# Moving Beyond Prevailing Street Design Standards:

## Assessing Legal and Liability Barriers to More Efficient Street Design and Function

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prepared by

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for the

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Source: CLEE

## Introduction and Executive Summary

With Assembly Bill 32 and Executive Order S-3-05, California has set ambitious goals to reduce greenhouse gas (GHG) emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. Meeting these targets will require drastic action in the transportation sector, which accounts for the largest share (37%) of the state's GHG emissions.[1] Technological solutions, such as higher fuel efficiency standards for vehicles and a low carbon fuel standard, can only achieve a limited share of the necessary reductions in the transportation sector if vehicle travel continues to increase. And indeed, over the past 30 years, annual vehicle miles travelled in California have increased by 106 percent,[2] due in large part to sprawling development patterns and a transportation system that favors automobiles. Designing streets that encourage people to travel by more sustainable transportation modes is a key strategy in reversing this trend. However, prevailing street design standards generally encourage wide streets and travel lanes designed to prioritize automobile traffic. This paper explores the why these standards are in place in spite of the policy shift toward encouraging more sustainable travel, as well as the challenges that local governments may face in attempting to move beyond prevailing standards.

Two recent state laws, Senate Bill 375 and Assembly Bill 1358, aim to reduce vehicle travel and GHG emissions by requiring local and regional governments to design more energy and resource efficient communities. SB 375, the Sustainable Communities and Climate Protection Act, requires that regional governments in California's metropolitan areas demonstrably reduce GHG emissions through their regional transportation plans, while AB 1358, the Complete Streets Act, requires local governments to identify how they will accommodate all travelers, including "motorists, pedestrians, bicyclists, individuals with disabilities, seniors, and users of public transportation,"[3] in the circulation element of their general plans. These two laws are both vital pieces of legislation in creating more compact communities that are better served by non-motorized transportation. Over one quarter of all trips in the U.S. are less than one mile in length,[4] and enabling travelers to make these trips by foot and bicycle, which are the most energy-efficient modes of transportation, is an important step in reducing GHG emissions. Since transit riders often access stations by foot, creating a better pedestrian environment can also encourage more energy efficient long-distance travel.

Though SB 375 and AB 1358 are important first steps in shifting travel to more efficient modes, they provide little guidance to local governments on how to create safe and comfortable street environments that encourage bicycling and walking. For the past several decades, the primary source of guidance on street design has been the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets*, commonly referred to as the Green Book. AASHTO was originally formed by highway officials lobbying for increased highway spending, and though its scope has since broadened to include other transportation modes, the designs in the Green Book remain focused on moving automobiles safely and efficiently, with

only secondary consideration given to the needs of pedestrians, bicyclists, and transit riders.

Though the Federal Highway Administration maintains that the Green Book is a "series of guidelines,"[5] transportation engineers often treat it as a standard, making it difficult for cities to design streets that improve pedestrian and bicyclist safety at the expense of vehicle throughput. This challenge is exacerbated by other transportation planning tools, such as the level of service indicators used to assess the impact of new developments and transportation projects on traffic, which also focus on minimizing delay for cars. Furthermore, other public agencies that use space on or beneath the street, such as public works departments, solid waste departments, and utilities, often have their own minimum street width requirements. Together, these standards and requirements often prevent cities from narrowing vehicle lanes, calming traffic, adding sidewalks and bicycle lanes, and other measures that improve conditions for pedestrians and cyclists. Amending auto-oriented street standards therefore will be a crucial step in implementing SB 375 and AB 1358.

Source: CREC

Though local governments often cite legal and liability concerns as a reason not to deviate from conventional auto-oriented streets, our research revealed a much more complex set of reasons why these standards persist, sometimes even in spite of policies that encourage otherwise. These include the lack of coordination between city departments, the lack of feasible alternatives to conventional design standards, the lack of resources to create alternative standards, and constraints placed on transportation planning by federal and state funding sources. This research is the first step in a potential multi-year research project by CREC and CLEE that will provide guidance for state and local governments on developing and implementing codes and standards that encourage sustainable transportation.

Source: iStockphoto

## Summary of findings

**Finding 1: There are no federally mandated design standards for streets and roads other than those that are part of the National or State Highway System.**

Neither federal nor California law requires local governments to adhere to specific street design standards. Federal law is explicit about requiring states to develop their own design standards for federally aided road projects that are not part of the National Highway System (NHS). The NHS, which consists of the Interstate Freeway System, principal routes connecting to it, and roads important to strategic defense, constitutes roughly 14% of federally aided projects by roadway mile in California, and 4% of all roadway miles.[6] This means that the state can use federal money while applying its own design standards for the vast majority of federal-aid road projects in California.

Similarly, state law does not mandate any design standards for federally aided road projects that are not part of the State Highway System (SHS), which is made up of the state numbered route system and associated frontage roads under state ownership. The California Department of Transportation (Caltrans) applies its own design manual to these routes, the *Highway Design Manual* (HDM), but this manual does not establish a legal standard for local roadway design in California. Still, Caltrans' adherence to the HDM can create conflicts with local transportation goals in municipalities where state highways serve as local streets. For roads that are federally funded but not part of the NHS or SHS, local governments are free to develop and apply their own design standards under authority delegated from Caltrans. While the majority of federal aid is spent on federal-aid highways, funding for local road projects is not insignificant.

**Finding 2: There are some federal and state laws with which cities must comply when designing streets, but these do not necessarily prevent cities from creating pedestrian and bicycle friendly streets.**

Among the provisions in federal and state law that influence street design are the Streets and Highways Code, the Uniform Fire Code and the Americans with Disabilities Act (ADA). The Fire Code (adopted as the California Fire Code and also by municipal ordinance) is one of the more significant federal or state impediments to designing multimodal streets. It requires a 20 foot unobstructed clear path on any street,[7] which means that a residential street with parking on both sides must have a minimum width of 34 feet. This can pose a significant barrier to creating streets that are easy for pedestrians to cross. However, there is some leeway in the law if extra precautions against fire are taken (such as the installation of sprinklers or use of fire retardant building materials), and many communities around the country have worked with fire departments to deviate from the requirement.

Compliance with the ADA, on the other hand, encourages pedestrian-friendly street design since disabled travelers typically use pedestrian facilities. Under the ADA, federal and state law requires projects using federal or state funds to comply with accessibility requirements that include installing passing zones on sidewalks every 200 feet or having sidewalk widths of five feet and following ADA guidance related to accessible routes, parking, curb ramps, and ramps.[8] Finally, California law requires a minimum right-of-way width of 40 feet for city streets, but this may be overcome by a fourth-fifths vote of a city council.[9]

**Finding 3: A federal requirement to functionally classify all roads as arterial, collector, or local creates incentives for cities to design higher-traffic streets.**

Federal law stipulates that the functional classification of a road as an arterial, collector, or local street is the basis for determining a transportation project's eligibility for federal aid.[10] Only projects on arterial and collector streets, which carry higher volumes of vehicle traffic, can receive federal aid, while projects to improve the local streets that carry the majority of pedestrian and bicycle trips must seek other sources of funding. This system creates an incentive for cities to designate more high-volume arterial and collector streets in order to receive more funding. Since these street classifications originate in the Green Book, the system also encourages engineers to rely on AASHTO's auto-oriented street designs. Each functional classification is associated with an allowable range of design speeds, which in turn determine the principal horizontal and vertical alignment of the roadway; the basic cross section in terms of lane width, shoulder width, and type of median; and other major design features. When local governments designate roads as arterials and collectors in order to receive funding, they must allocate more space to vehicles and design for higher speeds, which decreases safety and available space for other users.

**Finding 4: Interviews with staff from the cities of Fresno and Sacramento suggest that it is not legal or liability concerns that prevent the implementation of resource efficient street standards.**

Interviewees revealed that cities do not feel legally bound to follow the prevailing standards of AASHTO or Caltrans, but they often lack the resources to research, develop, and/or test alternative standards. However, cities attempting to promote biking and walking face many non-legal barriers such as width requirements for service vehicles, lack of coordination among departments, minimum level of service requirements in general plans that prevent road projects from slowing traffic below designated speeds, and general resistance among traffic engineers to innovative street designs. In spite of these barriers, both Sacramento and Fresno have been able to make limited improvements to the bicycle and pedestrian realm by adding bike lanes, creating more flexible designs standards, and implementing "road diets" that reallocate underused vehicle lane space to other users. Still, significant reductions in GHG emissions will require cities to take more drastic and sweeping reforms.

**Finding 5: A city may deviate from prevailing design standards for the sake of developing more resource efficient streets without being vulnerable to liability.**

Section 835 of the Government Claims Act provides that a public entity may be liable for an injury caused by a dangerous condition of public property. Cities typically comply with conventional design standards in order to prevent liability for this type of claim in two ways. First, adherence to standards can serve as evidence that the roadway was not in a dangerous condition, a necessary element of a claim under §835. Second, design standards can serve an evidentiary function when a city pleads design immunity under §830.6, which protects a public entity from liability where the dangerous condition was part of a reasonable design which was discretionarily approved prior to construction. Standards can substitute for approval of the design where the standards have previously been approved by a government official.

Moreover, compliance with standards also can serve as evidence that the design was reasonable.

Demonstrating compliance with prevailing design standards is only one of many ways for a city to shield itself from lawsuits under §835. Absence of accident history is convincing evidence that a roadway is safe, as is expert testimony, even if it does not discuss prevailing standards. *As long as a city properly approves a design feature in advance and properly documents the approval process, it can claim design immunity in a liability claim.* Fear of incurring liability is not a valid reason for a local government to develop street design codes that accommodate and encourage more efficient modes of transportation.

**Finding 6: A city must take proper steps and precautions when designing and approving a roadway in order to prevent liability.**

Regardless of compliance with standards, a city must take certain affirmative steps to prevent liability. First, in order to prevent roadways from developing dangerous conditions, a city should monitor the operational safety of its streets. Where a condition proves to be unsafe (i.e. where there is a higher than average accident ratio) cities should fix the problem or warn travelers. Second, in order to plead design immunity a city must use a thorough design process with proper documentation. This means that staff should be careful to properly document all elements of a plan, including those elements intentionally excluded from the design, and to document the plan's final approval. A city should also ensure that all street designs are based on professional work, and analyze the benefits and costs of alternative designs, especially in terms of safety. By following these guidelines, a city can prevent the development of a dangerous condition and successfully shield itself from §835 claims.

Overall, there is little in federal, state, or case law that precludes local governments from deviating from prevailing engineering standards and adopting codes that allow more resource efficient street designs. The major barriers are non-legal: municipalities often lack the resources to develop their own standards, while transportation engineers are reluctant to deviate from common practice even when policymakers and the general public urge otherwise. This conflict highlights the need for new guidance that is flexible enough to accommodate varied contexts, but rigid enough to become "prevailing standards." Potential models for moving beyond current street design standards include the Institute of Transportation Engineers' context sensitive solutions approach, and in particular its manual on designing walkable urban streets, as well as San Francisco's Better Streets Plan, which is a comprehensive effort to revise all sections of city code that pertain to street design. Future research on street design standards should focus on:

- Additional interviews and case studies with city planners and engineers at a greater number of California cities should be conducted to uncover further constraints and opportunities to resource efficient streets
- The potential for better institutional coordination within municipalities on street design issues
- The possibility for new manuals to be accepted by courts as "prevailing standards"
- Identifying constraints on federal or state funding that prevent resource efficient street design
- Developing funding opportunities, planning assistance, and model ordinances to help cities develop and implement their own street standards.

Since the rise of the transportation engineering profession in the 1930s, professional organizations like the American Association of State Highway and Transportation Officials (AASHTO) and the

Institute of Transportation Engineers (ITE) have written numerous publications related to street design under varying rubrics of "standards," "policies," and "guidelines." These publications (in particular AASHTO's *A Policy on Geometric Design of Highways and Streets*, a.k.a. "the Green Book") are often referred to as "bibles" within the transportation engineering profession, and the standards contained within them treated as mandates.[11]

This section examines the relationship between these professional engineering standards and the federal, state, and municipal laws and regulations that govern street design. It finds that there is actually very little in state or federal law that requires local governments to adopt specific standards related to street design. Thus, if local governments wish to implement resource efficient street designs that promote walking, biking, and transit and reduce automobile dependence, there is little in state or federal law precluding them from doing so.

Previous research has examined the influence of professional organizations and public agencies on street standards. In particular, Southworth and Ben-Joseph have written a comprehensive review of the influence of the Federal Housing Administration, Institute of Transportation Engineers, and the Urban Land Institute on the form and character of post-war suburban streets.[12] The purpose of this section is to focus on the smaller set of engineering standards and practices that are cited in laws and regulations.

Source: iStockphoto

## Federal, state and local laws and policies governing street design

### Federal Law

#### Professional standards and federal-aid highways

No organization has had more influence on federal road design standards than AASHTO. In 1914, AASHTO (then known as AASHO, the American Association of State Highway Officials) was formed by state and local highway officials to lobby Congress for increased highway spending.[13] By 1931, AASHTO had begun to draft road design guidelines that laid the groundwork for the Green Book. AASHTO standards for the Interstate system were first adopted by the "States, acting through [AASHTO]," before they were adopted by the Bureau of Public Roads in 1956.[14]

Though widely perceived as a set of mandatory standards for roadway design, the AASHTO Green Book is actually a set of flexible guidelines presenting ranges of values for the geometric dimensions of different types of roadways (e.g. widths of travel lanes, design speed, and stopping sight distance). The Federal Highway Administration (FHWA) characterizes the Green Book in the following manner: "Although often viewed as dictating a set of national standards, this document is actually a **series of guidelines** [sic] on geometric design within which the designer has a range of flexibility."[15] AASHTO itself echoes this sentiment in the foreword to the Green Book: "The intent of this policy is to provide guidance to the designer by referencing a recommended range of values for critical dimensions. Sufficient flexibility is permitted to encourage independent designs tailored to particular situations."[16] While the discussion of flexibility is important, it belies the fact that when the Green Book is applied to a particular project, it constrains transportation engineers to a set of parameters and values designed for the efficient movement of automobiles, often at the expense or neglect of other roadway users. In addition, many planners feel strongly that some of the guidance in the Green Book relies on outdated concepts such as functional classification and vehicle level of service, which do not apply to the design of multimodal roadways.[17]

In order for criteria in the Green Book to become mandatory standards, they must be adopted through law or regulation. The FHWA has adopted the Green Book as one of the sources providing specific criteria and controls for the design of projects in the National Highway System (NHS), and it is accorded similar status in Title 23 of the United States Code of Federal Regulations, commonly referred to as the Highways Code.[18] This means that highway projects in the NHS, which consists of the Interstate System, other urban and rural principal arterial routes, and roads deemed important to strategic defense, must conform to AASHTO standards.[19] The federal government has delegated authority to State Departments of Transportation (DOTs) to designate and design the routes of the NHS in conjunction with local and regional officials, though these decisions are subject to FHWA approval.[20]

The Highways Code also requires transportation officials to take into consideration a range of factors in addition to the Green Book guidelines for NHS projects. Congress has amended the section in the code on highway standards numerous times to encourage a balance of safety, mobility, economic, and environmental considerations in highway design and construction.[21] In particular, federal-aid highway projects must minimize air, noise, and water pollution; destruction of natural resources; adverse effects on employment or property; injurious

displacement of people; and general community disruption.[22] They must also take into account the constructed and natural environment of the area; the environmental, scenic, aesthetic, historic, community, and preservation impacts of the activity; and access for other modes of transportation.[23]

While state DOTs have to apply the AASHTO standards to NHS projects, they are also required to consider context-specific factors. Federal law also establishes an exception process to allow NHS projects to deviate from the minimum criteria set forth in the Green Book for "experimental features or projects" and "projects where conditions warrant that exceptions be made."[24] In determining whether an exception is warranted, the FHWA must give "due consideration" to "all project conditions."[25] Federal law thus dissuades blind adherence to the standards, and encourages their flexible application.[26]

There are no federally mandated design standards for streets and roads that are not part of the NHS. In fact, federal law is explicit about requiring states to develop their own design standards for federally aided street and road projects outside of the NHS. Specifically, the law states that "projects (other than highway projects on the National Highway System) shall be designed, constructed, operated, and maintained in accordance with State laws, regulations, directives, safety standards, design standards, and construction standards."[27] This language entered the law in 1991 with the passage of the Intermodal Surface Transportation Act (ISTEA). ISTEA divided "federal-aid highway" projects into those that are part of the NHS and those that are not, and only required the AASHTO standards be followed for NHS projects. The term "federal-aid highway" means a highway eligible for federal funding, which can be any road that is functionally classified as an arterial or any form of collector other than a rural minor collector.[28]

In California, roughly 32 percent of all public roadway miles are part of the federal-aid system, and only one eighth of federal aid routes, or four percent of public roadway miles, are part of the NHS.[29] This means that the state can use federal money while applying its own design standards on the vast majority of federal-aid road projects in California.

Indeed, for most of its history, the federal-aid highway system has had little to do with the local roads and streets that make up the remaining 68 percent of roads in California. Although the AASHTO standards that developed along with the federal-aid system are in widespread use, there was never a strong requirement in the law that these standards be applied to local roads, particularly in urban areas. From 1916 to 1944, the federal-aid system was confined by law almost entirely to rural areas.[30] Then as now, states were given discretion to designate the routes on the system, subject to federal approval. Total mileage in each state was limited to seven percent of the state's total highway mileage.

With the passage of the Federal-Aid Highway Act of 1944[31], and then as expressly confirmed in 1956[32], it was mandated that a portion of a state's federal-aid funds (25 percent) be used on extensions of the pre-existing rural system into urban areas. The latter act also split funds between the federal-aid primary, federal-aid secondary, and extensions of those systems into urban areas. In 1970, Congress added a formal classification called the "urban system" that, for the first time, allowed federal funds – and therefore federal standards – to be applied to urban road projects[33]. Congress envisioned this system as an independent program focused on urban areas, in contrast to previous legislation focused on extending the existing highway systems into urban areas.[34] It also introduced the terms "arterial" and "collector" into the Highway Code to describe the functional classification of roads.

Until 1958, there had been no "Standards" section in the federal Highways Code, which only contained a minimal set of specifications, such as requirements that roadways were to "adequately meet the existing and probable future traffic needs."[35] Design standards were addressed through a separate memorandum, which designated the "standards, policies, and guides, which have been adopted or accepted and published by the American Association of State Highway Officials" as the design standards for federal-aid projects.[36] In 1974, the FHWA incorporated this memorandum into the Highway Code[37], only to issue a "clarifying statement" in 1978 specifying that "this regulation does not establish Federal standards for work that is not federally funded."[38]

For a brief period from 1974 to 1978, therefore, the Code of Federal Regulations formally included AASHTO design standards[39], including the precursor to today's Green Book that prohibited design speeds of less than 30 mph on low-volume roads[40], and required them for federal-aid urban projects. In addition, a separate set of FHWA standards, passed in 1968, required each state to have a highway safety program that included a number of design standards for motorized travel, but none for non-motorized travel.[41] These standards were changed to non-mandatory "guidelines" in 1987 and removed entirely in 1995[42]. Though fairly short lived, both of these interludes with formal federal standards presumably had influence on state and local planning practice during the time that they were in the law, and possibly afterwards.

### The functional classification system

Though federal law no longer requires that non-NHS roads conform to AASHTO standards, it continues to influence road design by determining eligibility for federal aid based on the classification of all roads as arterials, collectors, or local streets.[43] The requirement is rooted in a 50 year-old AASHTO practice of designing and maintaining hierarchical street systems of fast-moving, high-volume arterials, slower local streets generally lacking in connectivity, and collectors connecting the two.

Many in the planning profession believe that this hierarchical system is directly linked to automobile dependency, since it prioritizes traffic flow over other uses. With few exceptions, only arterials and collectors, which carry higher volumes of vehicle traffic, are eligible for federal aid. Critics of functional classification believe that this creates an incentive for cities to designate and design more auto-friendly streets in order to receive funding, which in turn leads to higher traffic speeds. While the law does not require that a specific standard be followed for designating design speeds for a given street type, most traffic engineers will follow the Green Book because it is from here that these terms originate. The Green Book contains a range of design speeds for a given street type (e.g. 30 to 60 mph for urban arterials),[44] and design speed is used to determine geometric design features such as lane width, shoulder width, type and width of median. [45] Though the range of allowed design speeds allows for some flexibility, in general classifying more roads as arterials and collectors leads to wider roads with fewer and longer pedestrian crossings. It often also prohibits the implementation of traffic calming measures or the narrowing of lanes in order to accommodate bicycle or bus rapid transit on arterials and collectors. Instead of enacting mandatory standards that call for auto-friendly road designs, the FHWA implicitly encourages cities to prioritize automobiles by offering funding for road projects that speed traffic along at the expense of bicyclists and pedestrians.

### The Americans with Disabilities Act

As public entities covered under Title II of the Americans with Disabilities Act (ADA), transportation

agencies are required to ensure equal access for people with disabilities in all newly constructed and altered facilities.[46] These guidelines have been adopted by the Department of Justice, giving them the force of law, and California law requires that all sidewalks, curbs, and related facilities that use state, county, or municipal funds be accessible according to the standard of accessibility provided by Federal ADA standards.[47] In particular, the ADA Accessibility Guidelines require a passing space on sidewalks every 200 feet or, if this requirement cannot be met, a minimum sidewalk width of five feet.[48] ADA guidelines also apply to bicycle and pedestrian trails, parking facilities, and curb ramps.[49] Though these guidelines do place constraints on the design of state- and federally-funded city streets, these constraints generally act as improvements to the pedestrian environment.

## State law

### The Caltrans Highway Design Manual

Unlike in the Federal Highways Code and Code of Federal Regulations, there are no specific references to AASHTO in the California Code or Code of Regulations regarding street design. Still, the AASHTO standards play a prominent role in guidelines used by the California Department of Transportation (Caltrans) in its *Highway Design Manual* (HDM), which draws heavily from the Green Book.[50] Like the Green Book, the HDM is often treated as if it were legally binding, but is actually a set of guidelines rather than regulations. Under California law, a "regulation" is defined as a rule that is formally adopted under either the Federal or State Administrative Procedure Act.[51] The Caltrans HDM does not meet these criteria and so does not impose a mandatory duty nor carry the force of law[52] (although as discussed below, the failure of Caltrans to meet its own standards as established in the HDM can be evidence of negligence).[53] The foreword to the HDM makes no illusions about this fact, clearly stating that the manual "is neither intended, nor does it establish, a legal standard."[54] The HDM contains many standards that favor vehicle throughput, such as a requirement for a 20-foot clear zone free of trees or immovable objects on arterial roads. However, these requirements apply only to the nine percent of California's road miles that are part of the state highway system (SHS).[55]

Still, Caltrans' adherence to the HDM can cause problems for local governments that attempt to improve conditions for non-drivers on city streets that are part of the SHS. The City of San Francisco, for example, is planning to build a Bus Rapid Transit line down Van Ness Avenue, portions of which are part of the SHS and therefore under Caltrans' jurisdiction. Currently, vehicle lane widths along Van Ness fall below the widths required in the HDM, and in order to accommodate the bus lanes, some of these lanes would need to be kept at their current widths instead of being widened to standard. In spite of the project's potential benefits for transit users, Caltrans has so far refused to deviate from the HDM, which has been a major impediment to the project.[56]

### The California Fire Code and other state laws

Apart from the Highway Capacity Manual, two state policies act as significant barriers to creating pedestrian and bicyclist-friendly streets. The first is the provision in the California Fire Code that requires all public streets to have an unobstructed travel way of at least 20 feet.[57] This effectively sets a minimum curb-to-curb width on all city streets of 20 feet without parking, or 34 feet with parking. Most jurisdictions view this as a binding requirement for street design. However, some jurisdictions allow deviation from the minimum width for new subdivisions if the buildings in the development incorporate on-site fire protection facilities, including a water supply, fire resistant construction, or sprinkler systems. Developers can also apply for variances in some cities and propose alternate means of mitigation for non-compliance with the fire code.[58] Local

governments in other states have successfully deviated from the minimum width requirement by working with fire department personnel to conduct emergency services field tests, but no successful example of this was found in California.[59] While the minimum width specified in the Fire Code is often treated as a firm standard, it appears there is some room for flexibility in applying it.

The second is a provision in the Streets and Highways Code requiring that the right-of-way of all city streets (which includes sidewalks, center, and planters) be at least 40 feet wide. [60] The law does not apply to streets built prior to 1935 or to alleys, and also allows the governing body of any city to approve narrower widths by a vote of four-fifths of its membership. [61] Cities often approve narrower streets on a case-by-case basis rather than in an overarching policy. In a survey of 100 California cities, only one of the respondents had a minimum right-of-way standard of less than 40 feet, which suggests that the law may have some effect on setting minimum widths. However, the same survey revealed that only 6 cities used a 40-foot minimum right-of-way, while the vast majority of respondents used minimum widths that were well above 40 feet.[62] This suggests that engineering concerns and other considerations are producing streets that are much wider than required by law.

More recent state laws aim to encourage, energy-efficient street designs rather than prohibiting them. An amendment to the Vehicle Code enacted during the 1980s gives local governments the authority to carry out traffic calming by using islands, curbs, traffic barriers, or other roadway design features to close streets, or speed humps to slow traffic,[63] without fear that these features will be challenged as "unauthorized traffic control devices" (in California, only the state has the authority to regulate and control traffic, but this law exempts traffic calming measures from the definition of traffic control device).[64] This provision was incorporated in response to a successful challenge in the California Supreme Court to the "Berkeley barriers" (partial street closures installed by the City of Berkeley).

More recently, the state legislature passed Assembly Bill 1358, the Complete Streets Act, which requires local governments to identify how they will accommodate all travelers, including "motorists, pedestrians, bicyclists, individuals with disabilities, seniors, and users of public transportation," in the circulation element of their general plans. The Governors' Office of Planning and Research is in the process of producing guidelines for implementing AB 1358, which may recommend decision support tools such as multimodal LOS that give equal weight to pedestrians, bicyclists, transit users, and drivers. It remains to be seen whether the law will result in roads that encourage more efficient transportation modes.

Just as the federal government has delegated design authority to Caltrans for federal-aid projects off of the NHS, Caltrans has delegated significant authority to local agencies to develop and implement their own design standards on federal-aid road projects off of the SHS. *The Joint Stewardship and Oversight Agreement* between Caltrans and the FHWA states that Caltrans "will exercise its FHWA delegated authority by further delegating federal authority to local agencies to the greatest extent possible for those federal-aid projects that are located off of the State Highway System."[65] In particular, local geometric design standards that have been developed for use on locally funded projects can be used on federal-aid projects off of the SHS.[66] Caltrans has also delegated design approval authority to local governments for projects not on the SHS. While the majority of federal aid is spent on highways, some local road projects are eligible for federal funds. The Surface Transportation Program, for example, provides federal funds for bridge, safety, carpool related, and bicycle/pedestrian projects on any public road, regardless of functional classification.[67]

### Local policies and design standards

In addition to the design authority described above, cities can also specify in their general plans a minimum level of service (LOS) for major streets. LOS is a metric that traffic engineers use to rate the effectiveness of transportation facilities, under which streets and intersections are assigned letter grades from A to F based on how well they minimize vehicle delay. This minimum standard can act to prevent measures intended to reduce vehicle speeds and safely accommodate all road users, such as the installation of traffic calming devices or the narrowing of vehicle lanes in order to accommodate bike lanes. The following case studies of Fresno and Sacramento illustrate the many other factors that shape design standards. They also demonstrate that local governments must be flexible in designing and applying standards in order to encourage non-automobile travel.

### Case study: Fresno

For the last 40 years, Fresno has required residential streets to have a right of way that is at least 40 feet wide, while arterial streets have a minimum width of 106 feet. An interview with several Fresno city staff revealed that street width was the biggest barrier that they faced in their attempts to promote walkable and bike-friendly streets. According to one interviewee, "roads were designed more as highways than people-movers," and as a result, "the building-to-building stretch is just overwhelming" for a pedestrian.

Interviewees mentioned several influences on Fresno's design standards, including the HDM, other cities' codes, the California Fire Code, the California Vehicle Code, and solid waste collection and street sweeping vehicle requirements. AASHTO requires design speeds to be higher than actual posted speed limits, which results in the provision of wider lanes and thus wider streets. Fresno's general plan requires roads to be designed such that they operate at LOS D, under which vehicles move at average speeds of 9 to 17 miles per hour with delays of 40 seconds or less at intersections, during the peak 15 minutes of the day. Fresno's garbage service, which one interviewee boasted was "the most efficient in the state," utilizes the largest possible collection vehicle, with a 34 foot turning radius. This service vehicle is not mandated by law, but departmental policy requires it because it is cost-effective. The result is that Fresno as one city official reports, has "a hundred miles of sidewalk with hardly anyone using them."

Planners in Fresno have made some headway in developing more resource efficient streets in spite of the city's standards. In 2007, Fresno received a development proposal for a 130-acre smart growth project with streets too narrow to meet city standards for accommodating fire engines and solid waste collection vehicles. Instead of rejecting the proposal, staff conducted a field exercise and discovered that both types of vehicles could maneuver considerably smaller streets then previously expected. Fresno is also in the process of developing a bike master plan, and city officials report that in the last month they have installed approximately 11 miles of bike lanes, in part through road diets that reallocate space from Fresno's wide vehicle lanes. Fresno has also overcome public skepticism about multi-modal street designs through education campaigns, such as a recent public process to educate visually impaired residents about how to navigate traffic-calming roundabouts. City staff are also investigating other creative ways of working with fire, waste, and utility departments to design streets that are narrower than standards require, including making piping material thicker (to cluster pipes more tightly beneath the roadway) and placing fire

hydrants more frequently in exchange for relazing the Fire Codes' street width standard.

At the time of the interview Fresno was about to issue a draft addendum to its design standards reducing minimum lane widths on collector streets from 12 to 11 feet, which is still within the AASHTO standards range. Fresno planning staff reported that they did not feel legally bound to follow the standards in the HDM or the Green Book, but cited a lack of other credible manuals to rely upon. Fresno's streets are still wider in most cases than the minimum required by the Green Book, and the city will need to systematically re-evaluate design standards in order to encourage energy-efficient transportation.

### Case study: Sacramento

On the surface, Sacramento's wide streets and ample minimum lane and roadway widths are very similar to Fresno's. The "Standard Street Sections" listed in Sacramento's City Code generally conform to the standards in the AASHTO Green Book. Travel lane widths for all streets are 11 to 12 feet, which is on the high end of AASHTO values. Minimum widths for the total right-of-way range from 53 feet for local residential streets to 121 feet for a 6 lane arterial. However, staff from Sacramento's legal and planning departments have worked to build more flexibility into standards, which they believe is a key measure in encouraging residents to switch from driving to walking or bicycling. These more flexible standards emerged in part due to complaints from residents that previous standards were too rigid and "did not result in livable neighborhoods." In 1999, the City convened working groups and conducted emergency services tests in response to these complaints, creating new standards that encourage traffic calming devices such as bulb-outs or traffic circles, which can be approved by the city's traffic engineer on a case-by-case basis. These standards also give greater flexibility to developers to design streets with planting strips, on-street parking, and bike lanes. However, even though the residents who originally complained about street designs desired the narrowest street widths possible, Sacramento's standards still call for streets that are at least 40 feet wide.

Sacramento has also relaxed minimum LOS standards in certain areas where it is attempting to encourage greater levels of transit use, walking, and bicycling. Though the general policy, as in Fresno, is to maintain a LOS of at least D on most city streets, Sacramento's General Plan recognizes that congestion on downtown city streets is a fact of life, and that dense infill development can confer "transportation-system-wide" benefits. The General Plan specifies that LOS F is acceptable during peak times in the downtown Core Area, and allows projects that negatively affect LOS on adjacent streets to proceed if they "enhance non-auto travel modes" in the Core Area.

Despite this relaxation of standards, interviewees maintained that the lack of communication and collaboration between city planners and traffic engineers remains a key barrier to creating multimodal streets. Typically, city traffic engineers apply traditional design standards to city streets in processes separate from the ones planners use to implement the General Plan's goals and policies. Without improved collaboration between these two departments, it seems unlikely that the progressive policies contained in the General Plan will be widely implemented.

Source: iStockphoto

## Case law relating to local government liability and street design standards

In addition to requirements of federal and state law, localities must also consider the possibility of recurring liability for roadway injuries when street designs deviate from sanctioned standards. While AASHTO and Caltrans standards are not mandatory per se, these standards have historically served an important function in determining liability. When a public entity is sued for injury caused by a dangerous condition of the roadway under California Government Code Section 835 (§835), compliance with the standards in the AASHTO Green Book and Caltrans HDM can be used to shield a city from liability. However, cities may deviate from prevailing standards for the sake of developing more resource efficient streets without being vulnerable to liability, as long as they take proper steps when designing and approving a roadway.

This section provides with a basic description of the law pertaining to public entity liability under §835 before examining specific places in case law where design standards serve an evidentiary function, and describing alternative evidentiary sources. The section also examines past claims brought against cities regarding design elements that are associated with resource efficient communities. These suits have rarely been successful, regardless of whether or not streets have been designed according to AASHTO standards, suggesting that cities have little to fear from deviation from automobile-oriented street standards.

### Case law and §835 liability claims

While California does permit claims against public entities for an injury caused by a dangerous condition of public property, it also provides two immunities that can effectively shield a city from liability. The Government Claims Act, passed in 1961, delineates the circumstances under which a person can bring suit against a public entity. §835 creates liability for a public entity where a dangerous condition of public property is the proximate cause of an injury. To bring a successful claim, a plaintiff must prove four essential elements:

1. the property was in a dangerous condition at the time of the injury;
2. the injury was proximately caused by the dangerous condition;
3. the dangerous condition created a reasonably foreseeable risk of the kind of injury incurred; and
4. the public entity had actual or constructive notice of the dangerous condition… a sufficient time prior to the injury to take measures to protect against the dangerous condition.[78]

As an alternative to the fourth element, the plaintiff can instead show "that the dangerous condition was created by a public employee's negligent or wrongful act or omission within the scope of his or her employment."[79]

The California Government Code provides two important defenses to a claim brought under §835: reasonableness (§835.4) and design immunity (§830.6). Both are affirmative defenses that must be pled and proven by the public entity. [80] In order to successfully plead the defense of reasonableness, §835.4 requires a public entity to show that "the act or omission that created the condition was reasonable."[81] The jury determines "reasonableness" by "weighing the probability and gravity of potential injury to persons and property foreseeably exposed to the risk of injury against the

practicability and cost of taking alternative action that would not create the risk of injury." [82]

The second affirmative defense available to a public entity is design immunity, which is delineated in Cal. Gov. Code. §830.6.[83] Design immunity is intended to "prevent a court from simply reweighing the same factors considered by the governmental entity which approved the design."[84] In order to obtain design immunity, a public entity must prove three essential elements:

1. a causal relationship between the design and the injury[85];
2. discretionary approval of the plan or design prior to construction by the legislative body or employee who had the discretionary authority in the matter; and
3. "any substantial evidence"[86] supporting the reasonableness of the plan or design.[87]

Design immunity has been especially important to cities in preventing liability for a dangerous condition of the roadway. As §830.6 was originally written, the courts interpreted design immunity to be perpetual regardless of a design's safety in operation.[88] Then, in *Baldwin v. State* (1972), the Supreme Court of California overruled previous cases, finding that, "Once an entity has notice that the plan or design, *under changed physical conditions,* has produced a dangerous condition of public property, it must act reasonably to correct or alleviate the hazard."[89] In 1979, the California Legislature amended 830.6[90] for the "express purpose" of including loss of design immunity where a public entity has notice of a dangerous condition.[91] In *Bane v. State* (1989), the court interpreted the statute to mean that "once the state was put on notice that the… design for which the state had immunity nevertheless produced a dangerous condition, the immunity continued only for a reasonable time to allow the state to acquire the funds and to correct the dangerous condition. Once this time period expired, the immunity ended."[92] Because the amendment did not specify that "a change in physical conditions" was a necessary condition for loss of design immunity, *Bane* effectively overruled *Baldwin's* requirement.[93] However, subsequent cases have rejected this interpretation and read the amendment to provide that a public entity is still protected under design immunity, even if they have notice, where there is no change in physical conditions.[94]

The plaintiff bears the burden of establishing three elements for a public entity to lose design immunity:

1. the design has become dangerous because of change in physical conditions;
2. the public entity had actual or constructive notice of the dangerous condition thus created; and
3. the public entity had reasonable time to obtain funds and carry out necessary remedial work to bring the property back into conformity with a reasonable design or plan, or the public entity, unable to remedy the condition due to practical impossibility or lack of funds, had not reasonably attempted to provide adequate warnings.[95]

In practice, establishing loss of design immunity has proven difficult for plaintiffs. Bane, which, as noted, did not require a change in physical condition, has been the only case where loss of design immunity was upheld.[96]

### The role of AASHTO and Caltrans standards in liability claims

Though compliance with AASHTO and Caltrans standards is not necessary to successfully shield a city from liability, AASHTO's Green Book and Caltrans' HDM are "prevailing standards"[97] used as evidence in cases brought under §835. Until now, the role of other design manuals in tort

cases has been limited. For example, the Institute of Transportation Engineers' (ITE's) guidelines on context sensitive solutions have yet to appear in California case law. However, case law from other states suggests that these guidelines might potentially be able to serve as 'prevailing standards'.[98] In *James v. New York State Bridge Authority*, the New York Appellate Court affirmed summary judgment for the city due to discretionary immunity where the speed limit was based on studies conducted by ITE. This case suggests that if ITE studies are sufficient to obtain immunity, ITE's published guidelines likely can serve the same function as AASHTO guidelines. Nonetheless, until ITE or some other pedestrian and bicyclist oriented design manual is explicitly accepted as 'prevailing', cities can feel bound to AASHTO and Caltrans standards.

In a case brought against a public entity under §835, there are five points at which standards have been traditionally used as evidence:

1. Standards have served to determine the first element of a claim under §835, the presence of a "dangerous condition."
2. If the public entity raises the defense of reasonableness, standards may be used as means of determining reasonableness.
3. If the public entity raises the defense of design immunity, the required element of "discretionary approval" can rely on standards.
4. If the public entity raises the defense of design immunity, the required element of "reasonableness" of the design can rely on standards.
5. A jury can consider design standards when determining whether design immunity has been lost due to changed conditions.

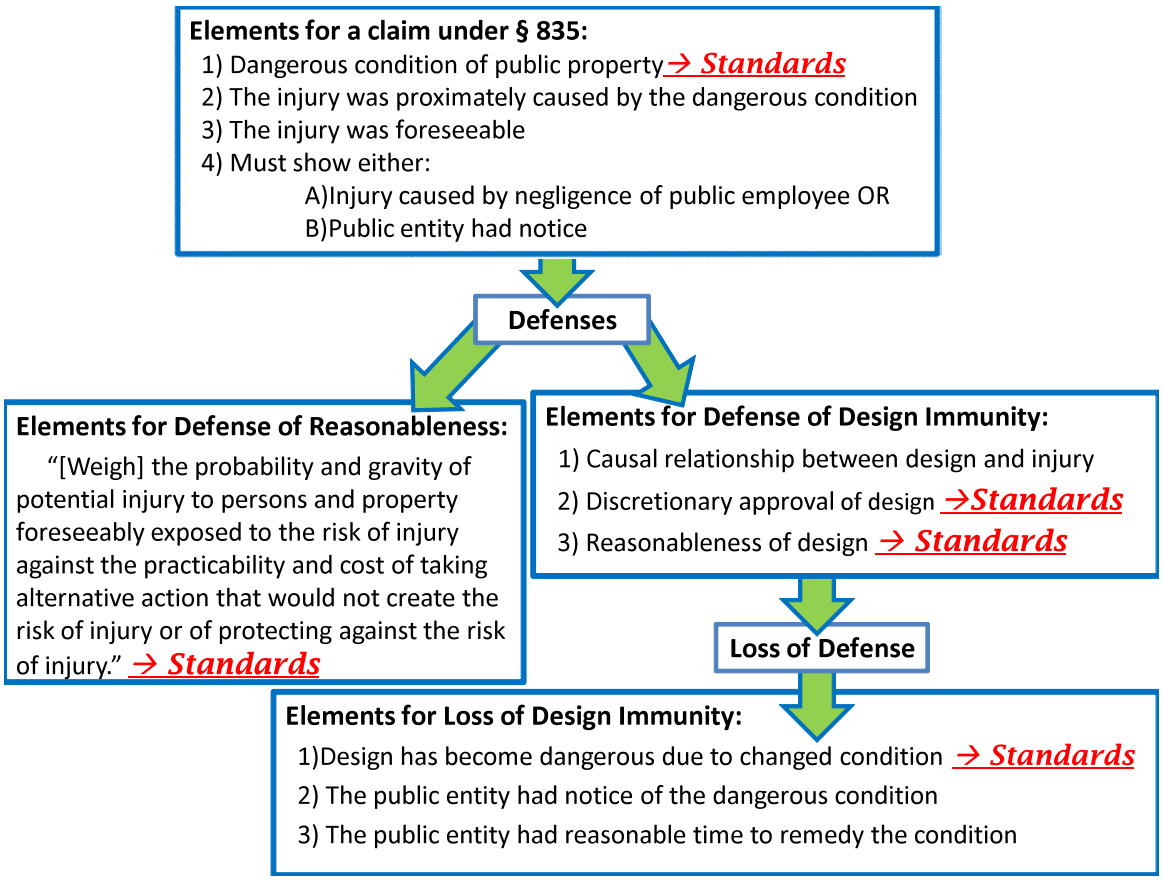


**Figure 1. Issues where design standards arise in a claim brought under Cal. Gov. Code §835.**

At each of these points, design standards only serve as one possible evidentiary source available to a city in order to avoid liability. The following subsections discuss the role that AASHTO and ITE standards play at each of these points, as well as the potential alternatives to these standards in each case.

**The presence of dangerous conditions**

When an individual brings a suit against a public entity under §835, one of the essential elements is that the property was in a "dangerous condition." Under §830(a), a dangerous condition refers to "a condition of property that creates a substantial (as opposed to a minor, trivial or insignificant) risk of injury." Determining whether there is a "substantial risk of injury" requires a full assessment of surrounding circumstances.[99] In this assessment plaintiffs may use noncompliance with standards as evidence of dangerousness.[100] Standards can also be used during expert testimony as evidence of the degree of risk created by the condition in question.[101] However, expert testimony need not discuss professional standards in order to persuasively argue whether a roadway is or is not in a dangerous condition.[102]

Moreover, courts consider other important factors regardless of compliance with standards, such as the manner in which the condition of the property caused the accident[103] and accident history.[104] If a city is proactive and monitors accident histories and makes necessary changes to improve the safety of those streets where there are disproportionate accidents, then its streets are less likely to be in a dangerous condition. In fact, this approach is crucial regardless of adherence to standards. Where a public entity has followed standards, it is still possible for the property to be in a dangerous condition.[105] Adherence to non-mandatory professional standards is only one way—and an inconclusive one at that—to prove that a street is not in a "dangerous condition."

**Determining reasonableness**

If a city chooses to plead the affirmative defense of reasonableness, design standards may again appear. Plaintiffs may use non-compliance with statutory or administrative standards as evidence that the public entity was not reasonable.[106] However, deviation from non-mandatory standards is not negligence per se.[107] Where a city has deviated from standards in order to promote resource efficient streets, a city could demonstrate that the design actually improves safety for pedestrians, bicyclists and drivers and therefore is reasonable.[108] Others have argued that AASHTO itself provides a basis for such a defense, since "The Green Book concedes that '[s]peed reduces the visual field, restricts peripheral vision, and limits the time available for drivers to receive and process information,'"[109] and because any collision is more likely to be fatal at higher speeds.[110] Finally, resource efficient streets can reduce congestion and air pollution, thereby improving the overall health of a community.[111] Thus, while deviation from Green Book or HDM standards can be used as evidence by the plaintiff, a local government that designs a street to accommodate and encourage travel by sustainable modes has several potential reasonable justifications for doing so.

**Discretionary approval under a claim of design immunity**

Usually, design immunity requires the public entity to show that someone with discretionary authority approved the design previous to construction. However, if a public entity is unable to establish prior approval of a specific design, it may be able to show that the construction was in conformity with design standards previously approved.[112] Where a city or other local government has adopted Caltrans or AASHTO standards, complying with these standards would provide a safety net for the public entity to prevent liability in this case. However, a city that adopted a different set of design standards that

encouraged more resource efficient streets would have the same safety net as one that adopted AASHTO standards. Moreover, if a city takes necessary precautions to document the approval process, this dependency on preapproved standards would not even arise.

#### Reasonableness under a claim of design immunity

In order to claim design immunity, a public entity must show "any substantial evidence" that a design was reasonable, and it may use "prevailing standards" to fulfill this test. That the standard used was a 'prevailing' one speaks to the reasonableness of its adoption.[113] As with other elements, standards are sufficient but not necessary, since the substantial evidence test does not involve a process of weighing conflicting evidence.[114] In fact, "recent appellate decisions have liberally construed the substantial evidence test to find reasonable approval even in the face of strong evidence from plaintiff's experts to the contrary."[115] A plaintiff must actually persuade the court that the public entity's reasoning is inherently unbelievable in order to prevent design immunity.[116] As long as "reasonable minds can differ concerning whether a design should have been approved," the substantial evidence test is satisfied.[117] A defendant city may accomplish this through expert witness testimony[118] from traffic engineers and accident history for the facility in question.[119] As such, compliance with non-mandatory design standards is not necessary to prove reasonableness.

#### Loss of design immunity due to changed conditions

In order for design immunity to be lost, the first essential element a plaintiff must prove is that a design has become dangerous due to a change in physical conditions. The test for whether the design has become dangerous is essentially the same as is used for fulfilling the first element of a claim under §835, only with the added requirement that the plaintiff show that there was a change in physical condition. As such, standards can play a role in this determination of dangerousness, but non-compliance does not necessarily mean the roadway is in a dangerous condition. Again, the city can use accident reports to show that the condition of the roadway was in fact safe, and the requirement that there be a 'changed condition of the roadway' poses an additional barrier to plaintiffs in showing loss of design immunity.

In sum, compliance with design standards is not required and noncompliance does not leave a city vulnerable to liability. One report on the flexibility of design standards states, "The protection provided the design engineer by design immunity is the best incentive for him or her to not be afraid to be innovative so long as the decisions are documented and backed up by sound engineering judgment."[120] With proper documentation of design, approval and reasoning, a city may design its streets as it sees fit.

### Liability claims related to resource efficient street design

There is no California case law that specifically deals with a situation where a city street was redesigned to encourage multimodal travel,[121] but there are cases that have addressed the individual elements that are associated with such a design. These elements include street trees, sidewalks, crosswalks, narrow roadways, on-street parking and bike lanes. This section reviews where some of these elements have arisen in case law as an alleged "dangerous condition." Overall, the body of case law shows that regardless of whether or not a street design complies with prevailing standards, a city is not likely to be held liable for injury on the roadway due to the presence of these elements.

### Street trees

Street trees provide shade to pedestrians and create a buffer from the street. On the other hand, street trees can be a safety hazard to drivers if they impair visibility or in the event of a collision. The Green Book and the HDM both have standards regarding street trees. Many cities also have master tree plans that designate where city trees can be planted. In City of Modesto v. Superior Court, the court suggests that planting conditions (e.g. pruning vegetation) are discretionary unless they are regulated by a local ordinance.[122]

There are two types of cases where street trees are alleged to be a dangerous condition. In the first category of cases, plaintiffs allege that street trees create a dangerous condition because they obstruct visibility. This category contains the only case found where a local entity was successfully sued under §835 for designing a street with elements that make it more pleasant for pedestrians. In *De La Rosa v. City of San Bernardino*, the city was held liable for injuries proximately caused by a tree allegedly obstructing the view of a stop sign.[123] The defendant city pleaded design immunity but failed to prove that the placement of the stop sign in relation to the tree was part of an approved design.[124] In *Lindsay v. Riverside*, the court found that there was an issue of triable fact as to whether a tree blocking a stop sign was a "substantially" dangerous condition. Design immunity was not pleaded in this case. [125] Finally, in *Navarra v. City of Oakland*, the court found the defendant city liable for an accident at an intersection where median trees obstructed the view and the city had notice of the issue from two separate complaints.[126] The court revealed two avoidable mistakes made by the city: failing to show that the design was properly approved and not requesting a jury instruction putting the burden to show loss of design immunity on the plaintiff.[127] Rather than causing fear of liability, these cases demonstrate the importance of properly documenting the details of a design and approval process and of responding to dangerous conditions of the roadway where a city has notice.

In the second category of tree-related cases, plaintiffs sue because of a collision between an automobile and a street tree. In both cases within this category, the city prevailed because the plaintiff could not satisfy all the elements of a claim under §835. In *Aragon v. City of Newport Beach*, when a car went out of control and struck large trees in the median, the court affirmed that the roadway was not in a dangerous condition if used with due care.[128] In *Paredes v. State of California*, when an injury was caused by a car sliding down an embankment and crashing into a tree, the court found for the defendant city because there was no notice of a dangerous condition or negligence of a city employee.[129] While these cases did not address design immunity, it is likely that it would be applicable if a city had taken proper steps in designing its streets.

### Sidewalks and crosswalks

It is important that city streets are equipped with pedestrian friendly design elements such as sidewalks and crosswalks in order to encourage walking. Like street trees, sidewalks and crosswalks are already a familiar sight on many urban streets; consequently, liability should not be a barrier to their construction. In fact, a city can be held liable under §835 for not having sidewalks if their absence creates a dangerous condition for pedestrians and is not part of a preapproved design.[130] Once a sidewalk is installed, it cannot be considered to be in a dangerous condition merely because trivial pavement defects cause a pedestrian to trip.[131] However, a sidewalk could potentially be in a dangerous condition if it does not properly protect a pedestrian from a driver exercising due care.[132] Even in such cases, design immunity should be available to the city, so liability should not be a concern. Case law suggests that

liability is likely not a concern for the construction of crosswalks either, as they have not been found to constitute a dangerous condition.[133]

### Width of travel lanes

Street width is also an important factor for resource efficient communities because wider streets increase crossing distances and wider lanes encourage speeding, increasing both pedestrians' exposure to collisions and the severity of these collisions.[134] The Green Book requires lanes to be wider than would be necessary for cars following the speed limit,[135] but case law demonstrates that a city has the discretion to determine both curb to curb width and lane width as long as it has conducted a study or found alternative standards to support its design. For example, a California district court has found that a narrow street is not inherently a dangerous condition.[136] Moreover, in *Fuller v. Department of Transportation*, the California Supreme Court found that the setting of speed limits is discretionary and is thus protected by design immunity if limits are "set in accordance with some plan and discretionarily adopted by an employee with authority to do so."[137] As such, cities have discretion to create narrow streets with low speed limits without fear of liability as long as they undergo a thoroughly documented design process.

### Traffic calming

Traffic calming measures aim to reduce vehicle speeds and improve safety and comfort for pedestrians and bikers through features such as traffic diverters, speed humps and sidewalk bulb outs. One study of 18 jurisdictions across the United Sates that had implemented traffic calming measures found that the majority of jurisdictions experienced no legal problems, and that the remainder had mostly faced legal threats rather than actions.[138] The general belief among jurisdictions was that as long as the measures were "well-designed, well-signed, well-lighted, and well-documented," there is little reason to fear liability.[139] In fact, only two lawsuits against traffic calming programs have ever been successful, and one of those was overturned on appeal.[140] The first of these was *Vicksburg v. Harrellton* (1980), a landmark case in which the Mississippi Supreme Court ruled that speed bumps on public streets were inherently dangerous.[141] Since then, cities have replaced speed bumps with the less abrupt speed humps. The second case did not concern tort liability.[142]

In summary, tort claims related to street design are rarely successful. This is in part because most states require that administrative remedies be exhausted before law suits are filed, so administrative damage claims are much more common in cities than tort claims.[143] One comprehensive study of traffic calming liability issues found that even administrative damage claims are relatively rare, and those that are actually paid are "miniscule."[144] Therefore, fears of tort liability and administrative damage claims are not a reasonable barrier to the development of urban streets that promote resource efficient transportation. Most design elements are not substantially dangerous, and even of those that potentially are dangerous, if proper procedure is followed, design immunity should shield cities from liability.

Source: iStockphoto

## Conclusion

### Summary of barriers to resource efficient streets

Neither federal nor state law mandate that cities follow prevailing design standards, and there are few places where the federal or state government puts any sort of control over how cities develop street standards. In general, apart from the need to comply with a few federal and state laws, cities are free to adopt standards as they see fit. Furthermore, liability issues should not prevent a city from deviating from design standards for the sake of promoting walkable and bikeable streets. Instead, many of the biggest barriers cities face are non-legal. Lack of communication between city departments, street width requirements of city service vehicles and lack of progressive prevailing standards all act to prevent cities from developing codes that promote resource efficient communities.

One reason for local governments' continued reliance on the Green Book and HDM is that deviating from such standards without exposure to liability involves conducting studies or otherwise documenting a supporting rationale, which is more labor-intensive, and therefore more costly, than simply adopting these standards. Cities that wish to implement more progressive street design standards without spending extra money face the issue of finding an alternate source of standards that they can rely on. Alternative traffic engineering standards are slow to proliferate; for example, 315 California cities have minimum LOS standards in their general plan, while only 32 have adopted alternative methodologies for gauging traffic impacts.[145] Developing and promoting alternatives to prevailing street design standards, or of case studies of cities that have adopted their own resource efficient design standards, will be an important step in making it easier for cities to design streets that encourage walking and bicycling.

The new ITE manual *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, is one potential source of alternative standards, and improved awareness of this resource would help cities develop more resource efficient streets. The context sensitive solutions (CSS) approach to designing roadways that is now being promoted by ITE, AASHTO, and the FHWA offers one potential method for designing roadways that meet the needs of all travelers while taking into consideration community desires and environmental goals. Under the CSS process, transportation planners and engineers engage a wide variety of stakeholders in roadway design decisions and seek to "understand the landscape, the community, valued resources, and the role of all appropriate modes of transportation in each unique context before developing engineering solutions."[146] ITE has published a "recommended practice" for using CSS principles to design walkable streets in urban areas. However, traffic engineers may not necessarily use this manual to make auto-oriented streets more pedestrian-friendly, since ITE stipulates that the manual should only be applied in "places where the qualities of walkable communities are a high priority objective."[147]

The limited applicability of these guidelines may be one reason why some of the transportation engineers we interviewed did not view the guidelines as establishing new "standards," and as a result, were reluctant to use them as guidance. Furthermore, the fiscal barriers that cities face in providing a rationale for road designs that deviate from prevailing

standards may also apply to CSS, since the process requires that planners and engineers spend more time engaging stakeholders. These issues highlight the need for resource efficient street design guidance that is not only flexible enough to accommodate varied contexts, but also rigid enough to establish new prevailing standards.

In response to the CSS movement, AASHTO has begun to take a more multimodal perspective on transportation engineering. The latest edition of the Green Book, published in 2004, states: "emphasis has been placed on the joint use of transportation corridors by pedestrians, cyclists, and public transit vehicles. Designers should recognize the implication of this sharing of the transportation corridors and are encouraged to consider not only vehicular movement, but also movement of people."[148] On local streets, AASHTO urges that the "overriding consideration is to foster a safe and pleasant environment whereas the convenience of the motorist is secondary."[149] The Green Book no longer favors the creation of six- and eight-lane arterial streets, stating that four is normal, and urges the building of medians to protect pedestrians on busy streets.[150] However, the Green Book retains its emphasis on hierarchical street patterns, high-speed arterials, and off-street parking, with the majority of its nearly 1,000-page guidance related to the movement of automobiles.

Changes in engineering guidelines alone are not sufficient to induce a shift to more resource efficient street designs; local governments must also create plans and policies that encourage the use of alternative standards. The San Francisco Better Streets Plan (BSP) offers an example of a comprehensive approach to ensure that CSS and complete streets principles are being implemented. The Better Streets Plan establishes a framework and desired outcomes for context sensitive design on the City's streets, and offers guidance to the numerous City departments with jurisdiction over its implementation. For the past few years, the City has been going through a rigorous process to identify and amend the numerous sections of its municipal code that affect street design, such as the Zoning, Traffic, Building, Fire, Planning, and Public Works Codes, and to promulgate new standards in their place.[151] The BSP requires that these changes be consistent with the City's General Plan and comply with the California Environmental Quality Act (CEQA).[152] Through this process, the City has identified key barriers to implementation, which include the lack of a formal framework for interdepartmental compromises and a reliance on LOS standards that prioritize movement of traffic over other street objectives.[153] The BSP urges departments to modify existing guidance in order to overcome barriers and to present changes that require legislative action to the City Council, which has passed both a Better Streets Policy (2005) and a Complete Streets Policy (2006) to establish legislative intent for the changes proposed in the BSP.[154]

Not every community will have the resources or political will to undertake such a comprehensive effort. Form-based codes, which regulate the physical form rather than the function of an area, offer the potential to integrate land use and transportation planning in a single code that regulates both building types and street designs, instead of using the engineering standards and hierarchical road classifications associated with conventional transportation planning. For example, a local government could use form-based codes to specify pedestrian-friendly street designs in core downtown areas. In California, some municipalities, such as Cotati, Ventura, and Petaluma, have made form-based codes mandatory within specific plans.[155] Specific plans apply to defined geographic areas and can override zoning regulations that would otherwise apply.[156] They provide opportunities for cities

to incrementally adopt form-based codes, or some other manner of revised street standards, before implementing them citywide.

**Further research needs**

Based upon these findings, the CREC and the Center for Law, Energy, and the Environment have identified the need for future research on how design guidelines become "prevailing standards," and on identifying constraints and opportunities in the transportation funding system.

Alternatives to current prevailing standards like the Green Book and HDM, such as ITE's new manual *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach*, provide important guidance on designing more pedestrian-friendly streets, but adhering to these standards will not protect a city from liability unless courts consider them "prevailing." Further research is needed to determine how design guidelines achieve this designation. If the term simply requires that many cities adopt a standard, it creates a dilemma where no city wants to expose itself to liability by being the first to do so. An agreement between many California cities to adopt new design standards or a state policy encouraging the use of new guidelines could overcome this problem.

While there is no federal or state law directly preventing a city from adopting codes that deviate from the AASHTO standards, there may be funding constraints that prevent cities from implementing pedestrian- and bicycle-oriented street designs. Some states, for example, do not allow state transportation funds to be used for sidewalk construction or maintenance, reserving the funds for roadway use only.[157] Untangling the complex web of funding sources that the federal government, the state, and California's metropolitan planning organizations (MPOs) allocate for transportation projects, and the constraints on these funding sources, will help identify other barriers to resource efficient street design, as well as potential funding sources that cities may be able to use to develop and implement new design standards.

These research tasks will provide guidance to local governments in California on creating, adopting, implementing, and defending design standards that reflect recent policy shifts toward sustainable transportation, yet are rigorous enough to hold up against current prevailing standards that encourage driving.

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[10] Federal Highway Administration (FHWA). 1997b. Flexibility in Highway Design. Chapter 4: Design Controls. http://www.fhwa.dot.gov/environment/flex/ch04.htm.

[11]Gowan, B. 1998. "Standards vs. Guidelines: Engineering Tools or Legal Weapons?" Prepared as part of a presentation for the 77th Meeting of the Transportation Research Board.

[12] Southworth, M. and E. Ben-Joseph. 2003. Streets and the Shaping of Towns and Cities. Washington: Island Press, 2003.

[13]Lewyn, M. 2008. "Why Pedestrian-Friendly Street Design is Not Negligent." Unpublished manuscript, March 5 2008. http://papers/ssrn.com/abstract=1112488.

[14] 40 Comp. Gen. 1, 524 (1960).

[15]FHWA 1997a.

[16]American Association of State Highway and Transportation Officials (AASHTO). 2004. A Policy on Geometric Design of Highways and Streets. Washington, DC: American Association of State Highway and Transportation Officials, 2004: 72.

[17] Stephen Burrington, Attorney and City Planner, Anderson-Krieger, LLP. Interview conducted by the authors, June 18, 2010.

[18]23 C.F.R. §625; 23 U.S.C. §109 (2007).

[19]23 U.S.C. §103 (2007).

[20]Ibid.

[21] Jones, S. "Context-Sensitive Design: Will the Vision Overcome Liability Concerns?" Transportation Research Record 1890: 5-15.

[22]23 US.C. §109(h) (2007).

[23]Ibid, §109(c).

[24] 23 C.F.R. §625. (2007)

[25] 23 C.F.R. §625.3. (2007)

[26] This is made explicit in the FHWA's Flexibility in Highway Design, which details the flexibility available to transportation engineers in roadway design (it should be noted that the publication is a supplement to the Green Book).

[27] 23 U.S.C. §109(o). (2007)

[28] Ibid. Roads are functionally classified as arterial, collector, or local and also have urban and rural designations.

[29] FHWA 2009 and Caltrans 2009.

[30] Kirk, J. 1980. Utility Relocation and Accommodation: A History of Federal Policy Under the Federal-Aid Highway Program Parts I and II. Washington, D.C.: Federal Highway Administration, 1980. Ntl.bts.gov/lib/12000/12200/12228/12228.pdf (Part I) and ntl.bts.gov/lib/12000/12200/12229/12229.pdf (Part II).

[31] Federal Aid Highway Act of 1944 (Pub. L. 78-521, 58 Stat. 212).

[32] Federal Aid Highway Act of 1956 (Pub. L. 84-627, 70 Stat. 374).

[33] Federal Aid Highway Act of 1970 (Pub. L. 91-605, 84 Stat. 1713)

[34] 23 USC §103(d) (1970)

[35] 23 USC §8, §10 (1952)

[36] Ibid.

[37] Federal Register Notice 39-35145 (1974)

[38] Federal Register Notice 43-14649 (1978)

[39] 23 USC §8, §10 (1952)

[40] 23 CFR §625 (1974)

[41] 23 CFR §204.4 (1970)

[42] National Highway System Designation Act of 1995 (Pub. L. 100-17, 60 FR 36641).

[43] FHWA 1997a.

[44] AASHTO 2004: 66.

[45] Ibid.

[46] Kirschbaum, J., et. al. 2001. Designing Sidewalks and Trails for Access: Part II of II: Best Practices Design Guide. Washington, D.C.: Federal Highway Administration, 2001

[47] Cal. Gov. Code §4450 (2010).

[48] Owens 1999.

[49] Kirschbaum 2001.

[50] California Department of Transportation (Caltrans). 2008. Highway Design Manual. Sacramento: Caltrans Publications Unit, 2008. http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm.

[51] Cal. Gov. Code §811.6 (2010).

[52] Gowan 1998: 3.

[53] Ibid: 5.

[54] Ibid.

[55] California Department of Transportation (Caltrans). 2009. Local Assistance Procedures Manual. Sacramento: Caltrans Publications Unit, 2009: 2-2.

[56] Tilly Chang, Deputy Director for Planning, San Francisco County Transportation Authority. Interview conducted by the authors, June 2010.

[57] 19 Code of California Regulations §3.05 (2008).

[58] Cathedral City Fire Department. 2010. "Fire Department Planning Approvals." http://www.cathedralcityfire.org/Fire%20Prevention%20and%20Saftey/planningapprovals.pdf.

[59] Ewing, R., Stevens, T. and Brown, S.J. 2007. "Skinny Streets and Fire Trucks." Urban Land (August 2007): 121-123.

[60] California Streets and Highways Code §1805 and §22101

[61] Ibid.

[62] Ibid.

[63] California Vehicle Code §21101.

[64] Ewing, R. 2000. "Traffic Calming Liability Issues," ITE Annual Meeting Compendium (2000). http://www.ite.org/traffic/documents/AB00H4304.pdf.

[65] Federal Highway Administration (FHWA) and California Department of Transportation. 2007. , Joint Stewardship and Oversight Agreement. http://www.fhwa.dot.gov/cadiv/Stewardship_Agreement/index.htm.

[66] Caltrans 2009.

[67] Ibid.

[68] Scott Mozier, Assistant Director of Public Works, City of Fresno; Bryan Jones, Transportation Affairs Manager, City of Fresno; Darrell Unruh, Planning Manager, City of Fresno; Keith Bergthold, Assistant Planning Director, City of Fresno. Interview conducted by the authors, May 28, 2010.

[69] City of Fresno. 2010. 2025 Fresno General Plan, Chapter 4-E: Public Facilities Element: 68. On many roads, this requires two through lanes, two turning lanes, and a right turn pocket in addition to sidewalks, bike lanes, landscaping setback and parking.

[70] This was thought to be 44 feet until the recent field exercise was conducted.

[71] Poeschel, D., W. Washburn, and B. Jones. 2009. "Overcoming Resistance to Narrower Streets". Practicing Planner 7(3).

[72] Sacramento City Code §18.04.190.

[73] Sabrina Gilbert, Sacramento City Attorney, and Kimberly Kaufmann-Brisby, Planning Department, City of Sacramento. Interview conducted by the authors, June 15, 2010.

[74] Owens 1999: 1.

[75] Ibid.: 11.

[76] City of Sacramento. 2009. Sacramento 2030 General Plan. Chapter 2: Mobility: 2-164. http://www.sacgp.org/documents/04_Part2.04_Mobility.pdf.

[77] Ibid.

[78] Levin v. Cal., 146 Cal. App. 3d 410, 415 (Cal. App. 1st Dist. 1983).

[79] Continuing Education of the Bar. California Government Tort Liability Practice. Berkeley, CA: Continuing Eduction of the Bar: §12.5.

[80] Ibid.: §12.61.

[81] Cal. Gov. Code § 835.4 (a) (2010).

[82] What is determined to be "reasonable" for a public entity differs from that for a private entity. A public entity faced with financial and political restraints is not expected to accomplish what would be reasonably expected of a private entity. Onlaw § 12.61; see Cardenas v. Turlock Irr. Dist., 267 Cal. App. 2d 352 (Cal. App. 5th Dist. 1968). Additionally, determining the reasonableness of a public entity's action or inaction takes into account factors such as "the time and opportunity [the government body] had to take action…the probability and gravity of potential injury to persons and property foreseeably exposed to the risk of injury against the risk of such injury." Baldwin v. State, 6 Cal. 3d 424, 436-437 (Cal. 1972).

[83] Cal. Gov. Code § 830.6 (2010).

[84]Cameron v. State, 7 C3d 318, 323 (Cal. 1972) (Citing Baldwin v. State, 6 Cal. 3d 424, 427)

[85] This element requires the public entity to show a particular design was purposefully adopted in regard to the "dangerous condition". Design immunity will not immunize against decisions that were not made. Cameron v. State of California, 7 Cal. 3d 318, 326 (1972). Absence of a design feature can be a design decision if excluded consciously. See Higgins v. State, 54 Cal. App. 4th 177, 186 (Cal. App. 2d Dist. 1997).

[86] The term of "any substantial evidence" creates a low evidentiary threshold to reflect the reluctance of the legislature to permit the courts to second-guess discretionary decisions made by public entities. See Fisher, G. 1991.

"Design Immunity for Public Entities," 28 San Diego Law Review 241: 244.

[87] Cornette v. Dep't of Transp., 26 Cal. 4th 63, 69 (Cal. 2001).

[88] Fisher 1991: 255.

[89] Baldwin v. State, 6 Cal. 3d 424, 427 (Cal. 1972).

[90] "Notwithstanding notice that constructed or improved public property may no longer be in conformity with a plan or design or a standard which reasonably could be approved by the legislative body or other body or employee, the immunity provided by this section shall continue for a reasonable period of time sufficient to permit the public entity to obtain funds for and carry out remedial work necessary to allow such public property to be in conformity with a plan or design approved by the legislative body of the public entity or other body or employee, or with a plan or design in conformity with a standard previously approved by such legislative body or other body or employee. In the event that the public entity is unable to remedy such public property because of practical impossibility or lack of sufficient funds, the immunity provided by this section shall remain so long as such public entity shall reasonably attempt to provide adequate warnings of the existence of the condition not conforming to the approved plan or design or to the approved standard." Cal. Gov. Code §830 (2010).

[91] Fisher 1991: 256.

[92] Bane v. Cal., 208 Cal. App. 3d 860 (Cal. App. 5th Dist. 1989).

[93] Ibid.

[94] Alvarez v. State, 79 Cal. App. 4th 720 (Cal. App. 5th Dist. 2000); Cornette, 26 Cal. 4th 63.

[95] Cornette 26 Cal. 4th 72.

[96] Continuing Education of the Bar: §12.74A.

[97] For more on the use of "prevailing standards," see Uyeno v. Cal., 234 Cal. App. 3d 1371 (Cal. App. 6th Dist. 1991).

[98] Lewyn 2008: 30.

[99] Ibid.

[100] See Curreri v. San Francisco, 262 Cal. App. 2d 603 (Cal. App. 1st Dist. 1968) (finding that noncompliance with non-mandatory city standards for curb height created a question of fact as to whether the roadway and adjacent sidewalk were a dangerous condition).; see also Lane v. City of Sacramento, 183 Cal. App. 4th 1337 (Cal. App. 3d Dist. 2010).

[101] Continuing Education of the Bar: §12.20D.

[102] See Cameron v. State, 7 C3d 318, 323 (Cal. 1972).

[103] Continuing Education of the Bar: §12.20A.

[104] Continuing Education of the Bar: §12.20B. See also Sambrando v. City of San Diego, 94 CA4th 225, 236 (Cal. App. 4th Dist. 2001) (history of similar accidents suggests that there is a dangerous condition, while absence of prior accidents is admissible as evidence that there is no substantial risk of injury).

[105] See Uyeno v. Cal., 234 Cal. App. 3d 1371 (Cal. App. 6th Dist. 1991)

[106] Continuing Education of the Bar: §12.61. For further examples, see Straughter v. State of California, 89 Cal. App. 3d 102 (Cal. App. 1st Dist. 1976) (state highway maintenance standards in official manual were considered in assessing actions taken by state in dealing with ice highway).

[107] Continuing Education of the Bar: §12.61.

[108] Lewyn 2008: 40.

[109] Ibid.: 8.

[110] Ibid.

[111] Ibid.: 41.

[112] For example, see Weinstein v. Department of Transportation, 139 Cal. App. 4th 52 (Cal. App. 6th Dist. 2006) (the highway signage was not part of the approved highway design, but was sufficient because it was in compliance with state's approved standards).

[113]Uyeno, 234 Cal. App. 3d 7. See also Continuing Education of the Bar: §12.71.

[114] Higgins v. Cal., 54 Cal. App. 4th 177, 186 (Cal. App. 2d Dist. 1997).

[115] Fisher 1991: 245.

[116] Ibid.: 246.

[117] Ramirez v. City of Rodando Beach, 192 Cal. App. 3d 515, 525 (Cal. App. 2d Dist. 1987); see also Higgins 54 cal. App. 4th 185; see also Hefner v. County of Sacramento, 197 Cal. App. 3d 1007, 1015 (Cal. App. 3d Dist. 1988) (expert testimony usually sufficient unless somehow "flawed sufficiently to destroy its substantiality").

[118] Fisher 1991: 242. The expert may simply demonstrate that the public entity's proper discretionary body relied on the advice of a competent engineer either from a "reputable private traffic engineering firm, or from the public entity's staff." Ramirez,192 cal app 3d 526.

[119] For example, Callahan v. City and County of San Francisco, 15 Cal. App. 3d 374 (Cal. App. 1st Dist. 1971).

[120] Gowan 1998 : 7.

[121] This is likely because these endeavors have been limited, but potentially this serves as evidence in itself that the fear is unsupported.

[122] City of Modesto v. Superior Court, 163 Cal. App. 3d 1103 (Cal. App. 5th Dist. 1985).

[123] De La Rosa v. City of San Bernardino, 16 Cal. App. 3d 739, 747-48 (Cal. App. 4th Dist. 1971).

[124] Ibid.

[125] Lindsay v. Riverside, 2001 WL 1649288.

[126] Navarra v. City of Oakland, 2007 WL 3122674, 1.

[127] Ibid.

[128] Plaintiff provided expert testimony stating that the lighting, tree diameters and distance of trees from roadway were not in compliance with AASHTO standards. The City provided expert testimony that the accident reports demonstrated the safe condition of the roadway and that it was the norm across cities to place trees in the median. Aragon v. City of Newport, 2001 WL 1297494, 1,25.

[129] Paredes v. State, 2008 WL384636,1,5.

[130] See Medina v. City of Fontana, WL 1683617 (2007) (court affirmed that absence of sidewalks was a dangerous condition where a student pedestrian was struck by a car).

[131] See Cortez v. Huntington Park, WL 5395116 (2007) (holding that a portion of sidewalk raised approximately an inch is not a substantially dangerous condition).

[132] Curreri 262 CA2d 603 (J. Brown) (finding a triable issue of fact as to whether plaintiff could satisfy the elements for a claim under §835 where the dangerous condition was alleged to be the combination of perpendicular parking, steep grade of the street, low curb (2-3 inches) and limited visibility).

[133] See Brenner v. City of El Cajon, 113 Cal. App. 4th 434, 440 (Cal. App. 4th Dist. 2003) (holding that a cross-walk is not dangerous merely because it is located on a street with heavy traffic on or without traffic signal); see also Sun v. City of Oakland, 166 Cal. App. 4th 1177,1188 (Cal. App. 1st Dist. 2008) (finding a study supporting an inference that removal of painted markings increases the risk of a pedestrian-car accident was insufficient to support a "reasonable inference"); Jackson v. City of Oakland, WL 184897, 5 (2007), (upholding summary judgment for the defendant city where the alleged dangerous condition was lack of lighting and a straight

and level road that encouraged speeding).

[134] Lewyn 2008: 17.

[135] AASHTO 2004: 72.

[136] See Guerrero v. City of San Diego, WL 3122371(2007).

[137] Fuller v. Dep't of Transp., 89 Cal. App. 4th 1109 (Cal. App. 4th Dist. 2001).

[138] Ewing, R., and C. Kooshian. 1997. "U.S. Experience with Traffic Calming." ITE Journal 32 (August 1997): 28-33.

[139] Ibid.

[140] Ewing 2000: 1.

[141] Ewing 2000: 9.

[142] The second case was Rumford v. City of Berkeley, in which the court found street diverters to be illegal because California state law preempted the entire field of traffic control. The state legislature effectively overturned the decision by explicitly excluding traffic calming measure from the definition traffic control thereby giving local governments the authority "to block entry to or exit from any street by means of islands, curbs, traffic barriers, or roadway design features." Ewing 2000: 13.

156 Ewing 2000: 13.

[144] Ibid.

[145] California Governors' Office of Planning and Research (OPR). 2010. California Planners' Book of Lists: 110-112

[146] Project for Public Spaces. 2010. "Core Principles of CSS." Context Sensitive Solutions.org. http://www.contextsensitivesolutions.org/content/topics/what_is_css/core-principles/,

[147] Institute of Transportation Engineers. 2006. Context Sensitive Solutions in Designing Major Urban Thoroughfares in Urban Communities. Washington, D.C.: Institute of Transportation Engineers, 2006: 19.

[148] AASHTO 2004: xliv

[149] AASHTO 2004: 390.

[150] Lewyn 2008: 21.

[151] City of San Francisco. 2010. "Better Streets San Francisco." http://www.sf-planning.org/ftp/BetterStreets/proposals.htm.

[152] Ibid.

[153] Ibid.

[154] Ibid.

[155] Slone, D., and Goldstein, D. 2008. A Legal Guide to Urban and Sustainable Development for Planners, Developers, and Architects. Hoboken, NJ: Wiley and Sons, 2008: 126.

[156] Ibid.

[157] Kirschbaum 2001: 2004.


**Moving Beyond Prevailing Street Design Standards**

**The Center for Resource Efficient Communities**

This paper was prepared for the
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