Complete Streets:
Plan, Policy & Performance
Not every street needs to be complete, but every mode needs a complete network.
## Session Agenda

- **40 minute presentation**
- **10 minute Q&A / Discussion**

<table>
<thead>
<tr>
<th>Planning</th>
<th>Policy/Guidance</th>
<th>Performance</th>
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</table>
| **Fundamentals**<br>20 minutes | • Network Planning  
• Facility Planning | • What are the components to consider when developing a complete streets policy? | • How do you measure success? |
| **Local Examples**<br>20 minutes | • Tempe’s Transportation Plan | • Tempe’s policies  
• Why not a complete street policy?  
• Elected officials role | • Economic development results |
Fundamentals: Complete Streets Planning
Fundamentals of CS Planning

- CS networks are best planned through alternate mode planning.
  - Network Gaps
  - Suitability and Safety
  - Identify Routes and Facility Types
  - What makes a good ... bike/pedestrian/transit facility or route?
Designing a CS Network

- Identify Activity Generators
  - Schools, Health Centers, Higher Density Residential, Commercial or Employment Concentrations
  - Alternate Mode Facilities (Parks, Trails, Open Space, Transit, Complete Streets)
  - Demographic Considerations
- Identify Safety Characteristics
  - Waterways/Washes, Highways, Rail
- Identify Gaps/Constraints
- Identify Key Connections
### What makes a good pedestrian route or a good pedestrian facility?

An ideal pedestrian route is determined by looking at the existing context of a community and the travel behavior of pedestrians along with all other roadway users (vehicles, buses, and bicycles). Determining a good route requires an understanding of who the pedestrian is and where they want to go. It also requires an understanding of land use and development patterns, origins and attractions, traffic volumes and speed, and sidewalk conditions, among other community characteristics.

#### Pedestrian Facility Types

- **4 Feet Attached**
- **4 Feet Detached**
- **5 Feet Attached**
- **5 Feet Detached**
- **7 to 8 Feet Attached**
- **7 to 8 Feet Detached**
- **10 Feet Attached**
- **10 Feet Detached**
- **10 to 12 Feet Multi-use Path**

#### Pedestrian Route Factors

<table>
<thead>
<tr>
<th>STREET CONDITIONS</th>
<th>Pedestrian-friendly Characteristic</th>
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<tbody>
<tr>
<td><strong>SIDEWALK PRESENCE</strong></td>
<td></td>
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<tr>
<td>Both-sides</td>
<td><img src="#" alt="Green" /></td>
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<tr>
<td>One-side</td>
<td><img src="#" alt="Yellow" /></td>
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<tr>
<td>None Present</td>
<td><img src="#" alt="Red" /></td>
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<tr>
<td><strong>SIDEWALK WIDTH</strong></td>
<td></td>
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<tr>
<td>≥ 10 feet</td>
<td><img src="#" alt="Green" /></td>
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<tr>
<td>5-9 feet</td>
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<tr>
<td>≤ 4 feet</td>
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<tr>
<td><strong>VEHICLE SPEED</strong></td>
<td></td>
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<tr>
<td>≤ 30 mph</td>
<td><img src="#" alt="Green" /></td>
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<tr>
<td>≥ 35 mph</td>
<td><img src="#" alt="Yellow" /></td>
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<tr>
<td><strong>TRAFFIC VOLUME</strong></td>
<td></td>
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<tr>
<td>&lt; 5000 Per Day</td>
<td><img src="#" alt="Green" /></td>
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<tr>
<td>&gt; 5000 Per Day</td>
<td><img src="#" alt="Red" /></td>
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<tr>
<td><strong>TRAVEL LANES</strong></td>
<td></td>
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<tr>
<td>≤ 2 Lanes</td>
<td><img src="#" alt="Green" /></td>
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<tr>
<td>≥ 3 Lanes</td>
<td><img src="#" alt="Red" /></td>
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<tr>
<td><strong>DRIVEWAY ACCESS</strong></td>
<td></td>
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<tr>
<td>Few Driveways</td>
<td><img src="#" alt="Green" /></td>
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<tr>
<td>Many Driveways</td>
<td><img src="#" alt="Red" /></td>
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<tr>
<td><strong>CONNECTIVITY</strong></td>
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<td>Transit</td>
<td><img src="#" alt="Green" /></td>
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<td>Schools</td>
<td><img src="#" alt="Green" /></td>
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<tr>
<td>Recreational</td>
<td><img src="#" alt="Green" /></td>
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<tr>
<td>Activity Generators</td>
<td><img src="#" alt="Green" /></td>
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<td><strong>BARRIERS</strong></td>
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<tr>
<td>Truck Route</td>
<td><img src="#" alt="Red" /></td>
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<tr>
<td>HWY Interchange</td>
<td><img src="#" alt="Red" /></td>
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</tbody>
</table>

#### Walkability Framework

- **Physical features**:
  - Sidewalk width
  - Traffic volumes
  - Building height
  - Number of people
  - Street width
  - Tree canopy
  - Wayfinding
  - Weather

- **Urban Design Qualities**:
  - Imageability
  - Enclosure
  - Transparency
  - Complexity
  - Legibility
  - Human scale
  - Linkage
  - Coherence

- **Individual Reactions**:
  - Sense of safety
  - Perception
  - Sense of comfort

- **Walking Behavior**

- **Overall Walkability**
What makes a good transit facility?

- Bus Frequency
- Bike Racks
- Transit Stops
- Street Furniture
- Trees (shade)
- Lighting
- Trailheads
- Crosswalks
An ideal bicycle route is determined by looking at the existing context of a community and the travel behavior of both drivers and bicyclists. Determining a good route requires an understanding of bicyclist and driver expectations. It also requires an understanding of the land use and development patterns, origins and attractions, traffic volumes and speed, roadway width and roadway configuration, among other community characteristics.
Facility Type Anticipated Performance
Determine CS Facilities

- Define Context
  - Land Use, Urban Design, Character Areas

- Determine Mode Priority
  - Combination of component zones:
    - Travel Way (Includes Bike Realm)
    - Pedestrian Realm
    - Context (Most important; dictates how people must negotiate a path to reach a destination)

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### Land Use/Development Context vs Mode of Travel Priority

<table>
<thead>
<tr>
<th>Land Use/Development Context</th>
<th>Mode of Travel Priority</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
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<tr>
<td>Urban Commercial/Mixed Use</td>
<td>Walk</td>
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<tr>
<td>Urban Residential</td>
<td>Walk</td>
</tr>
<tr>
<td>Urban Single Use</td>
<td>Bicycle</td>
</tr>
<tr>
<td>Suburban Commercial</td>
<td>Automobile</td>
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<tr>
<td>Suburban Residential</td>
<td>Walk</td>
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<tr>
<td>Suburban Mixed Use</td>
<td>Walk</td>
</tr>
<tr>
<td>Suburban Single Use</td>
<td>Bicycle</td>
</tr>
<tr>
<td>Rural Residential/Agricultural</td>
<td>Automobile</td>
</tr>
<tr>
<td>Rural Village</td>
<td>Walk</td>
</tr>
</tbody>
</table>
MAG MMLOS Study
HCM 2010 - Measuring LOS for All Modes

- Pedestrian LOS
- Vehicular LOS
- Bicycle LOS
- Transit LOS
Fundamentals:
CS Policy and Performance Measures
Policy v. Plan Implementation

- Ordinance v. Guidance?
- Dedicated Funding or Pooled?
- Ongoing Process for Implementation?
  - Citizen/Business Owner Input
  - Prioritization Process
  - Design Standards for Fixtures/Furniture
CS Policy Development

- Dictate intentions for **publicly-paid and privately-paid infrastructure**
- Focus on **Arterials and Collectors**
  - safety, barrier, activity generators
- Use **Subdivision Regulations**
  - tool for ongoing implementation of Minor Collectors and Locals
- Determine **Policy Components**
- Determine **Other Priorities**
  - economic development, activity generators, connections, character areas, gateways, comprehensive/strategic plan goals
- Establish **Exceptions**
  - prohibited, creates an unsafe condition, emergency/general maintenance activities, cost prohibitive, impact on ROW/natural resources
  - be careful with “absence of need” language
- Determine **Exception Approval Process**
  - City Council v. Department Director
CS Policy References

- **Smart Growth America**
  - *Complete Streets Local Policy Workbook* (identifies 10 essential components of good policies)
  - *The Best Complete Streets Policies of 2015*

- **Regional and Comparable Agency Examples**
  - *MAG Complete Streets Guide* (Phoenix Region)
  - *From Policy to Pavement, Implementing Complete Streets in the San Diego Region*
Establish Performance Measures

- **Inventory Measures v. Outcome Measures**
- **Inventory Measures**
  - Miles of trail, sidewalk, bike lanes
  - Miles of pedestrian lighting installed
- **Outcome Measures**
  - Change in pedestrian and bicycle related crashes
  - Change in pedestrian/bicycle counts conducted
  - Change in sales tax generated
  - Change in property values
Weekday Peaking by Facility Type

Chart 4-5: Average Hourly Weekday Bicycle Volumes by Facility Type

- **Bike Path**
- **Bike Lane**
- **No Facility**
Impact of Improved Bike Facilities of Activity Levels

1,100 - 1500 cyclists/month

1,800 - 2,000 cyclists/month
Impact of Improved Bike Facilities of Activity Levels (Cont’d)

Buffered Bike Lane Project Opening

4th Avenue 5th Avenue

Local Example: Complete Streets Planning
Tempe Story - PLAN
In the Middle of it All

- Tempe benefits from central location
- Well traveled bike/multi-modal routes connect Downtown Tempe in all directions
- Broad coverage city wide
Tempe

- 40.1 square miles
- 162K population
- 180k plus jobs
Community Development

- Focus on high-quality jobs
  - Advanced manufacturing
  - Financial services
  - High-technology
- Maintain diversity of commercial space
- Density in the Mill and Lake area – Downtown & ASU
- Leverage development to further transit goals
- High-tech/financial services in south Tempe
- Destination/specialty retail
Tempe Profile - Transportation & Land Use

- Highest density in state
- College Town, center of MAG region
- Older city in region – different growth patterns
- Imposed growth boundaries (density increase)
- Mixed use growth/intensifying land use – 20 + years
- Some decline/plateau in vehicle volumes, uptick in transit, bike, pedestrian
- Strong walkable core, campus and vicinity
Tempe Plans

- 1996 Transit Tax
- General Plans: 2020, 2030, 2040 (progressive in region)
- Transportation Plans: 2015, 2008
- Zoning and Development Code: Land use integrated with transportation
- ASU Commute Zone
- Transit/LRT service partnership/investment, compliments bicycle use
Bike & Multi-modalism
How it Started

- Since 1971 – Bike Lanes
- 1974 Bike Plan
- 1st bike lane in AZ
- Streets for all
Transit Program Overview

- Tempe’s multi-modal transit system
  - Light rail, Bus, Orbit, Dial-a-Ride, transit facilities, Bike/Ped. facilities
- Half-cent dedicated sales tax (voter approved in 1996)
- 2015-16 Operating Budget ($46.5 million)
- Sources of Revenue:
  - Tempe Transit Tax - $36.8 million
  - Passenger Fares
  - Regional Proposition 400
Complete Streets – The Plan

- Bike Lanes on all arterials, collectors
  - Green, protected, buffered
- Bike Paths, Canals, Rio Salado
  - higher & multiple uses for corridors
- Reinvest, Re-characterize all streets
- Everyone walks, is a pedestrian
- Road Diets
Local Example: CS Policy Development
POLICY (and practice/culture)

- No road widening (GP & Transportation Plans)
- Bike lanes all arterials and collectors; strong multi-modalism/growth solution
- Shared parking models
- Affordable housing strategies
- Transit Oriented Development Code
- Adaptive Re-use Code
- Balanced vs. Complete Streets
- Elected Officials
- Visionary, engaged, walk/bike the talk
Multi-modalism Culture is Tempe Policy

- Tempe Culture
- City Council Policy and Participation
- League of Cities 2015 (Bikes & Beer)
- Council and Advocacy Groups
- Events, Art, Economy
  - Tour de Tempe & Bike Month / Bike To Work Day
  - Tour de Fat – New Belgium Brewery
  - Bike Art – Public
  - Bike Hero
Tour de Tempe
Tour de Fat – 10,000 riders & $90K
Handlebar & Pedalhaus
State Bicycle CO.
TBAG – Tempe Bicycle Action Group

- Annual Bicycle Counts – 5
- Non-profit support/fundraising
- Advocacy
- Rides
- City Council elections
- Transportation Commission
Infrastructure – Invest to improve existing
Attractive Convenient Infrastructure
Innovate and Reinvent Infrastructure
High Design is Policy Priority
land use integration with multi-modalism
Multi-use Paths
Multi-use Paths

Crosscut

Western Canal
Mill Avenue

- 4-2 lanes
- Bike/Ped character
Apache Boulevard

- 6-4 lanes
- Add bike lanes
- Trees

- LRT
- Permit/investment increase
Local Example:

CS Performance Measures
PERFORMANCE – Complete Streets

- Lower commute times
- Greater travel options (invest in complete streets)
- Highest bike and transit % ridership
- Business community support
- Lower vacancy rates
- Higher permitting/development rates
Diversity of Means – Complete Streets Deliver

Travel to Work by Type

- Public transportation (excluding taxicab)
- Walked
- Other means

[Graph showing travel modes in various cities, with a box highlighting Tempe]
Making it Quick

Mean travel time to work (minutes)

- Apache Junction
- Avondale
- Cave Creek
- Chandler
- El Mirage
- Gilbert
- Glendale
- Goodyear
- Litchfield Park
- Mesa
- Paradise Valley
- Peoria
- Phoenix
- Queen Creek
- Tempe
- Youngtown
Performance - Bike

- 4% +- bicycle commuters – Census Data
- Strong bicycle network 175 miles bikeways
  - Bike boulevards, lanes, paths, routes, bridges
- Top Bike City in AZ, #17 (Bicycling Magazine)
- Gold, Bike Friendly Community
Tempe has the two highest off-street counts in region.
El Paso Multi-use Path

before

after
Performance - Transit

- 15 arterial bus routes
- 6 neighborhood circulator – Orbit routes
- 3 express routes
- 900 bus stop city-wide (300 with shelters)
- Light rail (9 stations)
- 11.5 million boardings 2014
- 85281 highest transit boardings in region
Hardy Drive

before

after
University Drive

- Street Trees
- Buffered Bike Lanes
- Infill mixed-use
- Complete Street

Before

After
Multi-modalism Mean Business

► Restaurants, merchants, community expresses support through integration of bikes in their business
► As Tempe has committed more in funding, the return on use of modes has increased
► Roughly ¼ of transit fund dedicated to improvements for multi-modal
► Vehicle lane removals on 5 core arterials, to add bike/ped. facilities has led to greater vitality & investment
Bike Commuters / Peer Cities

Percentage of commuters biking to work

1. Davis 19.1%
2. Boulder 12.1%
3. Palo Alto 9.5%
4. Eugene 8.7%
5. Santa Barbara 6.9%
6. Fort Collins 7.9%
7. Berkeley 7.6%
8. Santa Monica 5.2%
9. Madison 6.2%
10. Missoula 6.2%
11. Portland 6.1%
12. Gainesville 6.0%
13. Chico 5.7%
14. Mountain View 5.5%
15. Evanston 5.3%
16. Tempe 4.5%
17. Miami Beach 5.1%
18. Ann Arbor 4.9%
19. Flagstaff 4.7%
20. Minneapolis 4.5%
21. Providence 4.1%
22. Washington, D.C. 4.1%
23. Seattle 4.1%
24. Provo 4.1%
25. Bloomington 3.9%
Occupy Tempe

CY2014 “Class A” Office Vacancy Rates

- Tempe has a 5.4% vacancy rate
- Property owners and brokers are selling connectivity, multi-modalism and bicycle friendly amenities
- Highest occupancy rates in areas connected to transit and bike/ped
- Highest vacancies along US60, I-10, urban freeway system (big box)
Building our Reputation – Tempe Results

- “Class A” 2014 Construction/Existing
  - Total construction = 1.3 M ft²
  - Demand for urban product connected to transit and bikeways
  - Full integration into City
South Mill Avenue Today
South Mill Avenue Future
Q&A / Discussion