motor vehicle traffic.[55]

Pedestrian countermeasures on roadways – particularly sidewalks, marked crosswalks, traffic signals, and medians – have been shown to enhance both motorist and pedestrian safety. Motor vehicle crashes that involved pedestrians are twice as likely to occur in areas that lack sidewalks, while strategies such as raised medians, pedestrian refuge islands, and walk signals with time counters have been found to dramatically increase pedestrian safety.[56] Medians and pedestrian crossing islands, specifically, are examples of traffic calming measures can reduce the speed of vehicles approaching pedestrian crossings and reduce pedestrian-involved motor vehicle crashes by 46%, as they give pedestrians a safe place to stop at the midpoint of a roadway before crossing the remaining distance.[57]

1.5 ROUTINE ACCOMMODATION AND COMPLETE STREETS POLICIES

By the 1970s, community groups, advocates, and several state and local governments began to promote the concept of "routine accommodation" – having

transportation agencies not only consider the needs of non-motorized road users, such as pedestrians and bicyclists, but to also accommodate them as a routine part of their roadway planning, design, construction, operation, and maintenance activities.[58,59] Eventually, the concept of "routine accommodation" was formally embraced by the U.S. Federal Highway Administration (FHWA) in 1999 when Kenneth Wykle, the agency's administrator, wrote a memo to division administrators and highway program engineers that stated: "We expect every transportation agency to make accommodation for bicycling and walking a routine part of their planning, design, construction, operations and maintenance activities."[60]

While meaningful to transportation practitioners, advocates and laypersons found it difficult to get the term, "routine accommodation," to resonate with federal policymakers, decision-makers, and members of the public. To address this issue, staff at the advocacy organization, America Bikes, introduced an alternate term to the lexicon in 2003: "Complete Streets" – a transportation approach that ensures roads are designed and operated to meet "the needs of all travelers, regardless of age, ability, or mode of transportation."[61,62] Although attempts have been made to differentiate between "routine accommodation" and "Complete Streets" – particularly given the latter's association with other concepts, such as active living, transit-oriented design, and context sensitivity[63] – the terms continue to be used interchangeably by practitioners, and FHWA currently refers to both concepts synonymously.[64]

A Complete Streets policy is "aimed at producing roads that are safe and convenient for all users," including motorists, transit users, bicyclists, pedestrians, and people with disabilities.[65] The United States Department of Transportation (U.S. DOT) describes the purpose of a Complete Streets policy as one that is intended to "change the way every day transportation decisions are made; change design guidelines; educate and train everyone on the new approach, and use new measures of success."[66]

Specifically, these policies ensure that the entire right-of-way (land devoted to highway transportation purposes) is planned, designed, constructed, operated, and maintained to provide safe access for all users, including non-motorized users such as pedestrians and bicyclists.[67,68] This approach is intended to result in roadways that fundamentally shift away from auto-oriented design to a design that embraces trips made by trips to pedestrian, bicycle and transit modes (Figure 1.7).[65,69]

Complete Streets policies can include mandates that require state and local departments of transportation, planning, and public works to regularly use specific design guidelines and standards that provide traffic calming and safety accommodations for non-motorized transportation users. Figure 1.7 depicts an example of a street before and after it is made “complete,” and cites examples of specific design elements that can comprise a Complete Street.

Complete Streets policies have been adopted by state and local governments in a variety of forms ranging from statements in comprehensive plans, design guides, and departmental policies to formal resolutions, executive orders, and legislation. Complete Streets policies have been increasingly adopted by cities, counties, and states in a variety of forms to direct specific agencies and decision-makers to “fund, plan for, design, construct, operate, and maintain streets” to enhance safety, access, and mobility for all users, including pedestrians, cyclists, users of public transit, and motorists.[70]

Figure 1.7. A Street Before and After It Becomes a "Complete Street." *Source: Good Magazine and the Livable Streets Magazine, "The Street of the Future is a Livable Street: How to Overhaul a Manhattan Intersection," 2009.*

1. Street vendors help make streets into destinations.
2. Pedestrian street lamps provide those walking with essential lighting.
3. Curb extensions or bulb-outs narrow the street at crosswalks.
4. Dedicated bus lanes allow buses to move efficiently.
5. Dedicated bike lanes enhance the efficiency and safety of cyclists.
6. Raised, textured sidewalks provide clear distinctions of "pedestrian-first" zones.
7. Traffic lights with a leading pedestrian interval give pedestrians a head start before cars can start to turn into their lane.
8. Bollards serve as non-obtrusive pedestrian protectors.
9. Trees and plantings along streets provide aesthetics that can make walking enjoyable for pedestrians.
10. Speed bump countermeasures provide traffic calming by slowing motor vehicles.

According to Handy (2009), there are four environmental factors that influence non-motorized travel: land use patterns, network structure, facility quality, and natural features (Table 1.1).[32] Complete Streets policies directly address two of these factors – network structure and facility quality – in an attempt to enhance safety and access for non-motorized travelers.

Table 1.1. Environmental Factors Influencing Non-Motorized Travel. *Adapted from: Handy S. (2009). Walking, Bicycling, and Health. In PolicyLink, Prevention Institute, and Convergence Partnership, Shireen Malekafzali (Ed.), Healthy, Equitable Transportation Policy: Recommendations and Research, pp.63-77.*

Environmental Factor	Definition	Importance	Directly Addressed by Complete Streets Policies?
Land Use Patterns	The arrangement of land uses such as housing, shops, and offices, across the community	Determines the straight-line distance among different activities, such as housing, shopping, and offices	No – This factor is generally impacted by land use and zoning policies and decisions
Network Structure	The layout of streets and trails throughout the community	Determines how direct the connections from one place to another are and thus influences the travel distance	Yes – Policies may encourage connectivity in an attempt to create a comprehensive and integrated network for all roadway users
Facility Quality	Characteristics of streets, including presence of sidewalks and bike lanes, widths, pavement conditions, crosswalks, signals	Influences how comfortable, safe, and attractive it is to walk or bicycle that route	Yes – Policies may compel responsible agencies to use existing best practices for designing pedestrian facilities
Natural Features	Topography, weather, scenery	Influences the energy needed to walk or bicycle as well as comfort and enjoyment	Yes – Policies may inspire the use of trees and foliage to enhance the aesthetic features of roadways, as well as provide shade and comfort for pedestrians

While Complete Streets policies can exist in a variety of forms, only legislation (through local ordinances or state statutes) has the force of law to mandate that specific actions are implemented by responsible state and local transportation and planning agencies. Furthermore, while cities and counties have progressively adopted various forms of Complete Streets policies, legislative action at the state level is considered essential to ensure a long-term, statewide commitment to road safety beyond changes in state administration, and can ensure that transportation networks across the state are

consistently designed and retrofitted to ensure the safety of all users. According to the National Complete Streets Coalition – a non-profit, non-partisan alliance of public interest organizations and transportation professionals – “instituting a Complete Streets policy at the state level is essential in creating transportation networks that give citizens the transportation choices and access to destinations they need and want; states control many community roadways and often set the standard for streets in cities and counties.”[71]

Oregon has been credited with adopting the first state Complete Streets law through its “Bike Bill” (passed in 1971 and made effective in 1972) which states that “footpaths and bicycle trails, including curb cuts or ramps as part of the project, shall be provided wherever a highway, road or street is being constructed, reconstructed or relocated” and requires that “all state roads include bikeways and sidewalks whenever a road is built or rebuilt, including those built by local governments.”[72] The Oregon bill also requires that at least one percent of the state's highway fund be spent on “bicycle and pedestrian ways.”[65]

At the federal level, Complete Streets approaches have historically been encouraged but not mandated. In response to the language included in the federal surface transportation bill, *Transportation Equity Act for the 21st Century (TEA-21)*, in 2000, the U.S. Department of Transportation attempted to encourage state and local transportation agencies to accommodate pedestrians and bicyclists by adopting a policy that stated: “Bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist.”[73] The U.S. DOT’s 2010 policy statement went further and stated that “every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems” and that “transportation agencies and local communities should go beyond minimum design

standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks."[50] However, the policy statement could only "encourage" other states, local governments, and transportation agencies to adopt similar policies. Complete Streets federal legislation has been introduced in one or both chambers of Congress each year from 2008-2014, but none of the proposed bills ever made it out of committee. However, in the new FAST Act federal transportation bill, it states that the Secretary of Transportation shall "encourage each State and metropolitan planning organization to adopt standards for the design of Federal surface transportation projects that provide for the safe and adequate accommodation (as determined by the State) of all users of the surface transportation network, including motorized and non-motorized users, in all phases of project planning, development, and operation."[74] This is the first federal bill to include language that directly refers to Complete Streets principles.[75]

1.6 RATIONALE FOR EVALUATING COMPLETE STREETS POLICIES

Policy evaluation involves systematically assessing the merit, worth, and utility of a policy by examining its content, implementation, or impact.[76] Within the context of public health, the rigorous policy evaluation can help to determine whether a law can be empirically shown to impact the health of a population. While a Complete Streets policy can be adopted by a state or local government for a variety of reasons, safety is generally the primary motivation for policy adoption.[71]

According to the U.S. DOT, a Complete Streets policy "incorporates safe and convenient walking and bicycling facilities into transportation projects; improves conditions and opportunities for walking, and bicycling; integrates walking and bicycling into transportation systems; and provide safe and convenient facilities for these

modes."[66] A Federal Highway Administration review of research studies on pedestrian safety found that measures that design streets with pedestrians in mind all have been shown to improve pedestrian safety.[56] Given that roadway design and engineering approaches that enhance the safety of pedestrians (and other transportation users) can be mandated by Complete Streets policies, the question follows: *Can the adoption of a state Complete Streets policy be associated with a reduction in pedestrian injuries and fatalities?*

While there has been research linking specific pedestrian or bicycle-related *countermeasures* to health outcomes, research attempting to link *policies* intended to improve pedestrian safety to actual health impacts (changes in pedestrian non-fatal injuries or fatalities) has been limited and inconclusive. An evaluation of road safety measures that was included in Spain's 2004 political agenda found that there was a decreased risk of injury among all road users – except for pedestrians – over a two-year period.[77] In the United States, an examination of laws that required drivers to stop for pedestrians in crosswalks (instead of simply yielding) found no statistically significant reduction in pedestrian-involved fatal crashes that were attributable to changes in the laws.[78] A study conducted by Tolford et al., evaluated three pedestrian crash clusters in New Orleans, Louisiana and developed a framework for conducting a comprehensive pedestrian safety analysis to inform the implementation of Complete Streets policies that had been adopted at the state, regional, and municipal levels. However, an attempt was not made to link pedestrian-involved crash rates to policy change.[79]

The adoption of Complete Streets policies has been promoted and supported by a variety of federal agencies and organizations – ranging from the CDC and the FHWA to the American Planning Association (APA) and the American Society of Civil Engineers.[80-83] However, there is limited evidence that indicates whether or not these policies have been associated with specific public health outcomes. As such, evaluation

research in this area provides a unique opportunity to better understand what relationships (if any) exist between these state policies and pedestrian injuries, explore what mediating factors may influence the effectiveness of these policies, and determine what improvements are needed to strengthen the connections between these policies and population-level health outcomes.

1.7 RESEARCH STRUCTURE, PURPOSE, AND QUESTIONS

This research is comprised of two discrete, but connected studies:

1. A **legal mapping study**, which assesses the distribution and content of state Complete Streets and routine accommodation statutes throughout the United States; and
2. A **policy process and outcome evaluation**, which determines if a relationship exists between Florida's adoption of a Complete Streets state statute (Statute 335.065) and statewide pedestrian fatalities, and identifies supports and challenges associated with the implementation of a state Complete Streets law.

Across the two studies, four research questions were posed:

- Which states have a Complete Streets and routine accommodation legislative statute?
- What are the specific features and elements of these state statutes?
- Is the adoption of a state Complete Streets law associated with a reduction in pedestrian fatalities in Florida?
- What supports and challenges to policy implementation can impact the effectiveness of a state Complete Streets statute?

The chapters that follow will discuss the research findings, conclusions, limitations, and strengths associated with these studies.

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CHAPTER 2:

COMPLETE STREETS AND ROUTINE ACCOMMODATION STATE LAWS, EFFECTIVE JANUARY 1972 – MAY 2015[§]

[§] Porter J, Bryan S, Corso P, Lee J, Davis M, and Rathbun S. (2016). To be submitted to the American Journal of Preventive Medicine

2.1 ABSTRACT

Introduction

Complete Streets and routine accommodation laws have been adopted by states to improve the safety of non-motorized road users (e.g., pedestrians and pedalcyclists) by mandating the accommodation of these users as a routine part of roadway design, construction, operation, and maintenance activities. However, to date, there has not been a systematic review of these laws. The purpose of this study was to develop and describe a dataset inventorying Complete Streets and routine accommodation state laws made effective between January 1972 and May 2015.

Methods

A comprehensive survey of state legislative statutes was conducted using LexisNexis Academic and Fastcase databases. Both databases were used to search for and obtain the full texts of current statutes in all 50 states and the District of Columbia. Search terms included: *"complete streets," "pedestrian facilities," "pedestrian accommodation," "pedestrian and bicycle," "pedestrian or bicycle," "road construction," and "routine accommodation."* In cases where only a legal citation or act number was available, websites of individual state legislatures were consulted to obtain the full text of statutes. A codebook and dataset were developed to support the public use of these data. Laws were coded for total of 36 variables across 17 discrete categories.

Results

A total of 18 states (36 percent of all U.S. states) have adopted a Complete Streets and routine accommodation state law; however, over 70 percent (n=14) of these

statutes have been passed since 2007. While there are many common policy elements across laws, they vary substantially in detail and specificity.

Conclusions

This study describes and makes available a comprehensive dataset and inventory of existing Complete Streets and routine accommodation state laws. These data can be used by practitioners, researchers, and policymakers to identify specific policy elements and assess variations in these laws across states.

2.2 INTRODUCTION

Pedestrian and bicycle-related injuries are significant public health issues. From 2003 – 2013, 50,369 pedestrians and 7,743 pedalcyclists (bicyclists and other cyclists that include riders of two-wheel, non-motorized vehicles, tricycles, and unicycles powered solely by pedals) were fatally injured in collisions with motor vehicles on roadways throughout the United States. Furthermore, pedestrians and pedalcyclists collectively accounted for 16 percent of all traffic fatalities in 2013.[1-3] Preliminary 2015 data from the Governors Highway Safety Association indicate that pedestrian fatalities will have increased nationally by 10 percent compared to 2014.[4]

Throughout the 20th century, injurious and fatal interactions between motor vehicles, pedestrians, and pedalcyclists increased dramatically as roads were designed to accommodate motor vehicles as primary modes of transportation.[5] By the 1970s, community groups, advocates, and several state and local governments began to promote the concept of “routine accommodation” – having transportation agencies consider the needs of pedestrians and pedalcyclists and accommodate them as a routine part of their roadway planning, design, construction, operation, and maintenance

activities.[6,7] By the early 1990s, the U.S. Congress began to address the needs of non-motorized travelers with passage of the 1991 surface transportation bill titled, *Intermodal Surface Transportation Efficiency Act (ISTEA)*. ISTEA substantially shifted the focus of federal transportation policy by going beyond funding traditional highway and transit programs to also include funds for projects that improved air quality, reduced traffic congestion, and provided pedestrian and biking infrastructure.[8] ISTEA is also credited with requiring state departments of transportation fund a state bicycle and pedestrian coordinator.[9] Moreover, the concept of routine accommodation was formally embraced by the U.S. Federal Highway Administration (FHWA) in 1999 when Kenneth Wykle, the agency's administrator, wrote a memo to division administrators and highway program engineers that stated: "We expect every transportation agency to make accommodation for bicycling and walking a routine part of their planning, design, construction, operations, and maintenance activities."[10]

While meaningful to transportation practitioners, the term, "routine accommodation," did not resonate with federal policymakers, advocates, or members of the public. To address this issue, staff at the advocacy organization, America Bikes, introduced an alternate term to the lexicon in 2003: "Complete Streets" – a transportation approach that ensures roads are designed and operated to meet "the needs of all travelers, regardless of age, ability, or mode of transportation."[11,12] Although attempts have been made to differentiate between "routine accommodation" and "Complete Streets" (particularly given the latter's association with other concepts, such as active living, transit-oriented design, and context sensitivity[13]), the terms continue to be used interchangeably by practitioners, and FHWA currently refers to both concepts synonymously.[14]

A Complete Streets policy is a "legal directive" that includes "the needs of all people, regardless of how they travel, into the everyday transportation decision-making

process" and outlines "explicit exceptions to the routine accommodation of those users."[15] Specifically, these policies are intended to ensure that the entire right-of-way (land devoted to highway transportation purposes) is planned, designed, constructed, operated, and maintained to provide safe access for all road users, including non-motorized road users such as pedestrians and pedalcyclists.[16,17] To date, over 900 Complete Streets and routine accommodation policies have been adopted by state and local governments in a variety of forms, including comprehensive plans, design manuals, departmental policies, resolutions, executive orders, and laws.[18] However, legislation in particular – including ordinances and statutes – has the force of law to mandate that specific actions are implemented by responsible state and local transportation, planning, and public works agencies. According to the National Complete Streets Coalition, "instituting a Complete Streets policy at the state level is essential in creating transportation networks that give citizens the transportation choices and access to destinations they need and want; states control many community roadways and often set the standard for streets in cities and counties."[19] As such, legislative action at the state level is essential to ensure a long-term, statewide commitment to road safety for all users beyond changes in state administration.

While organizations such as the National Complete Streets Coalition and the National Conference of State Legislators have tracked the adoption of state and local Complete Streets and routine accommodation policies,[20,21] to date there has not been a systematic review of existing state statutes that could be defined as "policy surveillance": the "ongoing, systematic collection, analysis, interpretation, and dissemination of information about a given body of public health law and policy."[22] While existing efforts to track the existence of these statutes have been useful in monitoring policy action in this area, they are not sufficient to facilitate process, impact, or outcome evaluation studies or to examine changes in these laws over time.

This paper describes an open-source dataset of existing Complete Streets and routine accommodation state statutes and discusses common elements and features of these laws. While states have enacted such laws since the early 1970s, little is known of their content, similarities, or differences. As the first study to examine these statutes collectively, the goal of this paper is to inventory and describe these laws. As states continue to adopt and implement Complete Streets and routine accommodation laws, it will be essential for policymakers, practitioners, and researchers to better understand the content and provisions of these laws and to evaluate their effectiveness.

2.3 METHODS

The research methods used for this study were informed by those described by Ilbrahim et al.[23] and Harvey.[24] A comprehensive survey of state legislative statutes was conducted for laws that were made effective between January 1972 and May 2015 which can be described as routine accommodation or Complete Streets statutes – state laws that mandate the accommodation of non-motorized road users (e.g., pedestrians and pedalcyclists). LexisNexis Academic and Fastcase legal research databases were used to search for and obtain full texts of current statutes in all 50 states and the District of Columbia. The search terms that were used included: *"complete streets," "pedestrian facilities," "pedestrian accommodation," "pedestrian and bicycle," "pedestrian or bicycle," "road construction," and "routine accommodation."* To validate and inform the search results, comparisons were made between the laws obtained through the two databases and a publicly available list of known state Complete Streets statutes that were documented in a report by the AARP, Seskin, and McCann.[19] In cases where only a citation or act number was available in either database – but not the full text of the

statute – websites of individual state legislatures were visited to obtain the full text of these statutes.

After collecting the full text of each state law, a list of variables used to code the statutes was developed and defined. These variables were informed by the text of the laws themselves, as well as policy elements developed by the National Complete Streets Coalition to describe a comprehensive Complete Streets policy.[15] To ensure familiarity with legal terminology, two law students coded each of the statutes. The initial list of variables and definitions was reviewed and refined by the coders and supervising researcher through an iterative process. Laws were coded for total of 36 variables within 17 discrete categories, including road user types, roadway development and preservation activities referenced, and provisions related to design standards, exceptions, and funding allocations (Table 2.1).

Each law student coded the laws for all variables separately, blinded to the other's results. To calculate inter-rater reliability, nine states were randomly selected using the random number generator in Excel. Rates of divergence were recorded for all variables. Interrater agreement was calculated to be very high at 0.92, and the kappa value was calculated as $\kappa = 0.84$, indicating strong interrater reliability.[25] Divergences were reviewed by the supervising researcher and coders, and through several discussions, the divergences were ultimately resolved within the dataset. Upon completing the coding process, the codebook was finalized and included variable names, definitions, values, labels, and notes. The full dataset, codebook, and decision rules (rules which were used to guide how specific variables were coded) will be available on a publicly accessible website.

2.4 RESULTS

As of May 2015, 18 states (36 percent of all U.S. states) had adopted a state law that can be categorized as a routine accommodation or Complete Streets legislative statute (Table 2.2). A total of 19 laws were adopted (Rhode Island passed two separate laws in 1997 and 2012). These results were aligned with those documented by the AARP, Seskin, and McCann[19]; however, given that their report was released in January 2013, it did not include two statutes (West Virginia and Louisiana) that were adopted and made effective in April 2013 and June 2014, respectively. There were many common policy elements across statutes, however, they varied substantially in detail and specificity. Results across all statutes were summarized temporally (Figure 2.1) and geographically (Figure 2.2).

While the oldest state law (Oregon) was enacted in 1971 and made effective on January 1, 1972, over 70 percent (n=14) of statutes have only been passed since 2007. Only five states had adopted what were then solely known as routine accommodation laws from 1972 – 2000. Of these five states, four were located along the eastern seaboard; only one state in the Western Census region had adopted a statute and no states in the Midwestern Census region had adopted a statute. However, policy adoption began to pick up seven years later. Starting in 2007, at least one statute was adopted by a state legislature each year across the U.S. These included the first statutes to be adopted in the Midwest (Illinois in 2007 and Wisconsin in 2009). Nearly half of all existing statutes were adopted from 2009 – 2011, indicating particular interest in this policy area by several state legislatures during that time period. By 2014, multiple states in each of the four U.S. Census regions had adopted Complete Streets and routine accommodation statutes: five states each in the West and Northeast and four states in the Midwest and South, respectively.

Specific provisions were identified across several statutes that may be of particular interest to policymakers (Table 2.2 and Figure 2.2). They include provisions that: (1) encourage or require the accommodation of non-motorized users in local plans; (2) state that the statute applies to state and federally-funded roads; and (3) include references to specific funding allocations to be used for non-motorized accommodations.

- Local Planning*:* The majority of road development and preservation activities take place at the local level. Therefore, it is essential to ensure that local general or comprehensive plans (i.e., plans that serve as a guide for making local land use changes, and inform the rate, timing, and location of future growth[26]) include principles that are aligned with Complete Streets and routine accommodation state laws. This alignment can help ensure better coordination and cooperation between state and local transportation and public works agencies as they collectively address the needs of non-motorized road users. Nine states with Complete Streets and routine accommodation laws currently require that local general plans include elements that address accommodations for non-motorized road users.

- Funding: Given that routine accommodation and Complete Streets laws may require significant changes to road infrastructure, several laws refer to which roads these changes may apply and how these changes may be funded. *State and Federally-Funded Roads:* Provisions that specify that both state and federally-funded roads are addressed by the statute help ensure that all roads within the state are covered by the law, regardless of how they are funded. The statutes of five states (Connecticut, New York, Rhode Island, West Virginia, and Wisconsin) include provisions that specify that the law applies to both state and

federally-funded roads. *Funding Allocations:* Including specific allocations within the law may help ensure that non-motorized accommodations are regularly apportioned some minimum funding from the state. Six states include provisions that refer to how funding should be allocated to support transportation facilities for non-motorized road users.

2.5 DISCUSSION

At the time of this study, 18 states across the U.S. have adopted Complete Streets statutes, which were made effective between January 1972 and May 2015. Although laws varied in the specific type and number of provisions they included, there were 17 different categories that were coded across all laws. Three provisions were investigated in more detail due to their potential interest to policymakers: 47 percent of laws (n=9) included provisions that encourage or require the accommodation of non-motorized users in local plans; 26 percent of laws (n=5) state that the statute applies to both state and federally-funded roads; and 32 percent of laws (n=6) include references to specific funding allocations that are to be used for non-motorized accommodations on roadways.

As reflected in Figure 2.1, the first routine accommodation state statute was made effective in 1972, and only four additional statutes were adopted in the subsequent 28 years. However, once the term, “Complete Streets,” was coined in 2003, it sparked what was to become the “Complete Streets movement” – an effort started by a “broad coalition of bicycle riders, transportation practitioners, public health leaders, older Americans, smart growth advocates, real estate agents” and other groups that “came together to insist that we begin to build streets that are safe for everyone.”[11] This coalition – established as the National Complete Streets Coalition in 2005 – created

renewed momentum behind the adoption of state and local Complete Streets and routine accommodation policies. Prior to the existence of the National Complete Streets Coalition, policy adoption had been limited and sporadic. However, once the National Complete Streets Coalition was founded in 2005, it focused specifically on advancing federal, state, and local policy efforts. As a result, state statute adoption picked up dramatically, particularly in the Midwest and Northeast. The Complete Streets movement has been further amplified by demographic trends: recent surveys have revealed that Americans are largely supportive of broader access to public transportation and communities that are designed for safe walking and biking.[27,28] Furthermore, the baby boom generation – one of the largest generations in history – will require pedestrian-friendly streets and public transportation options as they age in order to travel safely and independently in their communities.[29] Complete Streets policy adoption has been even more substantial when other types of policies are considered beyond state statutes, such as local ordinances, resolutions, internal agency policies, executive orders, and comprehensive plans. As of April 2016, over 900 Complete Streets policies have been adopted by state and local governments and government agencies throughout the U.S.[18]

While policymakers and practitioners have found that adopting Complete Streets and routine accommodation laws can be relatively straightforward, implementing these laws and evaluating their effectiveness can be much more challenging.[30] Implementation can be particularly difficult when a policy requires the interpretation and application of potentially vague language, cooperation across a variety of agencies and jurisdictions, and significant changes to entrenched processes and systems. Understanding how and to what extent specific provisions are being implemented as intended, the degree to which specific policy elements can be supported by evidence, and potential connections between these laws and public health outcomes are important areas of future research. Additionally, the adoption of routine accommodation and Complete Streets legislation is

only one of several state policy approaches that may impact the safety of non-motorized road users. Many other policy approaches attempt to regulate specific behaviors of motorists (e.g., speeding laws, driver education policies, etc.). Determining how these laws may interact with Complete Streets and routine accommodation policies to address pedestrian and pedalcyclist safety is another area of potential research.

Claims have been made that Complete Streets and routine accommodation policies improve pedestrian safety, reduce motor vehicle crashes, increase physical activity levels, and prevent obesity.[31,32] As such, the adoption of Complete Streets and routine accommodation policies has been promoted and supported by a variety of federal agencies and professional organizations, including the CDC, FHWA, the American Planning Association (APA), and the American Society of Civil Engineers (ASCE).[32-35] However, there is limited evidence that clearly links the adoption of these policies with specific public health outcomes. Several specific safety strategies or "countermeasures" have been evaluated and found to have varying impacts on reducing injuries to pedestrians and pedalcyclists.[36] These countermeasures include engineering and infrastructural elements – such as raised medians, signalized intersections, curbs, and sidewalks – as well as public education and enforcement strategies.[37] While there are studies that have evaluated the efficacy of these countermeasures, there is little research that examines the relationship between the adoption of Complete Streets and routine accommodation policies and specific public health outcomes. However, identifying the elements that comprise these policies can be a first step toward investigating how the implementation of specific provisions may connect to public health outcomes.

Although the evidence base to support specific provisions for state Complete Streets laws continues to be developed, this study provides useful insights for states that

want to create or enhance their Complete Streets state laws. Specifically, it is recommended that state Complete Streets laws include provisions that:

1. *Require a minimum allocation to fund accommodations for non-motorized road users:* A common concern that implementers have when a policy is adopted is determining how the mandated activities will be funded. A provision that requires a minimum funding allocation for pedestrian and bicycle accommodations can ensure that some state funding is regularly allotted to support these projects, while preventing the law from becoming an unfunded mandate.

2. *Mandate the inclusion of Complete Streets principles and policy provisions in local plans to ensure the routine accommodation of non-motorized road users*: Although funding and guidelines for road development projects may come from state departments of transportation, they are largely implemented by agencies at the local level. Therefore, local general and comprehensive plans should be required to reflect Complete Streets principles and include provisions from the state's Complete Streets or routine accommodation legislative statute. Given that local plans guide land use and zoning decisions for cities and counties, including references to the state's Complete Streets law in these documents is critical to ensure that accommodations for non-motorized road users will be routinely included in transportation projects throughout the state.

3. *Explicitly include all road projects within the state's transportation network*: To have maximal reach and applicability, a Complete Streets state law should apply to all road projects within the state, regardless of how they are funded (using state and/or federal funds), where they are located within the road network, or

what agencies have jurisdiction over road construction and maintenance. This provision can help ensure that agencies at state, regional, and local levels understand that all of their road projects must meet the requirements of the law.

Limitations and Strengths

While this study was conducted using a replicable methodology, as with any study involving qualitative research and the analysis of legal texts (which are inherently subject to interpretability), one limitation to this study is subjectivity. However, a set of decision rules are included with the codebook to ensure that coders' varying interpretations of specific policy provisions are clearly documented for future users of the dataset. Additionally, this dataset includes an analysis of the statute text as enacted; as a result, this inventory can be used by practitioners, researchers, and policymakers to identify specific policy elements and assess variations in these laws across states. However, given the lack of information regarding the implementation of these laws across states, this study cannot draw conclusions regarding their quality or effectiveness. Determining relationships that may exist between the content, implementation, and effects of these laws is an area of future research.

2.6 CONCLUSION

This study contributes to future efforts to better understand the content of Complete Streets and routine accommodation state statutes by inventorying these laws and providing a comprehensive dataset of common elements across existing laws. This dataset can be used by practitioners, researchers, and policymakers to identify specific policy elements, assess variations in these laws across states, and inform the development and structure of future Complete Streets state laws.

2.7 ACKNOWLEDGMENTS

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Table 2.1: Variables in the Routine Accommodation/Complete Streets State Law Dataset: Categories, Definitions, and Number of Related Variables

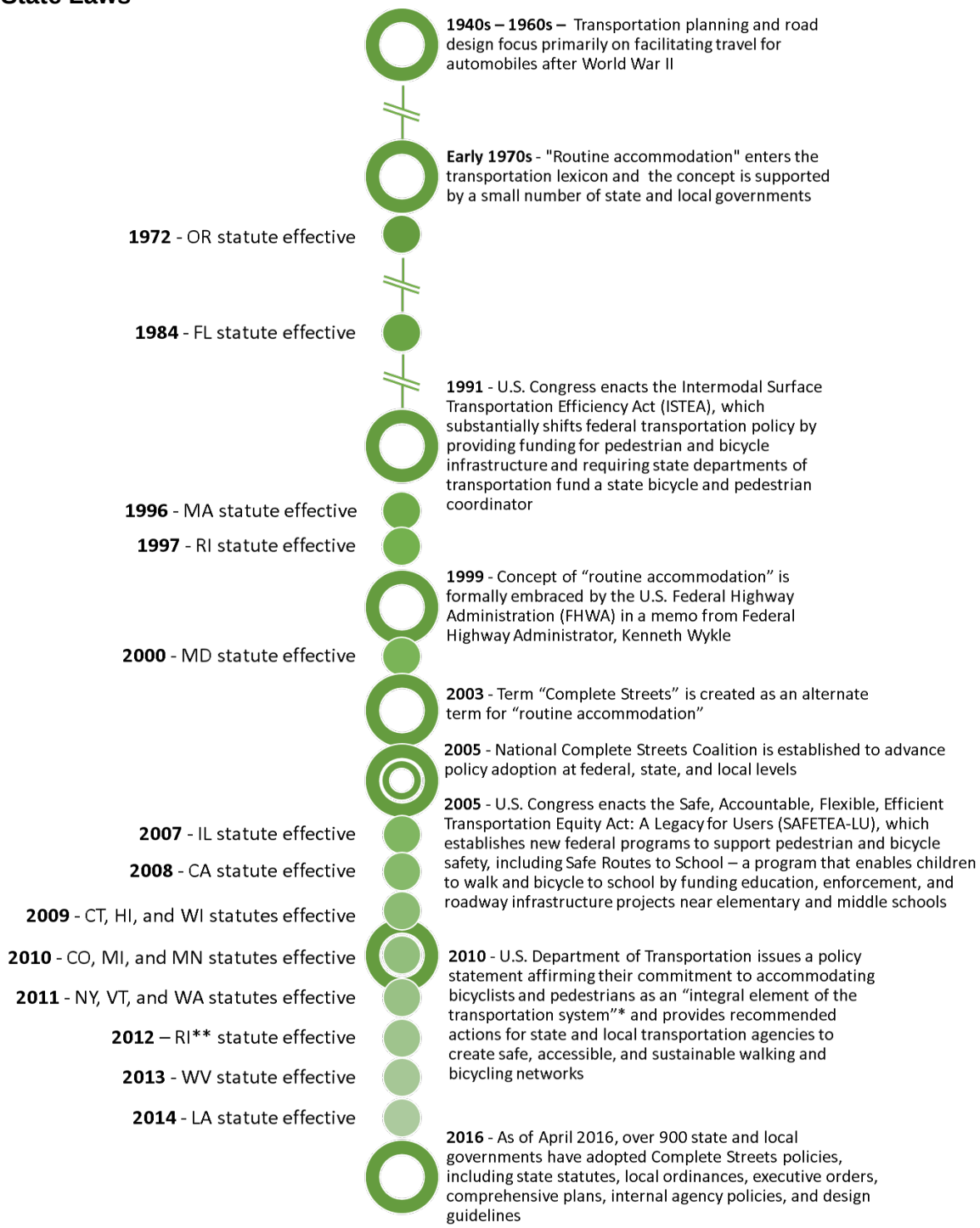
Category	Definition	Number of Related Variables
Statute Adopted	A state adopted or did not adopt a state routine accommodation/Complete Streets statute	1
Date Effective*	Date the date upon which the law was scheduled to take effect	1
References “Health” and “Safety”	Provision(s) that state a purpose of the law is to address “health” and/or “safety”	2
References “All Transportation Projects”	Provision that states that the law applies to “all transportation projects” related to roadways that are undertaken within the state	1
References “All Users”	Provision that states that the law applies to “all users” of the transportation system	1
Road User Types	Road users that the statute explicitly references that should be accommodated	8
Network Connectivity	Provision(s) that state or indicate that a purpose of the law is to create interconnected and/or integrated road networks that accommodate non-motorized travel	1
Roadway Development and Preservation Activities	Provision(s) that explicitly state to which road development and preservation activities the law applies	7
Design Standards	Provision(s) that reference specific design manuals, criteria, guidelines or standards	2
Performance Standards	Provision(s) that refer to the development of performance standards with measurable outcomes	1
Local Plans	Provision(s) that state that city and/or county general plans must include elements that address accommodations for non-motorized users	1
Modifications to Support Implementation	Provision(s) that encourage or mandate modifications to procedures, guidelines, or plans to support implementation of the statute	1
Advisory Board	Provision that establishes an Advisory Board to support the development of procedures and guidance to support multimodal planning and design	1
Exceptions	Provision(s) that describe specific exceptions to the law	4
Funding Allocation	Provision(s) that refer to specific funding allocations that should be used to support non-motorized transportation facilities	1
Application to State and/or Federally Funded Roads	Provision(s) that explicitly state that the law applies to state and/or federally funded roads	2
Responsible Agencies	Provision(s) that refer to agencies that are explicitly named as having any responsibility for implementing elements of the law	1
Total		**36**

* *“Effective dates are either specified in the statute text or are governed by default rules that specify the effective dates of newly signed state laws.*

Table 2.2: Key Elements of State Complete Streets and Routine Accommodation Laws

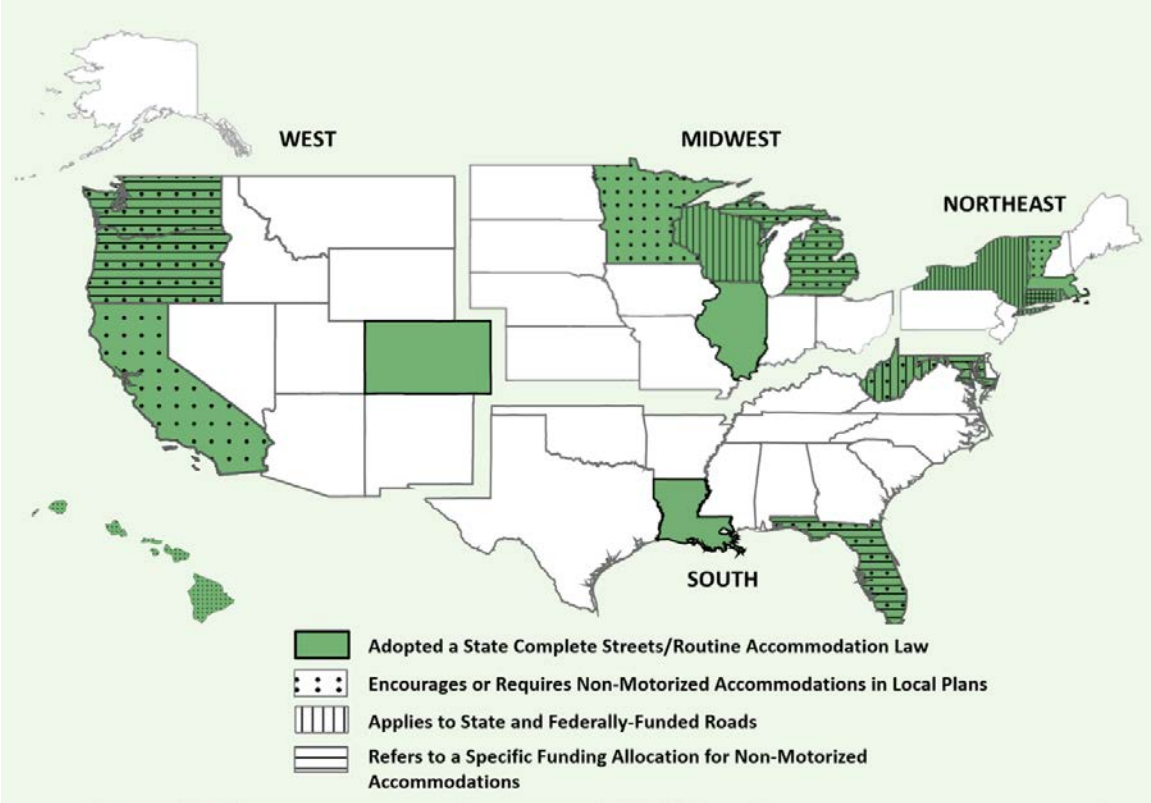
State	Statute Adopted	Date Effective*	Encourages or Requires Non-Motorized Accommodations in Local Plans	Applies to State and Federally-Funded Roads	Refers to a Specific Funding Allocation for Non-Motorized Accommodations
Alabama	N				
Alaska	N				
Arizona	N				
Arkansas	N				
California	Y	9/30/2008	✓		
Colorado	Y	7/1/2010			
Connecticut	Y	7/1/2009		✓	✓
Delaware	N				
Florida	Y	10/1/1984	✓		✓
Georgia	N				
Hawaii	Y	5/6/2009	✓		
Idaho	N				
Illinois	Y	7/1/2007			
Indiana	N				
Iowa	N				
Kansas	N				
Kentucky	N				
Louisiana	Y	6/4/2014			
Maine	N				
Maryland	Y	5/18/2000			✓
Massachusetts	Y	8/18/1996			
Michigan	Y	8/1/2010	✓		✓
Minnesota	Y	5/15/2010	✓		
Mississippi	N				
Missouri	N				
Montana	N				
Nebraska	N				
Nevada	N				
New Hampshire	N				
New Jersey	N				
New Mexico	N				
New York	Y	8/15/2011		✓	
North Carolina	N				
North Dakota	N				
Ohio	N				
Oklahoma	N				
Oregon	Y	1/1/1972	✓		✓
Pennsylvania	N				
Rhode Island	Y	7/2/1997			
Rhode Island	Y	6/20/2012		✓	
South Carolina	N				
South Dakota	N				
Tennessee	N				
Texas	N				
Utah	N				
Vermont	Y	7/1/2011	✓		
Virginia	N				
Washington	Y	7/22/2011	✓		✓
West Virginia	Y	4/19/2013	✓	✓	
Wisconsin	Y	6/30/2009		✓	
Wyoming	N				

Figure 2.1: Timeline of Events – Routine Accommodation and Complete Streets State Laws



**United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations. Washington, DC: United States Department of Transportation; 2010.*
***Rhode Island adopted a second statute in 2012 as advocates felt that the 1997 law lacked detail and did not include clear implementation guidance or accountability measures for transportation agencies. (Source: AARP, Seskin S, McCann B. Complete Streets in the States: A Guide to Legislative Action. Washington, DC, January 2013.)*

Figure 2.2: Map of State Complete Streets Laws and Routine Accommodation Laws



CHAPTER 3:

EFFECTS OF A STATE COMPLETE STREETS LAW ON PEDESTRIAN FATALITIES IN FLORIDA: A MULTI-METHOD POLICY PROCESS AND OUTCOME EVALUATION[**]

[**]Porter J, Bryan S, Rathbun S, Arseniadis M, Caldwell L, Corso P, Davis M, Lee J, and Li C. (2016). To be submitted to the American Journal of Public Health

3.1 ABSTRACT

Objectives

Following the adoption of Florida's 1984 state Complete Streets law (Statute 335.065), pedestrian fatalities decreased statewide. This study examined whether decreases were associated with the law's adoption and identified factors that influenced the implementation of the law.

Methods

A multi-method design included an interrupted time-series quasi-experiment and semi-structured interviews. Pedestrian fatality rates were calculated for 39 quarters before and 117 after adoption using FARS and U.S. Census data. ARMA models compared Florida to two comparison groups. Ten interviews were conducted with current and former transportation professionals by phone, recorded, transcribed, and analyzed.

Results

Compared to regional states and the U.S., Florida's pedestrian fatality rates decreased significantly more per quarter after Statute 335.065was adopted (0.251 percent and 0.252 percent, respectively). Interviewees described supports and challenges associated with implementing Statute 335.065.

Conclusions

This study confirms state Complete Streets laws can significantly reduce pedestrian fatalities and reveals factors that can influence the implementation and effectiveness of these laws.

Policy Implications

Transportation policies can have quantifiable and significant impacts on public health outcomes. Multi-method designs are valuable approaches for conducting policy evaluations.

3.2 INTRODUCTION

Pedestrian injuries and fatalities are a significant public health problem throughout the United States – particularly in Sun Belt states where large cities have grown and sprawled to meet the needs of motor vehicle users. Routine accommodation policies – more commonly known as “Complete Streets” policies – have been adopted by a variety of local and state governments to improve the safety of non-motorized road users (e.g., pedestrians and bicyclists) by mandating the accommodation of these users as a routine part of roadway planning, design, construction, operation, and maintenance activities.[1,2] A Complete Streets policy is defined as a “legal directive” that includes “the needs of all people, regardless of how they travel, into the everyday transportation decision-making process” and outlines “explicit exceptions to the routine accommodation of those users.”[3] These policies have been adopted in a variety of forms by state and local governments, including comprehensive plans, design manuals, organizational policies, resolutions, executive orders, and laws. However, legislation in particular (i.e., local ordinances or state statutes) has the force of law to mandate that specific actions are implemented by state and local transportation, planning, and public works agencies.

In 1984, Florida was the second state (after Oregon in 1971) to adopt a Complete Streets legislative statute (Statute 335.065). The statute states that “bicycle and pedestrian ways shall be given full consideration in the planning and development of transportation facilities, including the incorporation of such ways into state, regional, and

local transportation plans and programs" and that "bicycle and pedestrian ways shall be established in conjunction with the construction, reconstruction, or other change of any state transportation facility," with "special emphasis" on "projects in or within 1 mile of an urban area."[4] Following the adoption of Statute 335.065, the state's pedestrian fatality rates decreased substantially over the following three decades. However, the existence of a relationship between these decreases in fatalities and Florida's Complete Streets law has not been previously investigated. Furthermore, despite the fact that understanding implementation processes is key to assessing policy effectiveness, specific factors that may have either positively or adversely influenced the effective implementation of the law have not been examined.

Various claims have been made that Complete Streets policies improve pedestrian safety.[5,6] These assessments are largely based on evaluations of specific engineering and infrastructural countermeasures that have been found to enhance pedestrian safety, such as raised medians, signalized intersections, curbs, and sidewalks.[7,8] However, no study to date has examined whether the *adoption* of a Complete Streets law can be linked to a specific public health outcome, such as pedestrian fatalities.

The purpose of this study was two-fold:

1. To determine if the adoption of Statute 335.065 is associated with statewide decreases in pedestrian fatalities in Florida; and
2. To identify key factors that have supported or hindered to the implementation of Statute 335.065.

3.3 METHODS

A multi-method study design was used, which included an interrupted time-series quasi-experiment and a series of semi-structured key informant interviews.

Interrupted Time-Series Quasi-Experiment

Florida's pedestrian fatality counts from January 1975 – December 2013[††] (156 quarters total – 39 quarters before and 117 quarters after the adoption of Statute 335.065) were obtained from the National Highway Traffic Safety Administration (NHTSA) Fatality Analysis Reporting System (FARS).[9] U.S. Census data were used to calculate quarterly pedestrian fatality rates per 100,000 population.[10] To detect stationarity and seasonality, Box-Jenkins seasonally-adjusted autoregressive moving average (ARMA) models were used to analyze and forecast the time series data.[11] Florida was compared to two comparison groups: (1) an aggregated group of 13 states from the southern U.S. Census region that lacked a state Complete Streets law as of December 2013[‡‡]; and (2) an aggregated group of all U.S. states and Washington, DC. Three outcome models were initially estimated: raw frequencies; quarterly rates per 100,000 population; and natural logarithms of quarterly rates per 100,000 population. The logarithmic transformation of the data was ultimately used for all ARMA models to stabilize the variance of the data due to heteroscedasticity (changing variance in rates over time).

[††] Collected since January 1975, FARS is a census of motor vehicle traffic crashes collected by NHTSA that result in a fatality to a vehicle occupant or non-motorist within 30 days of the crash. FARS contains data on all fatal crashes within the 50 states, the District of Columbia, and Puerto Rico. As of this study, only data inclusive of December 2013 were available.

[‡‡] The 13 states that lacked a Complete Streets state law in the southern U.S. Census region as of December 2013 included: Alabama, Arkansas, Delaware, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

Letting time *t* denote the number of quarters that have elapsed since the fourth quarter of 1974, the mean log pedestrian fatality rate μ_t at time *t* and in the *j*th quarter of the year is described using the change-point model:

$$\mu_t = \alpha_j + \gamma_1 x_t + \gamma_2 t + \gamma_3 (t - t^*)_+,$$

where α_j denotes the seasonal effect of the *j*th quarter of the year, γ_1 describes the impact of the log pedestrian mortality rate in the comparison states, γ_2 is the rate at which log pedestrian mortality rate changes over time before adoption of Statute 335.065, and $\gamma_2 + \gamma_3$ denotes the rate at which log pedestrian mortality rate changes over time after adoption of the statute. The term $(t - t^*)_+$ denotes the amount of time that has elapsed since adoption of Statute 335.065 at t^*in the 39th quarter, taking the value zero for $t < t^*$. Thus, γ_3 represents the impact of Statute 335.065 on the rate at which log pedestrian mortality changes over time. The percent reduction in pedestrian fatalities each quarter may be calculated using $(e^{\gamma_3} - 1) \times 100\%$. Autocorrelation and partial autocorrelation plots from the residuals of the above model suggest that a third-order autoregressive model fit the data well. Two fitted ARMA (3,0) models comparing Florida's pedestrian fatalities to those of the two comparison groups used the form:

$$Y_t = \mu_t + \beta_1 (Y_{t-1} - \mu_{t-1}) + \beta_2 (Y_{t-2} - \mu_{t-2}) + \beta_3 (Y_{t-3} - \mu_{t-3}) + \varepsilon_t$$

Under this model, the log pedestrian mortality rate Y_t at time *t* is a function of data up to three units of time in the past, the autoregressive coefficient β_k denotes the impact of data *k* units of time in the past, and ε_t is white noise. Plots of the autocorrelation and partial autocorrelation functions of the residuals from the above model show no statistically significant departure from zero as confirmed by the Ljung-Box-Pierce test, indicating that the third-order autoregressive models fit the data well. All analyses were completed using SAS version 9.4.

Semi-Structured Key Informant Interviews

Upon receiving Institutional Review Board (IRB) approval, key informants were recruited using a snowball sampling technique.[12] Two professional contacts known by the supervising researcher were asked if they had any colleagues who currently or formerly worked in a field connected to transportation and health (e.g., engineering, planning, public health, or policy) within the state of Florida. The two initial contacts provided references to several individuals who served as the first "wave" of contacts. All contacts within the first wave were invited to participate in an interview and were asked to identify other potential key informants who could be contacted directly by email or phone. This process was repeated twice; a total of three waves resulted in a total of 24 contacts. Ten individuals who had worked in different areas of the state met the eligibility criteria for inclusion in the study and agreed to participate. Criteria included: currently or previously working within the Florida transportation system at the state or local level; familiarity with Statute 335.065; and having had direct or indirect responsibility for implementing activities associated with Statute 335.065.

Interviews were conducted by phone between October and December 2015 using a semi-structured interview protocol that included 20 open-ended questions. Questions were shared with key informants in advance and were informed by the statute text as appropriate. Constructs addressed in the interview protocol included: familiarity with Statute 335.065; perceived connections between the statute and the day-to-day work of the interviewee; and the perceived relationship between the statute and other external factors in the state that may influence pedestrian safety (e.g., local Complete Streets policies, land use and zoning laws, funding, etc.). These constructs reflected factors that may affect the relationship between policy adoption, improvements in roadway infrastructure to increase pedestrian safety, and ultimately, changes in pedestrian fatalities. Interviews ranged from 38 to 90 minutes, and were recorded and

transcribed. Analysis of the interviews was conducted using NVivo 10 software and took place in two stages:

1. **Coding and Codebook Development:** All transcripts were divided between three coders to allow each coder to review a different subset of transcripts and to ensure each transcript was coded twice, once each by two different coders. An open-coding approach was used that involves coding phrases within the text that reflect specific ideas or themes.[13] Upon completing the first round of coding, each coder developed an individual set of preliminary codes and corresponding definitions. The three individual sets of codes were combined to create a preliminary codebook – a draft set of codes and definitions that would ultimately be used to conduct a systematic analysis of the interview data. Through a collaborative and iterative process, the coders discussed instances of disagreement and proposed edits to refine the codebook, including merging duplicative codes, adding new codes, and removing extraneous codes. At the conclusion of this process, a final codebook was developed which included consensus codes and definitions that were used to code the transcripts a third and final time.

2. **Thematic Analysis:** Once the transcripts were coded using the final codebook, the coders conducted a thematic analysis to summarize and describe key themes that emerged from the qualitative data. Coders used thematic summaries and quotes from key informants to describe how factors positively or adversely influenced the implementation of Statute 335.065.

3.4 RESULTS

Statistical Analysis

Table 3.1 summarizes the results of fitting the ARMA models. The ARMA models indicated that the adoption of Statute 335.065 was associated with significant reductions in pedestrian fatalities. When compared to the 13 states in the southern U.S. Census region, Florida's pedestrian fatality rates decreased by 0.00251 log units more per quarter after the adoption of Statute 335.065 (95% CI, 0.00023, 0.00480; p=0.031). Adjusting for log mortality rates in the 13 southern states that lacked a state Complete Streets law, Florida's pedestrian fatalities decreased by 0.251 percent more each quarter compared to the previous quarter after Statute 335.065 was adopted. Similarly, when compared to all U.S. states, Florida's pedestrian fatality rates decreased by 0.00252 log units more per quarter after the adoption of Statute 335.065 (95% CI, -0.00013, 0.00518; p=0.062). Adjusting for log mortality rates in all U.S. states and Washington, DC, Florida's pedestrian fatalities decreased by 0.252 percent more each quarter compared to the previous quarter after Statute 335.065 was adopted. However, given the higher coefficient for the states in the southern U.S. Census region, this comparison group was a better predictor for the temporal pattern of pedestrian fatalities than all U.S. states and Washington, DC. A plot of each ARMA model confirmed that Florida's pedestrian fatalities decreased following the adoption of Statute 335.065 and that observed fatalities were lower than those forecasted by each model (Figures 3.1 and 3.2). Between 1985 and 2013, Florida's annual pedestrian fatality rate decreased by nearly 60 percent – from 6.18 to 2.56 per 100,000 population.[9]

Interview Findings

Interviewees discussed a variety of factors that positively or adversely influenced the implementation of Statute 335.065 (Tables 3.2 and 3.3), as well as their perspectives on the overall value of the statute.

Supportive Factors for Implementing Statute 335.065

Key supportive factors that positively influenced the implementation of Statute 335.065 included:

- **Complementary state transportation policies:** Interviewees discussed how other state policies bolstered the impact of Statute 335.065. For instance, the 1975 *Local Government Comprehensive Planning Act* required that local governments adopt comprehensive plans that included bicycle and pedestrian ways. In 1998, the Florida Department of Transportation (FDOT) adopted the *Transportation Design for Livable Communities* policy, which allows those working on state roads to create "features" (e.g., speed limits, sidewalks, crosswalks, etc.) that provide "a balance between mobility and livability" and can enhance the "safety of pedestrians, bicyclists, motorists and public transit users."[14]

- **Funding:** Nearly all interviewees felt there was adequate funding to support the implementation of Statute 335.065. According to one interviewee, Florida is "in much better shape than most states" and only depends on approximately 25% of its transportation funding from the federal government. However, interviewees noted that infrastructure for non-motorized users is often not prioritized. State

transportation funding has been largely allocated to projects that accommodate motorized road users rather than pedestrians and bicyclists. One interviewee also noted that funding needed to be better allocated to complementary education and enforcement activities.

- **Leadership within transportation agencies:** Ranging from Secretaries of Transportation, FDOT district secretaries, and directors of local public works agencies – having competent, collaborative, and energized leaders within transportation agencies was cited as critical to advancing pedestrian safety efforts aligned with Statute 335.065. Additionally, having officials who ensured that the requirements of Statute 335.065 were routinely incorporated into road design guidelines used for state and local transportation projects was key to the successful implementation of the statute.

- **Trained state and local transportation staff:** According to most interviewees, successful transportation projects that encompassed the spirit of Statute 335.065 were the result of efforts spearheaded by trained transportation staff at district, county, and city levels, including bicycle and pedestrian coordinators, planners, and engineers. Interviewees noted the value of having state and local staff who were not only engaged in mandatory trainings supported by their employers, but those who also sought additional education and training and conveyed this new knowledge to their colleagues Utilizing their newly acquired training and skills, these transportation staff were equipped to implement a variety of activities in support of Statute 335.065, including: ensuring that state, regional, and local pedestrian plans addressed pedestrian and bicycle accommodation; enhancing and utilizing design guidelines that emphasized accommodations for pedestrians

and bicyclists; and implementing “model” transportation projects throughout the state that illustrated how roads could be built to more equitably accommodate the needs of all users.

Barriers to Implementing Statute 335.065

Interviewees discussed a variety of barriers that hampered efforts to implement Statute 335.065. Key barriers included:

- **Inconsistent state oversight and local accountability:** Several interviewees noted that there has been inconsistent state oversight to ensure that district, county, and city-level officials are designing roads that accommodate pedestrians and bicyclists, as mandated by Statute 335.065. Several interviewees noted that the term, “full consideration” in the statute language is relatively vague and has been interpreted by some local transportation officials as only needing to “consider” the needs of pedestrians and bicyclists without actually fulfilling them. Without state oversight, some local governments have been able to avoid being held accountable for accommodating non-motorized users in their transportation projects.

- **Land use and zoning policies:** Land use and zoning codes, regulations, and ordinances mandate how land can be developed to address a variety of uses (e.g., residential, retail, civic, commercial, and recreational). According to interviewees, suburban sprawl and disjointed land uses in Florida have led to disconnected neighborhoods that lack pedestrian infrastructure and require the use of motor vehicles to reach nearby destinations. Some cities have begun to

embrace “mixed-use development” – pedestrian-oriented developments that have been zoned to include a “mix” of uses and to reflect a live-work-play environment.[15] However, interviewees noted that these were exceptions rather than the rule. Many Florida cities and counties continue to maintain inflexible land use and zoning policies that prohibit the development of pedestrian-friendly environments. Additionally, the passage of the state’s *Community Planning Act of 2011* resulted in reduced state oversight of local governments regarding land development.[16] According to interviewees, this reduction in oversight allowed local governments to establish land use and zoning policies that may have adversely impacted the implementation of Statute 335.065.

- **Uninformed decision-making by transportation agency staff and elected officials:** Many interviewees noted that transportation decisions have often been made by some agency staff members and elected officials with insufficient information; these poorly informed decisions have led to problematic consequences that have impeded the implementation of Statute 335.065. For example, interviewees noted that local elected officials have often been eager to reap the financial benefits of new residential or retail developments. In approving these plans too quickly, these officials neglected to require developers to provide sufficient accommodations for non-motorized road users. Furthermore, the Florida legislature’s dismantling of the Department of Community Affairs (mandated by the *Community Planning Act of 2011*), has impeded state officials from ensuring that local governments create residential and commercial developments aligned with Statute 335.065.

- **<u>Prioritization of motor vehicles</u>:** Nearly all interviewees described how transportation agencies' prioritization of motor vehicles hindered efforts to implement Statute 335.065. Roadway performance metrics – used to measure the quality of traffic service and functionality of roads – often exclude measures associated with pedestrian accommodation. One metric, level-of-service (LOS), evaluates the "speed, convenience, comfort, and security"[17] of the transportation system. Given that LOS was historically based on the movement of motor vehicles, it often led to highway improvements that benefitted automobiles rather than non-motorized road users. According to interviewees, LOS reflects a bias toward motor vehicles within the transportation system and has contributed to the overdevelopment of high-volume, high-speed roads that can endanger pedestrians and bicyclists who travel on them.

Overall Value of Statute 335.065

Interviewees described Statute 335.065 as an invaluable "blueprint" and "catalyst" for advancing statewide pedestrian and bicycle safety efforts in Florida. As a foundational piece of legislation, the statute reflected a long-term commitment by the state to enhance the safety of non-motorized road users:

> *I think the law was an essential piece. We really needed a grounding piece, something that is truly a document that everyone can go back to and say, "This is the intent of the legislature. It has not been changed. This is the direction we're going to go." I think that was fundamental.*

As a legislative cornerstone, Statute 335.065 gave FDOT the legal authority to develop complementary policies, rules, and guidance to ensure pedestrian and bicycle

accommodation on state and local roads. By January 2000, FDOT began to explicitly quote or refer to Statute 335.065 in road design guidance documents used by transportation engineers and designers statewide. These documents include the *Plans Preparation Manual (PPM)*, which provides design criteria for state highways, and the *Florida Greenbook*, which provides minimum standards for all local roads in Florida. Interviewees also noted the influence of Statute 335.065 on local transportation policy. After Statute 335.065 was enacted, many localities adopted similar policy approaches that were semantically connected to the statute, as the legislation was, according to one interviewee, “so well ahead of its time.”

3.5 DISCUSSION

This study revealed that Florida’s 1984 adoption of a state Complete Streets law (Statute 335.065) was associated with a 38-year decrease in pedestrian fatality rates. Interviewees described a variety of supports that contributed to the successful implementation of Statute 335.065, including complementary transportation policies, funding, leadership within transportation agencies, and the existence of trained local staff. In keeping, interviewees also discussed challenges that have impeded the overall effectiveness of the statute, including: lack of state oversight and local accountability; land use and zoning policies; uninformed decision-making by transportation agency staff and elected officials; and prioritization of motor vehicles.

Despite experiencing substantial reductions in pedestrian fatalities since the 1980s, Florida’s pedestrian fatality rate remains significantly high when compared to the national average. In 2013 alone, pedestrian deaths were 20.8 percent of Florida’s total traffic fatalities compared to the U.S. average of 14.5 percent.[18] Over a ten-year period (2004 – 2013), Florida had an average annual pedestrian fatality rate of 3.38 per

100,000 population – a figure twice as high as the national average annual rate of 1.66 per 100,000 population. By 2014, Florida had the second highest pedestrian fatality rate in the U.S. (2.96 per 100,000 population) – exceeded only by New Mexico.[9] Frustration with the state's persistently high pedestrian fatality rates was shared by interviewees:

> *We should be farther by now. We shouldn't be in last place anymore. We shouldn't be killing and maiming pedestrians and cyclists at the rate we're doing it. And I'm sure many people would say, "Well, wait a minute. That's not because the statute failed; in fact it might a lot worse if not for the statute." But we have a long way to go.*

While the adoption of Statute 335.065 represented an important and effective step in reducing pedestrian fatalities, more improvement is still needed nearly four decades later. In 2009, 2011, and 2014, four Florida metropolitan areas (Orlando-Kissimmee, Tampa-St. Petersburg-Clearwater, Jacksonville, and Miami-Fort Lauderdale-Pompano Beach) were consistently ranked as the most dangerous large metropolitan areas in the country by national organizations, Transportation for America and Smart Growth America.[19-21] These rankings prompted FDOT to create a "Bicycle/Pedestrian Focused Initiative" and a 2013 *Pedestrian and Bicycle Strategic Safety Plan (PBSSP)* that describes comprehensive objectives and strategies to improve pedestrian and bicycle safety in the state.[21]

FDOT and many local transportation agencies are also implementing other concerted policy initiatives to decrease pedestrian fatality rates. In September 2014, FDOT adopted an organization-wide Complete Streets policy that reflects the agency's commitment to "coordinate with local governments, Metropolitan Planning Organizations, transportation agencies and the public" to "routinely plan, design, construct, reconstruct

and operate a context-sensitive system of 'Complete Streets'" that will "serve the transportation needs of transportation system users of all ages and abilities."[22] To support the integration of this policy into FDOT's internal documents and processes, FDOT collaborated with Smart Growth America to develop a *Complete Streets Implementation Plan*. Released in January 2016, this five-part plan will be implemented by FDOT over a two-year period to institutionalize a "Complete Streets approach" within their organizational policies and practices.[23] Additionally, since 2009, nearly 50 counties, cities, and towns in Florida have adopted local Complete Streets policies in the form of ordinances, resolutions, and comprehensive plans.[24] These local policies – coupled with updated design guidance and support from FDOT – are intended to further advance pedestrian safety throughout the state. These efforts within the context of current data are encouraging. Compared to 2014, the Governors Highway Safety Association (GHSA) estimates that 2015 data will reveal a four percent decrease in Florida's pedestrian fatalities, despite an anticipated 10 percent increase in pedestrian fatalities nationally.[25]

A total of 10 current and former Florida transportation professionals were interviewed as part of this study. While the supports and barriers they identified related to Statute 335.065 may not be fully generalizable to other states, these interviews highlight key factors that may be associated with potential successes or challenges associated with advancing the safety of non-motorized road users. As a result, the experiences and insights shared by these interviewees can be translated into useful recommendations for states that want to use Complete Streets policies to improve road infrastructure for non-motorized users and reduce pedestrian fatalities. Based on our interview findings, states should:

1. *Adopt a state-level Complete Streets policy.* Legislative action at the state level is essential to ensure a long-term, statewide commitment to road safety for all users beyond changes in state administrations. Therefore, it is recommended that all states should adopt a state Complete Streets policy. While a legislative statute is be preferable (given that a statute serves as a long-standing legal mandate), other policies – such as internal agency policies, executive orders, and resolutions – may also be impactful if they have statewide reach. States that have already adopted state-level Complete Streets policies should review the provisions of their policies to ensure that they are comprehensive, meaningful, and clear to implementers.

2. *Obtain buy-in for policy implementation from leaders within state, regional, and local transportation agencies, including the state department of transportation, metropolitan planning organizations, and local public works agencies.* To ensure that the policy will be implemented properly, overt support is needed from transportation agency leaders at all levels. Ultimately, the support of these decision-makers is not only key to implementing the policy as written, but is essential to address significant external challenges to policy implementation, including inefficient decision-making processes, inconsistent design guidelines, and problematic zoning and land use policies.

3. *Invest the funding and staff necessary to completely and effectively implement a state Complete Streets policy.* Successful policy implementation requires not only funding investments, but also investments of time and effort from well-trained and skilled staff members within transportation agencies. Both of these elements are essential to ensure that the implementation of transportation projects that

enhance safety and access for all road users are implemented consistently and efficaciously.

4. *Set achievable goals and measurable objectives, then measure and report on progress regularly.* As in any implementation process, accountability is key. State, regional, and local transportation agencies should set achievable goals and measurable objectives associated with the provisions of their Complete Streets policies and ensure they are aligned across agencies at all levels. This alignment will require leadership from state departments of transportation and significant coordination and cooperation from all participating state, regional, and local organizations. Once the goals and objectives have been determined, agencies should work collaboratively to measure progress, affirm and report on both successes and challenges at least annually, and make process improvements as needed.

5. *Engage community members and partners from other sectors (e.g., public health, education, advocacy, etc.) in transportation planning and development activities associated with the state Complete Streets policy.* To ensure that transportation decision-makers understand and properly respond to the specific needs of road users in various communities, it is important to regularly engage community members and partner organizations throughout the policy implementation process. The input and feedback provided by these groups can help ensure that transportation agencies implement accommodations for non-motorized road users that increase safety, utility, access, and equity.

Limitations, Strengths, and Opportunities for Further Study

Between 1975 and 2013, Florida's pedestrian fatalities reached an all-time high in 1980 (7.54 per 100,000 population). Given that fatalities began to gradually decrease from that point, there may be another unknown variable that influenced this decreasing trend in addition to Statute 335.065. Given the complexity associated with population-level health outcomes, other variables could have contributed to these decreases, including economic conditions, fuel prices, changes in demographics, and other concurrent policy efforts (e.g., the 1975 *Local Government Comprehensive Planning Act*). These variables present additional opportunities for further study.

Findings from the interviews also present unique opportunities for further study. According to interviewees, other complementary transportation policies have bolstered the impact of Statute 335.065, including the 1975 *Local Government Comprehensive Planning Act* and the 1998 *Transportation Design for Livable Communities* policy. Future complementary analyses can investigate the interplay between these policies and possible associations between these complementary policies and decreases in pedestrian fatalities. Additionally, several interviewees discussed how inconsistent state oversight and uninformed decision-making has allowed some district, county, and city-level officials to design automobile-centric roads that do not meet the pedestrian and bicycle accommodation mandate of Statute 335.065. Building on a similar study conducted by Hanson et al.[26], geocoded pedestrian fatality data from FARS and data on road infrastructure features from Google Street View can be used to examine potential connections between the presence or lack of specific pedestrian accommodations (e.g., sidewalks, pedestrian refuge islands, and crosswalks) and locations of pedestrian fatalities in Florida. Geographic Information System (GIS) software can be used to map these data and support local area sub-analyses that can determine potential associations pedestrian fatalities, road design elements, and other related variables,

including: the age and race/ethnicity those that are fatally injured; levels of household income and vehicle availability that exist within “hot spots” for pedestrian fatalities; and the land use designations (e.g., rural, commercial, industrial, urban, and suburban) in which fatalities primarily occur. These sub-analyses (supported by U.S. Census data and other data sources) can help increase collective knowledge of where pedestrian fatalities are occurring in Florida, features of roadways that may be associated with these fatalities, and the demographics of subpopulations that may be most adversely impacted by pedestrian fatalities in specific areas of the state.

Finally, multi-method process and outcome evaluations of Complete Streets policies (e.g., statutes, ordinances, resolutions, organizational policies, etc.) in other states and localities can be conducted to add to the evidence base associated with these policies and their connections to public health outcomes. The knowledge gained from these studies can enhance understanding of the relationship between policy adoption and implementation, as well as inform future policy process and outcome evaluations.

3.6 PUBLIC HEALTH IMPLICATIONS

This study provides a variety of implications for public health, as it:

- *Confirms that transportation policies can have quantifiable and significant impacts on public health outcomes.* In the case of this study, the adoption of a state Complete Streets law was associated with significant decreases in statewide pedestrian fatalities across nearly three decades.

- *Reveals that the manner and extent to which a law is implemented can have a substantial impact on its effectiveness.* A variety of internal and external supports and challenges can influence the effective implementation of a law.

- *Affirms the value of using a multi-method approach to conducting a policy process and outcome evaluation*. Multi-method approaches can combine advanced statistical techniques with personal perspectives from policy implementers. This comprehensive methodology can allow evaluators, public health practitioners, researchers, and policymakers to better understand not only "if" policies are effective, but also "how" and "why." This more complete approach can help ensure that policies are implemented in ways that will ultimately enhance their overall effectiveness.

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Figure 3.1. Forecast Plot of ARMA Comparing Florida to 13 States from the Southern U.S. Census Region: Log-Transformed Pedestrian Fatalities per Quarter, 1975-2013

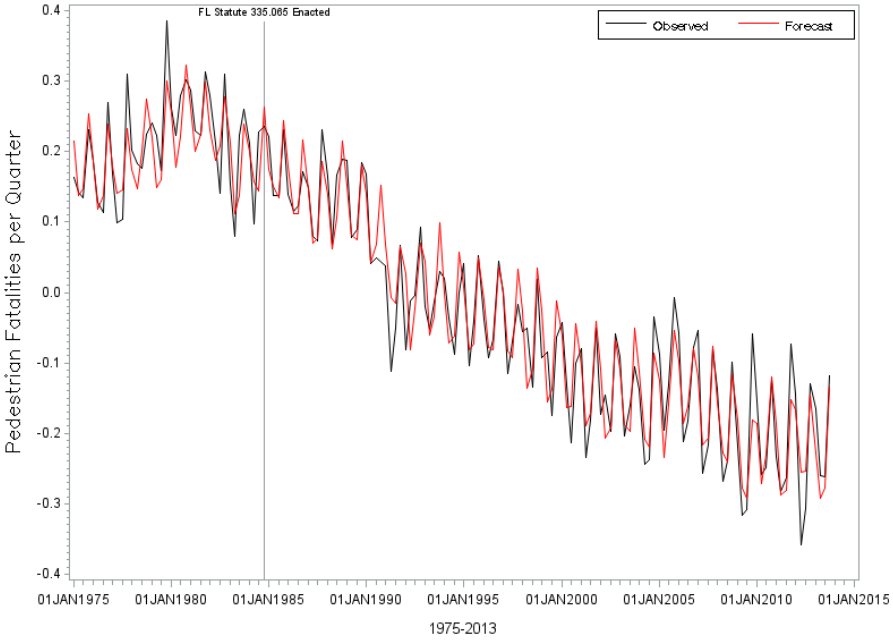

Figure 3.2. Forecast Plot of ARMA Comparing Florida to All U.S. States and Washington, DC: Log-Transformed Pedestrian Fatalities per Quarter, 1975-2013

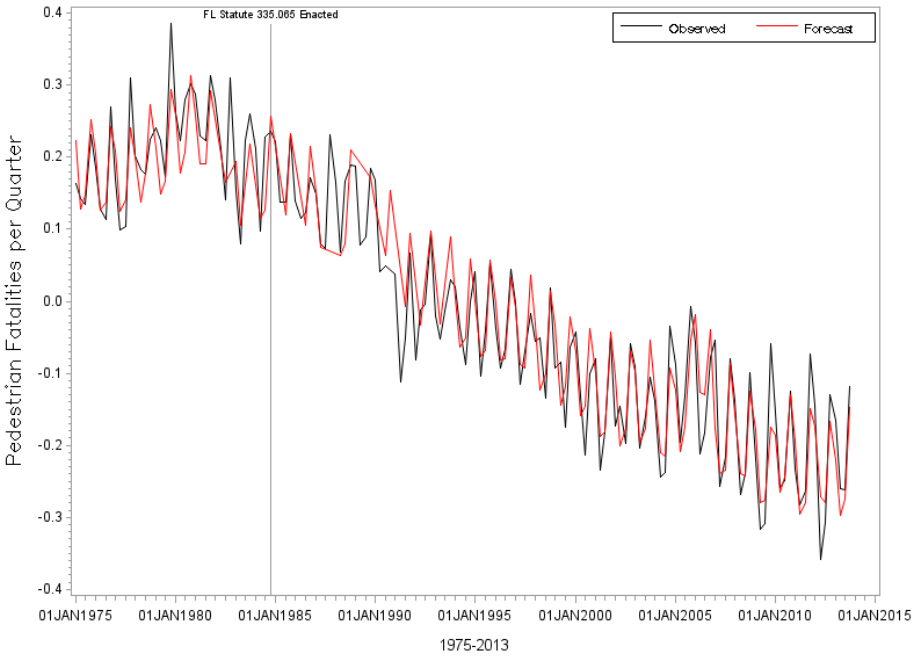

Table 3.1. Autoregressive Moving Average (ARMA) Analyses: Southern U.S. Census Region States and All U.S. States and Washington, DC

Parameter	Southern U.S. Census Region States			All U.S. States and Washington, DC		
	Estimate	95% CI	p=value	Estimate	95% CI	p=value
Quarter			<0.001			<0.001
First	0.230	0.168, 0.292		0.234	0.163, 0.305	
Second	0.153	0.091, 0.215		0.160	0.089, 0.232	
Third	0.149	0.086, 0.212		0.167	0.097, 0.239	
Fourth	0.243	0.177, 0.309		0.271	0.198, 0.343	
Time			0.031			0.062
Before Adoption	0.00004	-0.00198, 0.00206		-0.00074	-0.00300, 0.00152	
After Adoption	-0.00247	-0.00333, -0.000161		-0.00327	-0.00409, -0.00245	
Comparison Group	0.380	0.193, 0.567	<0.001	0.148	0.006, 0.290	0.041
Autoregressive						
First	0.197	0.040, 0.354	0.014	0.233	0.076, 0.389	0.004
Second	0.211	0.054, 0.367	0.008	0.214	0.056, 0.373	0.008
Third	0.257	0.099, 0.415	0.001	0.258	0.098, 0.419	0.002

Table 3.2. Key Supportive Factors for Implementing Statute 335.065

SUPPORTS	**Complementary state transportation policies**	*"[Statute 335.065] cannot be looked at in isolation from other requirements in state law…when you look at the state statutes, you also have to look at the overall planning framework in Florida to better understand how these requirements work together and support each other in achieving the overall state policies."*
	Funding	*"I'd say on the infrastructure side, funding is not an issue. I mean, the types of things that need to be done to improve pedestrian safety don't really increase costs in any significant amount. And some of those things, like for instance, if we were talking about adding street lighting to a road – that benefits all users. And so, no, I don't think the costs on the infrastructure side are really a problem or a hindrance."*
	Leadership within transportation agencies	*"I think what made [Statute 335.065] implementable was truly having the right governance, the right structure in place, having the DOT that over time was in that process of turning itself around. Maybe not doing it as fast as I certainly would've liked…but still exhibiting good leadership and being willing to do things in a different way."*
	Trained state and local transportation staff	*"We needed people below the district bicycle and pedestrian coordinators who would be able to get projects on the ground and truly make sure that they were overseen with the right designs and things like that…Nobody could just pass a law like [Statute 335.065] and have any change; that's just not how governments work. You have to have key people who get trained, who are very proud of what they've learned how to do, and have the competency and the courage to go against their own fears to build something different than what they had been building in the past."*

Table 3.3. Key Barriers to Implementing Statute 335.065

CHALLENGES	**Lack of state oversight and local accountability**	*"If there is not accountability, it's no difference what performance measurements or policies or statutes [say]. If there is no one holding people's feet to the fire, it doesn't get done."*
	Land use and zoning policies	*"Local governments and their land development regulations are a major contributor to this problem. But we can't fix the problem without them… you're not addressing the comfort or efficiency needs of pedestrians when everything is set way back from the sidewalk. That's why they're critical to the whole Complete Streets effort."*
	Uninformed decision-making by transportation agency staff and elected officials	*"Honestly, if the legislature really believed in it and the traffic engineers who have all the power and call all of the shots really believed in it, then they would say a lot more of the money needs to be spent on the things that make a difference for the pedestrians' and cyclists' experience. Instead what they do is they fight against those common sense things at every turn."*
	Prioritization of motor vehicles	*"We did well what we thought we knew to do well. We provided a five foot sidewalk…that was it. Or we provided a bit of bike lane. But what was happening on the concurrency side is the state was consumed with the requirements – that we have adequate capacity for cars on roadways – and part of that was based on the ability of a car to get from location A to B in a timely manner and fast. And so we didn't connect the dots very well between what was happening for the vehicle design and what was happening for the pedestrians and the bicyclists."*

CHAPTER 4:

CONCLUSION

This research was comprised of two discrete, but connected studies:

1. A **legal mapping study**, which assesses the distribution and content of state Complete Streets and routine accommodation statutes throughout the United States; and
2. A **policy process and outcome evaluation**, which determines if a relationship exists between Florida's adoption of a Complete Streets state statute (Statute 335.065) and statewide pedestrian fatalities, and identifies supports and challenges associated with the implementation of a state Complete Streets law.

Across the two studies, four research questions were posed:

- Which states have a Complete Streets and routine accommodation legislative statute?
- What are the specific features and elements of these state statutes?
- Is the adoption of a state Complete Streets law associated with a reduction in pedestrian fatalities in Florida?
- What supports and challenges to policy implementation can impact the effectiveness of a state Complete Streets statute?

The cumulative value of this research is the synergy between the two studies: the legal mapping study provides a national overview of state Complete Streets and routine accommodation laws. The study inventories the content and various provisions of these laws; nevertheless, given the lack of information about implementation, the legal mapping study cannot draw conclusions about the effectiveness of state Complete Streets and routine accommodation laws. The policy process and outcome evaluation, however, attempts to build on the legal mapping study by investigating one state with a Complete Streets legislative statute (Florida) to: (1) determine if the law can be associated with improvements in a public health outcome (decreases in pedestrian fatalities); and (2) identify specific factors that have influenced the implementation, and ultimately, the effectiveness of the law. In totality, this research:

- Provides a comprehensive inventory of existing Complete Streets and routine accommodation state laws that can be used to assess variations in these laws across states;
- Confirms that state Complete Streets laws can be associated with significant reductions in statewide pedestrian fatalities;
- Demonstrates that transportation policies can have quantifiable and significant impacts on public health outcomes;
- Reveals factors that can positively and adversely influence the implementation and effectiveness of state Complete Streets laws; and
- Affirms the value of using a multi-method approach to conducting a policy process and outcome evaluation.

While each study had inherent limitations and strengths, they also present new frontiers and opportunities for future research:

Legal Mapping Study

- As with any study involving qualitative research and the analysis of legal texts (which are inherently subject to interpretability), a limitation is subjectivity. To address this, a set of decision rules are included with the codebook to ensure that coders' varying interpretations of specific policy provisions are clearly documented for future users of the dataset.
- The dataset includes an analysis of the statute text as enacted; thus, this inventory can be used by practitioners, researchers, and policymakers to identify specific policy elements and assess variations in these laws across states. However, given the lack of information regarding the implementation of these laws across states, this study cannot draw conclusions regarding their quality or effectiveness. Determining relationships that may exist between the content, implementation, and effects of these laws is an area of future research.

Policy Process and Outcome Evaluation

- Between 1975 and 2013, pedestrian fatalities reached an all-time high in 1980 (7.54 per 100,000 population). Given that fatalities began to gradually decrease from that point, there may be another unknown variable that influenced this decreasing trend in addition to Statute 335.065. Given the complexity associated with population-level health outcomes, other variables could have contributed to these decreases, including economic conditions, fuel prices, changes in demographics, and other concurrent policy efforts (e.g., the 1975 *Local*

Government Comprehensive Planning Act). These variables present additional opportunities for further study.

- Findings from the interviews also present unique opportunities for further study:
    - According to interviewees, other complementary transportation policies have bolstered the impact of Statute 335.065, including the 1975 *Local Government Comprehensive Planning Act* and the 1998 *Transportation Design for Livable Communities* policy. Future complementary analyses can investigate the interplay between these policies and possible associations between these complementary policies and decreases in pedestrian fatalities.
    - Several interviewees discussed how inconsistent state oversight and uninformed decision-making has allowed some district, county, and city-level officials to design automobile-centric roads that do not meet the pedestrian and bicycle accommodation mandate of Statute 335.065. Geocoded pedestrian fatality data from FARS and data on road infrastructure features from Google Street View can be used to examine potential connections between the presence or lack of specific pedestrian accommodations (e.g., sidewalks, pedestrian refuge islands, and crosswalks) and locations of pedestrian fatalities in Florida. Geographic Information System (GIS) software can be used to map these data and support local area sub-analyses that can determine potential associations pedestrian fatalities, road design elements, and other related variables, including: the age and race/ethnicity those that are fatally injured; levels of household income and vehicle availability that exist within “hot spots” for pedestrian fatalities; and the land use designations (e.g., rural, commercial, industrial, urban, and suburban) in which fatalities primarily

occur. These sub-analyses (supported by U.S. Census data and other data sources) can help increase collective knowledge of where pedestrian fatalities are occurring in Florida, features of roadways that may be associated with these fatalities, and the demographics of subpopulations that may be most adversely impacted by pedestrian fatalities in specific areas of the state.

- Multi-method process and outcome evaluations of Complete Streets policies (e.g., statutes, ordinances, resolutions, organizational policies, etc.) in other states and localities can be conducted to add to the evidence base associated with these policies and their connections to public health outcomes. The knowledge gained from these studies can enhance understanding of the relationship between policy adoption and implementation, as well as inform future policy process and outcome evaluations.

Pursuing these options for additional research provides important opportunities to not only advance collective knowledge related to Complete Streets policies and their potential health impacts, but also expand the methods that used to evaluate such policies. The insights gained from future studies can further our understanding of the interrelationships that exist between the adoption, content, implementation, and potential health effects of transportation policies like state Complete Streets laws and affirm that not only is transportation a health issue, but that *health is a transportation issue*.

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APPENDICES

A-1 Final Codebook and All Coded Variables: State Complete Streets and Routine Accommodation Laws

Final Codebook: Complete Streets and Routine Accommodation State Laws

Variable	Question Text	Answer Type	Values	Labels	Notes
CS_Statute	Is there a state Complete Streets or routine accommodation statute?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Date_Effective	What date was the statute made effective?	Date	M/DD/YYYY	N/A	"Effective dates" can include when statutes were enacted, approved by the governor, signed into law, and/or filed. Effective dates are either specified in the statute text or are governed by default rules that specify the effective dates of newly signed state laws.
Safety_Explicit	Does the statute explicitly state that one of its purposes is to enhance, increase, or improve "safe" travel or the "safety" of road users?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Health_Explicit	Does the statute explicitly state that one of its purposes is to enhance, increase, or improve "health"?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
All_Projects	Does the statute explicitly state that it is applicable to "all transportation projects" in the state?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
All_Users	Does the statute explicitly state that roads, streets, and/or highways should accommodate "all users"?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Pedestrian_Users	Does the statute state that pedestrians should be accommodated?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Bicycle_Users	Does the statute state that bicycle users should be accommodated?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Public_Transit_Users	Does the statute state that public transportation (public transit) users should be accommodated?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
MV_Users	Does the statute state that motor vehicle users should be accommodated?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Commercial_Transport	Does the statute state that transporters of commercial goods should be accommodated?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	

Final Codebook: Complete Streets and Routine Accommodation State Laws

Variable	Question Text	Answer Type	Values	Labels	Notes
Disabled_Persons	Does the statute state that disabled persons should be accommodated?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Older_Adults	Does the statute state that older adults should be accommodated?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Children	Does the statute that children should be accommodated?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Network_Connectivity	Does the statute state that one of its purposes (or responsibilities of named agencies) is to create an interconnected and integrated network that accommodates non-motorized road users (e.g., pedestrians and bicyclists)?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Road_Planning	Does the statute explicitly state that it applies to the planning of roads or highways?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Road_Design	Does the statute state that it applies to the design of roads or highways?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Road_Construction	Does the statute state that it applies to the construction of roads or highways?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Road_Reconstruction	Does the statute state that it applies to the reconstruction of roads or highways?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Road_Rehabilitation	Does the statute state that it applies to the rehabilitation of roads or highways?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Road_Maintenance	Does the statute state that it applies to the maintenance of roads or highways?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Road_Operations	Does the statute state that it applies to the operations of roads or highways?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Design_Stds	Does the statute refer to the use of the specific design manuals, criteria, guidelines or standards to provide accommodations for transportation users?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	

Final Codebook: Complete Streets and Routine Accommodation State Laws

Variable	Question Text	Answer Type	Values	Labels	Notes
Design_Stds_Text	What are the specific names or titles of design manuals, criteria, guidelines, or standards included in the statute?	Text	Text	N/A	If no applicable text, type "."
Performance_Stds	Does the statute state or require the development of performance standards with measurable outcomes?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Modifications	Does the statute encourage or mandate modifications to procedures, guidelines, or plans to support implementation of the statute?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Local_Plans	Does the statute require that city and/or county general plans include elements that address accommodations for non-motorized users (e.g., pedestrians, cyclists)?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Advisory_Board	Does the statute establish an Advisory Board to support the development of procedures and guidance to support multimodal planning and design?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Exceptions	Does the statute include exceptions?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Exception_Prohibited	Exception: Use of the transportation facility by non-motorized users is prohibited by law	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Exception_Cost	Exception: Cost of new accommodation would be disproportionate to the need or probable use	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Exception_Need	Exception: There is a demonstrated absence of future need	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Funding_Allocation	Does the statute refer to specific funding allocations that should be used to support non-motorized transportation facilities?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
State_Funds	Does the statute explicitly state that it applies to transportation projects that receive state funds?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	

Final Codebook: Complete Streets and Routine Accommodation State Laws

Variable	Question Text	Answer Type	Values	Labels	Notes
Federal_Funds	Does the statute explicitly state that it applies to transportation projects that receive federal funds?	Dichotomous - Y/N	0, 1	1 = Yes, 0 = No	
Agencies_Responsible	Based on the legistative text, what agencies are specifically named as having any responsibility for implementing elements of the statute?	Text	Text	N/A	If no applicable text, type "."

Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	CS_Statute	Date_Effective	Safety_Explicit	Health_Explicit	All_Projects	All_Users
CA	1	9/30/2008	1	1	0	1
CO	1	7/1/2010	1	0	0	0
CT	1	7/1/2009	0	0	0	1
FL	1	10/1/1984	0	0	0	0
HI	1	5/6/2009	0	0	0	1
IL	1	7/1/2007	0	0	0	0
LA	1	6/4/2014	1	1	0	0
MA	1	8/18/1996	0	0	1	0
MD	1	5/18/2000	0	0	0	0
MI	1	8/1/2010	1	0	0	1
MN	1	5/15/2010	1	0	0	0
NY	1	8/15/2011	0	0	1	1
OR	1	1/1/1972	0	0	0	0
RI	1	7/2/1997	0	0	1	0
RI	1	6/20/2012	1	1	1	1
VT	1	7/1/2011	1	0	1	1
WA	1	7/22/2011	1	1	1	1
WI	1	6/30/2009	0	0	0	0
WV	1	4/19/2013	1	0	1	1
AL	0	.	.	.	.	.
AK	0	.	.	.	.	.
AZ	0	.	.	.	.	.
AR	0	.	.	.	.	.
DE	0	.	.	.	.	.
GA	0	.	.	.	.	.
ID	0	.	.	.	.	.
IN	0	.	.	.	.	.
IA	0	.	.	.	.	.
KS	0	.	.	.	.	.
KY	0	.	.	.	.	.
ME	0	.	.	.	.	.
MS	0	.	.	.	.	.
MO	0	.	.	.	.	.
MT	0	.	.	.	.	.
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OH	0	.	.	.	.	.
OK	0	.	.	.	.	.
PA	0	.	.	.	.	.
SC	0	.	.	.	.	.
SD	0	.	.	.	.	.
TN	0	.	.	.	.	.
TX	0	.	.	.	.	.
UT	0	.	.	.	.	.
VA	0	.	.	.	.	.
WY	0	.	.	.	.	.

Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	Pedestrian_Users	Bicycle_Users	Public_Transit_Users	MV_Users
CA	1	1	1	1
CO	1	1	0	0
CT	1	1	1	1
FL	1	1	0	0
HI	1	1	1	1
IL	1	1	0	0
LA	1	1	1	1
MA	1	1	0	0
MD	1	1	0	0
MI	1	1	1	1
MN	1	1	1	1
NY	1	1	1	1
OR	1	1	0	0
RI	1	1	0	0
RI	1	1	1	1
VT	1	1	1	1
WA	1	1	0	1
WI	1	1	0	0
WV	1	1	1	1
AL	.	.	.	.
AK	.	.	.	.
AZ	.	.	.	.
AR	.	.	.	.
DE	.	.	.	.
GA	.	.	.	.
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Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	Commercial_Transport	Disabled_Persons	Older_Adults	Children
CA	1	1	1	1
CO	0	0	0	0
CT	0	0	0	0
FL	0	0	0	0
HI	0	1	1	1
IL	0	0	0	0
LA	0	1	1	1
MA	0	0	0	0
MD	0	0	0	0
MI	0	1	1	1
MN	1	1	1	1
NY	0	1	1	1
OR	0	0	0	0
RI	0	0	0	0
RI	0	1	1	1
VT	0	1	1	1
WA	0	0	0	0
WI	0	0	0	0
WV	1	1	1	1
AL	.	.	.	.
AK	.	.	.	.
AZ	.	.	.	.
AR	.	.	.	.
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Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	Network_Connectivity	Road_Planning	Road_Design	Road_Construction
CA	1	1	0	0
CO	0	1	1	0
CT	0	1	1	1
FL	1	1	0	1
HI	0	1	1	1
IL	0	1	1	1
LA	1	1	1	1
MA	0	1	1	1
MD	1	1	1	1
MI	1	1	1	1
MN	0	1	1	0
NY	0	1	1	1
OR	0	0	0	1
RI	0	1	1	1
RI	0	1	1	1
VT	1	1	1	1
WA	0	1	1	1
WI	0	0	0	1
WV	1	1	1	1
AL	.	.	.	.
AK	.	.	.	.
AZ	.	.	.	.
AR	.	.	.	.
DE	.	.	.	.
GA	.	.	.	.
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Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	Road_Reconstruction	Road_Rehabilitation	Road_Maintenance	Road_Operations
CA	0	0	0	0
CO	0	0	0	1
CT	1	1	0	1
FL	1	0	1	0
HI	1	0	1	0
IL	1	0	0	0
LA	0	0	1	0
MA	1	0	1	0
MD	1	0	1	0
MI	1	0	1	0
MN	0	0	1	1
NY	1	1	0	0
OR	1	0	1	0
RI	1	0	0	0
RI	1	0	1	0
VT	0	0	1	0
WA	1	0	0	0
WI	1	0	0	0
WV	1	1	1	1
AL	.	.	.	.
AK	.	.	.	.
AZ	.	.	.	.
AR	.	.	.	.
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Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	Design_Stds	Design_Stds_Text	Performance_Stds	Modifications
CA	0	.	0	1
CO	0	.	0	0
CT	0	.	0	0
FL	0	.	0	0
HI	0	.	0	0
IL	0	.	0	1
LA	0	.	1	0
MA	0	.	0	0
MD	0	.	0	0
MI	0	.	0	1
MN	1	A Policy on Geometric De	0	1
NY	0	.	0	0
OR	1	ORS 447.310, ORS 447.23	0	0
RI	0	.	0	0
RI	0	.	0	0
VT	1	4 V.S.A. Section 4302 as a	0	0
WA	0	.	0	0
WI	0	.	0	0
WV	1	A Policy on Geometric De	1	1
AL	.	.	.	.
AK	.	.	.	.
AZ	.	.	.	.
AR	.	.	.	.
DE	.	.	.	.
GA	.	.	.	.
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Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	Local_Plans	Advisory_Board	Exceptions	Exception_Prohibited	Exception_Cost
CA	1	0	0	0	0
CO	0	0	0	0	0
CT	0	1	1	1	1
FL	1	0	1	0	1
HI	1	1	1	1	1
IL	0	0	1	0	1
LA	0	1	0	0	0
MA	0	0	1	0	0
MD	0	0	0	0	0
MI	1	1	1	1	1
MN	1	0	0	0	0
NY	0	0	1	1	1
OR	1	0	1	0	1
RI	0	0	1	0	1
RI	0	0	1	1	1
VT	1	0	1	1	1
WA	1	0	0	0	0
WI	0	0	1	1	1
WV	1	1	0	0	0
AL	.	.	.	.	.
AK	.	.	.	.	.
AZ	.	.	.	.	.
AR	.	.	.	.	.
DE	.	.	.	.	.
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Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	Exception_Need	Funding_Allocation	State_Funds	Federal_Funds
CA	0	0	0	0
CO	0	0	0	0
CT	1	1	1	1
FL	1	1	0	0
HI	1	0	0	0
IL	1	0	0	0
LA	0	0	0	0
MA	0	0	0	0
MD	0	1	0	0
MI	1	1	1	0
MN	0	0	0	0
NY	1	0	1	1
OR	1	1	1	0
RI	0	0	0	0
RI	1	0	1	1
VT	1	0	0	0
WA	0	1	0	0
WI	1	0	1	1
WV	0	0	1	1
AL	.	.	.	.
AK	.	.	.	.
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Codes and Variables: Complete Streets and Routine Accommodation State Laws

State	Agencies_Responsible	
CA	Department of Water Resources	
CO	.	
CT	The Department of	
FL	Department of Environmental	
HI	The Department of	
IL	.	
LA	The Department of	
MA	.	
MD	.	
MI	AARP, Leaghigan Bicyclists,	
MN	.	
NY	.	
OR	Department of Transportation	
RI	.	
RI	Rhode Island Department of	
VT	.	
WA	.	
WI	.	
WV	Division of Highways	
AL	.	
AK	.	
AZ	.	
AR	.	
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A-2 Purpose and Use of the Autoregressive Moving Average (ARMA) Model in Chapter 3 *("Effects of a State Complete Streets Law on Pedestrian Fatalities in Florida: A Multi-Method Policy Process and Outcome Evaluation")*

Purpose and Use of the Autoregressive Moving Average (ARMA) Model in Chapter 3 *("Effects of a State Complete Streets Law on Pedestrian Fatalities in Florida: A Multi-Method Policy Process and Outcome Evaluation")*

A time series (Y_t) is a sequence of data comprised of discrete measurements or observations made of the same variable(s) over several evenly spaced intervals, such as days, months, quarters, or years.[1] Time series data can be used to estimate the dynamic effects of related variables, as well as develop forecasting models that estimate future outcomes.[2] One method that can be used to analyze time series data involving a single variable is an autoregressive moving average (ARMA) univariate model. An ARMA is a special type of regression model that serves as a "mathematical model of the persistence or autocorrelation in a time series" which can "predict the behavior of a time series from past values" and use predictions as "a baseline to evaluate the possible importance of other variables to the system."[3] An ARMA model consists of two parts:

1. An *autoregressive (AR)*, represented by the term of order, *p*. The AR term specifies that the data at each time *t* is a function of its own values (i.e., "lagged observations")[4] up to *p* units of time in the past.[5]

2. A *moving average (MA)*, represented by the term of order, *q*. The MA term is the average variation of error terms (also known as "residuals" or "random shocks") over *q* previous time periods. Mean values that are calculated over short periods across the length of the time series reflect the "dynamic nature of the data," given that the mean values of the dataset will vary or "move" over time.[6]

As a result, an ARMA model is generally referred to as an ARMA *(p,q)* model, in which *p* is the order of the autoregressive term (the number of immediately preceding values in the series that are used to predict a present value) and *q* is the order of the moving average term (the number of immediately preceding error values used to calculate an average variation for specific time intervals).[7] Additionally, the error (residual or noise) series for an ARMA model must be "stationary," indicating that "both the expected values of the series and its autocovariance function (i.e., a function that describes the strength of the linear relationship between variables[8]) are independent of time."[9]

In Chapter 3 ("Effects of a State Complete Streets Law on Pedestrian Fatalities in Florida: A Multi-Method Policy Process and Outcome Evaluation"), an ARMA models are used to determine if the adoption of Florida Statute 335.065 is associated with changes in the statewide pedestrian fatalities over a 38-year time period (156 quarters). Two fitted* ARMA (3,0) models are used to compare Florida's pedestrian fatalities to those of the two comparison groups (13 states in the southern U.S. Census Region and all U.S. states and Washington, DC). The models use the form:

$$Y_t = \mu_t + \beta_1(Y_{t-1} - \mu_{t-1}) + \beta_2(Y_{t-2} - \mu_{t-2}) + \beta_3(Y_{t-3} - \mu_{t-3}) + \varepsilon_t$$

* A regression model that is "well-fitting" is a model that "results in predicted values close to the observed data values." *(Source: Grace-Martin K, "Assessing the Fit of Regression Models." Cornell University, Cornell Statistical Consulting Unit, StatNews #68, May 2005, Updated 2012. Retrieved May 1, 2016 from https://www.cscu.cornell.edu/news/statnews/stnews68.pdf)*

In these models:

- Y_t = Log pedestrian mortality rate at time *t* (*t* = Number of quarters that elapsed since pedestrian fatality data were initially collected, observed, and/or included in the dataset)†
- μ_t = Mean of the log pedestrian fatality rate at time *t*, which is a function of: (1) the seasonal effect of each quarter of the year; (2) the impact of the log pedestrian mortality rate in comparison states; (3) the rate at which log pedestrian mortality rate changes over time before adoption of Statute 335.065; and (4) the rate at which log pedestrian mortality rate changes over time after adoption of the Statute 335.065
- β_k= Autoregressive coefficient (i.e., "lag operator"‡) that denotes the impact of measurements that are *k* units of time in the past
- Y_{t-k} = Value of Y_t at time *t* minus *k* units of time in the past
- μ_{t-k} = Value of μ_t at time *t* minus *k* units of time in the past
- ε_t = White noise (a sequence of independent identically distributed or "iid" random variables[10])

As third-order autoregressive models, the models used in Chapter 3 indicate that the value of the time series at any time *t* is a linear function of the values at three previous time intervals: *t* – 1, *t* – 2, and *t* – 3.

The table below summarizes the results of the ARMA analyses described in Chapter 3.

Parameter	Southern U.S. Census Region States			All U.S. States and Washington, DC		
	Estimate	95% CI	p=value	Estimate	95% CI	p=value
Quarter			<0.001			<0.001
First	0.230	0.168, 0.292		0.234	0.163, 0.305	
Second	0.153	0.091, 0.215		0.160	0.089, 0.232	
Third	0.149	0.086, 0.212		0.167	0.097, 0.239	
Fourth	0.243	0.177, 0.309		0.271	0.198, 0.343	
Time			0.031			0.062
Before Adoption	0.00004	-0.00198, 0.00206		-0.00074	-0.00300, 0.00152	
After Adoption	-0.00247	-0.00333, -0.000161		-0.00327	-0.00409, -0.00245	
Comparison Group	0.380	0.193, 0.567	<0.001	0.148	0.006, 0.290	0.041
Autoregressive						
First	0.197	0.040, 0.354	0.014	0.233	0.076, 0.389	0.004
Second	0.211	0.054, 0.367	0.008	0.214	0.056, 0.373	0.008
Third	0.257	0.099, 0.415	0.001	0.258	0.098, 0.419	0.002

† Linear regression models generally operate according to four assumptions: (1) There is a linear and additive relationship between the independent and dependent variables; (2) Errors are statistically independent (i.e., unexplained variations of Y are independent random variables or are not autocorrelated if the variables are time series); (3) Variance of errors (i.e., disturbance in the relationship between the independent and the dependent variable) is constant across observations ("homoscedastic"); and (4) All errors are normally distributed. Time-series analysis tends to be more sensitive to violations of the assumption of normality in error distribution than ordinary least squares (OLS) regression (a process of estimating unknown parameters in a linear regression model in order to minimize differences between observed data and data predicted by the linear model). Thus, a nonlinear transformation – such as a logarithmic transformation – of time series data may often be appropriate. (*Source: Nau, R. Duke University, Fuqua School of Business, "Regression Diagnostics: Testing the Assumptions of Linear Regression." November 26, 2014. Retrieved May 1, 2016 from http://people.duke.edu/~rnau/testing.htm*)

‡Given the serial autocorrelation exhibited by many time series (i.e., there is a linear association and dynamic dependence of the time series on its immediately previous or "lagged" observations), the lag operator shifts a time series so that it lags a specified *k* unit of time behind, given that preceding values are used as predictors for present values. *(Sources: MathWorks, "Autoregresive Model," Retrieved April 29, 2016 from http://www.mathworks.com/help/econ/autoregressive-model.html and University of Vienna, "Time Series Operators," Retrieved April 29, 2016 from https://homepage.univie.ac.at/erhard.reschenhofer/pdf/zr/Operators.pdf)*

An interpretation of the estimates calculated are as follows:

Parameter	Southern U.S. Census Region States		All U.S. States and Washington, DC		Interpretation
	Estimate	p=value	Estimate	p=value	
Quarter		<0.001		<0.001	
First	0.230		0.234		The estimates associated with the first and fourth quarters are higher, indicating that Florida's pedestrian fatalities were seasonally higher in those quarters.
Second	0.153		0.160		
Third	0.149		0.167		
Fourth	0.243		0.271		
Time		0.031		0.062	
Before Adoption	0.00004		-0.00074		These estimates reflect the change in Florida's pedestrian fatalities in number of log units per quarter. "Before Adoption" estimates indicate change prior to the adoption of Florida Statute 335.065; "After Adoption" estimates indicate change following the adoption of the statute. Positive values indicate an increase, while negative values indicate a decrease. The difference between the "before" and "after" values is calculated to be the net change in Florida's pedestrian fatalities per quarter when juxtaposed with the comparison group. When adjusted for log mortality rates in the 13 regional states in the southern U.S. Census region, Florida's pedestrian fatality rates decreased by 0.00251 log units more per quarter after the adoption of Statute 335.065. When adjusted for the log mortality rates in the U.S. states and Washington, DC, Florida's pedestrian fatality rates decreased by 0.00252 log units more per quarter after the adoption of Statute 335.065.
After Adoption	-0.00247		-0.00327		
Comparison Group	0.380	<0.001	0.148	0.041	The larger and more statistically significant estimate for the Southern U.S. Census region indicates that the region is a better comparison group for Florida than all U.S. states and Washington, DC.

Parameter	Southern U.S. Census Region States		All U.S. States and Washington, DC		Interpretation
	Estimate	p=value	Estimate	p=value	
Autoregressive					According to the partial autocorrelation function (PACF)[§], the best fitting ARMA model has an autoregressive order of three (3). The autoregressive coefficients for the model do not have a causal interpretation. However, the estimates (all of which are statistically significant) indicate which measurements from preceding units of time are stronger predictors of the current value of the model.
First	0.197	0.014	0.233	0.004	1st autoregressive coefficient (β_1): Estimates denote the impact of measurements in the time series that are one unit of time in the past.
Second	0.211	0.008	0.214	0.008	2nd autoregressive coefficient (β_2): Estimates denote the impact of measurements in the time series that are two units of time in the past.
Third	0.257	0.001	0.258	0.002	3rd autoregressive coefficient (β_3): Estimates denote the impact of measurements in the time series that are three units of time in the past. Compared to the other two autoregressive coefficients, the 3rd autoregressive coefficient (i.e., a lag of three units of time in the past) is the strongest predictor for the current value of the time series for both models.

[§] The partial autocorrelation function (PACF) reflects the correlation between two variables based on the assumption that the values of other sets of variables are known and taken into account. (Source: Pennsylvania State University, Eberly College of Science, "Overview of Time Series Characteristics." Retrieved May 2, 2016 from https://onlinecourses.science.psu.edu/stat510/node/62)

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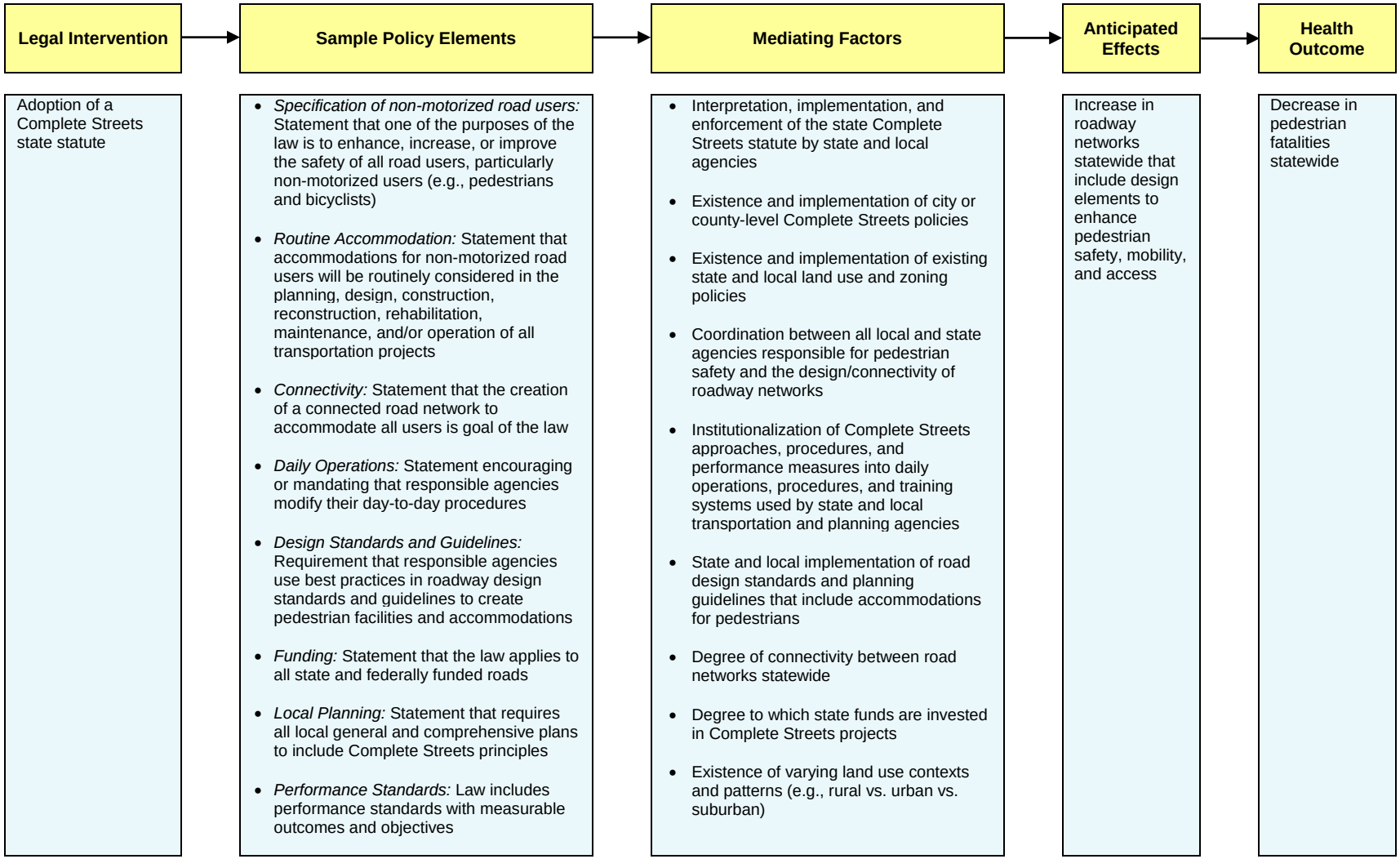
A-3 Logic Model: Proposed Relationship between a Complete Streets State Statute and Pedestrian Fatalities

Logic Model: Proposed Relationship between a "Complete Streets" State Statute and Pedestrian Fatalities



A-4 Institutional Review Board (IRB) Approval of Protocol

The University of Georgia

Phone 706-542-3199

Fax 706-542-3660

Office of the Vice President for Research
Institutional Review Board

APPROVAL OF PROTOCOL

August 27, 2015

Dear Joel Lee:

On 8/27/2015, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	The Effect of a State Complete Streets Statute on Pedestrian Fatalities: A Policy Outcome Evaluation Using Time-Series Quasi-Experimental and Case Study Designs
Investigator:	Joel Lee
IRB ID:	STUDY00002479
Funding:	None
Grant ID:	None

The IRB approved the protocol from 8/27/2015.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103).

Sincerely,

Larry Nackerud, Ph.D.
University of Georgia
Institutional Review Board Chairperson

A-5 Key Informant Interview Protocol

KEY INFORMANT INTERVIEW PROTOCOL:
The Effect of a State Complete Streets Statute on Pedestrian Fatalities: An Outcome Evaluation Using Time-Series Quasi-Experimental and Case Study Designs

Joel M. Lee, DrPH, MPH (Principal Investigator, Doctoral Committee Chair)
Jamila M. Porter, MPH (Co-Principal Investigator, Doctoral Candidate)

Thank you for agreeing to participate in today's interview. Our conversation will last approximately one hour. During the interview, you will be able to share information about you and your current or former agency's role in implementing Florida Statute 335.065, as well as your perspectives on other aspects of the statute's implementation.

While the results of the research study may be published, your name or any identifying information will not be used. No individual interviewee will be uniquely identifiable in any published results, and any summary of information will only be shared in aggregate. Therefore, I hope you feel comfortable sharing your thoughts and experiences with me, but if at any time you don't want to answer a question, that is absolutely fine.

Finally, please note that this discussion is being recorded and our conversation will be transcribed after the call for data analysis purposes only. If you like, we can send you a copy of the transcript once it is complete. If you have any concerns or would prefer not to be recorded, please let me know.

Do you have any questions before we begin?

---

1. First, tell me a little about yourself. What is your current employer, title, and job role?

2. To what degree are you familiar with Florida Statute 335.065, which states that "bicycle and pedestrian ways shall be given full consideration in the planning and development of transportation facilities"?
    A. In general, what do you know about the law?
    B. Can you provide me with any history about how the law came into being?
    C. Do you recall the original intent of the law?
        a. If YES: What can you tell me about it?

3. Are you familiar with the concepts of "Complete Streets" and "routine accommodation"? If so, how do you define them? Do you think they are synonymous or do you differentiate between them?

4. Do you think Florida Statute 335.065 should be referred to as a "Complete Streets legislative statute," a "routine accommodation legislative statute," or should another description be used?

5. Were you working in any field connected to transportation and health (such as engineering, planning, public health, or policy) in Florida when the statute was made effective on October 1, 1984?
    A. If YES:
        a. At that time, for what agency(ies) did you work in Florida?
        b. How long did you work there?
        c. What was (were) your job role(s)?
        d. What role did your agency and/or department play regarding the implementation of the statute?
        e. What role did you play regarding the implementation of the statute?
        f. What role did any of your direct partners at the time play regarding the implementation of the statute?
    B. If NO: *Continue to Question #6*

6. Are you currently working in any field connected to transportation and health in Florida?
    A. If YES:
        a. What role does your current agency and/or department play regarding the implementation of the statute?
        b. What role do you currently play regarding the implementation of the statute?
        c. What role do any of your current partners play regarding the implementation of the statute?
    B. If NO: *Continue to Question #13*

I understand that the state law addresses consideration for both pedestrians and bicyclists, but for the purpose of this interview, I'd like to focus on how the law addresses the needs of pedestrians. The next few questions will focus specifically on this aspect of the statute and the impact of this aspect on your agency's daily operations.

7. The statute states that: "pedestrian ways shall be given full consideration in the planning and development of transportation facilities, including the incorporation of such ways into state, regional, and local transportation plans and programs." In your view, does this section of the statute – giving full consideration to pedestrians – have any emphasis on your organization's regular decision-making processes? If so, how?

8. Can you provide an example of how a day-to-day process, organizational policy, or decision reflects an institutional commitment to giving pedestrian ways "full consideration"? Your example could include any process related to funding,

planning, designing, maintaining, or operating roads.

9. The statute requires the "incorporation of pedestrian ways into state, regional, and local transportation plans and programs."
    A. In your experience, to what degree do you think this has been or is currently being done?
    B. Do you think that this requirement has contributed to addressing pedestrian safety statewide? Why or why not?

10. There are many road design standards and planning guidelines that can be used to develop pedestrian infrastructure.
    A. What road design standards and planning guidelines does your agency use to ensure that roads are designed to accommodate pedestrians?
    B. How often does your agency review and update the design guidelines that are used?
    C. *(For designing streets at the local level):* Do you use the Florida Green Book to inform how streets are designed? To what degree do you think that the Florida Green Book addresses the spirit of Statute 335.065 to provide "full consideration" to pedestrians?

11. How does your agency monitor "success" when it comes to implementing Florida's Complete Streets policy and increasing accommodations for pedestrians?
    A. What metrics or performance measures do you track or report on to document progress?
    B. Do you measure or track infrastructural changes that are implemented to enhance pedestrian access, safety, or use? If so, how?

12. Do you currently work with other external organizations or agencies in Florida to support pedestrian safety as required by Florida Statute 335.065? Who are these agencies and organizations? What are their roles?

I'd now like to ask you a few general questions about Florida Statute 335.065 to get your feedback and perspectives.

13. Statute 335.065 was made effective on October 1, 1984.
    A. In your experience, how (if at all) do you think that the statute has influenced or changed how decisions are made within any state or local agencies in Florida? Can you give an example?

B. In your view, has the implementation of this law been well-integrated into your agency's (or any agency's) daily operations, procedures, decision-making, and trainings?
    a. If YES: Can you give an example?
    b. If NO: Why?

14. Understandably, the successful implementation of a statewide statute like this requires coordination across multiple agencies at the state and local level that have responsibility for pedestrian safety and the design/connectivity of roadway networks. Do you think this coordination exists in Florida?
    A. If YES: What factors have supported this coordination?
    B. If NO: What factors have inhibited this coordination?

15. In general, how do you think Statute 335.065 has improved the connectivity that exists between road networks across the state? Why or why not?

16. Within Florida, there are over 40 localities that have some form of a "Complete Streets" policy as of May 2015; these include internal agency policies, ordinances, and resolutions. All of these local policies were established 20+ years after Florida Statute 335.065 was enacted.

    A. Do you think that the Statute 335.065 may have helped to catalyze the adoption of these local Complete Streets policies?
        a. If NO: Then what do you think catalyzed the development of these local policies?
    B. On the other hand, do you think these local-level Complete Streets policies have impacted the implementation of the state law? If so, how?
    C. *(For FDOT staff only):* FDOT's internal Complete Streets policy was adopted in September 2014.
        a. What was the impetus for adopting this policy?
        b. In your view, what relationship (if any) do you think exists between Statute 335.065 and the FDOT "Complete Streets" policy?

17. How do you think the existence and implementation of state and local land use and zoning policies has impacted the implementation of Florida Statute 335.065? Have aspects of local land use and zoning policies made it easier or harder to implement the state statute in Florida?

18. In your view, has funding been sufficient to implement Statute 335.065? Why or why not?

19. In general, what elements have positively supported efforts to implement Statute 335.065?

20. What barriers have made it challenging to implement Statute 335.065?
    A. *If currently working in Florida:* How have you or your agency worked to address these barriers?
    B. *If NOT currently working in Florida:* How do you think these barriers could be addressed?

21. This completes our interview.
    A. Did you have any final thoughts you'd like to share before we conclude?
    B. Thinking about the nature of this research, do you have other colleagues that you think it would be beneficial for me to interview?

Thank you again for taking the time to participate in this interview. Did you have any final questions for me before we end the call?

Thank you and have a great day.