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Complete Streets

A Case Study of Boulder, Colorado, and the Great Streets Initiative

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Winter Quarter 2010
In the past fifteen years a new movement has spread across the planning world. The “complete street” is changing the way that streets are planned, designed, and built. In essence, a complete street is a multi-modal corridor that connects different parts of any given city using automobile transportation, bicycle lanes, pedestrian sidewalks, and many times transit lines. In addition, these streets also focus on changing the decision-making and design process so that all related users are able to participate within the process (Burden, 2007). This new type of road supports the theory that a road should be a destination.

The problem with many roads in the age of the automobile is that while a sidewalk may be in the design and bus stops as well, they are badly laid out, unappealing, and sometimes even unsafe for users. New roadways are generally built to fix a current city problem like congestion or insufficient access by building additional lanes, by adding more traffic lights, dividing neighborhoods to create interstates, and lastly, creating uninviting and inhospitable streetscapes (Laplante & McCann, 2008).

This article on complete streets discusses how Context-Sensitive Solutions (CSS) are a proposed way to battle these problems. CSS, like the idea of complete streets, aims at ensuring that new road projects will fit into the surrounding neighborhood context and therefore be more usable for its users as well as the area as a whole (Laplante & McCann, 2008). It also focuses on how to make this a more common practice in the United States so that less funding is needed for transportation construction. The National Complete Streets Coalition has simultaneously been working on spreading this idea on a federal, state, and local level. Over fifty jurisdictions as of the spring of 2008 have adopted some form of complete streets policy into their legislation (Laplante & McCann, 2008).

There is more to a complete street than implementing multimodal practices and ensuring safety. Several other main components in this theory are determining speed, timing traffic signals to work with the flow of traffic, raising medians, and planting low maintenance but aesthetically appealing landscaping (Laplante & McCann, 2008). Pedestrian safety, especially at crossings and transit stops, is also very important. To address this problem, countdown clocks, larger crosswalks, and the concept of a “road diet” is mentioned. A road diet refers to reducing a road by a lane and therefore slowing the pace of traffic (because of
drivers turning) to making it safer for drivers turning left and pedestrian to cross. Lastly, the concept of traffic taming is presented. This part of a complete street design simply refers to making an arterial street more community friendly through design.

The complete streets movement is occurring all over the United States. While the City of Cincinnati has not yet seen any change in policy to support this movement, there are many case studies out there that can be applied to current issues happening here. The City of Boulder, Colorado, is a prime example of how changing street design can improve the quality of life of residents as well as mobility as a whole. St. Louis’ Great Streets Initiative is another example of how to improve and implement better transportation practices at a policy level.

Case Study: Complete Streets - Boulder, Colorado

The City of Boulder, Colorado, is known for its exceptional planning practices as well as its implemented greenbelt, growth management practices, and cycling culture. It is also known for its exceptional transportation system, one that is used far more than most other cities in the United States (National Research Center, Inc, 2007). Several colleges including the University of Colorado make up a large portion of the population of about one hundred thousand people in the city and give it a much younger median age (National Research Center, Inc, 2007). In addition, Boulder is only about half an hour from Denver. In 1996, the city decided that there was need for street improvements that would encourage residents to use other modes of transportation besides the automobile. Planners recognized the fact that the area was continuing to grow in population as more people moved out from neighboring Denver.

The Transportation Master Plan created the Multimodal Corridor Project that identified ten existing multimodal corridors. All ten roads, which are all connectors and incredibly busy, would benefit greatly from these improvements (City of Boulder, 2006). The City of Boulder determined that this project would need to be implemented in several phases in order to fund it. The ten (later became twelve) corridors were then divided up into forty-two segments with eleven reserved for the first phase, twenty-one for the second phase, and the rest in the third (City of Boulder, 2006). In 1999, Boulder’s City Council started the Prioritization Process that prioritized multimodal corridors and “incorporated an improved understanding of the elements and integration needed to produce a corridor that works well for all modes (City of Boulder, 1
The project mostly focused on creating better multimodal components for streets by 2003. By this time the idea of creating a complete street for the city was about to begin construction.

Four types of improvements are addressed in all of the plans: roadways, pedestrian right-of-way, bicycling, and transit (City of Boulder, 2006). The first step for the roadways was to reconstruct deteriorating areas in the roads to lower future maintenance problems. Designers recognized that better design and construction would save a great deal of money in the future and congestion from needed repairs would not hinder travelers. Traffic studies would determine how intersections could be enhanced to make driving more efficient as well as better do better signal coordination to move the flow of vehicles.

Many existing streets in Boulder lacked certain multimodal amenities like complete sidewalks or intersection crosswalks. The plan would connect missing sidewalk sections and enhance crossings at many busy intersections that needed additional safety for pedestrians. More pedestrian signals and crossing count-downs were also added (City of Boulder, 2006). Like many sidewalks in Boulder, a large amount of bicycle trails needed completion to fill in missing sections as well as connect different trails to create a more cohesive network for bikers. Several busy underpasses also needed to be opened up and renovated to change their perception. Bicycle route signage will be added as well.

Lastly, Boulder has implemented the high-frequency Community Transit Network (CTN). This network has seven main bus routes that provide residents with an easy way to get around the city if they do not own a vehicle (GO Boulder, 2010). The seven routes, referred to as HOP, SKIP, JUMP, BOUND, DASH, STAMPEDE, and BOLT, would at the very least receive upgrades to their existing transit stops with new signs and pavement platforms (City of Boulder, 2006). Busier transit stops would be given more amenities like shelters, benches, and trash receptacles. To increase operational efficiency of the CTN improvements such as bus bypass lanes and bus signals prioritization would be implemented.

Of the forty-two prioritized multimodal corridor segments one of the most vital improvements was 28th Street from Baseline Road to Arapahoe Avenue. This heavily traveled corridor saw a great deal of congestion and lacked landscaping, full sidewalks and bicycle paths,
and many other amenities that improve how a street looks and feels to its users. The City was able to afford this project through funding from state and federal sources as well as Boulder’s Transportation fund. In all, 28th Street’s south section cost about ten million dollars (City of Boulder, 2010). After construction was completed, this particular section of the corridor plan was coined “Hello Boulder” by the community because it “created an attractive, efficient, and progressive entry” into the city, a gateway of sorts (Banuelos & Bondi, 2008). 28th Street’s design incorporated both new and improved facilities for vehicular, pedestrian, and bicycle use in a manner that was visually and artistically appealing. Designers followed many complete street principles by planning with the context of the neighborhood, adding needed signage, and incorporating features such as street buffers for pedestrians and landscaping that provided better drainage option to the area (City of Boulder2, 2010). One of the project’s main goals was to “protect and enhance the natural environment and communities affect by highway transportation (City of Boulder, 2010).” The new improvements, which are still being implemented even today, are also boosting the economy in the area. A large retail center on 29th Street has seen more activity and several large hotel projects are now in the works (City of Boulder, 2010). By following the principles of a complete street and working to enhance the surrounding environment and economy through the design, the City of Boulder Transportation Division won the Exemplary Human Environment Initiative Award from the Federal Highway Administration (City of Boulder, 2010).

In terms of design, a complete street has some standardized regulations but is generally up to the discretion of the designers or determined by local codes. Several well known measurements among many areas are, for example, that a sidewalk should be at least five feet wide and clear of any obstructions for pedestrian use (American Planning Association, & American Institute of Certified Planners, 2007). Bicyclists must have at least forty inches wide and one hundred inches high for operating space while lane measurements will vary because of the character and context of an area and how much traffic will be using that street (American Planning Association, & American Institute of Certified Planners, 2007).

This is just one renovation in the plan that Boulder has been actively working on for the past few years. But in addition to changing and improving many street sections, the city has
also drastically improved their bus system. As previously stated, many of the bus lines received new stations that boasted artistic styles as well as comfort in the winter or during stormy weather (GO Boulder, 2010). Completed bicycle trails are now used by residents and students alike. Overall, while it has been a long and tedious process, the City of Boulder has stuck with it and in return has many complete streets to enjoy.

This process would never have been successful without all the stakeholders involvement. Residents in Boulder actively worked with the City to come up with the best plan possible. Because Boulder is known for its cycling culture, the plan updated and added many new routes. Because of its low median age, the City worked to make more bus routes available and even have an optional Eco-Pass card that allows user to have unlimited bus access (GO Boulder, 2010). Many businesses along the construction areas dealt with the construction but are now thankful at how much their situation has been improved. Boulder’s Department of Transportation, the City’s Planning Board, City Council, and all the design teams have been instrumental in making the Multimodal Corridor Project a reality.

The 28th Street Project, as well as a number of others, have been a great success. Boulder is proud of its transportation system and continues to update and implement new pieces to work with the growing population. While the City still has a large portion of its population that drives, statistics show that the bicycling population has increased tremendously and is higher than most other parts in the United States. Another strength is that the bus system has a “fun” edge to it by creating interesting route names and spicing up bus stops. The multimodal corridors address environmental problems through design as well as socially by encouraging other forms of transportation. Economically, Boulder is actively working to improve the whole City’s network so that people are able to get around in any manner they choose and enjoy traveling because of the excellent aesthetics that surround them.

**St. Louis Great Streets Initiative**

A second case study exemplifies a different aspect of complete street principles. The St. Louis Great Streets Initiative was launched in 2006 to encourage communities in the surrounding region to view a street project as more just a way to move cars more effectively
but to “trigger economic and social benefits by centering communities around interesting, lively, and attractive streets that serve all modes of transportation (East-West Gateway Council of Governments, 2007). The project is run by the East-West Gateway Council of Governments in St. Louis. This council ultimately determines funding for streets, bridges, and other large transit projects across the St. Louis region. A great deal of coordination is required to oversee many of the larger plans, much like Cincinnati (Ohio) must partner with Kentucky and Indiana and focuses more on the legislation side of the process.

According to the Initiative, a great street is very similar to a complete street. For instance, great streets are comfortable to walk along and safe; they contribute to the economic vitality of an area; are functionally complete; have excellent mobility, and are green. Does that sound familiar? In addition, another principle is that great streets are supposed to be representatives of their places and facilitate place making (East-West Gateway Council of Governments, 2007). Several other strategies are mentioned as important in order to make a great street possible. Involving all local agencies, which ranges from DOT to traffic to environmental impact groups, from the get go will allow the project to progress much faster (Saint Louis Great Streets Initiative, 2007). Public involvement is also needed to build consensus among residents. Another suggestion is to provide incentives to private developments and business owners that are nearby to encourage not only more economic growth within a neighborhood and city but to get design tips but people who know the area best.

The Great Streets Initiative within St. Louis is divided into four main phases, starting with the coordination of over one hundred and sixty planners, engineers, city managers, and elected officials to help determine how to move this project forward (East-West Gateway Council of Governments, 2007). In 2007, the second phase created a Digital Guide filled with both design and process related recommendations on how Great Streets can be implemented. The third phase put the guide into action by giving four communities funding for projects; and the fourth and final phase has consultants working with several communities to create additional design documents along a corridor in West County.
One of the largest benefits of this Initiative is the resources that are available to neighborhoods who are interested in changing how their communities perceive their street systems and uses. Information on the East-West Gateway website given on all types of streets such as a downtown main street, mixed-use district, small town downtown, residential neighborhood office employment area, commercial service corridor, and several more (East-West Gateway Council of Governments, 2007).

The Great Streets Initiative is an excellent way to disburse information to groups that are looking for ways to improve their communities and ways of life whether it is economically, environmentally, or socially. Many available presentations and documents provide design tips, suggestions, and ideas how a single street can adapt to the uses around it and still be a major arterial to the community. It also discusses different practices and gives examples of places around the United States and the world. There will be large variation in terms of approaches and clients for a great street initiative in one city compared to the other. While residents, elected officials, city council members, business owners, and many others may choose to be involved in one, all approaches will be based upon that particular character of an area as well as what issues it needs to address.

Overall, both Boulder and St. Louis are making progress in planning their cities more efficiently and adapting to new transportation methods and designs. While the complete streets movement and the Great Streets Initiative are similar and have many of the same core values, I think a combination of the two would be exceptional. The East-West Gateway focuses a bit more on the governmental aspect of changing a street while Boulder specifically focused on multimodal routes and how to create the best access and mobility for its residents. Both cities are wonderful examples of how to change a street from a piece of the transportation network to a destination. Cincinnati has huge potential to change its existing streets to complete street and use the principles stated above to revitalize neighborhood and bring communities together.
References


Complete Streets:  
We Can Get There from Here

THIS FEATURE EXPLAINS
THE COMPLETE STREETS
MOVEMENT AND EXPLORES
WAYS TO MAKE URBAN
THOROUGHFARES MORE
PEDESTRIAN AND BICYCLE
FRIENDLY AND RESPECTFUL
OF THE SURROUNDING
COMMUNITY WHILE NOT
UNDULY COMPROMISING
MOTOR VEHICLE TRAVEL.
TECHNIQUES FOR DESIGNING
AN ARTERIAL STREET THAT
CAN CONTROL TRAFFIC
SPEEDS AND PERMIT MORE
COMFORTABLE AND SAFE
PEDESTRIAN AND BICYCLE
ACCESS ARE DESCRIBED.

A COMPLETE STREET IS A ROAD that is designed to be safe for drivers; bicyclists; transit vehicles and users; and pedestrians of all ages and abilities. The complete streets concept focuses not just on individual roads but on changing the decision-making and design process so that all users are routinely considered during the planning, designing, building and operating of all roadways. It is about policy and institutional change.

This may seem simple enough. Over the last 30 years, a lot of planning and engineering energy have gone into learning to create beautiful streets that work well for everyone. Standards from A Policy on Geometric Design of Highways and Streets have been changed to reflect a multimodal approach, but many roads continue to be built as if private motor vehicles and freight are the only users.1 Too many urban arterials feature a well engineered place for cars to travel next to a homemade pedestrian facility—a “goat track” trapped in the grass—with a bus stop that is no more than a pole in the ground uncomfortably close to high-speed traffic.

This stems in large part from entrenched planning and design practices. Transportation projects typically begin with an automobile-oriented problem—increasing average daily traffic or deteriorating level of service (LOS). The performance of the right of way for bicyclists, pedestrians and transit riders or transit vehicles often is not measured. Roadway classification is similarly oriented toward auto mobility.

CONTEXT-SENSITIVE SOLUTIONS (CSS)

As a reaction to this unhealthy trend, context-sensitive design concepts and techniques have developed. Within ITE, a new arterial street design paradigm for urban areas is being adopted in the Recommended Practice entitled Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities. The document is being developed in conjunction with the Congress for New Urbanism and the Federal Highway Administration.2

How do complete streets initiatives relate to CSS? CSS is a project-oriented and location-specific process and is aimed at making sure a road project fits into its context. Early projects tended to be large roadway improvements and featured extensive public meetings, stakeholder out-

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Figure 1. Proportion of service.

THE FUNCTIONAL CLASSIFICATION TRAP

Using the standard functional classification system, streets designated as arterials are, by definition, intended primarily to provide mobility, with emphasis placed on operating speed and traffic-carrying capacity (see Figure 1). This leads to other design requirements that stress access management, wider lane widths, increased turning radii and minimum interference with traffic movements. This, in turn, often leads to urban roadways dividing neighborhoods, destroying local businesses in established communities and creating sterile, inhospitable streetscapes in developing suburbs.
reach and plenty of extra work. More recently, CSS practitioners have recognized that this process can be applied to every project and that early public involvement does not necessarily lead to expensive and time-consuming outreach efforts.

Complete streets focuses more on road users and is about making multimodal accommodation routine so that multimodal roads do not require extra funds or extra time to achieve. The intent is to change the everyday practice of transportation agencies so that every mode should be part of every stage of the design process in just about every road project—whether a minor traffic signal rehabilitation or a major road widening. The ultimate aim is to create a complete and safe transportation network for all modes. CSS and complete streets can be seen as complementary, not competitive movements.

**NATIONAL COMPLETE STREETS COALITION**

The National Complete Streets Coalition has been working for three years to promote policy and procedural changes at the federal, state and local levels. In addition to ITE, the coalition includes the American Public Transportation Association, the American Planning Association, AARP and many others.

The coalition has succeeded in gaining national media attention and policy adoption across the country. More than 50 jurisdictions, from states to small towns, have adopted some type of complete streets policy, most over the last few years. In 2007, several cities adopted notable policies, including Salt Lake City, UT, USA, through a simple executive order; Seattle, WA, USA, through a comprehensive ordinance; and Charlotte, NC, USA, through adoption of its *Urban Street Design Guidelines*.

At the state level, a new law in Illinois requires the state department of transportation to accommodate bicycle and pedestrian travel on all its roads in urbanized areas. It is effective immediately for project planning and required in construction beginning in August 2008. Other places have been building complete streets for a while, including Oregon; Florida; Arlington, VA, USA; and Boulder, CO, USA.

A new complete streets policy adopted by a legislature or city council is likely to make any engineer nervous. If well written, the impact should be gradual and reasonable. These policies are not prescriptive. Complete streets will look different in different places. They must be appropriate to their context and to the modes expected on that corridor.

A bustling street in an urban area may include features for buses, bicycles and pedestrians as well as private cars; in a more rural area with some walkers, a paved shoulder may suffice. Low-traffic streets need few treatments. Places with existing complete streets policies are successfully building a variety of roads that meet the varied needs of children, commuters and other users while creating an overall network that serves all modes.

### IMPLEMENTATION CHALLENGES

In order for complete streets to be truly effective, the following implementation measures should be considered:

- Rewrite and/or refocus agency policies and procedures to serve all modes.
- Rewrite and/or adapt design guidelines.
- Train and develop staff skills in serving all modes.
- Collect data on all users and modes for performance improvements.

The policy change should result in an institutionalization of the complete streets approach in all aspects of the transportation agency and beyond and often means a restructuring of everyday procedures, beginning with scoping. For example, in Charlotte, transportation planners are using a new six-step complete streets planning process that systematically evaluates the needs of all modes (see Figure 2).

The National Complete Streets Coalition is offering a Local Implementation Assistance Program to help jurisdictions with this task.

An effective policy should lead to the rewriting of design manuals. The best example of this in the United States is Massachusetts. A complete streets policy statement became one of three guiding principles for the new award-winning design guide—context-sensitivity is another. The new manual has no chapters for bicycling, walking, transit,
or disabled users. Every mode is integrated into every chapter, with new tools to help engineers make decisions about balancing the modes.5

The third of the four implementation steps is the need for additional training for planners and engineers. Balancing the needs of all users is a challenge, and doing so with every project requires new tools and skills. For example, South Carolina has used its policy to launch a comprehensive training program.

Complete streets policies also should result in new ways to track the success of the road network in serving all users. Florida; Ft. Collins, CO; and other jurisdictions have adopted multimodal level of service standards to do that.

**SPEED MATTERS**

Complete streets is about more than simple allocation of street space. One of the major components of this new design paradigm is selecting a design speed that is appropriate to the actual street typology and location and that allows safe movement by all road users, including more vulnerable pedestrians and bicyclists. From a safety and community livability standpoint, speed does matter.

Everyone should be familiar with the chart that shows that a pedestrian hit by a car traveling at 20 miles per hour (mph) (32 kilometers per hour [km/hr.]) has an 85-percentage survival rate. That same collision with a car going twice as fast, 40 mph (65 km/hr.), will lower the survivability likelihood to 15 percent (see Figure 3).

Current practice is to use a design speed based on a somewhat arbitrary functional classification and then post a speed limit based on the 85th-percentile of speeds engendered by this artificial street designation. This practice is based on the conventional wisdom that to maintain mobility to and through communities, some arterial streets have to be designated as major traffic carriers or the entire regional economy will grind to a halt. Travel speed has always been equated as a necessary component of this mobility.

**REDEFINING MOBILITY**

Given that speeds much over 30 mph (50 km/hr.) in urban areas are incompatible with pedestrians (including transit passengers) and bicyclists, if not downright dangerous, is the only choice to sacrifice mobility for community livability? The answer to this question depends on how mobility is defined. One aspect of mobility is travel speed or, more accurately, total travel time.

For a 5-mile (8 km) trip along an arterial corridor with a 45 mph (70 km/hr.) travel speed, the added travel time for a reduced speed of 30 mph (50 km/hr.) would be 2.5 minutes. In the overall scheme of things, how important is this potential delay compared to the proven safety benefits and the city livability advantages that come with the slower traffic speeds?

Some will quote the standard benefit-cost travel-time delay litany that multiplies these 2.5 minutes times an average daily traffic of 30,000 vehicles times 365 days per year times $20 per hour in time costs, equaling $600,000 in lost wages to the economy. However, in reality, the loss is still under 3 minutes per individual for this one trip, for which he or she is probably not being paid and which is less than the time he or she willingly will spend in line for morning coffee.

Take this scenario one step further, to the all-too-common suburban arterial traffic experience of driving 45 mph (70 km/hr.), stopping for up to 2 minutes at a traffic signal, accelerating back up to 45 mph (70 km/hr.), only to stop and wait again one-half-mile (0.8 km) down the road. This uncoordinated signal system wastes time and fuel, and the many stops increase crash rates. If these signals can be coordinated to permit two-way progression at a constant speed of 25 or 30 mph (40 or 50 km/hr.), the total travel time ends up being roughly the same.

The other part of the mobility equation is capacity, with the number of lanes acting as the primary surrogate measurement. It should be recognized by now that LOS D is a reasonable peak period LOS in an urban area, provided the above-mentioned signal progression can be maintained. However, some state departments of transportation or regional planning organizations still recommend LOS C (or even B) in an urban setting whenever possible.

Not only is this a waste of tax dollars constructing unneeded pavement, it also increases pedestrian crossing distances (and thus pedestrian crossing times, which impact negatively on signal timing for vehicular traffic) and encourages faster vehicular speeds during the other 22 hours of the day in each direction.

**ARTERIAL TRAFFIC CALMING MEASURES**

The remainder of this feature deals with specific design measures that may be used to retrofit urban arterials into complete streets. These roads present one of the biggest challenges to engineers in that they tend to be the most hostile to bicyclists, pedestrians and transit riders, but all of these modes are usually present in significant numbers.

Arterial traffic calming first must deal with controlling vehicular speeds. In addition to timing the traffic signals for a 25 or 30 mph (40 or 50 km/hr.) operating speed, other possible speed control measures include:

- Narrower travel lanes: Based on the results of a recent National Cooperative Highway Research Program study, 11-foot (3.3-meter [m]) or 10-foot (3.0-m) lanes in urban areas are just as safe as 12-foot (3.6-m) lanes for posted speeds of 45 mph (70 km/hr.) or less.6
- Road diets: A four-lane to three-lane road diet can work for average daily traffic volumes as high as 20,000. This makes the more prudent driver the “pace” car for that roadway and greatly improves left turning safety.
- Tightening corner curb radii: Selecting the appropriate design vehicle and using the minimum needed to provide the “effective” turning radius from the closest approach lane into

Figure 3. Vehicle speed versus injury and death.
any lane in the departure roadway will slow down turning vehicle speeds.

- Elimination of any free-flow right-turn lanes: This specifically includes freeway entry and exit ramp connections. Encouraging freeway speeds onto or off arterial streets is particularly dangerous for both pedestrians and bicyclists.
- Raised medians: Raised medians visually narrow the roadway and provide a median refuge for mid-block crossings.
- Median and parkway landscaping: Appropriate low-maintenance landscaping further visually narrows the roadway and provides a calming effect.
- Curb parking: Retaining curb parking provides for community access while creating a significant traffic calming effect.
- Curb bulb-outs: Where on-street parking exists, curb bulb-outs shorten pedestrian crossing distances, improve sight lines and help control parking.

**PEDESTRIAN CROSSINGS**

The other important element in creating a pedestrian-friendly arterial street is making pedestrian crossing locations safe, comfortable and more frequent. On any road where there is transit service, a pedestrian will cross wherever there is a transit stop, whether it is provided for or not. In a dense downtown case with signals spaced every 300 to 600 feet (90 to 180 m), crossing at a traffic signal is a reasonable expectation. However, along most urban and suburban arterial streets, these signals usually are spaced no closer than every one-quarter mile.

Requiring travel just 1,200 feet (360 m) or more out of the way to cross a street will add 5 minutes to the travel time of a pedestrian walking at the average 4.0 feet per second (1.2 m per second) walking speed. If a 5-minute detour for all automobile traffic were suggested, this would be the equivalent of adding a distance of 2.5 miles (4 km) for a car traveling at 30 mph (50 km/hr.). The outrage would be loud and instantaneous.

Many of the suggested pedestrian crossing improvements flow directly out of the traffic speed control measures noted above. They include:

- Narrower travel lanes: Shorten the pedestrian crossing distance and roadway exposure time.
- Road diets: Reduce the number of lanes to be crossed.
- Tighter corner curb radii: Shorten pedestrian crossing distances and provide space for perpendicular curb ramps.
- Adding corner “pork chop” islands where design vehicle turning radii do not permit a small corner radius: Also shorten pedestrian crossing distances.
- Raised medians: Provide pedestrian refuge and allow pedestrians to cross half the street at a time.
- Curb bulb-outs: Shorten pedestrian crossing distances, improve sight lines and provide space for curb ramps.
- Continental-style crosswalks and pedestrian crossing warning signs: Effective for lightly-traveled arterials posted for urban speed limits.
- Pedestrian-actuated crosswalk warning signs: For heavier traffic flows.
- Pedestrian-actuated HAWK-style signals: Will be in the new Manual on Uniform Traffic Control Devices (MUTCD).
- Full signalization: All pedestrian signals should now be timed using the new MUTCD pedestrian walking speed of 3.5 feet per second (1.05 m per second) to set the Flashing Don’t Walk pedestrian clearance time and 3.0 feet per second (0.9 m per second) to determine the total Walk/Flashing Don’t Walk time.
- Countdown clocks: The new MUTCD will not only require countdown clocks at all new pedestrian signal installations, but there will be a 10-year compliance date for retrofitting all existing pedestrian signal locations, finally correcting the longstanding confusion surrounding the traditional but counter-intuitive Flashing Don’t Walk.

**TRAFFIC “TAMING”**

In conclusion, instead of the concept of traffic calming used in discussing the design of residential streets, the term “traffic taming” should describe the concept of making arterial streets more pedestrian, bicycle and community friendly. This compilation of suggestions for retrofitting arterial streets into complete streets is not meant to be all-inclusive. Many more solutions are available once the task of designing arterial roadways for community livability while retaining a reasonable level of mobility along the most important travel corridors is taken seriously.

Complete streets is both evolutionary and revolutionary. A growing awareness of other transportation modes has led to a trend toward accommodating a wider
variety of users. Complete streets is simply the latest evolutionary step in this process. At the same time, stepping beyond how design typically is done today by greatly increasing travel options, flexibility and usability, a revolutionary new network of travel can be created for all modes.

Largely through the work of the transportation industry, the United States has succeeded brilliantly over the last century in building better roads for farmers, national security and economic growth. It is now time to achieve the same success in the challenge of completing U.S. streets for everyone. ■

References


3. To see a complete list of coalition members, visit www.completestreets.org/whoweare.html.


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