Creating 'Complete Street' Design Guidelines for Windsor, CA

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Abstract

Staff from the Town of Windsor, California is working to create new Street Design Guidelines (SDG), a process that has been ongoing for four years. 'Context Sensitive Design' concepts had been discussed for several years when the Town Engineer asked that existing streets be inventoried to assess design successes and failures. What seemed to some like an unnecessary look backward turned out to be the turning point to resolve outstanding issues. Through the inventory process participants developed a more open mind to street design. This was fostered by conducting the driving, walking, and bike-riding inventories, and by performing some of these activities as a group, enabling them to gain experience as a variety of user 'types' and by discussing their observations. It led to a much better understanding of what constitutes a 'complete street' and an 'incomplete street'.

In March 2010, a Town Council member requested a presentation on Complete Streets concepts in May. This provides an opportunity to staff to obtain direction on how to proceed with the draft SDG, and it is obvious that the time and effort staff invested to develop these guidelines is timely in supporting their officials in their work to bring Complete Streets concepts to Windsor. These concepts are not new, but embracing them is new to the project team members.

Introduction

The Town of Windsor was incorporated in July 1992. The current General Plan Circulation Element was adopted in 1995 and reflected a shift in focus from vehicular travel needs to creating an environment for "safe and pleasant walking." For example, one program requirement was that the Town adopt street standards that addressed multi-modal accommodations, and in 1997 their Planning Department staff created the *Windsor Design Standards*. Unfortunately, this effort created some confusion for the development community because these standards did not replace the standards used by the Public Works Department, *Design and Construction Standards*, yet there was overlap and conflicting standards regarding street widths. Specifically, both standards list street widths for various street classifications but the widths are not the same. To create agreement Planning and Engineering staff are working collaboratively to create new Street Design Guidelines (SDG).

Draft Street Design Guidelines

Much effort has been made to date to provide a link between 'street type' and traffic characteristics. Ten street types were conceived, with associated quantifiable characteristics. Just as streets have a typical range of daily traffic volumes, the SDG were envisioned to include ranges of other traffic characteristics, including median and parking lane widths as well as pavement and sidewalk widths. Other design features were suggested for inclusion, such as design speed, design vehicle, street lighting, and the presence of bike lanes, and traffic indices were provided to ensure an appropriate roadway structural section. This information was developed and explained in detail in a draft report which included a matrix shown in Table 1.

Table 1
Street Design Summary

Street Type	Traffic Volume ADT	Design Speed	Traffic Index	Right of Way (ft)	Pavement Width (ft)	Number of Travel Lanes	Median Width (ft)	Bike Lane Width (ft)	Parking Lane Width (ft)	Planter Strip	Sidewalk Width (ft)	Center-line Radius (ft)	Inter-section Spacing (ft)	Design Vehicle
Major Arterial *														
Four Lane Boulevard	10,000-35,000	45 mph	11.5	92-120'	68-88'	4	12-16	5	7-8	6	6-10	500	300	WB-50
Two Lane Boulevard	7,000-15,000	40 mph	11	90-100'	50 - 66'	2	12-16	5	7-8	6	6-10	500'	300	WB-50
Connector Street *														
Industrial Connector	5,000-15,000	35 mph	11	66	44-50	2	12	5	N/A	5	5	350	150	WB-50
Neighborhood Connector	< 4,000	30 mph	9	64	40	2	N/A	N/A	8	6	6	175	125	Single Unit
Two Lane Main Street	2,000-7,000	25 mph	10	62-82	38-56	2	N/A	N/A	8-17	Tree Wells	12	250	150	Single Unit
Town Center-Two-Way Edge Drive	1,000-5,000	25 mph	9.5	54-64	30-40	2	N/A	N/A	17	Tree Wells	12	200	150	Single Unit
Local Streets *														
Industrial Street	<4,000	25 mph	10.5	60	40	2	N/A	N/A	8	5	5	200	125	WB-50
Neighborhood Street	<2,000	30 mph	8	60	36	2	N/A	N/A	8	6	6	175	125	Passenger Vehicle
Narrow Neighborhood Street	<1,000	25 mph	7	52	32	2	N/A	N/A	8	5	5	125	125	Passenger Vehicle
One-Way Street	<1000	15 mph	6	30	20	1	N/A	N/A	None	N/A	5	125	75	Passenger Vehicle

Notes: * All street types show values for "Urban Conditions." However, "Rural Conditions" may also occur on all street types where a street borders a county boundary. In such cases, the figure, "Rural Conditions" should be reviewed for additional considerations.

One recurring issue with the matrix is that it provides a range of values for the width of the travel lane, sidewalk, median, and/or parking lane. The concept behind recommending ranges rather than one value is that good street design depends on its setting or context. On the other hand, staff experience is that applicants nearly always choose the minimum widths no matter where the street is to be constructed. Further, staff experience is that some streets work well and others fail to provide a satisfying street design. Town staff decided that a quick inventory of these successes and failures might help develop the details to complete the SDG, so one was initiated in January 2010 and completed in March.

Conducting a Street Inventory – What a Concept!

Conducting the street inventory provided the most unexpected and positive outcome in the process of developing the street design guidelines. The project consultant and Town staff alike learned a great deal about street design from their effort to get out of the office and into the field to observe streets 'at work'. Design details became much more important considerations in 'real life' compared to how they appeared on a matrix. Further, sharing the experience with other observers increased the effectiveness of the fieldwork because each engineer and planner used the street a bit differently. Further, observers discussed what they saw, and these discussions often revealed inconsistencies in logic or application of principles.

All street types, including numerous alleys, were observed. There were several types of inventories conducted. One type of inventory was the *driving* overview of the Town. This consisted of selecting one quadrant of the Town and driving local, collector, and arterial streets for approximately 1.5 hours with two or three observers. Four of these inventories were completed within a two-month time frame, covering nearly all streets in Windsor. A second type of inventory was the *walking* inventory, which included starting at a residential 'origin' and making a trip to some 'destination', typically a commercial land use or park. These trips were conducted in inclement weather as well as fair, and on all days of the week, though only during daylight hours. A third type was the *bike trip* down a major arterial, including highway overcrossings and under crossings and 'jaunts' through neighborhoods. Stores, schools and restaurants are easily accessible on bikes but bike parking is not always well-designed. The last type was the *photography inventory*, where the purpose was to capture images of certain design features. Inevitably, these led to unexpected images, especially when reviewing the images days or weeks later. The camera often captures information not readily apparent to the observer. Bus rides were not inventoried, though some of the inventories included transit access locations.

<u>The Driving Inventory</u>

Lots of neighborhoods can be covered this way, and such inventories are very helpful at developing a sense of whether hierarchical street systems matter in neighborhoods. Field measurements are relatively easy to obtain if the arterial streets are observed during mid-morning off-peak times. Parking configurations are good to observe via automobile. It was common to assume widths of travel and parking lanes, medians, and sidewalks, but measuring these led to some surprises.

One surprise was the consistency of street curb-to-curb widths. For example, arterials were predominantly 64 feet wide, collector streets were 40 feet wide and many of the local streets were 36 feet wide. Some of the street element widths, however, remained unclear: without pavement markings it was not apparent whether a 36-foot wide local street was utilized as two 10-foot travel lanes and two 8-foot parking lanes, or as two 11-foot travel lanes with 7-foot parking lanes. The inventory process also included watching motorists use the road, and it became apparent to the engineers that many streets in Windsor would function satisfactorily with 7-foot parking lanes. This was a good 'discovery'. Another good discovery was that 11-foot lanes adjacent to medians could consistently accommodate large trucks on five-lane roads in Windsor. Until the inventory was completed, it was assumed based on California Department of Transportation (Caltrans) standards that these lanes required a 12-foot design width.

The Walking Inventory

Most local street sidewalk and planter strip widths combined to provide a 10-foot 'behind the curb' width. The total width seemed to provide a comfortable separation between motorists and pedestrians and between residential front yards and parking lanes. However, watching pedestrians use the sidewalks consistently revealed that five-foot sidewalks are too narrow. Walking is most commonly a social activity, and passing oncoming pedestrians is also common. Additionally, adults walking their dogs or pushing a stroller were frequently accompanied by children, posing a challenge to the adult to keep the children in their view when the sidewalks were less than six feet wide. As a result, staff developed an opinion that pedestrian safety and comfort are reasonably achieved where sidewalks are at least six feet wide and ten feet would be better in order to meet the community's average pedestrian need. This applies in particular to local streets, with major streets needing twice that, or 12-foot wide sidewalks. This is one reason that they developed the opinion that tree wells were preferable to planter strips: the all-weather surface constructed as part of tree-well designs was more useful in allowing pedestrians to gather or to pass each other when traveling in opposing directions while still providing a separation between them and moving vehicles. This was another good discovery. Storm water management program goals relative to impervious surfaces were also discussed since there is a need to balance wider sidewalks with surfaces that allow drainage. Finally, quite a few homeowners noted that the landscaped planter strip makes it difficult to accommodate passenger loading/unloading activities in the parking lane, together with the concern for ongoing maintenance.

The Biking Inventory

When presenting the street inventory information to Town staff, Planning staff suggested that they join the Engineering staff in reviewing a single important corridor, Old Redwood Highway, to complete a similar discovery process. This corridor review was conducted by bicycle, and again, yielded experiences that helped staff identify what they liked or disliked and what they would propose for this particular corridor's street design. Staff concluded that six- or seven-foot bike lanes would be appropriate for this busy corridor to increase the separation of the riders from the high speed, high-volume motorists and provide a greater level of comfort.

General Inventory Parameters plus the Photography Inventory

Field observations were scheduled at various times of the day and various days of the week. Observations occurred on Saturday mornings, Sunday mornings and afternoons, during the weekday peak periods, after school, and off-peak on weekdays. This scope of review enabled a much more accurate assessment of street operations than that resulting from observations conducted only during normal business hours. For example, the influence of parked cars on travel speeds on a local street is better understood after the end of a work day when more street parking occurs in residential neighborhoods. Also, pedestrian users varied significantly between observations: there is a great array of pedestrians using the sidewalks, and their travel patterns vary. Good street designs would anticipate these variations.

Studying photographs, and to an even greater extent videos, was useful in adding various perspectives. The work to study street designs is not complete by conducting the inventory alone: notes and photos should be reviewed and further discussed with all participants. Through the inventory process participants developed a more open mind to street design and challenged the participants' respective problem-solving assumptions, something that many of us had not done for years.

Information from the inventory was used to develop a matrix of street elements that defines widths of travel and parking lanes, medians, and sidewalks as a function of street type. This matrix is provided in Table 2.

Table 2
Street Element Widths

Lane Function *Component*	Street Type											
	Boulevards or Major Arterial				Other Cross-town Streets				Local Street			
	5 Lane	**4 Lane**	**3 Lane**	**2 Lane**	**Industrial Connector**	**Neighborhood Connector**	**Main Street**	**Town Center/ Edge Drive**	**Industrial Street**	**Neighborhood Street**	**Narrow/ Private/ Rural**	**Alley**
Pedestrian Areas (2 of each where used)												
Planter	6**	6**	6**	6**	5	5	4' tree well	4' tree well	0 or 4	0 or 4		
Sidewalk	6	6	6	6	6	6	12 or 16	12 or 16	6	6	6	
Medians and Center Lane (only 1 applies)												
Turn Lane or Median with Limited Landscaping	10		10									
Median with Trees	16		16									
Vehicle Travel Lanes (2 of each where used)												
Inside Lane	11	11										
Outside Lane	10	10	11/15*	11	11	10 or 11	10	10/15*	11	10	12	10
Bike Lane/Area	6	6	6	6	5	Shared	Shared	Shared	Shared	Shared		
Parking Lanes												
No Parking	0	0									0	0
Parallel One Side			8									
Parallel Both Sides				16	16	16	16		16	14		
Angled Parking One Side			19	19				19				
Angled Parking Both Sides			38	38				38				
Total Width	**88-94**	**78**	**76-120**	**90-96**	**70**	**58-60**	**68-80**	**67-108**	**50-58**	**54**	**36**	**20**

Notes: Blank indicates the configuration is not under consideration for this street type; minimum values are shown and may be increased per land use and street setting.
* 15 feet next to angled parking
** or 4 foot Tree well w/ 8 foot sidewalk

Enter 'Complete Streets' Concepts

In February 2010, several Windsor Town Council members attended the *9th Annual New Partners for Smart Growth: Building Safe, Healthy and Livable Communities Conference* in Seattle, Washington. The conference included a workshop on Complete Streets concepts. Upon return from the conference, a Council member requested that a presentation on Complete Streets concepts be made to the Town Council, a process that provides an opportunity for staff to obtain direction on how to proceed with the draft SDG. It is obvious that the time and effort the staff completed to develop these guidelines is timely in supporting the officials in their work to implement Complete Streets concepts.

The *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, an ITE Proposed Recommended Practice*, which was adopted as a recommended practice in March 2010, together with a variety of materials available on the *Complete Streets.org* website were reviewed. Through this research it was discovered that the State of California had passed legislation entitled, *The California Complete Streets Act of 2008*. This legislation requires that local agencies incorporate multi-modal policies in the General Plan Circulation Element updates beginning in January 2011.

At the time of this paper, the authors are scheduled to present *Creating Complete Streets* to the Windsor Town Council on May 5, 2010, and one of the authors is also scheduled to make this presentation to the County of Sonoma Planning Agency on April 29. Updates from these presentations may be included in the presentation of this paper at the ITE Western District 2010 Annual Conference scheduled in June 2010. Staffs from these agencies are focused on obtaining direction on what action they should take to implement the concepts in their communities. There are many options; some future actions could include updating their respective general plan circulation elements to meet the requirements of the *California Complete Streets Act of 2008*; creating street design standards to incorporate Complete Streets principles; and incorporating these principles into capital improvement program (CIP) projects, to name a few.

Obviously, Creating Complete Streets is a topic of interest to transportation-focused professionals, including local officials, agency staff, and our peers. We appreciate the opportunity to present this information on our process of assisting agencies in creating 'complete streets' in their communities.

Author Information

Mary Jo Yung, PE, PTOE, *Associate*. Ms. Yung has been employed in both public and private sector civil engineering and traffic engineering positions since 1986. Mary Jo has expertise in operating traffic systems for municipal government, including extensive experience with neighborhood traffic management, construction traffic control, traffic signal timing, and safety analysis. She has worked on a variety of public projects in the last several years, including preparation of a Safe Routes to School Plan for a small city, a corridor "road diet" evaluation for a major arterial, many Engineering and Traffic Surveys, and conceptual designs for bicycle facilities and pedestrian safety improvements. She has experience developing street design guidelines that employ a "complete street" approach, and her alternative mode designs reflect her experience as a bicycle commuter as well as an understanding of the importance of vehicle travel efficiency.

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