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Scenario Planning for Smaller Places: Aligning Methods and Context

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Robert Goodspeed
Taubman College of Architecture and Urban Planning, University of Michigan

David DeBoskey
Taubman College of Architecture and Urban Planning, University of Michigan

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Abstract

Empirical studies of the use of scenarios in planning processes have often focused on projects that are relatively atypical of broader professional planning practice, such as large, novel, complex regional visioning projects completed for major metropolitan areas. As a result, it is not well known how scenario methods have been apply by practitioners for different typical planning contexts. This paper reports the empirical comparison of ten case study planning projects in three categories where the use of scenario methods has been relatively understudied: neighborhood or district plans, medium-sized city comprehensive plans, and metropolitan planning organizations (MPOs) serving small (less than 200,000 population) and medium (200–500,000 population) sized regions. Within each category, the paper presents short case studies of projects that use scenario planning as well as those which use alternative planning approaches (vision- or forecast-based plans). These case studies were developed from a close analysis of plan documents and interviews of ten professionals involved in the plans. The cases illustrate how scenario methods have been applied in contextual ways, including: scenarios focused on different uncertainties, the specific composition of the scenarios, the use of scenarios to foster coordination among parallel or sequential plans, and the use of scenarios to analyze specific policies or infrastructure projects. Our interviews also captured a rich variety of impacts on decisions and implementation activities, but the diversity of projects we are not able to generalize more broadly about the effectiveness of scenario planning methods. Although falling loosely within existing scenario typologies, the cases illustrate the importance of adapting planning methods to meet local planning goals.

Keywords: scenario planning, planning methods, urban planning, uncertainty

About the Authors

Robert Goodspeed is an assistant professor of urban planning at the Taubman College of Architecture and Urban Planning at the University of Michigan. He conducts research and teaches in the areas of geographic information systems, collaboration, and planning methods. He can be reached at rgoodspe@umich.edu.

David DeBoskey is a candidate in the Masters of Urban and Regional Planning program at the University of Michigan.

Taubman College of Architecture and Urban Planning
University of Michigan
2000 Bonisteel Blvd.
Ann Arbor, MI 48109

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Introduction

Scenario planning is of growing interest in the urban planning field. Centered on the analysis of uncertainties and the creation of multiple plausible scenarios, scenario planning can be used in many different ways in planning (Goodspeed 2019). Normative projects, the most popular approach to conduct scenario planning for cities and regions, construct multiple scenarios in order to clarify the preferred scenario that can be used to guide decision-making. One such example is the Sacramento Regional Blueprint Plan, which proposed a set of regional land use and transportation patterns (Allred and Chakraborty 2015), an exemplar of a large body of scenario-based plans examining alternative transportation and land use patterns (Bartholomew and Ewing 2008; Oregon Department of Transportation 2013). Other practitioners point out that such projects typically neglect attention to external uncertainty affecting planning—such as the degree of growth that will occur. These practitioners have pursued more exploratory projects, more akin to the types of scenarios created in corporate strategic planning (Roberts 2014), at times seeking to integrate exploratory and normative elements (Avin 2007).

As a consequence of these developments, the choices facing practitioners about how to conduct scenario planning have only grown in complexity. As an illustration, while the widely-cited 2011 FHWA Scenario Planning Guidebook primarily described normative scenario planning (Federal Highway Administration 2011), the updated 2016 version discusses multiple types of scenario projects (Twaddell et al. 2016). Furthermore, the existing scholarly literature on the topic has tended to focus on large, well-funded regional projects, resulting in a gap in the literature about how scenario planning can be conducted in smaller places with more limited budgets.

In parallel with the growing use of scenario planning for urban plans—and a corresponding variety of projects—there is a growing interest for understanding and measuring the benefits they provide. In an earlier Lincoln Institute working paper on this topic (Goodspeed 2017), I argued that the evaluation of scenario-based plans should include analysis of their use and influence in decision-making, learning outcomes, and other implementation activities. One reason for the focus on decisions arises since scenario-based plans more strongly resemble *strategic plans*, which serve as a frame of reference for future decision-making, instead of a *project plan* that describes the intended end-state for urban development (Mastop and Faludi 1997). Building on the performance perspective, more recently Millard-Ball (2012) has suggested plan evaluations simply examine the *implementation*, *causal attribution*, and *causal pathways* for the impact of a plan. Whereas implementation focuses on whether its recommendations are realized, causal attribution aims to understand whether these were as a result of the plan, and causal pathways investigates the ways in which this occurred (e.g., such as by shaping preferences or coordinating decisions). In light of these ideas, my earlier working paper proposed that the empirical evaluation of scenario planning should "include whether [plans] are utilized in subsequent decision-making by various stakeholders, as well as an analysis of their influence on participant's thinking. Of particular importance is public-sector decisions, such as regulations and legislation, but other stakeholder decisions also matter" (Goodspeed 2017, 4).

In summary, this paper responds to two specific gaps in the scenario planning literature. First, it seeks to identify and document project examples that illustrate how scenario planning is conducted outside of the context of large regions, and in doing so highlight the diverse approaches practitioners take. In particular, it examines projects to create plans for neighborhoods, medium-sized cities, and long-range regional transportation plans for small- and medium-sized regions. These categories are also selected because they represent well-established categories of U.S. urban planning practice where scenario planning methods may be further adopted. Second, it seeks to evaluate the effects of these plans, through interviews with professionals involved in these projects. We also explore the impact of these plans through interviews, but the current paper does not fully report these results.

Research Design

The project adopts a case study research design, however given the project goals to examine planning methods specifically, we use only two primary sources of information about each case: the plan document produced by the project, and semi-structured interviews with the participants. The following sections describe how the cases were selected, and the data collection and analysis project used.

Case Study Selection and Data Collection

In order to highlight the diversity of scenario practice, we sought to identify cases that illustrated different approaches to construct scenarios. One challenge for conducting research on this topic is the need to combine a detailed analysis of processes with the consideration of the many different contextual factors that influence any particular plan, such as the number and types of participants, specific issues or problems to be addressed, and the type of plan being prepared. Consequently, this project adopted a comparative case study design that compares a small number of cases that are otherwise similar but differ in one variable of interest (their use of scenario methods). This paired case research design allows the comparison to examine the influence of the scenario methods. This design is inspired by Ulibarri's (2015) analysis of collaboration in hydropower licensing. We therefore also identified four comparison projects, one for each of the four categories.

The cases, summarized in Table 1, were identified in different ways. We identified the neighborhood and medium-sized city comprehensive plans by searching through professional documents for recent examples. The MPO region cases originated from a list of projects that resulted from an earlier research survey. Within this list of projects, which respondents had indicated used scenario plans, we looked at MPOs with populations less than 200,000 because out of the 405 MPOs listed, half fall under this threshold. In addition, regions in this size are provided less funds to conduct transportation planning activities than larger region. Similarly, we looked at medium-sized MPOs that had populations in the range 200,000-500,000, a category which includes 25 percent of all MPOs (103). The planning practices of these two categories, despite including 75 percent of MPOs in the country, have less professional and scholarly visibility than the remaining largest regions. Under federal law these MPOs are mandated to prepare Long-Range Transportation Plans (LRTPs; also called Metropolitan Transportation

Plans) every 4 to 5 years. In this paper we use both terms interchangeably. We wanted to focus on these lesser-known LRTPs to understand how scenario planning is utilized at this scale. Due to the focus on understanding the diversity of methods, we decided to exclude all regions from California from the study, because due to Senate Bill (SB) 375, they are now mandated to prepare Sustainable Communities Strategies using common scenario methodologies modeled on the approach previously used in Sacramento and other western cities (Rose 2011; Tsai 2015; Oregon Department of Transportation 2013).

Table 1: Case Study Cases

				Use of Scenarios			
Category		**Plan Title**	**Sponsor**	**No scenarios**	**Trans. scenarios**	**Land Use Scenarios**	**Trans. & LU Scenarios**
Corridor or District Plans	1	District Plan	Adams County, City of Brighton, CO	X			
	2	Parramore Comprehensive Neighborhood Plan	Orlando, FL				X
Comprehensive Plan	3	Reno Comprehensive Plan	Reno, NV	X			
	4	Imagine Madison	Madison, WI			X	
MTP - Medium	5	Lincoln 2040 LRTP	Lancaster County & City of Lincoln, NE	X			
	6	Go to 2040	St. Lucie Region, FL		X		
	7	Evansville MTP 2040	Evansville-Henderson Region, IN			X	
MTP – Small	8	BGMPO 2040 Metropolitan Transportation Plan	Burlington-Graham Region, NC	X			
	9	Transform 2040	Monroe County and Bloomington, IN				X
	10	Bannock 2040 MTP	Bannock County, ID				X

To conduct the interviews, we sent invitations to the project manager or planning director identified in the plan. In a few cases, we sent general inquiries that were routed to the professional planners currently engaged in implementing the plan. Among the 10 cases we completed 10 interviews, since two cases included two interviews. Our interviews included all of the plans incorporating scenario-based methodology. The two without interviews were Lincoln 2040 LRTP and the BGMPO 2040 MTP, both of which were conventional transportation plans.

Table 2: Interviewees

Number	Plan	Job Title	Role in Plan
1	District Plan	Agricultural Innovation Specialist	Involved in plan process, current Plan Implementation Manager
2	Parramore Comprehensive Neighborhood Plan	Chief Planning Manager	Wrote RFP and Project Manager
3	Reno Comprehensive Plan	Senior City Planner	Project Manager
4	Imagine Madison	Planner	Project Manager
5	Imagine Madison	Principle Planner	Project Staff
6	Go to 2040 (St. Lucie)	Executive Director	Agency head involved in management
7	Evansville MTP 2040	Executive Director	Agency head involved in management
8	Transform 2040 (Bloomington, IN)	Assistant Director, Planning and Transportation	Involved from the plan's inception
9	Transform 2040 (Bloomington, IN)	Senior Transportation Planner	Project staff
10	Bannock 2040 MTP	MPO Planning Director	Project Manager

Data Collection and Analysis

After case selection, we read through the plans, developing case summaries which described the plan and documenting the planning methods used and whether they used scenario planning or visioning techniques within the planning process. The summaries included what type of scenario was used for each plan and who was involved. These case summaries were then shortened and streamlined for inclusion into the paper. We then conducted interviews, targeting the identified project manager or senior professional urban planning staff member identified in the plans. We used a semi-structured interview protocol that included a common set of questions concerning the interviewee's participation in the plan, and their knowledge of its use and implementation activities (Appendix A). We made audio recordings of these interviews and used a third-party transcription service to create written transcripts. We then reviewed the interview transcripts, incorporating information into the case summaries.

Results

This section contains case descriptions of each of our ten cases. The comparison plans are presented in slightly less detail than scenario-based plans. In each category we begin with the comparison plans, before describing the plans which use scenario planning methods. Within the MPO category, these are roughly organized in order of complexity of the methods used.

Neighborhood Plans

City of Brighton District Plan (2016)

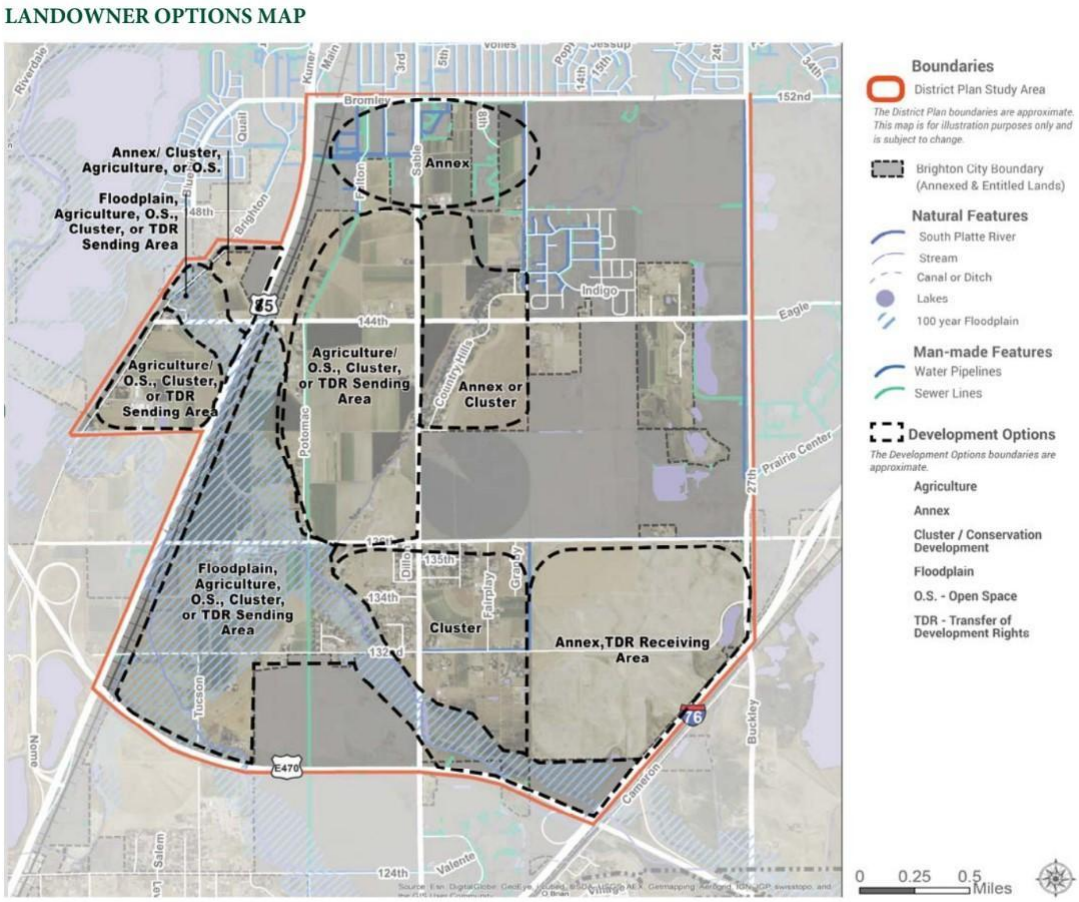
The city of Brighton, an agricultural suburb of Denver, seeks to preserve its agricultural character as urban development becomes increasingly likely in the future. The District Plan

studied how to maintain the agricultural character of southern Brighton and the remaining arable farmland and allow growing development opportunities, as well as guide decision-makers for future development. Close to two-thirds of the project area is in Adams County, while the rest resides in the City of Brighton. Planners utilized a visioning process to engage the community, resulting in a plan with a structure which suggested a set of preferred options for each of the major land parcels in the study area. The Guiding Values of the study were: 1) advance Brighton and Adams county's agricultural heritage, 2) respect private property and landowners, 3) ensure transparency, and 4) protect the rural landscape. This plan participatory process included neighborhood and agriculture subcommittee meetings, stakeholder interviews, workshops, surveys, city council meetings, and online activities. During the meetings, city staff and consultants presented the area's strengths and weaknesses along with a market study concerning water rights information and the local food economy.

Visions from prior plans, and other surrounding communities' plans combined to form this plan's vision, where a series of long-term strategies promoting agricultural uses, and a strong local food economy while giving landowners flexibility in the options for future land use. As Brighton city limits expand to annexed and vacant land, there is as much as 1000 acres of unzoned land that may not be subject to direct future development over the next twenty years. Of the nearly 1000 acres the District plan describes a set of land-use options landowners have depending on their specific parcel that would enhance landowner flexibility to maximize the use of their land: 1) current zoning, 2) agricultural land and water conservation, 3) local food system, 4) cluster development, 5) transfer of development rights (TDR) program, 6) apply for annexation with additional performance criteria. This landowner option feature of the plan is illustrated in Figure 2 with the Landowner Options Map shown below. In Figure 2, each of the polygons have a specific range of pre-approved land use actions that landowners can employ. According to Anneli Berube, the city's current Agriculture Innovation Specialist, Shannon McDowell, a former Brighton Long Range Planner who oversaw plan development, and Aja Tibbs, a current Brighton Long Range Planner, planners wanted to maximize landowners' options after recognizing the potential impact of a uniform designation of farmland preservation on property values. Uniform designation could also upset constituents by denying the difference in entitlements, zoning, and farmland preservation value.

Beyond landowner concerns, Ms. Berube also explained how planners opted to not use scenarios because planners felt scenarios projected a specific future that was too limiting and couldn't facilitate the potential for changing priorities and landowners' creativity and ingenuity. Priorities for land preservation and development can change quickly, therefore planners preferred to have a plan with the flexibility to adjust land uses to maintain desires for agricultural development. Having such flexibility gave planners the opportunity to adjust to future land uses, rather than committing to one perspective.

Figure 1: The District Plan's Landowner Options Map



Source: Adams County and the City of Brighton (2016, p.3).

The previously mentioned six landowner options and the corresponding map are used jointly with the County Future Land Use map, which was generated for the 2012 Adams County Comprehensive plan. Like the Parramore, FL plan, the District Plan's vision seeks to maintain the historical regional character, but does this through the presentation of multiple options, instead of defining a single preferred land-use strategy with specific recommendations for each parcel.

<u>City of Orlando Parramore Comprehensive Neighborhood Plan: Vision for a Healthy Community (2015)</u>

The longstanding heart of Orlando's African American community, the Parramore neighborhood is located near downtown Orlando and has a rich commercial and cultural history as well as a legacy of discrimination and harmful land use and planning decisions. In particular, as described in this plan, in the 1920s city leaders rezoned much of the neighborhood for industrial uses, and subsequent freeway projects resulted in the demolition of many residences and businesses. The neighborhood plan was supported by a Sustainable Communities Regional Planning Grant, and

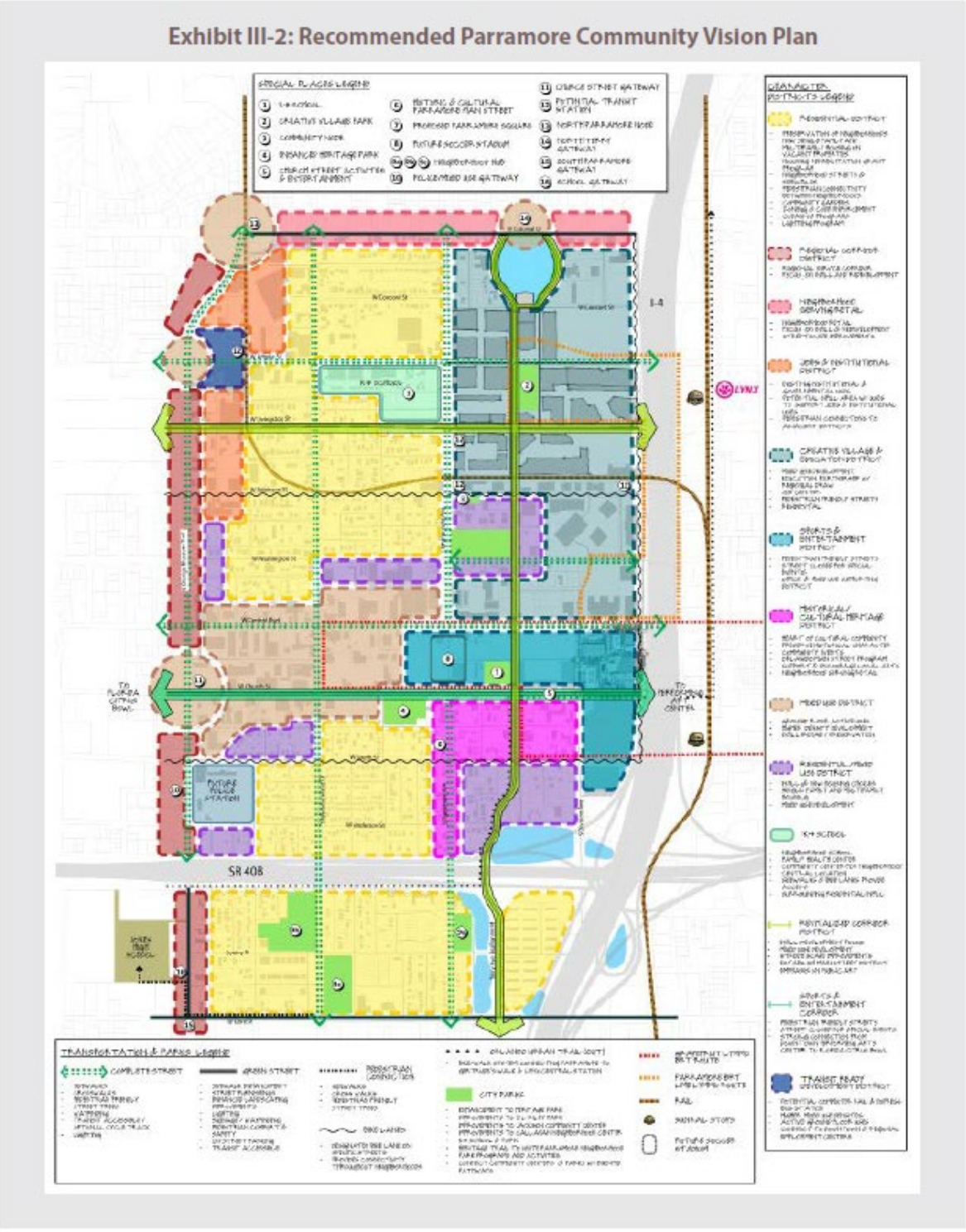
featured a multifaceted community engagement process involving the neighborhood's roughly 6,000 residents.

The resulting plan was organized around Ten Big Ideas for creating a healthy Parramore community, and each idea contains short-, mid- and long-term action items: (1) drive economic development by creating a unique identity, (2) improve access to job opportunities, (3) promote social and environmental justice, (4) increase housing opportunities, (5) make education the cornerstone of revitalization, (6) empower champions for a healthy community, (7) promote access to healthy food, (8) invest in people-not cars, (9) maximize the opportunity for all residents to get physical activity, (10) encourage mixed use development. In addition to the specific policy and design recommendations, the plan contains two Community Vision Plan maps that identify special places, indicate desired character districts and big land use ideas, and identify locations for transportation facilities, parks, and other amenities. Additionally, one of the appendices is a market analysis report that examined the financial feasibility of the development scenarios for three "catalytic" sites selected because they were determined to have the highest potential to transform Parramore (VHB and City of Orlando 2014). This analysis tested the market potential and return on investment within each scenario and examined the amount and potential sources of funding needed to realize these ideas if there was not sufficient estimated market demand.

This project's engagement process featured four main events. A community kick-off and planning fair collected input for the project, as well as provided free health screenings, captured community oral histories, and other educational opportunities. The first workshop featured a discussion of the healthy community design principles, as well as collected issues and opportunities in the neighborhood. The second workshop featured the presentation of three alternative revitalization scenarios, based on the earlier feedback. Each of the three scenarios focus on a long-term vision for the community and contrasting ideas for how to revitalize the neighborhood. A subsequent workshop involved discussion of small area plans, and a final event wrapped up the project and discussed implementation steps. The three scenarios presented in Workshop 2 were summarized as maps containing textual annotations:

1. Neighborhood Preservation and Enhancement: This scenario primarily represented existing development patterns, but included infill on vacant lots, street safety improvements, a cultural heritage district, and new public programs for housing and jobs.
2. Education Hub: This scenario focused on the potential of creating a unique neighborhood identity through the development of an educational hub, which would involve coordinated educational resources from several colleges, universities, and other educational organizations in the area. The scenario also featured new health and homeless services adjacent to the new hub. In addition, some industrial land would be redeveloped into a new residential district.
3. West Town Connector: This scenario focused on developing Orange Blossom Trail, a major route traversing the neighborhood, into an economic spine for the neighborhood through implementing complete street design principles and creating mixed-use nodes at key intersections.

Figure 2: Recommended Parramore Community Vision Plan Map



Source: VHB and City of Orlando (2015, p. 13).

After the presentation of the three scenarios, the community workshop participants decided to support a combination of the second and third scenarios. The resulting community vision plan is in effect a preferred scenario (Figure 1). The plan then contains detailed proposals and designs for 14 catalyst projects described by the overall vision. This plan reflects the integration of several planning principles and methods, especially extensive community engagement activities, Healthy Community Design principles, HUD Sustainability Community Principles, complete streets, scenario planning, and the use of a transect approach to land use regulation. Furthermore, the process illustrates how community-based planning can engage the unique history, strengths, and problems affecting historic African American neighborhoods like Parramore. The specific proposals respond to identified community needs for improving health and safety, as well as enhance educational and economic opportunities through redevelopment.

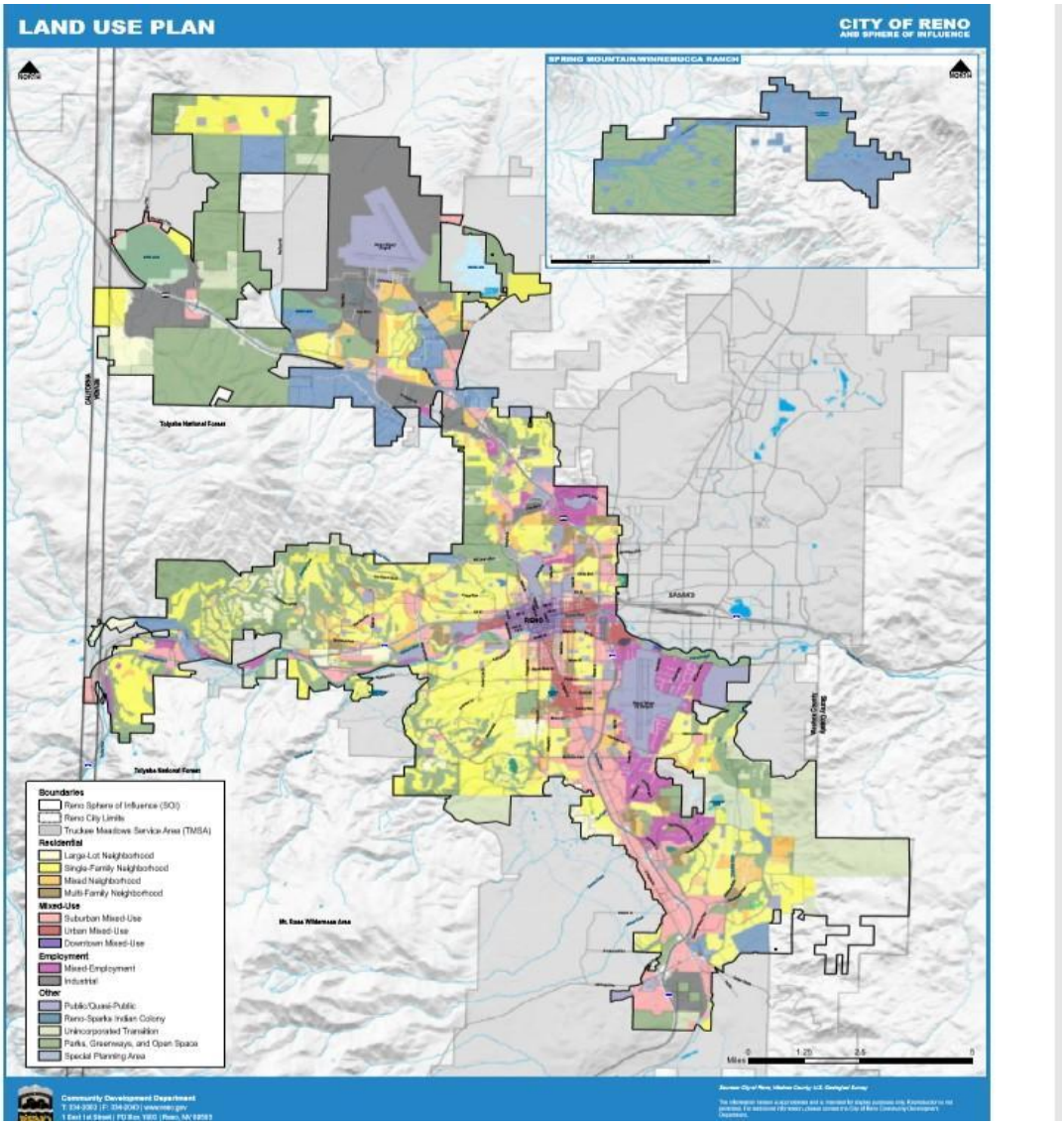
City Comprehensive Plans

City of Reno Master Plan: Reimagine Reno

Reno, Nevada, home to an estimated 251,000 people (U.S. Census 2018), is a significant city in Nevada located near the popular Lake Tahoe region. *Reimagine Reno* is a 2017 comprehensive master plan. This plan updates the prior plan adopted twenty years ago. *Reimagine Reno* formulates a city-wide community vision guiding future urban development towards an affordable, well-maintained, safe and attractive Reno. *Reimagine Reno* utilizes a visioning process with eight guiding principles representing the community's vision and values. The plan predicts a population of 300,000 by 2036. The population forecast originated from the 2036 Washoe County Consensus Forecast, created by the Truckee Meadows Regional Planning Agency (City of Reno 2018). Two separate 2016 forecasts and need assessment reports, one for future housing demand and another for future employment and job growth, helped inform the *Reimagine Reno* forecast by informing the development of master plan policies and strategies. The economic/employment report identifies economic assets, needs, areas of economic weakness, and a forecast and vision alignment check (Economic and Planning Systems 2016). The housing report identifies housing demographics, the existing housing stock, future housing demographics and demand, preferred housing types, future housing affordability concerns, and a forecast and vision alignment check (Economic and Planning Systems 2016).

In an interview with the project planner, we learned that the project decided to adopt the Truckee Meadows RPA forecast since scenario planning is being conducted at that scale and decided to coordinate their plan with the regional forecast. However, they did conduct supplementary analysis of alternative employment scenarios due to the potential for more warehousing and distribution jobs within the City of Reno than predicted in the regional scenario. In addition to the population forecast, *Reimagine Reno* planners employed a Land Use Plan with a Land Use Map (Figure 6) which illustrates the proposed zoning described within the Land Use Plan adopted by *Reimagine Reno*.

Figure 3: Reimagine Reno's Future Land Use Map



Source: City of Reno, Clarion Associates and Economic and Planning Systems (2016, p. 168).

Reimagine Reno effectively details the steps Reno is planning to take for the next 20 years. Clearly defined steps, policies, and diagrams help illustrate where and how planners and the community envision the future of Reno.

<u>City of Madison Comprehensive Plan: Imagine Madison—People Powered Planning (2018)</u>

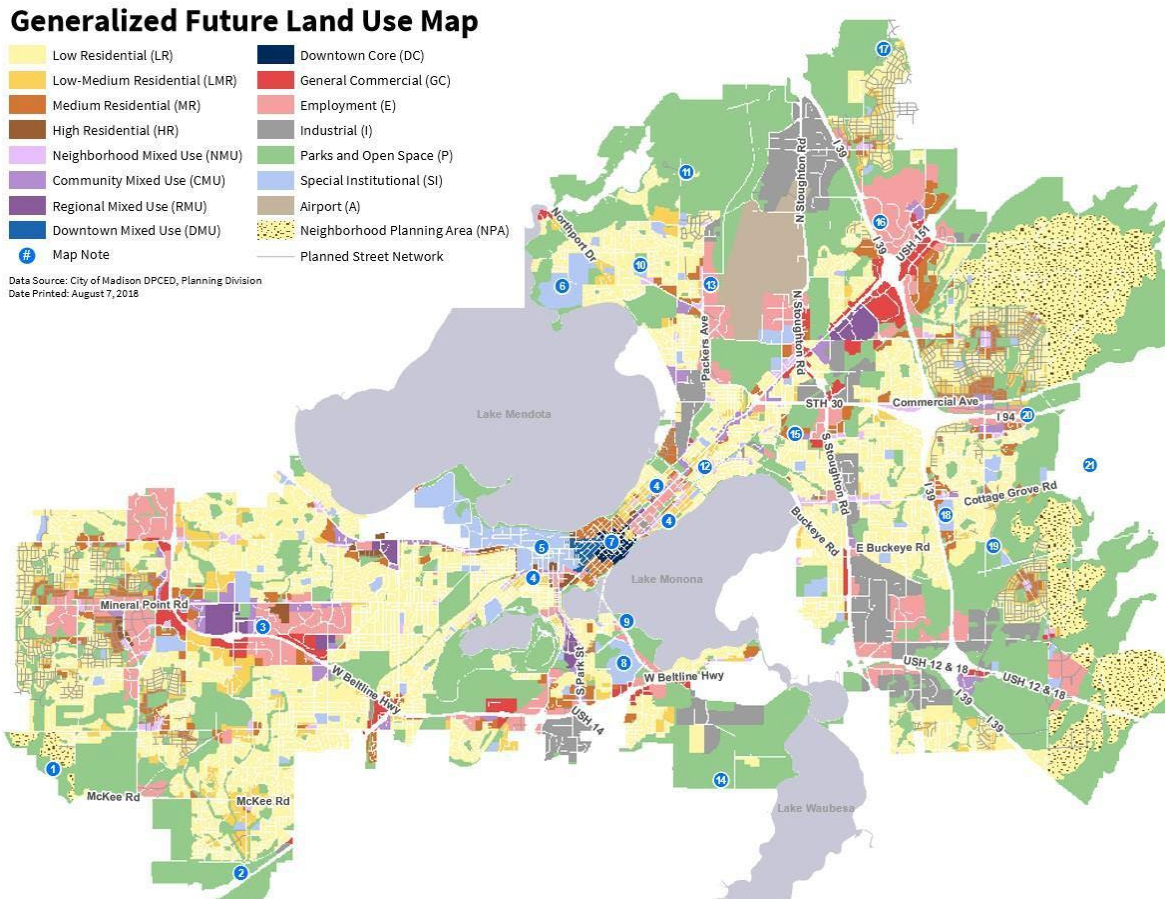
The capital of Wisconsin, Madison has a population of about 260,000 people. Home of the University of Wisconsin-Madison and located at a picturesque location adjacent two lakes, Madison boasts a vibrant economy, extensive natural amenities, and a history of political activism. *Imagine Madison*, completed in 2018, functions as the city's Comprehensive Plan under Wisconsin State Comprehensive Planning Law, and is therefore intended to influence other plans, policies, and decisions in the city. It replaced a previous comprehensive plan

prepared in 2006. The primary organizing component of the plan is a growth framework, which describes growth priority areas, contains a generalized future land use map (Figure 3) for the entire city, and includes a section addressing peripheral planning areas that may become part of the city in the future. As a Comprehensive plan, the specific details described by this general framework are organized into six elements; land use and transportation, neighborhoods and housing, economy and opportunity, culture and character, green and resilient, and effective government. Within each element, the plan is further organized into 12 goals, 50 strategies, and over 150 specific actions to implement each strategy. The plan was created through an extensive process of community engagement including events, a website, and consultation with neighborhoods and city committees. Some of the notable strategies include a proposal for a new bus rapid transit (BRT) system and new transit-oriented development.

The plan was developed in three phases. Phase 1 was organized around identifying a set of goals organized into elements. These goals were developed through data gathering, analysis of recent plans, and community feedback. Phase 2 involved the creation and refinement of draft strategies for each goal, as well as the creation and refinement of a generalized future land use map. To inform the selection of growth priority areas, three scenarios were created to analyze how different development patterns that could occur under the generalized land use plan. Phase 3 featured strategy and growth prioritization. Land-use scenarios were developed *after* the creation of the generalized future land use map. All three of the scenarios assumed the addition of approximately 70,000 new residents and 37,000 new employees by 2040 and were designed to explore the consequences of where growth would occur, *not* whether the generalized future land use map was followed. The specific impacts analyzed using the UrbanFootprint software were energy use, water use, fiscal impacts, transportation, emissions, health, and land consumption.

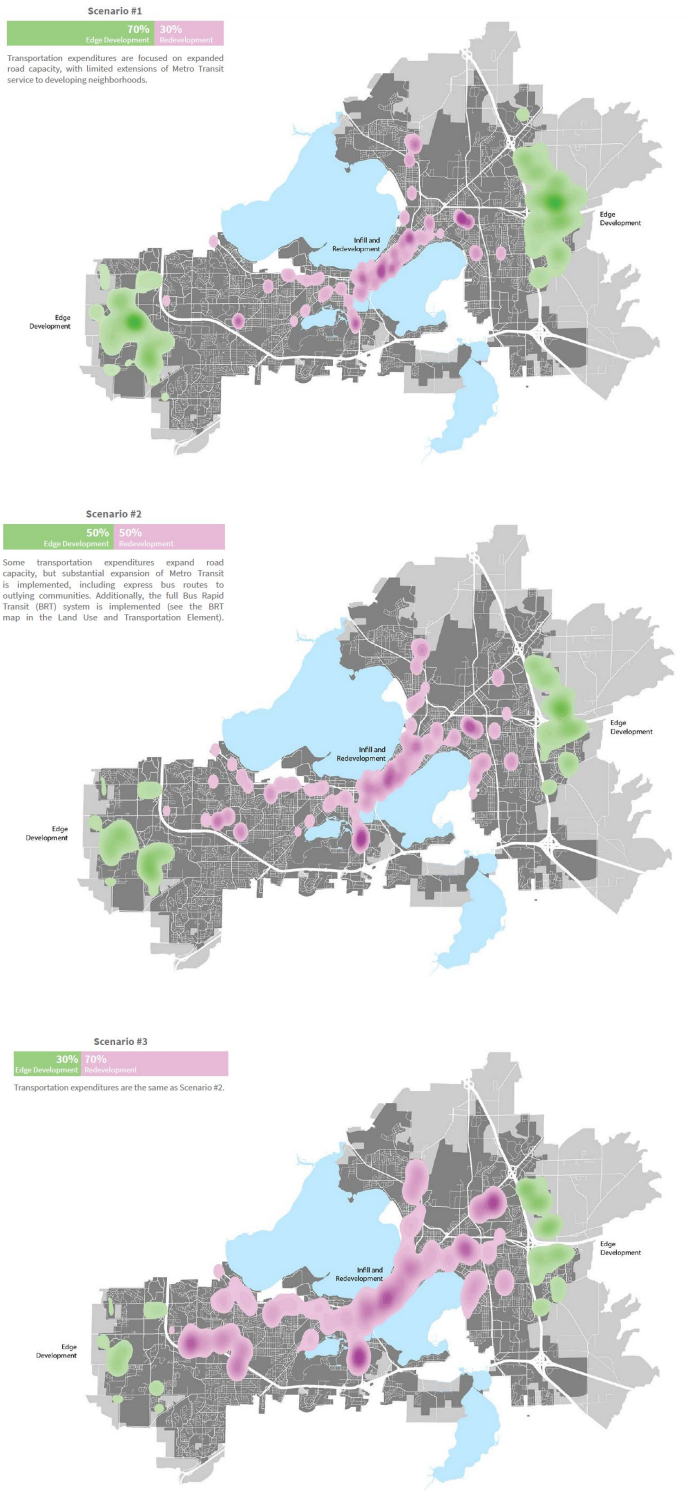
Three scenarios were created (Figure 4): Scenario 1 described most development being accommodated through edge redevelopment, with about 30 percent through downtown redevelopment, and limited transit expansion. Scenario 2 evenly split growth through edge development and redevelopment and the implementation of the proposed BRT system. Scenario 3 combined the BRT implementation with a land use scenario that accommodated 70 percent of growth through redevelopment. They were presented on a website, where visitors were asked to select their preferred scenario and provide other feedback by a survey. The scenarios were also presented to participants in community meetings, where participants then completed an exercise where they placed dots on a map to indicate where they preferred growth to occur. In addition to the citywide growth scenarios, a detailed analysis was conducted to explore development potential surrounding proposed BRT stations. Figure 5 below illustrates the growth priority area map generated from deliberation.

Figure 4: Imagine Madison Generalized Future Land Use Map



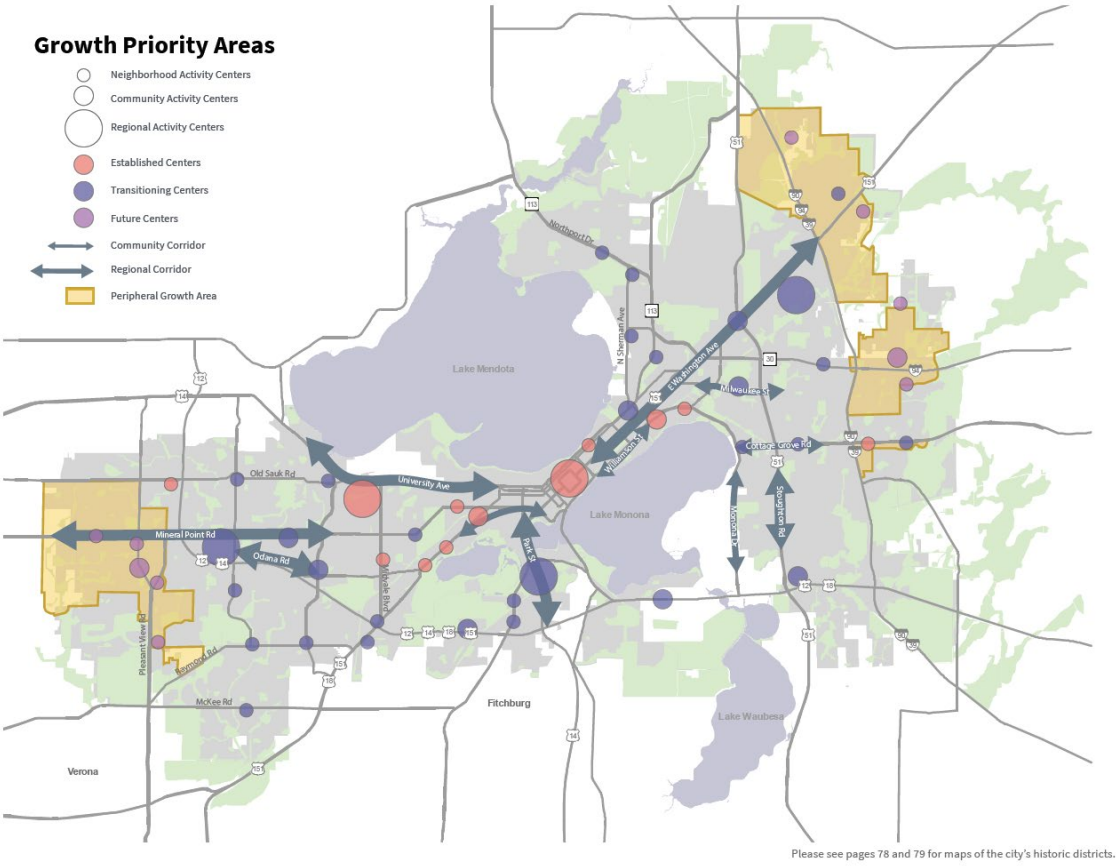
Source: City of Madison (2012, p. 18).

Figure 5: Imagine Madison Scenarios



Source: City of Madison (2012, p. 18)

Figure 6: Imagine Madison Growth Priority Area Map



Source: City of Madison (2012, p. 16)

Metropolitan Transportation Plans

Burlington Graham Metropolitan Planning Organization (BGMPO) 2040 Metropolitan Transportation Plan Update (2015)

The Burlington-Graham area consists of nine municipalities and is located in central North Carolina, approximately 60 miles west of Raleigh. The 2040 Metropolitan Transportation Plan Update was completed in 2015. The plan fulfilled the typical MTP plan role of identifying existing infrastructure, proposing new objectives, and describing how they will be funded through currently available and projected revenue sources. Public comment gave input and feedback to help form the plan while planners held community information meetings where participants identified the region's needs, strengths, weaknesses, and residents' ideas of how to improve the region's transportation system. Surveys distributed online and at community centers recorded additional input of the community's vision and regional assessment.

The plan is based on a 2013 socioeconomic forecast and visioning techniques. A land use map provided the basis for a travel demand model which was used to predict future travel and land use patterns. The goals established in this plan include: developing an efficient road network minimizing traffic; integrate a multimodal transportation network; designing a transportation

system that considers its impact on minority and low-income populations and environmental justice; improving resident mobility and lastly, developing a transportation system that protects and improves the natural and built environment. Planners reviewed current and future conditions and evaluated all transportation systems and all of the current and proposed projects, which was considered within a traffic demand model. Planners used a single socioeconomic projection, which was generated from the update to the Metropolitan Transportation Plan and the Piedmont Triad Regional Travel Model, and a single land-use map from 2013 data to help guide future land-use and transportation needs. This provided the basis for future travel and land use patterns and led to the creation of the regional comprehensive transportation plan (CTP). Public workshops and staff meetings sought guidance on the location of household and employment growth. The proposed transportation project map (Figure 10) depicts the projected transportation improvements described in the plan.

Figure 7: Burlington-Graham 2040 MTP Transportation Project Map

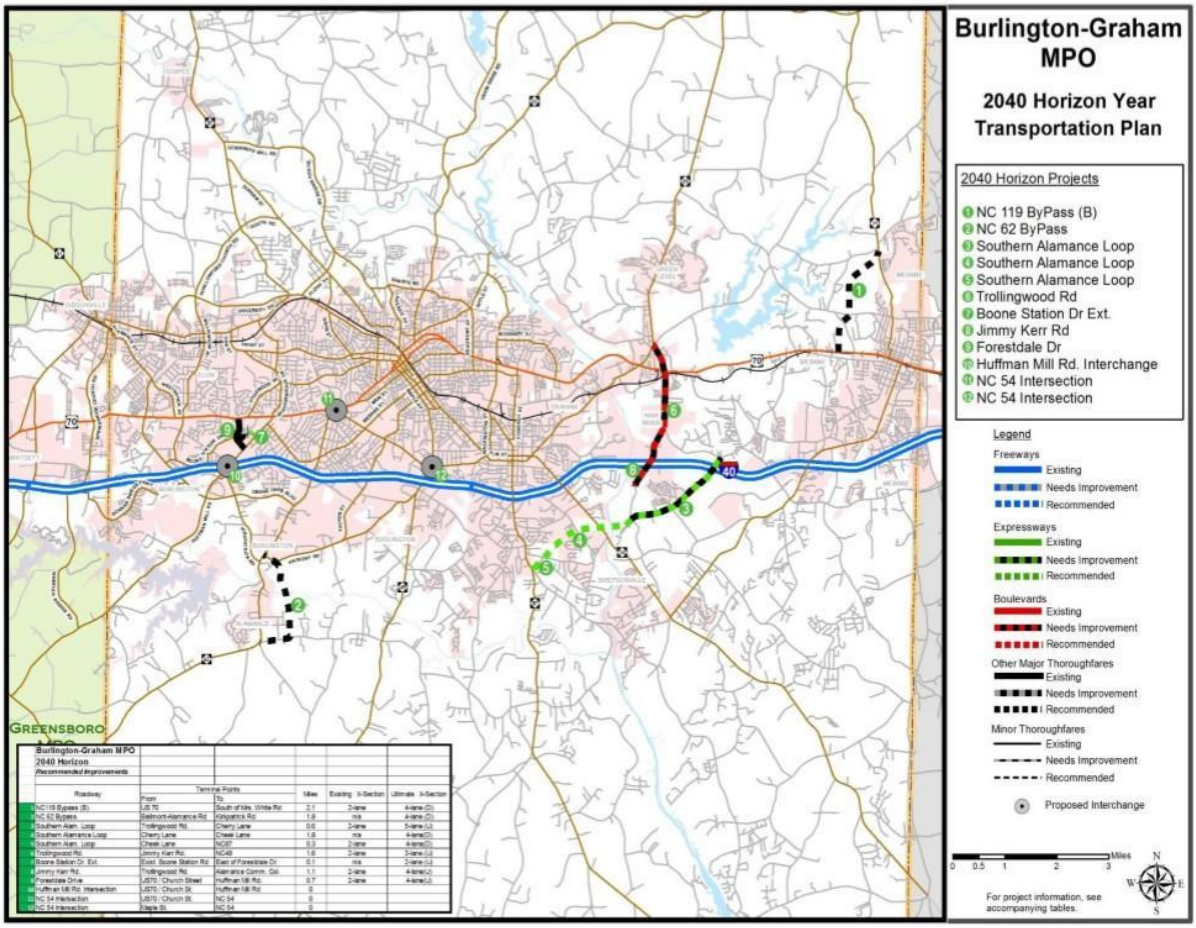


Figure 6 2040 Horizon Year

Source: Burlington-Graham MPO (2015, p. 17).

This plan thoroughly analyzes existing regional multimodal transportation networks. Planners devoted much of the plan to transportation system assessments of current and future projects:

"For the Urban Area, 92 percent of the funding will be used for highway and interstate capital improvement projects" (Burlington-Graham MPO 2015).

Lincoln MPO 2040: Long Range Transportation Plan Update (2017)

The city of Lincoln and Lancaster County is the second largest metropolitan area in Nebraska and is home to the University of Nebraska. The Long Range Transportation Plan (LRTP) synthesizes varying transportation mode-specific master plans into one comprehensive transportation plan. This plan works in tandem with the Lincoln-Lancaster County Comprehensive Plan. The plan's visioning process included an assessment of the existing transportation system where they identified needs and areas of improvement. Land-use forecasts generated from the Lincoln-Lancaster County Comprehensive Plan Update (LPlan 2040) helped formulate a population and employment forecast used within the plan to predict growth for three points in time: 2015, 2026, and 2040. Based on the land use forecast, the plan area is expected to grow by 44,000 households (39 percent increase) over the next 25 years, with most of that growth taking place along the project area's periphery. Employment growth forecasts expect commercial employment to grow by 35 percent and industrial employment to grow by 47 percent by 2040. Planners used a travel demand model to analyze patterns resulting from recorded travel patterns, traffic conditions and population and employment forecasts. Included within the travel projections were both current and proposed multimodal projects and the current and proposed infrastructure network.

The plan contains a variety of recommendations to allocate remaining available transportation funds to create a transportation network that connects community, supports multiple modes of transport, is flexible to withstand potential uncertainty and adaptable enough to integrate emerging technologies to support the projected population and housing forecasts.

GO 2040: St. Lucie Transportation Planning Organization Long Range Transportation Plan

The St. Lucie region is situated between Orlando and Miami, Florida, and is home to an estimated 321,128 people. The St. Lucie Transportation Planning Organization (TPO) is responsible for *GO 2040: Long Range Transportation Plan*. This multimodal plan, an updated plan from the prior LRTP, addresses transportation system and safety improvements, integration of economic development, land use and freight and goods movement, as well as accessibility of airport, port, and waterborne facilities. *GO 2040* is divided into five parts: the public process and visioning, a transportation needs assessment, analysis of financial resources, transportation alternatives and scenario planning, and cost feasibility plan. The planning process was divided into three phases: first, the development of a vision and plan; second, the creation of a needs plan; and lastly, the third phase, the generation of a cost feasibility plan.

The plan features four funding scenarios illustrating different transportation design scenarios possible under different potential amounts of funding. Plan makers developed the first scenario to illustrate which proposed projects could be funded with existing and already proposed funding sources. Planners created three additional alternative funding scenarios, each one tied to either only federal, state or local transit- designated funding to specific multimodal projects. These

scenarios gave participants better understanding as to which projects could be funded if additional funding arises within the plan timeline (2021 to 2040). The scenarios considered were:

- Alternative A: Federal and State Funds. This alternative is the least-funded scenario, generating revenue from state and federal programs geared to manage roadways, bike and pedestrian safety, congestion and operations. Additional funding comes from federal and state grants and dedicated local funding. Twelve road projects would be completed with this scenario, some road resurfacing, and some pedestrian projects.
- Alternative B: Federal, State and Existing Local funds. With additional existing local funds, this scenario includes all multimodal projects from Alternative A. It adds ten more road projects with new car/bike lanes and sidewalks as local funding originates from a local gas tax, and impact fee revenue.
- Alternative C: Federal, State Funds, Existing Local Funds and Proposed Local Funds. This alternative adds even more local funding than Alternative B, which would come from local jurisdictions in the form of enhanced millage, sidewalk and sales taxes. All multimodal services and projects from Alternative B would also occur in this scenario and would add two more road projects-where lanes and sidewalks would be added as well was a total of 76 St. Lucie Walk/Bike Network Projects from the TPO priority projects and SGL. The Transit program would also add seven new routes and new Administration and Operations building.

The alternatives were discussed during two public workshops. The first workshop discussed the assumptions, forecasts, needs, costs, revenues, and project evaluation criteria, while the second workshop incorporated staff and planners' comments in response to public feedback from the prior workshop. County administrators and city managers met additionally for two local agency coordination workshops. After discussing the alternatives with the TPO advisory committee, local government boards chose the modified Alternative A as the preferred scenario and the most economically feasible plan. This alternative only differed from the first Alternative A by changing the street parameters of one road project (which added car and bike lanes with new sidewalks) due to funding limitations.

The plan does a good job describing how the scenarios reached many stakeholders and participants within the region, and sparked debate on potential transportation trade-offs and infrastructure improvements. Especially as the region is facing increasing development pressure from the Miami region, a re-evaluation of the transportation infrastructure seems a worthwhile investment of resources. Because these scenarios were based on analyzing projects which could occur under different fiscal assumptions, this plan shows the utility of scenarios as a community engagement tool to foster focused discussion on this specific issue.

Evansville MPO Metropolitan Transportation Plan 2040

The Evansville, IN - Henderson, KY metro region spans across southeast Indiana to northern Kentucky, with an estimated population of 285,000 residents. MTP 2040 is an implementation manual of multimodal transportation improvements programs and policies. MTP 2040 goals and objectives replaces MTP 2035 goals and objectives. The plan received supplemental funding via a Sustainable Communities Regional Planning Grant (SCRPR) from HUD, the EPA and the US

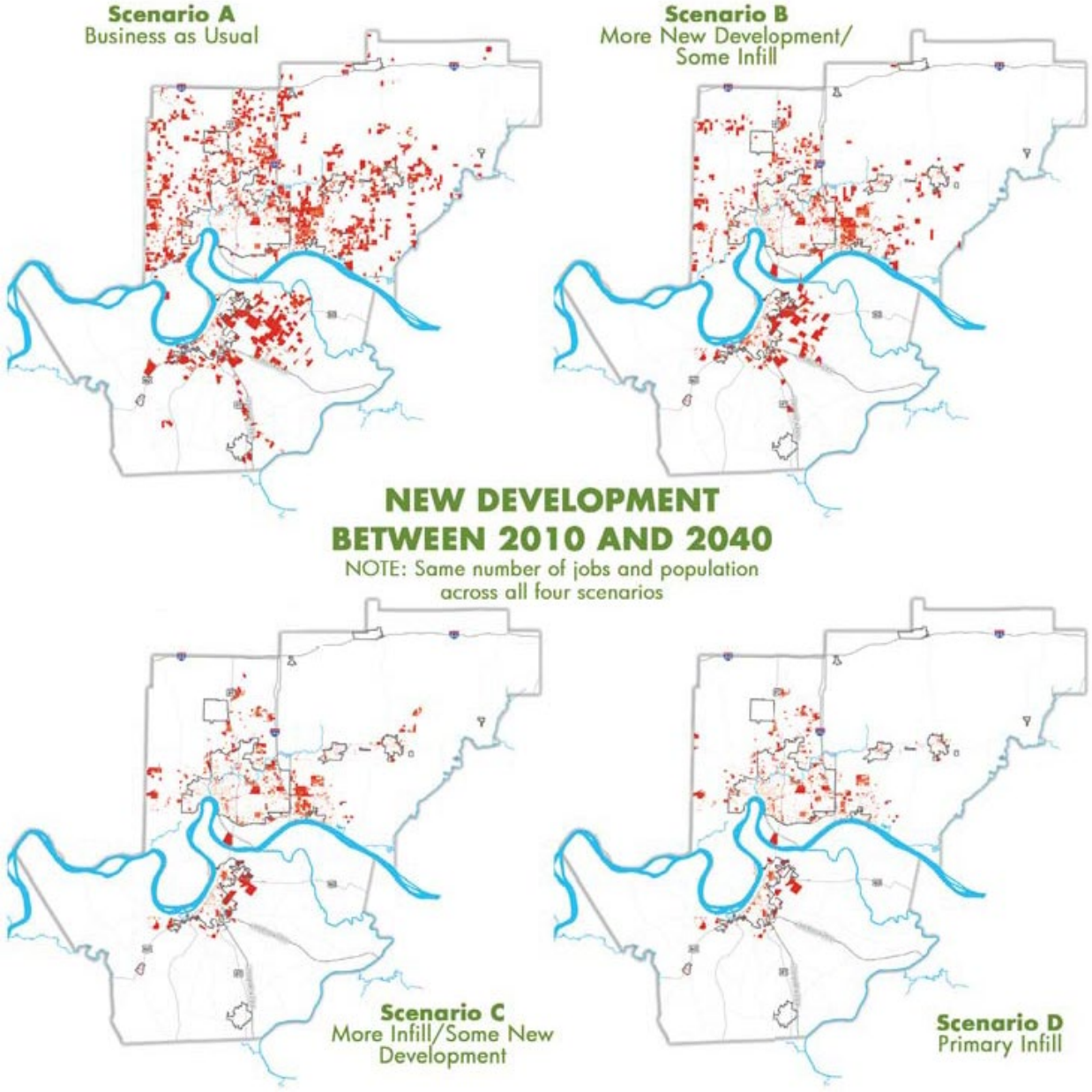
Department of Transportation. The grant funds the Sustainable Evansville Area Coalition's *Millennial Plan*, which is also known as Regional Plan for Sustainable Development (RPSD) by incorporating six livability principles into RPSD and into MTP 2040. MTP 2040 is one of four parts of the RPSD.

Four scenarios were created in this plan capturing four different growth patterns (Figure 8). Historic growth rates created projected population and employment forecasts for 2040. The scenarios were analyzed through their residential density and whether they emphasized greenfield or infill development locations:

- Scenario A grew according to the current trend growth. This scenario was categorized as "business as usual." It was also 90 percent Greenfield/New development and 80 percent Low density (5 DU/acre).
- Scenario B is identified as predominantly new development, categorized as "more new development/some infill." Its density was 50 percent low density with an even distribution of 25 percent for both medium (10 DU/Acre) and high (15 DU/Acre). It also had a 65 percent allocation of Greenfield/new development.
- Scenario C was characterized as "more infill/some new development," with 65 percent devoted to Greyfield/ infill development and the most equitable density spread out of the four—both low and high density breakdowns were 35 percent with medium at 30 percent.
- Scenario D is named Green Growth 2040 because of its high rate (90 percent) of Greyfield/infill development and 50 percent high density breakdown. It is categorized as "extreme infill/growth limits."

These scenarios were presented to three technical committees involved with the RPSD. After the committees' feedback the Sustainable Evansville Area Coalition (SEAC) and the MPO chose to use Scenario C jointly with the travel demand model to analyze and assess the existing transportation network and its needs, as well as guide the plan's objectives and approach. To develop the transportation infrastructure recommendations, the future land use pattern associated with the preferred scenario was analyzed using a travel demand model. The plan's recommendations included increasing transit ridership, integrating technology within the transit experience, improving the road network and traffic flow, increasing and expanding bike and pedestrian networks and connectivity, and improving air quality. These recommendations then were developed to address areas of congestion identified in the analysis.

Figure 8: Evansville *Millennium Plan* Regional Development Scenarios



This plan illustrates one way an MTP can incorporate scenarios. A related regional planning project focused on land use developed a set of alternative scenarios, one of which was selected to serve as the basis for transportation planning activities. The resulting recommendations are developed through local input, and an analysis of future congestion based on the accepted land use plan. Therefore, transportation infrastructure scenarios are not considered.

Bannock Transportation Planning Organization (BTPO) 2040 Metropolitan Transportation Plan (2015)

The Bannock Transportation Planning Organization (BPTO) conducts transportation planning for Bannock County, Idaho. Most of the county's population lives in the County seat, Pocatello, the fifth-largest city in the state and home to Idaho State University. Known as the "Gateway to the Northwest" and founded near the Oregon Trail, the city has long served as an important regional center for trade and transportation networks. In 2015, the BPTO developed a long-range transportation plan which helps identify future infrastructure investments and transportation needs. BPTO envisions a future transportation system that: (1) utilizes existing infrastructure to minimize needed future public investment, (2) supports and promotes both the local and regional economy; (3) implements land use strategies that reduce costs and adverse transportation impacts; (4) improves and conserves Portneuf Valley's human and natural environments; and (5) facilitates a healthy, active and safe community through multimodal transportation. Planners held one workshop where they helped the community understand what scenario planning is and its benefits.

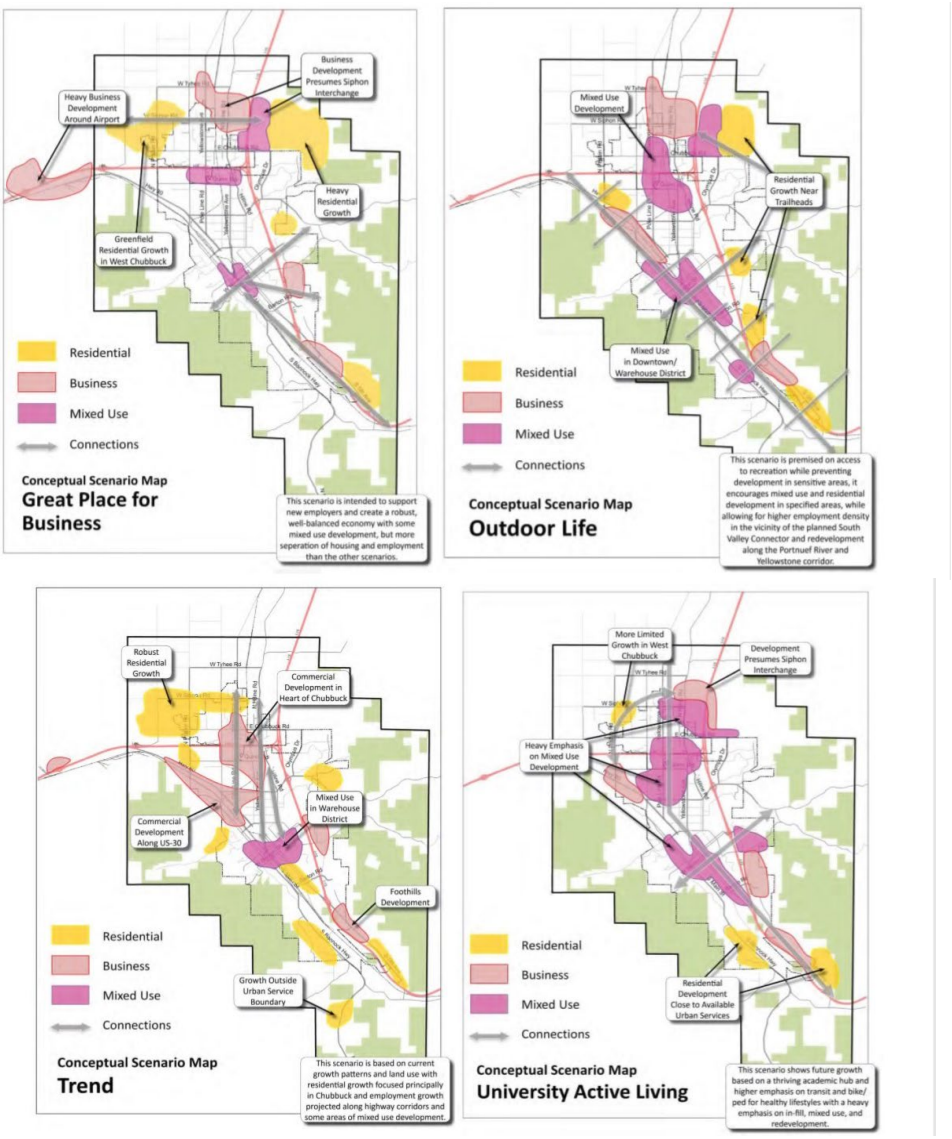
The plan uses four scenarios (Figure 7) to evaluate different patterns of future population and employment growth. Three scenarios were alternative land-use and growth patterns. The fourth scenario, the trend scenario, acted as a comparison for the other three scenarios. All of the scenarios assume a constant rate of growth and are evaluated against 15 identified performance measures and community indicators (Figure 8). Each scenario has unique land-use and transportation patterns

- The Trend scenario is perceived to follow the current projected growth and land-use patterns where the downtown area, the university and the Yellowstone Avenue corridor are projected to have the most employment growth.
- The University/Active Living scenario visualizes an academic-centered community that emphasizes infill and redevelopment around the university, downtown, the Warehouse District and existing neighborhoods. Connective and inexpensive transit options, such as biking and walking, are also emphasized in this scenario.
- The Great Place for Business scenario favors developing a strong economy with the development of new neighborhoods and some mixed-use development around the university and the Warehouse district. It also supports a new interstate highway and improved transit connections for pedestrians. Employment growth occurs where transportation access is strong, near the airport and in NW Pocatello.
- The Outdoor Life scenario emphasizes outdoor recreation access, while preserving environmentally sensitive areas from development and growth. This scenario creates walkable and bikeable network connections between districts. This scenario envisions a strongly developed Portneuf River Greenway system with access to trailheads. This alternative creates a new interstate highway (I-86) but focuses new residential and employment growth around the River Corridor and Yellowstone Ave.

Community members at a public workshop evaluated these three scenarios and considered how each one measured both to the trend scenario and to the community indicators. The preferred scenario (Figure 9), a composite of all four scenarios, was chosen by project leaders after

receiving public feedback. Then the scenario was sent back to the public for discussion in another public workshop. This scenario favors development and infill of Bannock and creates connective transit (biking and walking) options. It also emphasizes employment growth around the airport and outside of BTPO's planning jurisdiction. MPO Director Mori Byington remarked in an interview that one benefit of the scenario process was that participants learned "how there [are] a lot of different methods to grow, and not everybody that says, 'I want to see open space' means the same thing. Not everybody that says, 'I want a great place for our community to do business' means the same thing." This discussion of growth was spurred by the scenario process because it enabled participants to visualize the consequences of their values.

Figure 9: BTPO 2040 Scenarios

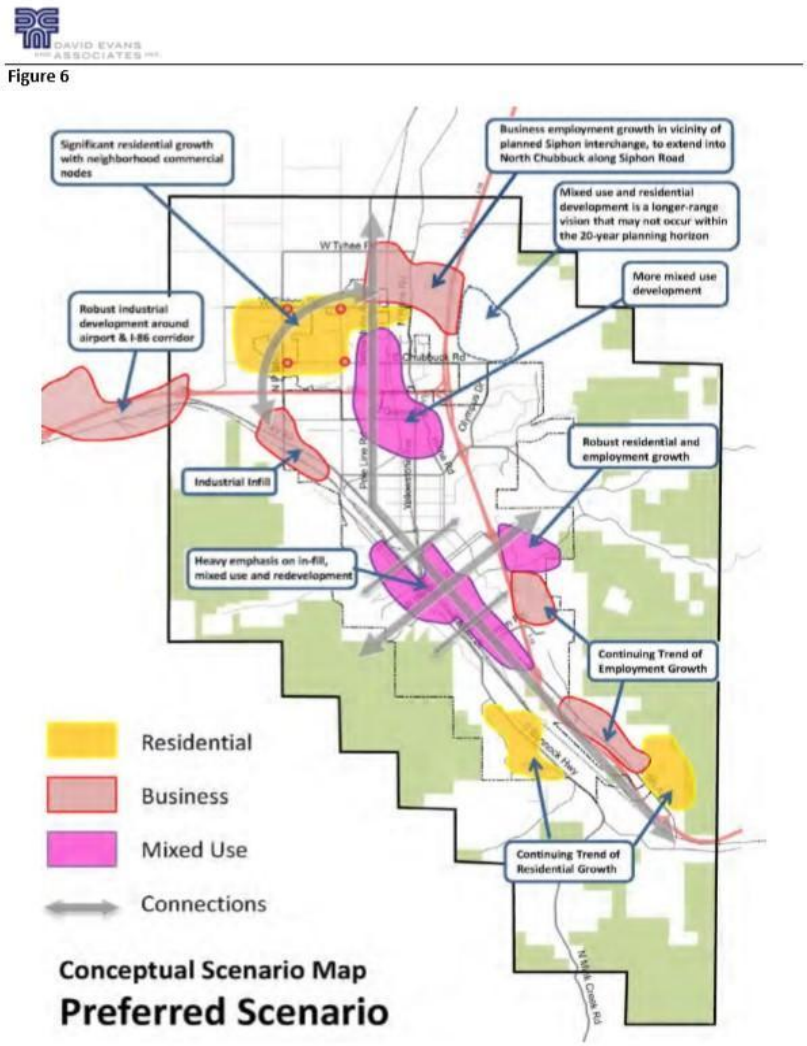


Source: Evans and Bannock MPO (2015).

Figure 10: BTPO MTP 2040 Scenario Performance Evaluation

Source: Evans and Bannock MPO (2015).

Figure 11: BTPO Preferred Growth Scenario



Source: Evans and Bannock MPO (2015, p. 8).

Project planners determined through modeling and analysis that the preferred scenario would improve the region's transportation system performance. The plan analysis shows that the preferred scenario, when compared with the trend scenario, would result in 4 percent reductions in vehicle hours traveled, and average trip times under no-build scenarios as well as 2 percent reductions in total miles of travel, and trip lengths. The preferred scenario would also reduce systemwide level of service deficiencies. Planners also conducted a traffic performance model, using average daily trips per roadway segment as a measurement, to understand how the preferred scenario affected trip distribution as well as traffic volume and flow in comparison to the trend scenario. The plan's sophistication is notable through the plan's performance measures and community indicators analysis and evaluation. This plan effectively demonstrates some of

the benefits, such as greater community dialogue of consequences and trade-offs typically generated from exploratory scenarios.

Transform 2040: Bloomington/Monroe County Metropolitan Transportation Plan (2017)

Transform 2040 is a metropolitan transportation plan prepared by the locally-designated MPO for Monroe County, Indiana. With a population of 143,000, most of the county's population is contained in the City of Bloomington, home to Indiana University. As an MTP, the plan was prepared to replace a previous MTP approved in 2015, and support an ongoing transportation planning process coordinated by the MPO. The plan contains four main sections: guiding principles, future transportation needs, financial forecast, and analysis of specific transportation network and policy options. The plan's guiding principles fall into five categories: mobility and accessibility, transit, community, safety, and preservation.

The plan uses scenarios to consider different assumptions for three main types of uncertainty: the overall level of population growth, the land-use pattern of the resulting growth, as well as different transportation network options. To do this, the plan presents two sets of different types of scenarios. First, the plan contains nine socioeconomic and land use scenarios for the future of Monroe County. These fall into three overall growth scenarios: low, mid-range, and high. Each category of growth contains three scenarios, describing standard, compact, or low density development styles. The analysis then specifies the number of housing units needed to accommodate the designated growth in rural and urban locations, converting them into numbers of acres of land. The result are nine socioeconomic scenarios, each of which describe an overall amount of growth and the specific development style. The second type of scenario combines different socioeconomic and land use scenarios with different transportation network options to evaluate their performance along a number of evaluation criteria. Although many combinations are possible, the plan presents thirteen scenarios: a "do nothing" scenario and twelve additional scenarios which reflect different combinations of the socioeconomic and land use scenario with a specific transportation network and/or policy changes (Table 3).

Table 3: Transform 2040 Transportation Option Scenarios

#	Scenario Name	Land Use	Network	Note
0	Do Nothing	Base Year	E+C	
1	I69 Section 5	Mid-Stnd	E+C	Existing and committed projects
2	BRT Route #3	Mid-Stnd	E+C+BRT	Test BRT route
3	State Road 37	Mid-Stnd	E+C excluding I69 projects	
4	Peak Oil	Mid-Stnd	E+C	Test $5/gal gasoline
5	TIP	Mid-Stnd	TIP	E+C plus projects in TIP
6	TIP + Public Workshop Allocation	Mid-Stnd	TIP+	TIP plus four additional projects: two trails, transit service, and connecting road
7	TIP + MTP 2035 Carryover Projects	Mid-Stnd(?)	TIP+ additional projects	
8	TIP + MTP 2030 Limited Carryover	Mid-Stnd(?)	TIP+ additional projects	
9	TIP + IU Research Park	IURP	TIP	Test impact of relocation of hospital to research park
10	TIP + Sample Road Bedroom Community	Bed Comm.	TIP	Explore consequences of potential new low-density development
11	TIP + 2-Way Streets	Mid-Stnd	2-Ways	Converts existing one-way streets to two-way
12	TIP + Urban Infill	Infill	TIP	Increases density through ADUs and minor density increases

Source: Adapted from BMCMPO 2017.

Notes: TIP: Transportation Improvement Program; E+C: Existing and Committed Transportation projects; ADU: Accessory Dwelling Units.

Figure 12: Transform 2040 Scenario Analysis Results

Scenario Statistics			Scenario									
		Scen #-->	0	1	2	4	5	6	9	10	11	12
		Land Use-->	Base	Mid-Strid	Mid-Strid	Mid-Strid	Mid-Strid	Mid-Strid	RJRP	Bed Comm.	Mid-Strid	Infill
Category	Measure	Net-->	Base	E+C	E+C+BRT	E+C	TIP	TIP+	TIP	TIP	2-Ways	TIP
Demand	Vehicle Miles (VMT)		2,955,625	3,384,415	3,364,909	3,297,662	3,694,826	3,731,774	3,700,595	4,107,402	3,570,078	3,469,918
Demand	Vehicle Hours (VHT)		108,575	152,246	154,397	135,499	152,050	154,939	152,203	166,853	153,584	148,175
Demand	Work Trip - Vehicle Occupancy		1.08	1.08	1.07	1.09	1.08	1.08	1.07	1.07	1.08	1.08
Demand	Person Trips		589,162	690,749	690,748	690,748	690,738	690,738	692,285	702,061	690,744	685,964
Demand	Transit Share		4.49%	5.50%	6.39%	8.14%	5.50%	5.45%	5.51%	5.30%	5.50%	5.67%
Demand	Daily Ridership		27,792	39,892	46,555	59,038	39,895	39,496	40,458	39,056	39,897	40,808
Demand	Transit Trips		26,468	37,992	44,128	56,227	37,995	37,615	38,168	37,196	37,997	38,864
Demand	Transit Person Miles		51,875	60,819	72,535	91,984	60,818	60,210	60,955	61,815	60,819	60,398
Demand	Transit Person Hours		3,435	4,028	4,591	6,092	4,028	3,987	4,023	4,094	4,028	4,000
Demand	Non-Motorized Share		38.3%	37.2%	36.7%	40.9%	37.2%	36.8%	37.2%	34.7%	37.2%	39.0%
Demand	Non-Motorized Trips		225,589	256,619	253,342	282,280	256,617	254,051	257,262	243,832	256,619	267,585
Demand	Non-Motorized Person Miles		278,934	327,028	320,831	359,731	327,024	323,754	327,756	310,732.84	327,026	306,894
Demand	Non-Motorized Person Hours		42,974	50,384	49,435	55,421.94	50,383	49,879	50,496	48,176	50,383	47,287
Efficiency	Vehicle Hours Under Delayed Conditions		3,976	28,416	28,826	25,006	28,379	28,168	28,294	28,002	29,717	28,568
Efficiency	Avg. PM Peak Speed		27.22	23.54	23.06	24.34	24.30	24.09	24.31	24.62	23.25	23.42
Efficiency	Avg. Auto Trip Length		6.78	6.50	6.55	9.36	6.50	6.57	6.51	6.43	6.50	6.24
Efficiency	Lane Miles at LOS E or worse		9.93	65.88	65.91	58.00	65.79	64.48	65.59	64.92	68.89	65.52
Environ	Vehicle Emissions (Daily Tons CO2)		1,418	1,845	1,835	1,697	1,902	1,921	1,905	2,114	1,838	1,786
Safety	Fatal Accidents		12	15	15	14	16	16	16	17	15	15
Safety	Injury Accidents		1,111	1,453	1,461	1,313	1,472	1,494	1,474	1,626	1,457	1,410
Safety	Property Damage Accidents		3,068	4,011	4,034	3,626	4,066	4,126	4,071	4,489	4,023	3,894
Econ	Avg. Daily Roadway User Costs in 2040 ($2013 millions)		$ 2.697	$ 4.830	$ 4.412	$ 5.362	$ 4.405	$ 4.339	$ 4.409	$ 4.739	$ 4.398	$ 4.290
Econ	Daily User Cost per Vehicle Trip (Autos and Trucks)		$ 8.00	$ 12.19	$ 11.22	$ 13.64	$ 11.12	$ 10.95	$ 11.11	$ 11.26	$ 11.10	$ 11.30
Econ	Present Value ($2013 millions) 2013-2040 lifecycle user and safety benefits		n/a	n/a	$ 1,106.67	$ (430.04)	$ 1,019.04	$ 1,042.39	$ 993.90	$ (1,064.14)	$ 1,176.28	$ 1,820.47
Econ	Capacity Added to Meet Standards (Road Lane Miles)		9.93	65.88	65.91	58.00	65.79	64.48	65.59	64.92	68.89	65.52
Econ	Est. Cost to Achieve LOS D ($Million)		$ 7.45	$ 49.41	$ 49.43	$ 43.50	$ 49.34	$ 48.36	$ 49.20	$ 48.69	$ 51.67	$ 49.14

Source: BMCMPO (2017, p. 33)

This MTP illustrates how an MPO serving a relatively small area can conduct a relatively sophisticated scenario analysis. The plan is notable in its consideration of multiple levels of overall growth, although most of the design scenarios use the mid-range growth at the standard level of density, instead of exploring the consequences of different transportation options under higher or lower levels of growth. Although the plan concludes that scenario #12 clearly demonstrated the best multi-modal system performance, it stops short from designating it as a "preferred" scenario. Instead the plan is presented as a strategic document for decision making, arguing that the chapter presenting the 13 scenarios should be used "to guide the decision-making process for future transportation investment by the BMCMPO." In addition, the final report document lacks maps illustrating the specific transportation networks or land-use patterns being tested. Another drawback of this plan is the large number of scenarios, which included several that were similar, making it difficult for decision makers to interpret key lessons and results. However, the benefit of such a nuanced analysis is the plan contains analytical results corresponding to many specific scenarios under deliberation in the community—such as the relocation of a hospital or construction of a controversial new freeway interchange. In that sense, despite its weaknesses the plan fully embraces the logic of scenarios, presenting analytical results which will be relevant to many different decisions in the coming years.

Discussion

Our case studies of scenario-based plans created at the neighborhood, city, and regional level show that scenario methods have been adopted in diverse ways by practitioners in order to address specific local planning contexts. By including non-scenario projects, we contrast these plans with comparisons to highlight their differences. In the following discussion, we comment on the use of scenario methods within each of the three general practice areas: neighborhood plans, city comprehensive plans, and MTP/LRTP regional transportation plans.

Neighborhood

From the perspective of scenario methodology, the Parramore Comprehensive Plan project illustrates an adaptation of methods of creating normative land-use plans that has been used extensively at the regional scale to the neighborhood context. The resulting scenarios therefore describe not only land use typologies, described as character districts, but also identify notable special places, and identify specific sites for new public facilities and transportation improvements. The resulting scenarios therefore combine strategic qualities--such as describing an overarching idea and general character districts--with more prescriptive design recommendations more typical of neighborhood plans. Overall, the project demonstrates that scenario methods can be valuable to organize discussions about how a neighborhood should be revitalized.

In contrast, the District Plan illustrates an alternative approach to planning which does not utilize scenarios yet still allows for the consideration of different policy options. Due to a desire to allow for flexibility for the use of specific large agricultural parcels, this plan incorporates a set of parcel-specific recommendations. This approach was also suitable for a project where a relatively small number of landowners played a key role as participating stakeholders and would be needed for several implementation actions. Another novel feature of this project is that a planner was hired to pursue implementation and has resulted in a variety of placemaking activities described in the plan being implemented, including branding and wayfinding, events, and community outreach.

In sum, the two plans illustrate that although the scenario idea—particularly the use of normative scenarios—can be translated to the neighborhood scale, there may be reasons practitioners avoid it. In the case of the District Plan, one reason may be a reluctance to be highly prescriptive for specific land parcels. Elsewhere, neighborhood plans may focus on urban form issues which may be best addressed through a design-oriented vision plan. However, the Parramore Comprehensive Plan shows how they can be used to foster deliberation about the more strategic qualities of the plan—such as the particular assets of the neighborhood and prioritizing the specific corridors for investment.

Comprehensive Plans

The two cases share many attributes common to city comprehensive plans: they include a focus on community vision, priorities, detailed policy analysis and recommendations, and future land use maps. However, the Imagine Madison plan illustrates how these ingredients which arise

partly due to mandates in state planning enabling laws can be combined with the use of scenario analysis to develop growth priority areas and coordinate the plan's specific strategies. Like many comprehensive plans, Imagine Madison contains a generalized future land use map (Figure 3) as well as "elements" describing goals and recommendations organized by conventional planning categories. However, the plan effectively used scenarios to foster deliberation about the desired location of future growth, which resulted in a growth priority area map *not* required under state law but thought necessary by local planners aware of the growth pressures facing the city (Figure 5). The scenarios also served to help link different topics better than in a conventional element-based plan, since they showed the effects of coordinating land-use changes with the creation of a new BRT to realize desired outcomes. Therefore, the style of scenario planning here strongly resembles the development of normative planning used in California and Oregon (Oregon Department of Transportation 2013) but was not used to analyze what might occur if growth did not occur, or other uncertain events occur in the future.

Metropolitan Transportation Plans

The six MTP/LRTP case studies illustrate a broad spectrum of planning approaches. Lincoln MPO's 2040 LRTP and Burlington Graham MTP both serve to illustrate a typical approach to preparing these plans. In both cases, the plans include only one population and employment forecast, which is translated into a single future land use map which is utilized to conduct standard travel forecasting analysis. These methods result in plans which are oriented towards building infrastructure to accommodate forecast growth, thereby implementing a "predict and plan" paradigm.

The remaining cases use scenarios to introduce explicit consideration of several types of uncertainty: land-use patterns, population growth, and the number and type of transportation investments. We will summarize the plans in order of increasing complexity of their use of scenario planning methods.

In previous plans, the St. Lucie MPO had examined alternative land use scenarios. For this project, the Go 2040 plan uses a single population and land use forecast as the conventional MTP plans, but instead of arriving at a single set of recommended transportation investments, the plan describes three funding scenarios. In this case, the agency director explained a major goal for this plan was to highlight the limited investments which would be possible under existing funding sources, and to describe the specific projects and their benefits, which additional revenues would make possible. This is partly because state funds can only be used on roads within the state system. In future years the agency is exploring using scenarios to consider uncertainties such as automated vehicles and climate change.

The Evansville 2040 MTP and Bannock 2040 MTP both illustrate variants on the well-established practice of constructing regional integrated transportation and land use scenarios. In the case of the Evansville 2040 MTP, the plan was prepared in close coordination with work by other agencies to define and analyze regional land use scenarios. The case shows how the administrative separation of regional land use and transportation planning need not be a barrier to coordinated planning. Since the overall project created three alternative land use scenarios and selected a preferred land use scenario, this plan is based entirely on the preferred land use

scenario. Although it does not report the results of analysis, through our interview we learned that the project did conduct transportation analysis using all of the land use scenarios.

The Bannock 2040 MTP also involved the creation of multiple scenarios through a method highly similar to the one recommended for Oregon municipalities. In this case, the MTP describes each of the three alternative land use scenarios, as well as a comparison "current trends" scenario. The MPO director told us the agency decided to use a scenario method in conversation with the plan consultant because they felt there was not a clear consensus about what vision of the future should underpin plans. One distinguishing feature of these scenarios is that they convey not only a specific land use pattern, but also a broader strategic concept for the type of growth the city should pursue. As a consequence, the scenarios have understandable descriptive titles such as "Great Place for Business" or "Outdoor Life" and are illustrated through conceptual maps, not only analytic maps illustrating quantitative density values. Although having qualitative elements, the scenarios were analyzed quantitatively, and the resulting preferred scenario integrated preferred elements of several of the alternative scenarios which were developed.

Finally, Bloomington's Transform 2040 illustrates a complex and relatively unusual scenario approach, inspired by the perceived lack of impact and usefulness of earlier plans. As previously described, their project constructs two sets of scenarios: one set describing both different levels of socioeconomic growth, as well as alternative land-use patterns that growth may take. The second set of scenarios combines selected socioeconomic and land use scenarios with different transportation and land use policies. The resulting set of 12 scenarios include scenarios considering the impact of specific controversial highway projects, proposed major land-use changes, and even a policy scenario analyzing the impact of increasing gasoline cost. However, we learned from our interviewees that the project ran into challenges with the consulting firm responsible for some of the scenario analysis, perhaps explaining why the plan lacks maps or detailed discussions of the results. This project therefore exemplifies a scenario planning approach resulting in a plan designed to inform specific, discrete decisions, not necessarily describing an overall vision for a community. The project staff explained they felt the community's overall vision was clear but not always clearly represented in MPO processes, which explains the detailed nature of the final scenarios.

Summing Up: Fitting Methods to Context

Overall, our analysis found all of the cases which used scenarios followed the method for the specific local planning context. In some cases, this meant deciding to develop scenarios clarifying an overall vision (Bannock, Parramore) or analyzing specific choices (Bloomington). In others, it meant using scenarios to highlight to elected officials the need for additional revenue to meet transportation needs (St. Lucie). For city Comprehensive Plans, both of our cases illustrate an emphasis on visioning, although Imagine Madison illustrates the use of scenarios to explore preferences for the location of new growth within a conventional future land-use map.

Since we were not able to interview contacts for the two non-scenario MTP cases, we are not able to speculate about why the projects did not use scenarios. However, our interviews with planners involved in *Reimagine Reno* and the *District Plan* were aware of the concept of

scenarios, and either used them in a limited way (for Reno) or decided to plan in an alternate way which they perceived to be more suited to the project context (Reno).

Overall, the cases illustrate that scenario planning capacity is developed over time within an agency, though that initial adoption requires additional funds or consultant assistance. We wish to note that two of these cases, Parramore and Evansville, received funds from the Obama Administration's Regional Sustainable Planning grants program. However, our research also uncovered cases of agencies conducting scenario plans using only more usual resources, such as Bloomington or Bannock.

Conclusion

Although the earliest scenario planning projects in urban planning were conducted over 20 years ago, it is still often perceived as a complex and somewhat novel method more appropriate for large metropolitan regions than the typical types of plans prepared by urban planners. As a result, this project set out to identify and document cases illustrating the use of scenario methods to write neighborhood, city comprehensive, and small and medium regional transportation plans. Overall, the cases illustrate how the idea of scenario planning has probably diffused more widely than is widely understood among planning scholars and practitioners. Instead of finding projects which fit established molds—such as the Oregon/SB 375 model of normative transportation and land use scenarios—we found in the cases professionals who sought to tailor methods to the particular institutional, political, or urban development contexts they faced. Although we freely admit our sampling approach overrepresented projects led by creative and thoughtful professionals, it serves as a valuable reminder that the normative principle for effective planning lies not exclusively in the diffusion of best practices, but the cultivation of reflective practitioners open to professional learning and innovation.

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Appendix: Practitioner Interview Questions

Background

1. What was your role in this project? Can you provide a general introduction?

Adoption of Scenarios

2. What were the primary reasons this project decided to use scenarios?

3. Did you consider using scenarios in different ways than was done in the final document?

4. After going through the scenario process what did you learn about scenarios for future projects?

5. Would you employ scenarios for future projects?

Use of Scenario Methods

6. What do you perceive the primary benefits of using scenarios to be?

Non-Adoption of Scenarios

7. Did you consider using scenarios? If so, why or why not?

Regardless of Method

8. What insights did the project participants draw from the plan(scenarios)?

9. How is the plan (scenarios) being used in current decision-making?

10. Has the plan (scenarios) influenced laws, zoning, or other regulations?