



Federal Highway Administration
Scenario Planning Workshop

State College,
Pennsylvania

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FHWA Scenario Planning Workshop

Thomas D. Larson Transportation Institute at The Pennsylvania State University

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Sponsor: Federal Highway Administration (FHWA)

Host Agency/Sponsor: Thomas D. Larson Transportation Institute (LTI) at The Pennsylvania State University (PSU)

Documentation and Event Planning: U.S. Department of Transportation (USDOT) Volpe National Transportation Systems Center (Volpe Center)

Participants: [See Appendix B](#)

Table of Contents

I. Introduction	4
II. Background	4
III. Presentations and Discussion	5
A. Welcome.....	5
B. FHWA Overview of Scenario Planning.....	6
C. Scenario Presentation and Discussion.....	7
D. Assessment of Business As Usual (BAU) I/II Scenarios.....	10
E. Alternative Scenario Evaluation.....	11
IV. Key Insights from the Workshop	12
V. Conclusions	14
Appendix A. Workshop Agenda	16
Appendix B. List of Workshop Participants	17

I. Introduction

This report summarizes a one-day scenario planning workshop co-sponsored by the Federal Highway Administration (FHWA) and The Thomas D. Larson Transportation Institute (LTI) at The Pennsylvania State University (PSU). (See [Appendix A](#) for the complete workshop agenda).

Scenario planning is a technique used to think through how the future, as it relates to a particular decision or issue, might unfold. Understanding the short-, medium-, and long-term implications of current decisions in the context of a changing external environment enables stakeholders to better prepare for different possible futures. The scenario planning technique used for this workshop was employed to assess the effects of demographic, economic, political, and environmental trends on transportation and land use decision-making. By considering and analyzing alternative future scenarios based on these variables, transportation agencies can better understand how a state, region, or community might look and function in the future. Transportation and land use scenario planning, as used in the context of this workshop, is the identification of land use patterns as variables (rather than static inputs) that affect transportation networks and investment decisions.

Scenario planning is a technique and comparative process used to assess and prepare for possible future conditions.

II. Background

The purpose of the workshop was to identify issues that might in the future significantly affect the Centre Region portion of Centre County, a rural county in central Pennsylvania, and discuss ways the region might better prepare for future transportation and land use changes. The Centre Region is the most populated portion of Centre County. Participants used scenarios as frameworks to discuss different futures and factors. The workshop convened representatives from local and regional agencies, the private sector, and other organizations involved in planning and development for the Centre Region (see Figure 1). (See [Appendix B](#) for a complete list of workshop participants).

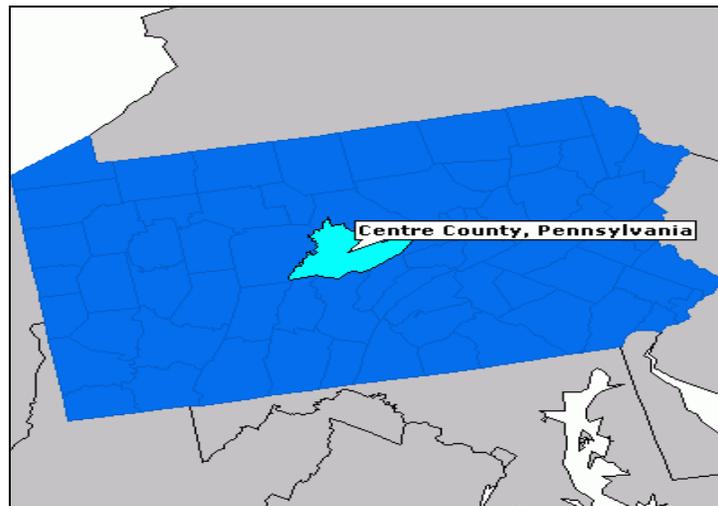


Figure 1. Map of Centre County, Pennsylvania

Centre County includes 25 townships that occupy over 1,100 square miles. The area has a total population of approximately 146,000, which has grown 7.7 percent since 2000 and 8.8 percent since 1990.² In comparison to nearby counties, only Union County has experienced more growth over the past twenty years. Most of the land in Centre County (nearly 75 percent) is forested. The

¹ Map from www.epodunk.com/cgi-bin/genInfo.php?locIndex=13710.

² From the U.S. Census at <http://quickfacts.census.gov/qfd/states/42/42027.html>.

Centre Region, the metropolitan planning region within Centre County, consists of approximately 20 percent developed land with the remaining 80 percent made up of agricultural tracts, forested parcels, and vacant land.³ The PSU University Park campus has an enrollment of about 44,000 students and is located primarily in State College borough within Centre County. State College and Bellefonte borough, the county seat, are the main job centers in the county (see Figure 2).



Figure 2. Downtown State College⁴

III. Presentations and Discussion

This section summarizes the presentations and discussions that occurred during the workshop.

A. Welcome

Martin Pietrucha, LTI/PSU

Dr. Pietrucha, Director of LTI, welcomed participants and discussed the overall objective of the workshop: to inform participants about how scenario planning can help the Centre Region planning and development organizations better prepare for possible, yet not necessarily predictable, changes. Dr. Pietrucha compared the use of strategic scenario planning to a wind tunnel that tests new design concepts. Both techniques are useful in helping people and organizations understand how alternatives might perform in the real world.

Scenario planning helps planners and stakeholders answer: “if the world were to unfold in a particular way, what actions can be taken today to prepare for or change the future?”

Darryl Farber, PSU

Dr. Farber, Assistant Professor in the Science, Technology, and Society Program at PSU, described the history of scenario planning. Scenario planning has been used by many types of organizations, including the military, the private sector, and educational institutions.⁵ For example, the United States' military pioneered scenario-based planning during the Cold War to assist with nuclear war planning, working with Herman Kahn of The Rand

Corporation and later the Hudson Institute. Business, government, and non-government organizations adapted Kahn's methods. Most notably, the Royal Dutch/Shell Company and the World Economic Forum have used scenario planning as a tool for strategic decision-making and risk management. These organizations have employed scenario planning to stimulate discussion

³From Centre County Planning and Community Development Office: www.co.centre.pa.us/planning/demographics/county%20fact%20sheet.pdf and www.co.centre.pa.us/planning/data.asp.

⁴ From Google Images.

⁵ For more information about the use of scenario planning in an academic context, see Christopher Zegras et al. (2004). “Scenario Planning for Strategic Regional Transportation Planning.” *Journal of Urban Planning and Development* (2-13). The paper is available for purchase at <http://tinyurl.com/383xsrk>

and to help think through and understand possible changes in the business environment to formulate strategic responses.

Overall, scenario planning is a technique that can be applied in many contexts. In all cases, it is designed to help practitioners answer the following question: “if the world were to unfold in a particular way, what actions can be taken today to prepare for and/or change the future?” Scenario planning is valuable in helping prevent stakeholders from getting “blindsided.”

B. FHWA Overview of Scenario Planning

Fred Bowers, FHWA Office of Planning

Mr. Bowers explained that the workshop followed up a one-day, FHWA-sponsored event planning workshop held at PSU in September 2009. Mr. Bowers also provided additional background information on scenario planning in a transportation and land use context and discussed FHWA’s concept of scenario planning. FHWA sees scenario planning as a technique that enhances, not replaces, traditional transportation planning processes. To promote scenario planning, FHWA established its scenario planning program in 2004. As part of this program, FHWA has conducted 16 scenario planning workshops in 16 states and produced training materials and guidance for interested agencies. FHWA shares this guidance and other resources through the scenario planning program website.⁶

Alisa Fine, U.S. Department of Transportation Volpe Center (USDOT Volpe Center)

Ms. Fine reiterated that scenario planning is a flexible technique and every application is unique. Many transportation scenario planning efforts take one to two years to complete and involve quantitative analysis of scenario outcomes. However, there are also many examples of shorter scenario planning efforts (e.g., one-day exercises, six-month processes) or efforts focused primarily on qualitative scenario analysis. The issues addressed in scenario planning, the analytic process used, and the length of effort will depend on the needs of the agency and other factors (e.g., available data).

Ms. Fine also noted that scenario planning has typically focused on interactions between transportation and land use. More recently, however, some agencies have used it to address new trends and less predictable factors, such as climate change, energy, technology, and public health.

Ms. Fine provided a brief overview of the FHWA *Scenario Planning Guidebook*,⁷ which provides a basic, suggested approach for transportation scenario planning. The centerpiece of the *Guidebook* is a framework that details six phases for a scenario planning approach and potential outputs from each phase. Ms. Fine explained that the PSU workshop would focus on Phase 4 (creating scenarios) and Phase 5 (assessing scenarios), with additional discussion related to Phase 6 (identifying an action plan or success factors for action steps) (see Figure 3 for an excerpt of the guidebook’s framework).

⁶ The FHWA scenario planning program website is available at www.fhwa.dot.gov/planning/scenplan/index.htm.

⁷ The *Guidebook* is available at www.fhwa.dot.gov/planning/scenplan/index.htm.

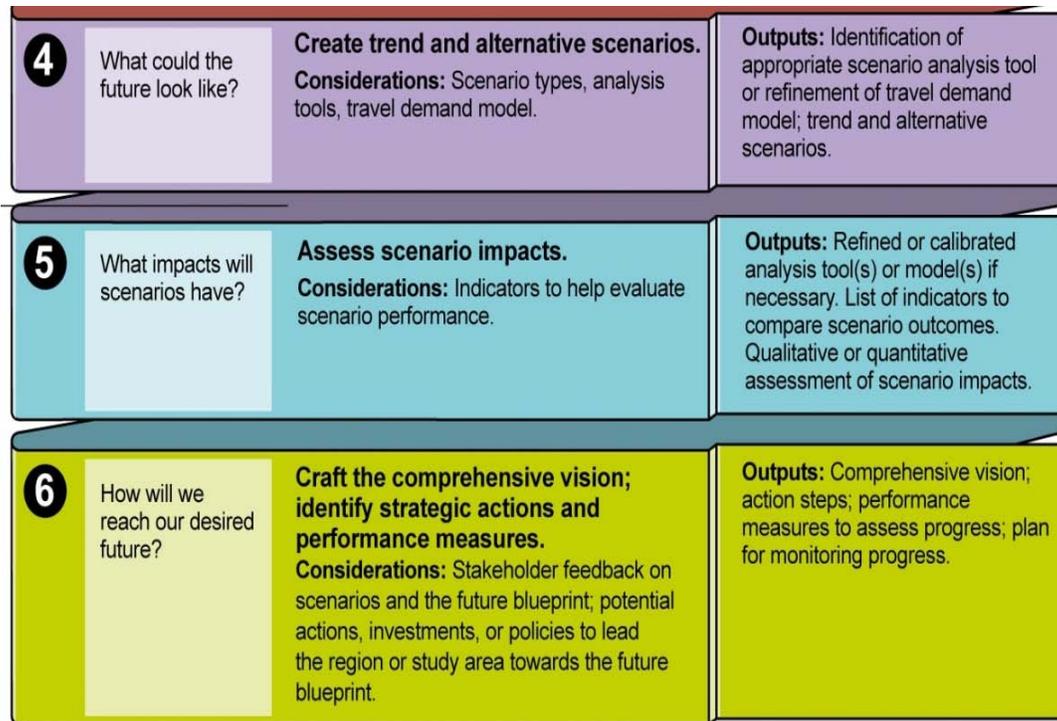


Figure 3. Phases 4, 5, and 6 from the FHWA Scenario Planning Guidebook

Ms. Fine concluded by describing a scenario planning effort conducted in November 2009 by the Metropolitan Washington Council of Governments (MWCOC), the regional organization of local governments in the Washington, District of Columbia (D.C.) area. Like the current PSU workshop, the MWCOC effort focused on identifying plausible future regional changes and qualitative analysis of scenario outcomes.⁸ MWCOC’s effort involved a one-day scenario planning exercise during which nearly 100 participants identified strategies that would serve the region well under several possible futures. The alternatives, which had been developed prior to the workshop, included a range of possibilities for the region’s economy, security, technology, and natural environment. The outcomes of the exercise were the “10 Big Moves,” or the strategies that would guide the regional growth vision. MWCOC believed that the event helped to encourage innovative and creative thinking on complex issues while building consensus around regional priorities. Similar to the MWCOC effort, scenario frameworks for the PSU workshop had been developed prior to the event; the focus of the workshop was on evaluating these frameworks and assessing their potential regional effects.

C. Scenario Presentation and Discussion

During this session, participants discussed and assessed four scenarios (two “business as usual” (BAU) and two alternative scenarios) using their collective knowledge of the region to identify plausible elements and potential outcomes. The scenarios had been developed prior to the workshop by Dr. Farber and Dr. Pietrucha.

Discussions of scenario outcomes included expected measurable factors (e.g., traffic congestion, land developed, transit ridership, sewage discharge, etc.), as well as expected effects of these factors on quality of life and community identity. The discussion focused more on general measurable outcomes rather than on the magnitude of these impacts, such as how much traffic congestion might be expected in the future and where it would be located. The participants

⁸ Additional information on the MWCOC and the scenario planning exercise is available at www.fhwa.dot.gov/planning/scenplan/ngscenplanrpt.htm

identified several factors, including the local economy, public finance, and fuel prices, as critical driving forces of change that could affect the region's future.

Summaries of each scenario and key themes from the discussions are presented below.

Business As Usual (BAU) Scenario (Version 1): Classic Suburbanization

One plausible vision of the Centre Region's future was a BAU I scenario focused on suburbanization. The BAU I scenario assumed the region would see unconstrained continuation of auto-oriented, suburban development over the next 20 to 30 years. The scenario also assumed no significant changes in the region's planning and development processes or in economic or development trends.

BAU I scenario: assumed the Centre Region would experience unconstrained suburbanization over the next 20 to 30 years.

Primary factors for the BAU I scenario were the observed resident preference for automobile-based travel and suburban living coupled with the assumed continuation of municipal government efforts to support private development.

Discussion about the BAU I scenario focused on the following topics and issues:

- **Identifying the boundaries of the "Centre Region."** While the Centre Region is formally defined, it is also a colloquial term referring to the southern portion of Centre County (see Figure 4). There is a need to specifically define what the region includes. There are many different boundaries for planning and development, including boroughs, townships, counties, metropolitan planning areas, state highway districts, regional watersheds, and commuting corridors. Participants agreed that it is more practical and effective to define the regional boundary on a case-by-case basis according to the specific issue being considered.



Figure 4. Pennsylvania's Centre Region⁹

- **Plausibility of the BAU I scenario.** Participants generally agreed that the BAU I scenario is plausible due to the following reasons:
 - Residents have consistently shown a preference for suburban living and large homes; developers will likely continue to respond to this preference.
 - It is typically easier and more cost effective to build on undeveloped farmland than it is to redevelop other existing developed parcels or fill in small vacant parcels.
 - While the BAU I scenario would likely require expensive upgrades to public water and sewer systems, these upgrades are feasible.

⁹ From Google Images.

- **Potential outcomes from the BAU I scenario.** Transportation, housing, and other outcomes could include:
 - More carpooling and vanpooling during temporary or extended energy cost spikes.
 - Increased cost of and need for municipal services. As the housing stock expands and neighborhoods grow, water and sewer systems must be upgraded and expanded, emergency services must cover more land area, and additional municipal services are required. However, low-density development can use well and septic systems and might not require as many municipal services, such as law enforcement.
 - Affordable housing would continue to be available in the rural townships. One of the participants noted that many blue collar workers chose to live in rural areas despite longer commutes because of community connections and rural lifestyle preferences, rather than because they cannot afford to live in more central areas.
 - High quality of life. Participants generally agreed that the region's suburban communities offer a high quality of life that would continue to be available under the BAU I scenario.

- **Unknown factors that could affect the BAU I scenario.** These factors could include:
 - Energy costs. Increasing fuel and energy costs could lead residents to move closer to downtown, although it might be more likely that people would adjust their commuting habits by carpooling, taking transit, or telecommuting rather than relocating. Most participants, however, did not think that energy costs would significantly change development patterns.
 - An unpredictable housing market. The region's population is aging. In the future, more residents might need or desire to downsize, reduce residential maintenance, and be located close to services and medical care. These factors could reduce demand for suburban living and increase demand for urban locations. Additionally, some residents might prefer more urban lifestyles. If developers misjudge the market, there could be vacant subdivisions and residential devaluation. Additionally, if the local economy loses middle income jobs, residents could have less buying power.
 - Zoning and developer requirements. These factors could lead to "leapfrog development," or development in nearby areas outside the Centre Region, if land becomes more expensive or regulated.
 - Projected population growth could change dramatically. Faster growth could lead to an undesirable level of suburban growth. Slower growth or contraction could lead to vacant subdivisions and residential devaluation.

BAU Scenario (Version 2): Urban Villages

A second plausible vision of the Centre Region's future focused on urban villages. This scenario assumed that several higher density, mixed-use developments ("urban villages"), which have been proposed over the last decade, will be built and be the prominent development pattern in the next 20 to 30 years. Urban villages are characterized by a mixed-use activity center with nearby alternatives to automobile-based travel.

There are many precedents for urban villages within the region and elsewhere. The assumed motivating factors that would lead to this scenario included desire for reduction of energy costs, preservation of rural land, and the emergence of a consumer preference for mixed-use development. Discussion about the BAU II scenario focused on the following topics and issues:

BAU II scenario: assumed that the Centre Region would experience urban village development in next 20 to 30 years.

- **Plausibility of the BAU II scenario.** Participants generally agreed that the BAU II scenario is plausible, although there are some factors that make it unlikely. Plausible elements include the following:
 - As current residents age, they might desire smaller homes that require less maintenance and are located in areas where services (e.g., shopping areas) are accessible via alternative transportation modes.
 - The region's soils are not conducive to on-lot septic systems, so denser development with municipal sewer services is an efficient option.
 - Light industry could be incorporated into urban villages if the amount of commercial and retail development proposed is not financially viable.

- **Potential outcomes of the BAU II scenario.** These outcomes could include:
 - Significant impact on municipal tax revenue. Even given a high rate of population growth, property tax revenue might be reduced for local municipalities that have higher density development (i.e., smaller homes on smaller lots) than with more dispersed development. This would depend, however, on property valuation, which, in turn, would depend on individual housing preferences. Higher density development might also allow reuse and redevelopment of land already served by roads, water supply pipes, and sewers, which might offset reduced revenue levels.
 - Alternative lifestyles. Urban villages might provide a notably different lifestyle option for residents in and around these developments.
 - Increased preservation of agricultural land.

- **Unknowns that could affect the BAU II scenario.** These factors could include:
 - Recent expansion of Interstate 99 has made it easier to commute to State College. Rather than lead to development of urban villages, a growth boundary could have an unintended consequence of encouraging leapfrog development to other areas outside State College.
 - Energy costs have remained low in real dollars. If this trend continues, the energy-efficiency offered by urban villages is not likely to motivate developers or residents to support this type of development.
 - Infrastructure funding might be constrained. If public funding for infrastructure continues to contract, municipal governments might not be able to continue to fund expansion projects.
 - Accelerated growth might lead to expansion of the regional airport (bringing new industries to the region) and intercity bus services (leading to increased commerce and potentially increased migration from outside the region to Centre County).
 - Slow growth of the region as a whole might mitigate scenario impacts. Even if all of the proposed and planned urban village developments were built, the overall impacts on the region might be minor due to a slowly growing population.

D. Assessment of BAU I/II Scenarios

During this session, participants discussed the assumptions that were incorporated into the BAU I and II scenarios and identified issues and factors that scenarios did not address. Participants agreed that the future will likely incorporate elements of the BAU I and II scenarios, but the region might also encounter challenges that neither scenario specifically mentioned or anticipated. A central focus of the discussion was on how to preserve desired elements of the region rather than try to anticipate how the region might change in the future.

To conclude the session, participants voted by placing a sticker on a flipchart to indicate which of the BAU scenarios they believed was most likely to occur or whether they thought that some combination of factors were likely to make another scenario (a hybrid of BAU I and II) more likely. The hybrid scenario received the most votes by a two to one margin.

The following assumptions were identified that could affect the region's future but were not fully addressed in the BAU I and II scenarios:

- Constraints on public funding availability. Infrastructure maintenance will likely require significant financial resources. The availability of this funding is contracting now and could continue to contract in the future.
- Changes in economic factors outside the region or changes in the region's economic base (e.g., a reduction in federal university research funding or state university support) could lead to regional decline and/or decrease of the student population.
- Growing challenges for the region's farmers could lead many to fail and sell land for development. This could trigger a "ripple effect" that would degrade quality of life in the region. Currently, active farms are an important regional element that attracts residents and visitors.
- If energy prices continue to increase, local residents and businesses may need to transition to more energy-efficient lifestyles.

E. Alternative Scenario Evaluation

This session explored alternative scenarios, developed by Dr. Farber and Dr. Pietrucha prior to the workshop, which incorporated factors that differed from those included in the BAU I and II scenarios.

Alternative Scenario (Version 1): Explosive Student Population Growth

Dr. Pietrucha described an alternative scenario in which the Governor of Pennsylvania decides (and the legislature agrees) to end Pennsylvania's historic support of PSU (see Figure 5). A potential PSU response to address the \$400 million shortfall might be to increase university enrollment by adding 10,000 out-of-state students. Participants agreed that this scenario is quite plausible, although a more likely response from PSU might be to add 1,000 students per year over a decade rather than 10,000 students at one time, given that state support of PSU would most likely gradually diminish.

Alternative scenario I: assumed 10,000 additional PSU students would be added to the student population in 2020.

The discussion of potential outcomes from this scenario focused on housing, parking, and transit. Additional students would likely require an increase in these services. However, participants agreed that it is possible that local residents and elected officials could react negatively to an increased student population and refuse to accommodate the growth. If this were the case, additional housing, parking, or services would need to be built in locations that are farther from campus, which could significantly impact parking, congestion, and transit use.



Figure 5. PSU's Campus¹⁰

These impacts could be greater given the additional faculty and staff that would be needed to support an increased student population.

Important unknowns that could affect the outcomes of this scenario included: the specific location for additional student housing, whether the State College borough would cooperate to accommodate the growth, and whether the impacts could be mitigated by extending PSU's daily and weekly class scheduling and/or increasing online instruction.

¹⁰ From Google Images.

Participants identified several actions that could be taken to mitigate the impacts of this scenario, including:

- Assessment of transit needs, including needs for additional vehicles, facilities, and operating funds, as well as dedicated right-of-ways and additional routes.
- Enactment of new zoning regulations to infill land and underutilized buildings close to campus. New regulations could promote higher density residential development that could house students or allow/encourage residents to sublet spare bedrooms.

Alternative Scenario (Version 2): Regional Transportation Hub Development: Population Doubles by 2020

A second version of the alternative scenario focused on increased regional population as a whole. This scenario assumed the completion of several major road projects in and around the Centre Region that would establish the region as a major transportation hub. Spurred by this growth, this scenario hypothesized the establishment of a Federal free trade zone that would transform the region into a major, intermodal inland port. The port's accessibility and economic incentives would subsequently lead to substantial regional growth, including warehousing and product support (i.e., preparation, repair) facilities in the region as well as associated housing and service-based business growth. Overall, this scenario would double the region's population by 2020. Participants generally agreed that this scenario appears to be plausible, although most housing and trucking-related jobs would probably occur outside of the Centre Region.

Alternative scenario II: assumed that region's population would double by 2020.

If this scenario came to pass, many participants thought that its impacts would be more significant in nearby areas rather than in the Centre Region because of the location of major access junctions. Growth that occurred inside the Centre Region might be focused on secondary uses such as shopping, healthcare, services, and housing. New water treatment facilities would be needed in this scenario, as would significant roadway and transit upgrades. The significant level of population growth would likely create severe congestion problems on local and arterial streets. Participants suggested that managing these issues would require partnerships and cooperation between the public and private sectors. Major uncertainties about this scenario included the ability to finance any needed infrastructure upgrades.

IV. Key Insights from the Workshop

Participants suggested that other regional scenarios besides those discussed in the workshop could be considered. For example, one scenario could assess what new infrastructure might be needed given dramatically higher prices of transportation fuels. Another could explore an extended period of decreased economic activity. The alternatives explored during the workshop, while focused on a narrow range of possibilities, helped participants consider and think through regional impacts and potential responses to plausible regional changes.

Critical Planning Issues

Discussions of the four scenarios revealed insights on the key issues affecting regional transportation and general planning in Centre Region, including the following:

- **Increased commute lengths are not ideal.** Longer commutes increase congestion and wear and tear on roads. Additionally, if fuel prices increase dramatically, residents with lengthy commutes might not be able to afford to drive to their jobs and other activities. The region may not be able to provide adequate public transportation to support residents' travel needs.

- **Limited funding presents a challenge.** The region has experienced limited or uncertain availability of funds for transportation infrastructure maintenance. This challenge is most pronounced in State College, which has experienced stagnant growth and a relatively fixed level of tax revenues. With limited funding, the region might have difficulty addressing transportation infrastructure needs that arise in any scenario.
- **The region should focus on preserving a vibrant core.** Most participants believed that due to the central location of PSU in the State College community, the downtown area is thriving more than many small cities. The vibrant downtown is an asset to the entire region. To retain a strong downtown and realize benefits from re-using existing transportation and utilities infrastructure, public incentives might be needed to encourage downtown re-use and re-development. However, development costs are higher in the downtown area than in surrounding suburban neighborhoods.
- **Suburbanization might continue as the dominant development pattern.** While infill and growth in already developed areas may be preferable from a traffic perspective, the expectation is that most residents will continue to prefer suburban living. Consequently, developers are likely to respond to this demand. It is a challenge to compare the measurable and non-measurable impacts that could result from continuing the suburban development pattern.

Since the focus of the workshop was to assess the general trends described in the scenarios, participants did not focus on identifying potential trade-offs or determining specific action steps. They did discuss general actions that could be taken to mitigate the impacts of each scenario should it come to pass. For example, if PSU enrollment increased dramatically, the Centre Area Transit Agency (CATA) and PSU could potentially work together to coordinate class schedules and achieve better utilization of the transit vehicle fleet.

Success Factors to Address Regional Challenges

Participants discussed success factors that would be required in addressing regional challenges. There was a consensus that it is difficult, yet critical, to transition from reacting to changes to planning for an effective future. Key themes in the discussion included: 1) a better understanding of “what the region is;” 2) a better understanding of community values; 3) the need for increased regional collaboration and coordination; 4) a better understanding of demand for and capacity of transportation and land use resources, such as highways, buses, parking, water, sewage, and housing, especially as related to identifying underutilized capacity; and 5) development of strategies for addressing funding limitations.

Success factors included the following:

- **Ensure regional collaboration and communication across planning-area boundaries.** While the Centre Region metropolitan planning organization coordinates planning activities within a portion of the county boundary, there is no formal governing body for the five municipalities and surrounding townships that are commonly known as the Centre Region. As a result, it can be difficult to identify specific agencies that should be involved in addressing a particular planning issue, as well as agency roles. More and better communication and collaboration is necessary to address many of the issues that would emerge in various scenarios. This collaboration should include increased partnerships across jurisdictional boundaries, public and private sectors, and across disciplines (e.g., transportation, land use, water, emergency services). It would also make use of future systems analyses to develop knowledge about specific Federal, state, and local administrative procedures that might constrain closer coordination between the transportation system and land use planning. The intent of these systems analyses would

be to identify procedures that need reform and to assess possible alternative administrative procedures.

- **Obtain private sector involvement in planning processes.** It is important to obtain feedback and input from the private sector; historically, transportation and planning agencies in the region have more often heard from residents and less often from businesses. Private sector feedback related to action steps is critical, especially given scenarios that assume substantial business and population growth in the region.
- **Use scenario planning to foster a continuing strategic conversation about trends and possible changes internally within planning organizations and among organizations and groups in the broader area or region.** Organizations are often busy with their day-to-day work and there might be limited opportunities to think broadly and strategically about internal organizational changes or possible futures. Scenario planning can be a strategic planning tool for organizations to enable reflection on current planning practices and processes and facilitate organizations' better preparation for the future.
- **Identify new or alternative sources of funding.** The Centre Region has experienced severe limitations in funding. It can be difficult or unrealistic to try and implement innovative action steps, ideas, or projects without access to funding. Possible strategies for the region could include seeking out discretionary funding opportunities, engaging in public-private partnerships, or implementing other innovative finance options to continue to provide high-quality transportation and other public infrastructure.
- **Understand community values to plan proactively.** Previous community surveys in Centre County have indicated how people view the borough and what their values are, but do not always provide a clear picture of what people value or why they value it.¹¹ Public agencies need to have a good understanding of community values to carry out plans and projects that will meet residents' needs and provide a high quality of life. It might not be desirable or feasible to implement changes unless a high level of community support can be obtained.

V. Conclusions

The workshop brought together a diverse set of participants with many different perspectives on regional futures. These perspectives allowed broad insights into the potential regional effects if a scenario were to come to pass. For example, a participant from the school district shared useful information during scenario discussions about how population growth might lead to the need for new schools in the region, although there is not a direct correlation. The need for new schools depends on the demographic of the increase in population (e.g., an increase in population that results from people of retirement age would not typically result in the need for more schools).

Through the discussion of the four scenarios and qualitative assessment of their driving factors, plausibility, and potential outcomes, participants identified several critical uncertainties that might affect the region and should be considered in future planning efforts. These factors included, but were not limited to, local economic health, level of public funding available for transportation infrastructure and municipal services, and fuel/energy prices.

Participants also focused on critical success factors that would be required to move forward with strategic planning in the region, including increasing coordination and collaboration across traditional jurisdictional boundaries and the public and private sectors, identifying new funding sources, and understanding community values to plan proactively for the continued high quality of life in the Centre Region.

¹¹ F.K. Willits, J.O. Janota, and L.A. Singletary. (1995). "Centre County: Today and Tomorrow--Public Perceptions." Bellefonte, PA: Centre County Government.

Overall, the workshop was a productive learning experience and was successful in meeting its objectives. On evaluation forms distributed after the event, participants commented that the event increased an understanding of scenario planning approaches and that it was useful to be made aware of examples from other parts of the nation. Additional noted benefits included learning about the importance of public involvement in scenario planning and the adaptability of the technique to address different issues. Others mentioned that thinking through the plausible scenarios had made them more conscious of possible changes in historic trends and would help them to better address their agency's business needs. Many individuals planned to share knowledge of scenario planning with their colleagues after the workshop and consider how the technique could be used as part of ongoing planning activities.

Appendix A. Workshop Agenda.

Time	Session
8:00-8:15	Check-in
8:15-8:30	LTI/PSU Welcome and Introduction
8:30-9:00	FHWA and USDOT Volpe Review of Federal Scenario Planning Program
9:00-10:00	Session I: Discussion of BAU I Scenario
10:10-10:30	Break
10:30-11:00	Session I (continued): Discussion of BAU I Scenario; Prioritization of Regional Uncertainties
11:00-12:15	Session II: Discussion of Alternative Scenarios
12:15-1:15	Working Lunch
1:15-2:15	Session II (continued): Discussion of Alternative Scenarios; Identification of Signposts and Possible Wildcards
2:15-2:30	Break
2:30-4:00	Identifying Critical Success Factors

Appendix B. List of Workshop Participants.

Name	Organization
Dan Abruzzo	Chamber of Business and Industry of Centre County
Fred Bowers	FHWA Office of Planning
Mike Casper	LTI/PSU
Rob Cooper	PSU Office of Physical Plant
Janice Dauber	LTI/PSU
Darryl Farber	LTI/PSU (report contributor)
Alisa Fine	USDOT Volpe Center (report author)
Max G. Gill	State College Borough Water Authority
Carl Hess, AICP	State College Borough
Bob Jacobs	Centre County Planning and Community Development Office
Greg Kausch	Centre Regional Planning Agency
George Khoury	Centre County Housing and Land Trust
Kevin Kline	PennDOT District 2
Thomas Kurtz	State College Borough (retired)
Norman K. Lathbury	Agricultural Preservation Centre County Planning and Development Office
Jim May	Centre Regional Planning Commission (metropolitan planning organization)
Hugh Mose	Centre Area Transportation Authority
Lisa O'Hara	LTI/PSU
Louwana Oliva	Centre Area Transportation Authority
Martin Pietrucha	LTI/PSU (report contributor)
Ed Poprik	State College Area School District
Paul Silvis	Restak, advanced technology manufacturer
Matt Smoker	FHWA Pennsylvania Division Office
John Spychalski	PSU, Smeal College of Business
Kate Sylvester	USDOT Volpe Center/MacroSys (report author)
Dan Vilello	Pennsylvania Department of Environmental Protection Community Revitalization Consultant
Tom Zilla	Centre Regional Planning Commission (metropolitan planning organization)