How Scenario Planning Affects Regional and Local Plans and Planning Practices: An Empirical Analysis

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Abstract

This project investigated how regional scenario efforts can shape regional and local plans. Through document analysis of scenario efforts and selected plans in six regions, plus key informant interviews with regional planning officials and local stakeholders in three of those regions, we identified how scenario planning efforts shaped not only plans but also planning processes.

Scenario planning is an approach to consider future outcomes of present-day decisions, especially when working with multiple uncertainties and differing stakeholder values. Scenario planning can involve significant public engagement, detailed technical analysis of regional phenomena, and sophisticated forecasting practices. Yet scenario planning's effects can be measured in the informal and formal relationships that the scenario effort itself help build. Through close study of selected cases, we identified strategies local and regional planning professionals can use within their scenario efforts in order to help ensure that the scenario effort has discrete, measurable, and positive impacts on planning practices and development outcomes. In this report, we discuss the significance of this study, and our methodology, and identify recommendations for regional and local agencies, and the consortium, that can help move the practice forward.

This document is intended for regional and local planners interested in scenario planning processes. It addresses both regional agencies and their local stakeholders.

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Scenario Planning For Regional Planning: What We Know and Do Not Know

Regional planning agencies across the United States have embraced scenario planning. Scenario planning is an approach to consider future outcomes of present-day decisions, especially when working with multiple uncertainties and differing stakeholder values (Bartholomew, 2005; Chakraborty & McMillan 2015; Hopkins & Zapata, 2007).[1] Scenario efforts may involve public engagement or technical analysis or both. Stakeholders and the greater public may be involved in ranking available decisions, selecting a preferred scenario, or identifying contingent actions.

Scenario planning aims to assist regional planning agencies and other participating organizations in making decisions that can achieve the best possible outcome. Yet, research on the ways in which scenario efforts affect plans and actions of participating agencies has been limited. Available research on the role and success of scenario planning in advancing regional planning have looked at the nature of scenario processes (Goodspeed, 2019), capabilities of technical tools (Avin et al., 2016; Klosterman, 2013; Holway et al., 2012), and applicability to planning contexts such as land-use and transportation planning (Bartholomew, 2007). However, less is understood about how scenario efforts impact planning decisions downstream or influence the functions of – and relationships between – agencies, municipalities, and organizations that participate in these processes.

Scenario planning may have an impact through *conformance* of subsequent plans or decisions in the region with the recommendations of the scenario effort. Impact may also be observable in *performance* of plans or decisions on attaining outcomes that are in line with the scenario effort. However, plans and decisions are often influenced by a much larger set of factors (Baer, 1997) and, like many multifaceted planning processes, direct influence of scenario recommendations may be difficult to identify or measure. For example, a scenario process may recommend that agencies in a region more actively coordinate their regulations or decisions around greenfield development, in order to achieve a more compact urban footprint. Yet, review of updates to local plans or development outcomes on the ground may not show strong conformance or performance (Allred & Chakraborty, 2015)**.** Beyond how well local agencies follow scenario recommendations in the plans, or the accuracy of scenario models over time, questions remain about how new organizations or institutions come from collaborating in scenario processes; how the scenario process (re-)shapes existing institutions; or how the scenario process changes relationships between major regional stakeholders. This suggests that while research on scenario efforts should look for conformance and performance, researchers should also more broadly explore the role of scenario processes in shaping *municipal and regional institutions.*

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[1] For a detailed background on Scenario Planning, please see: https://www.planning.org/knowledgebase/scenarioplanning/; a brief guide to design your own scenario process is available here: https://www.planning.org/pas/memo/2019/jul/

In this report, we looked for connections between scenario planning efforts, and the local and regional plans those scenario efforts aimed to inform. Our investigations include how the scenario process shapes the institutional environment across the region, and how the process of scenario planning can improve local planning capacities. We investigate how scenario planning has the promise not only to model robust futures, but build stronger local and regional institutions that can address the uncertain future more robustly. Within this project, we found many examples of how the process of scenario planning shaped regional and local institutions. These effects are typically harder to measure, partly explaining why they have been less of an emphasis in prior research.

Previous research has measured how regions follow recommendations of scenario efforts, largely centering on land-use and growth patterns (Allred & Chakraborty, 2015). Scholars who have researched scenario planning and institutional change typically rely on single case studies of one region or agency (Bexton et al 2011, Chang et al. 2007, Enfors et al 2008, Girolamo and Porto 2012). Studies that have measured scenario planning and institutional capacities across regions have relied mostly on Likert-based surveys (Holway et al., 2012; Jenssen, 2010). While important for building knowledge on regional scenario planning capacities, these studies have not targeted institutional change and capacity building across the region's agencies. These institutional factors change over time, and are relatively difficult to assess with quantitative survey panel data.

Our focus on how scenario planning processes shape regional institutions, organizations, and partnerships complements other means of assessing scenario impacts from prior studies, which largely focus on plan conformance or data capacities. We performed this research across six regions of various sizes and geographic contexts in the United States, all of which have performed scenario planning to varying extents. We examined planning documents from six regions: Madison, Wisconsin; Kansas City, Missouri/Kansas; Boston, Massachusetts; Sacramento, California; Atlanta, Georgia; and Lehigh Valley, Pennsylvania. This allowed us to understand how scenarios had been used across a variety of U.S. geographies. We conducted further research into three regions within our sample, leading extensive interviews with both regional planning officials and local stakeholders. These regions are Madison, Kansas City, and Boston. In these metropolitan areas we interviewed nine planning professionals and stakeholders involved in these plans. Additionally, we examined local plans in 40 municipalities in two of those regions with longer histories of scenario planning, seeking to find how scenario processes were adopted (or not adopted, as was more frequently the case). For this research, we sought to identify pitfalls and best practices for using scenario plans not only to envision an uncertain future, but also shape regional institutional relationships in the present.

Assessing How Scenarios Affect Plans and Decisions

Our work focused on how scenario efforts affect local plans and planning practices. To do this, we investigate the pathways between the regional scenario efforts and local plans and decisions. These often include the institutions, meeting points, routines and norms through which regional scenario efforts influenced local agencies. There a few reasons why this approach is logical. First, many regional scenario efforts are very recent: even within our small sample, the oldest scenario efforts were barely 10 years old. Given the common timeline for U.S. planning

endeavors, it could theoretically take over a decade for a regional scenario effort to appear in the text of a local plan. Therefore, looking at documents themselves may lead to an under-estimation of a scenario efforts' effects; it may be unsurprising that, as we found, scenario efforts appeared so rarely in local plans. Additionally, an extensive analysis of U.S. planning documents (e.g., text-scraping to count mentions of the regional scenario effort) would be both overly time-intensive and, more importantly, tell us very little about how the regional scenario effort actually shaped daily planning practice at the local scale. We would only have a "count" of mentions of scenario plans, less so an enumeration of local practices or a narrative about how the scenario effort shaped local practices (see Packer, 2011). Lastly, we believe a focus on regional planning processes rather than outcomes (i.e., emphasizing "*how* scenario efforts can affect local planning practice", rather than "*do* scenario efforts affect local plans") would provide more useful guidance for planning practitioners through identifying best practices. However, in order to ground this project in local planning practices, we did conduct an analysis of plans within two target regions only (which is elaborated below).

For this report, we purposefully identified six metropolitan areas that have employed scenario processes to varying capacities. We divided the metro areas by size, capturing two large (Atlanta, Boston), two medium (Sacramento, Kansas City), and two smaller regions (Madison [WI], Lehigh Valley [PA]). In addition to size we wanted to maximize a variety of other characteristics within the small sample, hence their selection from across the United States.

For these six metro areas, we methodically reviewed different regional plans with scenario efforts and/or regional scenario plans *per se*, and accounted for different key variables. We opt to use the term "scenario effort" to include both regional plans with significant scenario components, and efforts that were undertaken outside statutory processes. We sought to understand the key parties involved in the scenario effort (e.g., regional municipalities, state government, other regional policy actors), the future contingencies considered in the different scenarios (e.g., financing, climate change, the location and extent of regional growth), and how the plans "used" the different scenarios (Chakraborty, Kaza, Knaap, & Deal, 2011; Hopkins & Zapata, 2007).

We begin our findings sections by analyzing the plan documents. Following evaluation of the plan documents, we identified three metropolitan areas for which we would conduct extensive, interview-based research with key planners and stakeholders. MPO and RPC officials at these three cities responded to our request for interview and snowball sampling assistance. We elaborate upon these interviews following a narrative of our findings from plan document analysis.

Findings 1: Finance, Growth, Normative, Recent

The Six Plans, Summarized

In our preliminary research of the six planning documents, we identified a few key themes.

- *Finance* appear near consistently as a future contingency. We may speculate on reasons why this is (e.g., we examined many regional transportation plans [RTPs], which are project-oriented).
- Many scenarios and scenario planning efforts focus on *where* growth occurs in the future, not necessarily the land development process.
- Many plans follow a normative "preferred scenario selection format", in which after envisioning multiple scenarios a preferred one is "picked" through a public engagement process. The plan then features policies and recommendations designed to achieve that future.
- Plans are *mostly* from within the past 5 years, which qualifies how we measure their long-term impact.

Kansas City: A New Scenario Planning Framework

The Mid-America Regional Council (MARC)--the MPO for the Kansas City region—is currently producing an update of their Regional Transportation Plan (RTP). While not adopted as of writing in December 2019, MARC has completed much of the scenario planning process. This scenario planning process is to be folded into the federal DOT-mandated regional transportation plan. While focused on transportation investments, the plan also considers more comprehensive regional issues such as climate change, natural systems, and other topics. For this plan, MARC is building on their recent though robust history of scenario planning. Their integrated planning framework (2016) identified four broad, future challenges—including demographic & economic changes, technological shifts, and climate change—that all regional planning endeavors could consider. This framework informed the scenario-building process for their RTP, which MARC began in 2018. As plan-writing is ongoing, it remains unclear how *exactly* the RTP will employ scenarios to inform planning policy and investment decisions.

Figure 1: Kansas City Growth Forecast.
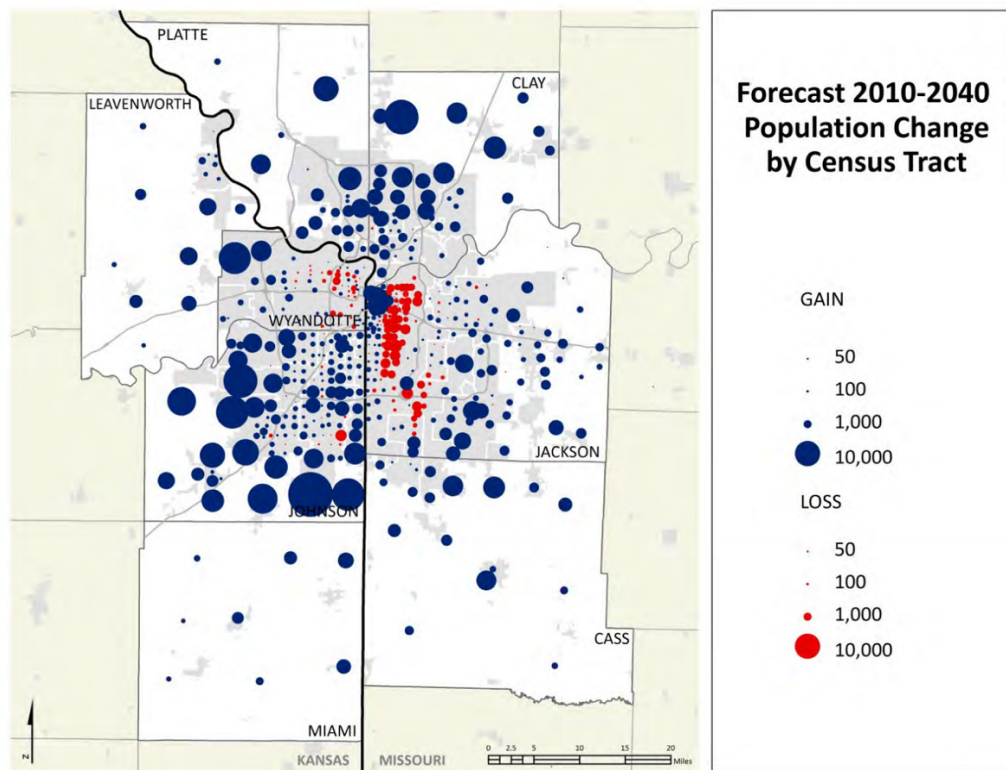
Source: Scenario Planning: Positioning the Kansas City Region for Success (2017)

Madison: Scenario Planning For an Upper Midwest Region

The Capital Area RPC (CARPC) is (like Kansas City) also in the midst of a scenario planning process. As part of their regional plan update, CARPC is undertaking the "Greater Madison Vision" project. Using data from a large public survey, the agency crafted four scenarios which they then presented back to the public in order to pick a "preferred" scenario that will be the baseline for the plan's vision and recommendations. The four normative scenarios focused on technological change, environmental change, land preservation, economic and demographic changes, and similar factors. Survey takers preferred the "conservation" scenario that concentrated growth in existing urban areas (in order to preserve farmland and open space). This will be the basis for the RPC's ongoing regional plan update.

Figure 2.

WHO TOOK THE SURVEY

The scenario survey launched on September 12, 2018, with eight "launch day events" around the region. Over the course of the next three months, Steering Committee members, CARPC staff, and other leaders and stakeholders promoted the survey through email, media, presentations, and events. Outreach was targeted to those traditionally under-represented in such surveys: persons of color, low-income, and rural communities. By the survey close, almost 9,200 people completed the survey.

The following graphics show a demographic breakdown of who completed the survey.

Age (in years)

Race (in percentage of total)

- Survey respondents
- Dane County residents

Income (in dollars per year)

Geography
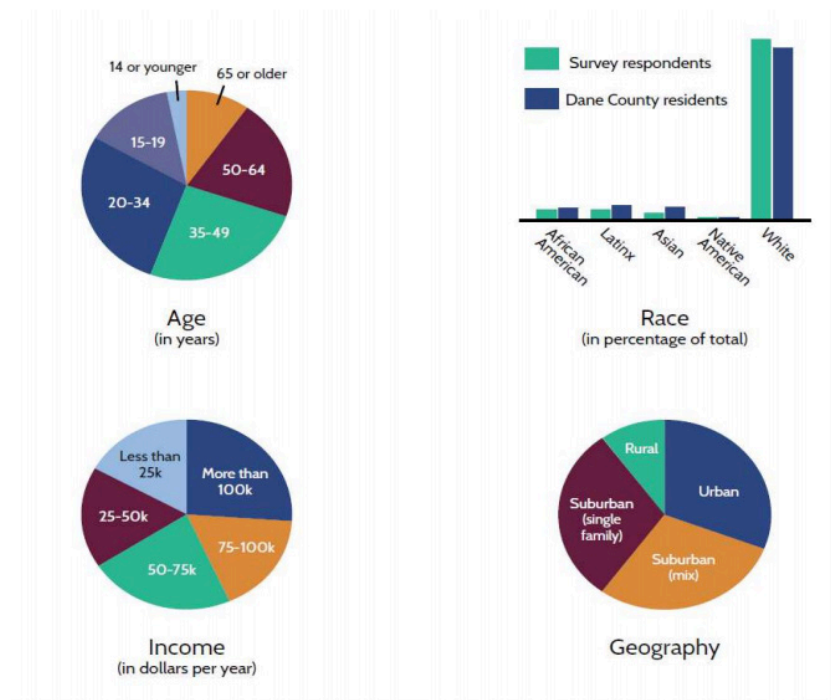
Source: Summary Report, Greater Madison Vision (2019)

Atlanta: Large Region, Broader Scenarios

The Atlanta Regional Council (ARC) maintains the Atlanta Region's Plan, of which we evaluated the Regional Transportation Plan (2016, updated 2019). Atlanta is one of the country's largest metropolitan areas. The metro region has—by the field's standards—a relatively long history of scenario planning, dating back to at least the *Fifty Forward* effort from 2008 and more recent efforts enabled by a SHRP2 federal planning grant. The SHRP2 project entailed region-wide collaboration to imaginatively engage with different future scenarios, of which the contingencies included climate, technology (including, for example, improved AI with ridehailing services), finance, economic and demographic changes, water supply, port traffic demand, and equity. Like the SHRP2 project, the RTP used a creative and large set of contingencies to guide its recommendations. However, within the plan itself, it remains unclear

how the scenarios actually guide the plan's recommendations, only how it structures future uncertainties. The RTP does not seem to follow the traditional normative "preferred scenario selection" format. (They do, however, mention how the SHRP2 scenario process informed other policy outcomes, outlined in the *Regional Transportation Technology Policy Report*).

Boston: Scenario Plans, 10 Years Later

Like Atlanta, Boston is a large metropolitan area with over a decade of scenario planning experience at its MPO. The Metropolitan Area Planning Council (MAPC) produced the Metrofuture Regional Plan in 2008. This plan represents the most "comprehensive" of the regional plans evaluated within this process, as it addresses not only land-use and transportation but issues like education, civic involvement, health care, affordable housing, and a large range of other broad policy concerns. For the Metrofuture plan, MAPC constructed three new future normative growth scenarios, along with an "as is" scenario based upon current trends. For the public engagement portion of the plan, participants across the region picked their preferred scenario, which became the baseline for the plan's (very comprehensive and aspirational) recommendations. The contingencies mostly focus on where growth occurs in the region; specifically, the different scenarios portrayed different spatial structure for the metropolitan region. Little is mentioned about how the municipalities within greater Boston will comply with the plan's measures. As this plan is older than most of the others within this report, there is comparatively more to learn about how the greater region has complied with its recommendations.

Figure 3.

MetroFuture Growth and Preservation Areas

Targeted Growth Areas

Higher Priority

Lower Priority
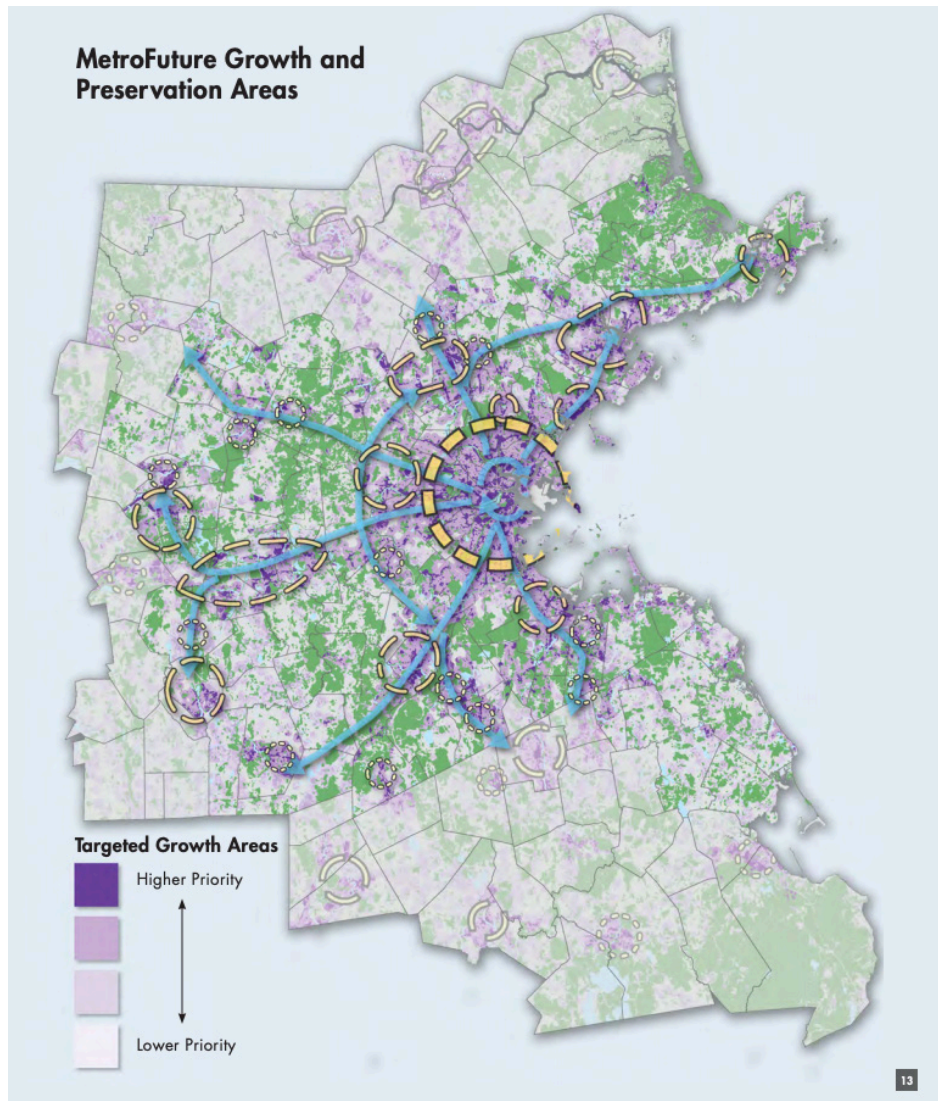
Source: Metrofuture: Making a Greater Boston Region (2008)

Sacramento: Scenario Planning History in Central California

Like Atlanta and Boston, Sacramento also has a relatively long history of scenario planning (despite being a smaller region). Their 2004 *Blueprint* scenario-planning effort was one of the earlier and more well-known regional scenario efforts. We reviewed the 2016 *Regional Transportation Plan/Sustainable Communities Strategies*, a very thorough regional plan that both identified transportation projects (per federal guidelines) and covered more comprehensive issues like land-use, open space, and environmental planning. For this plan, they constructed three different growth scenarios and then selected one per clear criteria outlined within the plan. Scenario contingencies largely focused on growth patterns and funding. While this does reflect a normative format similar to other plans, the process differs in some key respects. First, scenarios were constructed and then evaluated per pre-set criteria in the plan (e.g., fundability, feasibility).

Secondly, the scenarios informed planned infrastructure project funding. Thus, they were not part of the public engagement effort (like in other plans).

Figure 4.
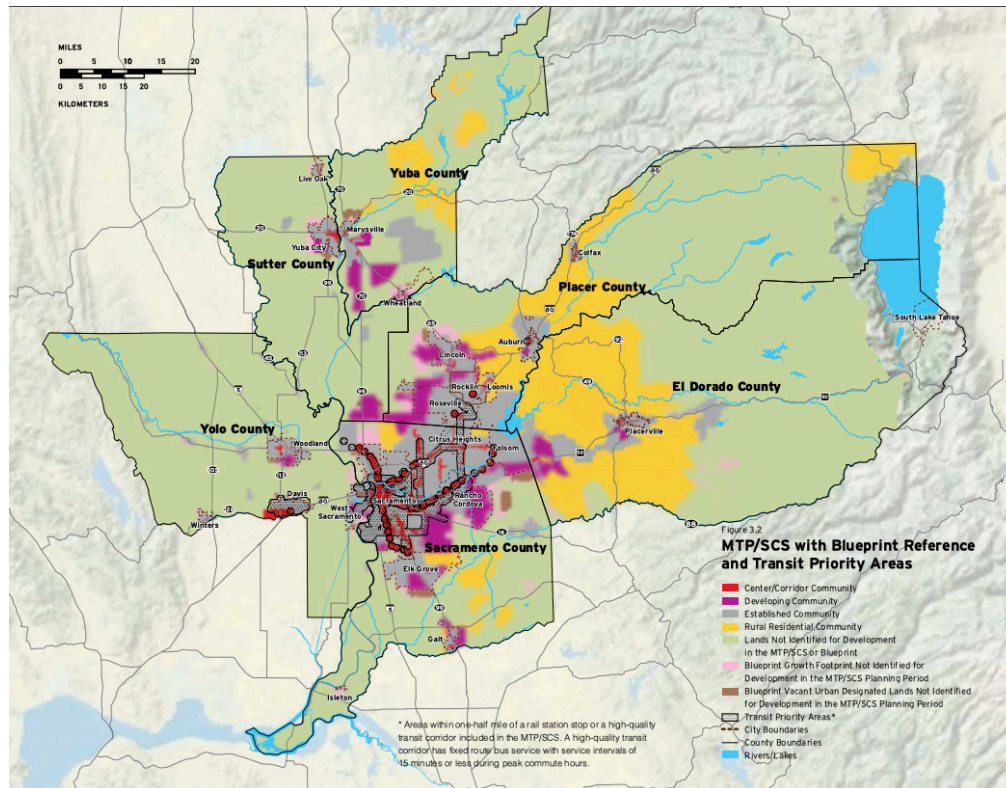
Source: Sacramento Regional Transportation Plan/Sustainable Communities Strategy (2016)

Lehigh Valley: Scenario Upstarts?

The Lehigh Valley metropolitan area, centered around the cities of Bethlehem and Allentown in eastern Pennsylvania, is located roughly 90 minutes from both New York City and Philadelphia. While smaller than most of the metro areas within this report, it is the fastest growing metropolitan area in the state of Pennsylvania. Its long-range transportation plan (2015), produced by the Lehigh Valley Planning Commission (LVPC), dictates transportation investments and planning for the region for the next 20 years. Like all federally mandated transportation plans, it features a transportation improvement plan that delineates specific projects. Throughout the planning process, LVPC used scenario models to test the transportation impacts of various proposed investments. However, within the document itself, it is in unclear how these models were employed and with what contingencies. There is one exception. The plan cites federal requirements for transportation plans to address environmental justice towards underprivileged populations. To test these impacts, the LVPC created two descriptive scenarios: a baseline without the plan's investments, and one with those investments, in order to test if the plan's recommendations would negatively or positively affect accessibility for marginalized communities in the region. They found that the plan's investments would improve accessibility.

This represents a creative use of scenarios to test for plan robustness. Unlike most other plans in our sample, scenarios were not used to create a planning vision or engage the public.

Figure 5.
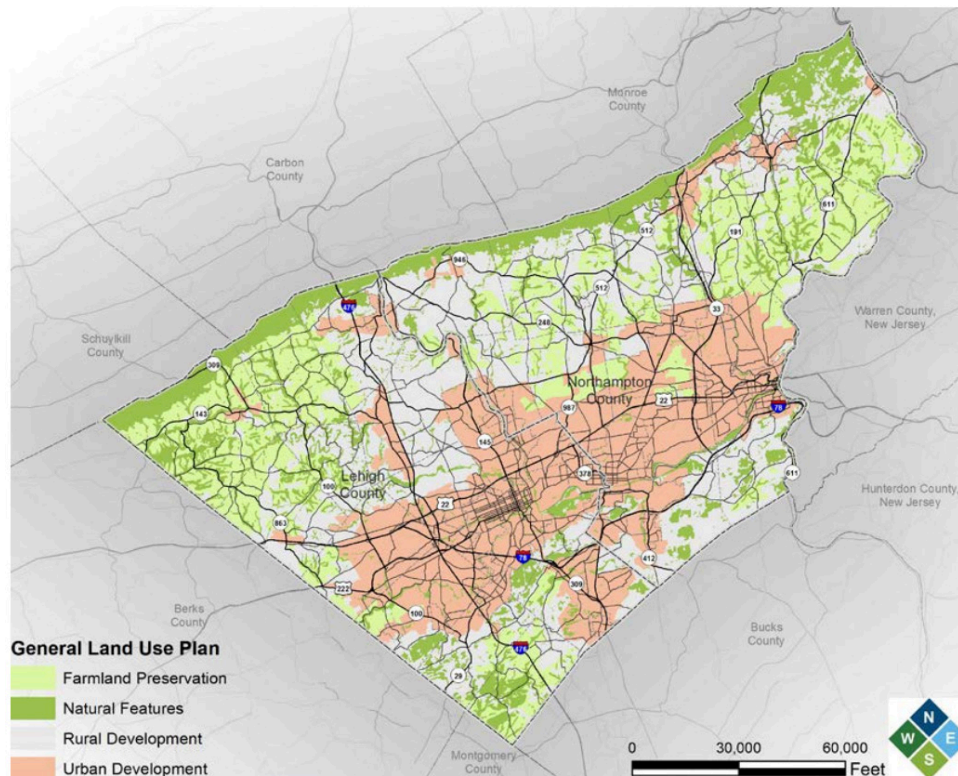
Source: Lehigh Valley Long Range Transportation Plan (2015)

We found certain patterns emerged across the six planning documents and plan endeavors (see Table 1.1). First, most are within the past 5 years, with Boston's *Metrofuture* being the older outlier. Second, four of the six regional plans we examined were regional transportation plans that used scenario processes. This may be related to our choice to examine regional plans, since MPOs must produce regional transportation plans in order to comply with federal highway funding. The only two non-transportation plans were produced by RPCs (Boston and Madison) that are separate from their regions' MPOs.

Table 1.1: Summary of Planning Documents

Region	Plan	Adoption date	Plan horizon	Plan type	Scenarios in plan	Contingencies	How scenarios are used
Madison	Greater Madison Vision	Ongoing	2044	Comprehensive regional scenario plan with land-use focus	Four regional growth scenarios	Internal and external: Fiscal, climate change, growth, transit, economics	Normative: Preferred scenario selected during public outreach

Kansas City	Regional Transportation Plan 2050	Ongoing	2050	Regional transportation plan	Ongoing	Internal and external: Fiscal, jobs and population growth, tech	Normative and exploratory
Boston	Metrofuture Regional Plan	2008	2030	Comprehensive regional scenario plan	Three regional growth scenarios, plus an "as-is" scenario	Internal: Growth location	Normative: Preferred scenario selected during public outreach
Lehigh Valley	MoveLV Long Range Transportation Plan	2015	2035	Regional transportation plan	Two scenarios evaluating environmental justice impacts	Internal: Whether RTP investment choices are made	Descriptive: Test environmental justice effects of plan recommendations
Sacramento	Regional Transportation Plan/Sustainable Communities Strategy	2016	2036	Regional transportation plan with comprehensive elements	Three regional growth scenarios	Internal and external: Fiscal, housing choice, infrastructure location	Normative and exploratory
Atlanta	Regional Transportation Plan	2016	2040	Regional transportation plan with comprehensive elements	Four regional growth scenarios (from earlier SHRP2 project)	Internal and external: Very diverse (including tech, growth, fiscal)	Normative and exploratory

Secondly, the regional transportation plans we examined varied in the amount of non-transportation policies they addressed. Some focused relatively strictly on transportation (e.g., Lehigh Valley), while Sacramento's regional transportation plan was also a "sustainable community strategy" that addressed a broad range of regional growth variables (and fulfilled a California state sustainability planning requirement).

Third, scenarios are mostly normative and used for visioning efforts. As emphasized in the past, scenarios can be used to enhance a plan's robustness and contingency (Chakraborty, Kaza, Knaap, & Deal, 2011). By crafting different exploratory scenarios, planners can envision different sets of contingent actions if different elements of that envisioned future come to pass. However, this was not the case in most plans. MPOs and RPCs crafted normative scenarios which they then presented to the public. The public—either through surveys and/or extensive meetings—picked a preferred scenario. This preferred scenario became the basis of the plans' recommendations. Lehigh Valley's transportation plan, while not featuring scenarios as extensively, is notable in how it uses descriptive scenarios as a robustness test for the environmental justice effects of their plan's recommendation. Atlanta's regional transportation plan, and Kansas City's plan, both mention how different exploratory scenarios can be used to build robustness into their plans, but it remains unclear (within the documents themselves) how exactly they do this.

Lastly, we find patterns in the contingencies these scenarios address. Most are internal. Financial and public fiscal factors seem to be most popular, which again may be a relic of these plans often addressing future transportation improvements in the region. This point will arise again in our conclusions and recommendations.

Going Deeper: Interview Research with Plan Stakeholders

Document analysis helped us in the next phase of this research project. For this project we sought to investigate how scenario efforts shaped local plans and planning practices. This prior exercise, while it helped us to understand the content of the plans, allowed less for us to examine the *effects* of these plans or planning processes within the regions. It is difficult to parse the social effects of the efforts from reading documents alone. However, the baseline understanding of the plans' contents helped shape our interview questions and approach for the second step of research.

After conducting analysis of the plan documents, we reached out to contacts in each of the six regions, using our connections within the Consortium for Scenario Planning member network. We are grateful to three MPO/RPC officials who took time away from their work to be interviewed. These planning officials also provided contacts for stakeholders across their regions who could provide a rich narrative about their experiences in the scenario planning process. The three target metropolitan areas were Kansas City, Madison, and Boston. Across this small sample we investigate metropolitan areas of the three different size categories, and covered multiple U.S. census regions.

In addition to MPO/RPC officials who were central to the regional scenario effort in question, we were connected with a variety of local stakeholders who had served, in different capacities, to support the scenario planning effort. Across the three regions, we interviewed a former city councilor, a community activist, a suburban mayor, a regional economic development official, a county economic development planner, and a suburban city planner. This snowball, convenience sample addressed a wide array of local constituencies and interest group types. We recognize that the small, non-random sample is an impediment to our findings' generalizability.

Finding 2: Scenario Plans Can Re-Shape and Re-Brand Regional Agencies

In discussions with MPO/RPC officials, we learned how scenario plans can provide the leverage for institutional change within the regional agency itself. This proved a notable finding: we sought to examine how scenario efforts can shape municipal and local plans and agencies, and instead we observed multiple ways that the *regional* institution shifted. We will focus on one MPO/RPC's narrative of institutional change, while providing broader lessons.

For example, prior to their scenario effort, one MPO/RPC was a relatively young agency mostly focused on regulating urban service expansion and regulating inter-jurisdictional land-use and water conflicts. The scenario effort presented an opportunity for the agency to strategically pivot towards performing more long-range, regional plans. Furthermore, the MPO/RPC's reputation, prior to the scenario plan, "was not the greatest," according to one official.

To help promote this agency change, the MPO/RPC recruited a large range of regional stakeholders to serve on its upcoming scenario plans' steering committee. This 50+ member committee included representatives from local governments; advocacy groups representing ethnic/racial minority communities, neighborhoods, and/or specific political issues; regional economic agencies; businesses; religious organizations; and public utilities, among other agencies. Amongst them, a smaller group served on the executive committee. The executive committee collaborated more closely with MPO/RPC staff to create draft scenarios, while the larger steering committee provided broader guidance and addressed details within the draft scenarios. To help foster a "group identity" among the steering committee, the MPO/RPC held regular, structured meetings.

This steering committee became a quasi-interest group that helped influence the MPO/RPC's agency structure. The MPO/RPC staff empowered the steering committee (made up of influential citizens) to lead the planning process. Additionally, the MPO/RPC is governed by an independent commission that had not supported scenario plans in the past. Because the scenario process involved such a large and diverse steering committee with representatives from powerful institutions, this committee could influence the commissioners to support the scenario plan in which they had invested their time and energy. The steering committee itself became a sort of political agency that shaped one major planning organization within its region (see Innes & Gruber, 2005).

The scenario planning endeavor also helped the agency re-brand itself to the broader public. The MPO/RPC partially obscured its role in the scenario plan (according to our informant within the agency). The scenario plan effort had its own web URL separate from the MPO/RPC's, and the agency hired a consultant to lead outreach (rather than relying on in-house staff). The agency also hired additional staff, improved their data analysis capacities, and shifted staff efforts towards this regional scenario effort. Thus, the scenario effort proved crucial in re-branding and re-organizing the MPO/RPC.

This example provides important lessons for practice. First, a broad base of influential stakeholders, involved from the start in the creation of different scenarios, can become an interest group *sui generis*. This group, as this case shows, can use political leverage to re-shape a regional planning agency.

Additionally, the scenario effort can help change staff capacity and re-brand the agency publicly. We noticed this within other metropolitan areas as well. Within one region, prior to the scenario effort most analysis was, according to one regional stakeholder, mostly outsourced. This stakeholder chose to become involved on the steering committee because the scenario effort seemed, to him, part of a "big re-working of the agency" that coincided with the agency hiring many new staffers. While we cannot independently confirm this regional stakeholder's assessment, his perception helps illustrate how scenario efforts can help support the impression of a savvy, well-staffed regional planning agency. "[The scenario planning process] helped establish us as being a thought leader," according to one MPO/RPC official.

New staff hired for scenario planning can help the agency attain other, non-scenario objectives. One notable example is how one of our target MPO/RPCs received significant, multi-year

federal funding for sustainability planning. According to a representative, once these grants expired the agency was able to continue the grant's projects and bring them to construction, as they were able to leverage funds across the region due to the fact that these projects had been identified within their scenario planning efforts and they had the staff capacity to execute them.

Findings 3: Increasing Local Capacity, Identifying New Issues

In our interviews with both local stakeholders and regional scenario planning experts, we identified a series of discrete ways through which the scenario process shifted the capacities, concerns, and practices of local planning departments. We identify some examples.

First, the scenario process, and the public engagement campaigns that accompanied it, allowed data sharing to occur between regional and local agencies. In one example, the regional agency shared its regional transportation projections across different scenarios. This helped one city planning official identify how one transportation node within their city boundary was very likely to be a major regional bottleneck across many different exploratory futures. This official was then able to take this knowledge to his local plans and planning commission. Local and regional stakeholders could also share data with each other. One regional economic development official emphasized how he came to every steering committee meeting "armed with data" in order to help guide the planning process towards his agency's ends. Oftentimes, the "data sharing" practices were not the delivery of data from one agency to another, or the regional agency sharing key datapoints with the assembled stakeholders. Rather, the collaborative scenario process enabled those with more knowledge of where to acquire data to share their knowledge. According to one stakeholder, "citizens aren't just going to use the data", even when the MPO or the state makes it relatively easily accessible online. The scenario process helped to publicize these sources.

Beyond data sharing, the scenario process helps bring new issues to the planning forefront within local communities. The scenario effort helped frame planning "beyond land-use" (to quote city planner) and towards more comprehensive, critical approaches. For example, one local stakeholder said that the regional scenario effort was the first time he heard "climate change" discussed within the context of a land-use plan. Another regional planning official said that the scenario effort helped their agency realize the importance of public health within future local planning efforts. A scenario effort can help local governments come to grips with the fact that "current conditions aren't going to continue forever" (MPO/RPC official), while helping local officials "think more regionally" (regional economic development official) to address these diverse challenges. Multiple local officials we interviewed felt that their regional agencies have the flexibility and technical expertise to address larger, more theoretical issues, while the mandates of daily regulatory practices meant that local planning agencies (with smaller staffs) could not as easily assume these roles.

Through gaining new data and identifying new issues, local agencies changed their planning practices in certain ways identified within our research. The local transportation bottleneck, cited above, is one example. A county planning official, who was on the selection committee for a consultant for an economic development plan, said that taking part in the regional scenario

process inclined her to select consultants who used scenarios (or more robust future-engaging planning methods) within their work.

A very salient example of how scenarios can change practice came from another interviewee, a planner in a suburban community. This interviewee largely credited the MPO/RPCs work, through scenario plans and other efforts, in informing his community's decision to cease annexing land. He warrants being quoted at length.

> If you think about [planning as] 'where we are and how do we get there,' that's not helpful. We've used [scenario planning] as a way to say, 'in 20 years what do we expect our city to be?' Our board has made some decisions based on that. We've decided we're not going to grow. We're not going to annex. We're happy to add people. We're going to change our model from lower to high density but stay within the same footprint.

In this instance, the scenario planning process has helped this auto-oriented, suburban municipality shift its planning practices towards favoring more dense, less car-oriented growth.

The above examples highlight how regional scenarios can shape planning practice. These data-sharing practices and new planning practices could theoretically also happen within more "traditional" collaborative regional planning endeavors. Yet stakeholders repeatedly emphasized the scenario's future-orientation when citing their changes in local practice. By positing itself as a savvy, future-oriented agency, the agency can help bring future issues to the forefront and change practice. Their technical staff can help local stakeholders identify future concerns within their local jurisdictions, as cited above. Yet doing so relies upon extensive public engagement, which is Finding 4.

Finding 4: Public Outreach Before and After

One MPO/RPC official believed he made "40 or so" presentations to support his region's scenario effort. "[The MPO/RPC] makes a recommendation for the region," said another official, "but then you have to go town by town to make it through." The third MPO/RPC official referred to how the many meetings he held, stating how they helped his agency understand the types of policies they could actually implement. An extensive public engagement platform helped his agency "work in areas it hadn't before."

A recurring topic of all of conversations was regional engagement: how the agencies did it (either through public meetings, meetings with local planning boards, or online and in-person surveys); what results emerged from this engagement; and how engagement ended up shaping both the scenario process and local-level plans and policies. As mentioned, the above findings center less so on the scenario plan *per se*; rather, they centralize how the scenario *process* could shape local policies and plans and the regional planning institution itself. When identifying the effects of the scenario planning efforts, local planning practitioners and other local-level stakeholders identified not the plans themselves, but the exchanges that occurred during both formal outreach efforts and on-going communications with regional MPO/RPC officials.

Institutional connections mattered greatly, arguably more so than the policies enumerated within the document.

Our interviewees also identified the concerns about public outreach. One of our more fruitful interviews came from a suburban mayor who did not possess an overall positive assessment of the scenario planning process. He had trouble understanding the point of the process, largely because the regional effort would not alter his city's plan or change his municipality's land-use law. Yet even this person still found worth in the networking aspect of the committee meetings. For example, he met officials from a local junior college and was exploring partnering with them for a workforce development endeavors in his city. The subjects with a more positive assessment of the scenario process shared this person's impression that regional meetings provided a useful forum for non-scenario-relevant networking.

A second concern related to time. Regions are large, and requiring local officials to travel for meetings can mean taking 2 hours or more from a person's day. One planner suggested more online meetings for scenario plan stakeholders and steering committee meetings.

Plan cynics like the mayor may be common, and their cynicism may be mitigated through engagement well before the scenario plan. Building goodwill takes time. Other local officials stated that they may not have participated in regional scenario efforts if not for their own long-term, extended relationships with MPO/RPC officials. MPO/RPC officials "need to build the relationship before you get to the [scenario planning process]," according to one county official.

The mayor mentioned above was relatively new to his position when he served on the scenario plan's committee. Newly elected officials may be less likely to possess a long-term relationship with MPO/RPC officials. In a different region, a regional official stated how the scenario effort alienated a select group of municipalities who did not foresee themselves growing in the way described in the scenario plan's final recommendations. This changed over time because, according to the MPO/RPC official, the "political climate" changed and the MPO/RPC had the ability to work with these municipalities in other smaller, non-scenario projects.

In all cases, the planning process shaped not only the scenario plan or regional plan itself, but regional and local institutions. Thus, careful design of the public and elected-official engagement process remains a necessity.

Finding 5: Practices Change, But Plan Documents Rarely Do

After the regional scenario plan review, and the subsequent interviews with stakeholders, the question remained about how often scenario practices actually appeared within local plans. To help answer this, we consulted the comprehensive plans within the Kansas City and Boston regions and examined them for scenario practices. We omitted Madison from this stage as their current scenario process is ongoing and the first in the region, and thus is too recent to appear in municipal plans. We downloaded plans from the Boston and Kansas City regions, focusing on the 20 largest municipalities within each region (except those only within Massachusetts within the Boston region, as MAPC is not a multi-state agency like MARC in Kansas City).

After downloading the plans, we searched them for mentions of scenario processes (by searching "scenario"), or if they mentioned the regional scenario effort (by searching the name of the relevant agency or the most recent scenario efforts' name). Results did not indicate that scenario practices had "trickled down" into municipal comprehensive plans. We were not able to locate any suburban comprehensive plan that used the scenario approach, or largely based its recommendations upon the scenario findings. Reasons for this are questions for future research. Some reasons may be explained simply: regional scenario plans often focus on transportation with the aim of modeling the region's growth, while local plans tend to focus primarily on land-use with the intent to inform the local zoning code.

This analysis has shortcomings. First, by emphasizing only municipal comprehensive plans, we omit plans and policy documents that focus on specific sub-urban areas (e.g., neighborhoods) or policy areas (e.g., economic development). This analysis also does not include counties or other geographies larger than municipalities but smaller than the region itself, such as a county. Lastly, it does not include the potential scenario planning practices of the private or not-for-profit sector.

While the results seem pessimistic for the effects of regional scenario processes on local plans, we identified one municipality in greater Boston that appeared to use scenario processes extensively within its areal plans. Elaborating their example can help identify best practices. Framingham, Massachusetts in a middle-ring suburb of Boston containing roughly 70,000 people. Its downtown transit-oriented development plan (2015), and the Golden Triangle areal plan (2018, also containing parts of the city of Natick) both contain scenario approaches to model different potential growth patterns for the target areas.

Both plans also feature significant work from outside parties. The TOD plan, notably, was not created by the city. Rather, MAPC (the regional MPO) led the 8-month-long planning process with significant input from the city, creating different downtown development scenarios with the help of outside consultants. The plan emphasizes Framingham's suitability for extensive TOD improvements, given its location, growth, and downtown assets. MAPC and consultants created a series of normative and exploratory scenarios, informed by public input, of key parcel and infrastructure improvements downtown. Shortly after the plan's completion in 2015, the city adopted a set of zoning changes in concordance with the plan's recommendations.

The Golden Triangle areal plan focuses on a predominately car-based commercial area on the border of Framingham and Natick. The Golden Triangle is located along major expressways and is a major commercial hub for not only Boston, but the entirety of New England. This led to severe traffic problems, prompting the cities to commission the plan and hire a set of three different consultants. The plan lays out three exploratory scenarios that model different potential outcomes for the area: Decline in Retail, Mix of Uses, and Growth in the Triangle. These scenarios in turn helped form the vision, which informed the plan's regulatory and infrastructural recommendations.

In both cases, Framingham needed outside assistance for scenario plans. Either consultants or MAPC produced the scenarios, while MAPC itself actually led and started the planning process for the TOD plan. Additionally, both plans have a significant transportation component, which complements the focus of most prior regional scenario plans and planning processes.

Framingham is also a relatively prosperous town. Its median family income exceeds $100 thousand dollars, and thus the city theoretically has both resources to hire consultants, and political clout to attract regional agencies. Lastly, the presence of the Golden Triangle, and its location along major regional interstates, may make the scenario approach seem more attractive (given how transportation issues would already be central to local problems).

Recommendations

Engage, Engage, Engage, But Think Towards the Future

Of the three main findings from the interview section of research, public engagement emerged as a central idea. Our research subjects all referred back to that process, even though our interview schedule did not necessarily centralize public engagement. To quote one informant, "you have to get to the politics of the matter" in order to implement regional plans in diverse municipalities. It is through the engagement processes that MPOs/RPCs can actually "gets to the politics." For example, through having an influential steering committee a scenario planning process can help re-shape an entire agency's mandate.

Yet as the case of our plan-wary mayor showed, not necessarily all regional stakeholders may be on board. This same mayor had an interesting suggestion. He believed that his municipality would have been better served had his planning staff, and not he himself, served on the scenario plan's steering committee. The staff would theoretically be "better connected to what the plan was trying to do." Local planning staff would also be more likely to have longer professional relationships with MPO/RPC staff, potentially enabling more productive partnerships. However, a steering committee filled with career civil servants would theoretically wield less political influence over a regional agency or an MPO/RPC's board (as was the case in one of our areas). MPO/RPC officials should carefully consider the region's and the agency's institutional and political structure when shaping the public engagement process. They should note the time demands on regional stakeholders and embrace stakeholder-engagement approaches that balance time and accessibility with the necessary commitment to the scenario plan.

These public outreach efforts can change regional planning agencies, and agencies should strategically consider how public engagement campaigns for scenario plans can re-shape their agency.

Financing the Future

The scenario plans we examined all considered an uncertain financial future within their scenario plans' future contingencies. Perhaps this was an artifact of the 2008 financial crash, which decimated many of the long-term growth, employment, and housing forecasts of older regional plans. Yet public finances, as a topic, proved largely absent from the interview stage of this research project. This is not to infer that our stakeholders or MPO/RPC officials did not consider public finances within their daily work or the scenario process. It does infer that public finances or taxes did not emerge are central, contentious issues during the scenario planning process in our target metropolitan areas (which is less-so the case in private-sector scenario plans, see

Bradfield et al., 2005). This may reflect consensus: that is, everyone agrees that future finances are uncertain, which forecloses any controversy.

Within the interview stage, we identified climate change and transportation system demand as two issues that the regional scenario process helped "bring to light" in local agencies. The regional scenario effort seemed to have less of an effect on the public finance practices of municipalities. We suggest a disconnect: finances take center stage within the future scenarios of scenario plans, yet public-sector scenario plans do not seem to translate into local officials performing public finance differently. According to one MPO/RPC official, a suggestion for inter-jurisdictional revenue sharing did not prove popular within local jurisdictions. Some regional scenario tools, like Envision Tomorrow, do include scenario planning tools.

We suggest future research investigate the disconnect between finance's centrality within scenario plans, and how scenario plans actually shape local practice. For practice, we suggest involving local and regional financial officials within the scenario planning process. We also suggest considering how new public finance policies can come out of scenario plans. Public finance may be a contingency within plans, but it can also be an output: new equitable, regional financial practices can be a result of regional scenario efforts.

Scenarios Shape Not Only Regions But Regional Institutions

Most of the plans we examined, and the regions where we focused our interview efforts, were places where normative, vision-based scenarios dominated practices (Chakraborty & McMillan, 2015). In these cases, the scenario planning practice hinged upon finding more desirable futures to work towards through regional and local policies. (Exploratory scenarios used in the process did not come to the forefront in the documents, only in the subsequent qualitative interviews.) These normative scenarios focused largely on growth patterns; literally, the future "shape" of the region.

Yet the interview portion focused less on how the scenario processes "shaped" the region, but on how they shaped regional institutions. Overall, this project proved a positive assessment of scenario plan's abilities to shape regional and local institutions. Local governments gained capacity, different agencies built stronger partnerships, and MPO/RPCs added expertise and assumed more broad, imaginative regional planning duties. Regional institutional evolution was not the focus of scenarios encountered within the plans, yet it seemed to be a product of these plans. Across all cases, we examined how regional scenario efforts built stronger partnerships, changed the mandates of regional institutions, and created new institutions (see Alexander, 2005; Booher & Innes, 2002)

We recommend that scenario planning efforts consider institutional factors as both inputs *and* outputs to normative and exploratory scenarios. As our research shows, the scenario process brings together diverse regional stakeholders in the effort to creatively discuss the region's future. Explicitly discussing regional institutions—their roles, interactions, and mandates—can likely help make the scenarios even more productive. This can likely help create the sort of institutions that can help realize the normative scenario identified in the plan.

Partnerships Matter for Local Scenario Plans

A major lesson from Framingham's example is that scenario planning, for municipalities, requires some outside help. MAPC, not Framingham, led the TOD plan. To execute the Golden Triangle plan, Framingham needed to join another city and hire outside consultants. Most suburban municipal planning departments do not have the capacity to do elegant modeling in-house. Scenario planning, while not *per se* requiring of advanced modeling capabilities, still uses them within most contemporary planning applications.

The Framingham case emphasizes the importance of regional partnerships. MAPC, realizing the area's centrality, intervened to produce a neighborhood-level plan within the city. Due to the strength of their local partnership, this TOD plan was able to warrant immediate changes to the local zoning code. Thus, implementing the plan not only required stronger modeling expertise, but an MPO whom the local government deemed trustworthy. Implementing the plan required strong intra-regional relationships.

Cities and local agencies should explore collaborative scenario plans. Collaborations can both yield more resources to help execute the plan, and (through a public engagement process) a more detailed account of regional challenges and contingencies across different community.

Conclusion

This project centered on assessing the effects of scenario plans on local and regional plans and planning institutions. We identified instances of institutional change—initiated by scenario planning processes—across many diverse regions and sub-regions within these metropolitan areas. Through devoted and long-term public outreach, regional agencies' scenario efforts highlighted new local issues, changed local planning practices, and brought new data to municipal and local agencies. However, this did not necessarily lead to scenario strategies being adopted by local plans.

We suggest that future scenario planning practice focus on institutions, consider finance more broadly, and perform outreach with an aim of reshaping regional relationships and affecting local plans. While this study possesses a relatively small, non-random sample size, it was performed across diverse regions and identified many institution-shaping practices that evidence scenario planning's success in shaping institutional outcomes.

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