Chapter 6: Regional Transportation Planning

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References: 1,799
Tables: 4
Figures: 1
Introduction

The history of transportation planning in the U.S. reflects an on-going struggle to find the appropriate geographic scale for addressing transportation challenges and build the institutions for doing so. As daily travel – both passenger and freight – increasingly extended beyond the boundaries of a single town or city over the 20th century, the need for government involvement at scales beyond cities and town became ever more apparent. Over a century ago, state governments, followed soon thereafter by the federal government, took on the responsibility of planning, building, and maintaining a highway network. At the same time, cities grappled with downtown congestion problems that accompanied the automobile’s rapid adoption and private transit providers’ increasing ailments. Recognition grew that transportation – and other pressing issues – ought to be considered regionally. But, it was not until state highway departments extended interstate construction activities into urban areas that the institutional framework for contemporary regional transportation planning emerged.

Metropolitan regions – comprised of cities and counties whose population and jobs create a fairly self-contained set of commute flows -- are an appropriate scale for planning, building, and improving the systems that handle daily travel needs in today’s world. About one-quarter of commute trips start and end within a central city; the rest spread throughout the metropolitan area, with nearly half of commute trips starting and ending in the suburbs (Polzin & Pisarski, 2015). Regional shopping centers and unique retail destinations draw customers from throughout the metropolitan region. Regions and regional economies generate flows of people and goods among neighboring cities, and these flows depend on an efficient regional
transportation system. Reflecting these intraregional interdependencies, 43 percent of lane miles on the interstate highway system are within rather than between urban areas, as are nearly two-thirds of the vehicle miles of travel on this system (U.S. Department of Transportation, 2012).

The metropolitan region is also an appropriate scale for transportation planning because problems associated with the system do not respect local political boundaries. Pollutants emitted in one city spread throughout the region and often beyond. Congestion in one city hampers the movement of goods to and from other cities and limits residents’ ability to travel to and from jobs and services in other cities. The negative impacts on health resulting from air pollutants and restricted access impose costs throughout the region. None of these problems can be solved city-by-city; instead, their solutions require cooperation across cities at a regional scale.

In the U.S., regional transportation planning is carried out by Metropolitan Planning Organizations (MPOs). Federal law requires the establishment of MPOs in all urbanized areas of over 50,000 population and vests them with responsibility for regional transportation planning, a process for making plans and decisions about investments in the region’s transportation system, at present and in the future. This chapter reviews the history of regional transportation planning in the U.S., then describes how MPOs meet their responsibilities, and finally, assesses the degree to which they provide the regional leadership that was envisioned.
History

As cities expanded in population and geographic size in the late nineteenth and early twentieth century, planners increasingly called for regional approaches to metropolitan-scale problems. These included not just traffic congestion and goods movement, but also water management, overcrowding, and sanitation. Scotsman Patrick Geddes and his U.S. followers – Lewis Mumford, Clarence Stein, Benton MacKaye, Stuart Chase and others – saw the antidote to urban ills not in city-centered solutions but in deliberate regional planning. They advocated for regional surveys, garden-city style regional plans weaving together city and hinterland, and economic and social interventions to remedy congestion, inefficiency, and deterioration in industrial cities. These early planners and their successors also recognized that the scale and complexity of housing, transportation, sanitation and other challenges of America’s rapidly expanding cities exceeded the limits of a single city’s decision making.

However, visions for regional-scale planning in transportation and other sectors were largely unrealized given the absence of institutional mechanisms for their pursuit in the U.S.’ federalist system of government. Grounded in a fundamental wariness of unitary government, the U.S. federalist system has evolved to share decision making and policy responsibilities among federal, state, and local governments. The absence of a clear framework for delegating government authority for responding to regional problems is a longstanding challenge that remains unresolved today. Powers not claimed by the federal government reside with states, and state governments in turn delegate to local governments authority in certain domains, such as providing basic municipal services and infrastructure and engaging in land use planning.
Thus, the structural limits of U.S. federalism leave regions in a twilight zone (Advisory Commission on Intergovernmental Relations, 1972; Banfield & Grodzins, 1958).

In spite of various 20th century efforts to establish regional institutions and contemporary acknowledgement of regional problems, few examples exist of regional agencies with legislative or taxing authority. State and local governments are instead vested with these authorities and understandably are reluctant to cede them. Absent formal regional governments, regional interests in the U.S. have been pursued through various ad hoc mechanisms, including administrative, procedural, functional, or sectoral, and political or structural approaches (Table 6.1). The federally-defined framework for regional transportation planning in the U.S. that emerged in the 1960s has followed a largely procedural approach.

The Emergence of the Federally-required Regional Transportation Planning
In the decades prior to the 1960s, federal and state transportation planning and construction had focused on highways providing rural connectivity. State investment, powered by widespread adoption of state gas taxes beginning in the 1920s, focused on building and maintaining state highways (Bloom and Bennett 1998). Early federal transportation aid to states also sought to ameliorate rural isolation, and state highway departments spent their federal dollars in rural areas. Meanwhile, local governments were responsible for circulation in urban areas; they struggled with severe traffic congestion and unstable ridership and ailing finances among urban transit systems, typically still privately owned (Jones 1985). Thus, state and local decisionmaking for transportation occurred on largely separate tracks. Even when
<table>
<thead>
<tr>
<th>Approach</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative Regionalism</strong></td>
<td>Administrative regions are a tool of decentralization for federal administrations.</td>
</tr>
<tr>
<td><strong>Procedural Regionalism</strong></td>
<td>Federal requirements for intergovernmental cooperation.</td>
</tr>
<tr>
<td><strong>Functional / Sectoral Regionalism</strong></td>
<td>An entity for formal government action is created and organized around a single purpose or service.</td>
</tr>
<tr>
<td><strong>Political / Structural Regionalism</strong> (“Metropolitanism”)</td>
<td>Formal government consolidation to achieve metropolitan- / regional-scaled government jurisdiction with purview over multiple functions and services.</td>
</tr>
<tr>
<td><strong>Informal/ Collaborative Regionalism; “New Regionalism”</strong></td>
<td>Regional interests are pursued not through top-down, unitary or formal government but via informal, collaborative efforts of government agencies, the private sector, citizens groups and NGOs.</td>
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</tbody>
</table>

*Sources: Banfield, 1958; ACIR, 1972; Fishman, 2000; Weir, 2000*
federal aid became available in the 1940s for urban extensions to the early federal system, existing state-oriented decision-making channels did not include urban officials.

At mid-century, however, this situation began to change. Some cities, including Chicago, Detroit, and San Diego, undertook pioneering urban transportation studies to understand broader metropolitan transportation needs across cities and suburbs and to predict future travel demand and highway expansion needs for the entire region. The federal government encouraged the development of regional councils and more comprehensive planning in metropolitan areas with the 1954 Housing Act and its Section 701 planning grants (Gage 1988; Mladinov 1963). Further, urban officials and advocates increasingly sought to recast federal transportation spending patterns which had emphasized rural highways (National Committee on Urban Transportation (NCUT), 1958). From these beginnings, a series of forces combined as the second half of the century progressed to underscore the urgent need for regional transportation activities, to create explicit support them, and to formally establish regional transportation planning in the U.S.

The dramatic expansion of federal highway aid with the 1956 Highway Act and ensuing construction of the Interstate System brought into high relief the lack of a forum for engagement between state highway planners and urban interests. Cities from San Francisco to New Orleans to New York witnessed the devastating impacts of federally financed, state-led urban freeway projects. In what became known as the “freeway revolts,” community groups, academics, and elected officials protested the power imbalance and technical assumptions that
had enabled state highway agencies to pursue projects at odds with urban interests (Lupo, Colcord, & Fowler 1971).

Together, the freeway revolts (Altshuler & Luberoff, 2003; Leavitt, 1970; Lewis 1999), urban lobbying (NCUT, 1958), and state-urban battles over transit funding (Banfield, 1961) all lent momentum to calls for local government involvement in federal and state investment decision-making. Congress and federal officials took such calls seriously (Holmes, 1973; Mohl, 2008), and the early 1960s marked a turning point.

Through the 1962 Federal Aid Highway Act, Congress established a foothold for metropolitan transportation planning and decision making in federal law. Under the Act, the federal government would fund transportation projects in urbanized areas only when projects were based on “a continuing comprehensive transportation planning process carried on cooperatively by States and local communities.” This so-called 3-C process makes intuitive sense and is still required today: regional transportation decisions based on planning that continues over time, that engages both local officials and states in a cooperative process, and that is comprehensive in scope.

Under the 3-c framework, regional transportation planning is embedded in, not independent of, other levels of government, as evidenced by MPOs’ structure and the decidedly intergovernmental environment in which they operate. Federal directives aim to ensure some uniformity across the country with respect to transportation system planning and design.
Federal funding for transportation projects in metropolitan regions passes through the state first, with varying implications, and the state must approve an MPO’s plans and spending programs. Regions spanning state borders may be served by separate MPOs, as in New York’s tri-state metro area, or a single, multi-state MPO with participation from respective DOTs.

The composition of an MPO’s decision-making board is determined by agreement for each region and is usually comprised largely of member local governments, represented by their elected officials. However, following the long U.S. tradition of “local control,” cities and counties continue to make local land use and development decisions for their individual jurisdictions, often with only secondary consideration of regional transportation impacts. Further, local governments supply a growing share of funding for major transportation projects (Goldman and Wachs, 2003), increasing their influence in regional planning matters. The responsibility for crafting regional transportation plans lies with MPOs, yet realization of those plans is circumscribed by independent actions of the federal, state, and local governments.

The Metropolitan Planning Organization (MPO) and its Evolving Role
While short on 3-C implementation instructions, the 1962 law sought to broaden decision making, shifting some power from state highway departments to urban officials. Successive federal transportation legislation and regulations in the early ’70s operationalized the vision, requiring that states and local governments cooperatively establish Metropolitan Planning Organizations (MPOs) as largely advisory bodies responsible for regional transportation planning. (See Tables 6.2 and 6.3.) The environmental movement added weight to calls for
Table 6.2. Key Characteristics of Metropolitan Planning Organizations

<table>
<thead>
<tr>
<th>Formation</th>
<th>Required in urbanized areas with population of 50,000 or more.</th>
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<tbody>
<tr>
<td></td>
<td>Designated by joint agreement between the governor and local governments in region.</td>
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<td></td>
<td>Local government signatories to the agreement must represent at least 75 percent of the region’s population.</td>
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<tr>
<td>MPO Structure</td>
<td>May be an independent organization, or part of a regional council or governments, a city or county government office, or state transportation department.</td>
</tr>
<tr>
<td>Composition</td>
<td>Governing or policy board.</td>
</tr>
<tr>
<td></td>
<td>Technical and citizen advisory committees to advise board.</td>
</tr>
<tr>
<td></td>
<td>Executive director, board appointed.</td>
</tr>
<tr>
<td></td>
<td>Professional transportation planning and technical staff.</td>
</tr>
<tr>
<td>Governing Board</td>
<td>Consists of local elected officials, transportation operating agencies, state (DOT) officials, and other appropriate stakeholders.</td>
</tr>
<tr>
<td></td>
<td>Board membership, voting rights, and voting rules determined by agreement between the governor and local governments in region.</td>
</tr>
<tr>
<td>Primary Products</td>
<td>Long Range (20-year) Regional Transportation Plan (RTP) – update every 5 years</td>
</tr>
<tr>
<td></td>
<td>Short range (4-year) Regional Transportation Improvement Program (TIP) – update every 4 years</td>
</tr>
<tr>
<td></td>
<td>LRTP and TIP Air Quality Conformity Determinations</td>
</tr>
<tr>
<td>Funding for MPO Planning* (median amount)</td>
<td>Federal funding: $448,000</td>
</tr>
<tr>
<td></td>
<td>State support: $37,000</td>
</tr>
<tr>
<td></td>
<td>Local support (e.g. sales, gas, &amp; property tax): $52,000</td>
</tr>
</tbody>
</table>

*Reported in U.S. GAO 2009a & 2009b.
<table>
<thead>
<tr>
<th>MPO</th>
<th>Sacramento</th>
<th>Jacksonville</th>
<th>Chicago</th>
<th>St. Louis</th>
<th>Austin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sacramento Area Council of Governments</td>
<td>North Florida Transportation Planning</td>
<td>Chicago Metropolitan Agency for</td>
<td>East-West Gateway Council of</td>
<td>Capital Area Metropolitan Planning Org.</td>
</tr>
<tr>
<td></td>
<td>(SACOG)</td>
<td>Organization (North Florida TPO)</td>
<td>Planning (CMAP)</td>
<td>Governments (EWGCOG)</td>
<td>(CAMPO)</td>
</tr>
<tr>
<td>Regional Population</td>
<td>2,274,557</td>
<td>1,274,426</td>
<td>8,444,660</td>
<td>2,571,253</td>
<td>1,759,122</td>
</tr>
<tr>
<td>(2010)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional Size (sq. mi.)</td>
<td>6,189</td>
<td>2,681</td>
<td>4,096</td>
<td>4,586</td>
<td>5,307</td>
</tr>
<tr>
<td>No. of Counties in Region</td>
<td>6</td>
<td>4</td>
<td>7</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Counties in Region</td>
<td>El Dorado, Placer, Sacramento, Sutter,</td>
<td>Clay, Duval,</td>
<td>Cook, DuPage, Kendall, Lake, McHenry,</td>
<td>MO: Franklin, Jefferson, St. Charles,</td>
<td>Bastrop, Burnet, Caldwell, Hays, Travis, and</td>
</tr>
<tr>
<td></td>
<td>Yolo, Yuba</td>
<td>Nassau, St. Johns</td>
<td>Will</td>
<td>St. Louis IL: Madison, Monroe, St.</td>
<td>Williamson</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Clair</td>
<td></td>
</tr>
<tr>
<td>No. of Cities in Region</td>
<td>22</td>
<td>12</td>
<td>283</td>
<td>41</td>
<td>49</td>
</tr>
<tr>
<td>MPO Structure</td>
<td>MPO within COG</td>
<td>Independent MPO</td>
<td>MPO within regional planning</td>
<td>MPO within COG</td>
<td>MPO is hosted by city</td>
</tr>
<tr>
<td>Combined MPO/COG Board</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>MPO Board Size (voting members)</td>
<td>31 total; 1 member/county (2 from Sacramento County), 1 member/city (3 from Sacramento)</td>
<td>15 total; 4 from member counties, 4 from Jacksonville, 1 from St. Augustine, 1 beach communities, 5 from transportation agencies</td>
<td>18 total; 1 from Chicago, 1 from other cities, 7 from counties, 9 from transportation agencies</td>
<td>24 total; 3 from IL cities, 5 from IL counties, 2 from MO cities, 9 from MO counties, 4 regional citizens</td>
<td>19 total; 1 member/county (4 from Travis County), 1 member/city (4 from Austin), 2 from transportation agencies</td>
</tr>
<tr>
<td>Staff size (FTE)</td>
<td>50 (COG)</td>
<td>9</td>
<td>92</td>
<td>56 (COG)</td>
<td>17</td>
</tr>
</tbody>
</table>
broadened decision making beyond state highway departments and their concerns. The 1969 National Environmental Policy Act (NEPA) required that environmental impact assessments be completed for proposed highways (and other federally funded projects), and that alternatives to a proposed highway or other project be identified and their environmental impacts evaluated. The NEPA process that has evolved fosters transportation decision making that balances consideration of environmental factors with engineering and transportation needs. It also provides a formal way for citizens to participate in decision making through its opportunities for public review and comment. Citizens and environmental groups have used lawsuits over NEPA compliance as a powerful tool to challenge proposed highway and other transportation infrastructure projects and to gain concessions for environmental mitigation.

Chapter 12 discusses NEPA and the environmental review process in greater detail.

The Clean Air Act of 1970 and subsequent amendments also led to greater emphasis on regional-scale transportation planning and enhanced the role of MPOs. The 1970 CAA led to the establishment of national air quality standards and requirements that states formulate plans to achieve these standards. The 1990 Clean Air Act Amendments (CAAA) strengthened these requirements; for regions failing to demonstrate air quality conformity, the CAAA increased sanctions including withholding of federal transportation funding. The requirements called on the use of travel demand forecasting models to assess the impact of the MPOs plans on air quality. Such models in transportation planning draw on early forecasting models from mid-century transportation studies that defined the “four-step” approach that remains in wide use today (see Chapter 5).
The 1991 Intermodal Transportation Efficiency Act (ISTEA) was a major turning point in the evolution of U.S. regional transportation planning. This legislation shifted transportation decision making more visibly from the state to the regional scale, not only locating more decision making authority with MPOs but also giving them flexibility to meet local needs. In particular, several interrelated ISTE A directives altered the substance of regional planning and the allocation of funds to enhance the MPO role. These included requirements that both long-term plans and near-term investment programs realistically reflect anticipated funding levels (fiscal constraint); that proposed transportation system improvements support federal air quality goals (conformity); and that MPOs actively involve the public in the development of plans and investment choices (public involvement). Further, ISTE A funding provisions allowed regions more flexibility and control in funding local transportation priorities, furthering multimodal planning. The law established federal funding pots explicitly for bicycling and walking investments and enabled funds formerly available only for highway investments to support transit, non-motorized modes, and demand management instead. Additionally, MPOs gained authority to more directly control the expenditure of some funds.

Subsequent legislation, including the 2012 federal surface transportation bill (Moving Ahead for Progress in the 21st Century, referred to as MAP-21), has generally reinforced the MPO role in regional transportation planning, while also streamlining some provisions and adding others. For instance, MAP-21 leaves many ISTE A-era planning requirements in place, but puts new emphasis on performance measurement in planning.
One of the on-going debates since ISTEA has focused on the appropriate role of the federal government in developing the surface transportation system. Some interests have pushed for devolution of the federal program to the states, arguing that completion of the interstate system means federal involvement in transportation is no longer needed. Such debates could have serious implications for regional transportation planning and MPOs, which exist through the federal requirements that devolution could make moot. At the same time, however, the ongoing shift of U.S. transportation funding responsibility to states and local governments is weakening the role of the MPO.

The Regional Planning Process

Practically speaking, the purpose of regional transportation planning in the U.S. is to inform and to make decisions about how to invest federal funds in regional transportation systems. What facilities or services should be improved, enhanced, or added to best serve regional access and mobility in the future? Consequently, establishing a guiding vision for the region’s desired future is central to the transportation planning process. This vision should inform the goals and standards for judging both existing conditions and possible futures. If current trends suggest that a region’s likely future will not match its desired future, that region can make investments and adopt policies that will better direct it toward that desired future.

This model of planning is visible in the two key steps at the heart of regional transportation planning: development of the long-range transportation plan (LRTP) and of the short-term
transportation improvement program (TIP), akin to a capital program. Federal policy requires these steps, establishes key parameters for their execution, and makes the receipt of federal transportation funds contingent upon their approval. The content of both documents is largely up to the MPOs, but federal law dictates critical components of the process, including the use of public involvement, travel demand forecasting, air quality conformity analysis, and performance measures in LRP and TIP development. Fulfillment of each step involves review and approval at multiple levels, including approval by the MPO board, the state, and the U.S. Department of Transportation, providing for involvement of many stakeholders along the way. Figure 6.1 depicts the general flow of, and important inputs to, this process. Regional goals and visions crafted considering public input, available budgets, and federal requirements in turn inform the development of alternative strategies, long range plans, and near term investments and projects to improve operation of the transportation system.

The Long-Range Transportation Plan (LRTP)

The LRTP articulates the region’s vision for its transportation system for twenty or more years in the future and serves to guide transportation investments and other policies within the region. Reflecting the 3-C approach, these plans are comprehensive in scope, addressing a full range of transportation modes for passenger and freight demand. Although focused on the long-term future, they represent continuing planning and are updated at least every five years following federal requirements. They are developed cooperatively with state, local, and other regional agencies.
Regional Vision and Goals

Alternate Improvement Strategies
  Operations  Capital

Evaluation & Prioritization of Strategies

Development of Transportation Plan

Development of Transportation Improvement Programs

Project Development

Systems Operations
In developing their long-range plans, MPOs are increasingly adopting a “visioning” framework (Ames, 1993) that asks four critical questions: (1) Where are we? (2) Where are we going? (3) Where do we want to be? (4) How do we get there? Spurred by growing awareness of the environmental, economic, and social impacts of unhampered growth and road expansion and by the need to explore the costs and benefits of different future development paths, the approach discourages reactive planning. Rather than planning transportation systems simply to accommodate anticipated population growth and travel demand, vision-based planning weighs alternative future scenarios, using regional plans instead to strategically influence how future growth and mobility unfold and to facilitate participatory planning. Widely praised visioning processes in Portland, Salt Lake City, and Sacramento in the 1990s and 2000s inspired other regions to follow their lead.

Following the visioning framework, the MPO first assesses current conditions and identifies problems and opportunities. Second, it examines trends under current policies and uses travel demand forecasting models (discussed below and in Chapter 5) to assess system performance, assuming that no new investments will be made (called the “no build” scenario). To answer the third question, the MPO develops its guiding vision as the basis for the LRTP goals. Although MPOs are free to set their own goals, federal requirements to provide for public involvement and use performance targets influence the goal-setting process. Fourth, the MPO identifies a plan of action for realizing its vision, forming a list of proposed investments and policies for the plan period. MPOs may examine multiple investment scenarios when developing their plans; travel demand forecasting models are used to assess the contribution of different investment
scenarios toward meeting plan goals and realizing the regional vision. The list of proposed investments becomes the core of the long-range plan.

When identifying proposed investments, MPOs are required by federal law to show that the long range plan—and any funded program ensuing from it later—demonstrate both “conformity” with federal air quality standards and “fiscal constraint.” To be considered “fiscally constrained,” a long-range plan must limit proposed investments to the amount of funding likely to be available over the plan period. Prior to ISTEA, long-range regional transportation plans typically included a long “wish list” of projects proposed by local governments, the costs of which would far exceed the funding anticipated over the life of the plan. ISTEA’s requirement for “fiscal constraint,” both within the long-range plan and subsequent investment programs, compelled MPOs to forecast future regional funding and to winnow proposed projects accordingly. In partial compromise, however, the law also allowed MPOs to include a second list of “illustrative projects” that would be implemented should future revenues exceed forecasts.

Additionally, long range plans are also subject to federal air quality requirements, articulated in the Clean Air Act and its amendments, for transportation-related pollutants such as ground-level ozone, carbon monoxide, small particulate matter, and sulfur dioxide. When the levels of these pollutants in a region exceed national air quality standards, the regional transportation plan and subsequent spending programs, if financed even partly with federal funds, must conform to wider state plans to lessen air pollution and meet those national standards. Under
the CAAA (1990) and ISTEA (1991), regions unable to show air quality conformity could experience sanctions, including withholding of federal transportation funds.

The Transportation Improvement Program (TIP)

The LRTP, once it has been approved, is implemented through the development of the Transportation Improvement Program (TIP). Among the projects listed in the LRTP, the MPO prioritizes those investments to be made in the near term, over the next three to five years. To prioritize projects for TIP inclusion, MPOs apply evaluation criteria that, ideally, are tied to the LRTP performance targets. Different criteria may be used to prioritize projects using different funding categories, and MPOs vary as to the formality and transparency of their scoring procedures.

The MPO lists these “programmed” projects in the TIP along with their funding sources, ensuring fiscal constraint. The MPO also performs a conformity analysis of the TIP. Using modeled forecasts of travel patterns and emissions, it tests whether the programmed transportation projects will help or hinder regional efforts to meet specified emissions standards under the Clean Air Act. Not merely procedural requirements, fiscal constraint and conformity rules enable MPOs to assert regional priorities more firmly when selecting projects than if they had to include all projects proposed by local governments. For example, some MPOs have leveraged fiscal constraint and conformity requirements to counter Congressional earmarks for parochial projects that would disrupt regional transportation priorities (Sciara 2012).
To be included in the TIP, a project must be sufficiently well developed to ensure that its cost estimate is fairly solid and that its execution or construction can advance within the three- to five-year TIP timeframe. Thus, project programming is linked to project development. The agencies responsible for building projects and operating the transportation system – the “implementing agencies” – develop individual projects from the concept stage, through design, environmental review, and engineering, and ultimately to construction and operation. States own and operate the highway system; cities and counties own and operate local roads; and state, multi-county, or local entities may own and operate rail transit and bus systems, airports, and maritime ports. As implementing agencies, they may propose projects for LRTP and TIP inclusion. MPOs are not implementing agencies and cannot include a project in the TIP unless an implementing agency will sponsor it.

In developing the TIP, MPOs program, or budget, funds for specific investments. Yet, with rare exceptions, they do not generate their own revenue for such investments. Instead, MPOs rely on the array of federal, state and local funds available, and they generally have little independent authority over how most of those funds are expended. Most federal highway funds flow to state departments of transportation, through so-called “core programs” such as the National Highway Performance Program focused on the interstate and national highway systems. Similarly, most federal transit funds flow directly to transit agencies, making operators most influential in decisions about their expenditure.
While state DOTs and MPOs coordinate the expenditure of highways funds in urban regions, the DOTs generally take the lead in identifying the projects. MPOs do not control the funds but may negotiate with the state over their use (Edner & McDowell, 2002). Some states elect to “suballocate” at least some federal funds, passing their control to sub-state regions. Yet, funds may be suballocated to state DOT subdivisions, not MPOs, and suballocation practices may be driven less by regional need than by the politics of geographical distribution, including state DOT district structure, historical funding trends, and statehouse politics (Hill, Geyer, & Puentes, 2003).

Prior to ISTEA, MPOs could exercise far less flexibility when programming available funds for desired projects. Federal funding was formerly distributed to specific categories of highways; funding from one category could not be spent on highways in another category, and certainly not on non-highway investments. Highly differentiated funding siloes gave the federal government significant influence over the kinds of projects funded. By overhauling the structure of federal funding, ISTEA enabled DOTs and MPOs to transfer some existing funds to different categories, depending on where they were most needed. Further, ISTEA gave large MPOs direct responsibility for programming the urban share of Surface Transportation Program (STP) funds, and it created the Congestion Mitigation and Air Quality Improvement Program (CMAQ), to support varied investments—including highways, transit, non-motorized modes, or even demand management programs—provided they lessen air pollution in regions challenged to meet federal air quality standards. While CMAQ funds flow to the state, many states suballocate them to the MPOs in urban regions where they are needed.
Some MPOs are using this discretion over flexible transportation funds to support regional transportation and land use goals (Sciara & Handy, 2013). In the San Francisco Bay Area, the Metropolitan Transportation Commission’s Transportation for Livable Communities program was a ground-breaking in this regard, and in its successor, the One Bay Area Grant program, furthers this innovation. These initiatives use flexible federal dollars as incentive grants to encourage planning and capital investments that support transportation alternatives and development in priority areas. They are also bolstered by MPO-board policies ensuring that other funds are distributed following similar principles.

Key Requirements of the Regional Transportation Planning Process

The regional transportation planning process first emerged in an era when automobiles were seen as symbols of modernity and system efficiency was the overriding concern. Engineers and planners sought to minimize travel time and maximize vehicle throughput, and road building was the primary strategy (Meyer & Miller, 2001; Wachs, 2004). The broader range of goals and strategies now under consideration (see Chapter 1) is both a reflection of and an impetus for revisions to MPO planning processes (e.g., Transportation Research Board (TRB), 2001). In some cases, federal policy has pushed MPOs to evolve, and in some cases MPOs are innovating beyond federal requirements. Federal law prescribes key components of the process; public involvement, performance-based planning, and travel demand forecasting are discussed here.
Public Involvement

While the public had little say in decisions about federal transportation investments prior to the 1960s, the freeway revolt increased conviction that citizens and their local officials should play a role in shaping future investments. The 3-C planning process as envisioned in the 1962 Highway Act would involve local communities and states in transportation planning and decision making, yet subsequent planning regulations failed to specify how that should occur, and many MPOs gave public involvement short shrift.

ISTEA placed renewed emphasis on public involvement by requiring MPOs to develop a Public Participation Plan and instituting an MPO certification process that considered the effectiveness of this plan. Additionally, the impetus for public involvement in planning was further strengthened by President Clinton’s 1994 executive order on environmental justice. Based on Article VI of the 1964 Civil Rights Act, the order requires all federal agencies to include environmental justice in their mission, by requiring consideration of a federal policy’s positive and negative impacts on minority and low-income communities and by requiring agencies to ensure “full and fair participation by all potentially affected communities in the transportation decision-making process” (Federal Highway Administration (FHWA), 2000). These enhanced public involvement requirements implicitly acknowledged that the transportation planning process had theretofore focused too narrowly on the traditional concerns of transportation agencies, not necessarily on the goals and values of the public they serve (Poorman, 2001). Over time, increased public involvement has gone hand-in-hand with a broadening of transportation planning goals in many regions (Handy, 2008).
Public involvement activities often help to inform the MPO’s vision of “where do we want to be” and to set goals, and MPOs employ many different techniques to achieve this aim. At a minimum, MPOs are required to hold public hearings for development of the LRTP and the TIP. Often, these hearing are held late in the process, following the release of draft documents and prior to their final adoption.

Public involvement should inform all stages of the planning process, and MPOs have increasingly focused on involving the public earlier in the planning process. Common approaches include forming citizen advisory committees, holding public workshops, and administering opinion polls (Howard/Stein Hudson Associates, 1996, 2011; Morris & Fragala, 2010). Federal law encourages the use of visualization techniques to describe the plan and requires MPOs to make the plan accessible electronically, as through a website. Increasingly, MPOs are incorporating web-based and social media tools to increase citizen engagement; these practices are evolving rapidly (Bregman & Watkins, 2013).

Achieving meaningful public involvement is not easy. Even in the face of vigorous public involvement efforts, participants may not be representative of the broader citizenry; voices from vulnerable and less empowered communities may be absent given language, cultural, and socioeconomic barriers (PBS&J, 2006); and organized interest groups may dominate the process. Even when public participation is robust, stakeholders may disagree as to whether better investment decisions have resulted and what should count as better. Case-study-based
guidance on best practices for public involvement is abundant, but systematic evaluation of the impacts of public involvement is rare. One study of state-level citizen participation efforts suggests encouragingly that citizen inclusion in decision making increases agency effectiveness and cost efficiency, while also allowing citizens to increase their understanding of transportation decision making (Neshkova & Guo, 2012).

Performance-Based Planning

Reflecting concern over public sector decision making, performance, and accountability, a movement toward performance-based transportation planning emerged in the late 1990s (Hartgen & Neumann, 2002; TRB, 2001), leading to a new federal requirement in MAP-21 that MPOs adopt a performance-based approach to transportation planning. Under MAP-21, an MPO’s performance-based approach must support national transportation goals (Table 6.4) and use performance measures and associated targets as tools for objectively assessing how both the LRTP and TIP will help to achieve the region’s goals (Grant et al., 2014). Thus, performance-based planning is a way to ensure that a region is moving toward its vision of “where we want to be” and that stakeholders agree on how to measure its progress. Further, whereas MPO performance has largely been defined with respect to procedural requirements, performance-based planning orients the evaluation of MPO accomplishments toward outcomes (U.S. GA0 2009a).

Developing appropriate performance measures that are clearly tied to the goals of the MPO is critical to the success of performance-based planning. Planners have traditionally measured
Table 6.4. U.S. Department of Transportation Goals under MAP-21

- **Safety** - To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.

- **Infrastructure Condition** - To maintain the highway infrastructure asset system in a state of good repair.

- **Congestion Reduction** - To achieve a significant reduction in congestion on the National Highway System.

- **System Reliability** - To improve the efficiency of the surface transportation system.

- **Freight Movement and Economic Vitality** - To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.

- **Environmental Sustainability** - To enhance the performance of the transportation system while protecting and enhancing the natural environment.

- **Reduced Project Delivery Delays** - To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.
transportation system performance with so-called “level-of-service” (LOS) standards, as defined by the Highway Capacity Manual (TRB, 2000), an appropriate approach if the goal is to reduce traffic congestion. However, the broadening of transportation planning goals that began with ISTEA is spurring the development and use of alternative measures of system service to reflect the travel experience of cyclists, pedestrians, and other non-auto modes users as well (Matute & Pincetl, 2013). Further, some MPOs are now developing broader measures of investment outcomes, such as changes in accessibility to jobs or reductions in health care costs. Challenges MPOs face in developing and using performance measures include lack of data (Pickrell & Neumann, 2001), little standardization of measures for broader goals, and institutional changes needed to ensure their effective application (Hartgen & Neumann, 2002).

Travel Demand Forecasting Models

Travel demand models are a tool used by MPOs to answer the question, “Where are we going?” and to assess whether proposed transportation strategies and projects will meet the region’s goals, informing the question, “How do we get there?” Travel modelling techniques were developed in the 1950s to forecast whether proposed highways would meet projected demand (Rosenbloom, 1988) and evolved into the well-developed and widely used four-step modeling approach, described in Chapter 5. MPOs have invested substantial resources in developing these models, updating and improving them over time, and applying them in developing their regional transportation plans (Johnston, 2004).
Model outputs, generated by an MPO’s technical staff or outside consultants, are used to inform the MPO policy board’s decisions. For instance, when the region considers various combinations of roadway and transit improvements for the LRTP, the model can forecast how each combination might affect overall congestion, given assumptions about other investments, future population growth, and economic development. Such models will be essential to performance-based planning, in that MPOs can use them to forecast whether the LRTP is likely to meet its future targets.

However, because travel demand models were designed to produce forecasts of level-of-service, they speak most directly to the goal of roadway congestion reduction and are best suited for evaluating proposed investments that aim toward this goal. The models do not easily represent certain kinds of proposed investments or policies, raising criticisms among advocates for the environment, for economically vulnerable groups, and for more state-of-the-art modeling techniques. For example, because most regional models not currently include bicycling and walking as modes, they cannot be used to assess the impact of proposed bicycling and pedestrian infrastructure investments without “post-processing” of model outputs. In addition, performance measures tied to goals other than congestion reduction are not standard model outputs. Hence, as they consider broader transportation goals, MPOs are increasingly using model outputs to derive new performance measures that reflect the wider range of goals in their plans. For example, these models have been used to assess the impact of proposed investments on accessibility to jobs for lower-income workers.
The use of travel demand forecasting models in the regional transportation planning process also presents a challenge from a public involvement standpoint (Handy, 2008). These models are often described as a “black box,” the complex inner workings of which are known only to the modelers themselves (Beimborn & Kennedy, 1996). On one hand, modelers need to acknowledge the judgment that goes into their work to avoid the “illusion of technical objectivity” (Wachs, 1987). On the other hand, members of the public may feel that modelers are inserting their own biases (or those of their clients or employers) into the models, leading to forecasts that support a favored alternative. For instance, if models forecast only a subset of performance measures, the public as well as decision makers may have an incomplete picture upon which to base decisions and be unsure how to weigh the forecasted measures against considerations for which they do not have forecasts. In general, observers note a weak link between modeling results and decision making (Meyer & Miller, 2001), despite the vast sums invested in these models.

Impending improvements in travel demand modeling, such as activity-based models and micro-simulation models, described in Chapter 5, may help with both of these challenges. Some argue that activity-based models are more intuitive and thus less opaque for participants in the planning process. In addition, they enable new performance measures that may better match the broader range of goals in today’s plans. For example, activity-based models can be used to estimate accessibility measures based on all activities and trips throughout the day rather than just peak-hour commute trips (Dong, Ben-Akiva, Bowman, & Walker, 2006). Micro-simulation models can be used to estimate benefits and impacts for different subsets of the population,
defined by characteristics such as gender, income, auto availability, or household structure (Castiglione, Hiatt, Chang, & Charlton, 2006). It is unlikely that all performance measures can be derived from even these new travel demand models, but they offer potential. Such improvements are essential for maintaining the technical legitimacy of MPOs in the eyes of stakeholders, who increasingly challenge the travel demand models.

Challenges in Providing Regional Leadership

Along with requirements for regional transportation planning, the federal government established MPOs as a way to strengthen across metropolitan areas the voice of local governments in what had been a largely state-driven highway planning process. Later, the MPO process was envisaged as a widely participatory forum for creating a unified regional transportation vision and providing the leadership needed to realize it (McDowell, 1999; Turnbull, 2007). However, many scholarly assessments of U.S. regional transportation planning suggest the reality falls short of this hope (Gage & McDowell, 1995; Wolf & Farquhar, 2005). Although vested with the important responsibilities of producing the LRTP and the TIP, MPOs face significant barriers to asserting leadership at the regional level (Mallett, 2010).

At the core of many of these barrier is the broad reluctance within the U.S. federalist system of government to empower regional-scale government institutions to address public problems. The processes and institutions through which federal policy requires regional planning in the U.S. represent a compromise position: the reality of travel flows and of transportation system performance requires regional-scale planning for major infrastructure investments, but federal
policy confers regional bodies with little real authority, leaving the choice to empower regions to individual states. Yet, state governments have varied track records when it comes to top-down support for regional scale decision making. For transportation investments, ISTEA and subsequent legislation has transferred only partial decision-making power in metropolitan regions from state DOTs to MPOs, and states have resisted giving it up (Goldman & Deakin, 2000). At the same time, local governments have routinely promoted their own interests in the regional planning process over those of the region, and many have begun to raise and allocate their own locally generated transportation funding. Sandwiched between state government and local governments, MPOs operate in a decidedly intergovernmental environment that puts checks on regional efforts. Nevertheless, many MPOs have successfully used levers available to them to foster a truly regional vision and to advance the investments that would support it.

Constraints on Regional Planning

Federal law empowers MPOs to conduct long-range transportation planning, lead the processes to establish a regional vision, set goals, generate and evaluate plan and project alternatives, and prioritize projects for funding. While this authority is not insignificant, it is also limited in several domains critically important for realizing regional plans. In various ways, the authority to make final decisions or take decisive action resides squarely outside the MPO.

First, as noted earlier, it is “implementing agencies,” not MPOs, that have authority over construction and operation of the transportation system and that propose projects for LRTP and TIP inclusion. MPOs cannot fund a project without an implementing agency sponsor,
whether the state DOT, a public transit property, or a local transportation or public works department. Further, the governor and the state DOT retain veto authority over MPO-selected projects (McDowell, 1999).

Second, despite increasing recognition that land development shapes travel demand and that regional transportation planning should consider alternative development patterns in identifying and prioritizing investments, land use control remains firmly within the purview of local governments, not regional entities such as councils of governments or MPOs. Cities and counties craft the general plans and zoning regulations that guide growth and hence impact travel demand, and they approve subdivision and development applications. These choices are based on local priorities and, increasingly, the drive to generate local revenue from land use (Burnes, Newmark, & White, 2011; Lewis, 2001; Wassmer 2006), not the regional plan.

A third check on the authority of regional planning is the absence of regional sources of revenue to support transportation investment. The widening gap between federal transportation funds for metropolitan investment and the need for such investment makes non-federal transportation funds increasingly important. State and local governments are empowered to raise revenues by imposing taxes and fees, but most MPOs are not (Sciara & Wachs, 2007). Regional authorities that operate transit systems, tollroads, or ports and airports may have revenue-generating capacity, but their proceeds typically support that particular modal system and not wider regional transportation facilities or services. Local and state governments are likely to use the revenue they generate and control to make transportation
improvements scaled to provide local or state benefits, leaving a resource vacuum for investments that provide dispersed regional benefits.

Transportation funding from local governments, in the form of local option tax revenues, play an increasingly important role in supporting transportation projects in metropolitan areas (Goldman & Wachs, 2003), a trend particularly visible in California. Through ballot initiatives, more than 20 California “self-help” counties have dedicated quarter- or half-cent sales tax increments to pay for pre-defined transportation improvements, raising close to $4 billion for such investments in 2014 alone. While locally-based tax measures can significantly increase the scale of transportation investment possible in an urban region and can work in favor of transit, as evident in Denver and Los Angeles, they may also develop alongside, not within, the regional planning process. Lest they fail at the ballot box, tax measures must support projects with voter appeal, making regional benefit a secondary consideration. Further, state legislation empowers counties and cities to pursue tax revenues for transportation but typically does not require those revenues to pay for projects in the regional plan, creating ambiguity for regional transportation planning that is required but inconsistently supported with available resources.

The level of internal resources available to provide for MPO staff and technical activities can be another check on regional planning. To support MPO operations, federal law devotes a small portion (historically about 1- to 1.25 percent) of Federal highway funds to metropolitan planning. While about 80 percent of MPOs rely on federal support for the majority of their planning activities, most also supplement with funds from the state and the region’s member
local governments (U.S. GAO, 2009b). Whether an MPO is a stand-alone entity or is housed within another agency may also influence its internal resources, for instance, by shaping how it recruits technical staff or its ability to share resources. Whereas in the early 1970s MPOs were largely housed within state DOTs, this model has waned. By 2010, MPOs were commonly housed within city or county governments or regional councils of governments (Bond & Kramer, 2011). An MPO’s internal resources determine whether it is able to move beyond simply fulfilling federal requirements to proactively address broad regional transportation questions.

Finally, realization of a region’s long-term transportation vision rests in part on many discrete decisions made not only by the MPO board as a group but also by cities or transit operators acting independently. Whether those decisions support the regional vision or not may depend on whether efforts to create a regional transportation system are viewed as appropriate and desirable. For MPO boards, political legitimacy is especially dependent on the willingness of member jurisdictions to weigh decisions from a regional perspective. Yet, the tension between local and regional interests is built into the structure of regional planning. Local elected officials are a dominant force on most MPO boards (Bond and Kramer, 2010) and this ensures local communities a voice in regional planning, yet members may put local concerns ahead of regional interests (Goetz, Dempsey, & Larson, 2002). As a result, MPOs have been known to distribute funding across local jurisdictions according to geopolitical considerations rather than prioritizing projects based on regional needs (see Chapter ??).
The legitimacy of regional planning may also suffer if MPO boards are not considered representative of the regions they serve. One analysis of MPO board composition shows that central cities are underrepresented relative to suburban areas on a representative-to-population basis (Goldman & Deakin, 2000). Further, MPO voting structures have the potential to bias funding decisions towards highway projects and away from investments in transit (Nelson, Sanchez, Wolf, & Farquhar, 2004; Sanchez, 2006). In addition, transit agencies have also had limited representation on MPO boards (Hoover, McDowell, & Sciara, 2004), though a new MAP-21 requirement for transit agency representation on MPO boards may help to correct the imbalance.

At the same time, the fundamental legitimacy of long range transportation planning (O’Toole, 2008) and regional planning itself – and, indeed, of planning of any sort – has been questioned in the early 21st century U.S. by certain libertarian political interests, most notably the Tea Party, that seek to diminish government’s role across broad sectors of public engagement (Frick, 2013). These challenges may have gained traction in part because of the ambiguous position of regional-scale planning in the U.S., transportation or otherwise, coupled with the strong “home-rule” tradition empowering local governments.

**Making it Work**

To carry out their regional planning responsibilities, MPOs thus depend on state and local agencies, but MPOs do retain some leverage over them, stemming from specific federal directives. First, only projects listed in the LRTP are eligible to be programmed in the TIP. This
means that state, local, and transit agencies must engage with the regional planning process, at least if they seek federal funding for their projects. Second, the requirement that the list of projects in the LRTP be fiscally constrained means that the MPO must decide what projects to include rather than simply listing every project proposed. Fiscal constraint creates an opportunity to apply criteria that favor regional rather than local interests. Third, air quality conformity requirements mean that those regional interests include reducing the emissions of air pollutants and give MPOs the power to say no to projects that do not contribute to this goal. Fourth, MPOs can use the flexibility in federal funding programs to steer regional efforts.

Even so, MPOs are reliant on support from both state and local agencies (Goldman & Deakin, 2000; Goetz et al., 2002), as well as internal support in the form of strong MPO leadership coupled with technical competence and credibility (Handy, 2010; Handy & McCann, 2011). In sum, its ability to play a leadership role in the region depends not only on the assets the MPO itself brings to the process but also on its relationships with the state DOT and local governments. Keys to success may be summarized as:

- **Top-down support** from the state DOT and state policy more generally to enable the MPO in and facilitate its regional planning efforts. Examples include additional sub-allocation of federal funding to the MPO, assistance with technical analysis, and enabling legislation for regionally scaled local-option taxes or other funding mechanisms. The state of California took a significant step to devolve transportation funding to MPOs and other county-level entities in 1997. The state also granted the San
Francisco Bay Area’s MPO the authority to levy a regional gas tax, though it has yet to exercise it.

- **Bottom-up support** from local governments (cities, counties, and others) in the form of consensus on the definition of regional problems and their solutions and a willingness to balance regional solutions with local interests, with backing from local interest groups. For example, Clark County, Nevada, voters approved a new way to fund Las Vegas transportation improvements with regional revenues, allowing the Las Vegas MPO to borrow the county’s taxing authority to support projects consistent with the regional plan (Sciara & Wachs, 2007).

- **Internal support** in the form of strong leadership from the MPO board and its director, coupled with strong staff, with technical competence and credibility. Strong MPO leadership can help to foster state and local support where it is lacking (Goetz et al., 2002), and some evidence suggests that MPOs dominated by non-elected managers produce more regionally-oriented transportation policies than those dominated by local elected officials (Gerber & Gibson, 2009). Strong board leadership allowed the Lee County, Florida, MPO to face down pressure in 2006 to amend its LRTP to add a new interchange project. Though never part of the regional plan, the project was awarded a $10 million Congressional earmark, supported by local real estate developers, builders and other businesses. Unswayed by the earmark or potential Congressional retaliation, the MPO board used its leverage over LRTP approval to reject the patently parochial project (Sciara, 2009).
A number of MPOs have presided over successful regional transportation planning efforts, in which a regional consensus emerged on a new direction for the transportation system. In addition, with encouragement from the federal government and some states, MPOs are increasingly exploring how alternative land use scenarios might address travel needs and reduce transportation’s economic, environmental, and social externalities. For instance, California state law SB375 asks MPOs to develop a regional land use vision that, when paired with supportive transportation investment, will reduce automobile reliance and associated greenhouse gas emissions. As required, each MPO in the state has adopted a “sustainable communities strategy” identifying a set of investments and other actions that, as forecasted by travel demand models, is likely to achieve the reduction targets. The state’s four largest MPOs have prioritized infill development in areas served by transit along with investments in alternatives to driving.

Whether regional transportation planning is easier in areas with strong regional planning in other domains is not clear. The Portland, Oregon example suggests that regional planning efforts can be synergistic: with its region-wide, directly elected Council, state-granted authority over the establishment of a growth boundary for the region, as well as the regional transportation planning powers conferred by federal policy, Portland Metro has succeeded more than most regions in achieving effective coordination of transportation and land use strategies (Abbott, 1997; Seltzer 2004). More generally, regional transportation planning may have a greater chance of success if it builds on previous collaborations at the regional scale.
(Deyle & Wiedenman, 2014). On the other hand, some research suggests that ongoing collaboration in regional transportation planning may in fact be negatively impacted by existing cooperative processes in other local policy arenas, such as watershed planning, other resource management, estuary planning, housing, economic development, social service delivery (Lubell, Henry, & McCoy, 2010). The limited resources that agencies can devote to collaborative planning efforts may explain this counter-intuitive finding. Each local government must weigh its own costs of collaborating – staff time and other resources – against the potential benefits of collaborating (Gerber, Henry, & Lubell, 2013).

An MPO’s chances of success in creating and implementing a regional vision may also rest on circumstances beyond its control, including underlying demographic and sociopolitical dynamics in the region it serves. For instance, collaboration appears to be more likely in regions where local governments are more homogeneous with respect to political attitudes, socioeconomic characteristics, and size and growth patterns. Geographic proximity also promotes collaboration by increasing interdependencies, on one hand, and opportunities for and ease of interacting, on the other hand (Gerber et al., 2013). That said, an MPO can maximize its chances through careful design of the planning process and selection of the key participants (Deyle & Wiedenman, 2014). Devoting adequate resources and dedicated staff to the process, ensuring access to high-quality and credible technical information, and encouraging on-going participation of individuals who can make commitments on behalf of their organizations can help to overcome any unfavorable starting conditions.
Regional Transportation Planning in the Future

Regional transportation planning in the U.S. has evolved since the mid-20th century as an intergovernmental process for making plans and decisions for investments in the region’s transportation system. It depends on relationships between the state and the MPO region, between the MPO as a whole and the individual local governments that comprise it, between the MPO and transit agencies, between the MPO and the public, all within the context of federal requirements. Although this decidedly intergovernmental process results in notable checks on MPOs and their authority to assert a regional vision, many MPOs have succeeded in doing so by using the powers they do have in effective and creative ways. Federal requirements, which traditionally emphasize process, have recently added a new outcome-based dimension to evaluation of MPOs accomplishments, through performance-based planning. A number of trends suggest that in the coming decades the regional scale will become increasingly important in planning the transportation system to meet societal needs while also addressing its economic, environmental, and social impacts. At the same time, regional planners are likely to face many new challenges and uncertainties, including:

**Increasing connectivity.** Metropolitan regions are becoming increasingly interconnected, with extensively overlapping commute sheds and interdependent economies. The concept of the “mega-region” is used to describe parts of the U.S. where economic interactions spread far beyond the conventional boundaries of metropolitan regions (Ross, 2009; Wheeler, 2009). Examples include the Boston-to-Washington corridor on the east coast, and the Los Angeles-San Diego and Bay Area-Sacramento conurbations in California. What does a half-century of
experience with regional planning reveal about how best to address “mega-regional”
problems?

**Technology.** While telecommuters are not likely to overtake drive-alone commuters as a share
of total daily travel (see Chapter ??), other technological innovations may rearrange daily travel
patterns in unpredictable ways. What will driverless cars, for example, mean for the regional
transportation system? Crowd-sourced traffic information and routing guidance (e.g. Waze)
could improve the efficiency of the system, but could they also generate unanticipated
consequences? And will new technology-enabled rideshare services alter patterns of vehicle
ownership or transit usage?

**Equity.** Who benefits is another on-going question for regional transportation planners. With
long-standing environmental justice requirements, has the planning process in fact become
more inclusive? Will the move toward performance-based planning help to ensure that the
needs of all segments of society are equally well served? How can regional planners find an
acceptable balance between satisfying regional needs and ensuring an equitable distribution of
costs and benefits at the local level, particularly with respect to vulnerable communities?

**Environmental Sustainability.** As California has acknowledged in state legislation, regional
transportation planning is imperative for achieving needed reductions in greenhouse gas
emissions. While technological solutions can accomplish much, analysis shows that reductions
in vehicle-miles-travelled (VMT) are also essential to meeting reduction targets. Is the recent
flattening of heretofore longstanding increases in VMT per capita a lasting trend? If not, what strategies can accomplish this while also meeting needs for access? In the meantime, regional planners must also identify strategies for adapting transportation systems to already inevitable climate impacts. Adaptation requires answers to a host of questions: what are the critical system components, what is their vulnerability to unavoidable and expected climate impacts, and what options are there to provide system redundancy?

As new challenges and discoveries continue to unfold with respect to the connectivity, technology, equity, and sustainability of urban transportation, the question for metropolitan regions is: how best plan for the changes to come? Answering that question is what regional transportation planning is all about.
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