Upper Macungie Township 2019 Comprehensive Plan

Lehigh County, Pennsylvania

A Plan for Growth Management and Preservation

Acknowledgements

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The development of the Upper Macungie Township 2019 Comprehensive Plan was a collaboration between the Planning Consultant Team, Township Staff, Planning Commission/Steering Committee, and Keystone Consulting Engineering (Township's Representing Engineer).

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Johnson, Mirmiran & Thompson Inc.

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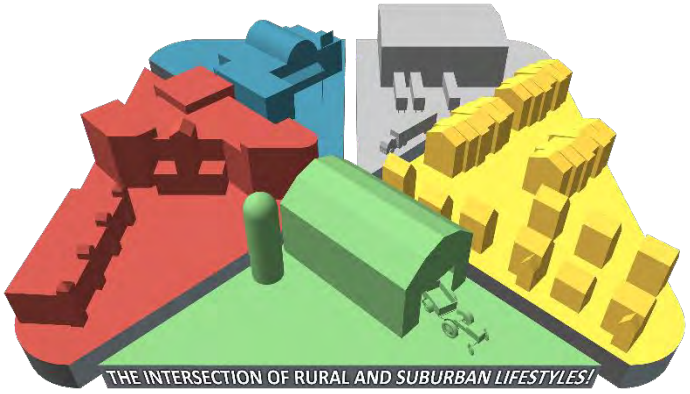
Upper Macungie



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TOWNSHIP OF UPPER MACUNGIE
Lehigh County, Pennsylvania

RESOLUTION #2019-50
(Duly Adopted October 3, 2019)

RESOLUTION ADOPTING A REVISED UPPER MACUNGIE TOWNSHIP COMPREHENSIVE PLAN

WHEREAS, Upper Macungie Township (Township) adopted a Comprehensive Plan (Plan) in the calendar year 1992; and

WHEREAS, the Plan was updated in the calendar year 2007; and

WHEREAS, the Board of Supervisors of the Township determined that with the passage of time, it would be appropriate for the existing Plan to be reviewed by a consultant for the purpose of considering the adoption of a new Plan by the Township; and

WHEREAS, the Board of Supervisors thereafter retained the services of a consultant, Johnson, Mirmiran & Thompson (Consultant) for the purpose of reviewing the existing Plan to consider the manner in which the existing Plan could be revised and/or replaced by an updated Plan; and

WHEREAS, in undertaking this project, the Consultant considered the character of the Township, its natural resources, the quality of new development, and the infrastructure of the Township; and

WHEREAS, as part of the planning process of the Consultant, community leaders and the general public were involved and in particular, a Steering Committee was created which was comprised of representatives of the school district, business community, farmers, and residents; and

WHEREAS, the Steering Committee provided review and policy guidance as the planning for the new Plan proceeded; and

WHEREAS, the Consultant created a Vision Statement for the Township to be utilized for a forthcoming 20-year period of time; and

WHEREAS, the Vision Statement was organized into five major categories which reflect the goals of the Plan, to wit: Community Character and Design, Natural Resources, Quality of Development, Infrastructure, and Excellence in Government; and

WHEREAS, upon the completion of the draft of the Plan, a review of the said Plan was conducted by the Upper Macungie Township Planning Commission (Planning Commission); and

WHEREAS, upon completion of this review, the Planning Commission conducted a Public Meeting in order for a presentation to be made by the Consultant to members of the public who were in attendance at this meeting; and

WHEREAS, this Public Meeting was held on April 3, 2019 at the Upper Macungie Township Municipal Building; and

WHEREAS, on May 15, 2019, at a Public Meeting of the Planning Commission, a Recommendation was made for the adoption of a new Comprehensive Plan; and

WHEREAS, following the submission of the Planning Commission Recommendation to the Board of Supervisors, the Plan was forwarded to the Lehigh Valley Planning Commission, the Parkland School District, and the municipalities contiguous to the Township; and

WHEREAS, following the 45-day waiting period, the Board of Supervisors conducted a Public Hearing, said hearing being held on July 30, 2019 at Jaindl Elementary School, Upper Macungie Township; and

WHEREAS, the Public Meeting of the Planning Commission and the Public Hearing of the Board of Supervisors were conducted in accordance with the provisions of the Pennsylvania Municipalities Planning Code (MPC) (53 P.S. Section 10302 et seq.); and

WHEREAS, with the conduct of the Public Hearing by the Board of Supervisors, the Board of Supervisors desire to take formal action with respect to the adoption of a new Comprehensive Plan.

NOW, THEREFORE, BE IT ADOPTED AND RESOLVED, that the Board of Supervisors of Upper Macungie Township does hereby adopt the new Comprehensive Plan as the same was prepared by the Township's consultant, Johnson, Mirmiran & Thompson, which Plan was reviewed at a Public Meeting held by the Upper Macungie Township Planning Commission and at a Public Hearing conducted by the Upper Macungie Township Board of Supervisors.

IT IS FURTHER RESOLVED, that with the adoption of the new Comprehensive Plan, the existing Comprehensive Plan which was adopted by the Board of Supervisors of Upper Macungie Township in the calendar year 2007 shall be and is hereby repealed and of no further force and effect.

IT IS FURTHER RESOLVED, that by taking this action, the Upper Macungie Township Comprehensive Plan, as the same was prepared by the consultant, Johnson, Mirmiran & Thompson, shall become the Comprehensive Plan whereby the purpose of the said Plan, the Planning Process, and the Vision Statement shall be considered and utilized for the continued orderly growth of Upper Macungie Township. With the adoption of this Comprehensive Plan, its primary purpose is to serve as a guide in order to strive in securing the best possible future for the Township, and to serve as a vision for the next 20 years whereby the residents of the Township may grow and prosper.

DULY ADOPTED this 3rd day of October, 2019, by the Board of Supervisors of Upper Macungie Township in a lawful session duly assembled.

ATTEST

KALMAN SOSTARECZ, Township Secretary

UPPER MACUNGIE TOWNSHIP
BOARD OF SUPERVISORS

JAMES M. BRUNELL, Chairman

JOHN P. GILL, Vice-Chairman

KATHY A. RADER, Member

Executive Summary

Executive Summary

Introduction

Upper Macungie Township (here in after referred to as UMT) plays an important role in the region's economy with respect to manufacturing, warehouse distribution and logistics, farming, natural and agricultural resources, high quality educational facilities, recreation, housing, and an educated labor force. The Township administration and decision-makers recognize that the population will change, the local and regional economy will fluctuate, the housing stock will age, the environment and natural resources will continue to be threatened by the impacts of development, and the needs of citizens will not be the same today as in the past or in the future. The Township Supervisors authorized the development of this plan as an update to the 2007 UMT Comprehensive Plan with this new plan built around achieving sustainability. The planning horizon for this plan is 20 years with emphasis on land use, preservation, and growth management.

Purpose of the Plan

- Manage land use and shape the character, timing, and layout of future development.
- Preserve and conserve agricultural land, forests, historic landmarks, and cultural resources.
- Protect the environment and natural resources.
- Plan for the reliable supply of water.
- Meet the housing needs of present and future residents.
- Revitalize and enhance historic villages.
- Identify and implement transportation and capital improvements.
- Provide for community facilities, utilities, and services needed by a growing population.

Source: PA Municipalities Planning Code (MPC).

Mission Statement

The mission of this plan and those involved in developing the 2019 Comprehensive Plan was to provide a blueprint to guide future decisions that will enhance the quality of life. This plan provides a vision, goals, objectives, policies, plan elements, strategies, and tools to assist UMT planners, staff, the Planning Commission, other boards and commissions, and the Board of Supervisors to meet today and tomorrow's challenges and to assist with achieving a sustainable community vision for 2040.

The Process

The planning process involved a citizen-driven, five-step process. The Planning Commission and a Steering Committee provided input, review, and policy guidance to the planning consultant, Township staff, and planning partners as community assessment, analysis, and citizen engagement were conducted.

The Steering Committee was composed of longtime residents, recent arrivals, representatives of the business and agricultural communities, developers, and regional planning partners. The process diagram to the right summarizes the citizen-driven, fact-based planning process employed to support development of this plan.

Community Issues and Implications

The Lehigh Valley has emerged as a region for robust warehouse development and operations in the state attracting increased truck traffic to the region and impacting the quality of life of residents across the region. While this boom in warehouse development has provided large economic gains, local and regional impacts must be mitigated. The warehouse and industrial cluster in UMT have created an employment hub for the region attracting a significant number of workers commuting to and from UMT daily and heavy volumes of truck traffic distributing goods within the region, the state, and across the northeast. The planning process focused on real and relevant community issues and implications across a range of issues including but not limited to warehouse development. The community prioritized issues below to be addressed through goals, objectives, policies, strategies, and implementation.

- Traffic Congestion
- Large-Scale Warehouse Distribution
- Community Connectivity
- Preservation and Conservation of Land
- Community Character and Sense of Place
- Housing Quality, Choice, and Affordability
- Commercial & Industrial Development/Redevelopment

The community feels strongly that if these issues go unchecked, unmanaged, or unaddressed or if there is no change in policy to mitigate outcomes, UMT risks offering a lower quality of life for today and tomorrow's residents. The following planning implications are addressed by strategies outlined in the main plan document.

- Increased traffic congestion and reduced accessibility will affect potential development in UMT. Commercial businesses will not locate along congested roadways with low visibility. At some point, traffic congestion will impede existing warehouse/logistic center operations and opportunity for future development.
- Increased traffic congestion impacts the quality of life for today and tomorrow's residents. Increased traffic congestion will impede the resale of existing residential properties as well as impede the occupancy of new residential developments.
- A significant amount of land has been zoned and developed for industrial uses including a range of heavy, general, and light industrial uses such as warehouse/logistic center development. Remaining lands zoned for industrial development are targeted for additional manufacturing and warehouse development.
- A lack of pedestrian and bicycle facilities with few transit routes connecting neighborhoods to schools, shopping centers, park and recreation facilities, community centers, and employment centers impacts quality of life and limits travel within UMT to use of automobiles.
- Anticipated growth could potentially result in the loss of approximately 2,800 acres of agricultural land and open space resulting in negative impacts on the natural environment.

- The design and mix of new development both inside and outside of villages will contribute to a sense of place and strengthen community character. If not carefully planned and designed, warehouse development poses the greatest threat to this aspect of the Township.
- The lack of affordable housing for all income levels has resulted in households spending over 30% of their income on housing costs resulting in "cost burdened households." Lands available for residential development provide opportunity to address housing quality, choice, and affordability.
- Lands currently zoned for commercial and industrial development provide opportunity for mixed-use development or redevelopment activity over time that will result in a balanced economy.

Potential for Development and Anticipated Growth

UMT population and employment is projected to increase by 35% and 39% respectively through 2040. This puts UMT as one of the top five municipalities in the Lehigh Valley to experience the highest growth in population and employment over the next 20 years. Future development is influenced by land use policy and regulations (e.g., zoning and development standards), demographic trends, market trends, a good transportation network, access to public water and sewer, quality public facilities and services, and the location of lands available for development.

The table below identifies total net lands available for development (lands that are undeveloped minus environmentally constrained lands) by zoning district. The existing land use patterns and remaining lands for development set the basis for envisioning the future land use. UMT has 18.18% of land available for development with 7.04% located inside the Act 537 Sewer Service Area and 11.24% located outside the Act 537 Sewer Service Area. The bulk of development opportunity is in areas currently zoned residential.

Table 1: Acres by Zoning District and Total Net Developable Land by District

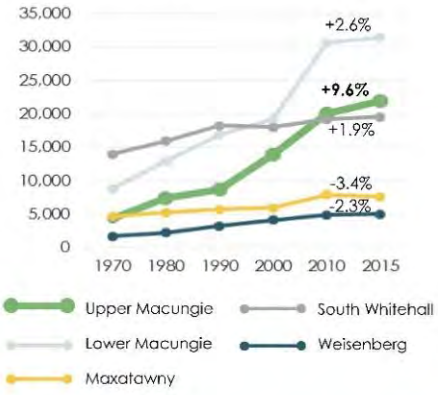
Zoning District	Total Acres	Total Net Developable Land*	Net Developable Lands Inside 537 Service Area	Net Developable Lands Outside 537 Service Area
Residential Zoning Districts				
RU3 – Rural 3 Districts	1,017.95	256.67	0	256.67
RU1.5 Rural 1.5 Districts	2,538.09	690.65	0	690.65
R1 – Rural Residential Districts	2,696.31	1,001.99	67.42	934.57
R2 – Low Density Residential Districts	3,048.34	231.34	231.34	0
R3 – Medium Low-Density Residential Districts	1,273.10	179.74	179.74	0
R4 – Medium Density Residential Districts	112.98	13.31	13.31	0
R5 – Medium-High Density Residential Districts	560.61	81.42	81.42	0
Total Residential Lands	11,247.38	2,455.12	573.23	1,881.89
Commercial Zoning Districts				
HC – Highway Commercial Districts	539.86	61.09	61.09	0
NC – Neighborhood Commercial Districts	300.40	35.09	35.09	0
RT – Research Technology District*	220.30	0	0	0
Total Commercial Lands	1,060.56	96.18	96.18	0
Open Space Preservation Districts				
OSP – Open Space Preservation District	58.91	0	0	0
Total Open Space Lands	58.91	0	0	0
Industrial Districts				
GI – General Industrial Park District	102.21	0	0	0
LI – Light Industrial Park District	3,943.07	191.69	191.69	0
LIL – Limited Light Industrial Park District	359.70	323.15	320.40	2.75
Total Industrial Lands	4,404.98	514.84	512.09	2.75
TOTALS	16,771.83	3,066.14	1,181.50	1,884.64

Source: Appendix F – Build-Out and Impact Analysis.

**Total Net Developable Land are lands available for development minus environmental constraints (slopes greater than 25%, forested land, wetlands, water features, and 100-year floodplain).*

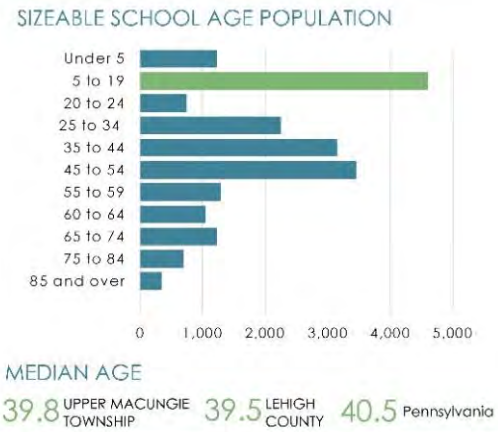
POPULATION

GROWING

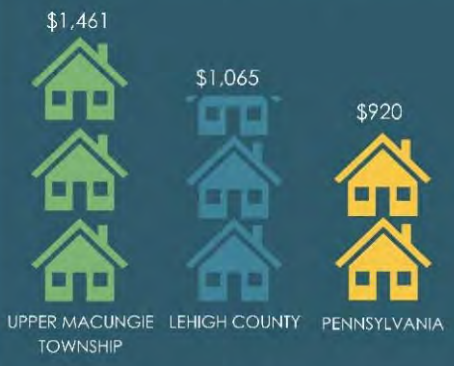


EDUCATED

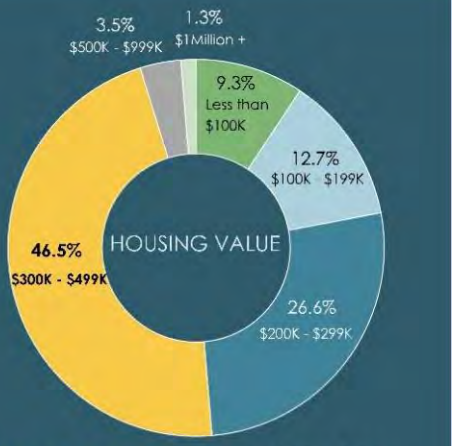
YOUNG



HIGH HOUSING COSTS

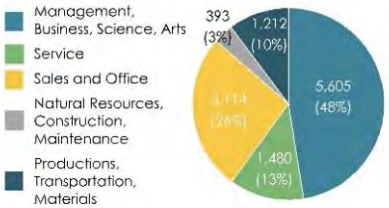


APPROXIMATELY
21% OF HOMEOWNERS &
41% RENTERS ARE CONSIDERED
COST BURDENED
[MEANING MORE THAN 30% OF THEIR INCOME GOES TO HOUSING COSTS.]

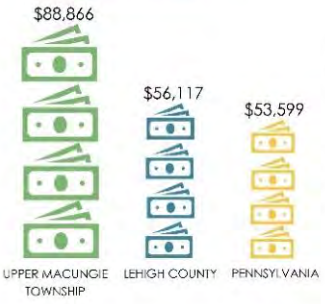


DIVERSE LABOR FORCE & ECONOMY

EMPLOYMENT SECTORS



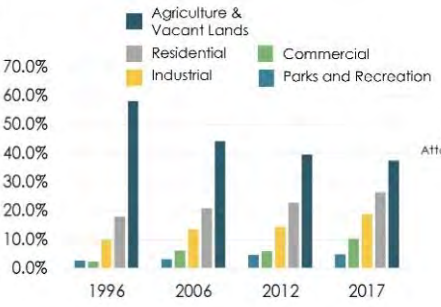
MEDIAN INCOME



TRAVEL TIME TO WORK

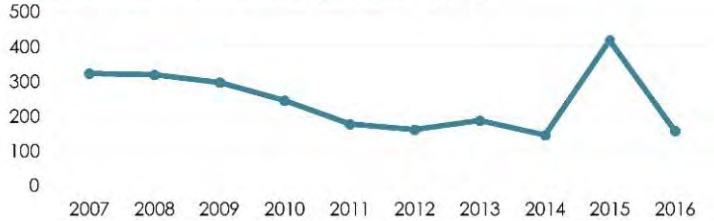
LAND USE & DEVELOPMENT

LAND USE



RESIDENTIAL PERMITS BY TYPE (2007 – 2017)

RESIDENTIAL PERMITS APPROVED (2007 - 2017)



Community Vision

Upper Macungie Township is an inclusive and family-friendly sustainable community and a welcoming place to live, work, and play. Our well-managed community and resident-focused government supports a diverse population and a strong economy and follows community approved sustainability principles to provide a high quality of life for residents and financial prosperity for businesses.

Sustainability Development Topics

- Community Character
- Natural Resources and Farmland Protection
- Affordable Housing
- Multimodal Transportation System
- Appropriate Public Infrastructure
- Quality Public and Private Services
- Economic Stability

Reaching Sustainability

Planning for sustainability depends upon the following definition as the basis for assessment, analysis, policy and strategy development, the timing of development, and implementation of initiatives, programs, and capital projects. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. In general, people want a better environment, a better economy, and better social conditions. Therefore, sustainable development has three main components – environmental sustainability, economic sustainability, and sociopolitical sustainability (American Planning Association).

Sustainability Indicators

The following twenty-four indicators of sustainability have been assessed as part of the plan analysis and will be used to support the metrics and targets of this plan to measure change overtime and to determine how well the Township is achieving sustainability in the context of the natural and cultural resource environment, social environment, and economic environment.

Figure 1: Indicators of Sustainability, Sustainable Development, and Sustainable Communities

Sources of Graphic Concept: United Nations, Department of Economic and Social Affairs (2015).

Land Use Goals, Objectives, and Policy

This section provides the framework for growth management in support of achieving and maintaining community sustainability and quality of life (QOL) for current and future residents.

Land Use Policy strives to achieve a balance between the natural and cultural resource environment, social environment, and economic environment striving to achieve the overarching goal of sustainability.

A balance between living space, economic development, and agriculture affects the overall health, vitality, and sustainability of UMT.

The following land use goals and objectives are interrelated to the specific community development goals, objectives, and policies for various aspects of planning and other topics detailed in Chapter 1.

Goal 1: UMT is a community that plans and designs for managed development that contributes to sustaining a modern community (society).

- Objective 1: Provide and maintain a safe and accessible multimodal transportation system.
- Objective 2: Provide adequate and timely public infrastructure and quality facilities and services.
- Objective 3: Provide incentives to develop and maintain a variety of affordable housing options.
- Objective 4: Apply and regulate design standards that establish or reinforce community character with a sense of place and identity.

Goal 2: UMT is a community that allows for a variety of uses creating a balanced and sustainable economy.

- Objective 1: Place more weight on sustainability of agricultural land (protection of lands, soils, and best practices) as part of economic growth.
- Objective 2: Mitigate the impacts of uses of regional significance such as the growth of the existing warehouse, distribution, and logistic center cluster development.

Goal 3: UMT is a community that protects and preserves environmentally sensitive areas (ESAs).

- Objective 1: Preserve lands registered as Agricultural Security Areas (ASA) permanently.
- Objective 2: Maintain a healthy, sustainable community through protection of ESAs.
- Objective 3: Protect and preserve historic and cultural resources.

Land Use Policy

Overall, the Land Use Policy of the Township should continue to promote and adopt appropriate land use strategies and regulations that achieve sustainable development principles and policies around the following aspects of the Township:

- Community Character
- Natural Resources and Agriculture Protection
- Affordable Housing
- Multimodal Transportation System
- Appropriate Public Infrastructure
- Quality Public and Private Services
- Economic Stability

Note: Chapter 1 provides details about each of these aspects of sustainable development and polices.

Relevant policies outlined in the 2007 Plan that should be continued as part of implementation of this plan along with new policies include:

- Direct development within the UGB (UMT Act 537 Service Boundary Area) and limit development in rural and agricultural areas.
- Recognize LVPC's Comprehensive Plan, Long Range Transportation Plan, Hazard Mitigation Plan, and other related topic plans.
- Adopt land use regulations that protect agricultural lands held in Agricultural Security Areas of the Township.
- Promote orderly patterns of development that are compatible between uses and with uses in adjacent municipalities.
- Use compact development and conservation by design standards to achieve natural, cultural, and agricultural resource conservation, preservation, and protection goals, objectives, and policies.
- Utilize tools contained in the PA Municipalities Planning Code to enhance the preservation, development, and redevelopment of UMT villages (e.g., Traditional Neighborhood Development - TND, Historic Preservation Districts, etc.).
- Integrate water resource management goals, policies, and strategies with land use planning and policies.
- Allocate appropriate lands for a mix of housing types and densities to provide an adequate supply of affordable housing options for households of all income levels.

Source: 2007 Comprehensive Plan.

Community Development Goals

Community development goals, objectives, and policies are identified in the main plan document. The following summarizes just the goals for development topics in support of land use goals, objectives, and policies.

Community Character and Design

Community character refers to the natural and built features that shape the Township's identity. Design standards focus on the way buildings, streets, and open space work together to define a sense of place.

- Goal 1: Upper Macungie will be a place that successfully integrates the rural landscapes with modern communities.
- Goal 2: Children growing up in UMT will be able to afford to live here in the future and throughout their lifetime with opportunities for aging in place.
- Goal 3: Upper Macungie's historic villages will be revitalized and serve as centers of the community.

Natural Resources

Natural resource conservation and management are essential to agricultural production and environmental sustainability. Management systems specific to characteristics of various suburban landscapes must contribute to sustainability of the community.

- Goal 1: Upper Macungie will preserve important green space and scenic open space through a variety of innovative conservation tactics that include zoning, partnerships with land trusts, and effective use of incentives for voluntary preservation.

Quality of Development

Quality development contributes to the economic, environmental, and social sustainability of the community improving the quality of life of today and tomorrow's residents.

Environmental sustainability is the condition when demands placed on the environment can be met without reducing its capacity to allow all people to live well, now and in the future.

- Goal 1: Development will be environmentally sustainable while enhancing surrounding neighborhoods and the community.
- Goal 2: When appropriate, use traditional neighborhood or village standards where walking and/or biking is possible.
- Goal 3: Balance land use opportunities to assure adequate residential, commercial, and institutional uses are provided for to support UMT's suburban industrial employment hub.

Infrastructure

Investments in infrastructure and technology are important to livability and economic sustainability. Fast growing suburban communities are challenged to provide, maintain, and operate public facilities and services.

- Goal 1: Public infrastructure and services will be well-planned, well-managed, and coordinated.
- Goal 2: Provide residents continued access to quality health care and wellness services.

Excellence in Government

Government plays an important role in implementing sustainable development. It is crucial to involve relevant decision makers and partners to implement sustainable policies.

- Goal 1: Demonstrate measurable progress to achieve goals, objectives, policies, and strategies for all plan elements.
- Goal 2: Build fiscal strength through SMART decision-making that contributes to community sustainability.
- Goal 3: Implement this plan and other plans through the Capital Improvement Plan (CIP) and Annual Budget.

Land Use Plan and Future Land Use Map

The Future Land Use Map is UMT's visual guide to future planning and community development as described by the vision statement and land use goals, objectives, and policy. This map brings together the other elements of this plan including community facilities (predominantly park and recreation facilities), natural and cultural resources, agricultural resources, housing, economic development opportunities, and transportation.

Community Vision

Upper Macungie Township is an inclusive and family-friendly sustainable community and a welcoming place to live, work, and play. Our well-managed community and resident-focused government supports a diverse population and a strong economy and follows community approved sustainability principles to provide a high quality of life for residents and financial prosperity for businesses.

This plan focuses on the conservation and preservation of agricultural land, open space, and natural resources while managing the potential for growth through development, redevelopment, and adaptive reuse of buildings, meeting the demands for housing for all income levels, and promoting diverse economic development opportunities that will result in jobs for local and regional residents.

Land Use Classifications

Land use involves the management and modification of the natural environment to a built or man-made environment (residential and non-residential uses) and semi-natural habitants including agricultural land, park and recreation land, open space, and managed woodlands. The land use classifications described below are represented on Map 3: Future Land Use.

Table 2: 2017 and Future Acreage by Land Use Classification

2017 % of Acres*	2040 Future % of Acres**	Land Use Classification
26.4%	23.2%	Residential – Land designated for residential and residential support uses including areas identified for low, medium, and high-density residential uses of various types including, but not limited to single-family attached and detached dwellings, townhouses, apartments, and condominiums.
10.4% Note: This area of land use was broadly identified as commercial.	1.0%	Town Center – Area for new development or redevelopment of land for the integration of a variety of land uses including residential, office, commercial retail, services, public open space, entertainment, research and development, education, and employment. These areas can result in measurable reductions in traffic impacts.
	6.3%	Mixed-Use Development – Areas including villages with small-scale development and surrounding mixed use development including commercial uses.
	2.9%	Commercial – Land designated for retail or wholesale marketing of goods and services, offices or office complexes, shops, hotels and resorts, and restaurants.
17.6%	18.9%	Industrial – Land designated for production, manufacturing, distribution, fabrication, or research and development activities including but not limited to industrial parks for light and heavy industrial uses.
1.4%	1.6%	Institutional – Land designated for nonprofit, quasi-public, or private uses such as religious institutions, libraries, public/private schools, colleges and universities, technical schools, hospitals, or government-owned or operated facilities.
11.4%	10.5%	Utility – Land designated for the transportation network (predominantly roads) and public and private utility infrastructure, wastewater treatment facilities, public stormwater facilities, overhead electric transmission, and other similar uses.

**Source: LVPC and UMT Park /Recreation Plan Data. **Source: UMT Future Land Use Map GIS calculations.*

Table 2: 2017 and Future Acreage by Land Use Classification (Continued)

2017 % of Acres*	2040 Future % of Acres**	Land Use Classification
28.0%	26.1%	Agricultural – Land that consists of Class I and/or Class II soils in the Soil Conservation Service land use compatibility classification and other soils suitable for use actively in the production of food, fiber, or livestock. Agricultural land also includes wasteland that is part of the farm unit.
4.8%	9.5%	Park/Recreation and Open Space/Green Space – Land designated for public or private recreation (parks, trails, paths, playing fields, and similar), nature-based or athletic education, cultural, or aesthetic uses; and environmentally sensitive areas, natural vegetation, forested areas and open space permanently preserved as part of current and future development for pubic and/or private use.

**Source: LVPC and UMT Park /Recreation Plan Data. **Source: UMT Future Land Use Map GIS calculations.*

Summary of Land Use Strategies

The following strategies will be implemented through policy, land use regulations, and public investment through the Township's Capital Improvement Plan (CIP) and Annual Budget. These strategies have strong interrelationships with other plan element policies, goals, objectives, and strategies. Implementation should be integrated and comprehensive to appropriately manage growth while programming adequate public infrastructure, facilities, and services.

Urban Growth Boundary (UGB) – Guide development to lands inside of the Urban Growth Boundary (Act 537 Sewer Service Boundary Area) where public infrastructure, utilities, and facilities are provided to support higher density and intensity residential, commercial, institutional, and industrial development.

Residential Land Uses – Rezone additional lands for high density residential uses (e.g., mobile home parks, manufactured homes, tiny home developments, apartments, and townhouses) to increase quality, affordable housing options that support the current and future labor force. Provide flexible housing options through regulation of accessory dwelling units to increase age-restricted affordable housing options and affordable housing for those entering the labor force.

Open Space and Park/Recreation Lands – Through zoning and other mechanisms continue to preserve and conserve woodlands and natural, cultural, and agricultural resources through dedication of open space and park/recreation lands, trails and paths, preservation easements, and other mechanisms to protect these resources from development.

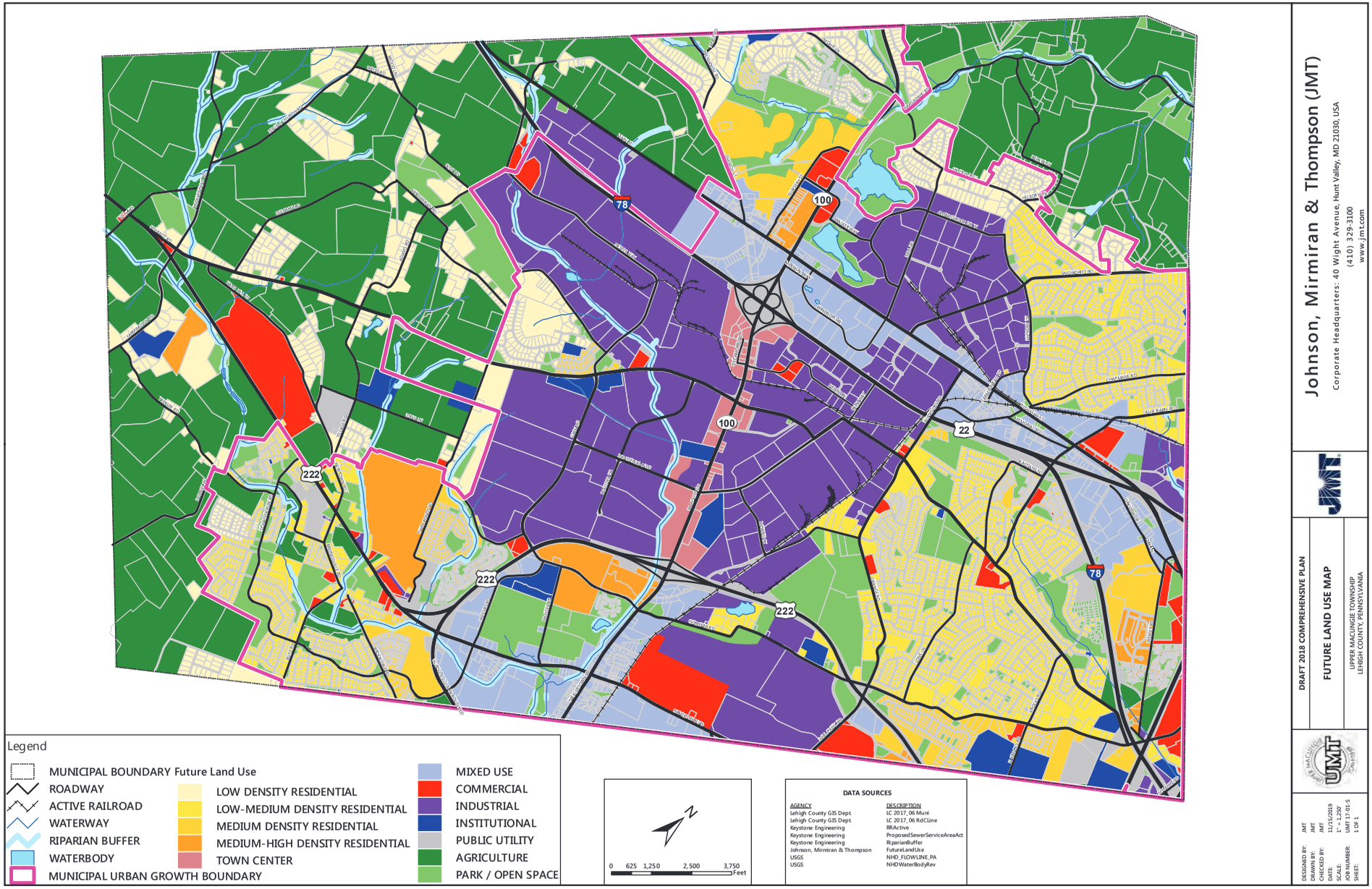
Commercial and Institutional Land Uses – Promote mixed-use development including residential units (upper floor living), community serving retail, services, dining, office space, and healthcare and education facilities (e.g., town centers, mixed-use development, or walkable development) through both new development and redevelopment. Promote internal circulation to include easy access to and from major transportation corridors using an internal roadway network designed with bus pull-offs, bus shelters, and other pedestrian and bicycle facilities.

Agricultural and Industrial Land Uses – Protect lands available for development (lands subject to potential rezoning) from warehouse, distribution, and logistic center development by:

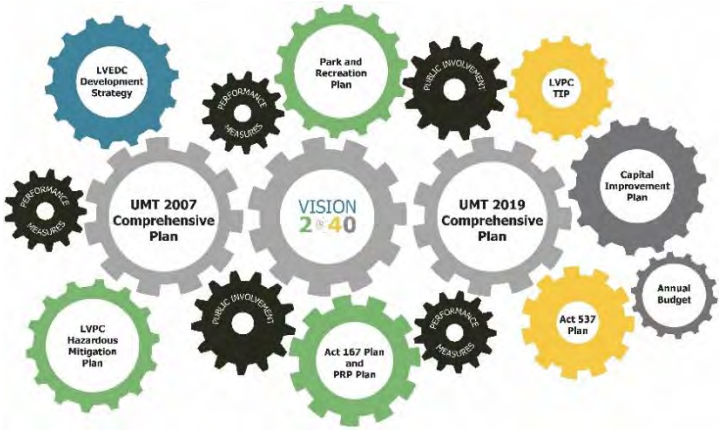
- Permanently preserving agricultural lands and other environmentally sensitive areas both inside and outside of the Township's UGB.
- Adopting Agricultural Protection Zoning (APZ) to protect lands currently farmed and inactive lands with prime agricultural soils available for future farming activity.
- Focusing economic development efforts on industrial uses offering higher wages for the local and regional labor force.
- Requiring environmental impact statements for land uses of regional significance.

In partnership with LVPC, LVEDC, PA Department of Community and Economic Development, LANTA, and municipalities impacted by warehouse cluster development, conduct a fair share analysis and community impact assessment studying the cumulative impacts of warehouse clusters (a land use of regional significance). Note: This study will strengthen the position of decision makers striving to balance warehouse development with other land uses to achieve community sustainability.

Future Land Use Map



Implementation Plan



Implementation of this plan will assist UMT government and its citizens, businesses, and institutions achieve the vision for future development of the Township to achieve long-term sustainability. Implementation is essentially the methods, actions, projects, or programs required to carry out the vision for UMT expressed in this plan.

Decision makers of sustainable communities apply a framework (a clear set of community development goals, objectives, policies, and strategies aimed at creating the vision) with standards for creating livable, healthy communities through a balance of development opportunities with open space preservation protecting natural and agricultural resources. This framework outlined in the previous chapters of the plan provide the basis for the following short-term, mid-term, and long-term actions implemented through various partnerships.

Vision 2040

Upper Macungie Township is an inclusive and family-friendly sustainable community and a welcoming place to live, work, and play. Our well-managed community and resident-focused government supports a diverse population and a strong economy and follows community approved sustainability principles that provide a high quality of life for residents and financial prosperity for businesses.

Source: Chapter 1, Community Vision, Goals, and Objectives

Relationship to Capital Improvement Plan, and Annual Budget

The Capital Improvement Plan (CIP) and Annual Budget are the mechanisms to implement public facility and infrastructure improvements outlined in this plan. These are also strategic tools that can be used to coordinate decision making within the Township and between other jurisdictions (e.g., surrounding municipalities, Lehigh County Authority (LCA), Lehigh County, Lehigh Valley Planning Commission (LVPC)/Lehigh Valley Transportation Study (LVTS), PennDOT, DEP, and other similar entities) to insure capital investments promote community goals and objectives outlined in the Comprehensive Plan. The comprehensive plan identifies community facilities and infrastructure capital investments, phasing strategy/timeframe, and grants and financing options for projects to be implemented through the CIP and Annual Budget.

Performance Metrics and 2040 Targets

Moving forward, the indicators of sustainability serve as a tool to evaluate the impacts of proposed development and plan implementation impacting the natural and cultural resource environment, social environment, and the economic environment. The performance metrics is the framework to evaluate the success and timing of achieving various aspects of the plan through implementation.

The level of measurability of these indicators has been documented in various chapters and the Appendices of the plan. Tracking and assessing various indicators to demonstrate progress is important to help determine appropriate regulation and mitigation of impacts as well as to determine future validity of the plan and any need to update the plan in whole or part as time passes, as preferences and challenges change, as federal and state regulations change, and/or as local policies and priorities change.

The following performance metrics relate to the various plan elements and respective goals, objectives, policies, and strategies outlined in previous chapters. Reference specific plan chapters to understand the basis for the identified metric and target for each sustainability indicator. These performance metrics are the basis for establishing a Township report card to measure progress to achieving community sustainability.

Figure 2: Sustainability Indicators and 2040 Targets

Implementation Schedule

Understanding UMT has limited lands remaining for development and will continue to be pressured to rezone agricultural lands for development, those items identified for immediate action are crucial to further strengthening the regulatory framework to manage growth as outlined in this plan to minimize further loss of agricultural land as part of the Township's economic base. The following identifies various actions as part of implementation of the plan with time references including immediately (1 yr.), short-term (1-3 yrs.), mid-term (1-5 yrs.), or long-term (1-10 yrs.).

Land Use & Housing Implementation Plan				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Amend Zoning Ordinance to include the community development goals and objectives identified in this plan.	Immediately (Upon Adoption of the Plan)	Staff time ($3,000-$5,000)	Planning Commission and Board of Supervisors	General Funds – Planning Budget
Amend Zoning Ordinance & Map to adopt Agricultural Protection Zone with provisions to protect agricultural land and integrate recently adopted secondary uses such as Agritainment/Agritourism regulations.	Immediately (Upon Adoption of the Plan)	Staff and Solicitor time ($5,000 - $10,000)	Lehigh County Ag Board, LVPC, Planning Commission, Solicitor, and Board of Supervisors	General Funds – Planning Budget
Increase lands zoned for higher density residential uses within the UGB and as logical extensions of existing villages.	5-7 years	Staff and Solicitor time ($5,000 - $10,000)	Planning Commission and Board of Supervisors	General Funds – Planning Budget
Evaluate LI & LIL Districts to include uses for adaptive reuse of warehouse, distribution, and logistic centers – some uses may be permitted by-right, by special exception, or by condition use. Require Environmental Impact Assessment for warehouse uses.	Immediately (Upon Adoption of the Plan)	Staff and Solicitor time ($3,000 - $5,000)	LVPC, Planning Commission, and Board of Supervisors	General Funds – Planning Budget
Amend Special Exception requirements for warehouse, distribution, and logistic centers to include an adaptive reuse strategy/plan for the facility and/or site for a range of permitted uses that may or may not be currently permitted.	Immediately (Upon Adoption of the Plan)	Staff and Solicitor time ($5,000 - $10,000)	LVPC, Planning Commission, and Board of Supervisors	General Funds – Planning Budget
Prepare and adopt an Official Map consistent with the Land Use, Transportation, and Community Facilities & Utilities chapters, and projects listed in the Capital Improvement Plan (CIP).	1-3 Years	Staff, Representing Engineer, and Solicitor time (planning and engineering) ($10,000 - $15,000)	Planning Commission and Board of Supervisors	General Funds – Planning & Engineering Budgets and Capital Budget
Conduct appropriate analysis and legal review to support changes in zoning that would constitute up/down zoning of areas for development and redevelopment.	1-3 Years	Staff and Solicitor time ($60,000 - $80,000)	Township Staff, Planning Commission, and Board of Supervisors	General Funds

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

Community Character and Design				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Prepare and adopt by resolution a Complete Streets Policy consistent with concepts identified in Chapter 4, Community Character & Design.	1-3 years	Staff, Representing Engineer, and Solicitor time ($2,000 - $5,000)	Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets
Evaluate Redevelopment Overlay Ordinance and amend to include Traditional Neighborhood Development Overlay design standards for Villages and surrounding areas with potential for growth – establish design criteria consistent with guidelines identified in Chapter 4, Community Character & Design.	1-3 years	Staff, Representing Engineer, and Solicitor time ($5,000 - $10,000)	Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets
Strengthen the Subdivision/Land Development Ordinance to include design standards for streetscapes including pedestrian, bicycle, and transit facilities and connections to adjacent neighborhoods and commercial centers. And, include design standards from Historic Preservation Plan.	1-3 years	Staff and Solicitor time ($10,000 - $15,000)	Planning Commission and Board of Supervisors	General Fund – Planning Budget
Implement various phases of the Trexlertown & Fogelsville Village Improvement Plan with update of the plan as needed.	1-10 years	Staff, Representing Engineer time and Consultant if plan is updated ($35,000 - $40,000)	Township, PA DCED, PennDOT District 5-0, PHMC, DCNR, Lehigh County, LVPC, LVEDC, Lehigh Valley Chamber of Commerce, Local Businesses, and Residents	General Fund, Various State Grants, and various County and regional programs and grants as outlined in the Village Improvement Plan
As part of LVPC's Walk/RollLV initiative and pan, consider additional regional connections to those connections identified on Map 12, Connections and incorporate any new connections as part of an Official Map.	1-3 years	Staff, Representing Engineer, and Solicitor time	Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets
Work collaboratively with LANTA, LVEDC, companies, and employees to discuss needs and determine feasibility of bus service, bus stops, and sidewalks early in the SALDO process and negotiate improvements with developers/owners.	1-10 years (on-going)	Staff and Representing Engineer time	LANTA, Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets for staff time and Developer/Owner sponsored improvements
Strengthen the Subdivision/Land Development Ordinance to include site and building design standards that address crime prevention through environmental design (CPTED) requirements.	1-3 years	Staff, Representing Engineer, Solicitor, and Consultant ($15,000-$20,000)	Planning Commission and Board of Supervisors	General Fund and DCED grants.

Community Character and Design (continued)				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Coordinate with PPL to gain easements to overhead utility rights-of-way to allow pedestrian and bicycle paths and trails connecting neighborhoods, shopping, schools, and employment centers. Outline projects in Capital Improvement Plan (CIP).	1-10 years (ongoing implementation of capital projects)	Staff and Representing Engineer time (planning, secure easement, and design)	PPL, Neighborhood Associations, Planning Commission, and Board of Supervisors	General Fund – Planning & Engineering, Municipal Bonds, Capital Budget, LVTS/PennDOT Transportation Alternatives Set-Aside Funds, DCNR grants, DCED GTRP grants, PennDOT and DCED Multimodal Funds, and Developers.
Plan, design, and construct off-road bicycle/ pedestrian facility along Cetronia Road east of Route 100 to connect with Uline path.	1-5 years	Staff and Representing Engineering time for plan/design phase ($20,000 - $30,000)	Air Products, Uline, other Property Owners, Planning Commission, and Board of Supervisors	
Update the 2011 Park and Recreation Plan to also address open space preservation and bicycle/pedestrian connections.	1-3 years	Staff and Consultant ($40,000 - $60,000)	Planning Commission and Board of Supervisors	General Fund, DCNR, and other funds.

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

Economy				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Conduct a detailed Cost of Community Services (COCS) Study.	1-3 years	$20,000 - $30,000	Township Manager, Accountant, and Solicitor	General Funds – Administrative, PA DCED Grant
Partner with developers and business owners to identify various resources to enhance the quality of new development and expansion of existing facilities.	1-10 years (ongoing)	Township Manager, Staff, and Representing Engineering	Township Manager, Director of Planning, Representing Engineer, Developers, and Business Owners	SBDC, LVEDC, and other potential sources.
Focus on business attraction and retention through efficient communications, process coordination, and clear explanation of development and permitting requirements.	1-10 years (ongoing)	Township Manager, Development Review and Permitting Staff	Township Manager, Director of Planning, Representing Engineer, LVEDC, Zoning Officer, SEO, and Building Official.	General Funds – Planning, Permitting, & Engineering Budgets
Coordinate with the School District, PA Department of Agriculture, Lehigh County, and SBDC to educate and promote farming as well as provide training for new farmers.	1-10 years (ongoing)	State and County Program Funds	School District and Lehigh County	Various Department of Agriculture and USDA Rural Education, Training, and Start-Up Programs
Refer to Land Use & Economy Chapters for warehouse adaptive reuse strategies and planning requirements.	See Land Use & Economy for details			
Refer to Land Use & Housing for affordable housing strategy to support employment hub (warehouse/industrial cluster) demands.	See Land Use & Housing for details			

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

Natural, Cultural, and Agricultural Resources				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Continue to promote and apply the conservation by design regulations and design standards to preserve and conserve natural resources.	1-10 years (ongoing)	Staff and Representing Engineer time	Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets
Continue public and private preservation and conservation of natural resources through land acquisition, riparian buffer and open space easements, path/trail development, floodplain management, and public dedication/donation by owners.	1-10 years (ongoing)	Staff, Representing Engineer, and Solicitor time and Project Specific Costs (TBD)	Planning Commission, Board of Supervisors, Property Owners,	Natural Lands Trust, DCNR, General Funds, The Conservation Fund, Lehigh County Farmland Preservation Program, and other programs
Continue to subsidize the permanent preservation of the total 1,116 acres of agricultural lands registered as Agricultural Security Areas.	1-10 years (ongoing)	Maintained in Annual Budget $200,000 - $250,000	Resident and Business Owner Support. Property Owner, Lehigh County Ag Board, Lower Macungie TWP, and Board of Supervisors.	State, Lehigh County Ag Board, and Upper Macungie Township
Review and amend Subdivision/Land Development and Stormwater Management Ordinances against the 2020 DEP Model Ordinance to assure water resource planning is integrated with land planning and development regulations. Incorporate current best management practices and green stormwater infrastructure (GSI) solutions.	1-3 years (Upon adoption of the plan)	Staff, Representing Engineer and Solicitor time ($15,000 - $20,000)	PA DEP, Planning Commission, and Board of Supervisors	General Fund and PA DCED, DEP, and DCNR Grants
Apply for grant and loan applications for planning, design, and construction of public trails/paths, greenways, park and recreation facilities, and GSI projects.	1-10 years (ongoing)	Staff and Representing Engineer ($20,000 - $50,000 Annually)	Planning Commission, Board of Supervisors, Staff, and Representing Engineer	DCNR Grant Programs, Commonwealth Financing Authority – DCED & PennDOT Multimodal Funds, DCED Greenways, Trails & Rec Funds, PennVEST, PA DEP, EPA, and other sources
Continued sanitary sewer maintenance and operations to eliminate I&I, SSO, and other situations impacting the environment – continue to include these types of programs and projects in TWP M&O Budget and CIP Budget.	1-10 years (ongoing)	TBD Based upon Capital Project and/or M&O Program—Refer to Annual Budget and CIP specific projects and allocations	Various TWP Departments, Lehigh County Authority, and DEP	Budget - Sewer O&M and Capital Funds
Build upon LVCP recently updated Historic Inventory to prepare a comprehensive survey of historic resources and prepare a Historic Preservation Plan.	1-3 years	Township, PHMC, and Consultant ($50,000 - $60,000)	Township and LVPC staff, Planning Commission, and Board of Supervisors	PHMC Grants

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

Transportation				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Interchange Improvement – Route 222 & Route 100 Interchange	1-10 years	Point of Access Study and Design & Construction Costs TBD through LVC TIP Process and PennDOT's Planning & Programming Phase	Township, LVPC, District 5-0 and Property Owners/ Developers	District 5-0, LVPC, UMT, and Private Investment
New Interchange Improvement – Route 222 & Mill Creek Road				
I-78 and Route 100 Interchange Full Replacement				
New I-78 and Adams Road Interchange				
Fogelsville/Glenlivet Connector	1-10 years	TBD	Developer requirement	Developer Capital Investment
Route 100 Corridor Study and CIP (part of a regional study – Integrated Congestion Management approach)	1-5 years	$350,000 - $500,000 (regional study)	LVPC, DCED, PennDOT, UMT, and surrounding Municipalities along the Corridor	LVTS UPWP, DCED, PennDOT Multimodal Funds, LVTS/PennDOT Transportation Alternatives Set-Aside Funds, UMT General Funds – Planning Budget, and other affected municipalities
Intersection, ADA & Crosswalks, and Improvements (Improve with Adaptive Signals) • Route 100 & Schantz Road • Route 100 & Penn Drive • Route 100 & Industrial Drive	1-5 years	$240,000	UMT, LVPC, PennDOT District 5-0, and Developers (as applicable)	LVTS Intersection and ITS Improvement Fund, PennDOT Highway Funds, and UMT
Congestion Management Safety • US Route 222 Corridor Study and CIP • Tilghman Street/Main Street Corridor Study and CIP • Phase 2 Hamilton Boulevard Corridor Study and CIP	1-5 years	$100,000 - $250,000 each	UMT, LVPC, PennDOT District 5-0, and Developers (as applicable)	LVTS, DCED and PennDOT Multimodal Funds, LVTS/PennDOT Transportation Alternatives Set-Aside Funds, and other sources
Route 100 & Hamilton Boulevard/Route 222 Multimodal Improvements (Trexlertown)	1-5 years	$500,000 - $1,000,000	UMT, LVPC, and PennDOT District 5-0	General Funds, Liquid Fuels, PennDOT Highway Funds, LVTS/PennDOT Transportation Alternatives Set-Aside Funds, and other sources

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

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Comprehensive Plan

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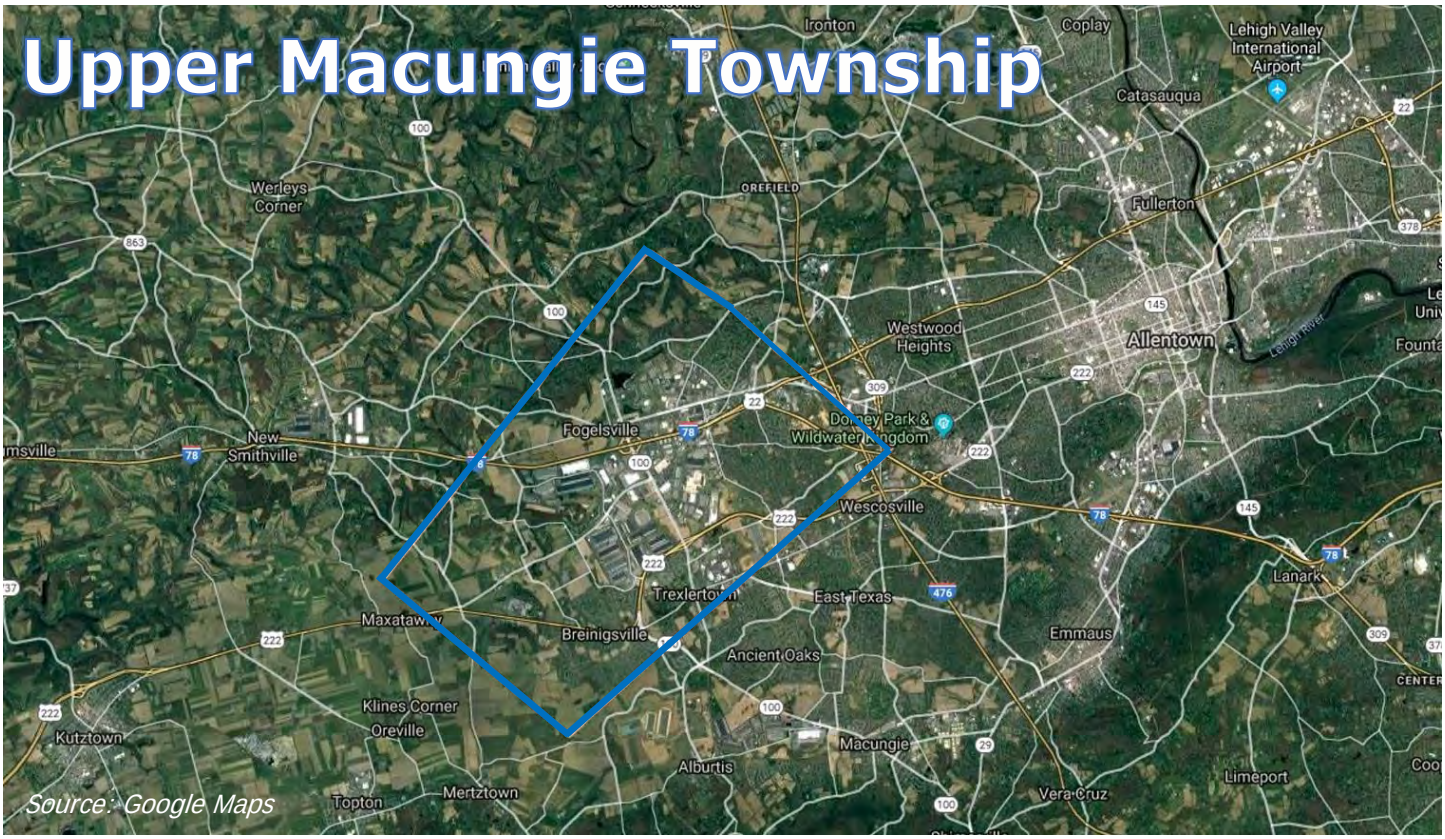


Introduction

Upper Macungie Township (here in after referred to as UMT) plays an important role in the region's economy with respect to manufacturing, warehouse distribution and logistics, farming, natural resource and agricultural preservation, high quality educational facilities, recreation, housing, and an educated labor force. The Township administration and decision-makers recognize that the population will change, the local and regional economy will fluctuate, the housing stock will age, the environment will continue to be threatened, and the needs of citizens will not be the same today as in the past or in the future. The Township Supervisors authorized the development of this plan as an update to the 2007 UMT Comprehensive Plan with this new plan built around achieving sustainability.

A decade of results, dedicated to implementation of the 2007 Plan, demonstrates that Township policies and land use regulations have successfully contributed to achieving quality places to live, work, and play. Still, there is more to be accomplished when striving to maintain quality places and to achieve higher levels of sustainability. Today, the following planning principles are crucial to meeting the challenges of change, to meeting the needs of future citizens, and to achieving higher levels of community sustainability.

- Creating livable, healthy, and bikeable/walkable places.
- Striving for social equity and diversity.
- Adopting policies that support inclusionary zoning for all types of land uses with recognition that housing is part of community infrastructure.
- Focusing on economic resiliency and nature-based solutions.
- Implementing community and data-driven processes, community-identified priorities, and community-driven design standards and strategies working collaboratively with the community.
- Embracing innovation that supports smart communities, smart transportation, smart farming, and smart infrastructure.
- Accepting technology driving change such as e-commerce, autonomous and connected vehicles (A/CV), artificial intelligence (AI), and other emerging technologies.

- Developing long-lasting public-private partnerships.
- Strategically implementing multimodal and inclusive mobility solutions.
- Encouraging green development, green stormwater infrastructure (GSI), and renewable energy.
- Implementing infrastructure and asset management programs.
- Emphasizing workable, practical, and implementable strategies and solutions.

Purpose of the Comprehensive Plan

The Comprehensive Plan is a plan to address change considering the past, the current, and the future. The purpose of this plan is to provide a vision and framework of community development goals and objectives that promote the health, safety, and general welfare of UMT. The planning horizon is a 20-year look-ahead with 2040 targets and viable strategies for sustainable growth management. Moving forward, this framework will assist the Planning Commission, the Board of Supervisors, property owners, and developers who are collectively responsible for:

- Managing the use of land and shaping the character, timing, and layout of future development.
- Preserving and conserving agricultural land, forests, historic landmarks, and cultural resources.
- Protecting the environment and natural resources.
- Planning for the reliable supply of water.
- Meeting the housing needs of present and future residents.
- Revitalizing and enhancing historic villages – Trexlertown, Fogelsville, and Breinigsville.
- Identifying and implementing transportation capital improvements.
- Providing for community facilities, utilities, and services to support a changing population.

Mission Statement

The mission of the plan and those involved in developing the 2019 Comprehensive Plan is to provide a blueprint (a plan) to guide future decisions that will enhance the quality of life for today and tomorrow's citizens.

The Process

The process diagram to the right summarizes a citizen-driven, fact-based planning process employed to support development and adoption of this plan. The Planning Commission, a Steering Committee, the public, and Township staff provided input and policy guidance for study analysis and plan development in steps 1 through 3. The Steering Committee was composed of longtime residents, recent arrivals, representatives of the business and agricultural communities, developers, and regional planning partners. The last step - Plan Implementation – is expected to occur over the next 10-15 years. UMT staff and the Planning Commission will be responsible for yearly assessments and reporting of accomplishments to the Board of Supervisors.

Figure I1: Planning Process

Source: Upper Macungie Township, PA website

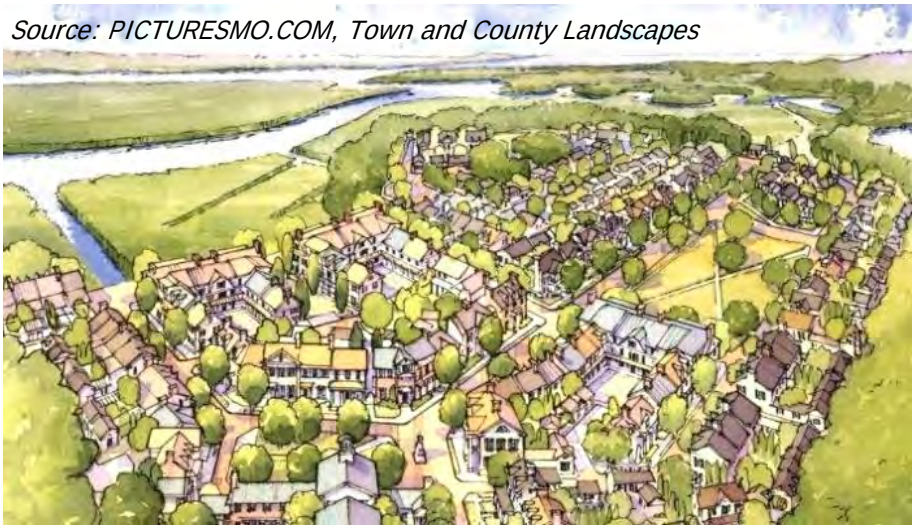
Community Vision, Goals, and Objectives

UMT is one of the fastest growing municipalities in Pennsylvania. With rapid growth comes challenges, costs, and risks to the natural and social environments along with benefits to the economic vitality of the community. The Township's vision, goals, and objectives along with policies identified in this chapter provide current and future citizens, businesses, organizations, and developers the information needed to learn about how the community would like to preserve valuable community resources and assets, enhance community character, and manage growth.

A vision statement describing what is important to the community is crucial to the success of development initiatives. The vision statement is supported by goals and objectives outlining what and how the community wants to achieve the vision. And, the vision is realized through policies or principles that guide rational outcomes as this plan is implemented. This chapter provides the framework for achieving the vision – the ideal future conditions for UMT that will contribute to achieving community sustainability.

VISION 2040

Source: PICTURESMO.COM, Town and County Landscapes



Vision Statement & Sustainability

Community Vision

Upper Macungie Township is an inclusive and family-friendly sustainable community and a welcoming place to live, work, and play. Our well-managed community and resident-focused government supports a diverse population and a strong economy and follows community approved sustainability principles to provide a high quality of life for residents and financial prosperity for businesses.

Reaching Sustainability

This plan applies various principles as the basis for developing land use goals, objectives, policies, strategies, actions, and performance measures. Planning for sustainability depends upon the following definitions as the basis for assessment, analysis, policy and strategy development, the timing of development, and the implementation of initiatives, programs, and capital projects.

- Sustainable development is development that maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend. Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. In general, people want a better environment, a better economy, and better social conditions. Therefore, sustainable development has three main components – environmental sustainability, economic sustainability, and sociopolitical (social) sustainability.

  Source: American Planning Association and Wikipedia

- Sustainable communities are economically, environmentally, and socially healthy and resilient and they meet challenges through integrated solutions rather than through fragmented approaches. Sustainable communities take a long-term perspective, focusing on both the present and future, well beyond the next budget or election cycle.

  Source: Institute for Sustainable Communities

Sustainable Development Principles

Community Character: Strengthening cultural resources and historic landmark protection, revitalizing villages, and following high standards for quality development.

Natural Resources and Farmland Protection: Providing quality open space, protecting the environment, and promoting a healthy community.

Affordable Housing: Offering housing options for all ages and all income levels.

Multimodal Transportation System: Offering transportation options by connecting communities through the integration of walking, bicycling, and transit with vehicular modes of travel.

Appropriate Public Infrastructure: Ensuring cost effective investment in public infrastructure keeps pace with development.

Quality Public and Private Services: Providing appropriate community services to offer a safe and healthy living environment, extending recreational options, and promoting active lifestyles.

Economic Stability: Promoting economic development that meets local and regional needs for employment, shopping and professional services, higher education, job training, and healthcare services.

Source: American Planning Association

Sustainability Indicators

Figure V1: Sustainability Indicators

An indicator of sustainability can be defined as the "measurable aspect of environmental, economic, or social systems that is useful for monitoring changes in system characteristics relevant to the continuation of human and environmental well-being (US EPA, 2012)." The planning principles of sustainability, sustainable development, and sustainable communities involves achieving and maintaining a desired Quality of Life (QOL) for Township residents.

QOL is the "general well-being of individuals and societies, outlining negative and positive features of life. It observes life satisfaction, including everything from physical health, family, education, employment, wealth, safety, security to freedom, religious beliefs, and the environment (Wikipedia 2018)."

The following twenty-four indicators of sustainability have been assessed as part of the planning analysis and will be used to support the metrics of this plan to measure change overtime to determine how well the Township is achieving sustainability in the context of the natural and cultural resource environment, social environment, and economic environment. The graphic for each indicator will be identified throughout the plan document and appendices to remind readers, planning partners, decision-makers, and implementors that each of these indicators are influenced by land use and development policies and decisions and measured by the level of capital investment and regulatory performance to achieve 2040 targeted goals.

Figure V2: Indicators of Sustainability, Sustainable Development, and Sustainable Communities

Sources of Concept for Graphic: United Nations, Department of Economic & Social Affairs (2015). Original graphic was modified to meet UMT needs.

Community Issues and Implications

The planning process focused on real and relevant community issues and implications using sustainability indicators to assess existing conditions and to measure performance over time. Implications are effects, impacts, or consequences that can be measured today and/or that may happen in the future. The community provided input to identify and prioritize the following community issues to be addressed by policy, strategies, and implementation. If these issues go unchecked, unmanaged, or unaddressed, or if there is no change in policy to mitigate outcomes, UMT risks offering a lower QOL for current and future residents.

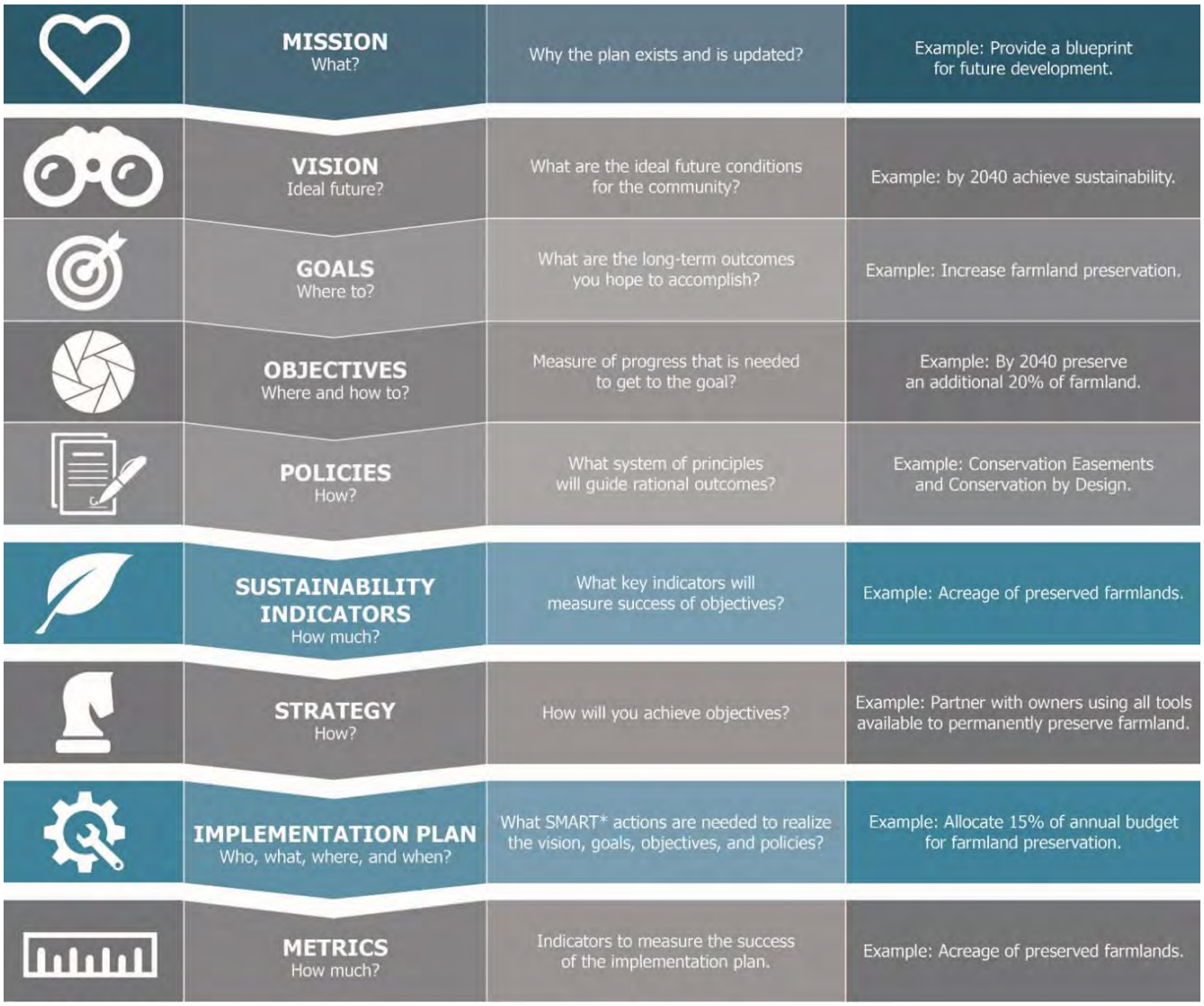
Table V1: Priority Community Issues and Impacts/Implications

Priority Community Issue	Impacts/Implications
1. Traffic Congestion Sustainability Indicators: 5, 6, 8, 9, 13, 14, 17, 19, and 24	• Increases commute times to work and local travel times. • Creates vehicular, bicycle, and pedestrian safety issues. • Increases deterioration of roadways and maintenance costs. • Impacts the environment (e.g. noise, air, water quality, etc.). • Decreases real estate values. • Increases emergency response times.
2. Large-Scale Warehouse Distribution Development Sustainability Indicators: 5, 9, 13, 14, 15, 18, 19, 23, and 24	• Creates safety issues associated with increased truck traffic mixed with local and commuter traffic. • Creates stormwater management and water quality impacts. • Operations result in environmental impacts including noise, air, and light pollution as well as vibration. • Impacts adjacent residential neighborhoods. • Increases tax revenues and infrastructure maintenance costs.
3. Community Connectivity Sustainability Indicators: 5, 11, 12, 13, 15, 20, and 24	• Decreases traffic impacts on the villages and neighborhoods. • Offers mode choice making travel more affordable (e.g. biking, walking, and transit) via a multimodal transportation system. • Reduces environmental impacts and energy consumption. • Creates healthier communities with individual health benefits.
4. Preservation and Conservation of Land Sustainability Indicators: 1, 5, 9, 12, 15, 19, 21, and 24	• Protects working rural landscapes (e.g. farming, timbering, etc.). • Protects water supply, floodplains, forests, natural habitats, environmentally sensitive lands, prime soils for agriculture, valuable natural resources, and local and regional food supply. • Curbs the costs and losses due to urban and suburban sprawl. • Fosters livable communities and neighborhoods. • Provides areas for suburban parks, recreational trails, greenways, open space, and public access to natural amenities. • Increases public investment for cost of preservation. • Decreases tax revenues due to lost development opportunity.
5. Community Character and Sense of Place Sustainability Indicators: 1, 2, 3, 7, 10, 12, 17, 23, and 24	• Affects residents' ability to identity with the community. • Creates livable communities through design, regulation, code enforcement, and amenities. • Increases business attraction and retention. • Welcomes opportunity for diversity.
6. Housing Quality, Choice, and Affordability Sustainability Indicators: 2, 3, 4, 6, 13, 23, and 24	• Decreases cost burdened households. • Increases and diversifies local labor force (blue and white collar). • Reduces traffic congestion from commuters to UMT for employment. • Increases UMT and School District tax revenues and cost of services. • Shapes community character by providing housing options.
7. Commercial and Industrial Development/Redevelopment Sustainability Indicators: 2, 6, 10, 13, 14, 15, 16, 18, and 22	• Increases jobs and economic vitality of UMT and the region. • Impacts the environment and decreases agricultural lands. • Redevelopment reduces community impacts and loss of farmlands. • Increases traffic congestion and infrastructure maintenance. • Increases tax revenues and reduces local/regional unemployment. • Attracts workers and visitors from the region and abroad.

Organizational Structure of An Implementable Plan

Notable characteristics of this plan include real and relevant community issues prioritized through citizen involvement, demographics, analysis and planning implications, sustainability indicators, local and regional context, practical and workable recommendations, and actions with implementation partners and support required by local elected officials. The graphic below defines the relationship between components of this plan.

Figure V3: Vision, Mission, Goals, Objectives, Policies, Strategy, and Implementation Plan
What is the difference?



**SMART – Specific, Measurable, Achievable, Realistic, and Timely actions in the context of short-term and long-term timeframes to achieve results with details – details that identify who, what, where, and when as well as how will actions be funded.*
Source: Graphic above based upon a concept developed by ADVISO (2018)

Community Development Goals, Objectives, and Policies

The community development goals, objectives, and policies outlined on the following pages were formulated based upon review, assessment, and update of the 2007 UMT Comprehensive Plan goals and objectives, consideration of existing conditions, and input from the public Visioning Workshop, Planning Commission, and Steering Committee. Identification of community development goals, objectives, and policies in this plan meets the requirements of the Pennsylvania Municipalities Planning Code with respect to Article III, Comprehensive Plan, Section 301 (1) (a) and Article VI, Zoning, Section 606 (Statement of Community Goals and Objectives).


Photography by April Showers, JMT

Community Character & Design

Community character refers to the natural and built features that shape the Township's identity. Design standards focus on the way buildings, streets, and open space work together to define a sense of place.

Goal 1: Upper Macungie will be a place that successfully integrates the rural landscape with modern communities.

- Objective: Achieve architectural excellence and create a pleasing community character by applying design and preservation standards.
- Objective: Improve major roads with appropriate landscaping and streetscape elements to enhance walking and bicycling.
- Objective: Conserve riparian buffers and provide public access to natural areas that will serve as active and passive recreation providing residents the opportunity to access the natural environment and green spaces.

Goal 2: Children growing up in UMT will be able to afford to live here in the future and throughout their lifetime with opportunities for aging in place.

- Objective: Provide incentives for a variety of housing types and options for residents of all ages and economic means.

Goal 3: Upper Macungie's historic villages will be revitalized and serve as centers of the community.

- Objective: Create physically attractive and pedestrian and bike-friendly places.
- Objective: Create a strong community identity and sense of place through architectural excellence, design standards, and consistent code enforcement.
- Objective: Offer suitable locations and incentives for small-scale niche retail, service, and office land uses.
- Objective: Preserve and restore historic resources including places, structures, and other resources.

Policy

Continue to incorporate high standards for site design and buildings into all phases of planning and the development review process.

Strengthen existing ordinances and design standards to enhance preservation and development of community character and the environment.

Offer incentives and development bonuses for mixed-use walkable development that preserves the natural environment with public access to greenways and open space.

Offer incentives and development bonuses for creative and attractive projects which exceed basic sustainability and design principles.

Partner with for-profit affordable housing developers to build quality mixed-income developments providing affordable renter and homeowner options for a range of incomes, ages, and disabilities.

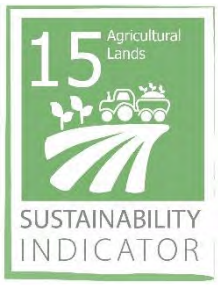
Provide specific design details for sidewalks, bike lanes, off-road facilities, and transit stops.

Improve existing villages, residential, and mixed-use neighborhoods to support safe walking and biking with connections to transit, shopping, schools, parks, and public places.

Require perpetual maintenance bonds for public amenities, private infrastructure, and other site improvements.

Use an Historic Village Zoning District integrating Traditional Neighborhood Development (TND) requirements for Fogelsville and Trexlertown.

Source: LVPC website



Natural Resources

Natural resource conservation and management are essential to agricultural production and environmental sustainability. Management systems specific to characteristics of suburban and rural landscapes must contribute to the sustainability of the community.

Goal 1: Upper Macungie will preserve important green space and scenic open space through a variety of innovative conservation tactics that include zoning, partnerships with land trusts, and effective use of incentives for voluntary preservation.

- Objective: Expand open space, greenways, and trails to link major parks, recreation, and activity areas.
- Objective: Protect water quality through appropriate development standards that will mitigate upstream impacts and ensure that waterways serve as community resources for public and private open space preservation.
- Objective: Improve air quality by providing alternatives to automobile use and by routing commercial traffic away from neighborhoods.
- Objective: Preserve habitats as an ecosystem of interconnected components through careful development and environmental protection practices and regulations.
- Objective: Protect woodlands and tree canopy by limiting unnecessary clearing for development.
- Objective: Increase preservation of farmland.

Policy

Implement the Township's MS4 Pollution Reduction Plan (PRP) through public-private and non-profit partnerships and grant funding.

Implement green stormwater infrastructure (GSI) as part of private development plans and through transportation and public works projects.

Retrofit existing stormwater facilities and implement stream and floodplain restoration projects using private, non-profit, grant, and general funds.

Require larger developments to utilize large-scale restoration as a stormwater best management practice (BMP) that incorporates nature trails, paths, and/or greenspace accessible to the public.

Continue to maintain the municipal Truck Route Map and continue to enforce and educate truckers to eliminate commercial traffic in residential neighborhoods.

Continue preservation of farmland, wildlife habitats, and woodlands/forests through Conservation by Design and Tree Preservation Ordinances.

Provide stronger protection of wildlife habitats.

Require perpetual maintenance of private and public landscaping, street trees, sidewalks, paths/trails, transit stops, and other amenities.

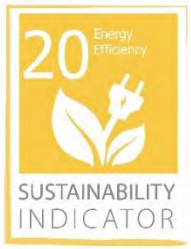
Require ongoing compliance monitoring of performance standards for warehouse/logistic center development (e.g. noise, glare, vibration, emissions, idling, and other hazardous and nuisances).

Minimize and mitigate impacts on the natural environment and residential neighborhoods by requiring adequate buffering and screening of incompatible and high intensity and density uses.

Photography by April Showers, JMT

Quality of Development

Quality development contributes to the economic, environmental, and social sustainability of the community improving the quality of life (QOL) of today and tomorrow's residents.



Goal 1: Development will be environmentally sustainable to enhance surrounding neighborhoods and the community.

- Objective: Provide incentives for use of conservation by design standards.
- Objective: Provide appropriate transitions, connections, and mixed-use clusters between new and existing development.
- Objective: Provide appropriate design standards and development concepts that demonstrate building placement, massing, appearance, and energy efficiency.

Goal 2: When appropriate, use traditional neighborhood development or village standards where walking and/or biking is possible.

- Objective: Integrate mixed uses and densities that encourage convenient alternatives to automobile use.
- Objective: Preserve and restore historic, cultural, and natural resources to enhance community character and appeal.
- Objective: Design local roads to form an integrated network for motorized and non-motorized travel to reduce congestion.
- Objective: Organize commercial development into walkable districts with attractive frontages on major roads.

Goal 3: Balance land use opportunities to assure adequate residential, commercial, and institutional uses are provided for to support UMT's suburban employment hub.

- Objective: Provide adequate space appropriately located for commercial retail/services.
- Objective: Offer varied employment opportunities and a diverse tax base.

Policy

Promote mixed-use development, conservation design standards, and appropriate buffering and screening of residential neighborhoods from industrial and warehouse uses.

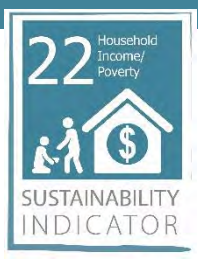
Adopt Traditional Neighborhood Development (TND) and village design standards to support mixed-use, walkable, and bikeable development and redevelopment. Apply design standards addressing conservation by design resulting in compact urban-scale development including:

- Open space and public spaces
- Connectivity (trails, pedestrian, and bicycle facilities, transit, and improve roadway connectivity)
- Transition between existing development and more intense, dense, and larger scale development
- Site design emphasizing building mass and placement
- Access management
- Shared parking
- Streetscapes & Complete Streets
- Natural and cultural resource preservation

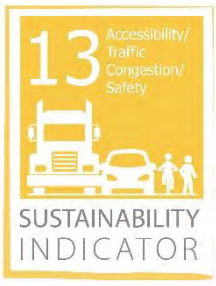
Provide regulations and incentives for development of neighborhood commercial uses within walking distance of existing and future neighborhoods with appropriate pedestrian and bicycle connections.

Provide for the appropriate location, size, and quantity of commercial retail and service uses through new development and redevelopment.

Maintain a strong economy and workforce while minimizing impacts on the quality of life for residents.



Photography by April Showers, JMT



Infrastructure

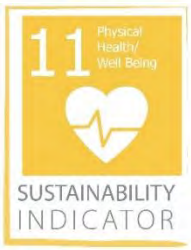
Investments in infrastructure and technology are important to livability and economic sustainability. Suburban communities are challenged to provide (fund), maintain, and operate adequate public facilities and services. Adequate infrastructure affects economic sustainability.

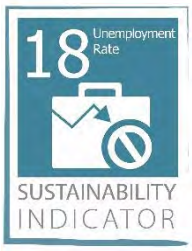
Goal 1: Public infrastructure and services will be well-planned, well-managed, and coordinated.

- Objective: Align water and sewer infrastructure with the Act 537 Service Area and this plan in a coordinated manner that meets long-term needs, guides desired development patterns, and conserves natural resources.
- Objective: Continue to provide high quality recreation facilities and programs.
- Objective: Develop new pedestrian connections to recreational facilities and implement a consistent maintenance plan.
- Objective: Continue to provide excellent emergency management services that keep pace with Township growth.
- Objective: Continue to enhance the local transportation system to improve safety, reduce congestion, offer alternative modes of travel, and provide for convenient circulation.
- Objective: Coordinate with the School District to assure high quality educational facilities commensurate with projected enrollment.

Goal 2: Provide residents continued access to quality health care and wellness services.

- Objective: Coordinate with health care providers to assure adequate land is allocated for new facilities and expansion projects.





Policy

Maintain the Act 537 boundary for public water and sewer service as UMT's Urban Growth Boundary (UGB).

Growth outside of the Act 537 boundary should be rural in nature and of a lower density and intensity of use compatible with the natural environment applying Conservation by Design standards.

Develop, adopt, and maintain an Official Map addressing various aspects outlined in the Pennsylvania Municipalities Planning Code, Article IV, Official Map.

Coordinate with PennDOT to control access along Route 100, Tilghman Street, and other major arterials by implementing access management solutions for new development and redevelopment as well as retrofits for existing development.

Require multimodal transportation solutions as part of all developments. Provide specific design details for sidewalks, bike lanes, off-road facilities, and transit stops. Require proactive collaboration with LANTA.

Require that all development and transportation projects sponsored by private developers, UMT, LVPC, LVEDC, PA DCED, LANTA, and/or PennDOT address all modes of travel and provide connections to current and future neighborhoods and facilities.

Require perpetual maintenance bonds for public amenities, private infrastructure, and other site improvements.

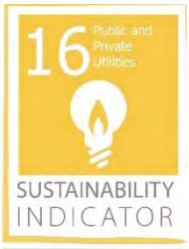
Coordinate with LVEDC and other agencies to address business retention needs and to attract new development that provides quality infrastructure and other community facilities.

As part of the Township's CIP, include a range of infrastructure improvements that support community and economic development goals and objectives.

Photography by Angie Hernandez, JMT

Excellence in Government

Government plays an important role in implementing sustainable development. It is crucial to involve relevant decision makers and partners in implementing sustainable policies.



Goal 1: Demonstrate measurable progress to achieve goals, objectives, policies, and strategies for all plan elements.

- o Objective: Continue to implement the various strategies and actions to meet the goals and objectives of this plan.
- o Objective: Provide adequate staffing and resources to implement this plan.
- o Objective: Promote relationships and effective interaction between UMT and public or private agencies, organizations, and utilities.

Goal 2: Build fiscal strength through SMART decision-making that contributes to community sustainability.

- o Objective: Continue to address community issues and measure success by tracking indicators of sustainability and performance.
- o Objective: Demonstrate fiscal responsibility to taxpayers.

Goal 3: Implement this plan and other plans through the Annual Budget and Capital Improvement Plan (CIP).

- o Objective: Implement this plan through short-term and long-term strategies and actions.

Policy

Partner with surrounding municipalities, LVPC, and other regional institutions in all aspects of comprehensive planning, regional infrastructure planning, and strategic implementation.

Support and participate in the intergovernmental review of proposals for development of regional significance.

Retain the Township's reputation for providing a high level of responsiveness to citizens and exercising visionary leadership in planning and investing for the future.

Continue to create and enforce innovative, effective, and fair regulations and development standards to guide growth and improve the quality of development.

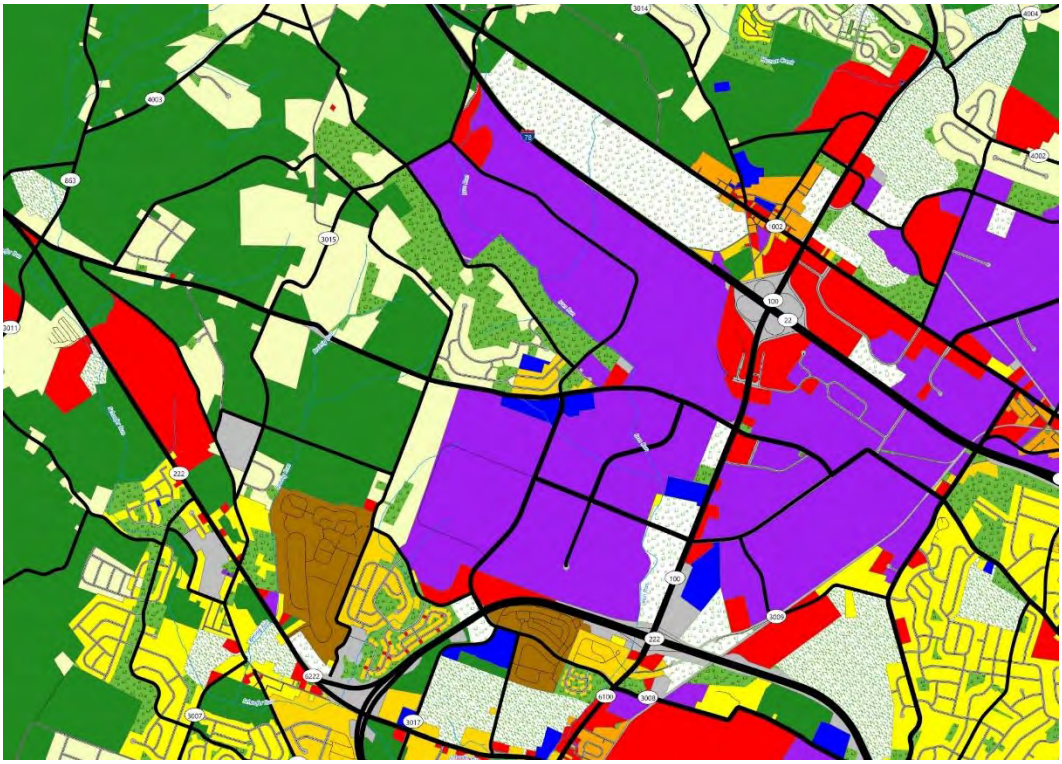
Continue to plan for short- and long-term needs for public services and facilities including police, fire, emergency services, and recreation.

Continue to implement policies that maintain and improve fiscal strength through a diversified and fair tax structure reflecting balanced residential, commercial, and industrial development.

Support planning for the maintenance and expansion of the regional water supply and wastewater treatment system to meet current and future demands.

Coordinate with regional utilities and telecommunication providers to ensure proper design and siting of facilities to meet expected demands of current and future customers.

Continue to respond to neighborhoods to address community issues, concerns, and development impacts.



Existing Conditions and Projections

Overview

Once a rural community focused on agriculture, UMT's economy and population has changed rapidly over two decades of development. These development trends along with population and employment projections indicate continued development is expected. Since the 2007 Plan, UMT has experienced:

- Rapid growth of population and employment.
- Continued growth of large-scale enterprises such as warehouse, distribution, and logistic centers.
- Continued growth of manufacturing.
- Significant expansion of suburban housing development including apartments, townhouses, and single-family-detached dwellings.
- Increased truck traffic and congestion.
- Loss of open space and agricultural land.
- Impacts to natural and cultural resources.

Growth of Upper Macungie Township

The beauty of Upper Macungie's rolling landscape, its key location in the Lehigh Valley, its excellent schools district, and the abundance of land have contributed to the Township's attraction for residential living and business development.

Source: UMT, 2007 Comprehensive Plan

Details pertaining to various sustainability indicators are outlined in the Technical Reports contained in the Appendices. Highlights from these reports are summarized in this chapter to provide an overview of existing conditions, population and housing projections, and the potential for build-out under current zoning by 2040 with relevant implications and recommendations.

This information along with input from the community provides the basis for development of policies, strategies, and a land use plan for continued development of UMT. Additionally, this chapter presents the history of land use, key information for several sustainability indicators, and identifies UMT's relationship to surrounding municipalities.

History of Land Use

The table below identifies the change in land use by percentage of acres from 1996 prior to the Route 222 bypass improvements through 2018. These changes shown demonstrate the rapid growth UMT has experienced over the past 20 years. In 2017, approximately 28% of the land in UMT is agricultural or vacant land. LVPC has set a regional goal of 25% of the land within the Lehigh Valley, measured across all municipalities collectively, should be permanently preserved for agricultural use.

Table E1: Changes in Land Use 1996-2017

Land Use	1996 Percent Acres	2006 Percent Acres	2012 Percent Acres	2017 Percent Acres
Residential	17.9%	20.8%	22.7%	26.4%
Commercial	2.3%	6.0%	5.8%	10.4%
Industrial	7.4%	6.4%	6.7%	5.4%
Wholesale and Warehouse	2.5%	7.1%	7.7%	12.2%
Roads and Utilities	5.9%	10.7%	11.0%	11.4%
Institutional	0.8%	1.8%	1.8%	1.4%
Parks and Recreation	2.8%	3.1%	4.8%	4.8%
Agriculture & Vacant Land	60.4%	44.1%	39.5%	28.0%
Total Acres	100%	100%	100%	100%

Source: LVPC, Municipal Profiles, 2006, 2012, and 2017 and UMT 2011 Park and Recreation Plan

Table E2 identifies the acres of land allocated by Zoning District. Over 25% of UMT land is zoned for industrial uses and 67% of the land is zoned for a range of residential uses at various densities. While agricultural land use is permitted in several zoning districts, UMT does not have an agricultural zoning district to protect these lands from future development. Farming is a business that provides many public and economic benefits.

Table E2: Acreage by Current Zoning

Zoning District	Total Acres	Percentage
Residential Zoning Districts		
RU3 – Rural 3 Districts	1,017.95	6.1%
RU1.5 Rural 1.5 Districts	2,538.09	15.1%
R1 – Rural Residential Districts	2,696.31	16.1%
R2 – Low Density Residential Districts	3,048.34	18.2%
R3 – Medium Low-Density Residential Districts	1,273.10	7.6%
R4 – Medium Density Residential Districts	112.98	.7%
R5 – Medium-High Density Residential Districts	560.61	3.3%
Total Lands Zoned Residential	11,247.38	67.1
Commercial Zoning Districts		
HC – Highway Commercial Districts	539.86	3.2%
NC – Neighborhood Commercial Districts	300.40	1.8%
RT – Research Technology District*	220.30	1.3%
Total Lands Zoned Commercial	1,060.56	6.3%
Open Space Preservation Districts		
OSP – Open Space Preservation District	58.91	.4%
Total Lands Zoned Open Space	58.91	.4%
Industrial Districts		
GI – General Industrial Park District	102.21	.6%
LI – Light Industrial Park District	3,943.07	23.5%
LIL – Limited Light Industrial Park District	359.70	2.1%
Total Lands Zoned Industrial	4,404.98	26.2
TOTALS	16,771.83	100%

Source: Calculated using UMT Zoning Map

Summary of Existing Conditions & Trends

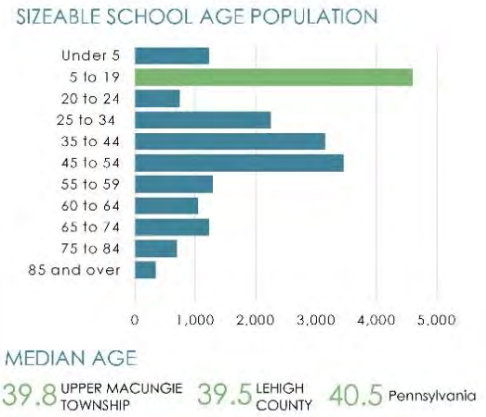
POPULATION

Source: US Census Bureau Data

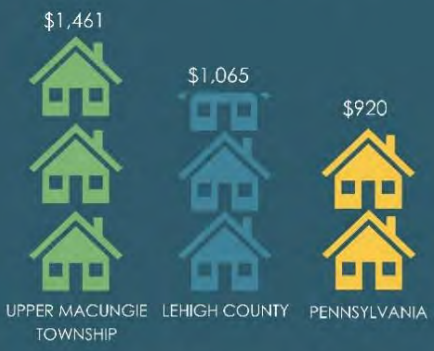
GROWING

EDUCATED

YOUNG

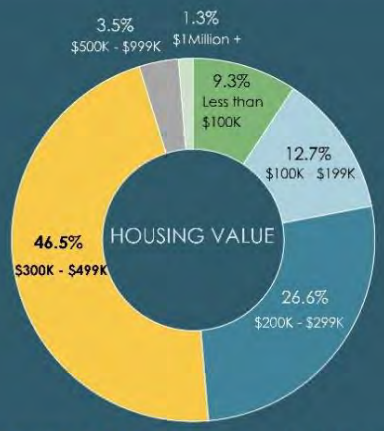


HIGH HOUSING COSTS



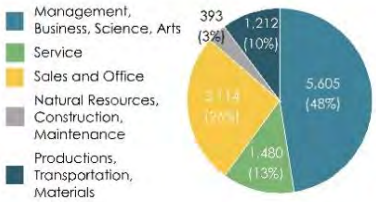
APPROXIMATELY 21% OF HOMEOWNERS & 41% RENTERS ARE CONSIDERED **COST BURDENED**

[MEANING MORE THAN 30% OF THEIR INCOME GOES TO HOUSING COSTS.]

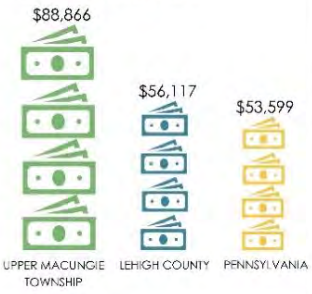


DIVERSE LABOR FORCE & ECONOMY

EMPLOYMENT SECTORS



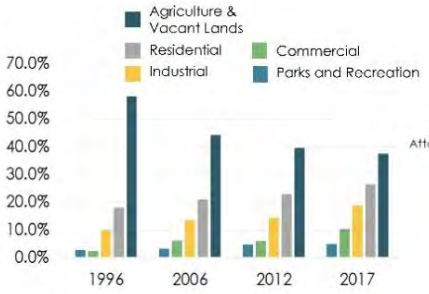
MEDIAN INCOME



TRAVEL TIME TO WORK

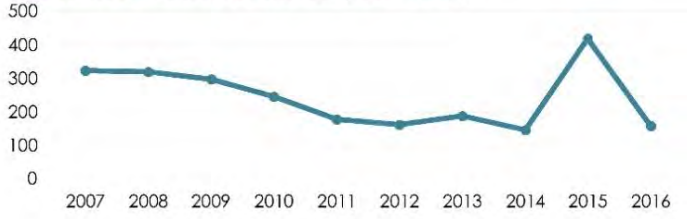
LAND USE & DEVELOPMENT

LAND USE



RESIDENTIAL PERMITS BY TYPE (2007 – 2017)

RESIDENTIAL PERMITS APPROVED (2007 - 2017)



Population

Population is a social environment indicator impacting the natural and cultural resource environment and is also a factor fueling economic development. Since 2007, UMT has been one of the fastest growing communities within the Lehigh Valley. And, looking ahead to 2040, UMT is one of the top five municipalities projected to experience the largest increase in population. Population is a measurable indicator used to plan for government facilities and economic development and can be used as a basis to project revenue and the demands on public services such as water, sanitary sewer, schools, and parks.

While the 2007 Comprehensive Plan projected the 2030 population to reach 24,992, UMT has grown at a faster rate than projected reaching a population of 23,884 in 2016. Similarly, Parkland School District has grown faster than other districts in the region and is expected to continue a fast rate of growth into the future. UMT makes up 36.4% of the land area within the School District. Today, approximately 23% of the population are school aged children and youth with forty-four percent (44%) of this population elementary age students.

Prior to 2017, LVPC projected UMT's population to grow to 36,235 by 2040 – a projected 52% increase in population since 2016. In 2017, LVPC has considered pending development plans for large warehouse development, commercial development, and other factors to re-forecast UMT's population to 32,220 by 2040 – a 35% increase in population. The Build-Out Analysis in Appendix F conducted as part of this plan considered pending development plans for large warehouse development, commercial development, redevelopment, and mixed-use development opportunities resulting in a population closer to the pre-2017 population projection by LVPC. This analysis is compared to the projected housing market demand for the region and UMT identified in Appendix D Housing Analysis.

Household Income

Household income is affected by where you live, cost of living, number of people employed in households and their levels of education, number of dependents, health, and transportation and housing costs. Spending 30% or more of a household's gross income on housing is considered "housing-cost burdened" by the Department of Housing & Urban Development (HUD). Understanding that many individuals choose to live in UMT to be part of Parkland School District, approximately 21% of homeowners and 41% of renters in UMT are considered cost burdened. UMT is part of the region with higher household incomes and higher housing costs. The median household income in the Township of $88,866 is higher than County and State averages. Approximately 2.8% of the population is living below the poverty level. Two-in-four or 47% of the people in the UMT over the age of 25 years old have a bachelor's degree or higher.

Community Facilities & Utilities

Adequate public facilities and utilities are essential to a sustainable community and affect the quality of life of Township residents. Public facility and utility providers have plans for service expansion to accommodate growth, continued operations and maintenance programs, and capital improvement programs to assure quality service to current and future customers. UMT has ordinances in place to require developers to address utilities and open space, parks, and recreation facilities. Approximately 729 acres of Township, County, private, or School District lands are dedicated for park and active and passive recreation. As residential development occurs, additional lands will be either dedicated or a fee in lieu of will be offered to the Township. These facilities provide open space, parks, and recreation space to support the projected 2020, 2030, and 2040 population. UMT has an annual budget for operations, maintenance, and capital improvements for public facilities such as roadways, stormwater facilities, sanitary sewer collection and conveyance systems, open space, parks, and recreation facilities.

Natural and Cultural Resources and Agricultural Preservation

The protection, preservation, and conservation of environmentally sensitive areas and agricultural lands are important to achieving long-term sustainability. UMT along with the State and the County Conservation District apply regulations to protect natural resources through permitting and inspection and/or enforcement programs to monitor short-term and long-term impacts and compliance. UMT has not yet adopted agricultural zoning to protect valuable farmland.

UMT in partnership with the State, County, and property owners has preserved and conserved over 3,500 acres or 20% of total lands in the Township containing environmentally sensitive lands, agricultural lands, parks, recreation facilities, and open space. In partnership with property owners, 12 farms totaling 932 acres have been permanently preserved through purchased agricultural conservation easements with additional acres registered in the Agricultural Security Areas (ASA) program with opportunity for permanent preservation in the future. Through the Township's Conservation Design Ordinance and public-private preservation efforts, UMT has obtained 156 acres of farmland and an additional 167 acres of open space over the past 10 years with farmlands scheduled to be placed in agricultural conservation easements. By 2021, UMT is on track to permanently preserve a total of 1,089 acres of farmland.

Housing

Housing availability and cost directly affects financial security of households. Affordable housing for all income levels affects the quality of life of residents with respect to health, access to education, and employment prospects. Low property taxes, quality public education, and access good to jobs locally and regionally has attracted residential development to UMT and surrounding Townships located within LVPC's growth area.

Fifty percent (50%) of housing values in the Township are between $300,000 and $500,000 with a vacancy rate of rental and owner-occupied housing at 4.2%. The Township and the region have a shortage of affordable rental units for various levels of income. Approximately 2,147 housing units of various type and cost are planned or under construction with another 1,885 approved units not yet built. Under current zoning, UMT has the capacity to receive another 2,354 units on lands available for development (reference Appendix F - Build-Out and Impact Analysis). The Housing Analysis in Appendix D suggests there is a demand regionally for additional affordable housing units for low-to-moderate income households and seniors (55+) for rent and ownership.

Economy

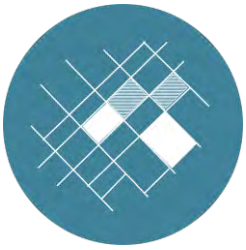
Development drives economic growth by creating jobs and contributing to a high quality of life for residents at an acceptable cost to the environment and at an acceptable level of investment to meet social needs and expectations of the community. While limited land remains for commercial, institutional, and industrial development, the pressures of growth are expected to continue impacting remaining lands available for development. UMT continues to experience a very low unemployment rate and is well positioned to continue to compete for industrial, warehouse, and distribution uses. LVPC employment projections predict a 39% increase from 2010 to 2040 with a total number of persons employed in UMT potentially reaching 41,707 in 2040. Truck traffic and congestion are important factors that must to be constantly addressed as growth occurs. Agricultural land has been permanently preserved with additional acres actively farmed – all of which contributes to the local and regional economy and food supply.

Transportation

UMT has several congested and priority corridors identified by both the Township and LVPC. Corridors of concern include: Route 222, Schantz Road, Route 100, Tilghman Street, Route 22, and Hamilton Boulevard – all of which will require a partnership between the Township, LVPC/LVTS, and PennDOT District 5-0 to make necessary capital improvements to meet current and future demands. UMT routinely measures and studies the impacts of traffic safety, accessibility, and mobility to support developer sponsored investments, Township capital improvements, and maintenance/operation improvements.

The Police Department, State Police, and PennDOT tracks and reports traffic incidents as part of the study and analysis of roadway conditions, projected conditions, and planned and programmed improvements. Moving forward, there will be a stronger emphasis on the role of technology to collect data and to improve safety, accessibility, and mobility. The Township plays an important role in implementing congestion mitigation and safety strategies through the development review process including Traffic Impact Studies, access management strategies, and developer sponsored capital transportation improvements in accordance with the Pennsylvania Municipalities Planning Code (MPC).

Land Use



Land is a limited resource. Based upon location, access to the transportation network, and other factors, land in UMT has been highly marketable for warehouse, distribution, and logistic center activity along with traditional industrial uses. A healthy mix of land use and management of land with respect to minimizing and mitigating impacts on the environment and minimizing demand and financial costs to provide public infrastructure contributes to achieving sustainability.

Development trends suggest that lands available for development could be built-out sooner than 2030. Roughly, 67% of lands in the Township are zoned for various densities of residential development with 26% zoned industrial, 6% zoned commercial, and less than 1% zoned for open space preservation. Approximately 18.28% of UMT lands are available for development with 7.04% located inside the Urban Growth Boundary (also referred to as the Act 537 Service Area) and 11.24% outside of the Urban Growth Boundary (reference Appendix F – Build-Out and Impact Analysis).

Potential for Build-Out

Communities like UMT pay a high price for rapid growth such as increases to traffic congestion and safety, to air and water pollution, to loss of open space, and to demands for costly public infrastructure and services.

As part of the planning study process, a build-out analysis was used to determine the location of potential development to illustrate a pattern that development may take in the future if land use policies and regulations do not change. This type of analysis determined the number of additional dwelling units and non-residential square feet that could be built on developable land under existing zoning regulations.

By providing this picture of the probable future, this analysis helps identify the implications of existing policies and regulations and helps communities discuss what steps should

Anticipated Growth

UMT population and employment is projected to increase by 35% and 39% respectively through 2040.

UMT is one of the top five municipalities in the Lehigh Valley projected to experience the highest growth in population and employment over the next 20 years.

The challenge to UMT is how to best manage this anticipated growth.

Source: LVPC The People 2017, Population and Employment Projections

be taken to manage future growth. The table below identifies the total net developable land by zoning district remaining for development. Net developable land are lands available for development minus environmentally constrained lands. As previously stated, UMT has approximately 18.28% of land available for development with 7.04% located inside the Act 537 Sewer Service Area and 11.24% located outside the Act 537 Sewer Service Area. Limited development opportunity exists for new development with the potential for redevelopment of occupied sites and/or vacant buildings. Additional details specific to the planned, approved, and potential development concepts for lands available for development is provided in Appendix F – Build-Out and Impact Analysis and for key opportunity sites in Chapter 5 – Community Character and Design.

Table E3: Total Acreage by Zoning District and Total Net Developable Land by District

Zoning District	Total Acres	Acres of Total Net Developable Land**	Acres of Net Developable Lands Inside 537 Service Area	Acres of Net Developable Lands Outside 537 Service Area
Residential Zoning Districts				
RU3 – Rural 3 Districts	1,017.95	256.67	0	256.67
RU1.5 Rural 1.5 Districts	2,538.09	690.65	0	690.65
R1 – Rural Residential Districts	2,696.31	1,001.99	67.42	934.57
R2 – Low Density Residential Districts	3,048.34	231.34	231.34	0
R3 – Medium Low-Density Residential Districts	1,273.10	179.74	179.74	0
R4 – Medium Density Residential Districts	112.98	13.31	13.31	0
R5 – Medium-High Density Residential Districts	560.61	81.42	81.42	0
Total Residential Lands	11,247.38	2,455.12	573.23	1,881.89
Commercial Zoning Districts				
HC – Highway Commercial Districts	539.86	61.09	61.09	0
NC – Neighborhood Commercial Districts	300.40	35.09	35.09	0
RT – Research Technology District*	220.30	0	0	0
Total Commercial Lands	1,060.56	96.18	96.18	0
Open Space Preservation Districts				
OSP – Open Space Preservation District	58.91	0	0	0
Total Open Space Lands	58.91	0	0	0
Industrial Districts				
GI – General Industrial Park District	102.21	0	0	0
LI – Light Industrial Park District	3,943.07	191.69	191.69	0
LIL – Limited Light Industrial Park District	359.70	323.15	320.40	2.75
Total Industrial Lands	4,404.98	514.84	512.09	2.75
TOTALS	16,771.83	3,066.14	1,181.50	1,884.64

**Net Developable Land – Land available for development minus environmentally constrained lands.*
Source: Appendix F, Build-Out Analysis

Implications of Build-Out Under Current Zoning

Land use decisions with respect to remaining lands inside the Act 537 Sewer Service Area should consider flexibility in zoning and rezoning to allow for mixed use development with more high-density residential uses mixed with a range of commercial retail and service uses.

A significant amount of land has been zoned and developed for industrial uses including a range of heavy general and light industrial uses including warehouse/logistic center development. Remaining lands zoned for industrial development or already developed industrial land with aging buildings are ripe for development or redevelopment and should be targeted for industrial uses with higher paying wages instead of continued warehouse/logistic center development.

Residential land use and lands zoned for additional residential development have the greatest impact on public schools and public services (e.g., cost of emergency services, schools, park and recreation facilities, bicycle/pedestrian facilities, etc.) potentially requiring the increase of taxes over time.

Water supply and sanitary sewer capacity will limit and dictate the timing of development as well as determine the level of developer investments in public infrastructure and facilities to support development proposals.

Increased traffic congestion and accessibility will affect potential development in UMT. Commercial businesses will not locate along congested roadways with low visibility as well as at some point, traffic congestion will impede warehouse/logistic/distribution center development (time is money for this industry).

Increased traffic congestion will impede the resale of existing residential properties as well as impeded the occupancy of new residential developments.

Recommended Strategies

- Consider extending the Open Space Preservation District zoning regulations outside of the Act 537 Sewer Service Area to protect natural resources and to preserve future rights-of-way for trails and regional connections. Densities permitted under a cluster development scenario outside of the Act 537 Sewer Service Area should be of a density that permits individual on-lot sewage systems.
- Discuss the feasibility of restricting warehouse/logistic/distribution center development to the existing footprint of development.
- Partner with the development community to foster desired development patterns for new development and redevelopment opportunities served by a multimodal transportation network.
- Strive to preserve additional agricultural land and open space outside of the Act 537 Sewer Service Area as part of reaching LVPC's regional goal of 25% preserved agricultural land.
- Adopt an Official Map to show the expansion of infrastructure and reservation of public lands and rights-of-way to support future development.

UMT Relationship to Surrounding Municipalities

Lower Macungie Township located southwest of Upper Macungie Township

Lower Macungie Township is part of the Southwestern Lehigh County Comprehensive Plan, October 2017 – http://lvpc.org/planswl.org/pdf/SWL%20FINAL%20COMP%20PLAN%20reduced%20size.pdf. Development patterns in Lower Macungie Township are consistent with development patterns in Upper Macungie Township. Lower Macungie Township wants to keep taxes low and preserve open space.

Lower Macungie Township is also experiencing impacts associated with warehouse/logistic/distribution center land uses. While changes in zoning in 2018 were adopted to restrict warehouse development, this type of development has been given recent approvals due to plans as part of past and recent proposals either grandfathered or part of lawsuit settlements between the Township and developers. Lower Macungie Township has started denying applications for warehouse development based upon traffic impacts and impacts on residential neighborhoods and the environment.

According to the 2017 LVPC Population and Employment Projections report, Lower Macungie Township and Upper Macungie Township are in the top 5 municipalities in the Lehigh Valley to experience the highest growth in employment through 2040. Lower Macungie Township 2040 projected population is 38,142 with 2040 employment projections at 17, 335. While the population projects for Lower Macungie are slightly higher than Upper Macungie, employment is significantly lower than Upper Macungie Township. Upper Macungie is slated to increase employment to 41,707 by 2040 continuing to provide employment opportunities for surrounding municipalities and the region. Actions of significance with potential positive impacts include the following:

- Lower Macungie Township is in the process of updating their 2009 Traffic Impact Fee Ordinance. Land Use Assumptions associated with the area subject to this ordinance will provide build-out information for remaining developable land and land targeted for redevelopment. Traffic impacts for key corridors of concern for both Lower Macungie and Upper Macungie Townships can be used to review development proposals and capital improvement projects.
- Lower Macungie Township is a partner to Upper Macungie Township to implement the Hamilton Boulevard Corridor Plan. In March of 2019, the Township received comments on zoning changes along Hamilton Boulevard to promote redevelopment and reuse of sites along this corridor. This is an area where UMT and Lower Macungie Township can collaborate and coordinate development and redevelopment activity as well as partner to implement multimodal transportation improvements.
- The Township's Official Map identifies open space, park land, and other improvements townshipwide as well as at the border of Upper Macungie Township (reference Lower Macungie Official Map – http://www.lowermac.com/docs/planning/OfficialMapRevised5-11-16.pdf).
- Lower Macungie Township has preserved approximately 601 acres of agricultural land and offers an opportunity to provide housing for those employed in Upper Macungie Township.

South Whitehall Township located northeast of Upper Macungie Township

South Whitehall Township has experienced similar growth as UMT. Their current comprehensive plan focuses on growth management – https://southwhitehall.com/wp-content/forms/Comprehensive%20Plan%202009-1437494299.pdf. South Whitehall Township kicked off their planning process in March of 2019 to update their comprehensive plan. Like UMT, the Township is projecting build-out and is discussing how will the Township accommodate over 30% growth in population and jobs. The LVPC projects a 2040 population for the Township at 24,818 and projects 2040 employment at 23,272. In addition to basic plan elements, the Township will address gateways and redevelopment. There is pending warehouse development proposed at the border of UMT and South Whitehall Township. Areas where the two Townships can plan together include transportation corridor planning, development at common gateways, and minimizing impacts of warehouse development.

North Whitehall Township located north of Upper Macungie Township

Along with UMT, North Whitehall Township is identified by the LVPC in the top five municipalities to experience the largest population growth through 2040. The population for North Whitehall is projected to significantly increase from a 2010 population of 15,703 to a 2040 population of 23,973 with a 2040 employment projection of 7,806. The community is a mix of both residential and agricultural uses and boasts of some of the best farmland in the Lehigh Valley. The Township just approved the establishment of a Fire/Rescue/EMS Camp as a means of educating and recruiting youth volunteers to support their volunteer fire company and EMS providers. This is an area where UMT could cooperate with North Whitehall to address a similar problem of limited volunteers for fire and rescue services. North Whitehall Township can help meet regional demands to increase the housing supply to support employment clusters in the region including anticipated employment growth in UMT.

Lowhill Township located directly north of Upper Macungie Township

Although Lowhill Township considers itself a suburb of Allentown, the development patterns in the Township are predominantly rural with emphasis on conservation and environmental protection. Lowhill Township in partnership with Heidelberg Township (another very rural township) is in the process of developing and adopting a Multi-Municipal Comprehensive Plan. Lowhill Township has preserved 562 acres of agricultural land and Heidelberg Township has preserved approximately 3,461 acres of agricultural land. Areas in common with UMT include conservation preservation of natural and agricultural resources and watershed protection. Lowhill Township's 2040 projected population is less than 5,000 with employment projected to be less than 1,000.

Weisenberg Township located northwest of Upper Macungie Township

Weisenberg Township is a predominantly rural residential community with approximately 4,192 acres of preserved agricultural land. The population of the Township is approximately 5,000 with a 2040 projected population of 7,601 and 2040 employment projected to 3,211. While the Township is focused on preserving farmland and open space, there has been some manufacturing and warehouse/distribution development along the I-78 corridor in the Township. Weisenberg Township is part of a Northern Region Comprehensive Plan in Lehigh County.

Maxatawny Township, Berks County located west of Upper Macungie Township

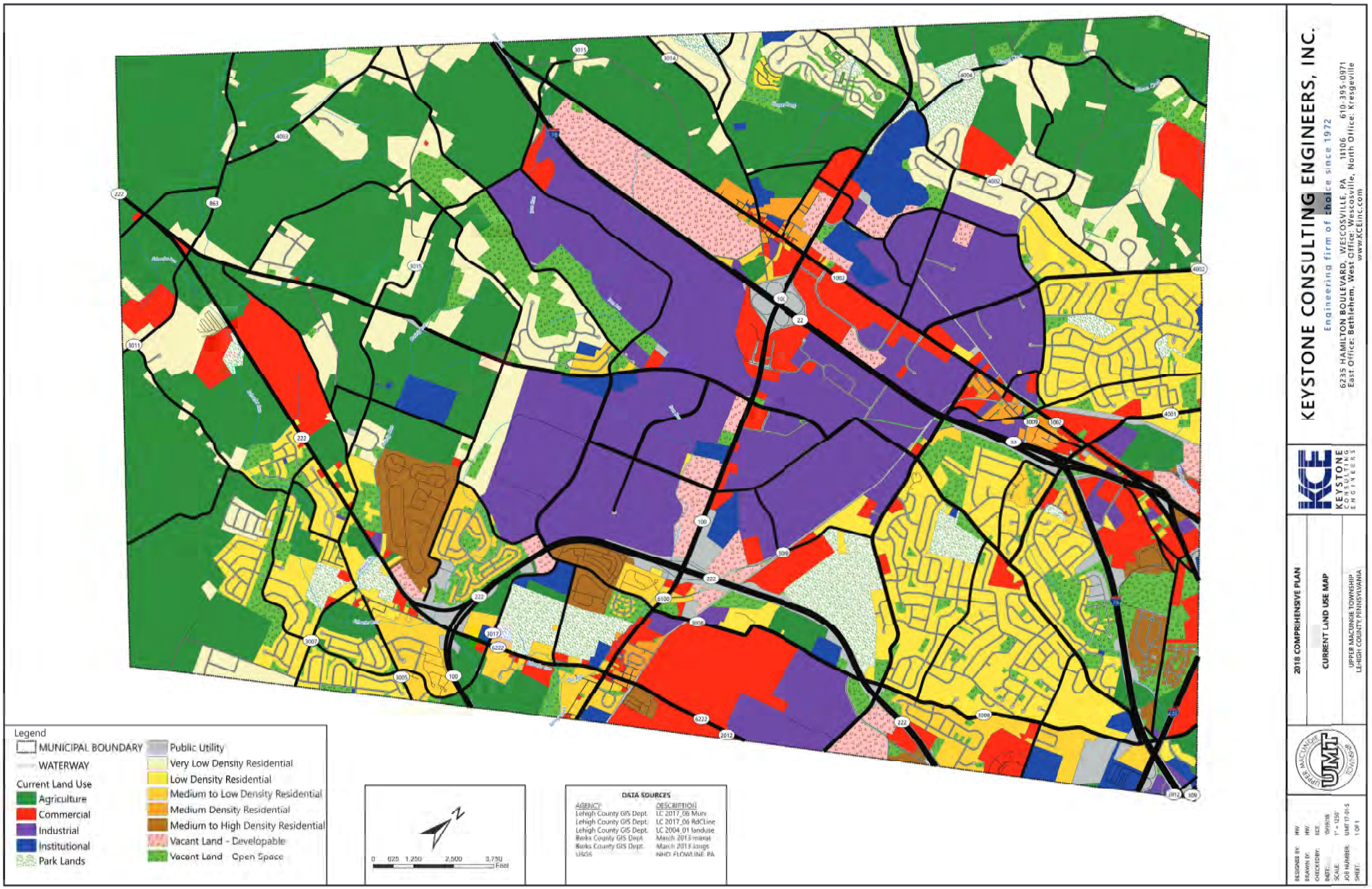
The Township is predominantly rural in nature with emphasis on agriculture and open space preservation. The 2040 population projection prepared by Berks County for the Township is 8,771. The Township anticipates continued rural residential development with predominant land uses to include agriculture and open space.

Longswamp Township, Berks County located southwest of Upper Macungie Township

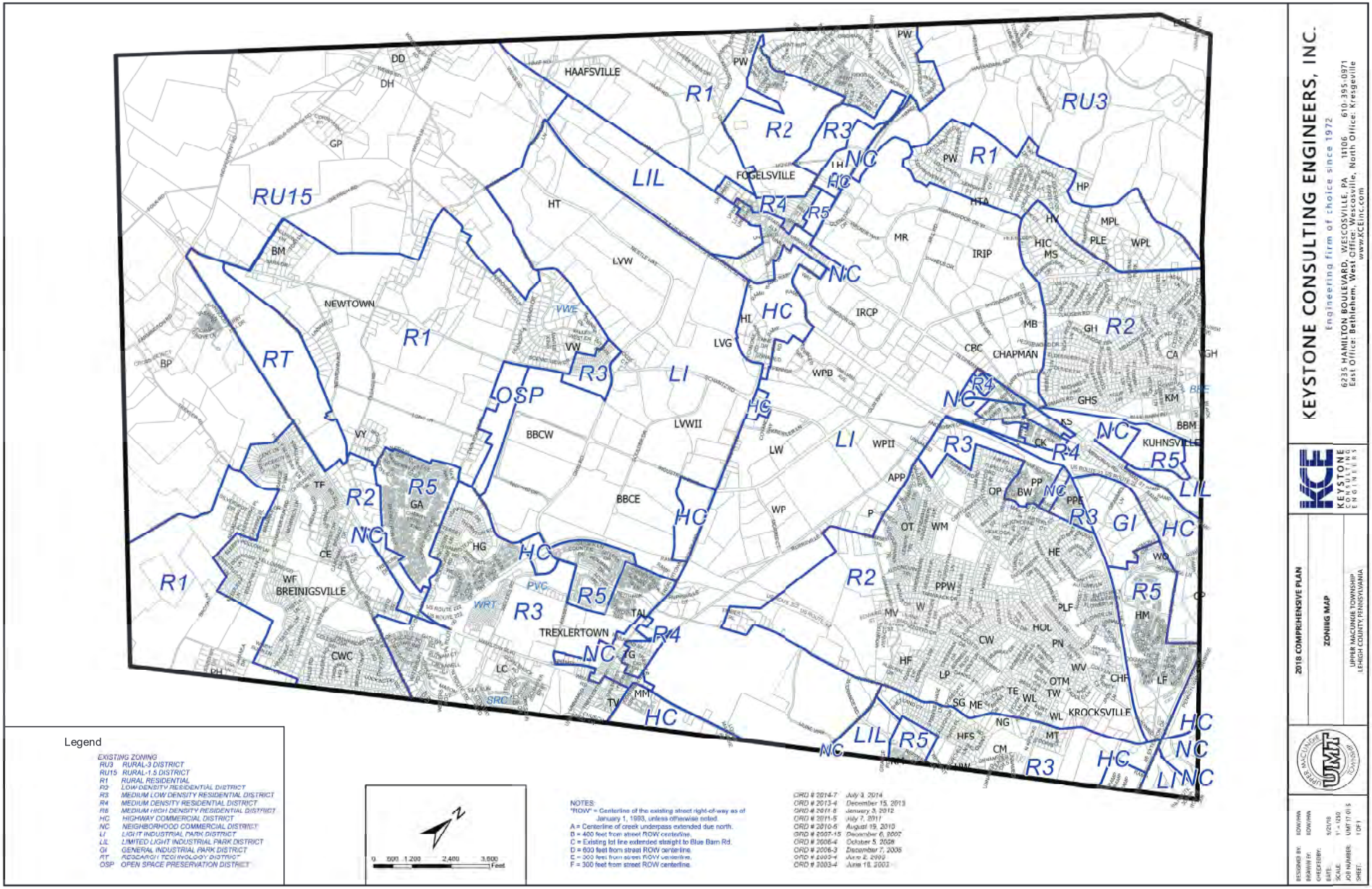
Longswamp Township's 2015 Comprehensive Plan describes the Township today and tomorrow as predominantly rural in nature with emphasis on agriculture and open space preservation. Last year, the Township updated their Act 537 Plan for all on-lot sewage systems and on-lot wells. The 2040 population projection prepared by Berks County for the Township is 6,296. The Township anticipates continued rural residential development with predominant land uses to continue agriculture and open space.

Sources of Information for Surrounding Municipalities: Township websites, Municipal/Multi-Municipal Comprehensive Plans (if the municipality has adopted one), Official Maps (if municipality has adopted one), discussions with Township staff, LVPC data sources, and Berks County data sources.

Map 1: Existing Land Use



Map 2: Zoning


HAAFSVILLE
FOGELSVILLE
NEWTOWN
BREINIGSVILLE
TREXLERTOWN
KUHNSVILLE
KROCKSVILLE
CHAPMAN
RU15
RU3
R1
R2
R3
R4
R5
RT
LIL
LI
OSP
NC
HC
GI
Legend
EXISTING ZONING
RU3 RURAL-3 DISTRICT
RU15 RURAL-1.5 DISTRICT
R1 RURAL RESIDENTIAL
R2 LOW DENSITY RESIDENTIAL DISTRICT
R3 MEDIUM LOW DENSITY RESIDENTIAL DISTRICT
R4 MEDIUM DENSITY RESIDENTIAL DISTRICT
R5 MEDIUM HIGH DENSITY RESIDENTIAL DISTRICT
HC HIGHWAY COMMERCIAL DISTRICT
NC NEIGHBORHOOD COMMERCIAL DISTRICT
LI LIGHT INDUSTRIAL PARK DISTRICT
LIL LIMITED LIGHT INDUSTRIAL PARK DISTRICT
GI GENERAL INDUSTRIAL PARK DISTRICT
RT RESEARCH TECHNOLOGY DISTRICT
OSP OPEN SPACE PRESERVATION DISTRICT
NOTES:
"ROW" = Centerline of the existing street right-of-way as of January 1, 1993, unless otherwise noted.
A = Centerline of creek underpass extended due north.
B = 400 feet from street ROW centerline.
C = Existing lot line extended straight to Blue Barn Rd.
D = 600 feet from street ROW centerline.
E = 300 feet from street ROW centerline.
F = 300 feet from street ROW centerline.
ORD # 2014-7 July 3, 2014
ORD # 2013-4 December 15, 2013
ORD # 2011-8 January 3, 2012
ORD # 2011-5 July 7, 2011
ORD # 2010-5 August 19, 2010
ORD # 2007-15 December 6, 2007
ORD # 2006-4 October 5, 2006
ORD # 2006-3 December 7, 2006
ORD # 2003-4 June 2, 2003
ORD # 2003-4 June 18, 2003
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2018 COMPREHENSIVE PLAN
ZONING MAP
UPPER MACUNGIE TOWNSHIP
LEHIGH COUNTY, PENNSYLVANIA

Summary of Supporting Plan Element Strategies

This chapter lists strategies contained in various sections in Chapter 7 Supporting Plan Elements in one location for review and reference when implementing land use policies and strategies outlined in Chapter 5 Land Use Policy and Plan.

Community Facilities, Utilities, and Services

Park and Recreation Strategies

- Continue to regulate the conservation and preservation of environmentally sensitive and natural areas restricted from development. Design of development should integrate these lands as natural amenities to those living, working, and/or visiting the site.
- Update the Township's 2011 Park and Recreation Plan. Continue to survey residents to identify needs and include pedestrian and bicycle connections as an element of the plan update.
- Promote developers to offer a fee-in-lieu of park and recreation land dedication requirements to provide financial resources for the ongoing upgrade and expansion of park and recreation facilities.
- Develop park master plans to demonstrate opportunities for developers to offer a fee-in-lieu of park and recreation land dedication requirements to provide financial resources for the ongoing upgrade and expansion of existing parks.
- Develop and adopt an MPC compliant Official Map identifying the location of future park and recreation lands, open space, greenways, and pedestrian and bicycle facilities and other eligible future public lands.
- Encourage the layout and design of all development, where appropriate, to incorporate pedestrian and bicycle facilities on the premises as well as provide logical connections to existing and future facilities.
- Promote the various conservation and preservation tools available to private property owners, non-profit organizations, municipalities, and authorities. Reference Pennsylvania Land Trust conservation tools website – https://conservationtools.org/.

Water Strategies

- Assist with tracking water usage data working collaboratively with users, LCA, and the State.
- Promote water conservation tools, techniques, equipment/fixtures, and practices for all users.
- Promote use of technologies to recover, reuse, and recycle water in manufacturing processes and for domestic and commercial use.
- Restrict land development impacting wellhead protection areas.
- Promote the use of innovation for snow removal and deicers to reduce the impacts on water quality.
- Offer public education about best practices to conserve and protect water quality and quantity.
- Apply an Integrated Water Management (IWM) approach to planning, design, and regulatory enforcement that contributes to conservation and protection of water quality and quantity, stormwater management, and land use management.

Sanitary Sewer Strategies

- Continue municipal inspection and enforcement of on-site system maintenance requirements.
- Continue to require a tested primary and replacement absorption area for proposed residential development requiring on-lot disposal systems outside of the Act 537 service area boundary.
- Continue to take corrective measures to monitor the performance of the public sewer collection and conveyance system as well as on-lot systems through the Township's Management, Operations, and Maintenance Program (MOM), the Lehigh County Authority Western Lehigh Interceptor Partnership Regional Flow Management Plan, and the Township's On-Lot Sewage Management Program.
- Maintain an up-to-date Official Sewerage Plan as prescribed by Act 537 that addresses existing sewage disposal needs and includes recommendations to prevent future problems through proper planning, permitting, design of all types of sewerage facilities, and capital projects.

- Continue to coordinate with Lehigh County Authority (LCA), Lehigh County, and LVPC to prepare and update plans that are consistent with population forecasts, development trends, existing user needs, and projected future sewage flows.
- Continue to work through the Western Lehigh Sewerage Partnership (WLSP) to routinely monitor flows and model peak flows of the system to support SCARP implementation, operation and maintenance activities, and planning, design, and construction of capital projects through the WLSP jointly with LCA as well as working individually at the municipal level.

Water Resource/Stormwater Strategies

- Apply an Integrated Water Management (IWM) approach to decision making understanding that land use decisions play an important role in sustainability of water resources.
- Promote the use of porous asphalt parking lots with a subsurface infiltration bed.
- Routinely review ordinance to assure complete and up to date regulations, best management practices, and technologies are identified consistent with federal and state legislation.
- Continue to study and assess changes over time integrating Act 167 planning and Act 537 planning with land use and comprehensive planning while complying with federal and state mandates.
- Regulate stormwater basin and wet pond maintenance and retrofits including water quality features, best management practices (BMPs), and amenities to better meet stormwater management goals and to provide a natural resource to the community.
- Identify effective low maintenance solutions that are integrated with the design of development.

Strategies Partnering with Utilities

- Coordinate with PPL and UGI to develop a Township-wide plan for equestrian, pedestrian, and bicycle trails, playgrounds, extension of existing recreational areas, athletic fields, stormwater infiltration systems, rain gardens, retention/detention ponds, and wet ponds in PPL And UGI easements designed and maintained as amenities through public, non-profit, and private partnerships.
- Coordinate with PPL and UGI to gain easements for future expansion of underground utilities.

Natural and Cultural Resources

Energy Efficiency and Conservation Strategies

- Apply conservation by design techniques to layout subdivisions to conserve, preserve, and/or protect natural, cultural, and agricultural lands and resources; to include transit, pedestrian, and bicycle facilities; and to reduce investment, maintenance, and operations of infrastructure.
- Promote green building design that results in energy efficiency and natural resources conservation for existing buildings, building expansions, and new construction.
- Support the use of multiple energy sources (fossil fuels and renewable energy sources).
- Continue to promote recycling and reuse of solid waste for energy reduction and energy efficiency as part of agreements with solid waste vendors, the LCA, and other partners.
- Encourage alternative means of transportation including motorized and nonmotorized means of travel.
- Promote reduction, reuse, and recycling.
- Evaluate Township investments with respect to fleet management, building maintenance and operations, and administration of public services that result in reduction of greenhouse gas emissions (GHG) and use of alternative energy sources as well as promote energy conservation and efficiency through public awareness.

Natural Resource Strategies

- Continue to protect environmentally sensitive areas through administering zoning and subdivision/land development regulations and implementation of plans including, but not limited to the Township's Park and Recreation Plan, Act 167 Plans, and Pollution Reduction Plans (PRP), and LVPC Hazard Mitigation Plan.
- Promote the use of green stormwater infrastructure (GSI), green roofs, and other green solutions and technologies as part of government operations, public and private development, and infrastructure improvements. Green infrastructure reduces and treats stormwater at its source while delivering environmental, social, and economic benefits
  Source and Examples: https://www.epa.gov/green-infrastructure/what-green-infrastructure.
- Adopt additional natural resource protection and agricultural protection zoning for areas identified as agriculture on Map 8: Agricultural Lands and Preservation and for specific resources identified on maps contained in this plan.
- Conserve priority areas such on steep slopes, stream quality, floodplains, wetlands, hydric soils, woodlands, and important natural areas referenced on maps contained in this plan. These maps should guide public and private conservation, acquisition, dedication of lands, or easements.

Cultural Resource Management Strategies

- Continue to align local historic preservation goals, objectives, and strategies with the regional goal of preserving important historic buildings, structures, and sites in Lehigh and Northampton counties.
- Work in partnership with the Lehigh County, LVPC, and Pennsylvania Historical and Museum Commission (PHMC) to conduct a comprehensive historic sites survey and evaluation to identify historic features that may be worthy of preserving.
- During development reviews, identify and mitigate impacts development may have on any National Register property or any other feature deemed eligible for the National Register by the PHMC.
- Promote private and public historic preservation of sites eligible for the National Register.
- Require roadway/highway projects and other public infrastructure improvements avoid significant features that are listed or are eligible for listing on the National Register of Historic Places unless reasonable alternatives are available.
- Consider adoption of historic district regulations pursuant to the Historic District Act (Act 167 of 1961) for the preservation of eligible Historic Districts.
- Preservation and restoration of eligible properties with the potential to attract tourists to UMT and the Lehigh Valley should be considered along with application for the National Register of Historic Places.

Agricultural Preservation

Agriculture Preservation Strategies

- Continue participation in the Lehigh County Municipal Partnership program and continue to annually allocate local revenues to support agriculture preservation.
- Maintain a healthy local economy with low unemployment rates and low levels of poverty to support the investment in the preservation of agricultural lands.
- Maintain the Urban Growth Boundary (the Township's established Act 537 Service Area boundary) to assure agricultural lands not preserved adjacent to this boundary are not targeted for development. Logical extensions of this boundary should be considered only when proposed uses support a balanced economy.
- Adopt Agriculture Protection Zoning (APZ) for agricultural areas identified on Map 8 such as those lands identified as Agricultural Easements, Agricultural Security, Agriculture Private, Agriculture Township, and 2018 Agriculture Easement applications. Work with Lehigh County and LVPC to gain technical assistance to develop appropriate regulation for this type of zoning.

- Adopt APZ regulations that recognize the recently adopted Agritainment Ordinance which includes a range of farm-based agritainment and agritourism uses secondary to a principal agricultural use.
- Create an Agriculture Advisory Panel to advise the Planning Commission and Board of Supervisors on issues dealing with or impacting agriculture prior to municipal actions affecting agricultural resources.
- Recognize and support various initiatives such as Buy Fresh/Buy Local, Farm-to-School, and other local food, farms, and outdoor attraction initiatives.
- Seek grant money with partners for agricultural preservation and conservation as well as for agricultural development.

Housing

Housing Strategies

- Continue to provide robust public amenities and well-functioning road and highway infrastructure to support the housing market.
- Partner with the development community to provide income-restricted affordable housing in UMT that will open opportunities for lower income families to benefit by reduced travel costs and reduced commute times to work in UMT industries and warehouse/logistic centers as well as provide access to high-quality public schools.
- Consider inclusionary zoning to ensure the long-term viability and attainability of affordable housing for all income levels. Reference LVPC's Inclusionary Zoning Model Ordinance at https://www.lvpc.org/pdf/inclusionaryZoning.pdf.
- Develop design guidelines and criteria for siting retirement communities in centrally located areas with access to transit and destinations within walking distance. Retirement communities should include a mix of age-restricted housing for independent living, assisted living facilities, and nursing home facilities that allow individuals to age in place close to family members and friends.
- Consider manufactured homes, mobile homes, and tiny homes as solutions to affordable housing for a range of individuals and households as first-time renters and/or home-owners and those who have low-middle incomes.
- Create mixed-use developments with residential units, community serving retail, services, and dining establishments as well as provide space for employers such as office, health care, and other neighborhood commercial uses to help reduce traffic volumes and appeal to the growing household preferences for walkable, live-work-play environments.
- Consider increasing residential density and diversity through zoning changes to maximize the value of remaining lands available for development and the contribution to the tax base.
- Increase preservation and conservation activity to reduce the amount of lands available for residential development providing increased sustainability for UMT and the Lehigh Valley.

Economy

Economic Development Strategies

- Conduct a detailed Cost of Community Services (COCS) study to provide a snapshot in time of costs versus revenues for each type of land use to help decision makers understand the benefits of conservation and preservation of land over development. Reference studies completed by the Department of Community & Economic Development for similar municipalities.
- Continue to provide financial incentives for preservation of agricultural lands to purchase agricultural conservation easements. Additional preservation of agricultural land sustains a diverse economic base, contributes to the local and regional food supply, impacts natural resources, water quality, and the regional water supply, and reduces impacts on the cost of public infrastructure and services.

- Continue regulatory requirements for preservation of environmentally sensitive lands, open space, and park and recreation lands and establish agricultural protection zoning.
- Continue to provide flexibility in land use regulations to include farmer's markets, agritainment, bed and breakfasts, and other appropriate on-farm commercial uses and/or operations.
- Continue to preserve agricultural land and promote farming as part of UMT's diverse economic base.
- Continue to provide opportunity for new and experienced farmers to lease Township owned land for farming activity. Provide information and links on the UMT website for PA Small Business Development Center (SBDC) education and financing programs for farmers.
- Based upon the Housing Analysis recommendations, support residential development for retirement communities. This type of residential development provides more in revenues than they require back in services (e.g. there is no demand for school services).
- Continue to identify redevelopment opportunities and adopt appropriate land use policies and regulations that support development of mixed-use centers. Based upon market factors, target areas for redevelopment over the next 5-10 years should consider the following:
    - Redevelop the aging Fogelsville Center located on Tilghman Street to create a mixed-use, walkable office and commercial retail environment that serves as a gateway to Fogelsville.
    - Redevelop the existing Air Products campus including adaptive reuse and newly constructed space for credit tenants – typically established companies or chain retailers to facilitate financing. This could include space for retail and office users in locations with visibility from Hamilton Boulevard and warehouse development accessible from Cetronia Road.
    - Redevelop existing office parks to provide contemporary office space with amenities offered as a mixed-use, campus-style development (e.g., restaurants, retail, fitness, open space, entertainment, and commercial recreation) improved with walking paths and transit access.
    - Redevelop smaller obsolete warehouse sites to provide smaller scale "last mile" delivery centers.
    - Where appropriate, encourage combining smaller sites to allow for increased buffers, setbacks, and screening to protect residential neighborhoods from non-compatible uses.
    - Where appropriate, consider mixed-used development and redevelopment to include affordable housing options for low-to-moderate income households, professionals entering the labor force, public service employees, and seniors.
    - Provide affordable housing for labor force of the future that replaced warehouse operations with other uses identified below as reuse strategies for large-scale warehouse facilities.
    - Modify existing developments with sidewalk improvements and other transit-friendly enhancements to increase potential ridership and feasibility of LANTA service to targeted redevelopment sites.
- As part of the land development process, continue to require traffic analysis, intersection improvements, access management strategies, and congestion mitigation solutions.
- Connect current and prospective small business owners with the Small Business Development Center (SBDC) at Lehigh University (an affiliate of the SDBC of PA), the Greater Lehigh Valley Chamber of Commerce and their small Business Center, and the Lehigh Valley Economic Development Corporation (LVEDC) offering a range of resources, technical assistance, and guidance on financial options.
- Require adaptive reuse strategies and plans for large-scale warehouse facilities as part of land development plans for potential reuse options such as:
    - indoor/outdoor sports complex and facilities;
    - indoor farming and/or hydroponics;
    - schools, universities, and similar uses with addition of upper floors;
    - mixed use development with first floor retail and office uses with upper floor office and residential uses (mix of market rate and mixed-use housing) with a mix of other support uses; or
    - mixed use community for senior living and other potential uses.

Transportation

Congestion Mitigation and Safety Strategies

- Continue to collaborate with LVPC/LVTS through the TIP process, multimodal planning, and implementation of local and regional projects that relieve congestion and improve safety for all modes of travel.
- Take a broad approach to resource allocation including planning and programming for the TIP, UMT Capital Improvement Plan (CIP), developer improvements, grant sponsored projects, and public-private improvements to implement multimodal solutions.
- Consider the context of the community and apply Context Sensitive Design and Flexibility in Design standards for a range of transportation solutions.
- Plan, prioritize, design, and construct multimodal projects through public-private partnerships that improve safety and logistics for other roadway users such as bicyclists, pedestrians, and transit.
- Instead of solely relying on LOS to measure performance, apply the broader approach of comprehensive transportation performance management (e.g., travel speed, reliability, safety, asset preservation, quality of life, and other measures) to support transportation investment decisions.
- Improve operations using Intelligent Transportation Systems (ITS) and prepare for roadways using technology and provide routine maintenance to support connected and automated vehicles (C/AV).
- Implement cost effective countermeasures that optimize traffic flow and improve safety through innovation of design and technology.
- Improve driver behavior through public education and awareness, signage, signal timing, detectors, and enforcement to reduce congestion and increase safety.
- Work as partners with LVPC to establish a transportation asset management system that links user expectation for network condition, performance, and accessibility with system management and investment strategies with a focus on performance of assets.
- Augment LOS requirements in UMT Subdivision and Land Development Ordinance with comprehensive transportation performance management factors requiring multimodal and context sensitive solutions, access management, and appropriate use of technology.
- Partner with warehouse owners and PPL to provide transit and pedestrian and bicycle facilities.

Pedestrian and Bicycle Strategies

- Adopt a Complete Streets Policy by either a Board of Supervisor resolution or through executive order and/or internal departmental directives. Promote biking and walking on the Township website.
- Review bicycle and sidewalk policies and regulations to consider appropriate changes to assure high-quality, safe, and convenient pedestrian and bicycle facilities.
- Include design standards in the Subdivision and Land Development Ordinance with graphic examples of types of on- and off-street bicycle and pedestrian facilities compatible with the character of the community and roadway vehicular speeds, functional classification, and level of congestion. Refer to concepts in Chapter 4, Community Character and Design.
- Creatively balance competing interests of all modes in a limited amount of right-of-way with emphasis on accessibility, mobility, and safety of bicyclists and pedestrians.
- Use routine targeted enforcement and information sharing to encourage motorists and cyclists to share the road safely and to promote pedestrian safety.
- Further evaluate and prioritize the potential pedestrian and bicycle connections identified on Map 12 Connections to be implemented through public-private partnerships, adopt an Official Map identifying on- and off-road facilities, and pursue grant applications for planning, design, and construction.

Freight Movement Strategies

- Designate alternative truck routes to meet freight mobility needs in the event of accidents, congestion, and/or construction to ensure safe and efficient freight movement.
- Use ITS, truck route signage, and traveler information systems to provide valuable information to improve safety and maximize mobility, and to help guide truck traffic to appropriate truck routes and alternative routes as part of incident management.
- Maintain local roads, bridges, signage, and pavement markings to promote proper use of roadways, safety, and mobility.
- Establish requirements for public truck parking spaces (individually or pooled), amenities (e.g., shower facilities, refreshments, etc.), and trailer storage in addition to adoption of standards for docking facilities for warehouse development.
- Consider truck parking facilities as part of interchange development and redevelopment as well as along designated truck routes where access is not limited or restricted.
- Work with LVPC/LVTS and PennDOT to upgrade existing interchanges and to plan, design, and program new interchange improvements that will increase access to the interstate system from warehouse cluster development within the region.
- Collaborate with adjoining municipalities also experiencing warehouse cluster development and other uses of regional significance to jointly implement appropriate transportation strategies and solutions as part of a capital improvement plan, land development investments, and maintenance and operations.
- Provide increased connectivity and options for all modes of travel to improve level of service (LOS) on existing roadways.

Readiness for Connected/Autonomous Vehicles (C/AV) Strategies

- Promote carpooling and ridesharing with reduced parking fees or designated parking to acclimate citizens to the benefits of ridesharing and to prepare society for ridesharing using autonomous vehicles.
- Establish and budget for robust road maintenance and safety programs including clear lane striping, avoidance of temporary abrupt lane shifts, timely snow and leaf removal, and on-the-road charging facilities to maximize efficiency and minimize congestion.
- Support the use of alternative fuels by providing charging facilities for electric vehicles at public facilities such as parks and other government facilities where appropriate. Seek funds through the state's Alternative Fuel Incentive Grant Program to implement this locally. Note: This program is being promoted by PA DEP and DCNR for charging facilities to be placed in state parks.
- Use ITS on arterials and congested roadways to integrate and manage driver and driver-less vehicles.
- Support driverless fleet-based services, shuttles, or minibus services economically managed by public transportation agencies instead of single ownership of autonomous vehicles.
- Design roadway improvements and interchange fueling stations with autonomous services.
- Create policies that incentivize the use of collective modes of transportation and ridesharing over individual driverless taxi services with the goal of access and equity for all users.
- Set and enforce speed limits and consider higher speeds permitted for collective transportation modes in comparison to driverless taxi services.
- As legislation permits, establish new policies for road usage fees for autonomous vehicles giving preference to a fleet-based use, ride sharing, and efficient use of vehicles.
- Design roads, on-street parking, and parking lots and garages so they can be easily converted or adaptively reused as public space, housing, or other uses or used for active or alternative modes of transportation. New design standards, zoning, and regulations must be developed (e.g., parking standards and formulas, designated drop off space, etc.).
- Prepare for new data systems, privacy, and security needs.
- Develop procedures for interaction of police and emergency services with autonomous vehicles.
- Plan for the loss of traffic violation revenue and the impact on police services.

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Source: Village of Plainsboro, NJ

Source: New Albany, OH

Note: The photographs, images, and graphics from various sources are used in this chapter for educational purposes.

Community Character and Design

Intersection of Rural and Suburban Lifestyles

This Chapter will demonstrate how innovation in design policies and standards contribute to strengthening and further defining the community character – the physical and social form of the Township. Refer to the goals, objectives, and policies in Chapter 1 that define important aspects of intersecting rural and suburban lifestyles.

Community Character and Design Policy

Since the 2007 Comprehensive Plan, the general description of UMT's community character has been strengthened through preservation, development, and redevelopment activity. Community character is a distinctive trait, quality or attribute, essential quality or nature of a place, and reputation (Webster). The various technical reports and data contained in the Appendices focus on the environmental, social, and economic aspects of sustainability of UMT as well as provide a description of the Township as summarized in Chapter 2, Existing Conditions. As UMT continues to plan and implement change to realize the vision of this plan, the following description of community character will provide the basis for further enhancement of character, identity, and sense of place.

The overall community character of Upper Macungie Township can be described as a diverse range of land uses, neighborhoods, activity centers, and rural landscapes. From suburban subdivisions, mixed use villages, and expansive industrial and offices centers to rural homesteads, the unique character of each area of the Township blends together to form a well-integrated community framework. Maintaining the character of each type of community, and hence the overall character of the Township, is challenging in a high-growth bedroom community with the intense development pressure Upper Macungie has experienced in the past several years.

Source: UMT 2007 Comprehensive Plan, Community Character and Design

The intent is to strike a balance between the suburban and rural character of UMT while strengthening the local and regional economy. Strategies and design standards, for managing growth and promoting prosperity and sustainability over the long run, help to strengthen community character. Both land use and design policy are used to articulate various physical aspects of community character that will be addressed in this chapter.

Design policy is the process by which UMT translates the community vision into practices, programs, and actions that support development of regulations and standards that promote the effective implementation of community development through private and public investment.

The details to follow include design policies in support of land use policies that are geared to achieving the vision of sustainable community development. Innovation in design includes development concepts, conservation and preservation, and growth management techniques that build a sustainable community.

Source: Bob Rodale Cycling & Fitness Park

Township and Regional Connections

A healthy corridor has land uses, services, and facilities that allow residents to more easily make healthy lifestyle choices. A healthy corridor is a place that reflects the culture of the community, promotes social cohesion, facilitates active living, offers transportation choices, and connects residents with shopping, employment, and community facilities.

Source: Urban Land Institute (ULI)

Healthy corridors contribute to all three aspects of sustainability (physical, social, and economic environments). The Township's non-vehicular connections should be consistent with the following planning principles, policies, and engineering standards to achieve aspects of a healthy corridor topology:

- ULI's Healthy Corridor Topology (tailored for UMT)
- LVPC's Active Transportation Plan for the Lehigh Valley – Walk/RollLV
- PennDOT's Statewide Bicycle & Pedestrian Plan, Design Manual Requirements, and PennDOT Connects Initiative
- LANTA Requirements for Bus Service, Bus Stops, ADA Compliance, Sidewalks, and Crosswalks
- FHWA and PennDOT's Linking Land Use and Transportation Policy integrated with the Local Economy and Culture of the Community
- Pedestrian and Bicycle Safety Index
- FHWA's Complete Streets Policy
- MUTCD Standards and FHWA Flexibility in Design
- PennDOT Design Manual and AASHTO Standards
- NACTO, FHWA, and NCHRP Design Guidelines
- Americans with Disabilities Act (ADA) Compliance

Public input coupled with conceptual planning resulted in the preparation of a Connections Map (Map 12) for UMT contained in Chapter 7, Section E. This map will help guide infrastructure improvements that result in building a healthy corridor topology through public-private partnerships. This map should be further evaluated to determine those facilities to be identified on an UMT Official Map.

Healthy Corridor Topology

<u>Design Land Use Patterns that Support Community Needs</u>

- Vibrant retail clusters with connections to residential neighborhoods.
- Housing options for all income levels with connections to community facilities.
- Buildings adjacent to sidewalks.
- Access management and shared parking.
- High-quality accessible parks and public spaces.
- Access to healthy food options.

<u>Township and Regional Connections</u>

- Well-connected, multimodal street networks.
- Safe and identifiable connections for pedestrians and bicyclists (e.g., sidewalks, multi-use paths and trails, bike lanes, etc.).
- Access to transit.
- On- and off-road bicycle facilities.
- Public access greenways.

<u>Enhanced Infrastructure</u>

- Safe and well-marked pedestrian and bicycle facilities.
- Reduced traffic congestion.
- Sidewalks that link neighborhoods to community facilities, schools, shopping, and transportation corridors.
- Complete streets streetscapes.
- Lighting to improve vehicular, pedestrian, and bicycle safety.
- Accessibility features meeting ADA standards.
- Underground utilities or utilities designed to blend into the streetscape.
- Wayfinding signage for trucks and visitors.
- Roadway technology to enhance travel.

Source: Building Healthy Communities, Transforming Urban and Suburban Arterials into Thriving Places, ULI, 2016.

Bicycles and Pedestrian Guidelines

A complete streets policy and design guidelines adopted and implemented by UMT can offer a safer, more inclusive and aesthetically pleasing transportation system for all modes and for people of all ages and abilities. The following are aspects of a complete streets policy and graphic concepts for a suburban community characteristic of UMT.

- Integrate bicycling and walking into the transportation system.
- Incorporate bicycling, walking, and transit facilities into land development and transportation projects unless exceptional circumstances exist.
- Provide a buffered or off-road shared use path or trail in areas of high volumes of truck traffic.
- Include a minimum four-foot wide on-street striped bicycle lane and accessible sidewalks and crosswalks on collector and arterial streets as needed where traffic volumes and speeds increase.
- Include a minimum four-foot paved shoulder and accessible sidewalks and crosswalks as needed where traffic volumes and speeds increase along rural arterials.
- Use traffic calming measures to reduce motor vehicle speeds to levels more compatible with biking and walking in high pedestrian and bicycling areas.
- In coordination with LANTA, where appropriate, integrate bus pull-off, bus stops, and other facilities.

Safety and Sustainability

Suburban and rural roadway options are identified in this section featuring bicycle and pedestrian facilities for residents who do not feel safe sharing the road with motor vehicles including heavy truck traffic.

Pedestrians and bicyclists are attracted to safe and accessible facilities that provide neighborhood connections to parks and recreation facilities, neighborhood shopping centers, government facilities, and schools.

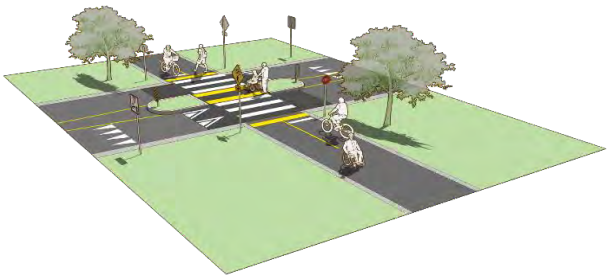
In addition to the Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO), National Association of City Transportation Officials (NACTO), Americans with Disabilities Act (ADA), and PennDOT design standards for pedestrian and bicycle facilities, the Small Towns and Rural Design Guide Facilities for Walking & Biking website provides a range of guidelines for bicycle and pedestrian facilities in urban, suburban, and rural environments. The following graphics have been selected from this publication to demonstrate options that address specific safety concerns for pedestrians and bicyclists expressed by UMT residents who are not avid on-road bicyclists.

Figure CD1: Pedestrian and Bicycle Facilities

Suburban and Rural Options for Pedestrian and Bicycle Facilities

Source of Graphics: Small Towns and Rural Design Guide Facilities for Walking & Biking
http://ruraldesignguide.com

Figure CD1: Pedestrian and Bicycle Facilities (continued)

Suburban and Rural Options for Pedestrian and Bicycle Facilities (Continued)	
	
Source of Graphics: Small Towns and Rural Design Guide Facilities for Walking & Biking http://ruraldesignguide.com	

The pedestrian and bicycle concepts shown in this section of the plan should be used along with current design standards to visualize public improvements to be made as part of a development proposal, as part of a public roadway projects, or as part of a public/private partnership.

Land Preservation and Environmental Protection Guidelines

While UMT has land preservation and environmental protection guidelines, the following content and graphic concepts are provided for educational purposes to describe current policies, guidelines, and tools and techniques as the framework for future development.

- Use cluster development applying conservation by design standards to transition from suburban development and villages to rural landscapes.
- Avoid fragmentation of agricultural lands and wildlife habitats as well as reduce infrastructure costs and other environmental impacts by using conservation-by-design standards.
- Avoid the use of cul-de-sacs, instead use loop roads and other roadway design options.
- Identify appropriate locations for cluster development applying conservation by design where appropriate outside of the Township's Act 537 Service Area Boundary or Urban Growth Boundary (UGB) where logical extension of public water and sewer is appropriate or where lot sizes are large enough to support on-lot septic systems.

Figure CD2: Conservation by Design versus Traditional Large Lot Subdivisions

Traditional Subdivision	Option for Conservation by Design
	
Source of Graphic: Conservation Subdivision Handbook – A Guide for North Carolina Communities in the use of Conservation Design for Land Use Planning – Images courtesy of Randall Arendt.	

The above concepts depict how to maximize the preservation and conservation of natural, cultural, and agricultural resources using conservation by design standards versus traditional development standards to visualize the potential for compact development. The tools and techniques identified on the following page provide the basics for land preservation and conservation.

Table CD1: Preservation and Conservation Tools & Techniques

Preservation and Conservation Tools & Techniques		
Conservation by Design	• Same number of homes as traditional development clustered on smaller lots on a smaller portion of the total available land. • Clustering development can preserve farmland, open space, natural resources, forest, and other natural amenities. • Septic system easements for primary and alternate systems in common open space, homeowners' association space, or community sewer systems when adjacent to denser development with public sewer. • Grass swales for infiltration of water. • Less impervious surface with more areas for infiltration. • Conservation Area Management Pans should be required as a supporting document to the subdivision/land development plan.	
Land Trusts	Private charitable organizations whose mission is to protect land under its stewardship from inappropriate change or development.	
Municipal Open Space	Municipal open space held and preserved for use as open space, greenways, trails/paths, and parks and recreation lands.	
Other Tools and Techniques		
Agricultural Conservation Easement Purchase Program	Agricultural Security Areas (ASA)	Agricultural Protection Zoning
Conservation Easements	Steep Slopes Ordinance	Historic Preservation & Zoning
Riparian Buffer Ordinances	Floodplain Ordinances	Tree Ordinance
Official Map	Protective Covenants	Forest Management
Sources: Growing Greener, Conservation by Design, Randall Arendt / PA DCNR https://www.greenerprospects.com/PDFs/growinggreener.pdf and Conservation Tools, Pennsylvania Land Trust Associations https://conservationtools.org/		

Redevelopment or Infill Development

Urban and suburban sprawl contributes to many factors that negatively impact the sustainability of a community. Within UMT there will be opportunities today and in the future for various types of redevelopment or infill development activity.

Suburban Redevelopment or Infill Development Guidelines

The following guidelines are for the redevelopment or infill of older subdivisions with larger lots. The goal is to densify the neighborhood to allow for conservation and preservation of open space outside of the UGB. Guidelines include the following:

- Adapt existing streetscapes or add sidewalks and other facilities that make the neighborhood pedestrian-friendly while deemphasizing the use of automobiles within the subdivision.
- Use alleyways (existing or new) to provide access to the rear of properties to locate garages, to access garages adaptively reuses as accessory dwelling units, and/or to use alleyways for pedestrian access and emergency access.
- Redevelop key sites to allow for diversity of housing types, size, and affordability. Mix existing single-family dwellings with apartments, townhouses, and accessory dwelling units.
- Provide density bonuses and incentives such as increased building height and building coverage to allow for a mixture of housing types.
- Eliminate cul-de-sacs and make direct pedestrian, bicycle, and vehicular connections to adjacent residential, commercial, and mixed-use developments.

Village Development and Expansion Guidelines

Village redevelopment, infill development, and expansion should reflect the character and physical qualities of the village applying flexibility to promote orderly development consistent with the following principles, strategy, and guidelines.

Strategy

Provide for Village District zoning to facilitate redevelopment and infill development compatible with existing building design, mass, scale, and density. Graphic examples and concepts for first floor conversion of residences with upper floor living and infill development are provided in this section and graphic concepts depicting the following guidelines should be addressed as part of ordinance content.

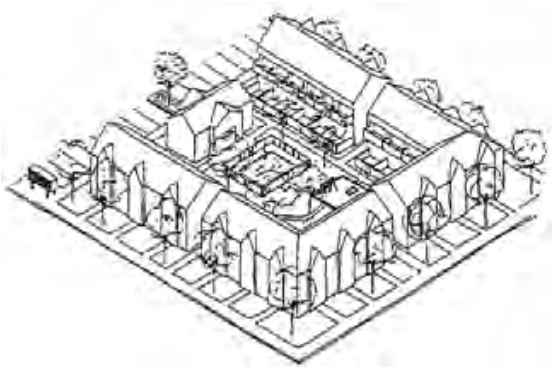
Guidelines

- Traditional Village Development: Apply the Traditional Neighborhood Development (TND) standards outlined in the Pennsylvania Municipalities Planning Code (MPC) as an overlay for the historic villages and areas immediately surrounding to allow for appropriate redevelopment, infill development, and expansion as well as allow for a transition area between lower density development and incompatible land uses.
- Massing, Scale, and Layout: Develop design standards that will transition from the scale of the adjacent surrounding block face(s) with respect to height, bulk, and structure size of the maximum height and mass of the proposed structure(s). When development involves single or multiple residential units, accessory uses such as parking, garages, and open space, parking should be located to the rear or interior of the lot. Wrap around porches are features that can help a home on a corner lot address both street fronts. Commercial building mass and scale should use materials and architectural design to provide for varied roof lines, distinct building entries and windows, and overhangs with design allowing for second floor living or office space.
- Building Orientation: Compliment surrounding development through design elements such as entries facing the street, roof pitches, balconies, front porches, and recessed detached garages where appropriate for residential uses.
- Streetscapes: Design streetscapes using materials to enhance the character of the village to provide pedestrian accessibility and safety facilities and features integrated with traffic calming measures.
- Off-Street Parking and Access: Locate off-street parking to the rear or side yards. Shared parking and consolidated

Sustainability Principles

Diversification of the economic base and enhancement of village amenities can be realized by allowing mixed-use infill development and adaptive reuse of residential first floors for small scale commercial uses and requiring compliance with Complete Streets standards.

Emphasis should be placed on preservation as well as highest and best use of older buildings, redevelopment of aging commercial buildings, and expansion of the village boundary where appropriate.



Source: Internet

Source: The Wall Street Journal

Source: New Hope Borough, PA

driveways should be emphasized. Parking should be screened from adjacent residential uses and parking for commercial uses and multi-family dwellings must be landscaped. Parking lots and cars should not dominate the visual character of the site. Expansive paved areas or parking lots located between the street and the building are to be avoided.

- Signage: Design signs compatible with the architecture, color, material, and placement of the building(s) and purpose of the building(s). Signs should be designed at an appropriate scale consistent with the use an inconsideration of vehicular and pedestrian traffic.

Transit Support Land Use Design Principles

Studies suggest that people tend to walk and use public transit more and drive less in places with more traditional design characteristics like those described in the previous section.

Transit-oriented design (TOD) integrates land use, zoning, and transportation planning elements to promote higher-density mixed-use development that is easily accessible by various modes of transportation.

TOD embraces the concepts of "smart growth" and traditional neighborhood design by encouraging higher-density development in areas with existing public services and by encouraging interconnected street networks.

Pedestrian accessibility and street-oriented site design are also important elements of TOD. Another important element of TOD is transit access design to ensure that development sites are accessible by transit vehicles.

In 2013, LANTA published a Transit Supportive Land Use document for the Lehigh Valley. Design standards appropriate for UMT's suburban landscapes are in the shaded box to the right. This study addressed:

- LANTA Bus Route Classifications within target areas across the region.
- Criteria for service level measures.
- Employment densities by use based upon LVPC 2040 Build-Out Analysis.
- Activity Density Index for enhanced bus service.

Map 8: Street Classification identifies current LANTA routes and the location of bus stops in the Township.

Bus routing in UMT and surrounding region is always changing due to growth trends, ridership, requests, feasibility, and efficiency. As development continues in UMT, the standards in this section will be applied to determine additional routes and bus stop locations.

Transit Fundamental Land Use & Design Standards

- Transit supportive uses include employment centers, retail clusters, high-density residential neighborhoods, and healthcare and educational campuses.
- Comprehensive pedestrian networks connected to transit stops to include sidewalks along roadways, crosswalks, lighting, and sidewalks extending into shopping centers and campuses with infill of satellite buildings to reduce large expanses of parking.
- Design of developments to allow transit to enter the development via the main thoroughfare.
- Design pedestrian facilities and transit stops to a one-minute walk to the transit stop.
- Building setbacks for commercial development immediately behind the sidewalk.

Source: LANTA, Transit Supportive Land Use (2013)

UMT development partners and property owners must engage LANTA early in the Subdivision/Land Development process to determine feasibility of transit corridors and route patterns for new or enhanced transit service as well as to identify bus stops, pedestrian and bicycle facilities, and other transit facilities where appropriate.

Larger Development Site Planning

The following guidance for large development site planning contributes to sustainability.

- Provide direct paths of travel for pedestrian destinations within large developments.
- Provide primary entrances for pedestrians that are safe, easily accessible, and a short distance from transit stops.
- Place buildings around a central common open space to promote safety and the use of shared outdoor areas.
- Provide bicycle lockers and/or racks near building entrances.
- Provide adequate buffering and screening to control impacts resulting from light, glare, noise, toxic substances, and release of airborne particles on adjacent residential uses.
- Incorporate green building design such as green roofs and solar panels for larger buildings.
- Provide linkages to residential neighborhoods via paths, trails, and greenways.
- Encourage mixed use development to include recreational facilities.
- Require a Traffic Impact Study to address impacts with multimodal solutions and complete a Feasibility Study working collaboratively with LANTA for transit service, bus pull-offs, and other facilities.
- Situate buildings on the site so they are oriented to maximize daylighting opportunities and harvest natural light within interior workspaces.
- Provide numerous entries at multiple street frontages, improve site design flexibility, and provide options for building location that maximize employee and pedestrian access to multiple tenant buildings.
- Use special entry treatments such as brick, pavers, stamped/colored concreate and other materials with special planting and signage at entrances.

Campus-Style Development

Develop and adopt campus-style design standards for Zoning and Subdivision/Land Development Ordinances.

Campus-style development integrates building type and design (including low-rise and high-rise buildings), environmentally suitable building and site design, and a mix of uses (residential commercial, cultural, institutional, hospitality, or entertainment).

Campus-style design utilizes open space, public plazas, landscaping, amenities, streetscapes, and signage to integrate use, design, and density of development.

Campus-Style Development Characteristics

- Productive use of green space.
- Preservation of natural resources.
- Links to trails and paths.
- Use of alternative energy sources.
- Use of technology.
- Develop integrating space for office, education, health care, housing, and research and development.
- Shared parking.
- Upper floor living.

Source of Images: Spur – Ideas+Action for A Better City, Business Park Campus designed by BAR Architects.

Development Concepts and Guidance for Opportunity Sites

Throughout the planning process several sites were identified that are crucial to maintaining the character of the community while allowing growth and economic development to occur. These sites are referred to as opportunity sites. The Planning Commission, Steering Committee, and public provided input with respect to the potential land use or mix of land use for these sites and important design factors.

Numerous opportunity sites are identified on Figure CD3 – Potential Development Sites/Opportunity Sites and Planned Development contained at the end of this section. Select opportunity sites referenced below correspond with opportunity site numbering on Figure CD3.

Development Concepts for Select Opportunity Sites

The following are priority opportunity sites with details of concepts for development, redevelopment, and/or expansion of existing development.

- Concept Opportunity Site 1: Fogelsville Village Redevelopment and Expansion
- Concept Opportunity Site 2: Route 100 Town Center Development
- Concept Opportunity Site 7: Route 22 Gateway Development
- Concept Opportunity Site 8: Air Products Campus and New Development Site

Figure CD4: Land Use Concept for Fogelsville Village Redevelopment and Expansion

Concept Site 1: Fogelsville Village Redevelopment and Expansion

- Redevelop Fogelsville Center strip mall and create a connection and a gateway to the village.
- Provide bicycle and pedestrian connections from planned residential developments to the village center and to commercial and industrial development expanding the village.
- Preserve open space and greenways along waterways incorporating other natural resources.
- Prioritize the improvement of a village bypass to route trucks away from main street.
- Provide vehicular and bicycle and pedestrian connections to the Fogelsville Center, Lehigh Heights Shopping Center, and medical facilities.

Expansion of Fogelsville Village will occur through anticipated development depicted below.

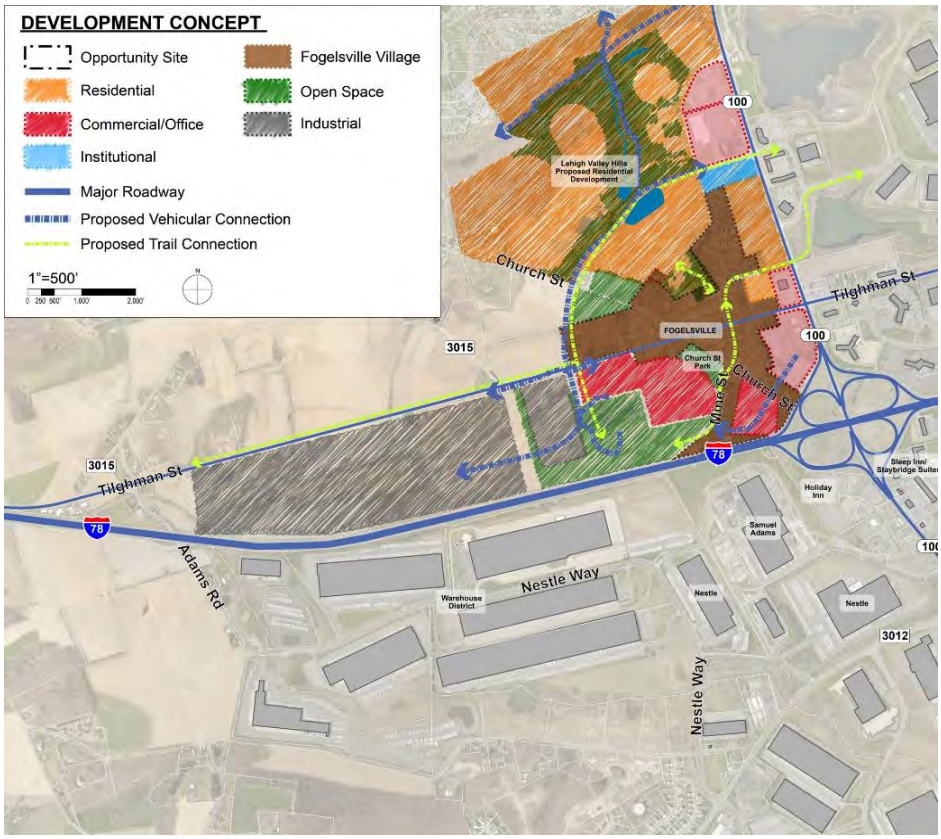
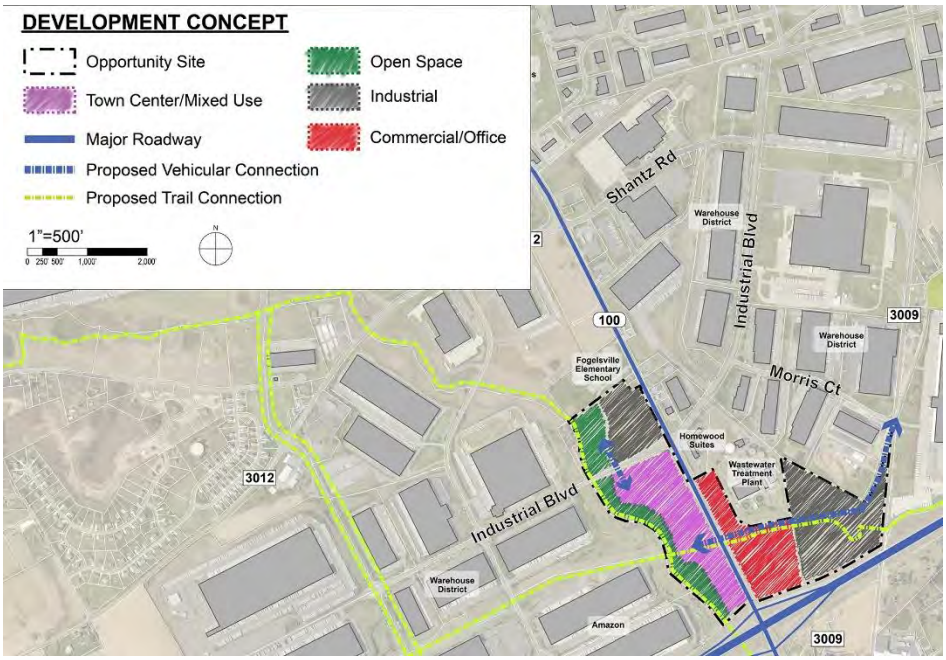


Figure CD5: Town Center Concept Along Route 100



Safe, affordable, and easy access to and from Route 100 is crucial for the development of this site as a Town Center.

Concept Site 2: Route 100 Town Center Development

- Promote Town Center development along major transportation corridors.
- Design bicycle and pedestrian connections from existing residential neighborhoods to the Town Center.
- Preserve open space and greenways along waterways and incorporating other natural resources.
- Require developer sponsored vehicular and bicycle and pedestrian connections to the Town Center, schools, and neighborhoods.
- Consider vehicular access via shared access enhanced by wayfinding signage.

Figure CD6: Gateway Concept Along Route 22

Concept Site 7: Route 22 Gateway Development

- Develop Town Center to support residents to the north and west.
- Integrate existing commercial uses fronting along Route 22 into the development.
- Make pedestrian and bicycle path and connections.
- Use open space as a transition between the Town Center and warehouse uses.
- Anticipate that pending changes to interstate and highway rights-of-way will impact the development envelope.
- Incorporate gateway design and entrances to the Township into development plans.

This mixed-use area includes a Town Center, employment, open space, commercial retail, and residential uses. The Town Center is a gateway to the Township and offers shopping opportunities to surrounding residents.

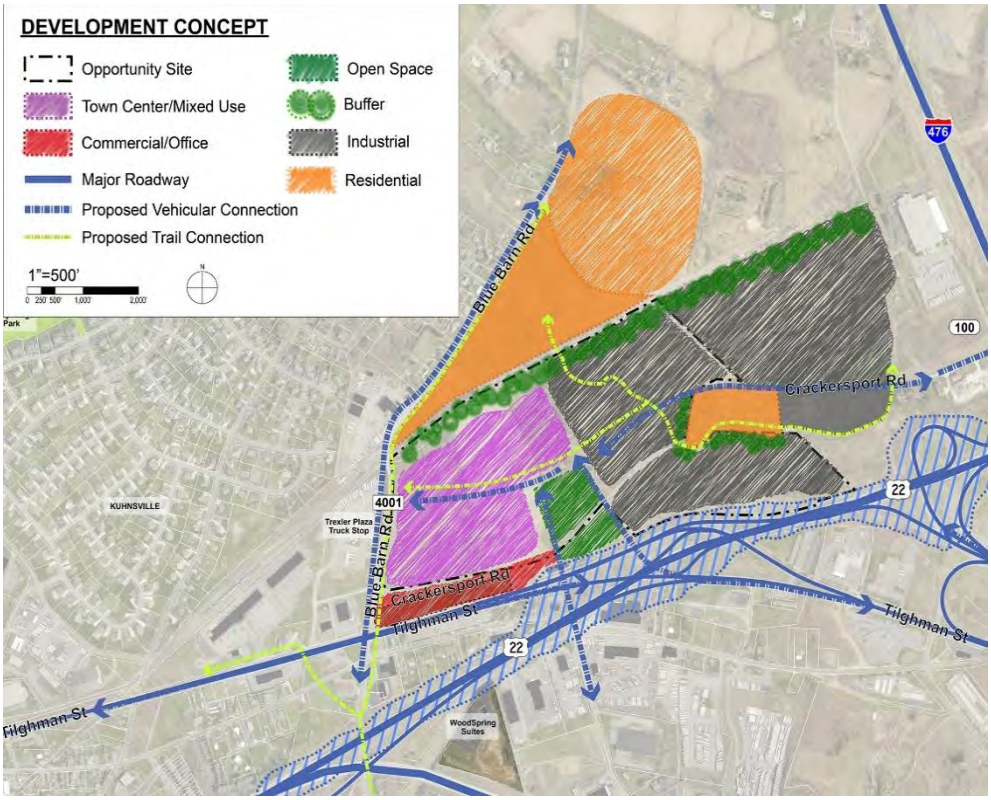
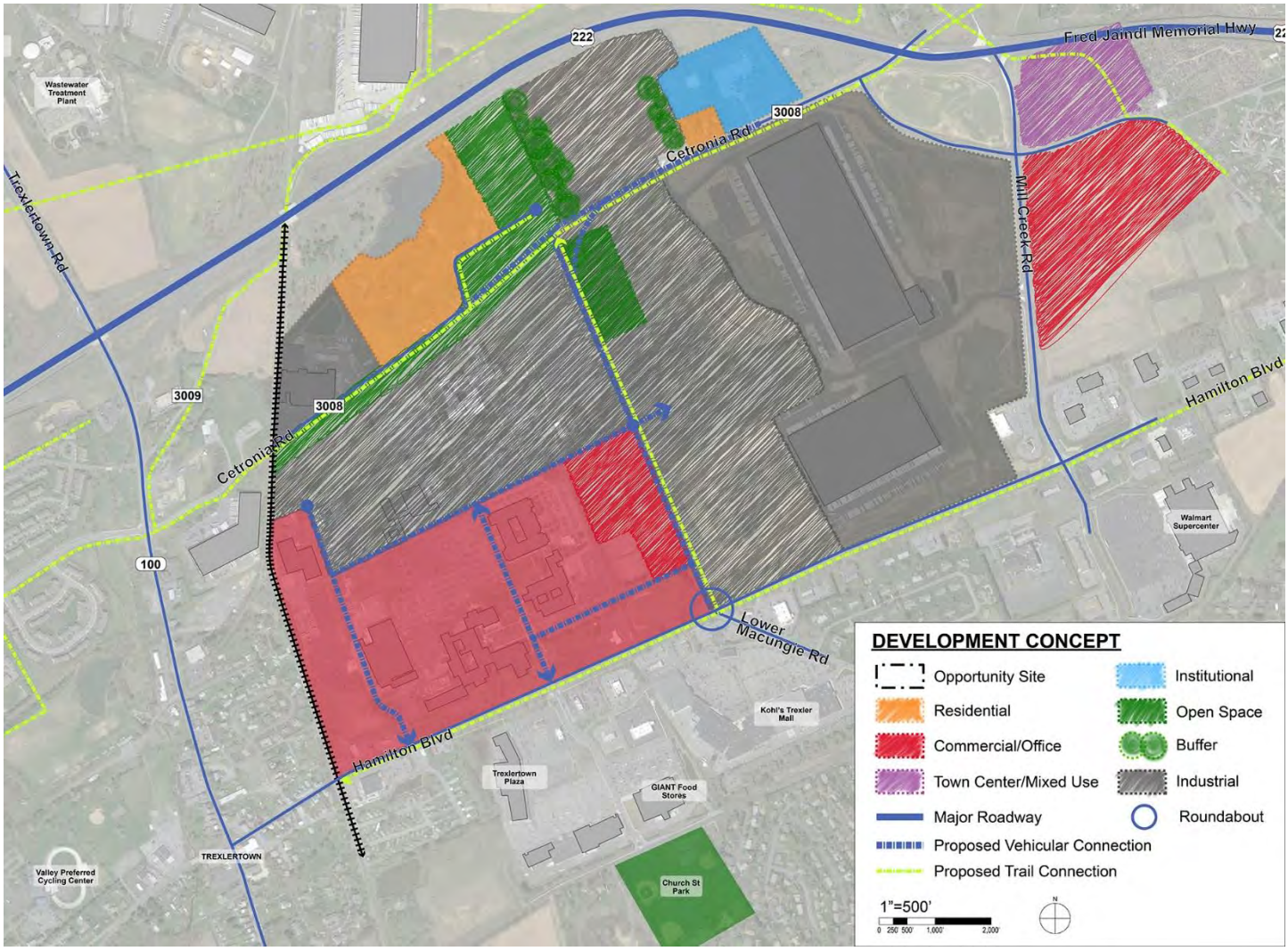


Figure CD7: Land Use Concept for Air Products Campus Redevelopment

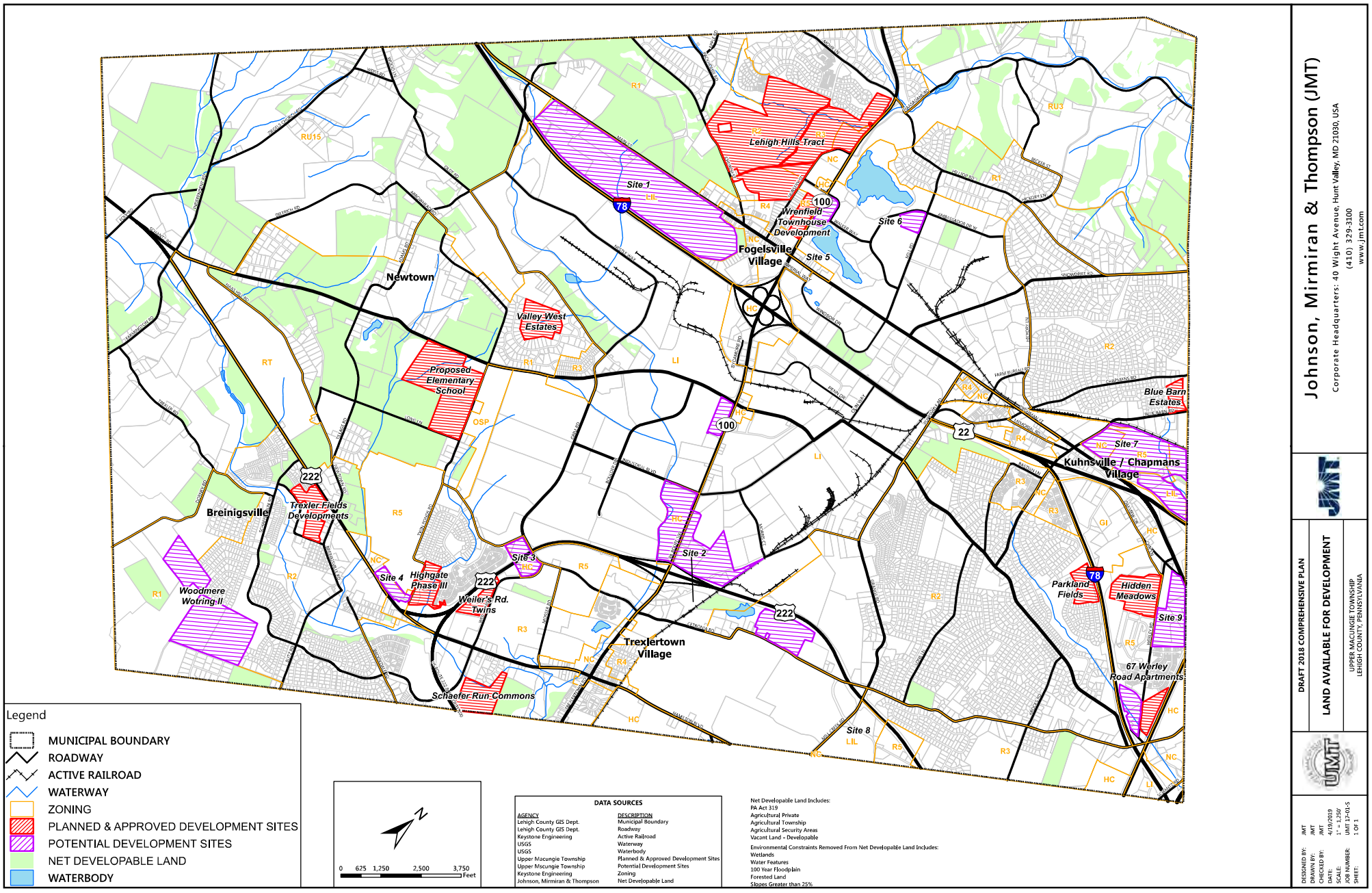
This area includes the current Air Products campus and the site for the new Air Products headquarters facility. This is a mixed-use area including new development and redevelopment opportunities including a neighborhood-based Town Center.



Concept Site 8 Air Products Campus Development and Redevelopment and Surrounding Area

- Integrate open space/athletic space with development and extension of off-road pedestrian/bicycle path along Cetronia Road from Route 100 to connect with existing path as part of Inline development.
- Promote Neighborhood-based Town Center development.
- Support development of Air Products corporate headquarters with amenities.
- Partner to redevelop Air Products campus and open space to include commercial office and research and development with some retail operations with frontage on Hamilton Blvd.
- Promote shared parking and green infrastructure.
- Use alternative energy sources.
- Design warehouse truck traffic leaving site to a limited traffic pattern to Cetronia Road east to Route 22.
- Support the streetscape planned for Hamilton Boulevard with roundabout to be located at Hamilton Boulevard and Lower Macungie Road.

Figure CD3: Potential Development Sites/Opportunity Sites and Planned Development




Source: The Morning Call


Source: The Morning Call

Land Use Policy & Plan

The Land Use Policy and the Future Land Use Map described in this chapter is concerned with the social, economic, political, legal, physical, and planning aspect of urban, suburban, and rural landscapes within UMT. The policy outlined in this chapter fits within the framework of recognized principles of sustainable development along with indicators of sustainability detailed throughout the plan.

Land Use Policies to Achieve Sustainability

Implementation of the land use goals, objectives, and policies of this chapter combined with the same for other plan elements will put UMT closer to achieving long-term sustainability. The Land Use Policy guiding future development of the Township is based upon the desire to:

- Meet the needs of the present without compromising the ability of future generations to meet their own needs – striving to achieve sustainability.
- Engage in the simultaneous pursuit of economic prosperity, environmental quality, and social equity through sustainable development.
- Take a long-term perspective, focusing on both the present and future well beyond the next budget or election cycle to achieve sustainability and to maintain the Township as a sustainable community.

This emphasis on long-term sustainability will assist planners, policy and plan implementors, and decision makers today and tomorrow to determine the appropriate level of growth management, public services, capital investments, and private investments necessary to achieve the vision for the Township. A land use management philosophy of balancing environmental, social, economic, and fiscal impacts is crucial to long-term sustainability.

Local Urban Growth Boundary (UGB) and Relationship to the Region

The LVPC Comprehensive Plan identifies a significant portion of UMT for urban development as part of the region's designated growth area. Within the region's designated growth area, lands within UMT identified as such are predominantly located within the Township's Act 537 Plan Service Area. As part of the UMT land use policy, this area is also referred to as the Township's Urban Growth Boundary (UGB). Lands inside the UGB should predominantly be used for higher densities of development including residential development, campus style mixed-use development, town center development, redevelopment and infill development, employment centers, and village redevelopment and expansion. Lands outside the UGB should focus on conservation and preservation of natural and agricultural resources with lower density residential and agricultural supportive uses.

Land Use Goals, Objectives, and Policy

This section provides the framework for growth management in support of achieving and maintaining community sustainability and quality of life (QOL) for current and future residents.

Land Use Policy strives to achieve a balance between the natural and cultural resource environment, social environment, and economic environment striving to achieve the overarching goal of sustainability.

A balance between living space, economic development, and agriculture impacts the overall health, vitality, and sustainability of UMT.

The following land use goals and objectives are interrelated to the specific community development goals, objectives, and policies for various aspects of community planning contained in Chapter 1.

Goal 1: UMT is a community that plans and designs for managed development that contributes to sustaining a modern community (society).

- Objective 1: Provide and maintain a safe and accessible multimodal transportation system.
- Objective 2: Provide adequate and timely public infrastructure and quality facilities and services.
- Objective 3: Provide incentives to develop and maintain a variety of affordable housing options.
- Objective 4: Apply and regulate design standards that establish or reinforce community character with a sense of place and identity.

Goal 2: UMT is a community that allows for a variety of uses creating a balanced and sustainable economy.

- Objective 1: Place more weight on sustainability of agricultural land (protection of agriculture lands, soils, and best practices) as part of economic development.
- Objective 2: Mitigate the impacts of uses of regional significance such as the growth of the existing warehouse, distribution, and logistic center cluster development.

Goal 3: UMT is a community that protects and preserves environmentally sensitive areas (ESAs).

- Objective 1: Preserve lands registered as Agricultural Security Areas (ASA) permanently.
- Objective 2: Maintain a healthy, sustainable community through protection of ESAs.
- Objective 3: Protect and preserve historic and cultural resources.

Land Use Policy

Overall, the Land Use Policy of the Township should continue to promote and adopt appropriate land use strategies and regulations that achieve sustainable development principles and policies around the following aspects of the Township:

- Community Character
- Natural and Agriculture Resource Protection
- Affordable Housing
- Multimodal Transportation System
- Appropriate Public Infrastructure
- Quality Public and Private Services
- Economic Stability

Note: Chapter 1 provides details about each of these aspects of sustainable development and polices.

Relevant policies outlined in the 2007 Plan that should be continued as part of implementation of this plan and new policies include:

- Direct development within the UGB (UMT Act 537 Service Boundary Area) and limit development in rural and agricultural areas.
- Recognize LVPC's Comprehensive Plan, Long Range Transportation Plan, Hazard Mitigation Plan, and other related topic plans.
- Adopt land use regulations that protect agricultural lands held in ASAs of the Township.
- Promote orderly patterns of development that are compatible between uses and with uses in adjacent municipalities.
- Use compact development and conservation by design standards to achieve natural, cultural, and agricultural resource conservation, preservation, and protection goals, objectives, and policies.
- Utilize tools contained in the PA Municipalities Planning Code to enhance the preservation, development, and redevelopment of UMT villages (e.g., Traditional Neighborhood Development - TND, Historic Preservation Districts, etc.).
- Integrate water resource management goals, policies, and strategies with land use planning and policies.
- Allocate appropriate lands for a mix of housing types and densities to provide an adequate supply of affordable housing options for households of all income levels.

Source: PA Municipalities Planning Code (MPC).

Land Use Plan and Future Land Use Map

The Future Land Use Map is UMT's visual guide to future planning and community development as described by the vision statement and land use goals, objectives, and policies. This map brings together the other elements of this plan including community facilities (predominantly park and recreation facilities), natural and cultural resources, agricultural resources, housing, economic development opportunities, and transportation to identify the location of future land use classifications.

Community Vision

Upper Macungie Township is an inclusive and family-friendly sustainable community and a welcoming place to live, work, and play. Our well-managed community and resident-focused government supports a diverse population and a strong economy and follows community approved sustainability principles to provide a high quality of life for residents and financial prosperity for businesses.

Source: Chapter 1 Community Vision, Goals, and Objectives.

This plan focuses on conserving and preserving agricultural land, open space, and natural resources while managing the potential for growth (through development, redevelopment, and adaptive reuse of sites, buildings, and facilities), meeting the demands for housing for all income levels, and promoting diverse economic development opportunities that will result in jobs and creation of wealth for local and regional residents.

Land Use Classifications

Land use involves the management and modification of the natural environment to a built or man-made environment including residential and non-residential uses and semi-natural habitants such as agricultural land, park and recreation land, open space, and managed woodlands. The following land use classifications are represented on Map 3: Future Land Use located at the end of this chapter.

Table F1: Future Acreage by Land Use Classification

Percentage of Acres	Land Use Classification
7.3% Low Density	Residential – Land designated for residential and residential support uses including areas identified for low, medium, and high-density residential uses of various types including, but not limited to single-family attached and detached dwellings, townhouses, apartments, and condominiums.
10.0% Low-Medium Density	
3.5% Medium Density	
2.4% Medium-High Density	
1.0%	Town Center – Land designated for new development or redevelopment integrating a variety of uses including residential, office, commercial retail, services, public open space, entertainment, research and development, education, and employment. These areas with access to transit can result in measurable reductions in traffic impacts.
6.3%	Mixed-Use Development – Land including existing villages with small-scale development and surrounding mixed use development with a range of commercial, institutional, residential, and community service uses sometimes developed using campus-style design guidelines.
2.9%	Commercial – Land designated for retail or wholesale marketing of goods and services, offices or office complexes, shops, hotels and resorts, and restaurants.
18.9%	Industrial – Land designated for production, manufacturing, distribution, fabrication, or research and development activities including but not limited to industrial parks for light and heavy industrial uses.

Source: Future Land Use Map GIS calculations.

Table F1: Future Acreage by Land Use Classification (continued)

Percentage of Acres	Land Use Classification
1.6%	Institutional – Land designated for nonprofit, quasi-public, or private uses such as religious institutions, libraries, public/private schools, colleges and universities, technical schools, hospitals, or government-owned or operated facilities.
10.5%	Utility – Land designated for the transportation network (primarily roads) and public and private utility infrastructure, wastewater treatment facilities, public stormwater facilities, overhead electric transmission, and other similar uses.
26.1%	Agriculture – Land that consists of Class I and/or Class II soils in the Soil Conservation Service Land Use Compatibility Classification; and other soils suitable for active use in the production of food, fiber, or livestock. Agricultural land also includes wasteland that is part of the farm unit.
9.5%	Park/Recreation and Open Space/Green Space – Land designated for public or private recreation (parks, trails, paths, playing fields, and similar uses), nature-based or athletic education, cultural, or aesthetic uses; and, environmentally sensitive areas, natural vegetation, forested areas and open space permanently preserved as part of current and future development for pubic and/or private use.

Source: Future Land Use Map GIS calculations.

Table F2: Comparison of 2017 and Future Land Use Percentages by Classification

2017 Land Use by Classification*	2017 Percentage of Total Lands*	Future Land Use Classifications**	Future Percentage of Total Lands**
Residential	26.4%	Residential	23.2%
Commercial	10.4%	Commercial, Town Center & Mixed-Use Development	10.2%
Industrial	17.6%	Industrial	18.9%
Institutional	1.4%	Institutional	1.6%
Public Utilities	11.4%	Public Utilities	10.5%
Agriculture & Vacant Land	28.0%	Agriculture	26.1%
Park Lands/Open Space	4.8%	Park Lands/Open Space	9.5%
Total	100%	Total	100%

*Sources: *LVPC Existing Land Use Percentage of Acreage and **Future Land Use Map GIS calculation of Percentage of Acreage*

Regional Land Use and Uses of Regional Significance

The Lehigh Valley has emerged as one of the most robust regions for warehouse operation in the state impacting quality of life issues and increasing truck traffic in the region. While this boom has provided large economic gains, a community impacts assessment for municipalities such as Upper Macungie Township has yet to be studied, quantified, and targeted for coordinated implementation and mitigation by local, county, and regional governments. A study of this nature from both a regional and local municipal perspective could help decision makers determine the appropriate balance between economic development, quality of life (social), and environmental protection as part of the ongoing planning, community development, program implementation, and monitoring processes to achieving community sustainability.

The warehouse and industrial cluster in UMT, has created an employment hub for the region attracting a significant number of daily commuters to UMT businesses and generating heavy volumes of vehicular traffic and truck traffic distributing goods within the region, the state, and across the northeast. Those impacts must be evaluated in greater detail in the context of similar employment hubs and warehouse clusters so that

Lehigh Valley municipalities can offer viable land use, economic and community development, and transportation strategies and solutions for the region.

Sustainable Land Use Strategies

The following sustainable land use strategies are augmented by strategies for other plan elements summarized in Chapter 3 and as detailed in various sections of Chapter 7. While other plan element strategies are not repeated here, they are intended to be coordinated through implementation of this plan. The following strategies will be implemented through policy, land use regulations, and Township's Ordinances as well as through investments detailed in the Township's Capital Improvement Plan (CIP), Annual Budget, and operations and maintenance programs. The tracking and measure of performance to meet 2040 target goals for plan topics and sustainability indicators are outlined in Chapter 6 – Implementation Plan.

Urban Growth Boundary (UGB) / Act 537 Service Boundary Area
Strategy: Guide development to lands inside of the Urban Growth Boundary (UGB), the Township's Act 537 Service Boundary Area, where public infrastructure, utilities, and facilities are provided to support higher density and intensity residential, commercial, institutional, and industrial development. Rationale: Lands inside the UGB are recognized regionally and locally for more dense development with the provision of adequate public infrastructure and facilities. Lands outside of the UGB are more rural in characteristics and contain agricultural lands, lower density residential development, and natural features targeted for conservation and preservation. Containing development within the UGB allows for reduction of sprawl, maximized capital investments, and a lower cost to offer public services.
Residential Land Uses
Strategy: Rezoned additional lands for high density residential uses (e.g., mobile home parks, manufactured homes, tiny home developments, apartments, and townhouses) to increase quality, affordable housing options to support current and future industrial market demands for a local skilled and unskilled labor force. Strategy: Provide flexible housing options through regulation of accessory dwelling units to increase age-restricted affordable housing options and affordable housing for those entering the labor force. Rationale: There is a demand for affordable housing including income-restricted housing in proximity to the employment hub (warehouse/logistics/distribution and industrial cluster) in UMT in locations feasibly served by transit. Increased affordable housing for workers supporting this market will reduce impacts associated with large volumes of commuter traffic – more than 31,000 workers commuted to UMT while 8,700 Township residents commuted to work outside UMT. Additional housing demand must be met as the employment base increases in UMT and in surrounding municipalities within commuting distance. By 2040, UMT population is projected to increase by 35% to 32,220 (latest population projections by LVPC) which in turn will affect traffic accessibility, mobility, and safety. Benefits include increased QOL due to shorter commute times and increased access to high quality education for lower income families. The supply of rental housing is somewhat limited in the Township and the market can support additional rental housing in both UMT and the surrounding region.
Open Space, Parks and Recreation Land Uses
Strategy: Through zoning and other mechanisms, continue to preserve and conserve woodlands and natural, cultural, and agricultural resources through dedication of open space, pars, and recreation lands, trails and paths, preservation easements, and other mechanisms to protect land from development. Rationale: Open space, parks, and recreation lands provide opportunities for active and passive recreation improving the health of residents and quality of life while protecting the environment by improving air and water quality, wildlife habitats, and other factors as detailed in the plan.

Commercial and Institutional Land Uses

Strategy: Promote mixed-use development including residential units for upper floor living, neighborhood and community serving retail, services, dining, office space, and healthcare and education facilities (e.g., town centers, mixed-use development, TND, or walkable development) through private and public development and redevelopment activity. Promote internal circulation to include easy access to and from major transportation corridors using an internal roadway network designed with bus pull-offs, bus shelters, and complete streets streetscape amenities such as pedestrian and bicycle facilities.

Rationale: Mixed-use development promotes conservation and preservation of environmentally sensitive areas (including agricultural land) and promotes walkability, energy conservation, and a reduction in travel trips. Opportunities for this type of development are limited for new development with greater possibility for redevelopment of older obsolete office buildings, commercial retail strip malls, and residential development as well as conversion or redevelopment of smaller older warehouse sites. The demand regionally and locally for various commercial and institutional uses support regulations to permit this type of development in a campus-style setting. By 2040, UMT employment is projected to increase by 39% over LVPC's 2010 employment figures. UMT may be pressured to expand the existing employment hub to accommodate a total of 41,707 workers by 2040. With this increase comes additional traffic and increased demand for local affordable housing, goods, and services.

Agricultural and Industrial Land Uses

Strategy: Protect lands available for development (lands subject to potential rezoning) from warehouse, distribution, and logistic center development by:

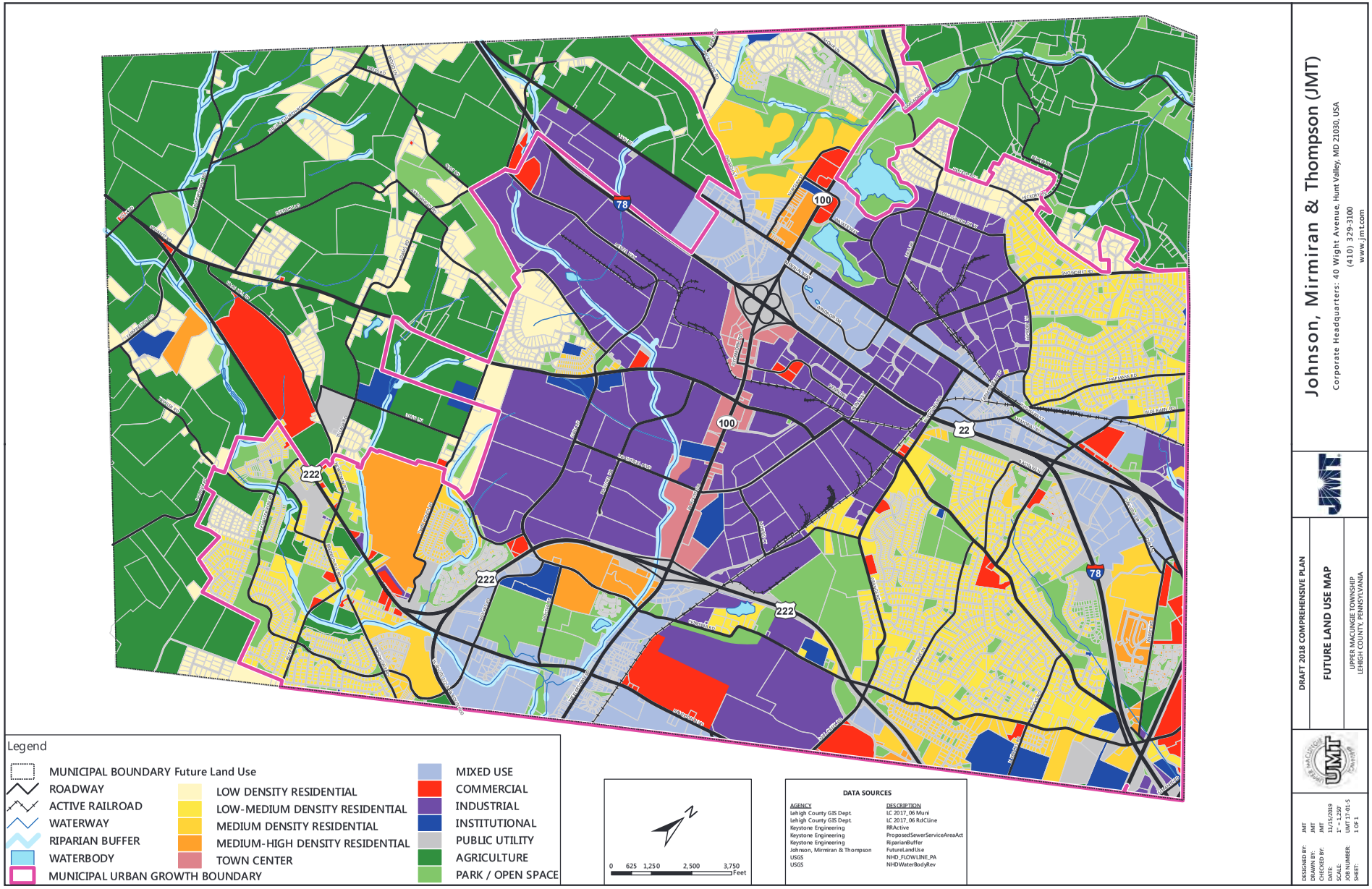
- Permanently preserving agricultural lands and other environmentally sensitive areas both inside and outside of the Township's UGB.
- Adopting Agricultural Protection Zoning (APZ) to strengthen the protection of lands currently farmed and inactive lands with prime agricultural soils available for future farming activity.
- Focusing economic development efforts on industrial uses offering higher wages for the local and regional labor force.

Strategy: In partnership with LVPC, LVEDC, PA Department of Community and Economic Development, LANTA, and municipalities impacted by warehouse cluster development, conduct a fair share analysis and community impact assessment studying the cumulative impacts of warehouse clusters in the region (a land use of regional significance). Note: This study will strengthen the position of decision makers striving to balance warehouse development with other land uses to achieve community sustainability.

Rationale: When compared to municipalities in the region, UMT is among several municipalities who have sufficiently provided for this warehouse, logistics, and distribution land uses and there is no demonstration of greater need for the local community to allow growth of the existing warehouse cluster outside of lands currently zoned for this use. UMT supplies 26% of Lehigh Valley's industrial space (both warehouse and industrial land uses) and experiences the economic benefits and impacts of the warehouse cluster.

While UMT is in the path of development, it is substantially developed and is at the break point of its ability to mitigate impacts of the existing warehouse cluster and any future expansion of this cluster. Community impacts include air quality (pollution from exhaust) and associated health impacts on children, elderly, and those with asthma and other respiratory conditions; noise, light, and glare from operations; heavy truck traffic congesting roadways and impacting the safety of the traveling public and the cost of roadway patrol and traffic safety enforcement; deterioration of existing roadways; demands on other public infrastructure; demand for additional costly roadway improvements (new interchanges and interchange upgrades) to provide access to interstates for state and national transport of goods; and impacts on stormwater and water quality due to large areas of impervious surface (building cover, parking lots, and truck storage lots). In addition to affecting residents, warehouse truck traffic has negatively impacted retailers along major roadways and has limited the ability to provide safe pedestrian and bicycle connections throughout the Township. Note: Air quality is monitored regionally not locally.

Map 3: Future Land Use



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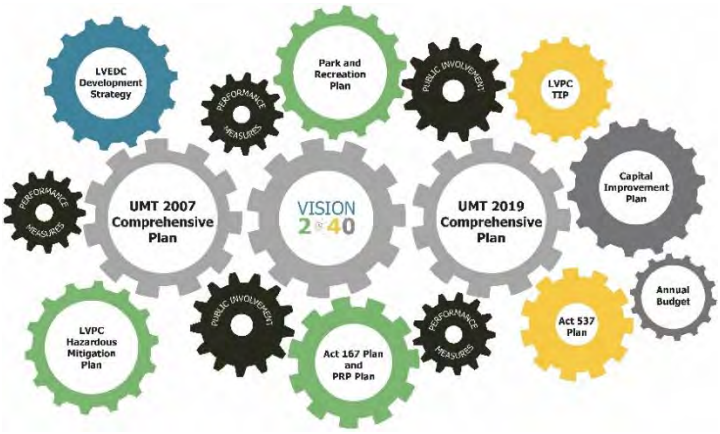

Implementation Plan

Decision makers of sustainable communities apply a framework – a clear set of community development goals, objectives, policies, and strategies aimed at creating the vision – with standards for creating livable, healthy communities through a balance of development opportunities with open space preservation protecting natural and agricultural resources. This framework outlined in the previous chapters of the plan provide the basis for short-term, mid-term, and long-term actions implemented through various partnerships.

Implementation of this plan will assist UMT government and its citizens, businesses, and institutions achieve the vision for development of the Township while maintaining sustainability in both the short-term and long-term future. Implementation is essentially the methods, actions, projects, or programs required to carry out the vision for UMT expressed in this plan.

Vision 2040

Upper Macungie Township is an inclusive and family-friendly sustainable community and a welcoming place to live, work, and play. Our well-managed community and resident-focused government supports a diverse population and a strong economy and follows community approved sustainability principles to provide a high quality of life for residents and financial prosperity for businesses.

Source: Chapter 1, Community Vision, Goals, and Objectives

Relationship to Other Plans

This plan is an update to the 2007 Comprehensive Plan with the refinement of the vision and plan goals, objectives, policies, strategies, and actions. This plan is intended to consider the purpose and intent of other adopted plans by the Township, County, MPO, and State. Implementation of this plan should consider the policies, strategies, and expected outcomes of other plans and efforts to implement this plan should be done so in partnership with other local, county, state, and federal agencies.

Relationship to Capital Improvement Plan, and Annual Budget

The Capital Improvement Plan (CIP) and Annual Budget are the mechanisms to implement public facility and infrastructure improvements outlined in this plan. These are also strategic tools that can be used to coordinate decision making within the Township and between other jurisdictions (e.g. surrounding municipalities, Lehigh County Authority (LCA), Lehigh County, Lehigh Valley Planning Commission (LVPC) and Lehigh Valley Transportation Study (LVTS), PennDOT, DEP, and other similar entities) to insure capital investments promote community goals and objectives outlined in the Comprehensive Plan. The comprehensive plan identifies community facilities and infrastructure capital investments, phasing strategy/timeframe, and grants and financing options for projects implemented through the CIP and Annual Budget.

Performance Metrics

Moving forward, the indicators of sustainability serve as a tool to evaluate the impacts of proposed development and plan implementation impacting the natural and cultural resource environment, social environment, and the economic environment. The performance metrics is the framework to evaluate the success and timing of achieving various aspects of the plan through implementation.

The level of measurability of these indicators has been documented in various chapters and the Appendices of the plan. Tracking and assessing various indicators to demonstrate progress is important to help determine appropriate regulation and mitigation of impacts as well as to determine future validity of the plan and any need to update the plan in whole or part as time passes, as preferences and challenges change, as federal and state regulations change, and/or as local policies and priorities change. The following performance metrics relate to the various plan elements and respective goals, objectives, policies, and strategies outlined in previous chapters. Reference specific plan chapters to understand the basis for the identified metric and target for each sustainability indicator. These performance metrics are the basis for establishing a Township report card to measure progress to achieving long-term community sustainability.

Figure I1: Sustainability Indicators to Achieve the 2040 Vision

Tracking and Reporting Growth and Accomplishments

As implementation occurs, the Township Planning staff shall track and report on the status of implementation of the plan by evaluating the performance of the Township and private development in response to local and state regulations and regional and national trends by measuring change over time associated with indicators of sustainability described in the plan. In accordance with the MPC, the staff and the Planning Commission will prepare an Annual Report of activity relevant to achieving sustainability through policy, regulation, and public and private development to the Board of Supervisors. The following are various metrics and relevant 2040 targets applying data from the Technical Reports in the Appendices of this plan and other noted sources.

Table I1: Performance Metrics and 2040 Targets

Comprehensive Plan Topic	Metric	2040 Target
Land Use and Environment		
Sustainable Land Use Policies Homeowners benefit from industrial, commercial, agricultural land, and open space as part of the local tax base – these land uses subsidize school expenses and cost of public services.	• Change in land use. • Acres of mixed-use development. • Acres of higher density residential development. • Acres of natural resources and land preserved and conserved.	• Promote approximately 90 acres of new mixed-use town center development. • Promote approximately 50 acres of new higher density residential development. • Preserve and conserve at least 750 acres of natural resources, woodlands, and watersheds.
Agricultural Lands To meet future challenges of food security, the preservation of agricultural land and the future farming of agriculture is necessary. Agricultural lands if farmed provide economic, environmental, and social benefits.	• Acres of preserved agricultural land. • Acres of agricultural land productively and environmentally sustainably farmed protecting air, water, soils, and habitats. • Reduction of CO_2 emissions and increase in energy efficiency.	• Permanently preserve a total of 1,500 acres of agricultural land. • Strive for 80-90% of preserved agricultural land sustainably farmed along with supporting agribusinesses. • Reduce CO_2 by 20% and increase energy efficiency by 20%. • Promote use of autonomous equipment, robotics, and precision techniques. • Promote the use of 100% biodegradable feedstock.
Quality of Development Walkable and bikeable mixed-used neighborhoods contribute to sustainability and quality of life.	Current Walk/Bike/Transit Scores • Walk Score 20 – Car dependent.* • Bike Score 40 – Somewhat bikeable.** • Transit Score 17 – It is possible to get a bus.*** • Miles of pedestrian and bicycle facilities and number of accessible transit-stops.	• Achieve Walk Score 50-69 – Somewhat walkable • Achieve Bike Score 50-69 – Some bike infrastructure • Achieve Transit Score 25-49 A few nearby public transportation options • Increase pedestrian, bicycle, and transit facilities and connections collectively by 40-50%.
Community Character & Design Design standards define a sense of place integrating buildings, streets, and open space.	• The number of walkable and bikeable mixed-use neighborhoods – complete streets policy and SALDO design standards. • Acres of open space preserved via conservation-by-design. • Number of preserved historic structures on National Register.	• Require new development to include pedestrian and bicycle facilities, connected open space, and unique architectural characteristics. • Enhance 50% of existing neighborhoods by providing connections to existing villages, mixed-use development, and planned town centers.
Historic/Cultural Resources Historic preservation plays an important role in the evolution of the villages, neighborhoods, and older areas of the community having direct impact on the quality of life of residents and workers.	• Number of preserved historic structures on National Register of Historic Places.	• Preserve, adaptive reuse, or develop in a sympathetic manner the 17 properties or districts eligible for the National Register of Historic Places – increase the number of registered sites. • Promote development compatible villages and neighborhoods.

** Source: Walk Score Methodology – https://www.walkscore.com/methodology.shtml.*
***Source: Bike Score Methodology – https://www.walkscore.com/bike-score-methodology.shtml.*
***Source: Transit Score Methodology – https://www.walkscore.com/transit-score-methodology.shtml.

Comprehensive Plan Topic	Metric	2040 Target
Land Use and Environment		
Regulations & Codes Land use controls achieve economic and ecological sustainability.	• Agricultural Protection zoning. • Traditional Neighborhood Development combined with Historic Preservation. • Acres of protected environmentally sensitive areas (ESA). • Density and height bonuses for mixed use development. • Act 537 Service Area serves as Urban Growth Boundary (UGB). • Dedication of land or perpetual easements for park and recreation, trails, and paths.	• Permanently preserve a total of 1,500 acres of agricultural land. • Promote village preservation, enhancement, and expansion. • Preserve or conserve at least 750 acres of natural resources, woodlands, and watersheds. • Prohibit the expansion of public water or sewer facilities outside the UGB. • Develop approximately 22 miles of potential stream corridor connections and approximately 33 miles of potential connections as shown on Map 12.
Open Space/Park and Recreation Local parks, recreation, open space, trails, and paths reconnect people to nature. Park, recreation, and open space conserve natural resources and wildlife habitats, protect air and water quality, and preserve open space for current and future generations.	• Dedication of lands as development occurs or fee in lieu of for expansion and maintenance of existing park and recreation space. • Private preservation or conservation of environmentally sensitive lands as part of land development.	• Accept approximately 100+ additional acres dedicated for public parks and recreation. • Promote the implementation of private Forest Management Plans. • Refer to additional targets for Regulations & Codes.
Air Quality Pollutants in the air affect public health directly and indirectly and, also affect natural and built environments. Transportation and manufacturing are significant contributors to air pollution.	• Air Quality Index Daily Report. • Asthma rates – American Lung Association rating of D for region.* • 1 acre of new forest can absorb 2.5 tons of carbon annually with trees 10 years old reaching their most productive carbon storage of 48 lbs. of CO_2/year.	• Contribute to improving regional Air Quality Level C or better. • Reduced vehicle emissions – use of alternative fuels and technology. • Reduce travel time to work to less than 30 minutes for 80% of population. • Plant tree species that absorb high levels of CO_2 – increase tree cover 20%.
Water Quality Ground and surface water quality is at the core of sustainable development and affects local economies, ecosystems, and human health. Surface water quality also affects recreation, aesthetics, and protection of aquatic life and ecosystems.	• LCA Annual Water Report. • DEP water quality monitoring. • Waterway designations. • Wellhead protection. • Proper disposal of hazardous household waste.	• Implement watershed restoration projects – see projects outlined in PRP. • Preserve floodplains and protect them from development impacts. • Prepare a Wellhead Protection Plan. • Promote Nutrient Management Plans. • Continue to participate in hazardous household waste disposal program. • Reference flooding/runoff below.
Flooding/Runoff Polluted runoff and flooding are recognized by the EPA as the single largest threat to water quality. Sustainable development is built to minimize increases in runoff.	• Little Lehigh Creek Watershed Act 167 Plan performance standards. • Pollution Reduction Plan (PRP) targets. • SALDO regulations to control runoff and Best Management Practices (BMP) performance standards.	• Implement 20% storm sewer and green stormwater infrastructure (GSI). • Increase # of effective BMPs – reduction in runoff by 1"and 50% reduction of pollutants. • Eliminate illicit discharge. • Increase area of porous pavement by 30%.
Waste/Recycling Sustainability can be achieved through conversion of waste management operations to a reprocessing and low carbon energy producing industry.	• % household solid waste and food waste. • % waste recovery. • % waste to energy. • Manufacture processing efficiencies. • Best practices and technology advancement.	• Reduce household solid waste and food waste by 30%. • Recycle, recover, reuse 65% of waste. • Convert carbon-rich waste into biofuel. • Promote landfill mining, resource recovery, and waste reprocessing to return valuable resources to manufacturers.

** Sources: https://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/states/pennsylvania/ and http://www.dep.state.pa.us/dep/deputate/airwaste/aq/aqm/psiabe.htm.*

Comprehensive Plan Topic	Metric	2040 Target
Social Environment		
Population According to US Census Bureau definitions, UMT is considered an Urban Cluster (UC) – at least 2,500 and less than 50,000 people. Population growth poses challenges and increases impacts of suburban sprawl.	• LVPC projected 2040 population of 36,235 for UMT and recently reduced the projection to 32,220. • Growth rate for Lehigh County over the past seven years is 1.9%. • Diversity index.	• Expect an increase in population to 32,220 by 2040 – a 35% increase in population.* • Strive to increase UMT Diversity Index of 46 to the US Diversity Index of 60.6.
Quality of Education Academically, Parkland School District is in the top 6% of school districts in the state. Education of students that integrates academics with real-life problem solving around community sustainability (e.g., recycling, farming and nutritious food supply, neighborhoods, environmental protection, physical health and active lifestyles, and energy conservation).	• Regional, State, and National rankings (Parkland School District ranked 31 in the top 100 of PA's schools).* • School District and UMT education around community sustainability factors.	• Continue investments to maintain current ranking and strive to improve rankings where possible. • Continue public education and awareness around sustainability factors (e.g., website, workshops, presentations, flyers/brochures, etc.). • Continue to provide a balanced tax base.
Crime & Safety Safety of the community, fear of crime, and anti-social behavior have a great impact on quality of life and determine where people choose to live, work, and send their children to school.	• A overall rating currently. • B+ violent and property crimes current rating.** • Law enforcement activity – arrest statistics and tracking. • Site and building design to increase safety – CPTED (crime prevention through environmental design) standards in SALDO.	• Maintain an A overall rating. • Achieve an A rating for violent and property crimes. • Reduce crime. • Conduct routine CPTED Audits and Site Assessments. • Improve driver safety conditions.
Physical Wealth/Wellbeing Sustainable communities focus on factors that affect health, life expectancy, wellbeing, and quality of life.	• Air Quality Index (reference Air Quality on previous page). • Access to physical activity/ recreation. • Access to health care. • Walk and Bike Scores (reference page 54). • Healthy work environment • Community health ranking – http://www.countyhealthrankings.org/.	• Refer to Land Use and Environment, Air Quality targets on previous page. • Provide park, recreation, open space, trails, and paths – active recreation opportunities. See Regulations and Codes section. • Provide lands zoned for medical and health care facilities. • Provide quality development – refer Quality Development section. • Maintain buildings codes and other regulations that create healthy work environments.
Partnerships Public private partnerships build sustainability through increased access to capital, innovation, transfer of risk, and capacity building.	• Number of plans and projects developed, designed, and implemented. • Public and private cooperative agreements, mutual support, and formal and informal partnerships.	• Provide incentives for increased amount of private investment. • Provide incentives for increased levels of innovation, efficiency, and cost savings.
Energy Efficiency Renewable energy sources reduce water pollution, hazardous waste, and air pollution contributing to achieving sustainability. It is important to ensure access to affordable, reliable, sustainable, and modern energy for all.	• Residential daily consumption of electricity is 11.9 kWh/person. • Percentage of businesses using renewable energy sources.	• Reduce residential daily consumption of electricity by 15%. • Increase the number of major employers, Parkland School District and warehouse development utilizing renewable energy sources by 30%.

** Source: LVPC, The People 2017 Population and Employment Projections*
*** Sources: NICHE – https://www.niche.com/places-to-live/upper-macungie-township-lehigh-pa/ and https://patch.com/pennsylvania/newtown-pa/pennsylvanias-best-school-districts-new-rankings-released.*

Comprehensive Plan Topic	Metric	2040 Target
Social Environment		
Accessibility/Traffic Congestion/Safety Strong links between all modes of transportation by "completing the streets for all users" contribute to achieving sustainable development goals.	• Vehicle miles traveled (VMT). • LOS D or better for suburban. • LOS C or better for rural. • Increased traffic volumes and congestion increase noise and air pollution. Transportation accounts for 17% of greenhouse gas emissions (well-to-wheel). • Traffic impact studies to measure traffic congestion and impacts on human health, the natural environment, property values, and quality of life. • Traffic safety improvements (e.g., intersection, roadway, and drainage improvements). • Miles of pedestrian and bicycle facilities. • Number of neighborhoods connected to shopping, schools, parks/recreation, and trails/paths.	• Reduce vehicle crashes with pedestrians and bicycles by 30%. • Increase transit service as population increases. • Place restrictions on growth if it causes decline of LOS D to E. • Provide a 600 to 1,000 feet buffer from major highways and warehouse/ distribution centers to protect neighborhoods, schools, hospitals, nursing homes, and similar uses. • Design and/or upgrade infrastructure to support automated and connected vehicle technology. • Reduce VMT and improve accessibility, mobility, and safety by 20%. • Collaborate regionally to provide diversity in types of jobs within a 20-minute travel time. • Refer to Land Use & Environment, Quality of Development – walkability, bikeability, and transit targets.
Infrastructure & Utilities The demands of growth require the innovative and integration of infrastructure and utility planning, design, and construction to support sustainable economic development. Inadequate investment in infrastructure and utilities will deter economic development and impact the quality of life of current and future residents.	• Miles of roadway, sanitary sewer and storm sewer line, and equipment and facility improvements, extensions, and maintenance & operations. • Planning, design, and construction of highway access improvements to reduce the truck and commuter travel distance to and from employment hub. • Acres and investment for new park and recreation facilities, expansions, and maintenance & operations. • Utility expansion, upgrades, new technology, and resiliency improvements. • Maintenance, upgrade, and expansion of government buildings, facilities, and equipment. • Number of private installations of new technology, equipment, and systems to support renewable energy.	Specific targets are identified in various plans referenced below. • Refer to Lehigh County Authority (LCA) Capital Improvement Plan and Maintenance & Operations program. • Refer to PennDOT, LVPC, UMT, and surrounding municipality partnerships for major roadway capital improvements (e.g., STIP/TIP and UPWP). • Increase community investments by developers. • Coordinate with UMT Capital Improvement Plan. • Coordinate with UMT Annual Budget and Maintenance & Operations allocations and programs. • Increase private investment and partnerships with utilities. • Improve regulatory compliance.

Comprehensive Plan Topic	Metric	2040 Target
Economic Environment		
Jobs/Economic Growth Sustainable community development promotes development-oriented policies that are formulated to support productive activities, creativity and innovation, entrepreneurship, job creation, and encourage growth of small- and medium-sized businesses.	• Number of jobs increase as local and regional population growth occurs – low levels of unemployment locally and regionally. • >20 jobs/acre. • Number of green jobs. • Number of commercial, health care, and education jobs. • Reduce warehouse development and adaptively reuse warehouse facilities for multiuse development. • Increase diversity of jobs to reduce commuter travel times and reduce transportation costs.	• Expect an increase of employment to 41,707 by 2040 in UMT.* • Support development and redevelopment that produce maximum jobs in a smaller building footprint. • Increase of jobs by 30% collectively in commercial, health care, and education markets. • Decrease warehouse development by 20% through redevelopment. • Contribute job creation to maintain low level of local and regional unemployment rates. • Diversify employment base to reduce commuter travel times.
Revenue/Tax Rates A stable adequate source of revenue allows the community to achieve sustainable goals and objectives.	• Development fees and fines. • Real Estate Tax. • Earned Income Tax. • Realty Transfer Tax. • School Tax. • Local Service Tax.	• Consider a Tax Increment Finance (TIF) District for infrastructure improvements for non-residential lands/employment cluster. • Utilize Municipal Bonds, Green Bonds, and other similar financing to achieve sustainability goals.
Unemployment The unemployment rate is a vital measure of economic performance. An unemployment rate below the natural rate suggests that the economy is growing faster than its maximum sustainable rate, which places upward pressure on wages and prices.	• Unemployment rate. • Job retention and job creation. • Diversification of market sectors and supply of jobs for various skill levels and professionals.	• Maintain low level of unemployment while providing an available workforce in the region to continue the attraction of business development. • Diversify market sectors. • Continue job retention and job creation strategies. • Increase in employment opportunities that increase household incomes.
Business Innovation Technology and innovation not only benefits business but also provides opportunity to develop an intelligent community. Technology and innovation impact environmental, economic, and social sustainability providing a foundation for a change in policies and provide a platform for sustainable growth.	• Return on investment. • Competitiveness. • Diversification of products and services. • Productivity levels. • Energy efficiency/savings.	• Increase in demand for skilled labor. • Diversify job opportunities. • Promote development that offers higher wages and opportunity for skill development and advancement of labor force. • Support startup and spin-off business development. • Increase in revenues and greater protection of the environment.
Asset Management Incorporating asset management programs and aligning these programs with community sustainability goals can help ensure a more balanced focus across the life-cycle of various infrastructure. A sustainable focus through procurement, construction, operations, maintenance, renewal, and replacement strategies for public and private infrastructure assets results in environmental benefits and impactful outcomes.	• Incorporation of technology and innovation will require more investment through public-private partnerships. • Level of service and other performance measures. • Life-cycle analysis. • Risk assessment. • Project prioritization. • Triple Bottom Line (TBL) – balance between social, financial, and environmental impacts.	• Promote the number of public-private partnerships – quantified on a project or program basis. • Improve level of service or performance – measurements unique to type of infrastructure. • Reduce environmental impacts – refer to land and environmental topics. • Achieve benefits to community development (social) – refer to social environment topics. • Support continued sustainable economic growth – measure of various indicators of economic growth – refer to economic environment topics.

**Source: LVPC, The People 2017 Population and Employment Projections – The economic development goals that are general in nature above are based upon the overall 2040 target of a total of 41,707 jobs/employment in UMT.*

Comprehensive Plan Topic	Metric	2040 Target
Economic Environment		
Housing Types/Affordability A shortage of affordable housing for all ages and income levels can impact the sustainability of the Township. The location of housing and transportation options dramatically affect affordability. Housing and transportation choices provide families access to employment and economic opportunities. Compact development and green design and construction can help communities protect the environment and create more affordable neighborhoods.	• Households with housing costs 30% or more of household income are considered cost burdened.* • Rental unit supply and demand. Nationally 63.5% of housing is owner occupied. • Housing for aging population. • Transportation alternatives affect affordability – 18% of household incomes is spent on transportation.	• Provide developer incentives to achieve 30%-35% of housing supply as rental units in all types of housing for all income levels (apartments, condos, townhouses, and single-family dwellings). • Provide developer incentives to achieve at least 10% of housing supply for age 55+ in various types of housing.
Household Income/Poverty Low household incomes and poverty affects the economic prosperity of a community, productivity of the economy, strains government services, and affects quality of life.	• Attract and retain jobs that provide a living wage for all levels of education, skills, and professional training. • Wages/household incomes that increase greater than annual cost of living increases. • Continue to promote increased education levels and opportunities for skills training, certifications, higher education, continuing education, and specialized training.	• Provide incentives for diversity of economic base that result in jobs for all skills and education levels. • Foster partnerships between education providers and employers. • Continue to promote education and job training availability for skilled labor jobs.

**Source: HUD Rent Affordability Index – https://www.huduser.gov/portal/pdredge/pdr-edge-trending-110716.html.*

Implementation Strategy

- Achieve excellence in government through sustainable community development and implementation of sustainability strategies through public-private partnerships.
- Utilize sustainability indicators, metrics, and 2040 targets to measure and report on successful implementation of the plan and progress toward achieving community sustainability.
- Develop and use a Sustainability Checklist including various sustainability indicators that help with planning, reviewing, and measuring sustainability of land development plans and project proposals for new development, redevelopment plans, and infrastructure improvements.
- Consider water, energy, and infrastructure in an integrated approach in cooperation and collaboration with various public and private partners. Treat the private sector as partners and analyze alternatives and implementation financial strategies.
- Continue to work collaboratively with public and private utilities and infrastructure owners to set sustainability goals and objectives that support the community goals, objectives, and policies outlined in this plan.
- Use the identified metrics, targets, and the Implementation Schedule to guide measurable actions. Annually asses progress to achieving the 2040 targets and routinely update the Implementation Schedule.

Implementation Schedule

Understanding UMT has limited lands remaining for development and will continue to be pressured to rezone agricultural lands for development, those items identified for immediate action are crucial to further strengthening the regulatory framework to manage growth as outlined in this plan to minimize further loss of agricultural land as part of the Township's economic base. The following identifies various actions as part of implementation of the plan with time references including immediately (1 yr.), short-term (1-3 yrs.), mid-term (1-5 yrs.), or long-term (1-10 yrs.).

Land Use & Housing Implementation Plan				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Amend Zoning Ordinance to include the community development goals and objectives identified in this plan.	Immediately (Upon Adoption of the Plan)	Staff time ($3,000-$5,000)	Planning Commission and Board of Supervisors	General Funds – Planning Budget
Amend Zoning Ordinance & Map to adopt Agricultural Protection Zone with provisions to protect agricultural land and integrate recently adopted secondary uses such as Agritainment/Agritourism regulations.	Immediately (Upon Adoption of the Plan)	Staff and Solicitor time ($5,000 - $10,000)	Lehigh County Ag Board, LVPC, Planning Commission, Solicitor, and Board of Supervisors	General Funds – Planning Budget
Increase lands zoned for higher density residential uses within the UGB and as logical extensions of existing villages.	5-7 years	Staff and Solicitor time ($5,000 - $10,000)	Planning Commission and Board of Supervisors	General Funds – Planning Budget
Evaluate LI & LIL Districts to include uses for adaptive reuse of warehouse, distribution, and logistic centers – some uses may be permitted by-right, by special exception, or by condition use. Require Environmental Impact Assessment for warehouse uses.	Immediately (Upon Adoption of the Plan)	Staff and Solicitor time ($3,000 - $5,000)	LVPC, Planning Commission, and Board of Supervisors	General Funds – Planning Budget
Amend Special Exception requirements for warehouse, distribution, and logistic centers to include an adaptive reuse strategy/plan for the facility and/or site for a range of permitted uses that may or may not be currently permitted.	Immediately (Upon Adoption of the Plan)	Staff and Solicitor time ($5,000 - $10,000)	LVPC, Planning Commission, and Board of Supervisors	General Funds – Planning Budget
Prepare and adopt an Official Map consistent with the Land Use, Transportation, and Community Facilities & Utilities chapters, and projects listed in the Capital Improvement Plan (CIP).	1-3 Years	Staff, Representing Engineer, and Solicitor time (planning and engineering) ($10,000 - $15,000)	Planning Commission and Board of Supervisors	General Funds – Planning & Engineering Budgets and Capital Budget
Conduct appropriate analysis and legal review to support changes in zoning that would constitute up/down zoning of areas for development and redevelopment.	1-3 Years	Staff and Solicitor time ($60,000 - $80,000)	Township Staff, Planning Commission, and Board of Supervisors	General Funds

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

Community Character and Design				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Prepare and adopt by resolution a Complete Streets Policy consistent with concepts identified in Chapter 4, Community Character & Design.	1-3 years	Staff, Representing Engineer, and Solicitor time ($2,000 - $5,000)	Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets
Evaluate Redevelopment Overlay Ordinance and amend to include Traditional Neighborhood Development Overlay design standards for Villages and surrounding areas with potential for growth – establish design criteria consistent with guidelines identified in Chapter 4, Community Character & Design.	1-3 years	Staff, Representing Engineer, and Solicitor time ($5,000 - $10,000)	Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets
Strengthen the Subdivision/Land Development Ordinance to include design standards for streetscapes including pedestrian, bicycle, and transit facilities and connections to adjacent neighborhoods and commercial centers. And, include design standards from Historic Preservation Plan.	1-3 years	Staff and Solicitor time ($10,000 - $15,000)	Planning Commission and Board of Supervisors	General Fund – Planning Budget
Implement various phases of the Trexlertown & Fogelsville Village Improvement Plan with update of the plan as needed.	1-10 years	Staff, Representing Engineer time and Consultant if plan is updated ($35,000 - $40,000)	Township, PA DCED, PennDOT District 5-0, PHMC, DCNR, Lehigh County, LVPC, LVEDC, Lehigh Valley Chamber of Commerce, Local Businesses, and Residents	General Fund, Various State Grants, and various County and regional programs and grants as outlined in the Village Improvement Plan
As part of LVPC's Walk/RollLV initiative and pan, consider additional regional connections to those connections identified on Map 12, Connections and incorporate any new connections as part of an Official Map.	1-3 years	Staff, Representing Engineer, and Solicitor time	Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets
Work collaboratively with LANTA, LVEDC, companies, and employees to discuss needs and determine feasibility of bus service, bus stops, and sidewalks early in the SALDO process and negotiate improvements with developers/owners.	1-10 years (on-going)	Staff and Representing Engineer time	LANTA, Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets for staff time and Developer/Owner sponsored improvements
Strengthen the Subdivision/Land Development Ordinance to include site and building design standards that address crime prevention through environmental design (CPTED) requirements.	1-3 years	Staff, Representing Engineer, Solicitor, and Consultant ($15,000-$20,000)	Planning Commission and Board of Supervisors	General Fund and DCED grants.

Community Character and Design (continued)				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Coordinate with PPL to gain easements to overhead utility rights-of-way to allow pedestrian and bicycle paths and trails connecting neighborhoods, shopping, schools, and employment centers. Outline projects in Capital Improvement Plan (CIP).	1-10 years (ongoing implementation of capital projects)	Staff and Representing Engineer time (planning, secure easement, and design)	PPL, Neighborhood Associations, Planning Commission, and Board of Supervisors	General Fund – Planning & Engineering, Municipal Bonds, Capital Budget, LVTS/PennDOT Transportation Alternatives Set-Aside Funds, DCNR grants, DCED GTRP grants, PennDOT and DCED Multimodal Funds, and Developers.
Plan, design, and construct off-road bicycle/ pedestrian facility along Cetronia Road east of Route 100 to connect with Uline path.	1-5 years	Staff and Representing Engineering time for plan/design phase ($20,000 - $30,000)	Air Products, Uline, other Property Owners, Planning Commission, and Board of Supervisors	
Update the 2011 Park and Recreation Plan to also address open space preservation and bicycle/pedestrian connections.	1-3 years	Staff and Consultant ($40,000 - $60,000)	Planning Commission and Board of Supervisors	General Fund, DCNR, and other funds.

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

Economy				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Conduct a detailed Cost of Community Services (COCS) Study.	1-3 years	$20,000 - $30,000	Township Manager, Accountant, and Solicitor	General Funds – Administrative, PA DCED Grant
Partner with developers and business owners to identify various resources to enhance the quality of new development and expansion of existing facilities.	1-10 years (ongoing)	Township Manager, Staff, and Representing Engineering	Township Manager, Director of Planning, Representing Engineer, Developers, and Business Owners	SBDC, LVEDC, and other potential sources.
Focus on business attraction and retention through efficient communications, process coordination, and clear explanation of development and permitting requirements.	1-10 years (ongoing)	Township Manager, Development Review and Permitting Staff	Township Manager, Director of Planning, Representing Engineer, LVEDC, Zoning Officer, SEO, and Building Official.	General Funds – Planning, Permitting, & Engineering Budgets
Coordinate with the School District, PA Department of Agriculture, Lehigh County, and SBDC to educate and promote farming as well as provide training for new farmers.	1-10 years (ongoing)	State and County Program Funds	School District and Lehigh County	Various Department of Agriculture and USDA Rural Education, Training, and Start-Up Programs
Refer to Land Use & Economy Chapters for warehouse adaptive reuse strategies and planning requirements.	See Land Use & Economy for details			
Refer to Land Use & Housing for affordable housing strategy to support employment hub (warehouse/industrial cluster) demands.	See Land Use & Housing for details			

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

Natural, Cultural, and Agricultural Resources				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Continue to promote and apply the conservation by design regulations and design standards to preserve and conserve natural resources.	1-10 years (ongoing)	Staff and Representing Engineer time	Planning Commission and Board of Supervisors	General Fund – Planning & Engineering Budgets
Continue public and private preservation and conservation of natural resources through land acquisition, riparian buffer and open space easements, path/trail development, floodplain management, and public dedication/donation by owners.	1-10 years (ongoing)	Staff, Representing Engineer, and Solicitor time and Project Specific Costs (TBD)	Planning Commission, Board of Supervisors, Property Owners,	Natural Lands Trust, DCNR, General Funds, The Conservation Fund, Lehigh County Farmland Preservation Program, and other programs
Continue to subsidize the permanent preservation of the total 1,116 acres of agricultural lands registered as Agricultural Security Areas.	1-10 years (ongoing)	Maintained in Annual Budget $200,000 - $250,000	Resident and Business Owner Support. Property Owner, Lehigh County Ag Board, Lower Macungie TWP, and Board of Supervisors.	State, Lehigh County Ag Board, and Upper Macungie Township
Review and amend Subdivision/Land Development and Stormwater Management Ordinances against the 2020 DEP Model Ordinance to assure water resource planning is integrated with land planning and development regulations. Incorporate current best management practices and green stormwater infrastructure (GSI) solutions.	1-3 years (Upon adoption of the plan)	Staff, Representing Engineer and Solicitor time ($15,000 - $20,000)	PA DEP, Planning Commission, and Board of Supervisors	General Fund and PA DCED, DEP, and DCNR Grants
Apply for grant and loan applications for planning, design, and construction of public trails/paths, greenways, park and recreation facilities, and GSI projects.	1-10 years (ongoing)	Staff and Representing Engineer ($20,000 - $50,000 Annually)	Planning Commission, Board of Supervisors, Staff, and Representing Engineer	DCNR Grant Programs, Commonwealth Financing Authority – DCED & PennDOT Multimodal Funds, DCED Greenways, Trails & Rec Funds, PennVEST, PA DEP, EPA, and other sources
Continued sanitary sewer maintenance and operations to eliminate I&I, SSO, and other situations impacting the environment – continue to include these types of programs and projects in TWP M&O Budget and CIP Budget.	1-10 years (ongoing)	TBD Based upon Capital Project and/or M&O Program—Refer to Annual Budget and CIP specific projects and allocations	Various TWP Departments, Lehigh County Authority, and DEP	Budget - Sewer O&M and Capital Funds
Build upon LVCP recently updated Historic Inventory to prepare a comprehensive survey of historic resources and prepare a Historic Preservation Plan.	1-3 years	Township, PHMC, and Consultant ($50,000 - $60,000)	Township and LVPC staff, Planning Commission, and Board of Supervisors	PHMC Grants

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

Transportation				
Action	Timeframe*	Cost	Implementation Partners	Funding Sources
Interchange Improvement – Route 222 & Route 100 Interchange	1-10 years	Point of Access Study and Design & Construction Costs TBD through LVC TIP Process and PennDOT's Planning & Programming Phase	Township, LVPC, District 5-0 and Property Owners/ Developers	District 5-0, LVPC, UMT, and Private Investment
New Interchange Improvement – Route 222 & Mill Creek Road				
I-78 and Route 100 Interchange Full Replacement				
New I-78 and Adams Road Interchange				
Fogelsville/Glenlivet Connector	1-10 years	TBD	Developer requirement	Developer Capital Investment
Route 100 Corridor Study and CIP (part of a regional study – Integrated Congestion Management approach)	1-5 years	$350,000 - $500,000 (regional study)	LVPC, DCED, PennDOT, UMT, and surrounding Municipalities along the Corridor	LVTS UPWP, DCED, PennDOT Multimodal Funds, LVTS/PennDOT Transportation Alternatives Set-Aside Funds, UMT General Funds – Planning Budget, and other affected municipalities
Intersection, ADA & Crosswalks, and Improvements (Improve with Adaptive Signals) • Route 100 & Schantz Road • Route 100 & Penn Drive • Route 100 & Industrial Drive	1-5 years	$240,000	UMT, LVPC, PennDOT District 5-0, and Developers (as applicable)	LVTS Intersection and ITS Improvement Fund, PennDOT Highway Funds, and UMT
Congestion Management Safety • US Route 222 Corridor Study and CIP • Tilghman Street/Main Street Corridor Study and CIP • Phase 2 Hamilton Boulevard Corridor Study and CIP	1-5 years	$100,000 - $250,000 each	UMT, LVPC, PennDOT District 5-0, and Developers (as applicable)	LVTS, DCED and PennDOT Multimodal Funds, LVTS/PennDOT Transportation Alternatives Set-Aside Funds, and other sources
Route 100 & Hamilton Boulevard/Route 222 Multimodal Improvements (Trexlertown)	1-5 years	$500,000 - $1,000,000	UMT, LVPC, and PennDOT District 5-0	General Funds, Liquid Fuels, PennDOT Highway Funds, LVTS/PennDOT Transportation Alternatives Set-Aside Funds, and other sources

*Note: Timeframe is prioritized based upon effectiveness, required coordination with partners and/or granting agencies, and budget constraints of the Township and implementation partners.

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Supporting Plan Elements

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Source: UMT website


Photography by April Showers, JMT

A. Community Facilities, Utilities, and Services

Community facilities, utilities, and services play an important role toward achieving social sustainability of residential neighborhoods. Basic facilities include recreation, healthcare, banks, post offices, libraries, schools, utilities, emergency services, police and fire protection, solid waste management, and other similar services. Provision of adequate community facilities and services has a significant impact on the health and welfare of residents and quality of living (QOL). The challenge for Township staff and decision makers is how to meet the needs and expectations of today and tomorrow's residents to create and maintain a sustainable community.

Decision-makers must carefully consider the placement, timing, and financial investments necessary to support an appropriate mix of public facilities and services in a growing community with changing quality of life (QOL) expectations. UMT routinely conducts feasibility studies, planning efforts, citizen surveys, and public meetings to obtain input to help identify the needs and desires for various public facilities and services. Existing community facilities, utilities, and services discussed in this chapter are shown on Map 4 Community Facilities and Utilities. The projected need for additional public facilities identified in this chapter are based upon recognized national and/or association standards.

UMT Public Facilities & Services

- Park & Recreation Facilities & Services
- Planning, Zoning, Permitting & Building Code Enforcement
- Police Department
- Fire/EMS Facilities and Services
- Public Works
  - Street Cleaning, Line Painting and Snow Removal
  - Leaf Collection Program
  - Yard Waste Drop-Off Site
  - Road Repair
  - Traffic Light Maintenance
  - MS4 Compliance & Storm Sewer System Maintenance
- Refuse/Solid Waste Disposal & Recycling
- Sanitary Sewer Billing
- On-Lot Septic System Inspection & Enforcement

Source: UMT website.

Municipal Administration & Budget

The Township employs a range of professionals to meet the demands of managing a Second-Class Township that offers and maintains a robust range of public facilities and services as well as enforces a broad range of local regulations. The Township Administration staff manages a $12 million annual General Fund Budget, a $2 million Solid Waste Budget, a $7 million Sewer Budget, and a $5 million Capital Improvement Budget.

The budget is supplemented by municipal bonds and capital reserve funds as well as from various state and federal grant fund sources and the state's liquid fuels tax.

Current Tax Rates, Revenue, and QOL

In comparison to other municipalities in the Lehigh Valley, UMT is one of several Townships with lower tax rates. This makes the Township an attractive location for residents and businesses. The rate of growth and development in the Township has provided a healthy tax base to support a robust range of public facilities and services that contribute to QOL for residents.

Type of Tax	2018 Rate
Township Real Estate Tax	.64 mils
County Real Estate Tax	3.79 mils
Parkland School District	14.19 mils
Realty Transfer Tax	0.5%
Local Service Tax	$52.00/yr.

Sources: UMT and Lehigh County website.

Community Facilities and Infrastructure Investments

The following table provides information with respect to the Township's 2017 and 2018 budget and expenses for various community facilities and infrastructure investments. Forecasting spending for routine community services, facilities, and capital needs for infrastructure are important to both the QOL for residents and long-term sustainability of a community.

Table C1: Community Facilities and Infrastructure Allocations

Allocations	2017 Budget		2018 Budget	
	Revenue	Expenses	Revenue	Expenses
Street Lighting Fund	$180,000	$180,000	$178,000	$178,000
Fire Protection & Alarms	$395,000	$350,000	$470,100	$300,000
Refuse and Recycling Fund	$2,042,500	$2,197,267	$2,090,500	$2,544,572
Sewer Revenue Fund	$6,905,500	$6,843,389	$7,073,500	$7,013,293
Sewer Capital Projects Fund	$1,315,000	$893,000	$1,460,000	$1,404,555
Recreation Capital Projects Fund	$2,214,379	$3,140,232	$1,567,875	$2,230,336
Storm Water Maintenance Fund	$60,390	$378,275	$0	$97,718
Township Capital Reserve Fund	$32,000	$2,515,000	$45,000	$12,000
Capital Equipment Fund	$791,800	$1,548,465	$832,600	$853,522
Open Space Preservation Fund	$0	$0	$219,000	$100,000
Highway Aid Fund	$743,560	$656,808	$811,389	$215,120
Traffic Improvement Fund	$188,794	$286,594	$342,777	$321,602
Fireman's Relief Fund	$255,800	$255,800	$225,000	$225,000
Escrow Fund	$1,365,000	$1,365,000	$1,460,000	$1,460,000

Source: UMT website, 2018 Budget.

Municipal Buildings

The Township Municipal Building, located on Schantz Road west of Route 100, provides office space for various department staff and a public meeting room. The Township's municipal functions, responsibilities, and staff are continually expanding to keep pace with the demands of community growth. Routine assessment of current and anticipated space requirements for staff and services is crucial to providing and maintaining a facility that meets the needs of today and tomorrow's population.

Source: UMT website.

Public Works

The Township's mission with respect to Public Works is *"to provide the highest quality Public Works services to residents through rapid response and enhanced communications with an emphasis on excellence in all aspects of service delivery."* Public Works is responsible for repairing and maintaining approximately 131 miles of Township roads including street cleaning, line painting, snow plowing, permanent repair of roads, as well as patching and sealing. Public Works also contributes to the maintenance of parks and recreation facilities and maintenance of storm sewer facilities to comply with MS4 requirements.

Source: http://www.uppermac.org/public-works/.

Park and Recreation Facilities

Providing adequate park and open space promotes community and environmental health and wellbeing and is a land management strategy to achieving a sustainable community. The Department of Conservation & Natural Resources (DCNR) suggests that community recreation and parks are an essential municipal service. Township, County, and private park and recreation facilities are shown on Map 5: Recreation and Conservation and are detailed in the table below. The Township has a variety of public parks and recreation facilities geared to youth and adults of all ages. The parks range in size from a two-acre playground to a 165+ acre multi-purpose facility.

Table C2: Park and Recreation Facility Inventory

Park Name	Master Plan / M&O Plan	Facility Size (Acres)	Community Center/Indoor Rec	Indoor/Outdoor Aquatic Center	Bicycle Lanes Leading to Park	Rental Facility/Concession Stand	Pavilions	Grills	Tables	Benches	Restrooms/Porta-Let	Water Fountain	Playground	Splash/Water Park	Ballfields	Little League Baseball Fields	Soccer	Basketball	Volleyball	Tennis	Paths/Trails	Fishing	Golf	Disk Golf	Dog Park	Parking
Township Facilities																										
Apple Park		18			■				■	■	■						■			■	■					■
Blue Barn Park		2			■					■								■		■						■
Breinigsville Park	✓	47			■		■	■		■	■	■	■		■	■	■	■	■		■					■
Church Street Park*		2			■													■	■							■
Fogelsville Dam Park		50			■					■											■	■				■
Grange Park	✓	165	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				■				■	■
Lone Lane Park		17			■		■	■	■	■	■	■	■		■		■	■	■		■					■
Ricky Park		14			■		■	■		■	■	■	■		■			■		■	■					■
Upper Macungie Park		156			■		■	■	■	■	■	■	■		■	■			■		■			■	■	■
Trexler Road Park		25			■		■	■	■	■	■	■	■		■	■	■				■					■
Twin Pond Road Park		50			■		■	■	■	■	■	■	■		■	■	■				■					■
Lehigh County Facilities																										
Rodale Park/ Velodrome**		103			■		■				■	■	■		■			■	■		■					■
Private Facilities***																										
Applewood Recreation Area		13		■	■								■					■	■	■						
Green Hills Recreation Area		3.5		■	■								■		■			■		■						

■ Current Amenities ■ Planned Amenities

Source: UMT website, Parks & Recreation, Township Staff, and 2019 Budget – http://www.uppermac.org/parks/.

**Park is on PPL property. **Details about the Velodrome can be found on the website - https://thevelodrome.com/.*

****Private Recreation Facilities are owned and maintained by Homeowners Associations.*

Private Open Space and Passive Recreation Areas


Source: UMT website

Approximately 250± acres of privately owned and maintained recreation areas and open space offers passive recreation opportunities for homeowner association members, employees, and others. Those lands are located on property owned and/or maintained by Air Products, Cetronia Road Apartments Park, Clover Hill Winery, Coldwater Crossing, Green Acres Association, Kuhnsville Grove, Rabenold Farms II, Rural Sportsman's Association, Terre Hill Water Park, Samuel Adams Brewery, Trinity Wesleyan Church, and Vynecrest Winery.

Park, Recreation, and Open Space Demand

In accordance with the Municipalities Planning Code (MPC), UMT continues to require developers to provide quality land as part of residential development proposals to provide for recreation facilities applying a standard ratio (acres per housing units) to meet recreation demands of additional population associated with the development. If land conditions or configuration of proposed development precludes dedication of park, recreation, or open space, a fee-in-lieu of option is available. Additionally, UMT requires a percentage of open space to be conserved for developers using a conservation design option in Township land use regulations.

Future recreation demand is measured compared to the existing acreage of public recreation land (public park land and open space) and the projected population applying National Park & Recreation Association (NPRA) recommended standards and/or Department of Conservation & Natural Resources (DCNR) guidelines.

Table C3: Recreation Capacity & Future Demand

Recreation Capacity and Future Demand				
	Existing Capacity 2018	2020	2030	2040
Population	23,884*	24,992	30,232	36,235
Acres of Parkland (Public and Private**)	685 acres	150 – 250 acres	181 – 302 acres	217 – 362 acres
Acres of Open Space**	714 acres	500 – 1,250 acres	605 – 1,512 acres	725 – 1,812 acres
Total	1,399 acres	650 – 1,500 acres	786 – 1,814 acres	942 – 2,174 acres

Source: Park and Recreation Plan, Upper Macungie Township, prepared by Keystone Consulting Engineers (2011).
Notes: Calculations apply the NPR standard and DCNR guidelines to generate lower and upper limits of acreage demand. Pending residential development plans have additional recreation lands and open space identified.
**US Census 2016 Population. **Private Parkland serve residential developments providing recreation opportunities.*

The 2011 UMT Park and Recreation Plan projected the following park, recreation, and open space needs for 2020 and 2030 applying NPRA standards and DCNR guidelines for various types of facilities.

Standard	2020 Projected Demand	2030 Projected Demand
NPRA standards recommend between 6.25 and 10 acres of local space (municipal park system) per 1,000 residents.	165.5 – 278.5 acres Municipal Park System	209.4 – 351.8 acres Municipal Park System
NPRA standards recommend 15 to 20 acres of regional space per every 1,000 residents.	397.2 – 529.7 acres Regional Open Space	502.6 – 670.2 acres Regional Open Space
DCNR guidelines recommend 1 acre of Tot-Lot Parks, 1-5 acres of Neighborhood Parks per every 1,000 residents.	53 – 132.4 acres Municipal Park System	67 – 167.5 acres Municipal Park System
DCNR guidelines recommend 10-50 acres of community open space per 1,000 residents.	264.8 – 1,324 acres Community Open Space	335.1 – 1,675.4 acres Community Open Space

Source: Park and Recreation Plan, Upper Macungie Township, prepared by Keystone Consulting Engineers (2011).

The tables on the previous page demonstrate how successful UMT has been with the preservation and conservation of open space and the improvement and programming of active and passive recreation facilities and park land. The existing capacity of 685 acres of public and private parkland serving neighborhoods and the 714 acres of open space can accommodate anticipated future growth of the Township for active and passive recreation and open spaces that protect environmentally sensitive lands.


Source: Lehigh Valley Live

Park and Recreation Strategies

- Continue to regulate the conservation and preservation of environmentally sensitive and natural areas restricted from development. The design of development should integrate these lands as natural amenities for those living, working, and/or visiting the site.
- Update the Township's 2011 Park and Recreation Plan and continue to survey residents to identify needs. Include pedestrian and bicycle connections as an element of the plan update.
- Promote developers to offer a fee-in-lieu of park and recreation land dedication requirements to provide financial resources for the ongoing upgrade and expansion of park and recreation facilities.
- Develop park master plans to demonstrate opportunities for developers to offer a fee-in-lieu of park and recreation land dedication requirements to provide financial resources for the ongoing upgrade and expansion of existing parks.
- Develop and adopt an MPC compliant Official Map identifying the location of future park and recreation lands, open space, greenways, and pedestrian/bicycle facilities and other eligible future public lands.
- Encourage the layout and design of all development, where appropriate, to incorporate pedestrian and bicycle facilities on the premises as well as provide logical connections to existing and future facilities.
- Promote the various conservation and preservation tools available to private property owners, non-profit organizations, municipalities, and authorities. Reference Pennsylvania Land Trust conservation tools website – https://conservationtools.org/.

Recreational Community Center

In response to citizen requests for a Community Center, UMT conducted a community survey to determine desired types of facilities and conducted a Feasibility Study, planning, and preliminary engineering for construction of a new 96,993 SF facility at Grange Park. This facility may be constructed in phases or in a combination of phases based upon community support. The Community Center will include a wide range of indoor and outdoor facilities such as gyms, courts, exercise and meeting rooms, equipment, and an indoor/outdoor Aquatic Center. This facility will provide year-round activities for citizens to meet both health and recreational needs.

Source: Internet

Source: UMT website http://www.uppermac.org/.

Libraries

In addition to the libraries in the Parkland School District facilities, Parkland Community Library located in South Whitehall Township provides reading, educational, and related events and activities. The Strategic Plan for this community library identifies the need for expansion of the existing facility. Over the summer months, Parkland Community Library has held various events at Independent Park Community Center. Parkland School District provides libraries in all education facilities and sponsors on-line Media Centers for all ages including curriculum, library tips, and online access for home use.

Sources: Parkland Library website http://www.parklandlibrary.org/home/, http://www.parklandlibrary.org/get-to-know-us/strategic-plan/,and UMT http://www.uppermac.org/library-events/.

Solid Waste Management and Recycling

UMT contracts with Waste Management, Inc. to provide curbside refuse pickup, hauling, and recycling services including one bulk item per week per residence for no additional charge. Additionally, Lehigh County holds an annual household hazardous waste collection event. Waste Management, Inc. is committed to the environment. They "think green" and "act green" to turn waste into a resource putting sustainability at the core of their business.

UMT contracts with a vendor for an annual electronic collection event and annual paper shredding event. They also offer annually a one-time yard-waste curbside pickup. Residents also have access to a yard-waste drop-off site with weekly hours located at the corner of Schantz and Grim Roads in Breinigsville.

Sources: Waste Management, Inc. website – http://www.wm.com/thinkgreen/how-we-thinkgreen.jsp and UMT website.

Fire Protection and Emergency Medical Service (EMS)

Pennsylvania law gives the Township flexibility with respect to how to provide fire protection to its residents. The Township is served by three volunteer fire companies: Fogelsville Volunteer Fire Company Station 8, Good Will Fire Company Station 25 (Trexlertown), and Upper Macungie Township Fire Company Station 56, a facility owned and maintained by the Township. The Township owns and maintains most of the apparatus and vehicles used by the volunteer fire companies. UMT employs a Fire Commissioner/Emergency Management Coordinator and two Fire Inspectors with other staff serving as volunteers. EMS is provided by Cetronia Ambulance Corps dispatched from two locations – UMT Emergency Services Building Station 56 also includes fire protection services equipment and Cetronia Ambulance Corps Headquarters Station 62 located in neighboring South Whitehall Township.

Source: UMT website http://www.uppermac.org/fire/.

Table C4: Fire Protection and EMS Facility Location and Response Area

Facility Name/Location	Type	Response Area
Good Will Fire Co. Station 25 Trexlertown	Full-Service Facility	Responsive actions to southern sector of UMT.
Fogelsville Fire Co. Station 8	Full-Service Facility	Rapid response to northern sector of UMT.
Station 56 Schantz Road	Intermediate Service Facility with EMS Services	Serves eastern sector of UMT.

The Fire Department Study conducted in 2015 indicates that the current stations in combination with both automatic and mutual aid from surrounding stations are positioned to provide the quickest response to current and future demands based upon population projections. One concern is with respect to changes in density through redevelopment and new development which may require services to be re-evaluated.

Source: Macungie Township, Pa Fire Department Study/Review, 2015 prepared by Emergency Services Consulting International (ESCI).

Police Protection

Today, the Police Department is comprised of 30 police officers and two professional support staff serving nearly 24,000 residents, businesses, and warehouse development. The mission of the department is to "enhance the quality of life and serve the citizens of UMT by providing quality and professional police services." The Police Department is housed in a stand-alone facility located at 37 Grim Road, Breinigsville, PA. In addition to law enforcement, the

The Mission of the Good Neighbor Coalition (GNC) is to enhance safety and improve community relations between law enforcement and the commercial and residential entities within UMT and beyond. This endeavor will be accomplished through education, awareness, and cooperation. This will be in keeping with the Department's mission of being "Committed to Service."

Source: UMT Website

Department sponsors several events in the community and leads the Good Neighbor Coalition.

Source: UMT website http://www.uppermac.org/police/.

Prior to December 2012, the Berks-Lehigh Regional Police Department, a multi-jurisdictional police department, provided law enforcement services to Topton Borough, Lyons Borough, Maxatawny Township, and Upper Macungie Township. The regional police force disbanded in December 2012. In December of that same year, the Upper Macungie Township Police Department was established and occupied a newly constructed 12,000 SF state-of-the-art Police Facility with the following amenities:

- First Floor—K9 training room and kennel area; women's and men's locker rooms; traffic, evidence, weapons, bulk evidence and processing room; a Patrol room; a holding cell; a sally port; a two-car garage; and a physical training room.
- Second Floor—Numerous single and group offices; interview rooms; secure storage; a vestibule and reception area; server, copy and break rooms; an archives area; restrooms; and a janitor's closet.

Source: Boyle Construction – http://boyleconstruction.com/projects/emergency-response/.

Future Police Service Demand

Act 39 of 1933 as amended by the Pennsylvania General Assembly, Article XIX – Township Police allows the Board of Supervisors for a Township of the Second Class to create or disband a police force. The Board has the power to provide for the organization and supervision of the police and is responsible for determining the number and the compensation of the police officers. UMT routinely evaluates police safety needs to determine appropriate staffing.

Source: https://www.legis.statel.pa.us.

Police Department Organization

- Office of the Chief
- Command Staff
- Patrol Division
- Crime & Community Services Division
- Good Neighbor Coalition

Source: UMT website.

Public Schools – Parkland School District

School Rankings

Parkland School District ranks within the top 10% of all 663 school districts in the state for math and reading proficiency.

Jaindl Elementary School ranks within the top 20% of schools in the state.

Fogelsville Elementary School ranks within the top 30% of schools in the state.

Source: https://www.publicschoolreview.com.

The Parkland School District is a top rated, public school district in academics, athletics, and the arts. The quality of education offered is either consistently equal to or above surrounding school districts in the region. In the 2017-2018 school year, the district had 9,431 students in grades K-12 with a student teacher ratio of 14 to 1. For the past two school years, the District has experienced a 1.4% increase each year. While the District's primary focus is investing in students and the curriculum, Parkland's mission is to also continue to invest in infrastructure and buildings.

Parkland School District Ratings

Parkland's 2018 local ratings indicate that the school district is ranked as the #1 School District in the Lehigh Valley. The District achieved this ranking by scoring high on various factors including test scores, student-teacher ratio, and reviews from students and parents. The school newsletter reported that 95% of the Class of 2017 intended to continue their education at colleges, business/technical schools, or the armed services.

Source: Parkland School District Newsletter and NICHE.com.

School Age Children

Approximately 23% of the population in UMT are school aged children enrolled in the largest and fastest growing District in the region as previously indicated. Educational attainment in UMT is higher than the Lehigh County averages – nine-in-ten people in UMT over the age of 25 have a high school diploma equivalency or higher level of education. The District continues to experience changing demographics which require the administration to focus their attention on a literacy goal of having all children read at grade level by the end of third grade. Achieving literacy goals as early as possible as part of the curriculum for grades K-3 has been proven nationally to have a significant relationship with graduation rates.

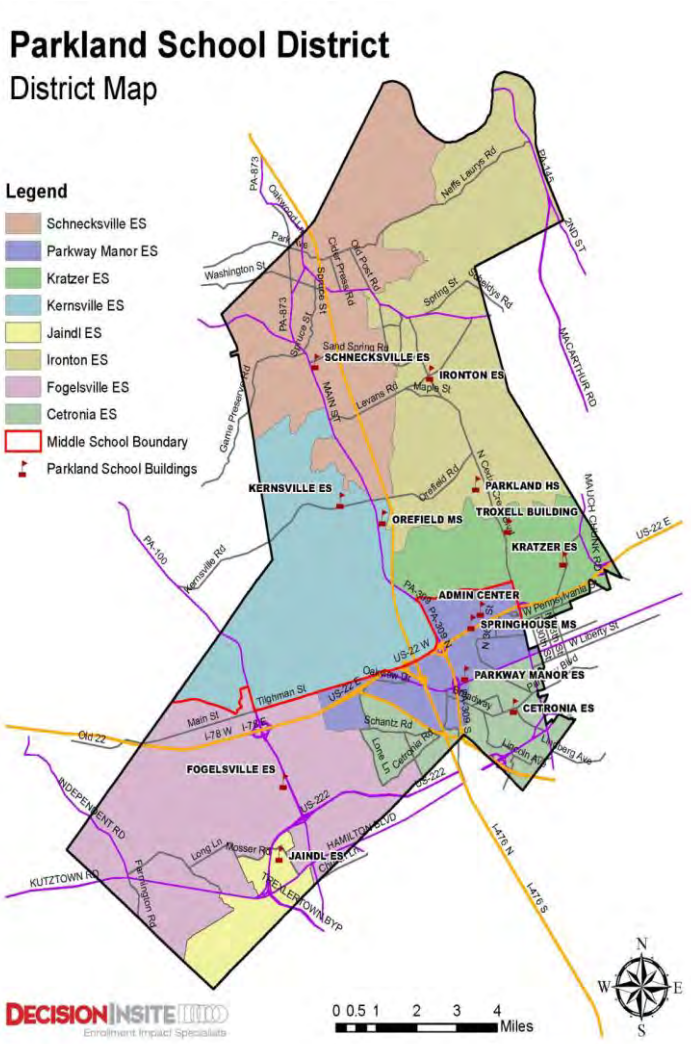
Source: Parkland School District Superintendent Message on website and Appendix C – Demographic Report.

Major Capital Improvements

In March of 2018, Upper Macungie Township approved the construction of the Veterans Memorial Elementary School to be built on Twin Ponds Road between Schantz Road and Long Lane in Breinigsville. This $34 million-dollar school is expected to open for the 2020-21 school year. The school will be constructed with separate wings for grades K-2 and 3-5 with a capacity of up to 700 students to meet the needs of the growing population in the district. In addition to the new elementary school in UMT, the Board of School Directors endorsed a sixth year of capital improvement projects in January of 2018.

Source: https://www.parklandsd.org/departmetns/superintendents-office.

Source: Image from The Morning March 2018.



Source: https://www.parklandsd.org/about-us/district-map.

Water and Sewer

Water Supply and Service

State Water Plan

Guiding Principle – Implement integrated water management (IWM) recognizing the critical links among water quality and quantity, surface and ground water and land use, and water resource management.

Source: State Water Plan, PA-DEP.

The Lehigh County Authority (LCA), Central Lehigh Division service area includes portions of Upper Macungie, Lower Macungie, Salisbury, South Whitehall, Upper Milford, Weisenberg, and Lowhill Townships in central and western Lehigh County. There are 14 wells located throughout the service area plus an interconnection with LCA's Allentown Division water system. LCA produces over an average of 9.3 million gallons of water per day. The Allentown Division draws its water from two large springs, the Little Lehigh Creek and the Lehigh River. Six of these wells are in UMT (four wells in the central portion and two wells in the rural outlying areas). Other sources of public water in the Township include one well operated by the City of Allentown and one non-licensed supply well operated by the Township for park facilities at Breinigsville Park. Several private wells are dispersed throughout the Township. Private centralized wells provide water service to major developments such as the Mosser Nursing Home and the Terry Hill Mobile Home Park.

Source: Central Lehigh Division 2017 Annual Water Quality Report - https://lehighcountyauthority.org/wp-content/uploads/CEN.pdf and UMT 2007 Comprehensive Plan.

In 1993, UMT entered in a Memorandum of Understanding (MOU) with the Lehigh and Northampton Counties Joint Planning Commission to recognize the wellhead protection area delineations for the Lehigh County Authority No. 4 and the Lehigh County Authority No. 7 wells and agreed to adopt a wellhead protection ordinance recognizing wellhead protection areas. Areas are mapped in the Lehigh Counties Wellhead Protection Implementation Program (February 1996).

As growth occurs, there is an increased demand for drinking water and water for residential and commercial development, agricultural activity, and food, bottling, and industrial processing. And, as growth occurs, UMT must consider the ability of LCA to meet future water needs. Additional details pertaining to water treatment and water quality can be found in the 2017 LCA Annual Water Quality Report.

Water Quality – Safe Drinking Water

LCA is a public, nonprofit water and sewer utility dedicated to a single mission – *"to provide continually improved, affordable, reliable, and sustainable services to their customers."* LCA continues to participate in programs and associations such as the Partnership for Safe Water, Lehigh Valley Water Suppliers, American Water Works Association, the PA-DEP Source Water Protection Technical Assistance Program, and the Pennsylvania Association of Accredited Environmental Laboratories.

For those who are connected to public water, LCA is required to routinely monitor and report on the quality of drinking water for specific contaminants. The US Environmental Protection Agency (EPA) establishes drinking water standards for various regulated contaminants. In addition to testing and monitoring regulated contaminants, LCA also tests and monitors unregulated contaminants to determine occurrences to help provide EPA with information that may contribute to future regulation. Publishing, monitoring, and testing results are important to not only the general population's health, safety, and welfare, but especially to those who have compromised immune systems, infants, and the elderly.

Source: Lehigh County Authority Annual Water Quality Report, Central Lehigh Division.

Metered Water Rates for Customers

LCA has monthly metered water rates based upon meter size, monthly and quarterly charges per 1,000 gallons for residential uses, and various rates for public and private fire protection for fire hydrants, fire line size, and hydrant security devices. The rate schedule is routinely reviewed and updated by LCA. Reference LCA's website for specific rates. In 2018, for a family of four using 100-150 gallons per person per day (a total of approximately 400-600 gallons per day per household or approximately 12,000-18,000 gallons per month per household), the average monthly water consumption bill ranges between $100 and $112.

Source: LCA – http://lehighcountyauthority.org/wp-content/uploads/LCA-WaterRateSchedule-1.pdf and Statista - https://www.statista.com/statistics/720418/average-monthly-cost-of-water-in-the-us/.

Projected Water Demand & Future Service

In addition to the LVPC Water Supply and Sewage Facilities Plan adopted in 1995, the LVPC completed a Water Supply Assessment Report in 2002. This report identified current and future well water users of all types through 2030 and water availability during normal and drought conditions. From the data available at the time of this assessment, it was found that well water demand will not exceed groundwater supply during normal and drought conditions through 2030. One of the main findings of the assessment was the lack of up-to-date reliable data on water usage, groundwater recharge, and water quality. Additional assessment may be necessary to consider future service conditions beyond 2030.

Source: 2007 UMT Comprehensive Plan.

Major Commercial and Industrial Water Users

- Nestle Distribution Co.
- Samuel Adams Brewery
- Herr Foods, Inc.
- Bimbo Bakeries
- Ocean Spray
- Several Plastic Food Container Manufacturers
- Agriculture

Source: UMT.

The table below projects water demand for residential growth only through 2040. Household consumption of water accounts for only a portion of water demand for UMT and the Lehigh Valley. Non-residential uses of concern include industrial users of water such as bottling plants, food and beverage operations, plastic container manufacturers, and similar types of manufacturing. A study of impacts and ongoing monitoring of these commercial and manufacturing uses is imperative to the future of UMT and the Lehigh Valley.

Table C5: Projected Residential Water Demand 2040

Projected Monthly Residential Water Demand				
	2016	2020	2030	2040
Population	23,884	24,992	30,232	36,235
Monthly Water Demand*	72 million gallons	75 million gallons	91 million gallons	109 million gallons

*Assumes 100 gallons per person per day and 30 days per month.

Sources: US Census, LCA, and Statista.

Water Strategies

- Assist with tracking water usage data working collaboratively with users, LCA, and the State.
- Promote water conservation tools, techniques, equipment and fixtures, and practices for all users.
- Promote use of technologies to recover, reuse, and recycle water in manufacturing processes and for domestic and commercial use.
- Restrict land development impacting wellhead protection areas.
- Promote use of innovative snow removal products and deicers to reduce impacts on water quality.
- Offer public education about best practices to conserve and protect water quality and quantity.
- Apply an Integrated Water Management (IWM) approach to planning, design, and regulatory enforcement that contributes to conservation and protection of water quality and quantity, stormwater management, and land use management.

Sewer Service Boundary and Planning

Community facilities and utilities depicted on Map 4 identifies a sewer service are in the Township's official Sewage Facilities Plan (commonly referred to as the Act 537 Plan) that has been delineated to address existing and future sewage disposal needs. This map identifies designated areas that are planned and not planned for extension of public sewer service – these designations are legally binding based upon the adopted Sewage Facilities Plan. In most cases, the PA-DEP requires completion of sewage facilities planning for new land development via the "planning module" process of updating or revising this official plan before a subdivision can be legally created. UMT is the delegated agency to make determination of exemption from the planning module process.

The Township's 1992 Sewage Facilities Plan was updated with a 2010 Supplement to address needs through the life of the 2007 Comprehensive Plan and potentially for a time period covered by this plan. As development may be anticipated within and outside of the Act 537 Sewer Service Boundary (also referred to as UMT's Urban Growth Boundary), consideration must be given to sewer capacity at the plant allocated to UMT, the collection and conveyance system capacity and condition, and new user needs and impacts on the environment. Past surges and future surges in development proposals continue to create pressure on the Township to accommodate developer requests to expand the sewer service boundary and/or permit traditional or alternative on-lot sewer treatment systems.

Source: 2007 UMT, Comprehensive Plan Language with modifications.

UMT Collection & Conveyance – Western Lehigh Sewerage Partnership (WLSP)

UMT is a partner in the WLSP as part of a 2009 EPA Order for Compliance over five years. While the compliance order has expired, LCA on behalf of WLSP partners continues to prepare and submit Semi-Annual Progress Reports providing the status of the ongoing Sewer Rehabilitation & Capacity Assurance Program (SCARP) implementation – activities undertaken by the WLSP partners focused on the control of infiltration and inflow in the system owned and operated by the WLSP entities. SCARP activities include inflow elimination through basement disconnections, chimney seals, manhole improvements, cleanout and repair, lateral repairs and replacement, sewer line replacement and rehabilitation (cured in place pipe lining—CIPP), and mainline testing and sealing. Other specific activity includes:

- A pilot Western Leigh Interceptor (WLI) rehabilitation program started in the second half of 2017 and completed the first half of 2018. This included easement clearing to support ongoing and future operation and maintenance efforts.
- Park Pump Station (PPS) rehabilitation completed in 2018 with the PPS force main evaluation to include investigate of alternative technologies to inspect the condition of the main.
- Investigation of alternative approaches to relieve WLI capacity issues in the Trexlertown area and ongoing study efforts to resolve capacity issues.

Wastewater Treatment Plants and Industrial Pre-Treatment

UMT owns and maintains the local sanitary sewer collection and conveyance system that connects to the Western Lehigh and Little Lehigh Relief Interceptors. This is a system of transmission mains that transports wastewater from western municipalities to the City of Allentown Kline's Island Treatment Plant. In 2016, the LCA spent nearly $2 million to repair the most vulnerable sections of the Western Lehigh Interceptor running through Upper Macungie and Lower Macungie Townships.

Source: https://www.google.com/maps

LCA operates a pre-treatment plant in Fogelsville located at the corner of Industrial Boulevard and Route 100. This plant is designed to

remove much of the biochemical oxygen demand and suspended solids contributed by several local industries prior to discharge to the Western Lehigh Interceptor system for final treatment in Allentown.

Sources: https://lehighcountyauthority.org/your-waste/wastewater-facilities/ and https://lehighcountyauthority.org/wp-content/uploads/LCA-SewerRulesRegs.pdf.

UMT Conveyance System

In 2008, UMT passed an ordinance regulating sanitary sewer connections for properties located within the Act 537 Sewer Service Boundary eliminating the introduction of prohibited waters into the local sanitary sewer system and requiring periodic inspections and/or testing of sanitary sewer lines. The ordinance was designed to identify and correct inflow and infiltration problems. Through ongoing operations and maintenance, the Township routinely identifies capital projects to improve the collection and conveyance system for current and future users. The Township works collaboratively with developers and property owners to expand the public system within the Act 537 Sewer Service Boundary as part of the land development process.

Source: UMT, Ordinance No. 2008-3

On-Lot Sewage Systems

Lands outside of the Act 537 Sewer Service Boundary/UMT Urban Growth Boundary (outlying areas) within the Township require on-lot sewage systems to support residential and non-residential development. The Township has a mandatory cleaning and inspection cycle to identify failing systems and to maintain per this Act a healthy environment for future generations. Additional details and relevant ordinances are identified on UMT's website. Both the PA-DEP and the Township provide information and references to better educate owners of on-lot systems about operations and maintenance and new technology that are acceptable alternatives to on-lot sewerage treatment systems.

Sources: UMT website - http://www.uppermac.org/sewer-information/ and PADEP https://www.dep.pa.gov/Business/Water/CleanWater/WastewaterMgmt/Act537/OnlotDisposal/.

Sanitary Sewer Strategies

- Continue municipal inspection and enforcement of on-site system maintenance requirements.
- Continue to require a tested primary and replacement absorption area for proposed residential development requiring on-lot disposal systems outside of the Act 537 service area boundary.
- Continue to take corrective measures to monitor the performance of the public sewer collection and conveyance system as well as on-lot systems through the Township's Management, Operations, and Maintenance Program (MOM), the Lehigh County Authority Western Lehigh Interceptor Partnership Regional Flow Management Plan, and the Township's On-Lot Sewage Management Program.
- Maintain an up to date official Sewerage Plan as prescribed by Act 537 that addresses existing sewage disposal needs and includes recommendations to prevent future problems through proper planning, permitting, designing all types of sewerage facilities, and implementing capital projects.
- Continue to coordinate with Lehigh County Authority (LCA), Lehigh County, and LVPC to prepare and update plans that are consistent with population forecasts, development trends and demands, existing user needs, and projected future sewage flows.
- Continue to work through the WLSP to routinely monitor flows and model peak flows of the system to support SCARP implementation, operation and maintenance activities, and planning, design, and construction of regional capital projects through the Western Lehigh Sewerage Partnership (WLSP) and jointly with LCA and individually at the municipal level.

Water Resources

UMT complies with the Municipal Separate Storm Sewer System (MS4 requirements) and EPA's mandated compliance with the National Pollution Discharge Elimination System (NPDES) requirements. The Township has an adopted Act 167 Storm Water Control Plan to identify strategies to control volume and quality of storm water runoff. The table below references relevant studies and ordinances.

Source: UMT Public Works – http://www.uppermac.org/public-works/.

Table C6: Act 167 Studies and Relevant Ordinances Regulating Water Resources

Relevant Ordinance Reference	Relevant Information
Chapter 8 Floodplain Regulation (Ordinance)	Identifies requirements for the Floodway Area (FW), Special Floodplain Area (FE), and the General Floodplain Area (FA).
Chapter 17 Little Lehigh Creek Watershed Act 167 – Stormwater Management Ordinance	Addresses each of the Watersheds with mapping of Stormwater Management Districts and provisions to implement each of the Watershed Stormwater Management Plans. Also includes standards for Post-Construction Water Quality Criteria.
Chapter 17 Jordan Creek Watershed Act 167 – Stormwater Management Ordinance	
Chapter 22 Subdivision & Land Development Ordinance	Identifies engineering and design requirements for stormwater management. Cross references Chapter 8 Floodplain Regulations and Chapter 17 Stormwater Management Ordinance. References PA-DEP, Chapter 102 regulations for Erosion & Sedimentation Control for new construction. References PA-DEP MS4 and NPDES requirements.

Source: UMT Municipal Code – https://ecode360.com/14582922.

Water Resource/Stormwater Strategies

- Apply an Integrated Water Management (IWM) approach to decision making understanding that land use decisions play an important role in sustainability of water resources.
- Promote the use of porous asphalt parking lots with a subsurface infiltration bed.
- Routinely review ordinances to assure complete and up to date regulations, best management practices, and technologies are identified consistent with federal and state legislation.
- Continue to study and assess changes over time integrating Act 167 planning and Act 537 planning with land use and comprehensive planning while complying with federal and state mandates.
- Regulate stormwater basin and wet pond maintenance and retrofits including water quality features, best management practices (BMPs), and amenities to better meet stormwater management goals and to provide a natural resource to the community.
- Identify effective low maintenance solutions that are integrated with the design of development.

Source of Images: Internet – Communities in the US – images shown are for educational purposes.

Electric & Gas Service Providers

Pennsylvania Power and Light (PPL)

PPL, the electric service provider for the region, has invested in Smart Grid technology that senses power outages and restores power within minutes. PPL continues to strengthen the electric delivery system to provide safe, reliable service. Today, customers have 30% fewer outages than 10 years ago. PPL is planning another 15% reliability improvement program to be implemented within the next five years.

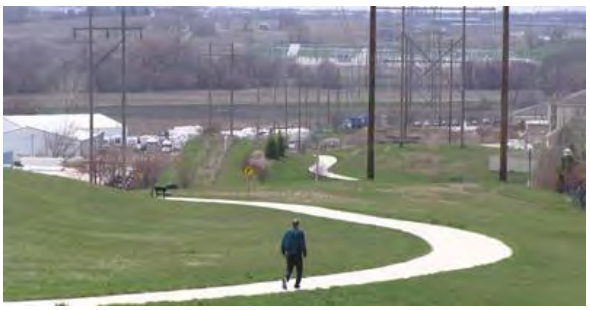
Source: https://www.pplelectric.com/reliability/reliability-projects/ppl-smart-grid.aspx.

The Township is dissected by two major PPL transmission lines as well as is home to numerous substations. PPL has Right-of-Way Use Guidelines and an application process to gain permission for various encroachments along with public access.

Source for Permitted Encroachments: https://www.pplelectric.com/-/media/PPLElectric/Reliability/Docs/Encroachment-Standards-11-7-16.pdf?la=en).

In 2013, PPL opened a 115,000 square foot Next-Generation Data and Operations Center in UMT. The center combined transmission and distribution operations from Allentown and Harrisburg housing nearly 150 employees and their Emergency Response Center serving 1.4 million customers. In early 2018, PPL received approval to rebuild the Breinigsville-Alburtis transmission line running from UMT to Lower Macungie Township replacing existing H-frame structures and several pole structures with all work conducted completely within the existing right-of-way.

Source: Morning Call Articles.



Source: Photographs on this page www.pedestrian.org.

UGI

UGI provides the region with an alternative energy source to electricity. UGI South provides gas and electric service offering a variety of residential and business rebate and assistance programs (reference website for details – https://www.ugi.com/). UGI conducts annual Infrastructure Replacement and Betterment Projects within its service area to ensure safe and reliable service for customers and communities. Capital projects such as pressure reinforcements, service line and meter replacements, and regular station improvements provide an opportunity for homes and businesses within project areas to convert to natural gas.

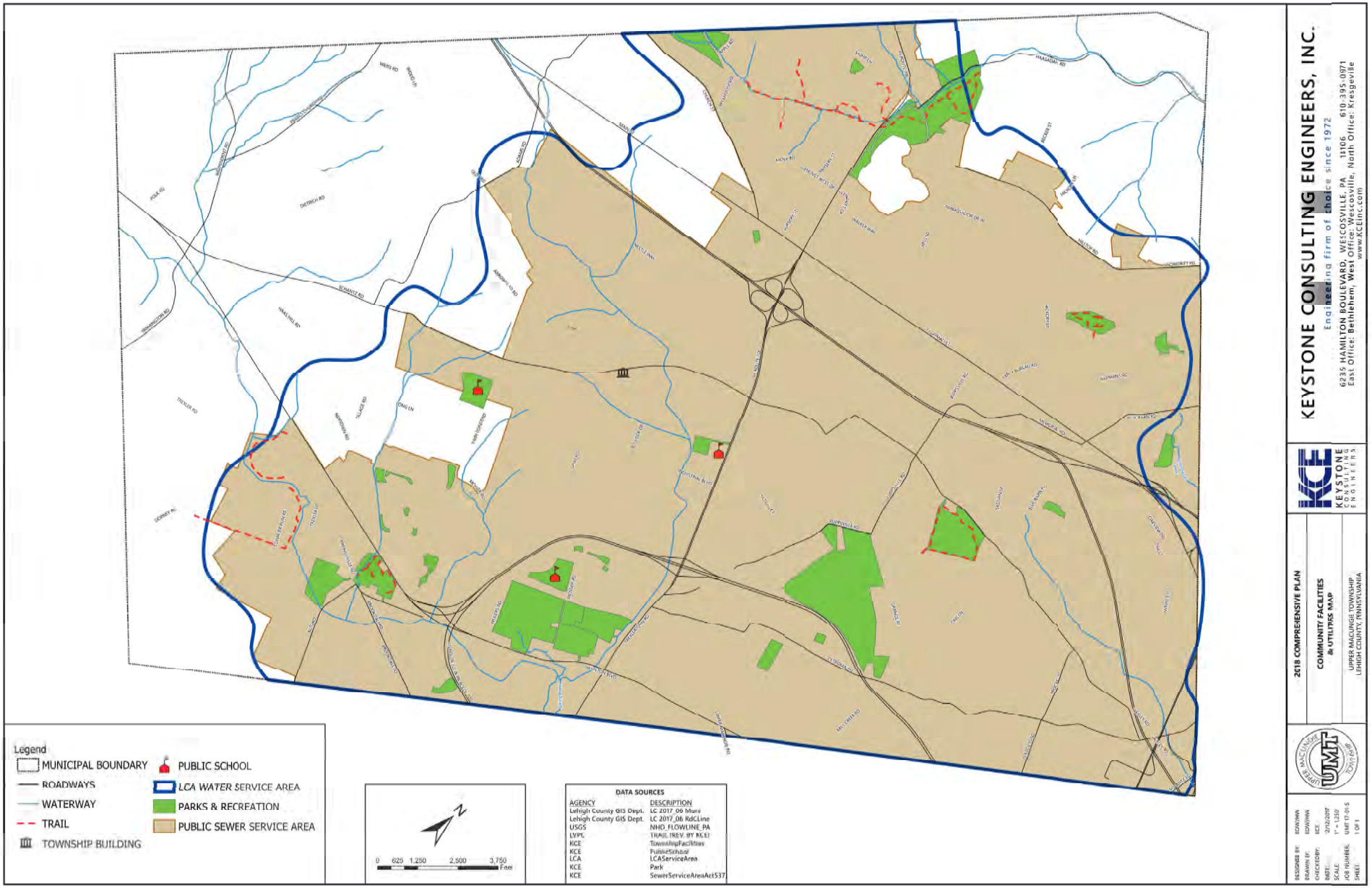
Other Utilities

Cable companies include RCN and SECTV and telecommunications companies such as Verizon, AT&T, Sprint, and MCI provide service to the Township and region.

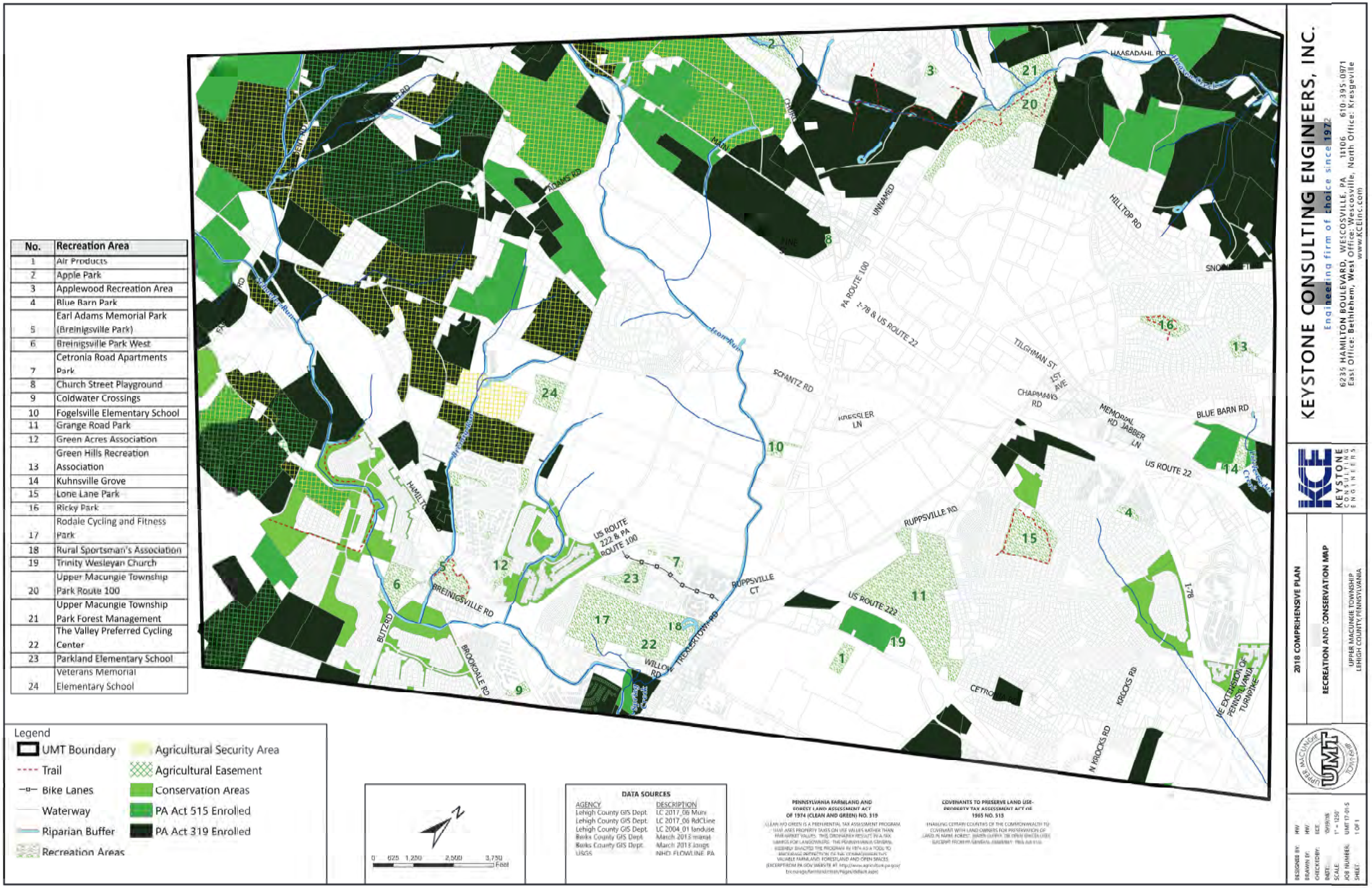
Strategies Partnering with Utilities

- Coordinate with PPL and UGI to develop a Township-wide plan for pedestrian, bicycle, and equestrian trails, playgrounds, extension of existing recreational areas, athletic fields, stormwater infiltration systems, rain gardens, retention/detention ponds, and wet ponds in PPL and UGI easements designed and maintained as amenities through public, non-profit, and private partnerships.
- Coordinate with PPL and UGI to gain easements for future expansion of underground utilities.

Map 4: Community Facilities & Utilities



Map 5: Recreation and Conservation




Source: Upper Macungie Township


Source: Upper Macungie Township

B. Natural, Cultural, and Agricultural Resources

Protecting the environment is a key element of sustainability. Managing growth to avoid, minimize, or mitigate impacts on environmentally sensitive areas is an important part of land use policies, regulations, and decisions.

"Natural, cultural, and agricultural resources contribute to the overall community character and must be integrated into the growth and development of UMT. Past losses and the potential for future loss of these resources is a significant threat to the rural character of the Township. The continued demand for industrial, commercial, and residential development coupled with the decline in the agricultural economy has contributed to the loss of prime agricultural land and natural and cultural resources. This circumstance continues to be relevant today and to the future development and sustainability of UMT."

Source: 2007 UMT Comprehensive Plan

When surveyed, UMT residents overwhelmingly supported preservation and conservation of environmentally sensitive areas (ESA). The following provides a basic definition of these terms used throughout this section of the plan.

- Preservation of the environment means that lands and their natural resources should not be consumed by humans and should instead be maintained in their original form.
- Land conservation is the process of protecting natural land and returning developed land to its natural state.
- Environmental protection are policies and procedures aimed at conserving natural resources, preserving the current state of the environment and, where possible, reversing degradation to the environment.

Environmentally sensitive areas (ESA) are landscape elements or places which are vital to the long-term maintenance of biological diversity, soil, water, or other natural and cultural resources both on the site and in a regional context. These areas include wildlife habitats, steep slopes, wetlands, and prime agricultural lands as well as historic sites and buildings considered cultural resources.

Features depicted on maps include:

- Map 6: Environmentally Sensitive Areas identifies natural and cultural resources.
- Map 7: Wellhead Protection Areas and Carbonate Bedrock Areas.
- Map 8: Agricultural Lands and Preservation identifies agricultural areas, conservation areas, and recreation areas.

Preservation, conservation, and protection of natural resources, ecosystems, wildlife habitats, and agricultural land combats climate change and sustains our society.

Source: https://www.sustainable.org/environment.

Environmental Protection

UMT is a leader in preserving land that focuses on protecting environmentally sensitive areas. UMT protects a range of environmental features through development regulations including but not limited to zoning (e.g. use regulations and performance standards), subdivision and land development, and stormwater management ordinances. Those features protected include the following:

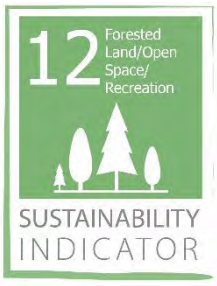
Table N1: Protected Environmental Features and Areas

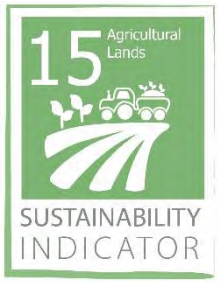
Environmental Features and Environmentally Sensitive Areas Protected by Development Ordinances		
Wetlands	Natural Areas	Soils
Surface Water	Trees and Woodlands	Floodplains
Groundwater	Wildlife Habitats	Floodplain Buffers
Wellhead Protection	Agricultural Land	Steep Slopes
Watersheds	Air	Karst Topography

Source: UMT Zoning, Subdivision/Land Development, and Stormwater Ordinances.

The State, County, Township, and private property owners alone or in partnership with various agency programs has preserved and conserved over 3,500 acres (20.9%) of land within the Township. These lands consist of public and private land identified as open space, park and recreation, natural features, woodlands, water resources, and agricultural resources quantified below and shown on Map 8.

Table N2: Preserved and Conserved Land





Preservation/Conservation Methods	Acreage*
Park and Recreation Land	591.45
Lehigh County Parks	104.55
Private Park	91.74
Public School	43.85
Township Park	351.31
Agricultural Lands	2,291.38
Agricultural Conservation Easements**	885.84
Agricultural Security Areas	1,116.65
Agricultural Land (Privately Preserved)	5.92
Agricultural Land (Township Owned/Leased)	151.59
2018 Agricultural Easement Applicants	131.38
Natural Resources	271.51
Conservation (Private)	173.93
Conservation (State)	5.54
Conservation (Township)	92.04
Woodlands	159.76
Woodlands (Private)	117.14
Woodlands (Township)	42.62
Water Resources	282.50
Watershed (Private)	185.74
Watershed (Township)	96.76
TOTAL	3,596.60

**Source: UMT, 2018 GIS Data Acreages.*

***Note: Official number of acreages permanently preserved in Agricultural Conservation Easements in 932 acres.*

Natural Resources

As previously stated, preserving natural resource is essential for maintaining community sustainability. The purpose of protecting natural resources is to ensure ecosystems resiliency, to preserve wildlife and their habitats, to maintain biodiversity, to improve air quality, and to conserve forests, water, and energy resources.

"Prominent natural features include Little Lehigh, Iron Run, Schaeffer Run, and Hassen Creeks. Other important feature includes rolling hillsides and steep slopes in the northern and western parts of the Township, prime agricultural soils, woodlands, sensitive wetlands, and floodplain areas as well as the watersheds that shelter the region's water supply. These areas are considered vital to UMT's health, welfare, community character, and sustainability. Natural, cultural, and historic resources and areas should be preserved and protected as much as possible as continued growth occurs."

Source: UMT Comprehensive Plan (2007), Section 2.7 Natural and Historic Resources.

Natural Heritage Areas

Pennsylvania's Natural Heritage Inventory of Lehigh and Northampton Counites (updated 2013) identifies areas within UMT as Natural Heritage Areas (NHA). The document includes an inventory of NHAs along with tools and recommendations for conservation of these resources by private landowners.

A Natural Heritage Area is an area containing one or more plant or animal species of concern, exemplary natural communities, or exceptional native biological diversity.

A substantial portion of the Little Lehigh Grasslands NHA and a smaller portion of the Little Lehigh Creek-Swabia Creek Watershed NHA cover UMT. In both NHAs, UMT is identified as a supporting landscape with a portion identified as a core habitat. The area within UMT identified as an NHA and details associated with this area are references as part of this plan and will not be replicated in content, instead the link to the plan below provides access to details associated with protection and conservation strategies.

Critical Concerns

- Increasing amount of impervious surface contributes to non-point source pollution of waterways and wetlands.
- Improperly functioning on-lot septic systems impacting groundwater and surface water.
- Excessive groundwater withdrawal for a range of uses.
- Impacts of development or activity within the floodplain.
- Impacts of farm ponds.
- Development impacts on sensitive species.
- Degradation of historic floodplain topography.

Air Quality

In 2018, the Lehigh Valley air quality ranking by the American Lung Association deteriorated – the ranking changed from a level C to a level D. In the Lehigh Valley, an ever-expanding warehouse industry with its accompanying truck traffic presents an added challenge to air quality. People living and working in proximity to the truck traffic, make them more vulnerable than others to its harmful effects. Projected growth locally and in the region will contribute to additional air pollution and effects on the health of residents in UMT and the region.

Source: American Lung Associations – https://www.lung.org/local-content/_content-items/about-us/media/press-releases/pa-allen-beth-east-smog-2018.html.

Water Quality and Conservation

Water is life sustaining and water quality is at the center of a sustainable community. Water quality affects the health of wildlife, natural habitat, and humans. Factors affecting water quality include pollutants released into the environment as gases, liquids, dissolved substances, or particulates and entering the aquatic ecosystem by atmospheric deposition, soil erosion, seepage, runoff, or direct discharge. The Clean Water Act is the primary federal law governing water quality in waterways, water bodies, and coastal oceans. The following are local strategies protecting water quality and water supply:

- Managing Growth: UMT has identified the Act 537 Service Area Boundary as an Urban Growth Boundary (UGB). The UGB is a tool used to address sprawl by directing and managing growth to urban centers both regionally and locally. Investments in public water and sewer and other infrastructure are targeted to areas inside the UGB to support higher density development while protecting natural, cultural, and agricultural resources, landscapes, and vistas located outside of the UGB. Additionally, this tool is used to assure adequate public facilities and services such as protection of the water supply for current and future populations.
- Wellhead Protection: UMT has adopted Wellhead Protection Regulations in the Zoning Ordinance that restrict the storage of hazardous materials in such a way that may contaminate the groundwater supply. The Wellhead Protection Overlay Zone shown on Map 7 encompass the three zones defined below.

Wellhead Protection Areas	Description
Area 1 – Wellhead Zone (WHZ)	That area of the land surface within a calculated one-week groundwater time of travel of a protected public water supply well.
Area 2 – Zone of Influence (ZOI)	That area of the land surface which represents the cone of depression associated with a protected public water supply well.
Area 3 – Zone of Contribution (ZOC)	That area of the land surface which, through recharge or other means, provides water to sustain the yield of a protected public water supply well.

Sources: UMT Ordinances provides definitions and references to DEP Chapter 102 Rules and Regulations and in Part 1 Administration, 27-100(2) outlines Wellhead Protection Provisions.

- Sustainable Site Design: Development affects both the quantity and quality of water by changing the natural flow of stormwater runoff in a watershed. Developers can avoid, minimize, or mitigate impacts on water resources by following the Township's Conservation by Design Ordinance regulations to develop compactly, preserve ecologically critical open space, and incorporate green infrastructure solutions, low-impact development, or environmental site design, and best management practices.
- Protection of Natural Resources: Development ordinances protect environmentally sensitive areas including wetlands, surface water, groundwater, watersheds, natural areas, woodlands, wildlife habitats, soils, agricultural lands, floodplains, floodplain buffers, steep slopes, and karst topography.
- Land Preservation and Conservation: Preservation and conservation of environmentally sensitive areas builds resiliency of ecosystems against development encroachments and natural occurrences that impact a range of aquatic elements, water quality, food sources, quality of life, and the economy.
- Integrated Water Resources Management Approach: Implement coordinated planning, development, protection, and management of water, land, and related resources in a manner that fosters sustainable economic activity, improves or sustains environmental quality, ensures public health and safety, and provides for the sustainability of communities and ecosystems.
  Source: American Water Resources Association.

The LVPC Water Resource plans and documents include a range of information with respect to water resources, water quality, and mitigation strategies to protect this valuable life sustaining resource for citizens of the Township and region.

Sources: UMT Act 167 Study; LVPC Act 167 Studies, Plans, and Best Management Practices Manuals; and American Water Resources Association. Reference LVPC for documents at: http://www.lvpc.org/water-resources.html.

Hazard Mitigation

Upper Macungie Township participated in the Lehigh Valley Mitigation Plan featured on the LVPC website. The section of the plan specific to UMT identifies community assets, critical facilities, culture and historic resources, capabilities assessment, known or anticipated development and redevelopment activity, hazard event history, and a Mitigation Action Plan. UMT's Mitigation Action Plan in this LVPC document is referenced as part of this plan and will not be replicated in content. This plan provides relevant strategies, projects, and education and outreach activities along with implementation partners for UMT.

Source: Lehigh Valley Hazard Mitigation Plan - http://www.lvpc.org/hazard-mitigation.html.

Energy Efficiency and Conservation Strategies

Long-term sustainability of the region is dependent upon energy consumption and conservation. Renewable energy and energy efficiency promote savings and health benefits and provide opportunities for economic growth and sustainable development. All sources of energy – fossil fuels and renewable energy sources – have an impact on the environment. UMT government, residents, businesses, institutions, and industries will continue to rely on multiple energy sources incorporating the following strategies:

- Apply conservation by design techniques to layout subdivisions to conserve, preserve, and/or protect natural, cultural, and agricultural lands and resources to include transit, pedestrian, and bicycle facilities; and to reduce investment, maintenance, and operations of infrastructure.
- Promote green building design that results in energy efficiency and natural resource conservation for existing buildings, building expansions, and new construction.
- Support the use of multiple energy sources (fossil fuels and renewable energy sources).
- Continue to promote recycling and reuse of solid waste for energy reduction and energy efficiency as part of agreements with solid waste vendors, the Lehigh County Authority (LCA), and other partners.
- Encourage alternative means of transportation including motorized and nonmotorized travel.
- Promote reduction, reuse, and recycling.
- Evaluate Township investments with respect to fleet management, building maintenance and operations, and administration of public services that result in a reduction of greenhouse gas emissions (GHG), use of alternative energy sources, and promote energy conservation and efficiency through public awareness.

Natural Resource Strategies

- Continue to protect environmentally sensitive areas through administering zoning and subdivision/land development regulations and implementation of plans including, but not limited to the Township's Park and Recreation Plan, Act 167 Plans, the Pollution Reduction Plan (PRP), and the LVPC Hazard Mitigation Plan.
- Promote the use of green stormwater infrastructure (GSI), green roofs, and other green solutions and technologies as part of government operations, public and private development, and infrastructure improvements. Green infrastructure reduces and treats stormwater at its source while delivering environmental, social, and economic benefits.
  Source and Examples: https://www.epa.gov/green-infrastructure/what-green-infrastructure.
- Adopt additional natural resource protection and agricultural protection zoning for areas identified as agriculture on Map 8 and for specific resources identified on other maps in this section.
- Conserve priority areas such as steep slopes, stream quality, floodplains, wetlands, hydric soils, woodlands, and important natural areas referenced on maps contained in this section. These maps should guide public and private conservation, acquisition, dedication of lands, or easements.

Cultural Resources – Historic Sites and Buildings

The National Park Service indicates that cultural resources can be defined as a site, structure, landscape, object, or natural feature of significance traditionally associated to a group of people. Cultural resources are community sustainability enablers affecting environmental, social, and economic aspects of UMT and the region. The intentional preservation, protection, and management of cultural resources requires understanding that cultural resources contribution to achieving sustainability and is dependent upon community support, property owner investment, and developer education. Building a sustainable suburban and rural community by using cultural resources to connect people to their historic and natural environment places emphasis on preservation and conservation policies and development controls. Successful implementation involves cultural resource management (CRM) such as research, planning, and stewardship.

Source: National Park Service.

Properties Eligible for Natural Register of Historic Places

UMT has seventeen properties or districts eligible for the National Register of Historic Places. These eligible properties are identified on Map 6: Environmental Sensitive Areas and listed below.

1. 1906 House
2. Bastian, R. House
3. Farmstead No. 928
4. Jonas Grammes No. 3 Property
5. Simon Grammes House
6. Samuel Grim Historic District
7. Benjamin Haines Property
8. Henry Laros Farmstead
9. John Marks Farm
10. Jonathan Miler Farmstead
11. Thomas Schmoyer Log House
12. Thomas Schmoyer Property
13. Sarah Stettler Property
14. Solomon Stettler Farm District
15. Stucco Residence and Stone/Frame Barn
16. Henry Swartz Farm District
17. Trexlertown Historic District

The Philadelphia Architects and Buildings (PAB) organization identifies 48 potential sites in UMT for consideration including the above eligible sites. This source is linked to the Pennsylvania Historical and Museum Commission (PHMC) Cultural Resource Database providing property or district status. Eligibility criteria and the process to list a property on the National Register of Historic Places is outlined by the National Park Service. In additional to contributing to community sustainability, there are advantages such as increased property values and educational and tourism opportunities as well as other benefits from historic preservation.

Sources: PHMC – https://www.philadelphiabuildings.org/pab/app/view_location.cfm/NULL,79104,077,1,1 and NPS – https://www.nps.gov/nr/publications/bulletins/nrb15/nrb15_2.htm.

Cultural Resource Management (CRM) Strategies

- Continue to align local historic preservation goals, objectives, and strategies with the regional goal of preserving important historic buildings, structures, and sites in Lehigh and Northampton counties.
- Work in partnership with the Lehigh County, LVPC, and PHMC to conduct a comprehensive historic sites survey and evaluation to identify historic features that may be worthy of preserving.
- During development reviews, identify and mitigate impacts development may have on any National Register property or any other feature deemed eligible for the National Register by the PHMC.
- Promote private and public historic preservation of sites eligible for the National Register.
- Require roadway projects and other public infrastructure improvements avoid significant features that are listed or are eligible for listing on the National Register unless reasonable alternatives are available.
- Consider adoption of historic district regulations pursuant to the Historic District Act (Act 167 of 1961) for the preservation of eligible Historic Districts.
- Preservation and restoration of eligible properties with the potential to attract tourists to UMT and the Lehigh Valley should be considered along with application to the National Register of Historic Places.

Agricultural Resources

Agriculture is an important component of the local and regional economy. The LVPC has a goal of preserving approximately 25% of the land in Lehigh and Northampton counties for agriculture. Today, approximately 29.5% of UMT land use consists of agricultural land and is located primarily in the western portion of the Township. Prime farmland and farmland of statewide importance is identified on Map 6 and lands preserved for agricultural use are shown on Map 8 – both maps are located at the end of this section.

Through the Lehigh County Preservation Program, UMT has preserved 12 farms totaling 932 acres through purchased easements. Additional acres are registered in the Agricultural Security Area (ASA) program eligible for permanent preservation in partnership with UMT and the Lehigh County Land Preservation Program (partially funded by the state). In cooperation with landowners, UMT participates in the Lehigh County Municipal Partnership Program as well as coordinates with Lower Macungie Township, the designated certifying entity, through the legal preservation process.

Key terms used in this section and depicted on maps includes:

- Prime farmland is a designation assigned by U.S. Department of Agriculture (USDA) defining land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these land uses.
- Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law. In some areas that are not identified as having national or statewide importance, land considered to be farmland of local importance for production of food, feed, fiber, forage, and oilseed crops.

  Source: USDA and PA Department of Agriculture Definitions.

Benefits of Agricultural Preservation

- Food Security – Farming contributions to the food supply system locally and regionally.
- Reduction of Sprawl – A more orderly development pattern with less impact on the environment and less investment in public infrastructure.
- Benefits of Amenities– Preservation of wildlife habitats, angling opportunities, and scenic views in addition to agricultural preservation.

Sources: USDA; Pennsylvania Land Trust Association - https://conserveland.org/conservation-101/; and Lehigh County Bureau of Agricultural Land Preservation - https://www.lehighcounty.org/Departments/Agricultural-Land-Preservation.

Under maximum buildout conditions applying current zoning, projected development in the future could result in a potential loss of approximately 2,804 acres of agricultural land including those lands that are identified as ASA not yet permanently preserved.

Preservation Programs

The federal and state governments and other organizations provide a variety of resources to current and future farmers. The following list has been included as a reference to those resources, programs, and funding.

- Lehigh County Agricultural Preservation Board
  Reference: https://www.lehighcounty.org/Departments/Agricultural-Land-Preservation/Preservation-Board.
- Department of Agriculture
  Reference: https://www.agriculture.pa.gov/Pages/default.aspx.
- Farmland Information Center
  Reference: http://www.farmlandinfo.org/.
- US Department of Agriculture
  Reference: https://www.usda.gov/.

Agriculture Preservation Strategies

Agriculture preservation contributes to the local and regional economy, protects the environment, and provides opportunities to society by sustaining local and regional food supply systems. If agriculture is to remain a viable component of the local and regional food supply system, agricultural land must be preserved with respect to the fertility and ecological health of the land and the preserved land must be well used (active sustainable farming). Investments in preserving the land and in those farming the land include permanent preservation, investment in training, equipment, and technology that will contribute to sustaining UMT's local economy. Strategies include:

- Continue participation in the Lehigh County Municipal Partnership program and continue to allocate local revenues to support agriculture preservation.
- Maintain a healthy local economy with low unemployment rates and low levels of poverty to support the investment in the preservation of agricultural lands.
- Maintain the Urban Growth Boundary (the Township's established Act 537 Service Area boundary) to assure that agricultural lands not preserved adjacent to this boundary are not targeted for development. Logical extensions of this boundary should be considered only when proposed uses support a balanced economy.
- Adopt Agriculture Protection Zoning (APZ) for areas identified as agriculture on Map 8 such those as lands identified as Agricultural Easements, Agricultural Security, Agriculture Private, Agriculture Township, and 2018 Agricultural Easement applications. Work with Lehigh County and LVPC to gain technical assistance to develop appropriate regulation for this type of zoning.
- Adopt the APZ regulations that recognize the recently adopted Agritainment Ordinance which includes a range of farm-based agritainment and agritourism uses secondary to a principal agricultural use.
- Create an Agriculture Advisory Panel to advise the Planning Commission and Board of Supervisors on issues dealing with or impacting agriculture prior to municipal actions affecting agricultural resources.
- Recognize and support various initiatives such as Buy Fresh/Buy Local, Farm-to-School, and other local food, farm, and outdoor attraction initiatives.
- Seek grant money with partners for agricultural preservation and conservation and for agricultural development.

Agricultural Zoning

Agricultural zoning is a special form of zoning used by communities that seek to preserve their agricultural base. It reflects a community-wide policy that farmland is a valuable resource that should be preserved to ensure the continued production of agricultural commodities.

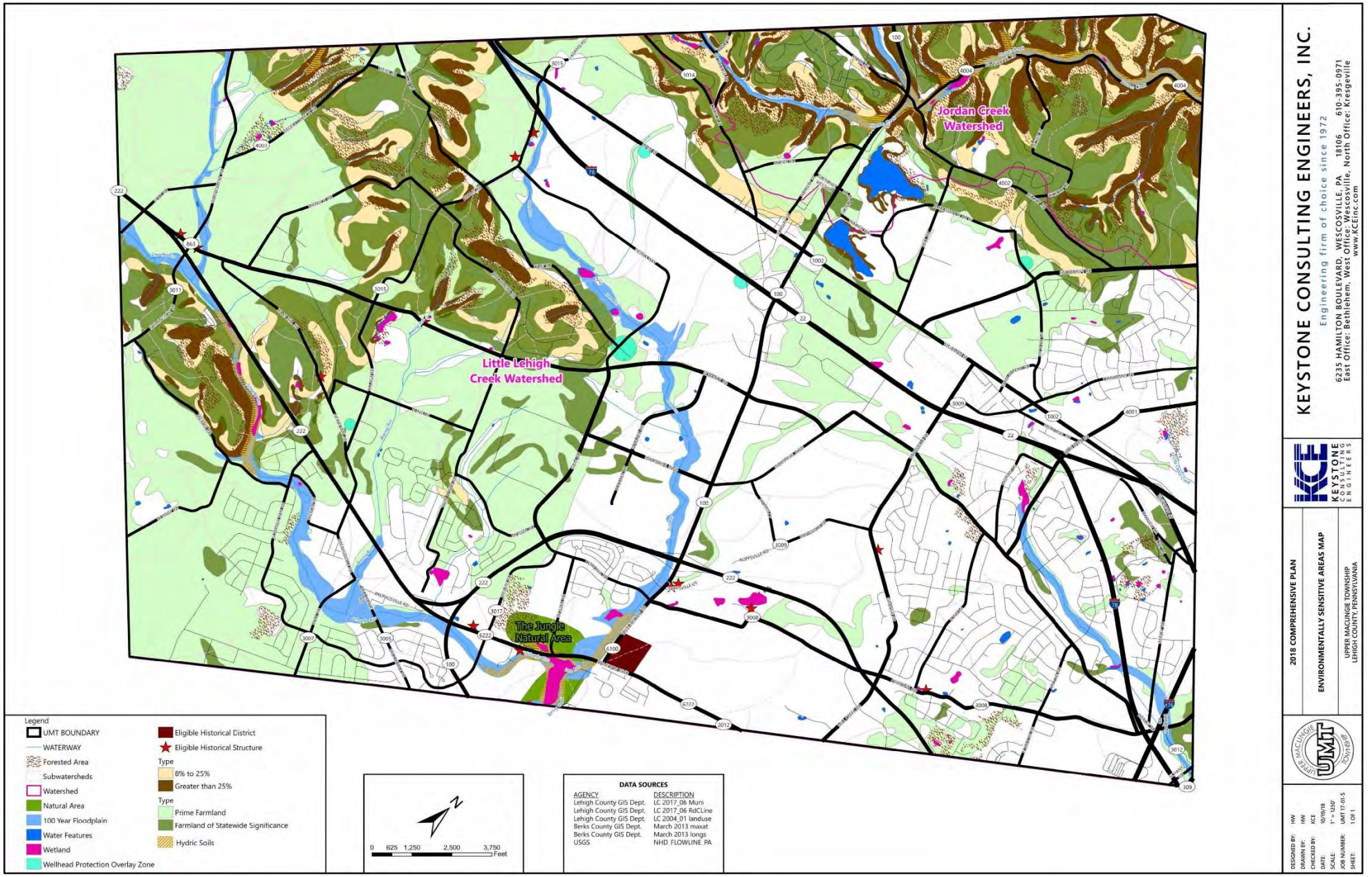
Source: Penn State Cooperative Extension.

Sources: Penn State Cooperative Extension and Pennsylvania Farmland Trust; and USDA, Farming Policy – https://fas.org/sgp/crs/misc/R44390.pdf.

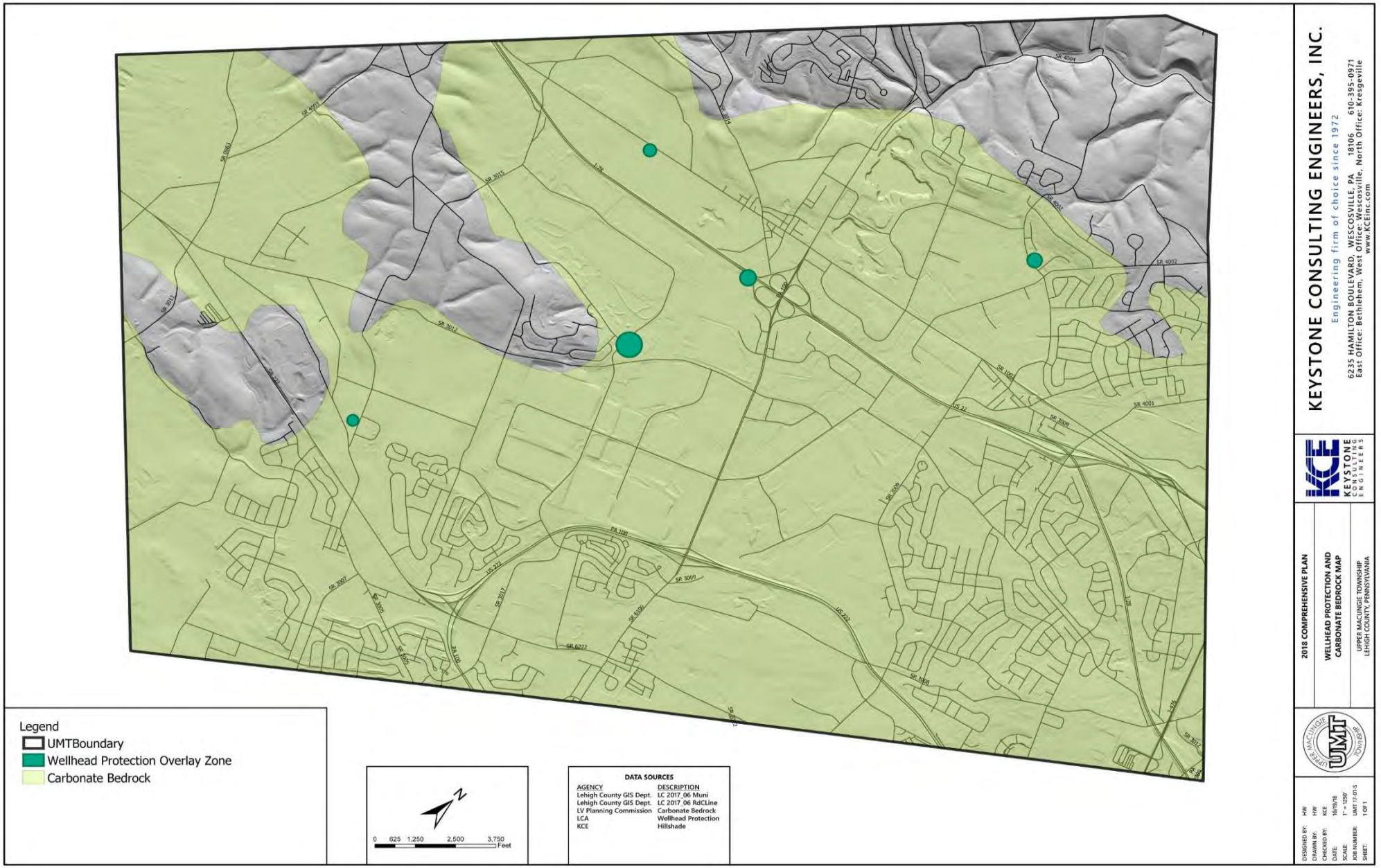
Source: Vynecrest Vineyard & Winery


Source: Glasbern Inn, Fogelsville

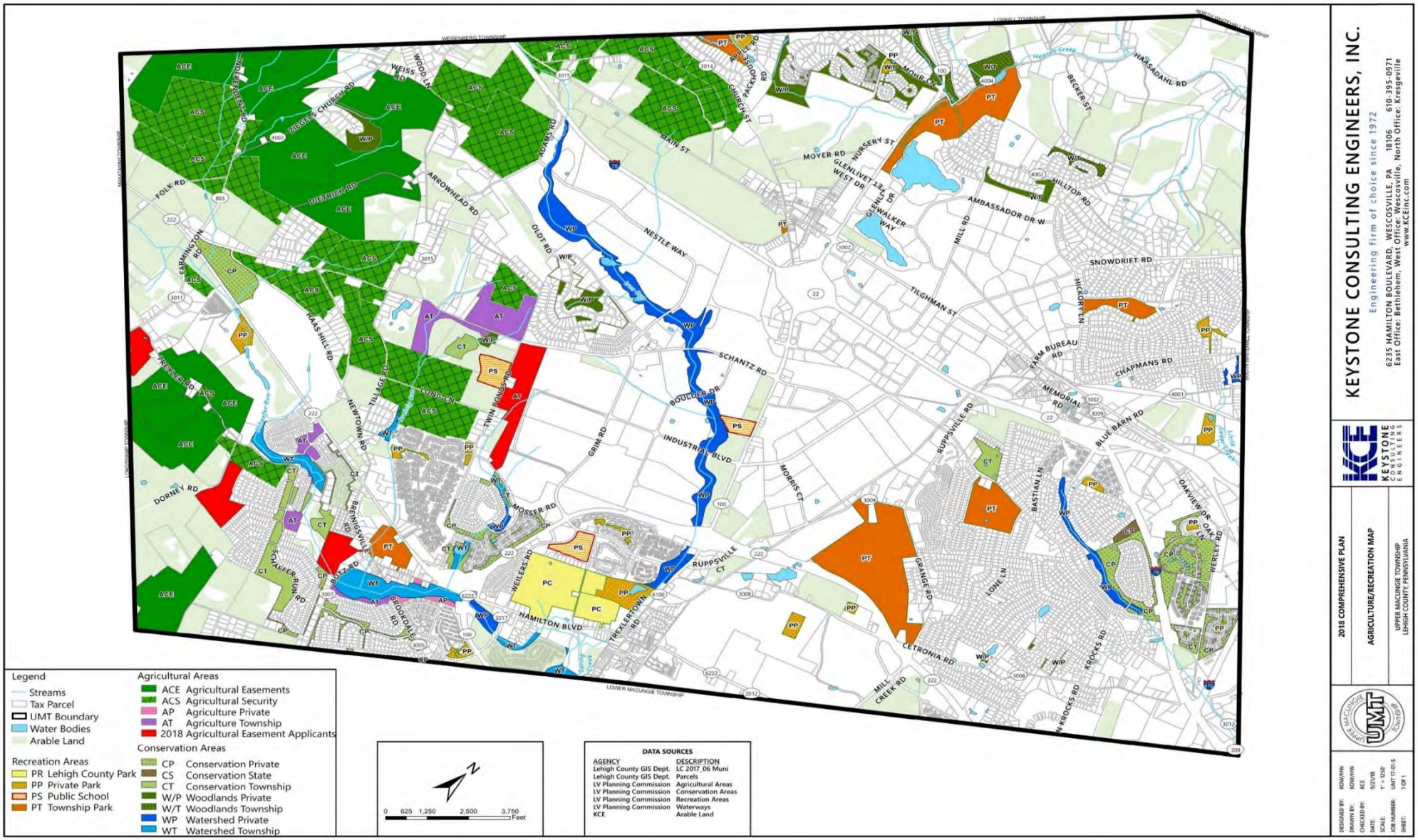
Map 6: Environmentally Sensitive Areas



Map 7: Wellhead Protection Areas and Carbonate Bedrock Areas



Map 8: Agricultural Lands and Preservation




Source: UMT Housing - Internet


Source: UMT Housing - JMT


Source: UMT Housing - Internet

C. Housing

Decent affordable housing is at the center of sustainable communities and shapes the character of a community. Land use, development policies, and regulations must promote housing options to support affordability, equity, and diversity creating thriving neighborhoods. Because there is capacity for more residential development, UMT plays an important role in supplying adequate affordable housing to meet a portion of the projected housing demand through 2030 and 2040 for the region. Housing is the biggest primary budget item for most families with transportation costs as the second biggest expense. While household incomes are among the highest in the region, housing affordability for all income levels is of concern. Consistently, transportation costs have grown significantly as a proportion of household income contributing to households being cost burdened.

Housing Issues

While the high value and low vacancy rate of housing in UMT is a positive indicator of the economy, a closer evaluation of housing issues will determine if certain unmet housing needs are preventing UMT from achieving sustainability. The following are issues identified in the Housing Section of the Demographic Report in Appendix C.

- High housing costs have created a shortage of affordable housing options for both homeowners and renters.
- Renters face more cost burden – a higher percentage of household income (at or over 30% of household income) is required to live in UMT.
- Renter-occupied housing units increased by 58.8% from 2010-2015 and there continues to be a demand for rental housing due to the average housing purchase cost between $300,000 and $499,999.
- There is a demand for smaller, more affordable housing options for owners and a demand for affordable rental housing.
- The aging population of the UMT suggest a shortage of options for seniors wanting affordable housing choices such as active senior living communities, active adult housing, or active living facilities.

Housing Affordability

Housing costs directly affect financial security of individuals and the sustainability of communities. People are choosing to live in UMT regardless of high housing costs. Approximately 21% of homeowners and 41% of renters in UMT are considered cost burdened due to high monthly housing costs.

Affordable housing for all income levels has the capacity to help improve the Quality of Life (QOL) of residents with respect to health, access to education, and employment prospects.

Housing cost is the largest budget item for most households and reflects the price of housing, neighborhood school quality, public safety, and access to jobs and amenities.

Thirty percent (30%) of income has become the standard threshold for renters and owner-occupied housing as an indicator of affordability for housing. Households spending over 30% of their income on housing is considered housing cost burdened.

Sources: Appendix C – Housing Analysis and US Department of Housing & Urban Development.


Source: UMT Housing - Internet


Source: UMT Housing - Internet


Source: UMT Housing - Internet

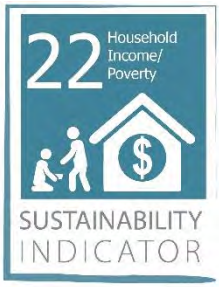
Housing Analysis

The Housing Analysis contained in Appendix D provides analysis and insight to how well the current and proposed local residential inventory matches the regional demand and what segments of the market may be underserved. Additionally, the analysis reviews existing housing market conditions in UMT and the surrounding competitive market area and addresses historic and projected demand through 2030 based upon LVPC demographic projections.

The Housing Analysis considered factors such as population and household trends including projections, population characteristics and income, housing replacement demand, gross residential demand, housing tenure and vacancy, home sales and price trends, rental housing supply, income-restricted housing, age-restricted housing, and housing product trends using building permit information.

The gross housing demand for the Primary Market Area (PMA) including municipalities within the Parkland and East Penn School Districts through 2030 is 11,017 residential units. The portion of this demand that can be captured locally depends on the competitiveness of UMT versus other municipalities in the PMA as well as lands available for residential development.

Source: Appendix D – Housing Analysis.



Build-Out Analysis Results – Meeting the Demand for Housing

A Build-Out Analysis was conducted as part of the land use planning process to determine the number of additional dwelling units and non-residential square feet that could be built on developable lands using maximum densities permitted under current zoning regulations. The details of the Build-Out Analysis are explained in Appendix F. The build-out potential capacity for additional dwelling units is contained below in comparison to the Housing Analysis for the PMA contained in Appendix D.

Approximately 1,667 housing units of various type are planned or under construction. Additionally, there is the potential for approximately 827 housing units as part of the development concepts for Opportunity Sites. The Build-Out Analysis suggests that under current zoning, UMT has the capacity to gain another 1,793 housing units on undeveloped lands zoned for residential development (both inside and outside of the Act 537 Sewer Service area). Combining planned, approved, and projected housing units, UMT has the capacity to supply

38.9% (4,287 units) of the PMA's total housing demand of 11,017 units through 2040. An additional 4,288 residential units with an average household size of 3 persons in UMT potentially increases the population from 23,884 in 2016 to approximately 36,748 by 2040 depending upon market factors, growth rate, and maximum housing unit capacity. The population projection is based upon capacity under current zoning and is consistent with the LVPC original population projection of 36,235 for UMT by 2040. In 2017, LVPC adjusted their population project for UMT to 32,220 by 2040 based upon projected large-scale non-residential uses.

Source: LVPC 2017 Population and Employment Projections—The People and Appendix F – Build-Out Analysis

Table H1: Residential Build-Out Under Current Zoning

(Excluding Residential Lands as part of Opportunity Sites and Planned/Approved Developments)

Housing Projections under Maximum Build-Out for Undeveloped Lands Inside/Outside of Act 537 Boundary			
Zoning District	Land Use Classification	Net Developable Land (Acres)*	Potential Housing Units**
RU3 – Rural-3 District	Very Low Density Residential	257	60
RU1.5 – Rural-1.5 District	Very Low Density Residential	691	242
R1 – Rural Residential	Very Low Density Residential	890	828
R2 – Low Density Residential District	Low Density Residential	100	280
R3 – Medium to Low Density Residential District	Medium to Low Density Residential	101	338
R4 – Medium Density Residential District	Medium Density Residential	0	0
R5 – Medium to High Density Residential District	Medium to High Density Residential	9	45
	TOTAL	2,048	1,793

**Net Developable Land are undeveloped lands minus lands with environmental constraints (steep slopes >25%, forested land, wetlands, water features, and 100-year floodplains) and minus 10% for roads and utilities.*

***Potential housing units is calculated based upon the maximum number of units according to current zoning regulations applying conservation by design preservation of land and permitted housing densities.*

Source: Appendix F – Build-Out and Impact Analysis.

Factors Influencing Housing Character and Supply

Factors influencing housing in UMT and the region that will shape future housing development, affordability, and choice for residents include that:

- UMT's location places it in the cross hairs of residential and non-residential development as demonstrated by significant population growth, housing demand, and economic development. Between 2010 and 2017, approximately 47% of growth within the PMA took place in UMT.
- Lands available for development zoned for various types and densities of residential development affect housing supply.
- Redevelopment of existing residential development could result in development of a greater density, resulting in the potential to experience a population greater than 40,000 by 2040.
- UMT continue to partner with the development community to supply quality, affordable housing offering a range of types for all ages and all income levels.
- Community safety, open space, recreation, good schools, and other public facilities and services influence housing trends and selection of one community over another to establish a residence.

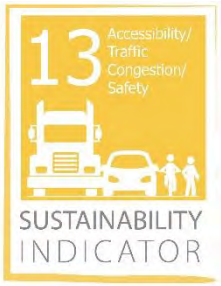
Source: Appendix D – Housing Analysis.

Housing Supply and Demand Implications

The Housing Analysis in Appendix D covers housing supply and demand in detail. The following are the comprehensive planning implications related to housing when considering land use policy, regulations, strategies, and plan implementation.

- The relationship between population growth in the region, housing development potential and marketability of location, increased traffic, and impacts on the environment, water supply, and other factors should be considered in the context of achieving sustainability.
- Housing costs directly affect financial security of individuals and the sustainability of communities. Approximately 21% of homeowners and 41% of renters in UMT are considered cost burdened due to high monthly housing costs at or in excess of 30% of household income.
- The Build-Out Analysis suggests 2,048 acres of land available for new residential development yielding approximately 1,793 units under current zoning inside and outside of the Act 537 Sewer Service Area.
- Housing diversity in terms of density, structure type, sales price and rental rate levels, and tenure offers opportunity for households to live in UMT at all life stages and cushions the Township's housing market from demographic shifts.
- Within the County and the Lehigh Valley region, there is a propensity for households to rent and the vacancy rate for rentals is 1.5%; therefore, apartment development should continue to have market support in both UMT and the region.
- Age-restricted housing and assisted living is limited in the region and is predominantly for-sale single family homes in 55+ communities. For example, a 157 unit 55+ townhome community, known as Schaefer Run Commons, is proposed for development in UMT.

Source: Appendix D – Housing Analysis and Appendix F Build-Out and Impact Analysis.

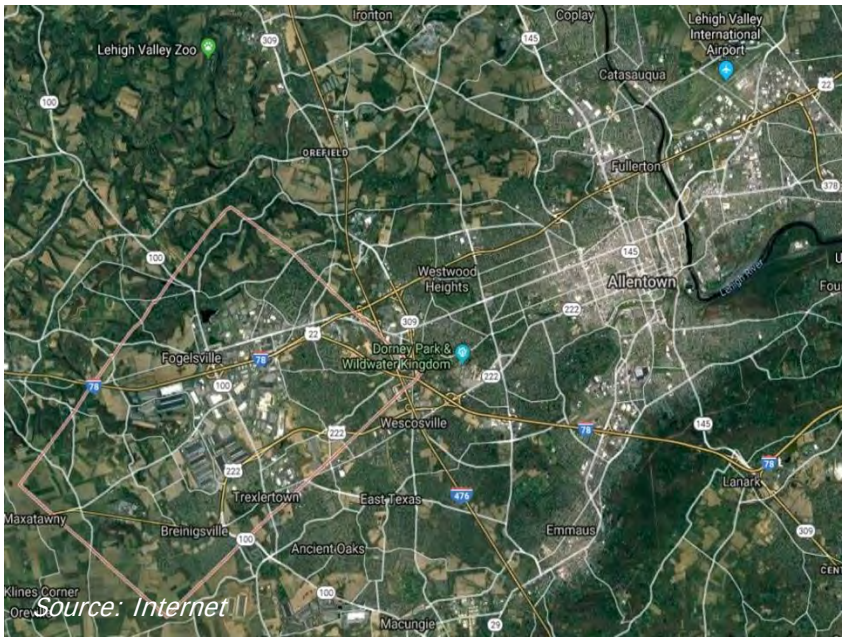


Housing Strategies

- Continue to provide robust public amenities and well-functioning road and highway infrastructure to support the housing market over time.
- Partner with the development community to provide income-restricted affordable housing in UMT that will provide opportunities for lower income families to benefit by reduced travel costs and reduced commute times to work in UMT industries and warehouse/logistic centers as well as provide access to high-quality public schools.

- Consider inclusionary zoning to ensure the long-term viability and attainability of affordable housing for all income levels. Reference LVPC's Inclusionary Zoning Model Ordinance at https://www.lvpc.org/pdf/inclusionaryZoning.pdf.
- Develop design guidelines and criteria for siting retirement communities in centrally located areas with access to transit and destinations within walking distance. Retirement communities should include a mix of age-restricted housing for independent living, assisted living facilities, and nursing home facilities that allow individuals to age in place close to family members and friends.
- Consider manufactured homes, mobile homes, and tiny homes as a solution to affordable housing for a range of individuals and households as first-time renters and/or homeowners and those who have low-middle incomes.

- Create mixed-use developments with residential units, community serving retail, services, and dining establishments as well as provide space for employers such as office, health care, and other neighborhood commercial uses that help reduce traffic volumes and appeal to the growing household preferences for walkable, live-work-play environments.
- Consider increasing residential density and diversity through zoning changes to maximize the value of remaining lands available for development and increase the tax base.
- Increase preservation and conservation activity to reduce the amount of lands available for residential development providing increased sustainability for UMT and the Lehigh Valley.



Source: Internet


Photography by Allie Scarfaro, JMT


Source: Internet

D. Economy

UMT is a growing suburban employment hub offering the local and county labor force opportunities to work close to home. Since the 2007 Comprehensive Plan, UMT continues to enjoy a strong economy that has been fueled by various local and regional factors.

Sustainable community development integrates environmental, economic, and social goals, objectives, and policies. Growth generates a complex set of social, environmental, infrastructure, and public services costs. Economic development is about giving people what they want without compromising quality of life (QOL) by providing opportunity at a cost to the environment and social aspects of a community that is reasonable to all.

Striking a balance between unbounded economic growth and sustainability requires land use policies focused on growth management, environmental protection, and community services and facilities spending to provide the QOL expected by today and tomorrow's residents. To achieve a balance, UMT may be at a point where more emphasis should be placed on sustainability and less on economic growth.

Factors Fueling Economic Development

- Population growth locally and regionally.
- Location in the region and northeastern US.
- Accessible transportation network.
- Competitive tax structure.
- Good schools, access to higher education, and highly educated labor force.
- Continued investment in public infrastructure.
- Access to a variety of housing types.
- Quality amenities locally and regionally (e.g. access to parks, recreation, trails/paths, shopping, tourism, health care, and entertainment).
- Sustainable management of natural resources and community supported policies for preservation of agricultural lands.
- Land use policies and regulations.

Importance of Economic Development

Economic development is a critical component that drives local, regional, and national growth, creates high wage jobs, and facilitates an improved QOL. UMT's partnership with LVEDC and others is important to achieve:

- Job creation – connecting new-to-market and existing companies with resources and partners that help attract new businesses and support business retention and expansion.
- Industry diversification – working to diversify the economy to reduce the Township and the region's vulnerability to a single industry.
- Business retention and expansion – retaining and expanding operations plays a significant role in economic growth locally and regionally.
- Economy fortification – attracting and expanding the region's major employers helps to protect the local economy from downturns.
- Increased tax revenue – increasing the presence of companies translates into increased tax revenue for community projects and local infrastructure.
- Improved QOL – improving the local and regional economy raises the standard of living for today and tomorrow's residents.

The following key factors affecting economic development should be tracked over time to measure performance toward achieving community sustainability. The Economic Analysis, Housing Analysis, and Build-Out Analysis reports contained in the Appendices to this plan suggest the following 2030 projections.

Table E1: Key Factors Affecting Economic Development

Key Economic Factor	Current	2030+	Projected Change
Population	23,884	35,341	+11,457
Commuter Trips into UMT	31,000	44,674	+13,674
Housing Units	8,579	12,398	+3,819
Acres of Agricultural Lands	4,319	1,516	-2,803
Acres of Open Space and Park/Recreation Lands*	685	801	+116
Commuter Trips to Work Outside of UMT	17,744	26,252	+8,508
Number of New Commercial Trips		9,349	
Number of New Jobs Created		7,624	
Number of School Aged Children	5,493	8,128	+2,635
Number of Elementary School Aged Children	549	812	+263

Sources: Appendix D – Housing Analysis, Appendix E – Economic Analysis, and Appendix F – Build-Out and Impact Analysis.

According to LVPC economic modeling, UMT when compared to other Lehigh County municipalities is projected to experience the second largest increase in population through 2040. Additionally, both UMT and Lower Macungie Township are on the list of the top five municipalities within the Lehigh Valley projected to experience the highest growth in employment through 2040. And, UMT is expected to experience the highest growth in employment through 2040. This anticipated growth in UMT and in Lower Macungie Township will impact land use, natural and agricultural resource protection, adequate public facilities and services, infrastructure, and transportation planning and investments.

Table E2: Population and Employment Projections

Municipality	Economic Factor	2010	2020 Projection	2030 Projection	2040 Projection
Upper Macungie TWP	Population	20,063	24,075	28,355	32,220
Upper Macungie TWP	Employment	29,954	36,255	39,006	41,707
Lower Macungie TWP	Population	30,633	33,169	35,834	38,142
Lower Macungie TWP	Employment	9,660	13,774	15,571	17,335

Source: LVPC, The People 2017 – Population and Employment Projections

Economic Implications

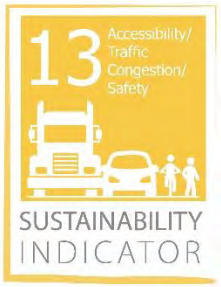
Issues impacting economic growth outlined in the Economy Section of Appendix C – Demographic Report, the Economic Analysis contained in Appendix E, and the Housing Analysis in Appendix D suggests the following:

- For over a decade, the Lehigh Valley and UMT have had unemployment rates lower than national and state averages. While full employment indicates a robust local and regional economy, very low unemployment rates can discourage additional employers from locating in a community because of concerns about a shortage of available labor.
- Traffic congestion impacts economic growth. Approximately 31,000 workers commute to UMT daily. Fourteen percent (14%) of the jobs in UMT are held by residents of the City of Allentown who predominantly work in manufacturing and warehouse/logistics/distribution and service sectors (generally lower wage paying jobs).
- The potential loss of low skilled jobs with warehouse operations using robots and other technology. Most warehouse and logistic center operations have combined distribution and fulfillment operations into a single facility using robots, highly automated conveyors, and equipment to assist staff with faster fulfillment processes. Many of the largest distribution and fulfillment centers have plans to automate almost every physical move in their facility by 2020. *Source: Material Handling & Logistics, Technology & Automation, Rise of the Warehouse Robots.*
- While the diversity of education levels in the Township and County offers a labor force for many types of businesses, local and regional land use and housing policies influence business location as well as impacts such as commuting and housing costs for households with low-to-moderate incomes seeking suitable, affordable housing close to where they work.
- UMT has a shortage of affordable housing availability and choice for low-to-moderate income households which affects the sustainability of the economy (refer to Appendix D: Housing Analysis).
- UMT agricultural preservation policies coupled with private and public investments to permanently preserve farmland have contributed to a diverse economy resulting in a stable level of employment in agriculture and extractive sectors from 2007-2016.

Housing Cost and Travel to Work are Economic Indicators

Housing and travel to work are the first and second largest costs of household budgets.

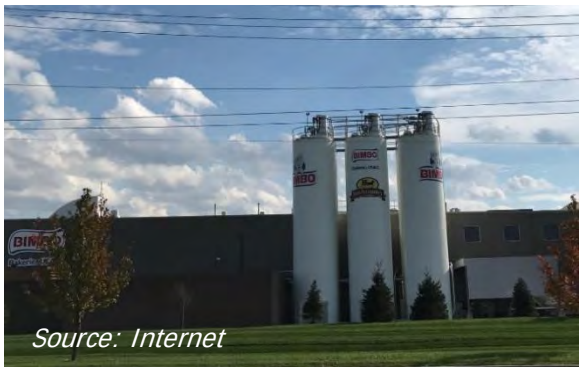
Fourteen percent (14%) of the workers commuting to UMT reside in the City of Allentown. The 24-mile commute could be an hour commute time during peak hours, and the cost to travel to work could be a significant portion of low-to-moderate income households.



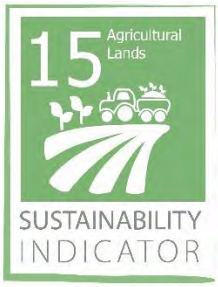
Photography by Allie Scarfaro, JMT

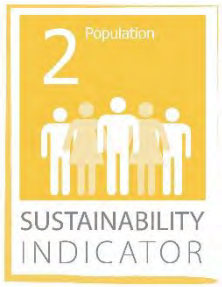
- Over 80% of businesses in Lehigh County have fewer than 10 employees. UMT has been successful at attracting and retaining several substantial employers in the region (e.g., Amazon.com; Air Products and Chemicals; Lutron Electronics, and satellite operations of several other employers such as Mack Trucks, B. Braun Medical, and regional hospital and health network medical facilities).
- The Lehigh Valley industrial market is well-positioned to continue to compete for warehousing and distribution uses. The concentration of large-scale warehousing and logistic centers in and around UMT has led to challenges related to heavy truck traffic on state and local roadways resulting in conflicts and traffic safety between residential and industrial uses.

Photography by Allie Scarfaro, JMT


Source: Internet

- Warehousing and logistic center facilities built prior to 1980 are becoming obsolete. There is a demand for "last mile" delivery facilities in areas in the urban fringe creating a need for the use of smaller existing or newly constructed industrial buildings as distribution nodes.
- As changes in the market occur, adaptive reuse of large warehousing and logistic center buildings may be an important factor to the future economic sustainability of UMT.
- The continued demand within the region for additional warehouse, logistics, and distribution space will continue to pressure UMT decision makers to rezone lands outside of the Act 537 service area for additional warehouse/logistics/distribution and residential development.
- While UMT and surrounding municipalities are well served by existing regional retailers, there is a demand to provide more retail locally as part of a mixed-use development including lodging, entertainment, restaurants, open space, and office uses in UMT.
- UMT has permanently preserved over 12 farms (932 acres) through the purchase of agricultural conservation easements. Through conservation by design, UMT has been able to obtain 156 acres of farmland and additional 167 acres of open space in the past 10 years with 323 acres of land owned by UMT is scheduled to be placed in Agricultural Conservation Easements.






Source: WFMZ

Build-Out Implications

The Build-Out Analysis in Appendix F identifies approximately 18.28% or 3,066 acres of net developable land. Net developable land is land minus environmental constraints that can be feasibly developed into residential, non-residential, or mixed-use development in accordance with current land use regulations. Planning implications include the following:

- An increase in residential and non-residential development impacts the local tax base and cost of public infrastructure and services (e.g., roads, water, sewer, emergency services, schools, etc.) to meet the needs and demands of the future population including school aged children and the economic base.
- The projected loss of approximately 2,800 acres of agricultural land negatively impacts QOL, employment opportunity in this economic sector, and the environment.
- The remaining 611 acres available for non-residential development is predominantly zoned for industrial and warehouse/logistic/distribution center uses.
- A significant amount of lands (1,949 acres) available for development are zoned for very low or low-density residential development (RU-3, RU-1.5, and R1 Zoning Districts). These districts regulate reduced density, resulting in the loss of larger amounts of agricultural lands and open space, increased roadway improvements, reduced walkability, and increased sprawl.
- Increased traffic in and out of UMT contributes to traffic safety, mobility, and accessibility (congestion) issues locally and regionally. This congestion translates into an increase of state and local taxes to meet transportation infrastructure demands.

Non-Residential Lands Available for Development under Current Zoning

- 61 acres are available for Highway Commercial development
- 35 acres are available for Neighborhood Commercial development
- 515 acres are available for Light Industrial development

Source: Appendix F – Build-Out and Impact Analysis.

Cost of Community Services and Fiscal Impacts

The way land is used in your community affects taxes and QOL. Land use matters, therefore, UMT Planning Commission members and Supervisors must carefully consider the financial impacts on the community when a development is proposed and/or when a rezoning request is made. Land use decisions should focus on social, economic, and environmental impacts and benefits to assure long-term sustainability of the community.

A Cost of Community Services (COCS) study is an approach used by municipalities to determine the fiscal contribution of existing and potential local land uses. And, a Fiscal Impact Study projects public costs and revenues for different land development patterns. These types of studies generally show that residential development is a net fiscal loss for communities and recommend commercial and industrial development as a strategy to balance local budgets. Greater detail associated with the cost of community services is provided in Appendix F – Build-Out and Impact Analysis.

Source: American Farmland Trust and USDA.

Current and future homeowners benefit from industrial, commercial, farming, and open space as part of the local tax base because these land uses help to subsidize school expenses and the cost of public services. The revenue from these land uses help to keep the taxes low for residents.

When residential development occurs, the land is converted from a net contributor to the Township and School District to a net drain.

Source: Penn State Cooperative Extension.

Economic Development Strategies

The following range of strategies will contribute to strengthening UMT's long-term economic sustainability.

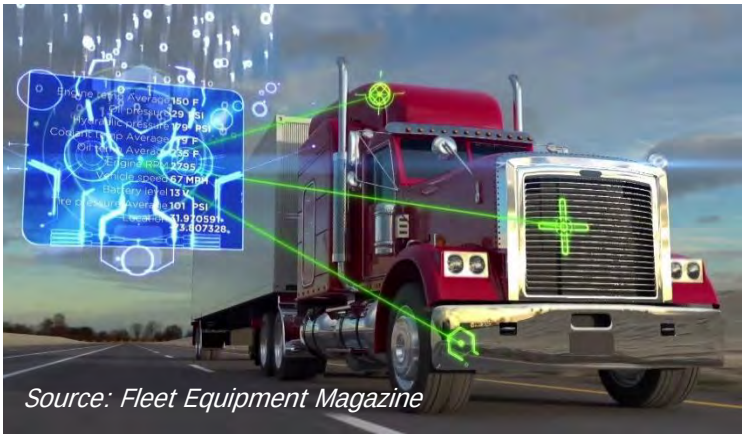
- Conduct a detailed Cost of Community Services (COCS) study to provide a snapshot in time of costs versus revenues for each type of land use to help decision makers understand the benefits of conservation and preservation of land over development.
- Continue to provide financial incentives for preservation of agricultural lands to purchase agricultural conservation easements. Additional preservation of agricultural land sustains a diverse economic base, contributes to the local and regional food supply, impacts natural resources, water quality, and the regional water supply, and reduces impacts on the cost of public infrastructure and services.
- Continue regulatory requirements for preservation of environmentally sensitive lands, open space, and park and recreation lands and establish agricultural protection zoning (APZ).
- Continue to provide flexibility in land use regulations to include farmer's markets, agritainment, bed and breakfasts, and other appropriate on-farm commercial uses and/or operations.
- Continue to preserve agricultural land and promote farming as part of UMT's diverse economic base.
- Continue to provide opportunity for new and experienced farmers to lease Township owned land for farming activity. Provide information and links on the UMT website for PA Small Business Development Center (SBDC) education and state financing programs for farmers.
- Based upon the Housing Analysis recommendations, support residential development for retirement communities. This type of residential development provides more in revenues than they require back in services (e.g. there is no demand for school services).
- Continue to identify redevelopment opportunities and adopt appropriate land use policies and regulations that support development of mixed-use centers. Based upon market factors, target areas for redevelopment over the next 5-10 years include the following:
    - Redevelop the aging Fogelsville Center located on Tilghman Street to create a mixed-use, walkable office and commercial retail environment that serves as a gateway to the Village of Fogelsville.
    - Redevelop the existing Air Products campus including adaptive reuse and newly constructed space for credit tenants – typically established companies or chain retailers to facilitate financing. This could include space for retail and office users in locations with visibility from Hamilton Boulevard and warehouse development accessible from Cetronia Road.

Photography by Allie Scarfaro, JMT

    - Redevelop existing office parks to provide contemporary office space with amenities offered as a mixed-use, campus-style development (e.g., restaurants, retail, fitness, open space, entertainment, and commercial recreation) improved with walking paths and transit access.
    - Redevelop smaller obsolete warehouse sites to provide smaller scale "last mile" delivery centers.
    - Where appropriate, encourage combining smaller sites to allow for increased buffers, setbacks, and screening to protect residential neighborhoods from non-compatible uses.
    - Where appropriate, consider mixed-used development and redevelopment to include affordable housing options for low-to-moderate income households, professionals entering the labor force, public service employees, and seniors.

  - Provide affordable housing for the labor force of the future that replaces warehouse operations with other uses identified on the following page as reuse strategies for large-scale warehouse facilities.
  - Modify existing developments with sidewalk improvements and other transit-friendly enhancements to increase potential ridership and feasibility of LANTA service to targeted redevelopment sites.
- As part of the land development process, continue to require traffic analysis, intersection improvements, access management strategies, and congestion mitigation solutions.
- Connect current and prospective small business owners with the SBDC at Lehigh University, the Greater Lehigh Valley Chamber of Commerce and their small Business Center, and the LVEDC offering a range of resources, technical assistance, and guidance on financial options.

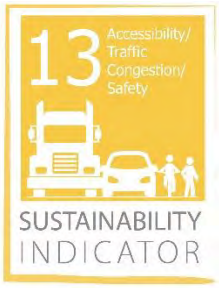
- Require adaptive reuse strategies and plans for large-scale warehouse facilities as part of land development plans for potential reuse options such as:
  - indoor/outdoor sports complex and facilities;
  - indoor farming and/or hydroponics;
  - schools, universities, and similar uses with addition of upper floors;
  - mixed use development with first floor retail and office uses with upper floor office and residential uses (mix of market rate and mixed-use housing) with a mix of other support uses; or
  - mixed use community for senior living and other potential uses.


Source: Fleet Equipment Magazine


Source: Phys Org News

E. Transportation

The transportation network plays an important role in UMT for local and regional commuters, freight movement (rail and truck), and local travel for basic needs and recreation. The 2012 federally adopted legislation MAP-21, Moving Ahead for Progress in the 21st Century, focuses both PennDOT and LVPC's attention on performance management and performance metrics for the regional transportation network. Metrics related to safety, bridge and pavement condition, air quality, freight movement, and performance of the National Highway System (NHS) are crucial to the economic viability and sustainability of the region. UMT is positioned to influence regional performance measures identified by the LVPC due to growth of local employment centers including the warehouse/logistic/distribution cluster. This chapter describes the transportation network in the context of the local landscape and the region.



Roadway Classification

UMT roadway classifications are depicted on Map 9 Street Classification. The following describes each classification by the intended function establishing guidance for spacing of intersections. Classifications have direct relationship to land use intensity, density, and trip generation.

Table T1: PennDOT Roadway Classifications

Roadway Class	Roadway Type	Desired Operating Speed	Ave Trip Length (mi)	Volume (AADT)	Intersection Spacing (ft)	Definition*
Interstate/ Expressway	Interstate	55-70 mph	25-350+	Rural 12,000 - 34,000 Urban 35,000 – 129,000	1 mi (urban interchanges) 2-6 mi (rural interchanges)	Designed for high-speed connections between regions and parts of a metropolitan area. Designed for high volumes of traffic with limited access.
Arterial	Regional	30-55 mph	15-35	10,000 – 40,000	600 – 1,320	Designed to provide the fastest method of travel with low access from adjacent roads. Designed with long distance travel in mind. Access management is used to provide safe accessibility for commercial uses.
	Community	25-55 mph	7-25	5,000 – 25,000	300 – 1,320	
Collector	Community	25-55 mph	5-10	5,000 – 15,000	300 – 660	Designed to connect local roads and arterial roads for moderate volumes and speeds providing a balance between access and mobility.
	Neighborhood	25-35 mph	<7	<6,000	300 – 660	
Local	Local	20-30 mph	<5	<3,000	200 – 660	Designed for low speeds and high accessibility from residential driveways with connection to collector and arterial roads.

Sources: PennDOT, Design Manual, Part 2 – Highway Design and USDOT, FHWA, Highway Functional Classification https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/ and Safety Assessment of Interchange spacing on Urban Freeways https://www.fhwa.dot.gov/publications/research/safety/07031/.

**Definition from UMT 2007 Comprehensive Plan (definition is generally consistent with FHWA and PennDOT) and Wikipedia – Functional Classification.*

Additional information with respect to required lane and shoulder widths, parking lane, bike lane, median, curb return, number of travel lanes, roadside amenities (e.g., sidewalks, buffers, etc.), and the desired operating speed for each of the classifications in the context of urban, suburban, and rural settings is detailed in PennDOT's Design Manual. This manual should be referenced to make routine updates to design standards and requirements in the Township's Subdivision/Land Development Ordinance and/or a Design Standards Manual.

Source: PennDOT, Design Manual-2- https://www.dot.state.pa.us/public/Bureaus/design/PUB13M/Chapters/TOC-2.pdf.

Integrated corridor management (ICM) programs focus on significant improvements for the efficient movement of people and goods through the integrated, proactive management of existing infrastructure along major corridors. A transportation corridor is "a combination of discrete, adjacent surface transportation networks (e.g., freeways, arterials, transit networks, etc.) that link the same major origins and destinations. An integrated approach to corridor management provides the framework for UMT to work collaboratively with PennDOT and LVPC transportation professionals to improve operations of corridors such as Route 100, US 222, Tilghman Street (SR 1002), and Hamilton Boulevard (Business US 222). Considering these corridors as a multimodal system will guide operational decisions and improvements that balance transportation, land use, and economic development goals and objectives. This type of approach to corridor analysis and management is most successful in collaboration with LVPC and surrounding municipalities that these corridors serve.

Source: USDOT, FHWA https://ops.fhwa.dot.gov/publications/fhwahop16036/ch1.htm.

Roadway Restrictions and Truck Parking

The implication of high volumes of truck traffic and truck safety is an important issue to the community. The UMT Board of Supervisors adopted a truck routes and restrictions map. Map 10 Truck Routes and Restrictions identifies routes where roadway conditions and development are compatible with truck traffic. The map also notes various restrictions associated with vehicle size as a factor for determining various routes.

As the industrial and logistic/warehouse cluster intensifies in UMT, the review and evaluate of roadway condition, safety, and congestion should be made by staff to update this map and refine restrictions. Education and enforcement of restrictions is through the UMT Police Department, the Good Neighbor Coalition, and communication and coordination with logistic/warehouse management staff and representatives from various trucking companies. The map and other information are routinely disseminated to these groups.

While the Electronic Logging Device (ELD) mandate is expected to result in increased safety, the impact has compounded the need for safe truck parking across the nation, in the region, and in UMT. Both public and commercial truck stops must consider the requirement for use of the latest technology to manage and communicate available parking to the trucking community. Real-time data collection technology using in-pavement sensors, ground-based radar sensors, crowdsourcing, and video ground truthing are used to count available spaces with information communicated through truck parking apps on smartphones.

Roadway Congestion and Safety

Mobility and safety are important to local and regional travelers, goods movement, QOL, and economic vitality. Roadways with insufficient capacity and/or poor management and maintenance result in higher than average levels of congestion and safety issues.

Congestion Performance Measures

- Level of Service (LOS)
- Crash (trucks, vehicles, bicycles, and pedestrians) Frequency and Severity
- Public Health Impacts
- Reliability and Travel Speeds
- Asset Management and Preservation
- Quality of Life (QOL)

Traffic congestion in UMT and the region have been significantly increasing over the past decade due largely in part to growth and development shaped by local land use policies within the Lehigh Valley as well as state and national growth of warehousing/logistic center operations. Studies suggests that the interrelationship between

traffic congestion and safety are attributed to unstable flow and roadway conditions, abrupt changes in traffic flow, or congested conditions resulting in increased frequency of crashes.

Level of Service

The 2010 Highway Capacity Manual defines Level of Service (LOS) as a "quantitative stratification of a performance measure or performance measures that represent quality of service measured on a A-F scale with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst." The following table provides a general description of each roadway level of service.

Table T2: General Definitions of Level of Service (LOS)

Level of Service	General Operating Conditions
A	Free flow, with low volumes and high speeds.
B	Reasonably free flow, but speeds beginning to be restricted by traffic conditions.
C	Stable flow, but most drivers are restricted in the freedom to select their own speeds.
D	Approaching unstable flow, drivers have little freedom to select their own speeds.
E	Unstable flow; may be short stoppages.
F	Forced or breakdown flow; unacceptable congestion; stop-and-go.

Sources: Adapted from the AASHTO Green Book and FHWA Flexibility in Highway Design.

While traffic projections and LOS is used as a performance metric, these measures have historically resulted in the movement of vehicular and truck traffic taking priority over preserving the character of neighborhoods. The engineering community has decided that generally LOS C in most communities and LOS D in urban environments represents a balance between congestion versus loss of neighborhood character. There is no state or federal mandate to apply LOS standards or to target 20 years into the future for traffic projections to dictate roadway or highway design. The sole use of LOS letter grade for the free flow of traffic based upon vehicular travel is too narrow a measure of the transportation network performance. While congestion should be addressed with the desire for free flow of traffic, designing every intersection for demand during the highest peak hour results in oversized and over designed roadways negatively impacting public spaces between the edges of roads and buildings such as space typically reserved for pedestrian and bicycle travel.

Source: USDOT, Evolving Level of Service Metrics in Transportation Analysis – Introduction
https://cms.dot.gov/sites/dot.gov/files/docs/mission/office-policy/transportation-policy/266046/los-case-study-intro508_0.pdf.

Congested Corridors

In 2017, the LVPC identified the following roadway segments in UMT as congested corridors with a 2040 projected peak hour LOS of D or lower assuming implementation of transportation investment projects in the current Transportation Improvement Plan (TIP) and Long-Range Transportation Plan (LRTP). The table below and Map 11 identifies congested corridors in UMT. As a matter of policy, congested corridors take a higher priority on the TIP over other projects.

Table T3: Congested Corridors and Priority Corridors

2017 Congested Corridors		2040 Projected Congested Corridors	
Corridors in UMT	Priority Crash Corridors*	Corridors in UMT (in part or whole)	Priority Corridors
Route 222 (Schaefer Run Road to Route 100)	✳	Route 222 (Folk Road to Route 100)	✳
Schantz Road (Adams Road to Route 100)	✳	Schantz Road (Route 222 to Route 100)	
		Route 100 (Claussville Rd to Tilghman St)	✳
		Tilghman Street (Route 100 to Route 309)	
		Route 22 (Route 100 to Wood Ave, Easton)	✳
		I-476	✳

Sources: LVPC, MOVELV Congestion Management Process (2017) and LVTS LRTP (2015).
**Portions of the corridor within UMT are identified by LVPC as priority crash corridors.*

The corridors identified above are generally located within what LVPC has identified as the Urban Development area for the County and are predominantly located within the UMT Urban Growth Boundary identified in the Land Use chapter of this plan. LVPC identified 15 Priority Corridors within the region based upon percentage of truck traffic, location on the National Highway System, functional classification, roadways in the County's Urban Development area, and corridors with a projected LOS F in 2040. Of the 45 congested corridors in the region, six (6) corridors in the region impact transportation infrastructure and quality of life in UMT with four (4) of those congested corridors identified for priority improvements and funding. Additional information about these corridors is contained in the LVPC, MOVELV Congestion Management Process (CMP) plan.

Source: LVPC, MOVELV Congestion Management Process (2017)

Bridges

The maintenance and replacement of bridges is crucial to accessibility, mobility, and safety locally and regionally. PennDOT's OneMap application and list of bridges on locally-owned roads identifies two bridges of concern for improvement – Hickory Lane (a County bridge replaced in 2017) and Township Line Road (a Township bridge).

Logistic Centers and Warehouse Development

Cluster warehouse development and logistic centers by nature and impact fit the definition of uses in the MPC identified as a "development of regional significance and impact or any land development that, because of character, magnitude, or location will have substantial effect upon the health, safety, or welfare of citizens in more than one municipality."

Source MPC Article I – General Provisions, 107 Definitions.

Land Use Decisions have Transportation Implications

Of the 1,000 acres of 2016 non-residential development in the Lehigh Valley, 915 acres were industrial with 87% of the floor area in both Upper and Lower Macungie Townships – nearly 2.2M SF in UMT and 3M SF in LMT of logistic center/warehouse development.

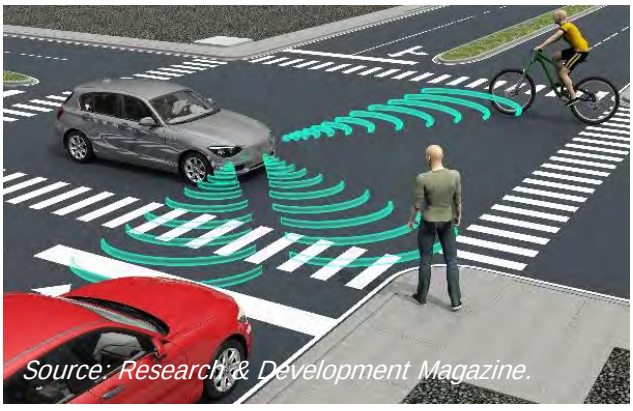
This type of development of regional significance and impact affects the natural environment, public health, the regional interstate system, and the local and regional transportation networks due to increased truck and commuter traffic.

Source: LVPC 2017.

According to the LVPC, BuildLV, and the Lehigh Valley Annual Development Report (2017), "industrial development will likely continue to dominate non-residential development in the Lehigh Valley, particularly as the region takes its place as one of the fastest growing locations for logistics and warehousing." Accessibility and clustering of similar uses are crucial factors in location decisions for this segment of the economy with direct access to interstate highways required for efficient economic transportation of cargo. The level of accessibility for this type of development with respect to capacity and structure of the transportation network makes one location versus another more attractive to logistic center/warehouse development. Transportation accessibility stimulates the movement of goods, reduces transport times, improves market access, and promotes economic growth.

Technology

Technology in motor vehicles is saving lives today with the goal to implement Automated Driving Systems (ADS) and Autonomous Vehicles (AV) within the 20-year horizon of this plan. A variety of technologies are used to reduce congestion and improve safety including technology to collect road and vehicle data, connectivity technology (smarter/automated cars), driving apps, and other technology under development. UMT has opportunity to utilize Intelligent Transportation Systems (ITS) as part of the public-private partnerships with developers to make transportation network improvements. ITS is the application



Source: Research & Development Magazine.

of sensing and data collection, analysis, and control and communications technologies to improve safety, mobility, and efficiency. ITS includes a wide range of applications that process and share information to reduce congestion, improve traffic management and safety, minimize environmental impact, and increase the benefits of transportation to all users.

Source: USDOT https://www.its.dot.gov/factsheets/benefits_factsheet.htm.

Source: LVPC website.

Congestion Mitigation and Safety Strategies

The USDOT, PennDOT, and LVPC continue to transition from using Level of Service (LOS) exclusively as a performance measure of congestion and safety to a broader base of performance measure. UMT in partnership with both PennDOT and LVPC have available the following methods and strategies that contribute to reducing local and regional roadway congestion and improving safety for all modes of travel.

Congestion Mitigation & Traffic Safety Solutions

- Intelligent Transportation Systems (ITS)
- Traffic Signal Modifications
- Intersection Improvements
- Roadway Realignment
- Access Management
- Public Transit
- Pedestrian and Bicycle Improvements

Source: LVPC, MOVELV CMP (2017).

- Continue to collaborate with LVPC/LVTS through the TIP process, multimodal planning, and implementation of local and regional projects that relieve congestion and improve safety for all modes of travel.
- Take a broad approach to resource allocation including planning and programming for the TIP, UMT Capital Improvement Plan (CIP), developer improvements, grant sponsored projects, and public-private improvements to implement multimodal solutions.
- Consider the context of the community and apply Context Sensitive Design and Flexibility in Design standards for a range of transportation solutions.
- Plan, prioritize, design, and construct multimodal projects through public-private partnerships that improve safety and logistics for other roadway users such as bicyclists, pedestrians, and transit.
- Instead of solely relying on LOS to measure performance, apply the broader approach of comprehensive transportation performance management (e.g., travel speed, reliability, safety, asset preservation, quality of life, and other measures) to support transportation investment decisions.
- Improve operations using Intelligent Transportation Systems (ITS) and prepare for roadways using technology and provide routine maintenance to support connected and automated vehicles (C/AV).
- Implement cost effective countermeasures that optimize traffic flow and improve safety through innovation of design and technology.

- Improve driver behavior through public education and awareness, signage, signal timing, detectors, and enforcement to reduce congestion and increase safety.
- Work as partners with LVPC to establish a transportation asset management system that links user expectation for network condition, performance, and accessibility with system management and investment strategies with a focus on performance of assets.
- Augment LOS requirements in UMT Subdivision and Land Development Ordinance with comprehensive transportation performance management factors requiring multimodal and context sensitive solutions, access management, and appropriate use of technology.
- Partner with warehouse owners and PPL to provide transit and pedestrian/bicycle facilities.

Pedestrian and Bicycle Facilities

Walking and bicycling is a healthy low-cost and environmentally sensitive mobility option. These modes of travel and recreation have increasingly gathered popularity and impact local economies. For example, the Alliance for Biking & Walking demonstrates how a $1 million investment creates more jobs through building infrastructure specific to bicycling and walking compared to road projects without these facilities.

Source: Alliance for Biking & Walking, Bicycling and Walking in the United Stations, 2016

The following commonly used terms are defined to support a local Complete Streets Policy and strategies to address pedestrian and bicycle accessibility, mobility, and safety.

Active Transportation is choosing to walk or cycle as your day-to-day way of travel from one place to the other.

Pedestrian Facilities are pedestrian access routes and reasonable amenities, including but not limited to benches, bus shelters, lighting, and water fountains as well as provisions to accommodate, enhance, or encourage walking.

Bicycle Facilities are improvements and reasonable amenities and provisions to accommodate, enhance, or encourage bicycling, including but not limited to bicycle lanes and paths, traffic control devices, parking, storage facilities, and bike share systems.

Local Complete Streets Policy

The Township shall provide a comprehensive and integrated multimodal transportation network with connections to community facilities, villages, and shopping and employment centers that are safe and convenient for people of all ages and abilities. This is accomplished by:

- Adopting Smart Growth land use policies that encourage active transportation (bicycling/walking) and transit trips.
- Providing Safe Routes to School via pedestrian facilities connecting schools with adjacent neighborhoods within an acceptable walking and biking distance based upon student ages.
- Incorporating bike/pedestrian facilities into all development, redevelopment, and transportation projects.
- Requiring connections from neighborhoods to community facilities, employment clusters, and business and shopping centers as part of the land development process.
- Coordinating with the Police Department to provide education and public awareness programs for the traveling public, bicyclists, and pedestrians.

Potential connections for pedestrians and bicycles identified by Township staff and the public as part of the Visioning Workshop are noted on Map 12 Connections located at the end of this section. UMT has collaborated with LVPC to identify regional connections throughout the Township and will continue collaboration as LVPC conducts and implements the Walk/RollLV Active Transportation Plan for the Lehigh Valley.

Pedestrian and Bicycle Strategies

- Adopt a Complete Streets Policy by either a Board of Supervisor resolution or executive order and/or internal departmental directives. Promote biking and walking on the Township website.
- Review bicycle and sidewalk policies and regulations to consider appropriate changes to assure high-quality, safe, and convenient pedestrian and bicycle facilities.

- Include design standards in the Subdivision and Land Development Ordinance with graphic examples of types of on- and off-street bicycle and pedestrian facilities compatible with the character of the community and roadway vehicular speeds, functional classification, and level of congestion. Refer to concepts in Chapter 4, Community Character and Design.
- Creatively balance competing interests of all modes in a limited amount of right-of-way with emphasis on accessibility, mobility, and safety of bicyclists and pedestrians.
- Use routine targeted enforcement and information sharing to encourage motorists and cyclists to share the road safely and to promote safety.
- Further evaluate and prioritize the potential pedestrian and bicycle connections identified on Map 12 Connections to be implemented through public-private partnerships, adopt an Official Map identifying on- and off-road facilities, and pursue grant applications for planning, design, and construction of pedestrian and bicycle facilities.

Transit Services

Taking the bus or bus rapid transit (BRT) is a sustainable way to transport residents quickly, efficiently, and safely within the region to employment, shopping, recreation, and entertainment. This cost effective means of transportation reduces impacts such as travel time, congestion, and local air pollutant emissions while improving traffic safety and increasing physical activity such as walking to and from terminal or stop (World Resources Institute, 2103).

Source: LANTA website.

Transit includes light, heavy, and commuter rail, motorbus (intercity and regional rubber tire bus), trolley bus, van pools, automated guideway, and demand responsive vehicles (FHWA, Glossary). Transit is often referred to as public transportation.

Public Transportation Service

For over 40 years, LANTA has provided reliable, safe, and affordable public transportation. The LANTA bus system is a network of 30 fixed bus routes throughout the region. The following LANtaBus fixed route service provides connection to and from UMT, the City of Allentown, and various attractions in the region.

- Weekday Route 213 – Allentown Transportation Center to Amazon and Lehigh Valley West
- Weekday Route 218 – Allentown Transportation Center to Weis Markets (Fogelsville)
- Weekday Route 322 – Allentown Transportation Center to Amazon

These routes provide connections to the downtown, suburban communities, medical facilities, and employment (including the logistic centers/warehouse development in UMT), and commercial shopping centers. In addition to the fixed-route system, LANta provides LANtaVan service for persons with disabilities – this is a door-to-door, shared ride, or paratransit service. This service is available to eligible individuals if there is no LANTaBus fixed-route service.

Source: https://www.lantabus.com

Commercial Transit Service

Trans-Bridge Lines, Inc. offers daily service to New York City, Newark, and JFK Airports from the Lehigh Valley area and surrounding region. Additionally, weekday service is available to Lower Manhattan, Wall Street, and Jersey City from the Lehigh Valley providing an option to personal vehicle travel and carpooling for long distance commuters. Since December 2017, Trans-Bridge Lines bus company opened a ticket office and bus stop at the Lehigh Valley International Airport's multimodal transportation center.

Source: http://www.transbridgelines.com/

Airports – Lehigh Valley International Airport (ABE)

ABE is a public airport located in Hanover Township, Lehigh County approximately three miles northeast of the City of Allentown. The airport is owned and operated by the Lehigh-Northampton Airport Authority with the Federal Aviation Administration (FAA) categorizing this facility as a non-hub primary commercial service facility. Due to the rapid growth of e-commerce, proximity to major population centers and increased demand for efficient shipping of merchandise, the airport has become heavily used for transportation of air cargo. Since 2016, the facility ships more than 126 million pounds of cargo annually with companies such as Amazon.com and FedEx Ground relying heavily on air-cargo services. Other airports in the region owned and operated by Lehigh-Northampton Airport Authority are Queen City Municipal Airport (XLL) located in the City of Allentown, PA and Braden Airpark (N43) in Easton, PA.

Source: ABE website https://www.flylabe.com/

Freight Movement

Local decision-makers and regulators need to understand various goods movement trends to best address environmental impacts such as emissions, climate change, and energy conservation. Freight plays an important economic role in the Lehigh Valley. Trade growth regionally and nationally and the demand for faster, more energy-intensive transportation modes (e.g., truck and air versus ship and rail) means emissions and roadway and bridge investments are increasing.

Rail Freight

Rail freight is an essential component of Lehigh Valley and the Nation's goods movement network (2007 LVPC Rail Freight Study). Rail infrastructure and facilities located in UMT provide important components to a regional and national network for movement of freight.

There is one active freight line in UMT – the former Reading Railroad line, now owned by Norfolk Southern Corporation, extending from Reading through Alburtis Borough, running parallel with PA Route 100, then through Kuhnsville, and terminating in South Whitehall Township. A rail spur provides freight service to the William Penn Business Center and the Lehigh Valley West industrial complex (2007 UMT Comprehensive Plan).

Regional Freight Goals & Policies

LVPC Multimodal & Freight Goal: Provide transportation choices, improve system connectivity, and improve safety for freight movement and passenger modes.

Relevant LVPC Policies:

- Freight recommendations must support the PA LRTP goals.
- Freight recommendations must support the statewide and national freight plan initiative and goals.
- Policies that have support and buy-in from the public and stakeholders.
- Consistency and alignment of policies across different transportation plans.

Source: MOVELV, Lehigh Valley Regional Freight Plan (2015).

Source: Google Earth.

Norfolk Southern Corporation began operating in the Lehigh Valley in 1999 and is the only Class One railroad operating in the Lehigh Valley over its own track network. Norfolk Southern operates two rail yards in Lehigh and Northampton Counties – the Allentown Classification Yard and the Chapman Yard in Ruppsville (UMT) serves as the center for secondary operations. The Chapman facility has four classification tracks with a 90-car capacity with typically 180 cars handled per day and facilitates service to the growing industrial and distribution development in UMT and surrounding municipalities in western Lehigh County.

Sources: LVPC Rail Freight Study (2007), MOVELV, Lehigh Valley Regional Freight Plan (2015), and LVTS LRTP (2015).

Truck Freight

Truck, rail, and air travel support the movement of goods in the region. Trucking is the predominant mode for transportation of building raw materials, warehouse and distribution center products, petroleum refining products, milk, and other commodities. Changes associated with the USDOT, FHWA MAP-21 initiative include principal arterials not already part of the National Highway System (NHS) routes were added as part of the enhanced NHS. Routes designated as part of the enhanced NHS are essential routes for the strategic movement of freight. The following roadways with high truck traffic designated as part of the NHS receive priority for federal funding in UMT include:

- Interstate 78 and Interstate 476
- US Route 22
- US Route 222
- SR 0100 (Route 100)
- SR 0222 (Hamilton Boulevard)

Sources: MOVELV, Lehigh Valley Regional Freight Plan (2015) http://www.lvpc.org/movelvfreight.html and USDOT, FHWA MAP-21 https://www.fhwa.dot.gov/map21/.

Additionally, as part of MOVELV Lehigh Valley Regional Freight Plan initiatives, LVPC studied and identified the following critical urban freight corridors in the region with significant flow of commodities. According to LVPC, most major roads are expected increases in freight traffic from 2011-2040. LVPC has proposed the following freight routes affecting UMT: State Route 22, State Route 222, and State Route 100.

Table T4: Truck Commodity Flow Projections

Truck Freight Route	2011 Commodity Flow	2040 Commodity Flow
State Route 22 from Airport Road (SR 987) to I-78 Merge	60M – 175M tons*	60M – 175M tons
State Route 222 from I-78 to Schantz Road (SR 3012)	4M – 20M tons	4M – 20M tons
State Route 100 from Tilghman Street (SR 1002) to SR 222	Up to 4M tons	4M – 20M tons
I-476 South of Interchange	20M – 40M tons	40M – 60M tons
I-78	40M – 60M tons	60M – 175M tons

**Commodity tonnage is for the portion of Route 22 in UMT.*
Sources: MOVELV, Lehigh Valley Regional Freight Plan (2015) http://www.lvpc.org/movelvfreight.html.

Truck Parking

National, state, and regional plans identify public and private truck parking facilities in need for the Lehigh Valley. PennDOT is implementing a public-private partnership to address truck parking in the state. Trexler Plaza Truck Stop is one of a limited number of commercial truck-stops to support the demand for truck-stop space in and around UMT. LVPC has held summits and is conducting a study on this critical matter to help identify resources and opportunities to solve this problem.

Freight Movement Strategies

- Designate alternative truck routes to meet freight mobility needs in the event of accidents, congestion, and/or construction to ensure safe and efficient movement of freight.
- Use intelligent transportation systems (ITS), truck route signage, and traveler information systems to provide valuable information to improve safety and maximize mobility, and to help guide truck traffic to appropriate truck routes and alternative routes as part of incident management.
- Maintain local roads, bridges, signage, and pavement markings to promote proper use of roadways, safety, and mobility.
- Establish requirements for public truck parking spaces (individually or pooled), amenities (i.e., shower facilities, refreshments, etc.), and trailer storage in addition to adoption of standards for docking facilities for warehouse development.
- Consider truck parking facilities as part of interchange development and redevelopment as well as along designated truck routes where access is not limited or restricted.

- Work with LVPC/LVTS and PennDOT to upgrade existing interchanges and to plan, design, and program new interchange improvements that will increase access to the interstate system from warehouse cluster development within the region.
- Collaborate with adjoining municipalities also experiencing warehouse cluster development and other development of regional significance to jointly implement appropriate transportation strategies and solutions as part of a capital improvement plan, land development investments, and maintenance and operations.
- Provide increased connectivity and options for all modes of travel to improve level of service (LOS) on existing roadways.

Future Transportation Network

The LVPC has identified that technology will lay the groundwork for future transportation innovations such as connected and autonomous vehicles and real time information services (LVPC LRTP 2015).

Studies conducted by the USDOT suggest that suburban communities, especially higher-income lower density and lower-income higher density suburban communities, may see the greatest impact of autonomous vehicles (Autonomous Vehicles and Commercial Real Estate, 2016). Future travel will be built around an AV-based shuttle service reducing driving and travel cost as well as suggests impacts to other modes such as walking and bicycling for non-recreational purposes. UMT is in the cross hair of these changes resulting from the deployment of driverless technology.

Readiness for Connected/Autonomous Vehicles (C/AV) Strategies

The following actions can help local and regional governments to work collaboratively to manage emerging autonomous driving technologies to support sustainability goals and respect sustainability principles.

- Promote carpooling and ride sharing with reduced parking fees or designated parking to acclimate citizens to the benefits of ridesharing. This will prepare society for ride sharing using autonomous vehicles.
- Establish and budget for robust road maintenance and safety programs including clear lane striping, avoidance of areas of temporary abrupt lane shifts, timely snow and leaf removal, and on-the-road charging facilities to maximize efficiency and minimize congestion.
- Support the use of alternative fuels by providing charging facilities for electric vehicles at public facilities such as parks and other government facilities where appropriate. Seek funds through the state's Alternative Fuel Incentive Grant Program to implement this locally. Note: This program is being promoted by PA DEP and DCNR for charging facilities to be placed in state parks.
- Use ITS on arterials and congested roadways to integrate and manage driver and driver-less vehicles.
- Support driverless fleet-based services, shuttles, or minibus service economically managed by public transportation agencies instead of single ownership of autonomous vehicles.

Planning Implication of C/AVs

More Travel: Individual travel decisions that favor use of AVs further induces demand and increases travel demand.

Cheaper Travel: More convenient for household to share vehicles or eliminate vehicle ownership.

Reduces Parking Demand: Decrease in the number of parking spaces and impervious surface design with additional drop-off space close to building entrances.

Increased Truck Traffic: C/AVs coupled with e-commerce technology result in increased efficiency and higher capacity for distribution to meet consumer demands.

Increased Traffic Safety: C/AVs allow the control of speed and spacing of vehicles and elimination of other safety factors related to driver error.

Efficient Use of Roadways: C/AVs use roadways more efficiently increasing the capacity and density of traffic eliminating the need to widen roadways.

Increased Public Investment: Additional cost for ITS technology and roadway maintenance.

Source: Autonomous Vehicles and Commercial Real Estate, 2016.

- Design roadway improvements and interchange fueling stations with autonomous services.
- Create policies that incentivize the use of collective modes of transportation and ridesharing over individual driverless taxi services with the goal of access and equity for all users.
- Set and enforce speed limits and consider higher speeds permitted for collective transportation modes in comparison to driverless taxi services.
- As legislation permits, establish new policies for road usage fees for autonomous vehicles giving preference to a fleet-based use, ride sharing, and efficient use of vehicles.
- Design roads, on-street parking, and parking lots and garages so they can be easily converted or adaptively reused as public space or other uses; or used for active or alternative modes of transportation. New design standards, zoning, and regulations must be developed (e.g., parking standards and formulas, designated drop off space, etc.).
- Prepare for new data systems, storage, privacy, and security needs.
- Develop procedures for interaction of police and emergency services with autonomous vehicles.
- Plan for the loss of traffic violation revenue and the impact on police services.

Status of Current Capital Projects

The following is a listing of projects in UMT identified in the Lehigh Valley Metropolitan Planning Organization (MPO) LRTP and project status on the TIP. Close coordination of these projects is crucial to assure roadway construction does impact alternative routes for vehicles, trucks, and transit.

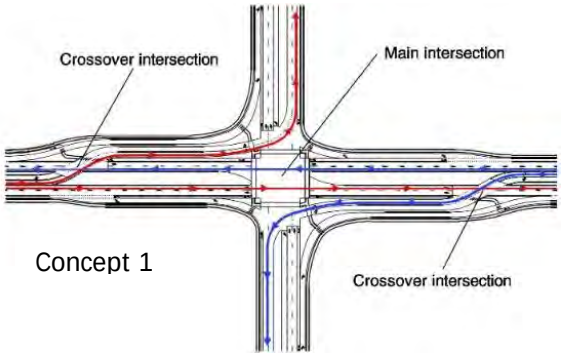
Table T5: Current List of Priority Congested Corridors and Other Improvements

Projects	Status
US 222/Hamilton Blvd. (Folk Road – Route 100)	• New signals were installed with geometric improvements at Hamilton Blvd (SR 0222) and Schantz Road (SR 3012) and Hamilton Blvd (SR 0222) and Independence Road (SR 0863) and Farmington Road (SR 3011) • Roundabouts planned for Hamilton Blvd (SR 0222) and Independent Road (SR 0863) (Construction scheduled for 2019-2021) • Recommendations: Intersection Improvements Newtown Road/Breinigsville and Farmington Road (SR 3011) (Candidate for roundabout in 2015 study). Add another lane or turning lanes if ROW allows. Extend existing LANta service west LANta 322 bus
Route 100 (Claussville Road – Tilghman Street	• Claussville/Kernville intersection was widened and improved • Section between Glenlivet Drive and Mohr Lane was widened from 2 to 4 lanes • Recommendations: Signal coordination. Extend existing LANta service north along Route 100.
Route 22 (Route 100 – Wood Avenue)	• Planned improvements on the TIP include bridge reconstruction, interchange reconfiguration, and widening. • Recommendations: Implement improvement projects on the TIP. ITS Improvements – build upon existing traffic cameras LANta – expand existing service.
I-78 & Adams Road (New) Interchange	• Point of Access Study is underway.

Source: LVPC, MOVELV CMP (2017), LV MPO TIP, and UMT Staff.

Route 100 Intersection Concepts

Various short-term and long-term transportation solutions will be considered and implemented over the 15 to 20-year horizon of this plan for the Route 100 corridor as well as for other priority corridors. Understanding that solutions evolve and land use changes over time, the following concepts are identified as potential long-term solutions to congestion, safety, and accessibility along this corridor.



Concept 1 – Displaced Left-Turn Intersection cuts down on left-turn conflicts while the main line is still stop controlled. This allows organized turning movement options with ability to provide safe pedestrian crossing.

Concept 2 – Grade Separated Intersection allows free-flow of mainline traffic improving safety for all turning movements at intersections. This option, while costly to construct, yields better results operationally.

Source of Images on previous page and here: Internet. (Images displayed as concepts for educational purposes).

Planned and Recommended Studies and Capital Improvement Projects

The following projects are identified, based upon projected local and regional growth, the Future Land Use Plan in Chapter 5, and Travel Demand Modeling and traffic analysis conducted by the Township traffic engineering professionals. This list of projects addresses the transportation goals, policies, and strategies outlined in Chapter 1 of this plan and strategies outlined in this chapter. Map 11 – Traffic Improvements and Congestion Map identifies average daily traffic (ADT) and transportation improvement projects listed below.

The following projects should be included as part of the LVTS' TIP process and PennDOT's STIP and 12-Year Plan process as well as part of the Township's Capital Improvement Plan (CIP), Act 209 Impact Fee Ordinance, and land development process for public and private investment in public infrastructure where appropriate in accordance with the Municipalities Planning Code (MPC).

Table T6: Transportation Projects Impacting the Township

Project Name	Description	Funding Sources
Interchange Projects Outside Township		
Route 222 & Krocks Road (New) Interchange	Planning, Engineering, and Construction	PennDOT District 5-0
I-78, Route 222 & 309, Hamilton Blvd Interchange		
Interchange Project Inside Township		
Improvements to Route 222 & Route 100 Interchange	Point of Access Study, Engineering, and Construction	UMT and PennDOT District 5-0
Route 222 & Mill Creek Road (New) Interchange		
I-78 and Route 100 Interchange	I-78/Route 100 Interchange Improvements (full interchange replacement improvements)	PennDOT District 5-0
Future I-78 and Adams Road (New) Interchange Improvements	POA Underway – Future Engineering and Construction of New Interchange	P3 Opportunity – PennDOT District 5-0 and Developer

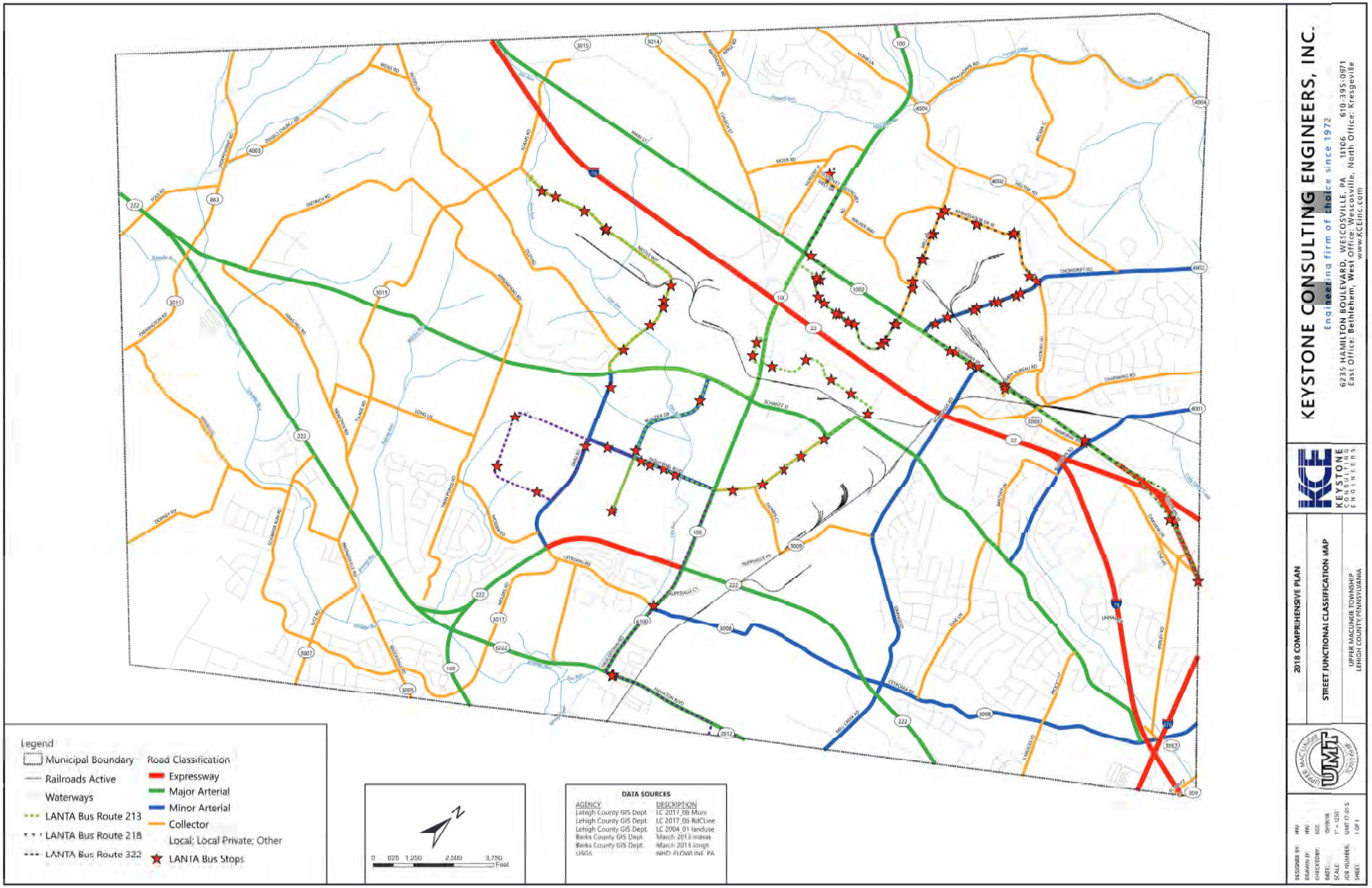
Source: UMT Staff and Keystone Consulting Engineers. Note: TA – Transportation Alternatives; LMT – Lower Macungie Township; and LVTS – Lehigh Valley Transportation Study – the LVTS is the Metropolitan Planning Organization (MPO).

Table T6: Transportation Projects Impacting the Township (continued)

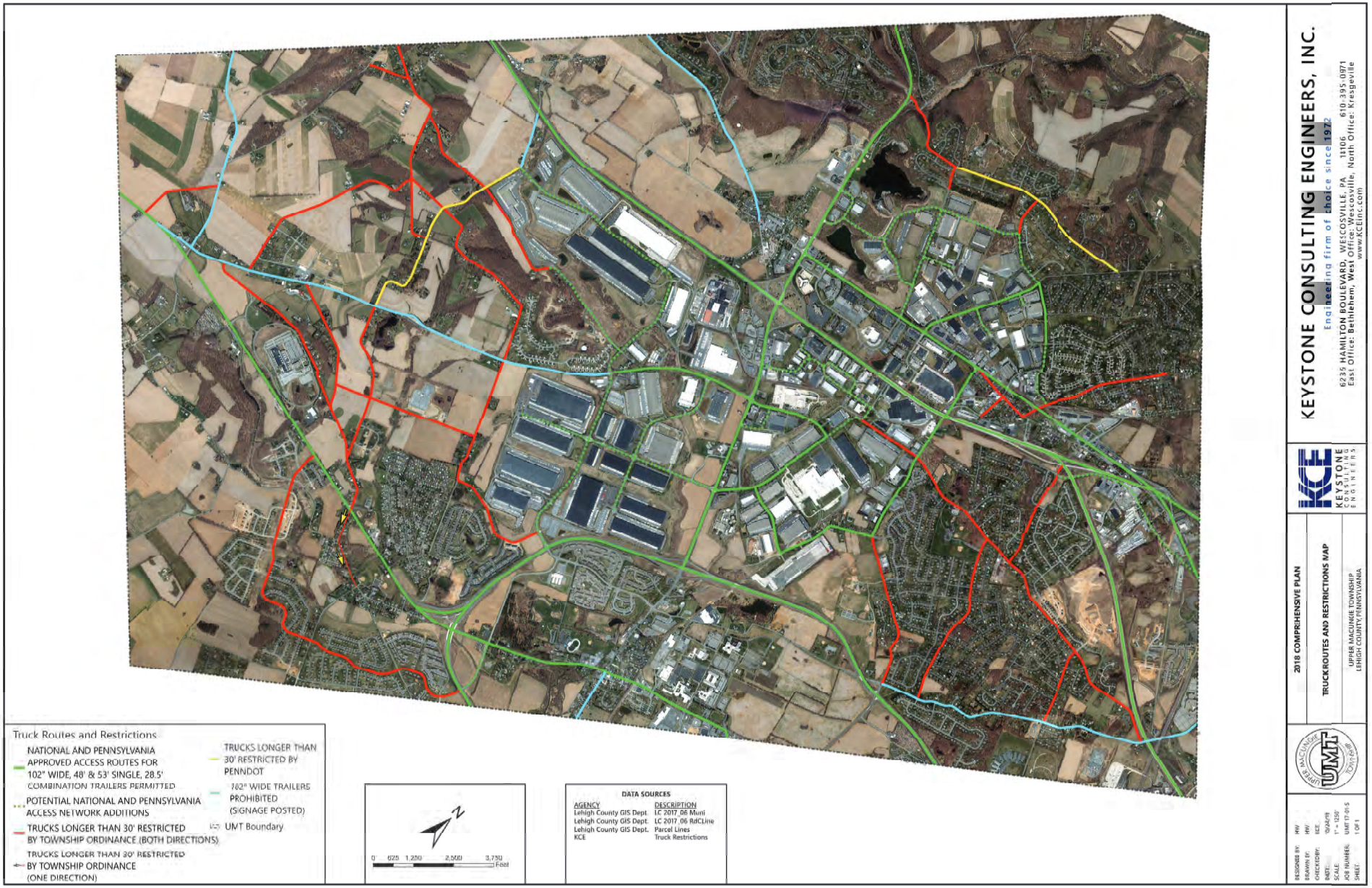
Project Name	Description	Funding Sources
Bypass Projects		
Fogelsville Bypass	Connect Main Street to the west of Fogelsville Village northeast to Route 100	Developer improvements, UMT, and other funding sources
Congestion Management & Safety Projects		
Route 100 Corridor Study and CIP	Congestion Mitigation and Multimodal Transportation Studies, CIP, and Capital Improvements (Integrated Congestion Management approach)	LVTS UPWP, DCED and PennDOT Multimodal Program Funds, LVTS/PennDOT TA Set-Aside Funds, and LMT as a local partner.
US Route 222 Corridor Study and CIP	Congestion Mitigation and Multimodal Transportation Studies, CIP, and Capital Improvements (Integrated Congestion Management approach)	LVTS UPWP, DCED and PennDOT Multimodal Program Funds, and LVTS/PennDOT TA Set-Aside Funds
Tilghman Street/Main Street Corridor Study and CIP		
Phase 2 Hamilton Boulevard Corridor Study and CIP		
Intersection Improvements		
Route 100 & Schantz Road	Planning, Design, and Construction of Intersection Improvements – Coordination of Intersection Improvements with Congestion Management & Safety Studies (Integrated Congestion Management approach)	TIP/STIP Funding Sources for Surface Transportation and Intersection Improvements and LVTS Intersection and ITS Improvement Funds
Route 222 & Grim Road	Planning, Design, and Construction of Intersection Improvements – Coordination of Intersection Improvements with Congestion Management & Safety Studies (Integrated Congestion Management approach)	TIP/STIP Funding Sources for Surface Transportation and Intersection Improvements and LVTS Intersection and ITS Improvement Funds
Route 100 & Tilghman Street		
Route 222 & Breinigsville Road		
Truck Studies		
Truck Parking Study	Collaborate with LVPC truck parking study and planning efforts to identify and prioritize local and regional transportation improvements (e.g. interchange improvements, etc.) and truck parking locations and solutions	PennDOT Multimodal Fund, DCED Multimodal Fund, LVTS UPWP, and Warehouse Owners
Bicycle/Pedestrian/Streetscapes		
PPL Utility Easement Multiuse Paths	Multiuse path improvements in PPL easements	Planning, Design, and Construction DCED and PennDOT Multimodal Program Funds, LVTS/PennDOT TA Set-Aside funds, Air Products Recreation Improvements or Fee in Lieu of Recreation Improvements, and UMT Township General Funds
Cetronia Road Off-Road Multiuse Path	Multiuse path for bicyclists and pedestrians along Cetronia Road east of Route 100 to connect to existing multiuse path at U-Line	Planning, Design, and Construction DCED and PennDOT Multimodal Program Funds, LVTS/PennDOT TA Set-Aside funds, Air Products Recreation Improvements or Fee in Lieu of Recreation Improvements, and UMT Township General Funds Design and Construction, DCNR, DCED, Developer Recreation Fees in-Lieu of Improvements, Developer Improvements
Main Street Multimodal Improvements (Fogelsville)	Roadway, sidewalk, and signage improvements to promote bicycling (e.g., share the road, etc.) and pedestrian travel	
Route 100 & Hamilton Blvd/Route 222 Multimodal Improvements (Trexlertown)	Roadway, sidewalk, and signage improvements to promote bicycling (e.g., share the road, etc.) and pedestrian travel Adopt Map 12 – Connections as an element of the Township Map – Various Greenway Multiuse Path Improvements	
Other Multiuse Paths/Rails and On-Road Pedestrian and Bicycle Improvements		
Green Stormwater Infrastructure / MS4		
Green Stormwater Infrastructure Improvements	Green Stormwater Infrastructure (GSI) improvements as part of roadway maintenance program	Liquid Fuels, General Fund, and PennDOT, Local Lead Projects.

Source: UMT Staff and Keystone Consulting Engineers. Note: TA – Transportation Alternatives; LMT – Lower Macungie Township; and LVTS – Lehigh Valley Transportation Study – the LVTS is the Metropolitan Planning Organization (MPO).

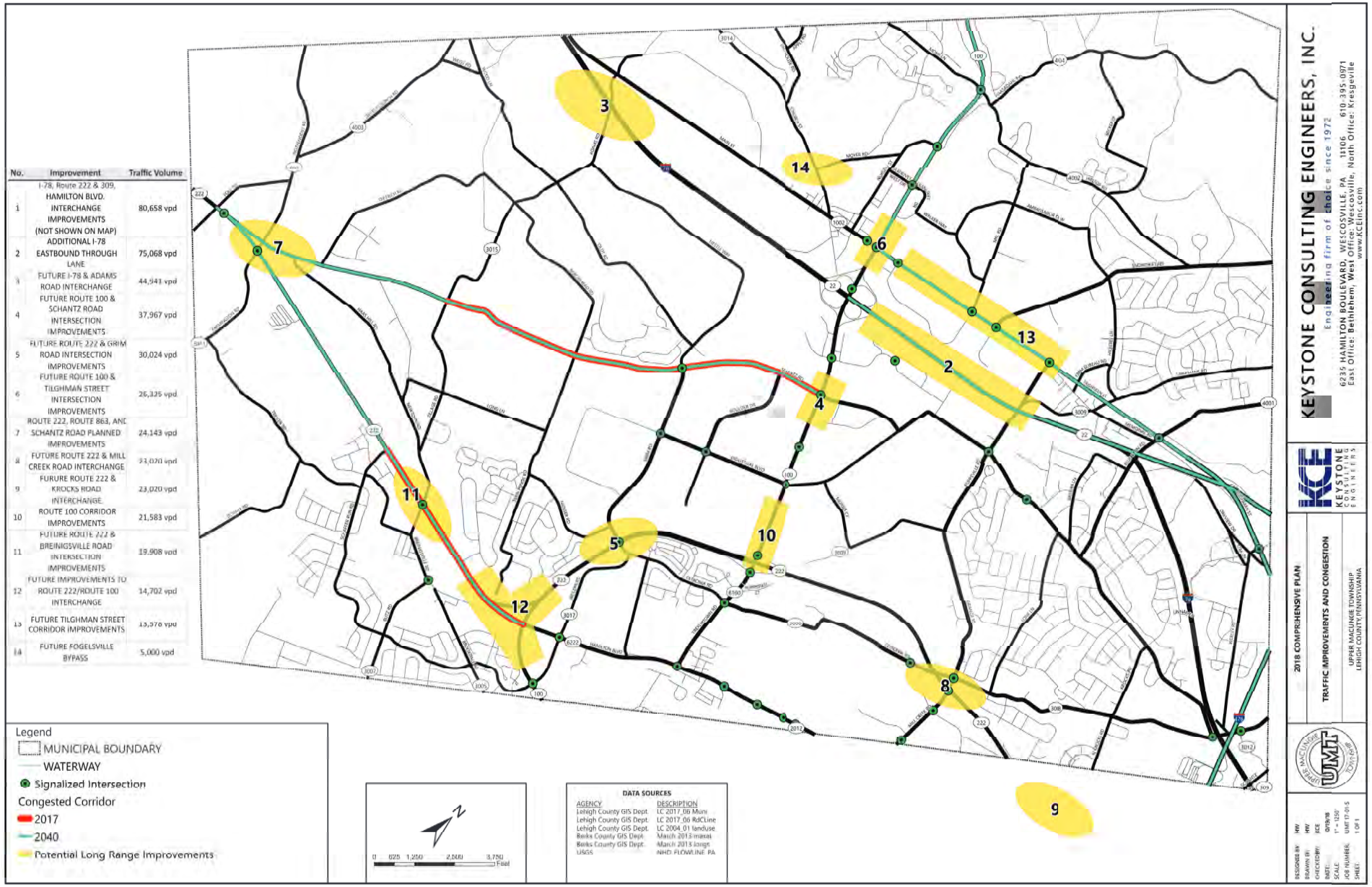
Map 9: Street Functional Classification



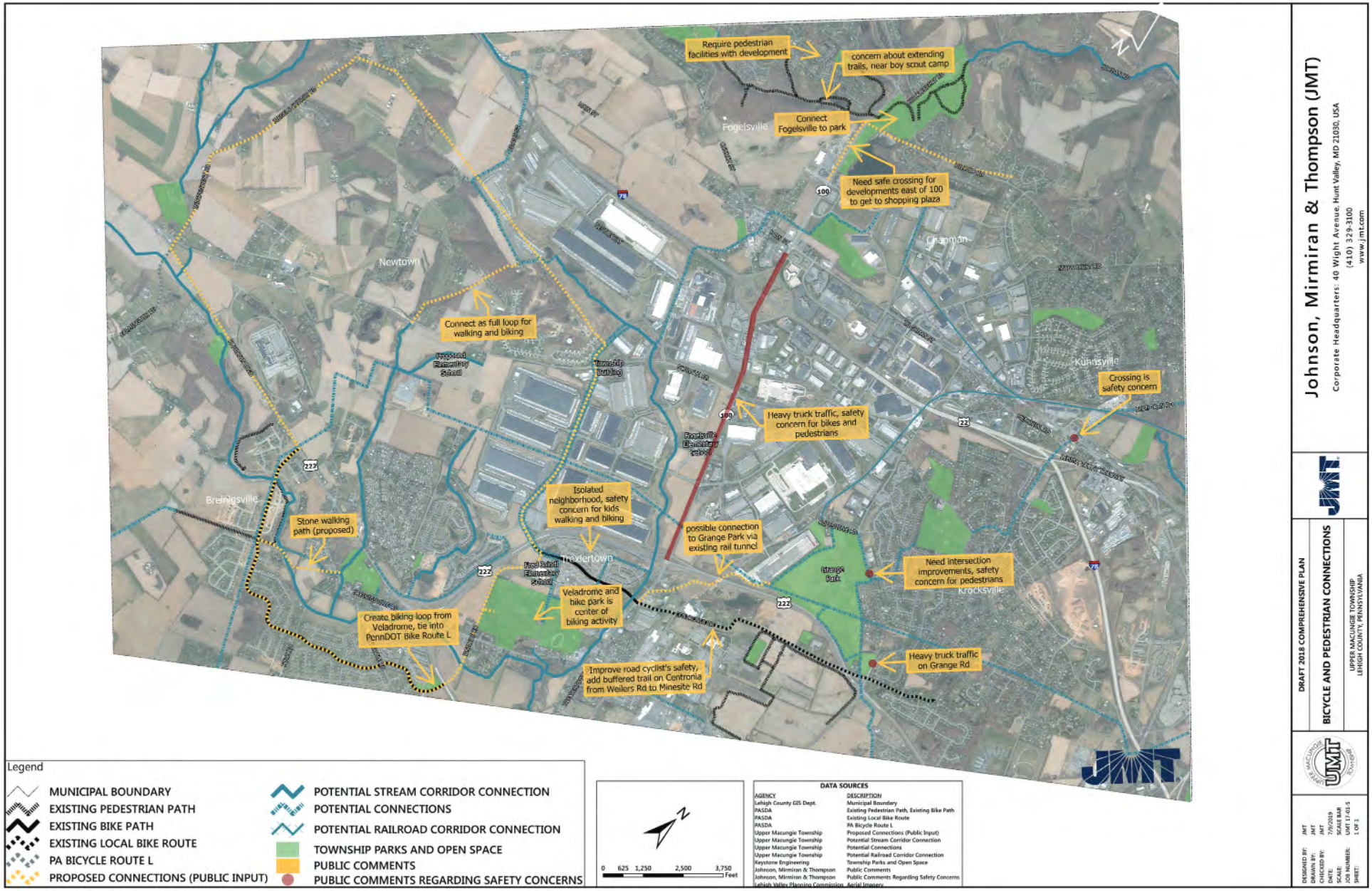
Map 10: Truck Routes and Restrictions



Map 11: Traffic Improvements and Congestion



Map 12: Connections



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