pennsylvania
DEPARTMENT OF TRANSPORTATION






APA Pennsylvania Chapter, Central Section
November 5, 2009

Smart **Transportation**
it starts with me

Content for Workshop

1. The Transportation World is Changing
2. What is Smart Transportation
3. Implementing Smart Transportation
4. Smart Transportation in Action
5. Understanding Land Use and Transportation Contexts
6. Revised HOP Process
7. Implementing Smart Transportation through Ordinances
8. Open Discussion

Wrap-Up

1

The Transportation World is Changing

"Sustainability must be reflected in all our infrastructure investments…

… it implies a commitment to the principles of livability...

The era of one-size-fits-all transportation projects must give way to one where preserving and enhancing unique community characteristics, be they rural or urban, is a primary mission of our work rather than an afterthought."

Secretary Ray LaHood, US DOT
January 21, 2009

EPA, HUD, and DOT Partnership on Livability

1. Provide more transportation choices
2. Promote equitable, affordable housing
3. Enhance economic competitiveness
4. Support existing communities
5. Coordinate and leverage federal policies and investment
6. Value communities and neighborhoods

Source: EPA website (http://www.epa.gov/dced/2009-0616-epahuddot.htm)

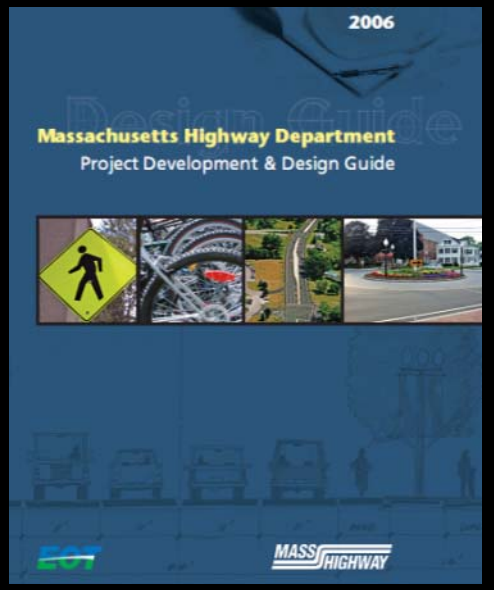
Partnership on Livability

- Enhance integrated planning and investment. integrate housing, transportation, water infrastructure, and land use planning and investment.
- Redefine housing affordability. Develop housing affordability measures that include housing and transportation costs.
- Redevelop underutilized sites. Target development to locations with infrastructure and transportation choices.
- Develop livability measures and tools.
- Align HUD, DOT, and EPA programs.

Source: EPA website (http://www.epa.gov/dced/2009-0616-epahuddot.htm)

What other State DOTs are doing

- Revised Project Process to include more thoughtful Planning Upfront
- Shift to Multi-Modalism
- Emphasis on System Preservation
- Performance Based Programming
- Organizational Change to Increase Planning/ Respond to Emerging Issues



New York State Department of Transportation

Oregon Department of Transportation

Maryland Department of Transportation

2

What is Smart Transportation?

"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 is about

- Linking land use & transportation decisions/investments.

Typical Land Development Pattern

Old Philadelphia Pike
340
Old Philadelphia Pike
340
Royal Circle
Kings Ct
Carriage Dr

LOWE'S


Castle Gifts
Dutch
WONDERLAND
Family
Amusement Park
GIFT SHOP DAILY 9TO6
AUTO TAPE TOURS
2000 SEASON PASSES

Pizza-H

TARGET


Now What?

Roswell, GA (1993)

Roswell, GA (2003)

No new network… but lots more people!

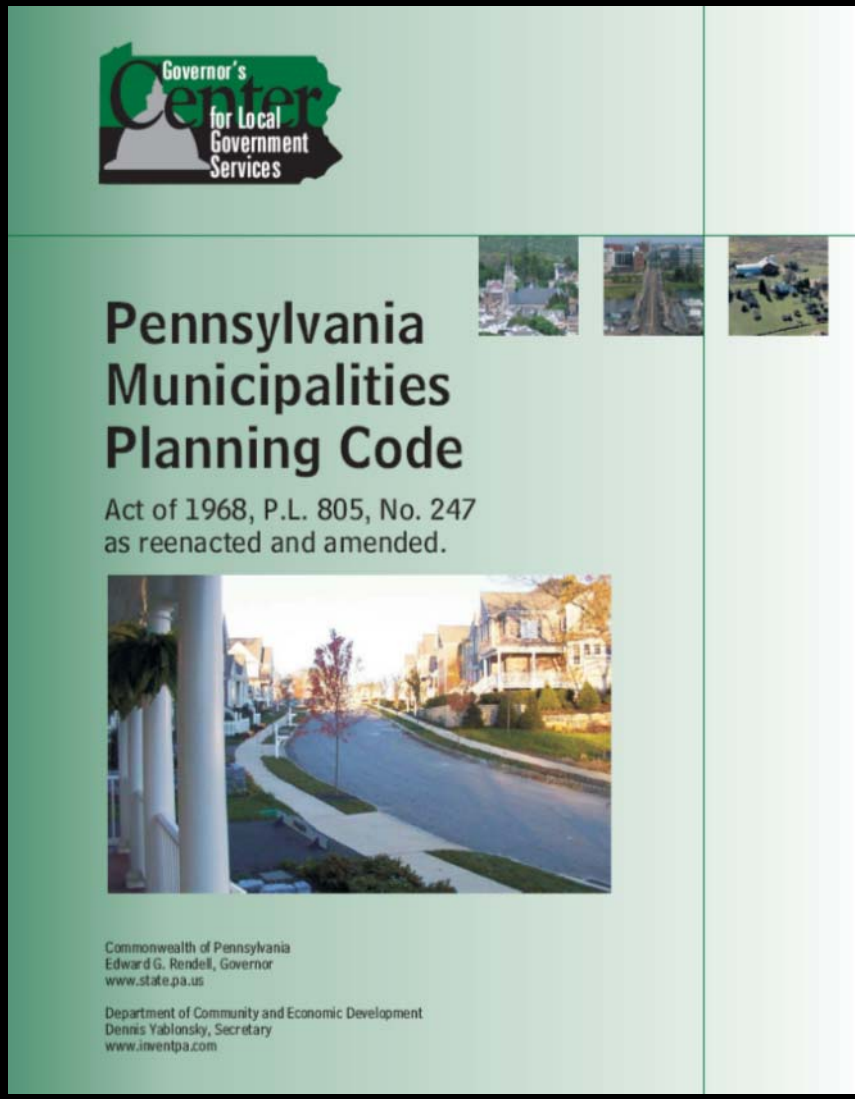
Land Development Retrofit using Smart Transportation

Smart Transportation is about

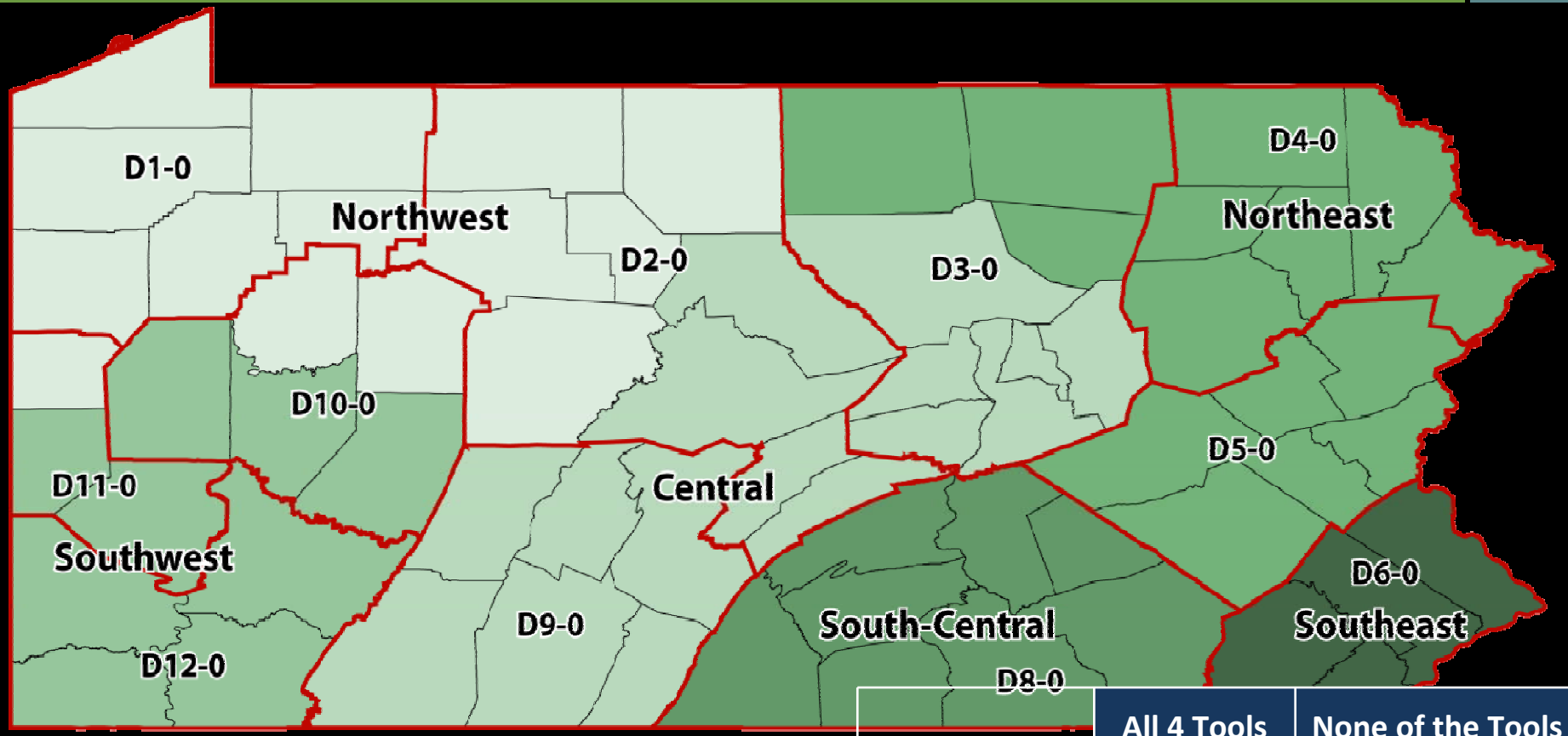
- Partnership with communities

Four BASIC Land Use Tools

- Comprehensive plans
- Zoning
- Subdivision ordinances
- Planning commissions



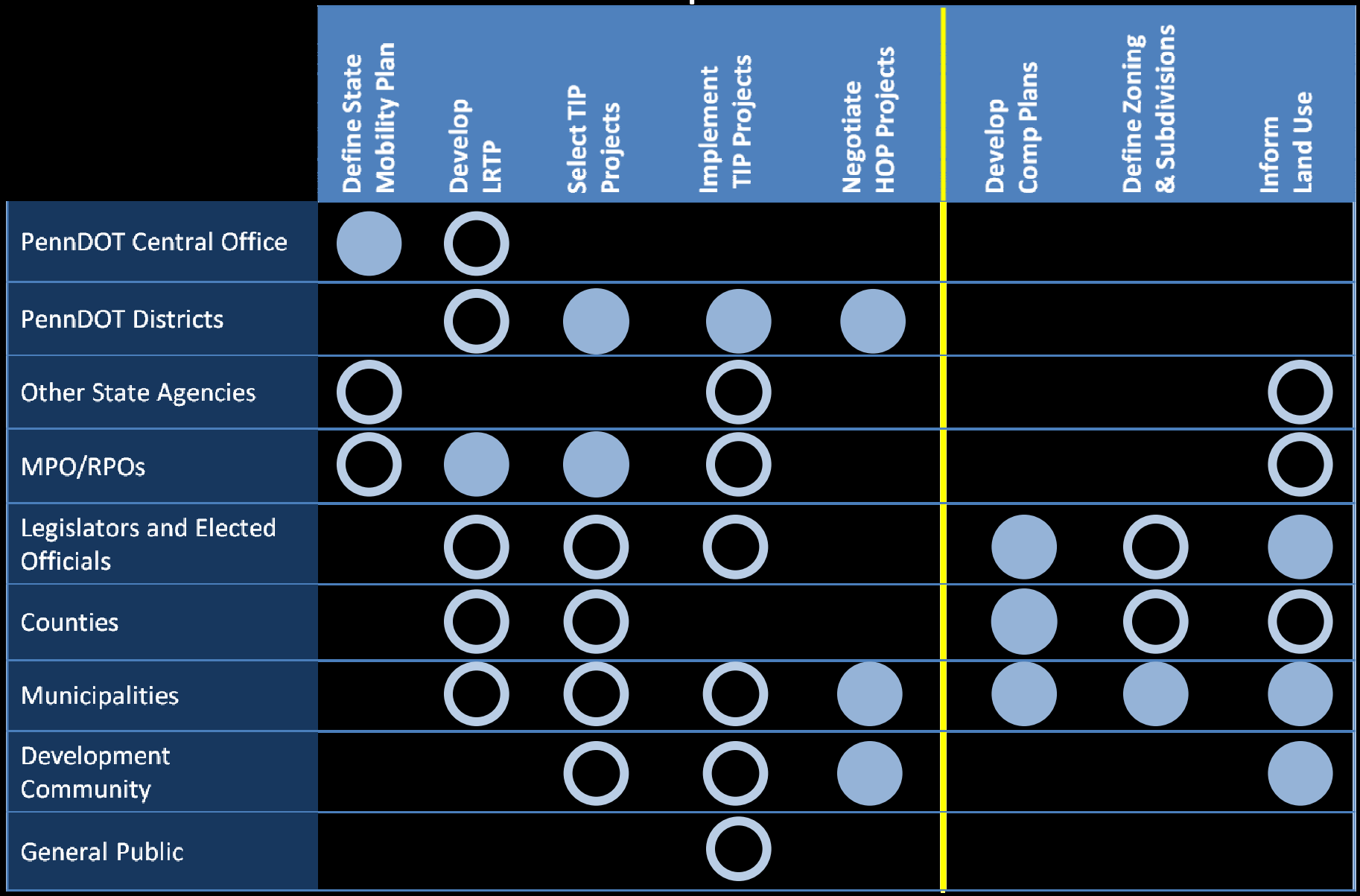
The Challenge…



	All 4 Tools	None of the Tools
Northwest	15%	**47%**
Southwest	31%	**32%**
Central	19%	**37%**
South-Central	61%	8%
Northeast	43%	**27%**
Southeast	87%	1%

Source: An Inventory of Planning in Pennsylvania, Penn State University, 2001

Transportation + Land Use



Existing Roles

PennDOT

- Manage statewide and regional mobility
- Allocate and manage state/federal transportation funds
- Maintain and improve state transportation infrastructure

MPOs and RPOs

- Help plan and allocate state/federal transportation funds
- Develop transportation plans (LRTP & TIP)

Local Government

- Manage local mobility
- Maintain local circulation system
- Manage and control land use and development

What other Partnering Actions can we take?

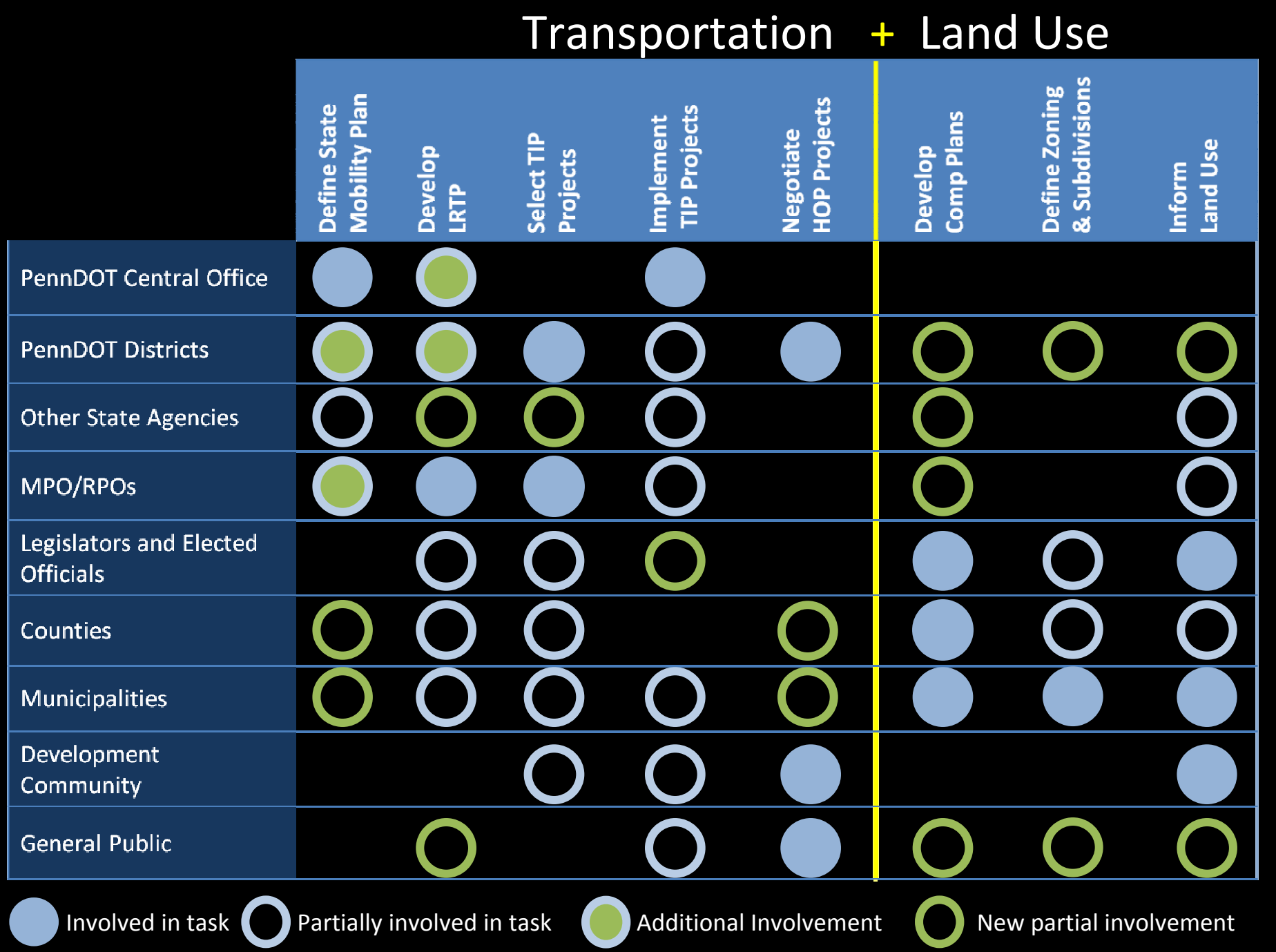
Partnering Actions

PennDOT & Planning Partners

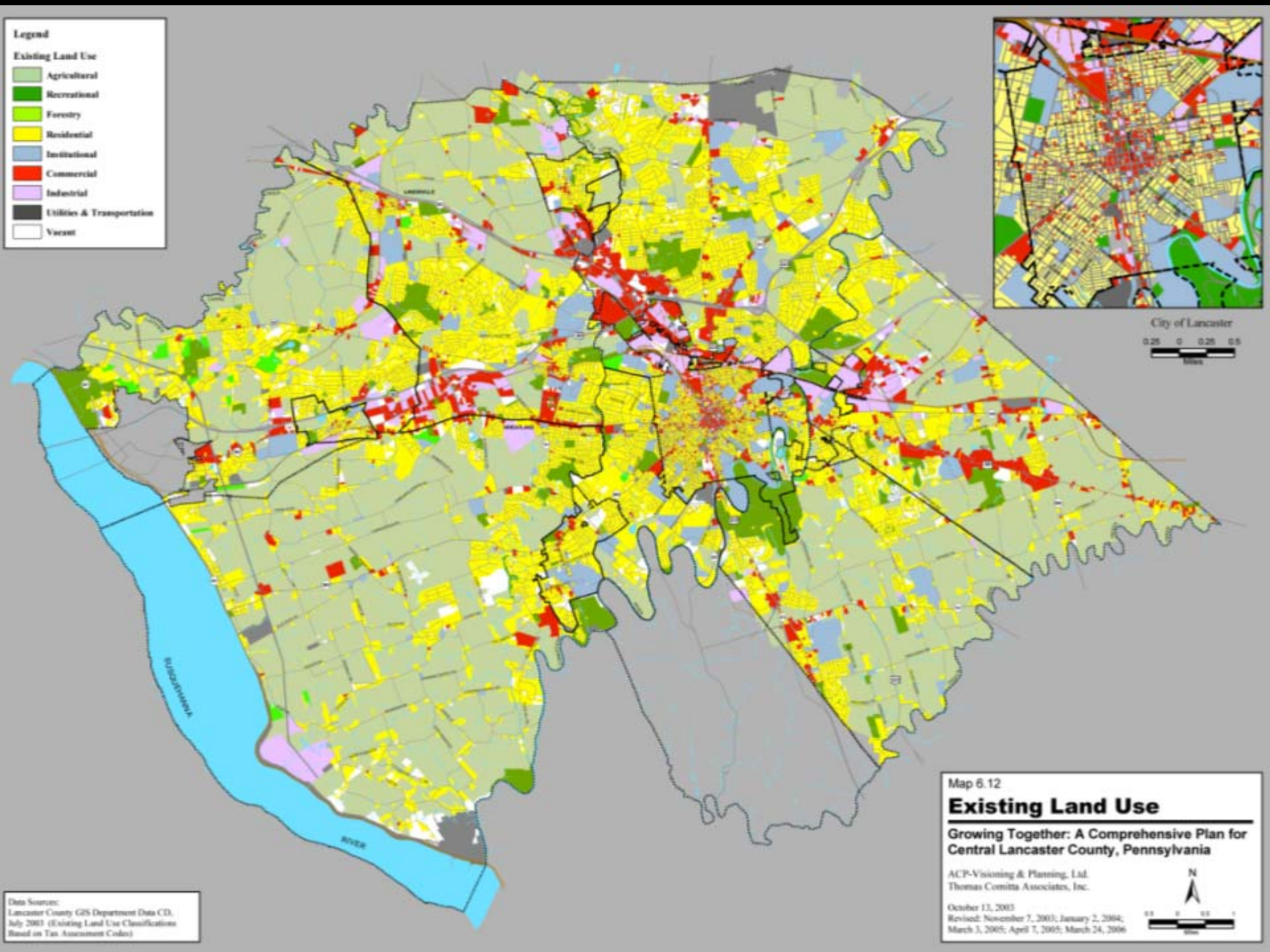
- Work with municipalities to understand land development decisions and limitations
- Work together to understand how to manage and maintain existing transportation assets
- Understand local planning and transportation goals and align project alternatives with these goals

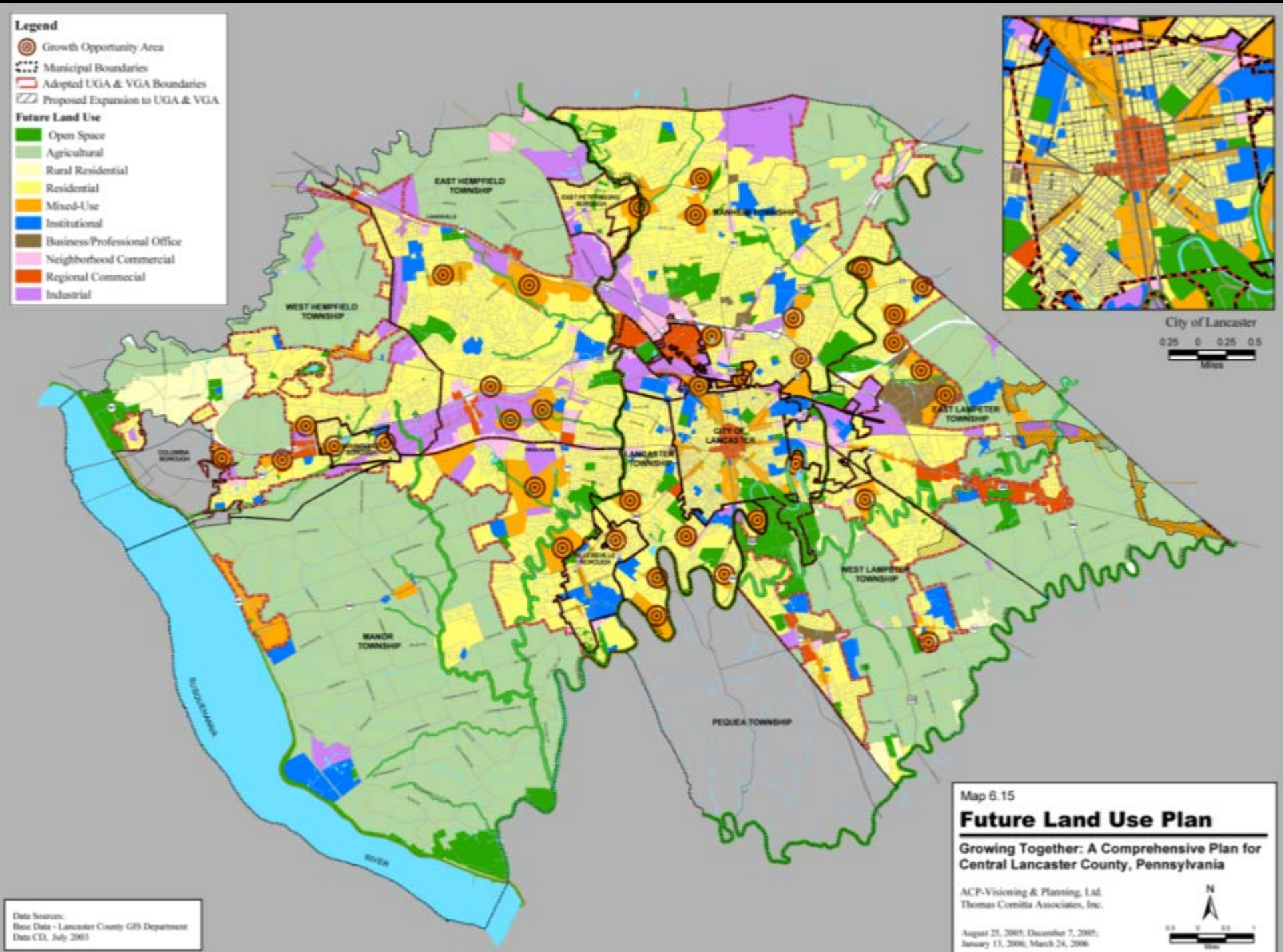
Municipalities

- Make land use decisions based on understanding of long-term transportation impacts and fiscal realities
- Improve local network connectivity
- Adopt ordinances that promote smart transportation (access management, mixed-use, TOD, etc.)
- Promote alternative modes of transportation
- Plan regionally and work with all levels of government


Transportation + Land Use
Define State Mobility Plan
Develop LRTP
Select TIP Projects
Implement TIP Projects
Negotiate HOP Projects
Develop Comp Plans
Define Zoning & Subdivisions
Inform Land Use
PennDOT Central Office
PennDOT Districts
Other State Agencies
MPO/RPOs
Legislators and Elected Officials
Counties
Municipalities
Development Community
General Public
Involved in task
Partially involved in task
Additional Involvement
New partial involvement

Smart Transportation can happen at many different levels


Legend
Existing Land Use
Agricultural
Recreational
Forestry
Residential
Institutional
Commercial
Industrial
Utilities & Transportation
Vacant
City of Lancaster
0.25 0 0.25 0.5
Miles
SUSQUEHANNA
RIVER
Data Sources:
Lancaster County GIS Department Data CD,
July 2003 (Existing Land Use Classifications
Based on Tax Assessment Codes)
Map 6.12
Existing Land Use
Growing Together: A Comprehensive Plan for
Central Lancaster County, Pennsylvania
ACP-Visioning & Planning, Ltd.
Thomas Comitta Associates, Inc.
October 13, 2003
Revised: November 7, 2003; January 2, 2004;
March 3, 2005; April 7, 2005; March 24, 2006
N
0.5 0 0.5 1
Miles


Legend
Growth Opportunity Area
Municipal Boundaries
Adopted UGA & VGA Boundaries
Proposed Expansion to UGA & VGA
Future Land Use
Open Space
Agricultural
Rural Residential
Residential
Mixed-Use
Institutional
Business/Professional Office
Neighborhood Commercial
Regional Commecial
Industrial
EAST HEMPFIELD TOWNSHIP
WEST HEMPFIELD TOWNSHIP
MANOR TOWNSHIP
LANCASTER TOWNSHIP
CITY OF LANCASTER
EAST LAMPETER TOWNSHIP
WEST LAMPETER TOWNSHIP
PEQUEA TOWNSHIP
SUSQUEHANNA RIVER
City of Lancaster
0.25 0 0.25 0.5
Miles
Data Sources:
Base Data - Lancaster County GIS Department
Data CD, July 2003
Map 6.15
Future Land Use Plan
Growing Together: A Comprehensive Plan for Central Lancaster County, Pennsylvania
ACP-Visioning & Planning, Ltd.
Thomas Comitta Associates, Inc.
August 25, 2005; December 7, 2005;
January 13, 2006; March 24, 2006
N


Towne Av
LIMIT
40


Village
CAR WASH
BURGER KING
LIQUOR
66

Route 30, Wayne

Route 30, Ardmore

Both roadways have devoted the same width to travel lanes, but there are important differences

What is missing from this ‘Main Street’?


MOVIES

Ordinances can encourage land uses to treat streets as traffic conduits

Or, Ordinances can encourage developments to treat streets as part of a Public Realm

3

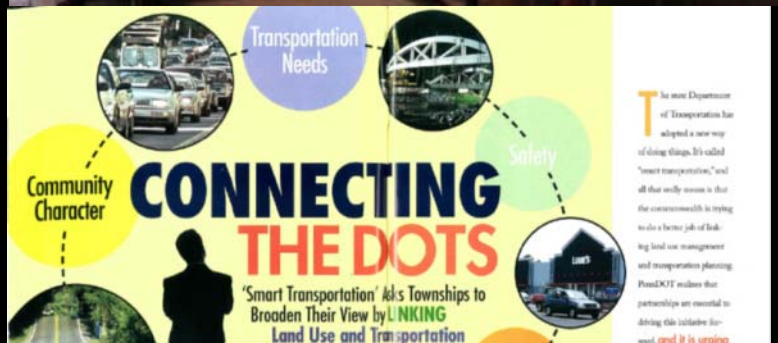
Implementing Smart Transportation

Implementing Smart Transportation

1. Increasing Partnership Efforts
2. Changing the Rules
3. Changing the Decision Making Processes

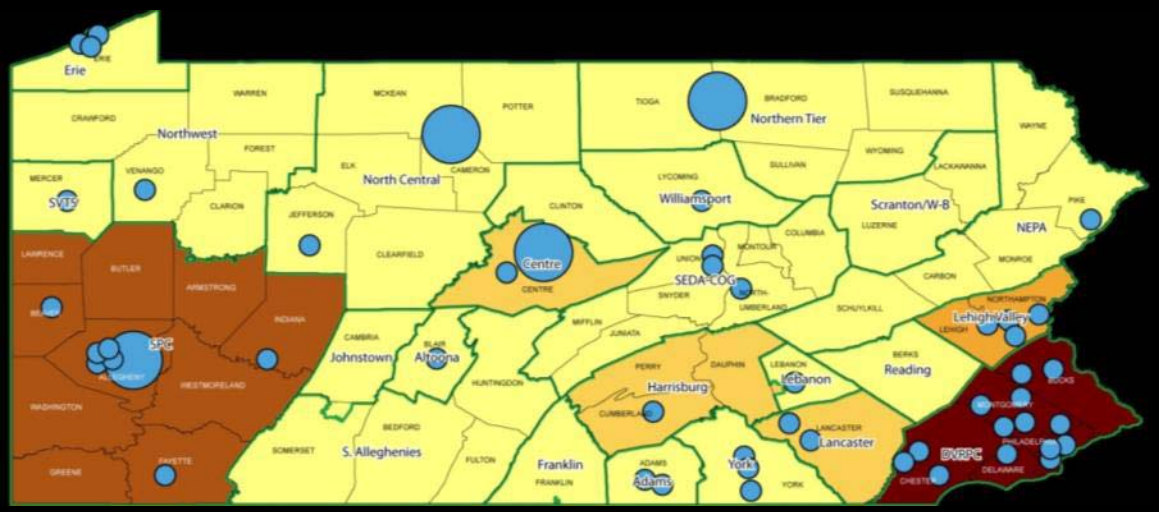
1. Increasing Partnership Efforts

- Sharing Smart Transportation message
- Strategic discussions with partner agencies and organizations and local municipalities
- Outreach activities and interactive workshops with local officials and professionals



Pennsylvania Community Transportation Initiative

- Applications received:
  403 requesting $600 million
- Applications selected:
  50 granting $59.3 million

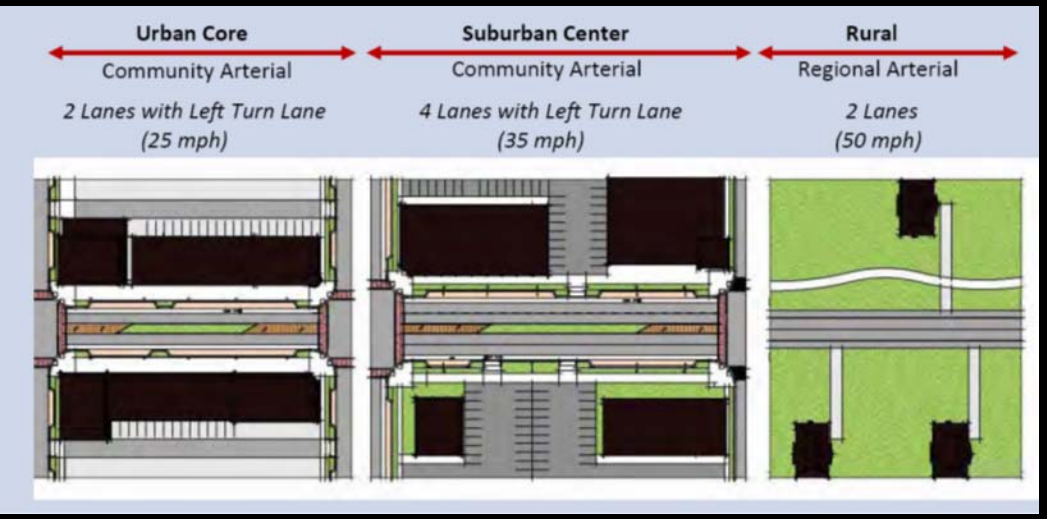


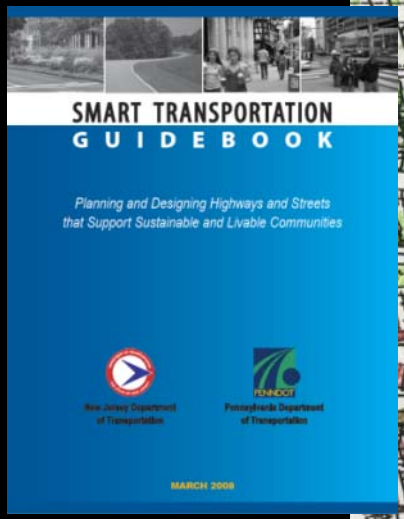
Type of Project	# of Selections	% of Total Selections	Total Funding for Selected Projects	% of Total Funding
Bicycle/Pedestrian	9	18%	$ 9,230,405	16%
Roads/Intersections/Local Network	6	12%	$ 9,937,000	17%
Intermodal/Transit-oriented Development	13	26%	$ 14,007,200	24%
Land Use & Transportation Planning/Redevelopment	13	26%	$ 7,666,500	13%
Streetscape/Traffic Calming	8	16%	$ 18,158,887	31%
Regional Planning	1	2%	$ 285,000	0%
TOTAL	***50***	***100%***	***$ 59,284,992***	***100%***

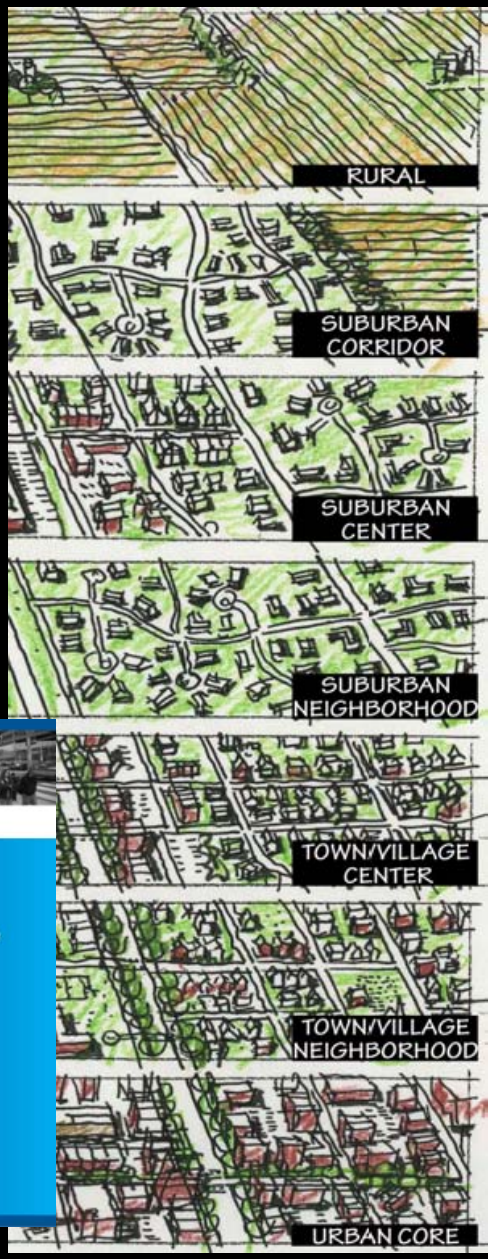
2. Changing the Rules

Smart Transportation Guidebook
(incorporated with Design Manual 2)

- Use flexible design on all projects
- Increase coordination with local municipalities
- Link existing and future land use contexts and roadway design values
- Design to a desired operating speed



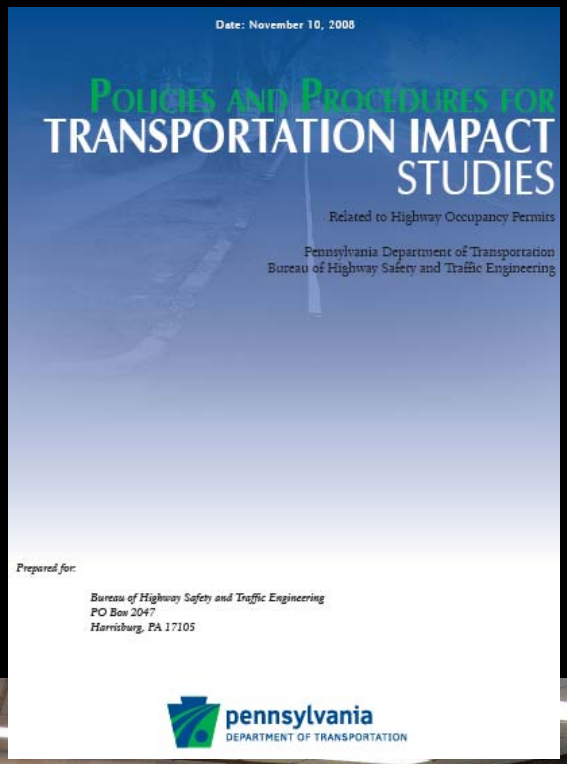




2. Changing the Rules

Revised HOP Guidelines

- Consistency with Smart Transportation Guidebook
- Local coordination throughout process
- Mitigation applied with consistency across the state
- Alternative mitigation strategies including local network, transit, TDM
- Predictable timelines for approval



3. Changing the Decision-Making Processes

Revised Project Delivery Process

- Including partners in the development of new process- Municipalities, MPOs/RPOs, Resource Agencies
- Emphasis on planning
- Organizational changes to respond to new focus
- Link Mobility Plan, LRTPs and TIPs – and reduce delivery times
- Develop Smart Transportation selection criteria for TIPs & LRTPs

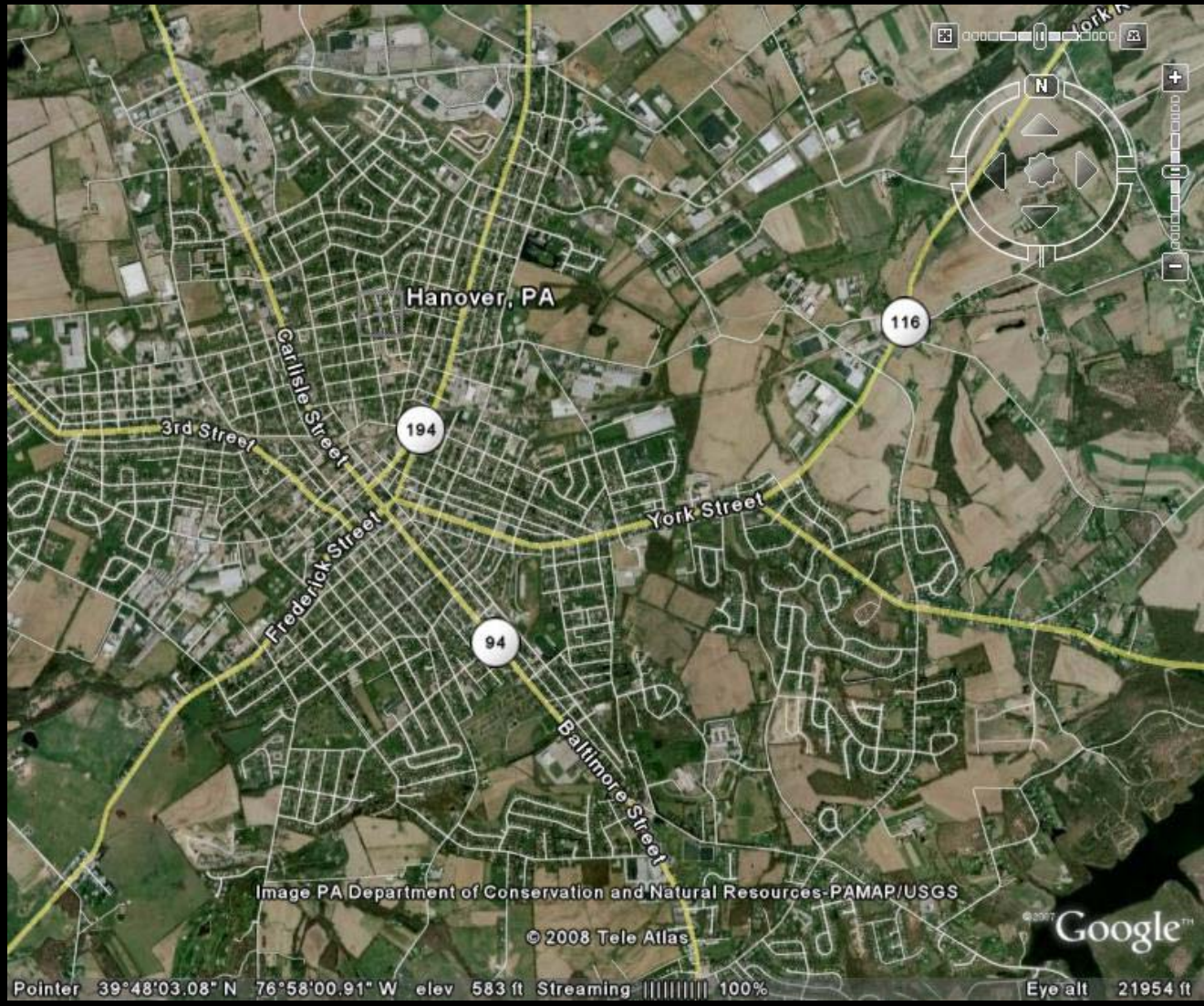
4

Smart Transportation in Action

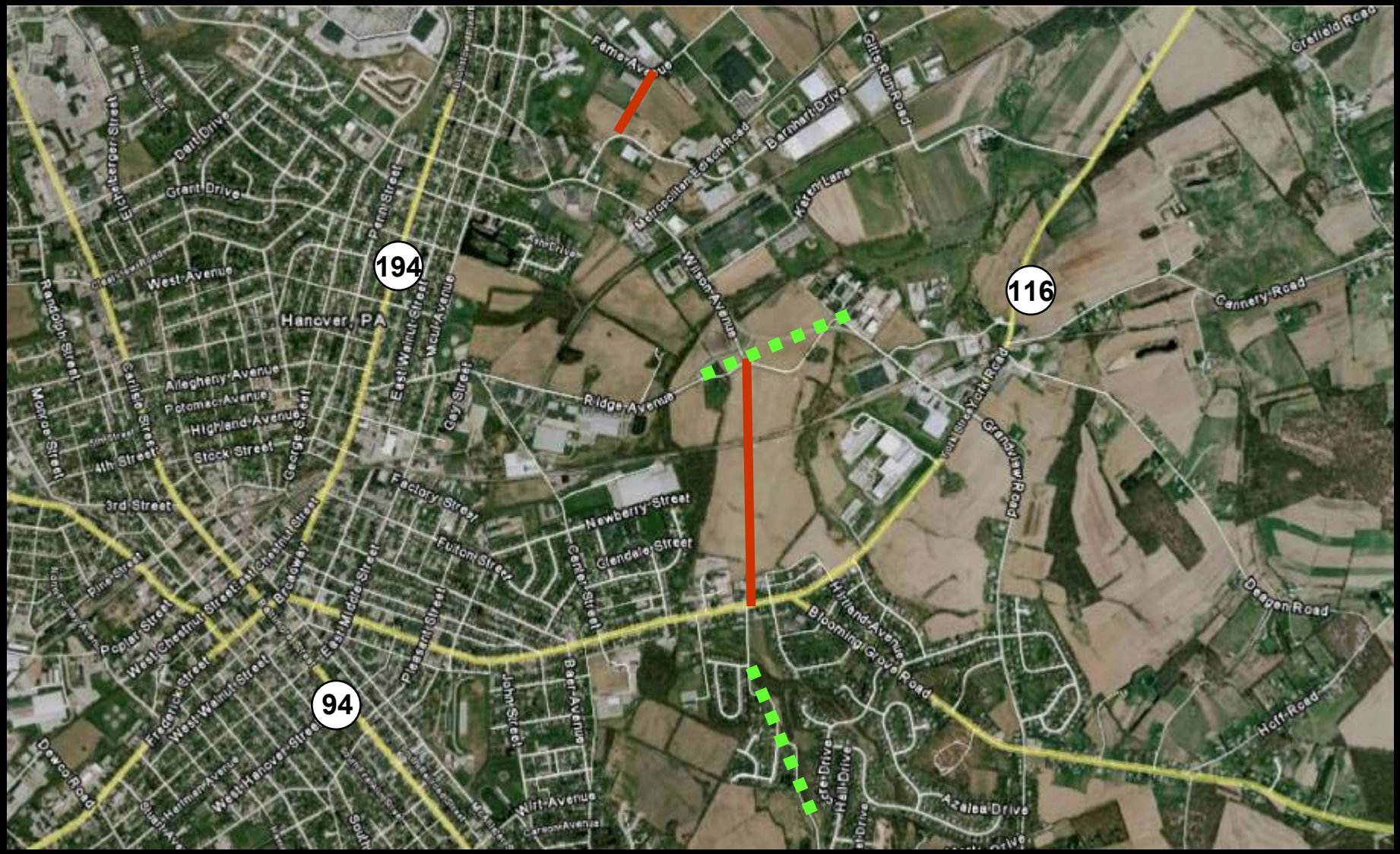
Case Study: Hanover Area Planning Study

Hanover Facts

- Population of traffic study area: 38,000
- Local officials wanted a bypass
- Radial pattern of arterial highways
- Only 11% of trips surveyed were “through” trips



Case Study: Hanover Area Planning Study



Straightening

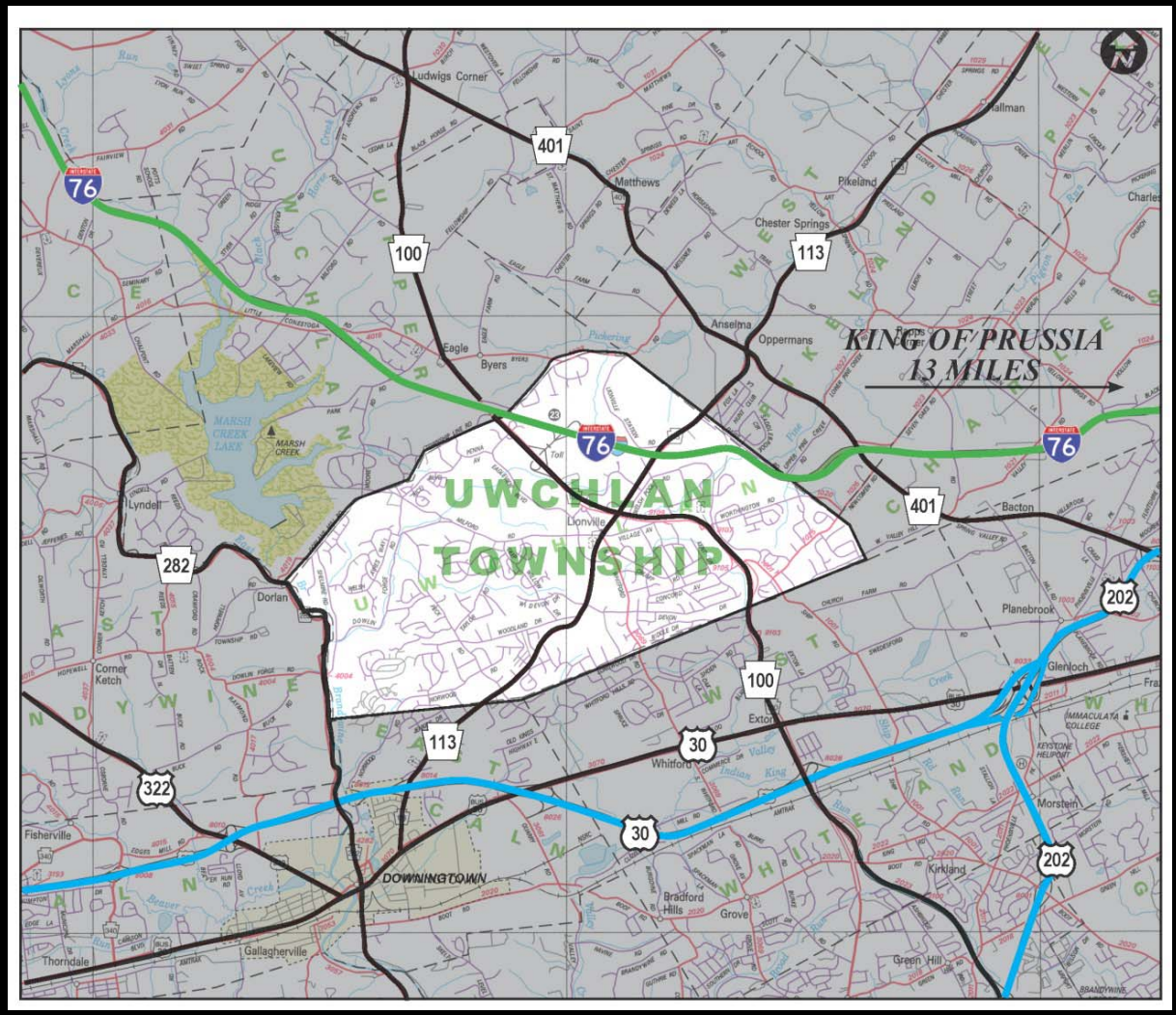
New Link

Case Study: Hanover Area Planning Study

- Goal: Keep local trips on the local network and provide a route for those trips around the center of Hanover
  - Through trips not the major problem
- Lesson: Proposed local links provided better measures of effectiveness than the bypass
  - Justified using federal investments on municipal streets

Uwchlan Case Study

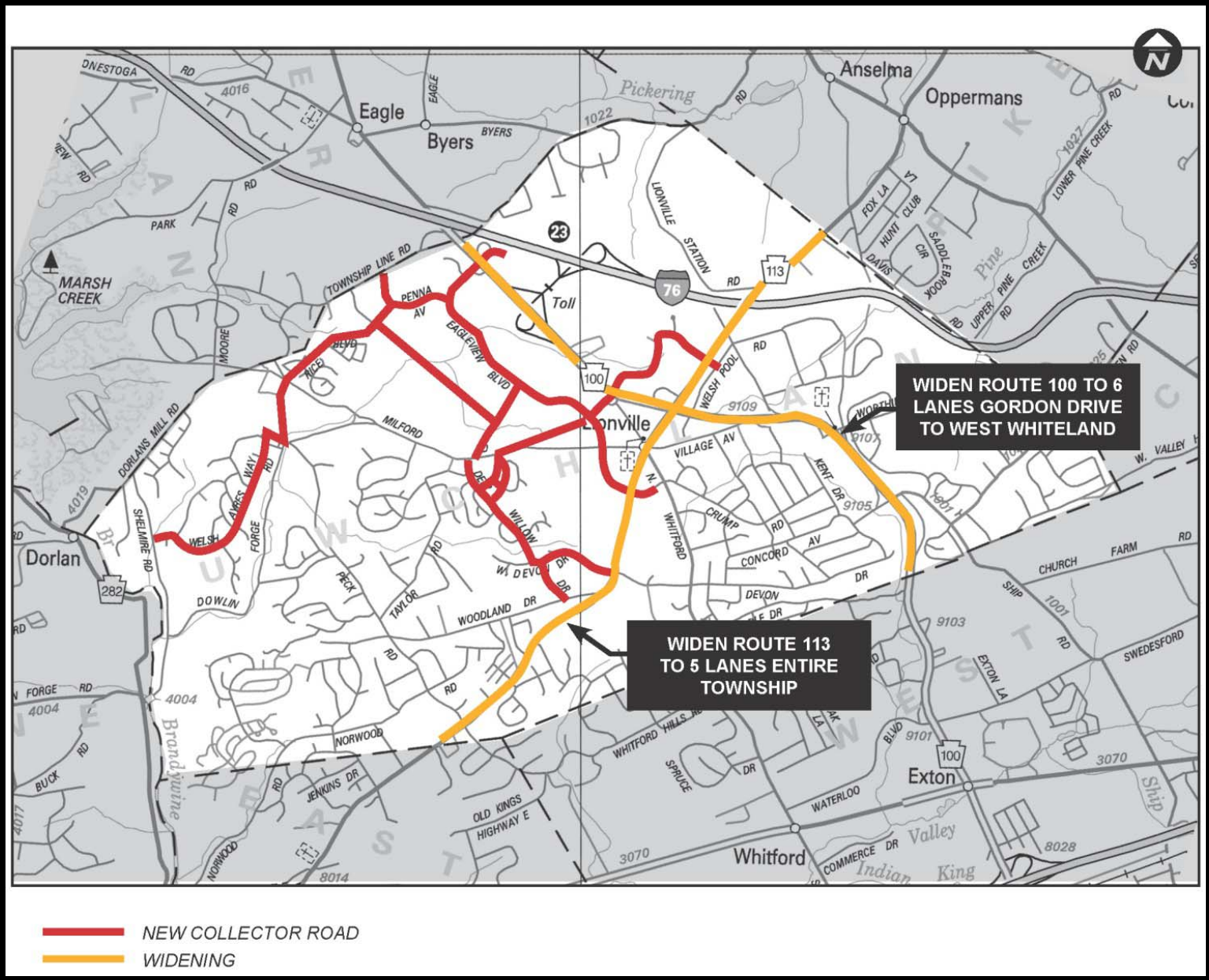
- Chester County community, 13 miles west of King of Prussia
- 1980: Uwchlan realizes it will inevitably be developed
  - Supervisors decide to develop Circulation Element for updated Comp Plan
- 1985: Master Traffic Plan is created
  - Route 113 proposed to widen from two lanes to five lanes
  - Route 100 to widen from four lanes to six lanes



Master Plan Efforts (continued)

- 1987: Master Traffic Plan for undeveloped northwest area of Township.
  - Principles established:
    - 'Two ways to get every which way'
    - Allow local motorists to travel anywhere in the township without using PA Routes 100 or 113.
    - Connect adjacent developments

Uwchlan Today



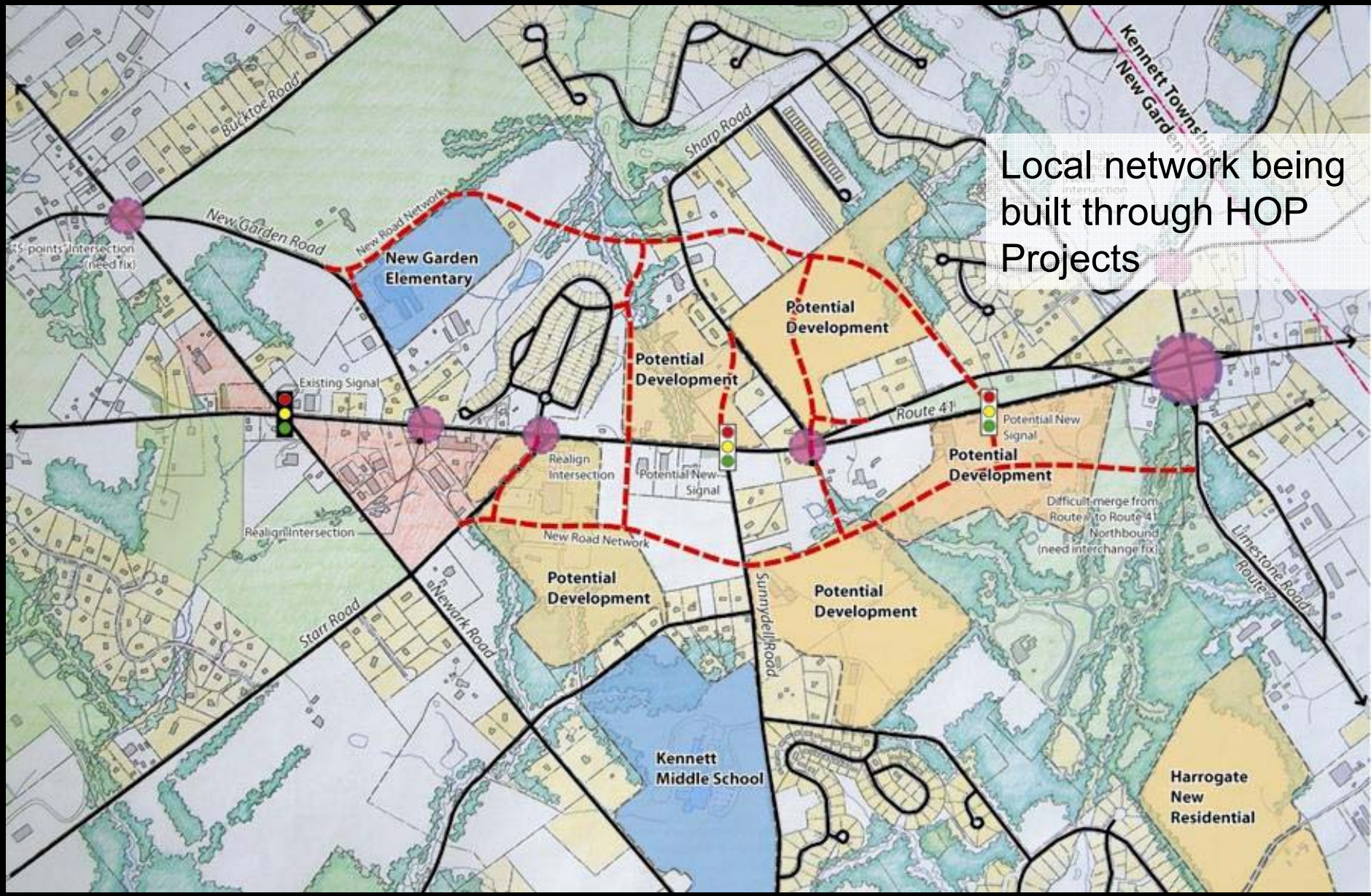
Partnerships on PennDOT Roadways in Uwchlan

- Route 100 improvement: Township designed, and PennDOT constructed
- Route 113 improvement:
  - Developers widened roadway base, curbed roadway, and constructed traffic signals
  - Township negotiated free release of right of way where needed
  - PennDOT overlaid the entire roadway

Partnerships on Collector Roadways in Uwchlan

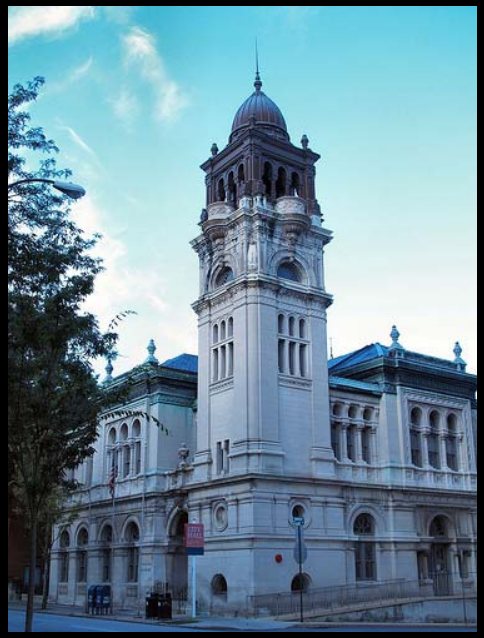
- Developers
  - Required to build collector roadways within tract
  - Assessed impact fees for adjacent improvements through Act 209 ordinance
  - Provided mitigation funds for conditional uses
- Township
  - Provided tax dollars to supplement developer contributions

New Garden Township



Queen Street TOD, Lancaster

- Transit-oriented development
- Partnership among Red Rose Transit, Lancaster Museum of Art, the City of Lancaster, and private developer
- Received PCTI Funding from PennDOT, Green roof funding from EPA



Queen Street TOD, Lancaster

- Redevelopment of parking lot into joint-use development
- Bus hub, Art Museum on ground floor, 350-space parking, and residential flats
- Supported by PennDOT through PCTI program
- Construction starting soon

5

Understanding Land Use and Transportation Contexts

Key Smart Transportation Approach:

Flex roadway design to respect the land use context

Identifying and using Land Use Contexts

50 mph

35 mph

45 mph

35 mph
School
Zone

40 mph

25 mph
School
Zone

What Does Land Use Context Mean to You?

- Existing and future land use context must be identified on all future State and HOP roadway projects
- Land use context is key to your selection of design values for the roadway cross-section
- By identifying the appropriate land use context on roadway projects, municipal consultants can help implement the community vision

Determining Transportation Context

Conventional Functional Classification

Arterial

Collector

Local

Why rethink function 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

Solution: New Roadway Type "Overlay"

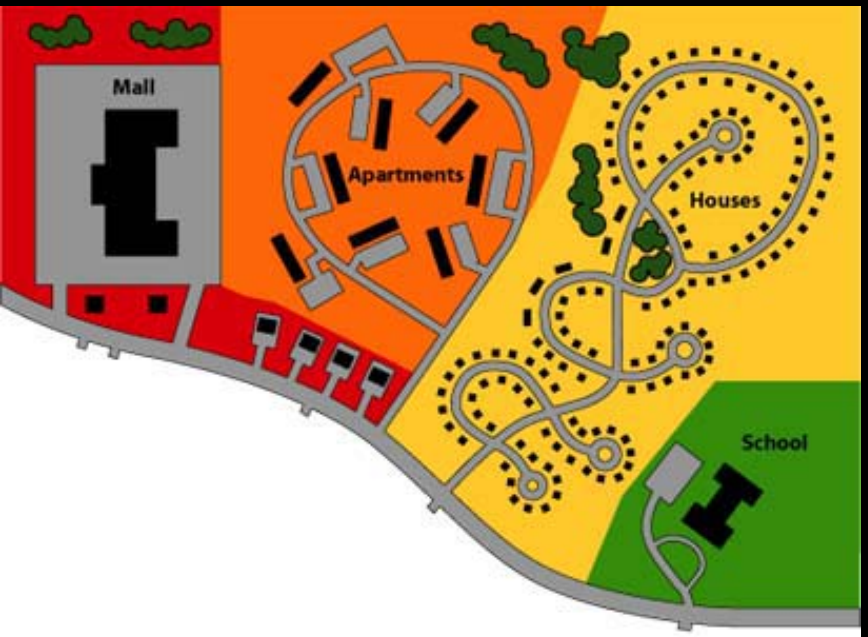
Roadway Class	Roadway Type	Desired Operating Speed (mph)	Average Trip Length (mi)	Volume	Intersection Spacing (ft)	Comments
Arterial	Regional	30-55	15-35	10,000-40,000	660-1,320	Roadways in this category would be considered "Principal Arterial" in traditional functional classification.
Arterial	Community	25-55	7-25	5,000-25,000	300-1,320	Often classified as "Minor Arterial" in traditional classification but may include road segments classified as "Principal Arterial."
Collector	Community	25-55	5-10	5,000-15,000	300-660	Often similar in appearance to a community arterial. Typically classified as "Major Collector."
Collector	Neighborhood	25-35	<7	<6,000	300-660	Similar in appearance to local roadways. Typically classified as "Minor Collector."
Local	Local	20-30	<5	<3,000	200-660	

Roadways in Context

Figure 5.1 Roads in Context

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.

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.*

Design Using the Principles

- Know the land use context
- Know the roadway type
- Set the desired operating speed
- Refer to the Matrix for the starting design values

Community Arterial

	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)
Roadway	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)
Roadway	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
Roadway	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'
Roadway	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
Roadway	Curb Return	25' to 50'	25' to 35'	25' to 50'	20' to 40'	15' to 30'	15' to 35'	15' to 40'
Roadway	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'
Roadside	Buffer[4]	NA	6'+	5' to 10'	4' to 6'	4' to 6'	4' to 6'	4' to 6'
Roadside	Shy Distance	NA	NA	NA	0' to 2'	0' to 2'	2'	2'
Roadside	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 reguar 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).

Community Arterial

	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 reguar 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).

Design Speed

- Design Speed: speed used to determine design features of roadway, such as curves
- Roads are typically designed to accommodate speeds above the speed limit
- Absent strong enforcement, drivers tend to drive as fast as they believe the road can safely accommodate, regardless of posted speed.
- Result: existing road design policy encourages speeding

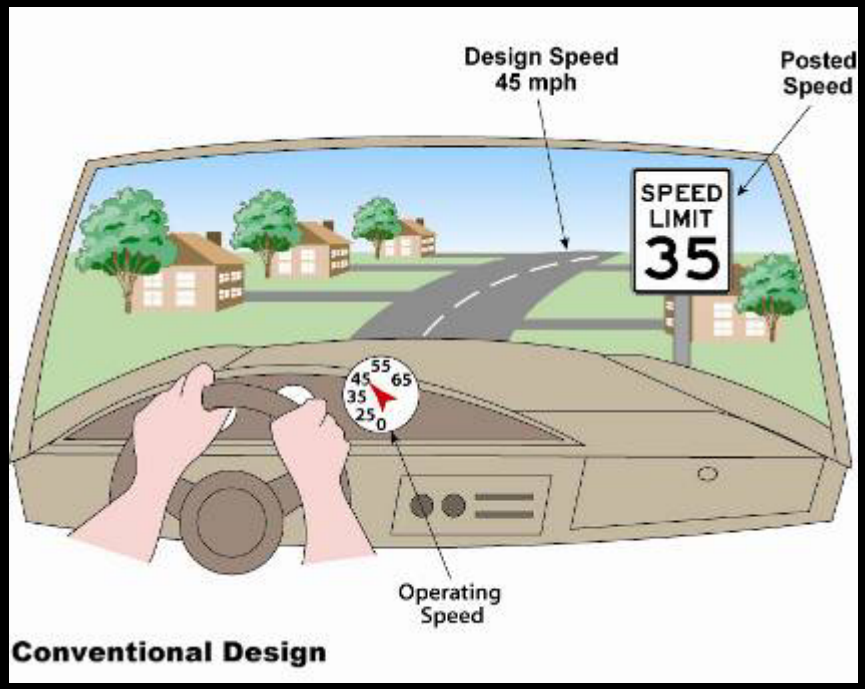
Desired Operating Speed

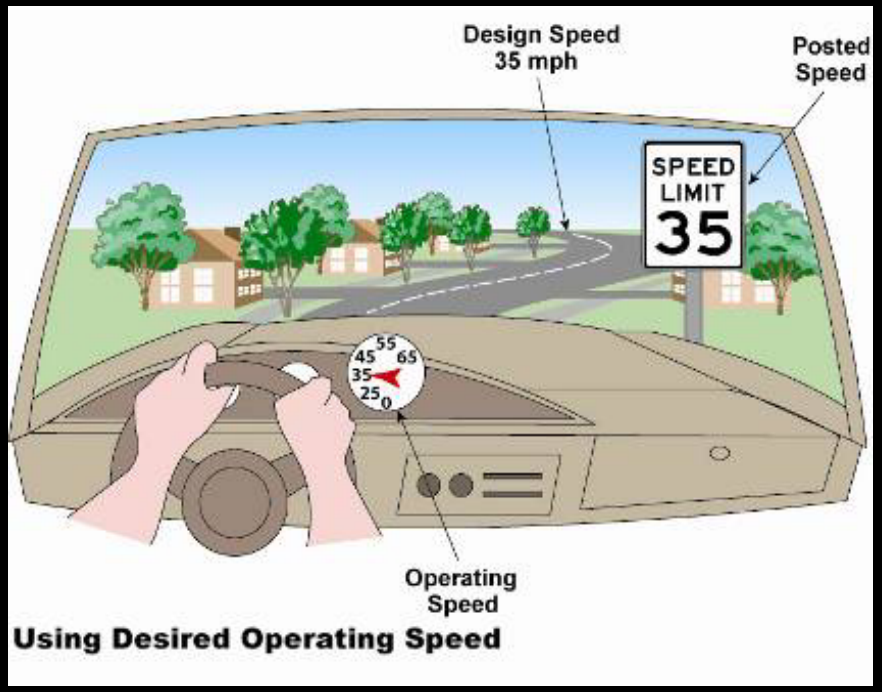
Desired Operating Speed: The speed of traffic that, in the expert judgments of the highway engineer and community planner, best reflects the function of the roadway and the surrounding land use context.

Simple Definition: The speed at which we would like vehicles to travel.

Use roadway and roadside design elements to encourage motorists to travel at the desired operating speed, and discourage speeding

Desired Operating Speed





Examples of Elements That Influence Speed

1. On-Street Parking

2. Street Trees

3. Curve Radius

4. Lane Width

Using Design Elements to Enforce Desired Operating Speed

- Horizontal and Vertical Curvature
- Sight Distance
- Street Trees
- Lane Widths
- Shoulder Widths
- Total Roadway Widths
- Clear Zone
- Access Density
- Signal Density
- Median
- On-Street Parking
- Curbs
- Pedestrian Activity
- Roadside Development
- Traffic Calming
- Superelevation
- Curb Return Radii
- Horizontal Offset between Inside Lane and Median Curb

Travel Lanes

- Smart Transportation practice: Take full advantage of range of travel lane widths
  - Consider 10 ft. lanes for low-speed urban roadways
  - Consider 11 ft. lanes for roads at 35 mph or higher
  - Consider 12 ft. lanes for heavily trafficked roadways with high truck volumes

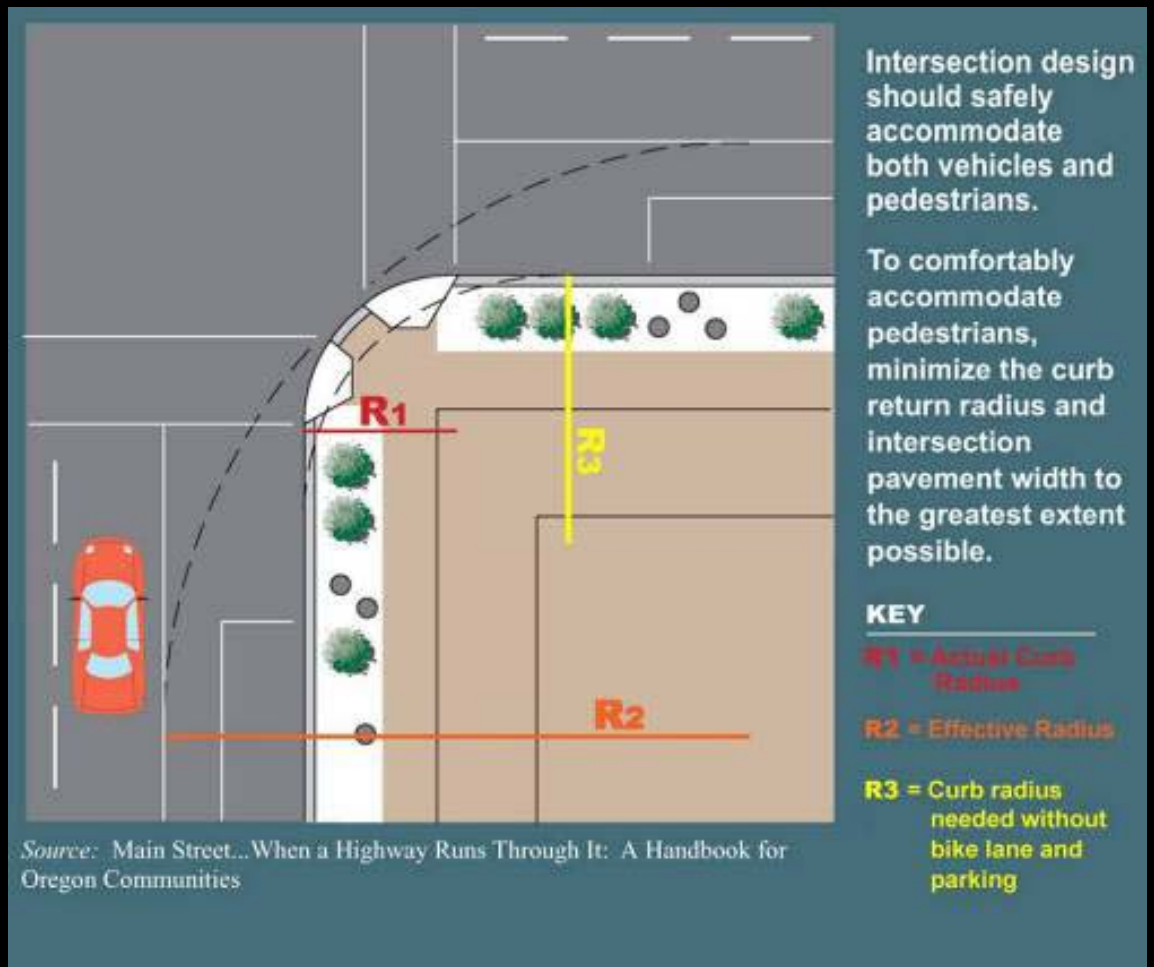
10 ft. travel lane

Shoulders

- Consider wide shoulders (8 ft) on high speed, heavily trafficked roadways
  - Also recommended for roadways with regular horse and buggy traffic
- Consider medium shoulders (4 to 6 ft):
  - To accommodate bicyclists
  - To accommodate pedestrians on roadways without sidewalks
  - On low-volume rural roads

Intersections

- In urban areas, balance the need to accommodate turning trucks with the benefit of smaller crossings for pedestrians



Bicycle Facilities

Three ways to accommodate bicyclists

Bike lane

Wide curb lane

Roadway with shoulders

Pedestrian Facilities

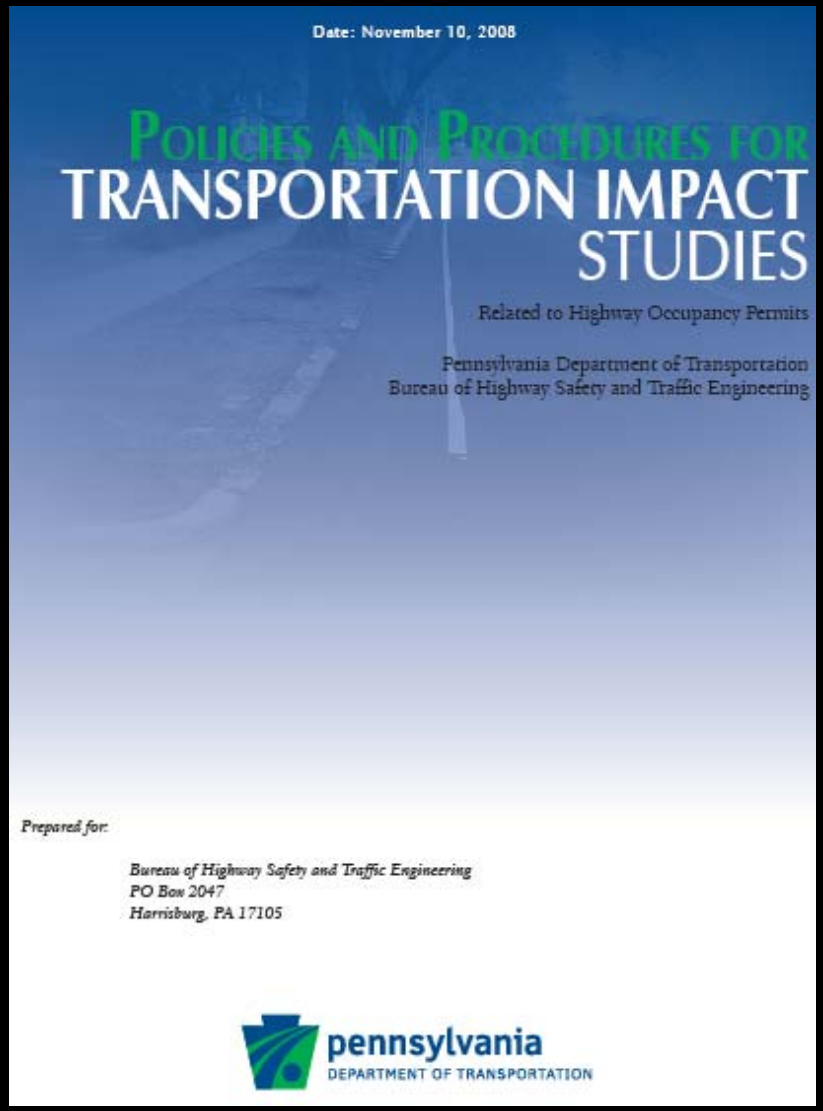
- Sidewalk network is the best gauge of a community's "walkability"
- Provide sidewalks along all developments except in rural districts
- Strive for "clear sidewalk width" of at least 5 ft.

Public Transit

- Consider how to best accommodate bus services when planning new developments

What Does Transportation Context Mean to You?

- It's not enough to look at the functional classification of a roadway – must determine the role of the roadway within the community ("roadway type") and the network
- Roadway type should be used along with land use context to select design values for the roadway
- Consider accommodation for all transportation modes when you choose a roadway design



6

Revised HOP Process

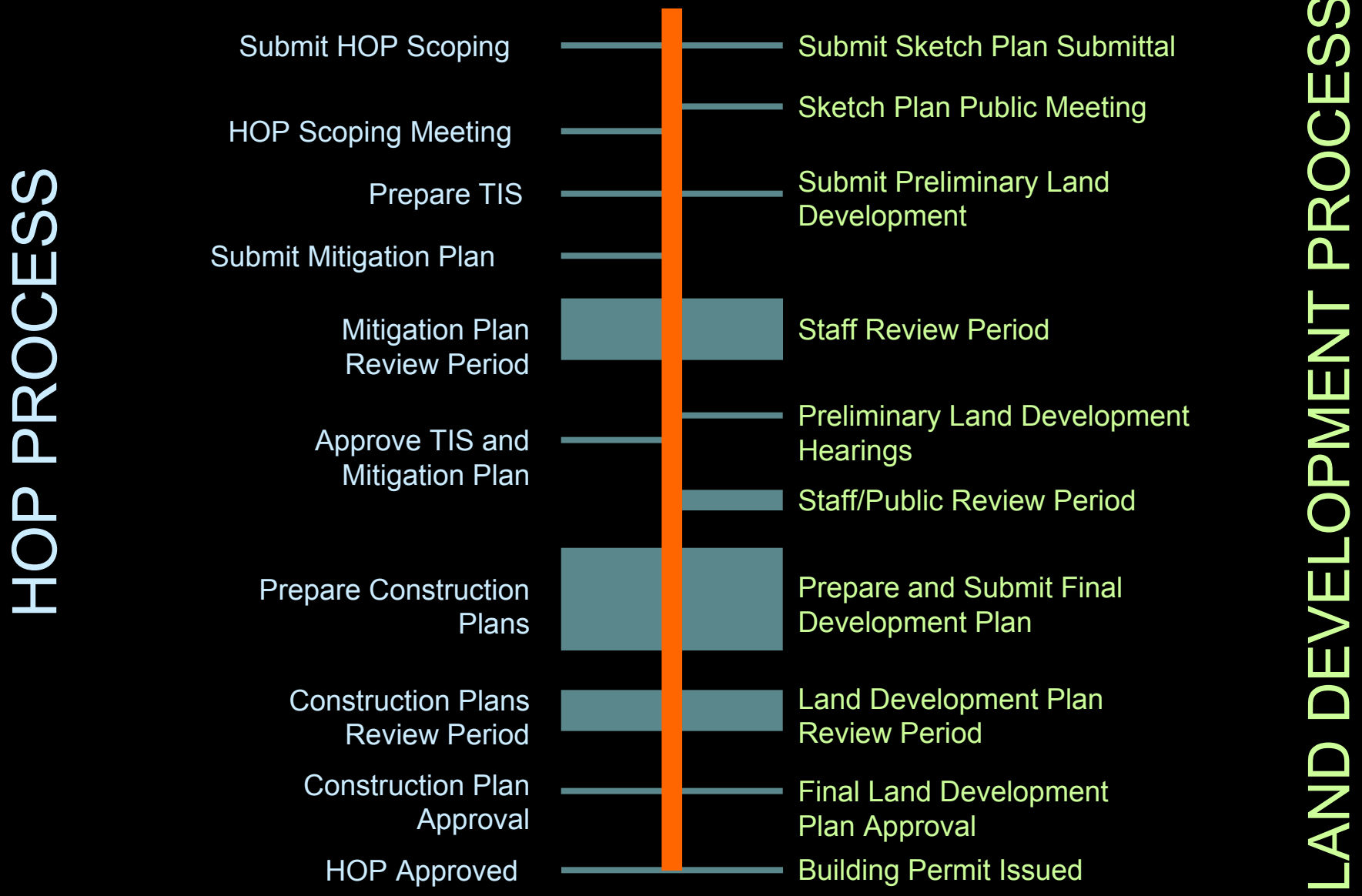
Smart Transportation Enters the HOP Process

- HOP projects to use Smart Transportation design values
  - Greater flexibility
  - Fewer design waivers
  - Cost savings for applicants
- HOP projects to apply key ST concepts
  - Land use context, roadway type, desired operating speed
- Alternative modes and building the network are encouraged (more on this later)

Local Coordination

- Municipalities encouraged to participate in review of HOP applications
- Municipal notification of all meetings
- Sharing of correspondence and review letters
- Municipalities to provide input on:
  - mitigation strategies
  - Alternative Transportation Plans

Aligning HOP Process with Land Development Process



Scoping Meeting

- Scoping Meeting held early in land development process, preferably during sketch planning stage.
- Goal: receive direction from PennDOT and municipality
- Identify land use context
- Identify roadway type
- Identify desired operating speed
- Concur on study area, trip generation, trip distribution, analysis years, growth rates

New Mitigation Flexibility (1)

- If LOS letter grade doesn't change, no mitigation required
- A 10-second increase in delay permitted at intersections
- Municipal input required if LOS goals not met
- At unsignalized intersections, review options other than just signalization
  - Roundabouts to be considered for new or reconstructed intersections

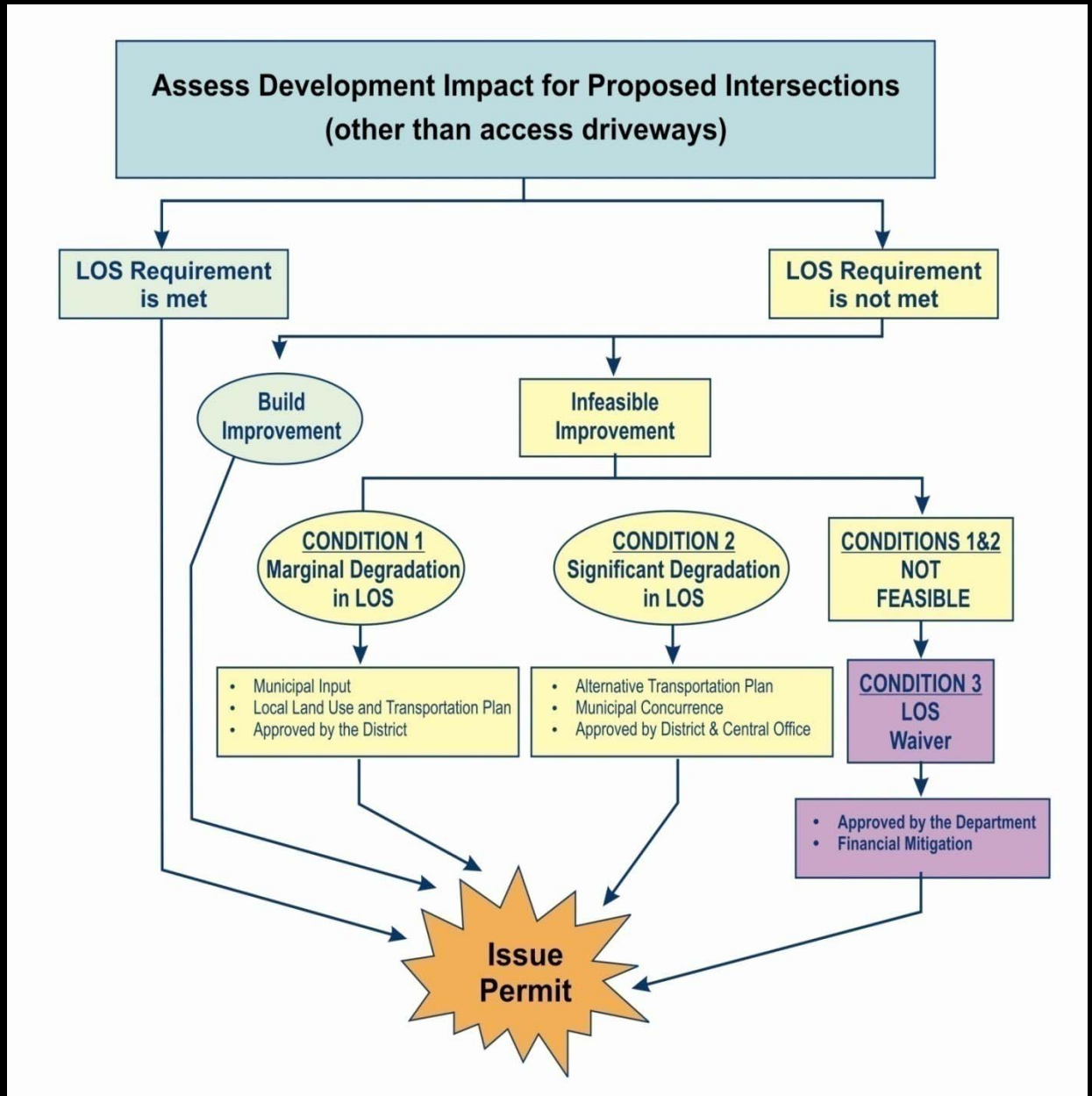
New Mitigation Flexibility (2)

- New intersections/driveways required to operate at LOS C for rural, LOS D for urban
- LOS E permitted with PennDOT and municipal approval
- Best Access Plan analysis required

Alternative Modes Encouraged

- Vehicular trip credits awarded for comprehensive sidewalk system, bikeway system
  - Must meet thresholds for road connectivity, density, land use mix
- Trip credits also awarded for:
  - Employer trip reduction program
  - Transit services

New Mitigation Flexibility (3)



Alternative Transportation Plans

- Alternate routes
  - Improve connectivity of area network
- Access management plans
  - Combine access points
- Pedestrian facilities
  - Identify “missing links”, and install sidewalks
- Transit facilities
- Bicycle facilities
- Park & ride
- Intelligent Transportation Systems (ITS)

Alternative Transportation Plans

- May not mitigate LOS drops, but still have value
- Developer costs should be similar to conventional improvements
- Must be implementable and funded

7

Using Ordinances to Implement Smart Transportation

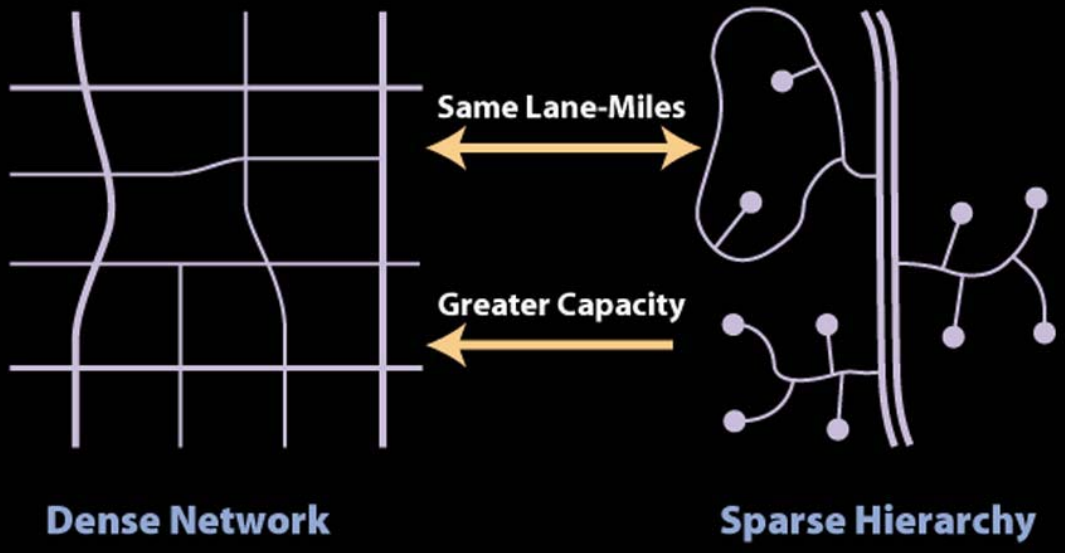
Ordinances & Smart Transportation

Key Categories that can either complement or conflict with Smart Transportation:

- Circulation/Transportation
- Land Use and Intensity/Density
- Site Design & Lot Layout

Making Connections

- Benefits of well-connected networks:
  - Reduce congestion on arterial streets
  - Provide better emergency vehicle access, and reduce costs of emergency services
  - Reduce cost of providing utilities
  - Increase ability of pedestrians and bicyclists to travel around community
- How to achieve:
  - Use of official map
  - Master plan of streets
  - Ordinances



Ordinances Affecting Connectivity

- Permit spacing of 600 feet between centerlines on arterial roadways
  - May wish to consider spacing less than 600 feet for traditional urban environments
- Permit spacing of 300 between centerlines on collectors
- Permit spacing of 150 feet on local roadways

Ordinances Affecting Connectivity

- Use curvilinear streets and cul-de-sacs only when dictated by topography and natural features
- In urban areas, use grid street systems whenever possible
- Provide stub streets adjacent to open lands to permit future connections

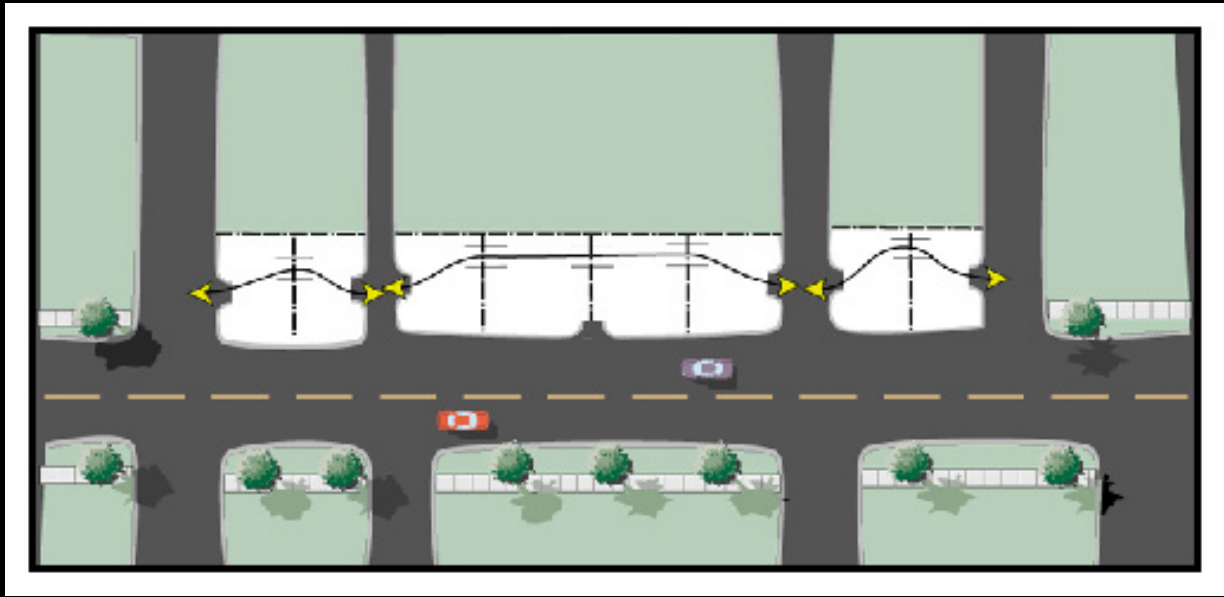
Access Management

- Controlling the number, location and design of driveways on arterial roadways results in safer, more efficient movement of traffic
- Recommendation: Permit one driveway per property, with additional driveways permitted if shown to be in best interest of traffic operations
- Recommendation: consider driveway spacing standards on arterials and collectors

Posted Speed (mph)	Spacing (feet)
35	250
40	300
45	360

Access Management

- Recommendation: require consideration of joint or cross access driveways between adjacent developments
  - To meet minimum driveway spacing standards, or in general interest of good traffic operations



  - Recommendation: Provide internal drive on all multi-building sites


Towne Av
LIMIT
40


village
CAR WASH
Friar Tucks
BURGER KING
LIQUOR
66

Access Management - Lebanon Case Study

- 2007: Lebanon County Planning Office recognized need to better manage access on highway corridors
- Study focused on suburbanizing areas of North Cornwall and North Lebanon
- Traffic conflicts were documented in areas with poor access controls
- Model access management ordinance developed for County
  - Adopted by townships after refinement to address local conditions

Street Standards

- Studies show wider streets have higher speeds, greater maintenance costs

- Recommendation: Adopt flexible street standards found in Smart Transportation Guidebook
  - Arterial: 10 to 12 ft
  - Collector: 9 to 12 ft
  - Local: 9 to 11 ft
- Factors in setting lane width: speed, context area, truck and bus volumes, and bicycle facility

Street Standards

- Vehicles travel faster through intersections with large radii
- Large radii are not justified at all intersections on arterials
- Use curb radii of 10 to 15 feet at intersections with high pedestrian volumes, and low turning volumes
- Consider larger curb radii when parking lanes are not present

Small curb radius

Large curb radius

Transportation Impact Study Requirements

- Recommendation: TIS applicant should be required to discuss:
  - Existing pedestrian, bicycle and transit facilities
  - Impact on these facilities
  - How pedestrians, bicyclists and transit users will be accommodated
- See City of Lancaster SALDO (265-40) for example

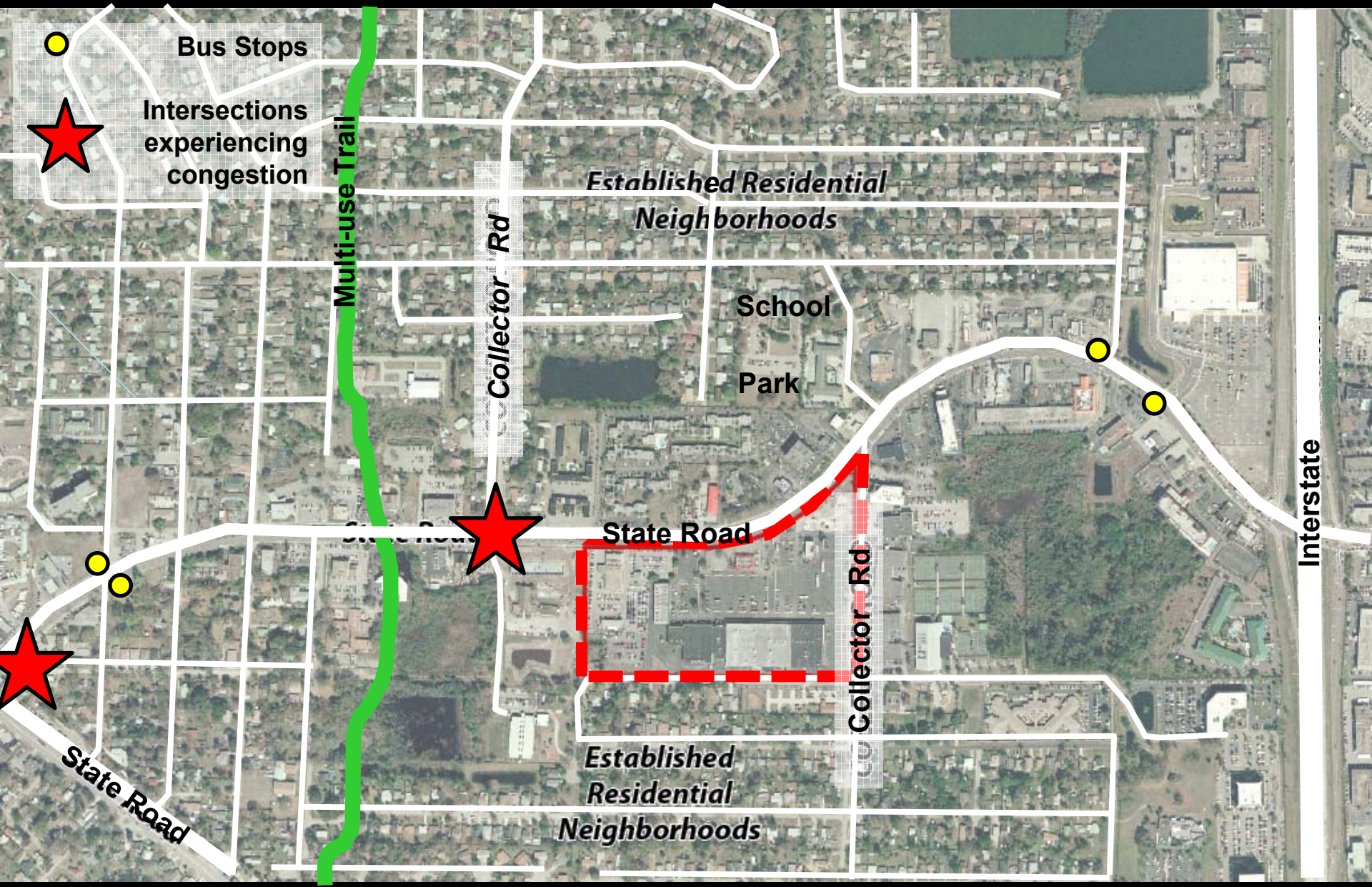
8

Group Discussion: Redeveloping a Shopping Center

Aging Shopping Center

- 22 acre site targeted for redevelopment
- Shopping center with out-parcels
- Located along a state road
- Redevelopment plans to include retail and residential uses

Context


Bus Stops
Intersections experiencing congestion
Multi-use Trail
Collector Rd
Established Residential Neighborhoods
School
Park
State Road
Collector Rd
Interstate
State Road
Established Residential Neighborhoods

Additional Site Information

- State Road corridor is heavily traveled has high volumes in the AM and PM peak hours.
- Congestion along state road and at specific intersections
- The State Route bisects the community.
- Light Industrial Parcels have regular truck deliveries, and also are a major employer in area.
- There are sidewalks in the Residential Street network area, and on street parking.
- There is a community park located in the residential neighborhood to the north of the site.
- There is transit service in the area, but no current stops at this corridor/study area.

Site


Apartments
Auto Shop
Fast Food
Light Industrial
Fast Food
State Road
Office
Retail
Collector Road
Flex Office
Light Industrial
Residential Street
Single Family Homes
Lee Rd
Adanson St
Courtland St
THE CLUB
423

Discussion Questions

- What land use scenario is appropriate?
- What Smart Transportation strategies can be used for the redevelopment (within the site)?
- Who do the property owners need to coordinate with and what is the timing for the coordination?
- What Alternative Mitigation Strategies can be used for redevelopment (outside of the site)?

Existing Site

Potential Solution

www.smart-transportation.com

pennsylvania
DEPARTMENT OF TRANSPORTATION

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it starts with me

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Click here for the latest information on the Pennsylvania Communities Transportation Initiative (PCTI) and Highway Occupancy Permits.

We all know the world is changing rapidly around us. Every day, we see the prices increase at our local gas station, we read in the newspaper about global warming, we talk to our neighbors about traffic congestion or the slowing economy.

All of these trends are changing the needs and demands of our transportation system. To adapt to this changing world, the Pennsylvania Department of Transportation (PennDOT) is integrating a concept called "Smart Transportation" into the way we do business.

Smart Transportation simply asks us to understand and embrace our evolving financial, environmental, technological, and social contexts as we approach our transportation challenges. It is about consistently applying the most innovative tools and ideas to solve our new transportation challenges, while also helping to build great communities across Pennsylvania.

On this website, you will find a number of resources that will help you understand what we are trying to achieve, and how you can get involved with this effort. We are still constructing this website, and it will be continually updated as the Smart Transportation effort goes forward. Please email us at smarttransportation@state.pa.us with any comments or suggestions.

We look forward to everyone's help as we seek to build a more efficient, affordable, and sustainable transportation system. Together, we can ensure that our communities remain great places for future generations of Pennsylvanians.