

Transportation Demands of the 21st Century: A Look to the Future - Possible Paths Forward

Executive Summary

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This document, produced by the USF Center for Urban Transportation Research for the Miami-Dade Metropolitan Planning Organization, is an executive summary of a larger document of the same title. This effort presents an overview of the strategic issues that will be shaping transportation policies and programs in the future. The paper characterizes the existing context and anticipated changes with the intention of helping to shape possible paths forward. The full report includes an appendix, “A Transportation Data Profile,” which helps set the context.

Over the past several decades, planners and policy makers have come to appreciate the significance of transportation on virtually all aspects of quality of life. This more holistic understanding of transportation has led to a far more complex process for transportation planning and decision making. The increasingly complex process leaves agencies facing something of a “perfect storm,” with numerous issues converging to create the most dynamic and perhaps most challenging time for transportation policy making in the past several decades. Among critical issues that are shaping transportation policy are the following:

- expectations of growing travel demand in areas predicted to see continuing growth,
- growing appreciation of the importance of transportation to economic competitiveness,
- short-term energy price spikes and long-term concerns of energy availability and cost,
- concerns about climate change and air quality,
- increases in infrastructure costs and prospects of renewed price pressures,
- an aging population and the prospect of greater demands on publicly-provided mobility,
- ongoing concerns about transportation safety and security,
- dramatic changes in technologies impacting transportation costs and impacts,
- a growing interest in the relationship between transportation and land use,
- recognition that existing revenue sources are inadequate, yet the presence of limited public and political resolve to increase taxes or fees, and
- pending reauthorization of the federal transportation legislation that is expected to lead to a thorough evaluation of roles, spending priorities, and perhaps funding.

What most epitomizes the challenges for transportation are the current desires to provide the mobility that enables economic competitiveness and personal opportunity while simultaneously striving to minimize the amount of vehicle travel to lessen its impact on the environment. The goals for the Miami-Dade 2035 LRP clearly call for the community to design transportation services and investments that both improve travel and minimize environmental consequences.

A second major goal that significantly challenges transportation planning is the desire to be effective and efficient with investments while still being responsive to the myriad stakeholders. Not every corridor needs a freeway interchange or rail line, not every project that creates jobs is a good investment. There are winners and losers, and resource programming that is driven by non-transportation goals can seriously compromise effectiveness goals.

Extremely broad and sometimes conflicting goals can create a situation that calls to mind the old proverb that cautions, “He who begins too much accomplishes little.” Planners and decision makers have to exercise caution or risk striving to satisfy various constituencies but providing very modest transportation benefits.

Growing Travel Demand

Travel is fundamental to the human desire to interact for social and economic benefit. Growth in knowledge and personal income fuel a desire for specialization in consumption, employment, and social interaction – each creating desires for more travel. Population growth is also forecast to continue. The U.S. is expected to grow far faster than most developed and many developing countries. While the current economic downturn has slowed Florida’s growth, the experts expect natural population growth and the fundamental appeal of climate and opportunity to continue to create population growth for Florida. The Bureau of Economic and Business

Year 2035 Long Range Transportation Plan Goals

The Miami-Dade Long Range Transportation Plan goals and objectives, as adopted by the MPO Board:

- Improve Transportation Systems and Travel
- Increase the Safety of the Transportation System for Motorized and Non-motorized Users
- Increase the Security of the Transportation System for Motorized and Non-Motorized Users
- Support Economic Vitality
- Protect and Preserve the Environment and Quality of Life and Promote Energy Conservation
- Enhance the Integration and Connectivity of the Transportation System, Across and Between Modes, for People and Freight
- Optimize Sound Investment Strategies for System Improvement and Management/Operation
- Maximize and Preserve the Existing Transportation System

***Miami-Dade Metropolitan Planning
Organization, September 2008***

“...absent an unprecedented change in the area’s and country’s economic health, it will still be necessary to plan for growing travel demand.”

Research predicts Florida's total population will grow by 37 percent to in excess of 25 million by 2030. Miami-Dade County is forecast to continue to grow, reaching over 3 million by 2030.

Transportation System Performance and Economic Competitiveness

The *2009 Urban Mobility Report* ranked Miami-Dade as the 11th most congested large urban area in America based on travel delay per traveler. Congestion can be a deterrent to travel and a drag on business and personal productivity. It also symbolizes a robust economy and is a signal that people and businesses so strongly desire to participate in social or business activities in a given location that they are willing to tolerate the time and money costs of travel to satisfy those desires. But ultimately, people and businesses will choose other locations to carry out their activities if the travel time costs are too high.

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Infrastructure Cost and Affordability

Part of the transportation challenge facing urban areas is the fact that the cost of transportation infrastructure has increased significantly. The cost of building roads and streets has outpaced the overall cost-of-living increases over the past several years. Thus, a dollar of transportation revenues today will not purchase nearly as much transportation capacity as a decade ago. This trend, led by global competition for commodities, higher energy costs, and competition for the workforce, may reverse somewhat in a period of slow economic growth; however, experts predict continued competition for commodities and do not expect infrastructure costs to return to the relative levels that existed in the 1990s and earlier.

The impact is an inability to repair and expand transportation infrastructure at the pace that was previously possible absent additional resources. There has not been the political or public will to expand resource commitments to transportation at a rate that would keep up with growth in demand and costs. The result is a system increasingly stressed with high travel demand.

Resource Requirements of a Multimodal Transportation System

A number of conditions collectively are creating a desire to expand the service levels and use of public transportation in urban areas as a desirable means of meeting mobility needs. Implicit in this interest is the expectation that total benefits of public transportation exceed those for additional investment in roadway transportation capacity. However, the fundamental cost structure of public transportation is far different than for private transportation. The consequence of these fundamental cost structure differences is that policy decisions to expand the role of public transportation in an urban area will require significant increases in publicly-collected resources in order to provide those services.

The Transportation Land Use Connection

Perhaps the most pervasive topic of interest in transportation planning is the coordination of transportation and land use. The motivation is to leverage the fact that higher-density

development generates measurably less travel per person by reducing trip lengths and enabling alternative modes (bike, walk and transit) to be viable options to auto travel.

The Miami metropolitan area is ranked as having high degrees of dispersion and decentralization. Central business district employment constitutes 7.5 percent of regional employment, with 77.5 percent of employment classified as dispersed. These conditions are among those that make it challenging to provide efficient public transit options and reinforce the logic of concentrating new activities along priority corridors in order to make alternative modes more competitive. The limited availability of developable land constrains the development options in Miami-Dade County such that densification of developed areas is implicit with growth.

Energy and Technology Change

Energy consumption and carbon emissions are likely to be critical to transportation in the future. Price and availability of energy, climate change, energy independence, and the uncertainty of fuel pricing and availability are expected to be critical concerns over the next 50 years as transportation transitions from predominant reliance on internal combustion engines to alternative and probably more diverse fuels. The burgeoning interest in an environmentally-sustainable transportation system has to factor in the changes coming in transportation technology, the performance of the various modes, and changes in public acceptance of modes.

Money, Money, Money

The greatest transportation planning challenge is carefully differentiating between compelling needs and wish lists. The line between vision and fantasy can become clouded even for those with the best of intentions. If the public is well informed, then the truest measure of the reasonableness of transportation needs is the consistency between the stated needs and the public's willingness to financially support the plans. Perhaps one of the prognostications about the future that is highly certain is that resources will be limited and competition for them will be fierce. This reality is coupled with extreme degrees of uncertainty that currently face transportation funding, including:

- weakness in revenue growth for traditional funding sources including gas taxes, sales taxes, and property taxes,
- recognition of the need to transition from fuel-tax-based transportation trust funds as vehicle efficiencies and fuel source changes undermine this traditional revenue source,
- recognition that the current financial climate creates strong competition for public resources and reluctance to increase taxes and fees from travelers,
- expectations that climate change concerns and the prospect of carbon taxes or fees will impact transportation and may help fund transportation infrastructure and services,
- personal, business and government debt levels that limit financial flexibility,
- sympathies for infrastructure investment as a possible stimulus strategy for the economy,
- limited private sector contributions through development extractions, concurrency, and impact fees as development slows and may remain slow for an extended period of time, and

- uncertainty regarding privatization opportunities for toll projects as liquidity is tight and leveraging opportunities far more limited than in the recent past.

The process of selecting which projects to fund and proceed with has both technical and political elements. With constrained resources, the transportation programming process often reverts to one where technical compliance governs entry into the project candidate pool and political considerations and funding availability govern the project prioritization process. Among the challenges for urban areas will be determining what basis they will use to prioritize spending scarce resources.

A Path Forward – Recommended Strategies

This section explores how the planning process might be adapted to accommodate the considerations mentioned above and the types of initiatives or projects that might be most likely to be relevant. The observations are designed to encourage the transportation planning community in Miami-Dade County to reflect on current activities and practices in the context of the issues raised in this paper. The specifics of how Miami-Dade County can respond to these observations are most appropriately left to the planning professionals in Miami-Dade. Changes may be as subtle as individuals approaching an issue with an enriched understanding of how it might be impacted as time moves forward, to consideration of more substantial changes in planning and decision making methods and practices.

How Planning Might Change

Dealing with uncertainty through robustness in planning - It appears that the U.S. is entering a new era in terms of transportation. The last half century was characterized by rapid increases in auto availability, continued dispersion of population and employment, the evolution of the interstate era, women joining the workforce, growing overall travel, and declining use of alternative modes as privately-operated vehicles dominated travel. The planning process was primarily auto-based, with predominant reliance on four-step modeling and development of long-range plans dominated by capacity-expansion initiatives. Looking ahead, we may be entering an era characterized by a different set of factors driving transportation planning. Individual travel levels appear to be stabilizing, with the increases in trip rates and the shifts to auto no longer as likely going forward. Perhaps more significantly, the supply side of transportation planning is likely to be very different, including:

- dramatic changes in infrastructure costs,
- constrained right-of-way availability,
- greater attention to environmental concerns,
- the probability of upward trending energy costs underlain by volatility, and
- the prospect of an uncertain global economy.

Responses in terms of how planning and implementation of transportation services and projects is carried out might include:

- a shift toward more complex financial partnerships among various levels of government and the public and private sectors,

- a general tendency to be reactive rather than proactive as resource constraints limit addressing future problems or leveraging opportunities,
- a shift toward more and larger regional study areas for planning,
- a frustration with the cumbersomeness of a highly-prescribed planning process, yet a desire to include the broad range of stakeholders and goals that make it very difficult to minimize the comprehensive, inclusive processes that characterize planning,
- more aggressive consideration of operational strategies to optimize existing investments,
- a growing interest in the incidence of transportation investments and services on various population segments and geographies, and
- a growing interest in longer-range planning.

The context in which transportation finds itself suggests several characteristics about how a path forward might be defined. The future is likely to be characterized by a great deal of uncertainty, and transportation planning has to be conducted in a manner that acknowledges and deals with that uncertainty. Key elements in such a strategy should address the following factors.

Acknowledge and adapt to uncertainty in key factors that impact transportation - Funding, travel demand, energy availability and cost, governance, and land use development are among the key factors that impact transportation and for which there is very credible evidence to suggest there will be a great deal of change and uncertainty in the future. Given this uncertainty, it is critical that transportation planning seek robust plans that strive to provide promising performance for a broad range of probable future scenarios.

Embrace adaptability to accommodate change - Implicit with change is the need to quickly adapt to take advantage of opportunities. This might include being quickly able to leverage new funding programs that might materialize, respond to changing requirements by having a professional capacity in place, or modifying plans and design features to adapt to cost, right-of-way or other challenges for projects.

Use innovative strategies governed by careful risk assessment - The current environment begs the consideration of innovative strategies for addressing transportation problems. This might include innovation in every aspect of providing transportation, from planning practices to decision making strategies, to funding, procurement, partnering, and construction materials specification, to implementation/delivery strategies.

Refine the rolls in transportation planning and decision making - The Miami-Dade area urgently needs to improve its credibility regarding transportation planning and administration that stems from conditions as old as the original Metro-Rail planning to as recent as the controversies regarding the ability to deliver on current transportation plans. Reaffirmation of roles, accountability mechanisms, and communications strategies can help to restore the trust necessary to enable risk taking and engender the support to carry initiatives through the inevitable challenges that accompany transportation plan implementation.

Rethink costs and benefits - The U.S. is fundamentally rethinking the measures of value for various investments. Stories of billions or trillions of dollars being gained or lost has partially desensitized people to the value of money. The current national economic crisis is re-instilling a keener sensitivity to value as every entity from individual households to businesses to all levels of government scrutinize spending.

How Project Priorities Might Change

Significant transportation planning and spending will be required to sustain the existing systems in good repair and accommodate state-of-the-practice safety features. However, the critical challenge will be to meet the demands that exceed the capacity of current systems. Florida and Miami-Dade are anticipated to grow and have continued growth in travel demand – thus, changes in travel behavior and/or additional transportation system capacity will be required.

Demand modification - Urban areas are embracing strategies to moderate demand for travel as a major element of their overall transportation strategy. The premise underlying demand management is to enable individuals to continue to carry out their activities but in a manner that reduces or shifts the time of their travel so as to be less of a burden on the transportation system. Tactics include enhanced traveler information, transportation pricing, and modifications to land use.

Capacity expansion - In many urban areas, capacity expansion for traditional roadway travel demand has been constrained by cost, right-of-way availability, and the prospect of intolerable impacts to the existing activities in the corridor. The greatest challenge is accommodating increased demands in already-fully-developed areas. Strategies might include compromising traditional design standards to fit more lanes into existing rights-of-way, using elevated or cantilevered structures to accommodate additional lanes, optimizing the configuration of lanes and ramps to maximize the traffic flow, using reversible lanes, using shoulder operation on select facilities where feasible, and installing ramp metering and/or dynamic traffic and control systems. This innovation extends to transit, where the high cost of new systems have led to exploration of Bus Rapid Transit and other strategies that leverage existing infrastructure and right-of-way. Often, these capacity enhancements offer greater flexibility for future refinement, much faster implementation timelines, and lower cost and impacts while capturing many of the transportation and intangible benefits of infrastructure investment.

What Miami-Dade is Doing

While there remain substantial unmet transportation needs, existing resources are being deployed in new ways to help address transportation needs and opportunities. The following are some of those innovative initiatives:

- Voter approval of the People’s Transportation Plan and the half-penny transportation surtax
- Port of Miami Tunnel Project collaboration agreement
- Pilot project to provide managed lanes on the existing I-95 corridor
- Open road tolling of the Gratigny Parkway
- Bus Rapid Transit planning for major arterials

- Bus operations on roadway shoulders along SR-874 and SR-878
- Trunk and feeder bus system service concept planning
- South Florida Vanpool Program operation
- Traffic operation improvements, including planning turbo lanes at T-intersections

Other initiatives are under way to make improvements in seaport, airport, freight, intermodal, and other projects across the county.

Steps Toward Change

The planning processes that govern moving projects toward implementation is highly prescribed by state and federal guidance and currently beset by expectations of changes in processes and priorities as the federal government moves toward reauthorization of its major federal transportation legislation. Thus, it is not simple to change how transportation is planned. That said, perhaps the most critical considerations in adapting planning to the current conditions are the attitudes and values that the local planners and decision makers have toward the future of transportation. Following are four key guiding principles:

- *Instill a commitment to enhance mobility as a priority goal for transportation program expenditures.* Unless transportation program dollars result in meaningful increases in capacity for travel options the public desires, mobility aspirations will not be met.
- *Use measures of value or cost effectiveness in project evaluation.* The plethora of other objectives has served to overwhelm the importance of getting additional transportation capacity for additional investment.
- *Pursue innovation in processes and solutions.* Agencies should be proactive rather than reactive. Scan the globe for potentially-relevant strategies and investments and implement processes that integrate new perspectives and out-of-the-box thinking. Invest in brainstorming sessions, outside expertise, and creative design competitions or strategies.
- *Build a culture of success with well-conceived and well-executed investments.* Be pragmatic – unrealistic visions can lead to cynicism and disappointments and stand in the way of progress toward accomplishing attainable goals.

Transportation is integral to our quality of life and economic activity. It deserves and requires leadership attention and a disciplined plan of action, unless urban areas are content to see continued deterioration in personal mobility and impeded commerce. The opportunity and need to pursue change has arrived.

*... The linking of knowledge to action
[is] the essential meaning of planning.*

Planning Theory,
Burchell and Sternlieb, 1978