Design Workshop C

Session C

Session Objective

Revisit alternatives developed in Session B, develop cross-section alternatives that address all modes of transportation, and refine alternatives based on identified modal priorities. Identify any design exceptions that might be needed and discuss the justification for design deviations and exceptions.

Assignment (1 hour, 30 minutes)

1. **Discuss the needs of various transportation modes and determine modal priorities (pedestrians, bicycles, ADA, transit, automobiles, trucks and rail (freight). Is the project walkable and bikable?**

2. **On base map, indicate type and amount of access to be provided**
    a. **Intersections**
    b. **Interchanges**
    c. **Property access**

3. **On either the base map or in cross-section sketches, show how the right-of-way will be organized to accommodate modes.**

4. **Revise alignment, if needed, to better address contextual issues, community values and modal needs.**

5. **Develop proposed cross-section and identify where design flexibility is needed to address contextual issues and/or modal needs:**
    a. **Clear zone treatments**
    b. **Shoulder and lane widths**
    c. **Intersection design**
    d. **Interchange type/design**
    e. **Easement uses**

6. **Discuss the need for design exceptions to achieve the preferred alternative. Discuss how a design exception would be justified.**

7. **Review issues identified in Session A and list issues that have not been fully addressed by the proposed design.**

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Excerpts from Penn DOT's "Smart Transportation Guidebook", March 2008

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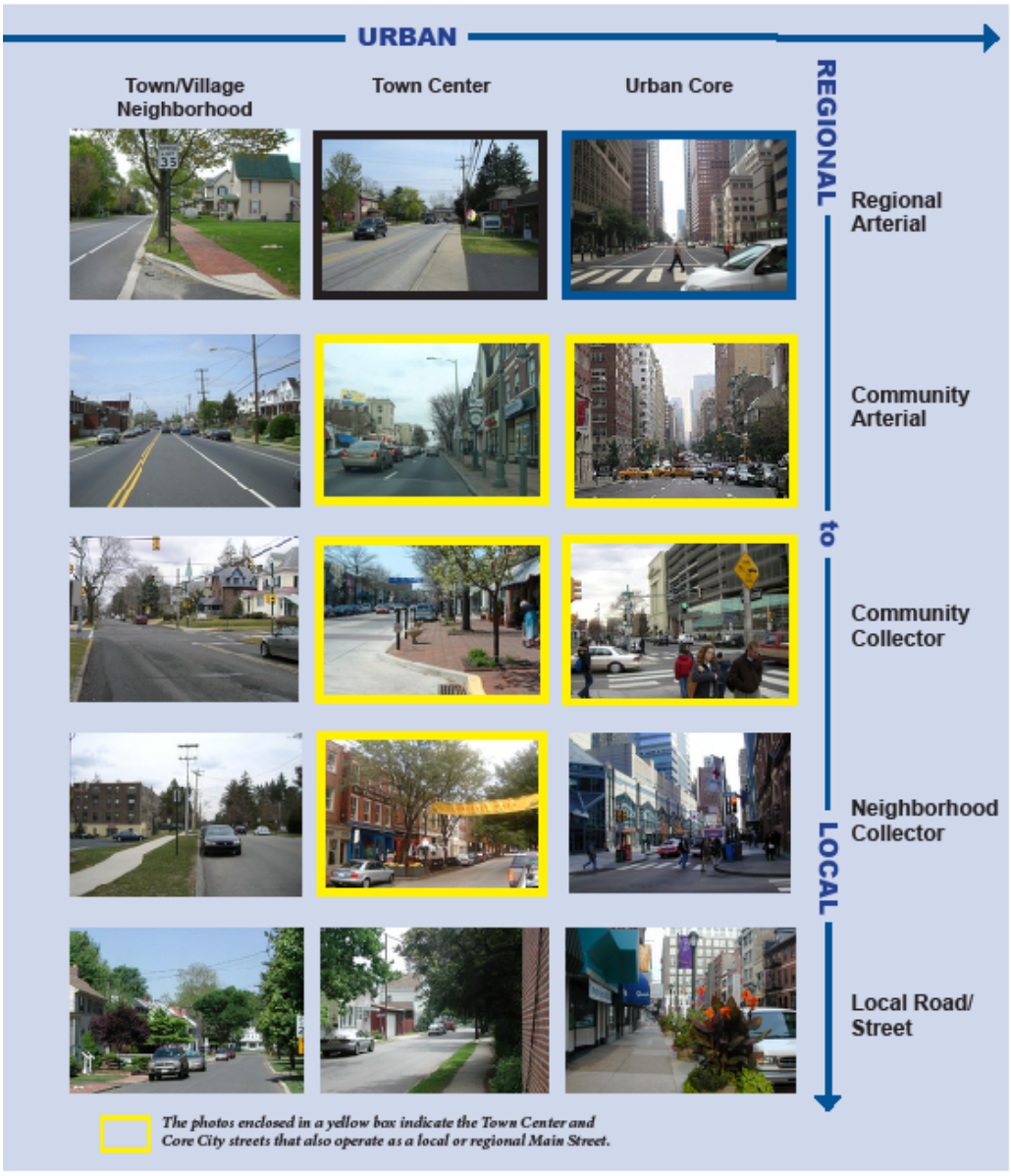

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Table 6.2 Matrix of Design Values

Regional Arterial		Rural	Suburban Neighborhood	Suburban Corridor	Suburban Center	Town/Village Neighborhood	Town/Village Center	Urban Core
Roadway	Lane Width[1]	11' to 12'	11' to 12' (14' to 15' outside lane if no shoulder or bike lane)	11' to 12' (14' to 15' outside lane if no shoulder or bike lane)	11' to 12' (14' outside lane if no shoulder or bike lane)	10' to 12' (14' outside lane if no shoulder or bike lane)	10' to 12' (14' outside lane if no shoulder or bike lane)	10' to 12' (14' outside lane if no shoulder or bike lane)
	Paved Shoulder Width[2]	8' to 10'	8' to 10'	8' to 12'	4' to 6' (if no parking or bike lane)	4' to 6' (if no parking or bike lane)	4' to 6' (if no parking or bike lane)	4' to 6' (if no parking or bike lane)
	Parking Lane[3]	NA	NA	NA	8' parallel	8' parallel; see 7.2 for angled	8' parallel; see 7.2 for angled	8' parallel
	Bike Lane	NA	5' to 6' (if no shoulder)	6' (if no shoulder)	5' to 6'	5' to 6'	5' to 6'	5' to 6'
	Median	4' to 6'	16' to 18' for LT; 6' to 8' for pedestrians only	16' to 18' for LT; 6' to 8' for pedestrians only	16' to 18' for LT; 6' to 8' for pedestrians only	16' to 18' for LT; 6' to 8' for pedestrians only	16' to 18' for LT; 6' to 8' for pedestrians only	16' to 18' for LT; 6' to 8' for pedestrians only
	Curb Return	30' to 50'	25' to 35'	30' to 50'	25' to 50'	15' to 40'	15' to 40'	15' to 40'
	Travel Lanes	2 to 6	2 to 6	4 to 6	4 to 6	2 to 4	2 to 4	2 to 6
Roadside	Clear Sidewalk Width	NA	5'	5' to 6'	5' to 6'	6' to 8'	6' to 10'	6' to 12'
	Buffer[4]	NA	6'+	6' to 10'	4' to 6'	4' to 6'	4' to 6'	4' to 6'
	Shy Distance	NA	NA	NA	0' to 2'	0' to 2'	2'	2'
	Total Sidewalk Width	NA	5'	5' to 6'	9' to 14'	10' to 16'	12' to 18'	12' to 20'
Speed	Desired Operating Speed	45-55	35-40	35-55	30-35	30-35	30-35	30-35

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 Curb 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		Rural	Suburban Neighborhood	Suburban Corridor	Suburban Center	Town/Village Neighborhood	Town/Village Center	Urban Core
Roadway	Lane Width[1]	11' to 12'	10' to 12' (14' outside lane if no shoulder or bike lane)	11' to 12' (14' to 15' outside lane if no shoulder or bike lane)	10' to 12' (14' outside lane if no shoulder or bike lane)	10' to 12' (14' outside lane if no shoulder or bike lane)	10' to 12' (14' outside lane if no shoulder or bike lane)	10' to 12' (14' outside lane if no shoulder or bike lane)
	Paved Shoulder Width[2]	8' to 10'	4' to 8' if no parking	8' to 10'	4' to 6' (if no parking or bike lane)	4' to 6' (if no parking or bike lane)	4' to 6' (if no parking or bike lane)	4' to 6' (if no parking or bike lane)
	Parking Lane[3]	NA	7' to 8' parallel	NA	8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled
	Bike Lane	NA	5' to 6' (if no shoulder)	5' to 6' (if no shoulder)	5' to 6'	5' to 6'	5' to 6'	5' to 6'
	Median	4' to 6'	12 to 18; for LT; 6' to 8' for pedestrians	12 to 18 for LT; 6' to 8' for pedestrians	12 to 18 for LT; 6' to 8' for pedestrians	12 to 18 for LT; 6' to 8' for pedestrians	12 to 18 for LT; 6' to 8' for pedestrians	12 to 18 for LT; 6' to 8' for pedestrians only
	Curb Return	25' to 50'	25' to 35'	25' to 50'	20' to 40'	15' to 30'	15' to 35'	15' to 40'
	Travel Lanes	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4
Roadside	Clear Sidewalk Width	NA	5'	5' to 6'	6'	6' to 8'	6' to 10'	8' to 14'
	Buffer[4]	NA	6'+	5' to 10'	4' to 6'	4' to 6'	4' to 6'	4' to 6'
	Shy Distance	NA	NA	NA	0' to 2'	0' to 2'	2'	2'
	Total Sidewalk Width	NA	5'	5' to 6'	10' to 14'	10' to 16'	12' to 18'	14' to 22'
Speed	Desired Operating Speed	35-55	30-35	35-50	30	25-30	25-30	25-30

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.

Sources for values in matrix: AASHTO Green Book (2001), and ITE "Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities" (2006).

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CHAPTER 6 Designing the Roadway

Community Collector		Rural	Suburban Neighborhood	Suburban Corridor	Suburban Center	Town/Village Neighborhood	Town/Village Center	Urban Core
Roadway	Lane Width[1]	11' to 12'	10' to 12'	11' to 12'	10' to 11' with bike lanes; w/o bike lanes or shoulder, 14' for bike routes	10' to 11' with bike lanes; w/o bike lanes or shoulder, 14' for bike routes	10' to 11' with bike lanes; w/o bike lanes or shoulder, 14' for bike routes	10' to 11' with bike lanes; w/o bike lanes or shoulder, 14' for bike routes
	Paved Shoulder Width[2]	4' to 8'	4' to 8' if no parking or bike lane	8' to 10'	4' to 6' (if no parking or bike lane)	4' (if no parking or bike lane)	4' (if no parking or bike lane)	4' (if no parking or bike lane)
	Parking Lane	NA	7'	NA	7' to 8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled
	Bike Lane	NA	5'	5' to 6'	5' to 6'	5' to 6'	5' to 6'	5' to 6'
	Median	NA	12 to 16 for LT; 6' for pedestrians only	12 to 16 for LT; 6' for pedestrians only	12 to 16 for LT; 6' for pedestrians only	12 to 16 for LT; 6' for pedestrians only	12 to 16 for LT; 6' for pedestrians only	12 to 16 for LT; 6' for pedestrians only
	Curb Return	20' to 40'	15' to 35'	20' to 40'	20' to 35'	10' to 25'	10' to 25'	10' to 30'
	Travel Lanes	2	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4	2 to 4
Roadside	Clear Sidewalk Width	NA	4' to 5'	5' to 6'	6' to 8'	5' to 6'	6' to 8'	6' to 10'
	Buffer[3]	NA	5'+	5' to 10'	4' to 5'	4' to 5'	4' to 5'	4' to 6'
	Shy Distance	NA	NA	NA	0' to 2'	0' to 2'	2'	2'
	Total Sidewalk Width	NA	4' to 5'	5' to 6'	10' to 15'	9' to 13'	12' to 15'	12' to 18'
Speed	Desired Operating Speed	35-55	25-30	30-35	25-30	25-30	25-30	25-30

1 11' to 12' preferred for heavy truck volumes > 5% and regular transit routes.
2 Shoulders should be installed in urban contexts only as part of 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.

Neighborhood Collector		Rural	Suburban Neighborhood	Suburban Corridor	Suburban Center	Town/Village Neighborhood	Town/Village Center	Urban Core
Roadway	Lane Width[1]	10' to 11'	10' to 11'	NA	NA	9' to 11' with bike lanes; w/o bike lanes or shoulder, 12' to 14' for bike routes	9' to 11' with bike lanes; w/o bike lanes or shoulder, 12' to 14' for bike routes	9' to 11' with bike lanes; w/o bike lanes or shoulder, 12' to 14' for bike routes
	Paved Shoulder Width[2]	4' to 8'	4' to 8' if no parking or bike lane	NA	NA	NA	NA	NA
	Parking Lane	NA	7' parallel	NA	NA	7' to 8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled
	Bike Lane	NA	5'	NA	NA	5'	5'	5'
	Median	NA	8' to 10' landscaping; 6' - 8' for peds	NA	NA	8' to 10' landscaping; 6' - 8' for peds	8' to 10' landscaping; 6' - 8' for peds	8' to 10' landscaping; 6' - 8' for peds
	Curb Return	15' to 35'	15' to 35'	NA	NA	10' to 25'	10' to 25'	10' to 25'
	Travel Lanes	2	2	NA	NA	2	2	2
Roadside	Clear Sidewalk Width	NA	4' to 5'	NA	NA	5' to 6'	6'	6' to 8'
	Buffer[3]	NA	4'+	NA	NA	3' to 5'	3' to 5'	4' to 6'
	Shy Distance	NA	NA	NA	NA	0' to 2'	2'	2'
	Total Sidewalk Width	NA	4' to 5'	NA	NA	8' to 13'	11' to 13'	12' to 16'
Speed	Desired Operating Speed	20 to 35	25-30	NA	NA	25-30	25-30	25-30

1 11' to 12' preferred for heavy truck volumes > 5% and regular transit routes.
2 Shoulders should be installed in urban contexts only as part of 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.

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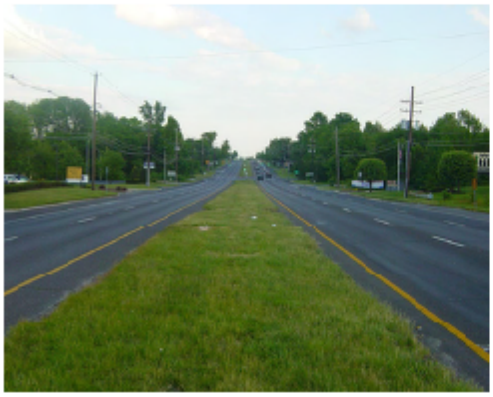
Local Road		Rural	Suburban Neighborhood	Suburban Corridor	Suburban Center	Town/Village Neighborhood	Town/Village Center	Urban Core
Roadway	Lane Width [1]	9' to 11'	See roadway width	NA	NA	See roadway width	9' to 11'	9' to 11' with bike lanes; w/o bike lanes or shoulder, 12' to 14' for bike routes
	Roadway Width [2]	See lane and shoulder width	Wide: 34' to 36' Medium: 30' Narrow: 26' Skinny: 20'	NA	NA	Wide: 34' to 36' Medium: 30' Narrow: 26' Skinny: 20'	See lane and parking width	See lane and parking width
	Paved Shoulder Width	2' to 8'	NA	NA	NA	NA	NA	NA
	Parking Lane	NA	See roadway width	NA	NA	See roadway width	7' to 8' parallel; see 7.2 for angled	7' to 8' parallel; see 7.2 for angled
	Bike Lane	NA	NA	NA	NA	NA	NA	NA
	Median	NA	NA	NA	NA	NA	NA	NA
	Curb Return	10' to 25'	10' to 25'	NA	NA	5' to 25'	5' to 25'	5' to 25'
	Travel Lanes	2	2	NA	NA	2	2	2
Roadside	Clear Sidewalk Width	NA	4' to 5'	NA	NA	5'	5' to 6'	6' to 8'
	Buffer [3]	NA	4'+	NA	NA	3' to 5'	3' to 5'	3' to 5'
	Shy Distance	NA	NA	NA	NA	0' to 2'	2'	2'
	Total Sidewalk Width	NA	4' to 5'	NA	NA	8' to 12'	10' to 13'	11' to 15'
Speed	Desired Operating Speed	20 to 30	20 to 25	NA	NA	20 to 25	20 to 25	20 to 25

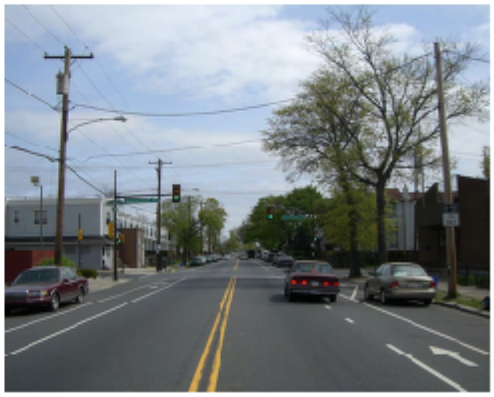
1 11" to 12" recommended for industrial districts.
2 Index to residential streets:
Wide: High-density neighborhoods, two-way, parking both sides
Medium: Can be used in all neighborhoods-two-way, parking both sides
Narrow: Low-density and medium density - two-way, parking both sides; all neighborhoods - one-way street, parking both sides, or two-way, parking one side
Skinny: All neighborhoods - one-way, parking one side; two-way, no parking

Low-density - less than or equal to 4 dwelling units/acre.
Medium-density - >4, and less than or equal to 8 units/acre.
High-density - >8 units/acre.

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.



Route 73 in Burlington County is the prototypical regional arterial in a suburban setting, with divided median and wide shoulders.



Torresdale Avenue in Philadelphia, which functions as a community collector in an urban area, has 11 ft. travel lanes, 5 ft. bike lanes, 8 ft. parking lanes, and 6 ft. sidewalks.