Application of the Guide on San Francisco Roadways
Two Recent Complete Street Projects

Polk St. (Civic Center)

Cesar Chavez
An Incomplete Street can feel like...
Result of Designing for Peak Hour*

Inefficient Use of Valuable Space
One-Dimensional Design
Encourages Speeding
Unnecessarily Wide for Pedestrians

*Peak hour occurs ~2hrs/day, 5 days/week, or 6% of the time

Cesar Chavez Street: 6 lane arterial
Designing for Peak Motor Vehicle Flow

Level of Service “F”

Unused Capacity

Peak Period

# of vehicles per hour
Cesar Chavez Streetscape Project

- Pedestrians
- Bicyclists
- Trucks
- Signal Design
- Traffic Routing during Construction
- Schools, Parks Access
- Transit
- Local and Regional Traffic
- Accessibility (APS)
50,000+ veh/day – LOS F acceptable trade-off for benefits
Multi-Agency Effort

**Signage:** Planning

**Street trees:**
DPW (Bureau of Urban Forestry) or property owner

**Lightpoles:**
PUC (PUC Streetlighting)

**Sidewalk permits and maintenance:**
DPW, property owner

**Parking, loading, bike, transit, traffic control:**
MTA (DPT, Muni)

**Storm drains, utilities:**
PUC (Wastewater Enterprise)

**Building facade, curb-cuts:**
Planning
Cesar Chavez – before project

Six lanes, 53,000 veh/day
Road diet, bike lanes, landscaping, bulb outs, LED lights
Cesar Chavez: before
Cesar Chavez: before
Cesar Chavez: after

Landscape median w turn pockets and ped refuges

Transit bulbs
Awkward intersection, degraded pedestrian sidewalk space, long exposed street crossings
Cesar Chavez at Mission and Capp

Plaza, raised intersection, shared space, and bulb out under construction
Cesar Chavez at Mission and Capp

All with permeable pavement
Cesar Chavez at York and Hampshire - before

Cut-through traffic, higher speed turns, ped xing
Cesar Chavez at York and Hampshire - after

Raised xwalk,
choker/bulb out
Polk Street - before

Poor bike connectivity, challenging ped xings
Polk Street Bikeways - after

Visible, connected, comfortable

Widened green lanes with back-in angled parking

Separated contraflow lane
Polk Street Contraflow Bike Lane

Improved Connectivity along One-Way Arterial
Polk Street – new ped xings

Bulb outs, shorter xings
Thank You!

Contact: Mike Sallaberry, mike.sallaberry@sfmta.com
<table>
<thead>
<tr>
<th>Downtown 1-Way Street</th>
<th>Residential Boulevard</th>
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<tbody>
<tr>
<td>Downtown 2-Way Street</td>
<td>Transit Corridor</td>
</tr>
<tr>
<td>Downtown Thoroughfare</td>
<td>Green Alley</td>
</tr>
<tr>
<td>Neighborhood Main Street</td>
<td>Commercial Alley</td>
</tr>
<tr>
<td>Neighborhood Street</td>
<td>Residential Shared Street</td>
</tr>
<tr>
<td>Yield Street</td>
<td>Commercial Shared Street</td>
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</table>
## NACTO vs. Functional Classification

<table>
<thead>
<tr>
<th>NACTO Street Types</th>
<th>Functional Classification</th>
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<tr>
<td>Downtown Streets</td>
<td>Arterial, Collector, Local</td>
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<td>Local</td>
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<td>Alleys</td>
<td>Local</td>
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</table>
Context is Critical

Street design should both respond to and influence the desired character of the public realm.
Context/Land Use

**Downtown**
- 1-Way Street
- 2-Way Street
- Thoroughfare

**Neighborhood**
- Main Street
- Street

**Yield Street**

**Residential**
- Boulevard
- Transit Corridor
- Green Alley

**Commercial**
- Alley
- Shared Street

**Commercial** Shared Street
Usage Characteristic/Mode

Downtown 1-Way Street
Downtown 2-Way Street
Downtown Thoroughfare
Neighborhood Main Street
Neighborhood Street
Yield Street
Boulevard

Residential Boulevard
Transit Corridor
Green Alley
Commercial Alley
Residential Shared Street
Commercial Shared Street
Size/Class/Configuration

Downtown 1-Way Street
Downtown 2-Way Street
Downtown Thoroughfare
Neighborhood Main Street
Neighborhood Street
Yield Street
Boulevard

Residential Boulevard
Transit Corridor
Green Alley
Commercial Alley
Residential Shared Street
Commercial Shared Street
SAN FRANCISCO STREETS
From the Better Streets Plan

Parkways
Park Edge
Boulevards
Ceremonial (Civic Streets)
Commercial Throughways
Downtown Commercial
Downtown Residential
Neighborhood Commercial
Residential Throughway
Mixed Use
Industrial
Shared Public Ways
Paseo
Alleys
Downtown 1-Way Street
Downtown 1-Way
Downtown 1-Way

9th Avenue Complete Street (2007-2008)

GOALS

• Higher quality experience for cyclists of all levels
• Secure and pleasant pedestrian experience
• Conflict-free loading and unloading
• Through vehicle movements accommodated
• Congestion-free surface transit

Credit: Mike Flynn
Downtown 1-Way

9th Avenue Complete Street (2007-2008)

Design Hour

A DAY IN THE LIFE OF A STREET

8:00 am

12 am

12 pm

1:00 pm

6 pm

Downtown pedestrian volumes reach their peak intensity at lunch hour.

8:00 pm

MID-DAY

EVENING

Traffic volumes begin to dip in the evening, after rush hour, while pedestrian traffic in certain areas begins to rise.

Analyze peak points of stress within the overall context and changing use of the street.

Highest Daily Hourly Vehicle Volume
Downtown 1-Way

9th Avenue Complete Street (2007-2008)

**DESIGN CONSIDERATIONS**

- Motorist-bicyclist turning conflicts (left hooks)
- Street sweeping & snow clearing
- Loading & unloading

**9th Avenue SB Traffic Volumes**

- < 1,800 vph during peak hours
- Travel lanes comfortably accommodate 600 vph
- 4 travel lanes = excess capacity

Credit: Mike Flynn
Downtown 1-Way

9th Avenue Complete Street (2007-2008)

- Pedestrian crossings reduced by 25’ (from 70’)
- New trees & planting beds
- Separated bike path
- Bicycle signals
- Sufficient capacity for motorists
- One left turn banned
- Single-space meters → multi-space
- Some parking loss
- Bus service unchanged

Credit: Mike Flynn
Downtown 1-Way

9th Avenue Complete Street (2007-2008)

BEFORE
Downtown 1-Way

9th Avenue Complete Street (2007-2008)
Downtown 1-Way
9th Avenue Complete Street (2007-2008)

RESULTS

• Cyclist injuries down 36%
• 46% fewer injuries to all users
• 43% fewer crashes with injuries
• Weekday bicycle volumes increased by 63%

Cyclist Volume - 12 Hour: 7AM - 7PM, Weekdays

Credit: Mike Flynn
Downtown 1-Way

9th Avenue Complete Street (2007-2008)

RESULTS

• 15% reduction in vehicle volume during peak hour
• During PM peak period, 14% of roadway users are cyclists
• 49% increase in retail sales between 23rd – 31st Sts, compared to 3% for borough and 26% for comparisons
Downtown 1-Way

9th Avenue Complete Street (2007-2008)

Capital Build-Out Concept

Credit: Mike Flynn
Downtown 1-Way

1st & 2nd Avenues Select Bus Service (2010-2013)

BEFORE
Downtown 1-Way

1st & 2nd Avenues Select Bus Service (2010-2013)

INTERIM
Downtown 1-Way

1st & 2nd Avenues Select Bus Service (2010-2013)

Bus Bulbs
Downtown 1-Way

1st & 2nd Avenues Select Bus Service (2010-2013)
Neighborhood Street
Neighborhood Street
Neighborhood Street

Neighborhood Slow Zone program (2011 – )

PROGRAM GOALS

• Community-based program to change driver behavior
• Lower incidence and severity of crashes
• Enhance quality of life by reducing cut-through traffic and traffic noise in residential neighborhoods
Neighborhood Street

Neighborhood Slow Zone program (2011 – )

APPROACH

• Application-based, competitive selection
• Self-contained areas of mainly local streets with strong boundaries
• Use of low-cost, quick interim treatments

TOOLKIT

• Gateway treatments at entries
• Channelization markings to visually narrow roadway
• Speed humps at regular intervals
## Neighborhood Street

### Neighborhood Slow Zone program (2011 – )

<table>
<thead>
<tr>
<th>Design Speed</th>
<th>Description</th>
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<tbody>
<tr>
<td>10–15 MPH</td>
<td>Driver's peripheral vision, stopping distance, crash risk</td>
</tr>
<tr>
<td>20–25 MPH</td>
<td>Driver's peripheral vision, stopping distance, crash risk</td>
</tr>
<tr>
<td>30–35 MPH</td>
<td>Driver's peripheral vision, stopping distance, crash risk</td>
</tr>
<tr>
<td>40+ MPH</td>
<td>Driver's peripheral vision, stopping distance, crash risk</td>
</tr>
</tbody>
</table>

*Higher speeds = Higher crash risk = Higher injury severity = Lower safety*
Neighborhood Street

Neighborhood Slow Zone program (2011 – )

RESULTS (Claremont Slow Zone)

• Speeds reduced at 6 out of 7 locations with speed humps (10% decrease in 85th percentile speeds)

• Traffic volumes inside zone decreased by 13%

• Extremely popular – program being doubled, with 15 projects in 2015

• 74 applications received from communities for 15 slots

Credit: Mike Flynn
Neighborhood Street

Neighborhood Slow Zone program (2011 – )

POTENTIAL TOOLKIT for CAPITAL BUILD-OUT

• Gateway
• Raised Crossing/
  Raised Intersection
• Pinchpoint
• Chicane
• Mini-Roundabout
Boulevard
Boulevard

Residential Boulevard

Existing

Reconstruction
Boulevard

Allen & Pike Street Malls (2008-2013)

BEFORE
Elements Used

- Protected Bike Lanes (Median)
- 10-ft. lanes
- Interim Public Plazas

Credit: NYC DOT
Lane width should be evaluated within the overall assemblage of the street.
Wider travel lanes are correlated with higher vehicle speeds.

"As the width of the lane increased, the speed on the roadway increased. When lane widths are 1 m (3.3 ft) greater, speeds are predicted to be 15 km/h (9.4 mph) faster."

Sidewalks: The City at Eye-Level
Activating the curb
Parklets
Temporary Street Closures
Interim Public Plazas
## INTERIM DESIGN STRATEGIES

<table>
<thead>
<tr>
<th>Year</th>
<th>Conventional Project Development</th>
<th>Phased/Interim Design Strategy</th>
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<tbody>
<tr>
<td>Year 1</td>
<td>Concept</td>
<td>Concept</td>
</tr>
<tr>
<td></td>
<td>Plan/Outreach</td>
<td>Plan/Outreach</td>
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<tr>
<td>Year 2</td>
<td></td>
<td>Interim Installation</td>
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<tr>
<td></td>
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<td>Impacts Analysis</td>
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<tr>
<td>Year 3</td>
<td>Design</td>
<td>Design</td>
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<tr>
<td>Year 4</td>
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<tr>
<td>Year 5</td>
<td>Construction</td>
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</tr>
</tbody>
</table>
Long design & approval process

Credit: Mike Flynn, NYC DOT

Street Trees & GreenStreets: Parks

Street Planning, Scope Design, Operations & Maintenance: DOT

(Some) Street Design & Construction: EDC

Final Design, Agency Alignment & Construction: DDC

Utilities: Various private companies & contractors

Street Cleaning: DOS

Land Use & Urban Design: DCP

Vaults & some Sidewalks: DOB

Sewers & Drains: DEP

Special Furniture & Upkeep: BIDs

Other Reviews & Approvals: Design Comm’n, Landmarks Comm’n, OMB

Image: SF Better Streets Plan
Pros & Cons

Pros
• Design in real time
• Realize project benefits now
• Evaluate and improve rather than spend then correct
• Build a constituency
• Build more, cheaper, faster

Cons
• Pilot projects can be removed
• Aesthetic quality often lower
• Potential absence of capital funds for improvement.
• Can look shabby if poorly maintained
Interim Public Plazas – *NYC Plaza Program*

Prioritizes High-Need Areas

- **Blue**  Existing plaza project
- **Red**   Lack of Open Space
- **Yellow** Low-Mod Income
- **Orange** Lack of Open Space & Low-Mod Income

Courtesy of Mike Flynn, NYC DOT
David Vega-Barachowitz
Director
Designing Cities Initiative
NACTO

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