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95 Express lanes in Miami area called "very impressive" with first annual report

By Peter Samuel on February 2, 2011
95 EXPRESS | FLORIDA | HOT LANES | I-95 | MIAMI



Toll express lanes on I-95 north of Miami are described as "very impressive" and as "accomplishing almost everything that was hoped for them" and as "very close to forecast" by Robert (Bob) Poole. Poole of the Reason Foundation follows priced lanes generally but the Miami/I-95 lanes are very close to home - literally for he lives not far from the northern end and often uses the highway, and professionally in that he has done consulting work on the project.

Poole - who we've known since the mid-70s - is nothing if not candid, including about deficiencies in projects he has championed. So far at least the 95 Express is performing well. Speeds are seriously increased in the HOT lanes as compared to the HOV lanes, and as free flow facilities they carry increased volumes of traffic/lane as well - 42% more according to FDOT data. Greater efficiency in the two priced lanes benefits the four free lanes alongside.

LOS gone from F to C in priced, D in unpriced lanes

Level of service by conventional lettering has gone from F to C in the priced lanes in peak hours and from F to D in the free lanes.

Part of the project benefit derives from narrowing shoulder width and lane widths (from 12ft to 11ft) to provide two HOT lanes each direction compared to the single HOV lane previously in addition to the four general purpose lanes per direction. Construction cost of the project also involving bus transit facilities, delineator poles, signage and the like was \$132m. In the first phase there is one intermediate entry-exit point each direction, apart from the entry and exit each end.

But there's major benefit apparent from price management of lanes described for the public in the project website this way:

"The toll fluctuates throughout the day to keep 95 Express from becoming congested with vehicles. The variable toll is based on congestion pricing, which means the toll goes up or down depending on the traffic volume. The toll will be higher during peak periods when demand is greater and lower during non-peak periods when the demand is less.

"This congestion pricing helps maintain traffic flowing freely by monitoring the number of vehicles accessing the express lanes. If travel speeds in 95 Express lanes start to slow, the toll will increase to maintain a free flowing condition.

"Tolls will vary and are likely to fluctuate between 25¢ to \$3.50, although they could go up to \$7.00 under extreme conditions."

71% satisfaction

The first annual report on the project is out - for the first full year of operations in the northbound lanes (evening peak travel) and 5 1/2 months operations southbound (morning peak travel). Surveys show 71% customer satisfaction with majority support for extending the project north. The toll lanes (2 each direction) and plastic delineator-separated from free lanes are carrying about 17m trips/year or average 58k/weekday.

They are already generating about \$13m a year in toll revenues and more than covering operating costs of \$11m (reported \$8.4 x 24/17.5). Revenues appear to be in what is often called ramp-up with potential customers still discovering the value there.

Tolls are all-electronic using a Florida standard SunPass transponder - mostly the TransCore sticker tags built to ISO 18000 6B standard plus proprietary encryption features. SunPass transponders are supplied at chain pharmacies CVS and Publix as well as delivered after website or telephone signup.

This involves an Express Lanes operator 24/7 monitoring operations, incident response, service patrols and maintenance.

95 Express lanes now extend 7.3 miles, 12km along I-95 between the Golden Glades interchange and FL836/I-395. Phase 2 currently in design will extend the project another 14 miles, 23km north into Broward County. Further extension is being studied.

Travel speeds in peakhours way up



	HOV/HOT lanes			general lanes			2008		2010	
	2008 HOV	2010 HOT	change	2008	2010	change	HOV - gen	HOT - gen	change	
am peak in to Miami SB	20.3	63.7	+43.4	15.3	51.0	+35.7	+5.0	+12.7		
pm peak out from Miami NB	18.1	55.8	+37.7	18.8	41.3	+22.5	+0.7	+14.5		

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RFPS

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RFQ: WSDOT Investment-Grade Traffic and Toll Revenue Analysis for the CRC Project

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Average travel speeds in the peak hours in the Phase 1 HOT lanes have gone from 20mph in the previous HOV lanes to 64mph southbound (SB) 6am to 9am and 20mph in the prior HOV lanes to 56mph NB 4pm to 7pm in the HOT lanes. (see table nearby with more precise numbers)

Average travel times are reported as 8 minutes now in the Express Lanes as compared to 25 minutes in the HOV or carpool lanes before in the 7.3 mile stretch.

Reliability improved

Reliability of travel speed is much better too. Morning peak travel speeds in the price-managed lanes were always over 45mph (100% of the time), while evening peak hours travel was over 45mph 93% of the time. (The FHWA standard for managed lanes is that they should flow at 45mph or over 90% of the time.)

With more traffic moved more quickly in the price-managed lanes, conditions in the free lanes have improved dramatically too. Southbound morning peakhours speeds of around 15mph have improved to 51mph average, while afternoon northbound peakhours speeds of 20mph before are now 41mph average.



Santana

improved dramatically too. Southbound morning peakhours speeds of around 15mph have improved to 51mph average, while afternoon northbound peakhours speeds of 20mph before are now 41mph average.

Tolls set "dynamically" by computer algorithm to reflect space available in the lanes have varied from 25c to \$6.00. The average monthly maximum has been \$3.35 southbound and \$4.40 northbound. 85% of toll transactions have cost \$1.75 northbound and \$1.80 southbound.

The project advertises "typical" hourly toll rates on the website for each direction of traffic, updated week by week.

see southbound

<http://www.95express.com/home/tolling-rates-sb.html>

and northbound

<http://www.95express.com/home/tolling-rates-nb.html>

It's a judgment call how much time to provide between toll rate changes. Here the program recalculates the appropriate toll every 15 minutes and tolls are set to the nearest quarter (25c).



Express Lanes Operator monitors and manages both directions of 95 Express with the newly updated Express Lane Manager software.

The only confusion seems to have been that some motorists have interpreted rising toll rates as signaling a quicker ride in the lanes when they indicate developing constraints on free flow and the need to keep some motorists out of the toll lanes. They are managed by the pricing to allow vehicle occupancy up to the level at which speeds are dropping toward 45mph. The major aim is to prevent traffic from being slowed below 45mph.

Half or more toll \$s in 2 peakhours

Southbound around 50% of toll revenue weekdays is earned during the two peakhours. Northbound over 60% of daily revenue is earned in the two evening peak hours. Outside those two hours of course both vehicle flows and toll rates are lower.

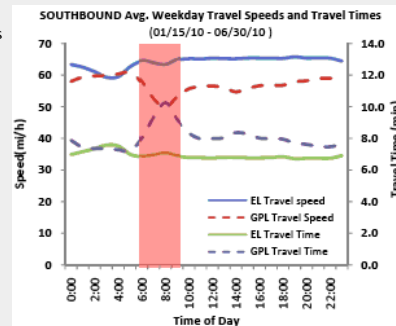
Bus ridership in the corridor was up 22% in a before and after three months comparison, this in an area where transit ridership overall is in decline - an indication that improved speed and reliability of bus service in price-managed lanes attracts riders. The only caution is that a part of the improvement is likely the result of extra bus routes being instituted.

Hybrids, buses, vanpools making heavy use of lanes

Major surprise Bob Poole says has been the number of buses using the lanes, buses of all kinds as well as transit buses. Poole makes the point that the greatly improved speeds for buses makes the extra bus routes viable where they weren't before.

He also says he was surprised how little controversy there was about politically tough decisions made at the start by Florida DOT - simultaneously converting from HOV to HOT while moving from a two person requirement to three persons for free travel (HOV2 to HOV3) and requiring all carpools to register for free access. Registration of carpool status has made enforcement easier and more effective.

Of those registered for toll-exempt rides in the 95 Express lanes the most numerous are hybrid vehicles, 3,420 of 8,450, or 40%. Carpools only constitute 2,170 or 26% and vanpools are 1730 or 21%. The remaining 13% are buses, including what they call over-the-road buses (we're trying to imagine what an under-the-road bus would be.)



UPCOMING EVENTS

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- Toll Technology Demonstration Summary Presentations
- Tolling Interoperability Certification Program Webinar
- The Value of Public-Private Partnerships
- Submit on All Electronic Toll Collection

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Peak hourly vehicle flows/lane are a bit lower on average in the express or HOT lane than in the general purpose or free lanes - 1250 veh/hr vs 1,500.

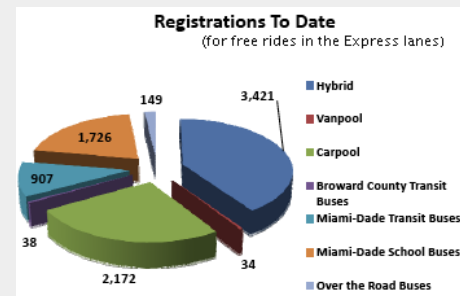
SOVs responsible for most of increased person throughput

Increased per person throughput has been from additional single occupant vehicles mostly. They dominate the traffic flow anyway but now have six lanes per direction and the additional choice of toll managed lanes or free.

In the two hour morning peak 7am to 9am southbound, inbound to Miami 23.2k people are now catered to on this stretch of I-95 with 4GPL+2HOTL vs 15.6k with 4GPL+1HOVL. That's a 48% increase in throughput compared to a 20% (6/5) increase in road capacity. In the northbound PM peakhours 4pm to 6pm the person throughput is up from 22.7k (this number seems high - editor) before to 23.8k, only 13% more.



Signage - on approach ramp from Golden Glades Interchange southbound



In total across all lanes single occupant vehicles (SOVs) have nearly doubled from 8.2k to 15.8k southbound, and northbound went from 9.1k to 13k, 42% more.

HOV numbers have remained about the same southbound in the mornings except that the small number previously in HOV3 carpools seem to have largely moved to bus transit - which is up 23%. But that's on a small base of a thousand.

Northbound in the mornings HOV2s have grown modestly but again HOV3s have dropped away. Transit ridership is up 36% but it remains small beer - 1.1k or 4% of total people moved (25.7k).

Interestingly despite the toll on HOV2s they comprise a decent chunk of the the HOT lanes traffic.

CREDIT: Rory Santana of Florida DOT District 6 is manager of operations. Santana took over the day to day work on the project from Debora Rivera who was promoted to District director of transportation operations. She says that major players in the tolling algorithms effort were:

- Rory Santana, PE, 95 Express Project Manager, FDOT, Miami
- Javier Rodriguez, PE, Intelligent Transportation Systems Operations Engineer, FDOT, Miami
- Trey Tillander, PE, Assistant State Traffic Engineer, FDOT, Tallahassee
- Jennifer Tsien, PE, Senior Project Manager, PBS&J (working under contract to the Florida's Turnpike Enterprise)
- Charlie Robbins, PE, Contract Project Manager, AECOM (working under contract to FDOT, Miami)

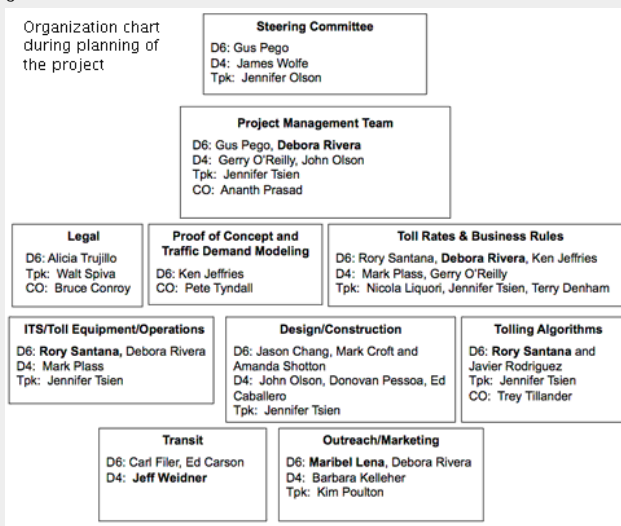
On the design-build side:

"Design on this design-build project was led by Jason Chang, PE, Senior Project Manager, FDOT, Miami. C3TS (Walfy Pevida, PE, Principal in Charge) did the actual design plan preparation under the direction of the contractor, MCM (Juan Munilla, Vice-President).

"The construction team members who led this effort were: Mark Croft, PE, District Construction Engineer, FDOT, Miami, Rudy Garcia, PE, Assistant District Construction Engineer (now the District Maintenance Engineer), FDOT, Miami, and Amanda Shotton, PE, Project Manager (no longer with FDOT), FDOT, Miami."

TransCore did the roadside equipment. Florida Turnpike Enterprise process the tolls.

COMMENT: the assessments would be improved if an attempt was made to distinguish between improvements in service on account of enlarged capacity (the extra highway lane each direction 6 lanes vs 5, and the extra bus routes) and the improvement deriving from price or toll management of traffic flow.



Bob Poole tells us he thinks a good portion of the improvement is attributable to the extra lane each direction. But he says the benefits of pricing will increase over time. That's because pricing will allow free flow to maintained in the toll-managed lanes whereas extra traffic will cause the unpriced lanes to clog. The difference will enhance the value of the choice offered motorists.

The good start for 95 Express lanes bodes well for extensions northward and also for more toll lanes in the region.



FL/I-95 two toll express lanes alongside four free lanes each direction

ADDITION: Deborah Rivera says other moves than the extra lane each direction and pricing have contributed to the dramatic improvements in speeds and reliability:

"Just a few months after the deployment of toll collections in each direction, the FDOT, Miami Office also launched ramp metering. Ramp metering further improved conditions for general purpose lane users: travel speeds increased from 38 MPH in the northbound direction prior to ramp metering but after express lanes to about 42 MPH after, and from 47 MPH in the southbound direction prior to ramp metering but after express lanes to roughly 51 MPH after. Ramp metering improved conditions by about 10% over the travel time and travel speed benefits resulting solely from the express lanes.

"Additionally, the FDOT, Miami Office implemented several new and more aggressive strategies to manage incidents, provided training to law enforcement personnel for the enforcement of ramp metering and violations within the express lanes, deployed a comprehensive and on-going public outreach effort, and maximized the utilization of its commuter services and van-pool activities around the 95 Express concept.

"The team continues to work on complementary strategies and projects which should help us offset increasing demand and the strain that puts on the infrastructure, with increased efficiencies.

"It was the integration of many strategies that ultimately led to the impressive results and what it shows is that there is power in combining operational strategies which are all focused on maximizing throughput and utilization of existing infrastructure."

Toll Express Lanes site:

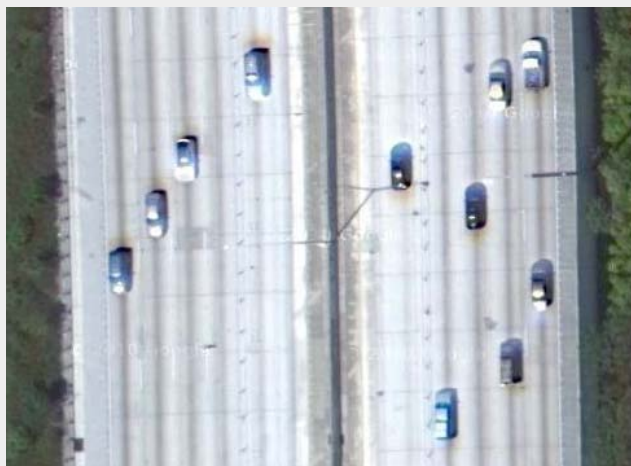
<http://www.95express.com/>

annual report:

http://www.sunguide.org/sunguide/images/uploads/tmc_reports/95X_P1_UPA_Eval_FY_10_Annual_Report__01_21_2010__FINAL.PDF



Rivera



Satellite photo picks up delineator poles separating Express Lanes from general purpose

TOLLROADSnews 2011-02-02 ADDITION 2011-02-03 12:30