FROM POLICY TO PAVEMENT

IMPLEMENTING COMPLETE STREETS IN THE SAN DIEGO REGION

PREPARED THROUGH COLLABORATION OF
THE COMPLETE STREETS TASK FORCE

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American Planning Association
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Making Great Communities Happen

WALK SanDiego
Promoting walkable communities

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CONTENTS

1. **EXECUTIVE SUMMARY** 1

2. **ABOUT THIS REPORT** 7
   - Background and Purpose 7
   - Process and Assumptions 7
   - Public Demand for Complete Streets 8
   - Questions Addressed by this Report 9

3. **ONE SOLUTION, MANY BENEFITS** 11
   - Economic Development 11
   - Fiscal Savings 12
   - Health 12
   - Health Savings 14
   - Safe Transportation for All 14
   - Greater Accessibility 15
   - Green Street Opportunities 15
   - Traffic Capacity 16
   - Safety 16
   - Noise 16
   - Environment 19
   - Conclusions 19

4. **SETTING A POLICY DIRECTION** 21
   - Why Adopt Complete Streets Policies? 21
   - Supportive State Policies 22
   - Regional Policy Initiatives 23
   - The 10 Elements of an Ideal Complete Streets Policy 24
   - Types of Complete Street Policies 25
   - What *Not* to Include in a Complete Streets Policy 26
   - Conclusions 27

5. **L.O.S. STANDARDS AND COMPLETE STREETS** 29
   - Level of Service Standards – A Barrier to Complete Streets? 29
   - Follow the Money 29
   - Alternatives to LOS 29
   - Is Traffic Congestion Inevitable? 33

- TDM – Efficient, Affordable and Largely Untapped 35
- Traffic Congestion as a Planning Tool 35
- Conclusions 36

6. COMPLETE STREETS UNDER CEQA 37
- CEQA Guideline Revisions 37
- Reducing Unnecessary CEQA Costs and Delays 38
- Conclusions 41

7. THE IMPLEMENTATION TOOLBOX 43
- Design Guidance for Complete Streets 43
- Leading Complete Street Guidelines, Plans and Programs 44
- Context-Sensitive Implementation and Assessment Tool 45
- More Effective Planning Tools 48
- The Standard Land Use Planning Toolbox 49
- Conclusions 51

8. MEASURING PROGRESS 53
- Purpose of Performance Measures 53
- Annual Performance Reports 53
- Recommended Performance Measures 53
- Project Measures – Before and After Construction 54
- Community or Network Measures 54
- Conclusions 56

9. COMPLETE STREET TREATMENTS 57
- Selecting Streets for Complete Street Treatments 57
- How Big Is the Regional Opportunity? 58
- Potential Treatments 58
- Gallery of Complete Street Treatments 61
- Conclusions 66

10. OVERCOMING BARRIERS TO IMPLEMENTATION 67
- State-Wide Survey 67
- Region-Wide Interviews 67
- Conclusions 71

11. REFERENCES 73

LIST OF FIGURES

- Figure 3-1. Web of Auto-Oriented Planning Policies and Standards 21
- Figure 4-1. Weekday Vehicle Travel 34
- Figure 6-1. Context-Sensitive Planning Process for Complete Streets 46

LIST OF TABLES

- Table 3-1 Pros and Cons of Various Policy Options 25
- Table 4-1 L.O.S. Relaxation Examples 30
- Table 4-2 Matrix of Roadway Performance Metrics 31
- Table 4-3. MM LOS Factors for Calculating Pedestrian and Bicycle Level of Service (2010 HCM) 32
- Table 6-1. Common Context-Sensitive Street Typologies for Urbanized Areas (ITE/CNU) 47
- Table 8-1. Complete Street Opportunities within SANDAG Smart Growth Areas 59
- Table 9-1. Summary of Complete Street Barriers and Potential Solutions 72

EXECUTIVE SUMMARY

There is tremendous pent up demand for safe, comfortable facilities to walk and bicycle, and for better transit service. Complete Streets help provide these opportunities. This report is a collaborative effort by local planners and traffic engineers who want to encourage the region's local governments to go beyond the minimum level of implementation of Complete Streets, required by State law (AB 1358).

The document is structured around five key assumptions:

1. A city's streets are its largest landholding and one of its greatest assets. Complete Streets maximize the value of that asset.
2. The way streets look and function should represent a community's vision of itself, not simply an opportunity to move vehicles. Cities need to regularly update their understanding of what the community values.
3. When a street is being designed or retrofitted, representative user groups and partners in other departments or agencies should be thoroughly consulted. The Complete Streets approach is as much about the design process as the outcome.
4. Good street design must be combined with compatible land uses to take best advantage of a Complete Street treatment.
5. Complete Streets help induce compatible land uses, but land use changes, by themselves, rarely induce Complete Streets.

One Solution, Many Benefits

The benefits of Complete Street investments are numerous:

- Designing streets primarily to reduce traffic delay has had numerous unintended consequences. Complete Streets treatments offer a way to keep traffic moving while providing for other modes and meeting other community values.
- For the municipality, Complete Streets investments can increase tax collections and jobs, reduce road building and maintenance costs, reduce emergency response costs, and improve air and water quality.
- "Green street" techniques such as bioswales and porous pavements can reduce the costs of constructing roads, managing stormwater, irrigating landscaped areas, and heating and cooling.
- For the individual, Complete Streets provide cost effective health and mental health benefits, reduce transportation costs, provide safe travel for non-drivers, reduce all types of crashes, reduce noise-related stress, and create more opportunities for local shopping and entertainment.
- The health and safety benefits of Complete Streets are especially noteworthy. Every $1 spent on walking and bicycling facilities can yield between $5-$100 in benefits, depending on which benefits are counted.
- New York City is among the most ambitious US municipalities implementing walking, bicycling, and traffic safety improvements. In just over a decade, the city's crashes have dropped over 40%, to the lowest level in 100 years.

Complete Streets Policy

Adopting a Complete Streets policy is an important step.

- Various local standards, zoning requirements, and funding mechanisms discourage or even prohibit implementation of Complete Streets. To address these barriers, it is necessary to adopt policies establishing Complete Streets as a priority.
- Policies at the federal, state, and regional level encourage or require Complete Street investments. All of the professional transportation organizations, such as AASHTO and ITE have endorsed Complete Streets and context-sensitive design, in which the local context and the needs of affected stakeholders take precedence over road classification.
- Complete Street policies can be established in a variety of ways, but the most effective mechanism is through the Circulation Element of the General Plan. Where a General Plan update has been recently completed, a stand-alone Complete Street Policy or other mechanism can be used.
- An effective Complete Street policy sets a vision for the community's streets, includes all modes, applies broadly, emphasizes connectivity, manages exceptions, recognizes neighborhood context, establishes performance standards, and includes implementation steps.
- Two ways the General Plan can work against Complete Streets is by specifying roadway dimensions and Level of Service standards in the plan itself. It is recommended that broad goals for modal performance be specified, and that the plan identify which areas or corridors will emphasize which modes.

Level of Service and Complete Streets

Traffic delay concerns, especially Level of Service (LOS) standards, are often seen as a barrier to Complete Streets, but need not be:

- In the past, preserving LOS has lead to streets that are less safe or impractical for walking, bicycling, and transit use.
- Some cities (e.g., National City and San Jose) have designated districts, corridors, or intersections where walking, bicycling, and transit are prioritized, and further road expansion is prohibited. LOS F is considered acceptable in these locations.
- Vehicle LOS can be supplemented by use of Multi-Modal LOS (MMLOS) methodologies, one of which is included in the 2010 Highway Capacity Manual. MMLOS is not yet widely used, but is designed to compare the trade-offs in the service quality for each mode when considering alternative designs, and requires additional data collection.
- San Francisco is preparing to replace the LOS metric with "Auto Trips Generated," in order to incentivize developers to minimize new vehicle trips and to fund improvements for walking, bicycling, and transit. Other cities will likely follow suit if this system proves successful.
- The traditional planning paradigm assumes traffic will grow steadily with time, but traffic volumes in the U.S. have leveled off in the last 10 years, and both young adults and retiring Baby Boomers exhibit a strong preference for walkable, transit-accessible neighborhoods.

- Traffic planning also assumes traffic volumes are predictable based on land uses. However, evidence shows a large portion of trips are flexible, and traffic tends to equilibrate with available capacity. Therefore, it may make more sense to build streets serving all modes rather than trying to predict and meet vehicle traffic demand.
- Transportation Demand Management (TDM) methods are often overlooked, but can be far more cost-effective than capacity improvements. Comprehensive TDM strategies reliably provide 15% reductions in trips and parking demand, which can solve most peak hour congestion problems. Complete Streets complement TDM investments.

Complete Streets under CEQA

Meeting the requirements of the California Environmental Quality Act (CEQA) is another potential barrier to Complete Streets, but there are strategies to overcome this barrier:

- Complete Street projects which maintain the current right-of-way and modes served can qualify for a CEQA exemption. Examples can be found in San Marcos and La Mesa.
- CEQA delays for more extensive Complete Street retrofit projects can be minimized or avoided by adopting appropriate General Plan policies or a freestanding Complete Streets program which has itself undergone CEQA review.
- For development review, CEQA provides flexibility to local governments to establish their own significance thresholds, and to require project mitigation that improves walking, bicycling, or transit facilities rather than expanding roadway capacity for vehicles.
- The 2010 revisions to the State's CEQA Guidelines emphasizes consideration of project impacts on all transportation modes, rather than prioritizing vehicle flow over all other modes. The Project Checklist allows the use of transportation measures other than Level of Service, if a jurisdiction so chooses.

The Implementation Toolbox

Many new guidance documents and other tools are available to ease implementation of Complete Streets:

- Newly emerging planning tools include more effective multi-departmental planning processes, "living street" design guidelines, and a Complete Streets project checklist.
- Although new planning processes are proving invaluable to implement Complete Streets, the standard planning toolbox, from general plans to zoning and design guidelines, should also be employed.
- Newer street design manuals are becoming increasingly available to redesign streets to meet the needs of all users while meeting AASHTO and other conventional guidelines. "It's not in the manual" can now be replaced with "We really need to update our manual."
- Cities leading the way to Complete Streets have found that Five-Year Transportation Action Plans are an essential tool to maintain progress implementing a long-term transportation vision.
- Public involvement which includes all stakeholders in street design decisions is a cornerstone of the Context Sensitive Solutions approach championed by FHWA, AASHTO, and Caltrans, and helps ensure design decisions consider the needs of diverse community members.

Performance Measures

The use of performance measures is important in tracking progress implementing Complete Streets and other long-term transportation goals.

» The chosen measures should reflect the general plan or other important policy documents, including in the following areas:

- Economic Development
- Mode Shares
- Crashes
- Public Perception
- Pedestrian Facilities
- Bike Facilities
- Safety
- Environment

» Performance measures are meaningful only to the extent they are compiled in an annual report and distributed to city departments, to elected officials, and to the public. Annual progress reports are an excellent tool utilized by cities leading the way on Complete Streets implementation.

» Performance measures should be established at the community level, and for particular projects. Community stakeholders should be involved in establishing performance measures, particularly at the project level.

» Project-level performance measures may be a small subset of the community-level measures, but should meaningfully reflect project objectives, chosen with the input from the community.

Complete Street Treatments – Where? and What?

Prioritizing street segments for Complete Streets and choosing appropriate treatments are subjects that are beyond the scope of this report, but some useful approaches include as follows:

» Tools for selecting street segments for Complete Street treatments include the

» Pedestrian Composite GIS Model

» SANDAG's Healthy Communities Atlas

» SANDAG's Smart Growth Opportunities Areas, submitted by each jurisdiction

» Regional Bike Plan routes

» The Complete Streets Task Force estimates that, across the region, there are 1092 miles of street segments that may be good candidates for treatments. Of that total, 292 miles are in existing or planned Smart Growth Opportunity Areas.

» Potential treatments exist for high-speed arterials, lower classification arterials, neighborhood collectors, and residential streets.

» Some promising approaches are Multi-way Boulevards, road diets, traffic calming devices, various intersection treatments, buffered bike lanes, enhanced crosswalks, conversion of a small number of parking spaces to seating or bike corrals, new bicycle or pedestrian facilities, and "shared streets."

Overcoming Barriers to Complete Streets

State-wide and regional surveys of local transportation agency staff identified several barriers to Complete Street implementation. The full report provides potential solutions for each barrier.

- Inadequate funding
- Inconsistent city council direction
- Uncoordinated transportation implementation
- Initial public opposition
- Lagging acceptance of changing professional standards
- Lack of training in Complete Streets concepts
- Out-of-sync environmental priorities
- Suboptimal Complete Street implementation
- Under-appreciation of the multiple benefits of Complete Streets

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ABOUT THIS REPORT

Background and Purpose

The San Diego Complete Streets Task Force (Task Force) was initiated jointly by the San Diego Section of the American Planning Association and WalkSanDiego in 2011. The principal goal of the Task Force is to transform city and neighborhood streets throughout the region into an interconnected multi-modal network that (1) places safe and convenient walking, bicycling, and public transit access on a more equitable footing with motor vehicles, and (2) uses street design to foster community places worthy of admiration.

The mission of the Complete Streets Task Force is to promote the implementation of Complete Streets by sharing best practices, encouraging dialogue, and recognizing innovative projects in the San Diego region.

To that end this report has been prepared to equip local governments with the road map to successfully transform their communities with Complete Streets. The content is solely the responsibility of the authors, and not the American Planning Association.

Process and Assumptions

This report is a collaborative effort by local planners and traffic engineers who see the enormous potential in the Complete Streets concept and want to encourage the region's local governments to go beyond the minimum level of implementation effort required by State law. At the same time we acknowledge the need to help fit new concepts and methodologies into the existing planning, funding, and regulatory framework. The document is structured around five key assumptions:

- A city's streets are its largest landholding and one of its greatest assets. Complete Streets maximize the value of that asset.
- The way streets look and function should represent a community's vision of itself, not simply an opportunity to move vehicles. Cities need to regularly update their understanding of what the community values.
- When a street is being designed or retrofitted, representative user groups and partners in other departments or agencies should be thoroughly consulted. The Complete Streets approach is as much about the design process as the outcome.

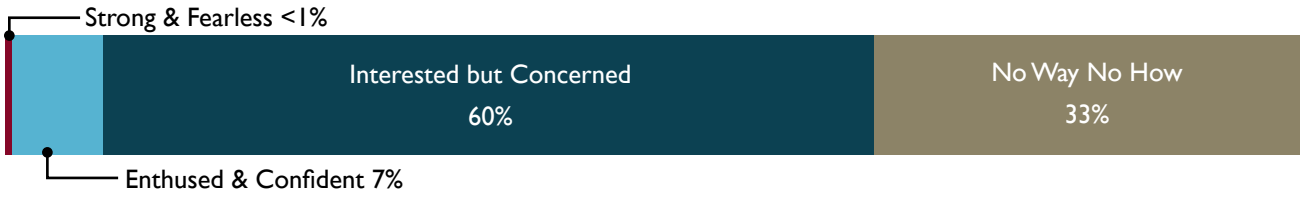
- Good street design must be combined with compatible land uses to take best advantage of a Complete Street treatment.
- Complete Streets help induce compatible land uses, but land use changes, by themselves, rarely induce Complete Streets.

Public Demand for Complete Streets

Local and national surveys and studies reveal a strong public preference for walkable neighborhoods and safe bicycling opportunities:[1]

- A 2010 survey of San Diegans found 79% of respondents support making neighborhoods more walkable as a greenhouse gas reduction strategy.[2]
- A study of mid-city San Diego neighborhoods commissioned by WalkSanDiego and The California Endowment found that during the 2007-2009 recession, home values in less walkable areas declined 17% whereas nearby homes in walkable locations declined 12%.[3]
- Nationally, homes in walkable neighborhoods command up to a 15% higher selling price than similar homes in less walkable neighborhoods, and a majority of Americans – particularly "Generation Y" and retiring Baby Boomers (the "Silver Tsunami") – would prefer to live in a walkable neighborhood.[4]
- The Portland, Oregon, Department of Transportation estimates that, counting current bicyclists, around 70% of residents would bicycle regularly for transportation if safe facilities were provided (see graphic). This number has been vetted nationally and most likely reflects the latent U.S. demand for better bicycling facilities.[5] Portland's 2030 Bike Plan is designed to serve the 60% of residents considered "interested but concerned" for their safety.

Figure 1. Four Types of Transportation Cyclists in Portland (by Proportion of Population)



- In a national survey conducted in May 2012, 80 percent of Republican respondents and 88 percent of Democratic respondents think Congress should maintain or increase federal funds for biking and walking.[6]
- The Alliance for Biking & Walking, a national support organization for local advocacy groups, reports[7] that since 1996, its membership has grown from 12 groups employing a combined 10 FTE staff, to 214 groups with 375 FTE staff. This represents a 1700% increase in groups and 5200% increase in combined staff.

Taken together, these data make a persuasive case that elected officials and agency staff who make Complete Streets a priority will receive strong support from residents and other stakeholders.

Questions Addressed by this Report

This report was organized to answer the "why" and "how" questions that usually arise when discussing the implementation of Complete Streets:

- Changing our jurisdiction's approach to streets will divert resources from other priorities. Is it really worth the trouble? (Chapter 2. One Solution, Many Benefits)
- Do we really need a Complete Streets policy? What are the options? (Chapter 3. Setting the Policy Direction)
- How can Complete Streets be implemented given the existing framework of Level of Service (LOS) standards? How can the city require developers to fund transportation improvements if we don't use LOS to document inadequacies? (Chapter 4. Level of Service Standards and Complete Streets)
- How can the costs, delays, and legal risks associated with CEQA (California Environmental Quality Act) be overcome? (Chapter 5. Complete Streets Under CEQA).
- Does a jurisdiction need a new set of policy documents, regulatory tools, and design guidelines? (Chapter 6. The Implementation Toolbox)
- How will we know when we've succeeded? How do we hold ourselves accountable? (Chapter 7. Measuring Progress)
- Which streets are good candidates for Complete Street treatments? (Chapter 8. Where to Begin)
- Even if we could afford another new program, how do we overcome the legal issues, uncertain Council and resident support, established engineering practice, and declining staffing levels? (Chapter 9. Overcoming Implementation Barriers). Hint: Complete Streets is not a "program," but rather a new way of meeting all transportation needs.

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ONE SOLUTION, MANY BENEFITS

Given today's fiscal realities, a new mantra for local governance might be:

"Every project should solve multiple issues and avoid creating new ones."

Transforming single-purpose roadways to Complete Streets fits well with this idea. Indeed, the Complete Streets concept emerged from the realization that roadway design meant to reduce traffic delays has had numerous unintended consequences with explicit or hidden costs. As the organization Project for Public Spaces[8] puts it:

- Congestion is rampant.
- Americans die on our roads at the rate of almost 3,000 a month.
- Parents are afraid to let their children walk down the streets.
- New communities have no soul.
- Obesity and its related diseases are rampant.
- Dependence on imported oil makes us vulnerable to the economics of oil price and climate change is not being sufficiently addressed.
- Furthermore, streets are no longer viewed as places, which is a huge loss given that streets can take up as much as one-third of a community's land.

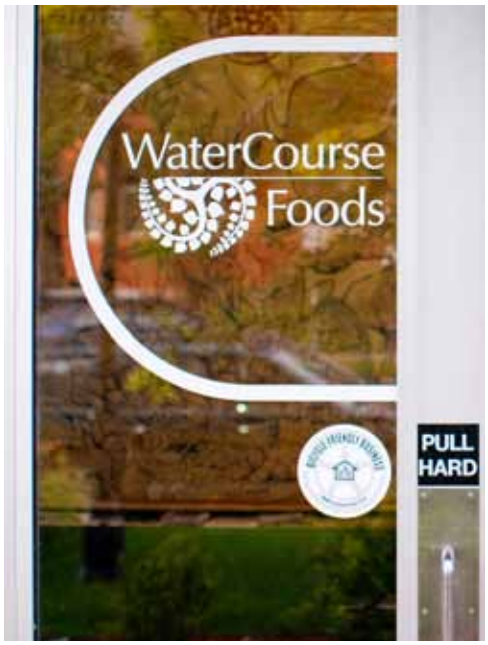
With these concerns in mind, designing streets to serve all users, in a sustainable manner, can have wide-ranging, comprehensive benefits.

Economic Development

Complete Streets represent a tangible public investment and commitment to stronger commercial centers and urban neighborhoods. Their contribution to place-making is essential and profound (see box for Lancaster, CA, example[9]). When combined with supportive zoning and increased land use efficiencies, Complete Streets create optimal conditions for infill development. Investment in Complete Streets is especially important for under-performing suburban corridors to redefine traditional auto dominance and catalyze economic growth.

Revitalizing commercial streets or raising residential property values through Complete Streets investments is a thoroughly proven strategy. Case studies can be found on the National Complete Streets Coalition website.[10] San Diego's most successful recent project, the transformation of La Jolla Boulevard in the Bird Rock area of La Jolla, is highlighted at the end of this chapter.

Commercial streets revitalized by Complete Street treatments can be promoted through community events, walking maps, Bike Friendly Business District[11] campaigns (see photo), and other promotions.



A Bicycle Friendly Business in Denver, CO
Photo: Kate At Yr Own Risk via Flickr

Fiscal Savings

Complete Streets cost less to build and maintain, and create more value in the long run because they serve non-drivers as well as drivers. Some examples are as follows: (Note that savings in avoided fuel use, crashes, healthcare costs, and other externalities are not included.)

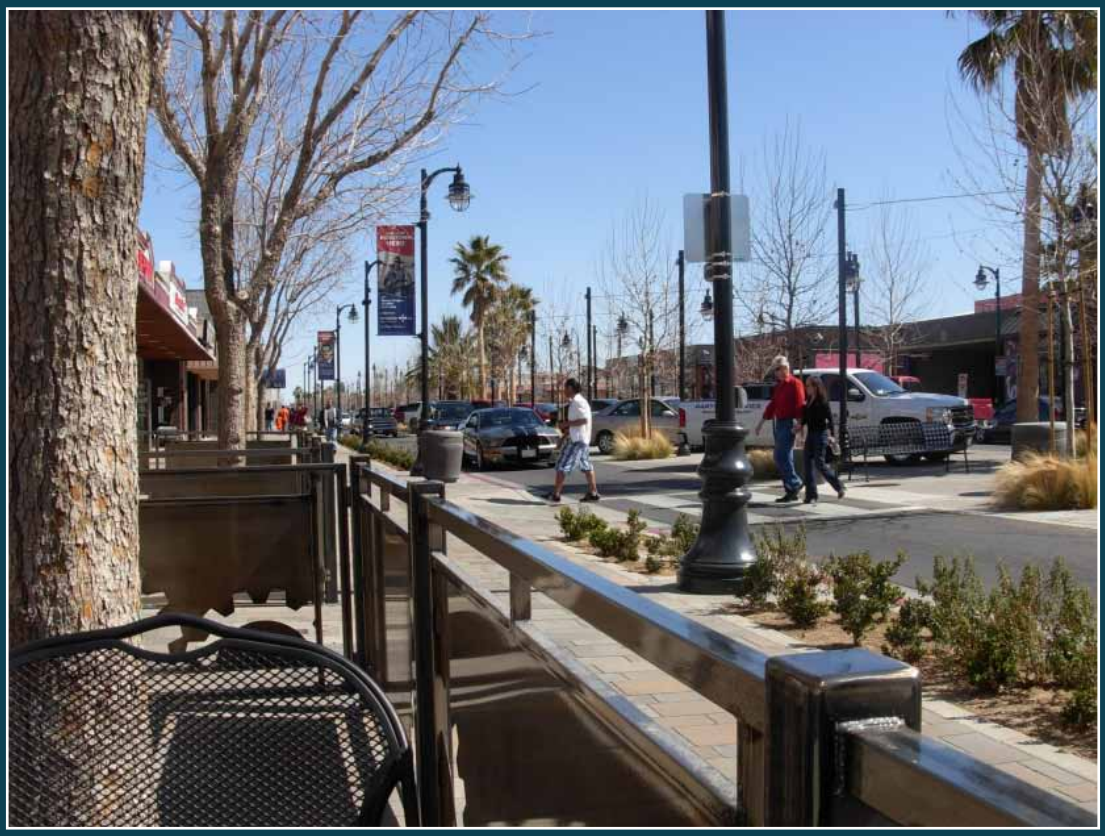
- In De Pere, Wisconsin, the county highway department saved $347,515 (16.5%) on construction of a major street by reducing the number of lanes from four to two, replacing two planned signals with roundabouts, and adding bicycle facilities.[12]
- In Lee County Florida, County staff looking for Complete Street candidates, saved $58.5 million by reprogramming five road widening projects approved in the 2035 Long Range Transportation Plan. Each was slated for four lanes, but was scaled back to two lanes with median and turn lanes, and cycling and walking facilities.[13]
- A study prepared by the City of Orlando found that re-striping Edgewater Drive from 4 lanes to 2 lanes, a center turn lane, and bicycle lanes reduced the frequency of crashes involving injuries from every nine days to once every 30 days while the number of people walking and bicycling rose 23% and 30% respectively.
- In Vancouver, Washington, Fourth Plain Boulevard was converted from four lanes with poor provisions for people walking, biking or in wheelchairs into a street with two through lanes, a center turn lane, two bicycle lanes, curb ramps and improved sidewalks. After this inexpensive treatment, vehicle collisions dropped 52%, and the number of pedestrian crashes dropped from two per year to zero.
- In 2012, the City of Carlsbad re-evaluated plans for a water line replacement and sidewalk construction project on Valley Street and Magnolia Avenue. To reduce vehicle speeds and avoid triggering expensive storm water treatment, staff found that narrowing the roadway from 40 to 34 feet would save the city over $78,000 and increase safety for everyone.[14] Future repaving costs would also be lower.

Health

By supporting active transportation, the Complete Streets approach is a key strategy to reduce chronic disease. According to the San Diego County Department of Health and Human Services, sedentary behavior is a primary or contributing cause of the top four chronic diseases in San Diego County: cancer, heart disease and stroke, type 2 diabetes, and pulmonary disease such as asthma. Considered together, these diseases cost $4 billion in direct treatment expenditures in San Diego County in 2007,[15] and a far greater total in indirect costs such as missed work days.

Complete Street Conversion Pays Off Big in Lancaster

The return on investment of a Complete Street treatment is dramatically illustrated by the nine-block redesign of 5-lane Lancaster Boulevard in Lancaster, CA. Prior to the project, the Boulevard was a blighted and crime-ridden business district. Within two years of the project's groundbreaking, the street and surrounding area were transformed into a vibrant regional destination for shopping, dining, entertainment and the arts. The economic development benefits during that period include: 1,100 construction jobs, 802 permanent commercial and retail jobs, 40 new businesses, and 807 new housing units constructed or rehabilitated. Project investments include $41 million by the Lancaster Redevelopment Agency ($11.1 million for the street improvements) and $107 million in private investment. Total economic output to date is estimated at $274 million with $13.3 million in state and local revenues.



The California Department of Public Health[16] estimated in 2011 that, for San Francisco, a shift in active transportation from a median of 4.4 to 22 minutes a day (2% to 15% mode share) would save $1.4 to $22 billion in annual health costs and add 9.5 months of life expectancy by reducing:

- Heart disease, stroke and diabetes by 14%
- Dementia and depression by 6-7%
- Breast and colon cancer by 5%

Health Savings

Research examining the health benefits of bicycling and walking point to the same conclusion: investments in active transportation pay enormous dividends. The literature suggests the largest share of benefits comes from the well-being and health outcomes associated with being physically active.[17]

- Lincoln, Nebraska: Every $1 spent on bicycle and pedestrian trails (including construction, maintenance, equipment, and travel) yields $2.94 in direct medical benefits.[18]
- Portland, Oregon: Every $1 invested in bicycling yields $3.40 in health care cost savings. When the statistical value of lives is considered, as is done for the evaluation of highway safety improvement projects, every $1 invested yields nearly $100 in benefits.[19]
- Kansas City: Every dollar invested in bicycle and pedestrian projects yields $11.80 in benefits, the greatest portion of which is the perceived health and recreation value of those biking and walking.[20]
- A summary of several studies in the U.S. and Europe found that every dollar invested in bicycle networks yields at least $4 to $5 in benefits, mostly related to health and safety.[21]

Safe Transportation for All

In the San Diego region, up to one-third of residents in low-income neighborhoods lack access to a car. This includes children, elderly and disabled residents, and those who cannot afford or choose not to own a car. Wide, high-volume streets are also more prevalent in low-income neighborhoods.[22] Not surprisingly, these residents suffer far higher rates of vehicle, bicycling, and walking injuries and fatalities. Thus, Complete Street treatments can often provide the greatest benefits in low-income neighborhoods.

Photo: Dan Burden via PedBike Image Library

Greater Accessibility

"Mobility" measures the ease of physical movement, whereas accessibility measures the ease of reaching goods, services, or activities. Too often, transportation planning focuses on increasing mobility – reducing vehicle congestion – when accessibility is what creates lasting economic value, quality of life, health, and equal opportunity. Complete Streets, combined with compact mixed uses, maximize accessibility for all members of society – and tax returns to the municipality – while reducing environmental impacts.

"Green" Trolley corridor, Photo: Jim Stone

E Street, Chula Vista – Before/After photo simulation by Urban Advantage courtesy of SANDAG[23]

Green Street Opportunities

Rebuilding a street for all users offers an opportunity to incorporate porous pavements, bioswales,[24] street trees, and other techniques that reduce heat load and pollution, and capture and treat stormwater on-site, rather than relying on the expensive and sometimes inadequate conveyance system. Some built examples Include as follows:[25]

- Seattle's Natural Drainage Projects saved an average of $329 per square foot.
- Chicago's Green Alleys Program was found to be 3 to 6 times more cost-effective handling storm water than conventional infrastructure.[26]
- Portland's Green Streets Program found that 80-85% of peak storm water flows could be managed on-site by two "green streets" it had installed, and at far lower cost than a conventional system.[27]

San Diego County's Low Impact Development Handbook is an excellent general resource for incorporating green street features. The Handbook notes:

> *Traffic circles, chicanes, chokers, and center islands, offer the opportunity for stormwater management through the use of bio-retention areas or infiltration within these areas while providing pedestrian safety. (p. 53)*

Traffic Capacity

An emerging literature of the past 20 years makes a compelling case that adding traffic capacity increases congestion (See Chapter 4) by attracting additional vehicle trips[28] and forcing more people to use their cars as roads become less safe and less pleasant for walking and bicycling. In short, widening roads may mean spinning our wheels and is not sustainable indefinitely. Conversely, street transformations such as Complete Street projects, road diets, and the conversion of signalized intersections to roundabouts have been found to allow the same traffic through-put, but at lower, safer, speeds, while providing new opportunities for walking, biking, and transit use (See box: Prospect Park West).

Photos: Ryan Snyder

Safety

The research of Dr. Eric Dumbaugh[29] and others,[30] shows that many of the engineering safety practices embodied in such authoritative sources as AASHTO's 2002 Roadside Design Guide are based on years of tradition, not necessarily strong evidence, and result in more, not fewer crashes than Complete Street designs. Urban standards that call for wide straight roads, wide lanes, infrequent intersections, and the removal of roadside objects, encourage speeding and result in a higher number of crashes.

A few transportation agencies are rethinking road standards in favor of Complete Street designs more in line with current safety evidence. New York City is leading the nation in innovative safety improvements for all street users. One result: bicycling trips increased 100% between 2007 and 2011. The city's focus on improved safety for bicyclists and pedestrians has especially benefited drivers. In 2011, the city recorded its lowest traffic fatality rate in 101 years of data collection, a 40% decrease since 2001.[31]

Noise

Studies show the human stress hormone cortisol rises with ambient noise.[32] Noise from traffic travelling at 50 mph can be ten times greater than at 25 mph. Indeed, traffic noise is one of the greatest impacts of high-volume roads on adjacent land uses. The remarkable Complete Street conversion of La Jolla Boulevard in the San Diego neighborhood of Bird Rock, discussed below, reduced traffic noise from about 60-70 dB(A) to 40 dB(A)[33]. Since noise is measured on a logarithmic scale, this represents at least a 100-fold decrease in noise level. This is one reason sidewalk cafes and strolling conversations are now a common sight in the area.

Prospect Park West: A Safer Street Serving More Trips

New York is leading the nation in innovative safety improvements for all street users. An example project is the Prospect Park West Traffic Calming/Bike Lane Project, which had the following benefits: (Photo: New York City Department of Transportation)

- Speeding decreased from 74% of drivers to 20%.
- Bicyclists riding on the sidewalk decreased from 46% to 3%.
- Weekday bicycle trips increased from 349 (June 2009) to 1,131 (August 2010).
- Children routinely accompany their parents on the bike lanes.
- Vehicle traffic peak volume was unchanged.
- Even with one traffic lane converted, counting cyclists, overall peak traffic increased.
- PM peak travel time through the corridor decreased by 4 seconds.
- Crashes were reduced 16%; injury crashes were reduced 62.5%.
- The pedestrian crossing distance, and thus traffic exposure, was reduced by half.

Case Study: La Jolla Boulevard– Bird Rock, San Diego

Each of the above benefits is reflected in the remaking of La Jolla Boulevard in the San Diego community of Bird Rock. For decades, this important street suffered from blight due to high speeds (38-42 mph), lack of safe pedestrian crossings, a shortage of parking, struggling businesses, and inadequate public space. After years of debate, several focus group sessions and various community workshops, the community settled on a plan to radically alter the boulevard using Complete Street concepts.

Changes included the development of five roundabouts, landscaped median islands 8–10 feet wide, pedestrian crossings and plazas, and diagonal parking on either side. Because of their efficiency at handling traffic, the roundabouts allowed the city to reduce the number of travel lanes from four to two. This reduces the pedestrian crossing distance substantially, resulting in less exposure to moving traffic.

The roundabouts reduced speeds to about 15-20 mph, substantially reducing both the number and severity of crashes. The reduction in lanes made space available for pedestrian seating and plazas, landscaped medians and other beautification treatments.

The accompanying reduction in traffic noise has been marked as one of the project's greatest benefits. Thriving businesses, sidewalk cafes, outdoor sales, and chance encounters with neighbors have made La Jolla Boulevard a community gathering place.

Landscaped roundabouts and medians combined with diagonal parking spaces create a village atmosphere that promotes more walking and better accommodates outdoor activities. The project triggered substantial revitalization of the adjacent businesses, and spurred a number of new developments, including a 139-unit condominium development, several new mixed use developments, and a major drugstore. Tax receipts from businesses spiked immediately after the reopening of the road.

Environment

The concept of sustainable communities is nearly meaningless without the provision of transportation choices beyond the personal automobile. Cities investing strategically in Complete Streets, such as Santa Monica, Vancouver, and Portland, find they can lower VMT and reduce criteria pollutants and greenhouse gas emissions from automobiles while providing a higher quality of life. Studies find that congestion, and emissions per vehicle trip and per capita, are lower in mixed use neighborhoods with many travel options.[34]

These beneficial effects align with SANDAG's Sustainable Community Strategy (SCS) which projects that most new housing units built in the region through 2050 will be multi-family, from luxury townhomes to affordable apartments. Greater reliance on alternative transportation, especially for short trips, supports and reinforces compact multi-family development patterns that lower total energy use for both space heating and transportation. Since many new housing units will be in designated Smart Growth Areas, it is imperative that cities plan now for Complete Streets in these areas, lest residents find walking and biking conditions too unwelcoming to adopt the transit-friendly lifestyle they will be offered. As discussed above, Complete Streets can also be built as green streets, with attendant on-site and downstream environmental benefits.

Conclusions

1. Designing streets primarily to reduce traffic delay has had numerous unintended consequences. Complete Streets treatments offer a way to keep traffic moving while providing for other modes and meeting other community values.
2. For the municipality, Complete Streets investments can increase tax collections and jobs, reduce road building and maintenance costs, reduce emergency response costs, and improve air and water quality.
3. "Green street" techniques such as bioswales and porous pavements can reduce the costs of constructing roads, managing stormwater, irrigating landscaped areas, and heating and cooling.
4. For the individual, Complete Streets provide cost effective health and mental health benefits, reduce transportation costs, provide safe travel for non-drivers, reduce all types of crashes, reduce noise-related stress, and create more opportunities for local shopping and entertainment.
5. The health and safety benefits of Complete Streets are especially noteworthy. Every $1 spent on walking and bicycling facilities can yield between $5-$100 in benefits, depending on which benefits are counted.
6. New York City is among the most ambitious US municipalities implementing walking, bicycling, and traffic safety improvements. In just over a decade, the city's crashes have dropped over 40%, to the lowest level in 100 years.

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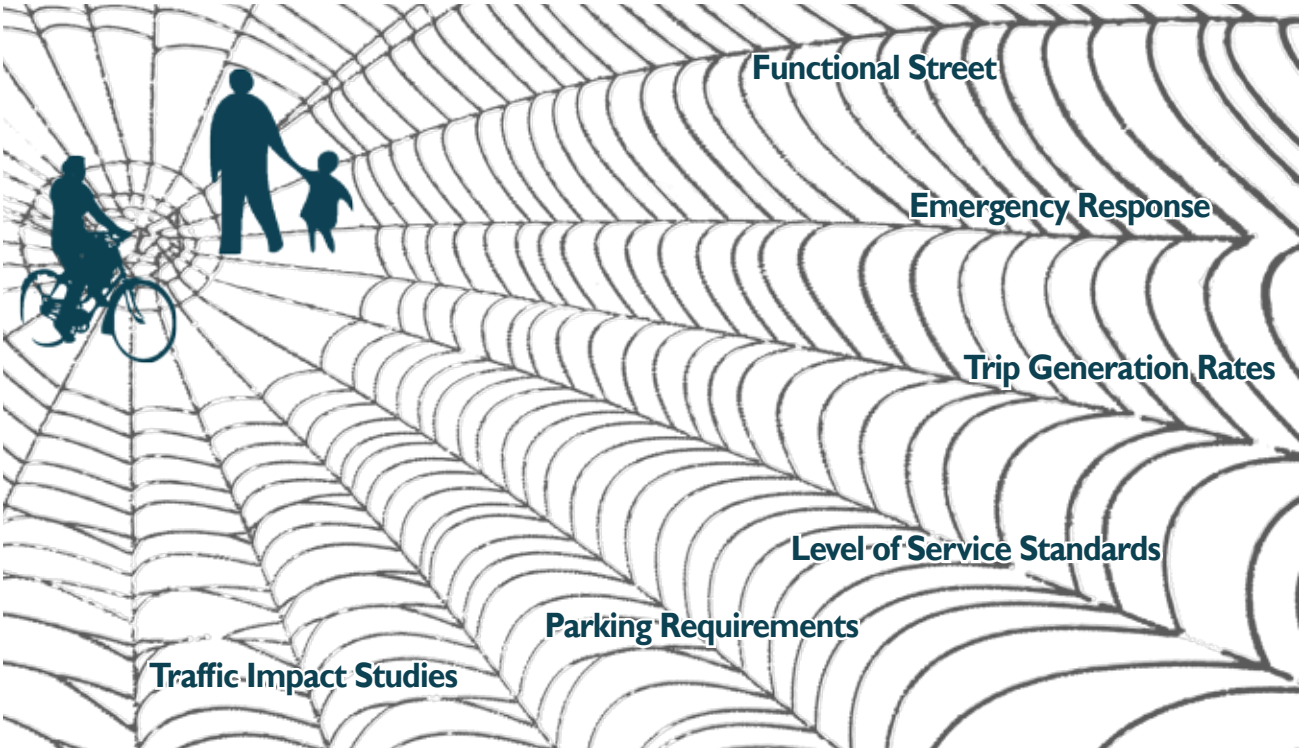
SETTING A POLICY DIRECTION

Why Adopt Complete Streets Policies?

At all levels of government, our current systems for planning, funding, implementing, operating, and maintaining transportation facilities are grounded in long-established policies, funding formulas, parking requirements, warrants, and guidelines (Figure 3-1). This entrenched policy web favors vehicle movement, with other street users considered only secondarily, and not with the research-based rigor we might hope for.

Any local government wishing to implement Complete Streets must therefore provide definitive policy direction, and reinforce it with staff training and changes in procedures, design guidelines, performance goals, and reporting mechanisms. As discussed in Chapter 4, clear policy direction also allows jurisdictions to avoid the "Level of Service straightjacket" imposed during CEQA review of new facilities and private developments.

Figure 3-1. Web of Auto-Oriented Planning Policies and Standards



Supportive State Policies

Adopting local Complete Street policies is more easily justified when corresponding State policies are in place. In California, state-level policy leadership promoting Complete Streets has been especially strong, in the form of new laws, guidance documents, and Caltrans policies, as follows (quoting actual language in each case):

The Complete Streets Act (AB1358)

The Complete Streets Act (2008) requires that,

> *Commencing January 1, 2011, upon any substantive revision of the circulation element, the legislative body shall modify the circulation element to plan for a balanced, multimodal transportation network that meets the needs of all users of streets, roads, and highways for safe and convenient travel in a manner that is suitable to the rural, suburban, or urban context of the general plan.*

Accordingly, every city in the region undergoing a General Plan update is now incorporating, to a greater or lesser degree, policies to provide safe accommodations for all users of the street. Jurisdictions, and their consultants, who fully understand the Complete Streets concept acknowledge within the General Plan that providing for all users is a new way of doing business, not simply an add-on program that competes with other departmental demands.

SB 97 CEQA and Greenhouse Gas Emissions

SB 97 (2007) directed the California Office of Planning and Research to revise the CEQA Guidelines to clarify how GHG emissions and their impacts should be addressed in the CEQA process. The eventual revisions, issued in March 2010, sought to redress the long-standing criticism that transportation impact analysis and mitigation has actually increased environmental impacts by focusing on the mitigation of traffic delay, which is not itself an environmental impact. The revisions emphasize the impact of a project on the circulation system as a whole, and on alternative modes in particular. The revised CEQA Guidelines are discussed further in Chapters 4 and 5.

Caltrans Deputy Directive, Complete Streets – Integrating the Transportation System, DD-64-R1[35]

This policy includes extensive discussion of the obligation and intention to provide a network of Complete Streets, including the necessity to break down departmental silos, revise manuals, and provide staff training:

> *Bicycle, pedestrian, and transit travel is facilitated by creating "complete streets" beginning early in system planning and continuing through project delivery and maintenance and operations. Developing a network of "complete streets" requires collaboration among all Department functional units and stakeholders to establish effective partnerships. (p. 1)*
>
> *[T]he Department and local agencies have the duty to provide for the safety and mobility needs of all who have legal access to the transportation system…To ensure successful implementation of "complete streets," manuals, guidance, and training will be updated and developed. (p. 2)*

Caltrans Director's Policy on Context Sensitive Solutions, DD#22

The intent of this policy is to move away from "one size fits all" road designs that ignore the context of a road segment, including demand for safe and convenient walking, biking, and transit. This is accomplished by (1) incorporating the viewpoints and needs of local stakeholders in all project phases, and (2) utilizing the flexibility in design afforded by primary guidance documents:

> *The Department's Highway Design Manual, Federal Highway Administration (FHWA) regulations, FHWA's Flexibility in Highway Design publication, and the American Association of State Highway Transportation Officials' A Policy on Geometric Design of Highways and Streets all share a philosophy that explicitly allows flexibility in applying design standards and approving exceptions to design standards where validated by applying sound engineering judgment. This design philosophy seeks transportation solutions that improve mobility and safety while complementing and enhancing community values and objectives. (p. 2)*

Regional Transportation Plan Guidelines (2010 Amendments)

The California Transportation Commission (CTC) approves regional transportation plans and projects. The Commission's guidelines for the preparation of Regional Transportation Plans were amended in 2010 to read, in part:

> *"MPOs and RTPAs should integrate Complete Streets policies into their Regional Transportation Plans, identify the financial resources necessary to accommodate such policies, and should consider accelerating programming for projects that retrofit existing roads to provide safe and convenient travel by all users.*
>
> *MPOs and RTPAs should encourage all jurisdictions and agencies within the region to ensure that their circulation elements and street and road standards, including planning, design, construction, operations, and maintenance procedures, address all users of the transportation system, to the extent practicable." (p. 24)*

Regional Policy Initiatives

SANDAG

In October 2011, the San Diego Association of Governments (SANDAG) adopted its first Sustainable Community Strategy (SCS) in conjunction with the 2050 Regional Transportation Plan (RTP). The SCS was required by SB375, a 2008 law that requires every California region to meet 2020 and 2035 targets for reductions in GHG emissions from cars and light trucks. The vision established by the SCS/RTP is "more sustainable, compact, well-designed communities interconnected by a transportation system that expands travel choices and reduces greenhouse gas emissions." Compared to previous RTPs, the 2050 RTP encompasses significantly more transit services and a 6-fold increase in funding for walking, bicycling, and traffic calming ("Active Transportation"). To support local efforts, SANDAG provides excellent, research-based resources[36] on planning for livable communities, including:

- Pedestrian design guidelines
- Smart growth design guidelines

- Parking strategies for smart growth areas
- Trip generation rates in smart growth areas
- A smart growth photo library
- Photo simulations of redeveloped/completed street scenes from around the region
- Transportation Demand Management implementation guidance
- The data-driven "Health Atlas" and other GIS tools

County Health Department

For the last several years, the San Diego County Department of Health and Human Services (HHSA) has brought significant attention to the role of infrastructure, neighborhood form, and other environmental issues in determining individual health outcomes. Among other efforts, HHSA teamed with SANDAG on the federally funded "Healthy Works" project, which in part brought a new health focus to the RTP/SCS, provided local health-related planning grants, and is establishing a network of high-tech pedestrian and bicycle counters to help measure progress.

Another and potentially powerful tool resulting from the Healthy Works collaboration is the creation of a large and unique set of GIS data layers that can reveal how environmental and social determinants of health are correlated with health outcomes (see Chapter 8). Still another aspect of this work is the piloting by SANDAG of Health Impact Assessments (HIA)on two infrastructure projects in the planning stage. The HIA is emerging as a potentially "game-changing" evaluation tool being pursued by planning departments nationwide, and by many California state agencies.

Air Pollution Control District

Pursuant to the California Clean Air Act, the APCD's Indirect Source Program has long provided technical assistance and comments to support smart growth and alternatives to automobile travel, which is the region's largest source of emissions. APCD published two advisory documents, Tools for Reducing Vehicle Trips Through Land Use Design and Slow Down! Taming Neighborhood Traffic, available upon request. Staff provides assistance to jurisdictions, developers, neighborhood organizations, business districts, and others regarding Complete Street policies and best practices in traffic calming, pedestrian and compact land use design.

The 10 Elements of an Ideal Complete Streets Policy

A Complete Streets policy can take many forms (Table 3-1). However, an effective policy must include several key components. In a 2010 report examining hundreds of Complete Streets policies, the National Complete Streets Coalition identified the best example policies of various types.[37] The report recommends the following elements be included in a Complete Streets policy:

1. Sets a vision.
2. Includes all modes.
3. Applies to both new and retrofit projects.

4. Emphasizes connectivity.
5. Applies to all phases of all applicable projects.
6. Specifies and limits exceptions, with management approval required.
7. Uses latest design guidelines, is flexible.
8. Is context-sensitive.
9. Sets performance standards.
10. Includes implementation steps.

Types of Complete Street Policies

Table 3-1 Pros and Cons of Various Policy Options

Policy Type	Pros	Cons
City Council Resolution	• Quick and easy, sets the vision	• Not comprehensive, may lack specificity and leave priorities, standards, procedures, and performance measures unchanged.
City Council Policy	• Can include most of the elements of an ideal policy.	• Possibly involves more steps, requiring longer preparation. • Not integrated with other policies with which it may conflict.
Ordinance	• Implements the vision and provides specific standards and procedures; has the force of law.	• More steps, requiring longer preparation. • May not have adequate policy support.
Tax Ordinance	• Provides the vision, relevant policies, and a funding source.	• May lack policy support. • Requires more public process since a public vote is required. • May be difficult to achieve (as part of a tax referendum) in a down economy.
Internal Policy	• Quicker implementation. • Required buy-in from affected agencies provides education opportunity across departments and disciplines.	• Not necessarily anchored in official policy. • May lack accountability mechanism such as performance measures and regular reports.

Policy Type	Pros	Cons
General Plan Policy	• Ideal policy vehicle for creating a Complete Street policy and exceptions to Level of Service. • The GP is the jurisdiction's "constitution". All other policies, zoning, and regulations must be consistent with the GP.	• General Plan amendments can require a lengthy process. • Must be followed up with specific implementation steps.
Street Design Manual	• Provides specific design guidelines allowing flexible options for complete street features.	• May lack necessary policy underpinning, including priorities, design flexibility, maintenance and operation details, performance measures, and a reporting requirement.
Pedestrian/Bike Plans	• Provide specific improvements and/or a framework for additional improvements.	• Tend not to provide guidance for balancing pedestrian or bicycle accommodations with those for other modes.
Focused Plans (Specific Plans, Corridor Plans, etc.)	• Tailored to a particular geographic area and population. • Provides a pilot to test ideas. • Successful strategies can be adapted to other projects, but may require a design- exception approval process.	• Limits applicability to a small area. • May lack some key elements that apply to a citywide policy, such as flexibility and accountability.

Once the Complete Street policy (or policies) is in place, it is important to ensure that related policies echo the Complete Street priorities. These may include street design requirements, traffic impact study guidelines, trip generation rates, parking requirements, and facility requirements for new development. Since this is a long-term effort, it is important to lay out how policy conflicts will be dealt with in the interim.

What *Not* to Include in a Complete Streets Policy

There are some policies that should not be included in a policy document governing community priorities, including road design and operation, for example:

» The Circulation Element of the General Plan should not specify roadway dimensions or the number of lanes for particular roads, since this may require a General Plan amendment should the community decide to reduce the number of lanes, revert to a lower classification, reduce speeds, narrow lanes, or otherwise provide for greater safety of all users.

» Most General Plans specify LOS C or D as a citywide standard while claiming a vision of expanded travel options for all. These two policies are difficult to reconcile, and may set the stage for later legal challenges. A specified LOS as the primary measure of transportation performance elevates traffic flow above all other community goals described in the General Plan, including traffic safety. A better approach is to map which areas or corridors will emphasize which modes. (These issues are explored further in the next chapter.)

With the emergence of Complete Streets as a significant planning imperative all over the country, alternative transportation metrics are evolving rapidly. Jurisdictions would be prudent to avoid stating explicit performance standards in the General Plan and other high-level planning documents, and instead establish multi-modal goals while retaining flexibility regarding how these will be attained, and how success is to be measured.

Conclusions

1. Various local standards, zoning requirements, and funding mechanisms discourage or even prohibit implementation of Complete Streets. To address these barriers, it is necessary to adopt policies establishing Complete Streets as a priority.
2. Policies at the federal, state, and regional level encourage or require Complete Street investments. All of the professional transportation organizations, such as AASHTO and ITE have endorsed Complete Streets and context-sensitive design, in which the local context and the needs of affected stakeholders take precedence over road classification.
3. Complete Street policies can be established in a variety of ways, but the most effective mechanism is through the Circulation Element of the General Plan. Where a General Plan update has been recently completed, a stand-alone Complete Street Policy or other mechanism can be used.
4. An effective Complete Street policy sets a vision for the community's streets, includes all modes, applies broadly, emphasizes connectivity, manages exceptions, recognizes neighborhood context, establishes performance standards, and includes implementation steps.
5. Two ways the General Plan can work against Complete Streets is by specifying roadway dimensions and Level of Service standards in the plan itself. It is recommended that broad goals for modal performance be specified, and that the plan identify which areas or corridors will emphasize which modes.

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4

L.O.S. STANDARDS AND COMPLETE STREETS

Level of Service Standards – A Barrier to Complete Streets?

Traffic flow has historically been analyzed using the vehicle Level of Service (LOS) metric, from A (free-flow) to F (stop and go). All jurisdictions in the San Diego region have established an LOS standard of C or D (E in downtowns), which routinely triggers roadway and intersection widening to reduce current or projected peak hour vehicle trips. LOS has been an important barrier to accommodating non-motorized modes and transit (since most transit riders are also walkers). Traffic engineer Gary Toth, a 34-year veteran of the New Jersey Department of Transportation, has written,

> *[I]n search of high LOS rankings, transportation professionals have widened streets, added lanes, removed on-street parking, limited crosswalks, and deployed other inappropriate strategies. In ridding our communities of the weeds of congestion, we have also pulled out the very plants that made our "gardens" worthwhile in the first place.*[38]

Follow the Money

The LOS rating mechanism provides legal leverage for a jurisdiction to demand traffic mitigation funds from developers during project entitlement. Even cities interested in Complete Streets are understandably reluctant to give up the LOS-based funding mechanism, grounded as it is in decades of technical validation, legal precedents, and simple logic. Yet, some cities in California and elsewhere have begun rethinking the application of LOS standards, and requiring developer funding of pedestrian, bicycle, and transit improvements instead of more travel lanes.

Alternatives to LOS

Strategic Relaxation of LOS

Some cities have designated in the General Plan or other governing document certain intersections, corridors, or districts where LOS standards will be lower or will not apply at all (Table 4-1). These are typically areas where expanding traffic capacity would unduly harm neighborhood character, undermine pedestrian comfort in a highly walkable zone, or compromise other community values.

Table 4-1 L.O.S. Relaxation Examples

City	Target Area	Alternative Method
San Jose, CA	• Downtown • Transit corridors • Neighborhood business districts	• "Protected Intersections" cannot be expanded • Projects impacting them must fund walk/bike/transit improvements
National City, CA[39]	• City-wide	• Designated "Community Corridors" (Complete Street avenues) cannot be widened
San Diego, CA	• Downtown	• LOS lowered from D to E, but improvements to LOS F streets may not endanger pedestrians
Lancaster, CA	• Lancaster Blvd.	• LOS lowered from D to E
Sacramento, CA[40]	• Downtown Core Area Multi-Modal Districts	• LOS lowered from D to F; impacts require enhancements to non-auto travel modes
Portland, OR	• Central Portland, including Downtown	• LOS F acceptable at peak hours
Vancouver, BC	• Downtown and West End	• No LOS applied. Capacity expansions prohibited.

Multi-Modal Metrics

At this writing, there were a number of road performance metrics available as an enhancement, supplement, or replacement of LOS (Table 4-2). While the array of tools may seem daunting, they are all based on similar approaches and research results. Cities are encouraged to experiment with these tools in their next road planning effort, and consider adapting one or more for future projects.

Example: MMLOS from the 2010 HCM

As an illustration of a multi-modal metric, the 2010 update of the ubiquitous Highway Capacity Manual includes a MMLOS methodology for quantifying trade-offs between service quality for vehicles, transit vehicles, bicycling, and walking when considering alternative designs. As with most of the other new metrics, the walk/bike computations are based on research that identified key factors (Table 4-3) affecting the decision to walk or bicycle on a particular street. The disadvantages of this method are that it is not yet widely tested, it requires additional data collection, not all important factors may be quantifiable (and are thus excluded), and it retains some of the flaws inherent in reliance on vehicle LOS.

Table 4-2 Matrix of Roadway Performance Metrics

Method	Method Type	Modes			
		AUTO	TRANSIT	BICYCLE	PEDESTRIAN
Pedestrian Environmental Quality Index	Checklist, Computational				●
Bicycle Environment Quality Index	Checklist, Computational			●	
Charlotte MMLOS	Other			●	●
Florida DOT MMLOS	Computational	●	●	●	●
HCM 2010 MMLOS	Computational	●	●	●	●
Fort Collins MMLOS	Checklist, Computational	●	●	●	●
Person Delay	Computational	●	●	●	●
Layered Networks	Other	●	●	●	●
Auto Trips Generated	Other	●	●	●	●

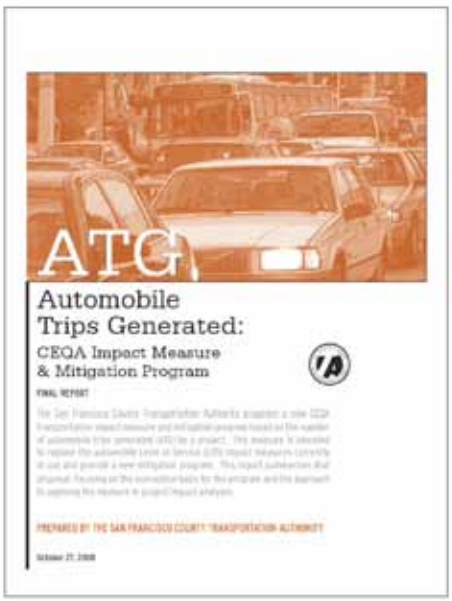
Adapted from Ronald T. Milam, Fehr and Peers, 2012. See online resource, MMLOS Toolkit.[41]

Table 4-3. MM LOS Factors for Calculating Pedestrian and Bicycle Level of Service (2010 HCM)

Pedestrian Level of Service Factors	Bicycle Level of Service Factors
Link Factor • Outside travel lane width (+) • Bicycle lane/shoulder width (+) • Buffer presence (e.g., on-street parking, street trees) (+) • Sidewalk presence and width (+) • Volume and speed of motor vehicle traffic in outside lane (-)	Link Factor • Volume and speed of traffic in outside travel lane (-) • Heavy vehicle percentage (-) • Pavement condition (+) • Bicycle lane presence (+) • Bicycle lane, shoulder, and outside lane widths (+) • On-street parking presence and utilization (+/-)
Intersection Factor • Permitted left turn and right-turn-on-red volumes (-) • Cross-street motor vehicle volumes and speeds (-) • Crossing length (-) • Average pedestrian delay (-) • Right-turn channelizing island presence (+)	Intersection Factor - Signalized • Width of outside through lane and bicycle lane (+) • Cross-street width (-) • Motor vehicle traffic volume in the outside lane (-)
Roadway Crossing Difficulty Factor (if mid-block crossing is allowed)	Driveways and Unsignalized Intersections per Mile

Auto Trips Generated

In 2003, the San Francisco Municipal Transit Agency (SFMTA) determined that the use of LOS to measure and mitigate transportation impacts from new development was resulting in infrastructure changes that were contrary to its long-standing Transit First Policy.[42] The city analyzed alternative options and settled on the simple metric, Auto Trips Generated (ATG). Development projects must demonstrate compatibility with the Transit First Policy and pay a mitigation fee for each new vehicle trip generated, thus creating a strong incentive to minimize trips. The collected fees will be applied to transportation performance improvements, either site-specific or city-wide, with all modes eligible. At this writing, the city is conducting a Nexus Study to establish the fee amount.[43]



LOS and CEQA – A Failed Marriage?

The ATG metric represents a significant departure from the customary assumption that traffic delay represents a "physical impact to the environment" – a fundamental requirement of CEQA. The SFMTA's study of alternative traffic metrics determined that LOS (traffic delay) is a measure of motorist convenience – a social impact – rather than an environmental impact. Indeed, agencies are within their rights to remove the LOS analysis from the CEQA umbrella. Traffic studies may still be needed to determine traffic-related physical impacts, namely conventional pollutants and GHGs, but LOS alone is a poor predictor of emissions. Mitigation of ATG via multimodal improvements addresses the direct air quality impacts, not the social benefit of reducing congestion, and is thus more in line with CEQA's purpose.

Evidence presented in this report suggests improvements to non-vehicular travel promise to alleviate traffic congestion more effectively than traditional LOS mitigations but in an environmentally responsible way. Nevertheless, SFMTA staff report they fully expect to be sued following replacement of LOS with ATG, but welcome the opportunity to set a legal precedent. California jurisdictions wishing to reduce the influence of LOS should follow the progress of the SFMTA's ATG adoption process.

Is Traffic Congestion Inevitable?

The conventional traffic planning paradigm assumes that traffic volumes grow steadily, based on traffic generation rates for each land use, and that failure to plan for them will lead to gridlock. However, studies of both road widening and road removal suggest that traffic demand is largely flexible, and equilibrates with the supply provided, rather than being a fixed number based on population or land uses.[44]

Induced Travel and Disappearing Traffic

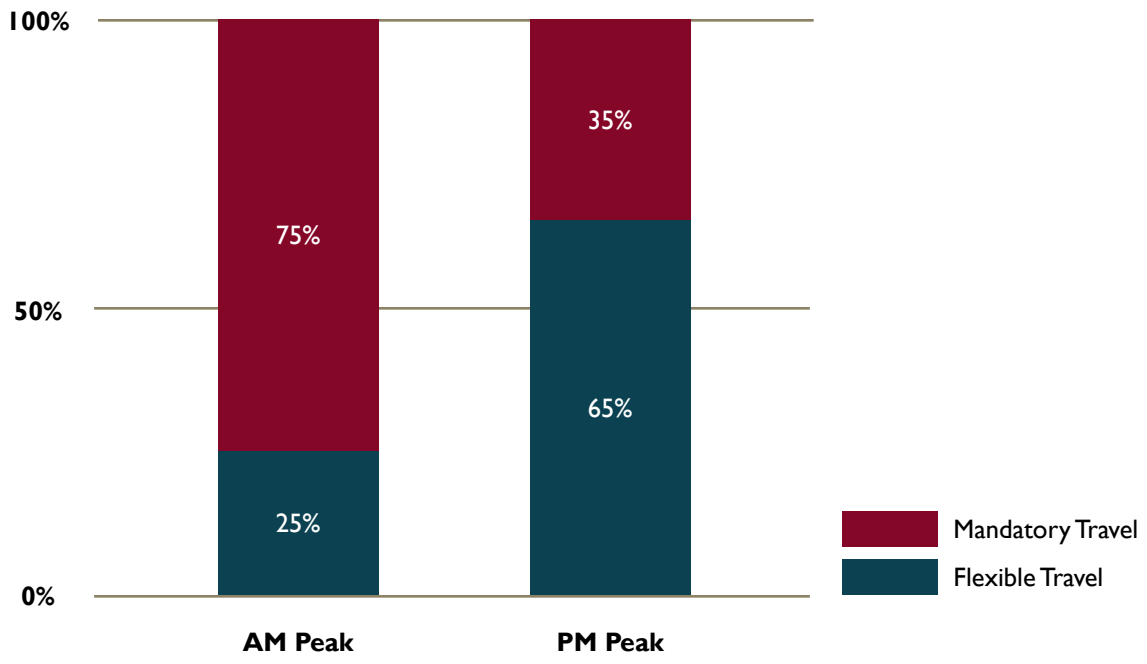
Two traffic demand phenomena have been studied: (1) the "induced travel" effect, in which far more drivers than predicted by a traffic model head for a new or expanded roadway, and (2) "disappearing traffic," wherein modeled gridlock or diversion of traffic to other roads following the removal of a key roadway fails to occur as predicted. A study of induced traffic in California showed that 60-90% of new roadway capacity is filled by new traffic within five years,[45] primarily from existing travelers switching modes or routes to the new or expanded facilities.

Similarly, a study of 60 roadway removal cases worldwide showed that around 16-25% of traffic simply disappears.[46] Surveys of the "disappeared" drivers show they switched to a different mode, changed travel times or destinations, or decided not to take the trip at all. These cases suggest that drivers exercise a larger degree of flexibility regarding when, how, and whether to travel than current traffic models assume.

Mandatory vs. Flexible Travel

Vehicle trips can be categorized as either mandatory (work or school related) or flexible (shopping, dining, visiting friends, etc.). Data from the National Highway Travel Survey show that on weekdays, morning peak trips are comprised of 75% mandatory and 25% flexible trips (Figure 4-1). By contrast, 65% of afternoon peak trips are flexible.[47] Thus, maintaining peak LOS in every location may not be necessary in order to accommodate travel needs, and in fact may be a poor use of public resources.

Figure 4-1. Weekday Vehicle Travel



Driving Declines

The New York Times recently reported,[48]

> *In 2008, 46.3 percent of potential drivers 19 years old and younger had drivers' licenses, compared with 64.4 percent in 1998, according to the Federal Highway Administration, and drivers ages 21 to 30 drove 12 percent fewer miles in 2009 than they did in 1995.*

Both young adults[49] and retirees show a majority preference for dense, lively neighborhoods built for walking, bicycling, and transit. Retirees are trading large-lot suburban homes for close-in walkable neighborhoods, partly for the opportunities, and partly in anticipation of outliving their ability to drive. The result of these choices, coupled with rising gas prices, will sooner or later show up in reduced or stabilizing traffic volumes in the San Diego region as it has in other regions.[50]

TDM – Efficient, Affordable and Largely Untapped

Over the four decades of their use, Transportation Demand Management (TDM) strategies have often proven to be far more cost-effective than expanding road capacity, while avoiding the undesirable impacts. TDM consists of measures to make the existing transportation system more efficient, partly by reducing drive-alone trips and shifting trips to off-peak hours.

A new volume addressing the subject, Sustainable Transportation Planning: Tools for Creating Vibrant, Healthy, and Resilient Communities,[51] states that a comprehensive set of TDM measures can realistically cut traffic and parking demand by more than 15%. Some recommended strategies are as follows:

- Employer-Based Transit Pass Subsidies reduced auto commuting by 24% in Bellevue, Washington, and by 16% in Santa Clara, California. Mountain View has required some new developments to provide free passes to all employees.
- Employee Parking Cash-Out Programs (providing cash in lieu of a parking space) have decreased parking demand an average of 27%, including 26% in transit-poor areas. (California law requires parking cash-out for certain employers of 50+ employees, and cities and counties may enforce the law, as of January 1, 2010.)
- Requiring Unbundling Parking Costs from Rent, which consists of charging for parking separately from residential or commercial rents, reduces parking demand 10-20% (and reduces trips). It also spares non-drivers from subsidizing others' parking spaces, and makes the parking cost more visible. Unbundling parking costs can be required in development standards.
- Development Requirements for Providing Bicycle Facilities such as showers, lockers, and secure bike parking. The American Planning Association's Bicycle Facility Planning guidance[52] recommends providing bike parking equivalent to 5-10% of auto parking spaces, depending on the use.
- Promoting Market Mechanisms to make the cost of driving more visible. These include car-sharing, pay-as-you-drive (PAYD) insurance, paid parking, and others. PAYD insurance is now available from at least three insurance companies operating in California.

Complete Streets complement TDM programs. For example, the recently concluded federal Non-motorized Transportation Pilot Program, which provided funding for four communities to improve walking and biking infrastructure and to conduct encouragement activities, found PM peak bicycling increased 49% and walking increased 22% over four years.[53] Most of these trips were made for meeting daily needs, displacing vehicle trips.

In 2012, SANDAG published a TDM manual highlighting best practices and successful strategies: Integrating Transportation Demand Management Into the Planning and Development Process: A Reference for Cities. The report will be available on SANDAG's website.

Traffic Congestion as a Planning Tool

The authors of Sustainable Transportation Planning argue that some degree of traffic congestion is inevitable, and that most successful cities locate their congestion bottlenecks strategically. Two examples worth noting are:

- In its 1997 Transportation Plan, Vancouver allowed traffic to reach saturation in areas where the city prioritized urban design and the convenience and safety of other modes (i.e., Complete Streets) above traffic flow. Despite dramatic growth in population and employment, the number of vehicle trips into and within Downtown Vancouver and adjacent neighborhoods has decreased over time.
- Santa Monica's 2010 Circulation Element[54] update concluded that it could best manage its traffic by allowing congested intersections at the edges of the community to remain congested, effectively "metering" traffic entering the heart of the community.

Jurisdictions are of course free to maintain roadway capacity such that every vehicle trip is accommodated everywhere, at all times. However, as discussed in previous chapters, it is important to consider what is lost in the way of safety, noise, aesthetics, public health outcomes, small businesses, and other quality of life factors. The current planning paradigm does not ensure these trade-offs are considered when LOS standards are adopted or renewed. Factoring in trade-offs occurs only when a jurisdiction takes it upon itself to embark in a new policy direction.

Conclusions

1. Vehicle Level of Service (LOS) is often a barrier to implementing Complete Streets, and leads to streets that are less safe or impractical for walking, bicycling, and transit use.
2. Some cities (e.g., National City and San Jose) have designated districts, corridors, or intersections where walking, bicycling, and transit are prioritized, and further road expansion is prohibited. LOS F is considered acceptable in these locations.
3. Vehicle LOS can be supplemented by use of Multi-Modal LOS (MMLOS) methodologies, one of which is included in the 2010 Highway Capacity Manual. MMLOS is not yet widely used, but is designed to compare the trade-offs in the service quality for each mode when considering alternative designs, and requires additional data collection.
4. San Francisco is preparing to replace the LOS metric with "Auto Trips Generated," in order to incentivize developers to minimize new vehicle trips and to fund improvements for walking, bicycling, and transit. Other cities will likely follow suit if this system proves successful.
5. The traditional planning paradigm assumes traffic will grow steadily with time, but traffic volumes in the U.S. have leveled off in the last 10 years, and both young adults and retiring Baby Boomers exhibit a strong preference for walkable, transit-accessible neighborhoods.
6. Traffic planning also assumes traffic volumes are predictable based on land uses. However, evidence shows a large portion of trips are flexible, and traffic tends to equilibrate with available capacity. Therefore, it may make more sense to build streets serving all modes rather than trying to predict and meet vehicle traffic demand.
7. Transportation Demand Management (TDM) methods are often overlooked, but can be far more cost-effective than capacity improvements. Comprehensive TDM strategies reliably provide 15% reductions in trips and parking demand, which can solve most peak hour congestion problems. Complete Streets complement TDM investments.

5

COMPLETE STREETS UNDER CEQA

The California Environment Quality Act (CEQA) requires state, local, and other agencies to evaluate and disclose the environmental impacts of their actions, and to mitigate these impacts to the extent possible. Environmental review is often expensive, lengthy, and provides a convenient target for litigation. By including traffic congestion as an environmental impact – something the CEQA statute does not require – it also traps traffic planners/engineers in a vicious cycle of widening roads to accommodate vehicle trips, which in turn induces more people to use cars. In this way, CEQA can be a roadblock, or a lengthy detour, to implementing Complete Streets. There are strategies available to overcome the CEQA barrier.

CEQA Guideline Revisions

In response to Senate Bill 97 (2007), the California Natural Resources Agency amended the CEQA Guidelines in March 2010 to include analysis and mitigation of greenhouse gas emissions (motor vehicles being the largest source), as well as potential negative impacts of traffic mitigation on bicyclists, pedestrians, and the environment. As the Agency stated,

> *"[E]vidence…indicates mitigation of traffic congestion may lead to even greater environmental impacts than might result from congestion itself.*[55]

Revisions to the CEQA Environmental Checklist Form[56] included the following changes to the Transportation/Traffic section.

Table 5-1 Revisions to the CEQA Environmental Checklist Form

Previous Language	Replaced With
Would the project: (a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	Would the project: (a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

Previous Language	Replaced With
Would the project: b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	Would the project: b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?
Would the project: f) Result in inadequate parking capacity?	(Parking provision deleted.)
Would the project: g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	Would the project: f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

Significantly, the CEQA Checklist revisions allow the use of transportation performance measures other than LOS (Chapter 4), instead emphasizing performance of the system as a whole. Additionally, consideration of a project's impacts on all modes is emphasized, while consideration of parking supply is eliminated entirely. (See Chapter 4.)

Reducing Unnecessary CEQA Costs and Delays

Complete Street projects can greatly improve the urban environment (Chapter 2), including pedestrian and motorist safety, land use, aesthetics, air quality, greenhouse gas emissions, and noise, and are initiated by cities for this purpose. Yet, CEQA Checklist threshold criteria can trigger environmental review, including mitigated negative declarations and full environmental impact reports, particularly for larger projects. Because of the threat of lawsuits, many cities spend considerable sums on environmental documentation, sometimes in excess of the project's actual cost.

How can locally-initiated Complete Street projects be implemented without unnecessary costs and delays due to CEQA review? Several options are available:

A Good Plan

Roadway and other infrastructure projects must conform to the General Plan and any other guiding documents. Many CEQA issues arise because the governing planning document was not internally consistent or not specific enough. If a document states that pedestrian and bicycle access take precedence over LOS considerations in a certain area of town, the CEQA document can cite and rely on this directive.

Clear Project Goals

Prior to the start of a major street project, the jurisdiction should invite stakeholders to help establish a clear set of project priorities and goals, which the City Council may then be asked to bless. If this step is taken, the CEQA process can cite project priorities established by the jurisdiction. In this way, declaring "overriding considerations" of any environmental impacts are easily explained and justified.

Categorical Exemption

Many Complete Street projects meet CEQA exemption criteria,[57] particularly if the total right-of-way width and facility uses will remain the same (per Section 15301(1)(c)). Local examples include Rock Springs Road in San Marcos and Allison Avenue in La Mesa (see photos). Re-striping projects (per Section 15282(j)) are also exempt. Whenever relying on an exemption, especially a common sense exemption, it is good practice to draft a memo for the file documenting how the conclusion that the project was exempt was reached. In addition, project sponsors should file a notice of exemption after approval of the project in order to trigger the applicable statute of limitations.

Rock Springs Road, San Marcos
Photo: City of San Marcos

Allison Avenue, La Mesa
Photo: City of La Mesa

Amend Local CEQA Thresholds

Local jurisdictions may raise the threshold criteria for determining when Mitigated Negative Declarations and Environmental Impact Reports are required for street improvements. This can best be done through the process of adopting a comprehensive Complete Streets Policy (Chapter 3).

Ministerial versus Discretionary Permits

Cities are given wide latitude to establish what project types are ministerial (allowed by right) and which require discretionary permits. Within highly urbanized areas, the potential environmental impacts of the two are often not much different. Thus, cities that want to encourage infill development can avoid unnecessary CEQA review by establishing under which circumstances permits will be ministerial, reducing the number of discretionary categories. More specifically, cities can eliminate requirements for conditional use permits for mixed-use developments and reduce the number of planned or special district permits. The use of form-based codes can also provide certainty to the city or residents while avoiding discretionary reviews.

17th Street Pedestrian Plaza, San Francisco

Inspired by New York City's conversions of excess pavement into plazas, residents of San Francisco's Castro district sought a similar treatment at the 17th & Castro transit stop. Partly to reassure skeptics, the project started as a completely reversible, low-budget pilot project. Sidewalk extensions and sitting areas were painted onto the pavement, and inexpensive concrete planters served as protective bollards. Once in place, the reclaimed pedestrian areas were immediately embraced by the neighborhood, demonstrating pent up demand. Residents partnered with the city to install more substantial planters, street furniture, and landscaping. The result was rapid implementation and a genuine sense of community investment and ownership.

Photos: Steven Kyle Weller via stevenkyleweller.com

Tiering from a Programmatic EIR

Complete Street programs can be described and undergo CEQA review as a stand-alone "project," or as part of a General Plan update. In this way, Complete Street conversions can avoid project by project CEQA review by referring to a programmatic EIR, so long as each project is consistent with the described program elements. This means the General Plan or Community Plan update process is an excellent opportunity to establish Complete Street goals and objectives which may then justify implementation without requiring the delay and cost of project-level CEQA review. For example, National City[58] adopted a general plan update and related documents which incorporated Complete Street plans, all of which underwent CEQA review.

Exempt Pilot Projects

In a two-year period, New York City was able, without environmental reviews, to complete dozens of Complete Street projects, including dedicating half the width of some streets to cycle tracks and converting other streets entirely to pedestrian plazas. This was done by treating these projects as pilot projects. The CEQA statute does not explicitly recognize pilot projects, but this avenue should be explored in individual cases. By definition, a pilot project is a temporary installation that is reversible if evaluation shows the goals of the project are not met. In no case has New York found it necessary to remove fairly dramatic Complete Street conversions, since motorists quickly adjusted to the changes, and residents embraced the new facilities created.

Statutory Exemption

In the long term, it may be appropriate for the California legislature to amend CEQA to statutorily exempt Complete Street projects if certain conditions are met, in the same way that safety projects included in the Regional Transportation Improvement Program are exempt from federal air quality conformity analysis. The State has shown periodic interest in CEQA streamlining for compact developments requiring less driving.

Form-Based Code

Form-Based Codes (FBC) are development requirements or options focusing on form rather than uses. FBCs, discussed more fully in Chapter 6, replace or overlay conventional zoning, in a particular district, corridor or citywide. FBCs can specify or suggest street dimensions and features as well. Examples include the Lancaster (Blvd) Specific Plan,[59] the Beach and Edinger Corridor Specific Plan in Huntington Beach,[60] and two corridor plans in the City of Ventura, the Midtown Corridor[61] and the Victoria Avenue Corridor.[62]

La Boheme, a mixed-use, infill project, 30th Street, San Diego
Photo: Greg Konar

Streamlining for Transit-Oriented Development (TOD)

SB 375, which is designed to promote compact infill development offers CEQA permit streamlining for transit priority projects located within half-mile of transit. While the premise behind transit priority projects is sound, it is generally acknowledged by local planning experts that the qualifying criteria are too limiting and the incentives too weak to interest developers. At this writing, the State's Office of Planning and Research is conducting rulemaking to implement CEQA streamlining provisions for infill development as mandated by SB 226 (2011).[63] Complete Street projects may be included as an element of a TOD.

Conclusions

1. Local governments interested in Complete Streets frequently struggle with CEQA, or the perceived barrier CEQA represents, when retrofitting a street to serve all users, or when reviewing private developments that will impact traffic.
2. Complete Street projects which maintain the current right-of-way and modes served can qualify for a CEQA exemption. Examples can be found in San Marcos and La Mesa.
3. CEQA delays for more extensive Complete Street retrofit projects can be minimized or avoided by adopting appropriate General Plan policies or a freestanding Complete Streets program which has itself undergone CEQA review.

4. For development review, CEQA provides flexibility to local governments to establish their own significance thresholds, and to require project mitigation that improves walking, bicycling, or transit facilities rather than expanding roadway capacity for vehicles.
5. The 2010 revisions to the State's CEQA Guidelines emphasizes consideration of project impacts on all transportation modes, rather than prioritizing vehicle flow over all other modes. The Project Checklist allows the use of transportation measures other than Level of Service, if a jurisdiction so chooses.

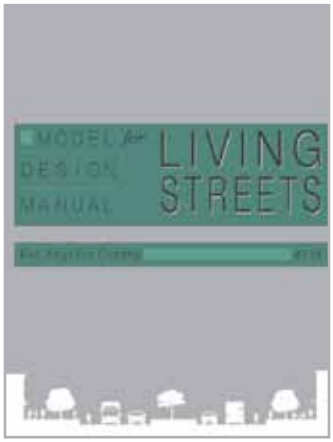
THE IMPLEMENTATION TOOLBOX

Design Guidance for Complete Streets

Although local governments may legally develop and test their own design standards, very few have the resources to do so. Therefore, a frequent question concerning Complete Streets is whether the concept is compatible with state, federal or professional traffic design guidelines. The following are recommended design resources, with deviations from current design guidelines as noted:

Model Design Manual for Living Streets

Ryan Snyder Associates & UCLA School of Public Affairs, Luskin Center for Innovation, 2011.[64]



This manual is a significant resource all cities should examine whether or not they are interested in providing Complete Streets. The Living Streets manual is a comprehensive treatment on Complete Street design techniques that specifically fit within the parameters of existing traffic engineering "bibles" (AASHTO,[65] MUTCD, HDM, etc.). The manual includes legal standing of street manuals, performance measures, street networks and classifications, traveled way design, intersection design, universal pedestrian access, pedestrian crossings, bikeway design, transit accommodations, traffic calming, the streetscape ecosystem, place-making for streets, designing land use around streets, retrofitting suburban streets, and community engagement.

Designing Walkable Urban Thoroughfares: A Context Sensitive Approach

Institute of Transportation Engineers & Congress for New Urbanism, 2010[66]

This path breaking guide is a collaborative report by ITE and the Congress for the New Urbanism which provides guidance on how Context Sensitive Solutions principles can be employed in the process of planning and developing walkable urban thoroughfares. ITE's involvement in the document lends legitimacy to the CSS approach, describing it as compatible with the flexibility that is inherent in the AASHTO "Green Book" (Policy on Geometric Design of Highways and Streets).

NACTO Urban Bikeway Design Guide

National Association of City Transportation Officials (updated continuously)[67]

The NACTO Urban Design Bikeway Guide is an online resource designed to provide cities with state-of-the-practice bicycling facilities. While each design has been tested in an American city, some designs have not been approved for inclusion in the requisite engineering bibles. Indeed, this resource was created specifically to support more rapid approval of proven, innovative designs. U.S. Secretary of Transportation Ray LaHood has endorsed the NACTO guide and many U.S. cities are actively using it.

Main Streets: Flexibility in Design and Operations

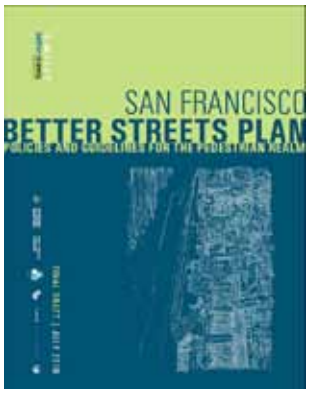
Caltrans 2005[68]

This is a concise booklet emphasizing Caltrans's commitment to make state highways that also happen to be local main streets more livable. The booklet identifies context sensitive solutions and livable community concepts that can assist communities and Caltrans in balancing community values with concerns for safe and efficient operations for travelers, pedestrians, bicyclists, transit users, and highway workers.

Leading Complete Street Guidelines, Plans and Programs

The following are leading examples of guidelines, plans, or program documents that reflect Complete Street principles.

City of San Francisco Better Streets Plan (2010)[69]



The Better Streets Plan provides a unified set of standards, guidelines, and implementation strategies for building and maintaining San Francisco's pedestrian environment. It carries out the intent of San Francisco's Better Streets Policy which requires best management practices in environmental planning and pedestrian oriented, multi-modal street design, and incorporation of sustainable water management techniques. The Better Streets Plan strongly emphasizes collaboration between City agencies to comprehensively plan for streets.

NYC Sustainable Streets Strategic Plan (2008) and Progress Report (2009)[70]

These two resources comprise a detailed transportation plan with clear goals and implementing actions that set a new direction in transportation policy for the City of New York. The plan contains benchmarks and performance standards that were used to evaluate progress in the 2009 Progress Report. The strategic plan underpins the impressive transformation of New York's streets during the past several years.

NYC Street Design Manual (2009)[71]

An outgrowth of the Sustainable Streets Strategic Plan, the NYC Street Design Manual is a leading example of a context sensitive street design manual for a large city.

Ada County Highway District Livable Street Design Guide (2009)[72]

One of the first comprehensive street design manuals to embrace the concept of livability and the potential for street design to change the character of existing areas, the Ada County manual also employs context sensitive street classifications.

Downtown Lancaster Specific Plan (2008)[73]

The Downtown Lancaster Specific Plan is a good example of how a specific plan can be used to coordinate Complete Street improvements with form based code zoning. The highly successful Lancaster "BLVD" project fulfills the plan's vision for the Boulevard District, one of seven in the downtown area. The plan also illustrates how potential conflicts with LOS standards can be resolved at the plan level.

City of Charlotte Urban Street Design Guidelines (2007)[74]

The USDG is an excellent example of street design guidelines intended to create Complete Streets on a city-wide basis. The guidelines are keyed to new context sensitive street types that overlay traditional functional classifications.

Sacramento Council of Governments Complete Street Resource Toolkit[75]

The toolkit is an online collection of useful resources related to Complete Streets, and part of the Sacramento Area's Council of Government's (SACOG) Complete Streets technical assistance program. The Caltrans-funded toolkit is funded through a Caltrans grant, and is continually maintained and updated through user input.

Moving Beyond Prevailing Street Design Standards: Assessing Legal and Liability Barriers to More Efficient Street Design and Function[76]

This paper clarifies the legal standing of prevailing road design guidelines, and discusses how cities can avoid legal liability when using road design techniques inconsistent with prevailing guidelines.

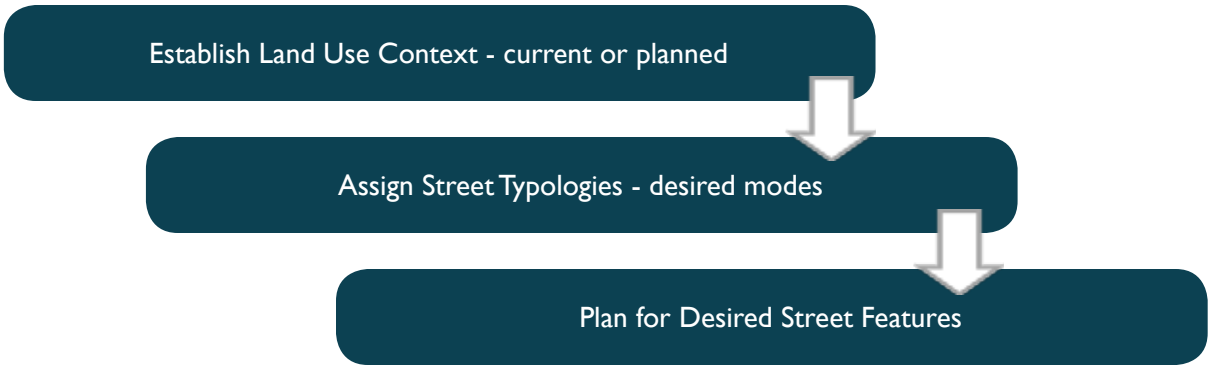
National Complete Streets Coalition Website[77]

A one-stop online source for Complete Street information including facts, fundamentals, resources, policy and advocacy support.

Context-Sensitive Implementation and Assessment Tool

This section describes a context sensitive implementation approach that can help cities move beyond current regulatory barriers to more rapid deployment of Complete Streets programs. As shown in Figure 6-1, the process involves acknowledging the current or future land use context in each area and then planning for streets that will support the desired context. This process aims to avoid the mismatch between street design decisions and desired land uses – for example building a wide boulevard to accommodate traffic through a neighborhood Main Street area, thereby degrading the qualities that draw traffic there.

Figure 6-1. Context-Sensitive Planning Process for Complete Streets



Context is the Key

Context Sensitive Solutions (CSS) is a Federal Highway Administration initiative[78] embraced by both AASHTO and Caltrans.[79] CSS is "a collaborative, interdisciplinary approach that involves all stakeholders in providing a transportation facility that fits its setting." In short, CSS aims to avoid the "one size fits all" street design approach that necessitated the Complete Streets concept in the first place.

Street Typology versus Functional Classification

For decades, a street's functional classification has been assigned based on whether it serves local or more regional traffic, and its traffic volume. Finer distinctions about the local land use character on a given segment of the street have been given less consideration. In addition, federal incentives have long favored choosing the highest possible classification.[80] These circumstances have led to dangerous situations, for example, transit passengers accessing a bus stop on a regional arterial must interact with high-speed, high-volume traffic, with tragic results.[81] On such streets, bicycling and walking have been neglected as legitimate modes of travel on a neighborhood-serving street.

The implementation of context sensitive Complete Street programs is still evolving and cities have taken a variety of approaches. The methods documented in Designing Walkable Urban Thoroughfares: A Context Sensitive Approach and further articulated in the Model Design Manual for Living Streets (both discussed above) can be customized to meet local needs and are compatible with the most advanced corridor and land use planning tools. Both documents recommend reclassifying all streets using customized, context-sensitive typology, rather than the traditional functional classifications (Table 6-1 provides an example). This approach is especially important in addressing the needs of specialized streets such as main streets, drives, transit malls, bike boulevards, festival streets, and shared space streets.

Street Typology Examples

The City of Charlotte, North Carolina, uses six context-sensitive street typologies: Main Streets, Avenues, Boulevards, Parkways, and Local Streets.[82] Similarly, the City of San Marcos introduced street typologies in its updated General Plan, mixing new typologies with more traditional classifications: Multi-Way Boulevard, Arterial, Arterial with Enhanced Bike/Pedestrian Facilities, Freeway, Collectors, Bicycle/Pedestrian Trails, Neighborhood Streets, Industrial Collectors, and Main

Table 6-1. Common Context-Sensitive Street Typologies for Urbanized Areas (ITE/CNU)

Street Type	Role	Characteristics
"Boulevard" (conventionally arterials)	Traverses and connects districts and cities; primarily a longer distance route for all vehicles including transit.	Designed for high vehicle capacity and moderate speed, traversing an urbanized area. Boulevards serve as primary transit routes and should include bike lanes and safe pedestrian access to transit stops. They may be equipped with dedicated bus lanes or side access lanes buffering sidewalks and buildings. Many boulevards also have landscaped medians.
"Avenue" (conventionally collectors)	Traverses and connects districts, links street with boulevards. For all vehicles including transit.	Designed for moderate to high vehicular capacity and low to moderate speed acting as a short distance connector between urban centers and may be equipped with a landscaped median.
"Street" (conventionally local street)	Serves neighborhoods, connects to adjoining neighborhoods; serves local function for vehicles and transit.	A local, multi-modal facility suitable for all urbanized zones, frontages, and land uses. A street is urban in character, with raised curbs (except where curbless treatments are designed), drainage inlets, wide sidewalks, parallel parking, and trees in individual or continuous planters aligned in an alley. Character may vary in response to the commercial or residential uses lining the street.
Alley/Lane	Link between streets; allows access to garages.	A narrow street, often without sidewalks. Alleys and lanes connect streets and can provide access to the backs of buildings and garages.

Street. The City of New York, whose context is more heavily weighted toward its dense urban setting, employs five context-sensitive street typologies: General Street, Boulevard, Slow Street, Transit Street, and Pedestrian-Only Street. Once a street or portion of a street is classified as a certain street type, the street design should reflect that classification and future land use decisions along the street should also reflect that classification.

Reclassifying streets around typologies shifts the focus from capacity and traffic flow to context and the full functioning of the street. In this approach, project planning, project review, and environmental documentation must account for how a private development or infrastructure improvement project supports or detracts from the broader functionality of the street. It also shifts the focus from Level of Service, whether vehicular or multi-model LOS, to qualitative standards that consider how the street contributes to the community. That is the objective.

The functional street classifications will remain to the extent required by State law. But the goal is to move entirely toward a context-sensitive street classification system. Once the streets are reclassified, the next step is to identify the potential and need for context sensitive/Complete Street retrofit. This is discussed further in Chapter 8.

More Effective Planning Tools

In addition to using context-sensitive street typologies, leading cities implementing comprehensive Complete Street Programs have adopted two additional tools: five-year Transportation Action Plans and more inclusive public participation.

Five-Year Action Plans

As a bridge between the long-term vision (general plan) and annual budget (Capital Improvement Program), a mid-term plan seems necessary to make steady progress implementing transformational change. WalkSanDiego's study[83] of successful Complete Street programs around the nation found that most utilize five-year Transportation Action Plans, usually supplemented by an annual update or "report card" (discussed in the next chapter). Example plans include:

- Charlotte's Five-Year Transportation Action Plan[84]
- New York City's (Five-Year) Pedestrian Safety Action Plan[85]
- Seattle's (Five-Year) Strategic Transportation Plan[86]
- Redmond, Washington's Transportation Master Plan and Five Year Transportation Status Report[87]
- Boulder's Transportation Master Plan (updated every five years)

Five-year action plans allow elected officials, city staff, and participating stakeholders to avoid the temptation to focus only on immediate issues, and instead to think strategically about what specific data-gathering and investments will be needed to implement the community's transportation vision.

Project Checklist

With the realization that street design affects so much more than traffic flow, leading Complete Streets programs have been successful in part because they endeavored to break down silos between city departments. In addition to regular meetings between departments, some cities have instituted a Project Checklist that is circulated for a sign-off from each interested department when street designs are in process. The best known example comes from the City of Seattle.[88] Metropolitan Planning Organizations also use project checklists to ensure funding for street improvements adhere to Complete Street goals. Examples include the Bay Area's Metropolitan Transportation Commission,[89] and the Mid-Ohio Regional Planning Commission.[90]

Inclusive Public Participation

As emphasized in the Key Assumptions of this report (Chapter 1), building Complete Streets is as much about the design process as the outcome. Cities such as Charlotte and Portland have placed great emphasis on involving all types of users in the design of streets. For example, Charlotte's six-step design process[91] is based on three underlying assumptions:

1. The process will involve a variety of stakeholders. The number of stakeholders and discussions will vary, depending on the magnitude and consequences of the street(s) to be designed.

2. The resulting street will be as "complete" a street as possible, in order to meet the multimodal objectives defined in the Transportation Action Plan.

3. The steps in the decision-making process will be well-documented. The documentation will clearly describe the major trade-offs made among competing design elements, how those were discussed and weighed against each other, and the preliminary and final outcomes. Thorough documentation will ensure that all stakeholders' perspectives are adequately considered in the final design.

The National Complete Streets Coalition is documenting the economic and financial advantages of Complete Streets, including the cost savings involved in designing for all users.[92] Involving stakeholders – especially traditionally absent voices – early and often in the design process can improve the final design, avoid costly delays, and prevent expensive retrofits later.

The Sacramento-based Local Government Commission (www.lgc.org) is updating its best practices report for public consultation aimed at working with stakeholders to implement better-functioning communities, including Complete Streets. Look for this manual in 2013.

The Standard Land Use Planning Toolbox

For long-term success implementing Complete Streets, the planning processes and documents familiar to local government staff and elected officials should be utilized.

General Plan

General Plans are State-required planning policy documents[93] that typically include both a vision for the community and plans for particular improvements. By law, General Plans must undergo CEQA review, thus smoothing the way for their implementation. A General Plan update is therefore the ideal opportunity for making a long-term commitment to Complete Streets (see Chapter 3). Some of the ways various cities have done so are as follows:

- The Complete Streets Act AB1358 (2008) requires updated General Plan Circulation Elements to "plan for a balanced, multimodal transportation network." Some cities have taken this to heart, reworking both the process and priorities for designing or retrofitting streets.
- Recognizing that land use and street design act in concert to create a safe and inviting environment for all modes, some cities (e.g., Chula Vista) have **combined the Land Use and Circulation Elements** into a single element. The intent is to restructure these elements around the enormous contribution that Complete Streets and other design issues can play in revitalizing neighborhoods and communities.
- General Plans can call for **Corridor Plans** and **Specific Plans** focusing on targeted transformation areas (e.g., National City). Such plans may include tailored design and development guidelines and overlaid zoning. In these situations, street design should be the main policy focus and the land use coordinated to support it.

» In the City of San Diego and the County, officially adopted **Community Plans** are an opportunity to work with local stakeholders on establishing targets and design approaches for future Complete Street treatments, per policy language and goals established in the General Plan.

Bicycle and Pedestrian Master Plans

These plans are an extension of General Plan policy and a bridge to Complete Streets implementation, but are usually project-focused rather than policy and context-centered. Since most bicycle and pedestrian master plans in the San Diego region continue the conventional approach of minimizing impacts on vehicle traffic, they may augment, but are not a substitute for a comprehensive Complete Street policy or plan.

Zoning Code

Conventional zoning codes emphasize land use and density, height, setbacks, parking and related regulations but often neglect the street interface. Mixed-use and Transit Oriented Development (TOD) overlay zones, and other specialized zoning have been used to enhance the development/street interface and are very compatible with Complete Street concept plans. Design guidelines may also be used in conjunction with conventional zoning codes.

Form-Based Codes

Form-Based Codes (FBC) are a specialized type of zoning that emphasizes building types and their relationship to the street rather than land use and density. Permitted uses are specified, but densities typically are not. Mixed-use is encouraged. The greater control over the appearance of buildings and the ability to establish a consistent street wall makes FBCs an ideal choice for main street applications and to compliment Complete Street corridor transformations. The Cities of Miami[94] and El Paso[95] have recently adopted comprehensive FBCs to ensure more effective planning decisions and better design, including Complete Streets.

FBCs may also be used in conjunction with Specific Plans. Because the regulations are highly prescriptive and implemented through ministerial permits, FBCs are not typically used with design guidelines. They also require more effort to develop which can limit their application to relatively few areas within a city. **Hybrid Form Based Codes** are essentially zoning codes which have areas of both form based zoning and conventional zoning. This is the most likely application scenario for form-based codes in cities with limited resources or a low tolerance for political risk.

Other Implementing Ordinances

Ordinances such as the subdivision ordinance or public works codes are also used by jurisdictions to govern the uses and development standards of the built environment within a City/County that affect the design of streets. The Street Design Guidelines are generally included within this regulatory category.

Design Manuals

Design Manuals may be developed for certain areas, i.e., a particular corridor, or may apply city-wide. Complete Streets principles can be incorporated in design manuals pertaining to street design, streetscape/frontage/landscape requirements, or bicycle or pedestrian facilities.

Case Study: National City

National City is one of the San Diego region's often over-looked and under-estimated cities located immediately south of Downtown San Diego along San Diego Bay. It has long been a low-income, ethnically diverse, and heavily industrialized pocket within the region. In January 2012, the City completed a comprehensive planning process,[96] from setting an ambitious vision, to creating policy and developing zoning regulations, to the programming components including a General Plan update, Climate Action Plan, specific plans, and Capital Improvement Program implementation. Through this effort the City focused on becoming a model for sustainability, smart growth and equity – and to complete its streets in the process. Key aspects of the program are:

- Integration of sustainability, health and environmental justice considerations throughout the planning process.
- Plans for construction of over 6,000 units of high-density housing in close proximity to two light rail transit stations.
- Designation of Complete Street community corridors throughout the City.
- Conversion of 10 unneeded street blocks into pocket parks dispersed throughout the city.
- Restoration of three miles of Paradise Creek, and construction of a creekside trail.
- Development of neighborhood gardens and local farmers' markets to emphasize healthy food in all of the city's neighborhoods.
- Amortization of industrial uses within residential neighborhoods, and new standards for industrial hygiene to enhance resident health.
- Coordination of these efforts with SANDAG's regional planning efforts under SB 375 to expedite processing future transit-priority projects.

Conclusions

1. Complete Streets implementation can be made easier by adopting newly emerging planning tools: more effective multi-departmental planning processes, "living street" design guidelines, and a Complete Streets project checklist.
2. Although new planning processes are proving invaluable to implement Complete Streets, the standard planning toolbox, from general plans to zoning and design guidelines, should also be employed.
3. Newer street design manuals are becoming increasingly available to redesign streets to meet the needs of all users while meeting AASHTO and other conventional guidelines. "It's not in the manual" can now be replaced with "We really need to update our manual."
4. Cities leading the way to Complete Streets have found that Five-Year Transportation Action Plans are an essential tool to maintain progress implementing a long-term transportation vision.
5. Public involvement which includes all stakeholders in street design decisions is a cornerstone of the Context Sensitive Solutions approach championed by FHWA, AASHTO, and Caltrans, and helps ensure design decisions consider the needs of diverse community members.

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MEASURING PROGRESS

Purpose of Performance Measures

While the General Plan and other long-range plans may include transportation goals, these documents are easily forgotten when it comes to executing a particular project, responding to a constituent issue, or creating the annual capital improvement budget. Performance measures are an important tool for pairing good planning intentions with the everyday work of providing transportation facilities and services.

Annual Performance Reports

Performance measures should reflect the jurisdiction's long-term goals for Complete Streets and other transportation priorities. However, they are useful only to the extent they are carefully tracked and distributed among departments, to the public, and to elected officials to ensure progress. Noteworthy examples include:

- New York City's Sustainable Streets Progress Report[97] and the Citywide Performance Reporting System[98]
- Redmond, Washington's Annual Mobility Report Card[99]
- Charlotte's Transportation Action Plan Annual Report[100]

Recommended Performance Measures

Performance measures discussed in this section are recommended for tracking progress toward meeting Complete Streets goals, for both a single project and at the community or network level. The metrics chosen should be meaningful to professionals, citizens, and elected officials so that all can be conversant in assessing how well community objectives are being met. Elected leaders also find annual progress reports to be useful in communicating with constituents, creating the annual city budget, establishing departmental priorities, and holding staff accountable.

Goals and performance measures are suggested below in the following areas:

- Economic Development
- Mode Shares
- Crashes
- Public Perception
- Pedestrian Facilities
- Bike Facilities
- Safety
- Environment

Project Measures – Before and After Construction

At the project-level, performance measures help focus the design of a project to meet transportation policy goals and ensure the needs of all users are met, or are at least balanced to the extent possible. Since project designers cannot possibly anticipate the needs of all users of a street, community stakeholders should be involved in establishing project-level performance measures for all significant projects. The following measures are recommended for Complete Street projects in both the before and after conditions:

- Average vehicle speed
- Number of pedestrian crashes
- Pedestrian counts at representative locations
- Bicycle counts at representative locations
- Percentage of people surveyed who feel safe using non-motorized modes
- Noise level at the sidewalk edge
- Total sales tax collections for affected street segments
- On-street parking use

Community or Network Measures

Performance measures at the community or network level should reflect policy goals from the General Plan, Circulation Element, Pedestrian or Bicycle Plan, or other publicly-vetted policy document. It is important to recognize that goals are value-based. For example, vehicle Level of Service standards favor vehicle through-put over all other considerations. The community may or may not share this value. In fact, surveys consistently suggest most do not. For this reason, the public and any especially affected stakeholders should be involved in establishing transportation goals, and then in crafting performance measures that will quantify progress toward meeting them.

The following should be considered for performance measures for the community or circulation network as a whole:

Economic Development

- Total sales tax collections
- Sales tax collections for key businesses or market segments such as "locally-owned"
- Mode share of Home-to-shop and Work-to-shop trips
- Percent of businesses easily accessible on foot or by bike

Travel Mode

- Pedestrian trips (representative sample taken at the same locations over a number of years)
- Bicycle trips

- Transit trips
- Vehicle trips

Crashes

- Pedestrian injuries per pedestrian trip
- Pedestrian fatalities per pedestrian trip
- Bicyclist injuries per bicycle trip
- Bicyclist fatalities per bicycle trip
- Motor vehicle occupant injuries
- Motor vehicle occupant fatalities
- Property damage
- Number of hotspot locations (crash clusters)
- Percent reduction in crashes (pedestrian, bike, and/or vehicle) at top-15 crash locations

Public Perception

- Percent of people surveyed who feel safe using non-motorized modes on arterial streets
- Percent of parents who feel comfortable allowing their children to walk or bike to school or to use city streets on the weekend, unaccompanied by an adult

Pedestrian Facilities

- Percent of sidewalk mileage in good condition
- Percent of signalized intersections with marked crosswalks
- Percent of signalized intersections with one or more of the following: countdown signals, leading pedestrian intervals, bulb-outs, or pedestrian refuge islands
- Percent of uncontrolled crosswalks that are marked consistent with federal guidelines
- Percent of unsignalized 4-way (multilane) intersections along urban arterials with marked crosswalks and one or more of the following: HAWK signal, yield to pedestrian signage, user-activated overhead warning lights, pavement flashers, rapid flash beacons, or equally effective treatment
- Percent of required curb ramps installed

Bike Facilities

- Percent of urban arterial mileage with dedicated bike lane/trail
- Percent of intersections with one or more of the following bicycle improvements: bike box, painted bicycle lane through the intersection, bicycle signal, functioning bicycle loop detectors, bicycle left turn lane

Safety

- Percent of urban arterials on which the 85th percentile driving speed is no greater than 25 mph
- Miles of lane reductions (road diets)
- Number of driveway cuts per mile on urban arterials

Environment

- Percent of urban arterial mileage designed to reduce environmental impacts through "green street" principles.

Conclusions

1. The use of performance measures is important in tracking progress implementing Complete Streets and other long-term transportation goals. The chosen measures should reflect the general plan or other important policy documents.
2. Performance measures are meaningful only to the extent they are compiled in an annual report and distributed to city departments, to elected officials, and to the public. Annual progress reports are an excellent tool utilized by cities leading the way on Complete Streets implementation.
3. Performance measures should be established at the community level, and for particular projects. Community stakeholders should be involved in establishing performance measures, particularly at the project level.
4. Project-level performance measures may be a small subset of the community-level measures, but should meaningfully reflect project objectives, chosen with the input from the community.

8

COMPLETE STREET TREATMENTS

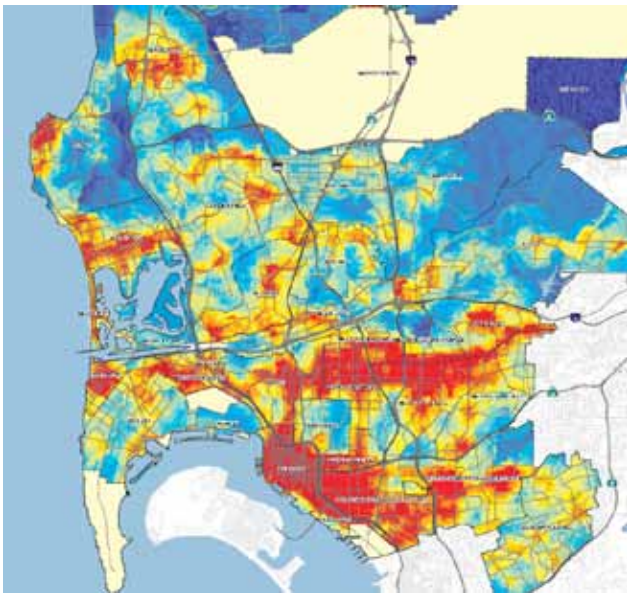
Once a jurisdiction embarks on the Complete Street approach, it must answer the questions of "Where?" and "What?" Although these questions are beyond the scope of this report, this chapter provides some hints on where to start.

Selecting Streets for Complete Street Treatments

Complete Street treatments are available for every imaginable street and situation. Once staff or interested stakeholders begin looking around, candidate streets pop up almost immediately. Some are high cost and require substantial planning; others, such as retiming a signal's pedestrian phase to accommodate slower walkers, can be implemented this afternoon. But where is the largest bang for the buck? There are a few ways to make these decisions.

Pedestrian Demand Models

Pedestrians are considered the "indicator species" of a livable community, which makes walkability investments a good place to start when considering Complete Street priorities. In recent years, pedestrian master plans prepared for many of the region's cities have included a GIS-based model which identifies the most promising areas for investment in traffic calming and pedestrian facilities. The model considers generators such as residences, attractors such as schools and shopping, and detractors such as injury crashes or posted speeds over 30 mph. A "composite model" combines these factors into a single pedestrian demand map. This methodology has the benefit of providing objective logic to the process of choosing areas for treatments, and helps steer the selection process away from the political process. To put it bluntly, it becomes harder to argue that places where fatalities are occurring should not receive the highest priority.



Composite Pedestrian Demand Model
City of San Diego Pedestrian Master Plan[101]

SANDAG's Healthy Communities Atlas

An important product of the Healthy Works work program undertaken by SANDAG and the County Health Department (Chapter 3) is a complete inventory of the region's sidewalks, and layering of GIS health data with neighborhood variables. Using these data, SANDAG has issued a "Healthy Communities Atlas" that maps many environmental and social determinants of health (proximity to parks, violent crime, income, traffic density, etc.). The GIS data behind those maps are available to help local agencies identify and address neighborhoods where improvements would be most likely to improve health and livability. No other US region has this mapping capability. Interested jurisdictions should contact SANDAG about using this tool.

Smart Growth Opportunity Areas

Another resource for identifying best Complete Street opportunities is SANDAG's Smart Growth Opportunity Areas (SGOA) map.[102] The map includes both existing and planned areas of denser, mixed use, walkable areas designated by each jurisdiction that is, will be, or could be served by public transit. Both major and minor streets in smart growth areas need to be carefully designed to serve all modes if the transit, walking, and biking in those areas is to be viable. The advantage of choosing streets from the SGOA map is that each jurisdiction has already spent considerable resources identifying these areas, hopefully in conjunction with residents and other stakeholders.

Regional Bike Plan Routes

Another excellent resource for considering Complete Street treatments is the 2012 Regional Bicycle Plan,[103] especially where planned bike facilities overlap with Smart Growth Opportunity Areas, transit stations, schools, beach access areas, and similar priority areas.

How Big Is the Regional Opportunity?

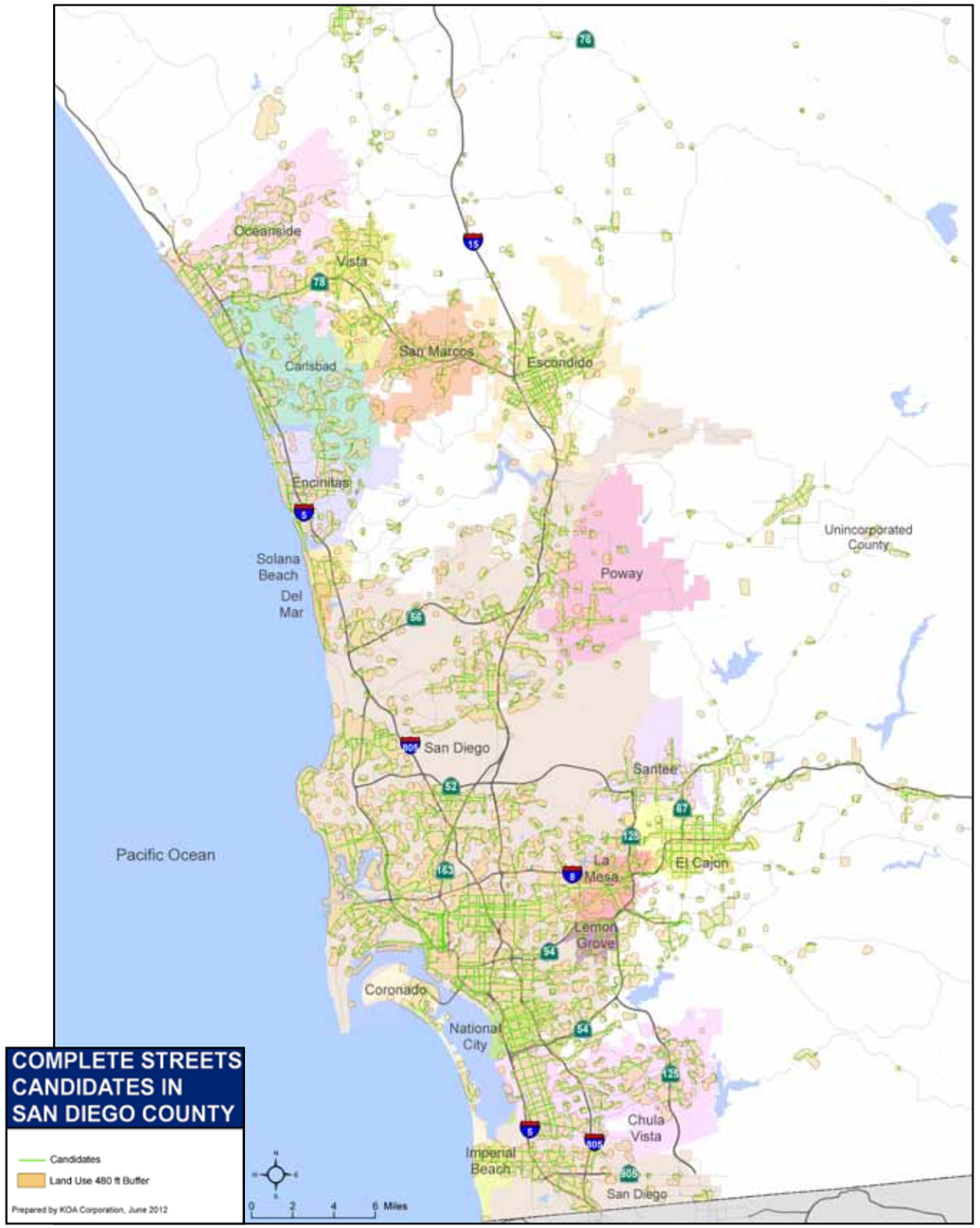
Using the SanGIS regional database, the Complete Streets Task Force sought to identify segments of existing non-residential roads throughout the region that may be good candidates for Complete Streets treatment. The database was queried for segments with relatively dense land use clusters within walking proximity of transit stops and nearby destinations such as shopping, parks, and schools. This gross-level query identified 1,029 miles of non-residential street segments worthy of consideration as high-priority candidates. Of this total, 292 miles fall within Smart Growth Opportunity Areas; around half of this total (158 miles) fall within the City of San Diego (Table 8-1). This query represents only one way to cut the data, but it provides a sense of the opportunity for applying Complete Street treatments throughout the region.

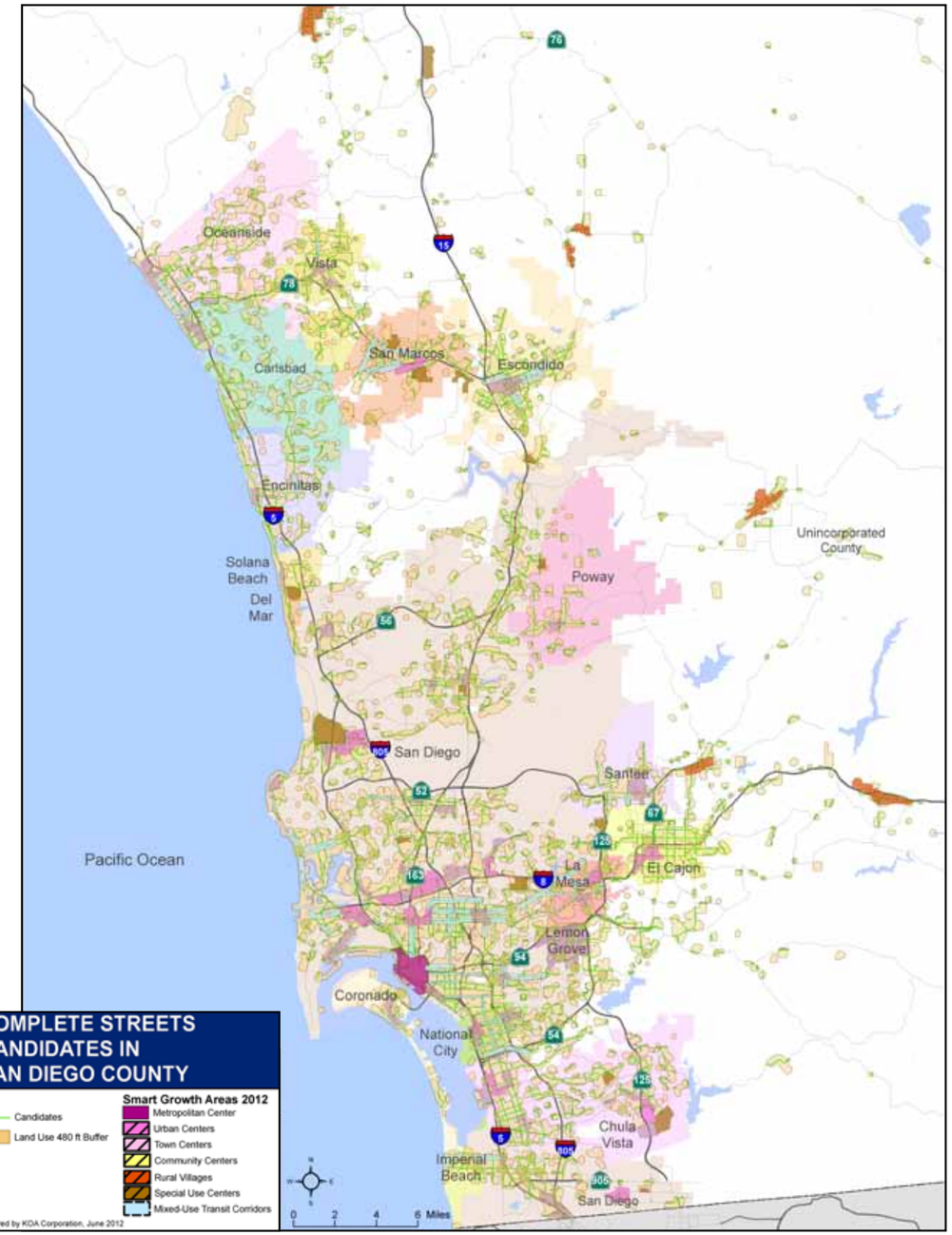
Potential Treatments

This descriptive section and the photo gallery in the next section hint at ways to apply Complete Street improvements to various types of roadways.

Table 8-1. Complete Street Opportunities within SANDAG Smart Growth Areas

Jurisdiction	Light Collector	Rural Collector	Major Road	Rural Light Collector	Prime Arterial	Collector	Two Lane Major	Local Street	Six Lane Major	Total Miles	Percentage of Total
San Diego	12.0	-	82.7	0.1	1.0	47.3	6.2	3.8	5.4	**158.4**	**54%**
San Diego County	1.9	0.4	4.8	1.6	7.1	2.5	2.9	0.0	-	**21.2**	**7%**
Escondido	3.2	-	0.4	-	7.7	6.0	0.3	-	-	**17.5**	**6%**
National City	1.4	-	10.6	-	-	2.3	0.1	-	0.1	**14.5**	**5%**
La Mesa	1.0	-	8.4	-	2.1	2.1	0.4	0.1	0.2	**14.3**	**5%**
Chula Vista	-	-	4.7	-	1.4	3.0	-	0.8	0.4	**10.3**	**4%**
Oceanside	2.2	-	2.5	-	2.4	1.4	0.2	0.0	0.6	**9.4**	**3%**
Vista	0.4	-	2.4	-	4.7	1.5	0.1	-	0.1	**9.2**	**3%**
San Marcos	0.1	-	0.7	-	5.3	1.1	-	-	0.2	**7.4**	**3%**
El Cajon	0.9	-	2.9	-	0.4	1.7	0.2	-	0.1	**6.4**	**2%**
Imperial Beach	1.5	-	1.1	-	0.3	1.5	0.1	-	-	**4.6**	**2%**
Santee	-	-	1.0	-	1.0	1.9	-	-	-	**3.9**	**1%**
Encinitas	0.4	-	-	-	2.2	0.7	-	-	0.1	**3.5**	**1%**
Coronado	0.4	-	1.8	-	0.6	0.3	-	-	-	**3.0**	**1%**
Carlsbad	0.5	-	0.8	-	1.1	0.6	0.1	-	-	**3.0**	**1%**
Lemon Grove	0.2	-	2.0	-	-	0.7	-	-	0.1	**3.0**	**1%**
Poway	-	-	0.3	-	0.7	0.3	-	-	-	**1.4**	**0%**
Solana Beach	-	-	-	-	0.9	-	-	-	-	**0.9**	**0%**
Del Mar	0.0	-	-	-	0.5	-	-	-	-	**0.6**	**0%**
Total	**26.1**	**0.4**	**127.0**	**1.7**	**39.5**	**75.0**	**10.5**	**4.7**	**7.2**	**292.1**	**100%**
Percentage of Total	**9%**	**0%**	**43%**	**1%**	**14%**	**26%**	**4%**	**2%**	**2%**	**100%**	


COMPLETE STREETS CANDIDATES IN SAN DIEGO COUNTY
Candidates
Land Use 480 ft Buffer
Prepared by KOA Corporation, June 2012
0 2 4 6 Miles
Oceanside
Vista
Carlsbad
San Marcos
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Unincorporated County
San Diego
Santee
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Pacific Ocean


COMPLETE STREETS CANDIDATES IN SAN DIEGO COUNTY
Candidates
Land Use 480 ft Buffer
Smart Growth Areas 2012
Metropolitan Center
Urban Centers
Town Centers
Community Centers
Rural Villages
Special Use Centers
Mixed-Use Transit Corridors
Prepared by KOA Corporation, June 2012
0 2 4 6 Miles
Oceanside
Vista
Carlsbad
San Marcos
Escondido
Encinitas
Solana Beach
Del Mar
Poway
Unincorporated County
San Diego
Santee
La Mesa
El Cajon
Lemon Grove
Coronado
National City
Chula Vista
Imperial Beach
Pacific Ocean

Arterials (45 mph+)

Most of the region's major arterials are part of the Regional Arterial Network System. Although they serve high volumes of traffic and serve important transit routes, most lack basic amenities to not just accommodate but attract pedestrians, bicyclists (other than "strong and fearless" cyclists), and transit riders. Examples include Palm Avenue (Imperial Beach), H Street (Chula Vista), El Cajon Boulevard and Clairemont Mesa Boulevard (San Diego), and El Camino Real (North County).

Because of prevailing speeds and volumes, major arterial roads have high crash rates, high ambient noise levels, and act as community barriers. Initially, Complete Street treatments on these facilities make the most sense where transit routes, regional bike facilities, and dense adjacent land uses coincide.

Lower Classification Arterials (25-45mph)

These community-serving roads suffer from some of the same constraints and challenges for non-drivers as major arterials, but also present some of the most promising Complete Street opportunities. Examples include University Avenue and Clairemont Drive (San Diego), Grand Avenue (Escondido), and much of the Coast Highway in North County.

Neighborhood Collectors

These roads are often lined with homes but serve an entire neighborhood or a particular group of residential streets. Examples include Texas Street (San Diego), Moss Street (Chula Vista), and Borden Road (San Marcos). Traffic calming, and bicycle and pedestrian facilities can attract more bicyclists and pedestrians to these streets. Since daily traffic volumes usually do not exceed 10,000, 4-lane collectors can successfully be restriped to two or three lane configurations while adding bike lanes.

Residential Streets

Residential street opportunities are very case-specific, based on prevailing speeds and neighborhood character. Even without sidewalks, many residential areas are considered walkable and bike-friendly by local residents because their narrow or curving design discourages fast vehicle speeds. A good test of whether a residential street is "complete" is whether parents allow their children to travel the street or to play in it during traffic lulls. If not, parking arrangements, traffic calming treatments, sidepaths, or other treatments can help.

Gallery of Complete Street Treatments

Multi-way Boulevard Design

This treatment applies to prime arterials of six or more lanes. It uses three medians to reduce pedestrian crossing distances, reduce speeds and crashes, and create a local access lane for busses, parking, bicyclists, and right-turning vehicles.

Octavia Blvd., San Francisco
Photo: MIG, Inc.

Planned multi-way boulevard conversion, Palm Avenue, Imperial Beach
Courtesy of SANDAG)

Supportive Land Uses

Adopt new or overlay zoning, form based code, and/or design guidelines to bring development to the sidewalk, create façade transparency (not blank walls), add landscaping, pedestrian amenities, bike parking, bus shelters, etc.

La Mesa Mixed-Use Strategic Plan
Courtesy of City of La Mesa

Street Conversion ("Road Diet")

Convert one or more travel lanes to provide room for buffered/colored bike lanes, wider sidewalks, bioswale gardens, street trees, etc.

North Coast Highway 101 Streetscape Project
Courtesy of City of Encinitas

University Avenue Mobility Plan
Courtesy of City of San Diego and KTU+A

Intersection Treatments

Pork chop islands, median refuge islands, pedestrian signal enhancements, cyclist call buttons, bicycle conflict area markings, etc. The publication, *Intersection Treatments That Benefit Pedestrians*[104] (America Walks/Fehr and Peers) recommends many possible treatments.

Pork chop island, Olympia Washington
Photo: Dan Burden via PedBikeImages.org

Multiple intersection treatments, Branford, CT
Photo: Tom Harned via PedBikeImages

Buffered Bike Lanes

To be "complete," arterial bicycle facilities must be sufficiently protected to attract the 60% of riders falling in the category of "Interested but Concerned" Riders (Chapter 1).

Buffered bike lane, Seattle
Photo: Seattle DOT

9th Avenue cycle track, parking lane, and crosswalk, New York City
Photo: Jacob-uptown via Flickr

Enhanced Crosswalks

Crosswalk and Pedestrian Refuge, San Diego
Photo: Andy Hamilton

High Intensity Activated Crosswalk Signal, Tucson, AZ
Photo: Mike Cynecki

Parking Space Conversions

Portland Bike Corral
Photo: Heather Bowden via PedBikeImages

San Francisco Parklet
Photo: Jeremy A. Shaw via Flickr

Traffic Calming Treatments

These apply primarily to two-lane roads.

Chicane, Fousatt Road, Oceanside
Photo: Andy Hamilton

Traffic circle, Louisiana Street, San Diego
Photo: Andy Hamilton

Raised crosswalk, Cedros Avenue, Solana Beach
Photo: Dan Gallagher

Curb extension and asphalt sidewalk, Del Mar
Photo: Andy Hamilton

Public Art Traffic Calming

Portland "intersection repair"
Photo: Donkeycart via Flickr

Portland "Intersection Repair"
Photo: City Repair via Flickr

New Pedestrian and Bicycle Facilities

Texas Street Multi-Use Path under construction
Photo: Andy Hamilton

Cherokee Street, San Diego
Photo: Greg Konar

Shared Streets or Pedestrian-Only Streets

Wall Street, Asheville, NC
Photo: Dan Burden via PedBikeImages

Conclusions

1. Tools for selecting street segments for Complete Street treatments include the following:
   - Pedestrian Composite GIS Model
   - SANDAG's Healthy Communities Atlas
   - SANDAG's Smart Growth Opportunities Areas, submitted by each jurisdiction
   - Regional Bike Plan routes
2. The Complete Streets Task Force estimates that, across the region, there are 1092 miles of street segments that may be good candidates for treatments. Of that total, 292 miles are in existing or planned Smart Growth Opportunity Areas.
3. Potential treatments exist for high-speed arterials, lower classification arterials, and neighborhood collectors, as well as residential streets.
4. Some promising approaches are Multi-way Boulevards, road diets, traffic calming devices, various intersection treatments, buffered bike lanes, enhanced crosswalks, conversion of a small number of parking spaces to seating or bike corrals, new bicycle or pedestrian facilities, and "shared streets."

OVERCOMING BARRIERS TO IMPLEMENTATION

While Complete Streets goals and policies are finding their way into the plans and ordinances of many cities, strategies for systematic and widespread implementation are still evolving. An important first step in developing such strategies is identifying the barriers that are impeding progress.

State-Wide Survey

A 2011 survey of California cities conducted by the UC Davis Department of Civil and Environmental Engineering[105] found that although many cities are exploring strategies that better integrate all modes into traditionally designed streets, more than half (57%) had not adopted a Complete Streets or context sensitive design approach. Further, the implementation of individual features typically associated with Complete Streets (such as enhanced landscaping, narrow lane widths, mid-block crossings, traffic circles, road diets etc.) varies widely.

Most cities have employed at least some Complete Street techniques ranging from planting trees (61% of reporting cities) to improving bicycle facilities (36%) to the use of road diets (15%). Yet the use of these techniques unguided by adopted policy or context does not necessarily achieve "Complete Streets."

In the same study, when cities were asked to identify key constraints to implementing Complete Streets and context sensitive design, the two most common responses were: 1) lack of financial resources (40%) and 2) unable to dedicate staff time to implement (32%).

Region-Wide Interviews

In conjunction with WalkSanDiego's report, *Safe for All: 2011 Street Design Benchmark Study for the San Diego Region,*[106] interviews were conducted with key staff from each city in the region to identify best street design practices and common barriers to context-sensitive Complete Street implementation, as follows:

Inadequate Funding for Roadway Retrofit Projects

Every city reported that the list of street retrofit projects, including bike and pedestrian projects identified in bicycle and pedestrian master plans, far exceeds available funding. All jurisdictions rely heavily on Transnet funding and actively seek other available sources. Nevertheless, local street maintenance sources do exist. Routine maintenance projects are an opportunity to restripe a street to accommodate more modes. Without sufficient funding the pace of more comprehensive Complete Street solutions is slow, projects are limited in scope, and political considerations often override plan priorities.

Several jurisdictions have planned or implemented Complete Street pilot projects and have produced some exemplary general plan circulation elements and bicycle and pedestrian master plans strongly supporting Complete Streets. However, staffing levels are dependent upon dwindling funding, and jurisdictions are unable to dedicate sufficient staff time towards rapid Complete Street implementation. Still, there appears to be untapped potential to harness ongoing street construction and maintenance projects as Complete Street projects. The goal should be to systematically implement an interconnected system of context sensitive Complete Streets in the San Diego region.

As noted previously, in the 2050 RTP, SANDAG increased the regional Active Transportation Program allocation from less than half of 1% in the previous RTP to 3% of the total transportation budget. This amounts to $3.8 billion dollars, and includes an Early Action Program (before 2013). It also includes a commitment to adopt a regional Complete Streets policy for the region.

Inconsistent City Council Direction

City councils within the San Diego region are showing increased interest in Complete Streets. This interest has mainly focused on traditional "main street" corridor projects identified in recently adopted general plans and revitalization/traffic calming projects initiated by business improvement districts or neighborhood groups. The cities of San Diego, Chula Vista, La Mesa, and Encinitas, in particular, have made significant progress. However, according to city staff, inconsistent city council direction is still a major barrier to widespread Complete Street implementation. It should be noted that, as one respondent stated, there has not yet been a concerted effort to "sell" the Complete Streets concept to city councils, and reinforce it with regular updates.

Because Complete Streets require a significant departure from the traditional approach to street design, staff may be hesitant to recommend new methods. Merely studying innovative techniques may be politically safe, but proposed projects can easily be shot down unless staff has assurances that the city council fully embraces a Complete Streets approach.

Context sensitive designs require more leadership from elected officials and more collaboration between traffic engineers, land planners, and specialized staff than ever before. Such collaboration demands a reorganization of current decision processes, the institution of new performance measures, and in some cases a rebalancing of Level of Service analysis, among other changes. Only the mayor or city council can provide the direction needed to overcome institutional barriers between city departments.

As discussed below, some neighborhood opposition to Complete Streets projects is inevitable, at least initially. Such opposition can easily compromise or derail good projects unless council members have a strong vision of what they wish to accomplish.

The good news for local leaders is that public acceptance of multi-modal streets is likely to be very strong once any initial skepticism is overcome. Cities that have taken the plunge toward a more balanced street system have discovered a pent up demand for walking and bicycling opportunities. The response of residents and businesses has been overwhelmingly positive and demand appears to be growing.

An attractive characteristic of Complete Street programs is that the community benefits are immediate and tangible. Politicians who campaign on a Complete Streets platform and deliver on their promises are likely to benefit at the polls. It is worth noting that Complete Streets concepts have the potential to be implemented rapidly--within a four-year election cycle. This potential has been amply demonstrated in cities outside the San Diego region, including Long Beach, New York City, Charlotte, Seattle, and many others.

Uncoordinated Transportation Implementation

Most local cities rely on the general plan circulation element for transportation policy guidance, and bicycle and pedestrian plans for more detailed policies and objectives related to active transportation. Bicycle and pedestrian plans do an excellent job of identifying projects and establishing implementation priorities. But while logical and thorough, the implementing components are not well coordinated across other transportation plans, maintenance practices, or repaving schedules.

While recent plan updates encourage the implementation of Complete Streets, including the concept at the core of a multi-modal transportation system is largely missed. For the most part, existing plans lack measurable goals, commitments to action, schedules for implementation, or a publicly accessible report on progress.

Cities outside the San Diego region that have committed to Complete Street implementation often have overarching multi-modal transportation plans or street design guidelines that elevate the role of Complete Streets in the larger transportation picture.

Examples of plans organized around Complete Street concepts include the *Charlotte Urban Street Design Guidelines* (2007),[107] the *City of New York Sustainable Streets Strategic Plan* (2008),[108] the *Seattle Transportation Strategic Plan* (2005),[109] and the *City of Redmond, Transportation Master Plan* (2005).[110] In Seattle, one dedicated planner interviewed department heads from various disciplines and wrote a series of white papers on the anticipated barriers to implementing the city's Complete Streets plan. The white papers were the basis for inter-disciplinary meetings among various departments regarding necessary revisions to codes and policies.

Initial Public Opposition

San Diegans live in an automobile oriented culture and the concept of actually designing streets for slower traffic speeds may alarm city residents who depend on the automobile for most trips. Such concerns when expressed at public hearings also influence local politics. Traffic engineers and planners interviewed during the study often described how Complete Street projects were scaled back or innovative features were trimmed in response to resident concerns over potential impacts to vehicular traffic or parking.

In general, support for Complete Streets appears to be stronger in urban areas with higher densities and transit opportunities and weaker in suburban areas that are more dependent on the automobile. But concern over the possibility of increased congestion and traffic delay can be found everywhere.

To be effective, Complete Streets must deliver on the promise that while speeds may be lowered, travel times will not be substantially reduced, congestion will not increase, and overall street capacity will be enhanced considering all modes. (From Lancaster to New York, this has proven to be quite feasible, in part because most trips are flexible by nature – see Chapter 4.)

Complete Streets must benefit all users. A comprehensive street design program will allow Complete Streets to vary by context. A suburban parkway for example will have a different configuration and modal emphasis than a downtown main street.

As Complete Streets are implemented and the benefits realized, public acceptance is likely to follow. This appears to be the overwhelming experience, even in cities with auto-oriented land use patterns.[111]

Lagging Acceptance of Changing Professional Standards

Many traffic engineers interviewed, while understanding the potential for Complete Streets, expressed caution in utilizing techniques that are not required by city ordinances or sanctioned by official traffic engineering manuals such as those provided by ITE, AASHTO, Caltrans and the Federal Highway Administration.

In the UC Davis survey described previously, the Caltrans Highway Design Manual was frequently cited as an impediment to Complete Streets, even though the standards were intended for highways and not local streets. This finding was confirmed to some extent locally but more often traffic engineers cited concerns about deviating from locally adopted standards and policies, which were often derived from the HDM.

In 2012, Caltrans substantially revised the HDM to support Complete Streets. Nevertheless, caution persists even as the laws and professional street design standards change. Fortunately many California policy initiatives in the last few years support greater inclusion of Complete Streets approaches to urban planning, transportation facilities, and environmental review (Chapter 3). Additionally, Complete Street techniques have been publicly endorsed by all of the professional transportation engineering organizations and the state and federal transportation agencies. Concerning liability, risks are often overemphasized. Clearly documenting the decision process when exceptions to previous standards are made allows adequate legal protection.[112]

These changes in policy and professional standards have allowed for the implementation of Complete Street projects, at least on a pilot basis. Interestingly, while no one interpreted the existing standards as authorization to begin converting streets into Complete Streets, neither did they report that existing city standards prevented Complete Streets from being implemented.

Lack of Training in Complete Streets Concepts

Knowledge and enthusiasm for Complete Street concepts varies widely among local transportation engineering and planning staff. Many transportation engineers would welcome the opportunity to implement more Complete Street projects and are making an effort to educate themselves on the latest techniques. Others feel that the existing functional based system and emphasis on vehicular LOS is perfectly adequate. (We respectfully disagree.)

On the whole, interest is growing, but the other barriers need to be addressed before the transportation engineers and planners will be in a position to take ownership of the change process. Often, the response to a new concept, like multi-modal LOS, will be to adopt a "wait and see" position. It is easier to let other jurisdictions test the new CEQA guidelines, for example, than to risk a legal challenge over the adequacy of a traffic analysis.

Out-of-Sync Environmental Priorities

Several high profile corridor improvement projects such as the University Avenue Mobility Project and the Mid-City Rapid Bus Project will have been in planning, design and environmental review at least a decade before breaking ground. Much of the delay can be attributed to the extensive design and review to which these projects have been subjected.

By contrast, during a two year period, the City of New York completed over a dozen Complete Street projects, including several innovative cycle tracks, two operational BRT lines, and the conversion of Times Square into a pedestrian plaza. In 2008 alone the City added 90 miles of new bicycle lanes contributing to an unprecedented 35% single-year increase in bicycle commuting. All of this occurred in an exceedingly dense, highly constrained and fully "built-out" area.

Chapter 4 discusses various ways to minimize delays due to CEQA. In general, the best approach is to establish clear goals and policies in primary policy documents, and conduct environmental review of these documents.

Suboptimal Complete Street Implementation

While not an actual barrier, it is worth noting that some projects described as Complete Street projects fall short of their potential. This can happen, for example, if the multi-model system is not truly integrated, if corridors are missing key components, if bicycle lanes are not designed to meet the safety concerns of ordinary riders, if the available funding is used primarily to reduce vehicle congestion, or if design integrity is seriously compromised. A corner shaved here or there can render a carefully-designed element completely ineffective.

Without comprehensive transportation plans, funding for active transportation could easily be absorbed into the current process without producing the transformative result needed to increase pedestrian safety, enhance community livability, and improve access to public transit. Unless these goals are realized local public support for Complete Streets may not materialize and funding could eventually be curtailed.

Under-appreciation of the Multiple Benefits of Complete Streets

Another factor that did not show up in surveys, but which contributes to the lag in Complete Street implementation, is the lack of a mechanism for forecasting the potential economic, health, and quality of life benefits of Complete Street projects. This can be addressed in part by instituting Health Impact Assessments for individual projects, plans, or policies. This approach is being taken by some leading California cities including Richmond and Encinitas, and is being tested by SANDAG.

Conclusions

Surveys of municipal traffic engineering and planning staffs throughout California and in the San Diego reveal a consistent set of barriers to Complete Streets implementation. The barriers and their potential solutions are summarized in Table 9-1.

Table 9-1. Summary of Complete Street Barriers and Potential Solutions

Barriers to Complete Streets	Potential Solutions
Funding	• Local maintenance funds • TransNet local streets and roads allocation • SANDAG Active Transportation Grants • SANDAG Smart Growth Incentive Program • Mitigation for private developments
Inconsistent Council Direction	• Establish comprehensive Complete Streets program through General Plan policies or stand-alone policy (Chapter 3). • Provide regular education and updates to City Council • Institute an annual transportation "report card" for City Council
Initial Citizen Skepticism	• Demonstrate pent-up demand for more walking, biking, and transit through advisory committees, surveys, workshops, etc. • Emphasize safety and health benefits, and (if applicable) travel time benefits • Implement improvements incrementally • Lead with Safe Routes to School, main street revitalization, or other popular project
Acceptance by Engineering Department	• Keep abreast of state and federal policies and guidelines; seek buy-in from elected officials.
Need for Technical Training	• Attend trainings offered by SANDAG, ITE, WalkSanDiego, APA, Caltrans, and others. Include staff training line item in departmental budgets.
Environmental Review	• Chapter 5 lists several ways to minimize delays and costs related to CEQA review.
Suboptimal Implementation	• Create comprehensive plans and accountability processes for measuring progress • Evaluate key streets for opportunities to apply low-cost solutions, e.g. crosswalks, road diets, bicycle lanes.
Undervaluing Benefits of Complete Streets	• Utilize new analysis tools such as Health Impact Assessments

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