

Creating Shared Spaces: Challenges in Federal, State, and Local Guidelines

by Rachel Hiatt, Paul Supawanich

ABSTRACT: Shared spaces are emerging in American cities after decades of street designs that segregate modes whenever possible. In the right context, shared spaces function well and offer unique benefits. However, implementation of new shared space faces stiff hurdles in local, state and federal codes and guidelines. This paper outlines key challenges that limit the creation of shared space in the US, and solutions being discussed in San Francisco and elsewhere in North America. The challenges involve design standards (including accessibility for the disabled) as well as operating and maintenance issues (including liability). At the national and local levels, various agencies are developing code revisions, ordinances, and design guidelines that may help to reduce the risk and uncertainty for cities seeking to implement shared spaces. Throughout this discussion, the paper also highlights existing locations that function as shared spaces and potential future shared spaces concepts.

BACKGROUND: Cities worldwide have “shared spaces,” public rights-of-way shared by multiple users, uses and activities: ceremonial plazas, commercial markets, residential squares, or utilitarian alleys. However, modern street design standards segregate travel modes and right-of-way uses for the sake of speed, safety, and efficiency. In some contexts, though, high speeds and efficient throughput are not the sole purpose of the public right-of-way. Where speeds are low and similar by nature or by design, spaces shared among pedestrians, bicyclists and vehicles may be appropriate. These types of facilities have the ability to increase safety due to heightened awareness (1) and decrease the potential for severe injuries at low speeds. (2) This report aims to address the challenges of implementing shared spaces in San Francisco in the context of current local, state, and federal guidelines.



Figure 1 (above): Columbus Avenue has already experienced the possibilities of shared spaces. This photograph captures the Columbus Day Festival where parking lanes were temporarily converted to customer seating. Yet, this arrangement has not been formalized in any city policy.



Figure 2 (above): Belden Place in San Francisco's financial district is an alleyway that allows for deliveries but also serves as a safe pedestrian environment with a variety of restaurants and outdoor seating. The geometric design includes a single-plane surface.

San Francisco currently has de-facto shared spaces. Alleyways such as Belden Lane, Waverly Place, Guy Lane, and the Powell Street Transit Mall exhibit many standard street characteristics and have high levels of “off-sidewalk” pedestrian activity. The City seeks to establish new shared spaces in plans for Fisherman's Wharf, Columbus Avenue, areas in Western South of Market and portions of Treasure Island whose community goals and environs are aligned with the results that shared spaces can bring. Yet, implementing new shared space in US cities faces significant challenges including local, state, and federal rules and guidelines.

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Recently, San Francisco has begun to implement other facilities which use existing vehicle space or parking space and reallocates that space for pedestrian or non-motorized use. While these pedestrian plazas and “parklets” do advance the ability to create safe spaces for pedestrians, these are not discussed in this paper since their intent is not to share

different modes of travel in the same space.

IMPLEMENTATION CHALLENGES: Experience shows that shared spaces, in the right context, perform well; however, new implementation of shared space faces stiff hurdles in city and state codes which interpret broader federal definitions. The challenges that need to be addressed if shared spaces are to be more formally codified and readily implemented include:

- Liability
- Geometric design
- ADA Accessibility
- Drainage and Structural Sections
- Daily operations and maintenance

Standard street designs address these issues in relevant codes and guidelines. Yet, these guidelines do not provide specific codified guidance for shared space, which unintentionally prevents its implementation by creating uncertainty and risk for local agencies.

Liability: Clear rights and responsibilities governing the use of public rights of way are necessary to enforce safe use. The present language of California Vehicle Code (CVC) does not recognize the concept of shared spaces where vehicles, pedestrians, and other non-motorized modes intermix. A shared space could be considered vehicle space with accommodations for pedestrians (like a crosswalk), or, pedestrian space with accommodations for vehicles (like a driveway).

According to the California Vehicle Code, pedestrians traveling in a crosswalk have the right-of-way and those traveling outside of a crosswalk should yield to vehicles. (3) However, crosswalks can be defined as “any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface.”(4) This clause suggests it could be possible to create a shared space where pedestrians legally have right-of-way by designating the length of an entire roadway a crosswalk.

The “driveway” concept could also clarify liability within shared spaces. In a driveway, the pedestrian has the legal right-of-way but vehicles are allowed to traverse the space. (5) Unfortunately, the California Vehicle Code does not define driveway with sufficient detail and is only referred to in the sense of private driveways. Because shared space is not recognized in codes as a possible use of public rights of way, implementation requires local agencies to make untested interpretations of federal and state codes, discouraging local willingness to implement. These types of interpretation issues are a common thread throughout the various implementation challenges facing shared spaces.

Geometric Design: The American Association of State Highway and Transportation Officials’ (AASHTO) Green Book, (6) the most commonly used roadway design guide, does not explicitly address shared streets. A supplemental document, the Guide for the Planning, Design, and Operation of Pedestrian Facilities, mentions that shared streets may be an appropriate design for “local urban streets with extremely low vehicle speeds.” (7) These AASHTO guides are helpful in designing optimal facilities for vehicles but not pedestrian-centric or shared space design solutions. (8) The FHWA Pedestrian Facilities Users Guide offers a high-level preview of the “woonerf” concept, but does not provide detail for design and implementation. (9) The Institute of Transportation Engineers (ITE) Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities document also does not make any specific mention of shared spaces, but does provide for an “alley/rear lane” designation that reflects shared space characteristics. The guidelines call for a design speed of 10 mph, an operating speed

of 5mph, and common use by pedestrians, bicycles, and deliveries. Unfortunately, the ITE document does not go into further detail on this “alley/rear lane” design and explicitly states that it is not addressed within the report. (10)

Accessibility: Accessibility for the disabled presents one of the greatest challenges in implementing shared spaces. Officials responsible for ensuring compliance with the Americans with Disabilities Act (ADA) may perceive shared spaces as dangerous without modal separation and devices such as curbs or truncated domes which provide navigation clues to the visually impaired. More generally, the lack of clear interpretation of state and federal level laws regarding accessibility requirements of shared spaces inhibits their implementation. Curbs and other detectable warnings, such as truncated domes, are standard devices used to differentiate between a safe pedestrian zone and a potentially hazardous vehicular way. The reference to “hazardous vehicular way” first appears in the Americans with Disabilities Act (ADA) but without a formal definition; subsequent state and local interpretation of “hazardous vehicular way” has broad impacts on the way pedestrian facilities and shared spaces can be built. Presently, according to the California Building Code (CBC), any walkway that crosses or adjoins a hazardous vehicular area requires curbs, railings, or other elements such as detectable warnings at a width of 36”. (11) These treatments reinforce the separation of vehicles from pedestrians, diluting or precluding the kinds of unchannelized space that shared concepts seek to achieve – a right-of-way that incorporates visual and physical cues that establish overall shared, non-hazardous vehicular environments.

Unfortunately, these codes do not clarify whether every part of a street that permits vehicles is necessary hazardous. Some areas of a street may permit vehicles, and yet not be “hazardous.” For example, through-lanes for mixed traffic may clearly be considered a hazard, but the on-street parking lane adjacent to the travel lane could be considered to be akin to a driveway (for parking/loading/unloading vehicles), which generally do not require detectable warnings. Private parking lots and aisles also do not require detectable warnings. These facilities may accommodate a large number of vehicles, but do not necessarily present a specific hazard to pedestrians due to slow speeds and the understanding that these areas are an intersection of pedestrian and vehicle space.

This issue has been discussed in great depth at the federal level under the United States Access Board (Access Board). In 1991, the Access Board released the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG), which contained the first requirement for detectable warnings (truncated domes) at hazardous vehicular areas, but with no definition of “hazardous vehicular area.” (12) The State of California’s California Building Code follows ADAAG nearly identically. (13)

In 2004, the Access Board updated ADAAG and removed references to hazardous vehicular ways (or areas), as well as specific requirements for placement of detectable warnings (with the exception of transit platform boarding edges). The vagueness of the 2004 ADAAG update was then supplemented by the 2005 Access Board’s Draft Public Rights-of-way Accessibility Guidelines (PROWAG), which specified right-of-way guidelines specifically for public rights-of-way and updated requirements for detectable warnings. PROWAG requires detectable warnings:

“...where curb ramps, blended transitions, or landings provide a flush pedestrian connection to the street. Sidewalk crossings **of residential driveways should not generally be provided with detectable warnings**, since the pedestrian right-of-way continues across most driveway aprons and **overuse of detectable warning surfaces should be avoided in the interests of message clarity**. However, **where commercial driveways are provided with traffic control devices or otherwise are permitted to**

operate like public streets, detectable warnings should be provided at the junction between the pedestrian route and the street.” *Emphasis Added (14)*

Technical requirements call for a minimum width of 24” in the direction of travel and a contrast of light-on-dark (or vice-versa). This clause of the 2005 PROWAG allows for an interpretation that shared spaces do not need the full array of detectable warnings, and in fact, that unless strictly necessary, detectable warnings should not be used; The 2005 PROWAG standards have not yet adopted by the US Department of Justice (DOJ), but they are considered by the US Department of Transportation as the current best practice in accessible pedestrian design. (15)

Two clarifications could help to establish whether and how shared spaces can be designed accessibly: 1) the definition of detectable warning and 2) the definition of hazardous vehicular way (on its own, Delaware has proposed several criteria including a street’s average daily traffic (ADT), posted travel speed, and signalization as means of determining if a street should be considered hazardous). If PROWAG and an updated AADAG are eventually adopted by the DOJ, these issues are subject to change.

Drainage and Structural Sections: Shared spaces must consider the stormwater drainage and structural section requirements to accommodate a variety of vehicle weights. Typically, curbs channelize stormwater runoff to the sewer drains; San Francisco requires curb heights of 4”-6” regardless of street width to accommodate a possible one-hundred year storm. However, some designs for shared spaces eliminate the curb, creating a single-surface, visually-integrated plane; here stormwater runoff can be accommodated through in-pavement gutters and channel designs.

Pedestrian-only spaces that are converted into shared spaces (that accommodate vehicles) may require reconstruction of the structural section if it is insufficient to physically withstand the weight of vehicles; this increases the cost of shared space projects and makes their implementation a true re-construction project rather than a simple conversion.

In addition, reinforcing sidewalks for vehicular weight loads is complicated by sub-sidewalk basements. The presence of these structures increase the cost and complexity of shared space implementation. Often, basements must be closed and filled to provide adequate structural section. Because these structures are privately owned, this process results in a more complex layer of permits and negotiations with property owners and a longer and more intensive construction period.

Daily Operations and Maintenance: Some shared spaces can be maintained by standard street-sweeping equipment. However, designs involving atypical arrangements of bollards, planters and the like may not allow standard equipment to operate effectively. In these situations, manual maintenance by hand is needed. The City of San Francisco mandates that such maintenance be privately provided, potentially through a Business Improvement District or Community Benefits District. Generally, the City prefers upfront maintenance commitments before considering any installations which would preclude street-sweeping equipment, creating another hurdle for the rapid implementation of shared spaces.

Shared spaces may also benefit from decorative and contrasting pavers, which trigger additional construction and maintenance costs. If and when any maintenance work is completed on a portion of sidewalk with decorative pavers (such as removal of sidewalk surface to access underground utilities, or the replacement of missing / damaged pavers due to tree root growth, normal wear and tear, etc.), the City of San Francisco is required only to resurface the space with asphalt, but not replace the original pavers. Securing community commitments early on to cover

additional capital and maintenance costs imposes another hurdle to doing anything beyond the “business as usual” design of streets.

EXISTING POLICIES AND GUIDANCE ON SHARED SPACES: Few localities have adopted citywide shared space policies; some have adopted codes that apply narrowly to a specific implementation of shared space, but none have comprehensive shared space policies that address the challenges outlined above. The San Francisco Planning Department, in collaboration with the Department of Public Works (DPW), the SF Municipal Transportation Agency (SFMTA) and the Mayor’s Office on Disabilities, has drafted a “shared public ways” policy (17) and associated guidelines. Highlights of this policy include:

- Hazardous Vehicular Area defined as a public right-of-way with a 15 mph or greater speed limit;
- Shared public ways are not hazardous vehicular areas by definition and design criteria;
- Shared public way policy is consistent with PROWAG 2005; Pedestrian-only zones and shared zones will be distinguished using visual/tactile cues (not limited to truncated domes)

The draft policy brings an added level of depth and detail to an area of planning that currently lacks much guidance. However, it has yet to be adopted; if it is, it could dramatically change the ability for shared spaces to be implemented in San Francisco and set a precedent for policy nationwide.

Seattle, WA: Seattle's Terry Avenue North Street Design Guidelines (18) is a shared space plan that has been adopted by the Seattle Department of Transportation. This plan provides specific details for converting a roadway into a shared space that would include streetcar operations. The portion of Terry Avenue shared with vehicles will use stamped pavement, differentiating it from the sidewalks, which will not be shared with vehicles. Detectable warnings are used at any corner junction of standard sidewalk and the plan’s shared spaces; visual impact is minimized with a light-to-dark contrast concrete rather than neon yellow. The Terry Avenue Plan seeks to level the entire right of way somewhat by using 2” curbs when possible (primarily, everywhere except alongside parking). Drainage is provided through a shallow channel called a “runnel.” A runnel is defined as a shallow channel that carries water from the pedestrian areas to areas which require water. It does not separate spaces and can be crossed at any location. Traditional curbs alongside planted sections of the street are in place to handle any additional rainfall.

Cambridge, MA: Harvard Square in Cambridge has two shared spaces in operation, supported by language in the city code that defines their purpose and guidelines. All motorized vehicles and non-motorized vehicles (including bicycles) must yield to pedestrians, and all vehicles are required to travel with caution and at a speed that does not pose a hazard to pedestrians (under 10 mph). Finally, a clause is included to ensure that access by fire protection is always available. Shared streets are defined at the discretion of the city Traffic Director. (20)

Livermore, CA: The city of Livermore, CA has acted to interpret the CBC and its view on hazardous vehicular ways. According to Livermore Code Interpretation (CI-21), vehicular ways that either have speed bumps or have a posted speed of 5mph or less should not be interpreted as hazardous. (21) This code interpretation was validated at the state level with the Division of the State Architect/Access Compliance (DSA/AC). Furthermore, loading/unloading zones such as in front of hotels or other lodgings also are to be considered non-hazardous.

San Francisco, CA: The San Francisco Planning Department's proposal for Jefferson and Taylor Streets (in Fisherman’s Wharf) is the most detailed shared space design presently under

DETAIL VIEW: Jefferson Street at Hyde Street

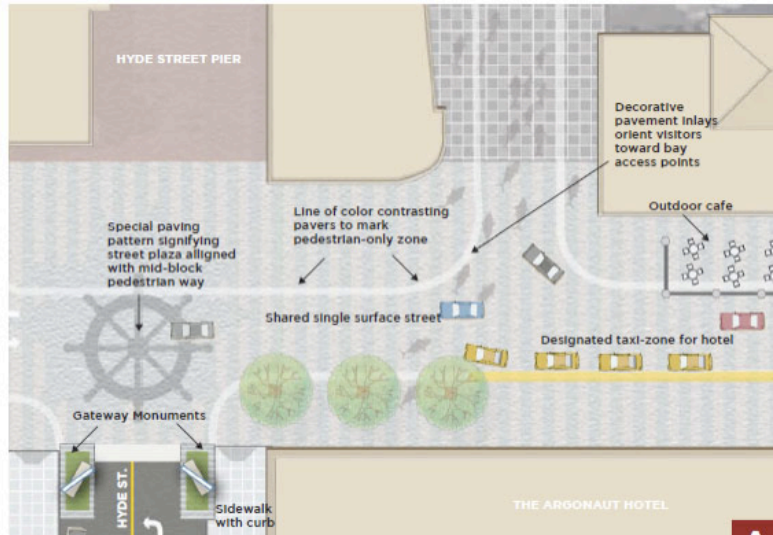


Figure 3 shows an initial draft for Jefferson Street in San Francisco. source: San Francisco Planning Department

development in San Francisco. The design concept includes a shared, single surface street, part of which accommodates at-grade streetcar tracks demarcated, by a standard curb. A second concept, for Treasure Island, is a network of shared public ways that would lattice the island, connecting proposed residential and commercial districts. The design concept includes a single-surface plane segmented into spaces for the different modes using color contrast (not physical barriers or vertical separation). Both of these plans are still in draft development and require formal design review and adoption by appropriate agencies.

POTENTIAL FUTURE SHARED SPACE CONCEPTS: In San Francisco, shared spaces do not only need to take the form of entire streets but should apply to other design solutions that provide benefits to the pedestrian environment. The following two concepts, flex-lanes and flex-spaces, are two ideas that have grown out of the development of the recently adopted Columbus Avenue Neighborhood Transportation Plan.

Flex-Lane A flex-lane would allow temporal flexibility in the use of on-street parallel parking lanes depending on pedestrian and commercial demands. Flex-lanes could be used during a portion of the day as a normal parking lane, allowing street parking, loading and unloading, and then converted at a defined time into a pedestrian zone available for café seating or general pedestrian usage.

Mountain View, CA, has operated flex lanes on downtown Castro Street for nearly ten years. (22) The Downtown Mountain View Sidewalk Café Guidelines describe in extensive detail different sidewalk zones and how those zones can be used (only in specific downtown areas). Maintenance responsibilities and furnishing requirements – for aesthetics as well as to provide safety and address liability concerns – are provided, but the guidelines also do not specifically address ADA requirements or drainage issues.

Potential Design Solutions: Several potential design solutions address aforementioned challenges of shared spaces, but all involve tradeoffs. The primary impediment to converting a parallel parking space temporarily into usable pedestrian space is maintaining ADA compliance.

Scenario One: Alternatives without curb ramps are significantly less costly and faster to implement. Instead of installing curb ramps to new café seating in the flex lane, businesses could maintain ADA-accessible seating adjacent to the building front, creating two dining zones, one on the sidewalk, and one in the flex-lane. The flex-lane seating area would not be ramp-accessible. Alternatively, this accessible seating could be located along the curb, creating one dining zone, but with both accessible and non-accessible seating.

Although this scenario would create a seating area where every seat may not be ADA-accessible, such conditions currently exist in many restaurants (not every seat in every restaurant is ADA accessible), and would still be a significant improvement over current conditions. Unfortunately, this scenario does not address the already narrow current sidewalk conditions. By keeping seating on the sidewalk, pedestrian circulation may not see the desired improvement.

Scenario Two: Nelson, New Zealand, elevates the parking lane to sidewalk level using wooden pallets. (23) The pallets must be privately installed, uninstalled and stored when not in use - although ADA accessible, everyday operation may be cumbersome, and more feasible where a Business Improvement District can provide the service of operating and maintaining the flex lane and pallets. Recently, in San Francisco, special risers were constructed to bring the parking lane to street level in construction of a “parklet” on Divisadero Street. Although this application was not intended to be installed and removed on a regular basis, it does infer that off-the-shelf tools are available to make street-level space readily available for other uses.

Flex-Lane Summary: Merchants may be hesitant to implement flex lanes if the liability for the safety of users in those lanes is unclear. One component of a solution would be a city-approved example design / layout of the flex-lane space, including options such as planter boxes or removable barriers, for providing sufficient buffer between any seating and the travel lane. Planter box barriers are cumbersome to move on and off the street on a daily basis and bulkier to store when not in use. Removable bollards offer more maneuverability but require capital cost to install foundations.

There are some challenges associated with daily operations of flex lanes; however, these would likely be minimal in comparison to the benefits of additional space for revenue-generating seating and general pedestrian circulation. For example, flex-lanes move café seating away from the restaurant, separated by the sidewalk with moving pedestrian traffic and any building mounted infrastructure such as heat lamps or lighting may not effectively reach the flex-lane. While these might be perceived as an inconvenience, these costs could potentially be offset with the additional revenue generated through additional seating capacity.

Restaurants and cafes would likely be the direct beneficiaries of the flex-lane conversion to seating, thus it would be prudent to establish a policy for their maintenance of the space. The scope of this responsibility could be the daily addition and removal of any barrier devices (planters or bollards), the addition of potential pallets to raise the lane to curb level, or any daily cleaning of the space.

Flex-Space: Flex-spaces also increase usable pedestrian space while maintaining some level of vehicle access by permanently widening a sidewalk into the parallel parking lane, or removing street parking. In contrast to flex lane, a flex space appears as a normal sidewalk and not a vehicle parking lane. The new sidewalk structural section would be designed to handle the weight of vehicles. A mountable curb would allow for loading and unloading on the flex-space. This arrangement allows for the sidewalk space to be well utilized and take advantage of the temporal needs of deliveries (which typically occur in the morning) and high levels of pedestrian activity (which occur in the afternoon and evening).

Planners in Vancouver, Canada are working on implementing a flex-space concept on Helmcken Street. This project proposes to remove the parking lane on a lane arterial, converting the parking into pedestrian use, while still allowing vehicle parking. The inner portion of the sidewalk is protected from vehicles through planting and artistic bollards that match the theme of the corridor. (24) This example is slightly different from what is being proposed in San Francisco,

which would only allow for delivery vehicles and general loading and unloading in the flex-lane space.

The project's administrative report to the city's Committee on City Services and Budgets, states that no serious challenges inhibited this shared space. Yet, the ease of implementation may result from the different regulatory environment.

Potential Design Solutions: In San Francisco, the Transportation Authority's investigation of the feasibility of flex space for Columbus Avenue faced the following constraints:

- Allowance of vehicles to mount the curb for deliveries
- Provide physical cues to alert visually impaired individuals of potential vehicles in the flex-space
- Provide a clear path of travel for disabled individuals along the block
- Provide adequate additional sidewalk space for pedestrian usage and/or café seating
- Maintain current DPW drainage/curb standards of 6"

The following design solutions assume continued interpretation of these flex-spaces as being potential hazardous vehicular ways, thus requiring detectable warnings. Yet, the loading/unloading activities could be interpreted a non-hazardous activity not requiring as much delineation.

Scenario One: One proposal is to improve upon the aesthetics of the current delineation requirements (bright yellow truncated domes) by instead using stamped, textured paving that could serve as the detectable warning. The paving could be colored to meet the 70% visual color contrast presently mandated by the ADA. Benefits of this design include a reduced visual impact of detectable warnings and a stronger visual and physical cue to for delivery vehicles as to their designated place on the sidewalk.

Scenario Two: A second proposal is to use a tiered-curb, siting the flex-space on a vertical level 3" higher than the roadway and 3" lower than the sidewalk. The intent of this design is to maintain the overall appropriate curb height of 6" for drainage purposes, while providing a detectable, vertical differentiation between the sidewalk and flex space. The 3" rise from the standard roadway bed would provide guidance for delivery vehicles. The initial curb between the



PERSPECTIVE VIEW - From Helmcken St. looking North (Year 2012)

Figure 4: The proposal for Helmcken Street includes a flex-lane for vehicle parking on the outer portion of the sidewalk. source: City of Vancouver.



Figure 5 shows an example near 4th & King in San Francisco shows how textured pavement could be a potential solution to demarcate flex-space from the accessible path of travel. source: author photo

roadway and the flex-space would likely be a rolled curb, and the upper curb between the flex-space and the sidewalk would likely be a barrier curb.

Scenario Three: A final alternative involves expanding the options for detectable warning devices, perhaps by creating a new standard to delineate between safe spaces and potentially hazardous ones. One of the primary disadvantages of the current standard of detectable warnings is its size and aesthetic impact. By code, truncated domes at a width of 36” are the off-the-shelf standard to use to separate any flex-space from the standard sidewalk area. However, this treatment covers valuable space that could be used for functions that require smooth paving (tables & chairs).

The UK's Guide Dogs for the Blind is researching designs for detectable warnings with less visual impact and footprint. One leading design is a “central delineator” with a trapezoidal shape, a base of approximately 150mm, and height of 20mm high, (25) providing the qualities of a detectable warning with a much smaller profile. Initial physical trials for this treatment have been very favorable in the UK among focus groups of disability groups.

Flex-Space Summary: Under current ADA compliance standards, flex space design must maintain detectable warnings; however, this can be achieved by using a central delineator or textured / color contrast pavement to indicate a hazardous vehicular way instead of the standard 36” of yellow truncated domes. Vehicle speeds should be restricted to (at least) less than 10 mph.

The volume and types of vehicles accessing flex-spaces differ from flex-lanes. In the San Francisco scenario, flex-spaces would generally be sidewalk space with the occasional use by delivery vehicles during certain times and no private vehicles. As a result, flex-space safety issues are more straightforward, and delivery vehicles would bear liability for any collisions. Delivery vehicles parked in flex-space zones will likely be required to provide accordion-folding warning fences around vehicles. As a permanent sidewalk, maintenance of flex-space would still be the responsibility of the city.

CONCLUSIONS: Our research has led us to several key recommendations for advancing the implementation of shared spaces. First, the adoption of the 2004 ADAAG and the 2005 PROWAG will provide critical certainty as to the interpretations of federal standards. Second, pending the adoption of the above standards, local and state governments should re-evaluate their guidelines for defining hazardous vehicular way and detectable warnings. Next, geometric references such as the AASHTO Green Book, the ITE Context-Sensitive Solutions Manual or the appropriate FHWA manuals should expand their menu of options to include specific best practices for shared spaces. The current FHWA Pedestrian Facilities Users guide mentions shared spaces as a design option without providing sufficient guidance on how to implement them. With these foundation pieces in place, local governments could make up the final components of implementation by developing policies on shared spaces such as the ones described in Mountain View or the San Francisco Draft Shared Public Ways Policy.

Through the lens of shared space implementation in San Francisco, the work and effort put towards the Shared Public Ways Policy is a courageous start at developing a comprehensive plan to make shared spaces function. Moving forward, we hope to see new and existing shared spaces on San Francisco’s grid. Furthermore, we hope to see a comprehensive policy that will define and guide future implementation of shared spaces in other parts of the city. These steps could truly benefit the future generations of pedestrians and other non-motorized users of these spaces while setting a precedent for other projects nationwide.

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