

APPLICATION OF CONGESTION MANAGEMENT PROCESS (CMP) STRATEGIES IN MIAMI-DADE COUNTY



Congestion Management Process (CMP)

The Miami-Dade County Urbanized Area Metropolitan Planning Organization (MPO) has an established Congestion Management Process (CMP) to monitor the state of the transportation networks in Miami-Dade County (County). The CMP is also a requirement in metropolitan transportation planning. The MPO's CMP, which was last updated in 2009, identified a number of congested corridors and spots in the County. The identified corridors and spots were subsequently added to the County's 2035 Long-Range Transportation Plan (LRTP) and to the subsequent annual updates of the Transportation Improvement Programs (TIP). The goal of this study was to select three corridors out of those identified in the 2009 CMP and apply congestion management strategies. Recommendations and cost estimates were developed for each corridor.

Corridor Selection

During the development of the study, a Study Advisory Committee (SAC) was created with participation from Florida Department of Transportation (FDOT), Miami-Dade County Public Works and Waste Management Department (PWWM), and Miami-Dade Transit (MDT). A list of congested corridors was sent to the SAC for their evaluation and recommendations. These agencies were asked to provide their priorities to ensure that this effort aligns with their goals as well. The SAC provided a total of seven corridors for further consideration. Site visits and desktop analysis were conducted to ensure that the work required for developing recommendations matched with the scope of this effort. After consultation, three corridors, Old Cutler Road, NW 36/41 Street or Doral Boulevard, and SW 88 Street or Kendall Drive, were selected for further analysis.



Rendering – A Potential Kendall Cruiser Station Area

Studies focused on Kendall Drive have identified a mismatch between transportation capacity and demand as the primary reason for the congestion. During the study coordination, MDT noted that a smaller proportion of people take transit to work in the Kendall area (three percent) as compared to Miami Dade County as a whole (five percent) and it because there are fewer attractive transit choices available in the Kendall area. The existing routes travel in mixed traffic, without any preferential treatment, and suffer from congestion. Therefore, as part of this effort, station area improvements were identified and potential for Transit Signal Priority (TSP) was evaluated.

STATION AREA IMPROVEMENTS

Transit stations are the first contact point between passengers and transit service, and thus a major determinant for the acceptance of a transit service. Currently, stops along Route 288 or Kendall Cruiser only have benches or shelters. An MPO study proposed station layout for Express Bus Services. These layouts were also used to improve Route 288 or Kendall Cruiser stops along the Kendall Corridor. The recommended station layout provides two alternatives: (1) a 15 feet deep and 25 feet long station area for conditions where right-of-way is available or can be easily acquired; and, (2) a 8 feet deep and 26 feet long station area for constrained physical conditions.

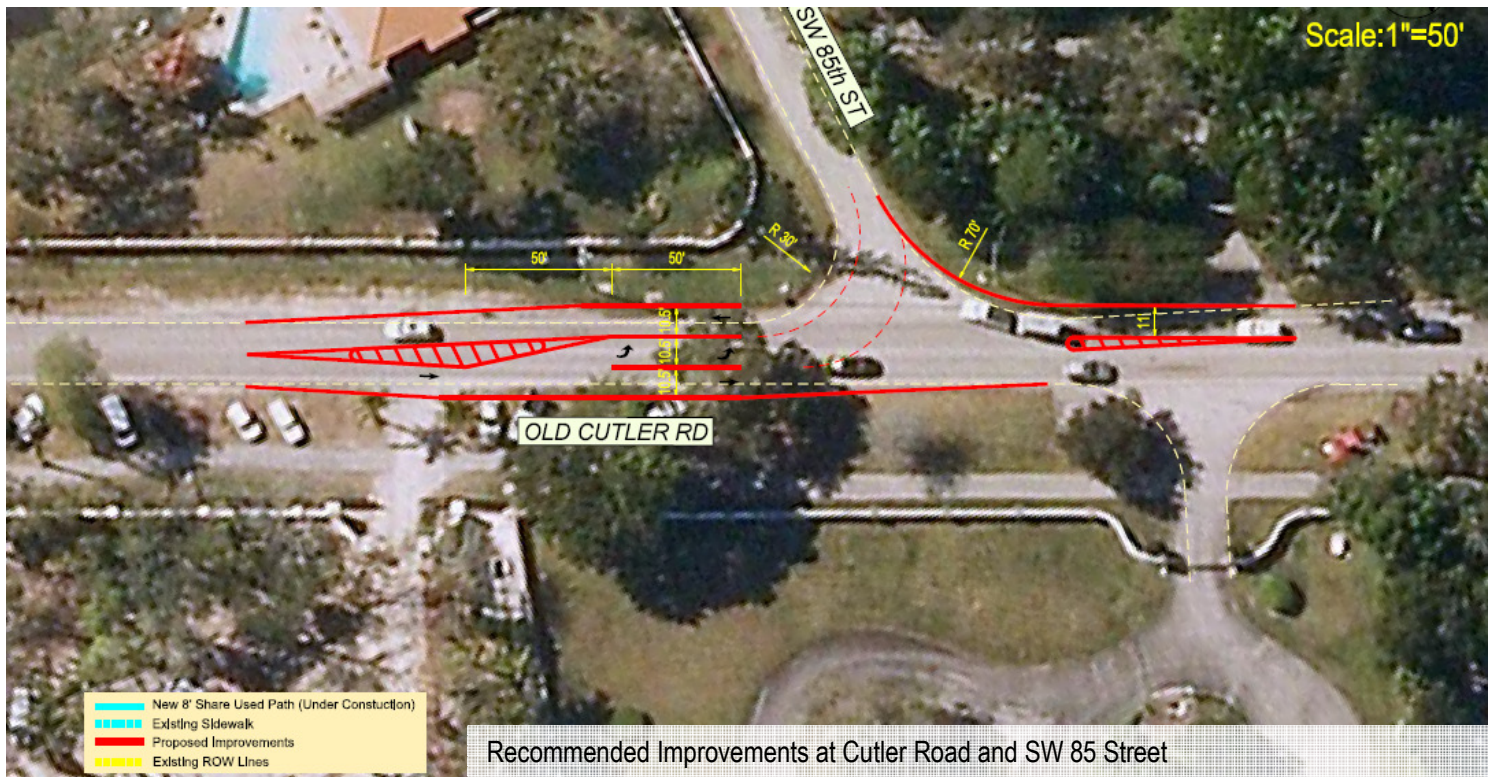
PRIORITIZING TRANSIT MOVEMENT

Transit movement can be prioritized by signal treatment in the form of TSP and by providing queue-jump or by-pass lanes at intersection. The segment of Kendall Drive between SW 137 Avenue and SW 127 Avenue was identified as the most congested segment and therefore, the one with the highest need for transit signal priority. This segment has the highest 24-hour traffic volumes and signal density in the corridor. Therefore, impacts of TSP along this segment were evaluated. A VisSim model was developed because of its capabilities to simulate transit alternatives operating in mixed traffic. Impacts, for the purpose of this analysis, were measured through Measures of Effectiveness (MOEs) determined as intersection control delay, travel time and speed changes for both transit and non-transit vehicles.

The simulation results indicated that, the TSP and the queue-jump / by-pass lanes will provide significant benefit to transit services, but private vehicle traffic will suffer. TSP treatment can improve transit travel time by as much as 17 percent. It should be noted that an average transit vehicle along Kendall Drive carries anywhere from 10 to 40 passengers during peak periods while single-occupancy vehicle carry, on an average, 1.5 passengers per vehicle. Priority acknowledgement criteria should be developed with more detailed analysis to ensure that person throughput is optimized.

The MPO's Implementation Plan for Enhanced Bus Service along Biscayne Boulevard provided planning-level cost estimates for some of the key elements. Those unit costs were used to estimate cost of recommended improvements. The total project cost for the recommended Kendall Corridor improvements was estimated to be nearly \$12.3 million.

Cutler Road – Recommended Improvements



Old Cutler Road, is a historically designated two-lane roadway that traverses through the City of Miami, City of Coral Gables, Village of Pinecrest, Village of Palmetto Bay, and Town of Cutler Bay. Traffic is particularly slow during peak periods in the northern portion of the corridor. Queues form at signalized intersections and generally are indicative of heavy traffic volumes relative to the capacity of a two-lane roadway.

In 1974 Old Cutler Road was designated as a historic road by Senate Bill No. 340. This bill prohibited the use of state funds for certain physical changes on or near the road. For instance, it prohibits usage of state funds to cut or remove any tree with a diameter of 6", within 35' of the edge of pavement. Section 9-2 of the Miami-Dade County Code prohibits the widening or expansion of Old Cutler Road from its presently paved right-of-way, except for the purpose of assuring safe travel. The Code permits limited expansion of intersections provided that an advertised public hearing is held to present the findings of fact necessitating such work prior to approval by Miami-Dade Board of County Commissioners. Due to these provisions, capacity expansion improvements are ruled out leaving room for operational improvements as long as they meet the applicable codes and criteria. There are limited ways to manage and relieve congestion and improve safety on a two-lane roadway. For a two-lane roadways, benefits can come from physically separating turning or slow vehicles from other vehicles by either providing auxiliary turn lanes or passing lanes. Auxiliary turn lanes, provided that they meet the provisions in the state and local regulations, can help. Potential for providing auxiliary turn lanes at 13 locations was identified.

In total, there are 15 auxiliary turn lanes were recommended and, at an average cost of \$51,000 per lane, improvements are expected to cost nearly \$765,000. This estimate does not include the cost of design, permitting, and public involvement. According to research estimates, such improvements can yield 3 to 20 percent increase in vehicle throughput.

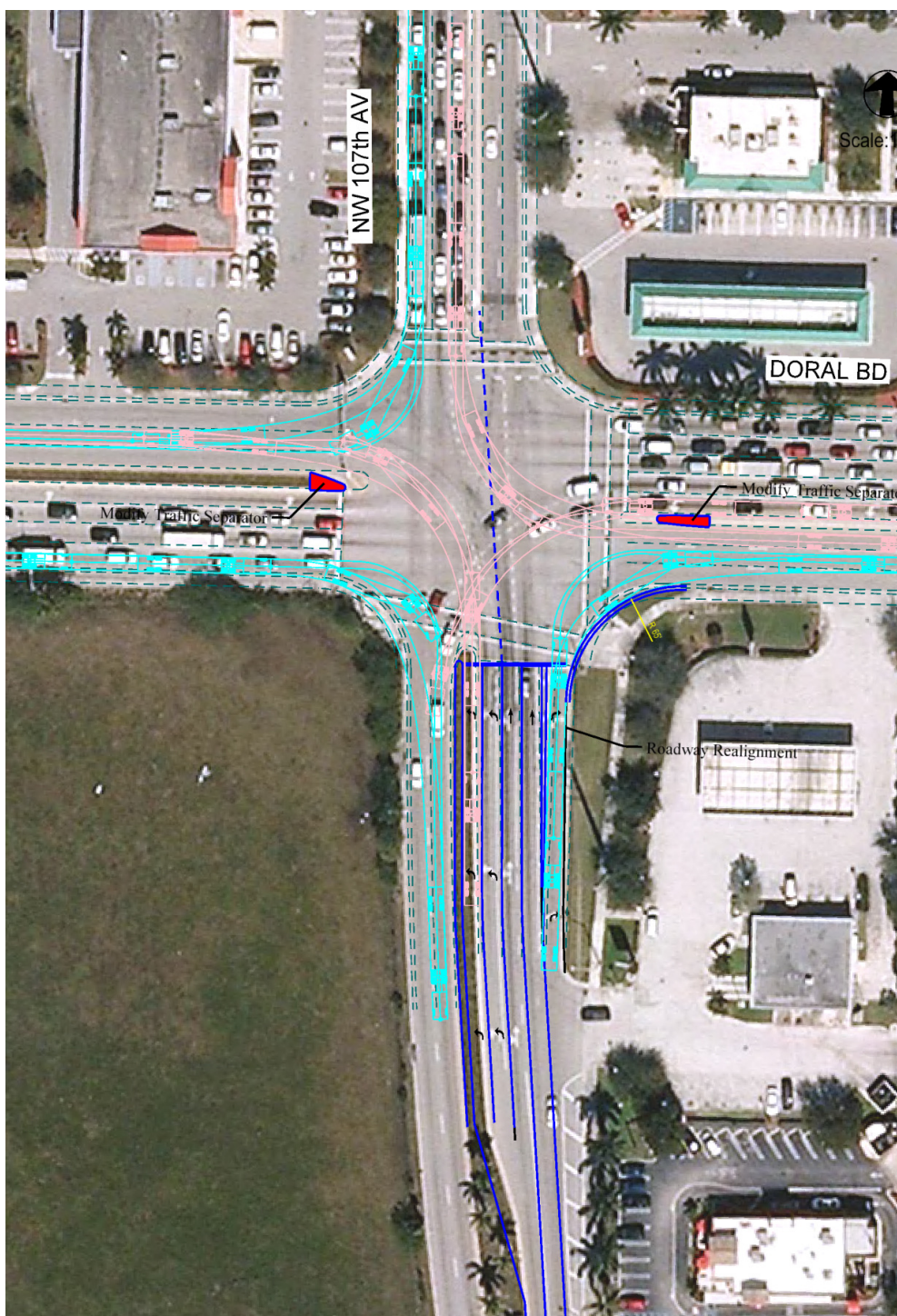


Potential Before and After views of the Recommended Improvements at Cutler Road and SW 85 Street

Doral Boulevard – Recommended Improvements

The Doral Boulevard, NW 36/41 Street, is a six-lane divided arterial located within the boundaries of the City of Doral and can be characterized as one of the primary veins of access to and travel within the City of Doral. The 2009 CMP identified Doral Boulevard, between HEFT and NW 42 Avenue, as a congested corridor. However, given the congestion, the focus of this effort was on the segment between the HEFT and SR-826. This segment is maintained by the PWWM Department.

The City of Doral is a major freight hub and attracts large number of trucks. Warehouse spaces are mainly located between NW 25 Street and NW 36/41 Street. Traffic counts compiled for an MPO study showed that proportion of heavy vehicles on Doral Boulevard varies from 4 to 11 percent. The counts were collected in August 2011 and confirm heavy vehicle volumes higher than those on an average arterial roadway in the County. The issues associated with heavy vehicle movements become more acute during morning and evening peak hours.



Heavy vehicles worsen congestion due to maneuverability issues. Turning movements with high friction create congestion as well as unsafe conditions for heavy vehicles, other passenger vehicles, and for pedestrians who might be on sidewalks. Trucks either block vehicles traveling in the same direction or those in the opposite directions. For instance, heavy vehicles making westbound NW 36 Street to northbound NW 79 Avenue turn encroach on turning lanes in the southbound NW 79 Avenue direction, often leading to long queues. Therefore, the focus of this effort was on ensuring less frictional movement for heavy vehicles. Turning movements for heavy vehicles were simulated. The FDOT Plans Preparation Manual (PPM) notes that WB-62FL is a more representative of heavy vehicles seen on Florida's roadways. Therefore, WB-62FL was used as the standard for turning movement simulation.

During study coordination, PWWM also mentioned roadway alignment issues at NW 107 Avenue that lead to a split phase signal timing and negative traffic impacts. Therefore, a conceptual design for NW 107 Avenue realignment was also prepared.

In total, there are four intersections and, at an estimated average cost of \$387,000 per intersection, all improvements are expected to cost nearly \$1,548,000. This estimate does not include the cost of design, permitting, and public involvement.