Why is transportation changing?
Transportation is Always Changing
Inflation Indices

Sources: FHWA Bid Price Index for PA (BPI), Engineering News Record Construction Cost Index (CCI), Bureau of Labor and Statistics Consumer Price - Index (CPI), compared to 3% Annual Increase Base Line (Calendar Year)
Revenue sources for financing transportation projects are severely limited.
Nearly 25% of Pennsylvania’s bridges are structurally deficient.

Pennsylvania ranks last in the nation in this statistic.
18% of an average household budget spent on transportation

In automobile-dominated regions, this figure can exceed 30% - often more than a family spends on housing

<table>
<thead>
<tr>
<th></th>
<th>Jan 2003</th>
<th>Sept 22 2008</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gasoline</td>
<td>$1.41</td>
<td>$3.71</td>
<td>???</td>
</tr>
<tr>
<td>Diesel</td>
<td>$1.50</td>
<td>$3.95</td>
<td>???</td>
</tr>
</tbody>
</table>

Source: U.S. Department of Energy; Bureau of Labor Statistics
Our Environment and Quality of Life
Revenue Limitations

Increased Construction Costs

Increased Energy Costs

Economic Revitalization

Environmental Concerns

Quality of Life

We Must Do Transportation Differently in Pennsylvania
2

What is Smart Transportation?
- Money counts
- Choose projects with high value/price ratio
- Enhance the Local Network
- Look beyond level-of-service
- Safety first and maybe safety only
- Accommodate all modes
- Leverage and preserve existing investments
- Build towns not sprawl
- Develop local governments as strong land use partners
- Understand the context; plan and design within the context
Smart Transportation is partnering to build great communities for future generations of Pennsylvanians by linking transportation investments and land use planning and decision making.
Smart Transportation Means Listening
Smart Transportation Means Flexibility
Smart Transportation Means Choice
Smart Transportation Means Safety
Fundamentally, smart transportation is about linking land use & transportation decisions and investments.
3
How will PennDOT do this?
SMART TRANSPORTATION GUIDEBOOK

Planning and Designing Highways and Streets that Support Sustainable and Livable Communities

New Jersey Department of Transportation

Pennsylvania Department of Transportation

MARCH 2008
Integrating Smart Transportation

Understand the Context

**Must** be determined in Planning – Pre TIP

Context **MUST** consider:

- Land Use
- Community
- Environment
- Transportation
- Financial
Scale Solutions to the Problem (right-sizing)

- Establish the Right Program
  - Program must address urgent problems

- Establish the Right Projects
  - Needs must focus on problems
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION

DATE: September 18, 2008

432-08-12

SUBJECT: Smart Transportation Interim Policy

TO: District Executives

FROM: Brian G. Thompson, P.E. /s/ David J. Azzato, P.E.
Director
Bureau of Design

The recent release of PennDOT’s Smart Transportation Guidebook is intended to guide the design of roadways and bridges that fit within the existing and planned contexts of the communities through which they pass, and to develop the best and most affordable transportation solutions.

The purpose of this Strike-Off Letter is to implement policy for the design of roadways that better reflect their context within the larger transportation network. These changes immediately implement the recommended design values from the Smart Transportation Guidebook into our design policy, and provide more flexibility for our designs. This time-sensitive Strike-Off Letter pertains primarily to Chapters 1 and 2 of Design Manual Part 3 (PM-3).
Revisions to Design Manuals

- Interim Design Policy – Issued September 18, 2008
  - Roadway/Context Typologies
  - Expanded Bridge Width Criteria
  - Design Speed
  - Highway Occupancy Permit Policy

- Design Manuals Under Revision
  - Design Manual Part 1
  - Design Manual Part 2

Integrating Smart Transportation
The Smart Transportation Guidebook is fully compatible and consistent with AASHTO.
## Defining the Contexts

<table>
<thead>
<tr>
<th></th>
<th>RURAL</th>
<th>SUBURBAN</th>
<th>URBAN</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neighborhood</strong></td>
<td>Rural</td>
<td>Suburban Neighborhood</td>
<td>Suburban Corridor</td>
</tr>
<tr>
<td><strong>Density Units</strong></td>
<td>1 DU/ac - 8DU/ac</td>
<td>1 DU/ac-8DU/ac</td>
<td>2 – 30 DU/ac</td>
</tr>
<tr>
<td><strong>Building Coverage</strong></td>
<td>NA</td>
<td>&lt;20%</td>
<td>20% - 35%</td>
</tr>
<tr>
<td><strong>Lot Size/Area</strong></td>
<td>20 acres</td>
<td>5,000 – 80,000 sf</td>
<td>20,000 - 200,000 sf</td>
</tr>
<tr>
<td><strong>Lot Frontage</strong></td>
<td>NA</td>
<td>50 to 200 feet</td>
<td>100 to 500 feet</td>
</tr>
<tr>
<td><strong>Block Dimensions</strong></td>
<td>NA</td>
<td>400 wide x varies</td>
<td>200 wide x varies</td>
</tr>
<tr>
<td><strong>Max. Height</strong></td>
<td>1 to 3 stories</td>
<td>1.5 to 3 stories</td>
<td>retail-1 story; office 3-5 stories</td>
</tr>
<tr>
<td><strong>Min./Max. Setback</strong></td>
<td>Varies</td>
<td>20 to 80 feet</td>
<td>20 to 80 feet</td>
</tr>
</tbody>
</table>
The photos enclosed in a yellow box indicate the Town Center and Core City streets that also operate as a local or regional Main Street.
Why rethink functional classification?

Just a few reasons…

• Some arterials carry predominantly local traffic and have many access points

• The design speed for the arterial class can be too high for an arterial serving as the “Main Street” of a community

• As land uses change, so should roadway design

Both of these roadways are principal arterials
## Regional Arterial

<table>
<thead>
<tr>
<th>Regional Arterial</th>
<th>Rural</th>
<th>Suburban Neighborhood</th>
<th>Suburban Corridor</th>
<th>Suburban Center</th>
<th>Town/Village Neighborhood</th>
<th>Town/Village Center</th>
<th>Urban Core</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lane Width¹</td>
<td>11' to 12'</td>
<td>11' to 12' (14' to 15' outside lane if no shoulder or bike lane)</td>
<td>11' to 12' (14' to 15' outside lane if no shoulder or bike lane)</td>
<td>11' to 12' (14' outside lane if no shoulder or bike lane)</td>
<td>10' to 12' (14' outside lane if no shoulder or bike lane)</td>
<td>10' to 12' (14' outside lane if no shoulder or bike lane)</td>
<td>10' to 12' (14' outside lane if no shoulder or bike lane)</td>
</tr>
<tr>
<td>Paved Shoulder Width²</td>
<td>8' to 10'</td>
<td>8' to 10'</td>
<td>8' to 12'</td>
<td>4' to 6' (if no parking or bike lane)</td>
<td>4' to 6' (if no parking or bike lane)</td>
<td>4' to 6' (if no parking or bike lane)</td>
<td>4' to 6' (if no parking or bike lane)</td>
</tr>
<tr>
<td>Parking Lane³</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>8' parallel</td>
<td>8' parallel; see 7.2 for angled</td>
<td>8' parallel; see 7.2 for angled</td>
<td>8' parallel</td>
</tr>
<tr>
<td>Bike Lane</td>
<td>NA</td>
<td>5' to 6' (if no shoulder)</td>
<td>6' (if no shoulder)</td>
<td>5' to 6'</td>
<td>5' to 6'</td>
<td>5' to 6'</td>
<td>5' to 6'</td>
</tr>
<tr>
<td>Median</td>
<td>4' to 6'</td>
<td>16' to 18' for LT; 6' to 8' for pedestrians only</td>
<td>16' to 18' for LT; 6' to 8' for pedestrians only</td>
<td>16' to 18' for LT; 6' to 8' for pedestrians only</td>
<td>16' to 18' for LT; 6' to 8' for pedestrians only</td>
<td>16' to 18' for LT; 6' to 8' for pedestrians only</td>
<td>16' to 18' for LT; 6' to 8' for pedestrians only</td>
</tr>
<tr>
<td>Curb Return</td>
<td>30' to 50'</td>
<td>25' to 35'</td>
<td>30' to 50'</td>
<td>25' to 50'</td>
<td>15' to 40'</td>
<td>15' to 40'</td>
<td>15' to 40'</td>
</tr>
<tr>
<td>Travel Lanes</td>
<td>2 to 6</td>
<td>2 to 6</td>
<td>4 to 6</td>
<td>4 to 6</td>
<td>2 to 4</td>
<td>2 to 4</td>
<td>2 to 6</td>
</tr>
<tr>
<td>Clear Sidewalk Width</td>
<td>NA</td>
<td>5'</td>
<td>5' to 6'</td>
<td>5' to 6'</td>
<td>6' to 8'</td>
<td>6' to 10'</td>
<td>6' to 12'</td>
</tr>
<tr>
<td>Buffer⁴</td>
<td>NA</td>
<td>6' +</td>
<td>6' to 10'</td>
<td>4' to 6'</td>
<td>4' to 6'</td>
<td>4' to 6'</td>
<td>4' to 6'</td>
</tr>
<tr>
<td>Shy Distance</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>0' to 2</td>
<td>0' to 2</td>
<td>2'</td>
<td>2'</td>
</tr>
<tr>
<td>Total Sidewalk Width</td>
<td>NA</td>
<td>5'</td>
<td>5' to 6'</td>
<td>9' to 14'</td>
<td>10' to 16'</td>
<td>12' to 18'</td>
<td>12' to 20'</td>
</tr>
<tr>
<td>Speed</td>
<td>Desired Operating Speed</td>
<td>45-55</td>
<td>35-40</td>
<td>35-55</td>
<td>30-35</td>
<td>30-35</td>
<td>30-35</td>
</tr>
</tbody>
</table>

¹ 12' preferred for regular transit routes, and heavy truck volumes > 5%, particularly for speeds of 35 mph or greater.
² Shoulders should only be installed in urban contexts as a retrofit of wide travel lanes to accommodate bicyclists.
³ Buffer is assumed to be planted area (grass, shrubs and/or trees) for suburban neighborhood and corridor contexts; street furniture/car door zone for other land use contexts. Min. of 6’ for transit zones.
⁴ Carb return radius should be as small as possible. Number of lanes, on street parking, bike lanes, and shoulders should be utilized to determine effective radius.
## Community Arterial

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Rural</th>
<th>Suburban Neighborhood</th>
<th>Suburban Corridor</th>
<th>Suburban Center</th>
<th>Town/Village Neighborhood</th>
<th>Town/Village Center</th>
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<td>10’ to 12’ (14’ outside lane if no shoulder or bike lane)</td>
<td>10’ to 12’ (14’ outside lane if no shoulder or bike lane)</td>
</tr>
<tr>
<td>Paved Shoulder Width²</td>
<td>8’ to 10’</td>
<td>4’ to 8’; if no parking</td>
<td>8’ to 10’</td>
<td>4’ to 6’ (if no parking or bike lane)</td>
<td>4’ to 6’ (if no parking or bike lane)</td>
<td>4’ to 6’ (if no parking or bike lane)</td>
<td>4’ to 6’ (if no parking or bike lane)</td>
</tr>
<tr>
<td>Parking Lane³</td>
<td>NA</td>
<td>7’ to 8’ parallel</td>
<td>NA</td>
<td>8’ parallel; see 7.2 for angled</td>
<td>7’ to 8’ parallel; see 7.2 for angled</td>
<td>7’ to 8’ parallel; see 7.2 for angled</td>
<td>7’ to 8’ parallel; see 7.2 for angled</td>
</tr>
<tr>
<td>Bike Lane</td>
<td>NA</td>
<td>5’ to 6’ (if no shoulder)</td>
<td>5’ to 6’ (if no shoulder)</td>
<td>5’ to 6’</td>
<td>5’ to 6’</td>
<td>5’ to 6’</td>
<td>5’ to 6’</td>
</tr>
<tr>
<td>Median</td>
<td>4’ to 6’</td>
<td>12’ to 18’ for LT; 6’ to 8’ for pedestrians</td>
<td>12’ to 18’ for LT; 6’ to 8’ for pedestrians</td>
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<td>Curb Return</td>
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<td>25’ to 50’</td>
<td>20’ to 40’</td>
<td>15’ to 30’</td>
<td>15’ to 35’</td>
<td>15’ to 40’</td>
</tr>
<tr>
<td>Travel Lanes</td>
<td>2’ to 4’</td>
<td>2’ to 4’</td>
<td>2’ to 4’</td>
<td>2’ to 4’</td>
<td>2’ to 4’</td>
<td>2’ to 4’</td>
<td>2’ to 4’</td>
</tr>
<tr>
<td>Clear Sidewalk Width</td>
<td>NA</td>
<td>5’</td>
<td>5’ to 6’</td>
<td>6’</td>
<td>6’ to 8’</td>
<td>6’ to 10’</td>
<td>8’ to 14’</td>
</tr>
<tr>
<td>Buffer⁴</td>
<td>NA</td>
<td>6’ +</td>
<td>5’ to 10’</td>
<td>4’ to 6’</td>
<td>4’ to 6’</td>
<td>4’ to 6’</td>
<td>4’ to 6’</td>
</tr>
<tr>
<td>Shy Distance</td>
<td>NA</td>
<td>NA</td>
<td>0’ to 2’</td>
<td>0’ to 2’</td>
<td>2’</td>
<td>2’</td>
<td>2’</td>
</tr>
<tr>
<td>Total Sidewalk Width</td>
<td>NA</td>
<td>5’</td>
<td>5’ to 6’</td>
<td>10’ to 14’</td>
<td>10’ to 18’</td>
<td>12’ to 18’</td>
<td>14’ to 22’</td>
</tr>
</tbody>
</table>

¹ 12’ preferred for regular transit routes, and heavy truck volumes > 5% particularly for speeds of 35 mph or greater.
² Shoulders should be installed in urban contexts only, as part of a retrofit of wide travel lanes, to accommodate bicyclists.
³ 7’ parking lanes on this roadway type to be considered in appropriate conditions.
⁴ Buffer is assumed to be planted area (grass, shrubs and/or trees) for suburban neighborhood and corridor contexts; street furniture/car door zone for other land use contexts. Min. of 6’ for transit zones.

**Definition:** The speed of traffic that, in the expert judgments of the highway engineer and community planner, best reflects the function of the roadway and the surrounding land use context.

*Simple Definition:* The speed at which we would like vehicles to travel.
Which Type of Network is Best?

- **Hint:** One network offers more flexibility in designing individual roadways, and gives more choices to motorists, bicyclists and pedestrians alike.
Bicycle Facilities

What is the best means of accommodating bicyclists?

- Bike lane
- Wide curb lane
- Roadway with shoulders
Intersections

• In urban contexts, choose the smallest curb radius that can accommodate the design vehicle
  – Balance the need to accommodate truck turning movements with the benefit of smaller crossings for pedestrians

• Add width of parking and bike lanes when determining effective curb radius
Pedestrian Facilities

• Sidewalk network is the best gauge of community’s “walkability”
• Provide sidewalks along both sides of all roadways in commercial areas, and along all arterials and collectors in residential areas
• Strive for “clear sidewalk width” of 5 to 8 ft.
• Provide more intensive crosswalk treatments for major roadways
• “Farside” bus stops are preferred to “nearside” bus stops
  – Pedestrian crashes at bus stops are more associated with nearside stops
  – Farside bus stops are shorter, giving more room for on-street parking

• Be prepared for greater interest in public transit!
Access Management

- Encourage municipalities to pass access management ordinances, focusing on arterials.
- Preserves the taxpayers investment in their transportation system.

Poor access management on suburban corridor
Design Using the Principles

- Understand the context
- Consider the role of the roadway within the network
- Know the roadway type
- Set the desired operating speed
- Refer to the Matrix for the starting design values

Requisite for process: understand the flexibility provided by the AASHTO Green Book
Integrating Smart Transportation

Revisions to HOP Process

- Tiger Teams were initiated
- Mitigation – Flexibility is Under Development
- Pre-Meetings and Correspondence
- Recommendations for Department and Local approval
- Expedited Reviews
- Education and Outreach
  - District workshops
  - Website
Integrating Smart Transportation

Local Outreach

- Statewide Meeting Presentations
- Guidebook Distribution/Web Site Information
- Coordinated through Municipal Advisory Committee
  - PA Association of Township Supervisors
  - PA Association of Boroughs
  - League of Cities and Municipalities
  - Association of County Commissioners
- Outreach to Developers
For more information, please visit: www.smart-transportation.com