



CHRISTINA "TORI" MORGAN
Chair

ARMANDO MORITZ-CHAPELLIQUEN
Vice Chair

PHILLIPS ARMSTRONG
Treasurer

BECKY A. BRADLEY, AICP
Executive Director

LEHIGH VALLEY PLANNING COMMISSION MEETING
Thursday, January 22, 2026, at 7:00 pm
Virtual Meeting

THE MEETING CAN BE ACCESSED AT <http://www.tinyurl.com/LVPC2026> OR VIA PHONE
610-477-5793 Conf ID: 947 550 319#

AGENDA

Roll Call

Courtesy of Floor

Chair's Report

1. Commissioner Information and Committee Updates
2. New Staff Introductions
 - a. Beth Ritter-Guth, Director of Research & Innovation
 - b. Steven Weber, AICP, Director of Transportation Planning

Special Presentation

1. Certified Citizen Planner Awards

Minutes

1. *ACTION ITEM*: Minutes and Review of Roll Call Actions of the December 18, 2025, Commission Meeting (CM)

Comprehensive Planning Committee:

1. *ACTION ITEM*: South Whitehall Township – Land Use of Regional Significance – Project Atlas Data Center Campus (JS, SMyerov)
2. *ACTION ITEM*: Summary Sheet (SMelnick)

Environment Committee:

1. *ACTION ITEM*: Environment Summary Sheet (SR)

Transportation Committee:

1. *PRESENTATION ITEM*: 2025 Transportation Improvements Accomplishments (STAFF)

Old Business:

1. *PRESENTATION ITEM*: Final Lehigh County Industrial Land Use Guide (JS)
 - a. Municipal Training ---- January 29, 12 PM OR 6 PM
 - i. Register at <https://www.eventbrite.com/e/new-emerging-industrial-land-use-guide-training-tickets-1975589950724?aff=oddttdtcreator>
 - b. Community Training --- February 11, 12 PM OR 6 PM

- i. Register at <https://www.eventbrite.com/e/new-emerging-industrial-land-use-guide-community-training-tickets-1980484645889?aff=oddtcreator>

New Business:

1. 2026 Major Plans and Projects (BB, Senior Staff)

Executive Director's Report:

1. Organizational Update and Recent Funding Announcements
2. *FutureLV* Process Guide

Monthly Reports:

1. *PACKET ITEMS*:
 - a. December 2025 Subdivision, Land Development, Stormwater and Municipal Ordinances/Plans Report
 - b. Highway Performance Monitoring System - Monthly Traffic Count Report

Communications and Engagement

1. *PACKET ITEM*: Morning Call Business Cycle Column
 - a. Published: December 21- "The Lehigh Valley is Thriving. Its Infrastructure Will Need to Keep Up"
 - b. lvpc.org; mcall.com
 - c. Next column: February 8
2. *PACKET ITEM*: Monthly, Plan Lehigh Valley Talk Show on WDIY, Lehigh Valley Public Radio, 88.1
 - a. Air Date: January 5 - "The Spirit of Implementation with Samantha Pearson"
 - b. Next show – 6:30 pm, February 2, 2026
3. *PACKET ITEM*: Grant
 - a. PennDOT: Green Light – Go Program for Traffic Signal Upgrades
 - o January 2, 2026 -- Scoping Form Deadline
 - o March 1- March 31 – Full Application period
 - b. PennDOT: Multimodal Transportation Funding (MTF)
 - o February 13 – Full Application Deadline
4. *PACKET ITEM*: Lehigh Valley Government Academy
 - a. Local Technical Assistance Program (LTAP) virtual
 - o January 29, 8 am – noon: Full Depth Reclamation
 - o February 10, 8 am – noon: Local Road Safety Plans
 - o February 19, 11 am – noon: PennDOT Adoption of the 2023 Manual of Uniform Traffic Control Devices
 - Register at www.gis.pennDOT.gov/LTAP/ or contact Hannah Milagio at hmilagio@lvpc.org 610-264-4544

Next Lehigh Valley Planning Commission Meeting:

Thursday, February 26, 2026, at 7:00 pm

Virtual Meeting

The LVPC/LVTS website, www.lvpc.org, may be translated into multiple languages. Publications and other public documents can be made available in non-English languages and alternative formats, if requested.



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LEHIGH VALLEY PLANNING COMMISSION
Minutes from the Thursday, December 18, 2025, Meeting

The LVPC held a public meeting on Thursday, December 18, 2025. The meeting was advertised in the Lehigh Valley Press on January 8th, 2025.

LVPC Chair Dr. Chris Amato chaired the meeting.

Mr. Christian Martinez took Roll Call.

Members in Attendance:

Lehigh County

Phillips Armstrong, Ron Beitler, Michael Drabenstott, Steve Glickman, Jennifer Gomez, Kent Herman, Christina Morgan, Santo Napoli, Owen O'Neil, Stephen Repasch, and Kevin Schmidt.

Northampton County

Christopher Amato, Charles Elliott, Cathy Fletcher, John Gallagher, Judith Haldeman, Carl Manges, John McGorry, Steve Melnick, and Armando Moritz-Chapelliquen.

Members Absent:

Lehigh County

Percy Dougherty, Bob Elbich, Sunny Ghai, Philip Ginder, John Inglis, Diane Kelly, Dennis Klusaritz, Richard Molchany, and Matthew Tuerk.

Northampton County

Jessica Cope, Andrew Elliott, Ken Kraft, Rachel Leon, Lamont McClure, Scott Minnich, Edward Nelson, Salvatore Panto, Jr., J. William Reynolds, Crystal Rose, Tina Smith, Jean Versteeg and Basel Yandem.

Staff Present: Becky A. Bradley, David Cohen, Jillian Seitz, Matt Assad, Susan Myerov, Christian Martinez, Corinne Ruggiero, Geoffrey Reese, Denjam Khadka, Mackenzie Geisner, Evan Gardi, Peter Lantz, Giovanna Rizkallah, Hannah Milagio, Samantha Pearson, Taylor Beasley, Subham Kharel, Minsoo Park, Clay Karnis, Jacob Weinberg and Mary Grace Collins.

Public Present:

COURTESY OF THE FLOOR

Ms. Bradley briefed the Commission about formal testimony the LVPC provided at a Pennsylvania Senate Democratic Policy Committee Hearing about affordable housing, on December 17, 2025. LVPC staff described the Housing Supply and Attainability Strategy and fielded questions from committee members on changes to the Pennsylvania Municipalities Planning Code, increasing quantity and diversity of housing types and possible state-backed investment options to support housing development.

Ms. Bradley also informed the Commission that there would be a press conference after the meeting to announce Phase II of a passenger rail feasibility study for the region, featuring PA State Senator Nick Miller, Lehigh County Executive Phillips Armstrong and incoming Lehigh County Executive Josh Siegel.

Finally, Ms. Bradley and members of the Commission thanked Dr. Chris Amato for serving as Chair of the LVPC from 2024-2025.

Chair Amato thanked board members and recounted how many of them helped him during his time as Chair.

CHAIR'S REPORT

Chair Amato turned the floor over to four new LVPC staff members to introduce themselves: Mary Grace Collins, Peter Lantz, Giovanna Rizkallah and Jacob Weinberg.

MINUTES

Chair Amato stated that the minutes of the Thursday, November 20, 2025, LVPC meeting are attached in the meeting packet. Mr. Martinez read each item voted on and then Chair Amato asked for a motion to approve the minutes. Commissioner Repasch made a motion to approve the minutes and Commissioner Melnick seconded the motion.

Chair Amato asked for any comments or questions. There were none. Chair Amato called for affirmative votes to accept the November 2025 minutes. Commissioner Schmidt abstained. The motion passed.

COMPREHENSIVE PLANNING COMMITTEE

INFORMATION ITEM: Data Centers

Ms. Seitz, Ms. Collins and Mr. Weinberg presented to the Commission about data centers, to help contextualize the land use, given the meeting's agenda featured the region's first hyperscale data center proposal for review. The staff provided an overview of what data centers are, their sizes, benefits and challenges, review criteria, and the legal framework behind land-use decisions in Pennsylvania.

Chair Amato asked for any comments or questions. There were none.

ACTION ITEM: Cetronia Road Data Center

Ms. Seitz presented on a proposal to redevelop the site of the former Air Products corporate headquarters by constructing three data center buildings totaling 2.6 million square feet. The LVPC previously reviewed a nearly identical site plan at the proposed project site, in a letter dated April 29, 2022. The LVPC noted that the applicant amended the formerly approved plans to submit the current plans to the Township as a Data Center land use, and the plans do not include essential information that is expected with a hyperscale data center submission. The staff review notes that the applicant should address limiting noise generation from operations, nighttime lighting levels, coordination with emergency services, and multimodal access to the site.

Ms. Myerov provided environmental comments. First, the submission does not provide sufficient information to evaluate the project's full electrical demand or its long-term impacts on the regional power grid. The applicant should clarify the total projected electrical load at full build-out and demonstrate coordination with PPL to confirm that the existing grid can reliably

accommodate this load without degrading service to current residential or commercial users. The submission also does not identify what kind of energy will power operations, which is necessary to understand the project's long-term sustainability and its alignment with regional clean-energy goals, of *FutureLV* Policy 3.4. Details regarding the number, type, and location of all proposed generators were not provided, which is needed so that potential noise, air-quality, and neighborhood impacts can be evaluated. The application lacks essential information regarding the project's water demands and cooling system. Specifying the type of cooling technology proposed is essential to understand implications for water use and infrastructure needs. Additional comments were provided about the need to coordinate with Lehigh County Authority for water supply needs and to take steps to mitigate the visual impact of such large buildings.

Chair Amato called for a motion to accept the staff review. Commissioner Schmidt made the motion, and Commissioner Moritz-Chapelliquen seconded the motion. Chair Amato asked for any comments or questions.

Commissioners Repasch and Morgan raised concerns about drought and water use, and Commissioner Melnick asked if the applicant would look in to using non-potable water for cooling. Chair Amato followed by asking about what happens to water when it is no longer usable for cooling.

Commissioner Schmidt asked if the LVPC would see the plan again in the future, and Ms. Seitz believes that the Commission will because significant changes to the proposal are likely. Commissioners Charles Elliott, Gallagher, and Beitler raised concerns about the proposal appearing to be incomplete.

Commissioner Charles Elliott proposed that the review letter be amended to include the following language: "Overall, given the lack of information submitted with the application as identified in this review letter, the LVPC is unable to reach a conclusion on this proposal's alignment with *FutureLV*. The LVPC strongly advises the Township against approving land development plans without information pertinent to reviewing the operational conditions or impacts the project will generate. As this project moves forward and details are determined by the applicant, if the submitted plans substantially change, the plans must be re-submitted to LVPC for review prior to plan signing and recordation."

Chair Amato asked for a motion and a second to amend the letter with Commissioner Charles Elliott's language. Commissioner Melnick made a motion and Commissioner Beitler provided a second.

Chair Amato called for affirmative votes to accept the staff review letter with the amended language. Commissioner Drabenstott abstained. The motion passed.

INFORMATION ITEM: Atlas Industrial Data Center

Ms. Seitz informed the Commission that the LVPC received another hyperscale data center application, Atlas Industrial in South Whitehall Township. The project is currently under review and will be presented in January.

Chair Amato asked for any comments or questions, and then he asked for and received confirmation that the proposed location is near Parkland High School.

ACTION ITEM: Easton Area High School Athletic Complex

Ms. Collins presented on an application that proposes recreational and site improvements to the Easton Area High School Athletic Complex, including the construction of two new turf baseball fields to replace existing grass athletic fields and other amenities. The proposed development supports policies of *FutureLV*, including reuse and redevelopment, of Policy 1.1, and 'supporting cultural and social programs', of Policy 5.2. The LVPC encourages Easton Area High School to consider opportunities for the general public to access and utilize the facility, which supports the goal of *FutureLV* for 'local institutions to invest in their surrounding communities' and 'create public spaces in underserved areas', of Policies 4.1 and 5.2.

Chair Amato called for a motion to accept the staff review. Commissioner Beitler made the motion, and Commissioner Glickman seconded the motion. Chair Amato asked for any comments or questions. There were none.

Chair Amato called for affirmative votes to accept the staff comments. The motion passed.

ACTION ITEM: Wilson Area School District Athletic Improvements

Mr. Weinberg presented on an application to reconstruct a new athletic field and 39,000-square-foot auxiliary building, among other improvements. The improvements generally align with *FutureLV* by supporting pedestrian and transit accessibility to the site. Staff provided recommendations to consider public access to the site, pedestrian safety at surrounding intersections and environmentally sensitive landscaping.

Chair Amato called for a motion to accept the staff review. Commissioner Moritz-Chapelliquen made the motion, and Vice Chair Morgan seconded the motion. Chair Amato asked for any comments or questions.

Commissioner Beitler commented that certain crosswalk types can be damaged by utilities when they do work that requires underground maintenance, and Commissioner Moritz-Chapelliquen asked if there had been comment from the school district.

Chair Amato called for affirmative votes to accept the staff comments. The motion passed.

ACTION ITEM: Comprehensive Planning Committee Summary Sheet

Comprehensive Planning Committee Chair Melnick briefed the Commission on the Comprehensive Committee Summary Sheet that featured a zoning ordinance amendment in Lynn Township.

Chair Amato called for a motion to accept the summary sheet. Commissioner Schmidt made the motion, and Commissioner Manges seconded the motion. Chair Amato asked for any comments or questions. There were none.

Chair Amato called for affirmative votes to accept the staff comments. The motion passed.

ENVIRONMENT COMMITTEE

ACTION ITEM: Environment Committee Summary Sheet

Commissioner Repasch briefed the Commission on Environment Committee's business that included an Act 537 review of a Sewage Facilities Plan Update in Plainfield Township.

Chair Amato called for a motion to accept the summary sheet. Commissioner McGorry made the motion, and Commissioner Herman seconded the motion. Chair Amato asked for any comments or questions. There were none.

Chair Amato called for affirmative votes to accept the staff comments. The motion passed.

TRANSPORTATION COMMITTEE

ACTION ITEM: Transportation Committee Summary Sheet

Transportation Committee Chair Schmidt briefed that the Transportation Committee's business that included a street vacation review in Salisbury Township.

Chair Amato called for a motion to accept the summary sheet. Commissioner Repasch made the motion, and Vice Chair Morgan seconded the motion. Chair Amato asked for any comments or questions. There were none.

Chair Amato called for affirmative votes to accept the staff comments. The motion passed.

PRESENTATION & DISCUSSION ITEM: Lehigh County Industrial Land Use Guide

Mr. Gardi, Ms. Seitz and Ms. Collins presented a detailed summary of the Lehigh County Industrial Land Use Guide. The complete draft text of the guide has also been provided in the meeting packets and the LVPC asked for comments on the draft by January 1, 2026. The LVPC staff presented the main sections of the guide, including the evolution of industry in Lehigh County, planning tools for local governments, emerging and evolving industrial land uses, impacts from these land uses, questions to ask developers, funding strategies, comprehensive plan best practices and definitions. At the end of the presentation, staff promoted two upcoming trainings on the guide, on January 29, 2026.

Chair Amato asked for any comments or questions. Commissioner Drabenstott asked why the guide is just for Lehigh County and Ms. Bradley reminded the Commission that a similar guide was previously published for Northampton County, and she also noted the broad applicability of the upcoming guide. Commissioner Beitler asked about the minimum threshold that makes a land use allowed and Ms. Bradley said it is two parcels.

OLD BUSINESS:

INFORMATION ITEM: LVPC Gala Report

Ms. Pearson thanked everyone who attended the 2025 Lehigh Valley Awards Gala, recognized the award winners and provided stats about the event.

Chair Amato asked for any comments or questions. There were none.

NEW BUSINESS:

ACTION ITEM: 2026 Officer Nominations

Chair Amato informed the Commission that the LVPC Executive Committee met on December 11 and received the report of the LVPC Nominating Committee. Commissioner Herman, a

member of the Nominating Committee, discussed the Committee's recommendations for 2026 LVPC Officers, which include Tori Morgan as Chair, Armando Moritz-Chapelliquen as Vice Chair and Phillips Armstrong as Treasurer.

Chair Amato then asked for Commissioners to review Resolution 12-18-25A of the Lehigh Valley Planning Commission for the 2026 Officers and asked for a motion to adopt the resolution, approving the 2026 officers. Commissioner Melnick made the motion, and Commissioner Haldeman seconded the motion. Executive Armstrong abstained. The motion passed.

INFORMATION ITEM: 2026 LVPC Work Plan and Budget

Ms. Bradley, Ms. Oscavich and Mr. Cohen presented segments of the 2026 LVPC Work Plan and Budget document, describing the LVPC's revenue and expenses, strategic pillars, upcoming work plan and project relations to strategic plan.

Chair Amato asked for any comments or questions. There were none.

MONTHLY REPORTS

Chair Amato notified the Commission that monthly BuildLV and traffic reports are featured in each Commissioner's packet. Chair Amato asked for any comments or questions. There were none.

COMMUNICATIONS AND PUBLIC ENGAGEMENT

Chair Amato notified the Commission that items for communications and public engagement are featured in the meeting packet. Chair Amato asked for any comments or questions. There were none.

ADJOURNMENT

Chair Amato stated that the next LVPC meeting will be on Thursday, January 22, 2026, at 7 pm. Chair Amato then asked if there was a motion to adjourn the meeting and Commissioner Morgan made a motion to adjourn. Commissioner Repasch seconded. The meeting was adjourned.

Submitted by:

Becky Bradley, AICP, Executive Director and Christian Martinez, Environmental Planner

January 7, 2026

David Manhardt, AICP, Director of Community Development
South Whitehall Township
4444 Walbert Avenue
Allentown, Pennsylvania 18104

Re: Atlas Industrial Data Center – Land Use of Regional Significance - REVISED
South Whitehall Township
Lehigh County

Dear Mr. Manhardt:

The Lehigh Valley Planning Commission (LVPC) will consider the subject application at its Comprehensive Planning Committee and Full Commission meetings, pursuant to the requirements of the Pennsylvania Municipalities Planning Code (MPC). Discussion on agenda items largely happens during the Committee meeting. Meeting participation details are below, and we encourage your participation:

**LVPC Comprehensive Planning
Committee Meeting:**

January 20, 2026, at 12:00 PM (Virtual)
<https://lvpc.org/lvpc-meetings>

**LVPC Full Commission
Meeting:**

January 22, 2026, at 7:00 PM (Virtual)
<https://lvpc.org/lvpc-meetings>

Background

The project proposes to develop a vacant 410-acre site by constructing six data center buildings totaling 5,038,100 square feet. The project site is located at 2493 North Cedar Crest Boulevard, south of Orefield Road between Mauch Chunk Road and North Cedar Crest Boulevard (parcel number 548824698560).



The proposal is considered a Land Use of Regional Significance under *FutureLV: The Regional Plan* as a Major Industrial Development. The Township's designated zoning for the site is Industrial as a base zoning district, and Planned Innovation, Research and Technology (PIRT) as an overlay district. The PIRT District was established to 'provide a controlled and protected environment for the orderly growth and development of research and technology-related businesses' (Township Zoning Ordinance §350-33(b)). The Township has intentionally directed this type of development to the PIRT District and updated its zoning regulations in anticipation of interest in data center development, demonstrating proactive planning and regulatory alignment with emerging industrial land uses.

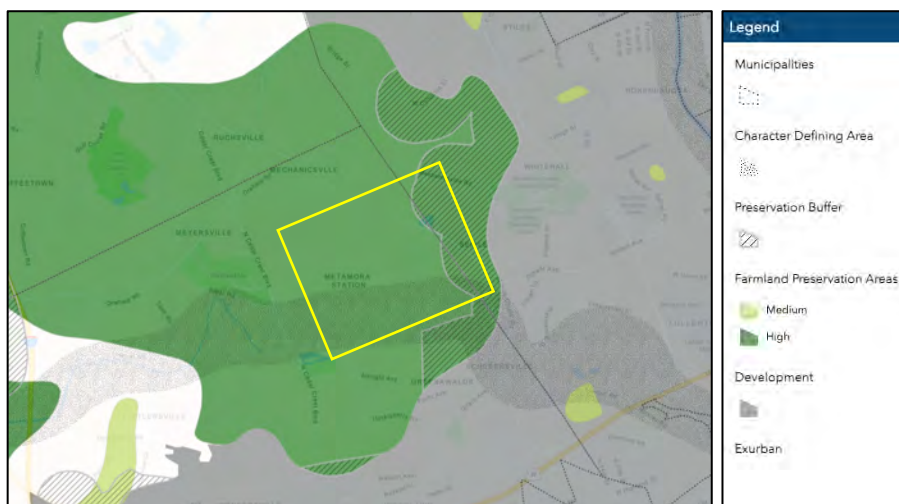
FutureLV recognizes that advances in technology and the increasing demand for real-time information and data transmission have made digital infrastructure and connectivity essential to the region's economic competitiveness (*FutureLV* Future Forces Section, page 42). Data centers play a critical role in supporting this modern digital infrastructure, however large-scale or hyperscale data center facilities can place significant demands on utility systems, particularly electric and water infrastructure, which necessitates careful evaluation and coordination.

To support this evaluation, LVPC convened a coordination meeting with external review agencies to discuss utility capacity, infrastructure considerations, and other regional impacts associated with the proposal. Continued coordination among the Township, service providers, and reviewing agencies will be essential to ensuring the project supports public health, safety, and welfare while advancing regional goals for innovation-oriented industrial development.

Site Suitability and Land Use

The project site is vacant and undeveloped agricultural land. Nearby land uses include Parkland High School to the west, heavy industrial uses to the south including chemical manufacturing, low-density residential to the north and agricultural uses surrounding the area.

The project site is identified for Farmland Preservation in the General Land Use Plan of *FutureLV: The Regional Plan*, with nearby Preservation Buffer and Exurban designations. From a regional perspective, land preservation is preferred in these areas to protect the region's existing open space, direct development to areas with existing infrastructure, and to minimize development pressures from creeping outwards from Development areas.



FutureLV General Land Use Plan

From a local perspective, the designated Industrial Zoning District and Planned Innovation, Research and Technology Overlay District were created to target development at the site, and existing infrastructure is generally accessible in the vicinity. The proposed development has the potential to align with *FutureLV* if it is designed to minimize impacts to adjacent properties; if the site configuration avoids disturbing existing natural resources on the site; and if utility infrastructure is demonstrated to be adequate to meet the facility's needs without adversely affecting service to existing users.

Data centers can pose health and quality of life impacts to neighboring residents and land uses if not appropriately mitigated. Potential impacts include:

- **Noise:** The proposed site layout orients the yards containing generator equipment away from Parkland School, and sound attenuation walls are also proposed along the generator equipment areas. These noise abatement design features support public health and welfare (of Policy 5.3). Pre-and-post-construction professional noise studies should be conducted to verify both perceived and low frequency noise levels at a maximum of 55 decibels measured at the project property line per LVPC's recommendation, or at a level acceptable to the Township.
- **Visual:** The buildings should be aesthetically designed to minimize the visual impacts of the scale of buildings on neighboring properties. While the generator equipment yards indicate they will be enclosed by the sound attenuation walls, the LVPC encourages the Township to request renderings from the applicant that illustrate what the facility will look like from different roadways and vantage points. Additional vegetation along the development areas could further reduce visual impacts and 'promote context-specific design solutions' (of Policy 5.4).
- **Lighting:** The project utilizes full cutoff and fully shielded light fixtures in compliance with the Township Zoning Ordinance, and site lighting designed to prevent glare and lighting spillover onto adjacent properties, which minimizes environmental impacts of development (of Policy 3.2).
- **Air Quality:** Because data centers rely on continuous mechanical cooling systems that exhaust significant amounts of waste heat, heat exhaust can create localized temperature increases that exacerbate heat stress in warmer months. These impacts can worsen long-term if development of additional paved surfaces continues in the area long-term. The LVPC recommends the applicant assess potential heat-exhaust impacts from mechanical systems that may affect nearby development or pedestrian areas (of Policy 3.4).

Emergency Services

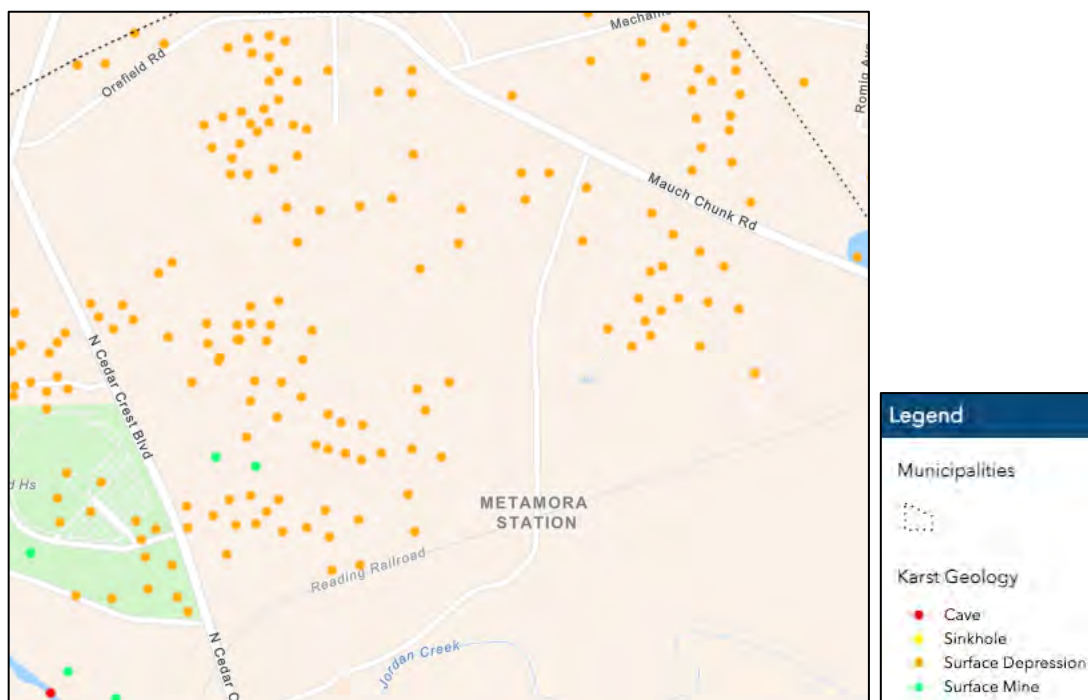
During partner agency engagement in the review process, the Township noted that emergency responder training on serving the development is anticipated, given the scale of the site and proposed buildings and the unique electrical, mechanical, and security characteristics of data centers. The LVPC encourages continued coordination between the applicant, Township, local emergency service providers, and the Lehigh County Office of Emergency Management to ensure adequate site design that supports preparedness and response capabilities. The applicant should provide fire, Emergency Medical Services, and police departments as well as Lehigh County Emergency Services with detailed information on site access, security protocols, hazardous materials storage, backup power systems, and any specialized equipment such as battery energy storage systems. Emergency responders should be consulted on the adequacy of access points, turning radii, hydrant placement and fire-suppression systems, and should

receive appropriate training or orientation prior to occupancy. This coordination is essential to safeguard responders, protect critical infrastructure, and ensure that the facility can be safely and effectively served during both routine incidents and large-scale emergencies (of Policy 5.1).

Environment and Utility Infrastructure

Mapping provided by the Pennsylvania Department of Conservation and Natural Resources (Bureau of Topographic and Geologic Survey) indicates the extensive presence of karsts in the form of surface depressions throughout the site, as well as surface mines towards the southwestern property boundary. Karst conditions can result in subsurface instability and warrant careful considerations for large-scale land-intensive development with heavy structural loads. Hyperscale data centers involve significant concentrations of structural and equipment loading, which has the potential to exacerbate subsurface voids or contribute to land gradually caving in throughout the area.

Additionally, karst systems are highly sensitive to stormwater management practices and utility installation. Improperly managed infiltration, altered groundwater recharge patterns, or leakage from underground utilities may further increase the risk of sinkhole formation. Given these conditions, LVPC strongly recommends comprehensive geotechnical and hydrogeologic investigation of the site to inform building placement, foundation design, stormwater management, and utility infrastructure. Consideration of these factors is critical to minimize impacts of development to support public health, safety, and welfare (of Policy 3.2).



LVPC GIS Mapping of Karst Geology

The project's full electrical demand and long-term impacts on the regional power grid is being coordinated between the Applicant and PPL Electric. The project proposes the addition of a substation to support electricity distribution to each proposed building as well as additional infrastructure upgrades. These upgrades are being funded by the Applicant, which alleviates the burden on taxpayers and other grid users and promotes fiscal health and sustainability (of Policy 4.6).

As this project progresses, the applicant should provide detail on how the facility will align with industry energy-efficiency standards, including anticipated Power Usage Effectiveness (PUE) targets, energy-management audits, and reporting practices as they are identified. Additionally, once the Applicant identifies the proportion of its energy use that will be met through renewable sources, that information should also be provided to support understanding of the project's long-term sustainability and its alignment with regional clean energy goals (of Policy 3.4).

The submitted Environmental Impact Assessment identifies that Tier 2-emission standards backup generators are proposed on site. The LVPC strongly recommends that Tier 4 backup generators be utilized instead, to minimize air quality impacts (of Policy 3.2). The Applicant should provide the Township with detailed specifications on emissions controls and fuel storage safety measures such as spill-prevention and secondary containment to ensure public health and environmental safety. The Applicant should also provide a generator-testing plan that outlines the frequency, duration, and timing of tests to be shared with surrounding property owners and tenants and the Township to adequately evaluate and/or prepare for potential noise disturbances (of Policies 5.2, 5.3, and 5.4).

The project is currently proposing an air-cooled system, which requires much less water usage and disposal on-site compared to other cooling technologies. The submission should clarify whether the system incorporates water-reuse or heat-recovery measures that could further reduce overall consumption.

Any future change to the proposed cooling system that requires greater water withdrawal or wastewater discharge would raise significant concerns. Increased water demand could place additional stress on local water supplies and would be particularly challenging to accommodate in an area with extensive karst geology. The Applicant should model water use under various scenarios, such as drought-stage, summer months, and any peak-stress conditions and demonstrate the long-term reliability of the proposed water supply based on the cooling system as described. Continued coordination with the Township as the water provider, as well as Lehigh County Authority, is recommended to evaluate potential infrastructure needs and confirm that the ultimate approach to system cooling does not result in adverse impacts to existing users or regional systems.

The plans depict eight septic field beds located in the northern portion of the project site, and sanitary sewer lines direct wastewater from each building to discharge in the septic field area. The adequacy of this design requires the proposal's discharge gallons per day to be assessed. If septic fields are to remain the method for disposal, primary and secondary fields should be identified. Due to the extensive presence of karst geology on the site, it is paramount that the project wastewater disposal system be designed to minimize impacts to groundwater resources, in order to protect the quality and quantity of surface water and groundwater (of Policy 3.2).



Landscaping is proposed to shield the building from adjacent properties and external roadways, including North Cedar Crest Boulevard north of the Parkland High School driveway, along the northern property boundary, and along a portion of Mauch Chunk Road until the project's proposed Private Road A just south of Mechanicsville Road. Additional landscaping is proposed within the parking areas.

The project site is located within the Coplay Creek and Jordan Creek Watersheds. These watersheds have fully implemented Act 167 Stormwater Management Ordinance. Comments relative to our review of the project's stormwater management plan are included as Attachment 1.

Transportation

A traffic impact study was submitted for the proposed project. The project is anticipated to generate an average of 3,865 weekday trips, calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 12th edition and Land Use Code 160 (Data Center). These average weekday trips include 371 new trips during morning peak and 265 new trips during evening peak times.

Access to the site is planned to be provided via two driveways, a full-access, secured driveway to the new township roadway, and a proposed full-access, emergency access driveway to North Cedar Crest Boulevard opposite Suncrest Drive.

A new township roadway is proposed to be constructed in concurrence with the proposed data center connecting Cedar Crest Boulevard opposite the Parkland High-School driveway and to Mauch Chunk Road just south of the existing Mechanicsville Road Intersection. The LVPC recommends coordination with the school district to minimize potential traffic interactions between students, guardians, and school buses and the traffic generated from the site.

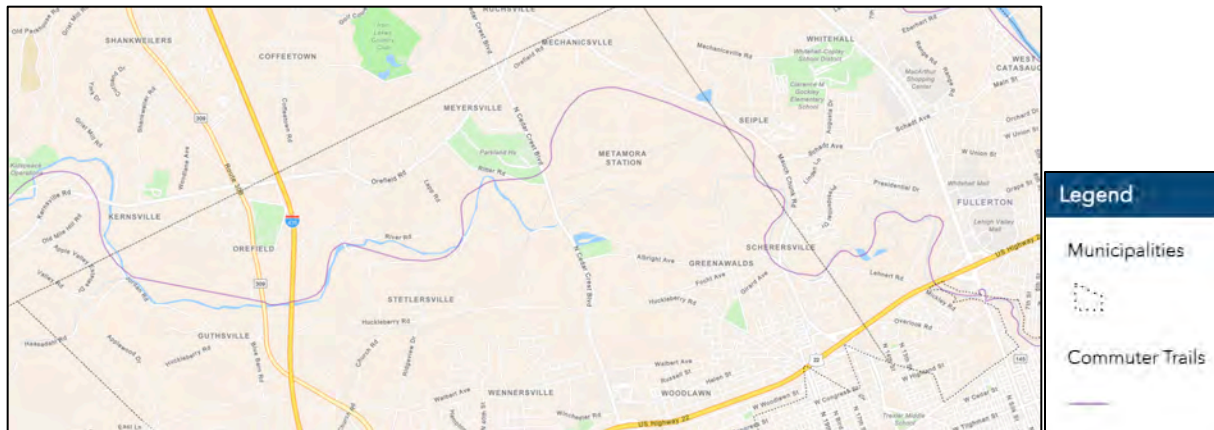
Aspects of the site plan can be improved to better ensure adequate transportation access and movement. There appears to be substantially more passenger vehicle parking spaces than typically required for data center land uses. The amount of provided parking should be re-evaluated and right-sized to minimize impervious surfaces (of Policy 2.2). Once the appropriate amount of passenger vehicle and commercial truck parking spaces is determined, any resulting changes to the site plans should clearly separate these traffic movements to minimize conflicts.

Any truck traffic generated from the site will most likely be traveling South from the site to Route 22. They will cross over Jordan Creek on North Cedar Crest Boulevard. The bridge over the Jordan Creek is in 'Fair' condition according to the Pennsylvania Department of Transportation Bridge Conditions Map. The bridge over Route 22 at the interchange of Cedar Crest Boulevard is also in 'Fair' condition. These bridges should be closely monitored to 'provide a safe, well-maintained transportation network' (of Policy 2.2) by making sure they do not fall into 'Poor' condition with the addition of the new trips generated by the development.

Sidewalks are proposed along all road frontages of the project site, which supports pedestrian safety and reducing fatalities towards zero (of Policies 5.1 and 5.3). The LVPC recommends including safe connections to proposed buildings and parking lots, with bicycle racks at each building, to support alternative transportation options and offer a seamless network for employees to safely commute to work using alternative modes (of Policies 2.2, 2.3 and 5.3). Electric vehicle charging capacity should be provided for both commercial and passenger vehicles (of Policy 2.5).

The Lehigh and Northampton Transportation Authority (LANTA) does not serve the project site or vicinity and currently has no plans to extend service to the area in the future. However, as the Lehigh Valley grows and potential for additional development in the vicinity remains, more people will need access to public transit. The developer should consider implementing the infrastructure for a future bus stop such as a concrete pad and benches along the frontage of the sidewalk on the new township road, potentially at the intersection of the Parkland High School Rd which would provide access to both the school property and the proposed site. The benches would still be able to be used even when there is no service from LANTA (of Policy 2.3).

The Parks, Recreation and Open Space plan of *FutureLV* identifies a Proposed/Conceptual Commuter Trail through the project site, which runs along Jordan Creek to the West, connects to Parkland High School and the project property, and then rejoins Jordan Creek to the East along the Whitehall Township border. The included sidewalks throughout the site support fulfilling this trail, however the LVPC strongly recommends including sidewalk along the northeastern property boundary along Mauch Chunk Road to further facilitate closing gaps in the region's trail network (of Policy 2.1).



LVPC GIS Mapping – Proposed/Conceptual Commuter Trails

North Cedar Crest Boulevard between Ritter Road and Walbert Avenue is identified as a Congested Corridor, where existing traffic conditions already present operational challenges. Given the scale of the proposed development, the construction phase is likely to generate commercial vehicle traffic at a level that would further affect corridor performance. The LVPC strongly recommends requiring construction traffic information such as anticipated truck volumes, designated routing, and hours of operation to adequately plan for and minimize traffic demand.



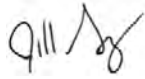
LVPC GIS Mapping – Congested Corridors

The LVPC has copied representatives from adjacent municipalities and review agencies to 'coordinate land use decisions across municipal boundaries' (of Policy 1.4).

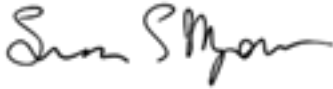
Municipalities, when considering land developments, should reasonably attempt to be consistent with *FutureLV: The Regional Plan*, as required by the Pennsylvania Municipalities Planning Code (MPC) [Article 1§105, Article III§303, §304 & §306(a), Article VI§603(j)]. The LVPC review does not include an in-depth examination of plans relative to subdivision design standards or ordinance requirements since these items are covered in the municipal review.

Please let me know if there are any questions about this review.

Sincerely,



Jill Seitz
Chief Community and Regional Planner



Susan Myerov
Director of Environmental Planning



Corinne Ruggiero
Environmental Planner



Evan Gardi
Transportation Planner

cc: Anthony Tallarida, Township Engineer; CDE Acquisitions LLC, Applicant; Andrew Lohr, Kimley-Horn, Project Engineer; Nate Jones, Lower Macungie Township Planning Director; North Whitehall; Lee Rackus, Whitehall Township Planning Bureau Chief; Jennifer Gomez, City of Allentown Planning Director; Meredith Keller, Upper Macungie Township Planning Director; Liesel Gross, Lehigh County Authority Chief Executive Officer; Garrett Cook, Lehigh County Conservation District Engineer; Fadia Halma, PA DCED Lehigh Valley Regional Director; Alicia Karner, PA DCED BusinessPA Lehigh Valley Regional Office Director; Dean Ritter, PA DEP Assistant Regional Director; Jane George, PPL Regional Affairs Director; Joseph Lookup, PPL Vice President of Transmission & Distribution Planning & Asset Management Brian Boyer, PennDot District 5; Chad Pindar, Delaware River Basin Commission Water Resource Planning Section Manager; Molly Wood, LANTA Planner/Land Use Specialist; Geoff Reese, LVPC Master Planner and Engineer; Denjam Khadka, LVPC Senior Civil/Environmental Engineer; Peter Lantz, Environmental Engineer.

Project Review Summary Sheet

Comprehensive Planning Committee

Date: January 2026

Project	Municipality	Brief Statement of Purpose	LVPC Comment
Zoning Ordinance Amendment	Upper Saucon Township	<i>Data Centers</i> – Adds Data Centers as a conditional use within the Industrial (I) Zone and the Enterprise Overlay Zone (EOZ), including definitions and requirements to provide for and regulate Data Center land uses including setbacks and buffers, noise, utility, water and sewer, and emergency requirements.	Permitting data centers as a conditional use supports efficient development processes responsive to regional needs (of Policy 1.4); standards for the protection of air quality, water and sewer impacts, and energy management ‘minimize impacts of development to protect the health, safety and welfare of the public’ (of Policies 5.4 and 3.2).
Zoning Ordinance Amendment	North Whitehall Township	<i>Data Centers</i> – Adds Data Centers as a conditional use in the Light Industrial/Business (LI/B) and Mineral Extraction/Industrial (ME/I) Zoning Districts, including definitions and requirements to provide for and regulate Data Center land uses including setbacks and buffers, noise, utility, water and sewer, and emergency requirements.	Permitting data centers as a conditional use supports efficient development processes responsive to regional needs (of Policy 1.4); standards for the protection of air quality, water and sewer impacts, and energy management ‘minimize impacts of development to protect the health, safety and welfare of the public’ (of Policies 5.4 and 3.2).

Project Review Summary Sheet

Environment Committee

Date: January 2026

Project	Municipality	Brief Statement of Purpose	LVPC Comment
Application to Renew Approval of Existing Groundwater Withdrawal Project (DRBC Review)	South Whitehall Township	Application by Dorney Park & Wildwater Kingdom to renew approval of an existing groundwater withdrawal of up to 8.0 million gallons per month (mgm) of groundwater from five existing wells for irrigation, non-contact cooling, water rides and features at the applicant's amusement park. The allocation is a reduction from the previous allocation of 13.14 mgm and is based on revised demands.	Aligns with <i>FutureLV</i> action to 'protect the quality and quantity of surface water and groundwater' (of Policy 3.2).
Application to Renew Approval of Existing Non-Contact Cooling Discharge (DRBC Review)	Whitehall Township	Application by Amrize Cement, Inc. to renew approval of existing 3.21 million gallons per day non-contact cooling discharge from the applicant's cement manufacturing facility. The current average flow from the plant is 2.79 million gallons per day. No expansions or modifications to the facility are proposed.	Aligns with <i>FutureLV</i> action to 'protect the quality and quantity of surface water and groundwater' (of Policy 3.2).
Application to Renew Approval of Existing Surface Water Withdrawal Project (DRBC Review)	City of Easton	Application by Easton Suburban Water Authority to renew approval of the Authority's existing surface water allocation of up to 323 million gallons per month (mgm) or 10.42 million gallons per day (mgd) of surface water to continue to supply its public water supply distributions system from an existing surface water intake on the Delaware River. The system serves all or portions of the City of Easton; West Easton, Wilson and Glendon Boroughs; and Lower Nazareth, Williams, Bethlehem, Forks and Palmer Townships, all located in Northampton County. No increase in allocation is proposed.	Aligns with <i>FutureLV</i> action to 'protect the quality and quantity of surface water and groundwater' (of Policy 3.2).



2025-2028

TRANSPORTATION IMPROVEMENT PROGRAM

Accomplishments + Annual Listing of Obligated Projects

A green-tinted photograph of a city street scene. On the left, a white bus is parked. A person is riding a bicycle in the foreground. A person is walking on the sidewalk. The scene is set in an urban environment with trees and buildings in the background.

OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025

The preparation of this report has been financed in part through grants from the U.S. Department of Transportation (USDOT) and the Pennsylvania Department of Transportation (PennDOT). The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official policies of either the USDOT, Federal Highway Administration (FHWA), Federal Transit Administration (FTA) or the Commonwealth of Pennsylvania at the time of publication. This report does not constitute a standard, specification or regulation.

The Lehigh Valley Transportation Study (LVTS) Metropolitan Planning Organization (MPO) is committed to compliance with nondiscrimination requirements of civil rights statutes, executive orders, regulations and policies applicable to the programs and activities it administers. Accordingly, the MPO is dedicated to ensuring that program beneficiaries are not excluded from participation in or denied the benefits of its services based upon race, color, national origin, religious creed, sex, age, disability or economic status.

This document is available in other formats upon request, in accordance with applicable state and federal laws. The LVPC will provide translation or interpretation services upon request. For more information, please call the LVPC at 610-264-4544.

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Este documento está disponible en otros formatos cuando se soliciten, de conformidad con las leyes estatales y federales correspondientes. La LVPC le proporcionará servicios de traducción o interpretación si los solicita. Para obtener más información, llame a la LVPC al 610-264-4544.

Traditional Chinese:

根據適用的州和聯邦法律，本文件可按要求提供其他格式。LVPC將根據需求提供翻譯或口譯服務。如需更多資訊，請致電610-264-4544聯絡LVPC。

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Arabic:

تيل اردفل او فيموكحلا نين اوقلل اقفو ،بلطلا دن ع ىرخأ غيصب حاتم دنتسمل اذم^١ بلطلا دن ع ريسفتلا وأ قمچرتلا تامدخ ميدقتب LVPC قنجل موقتس .امب لومعمل ٦١٠-٢٦٤-٤٥٤٤ مقرلا ىلع LVPC قنجلب لاصتالا ىجري ،تامولعمل نم ديزمل

Vietnamese:

Chúng tôi có thể cung cấp tài liệu này theo các định dạng khác nếu quý vị yêu cầu, chiếu theo luật hiện hành của tiểu bang và liên bang. LVPC sẽ cung cấp các dịch vụ thông dịch và chuyển ngữ tài liệu khi có yêu cầu. Để biết thêm thông tin, vui lòng gọi LVPC tại số 610-264-4544.



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INTRODUCTION

PURPOSE OF THE ACCOMPLISHMENTS + ANNUAL LISTING OF OBLIGATED PROJECTS

This report was prepared as an overview of transportation investments in the Lehigh Valley. It also serves as a reference to specifically highlight the accomplishments of transportation improvement projects within the region. Additionally, this report is the convey to the public the Annual Listing of Obligated Projects to fulfill federal transportation requirements. Federal regulation states that: “An annual listing of projects, including investments in pedestrian walkways and bicycle transportation facilities, for which federal funds have been obligated in the preceding program year shall be published or otherwise made available through the cooperative effort of the state, public transportation operator(s), and metropolitan planning organization. The listing shall be consistent with the categories identified in the TIP.”

These requirements were first established under the Fixing America’s Surface Transportation Act (FAST Act) and continued in the subsequent Infrastructure Investment and Jobs Act (IIJA) commonly referred to as the Bipartisan Infrastructure Law (BIL), which authorizes federal funding for transportation projects. The BIL enables the United States Secretary of Transportation to authorize funding to Metropolitan Planning Organizations (MPOs) across the United States, through the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA).

2025 ACCOMPLISHMENTS

A listing of projects and programs that were completed or substantially completed where no additional federal funding obligations have been authorized and the project is open for public use.

2025 UNDER CONSTRUCTION

Projects that are actively under construction where physical work is happening during the federal fiscal year 2025. Not all projects that are accomplished or under construction were obligated funding during 2025. These projects may have had prior federal fiscal years obligations that authorized the project to commence, however construction time frames can sometimes last many years, sometimes past the original obligation year.

DEOBLIGATED PROJECTS

Deobligations are monies not used during a particular phase of the project and have funding that can be reallocated to other eligible phases of other projects. The deobligations or funding may not reflect the current federal fiscal year obligations, and they may have been obligated several years prior as the project progressed through the various phases.

WHAT IS THE TRANSPORTATION IMPROVEMENT PROGRAM?

The Transportation Improvement Program (TIP) is the Lehigh Valley's four-year plan to maintain and enhance the transportation system in Lehigh and Northampton Counties. It is updated every two years, and this update is just one part of an overall plan to create a seamless network where roads, trails, sidewalks, technology and transit connect everyone to every place. The TIP is critical to the economic and social future of the region, targeting infrastructure investments that support a vibrant, inclusive, resilient and growing Lehigh Valley.

The TIP details the planned expenditure of federal funds and state capital funds for specific projects and programs within specified limits of fiscal constraint. Fiscal constraint requires only utilizing the amount of money allocated for specific funding categories and project types. TIP development is a rigorous process that includes significant opportunities for public engagement to provide for involvement and comment on transportation projects considered with a look at the region as a whole and indiscriminate of individual municipal boundaries within Lehigh and Northampton Counties.

The TIP and the overall plan are administered by the Lehigh Valley Transportation Study (LVTS), the federally designated Metropolitan Planning Organization (MPO) for Lehigh and Northampton Counties. As the MPO, the LVTS completes and implements two major foundational planning products, along with additional plans, studies and report. All of this work is done with the input of local officials, transportation agencies and the public. This is achieved through collaboration and meetings of the LVTS Technical and Coordinating Committees.

Federal Regulations Require That the TIP Shall:



Cover a period of at least
3 YEARS



Consist of projects from
*FutureLV: The Regional
Plan*, the locally developed
transportation plan



Reflect the area's
transportation needs
and priorities

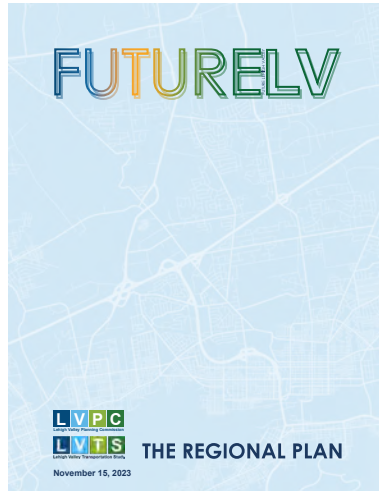


Include realistic cost
and revenue estimates
for all projects



Include all highway,
bridge and transit
projects to be funded
with federal money

PLANNING PRODUCTS



The Metropolitan Transportation Plan (*FutureLV: The Regional Plan*)

FutureLV sets the vision and direction to carry the Lehigh Valley to 2050 and beyond. It provides a blueprint for managing future growth, making the most of our assets and creating a Lehigh Valley where everyone has access to health, opportunity and a livable neighborhood. A key component of *FutureLV* maps out a 25-year plan to maintain and enhance the transportation network. This 25-year plan is the result of the Transportation Needs Assessment community engagement campaign, which included 30 public meetings around the region and more than 1,000 responses to a survey on transportation policy priorities.



The Transportation Improvement Program (TIP)

The TIP covers the most current four-year period of the Long-Range Transportation Plan and is the means by which funds are allocated to regional transportation projects. As part of implementing these plans, the LVTS is responsible for developing and updating the TIP to meet federal planning requirements and address local needs.



ACCOMPLISHMENTS

October 1, 2024 Through September 30, 2025

The Transportation Improvement Program (TIP) is the locally endorsed list of highway, bridge and transit projects proposed to be implemented with federal assistance. The federal and state governments designated the Lehigh Valley Transportation Study (LVTS) as the body responsible for preparing the TIP for Lehigh and Northampton Counties. This report of completed projects in federal fiscal year 2025 for the 2025-2028 TIP that was adopted June of 2024.

Every two years, the LVTS works in partnership with PennDOT, LANTA and area local officials to identify priority transportation needs and develop a new TIP to address these needs over the next four-year period. The TIP sources projects from the Metropolitan Transportation Plan (MTP) within *FutureLV: The Regional Plan*, the comprehensive plan for Lehigh and Northampton Counties.

MTP delineates how available and projected transportation funds will be spent over a 25-year period. MTP also outlines a vision of the future of transportation in the Lehigh Valley through a series of projects that involve the Goals and Policies of *FutureLV: The Regional Plan*.

The TIP details the planned expenditure of federal funds and state capital funds for specific projects and programs within specified limits of fiscal constraint. Fiscal constraint requires only utilizing the amount funding allocated for specific funding categories and project types. TIP development is a rigorous process that includes significant opportunities for public engagement to provide for involvement and comment on transportation projects considered with a look at the region as a whole and indiscriminate of individual municipal boundaries within Lehigh and Northampton Counties.

PERFORMANCE-BASED PLANNING + PROGRAMMING

The LVTS TIP follows a Performance-Based Planning and Programming (PBPP) process, with a focus on collaboration between PennDOT, FHWA, and the LVTS at the county and regional levels. These activities are carried out as part of a cooperative, continuing, and comprehensive (3C) planning process which guides the development of various plans and programs. The 3C process enables valuable coordination and public engagement with a focus on the policies of the LVTS and state and federal guidelines.

The completion of these projects also aligns with the FHWA and PennDOT Asset Management as well as Transportation Performance Management through Performance Measures. These Performance Measures are a set of targets to address various aspects of transportation. These targets and goals are related to safety, infrastructure condition and system performance with a relationship to air quality. Projects are selected to align with adopted Transportation Performance Management, Performance Measures by LVTS to ensure a safe and efficient transportation system.

Transportation Performance Management (TPM) is a strategic approach that uses data to make investment and policy decisions to achieve national performance goals. 23 CFR 490 outlines the national performance goal areas for the federal-aid program. TPM is systematically applied through a regular ongoing process. It provides key information to help decision makers understand the consequences of investment decisions across transportation assets or modes or transportation. Communication between decision makers, stakeholders and the public is provided through this management strategy. Ensuring targets and measures developed in cooperative partnerships and based on data and objective information.

These goals are embedded within three specific Performance Measures and targets adopted by the Lehigh Valley Transportation Study. Performance targets should be data-driven, realistic, and attainable and should align with the performance management framework and legislative intent.

PERFORMANCE MEASURES

Safety Performance Measures (PM1)

Five safety performance targets have been established and are updated annually. The measures are based on crashes that result in fatal and/or serious injuries. The targets assist the LVTS and PennDOT in addressing areas of concern for fatalities and serious injury.

Safety Performance Measures:

- Number of fatalities
- Rate of fatalities per 100 million vehicle miles traveled
- Number of serious injuries
- Rate of serious injuries per 100 million vehicle miles traveled
- Number of non-motorized fatalities and serious injuries

The goal of the Performance Measures is to collect data and target transportation investments to improve the system with the end result of a project selection process rooted in data and analysis to enhance transportation system performance.

Projects for the MTP and the TIP have been selected to align with adopted Performance Measures by LVTS to ensure a safe and efficient transportation system consistent with state and national transportation objectives.

Pavement/Bridge Performance Measures (PM2)

The Pavement/Bridge Performance Measures (PM2) apply to both pavement and bridge condition and are only applicable to the National Highway System (NHS). Conditions are rated as either Good or Poor and provide targets that are consistent with PennDOT's asset management objectives of maintaining the system in the state of good repair, managing to lowest life cycle costs, and achieving national and state transportation goals.

System Performance Measures (PM3)

The System Performance Measures (PM3) are six measures which assess performance of the National Highway System (NHS), Freight Movement on the Interstate System, and the Congestion Mitigation and Air Quality (CMAQ) Improvement Program. The LVTS and PennDOT continue their efforts to ensure the TIP and the LRTP are developed and managed to support progress toward the achievement of the statewide system performance targets.

System Performance Measures:

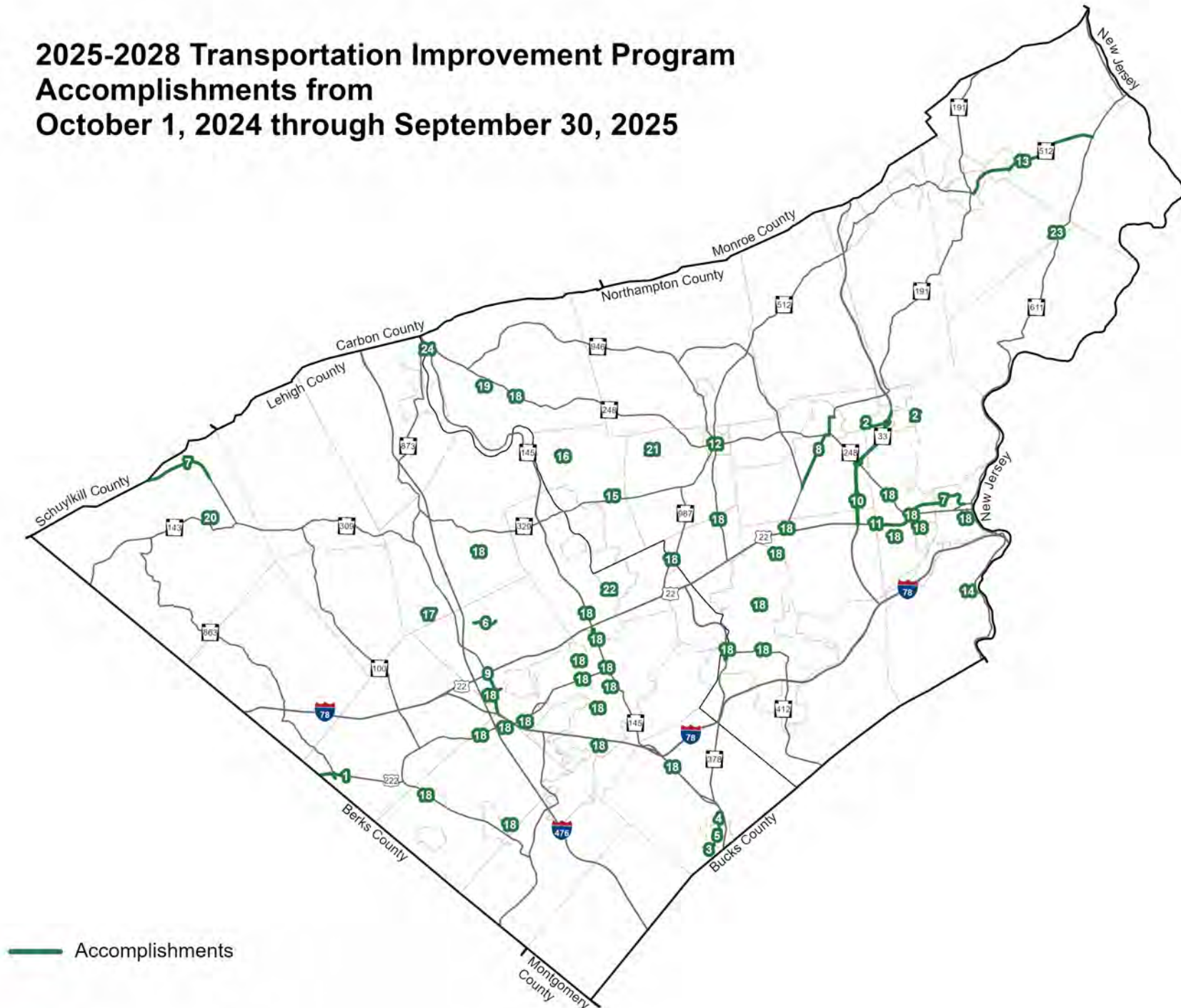
- Interstate Reliability
- Non-Interstate National Highway System Reliability
- Truck Reliability Index
- Annual Peak Hours Excessive Delay Hours Per Capita
- Percentage Non-Single Occupied Vehicle Travel
- Vehicle Emission Targets

Total for ACCOMPLISHED PROJECTS October 1, 2024 through September 30, 2025

During 2025, TIP projects with investments of
\$92,846,194
were completed and open for public use.

The following projects are critical infrastructure projects to the long-term sustainability and mobility of the Lehigh Valley. These projects were the result of a comprehensive planning and programming of various current and prior Transportation Improvement Programs.

2025-2028 Transportation Improvement Program Accomplishments from October 1, 2024 through September 30, 2025



HIGHLIGHTED ACCOMPLISHMENTS

October 1, 2024 through September 30, 2025

Coopersburg Main Street Streetscape Phase 3

Description: Installation of crosswalks, Americans with Disabilities Act-compliant (ADA) ramps, curb, sidewalk and pedestrian lighting along Main Street (Route 2045) between East Fairmount Street and Tilghman Street.

Location: Coopersburg Borough

Performance Measure: PM1

Total Project Cost: \$175,000

MPMS #: 110988

Project Administrator/Owner: PennDOT District 5

Map ID #: 3

Coopersburg Main Street Streetscape Phase 5

Description: Bicycle and pedestrian improvements along Main Street (Route 2045) from East Fairmont Street to Fairview Street that will include ADA ramps, crosswalks, pedestrian lighting, signage, on-street parking and sharrows, in Coopersburg Borough.

Location: Coopersburg Borough

Performance Measure: PM1, PM2, PM3

Total Project Cost: \$609,128

MPMS #: 112628

Project Administrator/Owner: PennDOT District 5

Map ID #: 4

Coopersburg Main Street Streetscape Phase 7

Description: Bicycle and pedestrian improvements along Main Street (Route 2045) from East Fairmont Street to Fairview Street that will include ADA ramps, crosswalks, pedestrian lighting, signage, on-street parking and sharrows, in Coopersburg Borough.

Location: Coopersburg Borough

Performance Measure: PM1

Total Project Cost: \$1,131,515

MPMS #: 113303

Project Administrator/Owner: PennDOT District 5

Map ID #: 5

Howertown Road Bridge Replacement/Rehabilitation

Description: Replacement/rehabilitation of the Howertown Road Route 3017) bridge over Dry Run in Allen Township.

Location: Allen Township

Performance Measure: PM2

Total Project Cost: \$2,912,857

MPMS #: 105371

Project Administrator/Owner: PennDOT District 5

Map ID #: 15

Jordan Creek Greenway in Covered Bridge Park

Description: Extension of the Jordan Creek Greenway Trail.

Location: South Whitehall Township

Total Project Cost: \$1,000,000

MPMS #: 118438

Project Administrator/Owner: PennDOT District 5

Map ID #: 6

Performance Measure: PM3

Route 309 & Tilghman Street Interchange Demolition

Description: Demolition of properties needed for the Route 309 and Tilghman Street Interchange project in South Whitehall Township.

Location: South Whitehall and Upper Macungie Townships

Performance Measure: PM2, PM3

Total Project Cost: \$667,207

MPMS #: 121093

Project Administrator/Owner: PennDOT District 5

Map ID #: 9

Race Street Bridge Replacement/Rehabilitation

Description: Replacement and rehabilitation of the precast deck of the Race Street (Route 1004) bridge over the Lehigh River in Whitehall Township and in the Borough of Catasauqua.

Location: Whitehall Township and Catasauqua Borough **Performance Measure:** PM2, PM3

Total Project Cost: \$6,879,075 **MPMS #:** 108134

Project Administrator/Owner: PennDOT District 5 **Map ID #:** 22

Route 512 Resurface S. Main Street to Route 611

Description: Resurfacing Bill Scott Boulevard, Central Avenue and Mount Bethel Highway(all section of Route 512) from Main Street in Bangor through East Bangor to Route 611 in Upper Mount Bethel Township.

Location: Upper Mount Bethel Township, and the **MPMS #:** 101571

Boroughs of Bangor and East Bangor

Total Project Cost: \$6,879,075 **Map ID #:** 13

Project Administrator/Owner: PennDOT District 5

Performance Measure: PM2, PM3

TOTAL ACCOMPLISHMENTS

October 1, 2024 through September 30, 2025

Map ID	MPMS #	Project Title	Project Description	Project Administrator/ Owner	Total Cost of Project
1	79554	Route 222 & Shantz Road & Route 863 Improvements	Safety improvements in Upper Macungie Township.		\$26,529,510
14	110055	Route 611 Culvert Replacement	Emergency project in Williams Township.		\$1,530,319
2	112129	Amazon Offsite Improvements	Highway reconstruction in Forks and Palmer Townships.		\$5,000,000
16	12310	Indian Trail Road over Hokendauqua Creek Bridge Replacement	Replacement of the bridge carrying Indian Trail Road over Hokendauqua Creek, in Allen Township.		\$5,118,330
17	89627	Kernsville Road Bridge Restoration	Restoration Kernsville Road Bridge.		\$4,310,710
7	117521	All Weather Pavement Markers 2023	Installation of all weather pavement markings at various locations in Lehigh and Northampton Counties.		\$539,181
18	116663	Low Cost Signal Upgrades	Signal upgrades at various locations throughout Lehigh and Northampton Counties.		\$198,675

Map ID	MPMS #	Project Title	Project Description	Project Administrator/ Owner	Total Cost of Project
19	12318	Maple Drive over Tributary to Bertsch Creek	Replacement of bridge carrying Maple Drive over Bertsch Creek.		\$1,233,473
20	85692	Mosserville Road over Ontelaunee Creek	Replacement of bridge carrying Mosserville Road over Ontelaunee Creek.		\$2,283,183
8	101560	Nazareth Pike Resurfacing	Resurfacing of Nazareth Pike in Lower Nazareth Township and Nazareth Borough.		\$2,627,510
21	110058	Old Carriage Road Bridge Replacement	Replacement of Old Carriage Road Bridge.		\$2,081,469
10	114351	Route 33 Resurfacing	Resurfacing of Route 33 from the Tatamy interchange to Route 22 in Whitehall Township and Catasauqua Borough.		\$6,879,075
23	12084	Richmond Bridge Replacement	Replacement of the Richmond Bridge in Washington Township.		\$2,982,010

Map ID	MPMS #	Project Title	Project Description	Project Administrator/ Owner	Total Cost of Project
11	114350	Route 22 Resurface, Bethman Road to 25th Street	Highway restoration on Route 22 from Bettman Road to 25th Street in Bethlehem and Palmer Townships, and Wilson Borough.		\$3,988,792
24	110176	Route 248 Signal Upgrade	Signal upgrades along Route 248 in Lehigh Township.		\$2,449,928
12	113887	Route 512 Bath Borough Corridor Signal Optimization	Signal upgrades along Route 512 in Bath Borough.		\$1,890,797



UNDER CONSTRUCTION

October 1, 2024 Through September 30, 2025

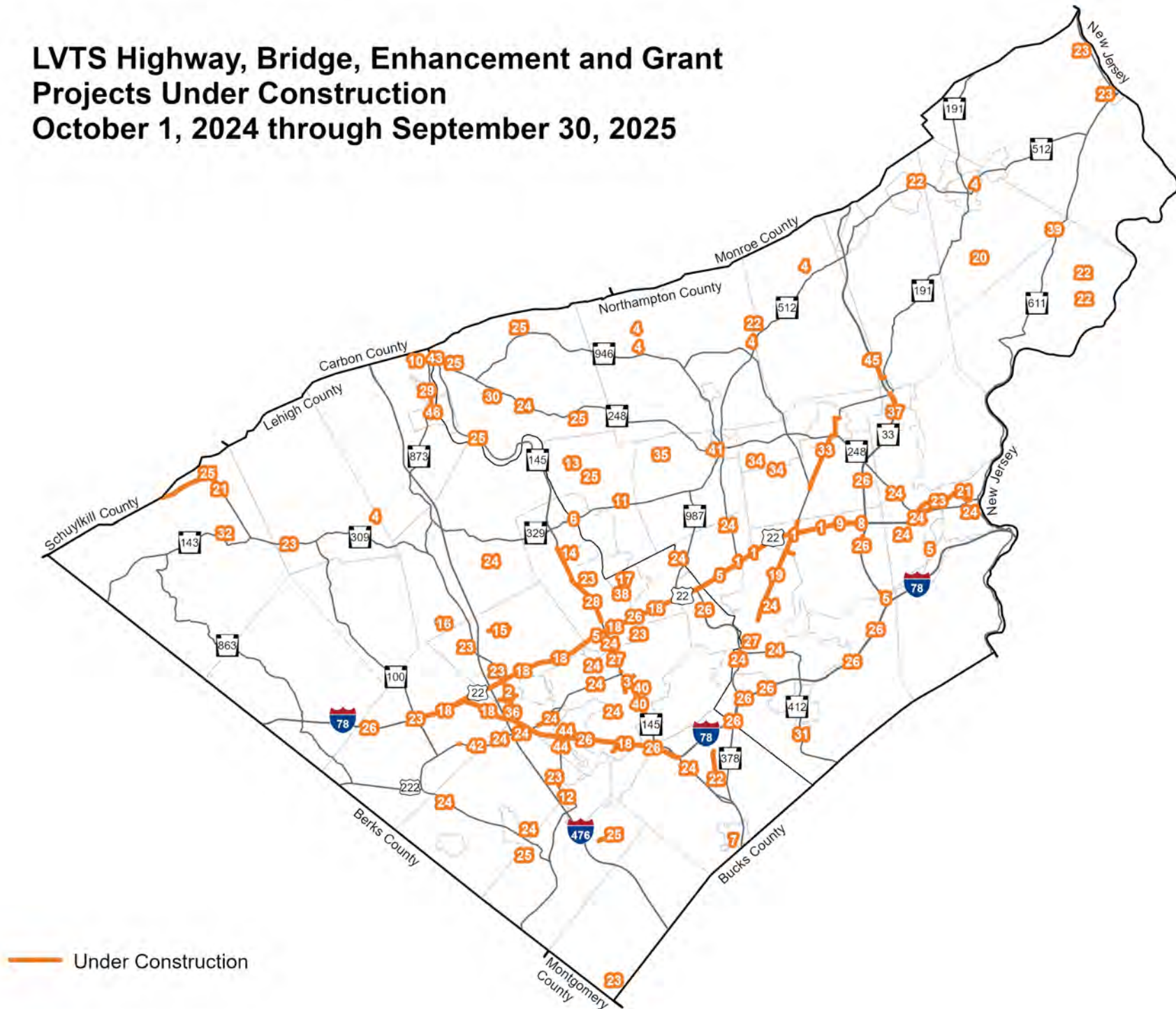
Total for Projects UNDER CONSTRUCTION

October 1, 2024 through September 30, 2025

\$401,659,004

Projects listed in this section are physical construction for Federal Fiscal Year (FFY) 2025. There are certain projects that may appear to be complete and are in fact open for transportation purposes. However, there are elements remaining to close out the project. These projects also may have small amounts of funding in the 2025-2028 TIP and will be closed out in the current FFY 2025 annual listing of obligated projects and accomplishments element within the report. Dollar totals are programmed amounts combined with past expenditures. These amounts are subject to change as projects develop.

LVTS Highway, Bridge, Enhancement and Grant Projects Under Construction October 1, 2024 through September 30, 2025



HIGHLIGHTED UNDER CONSTRUCTION

October 1, 2024 through September 30, 2025

Route 22 from Farmersville Road to Route 512

Description: Highway resurfacing/restoration of Route 22 from Farmersville Road to the Route 512 and restoration of Route 191 and Route 512 Interchange ramps in Bethlehem and Hanover Townships. Will include replacing all guiderails.

Location: Bethlehem Township, Hanover Township

Status: Started Summer 2022, Estimated Completion Fall 2023

Total Project Cost: \$24,099,476

MPMS #: 110070

Project Administrator/Owner: PennDOT District 5

Map ID #: 1

Route 309 & Tilghman Street I/C Recon

Description: Reconfiguration of the Route 309/Tilghman Street (Route 1002) Interchange and two bridge replacements at Route 309 over Tilghman Street and Route 309 over Broadway Street. Will also include rehabilitation of the Route 309 culvert over Little Cedar Creek, roadway drainage improvements, base repair, overlay, and two new signals at the end of the reconfigured ramps.

Location: South Whitehall Township, Lehigh County

Status: Started Summer 2024, Estimate Completion Spring 2030

Total Project Cost: \$129,594,328

MPMS #: 96432

Project Administrator/Owner: PennDOT District 5

Map ID #: 2

Cementon Bridge Replacement

Description: Replacement of the Cementon Bridge carrying Route 329 over the Lehigh River in Whitehall Township.

Location: Whitehall Township, Northampton Borough

Status: Started Winter 2023, Estimated Completion Fall 2028

Total Project Cost: \$34,871,088

MPMS #: 11413

Project Administrator/Owner: PennDOT District 5

Map ID #: 6

Lehigh Race Street Intersection

Description: Corridor improvements to Race Street (State Route 1004) in Catasauqua Borough, including installation of traffic signals at the intersections of Race Street/Lehigh Street, Race Street/Front Street and Race Street/Second Street. Will also include widening the Race Street structure over the Lehigh Canal, and installation of a right turn lane eastbound onto Lehigh Street (State Route 1007). A westbound left turn lane will be provided for westbound Race Street onto Lehigh Street. The widening of Lehigh Street to provide separate right turn lane will require the removal and replacement of the existing bridge over Catasauqua Creek which will also accommodate pedestrian traffic from the Delaware and Lehigh (D&L) trail. A left turn lane will be provided for eastbound Race Street onto Second Street. Both Front Street and Second Street will be converted into two-way streets.

Location: Catasauqua Borough

Status: Started Winter 2023, Estimated Completion Summer 2026

Total Project Cost: \$18,256,853

MPMS #: 57433

Project Administrator/Owner: PennDOT District 5

Map ID #: 17

Newburg Road over Trib Monocacy Creek

Description: This project involves a replacement of the bridges that carry Newburg Road (SR 3020) over a tributary of Monocacy Creek in Lower Nazareth Township and East Branch Monocacy Creek, Upper Nazareth Township.

Location: Lower Nazareth Township,
Upper Nazareth Township

Status: Started Fall 2023, Actual Completion Spring 2025

MPMS #: 85940

Total Project Cost: \$9,620,635

Map ID #: 34

Project Administrator/Owner: PennDOT District 5

Route 33 Bushkill Creek Bridges

Description: PA 33 Northbound and Southbound bridge replacements over Bushkill Creek in Stockertown Borough, Northampton County.

Location: Stockertown Borough

Total Project Cost: \$28,382,770

Project Administrator/Owner: PennDOT District 5

Status: Started Winter 2023, Estimated Completion Fall 2025

MPMS #: 96431

Map ID #: 37

Route 248 Realignment

Description: The proposed realignment would straighten Route 248 and reduce the number of turning movements in the Borough, reduce traffic on Main Street between Bridge Street and Chestnut Street, and direct traffic away from the Downtown Historic Area. The length of Northampton Street up to its intersection with Main Street will be designated as Route 248.

Location: Bath Borough

Total Project Cost: \$8,645,693

Project Administrator/Owner: PennDOT District 5

Status: Started Summer 2024, Estimated Completion Summer 2027

MPMS #: 86853

Map ID #: 41

Walnut Street Bridge

Description: Replacement of the bridge that carries South Walnut Street over Trout Creek in the Borough of Slatington, Lehigh County.

Location: Slatington Borough

Total Project Cost: \$14,291,380

Project Administrator/Owner: PennDOT District 5

Status: Started Winter 2024, Estimated Completion Summer 2028

MPMS #: 94680

Map ID #: 46

TOTAL UNDER CONSTRUCTION

October 1, 2024 through September 30, 2025

Map ID	MPMS #	Project Title	Project Description	Status	Project Administrator/ Owner	Total Cost of Project
3	116849	Allentown Martin Luther King Jr. Drive	Installation of a Rectangular Rapid Flashing Beacons at Martin Luther King Jr. Drive and 4th Street to cross pedestrians between the parking lot and Parkettes. School flashers will be placed at the Building 21 at MLK Jr. Drive and Lehigh Street in the City of Allentown.	Started Winter 2023, Estimated Completion Spring 2025	PennDOT	\$181,471
4	110062	Box Culvert Bundle-Round 1	Box culvert replacements at various locations in Lehigh and Northampton Counties.	Started Fall 2024, Estimated Completion Fall 2026	PennDOT	\$6,074,638
5	117154	Bridge Overlay Bundle #2	Bridge overlays and other preventative maintenance activities of various structures in Lehigh and Northampton Counties.	Started Fall 2022, Estimated Completion Summer 2025	PennDOT	\$2,545,883
N/A	116648	Coalition for Appropriate Transportation Bicycle Education 2021	Bicycle education for grades K-8, in the Easton Area School District, and the Cities of Allentown and Bethlehem.	Started Summer 2022, Actual Completion Summer 2025	PennDOT	\$154,036

Map ID	MPMS #	Project Title	Project Description	Status	Project Administrator/ Owner	Total Cost of Project
7	118434	Coopersburg Streetscape Improvements Phase 6	Traffic, pedestrian and bicycle improvements to South Main Street (Route 2045) from Thomas Street to Tilghman Street in Coopersburg Borough.	Started Spring 2024, Estimated Completion Summer 2025	PennDOT	\$1,534,014
8	89616	Country Club Road over Route 22	Replacement of the bridge that carries Country Club Road (Route 2031) over Route 22 in Bethlehem Township.	Started Summer 2022, Actual Completion Fall 2024	PennDOT	\$5,985,188
9	71707	Farmersville Road Bridge over Route 22	Replacement of the Farmersville Road (Route 2029) bridge over Route 22 in Bethlehem Township.	Started Fall 2024, Estimated Completion Summer 2027	PennDOT	\$6,144,395
10	107552	Gap Bridge Repairs	Rehabilitation of the Lehigh Gap Bridge (Route 873) over the Lehigh River & Norfolk Southern Railroad in Washington Township, Lehigh County.	Started Summer 2024, Estimate Completion Spring 2026	PennDOT	\$10,736,235
11	105371	Howertown Road Bridge	Replacement/Rehabilitation of the Howertown Road (Route 3017) Bridge over Dry Run in Allen Township.	Started Spring 2023, Estimated Completion Fall 2024	PennDOT	\$2,912,857
12	79127	Indian Creek Road over Leibert Creek	Replacement/Rehabilitation of the Indian Creek Road (Route 2018) bridge over Leibert Creek in Upper Milford Township.	Started Spring 2025, Estimated Completion Winter 2027	PennDOT	\$1,603,447

Map ID	MPMS #	Project Title	Project Description	Status	Project Administrator/ Owner	Total Cost of Project
13	12310	Indian Trail Road over Hokendauqua Creek	Replacement of the bridge carrying Indian Trail Road (Route 3016) over Hokendauqua Creek in Allen Township.	Started Winter 2023, Actual Completion Fall 2024	PennDOT	\$5,118,330
14	118436	Ironton Rail Trail Trailhead Improvement Project	Bicycle/Pedestrian safety improvements at Ironton Rail Trail Trailhead at the intersection of North Ruch Street and Chestnut Street in Whitehall Township.	Started Winter 2024, Estimated Completion Fall 2025	PennDOT	\$320,000
15	118438	Jordan Creek Greenway in Covered Bridge Park	Extension of the Jordan Creek Greenway Trail through Covered Bridge Park in South Whitehall Township.	Started Winter 2023, Actual Completion Fall 2024	PennDOT	\$1,000,000
16	89627	Kernsville Road Bridge	This project consists of a rehabilitation of the bridge carrying Kernsville Road (Route 4003) over Jordan Creek in Whitehall Township.	Started Summer 2023, Actual Completion Fall 2024	PennDOT	\$4,310,710
18	68190	Lehigh Valley Freeway Service Patrol	Two roaming tow trucks to respond quickly to incidents on Interstate 78 in Lower Macungie Township, from Route 100 to Route 22, and along Route 22 from the split with I-78, and Route 33 in Bethlehem Township.	Ongoing	PennDOT	\$1,340,592

Map ID	MPMS #	Project Title	Project Description	Status	Project Administrator/ Owner	Total Cost of Project
19	11981	Linden Street Improvements	Selective highway reconstruction and paving of Linden Street (Route 3015) from Elizabeth Avenue to Brodhead Road within the City of Bethlehem and Bethlehem Township. Improvements include milling and overlay throughout the corridor with select sections of base repair. Additionally, there will be Americans with Disabilities Act (ADA) ramps updated to current standards, traffic signal updates, the installation of pedestrian push buttons, pedestrian crossing improvements, signing and pavement marking improvements.	Started Summer 2023, Estimated Completion Fall 2024	PennDOT	\$8,266,545
20	85930	Lower South Main Street over Martins Creek	Replacement of the bridge carrying Route 1015 over Martins Creek in Washington Township.	Started Winter 2023, Estimated Completion Winter 2024	PennDOT	\$3,521,496
21	117521	All Weather Pavement Markers 2023	Installation of All Weather Pavement Markings at various locations, in Lehigh and Northampton Counties.	Started Spring 2023, Actual Completion Summer 2024	PennDOT	\$539,181
22	117528	BPN-4 Guide Rail Upgrades	Addressing guide rail upgrades at various locations, in Lehigh and Northampton Counties.	Started Summer 2024, Estimated Completion Summer 2026	PennDOT	\$100,000

Map ID	MPMS #	Project Title	Project Description	Status	Project Administrator/ Owner	Total Cost of Project
23	112231	Bridge Preservation #7	Consultant design and construction of bridge repairs and preservation of various bridges in Lehigh and Northampton Counties.	Started Winter 2024, Estimated Completion Fall 2027	PennDOT	\$5,295,878
24	116663	Low Cost Signal Upgrades	Adding retroreflective backplates and increasing signal head size from 8-inch to 12-inch lens at urban intersections at various locations in Lehigh and Northampton Counties.	Started Summer 2023, Actual Completion Fall 2024	PennDOT	\$198,675
25	117823	Systemic Safety Improvements	This districtwide design build project involves implementing low-cost safety systemic countermeasures to address lane departure sites on curves in various locations in Lehigh and Northampton Counties. Combined with similar projects in Berks, Carbon, Monroe and Schuylkill Counties.	Started Fall 2022, Estimate Completion Fall 2025	PennDOT	\$4,706,567
26	110086	Urban Intelligent Transportation Systems	Installation of Dynamic Message Signs (DMS) & Closed Circuit Television Cameras (CCTV) at various locations along Route 22 in Lehigh County. Locations added after the 2021 TIP adoption were various locations along Route 22, Route 33, Route 378 and Interstate 78.	Started Spring 2023, Estimated Completion Summer 2025	PennDOT	\$6,297,006

Map ID	MPMS #	Project Title	Project Description	Status	Project Administrator/ Owner	Total Cost of Project
27	119413	Vulnerable Road User Project - Tier 1	Implementation of a systemwide safety improvement for Vulnerable Road User by implementing pedestrian countdown timers on various routes in Lehigh and Northampton Counties.	Started Fall 2023, Estimated Completion Summer 2025	PennDOT	\$748,591
28	110170	MacArthur Road Signal Upgrades	Synchronization of twelve signalized intersections along MacArthur Road (Route 145), including two signalized adjacent ramp intersections in Whitehall Township.	Started Fall 2022, Estimated Completion Fall 2025	PennDOT	\$8,196,320
29	113099	Main Street (Route 873) & Walnut Street Intersection Improvements	The realignment of the /North Walnut Street (Route 873) intersection in the Borough of Slatington.	Started Summer 2025, Esitmed Completion Summer 2028	PennDOT	\$440,000
30	12318	Maple Drive over Tributary to Bertsch Creek	Replacement of the Route 4020 bridge over tributary to Bertsch Creek in Lehigh Township.	Started Spring 2023, Actual Completion Summer 2024	PennDOT	\$1,233,473
31	12286	Meadows Road Bridge (County Bridge #15)	Bridge improvements of the Meadows Road Bridge over Saucon Creek in Lower Saucon Township.	Started Spring 2024, Estimated Completion Summer 2026	PennDOT	\$5,855,085
32	85692	Mosserville Road over Ontelaunee Creek	Replacement of the Mosserville Road (Route 4024) bridge over Ontelaunee Creek in Lynn Township.	Started Spring 2024, Actual Completion Fall 2024	PennDOT	\$2,283,183

Map ID	MPMS #	Project Title	Project Description	Status	Project Administrator/ Owner	Total Cost of Project
33	101560	Nazareth Pike Resurface	Milling, base repair, ADA ramps, resurfacing and new pavement markings on Route 191, from Newburg Road in Lower Nazareth Township to North New Street in Nazareth Borough.	Started Winter 2023, Actual Completion Spring 2024	PennDOT	\$2,627,510
35	110058	Old Carriage Road Bridge Replacement	Replacement of the Old Carriage Road (Route 3018) bridge over a tributary of the Catasauqua Creek in East Allen Township.	Started Winter 2023, Actual Completion Spring 2024	PennDOT	\$2,081,469
36	121093	Route 309 & Tilghman Street Interchange Demolition	Demolition of properties needed for the Route 309 and Tilghman Street Interchange project in South Whitehall Township.	Started Spring 2024, Actual Completion Fall 2024	PennDOT	\$667,207
38	108134	Race Street Bridge over Lehigh River	Precast deck replacement and rehabilitation of the Race Street (Router 1004) bridge over the Lehigh River in Whitehall Township and the Borough of Catasauqua.	Started Fall 2022, Actual Completion Winter 2023	PennDOT	\$8,226,856
39	12084	Richmond Bridge Replacement	Replacement of the bridge that carries Route 611 over Oughoughton Creek in Washington Township, Northampton County.	Started Spring 2023, Actual Completion Fall 2024	PennDOT	\$2,982,945

Map ID	MPMS #	Project Title	Project Description	Status	Project Administrator/ Owner	Total Cost of Project
40	109971	Route 145 Safety Improvements	Safety improvements on Fourth Street/Susquehanna Street (Route 145)) from Emmaus Avenue to West Wyoming Street in the City of Allentown. Includes milling, overlay, ADA, restriping of protected left turn bays at signals, alignment of opposing left turns, installation of two-way left turn signals throughout the corridor, and implementation of access management.	Started Fall 2023, Estimated Completion Fall 2026	PennDOT	\$11,313,390
42	118306	Route 222 & Grange Road Improvements	Intersection improvements, pedestrian crosswalks and traffic signal improvements at Route 222 and Grange Road/Mill Creek Road in Upper Macungie Township.	Started Spring 2023, Actual Completion Summer 2024	PennDOT	\$140,041
43	110176	Route 248 Signal Upgrades	Improvements to the traffic signal operation at two intersections along Route 248 in Lehigh Township.	Started Summer 2023, Actual Completion Fall 2024	PennDOT	\$2,449,928
44	110169	Route 29/Cedar Crest Boulevard Signal Upgrades	Improvements of the traffic signal operation at four intersections along Route 29 in Salisbury Township.	Started Fall 2022, Estimated Completion Fall 2025	PennDOT	\$5,109,603
45	107761	Two Rivers Trail Gap 9A Construction	Construction of a pedestrian trail along Route 33 from Sullivan Trail to Henry Road in Plainfield and Bushkill Townships. The trail installation will include signage, pavement markings and fencing.	Started Summer 2022, Estimated Completion Summer 2024	PennDOT	\$654,036



ANNUAL LISTING OF OBLIGATED PROJECTS

October 1, 2024 Through September 30, 2025

Obligations are shown for all projects in Lehigh and Northampton Counties, including those projects outside of the control of the Lehigh Valley Transportation Study funding allocations and formulas such as the Interstate Program. Obligations for the Interstate System for example are shown in this report. The Interstate Management Program is administered by PennDOT Central Office.

Obligations are shown by project phases and include the funding source. Projects have many phases even before construction can begin. These phases include Preliminary Engineering (PE), Rights-Of-Way (ROW), Utilities (UTL), Final Design (FD), Construction (CON) and Study/Planning (S/P) or implementation of the project.

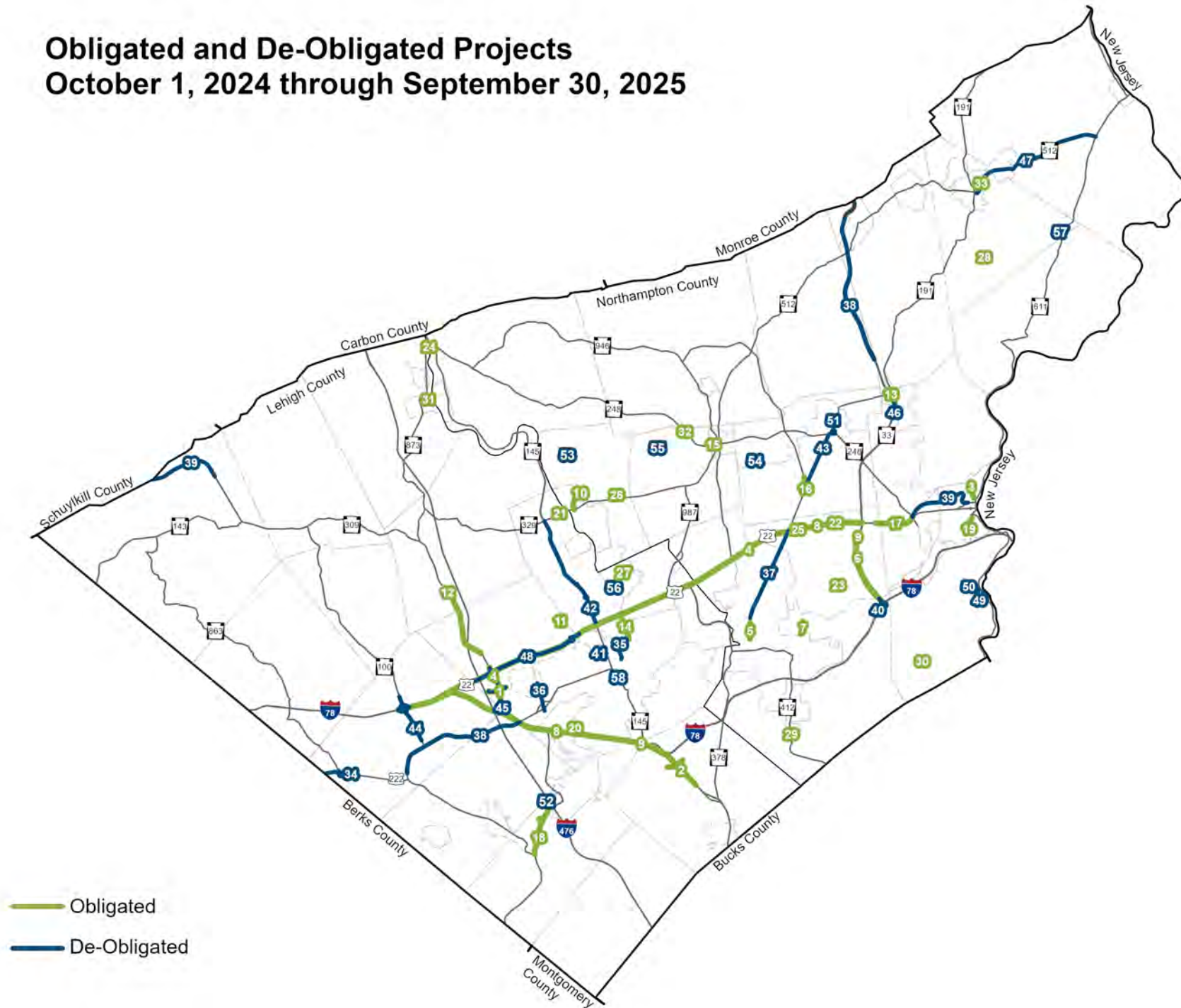
To fulfill this requirement, the 2025 LVTS Annual Listing of Obligated Projects shows all money obligated for highway, bridge, transit, bicycle and pedestrian projects within Lehigh and Northampton Counties for the Federal Fiscal Year (FFY) 2025, which is the time period of October 1, 2024, to September 30, 2025.

Total Obligations for HIGHWAY/BRIDGE ENHANCEMENTS/ GRANT PROJECTS

October 1, 2024 through September 30, 2025

\$53,742,280

Obligated and De-Obligated Projects October 1, 2024 through September 30, 2025



HIGHWAY/BRIDGE OBLIGATIONS

October 1, 2024 through September 30, 2025

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
1	96432	Route 309 & Tilghman Street Interchange Reconstruction	Reconfigures the Tilghman Street (Route 309/Route 1002) Interchange. Will also include two bridge replacements at Route 309 over Tilghman Street and Route 309 over Broadway Street, rehabilitation of the Route 309 culvert over Little Cedar Creek, roadway drainage improvements, base repair, overlay, and two new signals at the end of the reconfigured ramps.	CON	PennDOT	\$20,730,300	\$17,826,116	\$38,556,416
2	102160	Route 309 Center Valley Interchange Improvements	Geometric improvements to the Route 309 Center Valley Interchange, in Upper Saucon Township. The existing signalized intersection will be converted into a full direction grade separated interchange.	PE	PennDOT	\$1,259,824	\$0	\$1,259,824
20	118404	Bogert's Bridge Rehabilitation	Rehabilitation of Bogert's Covered Bridge over Little Lehigh Creek in Lehigh Parkway to restore structural integrity and ensuring future use in the City of Allentown. Items of work include evaluation and replacement of bridge members, replacement of roof system and timber siding.	CON	PennDOT	\$200,000	\$0	\$200,000

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
N/A	122781	Coalition of Appropriate Transportation Bike Education 2025	This project involves bicycle education for grades K-8 through bike safety assemblies, bike day events, small group events, and promotional campaign at various locations within Lehigh and Northampton Counties.	CON	PennDOT	\$468,860	\$165,262	\$634,122
21	11413	Cementon Bridge Replacement	Replacement of the Cementon Bridge carrying Route 329 over the Lehigh River in Whitehall Township and Northampton Borough.	CON	PennDOT	\$1,728,664	\$0	\$1,728,664
NA	97953	Construction Assistance	This project provides funding for consultant assistance for the inspection and/or oversight of approved Transportation Improvement Program construction projects that are eligible for federal funding. These include highway, bridge and transportation alternative projects in Lehigh and Northampton Counties.	CON	PennDOT	\$194,978	\$225,000	\$419,978
3	118435	Easton/Lafayette College Pedestrian Safety Project - Phase 3	Pedestrian safety enhancements in the College Hill neighborhoods along Cattell Street from College Avenue to High Street City of Easton.	CON	PennDOT	\$93,000	\$0	\$93,000
22	71707	Farmersville Road Bridge over Route 22	Replacement of the Route 2029 (Farmersville Road) bridge over Route 22 in Bethlehem Township.	CON	PennDOT	\$2,418,032	\$0	\$2,418,032

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
23	117509	Freemansburg Avenue Safety Improvements	Intersection safety improvements of Freemansburg Avenue (Route 2018) and Farmersville Road in Bethlehem Township. Improvements will include realignment of the northern leg of the intersection to align with the southern leg, a signalization and turning lanes.	FD	PennDOT	\$839,445	\$0	\$839,445
23	117509	Freemansburg Avenue Safety Improvements	Intersection safety improvements of Freemansburg Avenue (Route 2018) and offset Farmersville Road in Bethlehem Township. Improvements will include realignment of the northern leg of the intersection to align with the southern leg, a signalization and turning lanes.	ROW	PennDOT	\$683,000	\$0	\$683,000
4	68190	Freeway Service Patrol	Funding for two roaming tow trucks to respond quickly to incidents on Interstate 78. The service limits are from Route 100 to the Route 309 split and Interstate 78/Route 22 (at Route 100) to Route 22/Route 33 in Upper Macungie, Lower Macungie, South Whitehall, Whitehall, Hanover and Bethlehem Townships, and the City of Bethlehem.	CON	PennDOT	\$377,250	\$1,218,064	\$1,595,314

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
24	107552	Gap Bridge Repairs	Rehabilitation of Route 873 (Lehigh Gap Bridge) over the Lehigh River & Norfolk Southern Railroad in Washington Township, Lehigh County.	CON	PennDOT	\$2,941,040	\$0	\$2,941,040
25	89614	Hecktown Road Bridge over Route 22	Replacement of the Route 2027 (Hecktown Road) bridge over Route 22 in Bethlehem Township.	CON	PennDOT	\$4,649,468	\$743,321	\$5,392,789
26	105371	Howertown Road Bridge	Replacement/rehabilitation of Howertown Road (Route 3017) bridge over Dry Run in Allen Township.	CON	PennDOT	\$127,600	\$0	\$127,600
27	57433	Lehigh and Race Street Intersection Improvement	Corridor improvements to Race Street (Route 1004) in the Borough of Catasauqua. The intersections of Race Street/Lehigh Street, Race Street/Front Street and Race Street/Second Street will be signalized. The Race Street structure will be widened over the Lehigh Canal to provide a right turn auxiliary lane eastbound onto Lehigh Street (Route 1007), and the bridge over the Catasauqua Creek will be replaced. A left turn lane will be provided for eastbound Race Street onto Second Street. Front Street and Second Street will be converted into two-way streets.	CON	PennDOT	\$85,540	\$276,000	\$361,540

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
5	120976	Linden Street Two-Way Conversion	The conversion of Linden Street to improve circulation and congestion by converting Linden Street from a one-way southbound street to a two-way street in the City of Bethlehem.	PE	PennDOT	\$206,000	\$0	\$206,000
28	85930	Lower South Main Street over Martins Creek	Replacement of the bridge carrying Route 1015 over Martins Creek in Washington Township, Northampton County.	CON	PennDOT	\$40,000	\$0	\$40,000
6	120951	All Weather Pavement Markers 2025	Installation of All Weather Pavement Markings at various locations in Lehigh and Northampton Counties.	CON	PennDOT	\$165,688	\$400,000	\$565,688
7	120949	High Friction Surface - 2025	Installation of high friction surface on Routes 412, 2014 and 8018 in City of Bethlehem and Lower Saucon Township.	CON	PennDOT	\$173,840	\$440,000	\$613,840
8	114344	Traffic Operations Center	This project funds an operator working in the Traffic Operations Center in District 5-0. The operator monitors cameras, message boards and radio systems along Interstate 78, Route 309, and Route 22 in Lehigh and Northampton Counties.	CON	PennDOT	\$49,941	\$150,059	\$200,000

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
9	110086	Urban Intelligent Transportation Systems Enhancements	Installation of Dynamic Message Signs (DMS) & Closed Circuit Television Cameras (CCTV) at various locations along Route 22, Interstate 78, Route 33 and Route 378 in Lehigh and Northampton Counties.	CON	PennDOT	\$120,000	\$0	\$120,000
10	113812	Main Street—21st Street to Cherryville Road	Resurfacing Main Street from 21st Street to Cherryville Road in Northampton Borough.	CON	PennDOT	\$350,000	\$589,451	\$939,451
11	110174	Mauch Chunk Road Signal Upgrade	Improvements of the existing traffic signal operation at two existing intersections along Mauch Chunk Road in South Whitehall Township.	UTL	PennDOT	\$250,000	\$0	\$250,000
29	12286	Meadows Road Bridge Improvements	Bridge Improvements of Meadows Road Bridge, (County Bridge #15) over Saucon Creek in Lower Saucon Township.	CON	PennDOT	\$25,891	\$0	\$25,891
12	102312	Route 309 Resurfacing	Pavement restoration of Route 309 from Walbert Avenue to Shankweiler Road in North and South Whitehall Townships. This betterment work involves mill and overlay, concrete patching, guiderail upgrades and movement markings. Also included is the reconstruction of Orefield Road (Route 4003) and Route 309 intersection to accommodate truck turning movements and signal replacement.	FD	PennDOT	\$152,736	\$0	\$152,736

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
13	96431	Route 33 Bushkill Creek Bridge Replacements	Route 33 Northbound and Southbound bridge replacements over Bushkill Creek in Stockertown Borough.	CON	PennDOT	\$3,377,600	\$0	\$3,377,600
30	109914	Raubsville Road over Frey's Run	Replacement of the Raubsville Road (Route 2006) bridge over Freys Run in Williams Township.	CON	PennDOT	\$2,074,868	\$0	\$2,074,868
14	118070	Riverside Drive RAISE Grant	Convert approximately two miles of an abandoned railroad bed along the west side of the Lehigh River in Whitehall Township and the City of Allentown, from Lehigh Avenue to Furnace Street, to a complete two-lane street with an adjacent multi-use path. The multi-use path will continue north to connect to the existing Delaware and Lehigh Trail just north of Race Street. The project will also convert another 450 feet of an abandoned railroad bed between Hamilton Street and Union Street within the City of Allentown to complete the southern terminus of Riverside Drive. Proposed Riverside Drive will vary in width from 24 feet to 36 feet, providing one lane in each direction and allowing for turn lanes where warranted. The multi-use path will be 10 feet wide and located between Riverside Drive and the Lehigh River.	PE	PennDOT	\$725,000	\$0	\$725,000

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
15	86853	Route 248 Realignment	Realignment to straighten Route 248 and reduce the number of turning movements in the Borough, reduce traffic on Main Street between Bridge Street and Chestnut Street, and direct traffic away from the Downtown Historic Area. The length of Northampton Street up to its intersection with Main Street will be designated as Route 248.	CON	PennDOT	\$1,207,816	\$0	\$1,207,816
31	94680	South Walnut Street Bridge	Replacement of the bridge that carries South Walnut Street over Trout Creek in the Borough of Slatington.	ROW	PennDOT	\$480,000	\$0	\$480,000
31	94680	South Walnut Street Bridge	Replacement of the bridge that carries South Walnut Street over Trout Creek in the Borough of Slatington.	CON	PennDOT	\$4,247,718	\$3,806,906	\$8,054,624
16	116936	Route 191 Lower Nazareth Intersection Improvements	Improving signalization at the intersection of Nazareth Pike (Route 191) and Newburg Road (Route 3020) and the separate stop-controlled Y-intersection of Daniels Road (Route 946) at Nazareth Pike approximately 500 feet to the north in Lower Nazareth Township. Left turn lanes will be added at Newburg Road and Nazareth Pike and Route 946 will be realigned.	FD	PennDOT	\$67,421	\$748,330	\$815,751

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
17	114350	Route 22 Resurface, Bethman Road to 25th Street	Milling, concrete patching, binder course, wearing course, sawing and sealing, joint cleaning and sealing, guide rail, shoulder rumble strips, pavement markings, and other miscellaneous construction, for Route 22, in Bethlehem and Palmer Townships and Wilson Borough.	CON	PennDOT	\$89,153	\$0	\$89,153
32	120952	Route 248/Airport Road Intersection Improvements	Improving traffic signalization and other upgrades such as left turning lanes at intersection of Route 248 and Airport Road in East Allen Township.	PE	PennDOT	\$645,611	\$0	\$645,611
18	110183	Route 29 - Shimersville Hill Safety Improvements	Corridor safety improvements on Shimersville Hill (Route 29) from Buckeye Road to Route 100, including the removal and relocation of fixed objects, the widening of the roadway for left turn lanes, the installation of new signal equipment and signal interconnection between signals at Buckeye Road and Ramer Street. Will also include systematic signing and pavement marking upgrades in Upper Milford Township.	FD	PennDOT	\$146,421	\$0	\$146,421

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
18	110183	Route 29 - Shimersville Hill Safety Improvements	Corridor safety improvements on Shimersville Hill (Route 29) from Buckeye Road to Route 100, including the removal and relocation of fixed objects, the widening of the roadway for left turn lanes, the installation of new signal equipment and signal interconnection between signals at Buckeye Road and Ramer Street. Will also include systematic signing and pavement marking upgrades in Upper Milford Township.	UTL	PennDOT	\$81,673	\$0	\$81,673
18	110183	Route 29 - Shimersville Hill Safety Improvements	Corridor safety improvements on Shimersville Hill (Route 29) from Buckeye Road to Route 100, including the removal and relocation of fixed objects, the widening of the roadway for left turn lanes, the installation of new signal equipment and signal interconnection between signals at Buckeye Road and Ramer Street. Will also include systematic signing and pavement marking upgrades in Upper Milford Township.	ROW	PennDOT	\$1,170,000	\$0	\$1,170,000
33	85945	Route 512 over Brush Meadow Creek	Bridge replacement of Route 512 Washington Street over Brush Meadow Creek in Bangor Borough.	FD	PennDOT	\$23,420	\$0	\$23,420

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Federal Funds Remaining	Total Cost of Project
19	120975	St. John Street Improvements	Roadway and pedestrian improvements along St. John Street in the City of Easton.	PE	PennDOT	\$215,412	\$212,000	\$427,412
NA	89055	Transportation Alternative/ Multimodal Project Management	Provides funding for a consultant contract to assist local sponsors in developing approved transportation enhancement/alternative projects in Lehigh and Northampton Counties.	PE	PennDOT	\$236,948	\$150,052	\$387,000
NA	121551	Youth Bike Education- Community Bike Works	Bicycle education for children and teens in K-12 in the Lehigh Valley is offered through Earn-a-Bike and Junior Earn-a-Bike classes, as well as organized bike rides throughout the region in various municipalities in Lehigh and Northampton Counties.	CON	PennDOT	\$634,122	\$0	\$634,122

Total Deobligations for HIGHWAY/BRIDGE ENHANCEMENTS/ GRANT PROJECTS

October 1, 2024 through September 30, 2025

-\$7,563,600

Deobligated funds represent the amount a project came in under budget. These funds can be allocated for other projects. The deobligations may not reflect the current federal fiscal year obligations, and may have been from funds obligated several years prior as the project progressed through previous phases.

HIGHWAY/BRIDGE DEOBLIGATIONS

October 1, 2024 through September 30, 2025

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Federal Funds Remaining	Total Cost of Project
34	79554	Route 222 & Shantz Road & Route 863 Improvements	Improve safety, traffic operations and mobility at the Independent Road (Route 222/Route 863)/ Schantz Road (Route 3012) intersection through installation of a roundabout. Will include widening on Route 222, and eliminate the structural deficiency of the bridges on Schantz Road (Route 3012) and Route 222.	FD	PennDOT	\$37,212	\$0	\$0
34	79554	Route 222 & Shantz Road & Route 863 Improvements	Improve safety, traffic operations and mobility at the Independent Road (Route 222/Route 863)/ Schantz Road (Route 3012) intersection through installation of a roundabout. Will include widening on Route 222, and eliminate the structural deficiency of the bridges on Schantz Road (Route 3012) and Route 222.	ROW	PennDOT	-\$2,452,684	\$0	\$0
50	110055	Route 611 Culvert Replacement	Replacement of the South Delaware Drive (Route 611) culvert over a tributary to the Delaware River in Williams Township.	PE	PennDOT	-\$118,061	\$0	\$0

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Federal Funds Remaining	Total Cost of Project
35	111442	Allentown Jordan Creek Greenway Trail	Construction of Jordan Creek Greenway Trail segment in the City of Allentown, from Turner Street along the Jordan Creek to Sumner Avenue.	CON	PennDOT	-\$115	\$0	\$0
51	98094	Broad Street Nazareth Railroad Crossing	Safety improvements to upgrade railroad safety equipment where Route 191 crosses the track of Norfolk Southern Railway in the Borough of Nazareth. Work includes replacement of antiquated equipment with one mast arm and one cantilever to cover three lanes of southbound traffic.	CON	PennDOT	-\$193,896	\$0	\$0
36	117879	Cedar Crest Corridor Improvements Study	Corridor safety improvements study to include signal upgrades, widening, adding turn lanes, conversion of signalized intersections into roundabouts (where warranted) along Cedar Crest Boulevard from South Drive to Shrewsbury Road in South Whitehall Township. A corridor evaluation study will be performed during the study phase, which will include a Roadway Safety Audit. Recommendations in the phase will be used to determine alternatives to move ahead within the design phase.	S/P	PennDOT	-\$34,475	\$0	\$0

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Federal Funds Remaining	Total Cost of Project
52	11419	Chestnut Street over Norfolk Southern Railroad Bridge	Replacement of the bridge carrying Route 29 over the Reading Railroad in Upper Milford Township.	CON	PennDOT	-\$2,366	\$0	\$0
53	12310	Indian Trail Road over Hokendauqua Creek	Replacement of the bridge carrying Indian Trail Road (Route 3016) over Hokendauqua Creek in Allen Township.	CON	PennDOT	-\$1,006,306	\$0	\$0
37	11981	Linden Street Improvements	Selective highway reconstruction and paving of Linden Street (Route 3015) from Elizabeth Avenue to Brodhead Road within the City of Bethlehem and Bethlehem Township. The proposed roadway improvements include mill and overlay throughout the corridor with select sections of base repair. Will also include Americans with Disabilities Act (ADA) ramps updated to current standards, traffic signal updates, signal retiming, pedestrian crossing improvements, signing and pavement marking improvements, and drainage improvements.	FD	PennDOT	-\$127,600	\$0	\$0

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Federal Funds Remaining	Total Cost of Project
37	11981	Linden Street Improvements	Selective highway reconstruction and paving of Linden Street (Route 3015) from Elizabeth Avenue to Brodhead Road within the City of Bethlehem and Bethlehem Township. The proposed roadway improvements include mill and overlay throughout the corridor with select sections of base repair. Will also include Americans with Disabilities Act (ADA) ramps updated to current standards, traffic signal updates, signal retiming, pedestrian crossing improvements, signing and pavement marking improvements, and drainage improvements.	UTL	PennDOT	-\$41,884	\$0	\$0
38	114342	All Weather Pavement Markers 2021	Installation of all weather pavement markings in various locations throughout Lehigh and Northampton Counties.	CON	PennDOT	-\$34,460	\$0	\$0
39	117521	All Weather Pavement Markers 2023	Installation of all weather pavement markings at various locations in Lehigh and Northampton Counties.	CON	PennDOT	-\$80,348	\$0	\$0
40	116659	High Friction Surface - 2023	Application of epoxy high friction surface treatment with bauxite aggregate to various locations in Lehigh and Northampton Counties.	CON	PennDOT	-\$31,511	\$0	\$0

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Federal Funds Remaining	Total Cost of Project
41	119413	LVTS Vulnerable Road User Project - Tier 1	Implementation of a systemwide safety improvement for Vulnerable Road User by implementing pedestrian countdown timers on various routes in Lehigh and Northampton Counties.	PE	PennDOT	-\$100,206	\$0	\$0
42	96387	MacArthur Road Resurface	This partial design/build project involves mill and overlay of MacArthur Road (Route 145) from a quarter-mile south of Grape Street to Main Street (Route 329), including pavement markings, crack-seal, guide rail updates and concrete ADA ramps in Whitehall Township.	CON	PennDOT	-\$236,539	\$0	\$0
43	101560	Nazareth Pike Resurface	Milling, base repair, ADA ramps, resurfacing and new pavement markings on Route 191 from Newburg Road in Lower Nazareth Township to North New Street in Nazareth Borough.	CON	PennDOT	-\$134,269	\$0	\$0
54	85941	Newburg Road over E. Branch Monocacy Creek	Replacement of the bridge that carries Newburg Road (Route 3020) over the East Branch of Monocacy Creek in Upper Nazareth Township.	ROW	PennDOT	-\$74,009	\$0	\$0

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Federal Funds Remaining	Total Cost of Project
55	110058	Old Carriage Road Bridge Replacement	Replacement of the Old Carriage Road (Route 3018) bridge over a tributary of the Catasauqua Creek in East Allen Township.	ROW	PennDOT	-\$38,610	\$0	\$0
55	110058	Old Carriage Road Bridge Replacement	Replacement of the Old Carriage Road (Route 3018) bridge over a tributary of the Catasauqua Creek in East Allen Township.	CON	PennDOT	-\$52,747	\$0	\$0
44	102311	Route 100 Reconstruction	Roadway reconstruction Route 100 from Industrial Boulevard to Tilghman Street in Upper Macungie Township. The work will include overlay on the Interstate 78 ramps.	ROW	PennDOT	-\$112,843	\$0	\$0
44	102311	Route 100 Reconstruction	Roadway reconstruction Route 100 from Industrial Boulevard to Tilghman Street in Upper Macungie Township. The work will include overlay on the Interstate 78 ramps.	CON	PennDOT	-\$725,521	\$0	\$0
45	121093	Route 309 & Tilghman Interchange Demolition	Demolition of properties needed for the Route 309 and Tilghman Street Interchange project in South Whitehall Township.	CON	PennDOT	-\$92,920	\$0	\$0
46	96431	Route 33 Bushkill Creek Bridges	Route 33 Northbound and Southbound bridge replacements over Bushkill Creek in Stockertown Borough.	PE	PennDOT	-\$205,735	\$0	\$0

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Federal Funds Remaining	Total Cost of Project
56	108134	Race Street over Lehigh River Rehabilitation	Precast deck replacement and rehabilitation of the Route 1004 (Race Street) bridge over the Lehigh River in Whitehall Township and in the Borough of Catasauqua.	ROW	PennDOT	-\$29,160	\$0	\$0
57	12084	Richmond Bridge Replacement	Replacement of the bridge that carries Route 611 over Oughoughton Creek in Washington Township.	PE	PennDOT	-\$174,007	\$0	\$0
47	101571	Route 512 Resurface South Main Street to Route 611	Resurfacing Bill Scott Boulevard, Central Avenue and Mount Bethel Highway (Route 512) from Main Street in Bangor through East Bangor to Route 611 in Upper Mount Bethel Township.	CON	PennDOT	-\$15,000	\$0	\$0
48	96385	Route 22 Resurface 15th Street to Route 309	Resurfacing of Route 22 from Route 309 to 15th Street in Whitehall and South Whitehall Townships.	CON	PennDOT	-\$712,880	\$0	\$0

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Federal Funds Remaining	Total Cost of Project
49	79468	Williams Township Canal Wall Replacements	Replacement of the retaining wall supporting Route 611 alongside the Delaware Canal in Williams Township. Will include the full depth pavement reconstruction of northbound and southbound Route 611 in the area of the newly constructed wall, as well as the installation of new guiderail, where applicable. A temporary traffic signal controlled, single lane pattern will be implemented during the construction.	CON	PennDOT	-\$609,428	\$0	\$80,000
58	94682	Wire Mill Bridge	Replacement/rehabilitation of the Wire Mill Bridge that carries Lehigh Street (Route 145) over the Little Lehigh Creek in the City of Allentown.	CON	PennDOT	-\$88,810	\$0	\$0

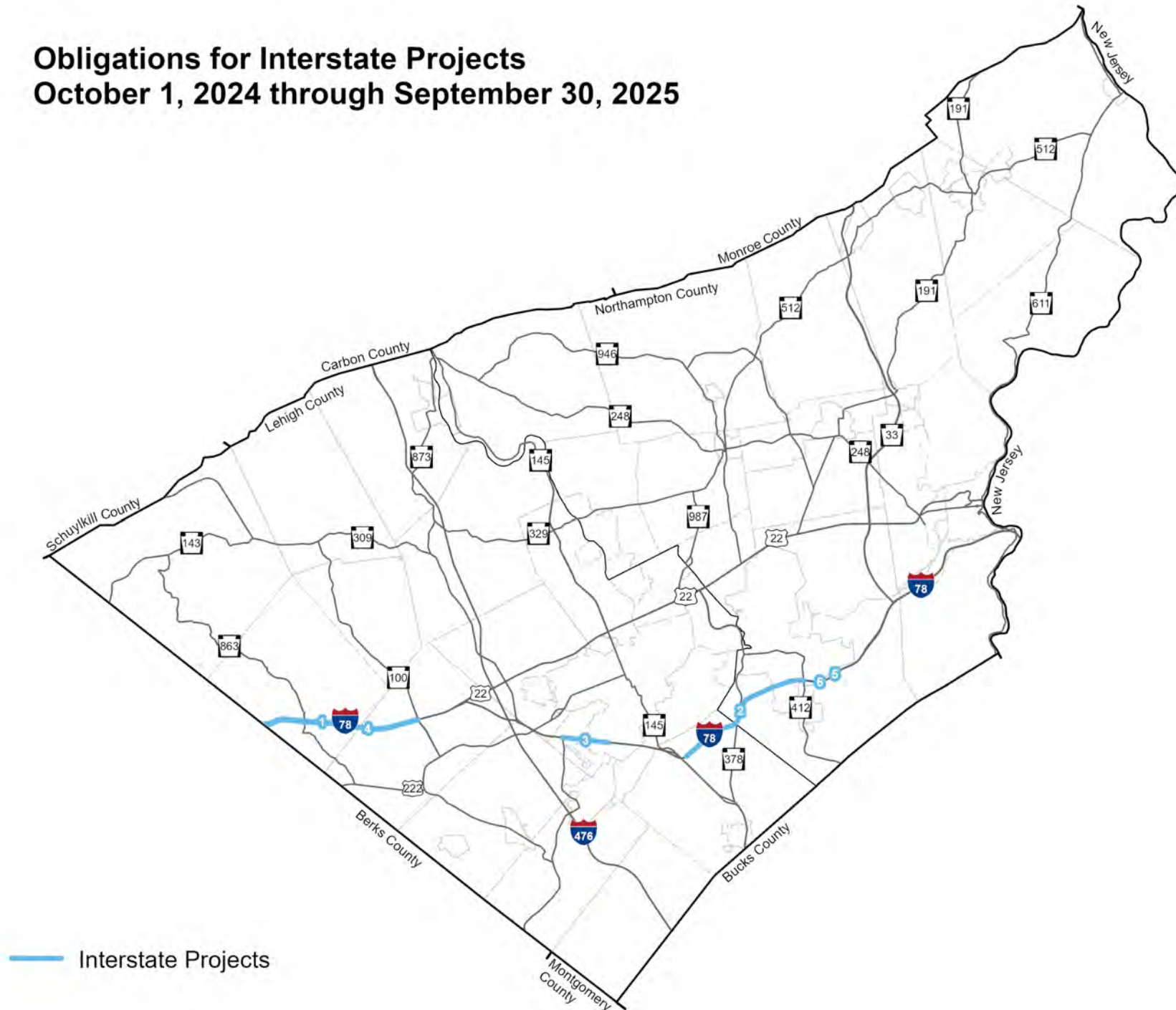
Total Obligations for PENNDOT INTERSTATE PROJECTS

October 1, 2024 through September 30, 2025

\$5,603,640

The following \$5,603,640 in Obligated Interstate Projects are for projects located on Interstate 78 that are programmed on the State Transportation Improvement Program (STIP). These projects are programmed by PennDOT Central Office and are reported to the LVTS as a point of information and to meet federal guidelines for the PennDOT Interstate Management Program.

Obligations for Interstate Projects October 1, 2024 through September 30, 2025



INTERSTATE OBLIGATIONS

October 1, 2024 through September 30, 2025

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Total Cost of Project
5	75849	Dual Bridges over Easton Road	Engineering study for substructure conditions on dual structures that carry Interstate 78 over Route 2006 in Lower Saucon Township.	FD	PennDOT District 5	\$0	\$0
6	75849	Dual Bridges over Easton Road	Engineering study for substructure conditions on dual structures that carry Interstate 78 over Route 2006 in Lower Saucon Township.	CON	PennDOT District 5	\$0	\$10,609,000
4	92780	Interstate 78 Reconstruction	Full reconstruction of Interstate 78 from the Berks County Line to Route 100 Interchange with ramps reconfiguration, including drainage system improvements, guide rail updates, safety barriers, signing, pavement marking, delineators and truck climbing lanes, in Weisenberg and Upper Macungie Townships.	PE	PennDOT District 5	\$0	\$0

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Obligation	Total Cost of Project
NA	120146	Districtwide Interstate Concrete Patching	Isolated concrete patching of failed slabs on Interstate 78 in Northampton County, Interstate Interstate 76 in Berks County, and Interstates 80 and 380 in Monroe County.	CON		\$4,740,600	\$4,740,600
1	120648	Interstate Berks County Line to Route 100 Patching	Patching of failed slabs and resurfacing of eastbound and westbound lanes of Interstate 78 from Berks/ Lehigh County Line to the Route 100 Interchange in Weisenberg and Upper Macungie Townships.	CON		\$863,040	\$863,040

INTERSTATE DEOBLIGATIONS

October 1, 2024 through September 30, 2025

Map ID	MPMS #	Project Title	Project Description	Phase	Project Administrator/ Owner	Deobligation	Total Cost of Project
2	72822	Interstate 78 Eastbound - Route 309 S to Saucon Viaduct Alkali-Silica Reaction	The treatment of rough pavement along eastbound mainline and shoulders of Interstate 78 with Ultra Thin Bonded Wearing Course and Stone Matrix Asphalt overlay, bituminous milling, concrete patching, guiderails, reflective tape pavement markers, line painting and bridge preservation activities, along with other miscellaneous construction items, in Upper and Lower Saucon Townships and the City of Bethlehem.	CON	PennDOT District 5	-\$1,380,535	\$0
3	11551	Interstate 78 in Lehigh County Improvements	Roadway improvements from Cedar Crest Boulevard to Lehigh Street, in Salisbury Township and the City of Allentown.	CON	PennDOT District 5	-\$890,128	\$0

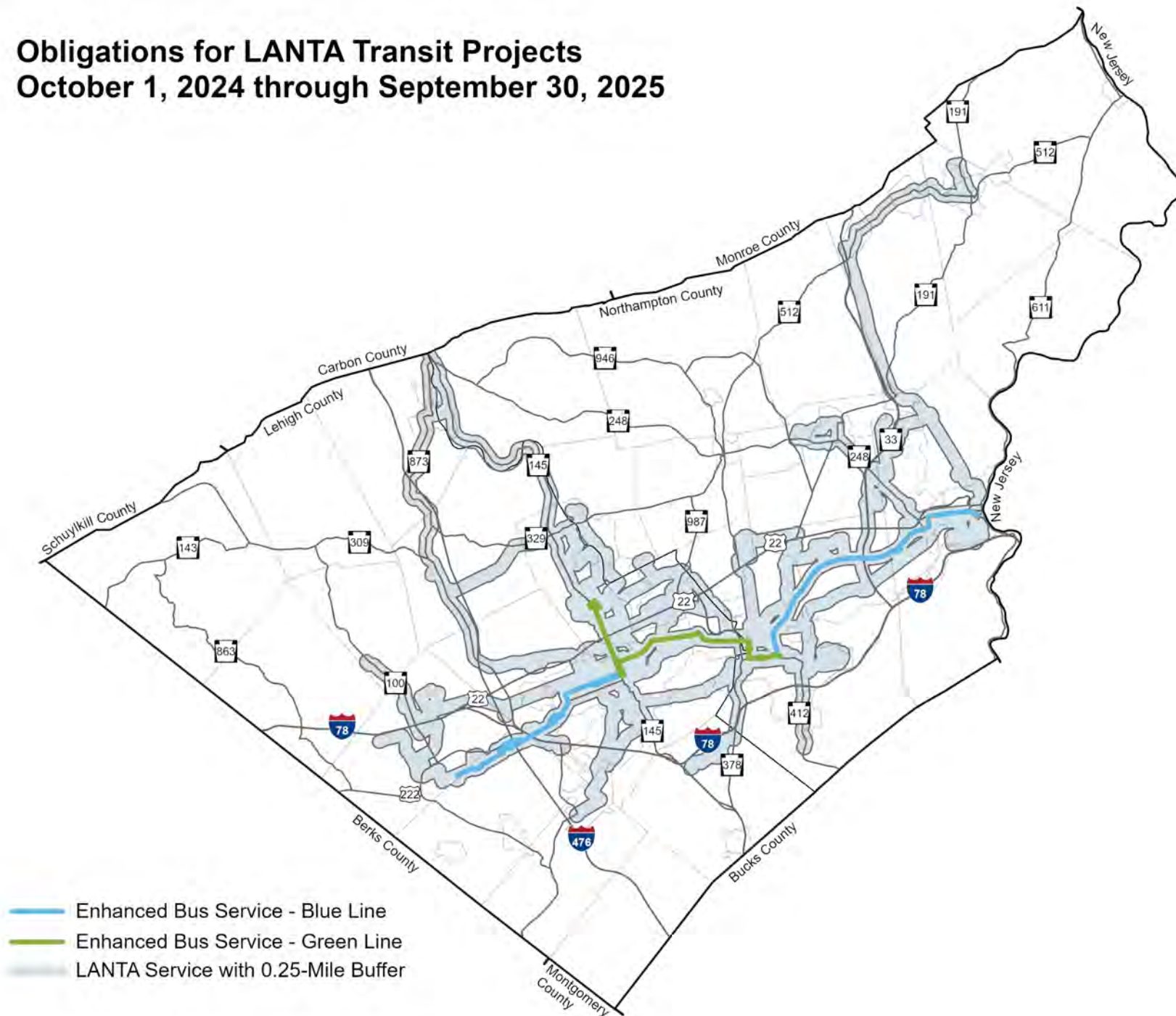
Total Obligations for LANTA TRANSIT PROJECTS

October 1, 2024 through September 30, 2025

\$2,031,823

The Lehigh and Northampton Transportation Authority (LANTA) was the recipient of \$2,031,823 in Federal Transit Administration (FTA) funding obligations for various public transit grants that were awarded. These funding obligations differ from the FHWA obligations for highway, bridge and enhancements/grant projects. These Transit funding categories and authorizations ensure safe and efficient public transit for the Lehigh Valley as a whole. LANTA's services are to meet basic transportation needs, support desired economic and environmental goals, and appeal to an increasing number of people. Services are to be comprised of a range of types, provided directly or through contract. The Transit Obligations through FTA grants awarded to LANTA help provide these services and ensure a safe and efficient public transit system for the Lehigh Valley.

Obligations for LANTA Transit Projects October 1, 2024 through September 30, 2025



TRANSIT OBLIGATIONS

October 1, 2024 through September 30, 2025

MPMS #	Project Title	Project Description	Project Administrator/ Owner	Obligation	Federal Funds Remaining
95008	Revenue Rolling Stock - 30-Foot Buses	Acquiring seven buses to provide shared ride service.	LANTA	\$626,994	\$0
95008	Revenue Rolling Stock - 30-Foot Buses	Acquiring three buses to provide shared ride service.	LANTA	\$536,592	\$0
95183	Bus Passenger Shelters	Bus Passenger Shelters	LANTA	\$128,042	\$32,842
110172	Easton Garage Gate Reader	Easton Garage Gate Reader	LANTA	\$5,504	\$1,264
110172	Allentown Garage Gate Reader	Allentown Garage Gate Reader	LANTA	\$5,800	\$0
110172	Allentown Gate Replacement	Allentown Gate Replacement	LANTA	\$13,804	\$0
110172	Easton Garage Tire Mounting Equipment	Easton Garage Tire Mounting Equipment	LANTA	\$16,450	\$0

MPMS #	Project Title	Project Description	Project Administrator/ Owner	Obligation	Federal Funds Remaining
95178	Fixed Route Scheduling Software	Fixed Route Scheduling Software	LANTA	\$19,752	\$0
110172	Easton Garage Security Camera Additions	Easton Garage Security Camera Additions	LANTA	\$21,320	\$0
110172	Allentown HQ Interior Door Access Controls	Allentown Headquarters Interior Door Access Controls	LANTA	\$12,520	\$2,200
110172	Bethlehem Transportation Center (BTC) Door Access Control	Bethlehem Transportation Center (BTC) Door Access Control	LANTA	\$5,769	\$0
95178	Masabi Fare Collection Project	Masabi Fare Collection Project	LANTA	\$359,432	\$65,140
110172	Maintenance Department Tablets for AssetWorks	Maintenance Department Tablets for AssetWorks	LANTA	\$2,620	\$2,620
110171	2017 Buses - Operator Seat Replacement	2018 Buses - Operator Seat Replacement	LANTA	\$36,467	\$0
110171	2018 Buses - Operator Seat Replacement	2019 Buses - Operator Seat Replacement	LANTA	\$21,792	\$0
110172	Allentown Fuel Tank Monitoring Upgrade	Allentown Fuel Tank Monitoring Upgrade	LANTA	\$20,745	\$1

MPMS #	Project Title	Project Description	Project Administrator/ Owner	Obligation	Federal Funds Remaining
110172	Allentown Bus Wash Update	Allentown Bus Wash Update	LANTA	\$27,520	\$0
95178	Token Transit Fare Collection	Token Transit Fare Collection	LANTA	\$40,320	\$0
95178	South Bethlehem Transit Center Digital Display	South Bethlehem Transit Center Digital Display	LANTA	\$15,180	\$0
110171	Associated Capital Maintenance Items	Associated Capital Maintenance Items	LANTA	\$115,200	\$28,967



CONCLUSION

Accomplishment + Annual Obligated Projects

The Accomplishments + Annual Listing of Obligated project is a product of the continuing, comprehensive and cooperative process of the LVTS, FHWA, FTA and other transportation stakeholders including the general public. This process is the foundation of the region's Long-Range Transportation Plan/Metropolitan Transportation Plan and Transportation Improvement Program which leads to projects being obligated or accomplished in this report.

Federal investments, or obligations, of \$53,754,280 were committed to 41 Highway, Bridge, and Enhancements/Grant projects during the federal fiscal year of 2025. During the same period, \$7,563,600 was deobligated, or saved, on 29 projects that came in under budget, enabling those funds to be committed to other approved projects in the region. Investments, or obligations, of \$5,603,640 were committed to five Interstate 78 projects, through the Interstate Management Program for projects that were included on the State Transportation Improvement Program. During the same period, \$2,260,663 was deobligated on two interstate projects in the region. In addition, another \$401,659,004 in projects remain under construction. Finally, \$2,031,823 was obligated to the Lehigh and Northampton Transportation Authority (LANTA) public transit operation through the Federal Transit Administration to ensure and equitable and robust public transportation system regionwide.

All together, these investments show a continuing federal and state commitment to maintaining the transportation network of a region of more than 700,000 people.



GLOSSARY

Activity Line Item (ALI) is the Federal Transit Administration (FTA) coding for specific activities related to grants and funding of transit projects and operations.

Agency Name identifies the public transportation agency responsible for administering and implementing projects sourced with public transportation funding streams.

Annual Listing of Obligated Projects (ALOP) is a federally required listing of highway, bridge and transportation projects, including investments in pedestrian walkways and bicycle infrastructure transportation facilities, for which federal funds have been obligated in the preceding year, which shall be published or otherwise made available by the cooperative effort of state, transit operators and metropolitan planning organizations for public review. In accordance with regulations 23 U.S.C. 134 (j)(7)(B), 49 U.S.C. 5303 (j)(7)(B) or 23 CFR §450.334.

Category describes the type of project.

- **Highways** are roadway projects that restore an existing highway to an acceptable condition or improves the roadway through the following types of work: pavement resurfacing, widening, shoulders, alignments, stormwater management, guiderails and other infrastructure.
- **Bridges** are projects related to elevated structures carrying modes of transportation over another physical feature such as another roadway, natural features such as a river or other transportation facilities such as rail lines.
- **Enhancements/Grants** are projects that received competitive grant awards for alternative transportation projects and improvements. They may also involve substantial grants awarded to projects from federal competitive grant award(s) that must be reported by the LVTS and the Annual Listing of Obligated Projects.
- **All** are generally line-item projects that support all aspects of transportation projects Highway, Bridge and Enhancements / Grants.

CMAQ is Congestion Mitigation and Air Quality.

Congressional District is a territorial division of a state from which a member of the United States House of Representatives is elected.

County is the geographic county in which the project is taking place. Specific locations are geographically categorized by PennDOT. All projects for LVTS are of regional importance to both Lehigh and Northampton Counties identified during collaboration through the project selection process during TIP development.

Deobligations represent the amount of federal authorizations no longer need for a specific phase of a project during federal fiscal year 2024. These funds may be reallocated to other regional projects that meet the funding criteria.

Federal Fiscal Year is the calendar timeframe from October 1, 2023 through September 30, 2024.

Federal Funds Awarded is the amount of funding associated with a specific public transit project or task for a certain time period.

Federal Fund Category is funding associated with specific tasks related to implementation of various public transit projects.

Federal Funding Code is the numerical number for a specific fund category related to public transit funding

Federal Funds Remaining is the amount of funding remaining not obligated to a prior phase or year(s) from the overall allocation of funding for the project.

Federal Transit Funding Codes

- **5339 Funds** are Federal grants to replace, rehabilitate and purchase buses and related equipment and to construct bus-related facilities, including technological changes or innovations to modify low or no emission vehicles or facilities.
- **5307/5340 Funds** are funds for transit capital and operating assistance in urbanized areas and for transportation related planning
- **5310 Funds** provide formula funding to states and designated recipients to meet the transportation needs of older adults and people with disabilities when the public transportation service provided is unavailable, insufficient, or inappropriate to meeting the needs of these individuals.

FHWA is the Federal Highway Administration.

FTA is the Federal Transit Administration.

FTA Grant Number is the Federal Transit Administration Identification number for a specific grant allocation source.

ITS are intelligent transportation systems.

LANTA is the Lehigh and Northampton Transportation Authority.

LVTS is the Lehigh Valley Transportation Study, the federally designated Metropolitan Planning Organization for Lehigh and Northampton Counties.

Map Identification Number represents the location number on the map depicting the location of the project.

MPMS is the project identification number in the PennDOT Multimodal Project Management System for locating, tracking and reporting on the status of phases of various projects.

MPO is the Metropolitan Planning Organization, an organization created and designated to carry out the metropolitan transportation planning process. MPOs are required to represent localities in all urbanized areas (UZAs) with populations over 50,000, as determined by the U.S. Census.

Municipality is the county, city, town, borough, or township of the Commonwealth of Pennsylvania associated with the project general location.

Obligations represent federal authorizations to proceed with specific project phases for the federal fiscal year of 2024.

Obligated Federal Amount FFY 2024 is the amount obligated towards public transportation for a specific project or task during Federal Fiscal Year 2024.

OTH-Flex CMAQ are funds provided by LVTS to the public transit operator LANTA utilizing CMAQ funding to support various public transit projects.

PennDOT is the Pennsylvania Department of Transportation.

PennDOT District is the PennDOT engineering District in which the project is taking place. PennDOT District 5-0 is the engineering district that encompasses Lehigh and Northampton counties for the LVTS.

Performance Based Planning and Programming (PBPP) is a process focused on collaboration between PennDOT, FHWA, and MPOs at the county and regional levels.

Performance Measures are adopted metrics for evaluating various transportation aspects related to safety, mobility, infrastructure condition and air quality.

- **PM1:** Safety
- **PM2:** Asset Condition
- **PM3:** Mobility and Congestion Mitigation and Air Quality (CMAQ)

Phase of Work is the list of phases associated with a particular project that is on the Transportation Improvement Program (TIP).

Not every project will have every phase of a project. However, generally, the projects will have several of the following phases:

- **Study/Planning (S/P)** – In this phase, a general overview or analysis is performed to identify elements for improvements to an identified project. This phase can be for corridors, potential connections and for enhancing and improving the projected need of a transportation asset.
- **Preliminary Engineering (PE)** – In this phase, a preliminary field survey, utility location, environmental/historical studies, road design alternatives, drawings, final field inspections, and initial public engagement are done. This process can take a few months to several years to complete.
- **Right-of-Way (ROW)** – This is the portion of the project in which negotiations with property owners take place, payments are made, and arrangements with utility companies are finalized to obtain the land necessary for the project. Right-of-Way work does not begin until most of the Preliminary Engineering steps are complete.
- **Utilities (UTL)** – In this phase, ownership of existing or potential new utilities are identified. Coordination of infrastructure that may need to be relocated or otherwise changed to accommodate the project are done with the entities responsible for various utilities. Electric, telecommunications and pipelines are examples of utilities.
- **Final Design (FD)** – is the phase that identifies project-related improvements, materials, quantities and activities. The plans must include sufficient detail to inform project stakeholders (designers, reviewers, contractors, suppliers, etc.) of the actions required to advance the project from design through completion of construction and to satisfy permit conditions. Final Design Plans must also provide reasonable information needed by the contractor to submit a sound, equitable bid and to build the project to PennDOT's standards.
- **Construction (CON)** – In this phase, the project is advertised to prospective contractors for bids. Once the bids are opened and a contract is awarded, construction can begin.

Program Total is the overall cost associated and programmed for a project on the Transportation Improvement Program (TIP). Entries that contain “0” are for projects that were deobligated funds and had no obligations associated with it.

Projects Administrator/Owner is the agency responsible for implementation of the project/owner of the project location or structure.

Project Title is the name assigned to the project.

Project Description provides details and the intent of the project as applicable.

Public Narrative is a version of the Project Description simplified.

Requested Federal Amount FFY 2024 is the amount of funding requested by the public transit operator for Federal Fiscal Year 2024 projects and tasks.

State Match are Commonwealth of Pennsylvania funds to match certain federal funding requirements.

State Route (SR) is the State Route identification number of a PennDOT owned or supported roadway associated with the project if applicable.

Sub-Recipient is the public transportation provider receiving the transit funds

TIP is the Transportation Improvement Program.

Transportation Improvement Program (TIP) is a list of transportation projects—covering a period of at least four years. The TIP must be developed in cooperation with the MPO, state and public transit providers. The TIP should include capital and non-capital surface transportation projects, bicycle and pedestrian facilities and other transportation enhancements to address various Transportation Performance Management requirements.

Transportation Performance Management is a strategic approach that uses transportation system information to make investment and policy decisions to achieve national transportation performance goals for safety, asset condition and mobility / air quality. (see Performance Measures)



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LEHIGH COUNTY **INDUSTRIAL LAND USE**

GUIDE

DRAFT

Prepared by



Lehigh Valley Planning Commission

This program is being funded by Lehigh County. This document serves as guidance to Lehigh County, the 62 municipalities of the Lehigh Valley, developers and community members, all of which have a vested interest in the impacts of industrial land uses on the health and well-being of the region. The LVPC is committed to supporting municipal governments and building collaboration between public and private partners to ensure the region's continued sustainability and resilience.



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Thank you to the outgoing 2025 Executive, Phillips Armstrong, and District 5 Commissioner Jeffrey Dutt for their service to the region.

2026

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LEHIGH COUNTY **INDUSTRIAL LAND USE**

GUIDE

INTRODUCTION



Industrial development and rapid technology advancements are shaping Lehigh County's land use needs, forcing communities to evolve quickly to handle the emerging uses arriving at their doorstep.

However, this region has a history of adapting because industrial development has been a defining influence on Lehigh County's economy and landscape since the 1700s, when the earliest European settlers established water-powered mills for grain processing, lumber production and iron works along creeks such as the Little Lehigh, Jordan, Coplay and Saucon. The opening of the Lehigh Canal in 1829 revolutionized the local economy by allowing goods to easily move between Lehigh County and nearby regions, and local towns like Allentown grew into industrial centers.

By the late 1800s, Lehigh County and the broader Lehigh Valley had become home to a wide array of prominent industries. Iron production expanded with the advent of anthracite-fired iron furnaces, including the Allentown Iron Works on the Little Lehigh Creek, the Thomas Iron Works in what is now Hokendauqua, and the Coplay Furnace complex, several of which still stand today as historic sites. These operations helped make the region a national center for early iron manufacturing before Bethlehem Steel's rise.

The Valley also became one of the nation's premier silk manufacturing hubs in the late 1800s, driven by mills such as the Adelaide Silk Mill in Allentown, the Hemphill and Sayre silk operations in Catasauqua, and numerous smaller mills in Emmaus, Slatington, and Alburtis. At the same time, the region's cement industry began to take shape through plants near Coplay and Egypt, laying the groundwork for the Lehigh Valley's emergence as the "Cement Belt of the United States." By the late 1800s and early 1900s, Bethlehem Steel anchored a regional economy built on heavy industry, headquartered just across the county line in Bethlehem.

Industry shifted after World War II as American steel and traditional manufacturing declined, but due to the key positioning of Lehigh County relative to adjacent regions, the County emerged as a hub for logistics uses supporting the rise of global supply chains and e-commerce. This rapid shift and expansion of large-scale warehouse development created economic opportunity but also caused traffic, environmental and quality-of-life challenges for municipalities.

Today, industry continues to rapidly evolve, as technology-based industrial uses, advanced manufacturing, and alternative energy are expanding into the region, bringing new demands for land, transportation and utility infrastructure. Communities must prepare for a changing industrial landscape to balance community, economic and environmental priorities. The Lehigh County Industrial Land Use Guide provides the resource tools, data and best practices local governments need to manage current impacts and proactively plan.





LEHIGH COUNTY **INDUSTRIAL LAND USE**

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HOW TO USE THE GUIDE

The Lehigh County Industrial Land Use Guide is a practical reference for planners, municipal officials and other community stakeholders to better manage industrial growth and its impacts. It serves as a policy alignment and decision-support tool that helps municipalities connect data, best practices and regulatory tools to make informed, balanced decisions about existing and emerging industrial land uses.

UNDERSTANDING INDUSTRIAL LAND USES

STEP 1

Identify impacts by Type

STEP 2

Understand the impacts

STEP 3

Address with available tools

STEP 4

Regulate with Pennsylvania Municipalities Planning Code

Municipalities can use this guide to:

- **Support Comprehensive Planning:** Align local policies and future land use maps with evolving land use trends, identify suitable areas for industrial activity, and integrate industrial corridors into long-range economic and transportation strategies.
- **Inform Zoning and Land Development Regulations:** Translate best practices into zoning districts, use standards, and subdivision and land development ordinance (SALDO) criteria that balance industrial needs with community character and environmental protection.
- **Strengthen Development Review:** Reference the guide when evaluating industrial proposals for consistency with comprehensive plans, transportation access and infrastructure capacity. The guide's recommendations can also serve as technical justification in decision-making.
- **Plan Infrastructure and Transportation Improvements:** Coordinate industrial land use planning with roadway, freight, rail and utility networks; prioritize capital projects that make appropriate sites development-ready.
- **Promote Regional Coordination:** Use the guide to collaborate with neighboring municipalities on shared issues like truck routing, stormwater or infrastructure extensions that cross boundaries.

- **Engage the Public:** Reference the guide to communicate how industrial uses are evaluated, what impacts are being mitigated, and how local and regional plans align.

Industrial development continues to fuel Lehigh County's economic and population growth. By using this guide, communities can manage that growth thoughtfully while supporting jobs and tax revenue, maintaining infrastructure efficiency, protecting environmental and community assets, and positioning themselves for future funding and investment opportunities.



LEHIGH COUNTY **INDUSTRIAL LAND USE**

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MUNICIPAL ENGAGEMENT

KEY TAKEAWAYS FROM PARTICIPANTS

On October 15, 2025 from 5:30-7 pm, representatives of Lehigh County communities gathered at the LVPC Conference Center to workshop the Lehigh County Industrial Land Use Guide and discuss common challenges and opportunities. The workshop included a presentation by LVPC on project scope and initial data findings, a facilitated discussion on local industrial land use and freight concerns, priorities for planning for industrial growth, areas of traffic impacts and tools that municipalities have available to address impacts. The outcome of this engagement directly informed the development of the Guide.

1

Managing Traffic and Transportation Impacts Is a Universal Priority

Communities cited freight traffic, congestion, truck routing and access management as their top concerns, and emphasized that freight traffic often spills onto local roads when major corridors like Route 22 or Interstate 78 (I-78) back up, creating safety and quality-of-life challenges in boroughs and townships where roads were not designed for heavy truck volumes.

Participants expressed interest in stronger coordination on Highway Occupancy Permits (HOPs), improved truck management tools, and better access to Annual Average Daily Traffic (AADT) data, turning volumes and freight routing patterns to make informed decisions.

2

Infrastructure Capacity, Especially Energy, is Emerging as a Critical Limiting Factor

Participants commented on the growing need for electric capacity to support data centers, cold storage and advanced manufacturing. Several communities questioned whether local grids have the infrastructure to handle large-scale users without compromising service to existing residents and businesses.

3

Communities Need Guidance on Emerging Industrial Uses

Municipalities reported a high level of uncertainty about the unique impacts of data centers and other new industrial uses. Key themes included:

- Understanding noise, cooling systems, backup power generation and utility intensity
- Clarifying decommissioning expectations and life-cycle impacts
- Ensuring local zoning standards are consistent with state legislation

Several communities are researching emerging uses or revising ordinances, but expressed the need for consistent regional data and best practices to support their efforts.

4

Brownfield Reuse and “Best Use of Existing Space” Remain Strong Values

Many municipalities voiced a desire to direct industrial growth to brownfields, existing industrial districts, and redevelopment areas rather than greenfields.

Townships and boroughs emphasized:

- Leverage existing regional assets such as the Lehigh Valley International Airport and FedEx Ground logistics hub
- Aligning industrial development with long-term community visions, including housing and commercial growth priorities

5

Land Use Conflicts Are Becoming More Nuanced

Local leaders expressed concern that new industrial users — especially large energy-intensive ones — could crowd out desired residential or commercial development by consuming disproportionate shares of available infrastructure capacity or land supply.

Municipalities are navigating how to balance:

- The need for economic growth
- Maintaining community character
- Avoiding over-concentration of industrial uses in certain areas

6

Communities Need Practical Tools, Examples and Clear Data

Across municipalities the most requested supports from LVPC included:

- Case studies that illustrate impacts, such as utility consumption, traffic generation and project timelines
- Regional studies, guidance documents and examples from peer communities
- Support in developing or updating comprehensive plans, zoning, and Subdivision and Land Development Ordinances (SALDOs)
- Technical assistance in capital improvement planning
- Assistance in funding frequent ordinance updates, and planning and code modernization

7

Urban Communities Have Distinct Concerns

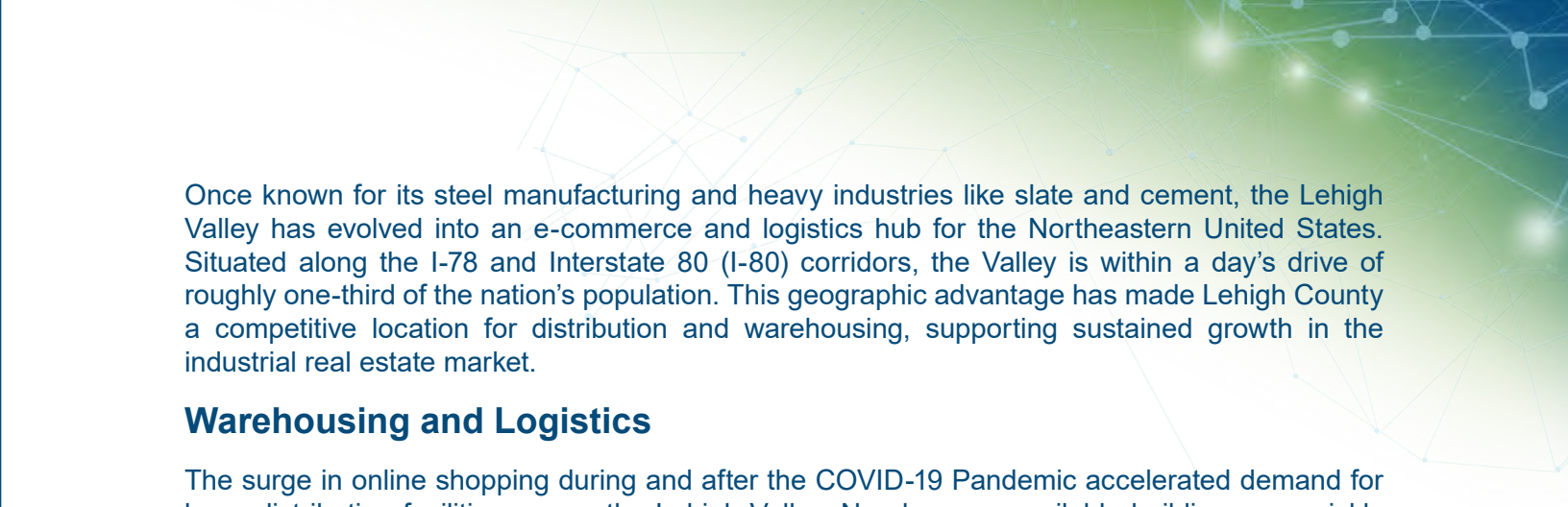
- City of Allentown representatives highlighted challenges around adapting pre-war industrial buildings for modern manufacturing and freight demands. Questions included how to incorporate modern loading, circulation and safety requirements into dense, historic settings.
- The workshop made clear that industrial land use in Lehigh County is evolving rapidly, and municipalities are eager for coordinated regional guidance. Participants are facing a mix of long-standing issues — like freight traffic and redevelopment — as well as new, complex challenges around utility capacity, digital infrastructure and emerging industrial uses.
- The feedback from this engagement directly shaped the structure of the Guide, ensuring it addresses the real-world issues communities are facing and provides the tools, insights, and resources needed to support informed, proactive planning for Lehigh County's industrial future.



LEHIGH COUNTY **INDUSTRIAL LAND USE**

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INDUSTRIAL MARKET EVOLUTION AND DEVELOPMENT TRENDS



Once known for its steel manufacturing and heavy industries like slate and cement, the Lehigh Valley has evolved into an e-commerce and logistics hub for the Northeastern United States. Situated along the I-78 and Interstate 80 (I-80) corridors, the Valley is within a day's drive of roughly one-third of the nation's population. This geographic advantage has made Lehigh County a competitive location for distribution and warehousing, supporting sustained growth in the industrial real estate market.

Warehousing and Logistics

The surge in online shopping during and after the COVID-19 Pandemic accelerated demand for large distribution facilities across the Lehigh Valley. Nearly every available building was quickly leased, and vacancy rates fell to around 3% in 2022 — an extremely low level for the market. With space scarce, rental prices more than doubled in just a few years, climbing from about \$5 per square foot in 2021 to over \$11 per square foot by the end of 2024.

As of mid-2025, the market has begun to stabilize. Vacancy rates have risen to about 7%, and lease rates have leveled off, signaling a transition from rapid expansion to a more sustainable balance of supply and demand. This shift reflects a healthy market adjustment rather than a broader decline.

The logistics sector is also diversifying. Subleasing activity has increased as companies reassess space commitments made during the pandemic, creating new opportunities for smaller businesses. Flex space, which can accommodate light manufacturing, assembly, storage, and administrative functions (potential call-out definition), is becoming more common.

Manufacturing

Manufacturing in Lehigh County is becoming increasingly high-tech, driven by automation, robotics and digital systems that reduce labor needs but heighten demands for skilled technicians, reliable power and broadband. These technological advancements require less space to operate, leading to a shift toward smaller facilities, typically between 20,000 and 50,000 square feet. Emerging manufacturers are producing electronics and medical devices, while reshoring trends are returning production of semiconductors, pharmaceuticals and other goods to the United States to shorten supply chains.

Together, warehousing and manufacturing trends illustrate a regional industrial market that remains active but is beginning to stabilize after a period of rapid growth.

Industrial Market Conditions

Following years of record expansion, the Lehigh Valley's industrial market is entering a period of stabilization as demand begins to balance with available supply. Net absorption — the difference between space leased and vacated — has slowed, while new construction has declined to its lowest level since 2013, with just 743,000 square feet breaking ground along the Interstate 78/Interstate 80 corridor in early 2025, according to international real estate firm CBRE.

Both declining absorption and reduced construction reflect a market realignment after the pandemic-era surge in warehouse development. As fewer large-scale projects are proposed, the total industrial square footage added to the market each year has moderated.

Lease rates have since stabilized around \$11.50, remaining among the highest along the corridor. Nationally, 2024 marked the 15th consecutive year of industrial expansion across the United States, though at its slowest pace since 2010. Within this context, the Lehigh Valley has demonstrated steady performance and resilience, maintaining near-zero changes in inventory, absorption and rent growth, even as larger metros experienced sharper swings.

Recent trade policies and executive actions have introduced some uncertainty, prompting many companies to delay expansion decisions until costs and supply chain implications become clearer. This cautious, strategic approach is visible nationwide, including in the Lehigh Valley, where developers are taking a longer-term view of new industrial investment.

Regional Development Patterns

Development patterns across the Lehigh Valley over the past decade reflect a region in transition — shifting from rapid industrial expansion toward more balanced, mixed-use growth. Between 2015 and 2022, multi-family housing approvals rose steadily, reflecting increased demand for higher-density living near employment and service centers. Public and quasi-public uses such as healthcare facilities also expanded, signaling broader investment in community infrastructure.

During the pandemic, municipalities such as Bethlehem, and the townships of Lower Macungie, South Whitehall and Whitehall experienced a temporary spike in non-residential square footage as businesses sought space outside dense urban areas. That surge has since receded, while steady growth continues in Upper Macungie Township, Allentown and Bethlehem, where strong transportation access, workforce proximity and established infrastructure continue to attract investment.

Meanwhile, warehouse and industrial development peaked during the pandemic and has since returned to pre-pandemic levels. Office and retail construction have declined since 2018, influenced by remote work, e-commerce, and automation. These changes highlight an evolving regional identity — one that increasingly emphasizes livability, resilience and sustainable economic diversity.

Importantly, the industrial surge was accompanied by parallel residential growth. Municipalities including Allentown, Bethlehem, Emmaus Borough and South Whitehall Township experienced simultaneous increases in both housing and non-residential development, underscoring the close link between industrial expansion and housing demand. As both sectors stabilize, the Lehigh Valley appears to be entering a post-boom phase defined by moderate, sustainable growth that supports long-term economic strength and regional balance.

Evolving Industrial Needs

Looking ahead, Lehigh County's industrial landscape will continue evolving as new technologies, energy systems, and logistics models reshape how and where industries operate. Traditional warehousing and manufacturing will increasingly intersect with technology-driven production — such as biofabrication, microchip manufacturing and large-scale 3D printing — that demand smaller, more specialized facilities supported by high-capacity utilities and broadband.

Digital and automated industrial operations, including data centers, cryptocurrency mining, and autonomous vehicle hubs, will expand the region's role in the national digital economy but will also heighten energy and infrastructure demands.

Simultaneously, energy generation and storage facilities from solar and battery installations to advanced grid management systems will become more common as Pennsylvania's energy market modernizes and industries seek sustainable, resilient power sources.

The freight and logistics sector is also expected to transform with the adoption of electric and autonomous trucks, increased intermodal connectivity, and the redevelopment of aging warehouse stock for more efficient operations.

Together, these shifts point toward an industrial future defined by varying footprints, higher energy intensity, greater digital integration, and closer ties between industrial land use, infrastructure and community planning. For municipalities, this means planning proactively, by updating zoning, infrastructure, and comprehensive plans to ensure that future industrial growth remains compatible with community character, resource capacity and long-term regional goals.





LEHIGH COUNTY **INDUSTRIAL LAND USE**

GUIDE

TOOLS FOR LOCAL GOVERNMENT

The foundation for how Pennsylvania municipalities guide growth and development is established by the Pennsylvania Municipalities Planning Code (MPC). The MPC grants local governments the authority to adopt comprehensive plans, zoning ordinances, and subdivision and land development ordinances, which together form the framework for managing land use and development.

Many municipalities in Lehigh County have adopted these planning and regulatory tools provided under the MPC, but too often these tools are developed and maintained in silos. A municipality may prepare a comprehensive plan, write a zoning ordinance, and adopt a subdivision and land development ordinance (SALDO), yet over time the connection between the three becomes blurred. Outdated zoning may not reflect the vision set forth in the comprehensive plan, and SALDO provisions may drift away from the standards needed to support zoning districts. When this happens, municipalities are left reacting to development proposals instead of proactively guiding them, particularly as new or unfamiliar industrial uses emerge.



For industrial land uses in particular, integration is critical. Industrial facilities often come with large site footprints, significant infrastructure demands, and potential community impacts on traffic, environment, and quality of life. If zoning regulations are not aligned with SALDO standards, municipalities may miss opportunities to manage truck circulation, buffer adjacent neighborhoods, or ensure adequate utility capacity. Likewise, if zoning diverges from the comprehensive plan, municipalities may find themselves facing development in areas that conflict with community goals.

When used together intentionally, these tools allow municipalities to stay ahead of market trends, set clear expectations for developers, minimize conflicts between industrial development and surrounding land uses, ensure that industrial growth aligns with local priorities, and protect quality of life while supporting economic opportunity. The sections that follow provide guidance on how each tool can be applied to help communities make informed, forward-looking decisions about industrial land use.

Comprehensive Plans

A comprehensive plan is the highest-level policy document a municipality has under the MPC. While not regulatory on its own, it establishes the vision, goals, and framework that zoning ordinances and subdivision and land development ordinances (SALDOs) should implement.

Here is how comprehensive plans can address industrial land uses:

Identify Suitable Locations

Analyze transportation networks, utility capacity, environmental features and land availability to guide where industrial development is most appropriate. Set policies that clearly determine the outcomes of development, avoiding conflicts with residential areas, schools or sensitive natural resources. Designate industrial growth areas, and highlight opportunities for reuse or redevelopment.

Balance Land Use Priorities

Consider housing, agriculture, open space and economic development together to ensure that industrial growth is accommodated without displacing other community priorities.

Anticipate Emerging Trends

Include policies for new or evolving uses to proactively set expectations before proposals arrive.

Set Transportation and Infrastructure Policies

Identify where infrastructure upgrades may be needed; outline strategies for coordinating with utility providers and transportation agencies; include policies to elevate the quality of developments and minimize impacts (truck driver necessities, parking, etc.); reference other municipal planning documents such as Official Sewage Facilities Plans and Capital Improvements Plans.

Promote Design and Mitigation Standards

While zoning and SALDO carry the enforceable requirements, the comprehensive plan can establish policies for enhanced built environments through buffering, landscaping, sustainable building practices, renewable energy, architectural treatments and building aesthetics.

Support Regional Coordination

Align local goals with *FutureLV: The Regional Plan* to support regional coordination, as industrial markets and freight traffic cross municipal boundaries.

Zoning

Zoning is the most direct regulatory tool municipalities have to manage industrial land uses. As authorized by the MPC, zoning ordinances establish where industrial uses are permitted, the standards they must meet, and how they relate to surrounding land uses. Zoning regulations are created to implement the visions of comprehensive plans and are legally enforceable.

Here is how zoning ordinances and maps can address industrial land uses:

Differentiate Between Types of Industry

Ordinances should include clear definitions that establish separate uses based on their types and resulting impacts, including manufacturing, technology industry, warehousing and logistics.

Designate Appropriate Districts

Zoning maps identify where industrial uses can go, typically near highways, rail corridors, or other infrastructure, and away from residential neighborhoods and sensitive environmental areas.

Utilize Overlay Districts

Overlay districts apply an additional set of standards to a specified geographic area on top of the underlying zoning district. They can be used to increase flexibility and target development, for example by allowing for a wider range of permitted uses than the base zoning, or to impose additional standards that limit development, such as due to the presence of natural features.

Set Dimensional and Site Standards

Requirements for setbacks, buffering and building height reduce conflicts with adjacent uses, especially when near residential or mixed-use areas.

Require Screening and Design Features

Landscaping, berms, façade requirements and green building practices can help reduce the visual and environmental footprint of large industrial buildings.

Mitigate Operational Impacts

Performance standards address noise, lighting, emissions, truck circulation, hours of operation and other potential impacts, ensuring industrial activity does not create nuisances for neighbors.

Address Transportation and Parking

Truck routes, loading areas and parking requirements can be tailored to industrial uses, keeping heavy vehicle traffic off local streets and ensuring adequate but not excessive parking.

Encourage Redevelopment and Reuse

Flexible zoning provisions can make it easier to reuse or redevelop obsolete industrial sites and reinvest in brownfield sites to support community revitalization.

Protect Natural Resources

Overlay districts, environmental performance standards, and conservation design techniques can ensure that industrial development avoids or mitigates impacts on critical habitats, farmland or water resources.

Subdivision and Land Development Ordinances

While zoning determines where industrial uses may be located, Subdivision and Land Development Ordinances (SALDOs) establish detailed requirements for how land is divided and developed. These ordinances as authorized by the MPC allow municipalities to ensure that new industrial sites are designed safely, efficiently and in ways that minimize impacts on surrounding communities, working in tandem with zoning and comprehensive plans to create a predictable, consistent framework of plan submission and review for both municipalities and developers.

Here is how SALDOs can address industrial land uses:

Transportation and Access Management

Require traffic impact studies that are accurate for the intended use, to assess infrastructure needs and ensure safe and efficient truck circulation, including designated entrances, on-site truck parking and turning radius requirements.

Infrastructure and Utilities

Require adequate sewer, water, stormwater, and broadband capacity before approval of plans. Incorporate modern infrastructure needs, such as electric vehicle charging or redundant power for high-tech uses.

Stormwater and Environmental Management

Encourage green infrastructure approaches such as rain gardens. Protect floodplains, wetlands and steep slopes through development standards that minimize site disturbance. Require landscaping and tree plantings in parking areas and throughout sites to improve air quality and mitigate heat island effects.

Site Layout and Design Standards

Establish minimum requirements for parking, loading areas and internal circulation that reflect industrial needs without overbuilding. Require screening of loading docks, outdoor storage and mechanical equipment from public rights-of-way and adjacent residential areas. Require pedestrian and bicycle infrastructure to support workforce mobility and safety, including sidewalks, lighting, bus shelters, and safe crossings.

Worker and Driver Amenities

Encourage or require workforce amenities such as break areas, green space and driver facilities.

Regional Coordination

Incorporate external agencies including the Lehigh and Northampton Transportation Authority (LANTA) and LVPC early and often in review processes.

Emergency Services Coordination

Within plan review regulations and procedures, require early coordination with local fire, emergency medical, and police services to review site access, circulation, and any features that may affect emergency response including building layout, gate locations, hydrant access, and internal road design. This coordination ensures that sites are designed to support effective emergency access.







LEHIGH COUNTY
**INDUSTRIAL
LAND USE**

GUIDE

**STRATEGIES
FOR ADDRESSING
INDUSTRIAL LAND USES**



LEHIGH COUNTY **INDUSTRIAL LAND USE**

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EMERGING AND EVOLVING INDUSTRIAL LAND USES

Evolving and emerging industrial land uses are grouped into several categories: **Digital Infrastructure and Tech Facilities** driven by modern-day use of computers and data exchange, **Advanced Manufacturing** driven by technological advancements, **Freight, Logistics and Supply Chain** as systems increasingly incorporate automation to maximize efficiency, **Energy Generation and Storage** to power these utility-intensive land uses, and **Resource Extraction** as the industry's materials needs shift.

DIGITAL INFRASTRUCTURE AND TECH FACILITIES

Data Centers

Data centers are facilities that house physical hardware, like computer servers and telecommunications and storage systems, that enable the digital world.

When you use devices such as a smartphone or laptop, it's not the device itself that processes your requests. The device sends your request to a data center, where data is accessed, processed, and returned to your device to complete the request, typically within a fraction of a second. Hyperscale Data Centers are growing rapidly across the country in tandem with the proliferation of artificial intelligence and cloud computing.

Data centers, like all technology-based industrial facilities, must be operational 24 hours a day, seven days (24/7) a week and require uninterrupted electricity supply. The equipment produces a lot of heat, and robust cooling systems are required for proper functioning. Most of these cooling systems are water-based and may require between 20,000 gallons per day for smaller data centers to over 500,000 gallons per day for large data centers.

Cryptocurrency Mining

Cryptocurrency mining facilities operate high-powered computers that validate blockchain transactions and generate digital currency.

Unlike data centers, which process and store information for many users, cryptocurrency mines are single-purpose computing operations designed to solve complex mathematical equations. These facilities are often housed in warehouses or modular container units and rely on constant electricity supply and heavy-duty cooling systems to maintain safe operating temperatures.

Cryptocurrency mining is extremely energy-intensive and can create substantial strain on local power grids. While some operations locate near renewable energy sources, many depend on fossil-fuel-based electricity, leading to measurable air quality and climate impacts. The number of large-scale cryptocurrency mines in the United States remains relatively small but is expected to grow as digital currencies gain acceptance and the technology becomes more commercially viable.

Telecommunications Hubs

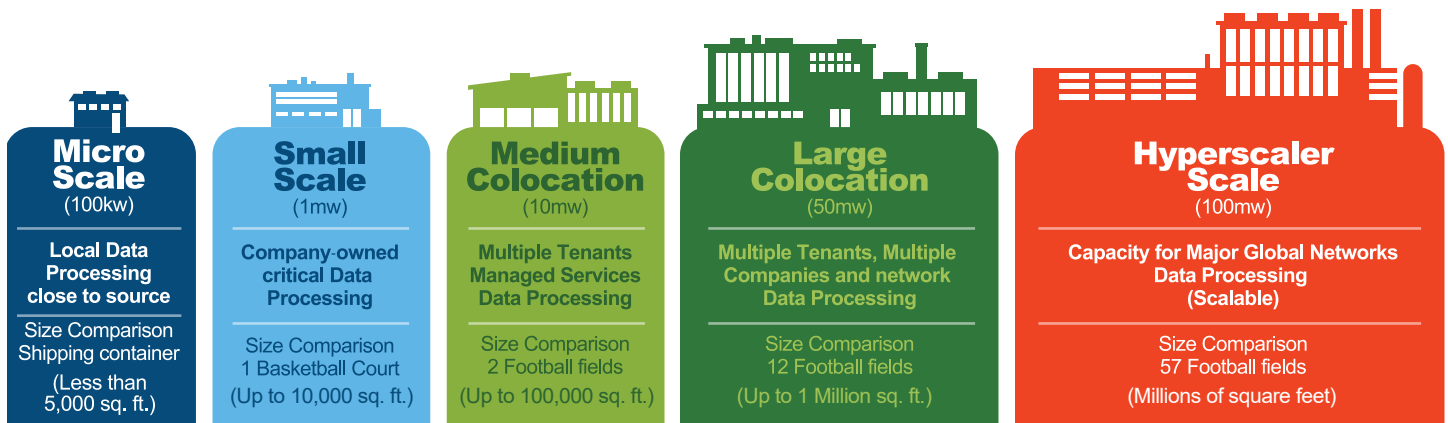
Telecommunications hubs, sometimes called network exchange points, carrier hotels, or telecom switching facilities, are specialized sites that house the equipment and infrastructure enabling digital communication networks.

These facilities connect internet service providers, mobile carriers, data centers and cloud platforms, allowing data to move efficiently across regional, national and international systems.

While data centers primarily store and process large volumes of digital information for cloud computing, telecommunications hubs focus on transmission and routing — the physical interconnection points that keep networks operational. Telecom hubs often occupy smaller buildings than data centers but require similar infrastructure, such as redundant power supply, advanced cooling and robust security systems.

Key Impacts Across Digital Infrastructure Uses

Energy Demand and Grid Reliability	High and constant electricity demand
	Potential strain on local substations and transmission networks
	Need for redundancy and emergency power
Cooling, Water Use and Heat Generation	Significant heat output from information-processing equipment
	Cooling systems that may use water, large air-handling units or mechanical chillers
	Potential opportunities for heat recovery or reuse
Noise and Environmental Factors	Persistent noise from fans, chillers, air-handling units, transformers and generators
	Air emissions from backup generators or on-site fossil-fuel power sources (more common in crypto mining)
	Stormwater impacts from large impervious surfaces and roof areas
Visual and Design Considerations	Windowless or utilitarian buildings, equipment yards, outdoor containerized units
	Need for screening, buffering and architectural standards
	Antenna structures and small-cell nodes at telecom hubs
Emergency Response and Resiliency	Hazard mitigation for electrical systems, batteries and fire suppression
	Requirements for 24/7 access and operations continuity
	Elevated risk considerations due to heat, high voltage and redundant power systems
Community Compatibility	Siting concerns near residential areas
	Public perceptions about electromagnetic frequency (telecom), fossil-fuel dependency (crypto) or noise (all uses)
Construction Traffic	Increased passenger vehicle traffic due to construction workers accessing site
	Heavy equipment traffic when building is under construction
	Truck traffic to transport data center equipment



SIZES OF DATA CENTERS



In this daytime view of the New Albany data center campus in Central Ohio, data center Buildings 3, 2, and 1 (from left to right) are in the foreground. Photo Credit: Google Data Centers

Mitigation Strategies and Best Practices

Digital Infrastructure and Tech Facilities

Comprehensive Plans Should:

- Inventory and establish goals and policies for the protection of existing natural and historic resources
- Inventory, analyze and project existing and future community facilities and utility needs. Establish goals and policies directing digital infrastructure land uses to adequate utility capacity
- Establish goals and policies supporting the expansion of broadband and fiber internet infrastructure
- Identify the economic development potential of digital infrastructure facilities, as emerging industrial land uses with impacts that must also be mitigated if encouraged to locate in the community
- Establish policies that encourage protection of residential areas and community-centered land uses from environmental impacts of land uses adverse to public health and quality of life
- Establish sustainability goals and policies encouraging renewable or carbon-neutral energy usage
- Reference other planning documents such as Sewage Facilities Plans, Hazard Mitigation Plans, Energy Conservation Plans, Capital Improvement Plans; and/or identify creating or updating such documents as Comprehensive Plan implementation steps

Zoning Ordinance Considerations

Definitions

- Include a broad definition for “Data Centers” that encompasses all aspects of digital infrastructure land uses
- Differentiate “Data Centers” as a primary use from an accessory data center

Districts

- Direct Data Centers to appropriate areas with:
 - + Compatible land uses such as technology/innovation districts, light or heavy industrial districts, business parks or highway commercial areas
 - + Adequate electrical capacity
 - + Public water service availability
 - + Public sewer service availability
 - + Access to broadband and/or fiber networks
 - + Adequate transportation access for construction and emergency vehicles.

- Avoid siting in or near:
 - + Areas with inadequate infrastructure, such as rural areas
 - + Floodplains, wetlands and other natural constraints
 - + Residential neighborhoods or community facilities
- Consider creating overlay districts to ensure adequate siting

Regulations and Performance Standards

- Permit “Data Center” as a conditional use to establish criteria and a process for additional oversight
- Specify building scale and design standards, including building height, orientation and façade treatments
- Establish adequate setbacks and buffering
- Establish standards limiting noise levels at property lines
- Establish standards limiting light levels at property lines and projected onto adjacent properties
- Specify a contextual parking requirement, such as one space per employee

Subdivision and Land Development Ordinance Considerations

Utility Capacity & Infrastructure

- Demonstrate adequate water, sewer and electric capacity, with confirmation from utility provider.

Site Design

- Require Pennsylvania-native landscaping throughout sites and within buffer areas
- Require visually aesthetic enclosures around outdoor equipment
- Require adequate site access for emergency vehicles
 - + Incorporate emergency service providers in the development review process

Impact assessments should require community and environmental impact statements evaluating:

- Energy and water demand
- Emissions and air quality impacts
- Noise levels
- Emergency service requirements
- Municipal fiscal impacts

ADVANCED MANUFACTURING

Biotechnology

Biotechnology or Biotech is a field using living organisms or systems to develop products, processes or services.

The field includes biofabrication, which can produce lab-grown meats and animal-free materials such as leather or fur, create bio-based fuels and plastics, and manufacture advanced medical products like implantable organs and 3D tissue models for drug testing. These industries collectively hold potential to transform manufacturing, energy and healthcare while addressing global challenges such as sustainability, ethical production and resource scarcity.

In Lehigh County, the region's strong healthcare sector, higher education institutions, and established manufacturing base position it well for future growth. Facilities typically resemble research laboratories or small-scale production sites and require reliable utilities, advanced ventilation, temperature control and specialized waste management systems. As the sector evolves, municipalities will need to plan for the unique spatial, environmental and regulatory requirements of this rapidly developing field.

3D and Large-Scale Printing

3D printing, also called additive manufacturing, uses computer-guided equipment to build three-dimensional objects layer by layer from digital models.

While small-scale 3D printing is already common in prototyping and component fabrication, large-scale additive manufacturing applies this technology to produce full-size building elements, bridges, vehicles, and industrial components. These operations often utilize materials such as concrete, metal, polymer or composite blends and may locate within light industrial or research and development facilities.

Unlike traditional manufacturing, which removes material from a solid block, additive processes use only what is needed, significantly reducing waste and allowing greater design flexibility. As costs decrease, large-format printers are expected to become more common in construction, infrastructure and custom manufacturing sectors, changing the spatial and infrastructure needs of industrial areas.

Microchip Manufacturing

Microchip manufacturing facilities, also known as semiconductor fabrication plants or “fabs”, produce the chips that power everything from smartphones and vehicles to medical devices and national defense systems.

The industry includes both front-end wafer fabrication, where silicon wafers are imprinted with microcircuits, and back-end assembly, testing and packaging (ATP), where chips are cut, tested and prepared for integration into finished products.

Driven by global supply chain shifts and national security priorities, the CHIPS and Science Act of 2022 has spurred new investment in domestic semiconductor production to reduce reliance on overseas manufacturing. The Lehigh Valley’s existing logistics infrastructure, workforce base and proximity to major metropolitan markets make it a competitive location for semiconductor investment — illustrated by proposals such as the Infinera packaging facility in Bethlehem.

These facilities typically require large-scale buildings, extensive water and energy resources, high-skill labor, and robust transportation networks for inbound materials and outbound products. Their complexity and scale make proactive planning essential to ensure compatibility with community goals, infrastructure capacity, and environmental standards.

Key Impacts Across Advanced Manufacturing Uses

Infrastructure & Utility Demand	High and potentially continuous electric demand
	Significant water demand, especially for bioengineering and semiconductor fabrication
	High-capacity cooling
	Potential need for substantial utility upgrades
Environmental Factors	Air emissions and ventilation needs
	Specialized waste streams
	Significant heat generation from processing equipment
	Noise from machinery, ventilation systems and freight activity
Freight, Logistics & Transportation	Frequent deliveries of specialized materials
	Passenger vehicle traffic associated with workforce shifts
	Freight traffic from shipping materials and product
Building Scale & Site Characteristics	Varying building footprints
	High-clearance interior spaces for some 3D processes
	Outdoor equipment yards and mechanical systems
Hazard Management & Emergency Response	Complex hazard profiles including biological materials, combustible powders/metal dust or hazardous chemical agents
	Heightened fire-suppression needs

Mitigation Strategies and Best Practices

Advanced Manufacturing

Comprehensive Plans Should:

- Inventory and establish goals and policies for protecting natural and historic resources that may be affected by high-intensity advanced manufacturing operations.
- Inventory, analyze and project community facility and utility needs, including water, sewer, electric, broadband, and emergency service capacity. Establish policies directing advanced manufacturing uses to areas with adequate infrastructure.
- Identify the economic development potential of advanced manufacturing, particularly sectors such as bioengineering, 3D printing, and semiconductor fabrication, while recognizing the need to mitigate their utility, environmental and freight impacts.
- Designate suitable areas for advanced manufacturing within industrial, technology, or research corridors, especially near workforce, higher education institutions transportation networks, and existing utility infrastructure.
- Support sustainability and innovation goals, including energy efficiency, renewable or low-carbon energy use, waste minimization, and opportunities for material reuse or circular manufacturing processes.
- Integrate workforce and training initiatives by referencing or coordinating with higher education, technical training centers, and industry partnerships supporting biotechnology, robotics, fabrication, and semiconductor disciplines.
- Reference related planning documents (Sewage Facilities Plans, Hazard Mitigation Plans, Energy Conservation Plans, Capital Improvement Plans, etc) and identify updates to these plans as Comprehensive Plan implementation steps.

Zoning Ordinance Considerations

Definitions

- Include clear definitions for Bioengineering/Biofabrication Facilities, Additive or 3D Manufacturing Facilities, and Microchip/Semiconductor Manufacturing Facilities to distinguish them from general manufacturing or research laboratories.
- Differentiate primary manufacturing operations from accessory research, testing, or prototyping uses.

Districts

- Direct advanced manufacturing uses to districts with:
 - + Compatible industrial, technology, innovation or business-park land uses
 - + Adequate and reliable electric capacity
 - + Adequate public water and sewer capacity (especially for biotech and semiconductor fabrication)
 - + Access to freight routes and goods-movement corridors
 - + Sufficient broadband or fiber-optic infrastructure
 - + Adequate transportation access for deliveries, workforce and emergency services
- Avoid siting in or near:
 - + Residential neighborhoods or sensitive community facilities
 - + Areas with inadequate utility infrastructure
 - + Floodplains, wetlands, and environmental constraint areas
- Consider overlay districts for advanced manufacturing clusters to standardize siting, design, and impact-mitigation requirements.

Regulations and Performance Standards

- Permit advanced manufacturing uses as conditional uses or special exceptions to establish evaluation criteria and provide additional oversight of facility intensity, environmental impacts, and freight activity.
- Specify building scale and design standards, including height, façade treatments, screening of mechanical equipment, and building orientation.
- Establish setbacks and buffering to protect adjacent uses.
- Establish noise and light standards at property lines.
- Require contextual parking requirements, scaled to workforce needs.
- Note where compliance with specialized codes is applicable, such as biosafety regulations (bioengineering), fire and ventilation codes for industrial robotics (3D printing), or cleanroom and chemical-handling standards (semiconductors).
- External agency regulation or permitting requirements can be referenced as notes on development plans.

Subdivision and Land Development Ordinance Considerations

Utility Capacity & Infrastructure

- Require applicants to demonstrate, with utility-provider confirmation:
- Adequate water capacity, critical for biotech and semiconductor fabrication
- Adequate sewer capacity for process discharge and wastewater flows
- Adequate electric capacity, with documentation of continuous power needs and redundancy
- Adequate broadband/fiber capacity for digitally intensive manufacturing
- Identification of required infrastructure upgrades, with developer responsibility where appropriate

Site Design

- Require Pennsylvania-native landscaping and buffer plantings
- Require aesthetic enclosures around outdoor equipment, mechanical systems, chemical storage areas, and utility yards
- Require adequate emergency vehicle access, including turning radii, drive aisle widths, and fire-suppression system access
 - + Incorporate local emergency service providers into the review process
- Require plans showing ventilation exhaust locations, emissions-control systems, and equipment requiring special containment

Impact assessments should require community and environmental impact statements evaluating:

- Energy demand and reliability requirements
- Water demand and wastewater generation
- Emissions, chemical usage and air-quality impacts
- Noise and vibration levels
- Hazardous or specialized waste streams, such as biological, chemical, particulate
- Emergency service requirements
- Municipal fiscal impacts
- Freight and truck movement patterns, especially for semiconductor and additive manufacturing

FREIGHT, LOGISTICS AND SUPPLY CHAIN

Freight is an essential function of every economy, connecting producers, suppliers and consumers both within the region and far beyond.

The facilities that support freight movement vary widely in size and purpose, and accommodate a diverse range of activities, including manufacturing, assembly, storage, staging and distribution. Freight-based land uses in Lehigh County depend on efficient connectivity by road, rail and air, and can take many forms such as distribution centers, fulfillment centers, truck terminals, industrial or business parks and light manufacturing operations.

Many modern freight facilities are multi-tenant or multi-purpose, designed for flexibility so different users can cycle in and out as business needs evolve. This adaptability allows the regional industrial market to respond quickly to economic shifts but can also complicate local planning, as turnover in tenants may lead to changing traffic, infrastructure, and environmental impacts. Inside the walls of these facilities, operations are often highly integrated. Production, assembly, packaging and distribution may occur under one roof or across multiple buildings within the same business park. In some cases, adjacent or nearby facilities operate in synergy, forming industrial ecosystems that depend on proximity and shared infrastructure.

Municipalities are encouraged to align definitions for all freight-based land uses with the Institute of Transportation Engineers (ITE) Trip Generation Manual, provided below. The ITE is the industry standard for estimating the traffic impacts of land uses, and aligning definitions helps ensure that facilities with freight impacts are accurately assessed to address transportation infrastructure needs. Freight-Based Facilities can be generally classified into the following high-level categories:

- Manufacturing
- Warehousing (with subsets)
- Fulfillment Center
- Industrial/Business Parks
- General Light Industrial

Manufacturing

ITE Definition: “A manufacturing facility is an area where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to the actual production of goods, a manufacturing facility typically has an office and may provide space for warehouse, research, and associated functions.”

Manufacturing facilities focus on producing finished goods, often with supporting functions such as research, warehousing and office operations. While manufacturing sites generate freight movements, the majority of trips are typically employee-related. Truck volumes depend on whether raw materials are stored on-site or off-site and on the scale of distribution operations. Because operational intensity and floor area use can vary by tenant or industry, zoning and land development standards should allow flexibility to accommodate different manufacturing processes over time.

Warehousing

ITE Definition: “A warehouse is primarily devoted to the storage of materials, but it may also include office and maintenance areas.”

Related uses include high-cube transload and short-term storage warehouses (Land Use 154*), high-cube fulfillment centers (155*), parcel hub warehouses (156*), and cold storage warehouses (157*).

Warehouses are primarily storage and logistics facilities that may include limited office or employee support space. Transportation impacts depend on the type of operation — short-term storage, transload, or specialized high-cube warehousing for e-commerce and parcel distribution. These facilities often generate moderate to heavy truck traffic, particularly during peak shipping hours. Rather than including blanket definitions for a “Warehouse” land use, municipalities should distinguish among these warehouse subtypes to ensure appropriate performance standards for circulation, access and buffering.

**Each number corresponds with an ITE Land Use Code*

Fulfillment Centers

ITE Definition: Fulfillment centers are categorized as sort or non-sort facilities:

- **Sort facilities** handle smaller items requiring extensive manual sorting, typically with high employee counts and greater vehicle trip generation.
- **Non-sort facilities** process larger items primarily through automated systems, resulting in fewer employees per square foot but similar freight activity.

Fulfillment centers represent the most logistics-intensive subset of warehousing, driven by e-commerce operations. These facilities often operate 24/7, generating high truck volumes and employee traffic during shift changes. Because of their size and transportation impacts, municipalities should require traffic impact studies that are accurate for the intended land use, as well as ensure truck routing is managed and that adequate infrastructure capacity is accounted for through the land development process.

Parcel Hubs/Distribution Centers

ITE Definition: A form of high-cube warehouse that serves as a regional and local freight-forwarder facility via airfreight and ground carriers.

Parcel Hubs/Distribution Centers are high intensity freight-based land uses that often have very large building footprints and generate significant peak-hour traffic.



Photo Credit: Prologis

Prologis Park 33, Lower Nazareth Township, has an automated system that demonstrates advancements in smart buildings to lower carbon footprints and make supply chain and logistics systems more sustainable.

Key Impacts Across Advanced Freight-Based Uses

Transportation & Freight Movement	High truck traffic volumes
	Increased passenger vehicle traffic during employee shift changes
	Need for safe truck routing from site to interchanges
	Need for multiple transportation modes, especially transit, to meet workforce needs
Site Circulation & Access	Tractor-trailer movements require large parking and circulation areas, truck staging, employee parking and loading docks
	Internal circulation conflicts between passenger vehicles and trucks
Infrastructure & Utility Demand	Roadway infrastructure demand, including pavement wear from heavy truck loads
	Need for adequate public utilities including electrical infrastructure to support industrial operations + Cold storage, increased automation, and autonomous vehicles all increase utility demand
Environmental Factors	Noise from trucks, loading docks and refrigeration units
	Air quality impacts from truck emissions and generators
	Light pollution from loading dock areas and security lighting
	Impervious surface coverage contributing to stormwater runoff and heat generation
Land Use Impacts	Large buildings with significant height and massing
	Tenant turnover may change impacts and operational intensity

Mitigation Strategies and Best Practices

Freight, Logistics and Supply Chain

Comprehensive Plans Should:

- Inventory and analyze existing transportation, utility and community facility capacity that support freight-based development.
- Identify appropriate areas for freight-based uses, such as industrial districts and areas with direct access to major roadways, rail or airports.
- Set goals and policies that protect residential and community-centered uses from freight-based land use impacts.
- Align future land use designations with regional freight networks, focusing on corridors with adequate capacity and multimodal goods-movement opportunities.
- Support economic resilience by recognizing the role of freight-oriented businesses, while balancing this with policies that mitigate transportation and environmental impacts.
- Incorporate sustainability goals, including reducing emissions, managing stormwater from large impervious surfaces, and encouraging renewable or energy-efficient systems.
- Reference related planning documents, such as Transportation Improvement Programs, Act 209 Traffic Impact Fee Studies, Hazard Mitigation Plans, Comprehensive Parks and Recreation Plans, and Capital Improvement Plans. Identify any necessary updates as Comprehensive Plan implementation steps.
- Promote intermunicipal coordination, especially where freight activity crosses municipal boundaries or relies on shared roadway and infrastructure systems.

Zoning Ordinance Considerations

Definitions

- Align definitions for Manufacturing, Warehousing, High-Cube Warehouses, Fulfillment Centers, Parcel Hubs, Industrial Parks, and Light Industrial Facilities with the ITE Trip Generation Manual to support accurate transportation impact evaluation.
- Differentiate primary freight-based uses from accessory functions such as small-scale storage, incidental shipping, or on-site fleet parking.

Districts

- Direct freight, logistics, and supply chain uses to zoning districts with:
 - + Adequate truck access to highways and key freight corridors
 - + Appropriate roadway capacity and turning geometry
 - + Public water and sewer availability
 - + Suitable electric and broadband infrastructure
 - + Safe multimodal access for employees and emergency services
- Avoid siting freight-intensive uses in or near:
 - + Residential neighborhoods
 - + Schools, parks, and community facilities
 - + Areas with inadequate roadway capacity or geometric constraints
 - + Environmental constraint areas, such as floodplains and wetlands
- Use overlay districts to direct high-intensity uses to strategic areas.

Regulations and Performance Standards

- Permit major freight-based uses as conditional uses to allow additional oversight of traffic, noise, lighting and environmental impacts.
- Establish building design and site-scale standards, including height, façade treatments and orientation of loading docks away from sensitive uses.
- Require adequate setbacks and buffering from adjacent properties.
- Establish and enforce noise limits at property lines, especially near residential or mixed-use districts.
- Establish lighting standards that limit glare and light spillover onto adjacent properties.
- Require adequate parking, loading and queueing spaces.
 - + Specify the inclusion of electrified tractor-trailer stalls and employee parking spaces.

Subdivision and Land Development Ordinance Considerations

Utility Capacity & Infrastructure

- Require site access via specified level of roadways with adequate capacity.
- Require applicants to demonstrate adequate public water and sewer service with confirmation from utility or infrastructure providers.

Site Design

- Require Pennsylvania-native landscaping and buffering, especially along building edges, loading areas, and property lines near non-industrial uses.
- Require visually aesthetic enclosures for loading docks, trailer parking, dumpsters, utilities, and mechanical equipment.
- Ensure safe and adequate site access for emergency vehicles, considering turning radii, drive aisle widths, and multiple access points for very large sites.
 - + Incorporate emergency service providers in the development review process.
- Require on-site circulation plans that prevent on-road queueing and ensure safe separation between truck traffic and employee or visitor traffic.
- Require snow and ice removal equipment for trucks in freight-based land uses to help drivers comply with state regulations and minimize roadway hazards.

Impact assessments should require community and environmental impact statements evaluating:

- Trip generation, including truck volumes and peak-hour movements
- Traffic impacts on surrounding roadways and intersections
- Noise levels from trucking, mechanical systems and 24/7 operations
- Emissions and air-quality impacts
- Emergency service needs and response requirements
- Municipal fiscal impacts, including infrastructure maintenance
- Freight routing patterns and mitigation of cut-through traffic in residential areas

AUTONOMOUS VEHICLES AND FREIGHT-BASED LAND USES

Autonomous vehicles (AVs) are self-driving technologies that use sensors, cameras, radar, and artificial intelligence to navigate without or with limited human input.

Within the freight and logistics sector, autonomous technologies are emerging most rapidly in long-haul trucking, last-mile delivery, and yard or warehouse operations.

Freight AVs range from autonomous tractor-trailers operating on major highway corridors to automated yard tractors, forklifts, and delivery robots functioning within controlled industrial environments. Fully autonomous trucking is permitted on public roads, with the Pennsylvania Legislature signing Act 130 into law in 2022, which authorizes automated vehicles on roadways with PennDOT certification. As technology advances, logistics companies are investing heavily in AV-ready infrastructure, such as smart distribution centers, digitally connected loading areas, and logistics corridors designed for safe, efficient automation.

In the Lehigh Valley, where freight volumes are among the highest in Pennsylvania, autonomous vehicle technologies are expected to play a growing role in improving efficiency and addressing labor shortages in trucking and warehouse operations. However, these innovations will also have land use, infrastructure, and safety implications that municipalities should anticipate in local planning and regulatory frameworks.

Best Practices

Autonomous Vehicles and Freight-Based Land Uses

Comprehensive Plans Should:

- Inventory and analyze existing transportation, utility and community facility capacity that:
 - + Recognize autonomous freight technology as a long-term trend in goods movement and incorporate related infrastructure and workforce implications into transportation, land use, and economic development elements.
 - + Identify AV-ready freight corridors and industrial districts where connected infrastructure can be prioritized, particularly near interstates, intermodal facilities, and business parks.
 - + Encourage partnerships with PennDOT, LVPC, and private-sector logistics operators to coordinate pilot programs and share data on automation impacts.

Zoning Ordinance Considerations

- Define autonomous vehicle facilities (such as AV truck hubs, testing centers, or charging depots) as specific use categories within industrial or logistics districts.
- Require performance standards for noise, lighting and safety systems associated with continuous automated operations.
- Support adaptive reuse of existing freight facilities for AV staging, fleet charging and maintenance, ensuring compatibility with surrounding uses.

Subdivision and Land Development Ordinance Considerations

- Require site plans to account for automated circulation patterns, vehicle staging, and emergency access routes within industrial developments.
- Encourage the integration of smart infrastructure — including sensors, fiber optic connectivity, and electric vehicle (EV) charging stations — into new industrial park designs.
- Coordinate with PennDOT and regional planning agencies to ensure new development aligns with connected-vehicle infrastructure standards and emerging statewide AV policies.

ENERGY GENERATION, STORAGE AND MANAGEMENT

Nuclear Energy

Nuclear facilities generate electricity through controlled nuclear reactions that produce heat. Although Pennsylvania currently hosts large regional nuclear facilities, future trends may include small modular reactors (SMRs) designed to serve regional grids, or microreactors that could support large industrial or campus-style energy demands.

Impacts

- Large-scale energy generation facilities may require substantial land area and separation distances to ensure compatibility with surrounding land uses.
- Certain energy generation technologies may involve significant water use or water-related infrastructure, requiring coordination with state environmental permitting agencies.
- Transportation of specialized industrial equipment, fuel, or waste materials may present regional logistics and infrastructure considerations.
- Energy generation facilities may create visual, aesthetic, or perception-related impacts associated with industrial structures, supporting infrastructure, and access controls.



Nuclear energy facilities are regulated exclusively by the federal government through the U.S. Nuclear Regulatory Commission (NRC) under the Atomic Energy Act. While state and local governments may not regulate nuclear facilities based on reactor safety or radiological risk, municipalities retain their traditional land-use authority over non-safety-related issues.

These include

LAND-USE	SITE ACCESS	INFRASTRUCTURE
STORMWATER	VISUAL IMPACTS	PUBLIC SERVICES

Best Practices

Energy Generation, Storage and Management

Comprehensive Plans Should:

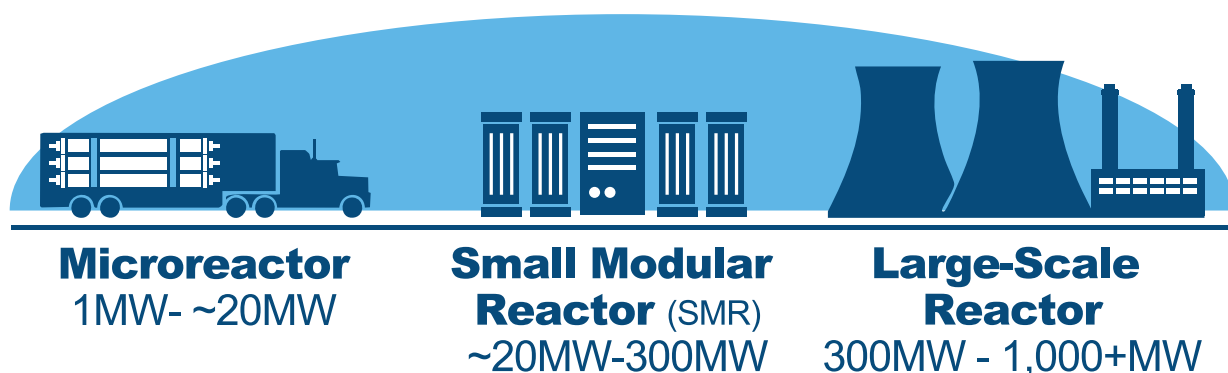
- Identify appropriate locations for large-scale or campus-oriented energy generation facilities based on access to transmission infrastructure, transportation networks, water resources, and surrounding land-use patterns.
- Address intergovernmental coordination and emergency management communication frameworks applicable to major industrial and energy facilities, consistent with state and federal roles and responsibilities.

Zoning Ordinance Considerations

- Establish energy generation facilities, including nuclear energy generation, as permitted uses, conditional uses, or special exceptions, subject to objective zoning standards applicable to large-scale industrial or utility uses.
- Apply setbacks, buffering, and dimensional standards based on land-use compatibility, visual impacts, noise, and protection of adjacent uses, without regard to radiological or reactor safety considerations.
- Consider overlay zoning districts for large-scale energy and utility infrastructure that encompass generation, transmission, and supporting facilities.

Subdivision and Land Development Ordinance Considerations

- Require detailed site plans addressing stormwater management, grading, access, utilities, landscaping, and other customary land development considerations.
- Allow for coordination and information-sharing with emergency management agencies and infrastructure providers related to construction logistics and site access, without evaluating nuclear safety or other federally regulated matters.



Graphic Credit: Stanford University, adapted from U.S. Department of Energy

*MW = Megawatt

Solar Energy

Solar energy systems convert sunlight into electricity using photovoltaic (PV) panels or solar thermal technologies. Systems range from small rooftop installations to utility-scale solar farms spanning dozens or hundreds of acres.

Impacts

- Large ground-mounted arrays may alter rural landscapes, consume farmland and affect stormwater runoff
- Reflectivity and glare can impact nearby roads or airports
- Decommissioning and recycling of panels require long-term management plans

Best Practices

Comprehensive Plans Should:

- Designate suitable areas for solar energy, prioritizing brownfields, rooftops, parking lots and other previously disturbed lands.
- Integrate solar siting goals into future land use and energy resilience planning.

Zoning Ordinance Considerations

- Define solar energy systems by types, such as accessory, community-scale and utility-scale.
- Establish performance standards for glare, screening, setbacks, fencing and pollinator-friendly groundcover.
- Consider agricultural zoning flexibility for dual-use “agrivoltaics” projects that combine farming and energy production.

Subdivision and Land Development Ordinance Considerations

- Require plans for grading, drainage and soil stabilization under arrays.
- Include decommissioning and financial assurance requirements to restore land to pre-development conditions.
- Ensure access roads and fire lanes meet emergency service needs.

Hydroelectric

Hydroelectric power uses flowing or stored water to turn turbines and produce electricity. While large dams are uncommon in Lehigh County, smaller run-of-river and micro-hydro projects may emerge on existing waterways or dam retrofits.

Impacts

- Alteration of aquatic habitats and stream flow
- Fish migration barriers and sedimentation changes
- Potential flooding, erosion, or downstream water quality effects
- Safety considerations for public recreation and access near facilities

Best Practices

Comprehensive Plans Should:

- Identify opportunities for renewable energy production using existing dams or water infrastructure.
- Incorporate watershed and ecological protection objectives in energy planning.

Zoning Ordinance Considerations

- Limit siting to areas with existing hydrologic infrastructure or previously altered waterways.
- Require coordination with the Pennsylvania Department of Environmental Protection (DEP) and U.S. Army Corps of Engineers.
- Include riparian buffer and floodplain protection requirements.

Subdivision and Land Development Ordinance Considerations

- Require hydrologic and environmental studies prior to approval.
- Evaluate impacts on public access, recreation, and streambank stabilization.
- Incorporate erosion and sedimentation control standards specific to water-based facilities.

Wind Energy

Wind energy facilities convert the kinetic energy of wind into electricity using turbines. Projects may be utility-scale, with large towers on ridgelines or open plains, or small-scale for agricultural or commercial sites.

Impacts

- Visual and aesthetic changes to landscapes and ridgelines
- Noise and shadow flicker effects on nearby residences
- Bird and bat mortality, especially in migratory corridors
- Construction access impacts on rural roadways and hillsides

Best Practices

Comprehensive Plans Should:

- Map ridgelines, open plains and other areas with sufficient wind resources while protecting scenic and environmental resources.
- Incorporate policies for renewable energy production and community benefit sharing.

Zoning Ordinance Considerations

- Define wind energy systems by scale (small, community, utility).
- Require setbacks from dwellings, property lines, and public rights-of-way based on turbine height.
- Include performance standards for noise, shadow flicker, and decommissioning.
- Require visual impact assessments and coordination with FAA and state aviation agencies for turbine height compliance.

Subdivision and Land Development Ordinance Considerations

- Require construction access and grading plans that minimize erosion on steep slopes.
- Include decommissioning and site restoration requirements with financial guarantees.
- Ensure turbine foundations and electrical systems meet local and national safety codes.

Storage of Power

Battery Energy Storage Systems (BESS) capture and hold energy for later use, improving grid reliability and supporting renewable integration. Systems may include battery storage (lithium-ion or flow batteries), thermal storage, or compressed air systems, ranging from small on-site installations to large standalone “battery farms.”

Impacts

- Fire safety and explosion risks from battery failures
- Noise and heat generation from cooling and ventilation systems
- Visual and compatibility issues in residential or mixed-use areas
- Decommissioning and disposal of batteries requiring specialized handling

Best Practices

Comprehensive Plans Should:

- Integrate microgrids into community resilience strategies for storms, grid failures, and critical facilities (e.g., hospitals, data centers).
- Plan for integration with the utility grid, broadband, and emergency management systems.

Zoning Ordinance Considerations

- Allow in industrial, commercial, institutional or mixed-use zones where more energy-consumptive land uses are located.
- Provide expedited permitting or density/intensity bonuses for renewable-powered facilities.
- Establish energy storage as a distinct use, separate from general utilities or manufacturing.
- Require compliance with National Fire Protection Association (NFPA) 855: Standard for the Installation of Stationary Energy Storage Systems.
- Include setbacks, screening and fire safety access standards.
- Consider requiring special exception review for large standalone systems to ensure compatibility.

Subdivision and Land Development Ordinance Considerations

- Require plans to show electrical connections, battery storage enclosures, emergency access, fire suppression systems and noise buffers.
- Require fire safety measures, hazardous material handling protocols and coordination with local first responders.
- Include decommissioning and recycling plans for spent batteries or equipment.

ALTERNATIVE FUELING

As the transportation and industrial sectors transition toward cleaner and more efficient technologies, alternative fueling infrastructure is becoming a critical component of local and regional energy systems.

These facilities support vehicles powered by electricity, hydrogen, and compressed natural gas (CNG), each with unique siting, safety and infrastructure needs.

For municipalities, planning for these land uses helps reduce emissions, strengthen regional competitiveness, and ensure the local road network and utility systems are ready for the next generation of freight and passenger vehicles.

Electric Vehicle Charging Stations

Electric vehicle (EV) charging stations deliver electrical power to recharge battery-electric or plug-in hybrid vehicles. Facilities range from Level 1 and Level 2 chargers in parking lots or garages to Direct Current (DC) fast-charging hubs serving fleets or highway travelers.

Impacts

- Increased electrical load on local grids and potential need for utility coordination
- Parking layout changes and accessibility requirements
- Potential site design conflicts with pedestrian or traffic circulation

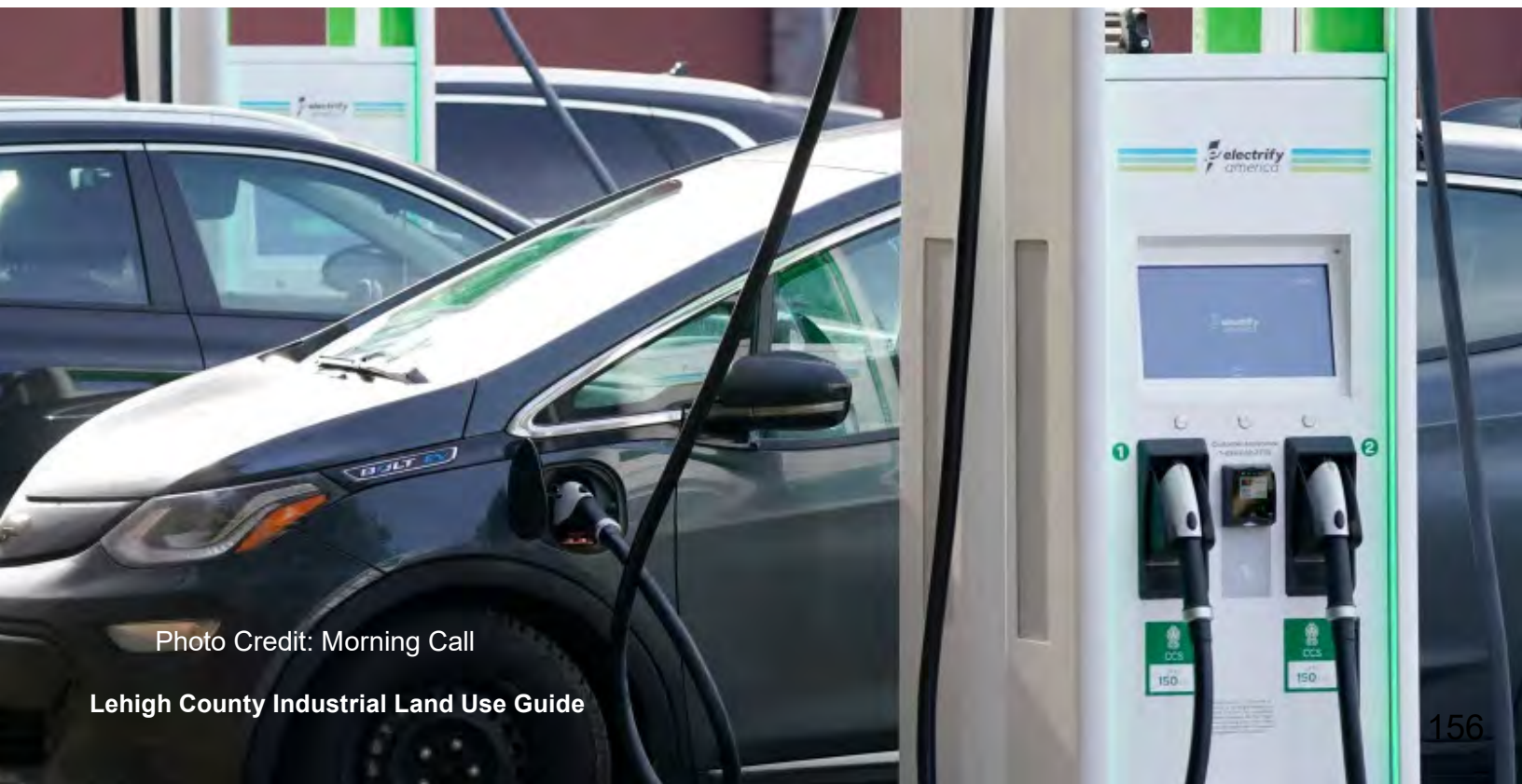


Photo Credit: Morning Call

Best Practices

Alternative Fueling

Comprehensive Plans Should:

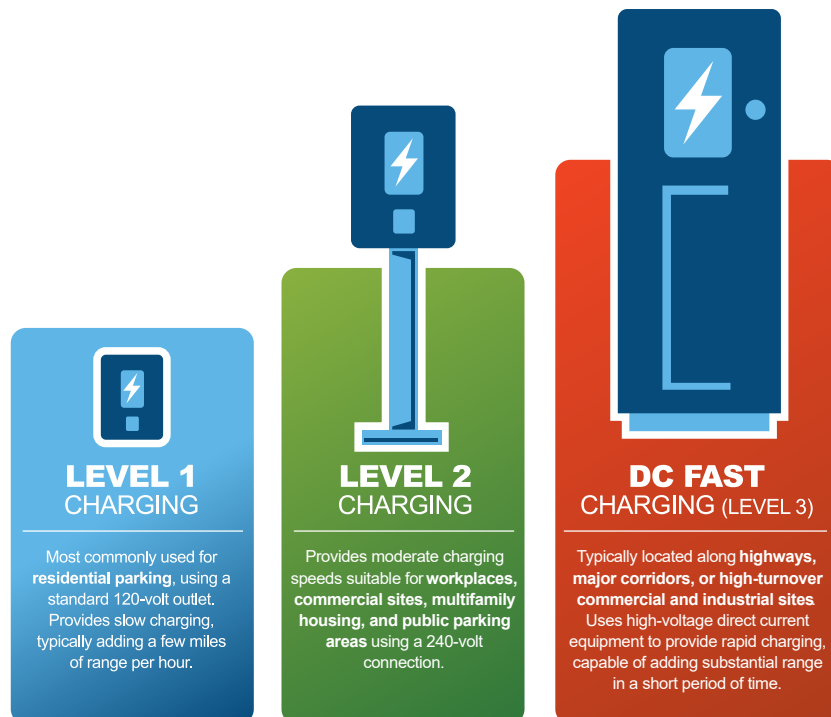
- Incorporate EV infrastructure into transportation and sustainability elements.
- Identify strategic corridors and community destinations for charging investment (downtowns, employment centers, freight routes).
- Encourage integration with renewable energy or battery-storage systems for grid resilience.

Zoning Ordinance Considerations

- Define EV charging stations as a principal or accessory use depending on scale.
- Allow Level 1 and 2 chargers by right in most zoning districts; require conditional or special exception review for large DC fast-charging plazas.
- Establish standards for signage, lighting, screening and Americans with Disabilities Act-compliant accessibility.
- Encourage shared-use parking and integration with existing commercial or public lots.

Subdivision and Land Development Ordinance Considerations

- Require site plans showing electrical connections, conduit placement and protective bollards.
- Coordinate with utility providers early in design.
- Ensure drainage, landscaping, and pedestrian circulation maintain safety and accessibility.



Hydrogen Fueling Stations

Hydrogen fueling stations store and dispense compressed hydrogen gas used to power fuel-cell vehicles. These may serve heavy-duty fleets, transit vehicles, or long-haul trucks and often co-locate with industrial or freight facilities.

Impacts

- High-pressure gas storage presents fire and explosion risks
- Requires significant setbacks, emergency access, and ventilation
- Visual and compatibility concerns near residential or commercial areas
- High capital cost and reliance on specialized supply chains

Best Practices

Comprehensive Plans Should:

- Incorporate hydrogen fueling infrastructure into transportation and sustainability elements.
- Establish policies directing hydrogen fueling to appropriate corridors, particularly near interstate interchanges or distribution centers.
- Coordinate with regional transportation and energy providers to ensure safety and supply reliability.
- Include hydrogen infrastructure in climate and clean-energy strategies.

Zoning Ordinance Considerations

- Define hydrogen fueling as a distinct use under “Alternative Fueling Facilities.”
- Limit siting to industrial, highway commercial or heavy commercial districts.
- Require compliance with National Fire Protection Association 2 (NFPA 2): Hydrogen Technologies Code and local fire-safety standards.
- Establish minimum setbacks from occupied structures and public rights-of-way.
- Require emergency access and signage consistent with hazardous-material regulations.

Subdivision and Land Development Ordinance Considerations

- Require engineered site plans detailing storage tanks, dispensing equipment, containment and ventilation.
- Coordinate review with fire marshals and emergency management officials.
- Include drainage and containment design to prevent runoff contamination.
- Require decommissioning and inspection protocols for storage vessels.



Photo Credit: Air Products

Air Products' state-of-the-art hydrogen fueling station located at its industrial gases facility in Ulsan City, South Korea, is the first station in the city built and operated by the private sector under the South Korea government's subsidy program.

Compressed Natural Gas (CNG) Fueling Stations

CNG stations store and dispense natural gas that has been compressed to less than 1% of its volume at standard atmospheric pressure. CNG is used by municipal fleets, buses and freight vehicles as a lower-emission alternative to gasoline or diesel.

Impacts

- Safety risks from pressurized gas storage and handling
- Increased truck or bus traffic at fueling depots
- Odor, noise, and visual impacts from compressors and venting equipment
- Potential conflict with adjacent sensitive land uses if not properly sited

Best Practices

Comprehensive Plans Should:

- Include policies supporting suitable corridor locations for CNG fueling, especially near transit or logistics facilities.
- Integrate CNG planning with municipal fleet-conversion or clean transportation goals.
- Encourage co-location with maintenance yards or industrial parks to reduce land-use conflicts.

Zoning Ordinance Considerations

- Define CNG fueling as a specific land use under “Alternative Fueling” or “Utility and Energy Uses.”
- Limit to highway commercial or industrial districts with adequate buffering.
- Include standards for noise, lighting, odor, and equipment screening.
- Ensure adequate distance from residential or institutional uses.

Subdivision and Land Development Ordinance Considerations

- Require detailed site plans showing compressors, storage cylinders, piping and emergency shut-off locations.
- Include ventilation and containment systems in design review.
- Coordinate with utilities for gas-line pressure requirements and emergency response planning.
- Require ongoing maintenance and inspection documentation for compliance.



Resource Extraction

While heavy industries like mining, quarrying and raw material processing have declined in many regions, demand for certain materials is surging again due to the technologies driving today's economy.

Resource extraction and material supply industries encompass the mining, quarrying, and processing of raw materials such as stone, cement, slate, and sand that form the backbone of construction and manufacturing. In the Lehigh Valley, these industries have long shaped regional identity and economic development. The Valley's abundant limestone and cement deposits supported the rise of the American cement industry in the 19th and 20th centuries, while nearby slate, iron and aggregate operations drove industrial growth that laid the foundation for today's economy.

Although large-scale extraction has declined, this sector is transforming, not disappearing. Modern operations are becoming more efficient, technology-driven, and environmentally responsible, with greater emphasis on reclamation, material recycling, and circular-economy practices. Many active quarries now integrate aggregate recycling, soil blending, or material recovery operations to reduce waste and extend the life of local resources.

At the same time, global industrial evolution is reshaping material demand. The transition to clean energy, electric vehicles, advanced manufacturing, and digital infrastructure is fueling a worldwide surge in demand for minerals such as lithium, nickel, copper, and rare earth elements. While Pennsylvania is not a major source of these critical minerals, it remains a significant supplier of construction materials and cement and participates in national supply chains that depend on stable domestic sources. As U.S. policy increasingly prioritizes domestic resource security and recycling, Pennsylvania's material-processing and reclamation industries will play a key supporting role.

Locally, this means that even as new extraction slows, municipalities may see growth in material handling, secondary processing and recycling operations that function much like traditional resource extraction uses. These activities — such as concrete and asphalt recycling, metals reclamation, or the reuse of byproducts from energy or manufacturing — represent the modern evolution of the same land use category.

Impacts

- **Environmental:** Dust, noise, vibration and water quality impacts from extraction or crushing operations. Habitat disturbance and visual impacts in rural and scenic areas.
- **Infrastructure:** Heavy truck traffic, roadway wear and safety concerns on local roads serving quarry or processing sites.
- **Land Use Compatibility:** Conflicts with nearby residential or agricultural uses due to noise, hours of operation, or aesthetics.
- **Post-Use Challenges:** Long-term management of inactive or reclaimed sites, including safety and redevelopment readiness.
- **Opportunities:** Adaptive reuse of reclaimed sites for recreation, renewable energy, stormwater management or redevelopment.

Best Practices

Resource Extraction

Comprehensive Plans Should:

- Recognize existing and historic mining, quarrying and cement production areas within the Future Land Use Map.
- Designate mineral resource overlay areas consistent with the Pennsylvania Municipalities Planning Code (§603(i)) to protect known deposits and ensure compatibility with nearby uses.
- Plan for post-extraction reuse of sites for recreation, open space, energy generation (e.g., solar installations) or redevelopment.
- Address connections between resource extraction, freight routes, and industrial supply chains to ensure safe and efficient goods movement.
- Incorporate recycling, reclamation and circular-material industries as emerging components of the regional economy.

Zoning Ordinance Considerations

- Define extraction-related uses clearly (e.g., mineral extraction, quarrying, aggregate recycling, material processing) to distinguish between traditional extraction and modern reclamation or recycling.
- Limit these uses to industrial or mineral-resource districts with adequate buffering from residential or institutional uses.
- Establish performance standards for blasting, dust, truck routing and hours of operation to minimize community impacts.
- Require landscaping, berming and visual screening to reduce aesthetic impacts.
- Support transitional and circular economy uses within existing industrial areas that handle, recycle, or repurpose materials.

Subdivision and Land Development Ordinance Considerations

- Require site and reclamation plans addressing grading, erosion control, stormwater management and future site reuse.
- Coordinate with Pennsylvania DEP permitting under the Noncoal Surface Mining Conservation and Reclamation Act and related regulations.
- Include truck circulation and access management standards to reduce conflicts with local roads.
- Require bonding or financial assurance for reclamation and long-term maintenance.
- Encourage redevelopment-ready reclamation that aligns with future land use and economic goals



Penn Slate operates an active slate mine in Washington Township just outside of Slatington Borough. Photo Credit: Penn Praxis





MANAGING INDUSTRIAL LAND USE IMPACTS

Lehigh County's industrial landscape has already been shaped by decades of growth in manufacturing, warehousing and logistics. These uses remain vital to the regional economy, but they also generate ongoing impacts on infrastructure, utilities, the environment, community character and quality of life. Municipalities can address these challenges not only when new projects are proposed but also as part of managing the day-to-day realities of existing industrial operations. The following topics outline key areas of concern and provide best practices that local governments can use to manage existing industrial land uses more effectively.

The following section outlines ways municipalities can address specific impacts.

TRANSPORTATION INFRASTRUCTURE

Roads and Bridges

Industrial development in Lehigh County depends heavily on the regional road network.

Warehousing, logistics and manufacturing generate substantial truck traffic that affects local roads and bridges, particularly near highway interchanges and industrial corridors. As freight volumes grow, municipalities must balance the economic benefits of access with the costs of maintenance, congestion and safety.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Identify key freight routes and roadways suitable for truck access. Discourage industrial development along local streets not built for heavy vehicles.
- **Zoning:** Require industrial sites to locate near arterial roads or highway interchanges, with clearly designated truck access points.
- **SALDO:** Mandate traffic impact studies accurate for the intended land use for new or expanded industrial projects and require developers to fund off-site roadway or intersection improvements.
 - + Require on-site design that safely accommodates truck turning movements, staging and parking without impacting public roads.
 - + Require snow and ice removal equipment for trucks in freight-based land uses to help drivers comply with state regulations and minimize roadway hazards.
- Implement local truck routing ordinances or signage to keep heavy vehicles on preferred corridors.
- Coordinate with PennDOT and Lehigh Valley Transportation Study (LVTS) to prioritize freight-related infrastructure investments.

Air Travel

Air travel infrastructure, especially Lehigh Valley International Airport (ABE), is an integral part of the region's freight network, supporting time-sensitive shipments and specialized cargo.

Industrial and logistics growth around the airport creates both opportunity and planning challenges, including noise exposure, airspace protection, and land use compatibility. Municipalities near flight paths or airport influence areas must balance economic development with community impacts and aviation safety.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Include airport influence areas and flight paths in land use maps to guide compatible development.
- **Zoning:** Establish airport overlay districts to limit building height, lighting and electromagnetic interference. Ensure compatible land uses near airports.
 - + Encourage logistics and industrial uses that directly benefit from proximity to the airport, while maintaining appropriate buffering from residential areas.
- **SALDO:** Require Federal Aviation Administration (FAA) and airport authority coordination for developments within defined approach or transition zones.
 - + Support multimodal connections between air freight facilities, roadways, and rail to reduce congestion and improve efficiency.



Cargo plane for FedEx Express in Hanover Township. Lehigh County.

Rail

Rail remains a key component of Lehigh County's industrial and freight network, connecting local industries to regional and national markets.

Industrial development near existing rail lines can improve efficiency and reduce truck dependency, but it also presents unique safety, noise and access challenges. Municipalities can play a role in protecting rail corridors, supporting rail-served development, and ensuring that rail-adjacent uses are compatible with surrounding communities.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Identify and protect existing rail corridors and sidings for industrial and freight uses; encourage redevelopment of brownfield or obsolete industrial sites with rail access.
 - + Encourage rail as part of multimodal freight planning to reduce truck dependency and roadway impacts.
- **Zoning:** Create or update industrial districts that support rail-served uses, with appropriate setbacks and buffering from sensitive land uses.
 - + Promote adaptive reuse of older industrial properties near rail for modern, rail-compatible industries.
- **SALDO:** Require coordination with rail operators for developments adjacent to rail lines or crossings; ensure safe design for truck and employee access.
 - + Support grade separation projects and safety enhancements at rail crossings where feasible.



Freight trains stationed outside of an open space area in East Allen Township.

UTILITY INFRASTRUCTURE

Water

Industrial facilities can place significant demands on local water systems, whether through high-volume users like food and beverage manufacturing, cold storage, or data centers, or by expanding into areas without adequate infrastructure.

In Lehigh County, where communities rely on a mix of municipal systems, private wells, and regional authorities, these pressures can strain capacity or create costly infrastructure needs.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Map existing and planned water infrastructure to guide industrial growth to serviceable areas.
- **Zoning:** Require water-intensive uses (e.g., data centers, food processors) to locate in districts with adequate public water service.
- **SALDO:** Mandate proof of adequate water supply and capacity before plan approval, including coordination letters from water providers.
- Require developers to fund necessary extensions or upgrades to municipal water systems as opportunities present themselves, rather than shifting costs to the community.
- Incorporate water conservation and efficiency requirements into zoning performance standards, especially for high-demand uses.
- Encourage industrial users to adopt alternative water systems (graywater reuse, rainwater harvesting) to reduce reliance on potable supplies.

Sewer

Industrial growth can overwhelm existing sewer systems, especially when large-scale facilities concentrate in areas not built for high wastewater flows.

In Lehigh County, many municipalities with development areas rely on local sewer authorities with aging infrastructure that may already be near capacity. Uncoordinated expansion can lead to capacity shortfalls, costly upgrades and water quality risks, and service extensions may drive unplanned sprawl or conflict with preservation goals.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Identify areas with sufficient sewer capacity for industrial growth and avoid designating sewer-dependent uses in areas without planned service.
 - + Update Official Sewage Facilities Plans (Act 537).
- **Zoning:** Direct intensive industrial uses to districts with existing or expandable sewer infrastructure. Require pretreatment facilities for high-strength or specialized waste streams.
- **SALDO:** Require developers to demonstrate available sewer capacity before approval, including written confirmation from the sewer authority.
 - + Condition approvals on necessary upgrades or expansions being funded by the developer rather than the municipality or ratepayers.
 - + Establish clear standards for industrial wastewater discharge, including pretreatment requirements where needed.
 - + Coordinate land use approvals with regional sewer authorities early in the review process to avoid service conflicts or capacity shortfalls.

Stormwater

Industrial facilities create large impervious surfaces that increase stormwater runoff, flooding and pollution risks.

In Lehigh County, where stormwater management is regulated at both the local level by the municipality and at the watershed level by LVPC, many communities have older systems that weren't designed for today's scale of development combined with increasing rainfall. Without proactive management, stormwater can degrade streams, overwhelm infrastructure, heighten local flood risks.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Identify flood-prone and environmentally sensitive areas, steering industrial development away from high-risk locations.
- **Zoning:** Require stormwater management practices that reduce peak runoff, protect water quality and encourage green infrastructure (bioswales, rain gardens, permeable pavement).
- **SALDO:** Mandate detailed stormwater management plans with development applications, ensuring compliance with state Municipal Separate Storm Sewer System regulations (MS4) and Act 167 watershed requirements.
- Require developers to establish long-term maintenance agreements for stormwater facilities, with clear responsibilities and funding mechanisms.
- Encourage retrofitting of older industrial sites with improved stormwater controls during redevelopment.
- Promote site design that minimizes impervious coverage through shared parking, reduced pavement, and compact building footprints.

Waste Disposal

Industrial uses generate solid and hazardous waste that can strain local systems if not properly managed.

High volumes of packaging, pallets, and other materials from warehouse and logistics operations can overwhelm local disposal and recycling systems, and certain manufacturing processes produce specialized wastes requiring pretreatment or off-site disposal. In Lehigh County, improper storage or disposal risks contaminating groundwater, impacting neighboring land uses, or burdening municipal services.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Establish policies for sustainable waste management, including recycling and reduction goals, that industrial land uses should support.
- **Zoning:** Require on-site waste and recycling storage areas to be screened from public view and designed to prevent nuisances.
- **SALDO:** Mandate inclusion of adequate waste handling, storage and pickup facilities in site plans, sized appropriately for the scale of industrial operations.
- Coordinate with county and regional solid waste management plans to ensure capacity and compliance with broader goals.
- Encourage or require recycling and reuse programs for common industrial materials such as pallets, cardboard and plastics.
- For specialized or hazardous waste generators, require proof of compliance with Pennsylvania DEP and federal disposal standards as part of land development approval.

Electricity

Industrial operations are among the largest consumers of electricity, and demand is growing as energy-intensive uses like data centers, cold storage, and advanced manufacturing or logistics hubs expand in Lehigh County. Reliable, resilient power is essential for these facilities, and high demand can cause service disruptions and costly upgrades if siting and use is not coordinated.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Coordinate future land use designations with areas that have sufficient electrical infrastructure or where upgrades are planned.
- **Zoning:** Require siting standards for substations and generators, including screening, setbacks and noise/emission controls.
- **SALDO:** Mandate documentation from utility providers confirming service capacity before project approval.
- Require developers to finance necessary electrical system upgrades rather than shifting costs to the municipality or ratepayers.
- Encourage or require energy-efficient building design and renewable energy integration, such as solar-ready rooftops and EV charging infrastructure.
- Coordinate with utilities and regional grid operators early in the planning process to align infrastructure planning with industrial growth.

Broadband

Modern industries depend on high-speed broadband for logistics, operations, and advanced technologies. In Lehigh County, gaps in broadband coverage or capacity can limit industrial growth, and if new land uses outpace broadband infrastructure, that may leave facilities and surrounding communities without reliable service.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Identify broadband access as critical infrastructure, mapping service availability and prioritizing connected areas for industrial development.
- **Zoning:** Require new data centers or high-tech facilities to demonstrate broadband redundancy and reliability as part of approval.
- **SALDO:** Mandate installation of conduit or fiber-ready infrastructure in new industrial subdivisions and developments.
- Coordinate with broadband providers early in the land development review process to ensure capacity and timely installation.
- Encourage or require “dig once” policies so that when roads or utilities are opened for construction, broadband conduit is installed concurrently.
- Partner with county and regional broadband initiatives to align industrial growth with long-term digital infrastructure investments.

EMERGENCY MANAGEMENT

Emergency Response

Industrial facilities can pose heightened risks for fire, hazardous materials and worker safety incidents. In Lehigh County, where many municipalities rely on volunteer emergency services and regional coordination, industrial land uses can stretch local response capacity. Ensuring that emergency services can access sites quickly and safely, and that facilities have appropriate safety plans in place, is essential to protecting workers and nearby residents.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Include coordination with emergency services in land use policies. Identify response time gaps and plan for mutual aid agreements.
- **Zoning:** Require safety and hazard mitigation plans for high-risk industrial uses, including materials storage, evacuation routes and suppression systems.
- **SALDO:** Mandate review of site plans by local fire and emergency services to ensure adequate access, hydrant placement, and water flow.
 - + Ensure that emergency responders receive appropriate training or site orientation prior to occupancy.
- Require industrial developers to provide on-site fire protection infrastructure, such as hydrants, sprinklers, or water storage where public supply is limited.
- Coordinate with local emergency management agencies for training and response planning tailored to facility operations.
- Encourage or require developers to contribute to emergency service infrastructure or equipment needs when projects significantly increase risk exposure.

Access

Safe, efficient site access is a key factor in managing industrial land use impacts. Facilities generate frequent truck and employee traffic, and poorly designed entrances or internal circulation can create hazards for both site users and the public. In Lehigh County, industrial access design plays a critical role in maintaining safety, reducing congestion and ensuring emergency responders can reach facilities when needed.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Identify preferred access routes for industrial areas, linking them to major corridors while minimizing neighborhood impacts.
- **Zoning:** Require separate truck and passenger vehicle access points where feasible and set minimum driveway spacing and turning radius standards.
- **SALDO:** Mandate transportation impact studies that evaluate access design, intersection function and safety improvements. Require developer-funded mitigation.
- Require adequate turning radii, internal circulation loops and designated truck staging areas to prevent queuing on public streets.
- Coordinate access design with PennDOT and county agencies to ensure consistency with highway occupancy and freight movement standards.
- Require signage, lighting and pavement markings that clearly separate truck, employee and visitor routes within large sites.

PARKING

Visitor Parking

Visitor parking at industrial sites supports business operations, meetings and deliveries but is often overlooked during site planning. While visitor traffic is typically lower than employee or truck traffic, inadequate parking or poor placement can create safety conflicts and accessibility issues, especially when visitors must navigate active loading or truck areas.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Promote safe, accessible design for visitor parking areas as part of overall site circulation policies.
- **Zoning:** Require visitor parking to be located near primary entrances and separate from loading and truck areas.
- **SALDO:** Mandate pedestrian connections from visitor spaces to building entrances that are ADA-compliant and well-lit.
- Encourage clear signage and wayfinding to distinguish visitor parking from employee and truck areas.
- Allow reduced visitor parking requirements where demand is low or shared parking arrangements are appropriate.
- Require landscaping or green buffers to soften visual impacts along road frontages.

Employee Parking

Employee parking directly influences site design, land use efficiency and transportation patterns.

Industrial facilities often operate multiple employee shifts, leading to varying parking demands and concentrated traffic peaks during shift changes. Large parking lots can consume significant amounts of land, increase stormwater runoff and reduce space available for buildings, landscaping, or sustainable site features. At the same time, insufficient parking can affect employee accessibility and operations, especially in areas without robust transit service.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Encourage right-sizing parking to balance availability with land conservation. Promote safe and efficient site access and use of alternative transportation modes.
- **Zoning:** Establish employee parking minimums and maximums by industrial use type.
- **SALDO:** Require site plans to demonstrate safe pedestrian circulation between employee parking and building entrances. Require separation of employee parking from loading areas.
- Encourage alternative transportation options such as carpooling, public transit, biking and walking to lower parking demand.
- Support transit-oriented development and shared mobility infrastructure near industrial employment centers to reduce the need for large surface lots.

Truck Parking

Truck parking, loading and staging are among the most critical and challenging aspects of industrial site design in Lehigh County.

The region's role as a major freight and logistics hub means that industrial facilities depend on the safe and efficient movement of heavy vehicles. When on-site truck parking or loading areas are insufficient, drivers often resort to idling or parking along public roads, creating congestion, safety hazards and community concerns. Truck parking and loading facilities also consume large land areas, influencing site layout, traffic circulation, and the overall efficiency of industrial land use. Poorly planned or oversized facilities can generate noise, air pollution and visual impacts that affect nearby residents, workers and property values.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Identify freight infrastructure as part of goods-movement planning; map preferred industrial corridors and suitable sites for truck parking facilities that minimize neighborhood impacts.
- **Zoning:** Require industrial developments to provide dedicated on-site truck parking and staging areas separated from employee and visitor parking.
- **SALDO:** Mandate circulation plans that include designated truck entrances, queuing areas, and turning radii suited to large vehicles. Minimize community impacts by prohibiting truck parking and loading areas from facing residential districts. Require aesthetic, noise and light mitigation strategies such as downward lighting, buffering, berms and landscaping, and sound level restrictions and monitoring. Require electric plug-in infrastructure or anti-idling measures to reduce emissions at parking and loading areas.
- Support regional initiatives, such as the Eastern Pennsylvania Freight Infrastructure Plan (EPFA), which emphasize expanding overnight truck parking capacity to meet growing freight demands.



Truck parking in Upper Macungie Township.

ENVIRONMENTAL FACTORS

Noise

Noise is one of the most common community concerns associated with industrial land uses. Truck movements, loading docks, refrigeration units, cooling systems, backup generators and around-the-clock operations can create constant or intermittent noise that affects nearby residents and businesses. In Lehigh County, where industrial areas are often close to residential neighborhoods or mixed-use corridors, managing noise is essential to maintaining quality of life and community compatibility.

Mitigation Strategies and Best Practices

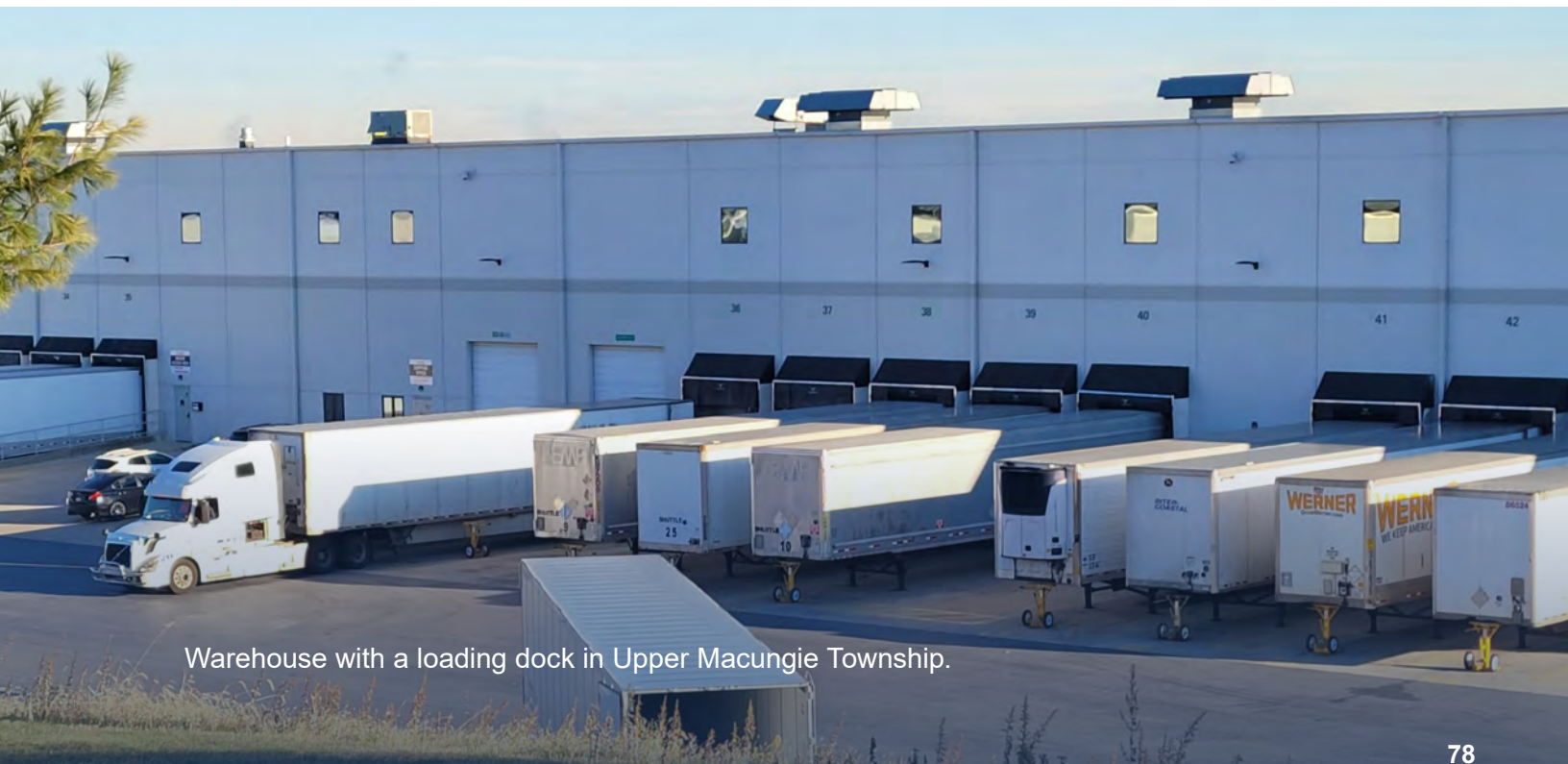
- **Comprehensive Plans:** Identify noise-sensitive land uses like residential neighborhoods, schools, healthcare facilities, and high-priority natural habitats to guide industrial growth away from these areas.
- **Zoning:** Establish clear noise performance standards and maximum decibel levels at property lines. Require noise mitigation strategies such as setbacks, sound walls, or landscaped buffers between industrial and non-industrial uses.
- **SALDO:** Require proposals to submit acoustic studies and/or noise impact assessments and encourage orientation of loud equipment, loading docks, and truck parking away from nearby non-industrial uses.
 - + Encourage applicants to incorporate insulated and soundproofing building materials into site design.
- Monitor and enforce noise standards.

Light

Industrial facilities require exterior lighting for safety, security and operations. Excessive or poorly directed lighting can spill into neighboring properties, disrupt wildlife habitats, and degrade nighttime visibility. In Lehigh County, industrial growth near residential and rural areas causes concern for light pollution.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Encourage dark-sky compliant lighting policies and balance safety/operations needs with environmental quality.
- **Zoning:** Establish maximum illumination levels at property lines and require lighting standards such as height limits for lighting poles, maximum illumination levels at property lines and cutoff fixtures that direct light downward.
- **SALDO:** Require lighting plans with photometric data to evaluate impacts and compliance.
 - + Incorporate landscaping or fencing to screen light from adjacent properties.



Warehouse with a loading dock in Upper Macungie Township.

Air Quality

Industrial operations can affect local and regional air quality through emissions from both stationary sources such as generators, boilers and manufacturing processes, and mobile sources like trucks, forklifts, and equipment.

The most common pollutants include volatile organic compounds (VOCs), nitrogen oxides (NO_x), particulate matter (PM) such as dust, and greenhouse gases (GHGs) from fuel combustion. While modern facilities are increasingly efficient and regulated, cumulative emissions from industrial sites and freight activity can still impact public health, visibility, and environmental quality, particularly in areas with high concentrations of industrial and transportation uses.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Recognize air quality as a health and environmental priority. Specify that high-emission uses should be located away from sensitive areas. Incorporate goals to minimize emissions that reduce air quality.
- **Zoning:** Require air quality performance standards for emissions and dust control. Regulate outdoor storage, truck idling and the location of exhaust vents to minimize community exposure.
- **SALDO:** Require air quality impact assessments for large-scale or high emission uses.
 - + Encourage or require installation of electric vehicle charging infrastructure to support clean fleets.
 - + Encourage and/or incentivize alternative energy sources such as solar panels or green roofs to reduce energy needs for industrial buildings.

Building Form and Aesthetics

The mass, height and design of industrial buildings can have a profound impact on the visual character and identity of surrounding communities

Large-scale warehouses, logistics centers and production facilities often feature tall, box-like forms, expansive façades and wide parking areas that can dominate the landscape. When located near residential, commercial or rural areas, these visual and spatial differences can create a sense of imbalance and affect perceptions of neighborhood quality and property values. Thoughtful building design, orientation and screening can help integrate industrial development into the community form while maintaining operational efficiency and supporting high-quality economic growth.

Mitigation Strategies and Best Practices

- **Comprehensive Plans:** Identify design and aesthetic goals for industrial structures as part of broader placemaking and community character objectives. Identify gateways, corridors and transition areas where design quality and landscaping are especially important. Promote site and building design that reflect local identity.
- **Zoning:** Establish bulk, height and setback requirements appropriate to the surrounding context, ensuring smooth transitions between industrial and non-industrial areas.
- **SALDO**
 - + Require façade articulation, roofline variation and architectural detailing to reduce the monotony of large walls and enhance visual interest.
 - + Limit or screen outdoor storage, loading docks, and mechanical equipment from public view through fencing, landscaping and building placement.
 - + Require site plans to show how building orientation, service areas, and loading docks are placed to minimize visibility from public roads and neighboring properties.
 - + Encourage or require enhanced landscaping along public rights-of-way, including tree rows, berms, and pollinator-friendly vegetation to soften views and reduce environmental impacts.
 - + Promote building materials and color palettes that complement local character and minimize visual contrast with surrounding landscapes.
 - + Require pedestrian-scale design features, lighting and signage standards that contribute to safe and attractive site environments.

UNKNOWN END USERS AND SHIFTING USERS

Industrial buildings are often constructed speculatively, without a confirmed end user or tenant at the time of development approval.

These speculative projects allow for rapid occupancy once demand arises but can present challenges for municipalities when evaluating site impacts, infrastructure needs and compatibility during the review process. Because the ultimate user may have operational characteristics different from those assumed in the original design — such as higher truck volumes, longer hours of operation, or more intensive energy use — unknown or changing tenants can lead to unanticipated community or environmental impacts.

Even after occupancy, industrial buildings frequently change users or shift functions over time as markets evolve. A warehouse may become a light manufacturing facility, or an assembly operation may expand distribution activity. These shifts can significantly alter traffic patterns, utility demands and emissions, underscoring the importance of adaptable regulations and ongoing coordination between municipalities, developers and operators.

Mitigation Strategies and Best Practices

Unknown End Users and Shifting Users

- **Comprehensive Plans:** Encourage flexible land use designations that allow for the evolution of industrial and employment centers over time. Identify infrastructure corridors capable of supporting a range of industrial activities — from light manufacturing to logistics or high-tech uses — without overburdening surrounding neighborhoods.
 - + Incorporate policies promoting adaptive reuse and building design flexibility to extend the life and usefulness of industrial structures as market demands change.
- **Zoning:** Define performance standards that apply regardless of tenant, focusing on measurable outcomes such as truck trips per day, noise thresholds or hours of operation.
 - + Consider use classification systems that group industrial activities by intensity or impact rather than narrow use type (e.g., “low-impact manufacturing,” “high-intensity logistics”), giving flexibility to assess future users without constant ordinance amendments.
- **SALDO:** Require applicants to identify anticipated user types and conservatively estimate operational characteristics, while maintaining flexibility for future occupancy.
 - + Include conditions of approval or occupancy permit triggers requiring municipal review when a new user significantly changes the operational intensity of a site.
 - + Encourage property owners to maintain ongoing communication with municipalities regarding user changes to ensure continued compliance with zoning and performance standards.

ADDRESSING EXISTING LAND USE IMPACTS

While the MPC tools are targeted to regulating development proposals, there are numerous approaches municipalities can take to address the impacts already being created by existing industrial land uses:

1

Use Existing Ordinances for Operations and Maintenance

- a. **Zoning Ordinance Enforcement:** Municipalities can enforce ongoing compliance with conditions of approval (e.g., landscaping, lighting, noise limits).
- b. **Property Maintenance Codes:** If adopted, these codes can be used to address blight, nuisance and unsafe site conditions.
- c. **Nuisance Ordinances:** Municipalities can regulate excessive noise, odor, dust or vibrations that impact nearby residents.

2

Targeted Infrastructure Partnerships

- a. Work with water and sewer authorities to manage capacity and monitor impacts from high-demand users.
- b. Coordinate with PennDOT and county agencies for roadway improvements near freight clusters.
- c. Seek funding (PennDOT Multimodal Fund, DCED grants, federal programs) for infrastructure that mitigates existing strain.

3

Monitoring and Data Collection

- a. Use traffic counts, air quality monitoring, or noise studies to document ongoing impacts. This data supports enforcement, future planning and funding applications.
- b. Require periodic reporting from facilities with high truck volumes or energy/water usage, where legally feasible.

4

Community Engagement and Complaint Tracking

- a. Establish hotlines or online reporting systems for residents to log issues such as truck idling, noise, litter or drainage problems.
- b. Tracking complaints over time provides leverage for working with operators and shows trends that can justify ordinance updates.



5

Intergovernmental and Regional Coordination

- a. Partner with adjacent municipalities to address impacts that cross borders such as truck traffic or utility demand. Enter into intergovernmental agreements to share costs and enforcement capacity, particularly for infrastructure and stormwater.

6

Incentives and Voluntary Compliance

- a. Work with operators to implement best practices like truck idling limits, electric vehicle hookups or improved landscaping to reduce visual and environmental impacts. Explore recognition programs for businesses that adopt sustainability measures, such as Leadership in Energy and Environmental Design (LEED) certification, renewable energy use.

7

Amend Local Plans and Ordinances to Minimize Future Impacts

- a. While ordinances typically regulate new development proposals, municipalities can update ordinances with retrofit standards that would apply if a use changes or a building redevelops. For example, requirements for stormwater upgrades or truck circulation improvements can be added into SALDOs for when expansions or major renovations are proposed.

In general, municipalities should monitor the impacts of existing development and continuously update regulations to improve performance and ensure new or future land uses align with community goals.

REUSING BROWNFIELDS AND EXISTING INDUSTRIAL SITES

Brownfields are former industrial properties where redevelopment or reuse is complicated by the presence or potential presence of hazardous pollutants or contaminants.

In Lehigh County, legacy sites such as former rail yards, manufacturing or processing facilities have the potential for reuse. Sites are often strategically located near highways and population or employment centers and redevelopment can direct growth to areas with existing infrastructure, reduce pressure on farmland and open space, and deliver jobs, tax revenue and environmental cleanup.

How Brownfield Reuse Can Address Industrial Land Uses

- **Promote Revitalization and Economic Growth:** Reuse of underutilized industrial sites brings new employers, creates long-term jobs and expands the local tax base by increasing property values and signaling that a community is “investment ready.”
- **Support Environmental Cleanup and Public Health:** Remediation of contaminated sites prevents pollution, improves soil, water and air quality, and restores environmental functions to degraded lands.
- **Reduce Development Pressure on Greenfields:** Channeling redevelopment to existing industrial areas conserves farmland and open space while strengthening established urban and suburban centers.
- **Leverage Existing Infrastructure:** Brownfield redevelopment utilizes existing water, sewer, road and energy networks, reducing the cost and environmental impacts of new extensions.
- **Encourage Adaptive Reuse through Zoning:** Zoning provisions that allow flexible redevelopment options, mixed-use conversions or performance-based standards make reuse more feasible for property owners and developers.
- **Coordinate Planning and Mapping Efforts:** Maintain a community inventory of vacant and underutilized industrial parcels. Align these locations with comprehensive plan goals to target infrastructure investment and guide redevelopment priorities.
- **Coordinate with the Lehigh County Redevelopment Authority (RALC):** RALC is focused on repurposing blighted properties in Lehigh County’s boroughs and townships, and partners with communities to pursue a variety of financing and incentives.
- **Address Barriers Early:** Conduct site assessments to identify contamination risks, evaluate cleanup needs and clarify liability issues. Incorporate demolition, asbestos abatement, or historic preservation costs into redevelopment planning.



The Bethlehem Steelstack, located in City of Bethlehem, is an example of how one can revitalize a brownfield.





LEHIGH COUNTY **INDUSTRIAL LAND USE**

GUIDE

RESOURCES

QUESTIONS TO ASK DEVELOPERS

Asking questions during the plan review process positions municipalities to be proactive rather than reactive and is one of the most important ways to ensure that industrial projects align with community goals, protect public health and safety and comply with local ordinances. Developers are experts in their own projects, but municipalities are the guardians of community interests. Without asking the right questions, local governments may miss opportunities to identify impacts, negotiate improvements or require conditions that make a development compatible with its surroundings.



Asking the Right Questions Will:

Clarify Project Details

How operations will affect traffic, infrastructure, utilities, and nearby residents

Ensure Compliance

Confirm that municipal requirements are correctly interpreted and met by applicants

Identify Impacts Early

Issues are less costly to address during the review process than after construction

Encourage Transparency

Build trust between local government, applicants, and residents

Promote Collaboration

Open a dialogue that can lead to creative solutions and community benefits

Plan for Emerging Uses

Understand unique needs and impacts that may not yet be reflected in ordinances

Site Location and Compatibility

- Why was this site chosen for the proposed industrial use, and how does it align with the municipality's zoning and comprehensive plan?
- Is there an identified end user? If not, are there particular end users speculated?
- What adjacent land uses exist, and what potential impacts could the project have on those uses (e.g., noise, lighting, traffic, environmental)?
 - + What noise levels will be generated (vehicular traffic, load/unloading, manufacturing, utility)?
 - + What light will be emitted, in what directions (parking areas, building lighting/security lighting, signage lights)?
- How will the development affect nearby (not adjacent) land uses, including residential areas, schools, businesses or community facilities?

Workforce and Operations

- How many employees will work at the site, and what shifts or hours of operation are anticipated?
- What workforce amenities (sidewalks, break areas, transit connections, driver facilities) are provided to support safety and quality of life?
- Will multiple tenants occupy the building (e.g., flex space or subleases), and how will operations be coordinated to comply with zoning?

Transportation and Freight Impacts

- What is the anticipated volume of truck and passenger vehicle traffic at peak and average levels?
- What routes will trucks use to access highways, and how will you minimize impacts on local streets?
- Have traffic impact studies been conducted based on a land use accurate to the intended development, and what improvements or mitigations are proposed?
- Will on-site truck parking, loading and staging areas prevent trucks from queuing on public roads?

Utilities and Infrastructure

- What are the utility needs of the facility, such as amount of electricity usage, water consumption, wastewater disposal, etc.
- Does the site have adequate water, sewer, power and broadband capacity to support the proposed use?
- Will the project require infrastructure upgrades, and who will pay for them?
- Are backup systems, such as generators for data centers or cooling for cold storage, designed to minimize noise, emissions or neighborhood disruption?

Environmental Considerations

- How will stormwater runoff be managed, and what low-impact development or green infrastructure techniques will be used?
- Are there wetlands, floodplains or steep slopes on site, and how will they be protected?
- What measures will be taken to minimize air, noise, light, and vibration impacts?
- What steps are being taken to reduce the building's energy consumption and carbon footprint?

Site and Building Design

- How will building design and landscaping reduce visual impacts, especially for large-scale facilities?
- How will the site accommodate pedestrian and bicycle access, both within the site and connections to nearby transit or roads?
- Where will outdoor storage, loading docks, and mechanical equipment be located, and how will they be screened?

Emerging Uses and Safety

- For specialized facilities, such as data centers, battery storage, cold storage or indoor agriculture, what unique infrastructure or safety needs should the municipality be aware of?
- What emergency response coordination has been conducted with local fire, Emergency Management Services (EMS), and police departments?
- Are hazardous materials or alternative energy systems involved, and how will risks be mitigated?
- What is the size of the proposed building (height and lengths), and does the municipality have adequate equipment and training to provide emergency services?



FUNDING STRATEGIES

Addressing the impacts of industrial development and preparing for emerging industrial land uses requires not only sound planning and policy but also strategic investment. Municipalities often face financial constraints when updating land use regulations, maintaining and upgrading infrastructure, or mitigating impacts associated with industrial activity. A range of funding and financial incentive tools are available at the federal, state, regional and local levels to provide community assistance.



Lehigh Valley Transportation Study

The Metropolitan Transportation Plan (MTP) is a multi-billion-dollar transportation investment plan that spans 25 years. The program opens every four years, and only projects that apply are eligible to be listed for funding.

Funding categories include Bridges, Road, Road Reconstruction, Modernization and Automation, Roadway Expansion, Multimodal, Planning + Research, Safe Routes to School, Rail, and Transit.

Project funding is determined by a **Project Selection Process**.

Project Selection Process

Tips for Communities/Developers Applying for Industrial Land-Use Funding

Communities/developers pursuing federal, state, or regional funding for industrial land-use projects, including manufacturing, logistics, warehousing, light industry, and emerging technology, can increase their competitiveness by following the recommendations below. This guidance applies to standalone development proposals as well as local government infrastructure improvements that support future industrial growth.

1. Align Your Project with Regional and Local Plans

Tip for Applicants: Demonstrate clear consistency with adopted plans, such as:

FutureLV: The Regional Plan

Eastern Pennsylvania Freight Alliance Freight Infrastructure Plan

Walk/Roll LV: Active Transportation Plan

Priority Climate Action Plan for Transportation Decarbonization

Your municipality's comprehensive plan, zoning ordinance, capital improvement plan or official map

Funding agencies want assurance that proposed investments support long-term regional goals and fit into an integrated land-use and transportation strategy. Projects explicitly tied to adopted plans score higher and are viewed as lower risk.

2. Understand Key Evaluation Criteria and Prepare to Address Each One

Most funding programs evaluate projects using several common criteria. Communities should tailor their applications to address:

Economic Impact

Potential for job creation and workforce development

Support for key sectors such as manufacturing, logistics, clean tech, emerging industries

Long-term effects on local tax base and economic resilience

Transportation Efficiency

Site access to interstate highways, freight corridors, rail connections, ports and airports

Reduction of bottlenecks or congestion on regional routes

Ability to improve freight mobility and reduce travel times

Land Use Compatibility

Siting near existing industrial clusters or economic hubs

Adequate buffering from neighborhoods, schools, parks and environmentally sensitive areas

Alignment with zoning, future land-use maps and local development standards

Environmental Sustainability

Brownfield remediation and adaptive reuse

Emissions reduction, decarbonization strategies and clean-energy technologies

Stormwater management and green infrastructure

Minimization of impacts on wetlands, waterways and habitats

Community Impact

Access to employment via transit, walking and biking

Reduced impacts on overburdened or vulnerable populations

Opportunities for upskilling, training and equity-focused benefits

Project Readiness

Site control secured

Engineering and design progress

Zoning compliance

Committed funding partners

Public engagement completed

Tip for Applicants: Organize your narrative around these topics. Clear, structured responses make your application easier to evaluate and more competitive.

3. Build a Strong, Evidence-Based Application

Use both quantitative data (e.g., vehicle counts, freight volumes, crash patterns, job projections) and qualitative insights (e.g., community priorities, local lived experience).

Strengthen your application with:

- Geospatial analysis showing proximity to freight networks, workforce clusters or brownfields

- Cost-benefit and life-cycle analyses

- Environmental screening or preliminary engineering

- Letters of support from businesses, residents and agencies such as the LVPC

- Documentation of community outreach and stakeholder feedback

Tip for Applicants: Most programs use weighted scoring. Reviewers compare applications side-by-side, so data clarity, completeness, and consistency make a substantial difference.

4. Engage Stakeholders Early and Often

Tip for Applicants: Before submitting, coordinate with:

- Municipal leadership and planning commissions

- Industrial facility operators or developers

- PennDOT/Federal Highway Administration and Metropolitan Planning Organization staff

- Workforce development boards

- Local emergency responders

- Environmental and community organizations

Projects that demonstrate multi-sector alignment and community backing tend to score higher and move more efficiently through review.

5. Leverage Technical Assistance and Data Resources

Tip for Applicants: Use external support to collect data, document conditions and identify improvements. The PennDOT Local Technical Assistance Program (LTAP), with support from LVPC, can help municipalities by providing:

- Corridor, intersection and school zone safety reviews
- Traffic counts, speed studies and freight movement analysis
- Pavement, drainage and signage/markings assessments
- Walkability and bikeability audits
- Heavy-vehicle impact evaluations
- Analysis of land-development impacts and traffic circulation needs
- Recommendations for short-term and long-term roadway improvements
- Staff training, workshops and follow-up assistance

LTAP-supported data can significantly strengthen funding applications, demonstrating due diligence and professional validation.

6. Plan for Transparency and Public Engagement

FYI About the Process: Many funding programs require public transparency as a condition of award. Communities with existing communication channels, websites, boards and public meetings are better positioned to meet these expectations.

Tip for Applicants: Prepare to publish evaluation results and project information on your municipal website or through community outreach.

7. Stay Updated on Evolving Criteria and Regional Priorities

FYI About the Process: Criteria change as regional freight plans, climate plans, and transportation strategies evolve.

Tip for Applicants: Check program guidance every cycle. Update your data, language and design to reflect new state or federal directives.

8. Prepare Local Government Infrastructure to Support Industrial Land Uses

To increase project readiness and strengthen funding applications communities should proactively invest in infrastructure that supports industrial development.

Transportation Infrastructure

- Upgrade intersections to handle heavy trucks (signal timing, radii, geometric design)
- Improve last-mile freight connections from industrial parks to major corridors
- Replace weight-restricted bridges or culverts
- Enhance roadway pavement design for heavy-vehicle loads
- Expand or improve rail sidings, transload facilities or spur connections

Utility and Site Infrastructure

- Expand water and sewer capacity for industrial-intensive uses
- Modernize stormwater and drainage systems to manage large impervious areas
- Upgrade electrical capacity to support advanced manufacturing and clean-tech facilities
- Evaluate broadband needs for technology-driven industries

Active Transportation and Transit

- Add sidewalks, trails, bike lanes or shared-use paths connecting workers to job sites
- Coordinate with transit providers to serve industrial parks with job-access routes
- Improve pedestrian safety near industrial driveways and corridors

Environmental and Resilience Investments

- Conduct brownfield assessments and environmental due diligence
- Include green infrastructure for stormwater mitigation
- Improve tree canopy and buffer plantings around industrial edges
- Plan flood-resilient design for sites in risk-prone areas

Land Use and Policy Tools

- Update zoning to permit target industries while ensuring compatibility with neighbors
- Create overlay districts or special industrial corridors
- Adopt an official map to reserve key road, trail, or utility corridors
- Develop capital improvement plans identifying infrastructure gaps
- Use tax increment financing Local Economic Revitalization Tax Assistance (LERTA) programs, or other tools to support project feasibility

Tip for Applicants: Infrastructure investments, even preliminary ones, signal readiness to funding agencies and make your industrial project far more competitive.

This section details some assistance programs at all levels that these tips and processes can help communities utilize.

State Assistance

- **Municipal Assistance Program:** Offers grants for comprehensive plans, zoning and SALDO updates, and multi-municipal planning to manage industrial growth and mitigate impacts.
- **Local Share Account:** Funded by gaming revenues for local infrastructure improvements supporting industrial or brownfield redevelopment.
- **Brownfield Cleanup and Industrial Site Reuse Program:** For remediation and redevelopment of industrial or contaminated sites.
- **Energy Programs (Alternative Fuels Incentive Grant, etc.):** For the applicants and developers of industrial sites incorporating cleaner technologies or energy-efficient operations.
- **Community Conservation Partnerships Program:** Supports green buffers, trail connectivity, and open space preservation near industrial zones to mitigate environmental impacts.

Federal Assistance

- **BUILD/INFRA Grants (USDOT):** Large-scale, competitive grants that municipalities can pursue jointly with LVPC or counties for freight and industrial corridor improvements.
- **Brownfields Assessment and Cleanup Grants (USEPA):** For planning, assessment and remediation of former industrial sites.
- **Climate Pollution Reduction Grants (CPRG):** Can support planning for industrial decarbonization or energy transition strategies.

Local Fiscal Tools and Resources

- **Transportation Impact Fees + Capital Improvement Plans**
 - + Municipalities can adopt impact fee ordinances under the MPC to recover costs from industrial traffic impacts (Section 501-A).
 - + Capital Improvement Plans can strategically fund long-term infrastructure to support or mitigate industrial growth (Section 504-A).
- **Tax Increment Financing (TIF) and Local Development Districts**
 - + Through county or municipal authorities, TIFs can help pay for infrastructure and remediation needed for industrial redevelopment.
- **Lehigh Valley Government Academy Local Technical Assistance Program (LTAP)**
 - + Free training and technical assistance designed to help with roadway maintenance.
- **Lehigh County Redevelopment Authority**
 - + Partners with municipalities with the goal of remediating and repurposing blighted properties in Lehigh County's Boroughs and Townships.



COMPREHENSIVE PLAN BEST PRACTICES CHECKLIST

☐ **Identify Suitable Locations That Balance Land Use Priorities**

- ☐ Designate industrial growth in areas with direct access to major highways, freight corridors or rail facilities to minimize truck traffic through residential neighborhoods.
- ☐ Preserve agricultural and environmentally sensitive lands by steering industrial development toward brownfields, underutilized sites and already serviced land.
- ☐ Cluster industrial uses to maximize infrastructure efficiency and reduce conflicts with other land uses.

☐ **Ensure Adequate Design and Compatibility**

- ☐ Require site design standards that buffer industrial operations from adjacent residential and community uses through landscaping, setbacks, berms and architectural treatments.
- ☐ Encourage context-sensitive building design to minimize visual impacts of large-scale warehouses and manufacturing facilities.
- ☐ Promote sustainable site planning that incorporates green infrastructure, low-impact stormwater management and energy-efficient building design.

☐ **Set Transportation and Freight Management Policies**

- ☐ Plan for roadway networks that separate truck traffic from local streets, schools and pedestrian areas.
- ☐ Coordinate with PennDOT, LANTA and regional planning partners to ensure freight movement is efficient and safe.
- ☐ Support the development of truck parking facilities and driver amenities in appropriate locations to reduce illegal or unsafe parking.

☐ **Set Infrastructure and Utilities Policies**

- ☐ Direct new industrial development to areas with adequate sewer, water, energy and broadband capacity.
- ☐ Establish policies for coordinating infrastructure investment with anticipated industrial demand to prevent overextension of services.
- ☐ Encourage the use of renewable energy and on-site energy generation where feasible.



□ **Anticipate Emerging and Evolving Uses**

- Anticipate new industries such as data centers, cold storage, advanced manufacturing and alternative energy facilities by including them in land use planning policies.
- Support flexible industrial spaces that can accommodate multiple tenants or hybrid uses, while ensuring zoning and site standards address parking, noise and safety impacts.
- Monitor evolving technologies such as additive manufacturing, life sciences and battery storage, and update policies regularly to stay current.

□ **Facilitate Economic and Workforce Development**

- Align industrial land use planning with workforce development initiatives to ensure facilities are accessible to employees by transit, bike and pedestrian routes.
- Encourage industrial employers to provide amenities that support employee well-being, such as safe break areas, mobility options and sustainable workplaces.
- Promote redevelopment of older industrial areas to support new job growth and modern business needs.

□ **Leverage Regional Coordination**

- Coordinate industrial land use planning with neighboring municipalities to manage shared impacts of traffic, infrastructure, and environmental systems.
- Support consistency with *FutureLV: The Regional Plan* and county economic development goals.
- Partner with agencies such as Lehigh Valley Economic Development Corp. (LVEDC), PennDOT, and Pennsylvania Department of Community and Economic Development (DCED) to leverage resources for industrial site readiness and infrastructure improvements.

DEFINITIONS

These are definitions that may be necessary to craft an effective municipal ordinance.

A

Additive Manufacturing or 3D Printing Facility

A facility where the primary activity is the fabrication of objects by additive processes such as 3D printing, typically using plastics, metals, concrete, resins or composites. Operations may include design, prototyping, limited production runs, finishing, assembly and associated office or research space. Additive manufacturing may occur as a stand-alone use or as part of a larger manufacturing, research or industrial operation.

Advanced Manufacturing

High-tech production facilities using automation, robotics, 3D printing, or clean rooms for industries such as aerospace, medical devices or electronics.

Alternative Energy Generation

Facilities generating renewable energy such as solar farms, wind turbine assembly sites, hydrogen plants or biofuel refineries.

Autonomous Vehicle Support Facility

A facility or area designed to support automated or semi-automated vehicles serving freight, logistics or industrial operations, including staging areas, calibration zones, equipment storage, charging or fueling infrastructure, maintenance bays, and control rooms. This use may be accessory to a truck terminal, distribution center, warehouse, or industrial park.

B

Battery Energy Storage Facility

A facility where electrochemical energy storage systems, such as large-scale batteries or battery containers, are installed to store and discharge electricity to the grid or to serve one or more principal uses on the site. The facility may include inverters, transformers, control equipment, fire suppression systems and security fencing. This use excludes small, building-integrated storage serving a single principal use as an accessory component.

Bioengineering or Biofabrication Facility

A facility where biological materials, cells, tissues or bio-based products are engineered, produced or fabricated for commercial, medical, industrial or research purposes. Operations may include laboratory functions, controlled-environment production, quality control, warehousing of inputs and outputs, and associated office or research space. Facilities may handle biological, chemical, or hazardous materials subject to applicable biosafety and environmental regulations.



Business Park

A planned development containing one or more buildings on a common internal roadway network, designed for flexible tenant space that may include offices, light manufacturing, warehousing, research and development, laboratories and related uses. Buildings are typically one or two stories, with shared access, parking, utilities, stormwater management and landscaping.

C

Cold Storage Warehouse

A warehouse primarily devoted to the storage and handling of refrigerated or frozen goods, including food products and temperature-sensitive materials, generally consistent with the cold storage warehouse land use in the ITE Trip Generation Manual. The facility may include loading docks, limited processing or packaging areas and associated office space, and typically requires mechanical refrigeration and higher energy demand.

Cryptocurrency Mining Facility

A facility where specialized computers or servers perform cryptographic calculations to validate blockchain transactions or generate digital assets, with high ongoing electricity demand and cooling requirements. The facility may be located within a building or in modular or containerized units and may include associated office, security and electrical infrastructure.

D

Data Center

An establishment engaging in the storage, management, processing or transmission of digital data, and housing computer network equipment, systems, servers, appliances, and other associated components related to digital data operations.

Data Center Mechanical Equipment

On-site exterior machines used to sustain and/or provide energy for the operations of a Data Center.

Decibel

A unit for measuring the volume of sound using the A-weighting network on a sound level meter. Decibel may be expressed as dB, dB(A), dBA, dba, or db(A).

Distribution Center, High-Cube

A warehouse or distribution facility characterized by a large building footprint, high ceiling clearances and high-bay racking designed for the storage and distribution of goods, consistent with high-cube warehouse/distribution land use categories in the ITE Trip Generation Manual. The facility primarily handles palletized or containerized goods, with frequent truck loading and unloading and limited retail or customer activity.

E

Electric Vehicle Charging Space

An automobile parking space that includes an electrical component assembly or cluster of component assemblies (battery charging station) designed and intended to transfer Level 2 charging, as defined by the United States Department of Energy, electric energy by conductive or inductive means from the electric grid or other off-board electrical source to a battery or other energy storage device within a vehicle that operates, partially or exclusively, on electric energy. Spaces are marked to indicate that such spaces are reserved for the sole use by plug-in electric vehicles.

Electric Vehicle Supply Equipment (EVSE)

Devices that provide electric power to a vehicle to recharge the vehicle's batteries. EVSE systems include the electrical conductors, related equipment, software and communications protocols that deliver energy to the vehicle.

Energy Storage Facility

Energy storage equipment or technology that can absorb energy, storing such energy and redelivering energy after it has been stored.

A. Energy Storage, Utility Scale: One or more devices, assembled together, capable of storing energy to supply electrical energy at a future time, greater than 600kWh (kilowatt per hour) in nameplate capacity.

B. Energy Storage, Site-Specific: One or more devices, assembled together, capable of storing energy to supply electrical energy at a future time, less than or equal to 600kWh in nameplate capacity. Storage devices are an accessory use located on the property providing the energy generation source. This does not include energy storage facilities or devices associated with Solar Facility, Utility Scale.

F

Façade

The exterior wall of a building exposed to public view or a wall viewed by persons not within the building.

Flex Industrial or “Flex Space”

A building or group of buildings designed with adaptable floor plans that can accommodate a mix of uses such as light manufacturing, warehousing, research and development, small-scale assembly, laboratories and office space. Interior spaces may be reconfigured over time without substantial exterior changes. Flex space is typically located in business or industrial parks and is intended for low- to moderate-intensity industrial and commercial activity.

Fulfillment Center, High-Cube

A specialized high-cube distribution facility serving e-commerce or direct-to-customer operations, generally aligned with high-cube fulfillment center categories in the ITE Trip Generation Manual. The facility may include automated storage and retrieval systems, sorting and packaging operations and high employee densities. Fulfillment centers typically generate significant truck and delivery vehicle traffic and may operate extended or continuous hours.

G

General Industrial Use

A facility engaged in manufacturing, processing, assembly, repair, storage or similar industrial activities. General industrial uses may involve the use of machinery, handling of raw or finished materials, truck traffic and associated office or warehouse functions, but do not rise to the intensity of heavy manufacturing or hazardous industrial operations.

H

Hours of Operation

The time period during which an activity or enterprise is active, including any times during which the activity is open to customers or other members of the public, employees are present and working, deliveries are made, or equipment (other than utilities or ordinary indoor appliances) is being actively operated on the site.

I

Indoor Vertical Farming/Ag-Tech

Warehouses or controlled-environment structures used to grow crops year-round with advanced hydroponic or aeroponic systems.

Industrial Park

A planned development containing multiple industrial, manufacturing, warehousing, logistics or related facilities served by a shared internal roadway and utility network, generally consistent with the industrial park land use category in the ITE Trip Generation Manual. Uses within an industrial park may include manufacturing, distribution, research and development, support services and accessory office space.

Industrial Storage

A fixed installation where any of the following are stored, either for subsequent transshipment to a smaller fixed installation or for pick-up by truck for transport to the site where the product will be used by the consumer:

- A. Oil and gas storage
- B. Petroleum products
- C. Natural gas
- D. Coal
- E. Lumber
- F. Building material
- G. Construction equipment
- H. Empty solid waste vehicles and containers
- I. Building materials.

Intermodal Freight Terminal

A facility where freight is transferred between at least two modes of transportation, such as truck-to-rail or truck-to-air. The facility includes associated loading areas, container storage, staging tracks, maintenance areas and administrative offices. Intermodal terminals typically generate high truck, rail, or cargo activity and require direct access to major transportation corridors.

L

Last-Mile Distribution Centers

Logistics and warehouse facilities closer to population centers that facilitate rapid delivery of goods ordered online.

Light Industrial Facility

A free-standing building or complex used for lower-intensity industrial activities such as assembly, packaging, testing, small-scale fabrication or craft production, generally consistent with light industrial land use categories in the ITE Trip Generation Manual. These uses typically have limited heavy truck traffic, minimal outdoor storage, and lower noise and emissions than heavy manufacturing, and may be suitable at transitions between industrial and commercial or mixed-use areas.

Logistics Center

A facility or complex primarily devoted to coordinating the movement, storage and distribution of goods in the supply chain. A logistics center may include one or more warehouses, cross-dock or transload facilities, truck terminals, fleet parking and associated office or dispatch functions. The use is characterized by significant freight activity and connections to regional highway, rail or air networks.

M

Manufacturing, Heavy

A facility where raw materials or basic commodities are converted into finished products through intensive industrial processes that may involve large machinery, high energy use, outdoor storage, or more significant noise, vibration or emissions. Heavy manufacturing may include metal fabrication, chemical processing, large-scale fabrication or similar operations and typically requires greater separation from residential or sensitive uses.

Manufacturing, Light

A facility where raw materials, parts or components are assembled, processed or fabricated into finished products using relatively clean and quiet processes with limited emissions, outdoor storage or heavy truck traffic. Light manufacturing operations often occur within enclosed buildings and may include associated office, research and warehousing functions.

Microchip or Semiconductor Manufacturing Facility

A facility where semiconductor wafers, microchips, or related components are fabricated, processed, assembled, tested, or packaged. Operations may include cleanrooms, specialized equipment, and the use of chemicals, gases and ultrapure water. The facility may consist of front-end wafer fabrication, back-end assembly, test and packaging, or a combination thereof, along with support, utility and office areas.

Micro-Fulfillment Centers

Highly automated, compact warehouse facilities designed to speed up grocery and retail deliveries within urban and suburban areas.

O

Outdoor Storage Yard, Industrial

An area used for the outdoor storage of equipment, vehicles, materials or containers associated with industrial, construction, utility or logistics operations. The use may be a principal use or accessory to a permitted industrial use and typically includes fencing, screening and surfacing for vehicle and equipment maneuvering.

P

Parcel Hub Warehouse

A freight facility, generally consistent with parcel hub or parcel sorting land use categories in the ITE Trip Generation Manual, where parcel carriers receive, sort and dispatch packages for regional or local delivery. Operations may include conveyor systems, loading docks, staging areas for delivery vehicles and associated office or dispatch space, with high trip generation by trucks and smaller delivery vehicles.

R

Recycling and Materials Recovery Facility

A facility where recyclable materials such as paper, cardboard, plastics, metals, glass, or construction and demolition debris are received, sorted, processed, baled or temporarily stored for shipment to end users. The facility may include enclosed processing areas, outdoor storage of containers or baled materials and associated office space. This use does not include landfills, waste incineration or hazardous waste treatment facilities.

T

Telecommunications Hub or Network Facility

A facility where telecommunications, broadband, fiber-optic or data network equipment is housed to route, switch or process communications signals. The use may include server rooms, switching equipment, backup power systems, cooling equipment and associated office or maintenance space. It does not include broadcast towers, which may be separately regulated.

Truck Stop or Travel Plaza

A facility designed primarily to serve truck drivers and long-distance motorists, providing services such as fuel, parking, restrooms, showers, food service and limited maintenance. The facility may include convenience retail and ancillary uses and typically generates frequent truck movements and 24-hour activity.

Truck Terminal or Truck Freight Station

A facility, generally consistent with truck terminal or truck freight station land use categories in the ITE Trip Generation Manual, where freight is staged, sorted, or transferred between trucks, or between trucks and local delivery vehicles. Operations may include fleet parking, loading docks, cross-docks, dispatch offices and minor maintenance areas, and are characterized by high truck traffic and frequent vehicle movements.

U

Utility-Scale Energy Generation Facility

A facility used to generate electricity for delivery to the electric grid or to serve multiple off-site users, using renewable or non-renewable energy sources. This may include gas-fired peaker plants, solar or wind farms, combined heat and power plants or similar installations, along with associated equipment such as inverters, transformers, substations, control buildings, access drives and security fencing. Small-scale systems serving a single principal use as an accessory component are not included.

W

Warehouse, General

A facility primarily used for the storage of goods, materials or merchandise, generally consistent with general warehouse land use categories in the ITE Trip Generation Manual. The facility may include office, maintenance or limited processing areas, and is characterized by truck loading and unloading, indoor storage and minimal customer or retail activity.

Warehouse, High-Cube Storage

A warehouse facility with a large footprint and high interior clear heights designed for high-bay racking and high-density storage, consistent with high-cube storage land use categories in the ITE Trip Generation Manual. High-cube warehouses may be used for long-term storage, transload operations or as part of larger logistics or business parks.

Wholesale Trade Establishment

A facility where goods, merchandise or equipment are sold or distributed primarily to retailers, contractors or other businesses rather than to the general public. Wholesale trade establishments may include indoor storage, showrooms, loading docks and associated offices, with regular truck traffic and limited walk-in customer activity.



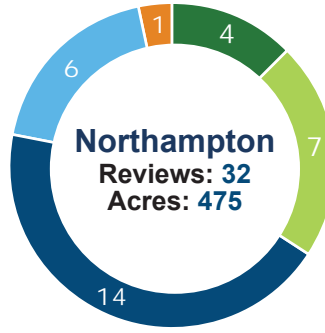
Lehigh Valley Planning Commission

615 Waterfront Dr / Suite 201
Allentown, PA 18102
Phone: (610) 264-4544

LVPC.org



PLAN ACTIVITY BY COUNTY



REGIONAL TOTALS*

23
Subdivision/Lot Line
Adjustments

26
Development

20
Stormwater
Management

2
Municipal Ordinances,
Maps and Plans

889
Acres

*Includes preliminary and final plans

RESIDENTIAL

NON-RESIDENTIAL

SUBDIVISIONS AND LOT LINE ADJUSTMENTS

STORMWATER MANAGEMENT

MUNICIPAL ORDINANCES, MAPS AND PLANS

RESIDENTIAL DEVELOPMENT

266 Total Units



262

SINGLE-FAMILY
DETACHED



0

TOWNHOUSES



0

APARTMENTS



2

TWINS



0

ASSISTED-
LIVING



0

MANUFACTURED
HOMES



2

CONDOS

NON-RESIDENTIAL DEVELOPMENT

3,156,715 Total Square Feet



149,560
COMMERCIAL



0
RETAIL



327,914
PUBLIC/
QUASI-PUBLIC



2,601,250
INDUSTRIAL



0
WAREHOUSE*



0
OFFICE



38,991
TRANSPORTATION



0
AGRICULTURE



39,000
RECREATIONAL

*Warehouse is a subset of Industrial

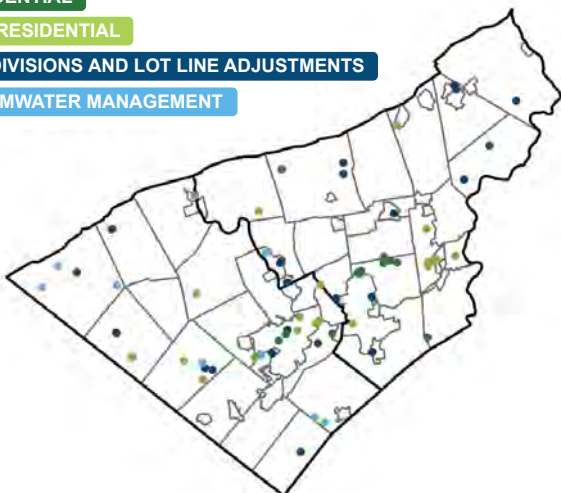
LOCATION OF DEVELOPMENT

RESIDENTIAL

NON-RESIDENTIAL

SUBDIVISIONS AND LOT LINE ADJUSTMENTS

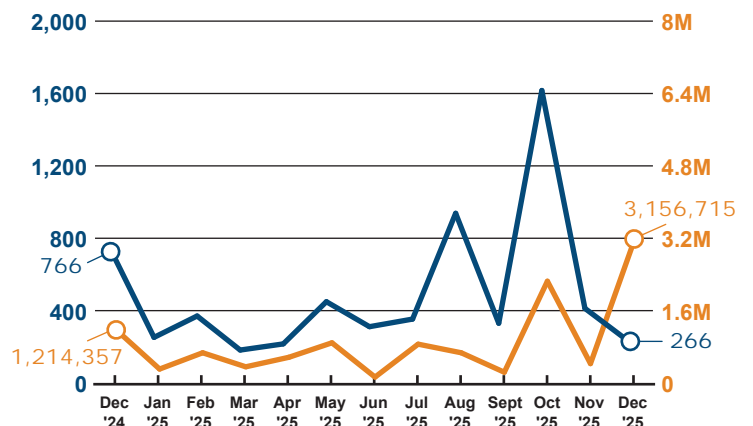
STORMWATER MANAGEMENT



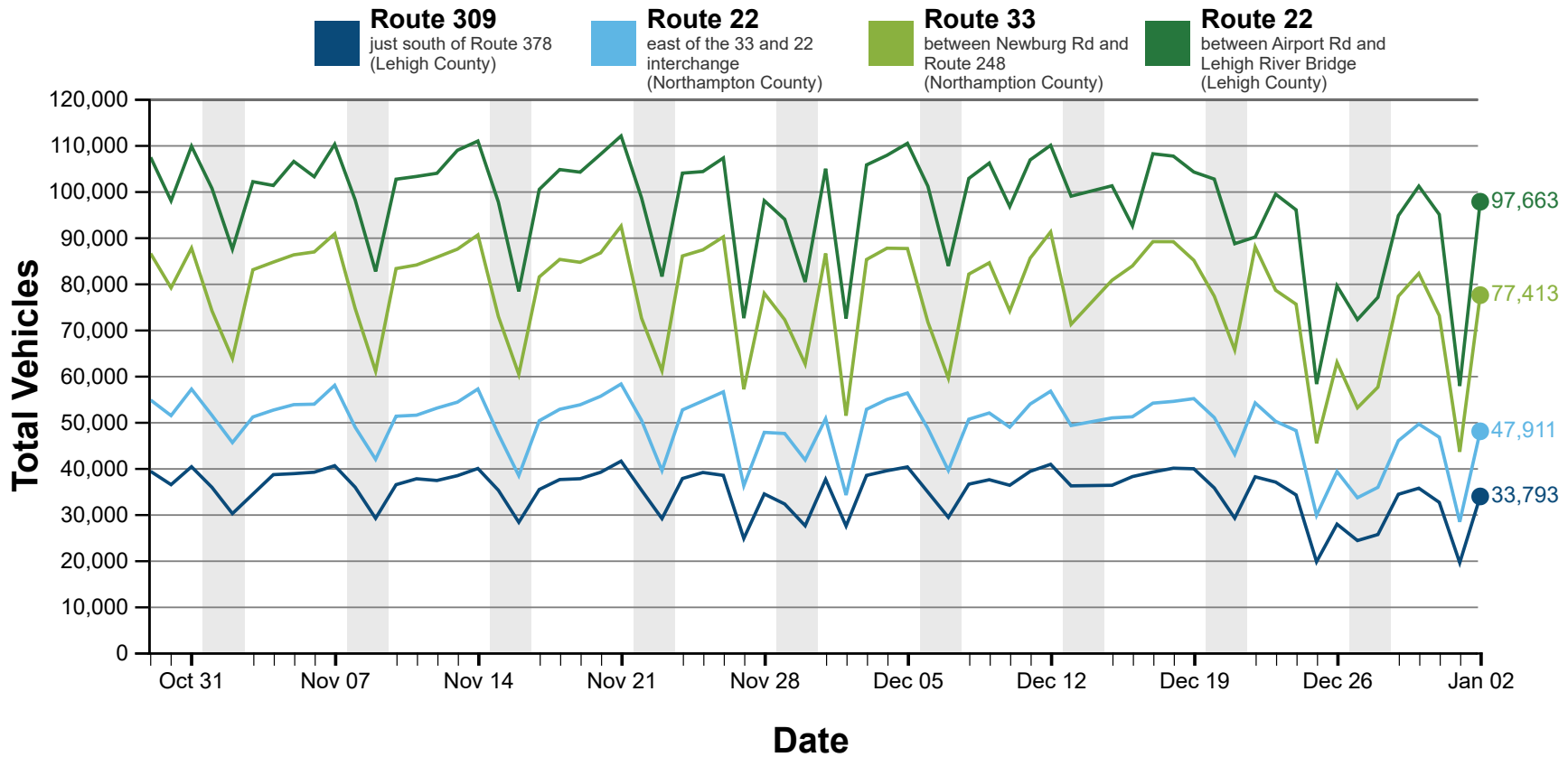
YEAR-TO-DATE (YEAR-TO-YEAR)

RESIDENTIAL UNITS

NON-RESIDENTIAL SQUARE FOOTAGE

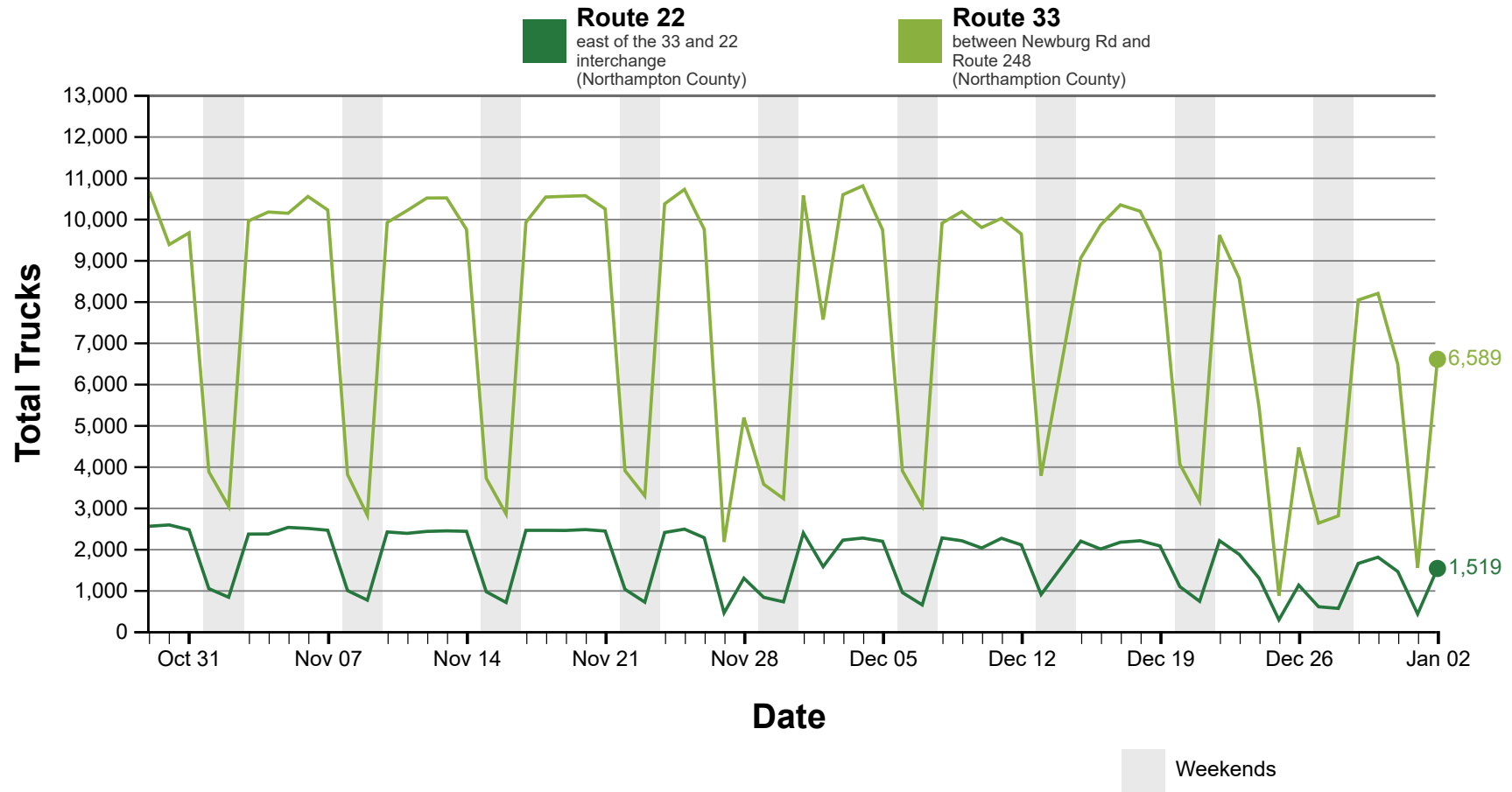


Traffic Volumes Throughout the Lehigh Valley



*Data from Oct/29/2025 - Jan/2/2026 at daily intervals

Truck Volumes Throughout the Lehigh Valley



**Data from Oct/29/2025 - Jan/2/2026 at daily intervals*

THE MORNING CALL

Talking Business with Becky Bradley: The Lehigh Valley is thriving. Its infrastructure will need to keep up.

By Becky Bradley

For The Morning Call

Dec. 19, 2025 at 8:30 AM



The Lehigh Valley is a rare combination of old-world culture and new economy innovation, where historic significance is joined by industrial innovation, and open space preservation unites with smart development. We have a unique location that's close to world-class cities, but without the overcrowding headaches those cities have to deal with.

Our high quality of life is why so many people and businesses want to be here.

Our new analysis shows that another 100,000 people will be added by 2050 as the region grows by 18.6%, carrying the population to 816,000 people. Our job market will

grow even faster, by nearly 25%, adding more than 80,000 jobs and pushing our employment market to more than 404,000.

But with more people and workers, those headaches we've avoided for so long start to come into play — and the biggest may be our infrastructure. However, the one most people notice is our transportation network. Drivers are already logging almost an additional 1 million vehicle miles per day on Lehigh Valley roads compared to a decade ago, and that number will only continue to rise as more people move into the region.

There's a \$4.4 billion Long-Range Transportation Plan designed to maintain and enhance our network, but with us growing so quickly, it's not nearly enough. It's why we've requested that 31 of our most traveled roads be given a higher classification, so they can be enhanced to better handle the vehicles that are already pushing them beyond capacity. It's a big reason we've requested that Route 22, and possibly 33, be reclassified as an interstate, which would make it eligible for funding from a different pot of federal money. This will be a process through the American Association of State Highway and Transportation Officials and the Pennsylvania Department of Transportation. As it stands, modernizing the roadway and expanding its capacity to handle our growth just doesn't fit in that \$4.4 billion equation.

We know that maintaining the road network is going to be a constant challenge as we grow, and everyone has been talking lately about how the capacity of our power grid will have to increase rapidly to handle all the electricity we're going to need, but there's one infrastructure strain that goes unnoticed to most but might be an even bigger challenge during our future expansion — sewer and water.

I always feel inelegant when I tell people that a big part of planning is about “poop and parking,” but it is so true, and the solid waste part is the one I'm most worried about. There are large areas of this region that have little or no public sewer capacity left and many communities that are growing with only on-lot well and septic systems that are best suited for truly rural places and not subdivisions or industrial parks. This lack of infrastructure has municipalities approving projects that include on-site septic or package plants to handle wastewater.

That's almost never the best option unless it's actually rural, not the lingering perception of an agricultural past. That option often leads to failed systems that literally leave, well, poop, bubbling to the surface, drinking water contamination and ultimately real threats to the public health and welfare. Throw on a general sense that paying for anything additional when families are already financially stressed into the mix and you have a looming potential crisis.

We really have to ask where, what and how to address sewer capacity constraints, expansions and yes, even building new public sewer and water systems where a community has become suburbanized or even urbanized.

It's one of the reasons the Lehigh County Authority's (LCA) five-year capital plan has \$335.5 million in projects to replace and upgrade aging infrastructure. LCA is near capacity in serving roughly 270,000 people and businesses in large areas of the Lehigh Valley, and the area it serves includes some of the region's fastest-growing communities — Allentown, Upper Macungie, Lower Macungie and a host of other communities that we expect to grow.

That's why it's imperative that communities update their Act 537 sewage facilities plans, that new developments be put on public sewer and water systems if they're in a development zone, and that people and businesses outside of development zones that have on-lot systems regularly maintain them before they fail.

That brings us back to that forecast that raises concerns about infrastructure. LVPC Senior Data and Analytics Planner Dr. Subham Kharel and LVPC and Workforce Board Economist Minsoo Park used more than 70 data sets and developed their own artificial intelligence model to perform what we believe will be our most accurate forecast yet. Not only will we be adding roughly 4,300 new residents a year — even as two-thirds of Pennsylvania flatlines or shrinks — but our analysis showed that our strong job market is driving our growth. In fact, we're now a net importer of workers. Nearly 5,000 more workers commute into the Lehigh Valley than leave it for work each day. That's an about-face from just five years ago when the region was a net exporter of nearly 4,000 workers a day.

More jobs and more people equal more needs, more refinement to our systems and the greater need for collaboration, coordination and management. It's not enough to review a land development, for a local government to sign off on it and for everyone to move on.

Development adds in every context. How developments relate to each other is critical and this happens over time and changes over time.

Yes, I'm worried about how we'll afford all these infrastructure upgrades, but I'm also confident we'll tackle this because we have lots of experience. The growth we're about to see looks a lot like what we've been doing for more than a half-century. We've added 240,000 people since 1970. That's like adding another Allentown, Bethlehem, Easton and Emmaus. Yet, we remain one of Pennsylvania's fastest growing regions — and in my view, one of the nation's most livable areas.

If we plan with the same resolve that made this region what it is today, the Lehigh Valley's next chapter can be its most promising.

This is a contributed opinion column. Becky Bradley is executive director of the Lehigh Valley Planning Commission. She can be reached at planning@lvpc.org.



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MEMORANDUM

DATE: January 8, 2025
TO: Lehigh Valley Planning Commission
FROM: Matt Assad, Managing Editor

REGARDING: Public Engagement, Education and Grants

Public Engagement

The most recent **Plan Lehigh Valley National Public Radio** show, which aired at 6:30 pm, January 5 on WDIY radio 88.1 FM, was a recap of the 2025 Lehigh Valley Awards Gala. The December 3 event honored excellence in Transportation, Environmental and Community Planning. With co-hosts Becky Bradley and Matt Assad, LVPC Director of Development Samantha Pearson detailed a successful event with a sellout crowd of more than 200 at the Hotel Bethlehem, including the highlight of the night, the naming of Emmaus Borough as the 2025 Community of Distinction. The podcast is now streaming at www.wdiy.org/show/plan-lehigh-valley and www.lvpc.org/news/v. The next Plan Lehigh Valley show will air Monday, January 5 at 6:30 pm.

The latest **Morning Call Business Cycle Column** published Sunday, December 21, and it focused on how the region's rapid growth will require communities to begin upgrading and expanding key infrastructure that includes roads, power generation and water and sewer capacity. In the column, Becky discussed why we're going to have to evolve quickly to handle the growth that will push the region past 800,000 residents and 400,000 workers by 2050. The column is available at www.lvpc.org/news/v and mcall.com. The next column in the Morning Call will publish on Sunday, February 3.

Educational Opportunities

The following Lehigh Valley Government Academy (LVGA), Local Technical Assistance Program (LTAP) Class will be held virtually:

Full Depth Reclamation, January 29, 8 am to noon, Virtual

What: This course provides formal training in this operation to supplement the specifications that were incorporated into PennDOT Publication 447, Approved Products for Lower Volume Local Roads. Full Depth Reclamation provides local government agencies with another operation to consider when planning road and street projects. This process recycles existing pavement materials saving energy and valuable resources. The participants will be able to identify typical roadway distress that can be addressed by Full Depth Reclamation. The various types of the Full Depth Reclamation process will be described. The latest techniques, material and equipment will be reviewed to assist the participants in project design for planning purposes. The operational sequence of performing this activity will be presented.

Who: Local government officials responsible for asset management, project planning, and inspection of roadway improvement projects. This includes Public Works Directors, Supervisors, Road Masters and Foremen.

When: Thursday, January 20, 8 am to noon

PennDOT Adoption of the 2023 Manual of Uniform Traffic Control Devices (MUTCD)

What: This webinar will discuss the adoption of the 2023 MUTCD in Pennsylvania. We will present an overview of the changes in the 2023 MUTCD, and how these changes will affect the traffic control devices on local roads in your municipality. Some of the key changes include:

- Expanded focus on vulnerable road users
- Modifications to speed limit and stop sign studies
- Adjustments to the placement of advance warning signs
- Channelization devices used for emphasis

There are also specific compliance dates for weight limit and overhead clearance signs.

When: Thursday, February 19, 11 am to noon

All LVGA LTAP classes are free and are intended for municipalities, transportation non-profits and organizations with a transportation purpose. LTAP enables many practitioners who need courses with professional development hours (PDHs) to earn credits for maintaining their licenses and certificates.

Anyone can register at www.gis.penndot.gov/LTAP or by contacting Hannah Milagio at hmilagio@lvpc.org or 610-264-4544

Grant Opportunities

PA Department of Transportation (PennDOT) Green Light – Go

The Green Light—Go Program is a competitive application and reimbursement grant program that enables municipalities and metropolitan or rural planning organizations to request financial assistance to replace or enhance traffic signals. A 20% match from grantees is required.

During Fiscal Year 2026-2027, up to \$40 million will be available for upgrading traffic signals to light-emitting diode technology and intelligent transportation applications, such as autonomous and connected vehicle-related technology, performing regional operations such as retiming, developing special event plans, monitoring traffic signals and for maintaining and operating traffic signals.

Additional information and guidelines can be found on the Department's Traffic Signal website at docs.penndot.pa.gov/Public/Bureaus/BOO/TSPortal/index.html

Pre-Applications Project Scoping forms must be filed by January 2, 2026 and the full application period runs from March 1, 2026 through March 31, 2026.

Questions should be directed to Michael Centi, Senior Traffic Control Specialist, Bureau of Maintenance and Operations, Department of Transportation, 400 North Street, 6th Floor, Harrisburg, PA 17120, (717) 787-5313, GLG@pa.gov.

PA Department of Environmental Protection (DEP) 904 Recycling Performance Grant

Recycling Program Performance Grants are available to all Pennsylvania local governments with recycling programs. Grants are awarded based on the weight of source-separated recyclable materials identified in Section 1501 of Act 101 that were recycled or marketed in the previous calendar year and the population of the municipality. Applications are due December 31, 2025 at 11:59 PM. More information is available at <https://www.pa.gov/grants/search/grant-details/dep/38>

PA Department of Conservation + Natural Resources (DCNR) Peer + Circuit Ride Programs

These grant programs fund projects that help municipalities, counties, multi-municipal partnerships, and council of governments to increase local capacity for recreation, parks and conservation. The Peer program funds projects that, through a collaborative process, focus on a specific need identified by the grantee and its partners. The Circuit Rider program aides in the hiring of a full-time park, recreation or conservation professional whose services are shared by the members of a formal partnership, commission or authority. Applications are due June 30, 2026. More information is available at <https://www.pa.gov/grants/search/grant-details/dcnr/8>.

PA Department of Transportation (PennDOT) NEVI Corridor Connections

Funds for the PennDOT NEVI program are to be awarded on a competitive basis to plan, design, construct, operate, and maintain Electric Vehicle Supply Equipment (EVSE) sites across Pennsylvania. All incorporated entities are eligible to receive NEVI funds, and project sites must be located in an eligible corridor group. Interstate 78 in Lehigh and Northampton counties is a Priority 1 location. **PennDOT will begin accepting proposals on December 22, 2025. Proposals must be submitted by 5:00 PM EST on January 30, 2026.** For more information, go to <https://www.pa.gov/agencies/penndot/research-planning-and-innovation/electric-vehicles-and-alternative-fuels/corridor-connections-funding-round>