Transportation

TRANSPORTATION ANALYSIS

Introduction

At the time of the 1968 Comprehensive Plan, Interstate 80 was under construction. Pa. Route 28, The Allegheny Valley Expressway, was proposed and planned, but not yet funded or built. In fact, the Plan stated, "The impact of the proposed Allegheny Valley Expressway, which will be partially located in Buffalo Township, is already causing new thinking related to land use".

Since that time, many transportation improvements have been made, and land use patterns have changed significantly in Clinton Township, Buffalo Township and many of the surrounding municipalities. Transportation improvements are one of the factors that contribute to an increase in growth and development. This has been recognized already, and has been a focus of past planning. In 1999, the Southwest Pennsylvania Commission (The Planning, economic development, and transportation agency for the 10 County southwestern Pennsylvania region) prepared the Route 228 and Route 356 Early Options Analysis. In 2002, the Commission assisted Buffalo Township in receiving funding to prepare the Buffalo Township Land Use and Transportation Initiative. The Early Options Analysis identified problem intersections. The Land Use and Transportation Initiative further examined these problem intersections and developed plans and improvements to meet the needs of anticipated growth. This chapter of the Comprehensive Plan summarizes data and recommendations from these previous studies and where necessary, updates them to reflect current conditions. Because transportation planning was an identified local priority at the beginning of the Plan process, the project planner was assisted in this endeavor by transportation engineers from Herbert, Rowland and Grubic, Inc (HRG). More detailed data on these issues can be seen in the aforementioned reports. The Buffalo Township Land Use and Transportation Initiative have been partially incorporated herein.

One of the most important factors in local transportation system is their inter-

connectedness. Future development in Clinton Township will affect Buffalo Township. The Buffalo Township Land Use and Transportation Initiative showed that the Route 356 and Route 28 interchange acts as the bottom of a funnel where much of the traffic in the entire southeastern portion of Butler County is conducted. For example, traffic leaving the Victory Road Business Park may proceed from Route 228 to either Route 8 or route 356. If it moves in the latter direction, much of the traffic will affect Buffalo Township as well as Clinton.

Transportation and Land Use are also interconnected. Each new home, business, or institutional development puts more vehicles into the local road network. This is not inherently bad-if both the transportation infrastructure and traffic management systems are adequate. If only the transportation infrastructure is expanded, it may actually attract more development and absorb the additional capacity the expansion creates. While funding of road improvements will be crucial to local economic and community development, it will also be crucial to integrate access management and road design into the development process.

EXISTING CONDITIONS

Roadway Classification

Functional classification is used in this analysis to categorize the roadways in the Townships according to their function. Primarily roadways serve two functions, mobility (the ability to go from one place to another) and access (the ability to enter adjacent property). The roadway's functional classification is based on these two roadway classifications. Municipal level functions are not always consistent with PennDot classification. Functional classifications are illustrated on the attached map as they relate to municipal conditions.

Table 1 reflects the roadway volumes and classifications for the major roads included

in this analysis. Roadways are normally classified into the following four categories:

Arterials provide for high mobility and limited access. Arterials generally convey between 10,000 and 25,000 average daily traffic (ADT). These roads connect urban centers and convey traffic for distances over one mile. Arterials often connect urban centers with outlying communities and employment. The roadway design is usually four to five 12-foot lanes with 8-10-foot shoulders and medians and design speeds of 40-60 mph. PENNDOT further classifies Arterials as Principal and Minor.

Major Collectors are intended to provide for a greater degree of mobility than for land access. Collectors generally convey traffic for medium travel distances (generally greater than one mile) and convey between 1500 and 10,000 ADT. Collectors serve motorists between local streets and arterial roads. The roadway design is two 12-foot lanes with 8-10-foot shoulders and design speeds of 35 mph.

Minor Collectors provide for equal amounts of mobility and land access. These roadways serve as major circulation roads. Minor collectors are two 11-12-foot lanes with 4-10-foot shoulders and design speeds of 30 mph.

Local Roads are intended to provide immediate access to adjoining land uses. Local roads are intended to only provide for transportation within a particular neighborhood, or to one of the other road types described. Local roads are generally 20-22 feet wide with 2-8 foot shoulders or curbing and design speeds of 25 mph.

State Route No.	Street Name	Classification	Location	Count Year[1]	Avg Daily Traffic
28	Route 28	Expressway	Rte 356 to N	2003	16,000
28	Route 28	Expressway	Rte 356 to S	2003	18,000
356	North Pike Road	Minor Arterial	Twp line to Rte 228	2002	10,460
	South Pike Road	Minor Arterial	Rte 288 to Younkins	2002	16,870
	South Pike Road	Minor Arterial	Younkins to Rte 28	2002	20,020
	Butler Road	Principal Arterial	Rte 28 to Twp line	2003	10,000
0228	Glade Mill Rd	Arterial	At Clinton Middlesex Line	2003	8,200
	Glade Mill Rd	Arterial	Between Saxonburg Blvd North and South	2003	7,500
	Ekastown Rd	Arterial	West of Freeport Rd	2003	4,600
	Ekastown Road	Arterial	At Buffalo/ Clinton Line	2002	7,570
	Sarver Road	Arterial	Sarver to Rte 356	2002	5,780
SR 2005	Saxonburg Blvd.	Minor Arterial	North of 228	2003	3400
SR 2007	Saxonburg Blvd.	Minor Arterial	South of 228	2003	1800
SR 2009	Ekastown Road	Rural Major Collector	Sarver to Hranica	2002	5,280
SR 2009	Ekastown Road	Rural Major Collector	Hranica to Twp line	2002	6,510
SR 2011	Freeport Rd	Functional Collector	North of 228	2003	2,700
2011	Lardintown Rd	Functional Collector	South of 228	2003	450

[1]Counts in 2002 were completed by HRG for this study. Counts in 2003 are PENNDOT data.

The following summarizes the classification of the existing roadways and intersections within the study area. Any existing deficiencies noted are also included. A graphical representation of the existing transportation system is included on Map A.

Route 356 is classified as a Minor Arterial also known as North Pike Road (north of Route 228) and South Pike Road (south of Route 228). Regionally, Route 356 provides access from the City of Butler through southwestern Summit Township and Jefferson Township to Buffalo Township. Route 356 has a full interchange with Route 28 and continues into Freeport. Within Buffalo Township, Route 356 provides access to Lernerville Speedway, Freeport Area Senior High School, and commercial development. Daily traffic volumes increase from 10,460 vehicles per day (vpd) entering from Winfield Township to 16,870 vpd after the merge of Route 228 and 20,020 vpd near Route 28.

The volume of traffic is high for the roadway classification, width and number of lanes. For this volume of traffic, the roadway is approaching classification as a Principal Arterial, especially from Route 228 to Route 28. As an arterial, the roadway design should have four 12-foot lanes and 8-10 foot shoulders.

The roadway is typified by rolling vertical geometry and numerous side streets and curb cuts. Due to the high traffic volumes, minimal gaps are provided to access to and from the side streets and businesses. Turn lanes are not typically provided.

Route 228 is also classified as a Minor Arterial and is known as Ekastown Road (north of Ekastown) and Sarver Road (from Ekastown to Route 356). Regionally, Route 228 runs east-west from Cranberry Township in the west to Buffalo Township in the east. The roadway provides access from Interstate 79 and the Pennsylvania Turnpike in the west, through the Southern Butler County Townships of Cranberry, Adams, Middlesex, Clinton and Buffalo Township. Route 228 crosses State Route 8 in Middlesex Township. Within Buffalo Township, Route 228 terminates at Route 356. Daily traffic

volume is 7,570 vpd north of Ekastown and 5,780 vpd from Ekastown to Route 228.

The volume of traffic is high for the width and number of lanes. For this volume of traffic, the roadway is appropriately classified as a Minor Arterial, and the roadway design should have four 12-foot lanes and 8-10 foot shoulders.

The intersection of Route 228 and Ekastown Road/Sarver Road carries a predominance of traffic making a 90-degree movement to continue along Route 228. The intersection is constricted by the Union Cemetery on the northeast quadrant and Emory Chapel United Methodist Church on the southeast quadrant. A flashing red beacon has been installed at the four-way stop controlled intersection. Turn lanes are not provided.

The intersection of Route 228 and Route 356 also carries a significant amount of traffic making a 90-degree turn. The intersection is constricted by an embankment on the northern and southern sides of Route 228, which enters the intersection at a downgrade. The Route 228 approach is stop controlled. No turn lanes are present.

Ekastown Road (S.R. 2009) is classified as an Urban Major Collector and provides access from Route 228 to S.R. 1028 (and the Route 28 interchange) in Fawn Township. Daily traffic volumes increase from 5,280 vpd at Route 228 to 6,510 vpd near Fawn Township.

The volume of traffic is appropriate for the roadway classification, width and number of lanes. For this volume of traffic, the roadway is adequately classified as a Major Collector with two 12-foot lanes and 8-10-foot shoulders.

The roadway is typified by gently rolling vertical geometry with residential access. The adjacent development is set back from the roadway. Gaps are provided to access to and from the side streets and residences.

Directional Analysis and accident data is available for these intersections within the longer Early Options and Land Use and Transportation Initiative reports. Full reference to each of these separate reports is included at the beginning of this chapter. Manual turning movement counts were performed at these intersections and further analysis was completed. In Buffalo this work emphasized turning movement counts. In Clinton Township, the work entailed building upon the early options analysis to develop a preliminary strategy and costs. IN the case of both communities, this was also done with an eye towards preliminary analysis of the feasibility of transportation impact fees pursuant to the Pa. Municipalities Planning Code.

FUTURE CONDITIONS

Programmed Improvements

Programmed traffic improvements to state routes are made by PennDot through a planning process which involved the Municipality, the County and the Southwestern Pennsylvania Commission.

The following are being completed or have been completed as part of local progress in transportation improvements:

- **Route 356 and Monroe Road** – Signalization, left turn lanes along Route 356 and realignment of Monroe Road with development driveway
- **Route 356 and Cole Road** – Left turn lanes in both directions of travel on Route 356 and related signal modification
- **Route 356 – Cole Road to Monroe Road** – Three lane roadway cross section providing a center, optional left turn lane in areas where dedicated turn lanes are not needed.
- **Route 228-Light at Saxonburg Blvd-** A traffic light has been installed at this intersection near the Clinton Township Municipal Building. This implemented a recommendation of the Early Options Analysis.
- **Route 356 and Sarver Road (S.R. 2018) and Coal Hollow Road (Buffalo Elementary School Intersection)** – Realignment, expansion and signalization of Sarver Road with Coal Hollow Road. This project is complete.

Traffic Projections

As a result of the Land Use Analysis, the project team used current trends in

development activity to arrive at future anticipated housing development in Buffalo and Clinton Townships. These projections formed the basis for determining traffic growth throughout the Township.

Traffic forecasting within the study area was accomplished through the application of a travel demand model. In this model, the simulation of trips is developed though a series of steps in which the projected development is translated into actual traffic and vehicle movements throughout the region. The results of the travel demand model are summarized in tabular form in the Appendix.

- The projected development in Buffalo Township was broken into 28 Travel Analysis Zones (TAZ)

- The number of projected new housing development was determined per TAZ from the Land Use Initiative assumptions developed during the course of this project. This involves the development of approximately 1,700 new homes within the next 10 to 15 year period.

- The number of projected peak hour vehicular trips per zone was determined using the Institute of Transportation Engineers Manual (ITE), Sixth Edition rates indicated in the following table.

TABLE 7
TRIP GENERATION – SINGLE FAMILY DWELLING

Peak Hour	Rate Trips/House	Enter	Exit
AM Peak Hour	0.75	25%	75%
PM Peak Hour	1.01	64%	36%

- The projected trips per zone were distributed using the trip distribution percentages in Table 8. These percentages were based on existing peak hour travel patterns for the seven major corridors into and out of the study area. A graphical representation is included in the Appendix.

TABLE 8
TRIP DISTRIBUTION

Corridor	Direction	Trip Distribution	
		AM Peak Hour	PM Peak Hour
Route 356	N	12%	20%
S.R. 228	NW	18%	15%
Ekastown Road	S	8%	15%
Sarver Road	N	2%	3%
S.R. 28	N	7%	5%
S.R. 28	S	35%	25%
Route 356	SE	18%	17%

- In addition, the proposed Victory Business Park and development area in Clinton Township was also included in the analysis. The 350-acre business park was assumed to be 75% complete in 10 years. The trip generation was projected using ITE Land Use Code 130 – Industrial Park. Of that projection, 50% of the trips were projected to Route 28 through Buffalo Township as indicated in Table 10.

TABLE 10
ANTICIPATED TRIPS FROM VICTORY BUSINESS PARK

Condition	Weekday	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Total Development	17,375	1,939	397	2,336	437	1,642	2,079
75% Dev in 2012	13,031	1,454	298	1,752	328	1,232	1,559
50% to Route 28	6,516	727	149	876	164	616	780

The projected AM peak hour and PM peak hour trips distributed through the study intersections for 2012 are shown in drawings 7 and 8, included in the reports appendix. The projected ADT in 2012 is depicted on Map I.

Analysis of Future Conditions

Analysis of the future traffic conditions in the ten-year horizon was completed. A level of service analysis was completed to identify projected transportation network deficiencies that can be expected from anticipated growth in Buffalo Township as well as pass-through traffic from surrounding communities. The analysis was

conducted for projected 2012 traffic conditions for the study intersections using turning movement projections developed by the traffic demand model. As with the existing analysis, the future conditions analysis included capacity analyses and signal warrant analyses. The results are summarized in the following tables.

A review of the existing 2002 Analysis and the 2012 Analysis yielded the following:

- Of the twelve (12) intersections studied in Buffalo Township, all twelve (12) were projected to operate with at least one approach at unacceptable condition (LOS E or F) in 2012, compared to four (4) intersections in the existing 2002 condition.

- Of the twelve (12) intersections studied, eight (8) were projected to meet peak hour warrants for installation of a traffic signal in 2012, compared to two 2 intersections in the existing 2002 condition.

Recommendations

Based upon the Future Growth Analysis, A number of Major Improvements will be necessary if the two townships are to accommodate the anticipated level of future growth and development. These are identified as local priorities for necessary improvements.

Clinton Township Priority Improvements

The project team also analyzed three (3) Clinton Township priority projects from the early option analysis. To update these, planning level cost estimates were prepared by a transportation engineer. These costs reflect 2006 values.

Sharp Turn in Route 228 at Brewer Road

Improvement Description: Construct reversing 45-50 mph design curves on new alignment. New roadway alignment will continue off of the tangent segment west of Brewer Road, travel across farm pastures to the southeast of an existing farm complex and intersect the tangent segment of roadway near Westminster Drive. This improvement will also require reconstruction of the intersection of Route 228 with Saxonburg Boulevard and with Westminster Drive.
Estimated Costs
Design: $150,000 to $200,000
Right-of-way: $250,000 to $300,000
Construction: $1.0 to $1.5 million
Total: $1.4 to $2.0 million

Alternate Improvement: Construct a large radius (>1,000 ft) curve that traverses north of the utility tower
and touches down near the existing farm complex.
Estimated Costs
Design: $50,000 to $100,000
Right-of-way: $250,000 to $300,000
Construction: $0.5 to $1.0 million
Total: $0.8 to $1.4 million

Intersection of Saxonburg Boulevard and Route 228

Improvement Description: Long term improvement will be achieved as part of Project 19. A potential improvement combined with the Alternate Improvement listed for Project 19 is to design a radius for Route 228 to facilitate the through movement of traffic. Saxonburg Boulevard will be relocated to intersect the new roadway as close to possible to 90 degrees.
Estimated Costs
Design: $40,000 to $60,000
Right-of-way: $20,000 to $50,000
Construction: $250,000 to $400,000
Total: $310,000 to $510,000

Intersection of Coal Hollow Road and Route 228

Improvement Description: Widen to provide an eastbound left turn lane and cut back embankments on the north side of Route 228 to provide adequate sight distance.
Estimated Costs
Design: $30,000 to $50,000
Right-of-way: $20,000 to $30,000
Construction: $150,000 to $250,000
Total: $200,000 to $330,000

Buffalo Township Priority Improvements

The Buffalo Township recommendations to accommodate future traffic conditions were presented to the public on May 7, 2002 and were subsequently adopted in the Land Use and Transportation Initiative. The following is a summary of the recommended improvements with public response indicated in italics:

- With the recommended short term and long term improvements, all intersections were projected to operate under acceptable conditions (LOS D or better).

- The travel demand model included the future promotion of Ekastown Road (S.R. 2009) as an alternate access to Route 28. The analysis included a significant redistribution of future trips generated within and outside Buffalo Township via Ekastown Road, using improved signage and markers and

maintenance priorities. Should this strategy be implemented, the functional classification of Route 908 from the Route 28 interchange in Fawn to Ekastown Road as well as Ekastown from Route 908 to the Clinton Township line would need to be upgraded to an Arterial classification. *This received favorable support from the public.*

- Based on the projected traffic demand, the required improvements include upgrading Ekastown Road to a four-lane roadway from the Clinton Township line to Route 908 in Fawn Township. Auxiliary turn lanes should be provided major intersections and critical site access points, as needed. *This concept received strong support from the public as a way to better handle both existing and anticipated through traffic to and from Route 28.*

- Due to the reduction of setbacks to existing homes and businesses south of Hranica Drive, relocation of the lower portion of Ekastown Road through the old landfill site to the west should be considered in the future. *This also received favorable support from the public.*

- Associated widening of Ekastown Road for turn lanes at the Route 228 and Route 908 intersections is also included in the recommendations.

- The redirection of traffic and improvements to Ekastown Road does not preclude additional required improvements on Route 356.

- Under both existing and future conditions, the intersection of Route 228 and Route 356 requires signalization and the addition of turn lanes. *This received the highest priority response from the public.*

- Due to the topography and obstructions at the Route 228 and Route 356 intersection, relocation of the intersection further south should be considered. *However, this did not receive strong public support.*

- Based on the projected traffic demand, the required improvements include upgrading Route 356 to a four-lane roadway from Monroe Road/Cinema Driveway to the Route 28 interchange. The widening of this ½-mile section approaching the Route 28 interchange may be required in the future. *The widening of all of Route 356 to four/five lanes received negative public support.*

- The remainder of the Route 356 recommendations included signalization and the addition of turn lanes at appropriate locations. *This received favorable public support.*

- The Route 228/Ekastown Road and Route 228/Route 356 intersections would benefit from upgrading an additional connector roadway between Route

228/Ekastown Road and Route 356, within (i.e. Cole Hollow Road) or north of the Township. *Locating this connector north of the Township received favorable public support.*

- *Interconnection of adjacent traffic signals, especially along Route 356, should be stressed to enhance the capacity of this corridor by providing a progressive movement of traffic along the subject roadway.*

Short Term – Transportation (2002)

To provide acceptable operating conditions in the existing 2002 condition, the following improvements are needed:

Intersection (2): Route 356 and Route 28 Northbound On-Off Ramp

- Signalization
- Permissive Southbound Left Turn Signal Phasing

Intersection (5): Route 356 and Sarver Road (Route 228)

- Signalization
- Northbound Left Turn Lane on Route 356 (125')
- Protected/Permissive Northbound Left Turn Signal Phasing

Intersection (7): Route 356 and Monroe Road

- Southbound Left Turn Lane on Route 356 (100')

Intersection (9): Route 356 and Sarver Road (Route 2018)

- Southbound Left Turn Lane on Route 356 (75')

(Warranted, but intersection currently operates with acceptable levels of service)

Long Term – Transportation (2012)

To provide acceptable operating conditions in the projected 2012 condition, the following improvements are needed:

Intersection (1): Route 356 and Younkins Drive

- Restrict westbound left-turn movement from Younkins Drive

(Signalization is not warranted)

Intersection (2): Route 356 and Route 28 Northbound Ramp

- Signalize intersection
- Southbound left-turn movement protected/permitted phasing
- Separate westbound left and right-turn movements

Intersection (3): Route 356 and Route 28 Southbound Ramp

- Signalize intersection

Intersection 6: Route 356 and Cole Road

By 2012, a northbound left-turn lane and a southbound left-turn lane will be provided at this intersection.

- Construct eastbound left-turn lane
- Construct westbound left-turn lane

Intersection 7: Route 356 and Monroe Road-Cinema Driveway

By 2012, the Cinema Driveway will be aligned with Monroe Road, a signal will be installed at this intersection, a northbound left-turn lane and southbound left-turn lane will be provided, and the northbound left-turn movement will have advanced phasing.

- Construct additional northbound thru lane
- Construct additional southbound thru lane

Intersection 8: Ekastown Road and Sarver Road (S.R. 228)

- Signalize intersection
- Southbound left-turn movement protected/permitted phasing
- Construct additional northbound thru lane
- Construct northbound left-turn lane
- Construct additional southbound thru lane
- Construct southbound left-turn lane

Intersection 9: Route 356 and Sarver Road (S.R. 2018)-Coal Hollow Road

By 2012, Coal Hollow Road will be realigned with Sarver Road and northbound and southbound left-turn lanes will be provided.

- Signalize intersection
- Construct northbound right-turn lane

Intersection 10: Ekastown Road and Route 908

- Signalize intersection
- Southbound left-turn movement protected/permitted phasing
- Construct southbound left-turn lane
- Construct westbound right-turn lane

Intersection (11): Route 356 and Harbison Road

- Restrict westbound left-turn movement from Harbison Road
- Construct additional northbound thru lane
- Construct additional southbound thru lane (Signalization is not warranted)

Intersection (12): Route 356 and Bear Creek Road

- Restrict westbound left-turn movement from Bear Creek Road
(Signalization is not warranted)

Local Road Networks

Neither the early options analysis or the Buffalo Township land use and transportation analysis focused significant effort on Township roads. The location of certain Township roads within growth corridors could lead to their being stressed. Typically, Buffalo Township re-paves one mile of road each year, of a fifty mile network. Without carefully planning for development, local road traffic will make reasonable maintenance financially unsustainable. For Clinton Township, most development will affect State roads. For Buffalo, a number of Township owned and maintained roads are within growth areas. Their stressed roads are shown on the transportation plan map. An example of this is Harbison Road, which abuts a nonresidential development priority area. If carefully planned, Harbison Road can be improved with better geometry, width, circulation and site distance, during the course of development. Some tools to help ensure such planning include:

- Require traffic studies for development which abuts stressed roads.
- Ensure new development has sufficient setbacks for a modern fifty foot right-of-way.
- Assess front footage improvements for cartway widening, or require cartway widening consistent with frontage.

Impact Fee Feasibility

A significant portion of the planning process was devoted to discussion over the issue of implementing transportation impact fees at the Township level (Or possibly the Multi-Municipal level). Impact fees are authorized by Article V-A of the MPC. In essence, they allow a municipality to estimate future growth and its traffic impacts, pre-design roadway improvements to meet the impacts, then assess developers a fee based upon their proposed trip generation. Impact fees in Pennsylvania can become a significant source of revenue. One Major Commercial development can easily generate $800,000.00 in fees. However, the use of these funds are restricted.

• Impact Fees can only pay up to half (50%) of projects on state roadways. As most improvements would be on state owned roadways, impact fees cannot construct any whole project.

• Significant pass-through traffic exists on the state roadway system, thus limiting the ability to fund projects caused by traffic in Winfield, Middlesex, or other places.

• Impact fees cannot pay for existing deficiencies. Existing operational or safety deficiencies must be paid for by other funding mechanisms.

• Impact fee engineering studies can cost $90,000-$100,000 for one community and up to $200,000 for a joint impact fee program. Basically, improvements must be initially designed.

• Commercial development is the main impetus for roadway improvements.

Anticipated growth • 1,700 residential units in Buffalo Township – add 1,700 PM peak hour trips • Victory Road Industrial Park (350 acres) – add about 2,000 PM peak hour trips • Commercial in Buffalo Township – sizable model increases in volume (see attached) However, this is based on a land use policy that limits development of many key tracts for commercial purposes.

Some critics believe that the investments which impact fees pay for may actually increase growth, as more land becomes accessible for development. It may be possible, but this has never been formally studied in Pennsylvania. A discussion with Buffalo Township Developers several years ago revealed their support for impact fees

because it levels costs of roadway improvements to a proportionate share. At present they feel that the PennDot mandated improvements (such as traffic signals) allow later developers to take advantage of the first developer's investment.

Based on projected added traffic in Buffalo and Clinton Townships, impact fees may be technically feasible, especially for Buffalo Township. However, the transportation service areas will need to be carefully selected to ensure that development generated traffic covers the areas of impact. In Clinton Township the impacts will be largely confined to state maintained roads in the growth area around Victory Road Business Park.

As an alternative to Traditional Impact Fees, it is recommended that each Township examine participation fees and or frontage assessments, possibly linked to expanded choice through overlay zoning. Road improvements and possible new collector roads should also be mapped on the new GIS system and the subsequent map adopted under Article IV of the Pa. Municipalities Planning Code. This kind of approach was successfully implemented by Adams Township Butler County, prior to their establishment of true impact fees. Adams Township set up a modest participation fee and lineal foot assessments to build secondary access roads to implement the Official Map Ordinance. There is a clear basis for a front foot assessment for transportation improvements, if it can be linked to *on-site*, versus *off-si*te projects. This has potential in cases such as Coal Hollow Road, where future development could create problems on a road with very poor geometry. Either Township could assess a new development based upon its frontage then stockpile the money for right of way or cartway improvements. Another alternative may be to increase the traffic study requirements in local ordinances and require a local road occupancy permit that more closely mirrors the PennDot process for state roads.

Land Use/Transportation Connections

As each community grows and develops, there will be pressure for more transportation projects to eliminate congestion. In order to avoid this endless cycle of

physical improvements, Buffalo Township began to look at traffic management through land use controls. After the Land Use and Transportation Initiative, Buffalo Township adopted an A-2 Access Management Overlay Zone to accomplish several basic goals: limiting future access to major roads, requiring significant setbacks, requiring corner properties access roads from the corner with the least traffic, and requiring geometric coordination of new curb cuts to facilitate future signalization.

The Township also adopted changes to its subdivision and land development to discourage or disallow cul-de-sacs and other dead-end streets, without reason. This is essential to good traffic management. Provisions also require sidewalks under certain clear circumstances. These type of changes begin to find solutions to typical smart growth concerns about development-traffic congestion and a lack of walkable communities. The next stage will be to refine these further to integrate Route 228 in Clinton Township, and possibly even non-motorized routes, such as requiring setbacks from the trail right of way. Future development within greenway areas could also leave land adjacent to rights of way for a bike or pedestrian trail. A marked bikeway has been included in part of Jefferson Township adjacent to a public road. However, some planners have expressed concern where rural bikeways do not include a curb or buffer area. The attached concept sketches show how that could be remedied.

Smart transportation must become an integral part of the two townships' smart growth strategy. Otherwise, transportation policies will undermine land use policies. The key action will be for Clinton and Buffalo to work together to refine the initial overall concept into a second generation approach for the long term.