PLANNING BETTER TRANSIT STOPS
The Public Transit / Land Use Connection

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Southeastern Pennsylvania Transportation Authority (SEPTA)
A purpose of the Municipalities Planning Code is to “accomplish coordinated development”

Addresses public health, demographic needs

Reduces infrastructure costs associated with sprawl

Why design for transit?

SEPTA LAN'ta LVPC
Lehigh Valley Planning Commission
The MPC and designing for transit

• Safety (transit vehicles, pedestrians, other traffic)
• Guiding, protecting amenity and convenience of public facilities
• Conservation of energy through planning
• Promote small business development
• Promote revitalization of urban centers
Comprehensive Plan

- One of the basic elements is to “plan for the movement of people and goods, which may include… public transit systems…”

How does the MPC propose to do it?
Where does transit fit in?

- Budgets
  - Capital
  - Operating
- Service Planning
TRANSIT SUPPORTIVE LAND USE: A Regional Partnership

Lehigh Valley Planning Commission

MOVING LANTA Forward

Lehigh Valley Regional Public Transportation Plan
LANta + Lehigh Valley Overview

• LANta Service
  • Entirely wheeled system
    • LANta Bus & LANta Van

• Lehigh Valley
  • 3 cities (Allentown, Bethlehem and Easton), 2 counties (Lehigh and Northampton), 62 municipalities, 17 school districts
  • Region defined geographically by the Blue Mountain, southern ridges and linked by East-West oriented Route 22 and I-78
LVPC
Lehigh Valley Planning Commission

2 County Planning Agency + Metropolitan Planning Agency

Share Board + LVTS/MPO Membership + MOU for Planning

Public Transit Authority
Population Growth

- 1980: 497,767
- 1990: 538,235 (+8.1%)
- 2000: 579,156 (+7.6%)
- 2010: 647,232 (+11.8%)
- 2020: 715,226 (+10.5%)
- 2030: 792,928 (+10.9%)
- 2040: 873,954 (+10.2%)
Population by Age

<table>
<thead>
<tr>
<th>Age Group</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
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<td>65 and over years old</td>
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LEHIGH VALLEY + 5,057

Pennsylvania
9,741
12,835

New Jersey
1,581
6,812

New York
1,740
4,348

Other States and Countries
10,224
9,912
Job Flows

IN COMMUTERS
88,764

LEHIGH VALLEY
186,497

OUT COMMUTERS
103,667
The amount of agricultural/vacant land has decreased since 1964 from urbanization, particularly through residential development.
CURRENT TRENDS + SNAPSHOTS

This summary document organizes the HUD Sustainable Communities Grant reports around four basic themes: Economy, Environment, Transportation and Livable Communities. This section looks at current trends and conditions as they relate to those four themes, identifying and illustrating some of the issues that the Consortium set out to explore when this project began in 2011. Concerns raised by the maps in this section reveal the interrelatedness across all four themes and serve as key findings in several of the reports. The LVPC has integrated existing data from a variety of reliable sources to provide an overview of the region through the lens of the four themes.
ECONOMY

It is impossible to consider Economy as a theme without exploring the interplay between where people live and work. Most jobs today are being created in the suburban townships and not the cities. Suburban townships are also the source of the vast majority of population growth. Townships located within the urbanized areas contain low to moderate population densities, while the rural township densities are very low. Meanwhile, the highest concentrations of people remain in Allentown, Bethlehem and Easton, despite comparatively modest growth—or even decline—in job density. The two maps, which depict population and jobs per square mile for each census block in the Lehigh Valley, not only confirm these observations but elicit an array of other concerns relating to households’ access to capital.

For example, the high costs of housing and transportation especially affect residents of the three cities, given that the majority of jobs are outside the three cities and require dependable transportation. Industries with abundant jobs—entry-level retail, services and warehousing—are not place-oriented but dispersed throughout the region, usually on the outer fringes of the existing transit system.
Using a combination of Census, U.S. Department of Agriculture (USDA) and LVPC data, the second map shows that the majority of Lehigh Valley residents do not live within walking distance of schools or grocery stores—potential evidence of decades of decentralized development outside the cities and boroughs. The majority of new schools today are built in areas only accessible by a school bus. Grocery stores are often located in shopping malls or along major highways. By using the 2-mile biking distance, most people in the region are within that distance of schools and grocery stores, but these high numbers do not necessarily coincide with a large population safely being able to use the bicycle routes. Those who lack the ability or income to either drive or ride bicycles may find that essential goods and services remain out of reach.
Many residents of the Lehigh Valley depend on the automobile to get around on a daily basis. According to U.S. Census statistics, nearly 95% of the region’s labor force uses a car to get to work, school or shopping. The dependence on cars for getting around may be related to a lack of accessibility to important amenities using other transportation options. The map of LANta accessibility reveals the full network of approximately 2,600 fixed-route bus stops; GIS resources have helped to generate areas surrounding the bus stops within a quarter-mile distance for walking and two miles for biking. The percentage of the Valley’s population that lives within these distances of non-motorized access is based on population counts within census blocks. The metrics include the full population for any blocks that fall entirely within the distance and a proportioned population for those blocks that only fall partially within the distance. Almost half of the people in the region are not within the quarter-mile walking distance of LANta stops. Most people in the region are within the 2-mile biking distance of LANta stops, though the safety, directness and interconnectivity of the bicycle route is an entirely different consideration. Most transit stops are in the cities, but the majority of population growth over the last 30 years has taken place in the townships.
TRANSPORTATION - Which of the following changes to the transportation system should be the top priority in the Lehigh Valley?

- Road improvements: 52%
- Rail: 15%
- Enhanced transit service: 13%
- Pedestrian safety improvements: 10%
- Additional bike infrastructure: 5%
- Improved sidewalks: 4%
- Other: 1%
ENVIRONMENT - Which of the following natural resources should the region promote as a top priority?

- Clean air + water: 63%
- Wildlife + habitat: 19%
- Scenery + open vistas: 13%
- None: 4%
- Other: 1%
1. **Provide more transportation choices.** Develop safe, reliable and economical transportation choices to decrease household transportation costs, reduce our nation’s dependence on foreign oil, improve air quality, reduce greenhouse gas emissions and promote public health.

2. **Promote equitable, affordable housing.** Expand location and energy-efficient housing choices for people of all ages, incomes, races and ethnicities to increase mobility and lower the combined cost of housing and transportation.

3. **Enhance economic competitiveness.** Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services and other basic needs by workers, as well as expanded business access to markets.

4. **Support existing communities.** Target federal funding toward existing communities—through strategies like transit-oriented, mixed-use development and land recycling—to increase community revitalization and the efficiency of public works investments and safeguard rural landscapes.

5. **Coordinate and leverage federal policies and investment.** Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.

6. **Value communities and neighborhoods.** Enhance the unique characteristics of all communities by investing in healthy, safe and walkable neighborhoods—rural, urban or suburban.
LANta Overview – Strategic Plan

• LANTA’s 12 Year Strategic Plan *Moving LANTA Forward* calls for:
  
  • An ambitious expansion and restructure of fixed route system to meet growing population and demand
  
  • Commitment from municipal/county governments to promote transit through land use planning decisions

• Supported by:
  
  • LVPC’s Comprehensive Plan for the Lehigh Valley
  
  • LVTS’s Long-Range Transportation Plan
  
  • 1LV Sustainable Communities Plan
Land Use Outreach Initiative

• LANta Hired a Director of Planning
• Entered into MOU with LVPC to conduct joint land use outreach program
• Initiated series of Transit Supportive Land Use practices presentations to municipal planning commissions
• Updated Land Use Toolkit to the Transit Supportive Land Use for the Lehigh Valley as part of Sustainable Communities Program with LVPC/LVTS targeting infrastructure investment within urban growth boundary to support transit
Key Planning Issues
• Describe shared goals between planning documents and *Moving LANTA Forward*
  • Use specific quotes from municipality’s planning documents
• Stress that we have an opportunity to work together to realize shared goals
• Key factors for transit
  ▪ Service
  ▪ Sidewalks
  ▪ Site Planning
  ▪ Centers

Whitehall Township Goal Statement:
*Encourage land use patterns which support transit use.*
Service
- Support the provision of service
- Traffic/parking enforcement
- Allow for signage and shelters

Whitehall Township Goal Statement:
Encourage LANTA service and ridership throughout Whitehall Township
Sidewalks

• A comprehensive and safe pedestrian network is essential to transit
• All transit riders start their trip as pedestrians or bicyclists
• Walking/biking for transportation purpose; not just recreation

Lower Macungie Township Goal Statement:

Provide sidewalks on both sides of the street in all developments.
Site Planning

- Unimodal site planning adversely affects transit provision
  - Every minute counts
  - Inconvenient for through passengers
- Ideal for transit:
  - Ability to serve location from street
  - When not possible, minimize internal circulation
Site Planning

- Site Planning Review
  - LVPC/LANTA review may or may not come early in the land development process

South Whitehall Township Goal Statement:
Consider mass transit in site planning for more efficient access to this mode of transportation.
Site Planning

<table>
<thead>
<tr>
<th></th>
<th>Outbound</th>
<th>Inbound</th>
<th>Recovery</th>
<th>Total</th>
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<tr>
<td>Frequency</td>
<td>25 28 31</td>
<td>25 28 31</td>
<td>10 4 0</td>
<td>60 60 62</td>
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<tr>
<td>Buses</td>
<td>30 30 ?</td>
<td>2 2 ?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Commercial Development

Newer, Bigger Commercial Development
Centers

- Increasing density
- Incorporating mixed uses
- Creating centers of activity

South Whitehall Township Goal Statement:
Incorporate appropriate criteria for infill development in and around existing existing villages.
Key Discussion Points

• Municipalities play key role in regional transit vision
• Does not require “radical change”
  • Requires subtle change to assumption that everyone will drive everywhere
• View walking/biking as transportation mode, not just recreation
• Regardless of transit, this represents planning that realizes YOUR goals
• We want to work with you/We are 1LV
Supporting Bus Rapid Transit
Municipal Cooperation

- Current Silk Mill Redevelopment Project
- Karl Stirner Arts Trail
- Wood Avenue
- Paxinosa Elementary School
- Northampton Street
- Bushkill Drive
- Bushkill Creek
- US 22
- 13th Street Corridor

Legend:
- 13th Street Corridor
- Major Cross Streets
- Karl Stirner Arts Trail
- Bushkill Creek
- Significant Intersections
Municipal Cooperation Growing
Where does SEPTA fit in?

- Strategic Business Plan
- Sustainability Plan
- Service Planning
  - Service Standards and Process
  - Annual Service Plan
  - Bus Stop Design Guidelines
• Public rules to make decisions in our 5-county service area
• Best uses of limited resources
• Fair and objective comparison of service requests
- Service coverage
- Stop spacing
- Route economic performance
- Transfers
- Service frequency & span
- On-time performance

### TRANSIT VEHICLE LOADING STANDARDS

<table>
<thead>
<tr>
<th>MODE</th>
<th>SEATS</th>
<th>OFF-PeAK HOURS</th>
<th>MAXIMUM LOADING STANDARD [PEAK HOURS]</th>
<th>PERCENTAGE OF MAXIMUM CAPACITY TO SEATS ON VEHICLE</th>
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<tr>
<td><strong>BUS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27' Cut-Away (93&quot; wide)</td>
<td>26</td>
<td>26</td>
<td>34</td>
<td>131%</td>
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<tr>
<td>30' ADB Standard (96&quot; wide)</td>
<td>26</td>
<td>26</td>
<td>40</td>
<td>154%</td>
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<tr>
<td>40' ADB Standard (102&quot; wide) (NABI *)</td>
<td>44</td>
<td>44</td>
<td>70</td>
<td>159%</td>
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<tr>
<td>40' ADB Low-Floor (102&quot; wide) (New Flyer)</td>
<td>39</td>
<td>39</td>
<td>66</td>
<td>169%</td>
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<td>40' ADB Low-Floor (102&quot; wide) (NovaBus)</td>
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<td>40</td>
<td>68</td>
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<td>60' ADB Articulated (102&quot; wide) (Neoplan *)</td>
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<td>99</td>
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<td>62' ADB Low-Floor Articulated (102&quot; wide) (NovaBus)</td>
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<td>108</td>
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<td>LRV (Single or Double Ended)</td>
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<td>85</td>
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<td>PCC II</td>
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<td>Norristown High Speed Line (N-V)</td>
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<td><strong>TRACKLESS TROLLEY</strong></td>
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<tr>
<td>New Flyer</td>
<td>39</td>
<td>39</td>
<td>64</td>
<td>164%</td>
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**NOTE:** Maximum loading standard is based on manufacturer’s specifications and PennDOT transit guidelines (five square feet per passenger for 15-minute travel period). On limited-access highway (expressway operation), Pennsylvania motor code limits passenger capacity to 125% of the seats on a vehicle. (Pennsylvania Motor Vehicle Code, Title 75, Chapter 49, Subchapter C, Section 4948; http://www.dmv.state.pa.us/pdf/forms/vehicle_code/chapter49.pdf)

* — This fleet is expected to be fully retired during CY 2015.
Fiscal analysis (FTA)

- Cost: Hours, Miles & Peak vehicles
- Projected revenue
- Cost recovery – Operating ratio
Community Benefit Analysis changes

- Number of passengers
- Transfers
- Travel time
- Walking distance

**Proposed Route 201**

<table>
<thead>
<tr>
<th>Service</th>
<th>Benefit Points</th>
<th>Existing Pages</th>
<th>Existing Points</th>
<th>Proposed Pages</th>
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**ANNUALIZED**

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<tr>
<th></th>
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<td>FBS Calculation</td>
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<td>57,375</td>
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<tr>
<td>Annual Benefit Points</td>
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<td>Annual Expenses</td>
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<td>FBS</td>
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**Context: Annual Service Plan**
All transit agencies in Pennsylvania are working with & around:

- Existing land uses
- Existing design

Opportunities to improve conditions for transit include:

- Corridor-wide improvements
- Site-specific plans
- Retrofitting existing uses

LANTA’s approach is similar
- Route classification system that connects routes with targeted areas served
  - Ties in population, employment density
  - Creates an activity density index
- Explains the impact on vehicle cycle time when new routings/destinations are added
Why Bus Stop Design Guidelines?

- Awareness about relationship between street design, transit operations/performance
- Consideration of transit needs, amenities by:
  - Municipalities – zoning, SALDO
  - Developers – preparing initial site plans
- Improve safety for SEPTA passengers, vehicles
- Encourage investment that can bring new users to the system
• Bus Stop location
• In-Street Design
• Curbside Design
• Passenger Amenities
Advantages:
• Fewer right turn, sight line conflicts
• Pedestrians cross behind bus

Disadvantages:
• Double stopping with red signal on approach
• More risk for rear end collisions

Bus Stop Location: Far-side
Advantages:
• Minimal traffic interference in peak
• Passengers board near crosswalk

Disadvantages:
• Conflicts with right turning vehicles
• Obscured sight lines for intersection

Bus Stop Location: Near-side
Advantages:
- Minimal sight line obstructions
- Removes intersection conflicts

Disadvantages:
- Pedestrian crossing if no crosswalk is provided
- Reduces space available for on-street parking

Bus Stop Location: Midblock
Table 3: Dimensional specifications for in-street (but outside travel lane) stop types

<table>
<thead>
<tr>
<th>Stop Configuration</th>
<th>Roadway Characteristic</th>
<th>Minimum Safety Buffer</th>
<th>Primary Bus Zone Length</th>
<th>Additional Deceleration Space</th>
<th>Additional Acceleration Space</th>
<th>Equiv. Parking Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Curbside/shoulder stop (near side)</td>
<td><strong>Urban street with on-street parking:</strong> typical posted speeds 25-30 mph; Bus enters stop area at 10 mph</td>
<td>10 ft. (3.0m) safety buffer behind crosswalk</td>
<td>100 ft. (30.5m) l x 10 ft. (3.0m) w in parking lane; add 20 ft. (6.1m) for articulated bus*</td>
<td>No additional space required</td>
<td>N/A; Uses intersection to accelerate</td>
<td>Up to 5 spaces needed to create bus zone</td>
</tr>
<tr>
<td></td>
<td><strong>Minor road with no on-street parking:</strong> typical posted speeds 25-35 mph; Bus enters stop area at 15 mph</td>
<td>10 ft. (3.0m) safety buffer behind crosswalk</td>
<td>100 ft. (30.5m) l x 10 ft. (3.0m) w in shoulder; add 20 ft. (6.1m) for articulated bus*</td>
<td>50 ft. (15.2 m) transition</td>
<td>N/A; Uses intersection to accelerate</td>
<td>None; road shoulder is used</td>
</tr>
<tr>
<td></td>
<td><strong>Major road with no on-street parking:</strong> typical posted speeds 35-45 mph; Bus enters stop area at 20 mph</td>
<td>10 ft. (3.0m) safety buffer behind crosswalk</td>
<td>100 ft. (30.5m) l x 11 ft. (3.4 m) w in shoulder; add 20 ft. (6.1m) for articulated bus*</td>
<td>100 ft. (30.5 m) transition</td>
<td>N/A; Uses intersection to accelerate</td>
<td>None; road shoulder is used</td>
</tr>
</tbody>
</table>

*The standard bus zone length in the City of Philadelphia has been 60 feet for standard buses and 90 feet for articulated buses. This practice will remain in place for city stops, with new bus zones meeting the standards in this table wherever possible.

Source: DVRPC 2012

**Dimensional Specifications**
In-Street Design: Curbside

Most common stop type in SEPTA system
In-Street Design: Bus Bay Stop

- Higher volume loading
- Longer dwell times
- Returning to traffic
In-Street Design: Curb Extension

Used with:
• Near side stop with parking lanes
• Multiple travel lanes
Various in-street & off-street applications

Open Bus Bay
In-Street Design: Engineering Considerations

Loading area horizontal & vertical clearances
In-Street Design: Bus Turning Radii
Addressing heavier than normal loads (about 21.5 tons for 40’ bus)

In-Street Design: Roadway Paving
Curbside Design: Loading/Waiting Area

Scaled to reflect ridership levels & passenger movement

Clear zone for boarding/alighting - ADA

Separate pedestrian path and waiting area where possible
### Table 4: Dimensional specifications for curbside passenger facilities

<table>
<thead>
<tr>
<th>Type 1: Minimum stop with recessed pedestrian path</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
</tr>
<tr>
<td>A</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type 2: Minimum stop with curbside pedestrian path</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Element</strong></td>
</tr>
<tr>
<td>A</td>
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<tr>
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</tr>
</tbody>
</table>

**Source:** DVRPC 2012
Thoroughfare Access Only

Bus Stop is far from Land Use and Riders must access building through parking lot

Site Development Design – Cooperation and Conflicts
Routing Through Development Site

Pedestrian Promenade

Site Development Design Options
Can include:
- Transit shelters
- Stop area seating
- Bicycle racks/storage

Passenger Amenities: Bus Stop Comforts
Bus Stop Signage

Includes:
- SEPTA contact information
- Stop ID information connected to SEPTA real-time bus information

Not a regulatory sign
Bus Stop Signage

The (Federal) Manual on Uniform Traffic Control Devices (MUTCD) uses these regulatory sign conventions.

R7-107

R7-107a

Bus Stop Signage

This area may be used for a transit logo. (If not used decrease sign height by 6 inches)
• Highway commercial shopping center with curbside stop
• Shopping mall transit hub
• Urban neighborhood stop – curb extension
• Urban stop – coordination between routes
• Posted on DVRPC, SEPTA websites
• Copies sent to municipalities
• Presentations to traffic engineers, planners
• Referenced at various meetings, project discussions
• Planning staff reviews

Bus Stop Design Guidelines’ use so far
Bus Stop Design Guidelines' use so far
Recent developments

- DVRPC including transit service in:
  - Corridor studies
  - Access management promotion
- Counties/municipalities identifying developments of significant impact for reviews
  - Chester County Circulation Handbook update
Recent developments

• PennDOT engaging SEPTA in:
  • Transportation Impact Studies
  • Highway Occupancy Permit (HOP) reviews
• Cooperation from major developers
Transit agencies strive to improve conditions for transit whenever possible

- Understanding site constraints
- Status quo is not usually context sensitive design
- Safety of buses and passengers is key factor
Overarching Issues for Reviews

Lead time is needed for reviews (HOP, site plans, etc.)

- Field investigation may be required
- At SEPTA, review letters must be signed off by senior Operations staff
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