Metromover System Expansion Study
Executive Summary

Capital Costs

Based on the refined concept, budgetary capital costs were developed (Table 1). The construction costs summarized within this table are based on recent construction costs for APM projects with similar technologies for projects within the U.S. and represent conceptual, high-level costs for planning purposes. The costs include guideway costs, station costs, the associated demolition, costs for new vehicles, and other system costs (propulsion power substation, automatic train control, running surface, guide beams, power, etc.).

Table 1: Order of Magnitude Cost Estimate, South Brickell Loop

Item	Estimated Cost
Guideway Construction	$96.5M
Station Construction	$22.5M
Demolition	$9.5M
Vehicles	$12.5M
Other System Costs	$66M
Sub-Total	$207M
25% Contingency and Soft Costs	$51.8M
Total	**$260M**

The additional O&M costs for the 0.77-mile proposed extension is estimated to be approximately $6M per year based on this O&M estimate.

Project Implementation

The time-line for advancement of the project is summarized in Table 2, consistent with the metropolitan transportation planning process phases for planning and implementation of major transportation projects. The project is not currently funded, but funding for each phase can be provided in part, or fully, by the Federal Transit Administration (FTA), Miami-Dade MPO, Miami-Dade County, City of Miami, businesses/residents along the project's corridor, and FDOT. Funding for the final design and construction/captial phases should be a combination of FTA New Starts funding (50%), local (25%), and FDOT (25%).

Table 2: Summary of Implementation Plan, South Brickell Loop

Implementation Task	Budget	Schedule
Project Development/NEPA	$8M	2 Years
Engineering and Design	$45M	2 Years
Construction/Vehicle Purchase	$215M	2-4 Years
Total Project (to Operation)	$270M	8 Years
Operations and Maintenance	$6M/year	Annual

Based on the above high-level implementation plan, it is recommended that the South Brickell Loop seek inclusion in the Long Range Transportation Plan and move forward with the project development and NEPA process.

Overview

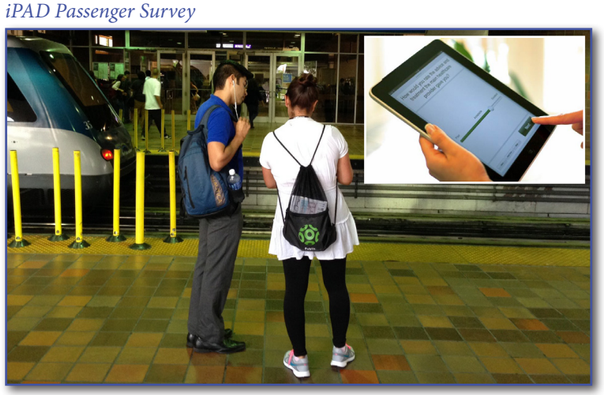
The Metromover System Expansion Study was developed by the Miami-Dade Metropolitan Planning Organization (MPO) in coordination with Miami-Dade Transit (MDT) and other partner agencies. The goal of this initiative was to assess the feasibility of expanding the Metromover System to connect the underserved markets while maintaining an efficient operation. With the dramatic increase in Metromover ridership over the last decade and the recent development in key areas of downtown Miami, feasible options to connect future Metromover passengers to a new urban downtown lifestyle through an expanded Metromover system are clearly needed.

During this study, viable options for system expansion were conceptualized and evaluated to provide greater system accessibility to Metromover users and improve system efficiency within downtown Miami, Brickell, and the arts/entertainment areas. Major elements of the study include:

- **Data Collection**
- **Feasability**
- **Metromover Expansion Master Plan**
- **Preferred Short-Term Concept**

As part of the refinement process, estimated capital and operations and maintenance (O&M) costs for the project were developed. In addition, a high-level implementation plan and schedule was identified.

iPAD Passenger Survey



Data Collection

The data collection effort consisted of three tasks: review of prior related studies, peer systems review, and a Metromover passenger sampling survey. The study review identified intermodal centers, recommended connections to the Metromover, and discussed Metromover expansion options at a very high level, such as closing the Brickell and Omni Loops. The system review found that Miami is unique because the majority of fully automated urban transit systems are located outside the U.S. The Metromover's 4.4 mile length establishes it as one of the longer urban APM systems, especially in the U.S. In addition, there are very few similar systems that have been expanded. The expanded systems identified include Jacksonville, Florida; Lille and Paris, France; and Lausanne, Switzerland. This indicates that although systems are not frequently expanded, expansion can successfully occur with good planning and engineering.

In addition to the study review and systems review, a Metromover passenger sample survey was developed to obtain background information on Metromover patrons, use tendencies, trip patterns, and ultimately solicit their opinion on potential Metromover expansion. The short survey length resulted in a a great response rate for the one-day sampling survey with key findings summarized below:

- **Trip Purpose:** Primary responses were home (31-49%) and work (24-29%) trips
- **Zip Code:** Users were distributed throughout the County, with downtown residents comprising the highest concentration (35%)
- **Frequency:** Passengers were high frequency users, with the majority (66%) of survey participants using the Metromover at least five days per week
- **Modes:** Users primarily walk (41-46%) to stations, but also have a high percentage of connections to rail (23-25%)/bus (19-21%)
- **Origin/Destination;** identified passengers are using Metromover as an urban circulator with the highest movements between the Bayfront Park/Bayside (east) and the Government Center (west) (20%) and a significant number of passengers remaining within the Brickell (south) zone (10%)

Feasibility Assessment

One of the primary purposes of this study was to identify expansion concept alternatives for the Metromover. A workshop was conducted to facilitate development of the concept alternatives. The workshop used a charette-style forum to efficiently identify 40 alternatives in a short period of time. Following the workshop, a field review was conducted by foot and vehicle to assess potential infrastructure constraints and obtain an understanding of the alignment environment. During the field review, several criteria were qualitatively evaluated and assessed along the proposed routes: infrastructure constraints, geometric constraints, constructability, and the pedestrian environment.

GIS was used to complement the qualitative assessment using quantitative metrics. A variety of metrics were evaluated:

- Residential population
- Residential density
- Bus ridership
- Proposed development

Online walk scores were also reviewed to obtain a quantitative assessment of the pedestrian environment. In addition, high-level order of magnitude costs were developed to provide a comparison between concept alternatives.

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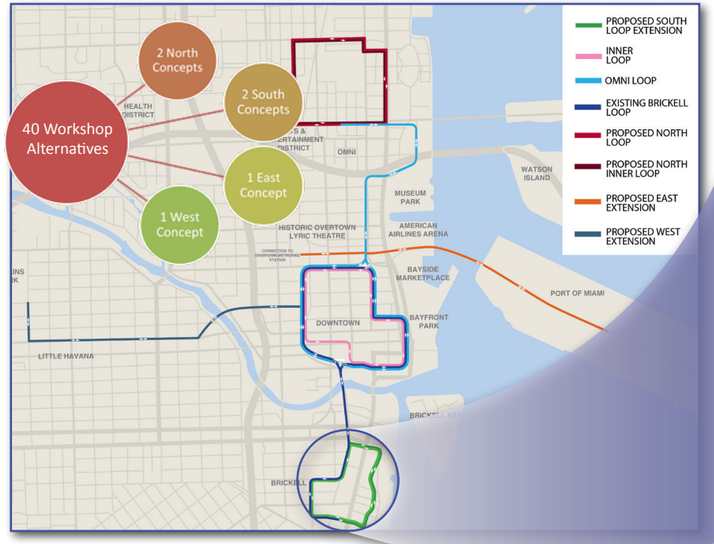
Metromover Expansion Master Plan

From the 40 workshop alternatives, six concept alternatives were identified with concepts in each of the cardinal directions. The six refined concept alternatives were analyzed in a feasibility assessment completed using both qualitative and quantitative metrics. From the initial screening of the six alternatives, an overall Metromover Master Plan was developed summarizing the preferred route to the north, south, east, and west. The Metromover Master Plan represents the ultimate vision for the expansion of the system. The Master Plan adds 5.8 miles of guideway to the current Metromover system, resulting in a total system length 10.2 miles and making Metromover the largest urban APM system in the U.S. The corresponding order of magnitude cost estimate for implementing the Master Plan is estimated at $1.9B. An additional O&M estimate of $42.6M per year is estimated based on the guideway length added to the system.



Preferred Short-Term Concept

The Master Plan presents an ultimate vision, but since it is unlikely that all options can be built simultaneously, the concepts were prioritized to identify a feasible short-term expansion option. The South Brickell Loop was identified as the preferred short-term concept alternative. This concept alternative closes the south loop to form a counter-clockwise loop that connects at the 8th Street Metromover Station. This concept also adds an inner loop that travels clockwise, providing additional circulation within the area. The South Brickell Loop concept alternative provides the most benefit with the fewest constraints, and was therefore selected for refinement. The refinement process was initiated in a meeting with MDT to discuss the system impacts. Then an analysis was completed to provide a high-level operational simulation.

As part of the concept refinement, three additional stations were identified along the route. The approximate station locations were determined based on the existing station spacing as well as communicated transportation needs within the area. Station A is in close proximity to the 8th Street Metromover station and will facilitate a transfer point between the inner and outer loops. Station B provides a station close to Brickell Key; the MPO has received numerous requests for additional transit options to Brickell Key, and the proposed Station B would accommodate that request. Station C provides an additional station to connect to southern Brickell destinations. Finally, Station D is a modification of the existing Financial District Station. All proposed station locations are approximate and will be refined during the future design.

Based on feedback from MDT operations staff, it is anticipated that the 0.77-mile additional guideway extension requiring four additional operating trains can be accommodated with the existing Metromover maintenance facility and train control system. As such, this significantly improves the viability of the South Brickell Loop for implementation in the short or medium term, as this concept alternative does not rely on large Metromover system upgrades inherent to some of the other concept alternatives.