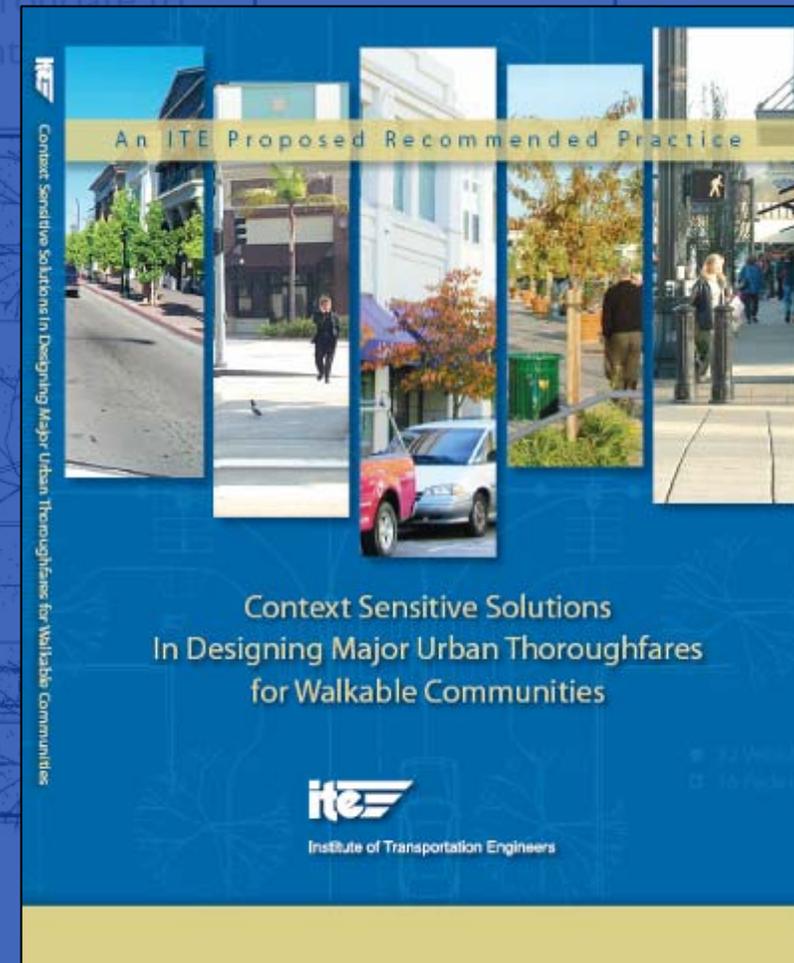


Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities

An ITE Proposed Recommended Practice

James M. Daisa, P.E.
Kimley-Horn and Associates, Inc.



Pedestrian amenities
such as benches,

Urban Design
Features

Short pedestrian
scaled blocks

Communities Want:

- Flexibility
- Compatibility with adjacent land uses
- Balanced land use/transportation functions
- Safe and attractive streets
- Multimodal facilities
- Streets that are quality public space
- Fewer design exceptions

Raised median on
Boulevards with
landscaping

Mid-block crossings
with curb extensions
and median refuge

Sidewalk width appropriate to
function of adjacent land use



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Report Objectives

- Aid context sensitive design
- CSS principles for planning, project development
 - Network
 - Corridor
 - Project
- Create a design framework
- Present criteria and guidance
- Consistent with established guidance

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Project Sponsors

- Federal Highway Administration
- Environmental Protection Agency
- A joint effort:
 - Institute of Transportation Engineers
 - Congress for the New Urbanism



U.S. Department of Transportation
**Federal Highway
Administration**



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Technical and Steering Committees

- Traffic and design engineers
- Transportation planners
- Land use planners
- Architects
- Urban designers
- Landscape architects
- Transit planners
- Organization Reps (APWA, AASHTO)
- Over 60 reviewers and balloters

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Focus of the Proposed RP

- Major urban thoroughfares in walkable areas
 - “Major”:
 - arterials and collectors
 - “Urban”:
 - Walkable suburbs, town and city centers, neighborhoods
 - mix of interactive land uses
 - Viable, attractive choices
 - Walking
 - Biking
 - Transit



Photo: Skidmore, Owings, and Merrill LLP

Tenets of CSS

- Balance
 - Safety
 - Mobility
 - Community objectives
 - Environment
- Multimodal
- Involve public, stakeholders
- Interdisciplinary teams
- Flexibility in design
- Incorporate aesthetics



Source: Minnesota Department of Transportation

What CSS is not:

Raised median on
Boulevards with
landscaping

Mid-block crossings
with curb extensions
and median refuge

Sidewalk width appropriate to
function of adjacent land use



- Designer knowing best
- Improving travel performance only
- Sacrificing safety or good design
- Just aesthetics
- Putting the needs of any single mode first
- Not a one-shot or add-on
- Going it alone
- “Us against them”

CSS: Bringing Place and Thoroughfare Design Together

Simulation by Steve Price,
UrbanAdvantage



CSS: Bringing Place and Thoroughfare Design Together

Simulation by Steve Price,
UrbanAdvantage



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Contents of the Proposed RP

- **Introduction**
 - Overview
- **Planning**
 - Network and corridor planning
 - Design framework
- **Design**
 - Principles, criteria, guidelines
 - Roadside
 - Traveled way
 - Intersections
 - Design in constrained rights-of-way
 - Flexibility
 - Examples

Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities

Overview

A continuing challenge in planning and designing thoroughfares in urban areas is balancing the interests of travelers and community stakeholders. One group may focus on travel time and speed while others may be concerned with the character of the community. When freight carriers, emergency service providers, local business people, transit operators and other parties are brought into the picture, it becomes even more complex. In cities and town centers, resolving these multiple demands can be even more difficult because the wide range of objectives for the thoroughfare often is coupled with limited opportunity to expand or alter the public right-of-way.

The publication provides a resource for practitioners working in the challenging practice of urban thoroughfare design. The principles are based on the evolving practice of context sensitive solutions (CSS), which integrates CSS principles into existing processes to facilitate informed decision-making that considers the needs, interests and constraints within a project. CSS provides a foundation for planning and design in urban areas by emphasizing a collaborative and multidisciplinary approach, coupled with an emphasis on the flexible application of design guidance. Use of CSS principles should begin in long-range transportation and land use planning processes, and continue throughout the entire project development process.

Overview

The CSS publication was developed to provide planners and designers with guidance and information for using flexibility in existing American Association of State Highway and Transportation Officials (AASHTO) policy and information for context sensitive solutions (CSS) in design of major urban thoroughfares (arterials and collectors). The report was a joint effort between the Institute of Transportation Engineers and the Congress for the New Urbanism, sponsored by the Federal Highway Administration and the Environmental Protection Agency.

The publication describes:

- The importance of integrating the principles of CSS in urban roadway improvement projects.
- How CSS principles can be used in the transportation planning and project development processes, and
- Specific guidance on thoroughfare cross-section and intersection design.

The publication, published as an ITE Preprint, provides an opportunity to use the new guidance and information, then to provide suggestions for improvements to be incorporated into the final ITE recommended practice.

Figure 1 An urban avenue in Denver, CO.



Figure 2 The roadside supports many urban activities.



Fact Sheet 1 - Overview

Context Sensitive Solution Major Urban Thoroughfares for Walkable Communities

Successful urban thoroughfare design requires an understanding of both context and thoroughfare design. The book explains the features of the built environment that create and shape urban context, then presents a new framework for context sensitive solutions (CSS) in walkable communities. The framework:

- Introduces and defines four context zones that describe places varying in intensity from walkable suburbs to the urban downtown;
- Introduces a new classification system that uses both functional class (such as arterial, collector and local designations) and thoroughfare type (such as boulevard, avenue and street) to describe the role of a thoroughfare in the circulation network and its design character; and
- Describes features of thoroughfare types and context that result in compatibility.

The Concept of Context Zones
Information contained in the report uses urban context to describe adjacent surroundings, then uses context to help compatible thoroughfare type and design offer Context zones as a tool to categorize urban development density and use (see examples in Figures 1-3). The four context zones referenced in the report are a sub-set of the seven zones describing a full "franchise," or continuum, of environments from natural to highly urbanized, as shown in Figure 4.

Context zones offer a shorthand for describing different parts of cities and towns, emphasizing the characteristics that create walkable communities. In some communities that will benefit from this report, these characteristics already are in place. In others, the creation of these characteristics is a community goal. Successful thoroughfare design in urban places is not

Figure 1 An avenue in a suburban context. Source: Xalix-Beco and Associates Inc.



Figure 2 A street in an urban center context. Source: Mayer, Metcalfe and Associates Inc.



Figure 3 A boulevard in an urban center context. Source: The Congress for the New Urbanism.



Fact Sheet 2 - A Framework for CSS in Urban Thoroughfare Design

“Fact Sheet” Series



CSS Design Framework

- Context zones:
 - Suburbs - downtowns
- Street classification:
 - Functional class
 - Arterial
 - Collector
 - Thoroughfare type
 - Boulevard
 - Avenue
 - Street
- Compatibility

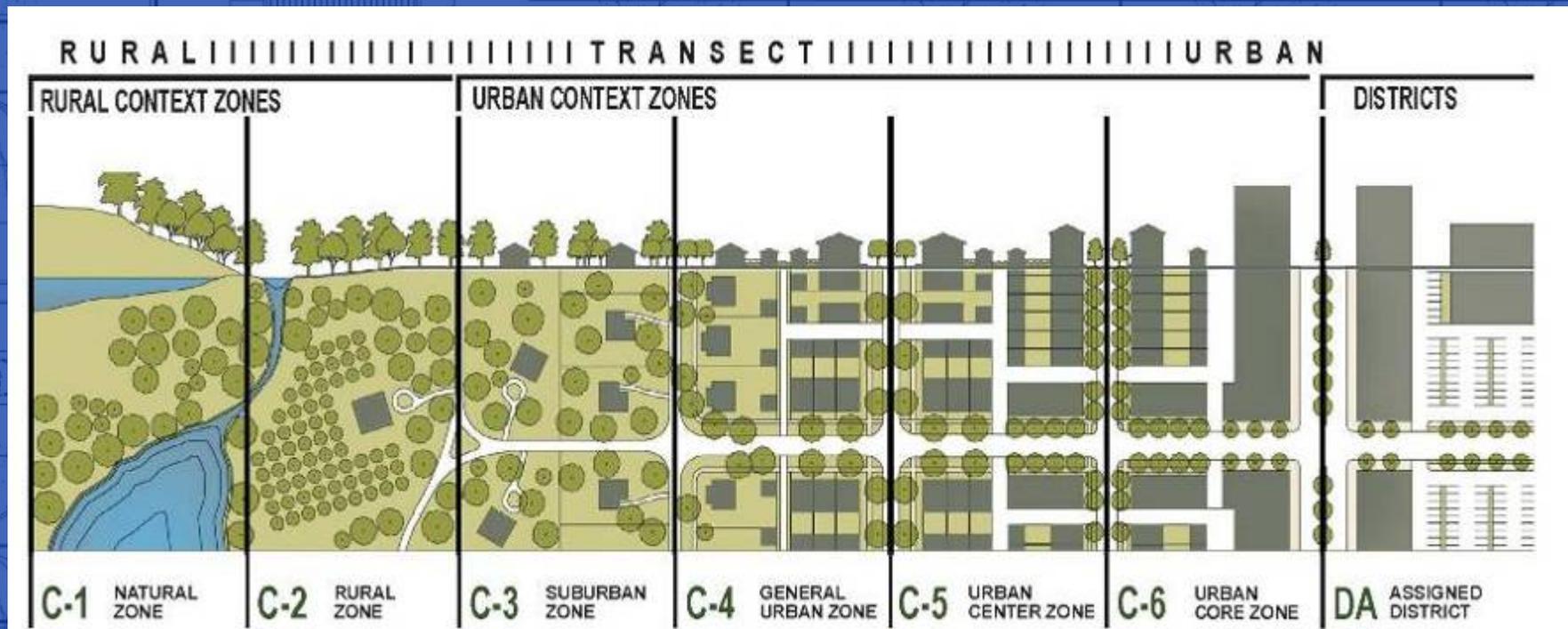


Placemaking

- Community-based approach to the development and revitalization of cities and neighborhoods
- Placemaking:
 - Unique places with lasting value
 - Compact, mixed-use
 - Pedestrian and transit oriented
 - Strong civic character
 - Contributes to economic development



Context Zones – An Organizing System for Thoroughfare Design



Source: Duany Plater-Zyberk and Company

Pedestrian amenities
such as benches,

Urban Design
Features

Short pedestrian
scaled blocks

Context Zones – An Organizing System for Thoroughfare Design

Source: Duany Plater-Zyberk and Company

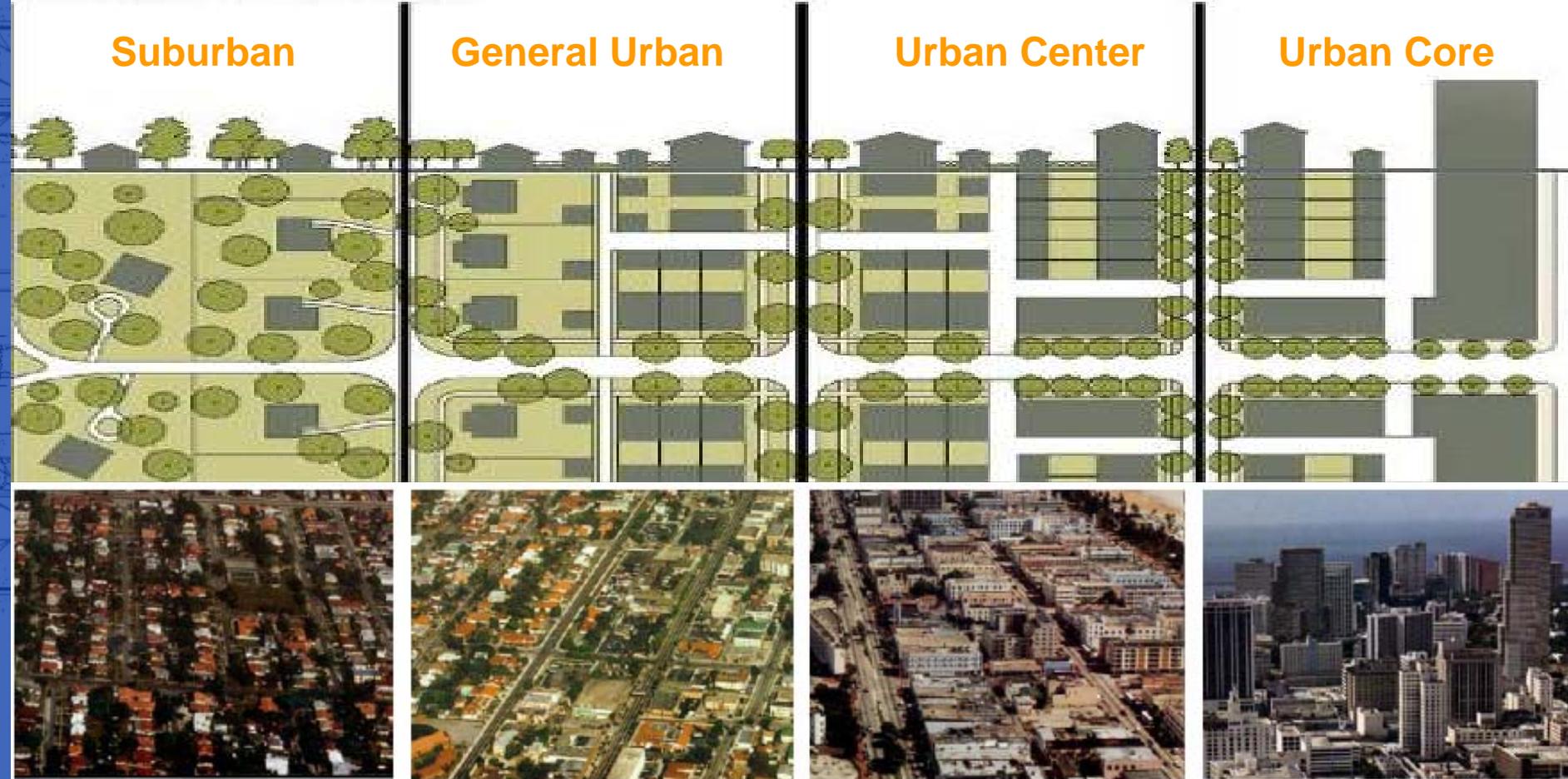
URBAN CONTEXT ZONES

Suburban

General Urban

Urban Center

Urban Core



CSS vs. Conventional Thoroughfare Design Approach

Conventional	CSS Approach
<p>Context:</p> <ul style="list-style-type: none">UrbanRural	<p>Context:</p> <ul style="list-style-type: none">SuburbanGeneral urbanUrban centerUrban core
<p>Design criteria primarily based on:</p> <ul style="list-style-type: none">Functional classDesign speedForecast travel demandLevel of service	<p>Design criteria primarily based on:</p> <ul style="list-style-type: none">Community objectivesFunctional classThoroughfare typeAdjacent land use

Features That Create Context

- **Land use**
 - Defines urban activity
 - Major factor in design criteria
- **Site design**
 - Arrangement of buildings, circulation, parking and landscape
 - Vehicle or pedestrian-orientation
- **Building design**
 - Height, massing shape context
 - Create enclosure/pedestrian interest



Land Use

- Major factor in thoroughfare design
- Influences:
 - Travel demand
 - Activity in roadside
 - Width of roadside
 - On-street parking
 - Target speed
 - Freight and transit



Site Design

	Auto Oriented	Pedestrian Oriented
Building Orientation and Setback	<ul style="list-style-type: none"> – Set well back into private property – Oriented to parking or landscape 	<ul style="list-style-type: none"> – Oriented to, and adjacent to street – Direct pedestrian entrance on street – Integrated with street using stoops, arcades, cafes
Parking Type and Orientation	<ul style="list-style-type: none"> – Surface lot between buildings and street 	<ul style="list-style-type: none"> – Under or behind building access by alleys – Structured – On-street
Block Length	<ul style="list-style-type: none"> - Large blocks, often with no public throughway - Superblocks 	<ul style="list-style-type: none"> - Short blocks - High connected network

Building Design

- Significant contributor to context defined by:
 - Height and thoroughfare enclosure
 - Massing
 - Scale and variety
 - Entries and windows
 - Placement on site
 - Architectural style



Raised median on
Boulevards with
landscaping

Mid-block crossings
with curb extensions
and median refuge

Side walk width appropriate to
function of adjacent

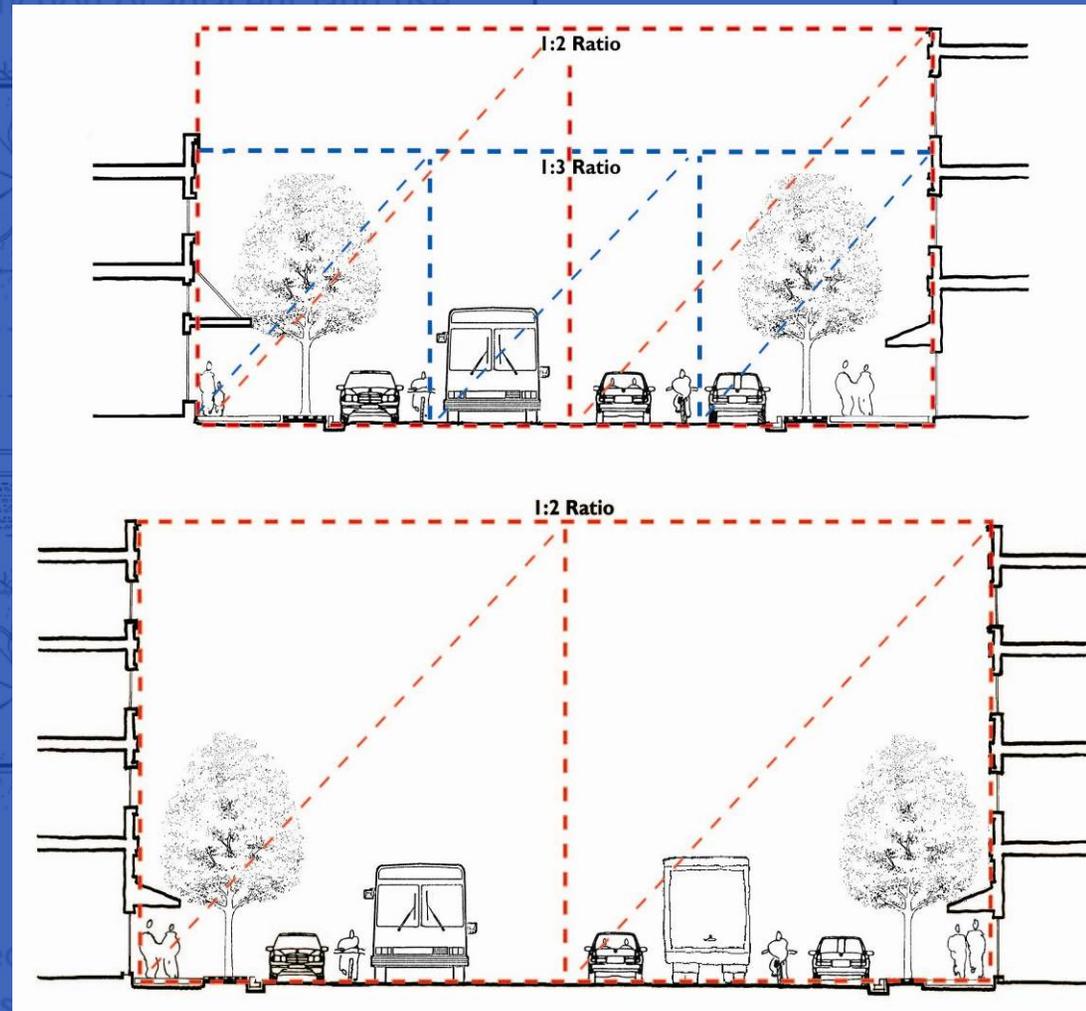
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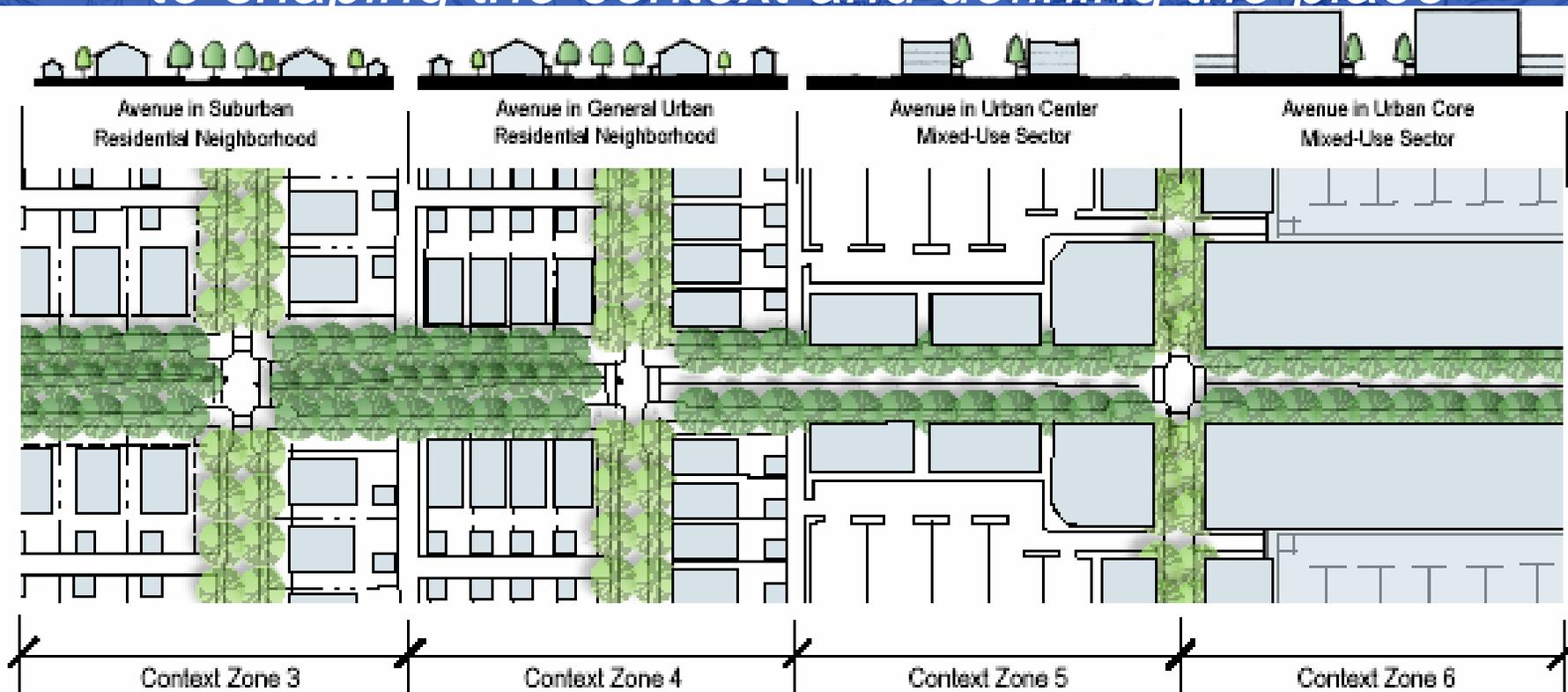
Street Enclosure

- Building height to thoroughfare width ratios:
 - 1:4 suburban
 - 1:2-1:3 urban
- Pedestrians first perceive enclosure at a 1:4 ratio



Thoroughfare Design Changes as Context Changes

The thoroughfare both responds to and contributes to shaping the context and defining the place



Thoroughfare Types

- Three classifications:
 - Boulevard
 - Avenue
 - Street
- Basis for:
 - Physical configuration
 - Design criteria

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Urban Design
Features

Short pedestrian
scaled blocks

Boulevard

- Divided arterial (4+ lanes)
- Target speed (35 mph or less)
- Through and local traffic
- Serve longer trips
- Access management
- Major transit corridor
- Primary freight route
- Emergency response route
- Limited curb parking

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Amenities
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Urban Design
Features

Short pedestrian
scaled blocks









Multi-way Boulevard

- Characterized by:
 - Central roadway for through traffic
 - Parallel roadways access abutting property, parking, and pedestrian and bicycle facilities
 - Parallel roadways separated from the through lanes by curbed islands
- Require significant right-of-way
- Special treatment of intersections

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NEED
TRANSIT
INFO?
CALL
511

CHAMING
Way



THE ARTS & COMMERCE DISTRICT

THE ARTS & COMMERCE DISTRICT

THE ARTS & COMMERCE DISTRICT

Avenue

- Arterial or collector (4 lanes max)
- Target speed (30 to 35 mph)
- Land access
- Primary ped and bike route
- Local transit route
- Freight - local deliveries
- Optional raised landscaped median
- Curb parking





NO
PARKING
BETWEEN
2AM
AND
6AM



HERE TO
COVER



ZUPANS
MARKET

Belmont
DAIRY

ZUPANS
MARKET



Shortest
Route
to
Bakery

P
1-2 HOURS

FREE

PONTIAC



Washington Mutual

SAN PEDRO

P
←

Bus Stop
22
84
68
HYT

DAC
PHUC

2B

P
↑
←

Street

- Collector or local
- 2 lanes
- Target speed (25mph)
- Land access primary function
- Designed to:
 - Connect residential neighborhoods
 - Connect neighborhoods with commercial districts
 - Connect local streets to arterials
- May be commercial main street
- Emphasizes curbside parking
- Freight restricted to local deliveries

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Photographs from Michael King
and Reid Ewing

Thoroughfare Examples

- Street in urban center context



Thoroughfare Examples

- Boulevard in general urban context



Thoroughfare Examples

- Boulevard in urban core context



Thoroughfare Examples

- Avenue in suburban context



Thoroughfare Examples

- Avenue in urban center context



Change is Gradual

Raised median on
Boulevards with
landscaping

Mid-block crossings
with curb extensions
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Sidewalk width appropriate to



Steve Price, UrbanAdvantage

Change is Gradual

Raised median on
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Steve Price, UrbanAdvantage

Change is Gradual

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Steve Price, UrbanAdvantage

Design Controls in CSS

- Design control – guide selection of design criteria
 - Speed
 - Design vehicle
 - Thoroughfare type, context, land use type
 - Location
 - Sight distance
 - Horizontal / vertical alignment
 - Access management
 - Pedestrians and bicyclists

Speed Definitions

- Target speed
 - Desirable operating speed in specific context
 - Range: 25 to 35 mph
 - Balances
 - Vehicle mobility
 - Safe environment
 - Usually posted speed limit

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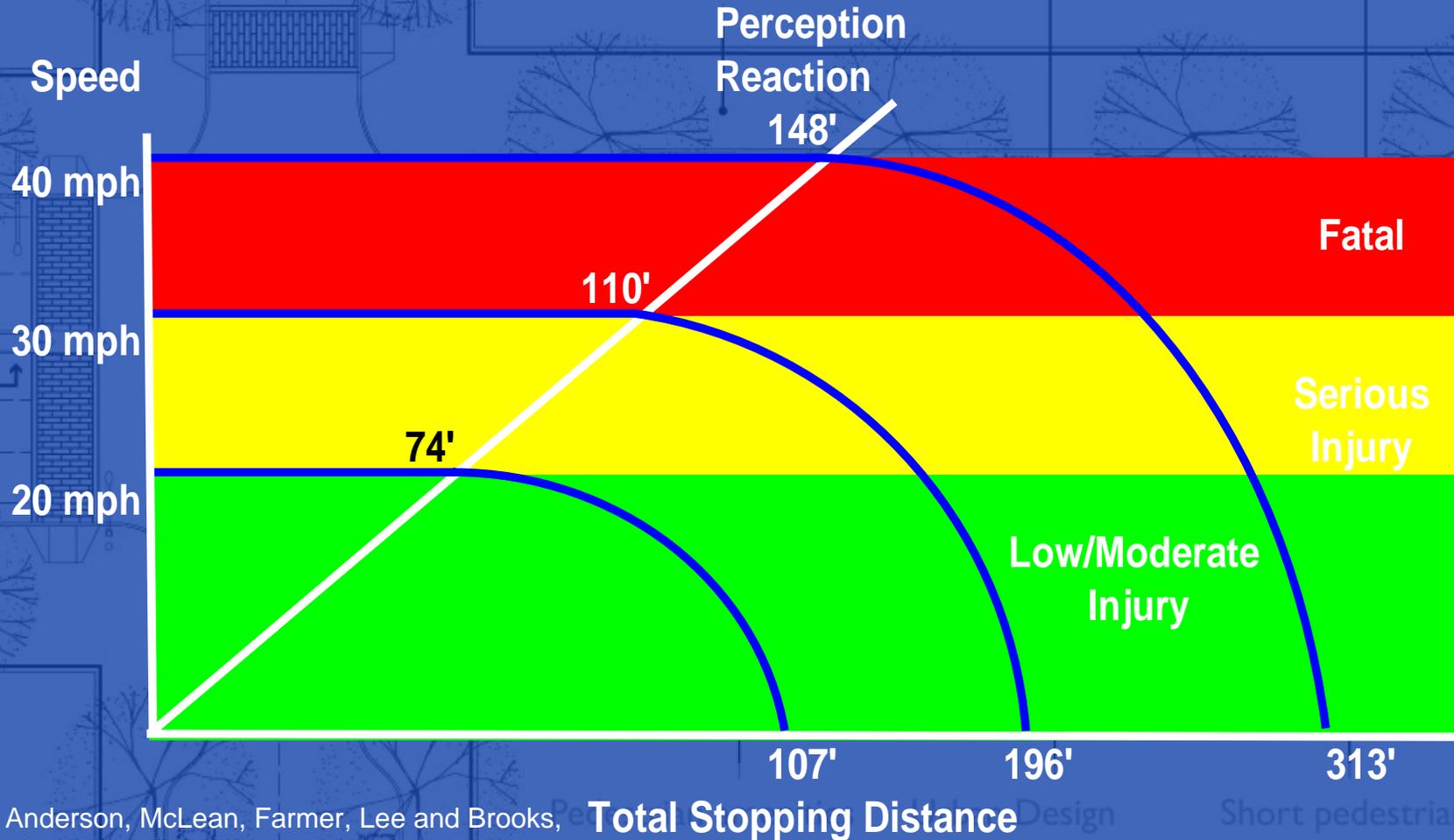
Sidewalk width appropriate to
function of adjacent land use

Pedestrian amenities
such as benches,

Urban Design
Features

Short pedestrian
scaled blocks

Speed/Accident Severity Relationship



Source: Anderson, McLean, Farmer, Lee and Brooks, Accident Analysis & Prevention (1997)

Total Stopping Distance

Design Factors that Influence Target Speed (Urban Areas)

- Lane width
- Minimal offset
- No superelevation
- No shoulders
- On-street parking
- Smaller curb return radii
- Design of right turn lanes
- Spacing of signalized intersections
- Synchronization to desired speed
- Paving materials

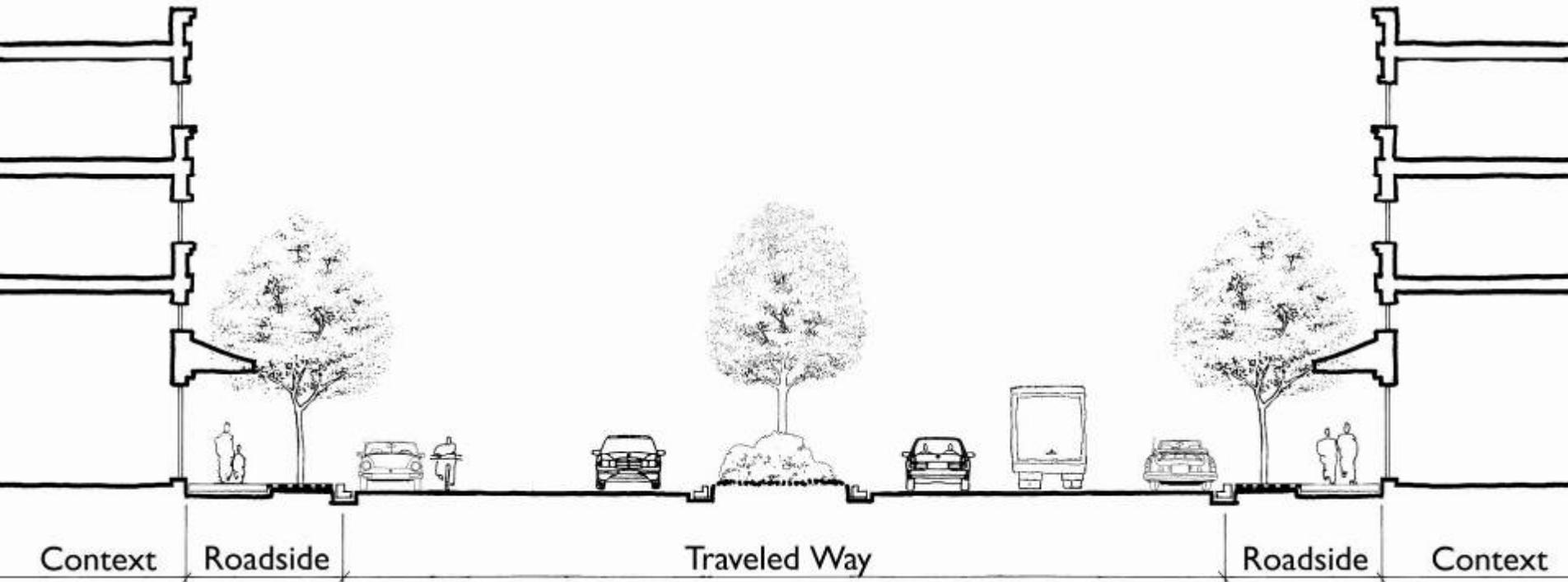


Thoroughfare Components

Raised median on
Boulevards with
landscaping

Mid-block crossings
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and median refuge

Sidewalk with appropriate
function of adjacent land use



Pedestrian amenities
such as benches,

Urban Design
Features

short pedestrian
scaled blocks

Changing Thoroughfare & Context

Simulation by Steve Price,
UrbanAdvantage



Changing Thoroughfare & Context

Simulation by Steve Price,
UrbanAdvantage



Changing Thoroughfare & Context

Simulation by Steve Price,
UrbanAdvantage



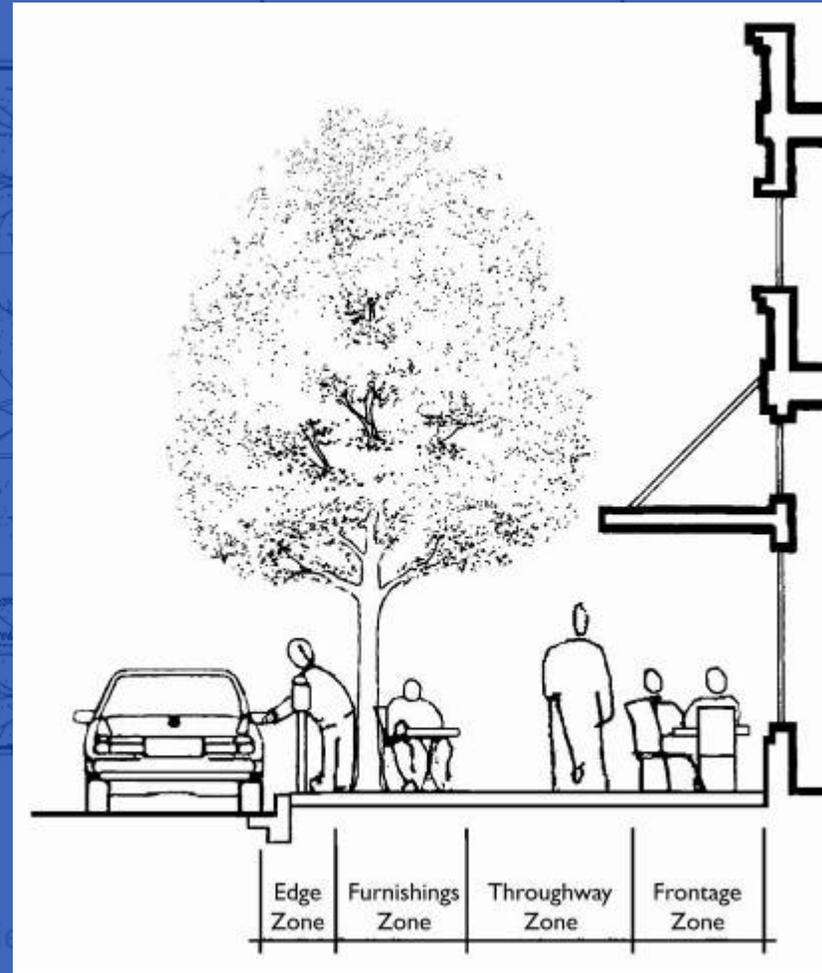
Changing Thoroughfare & Context

Simulation by Steve Price,
UrbanAdvantage



Roadside Design

- Roadside zones:
 - Edge Zone
 - Furnishings Zone
 - Throughway Zone (ADA)
 - Frontage Zone
- Function and dimensions vary by context zone and adjacent land use



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Features

scaled blocks

Roadside Defined

- From property line to face of curb
- Accommodates street activity
 - Mobility
 - Business
 - Social
- Public space

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Pedestrian amenities
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The Urban Roadside – Uses and Activities

- Movement of pedestrians
- Access to buildings/property
- Utilities/appurtenances
- Transit stops
- Landscaping
- Urban design/public art
- Sidewalk cafes
- Business functions
- Civic spaces (plazas, seating)



Roadside Design

- Roadside zones
- Public places
- Placement of roadside facilities
- Public art
- Sidewalk width and function
- Pedestrian buffers
- Sidewalk/driveway/alley crossings
- Street furniture
- Utilities
- Landscaping/street trees









GUINNESS
DRAUGHT









Juice

Juice

Juice

Juice





Traveled Way Design

- Cross-sections
- Access management
- Transition principles
- Lane width
- Medians
- Bicycle facilities
- On-street parking
- Mid-block crosswalks
- Pedestrian refuge islands
- Mid-block bus stops
- Snow removal
- Transit stops



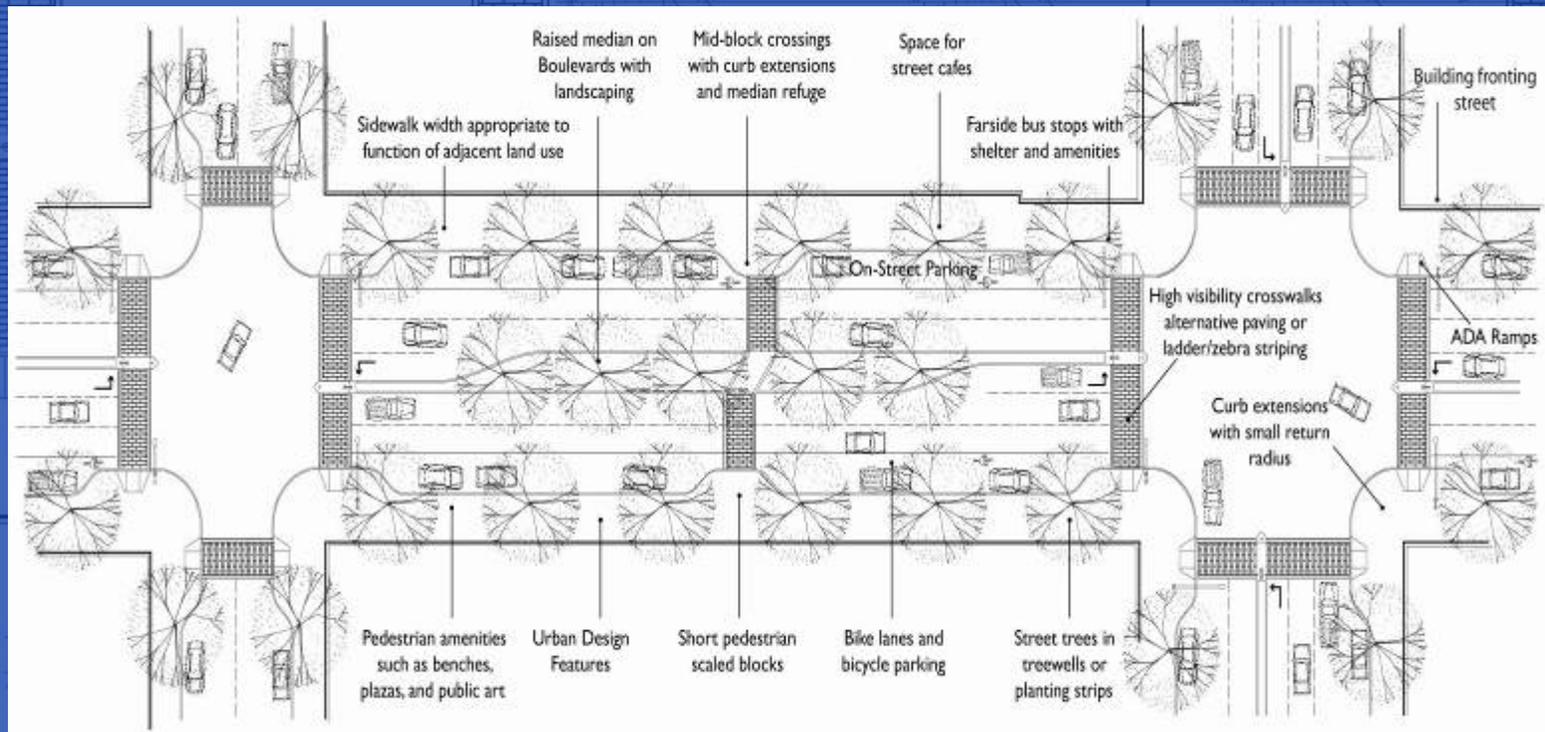
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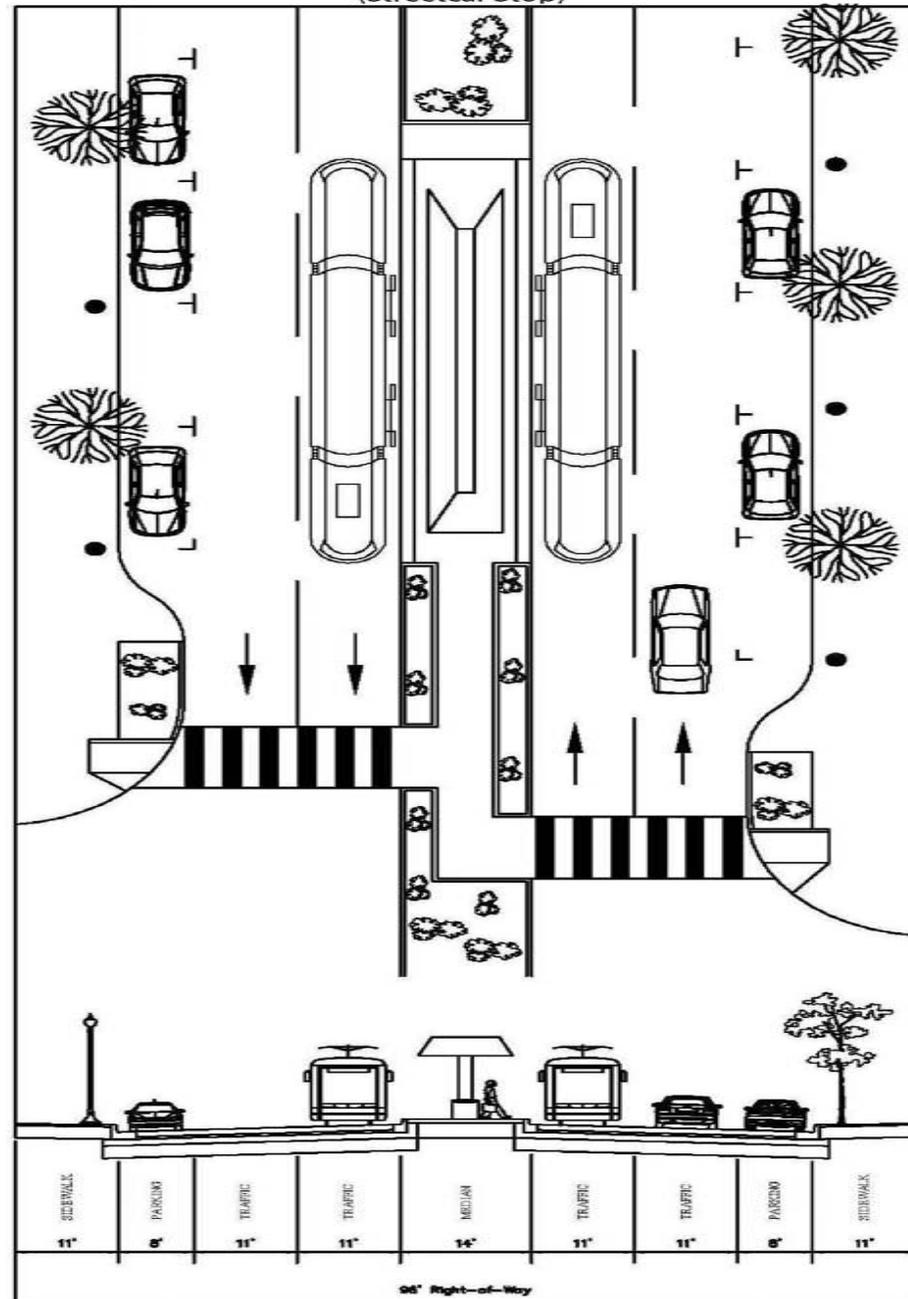
The Urban Traveled Way

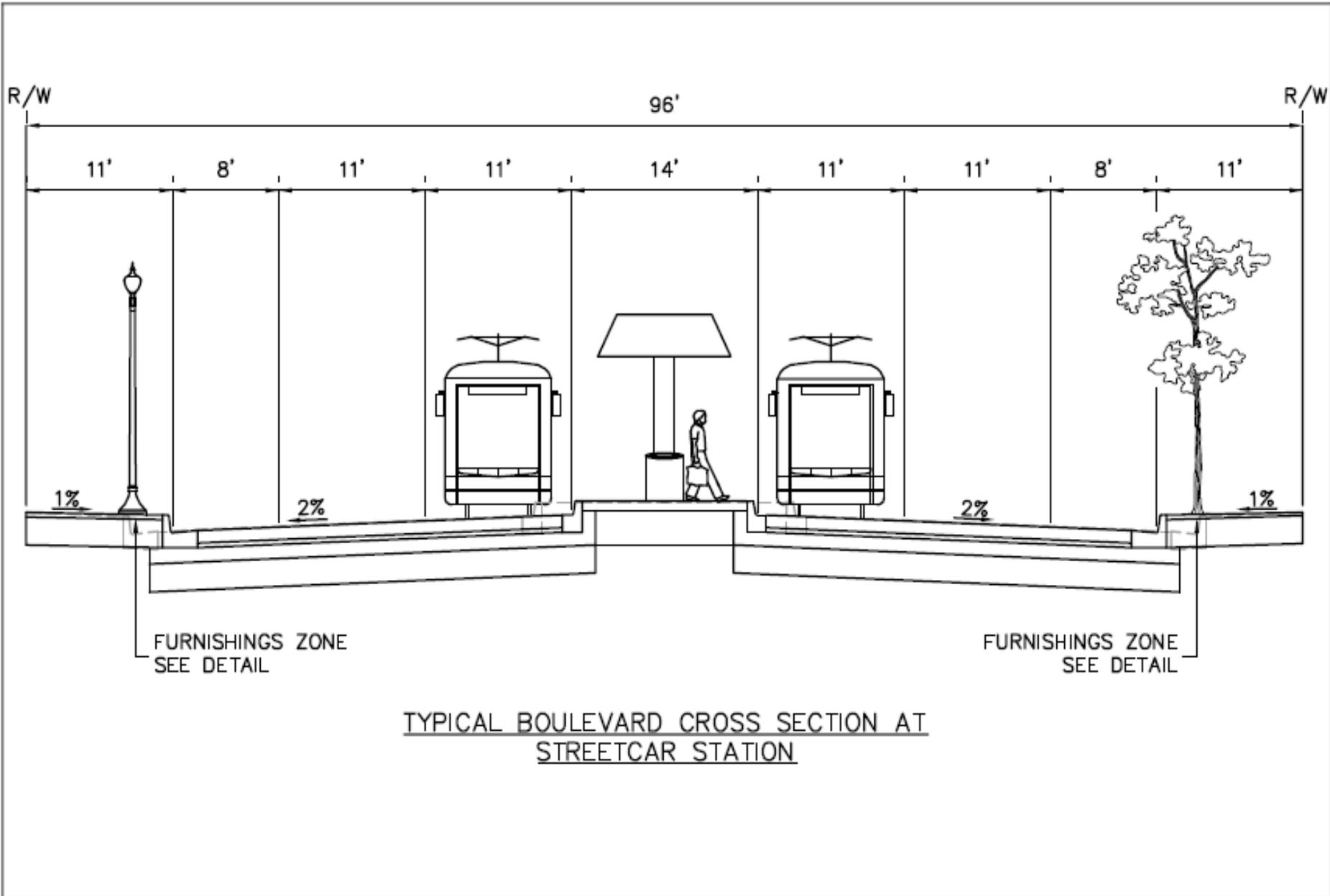
- Central portion of thoroughfare between curbs
- Provides for movement of vehicles
- Interface with roadside via on-street parking



Streetcar Stop

- Fits within existing R/W
- Streetcars operate within inside lanes shared with traffic
- Platforms in median
- Special crossings for pedestrians to access stations



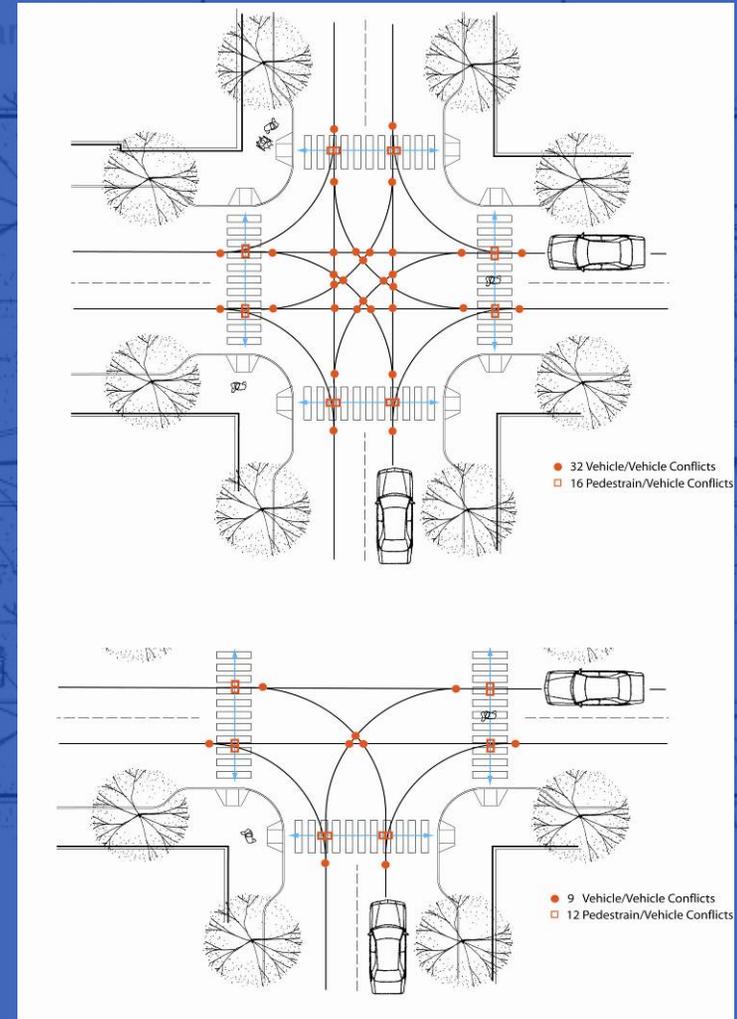






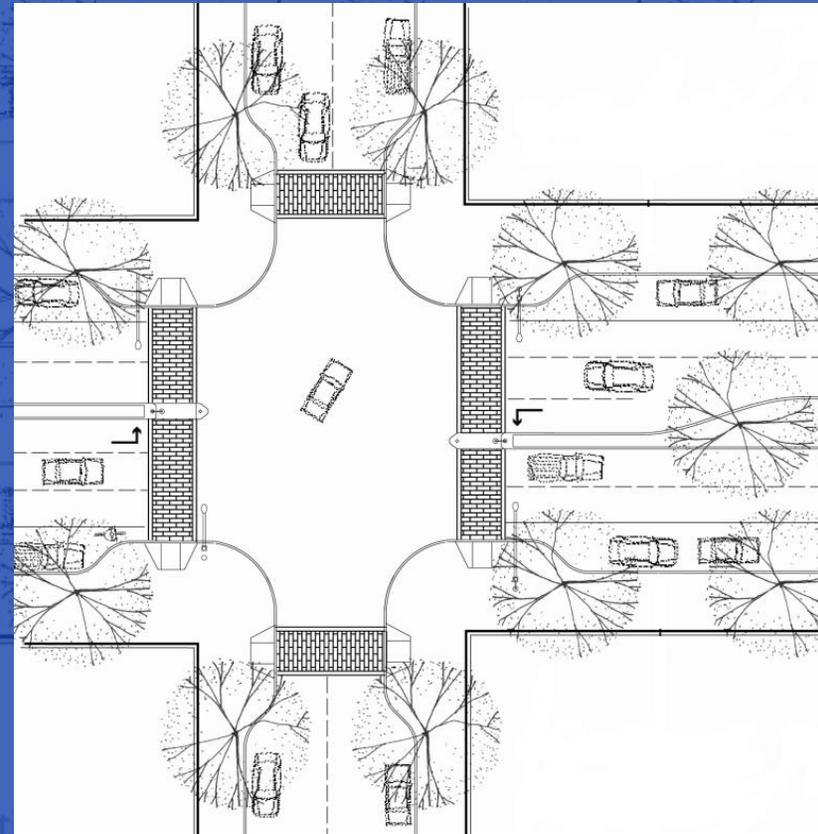
Urban Intersections

- General principles
 - Minimize conflicts between modes
 - Minimize pedestrian exposure
 - Provide crosswalks on all approaches
 - Minimize curb radii consistent with design/control vehicle
 - Ensure good visibility
 - Balance vehicle LOS with pedestrian convenience and safety



Urban Intersections

- Design elements
 - Through and turning lanes
 - Intersection sight distance
 - Medians
 - Curb return radii
 - Design vehicle
 - Channelized right turns
 - Modern roundabouts
 - Crosswalks and refuges
 - Curb extensions
 - Bicycle lane treatment
 - Bus stops
 - Traffic signals



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Intersection Design

- Design considerations

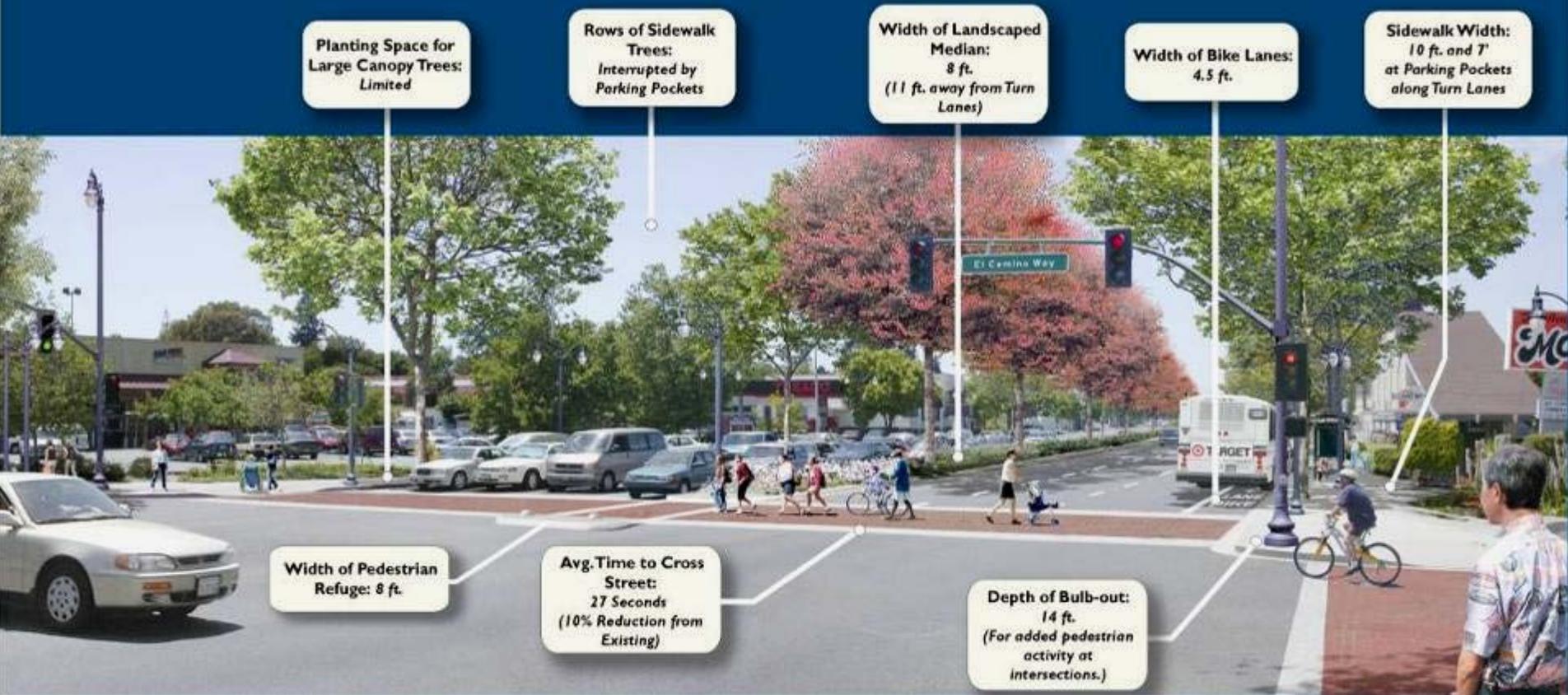


Source: City of Palo Alto
CD+A, FPA, and Urban Advantage

El Camino Real @ Los Robles – EXISTING CONDITIONS

Intersection Design

- Creating opportunities to improve context

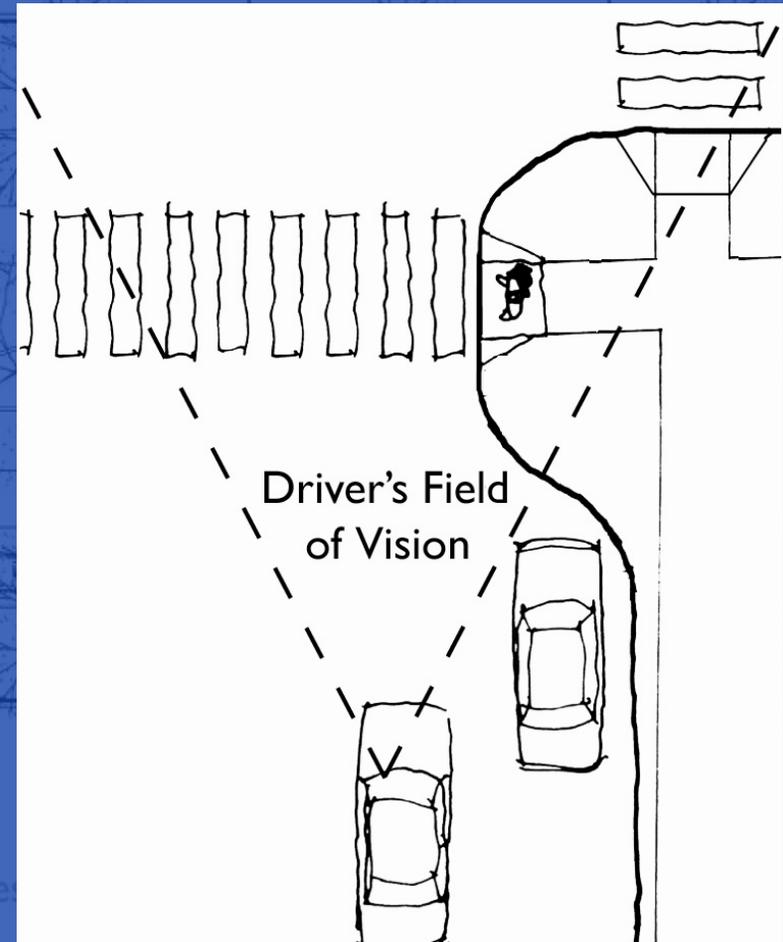


Source: City of Palo Alto
CD+A, FPA, and Urban Advantage

El Camino Real @ Los Robles – PROPOSED IMPROVEMENTS

Bulb-Outs

- Improve visibility
- Reduce crossing width
- On streets with parking
- Recommended practice
 - Extend curb line 1 ft. less than parking width
 - Curb return radius for control vehicle
 - Use with bus stops to increase waiting area

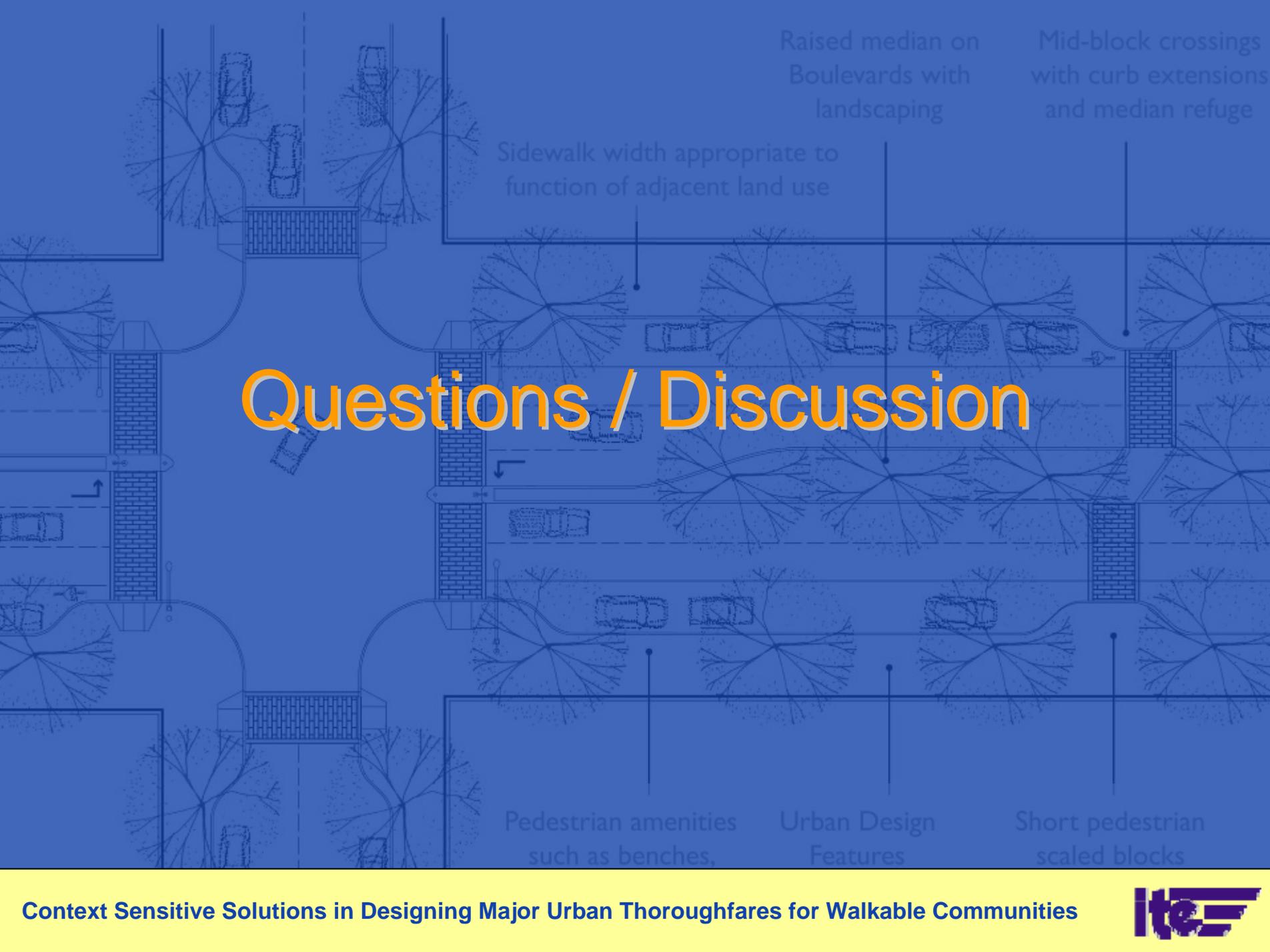




WHITE BLACK

Mammal Bar





Questions / Discussion

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Areas of Debate, Continuing Discussion

- Design speed vs. target speed
- Appropriate target speeds
- Appropriate lane widths
- Maximum number of moving lanes
- Reduction in design exceptions
- Design vehicle
- Role of level of service
- Clear zones/street trees in urban areas
- Mid-block crosswalks
- Extensive use of bike lanes

Reduce Target Speeds

- Arguments for reduction
 - More walkability
 - Safer; reduced crash severity
 - Recommended range should reach 20 mph (or lower)
- Arguments for no change
 - Target speeds already range to 25 mph
 - Arterials 25-35 mph
 - Collectors 25-30 mph
 - Report does not include slower local streets

Raised median on
Boulevards with
plantings

Mid-block crossings
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Pedestrian sidewalk width appropriate to
function of adjacent land use

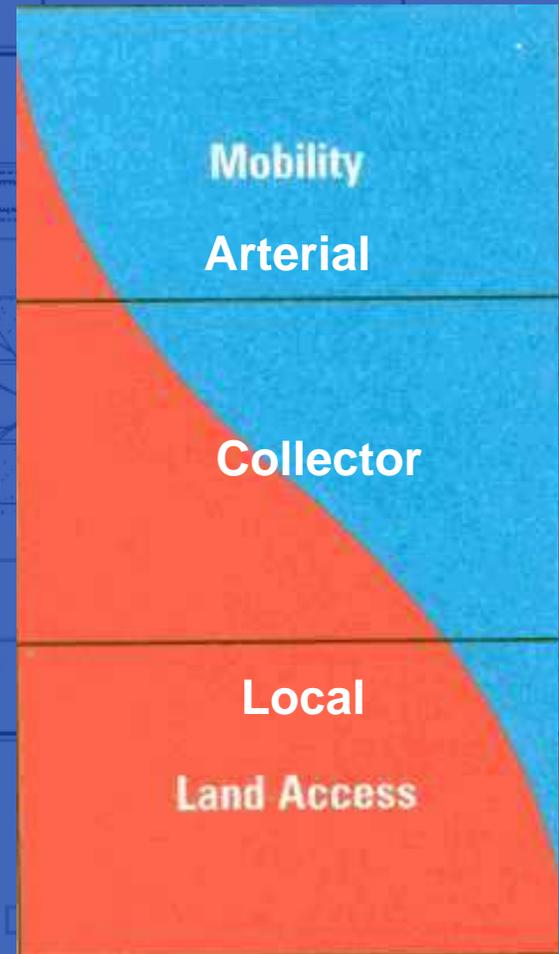
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Delete Functional Classifications

- Arguments against functional classifications:
 - Politically assigned
 - Motivated by funding desires
 - Arbitrary
 - Not reflective of actual function or use
 - Over prioritize mobility role
 - Not properly reflective of urban thoroughfare functions



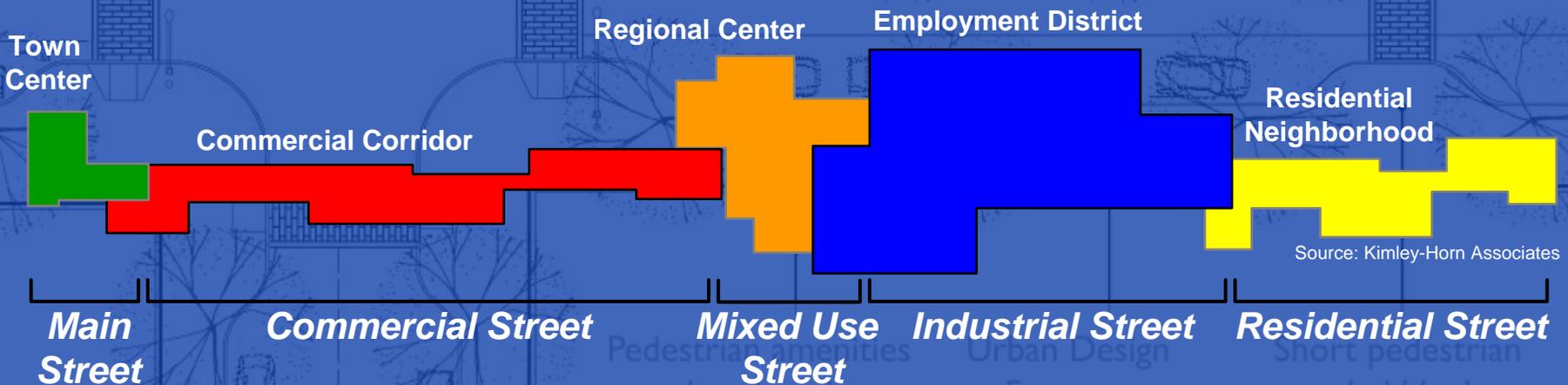
Expand Thoroughfare Types

Current types

- Boulevard
- Multi-way boulevard
- Avenue
- Street

Additional possibilities

- Define by adjacent land use
 - ▣ Main street
 - ▣ Commercial street
 - ▣ Mixed-use street
 - ▣ Residential street
 - ▣ Industrial street



Source: Kimley-Horn Associates

Narrower Traffic Lanes and Increased Range

- Widths vary
 - Most 10-11 feet (11-12 at 35mph+)
 - A few 10-12 feet
- Request for 9 foot widths
- AASHTO
 - Minimum 10 feet for *major* thoroughfare
 - Permits 9 feet for turn lane on *local* streets



De-emphasize or Emphasize Use of Level Of Service

- Arguments against retention
 - Puts too much emphasis on vehicle movement
 - Does not effectively address Pedestrians, Bicycles, and Transit
 - Over-emphasizes auto mobility function
 - High levels of service not necessarily better for walkable areas
- Arguments for increased emphasis
 - Vehicles provide most of mobility
 - Safety experience tied to LOS
 - Emergency access (area) dependent on LOS



Guidelines for Small Town Main Streets

Sidewalk width appropriate to function of adjacent land use



such as benches,

Features

Short pedestrian scaled blocks

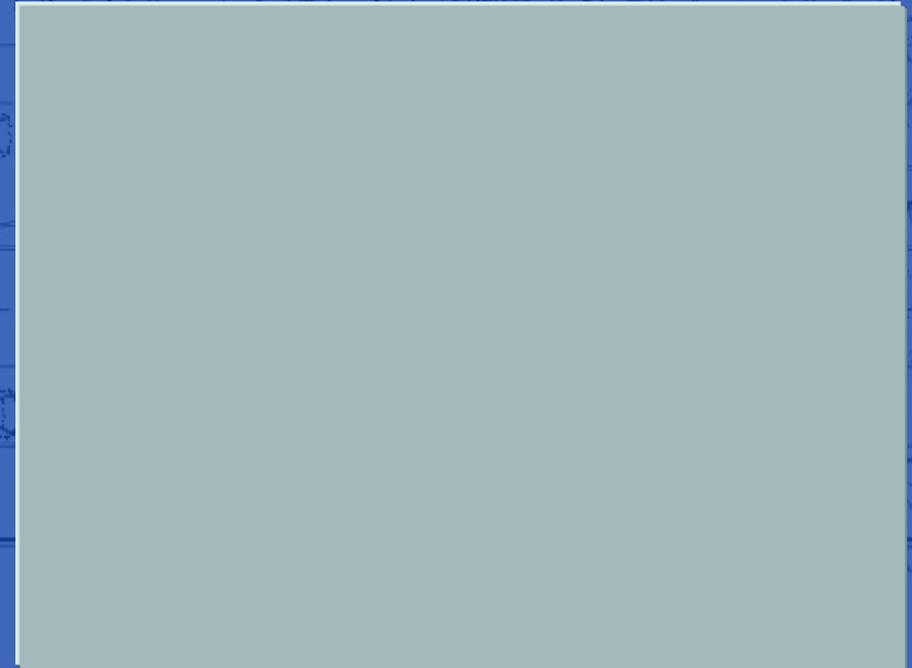
Provide Mid-Block Signalization Criteria

- Users seek MUTCD warrants or guidelines
- MUTCD signal warrant #4
 - Pedestrian volume warrant
 - Applicable to mid-block
- Add reference to MUTCD warrant #4 in midblock cross-section



More on Multi-way Boulevards

- Requests
 - Make independent thoroughfare type
 - Add more material



Expand Section on How to Locate/Orient Buildings



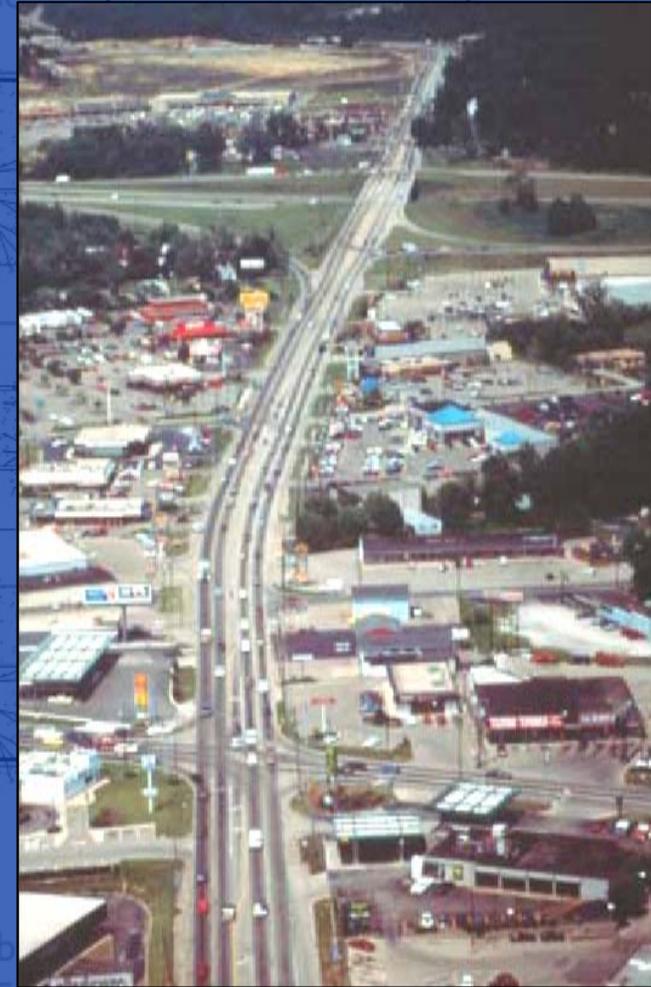
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Vehicle Mobility Priority

- Chapter 11
- Mobility priority thoroughfares
- Many requests for removal
 - Does not fit context of rest of report
- Some requests for expansion



Other Requested Changes

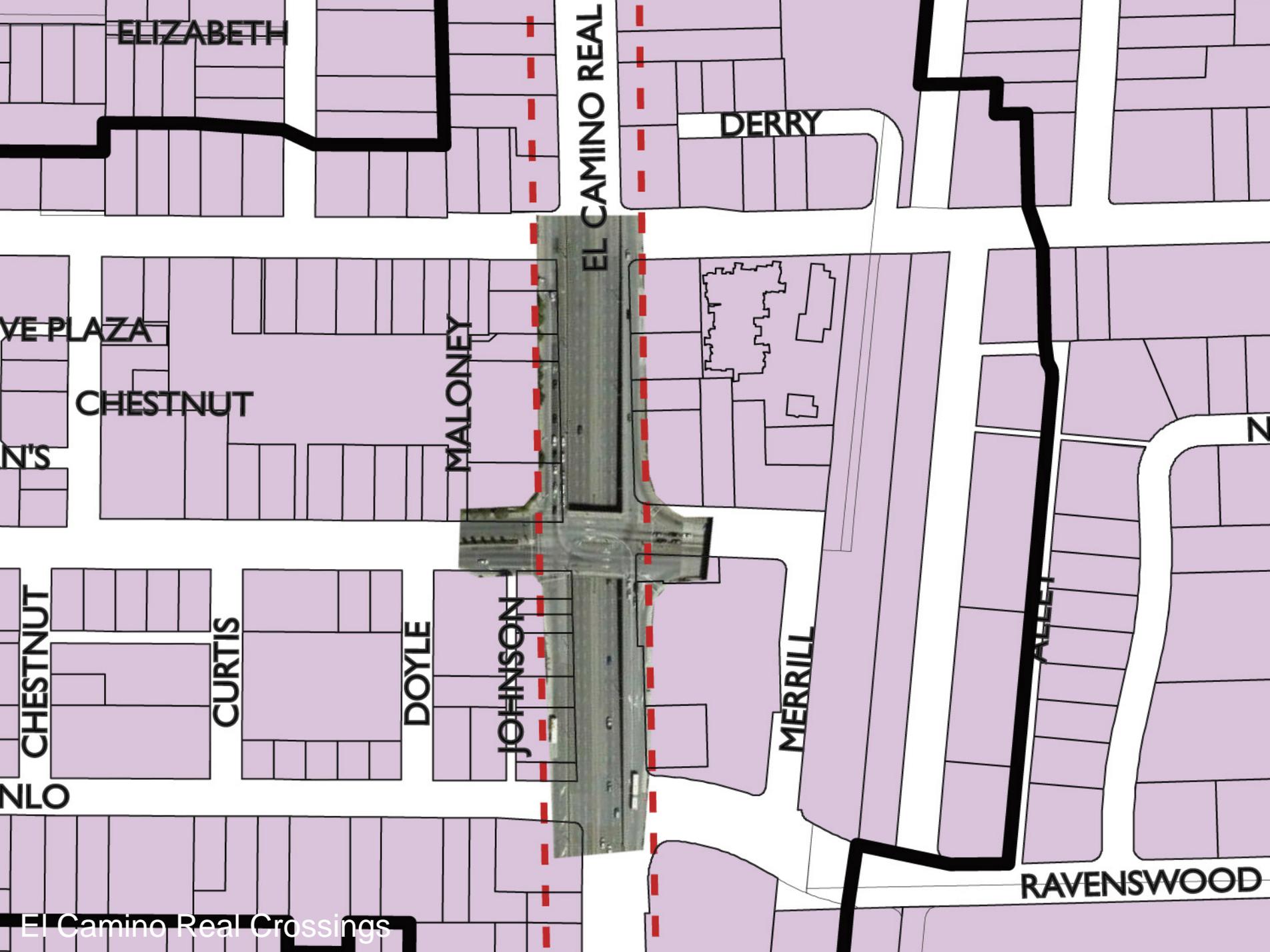
- More and better examples
 - Photos, illustrations, visualizations
 - Case studies
- Increased flexibility
- More/less bike provisions
- Green streets and storm water management
- More on utility location
- Section on favorable court decisions
- More on ADA policies and requirements
- Broaden section on trade-offs
- Expanded emergency access section



Pedestrian amenities
such as benches,

Urban Design
Features

Short pedestrian
scaled blocks



ELIZABETH

DERRY

EL CAMINO REAL

VE PLAZA

CHESTNUT

MALONEY

N'S

CHESTNUT

CURTIS

DOYLE

JOHNSON

MERRILL

ALLEY

NLO

RAVENSWOOD

El Camino Real Crossings