SOUTH FLORIDA REGIONAL TRANSPORTATION AUTHORITY

Strategic Regional Transit Plan

December 2008

Chapter 11:

Transit Network Composition and Analysis

(Chapter 11 originally prepared July 2008)

TRANSIT NETWORK COMPOSITION AND ANALYSIS
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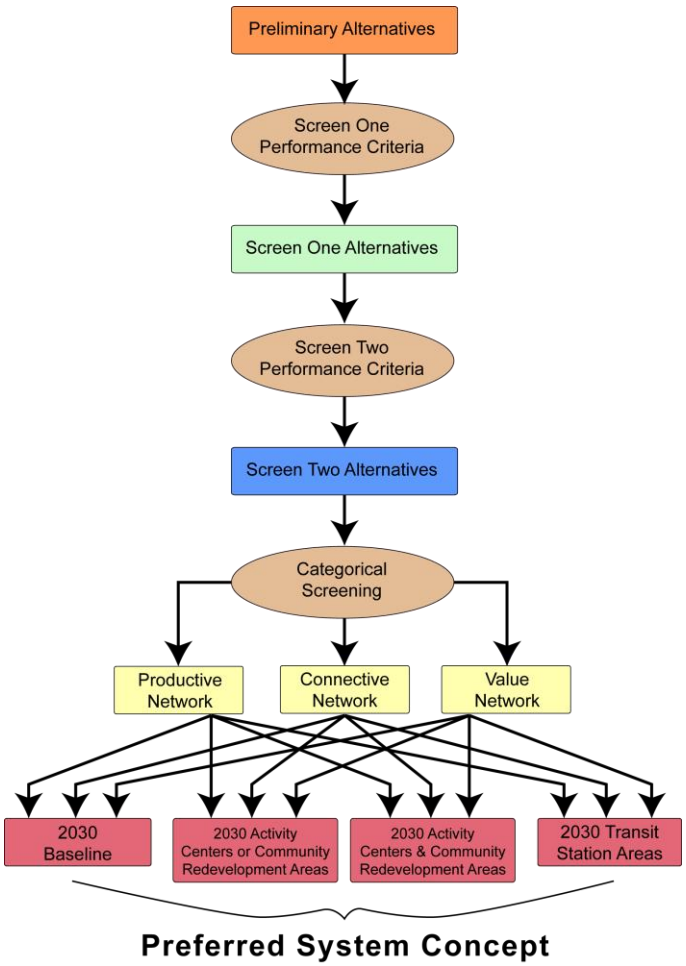
1.0 ALTERNATIVES DEVELOPMENT

The process of developing refined alternatives included in the networks is discussed in *Chapter 4: High Opportunity Corridors (Screen One)* dated June 2007 and *Chapter 7: Screen Two (Detailed) Evaluation* dated December 2007.

Figure 1 shows how alternatives advance through the screening process and ultimately into the three networks tested using four land use scenarios. A complete discussion of the land use scenario process is provided in *Chapter 10: Land Use Scenarios* dated January 2008.

Figure 1 – Alternatives Development Process



1.1 PRELIMINARY NETWORK COMPOSITION

Through the Screen Two Evaluation, each performance criterion was given equal weight during the scoring process, resulting in the alignments competing to perform best overall. Once Screen Two was complete, the resulting alternatives were identified and additional analysis was conducted to determine which alternatives that serve the same travel markets would be included in the Connective, Productive, and Value Networks.

Table 1 shows each corridor's characteristics in quantitative values for each of the performance criteria categories.

Weighted Scoring

Contribution to the regional system for each alignment was weighed by emphasizing the specified criteria classification groups separately: Connective, Productive, and Value. This allowed a secondary check of the alignments and their comparative performance to one another by focusing on certain characteristics. **Table 2** shows the alternatives' weighted scores and the scores for each of the performance criteria.

Each alignment's score was classified as low, middle, or high regarding the percentile in which their weighted score fell for the three classification groups. **Figures 2**, **3**, and **4** show the preliminary networks that were established using only the medium and high scoring alternatives from the three specified criteria classification groups.

Preliminary Connective Network (Figure 2)

The preliminary Connective Network alternatives scored well based on the number of county lines they cross (*Interjurisdictional*), the number of Regional Activity Centers (RACs) served by the transit alignment, and the number of other transportation modes the alignment connects (*Intermodal Connection*).

Preliminary Productive Network (Figure 3)

The preliminary Productive Network alternatives scored well based on the number of new riders generated by the alignment (*Incremental Trips per Mile*) and trip demand in the corridor (*Trip Flows*).

Preliminary Value Network (Figure 4)

Alternatives included in the preliminary value network scored well based on Capital Costs per Mile (including construction costs for route, stations, and maintenance facility; vehicle purchase; and right-of-way), Annual Cost per Trip (based on operating and maintenance costs, as well as annualized construction costs), and Subsidy per Trip.

Table 1 – Raw Data

	Alternative		Mode	Performance Criteria														
				Total Alignment Length (in miles)	Total Trip Flows	Incremental Trips on New Service (Annual)	Incremental Trips/Mile on New Service (Annual)	Total Daily Trips	Tri-Rail Trips	Inter-jurisdictional (Crosses county lines)	Number of Regional Activity Centers (RACs) Served	Intermodal Connection (Airport/ Seaport/Tri-Rail/ Metrorail)	Capital Cost per Mile (w/ Right-of-Way) (in millions)	Capital Cost per Mile (w/o Right-of-Way) (in millions)	Annual Cost per Trip	Subsidy per Trip	Total Capital Cost (w/ Right-of-Way) (in millions)	Total Capital Cost (w/o Right of-Way) (in millions)
Miami East-West	30C	East-West Metrorail Extension West to FIU	Metrorail	8.8	GT 30,000	3,561,600	404,727	30,269	26,357	0	7	3	$145.0	$121.3	$29.19	$2.55	$1,276.20	$1,067.1
Miami East-West	30D	East-West Metrorail Extension South to Kendall	Metrorail	14.4	GT 30,000	4,490,100	311,813	35,650	26,649	0	7	3	$144.2	$120.5	$37.70	$3.50	$2,077.14	$1,735.0
Miami East-West	31R	137th Rapid Bus	BRT	23.6	GT 30,000	1,225,920	51,946	8,915	25,895	0	2	3	$23.3	$15.3	$38.91	$2.85	$548.78	$361.88
Miami East-West	31T	Metrorail Extension plus 137th Avenue Rapid Bus	Combined Metrorail/BRT	22.6	GT 30,000	5,663,680	250,605	36,660	26,334	0	5	3	$70.6	$56.5	$23.26	$2.21	$1,595.93	$1,277.53
Miami East-West	30E	Kendall Drive East-West Extension	Metrorail	7.8	20-30,000	2,714,400	348,000	53,456	25,680	0	5	1	$142.9	$119.1	$32.30	$2.02	$1,114.35	$929.0
MB	30F	Miami Beach LRT	LRT	8.6	GT 30,000	3,965,755	461,134	13,535	25,146	0	3	2	$56.7	$40.9	$12.14	$1.99	$487.94	$351.7
Broward East-West	30G	Broward East-West LRT	LRT	20.8	20-30,000	7,623,274	366,504	26,018	28,133	0	6	3	$75.2	$59.3	$17.94	$1.21	$1,563.78	$1,234.3
Broward East-West	30T	Broward E-W LRT SFEC to CBD	LRT	8.2	10-20,000	4,121,631	502,638	14,067	27,006	0	2	1	$76.7	$60.8	$13.41	$1.05	$628.87	$499.0
Broward East-West	30U	Broward E-W LRT SR7 to CBD	LRT	3.6	10-20,000	3,143,304	873,140			0	1	1	$81.1	$65.3	$8.26	$0.71	$292.04	$235.0
Broward East-West	32L	Broward E-W LRT Sawgrass to CBD	LRT	17.9	10-20,000	6,544,448	365,612	22,336	27,999	0	5	2	$82.1	$66.2	$19.50	$1.17	$1,469.10	$1,185.6
Jupiter Tri-Rail Extensions	30I	Jupiter West Palm Beach DMU	DMU	17.0	20-30,000	2,818,367	165,786	8,254	26,941	0	2	2	$40.7	$24.9	$20.05	$1.64	$692.42	$423.1
Jupiter Tri-Rail Extensions	30V	Jupiter Extension (7 Stations)	Commuter Rail	13.4	20-30,000	1,973,648	147,287		32,312	0	7	2	$41.6	$25.8	$23.38	$1.62	$557.39	$345.09
Jupiter Tri-Rail Extensions	30W	Jupiter Extension (5 Stations)	Commuter Rail	13.4	20-30,000	1,622,927	121,114		31,115	0	7	2	$40.7	$24.9	$27.92	$2.15	$545.74	$333.44
Jupiter Tri-Rail Extensions	30X	Jupiter via Mangonia	Commuter Rail	15.5	20-30,000	1,163,503	75,065		29,547	0	7	2	$39.6	$23.8	$43.32	$3.55	$614.34	$368.84
Jupiter Tri-Rail Extensions	31U	Tri-Rail Extension to VA Hospital	Commuter Rail	2.8	GT 30,000	278,057	99,306		26,525	0	6	2	$45.0	$29.1	$33.87	($1.11)	$125.92	$81.52
Miami Tri-Rail Extensions	30J	Tri-Rail Split to CBD	Commuter Rail	9.6	GT 30,000	2,462,079	257,809		33,989	0	6	2	$40.4	$24.6	$20.82	$8.21	$386.01	$234.7
Miami Tri-Rail Extensions	32K	Tri-Rail Extension to Dadeland	Commuter Rail	10.7	GT 30,000	1,970,425	184,152		32,301	2	11	3	$39.6	$23.7	$17.92	$0.78	$423.36	$253.86
FEC	30K	FEC Complete	Commuter Rail	83.3	GT 30,000	10,793,534	129,574	46,450	15,964	2	9	3	$41.1	$25.3	$27.51	$3.29	$3,426.53	$2,107.0
FEC	30L	FEC Shorter Line	Commuter Rail	40.6	GT 30,000	8,512,529	209,668	32,406	22,223	1	5	4	$40.2	$24.4	$16.71	$1.77	$1,634.05	$991.0
FEC	30Z	FEC Complete (LRT)	LRT	82.3	GT 30,000	11,350,820	137,920			2	9	3	$41.7	$25.8	$26.59	$1.79	$3,429.65	$2,126.05
FEC	32A	FEC West Palm Beach to Miami	Commuter Rail	66.1	GT 30,000	8,586,951	129,908	38,347	16,536	2	9	3	$41.2	$25.4	$27.49	$3.30	$2,723.51	$1,676.51
FEC	32B	FEC Ft. Lauderdale to Miami	Commuter Rail	24.4	GT 30,000	4,976,898	203,971	20,634	21,928	1	5	3	$43.1	$27.2	$24.78	$2.69	$1,050.60	$664.10

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Table 1 – Raw Data (Cont.)

	Alternative		Mode	Performance Criteria														
				Total Alignment Length (in miles)	Total Trip Flows	Incremental Trips on New Service (Annual)	Incremental Trips/Mile on New Service (Annual)	Total Daily Trips	Tri-Rail Trips	Inter-jurisdictional (Crosses county lines)	Number of Regional Activity Centers (RACs) Served	Intermodal Connection (Airport/ Seaport/Tri-Rail/ Metrorail)	Capital Cost per Mile (w/ Right-of-Way) (in millions)	Capital Cost per Mile (w/o Right-of-Way) (in millions)	Annual Cost per Trip	Subsidy per Trip	Total Capital Cost (w/ Right-of-Way) (in millions)	Total Capital Cost (w/o Right of-Way) (in millions)
Bus	31A	North-South Premium Bus	BRT	98.0	GT 30,000	5,712,000	58,286	24,228	26,858	2	8	3	$7.1	$4.0	$11.82	$0.88	$700.65	$390.15
Bus	31S	North-South Rapid Bus with Douglas Avenue	BRT	92.5	GT 30,000	4,315,520	46,654	20,514	26,599	2	8	3	$7.2	$4.1	$15.09	$1.57	$670.38	$377.38
Bus	31D	University Drive Rapid Bus	BRT	23.0	10-20,000	1,617,280	70,317	10,645	25,253	1	2	1	$22.7	$14.8	$27.51	$1.52	$522.79	$340.59
Bus	31K	Wellington Rapid Bus	BRT	13.9	10-20,000	2,535,040	182,377	7,748	25,275	0	1	1	$22.7	$14.8	$10.66	$0.26	$316.01	$205.91
Bus	31L	Military Trail Rapid Bus	BRT	32.2	GT 30,000	4,306,240	133,734	10,782	23,752	0	6	2	$22.7	$14.7	$14.47	$0.09	$729.35	$474.35
Bus	31N	Pines Rapid Bus	BRT	16.0	10-20,000	2,553,600	159,600	10,698	25,366	1	0	2	$23.2	$15.3	$13.61	$1.60	$370.73	$244.03
Bus	31P	Atlantic Rapid Bus	BRT	18.1	10-20,000	2,243,840	123,969	6,381	25,521	0	1	1	$23.3	$15.3	$17.40	$1.94	$421.08	$277.68
Bus	31O	Oakland Park Rapid Bus	BRT	18.5	GT 30,000	2,235,840	120,856	7,577	25,562	0	3	1	$23.5	$15.6	$18.25	$2.04	$435.15	$288.65
Bus	32O	Oakland Park Rapid Bus - Revised	BRT	29.5	GT 30,000	2,247,680	76,193	10,232	25,471	0	3	1	$15.8	$12.7	$19.75	$2.07	$467.20	$373.70
Bus	32D	Sample Road Modified Rapid Bus	BRT	27.4	10-20,000	1,651,200	60,263	7,202	25,729	0	1	1	$22.4	$14.4	$31.53	$1.91	$612.70	$395.70
Bus	32P	Sample Road Modified Rapid Bus - Revised	BRT	23.5	10-20,000	2,127,040	90,512	8,399	25,787	0	1	1	$15.8	$12.6	$15.75	$1.20	$371.40	$297.00
Bus	32R	US 1 Rapid Bus	BRT	43.4	GT 30,000	1,859,200	42,839	7,485	24,134	2	6	3	$15.7	$12.5	$61.20	$2.34	$679.60	$542.10
Kendall	31V	Tri-Rail Extension to Zoo	Commuter Rail	19.4	GT 30,000	1,215,071	62,633		29,723	0	6	2	$41.1	$25.2	$55.84	$6.73	$796.72	$489.42
Kendall	30O	Kendall DMU #1 - Zoo	DMU	14.4	10-20,000	1,277,480	88,714		25,775	0	3	2	$46.6	$30.8	$43.34	$4.54	$671.60	$443.5
Kendall	30Q	Kendall DMU #3 - Krome	DMU	14.6	10-20,000	1,399,661	95,867		26,303	0	3	2	$45.2	$29.4	$38.93	$3.97	$660.12	$428.8
Kendall	30Y	Kendall DMU Combination	DMU	21.4	10-20,000	1,812,791	84,710	5,818	25,945	0	3	2	$41.9	$26.0	$41.02	$4.42	$895.84	$556.84
Kendall	31W	DMU to Zoo plus Airport Feeders	Combined DMU/BRT	38.5	10-20,000	2,352,008	61,091			0	3	3	$32.9	$21.0	$43.86	$3.19	$1,268.22	$810.02
Kendall	31Q	Kendall Rapid Bus	BRT	8.0	20-30,000	874,240	109,280	6,810	25,588	0	1	1	$23.4	$15.4	$18.53	$0.99	$186.89	$123.49
Kendall	32Q	Kendall Hybrid BRT Only	BRT	9.2	20-30,000	2,907,200	316,000	9,085	25,596	0	1	1	$23.2	$15.3	$6.29	$0.00	$213.80	$140.90
Kendall	32E	Kendall Hybrid BRT-DMU SW 137th	Combined DMU/BRT	17.7	20-30,000	1,829,350	103,353			0	2	1	$33.2	$21.5	$27.30	$2.64	$587.87	$380.37
Kendall	32G	Kendall Hybrid BRT-DELRT SW 137th Augmented	Combined DELRT/BRT	15.2	20-30,000	3,741,268	246,136	11,978	25,671	0	2	1	$33.9	$21.6	$12.29	$0.95	$515.87	$328.17

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Table 2 – Weighted Scores

	Alternative		Mode	Productive			Connective			Cost-Effective			TOTAL SCORE
				Subtotal	Weighted Score	Rank	Subtotal	Weighted Score	Rank	Subtotal	Weighted Score	Rank	
Miami East-West	30C	East-West Metrorail Extension West to FIU	Metrorail	8	7	MID	6	6.2	MID	5	5.8	BOT	19
Miami East-West	30D	East-West Metrorail Extension South to Kendall	Metrorail	8	6.6	MID	6	5.8	MID	3	4.6	BOT	17
Miami East-West	30E	Kendall Drive East-West Extension	Metrorail	7	5.6	MID	3	4	BOT	4	4.4	BOT	14
Miami East-West	31R	137th Rapid Bus	BRT	5	5.2	MID	4	4.8	MID	7	6	MID	16
Miami East-West	31T	Metrorail Extension plus 137th Avenue Rapid Bus	Combined Metrorail/BRT	8	7	MID	5	5.8	MID	6	6.2	MID	19
MB	30F	Miami Beach LRT	LRT	8	7.4	TOP	4	5.8	MID	9	7.8	TOP	21
Broward East-West	30G	Broward East-West LRT	LRT	7	7	MID	6	6.6	MID	8	7.4	MID	21
Broward East-West	30T	Broward E-W LRT SFEC to CBD	LRT	6	5.8	MID	2	4.2	MID	9	7	MID	17
Broward East-West	30U	Broward E-W LRT SR7 to CBD	LRT	6	5.8	MID	2	4.2	MID	9	7	MID	17
Jupiter Tri-Rail Extensions	30I	Jupiter West Palm Beach DMU	DMU	6	6	MID	3	4.8	MID	9	7.2	MID	18
Jupiter Tri-Rail Extensions	30V	Jupiter Extension (7 Stations)	Commuter Rail	6	6	MID	5	5.6	MID	7	6.4	MID	18
Jupiter Tri-Rail Extensions	30W	Jupiter Extension (5 Stations)	Commuter Rail	5	5.4	MID	5	5.4	MID	7	6.2	MID	17
Jupiter Tri-Rail Extensions	30X	Jupiter via Mangonia	Commuter Rail	4	4.4	BOT	5	4.8	MID	5	4.8	BOT	14
Jupiter Tri-Rail Extensions	31U	Tri-Rail Extension to VA Hospital	Commuter Rail	6	6	MID	5	5.6	MID	7	6.4	MID	18
Miami Tri-Rail Extensions	30J	Tri-Rail Split to CBD	Commuter Rail	8	7.2	TOP	5	6	MID	7	6.8	MID	20
Miami Tri-Rail Extensions	32K	Tri-Rail Extension to Dadeland	Commuter Rail	7	8	TOP	9	8.8	TOP	10	9.2	TOP	26
FEC	30K	FEC Complete	Commuter Rail	6	6.4	MID	9	7.6	TOP	5	6	MID	20
FEC	30L	FEC Shorter Line	Commuter Rail	7	7.6	TOP	7	7.6	TOP	10	8.8	TOP	24
FEC	30Z	FEC Complete (LRT)	LRT	7	7.4	TOP	9	8.2	TOP	7	7.4	MID	23
FEC	32A	FEC West Palm Beach to Miami	Commuter Rail	6	6.4	MID	9	7.6	TOP	5	6	MID	20
FEC	32B	FEC Ft. Lauderdale to Miami	Commuter Rail	7	6.6	MID	6	6.2	MID	6	6.2	MID	19
Bus	31A	North-South Premium Bus	BRT	5	7.2	TOP	9	8.8	TOP	12	10	TOP	26
Bus	31S	North-South Rapid Bus with Douglas Avenue	BRT	5	7	MID	9	8.6	TOP	11	9.4	TOP	25
Bus	31D	University Drive Rapid Bus	BRT	3	4.2	BOT	3	4.2	MID	9	6.6	MID	15
Bus	31K	Wellington Rapid Bus	BRT	5	5.8	MID	2	4.6	MID	12	8.6	TOP	19
Bus	31L	Military Trail Rapid Bus	BRT	6	7	MID	5	6.6	MID	12	9.4	TOP	23
Bus	31N	Pines Rapid Bus	BRT	5	6	MID	4	5.6	MID	11	8.4	TOP	20
Bus	31O	Oakland Park Rapid Bus	BRT	6	5.8	MID	3	4.6	MID	8	6.6	MID	17
Bus	31P	Atlantic Rapid Bus	BRT	4	4.8	BOT	2	4	BOT	10	7.2	MID	16
Bus	32D	Sample Road Modified Rapid Bus	BRT	3	4	BOT	2	3.6	BOT	9	6.4	MID	14
Kendall	30O	Kendall DMU #1 - Zoo	DMU	3	3.4	BOT	4	3.8	BOT	4	3.8	BOT	11
Kendall	30Q	Kendall DMU #3 - Krome	DMU	3	3.4	BOT	4	3.8	BOT	4	3.8	BOT	11
Kendall	30Y	Kendall DMU Combination	DMU	3	3.4	BOT	4	3.8	BOT	4	3.8	BOT	11
Kendall	31Q	Kendall Rapid Bus	BRT	5	5.4	MID	2	4.2	MID	10	7.4	MID	17
Kendall	31V	Tri-Rail Extension to Zoo	Commuter Rail	5	5	BOT	5	5	MID	5	5	BOT	15
Kendall	31W	DMU to Zoo plus Airport Feeders	Combined DMU/BRT	4	4.2	BOT	5	4.6	MID	4	4.2	BOT	13
Kendall	32E	Kendall Hybrid BRT-DMU SW 137th	Combined DMU/BRT	6	5	BOT	2	3.4	BOT	5	4.6	BOT	13
Kendall	32G	Kendall Hybrid BRT-DELRT SW 137th Augmented	Combined DELRT/BRT	7	6.4	MID	2	4.4	MID	9	7.2	MID	18

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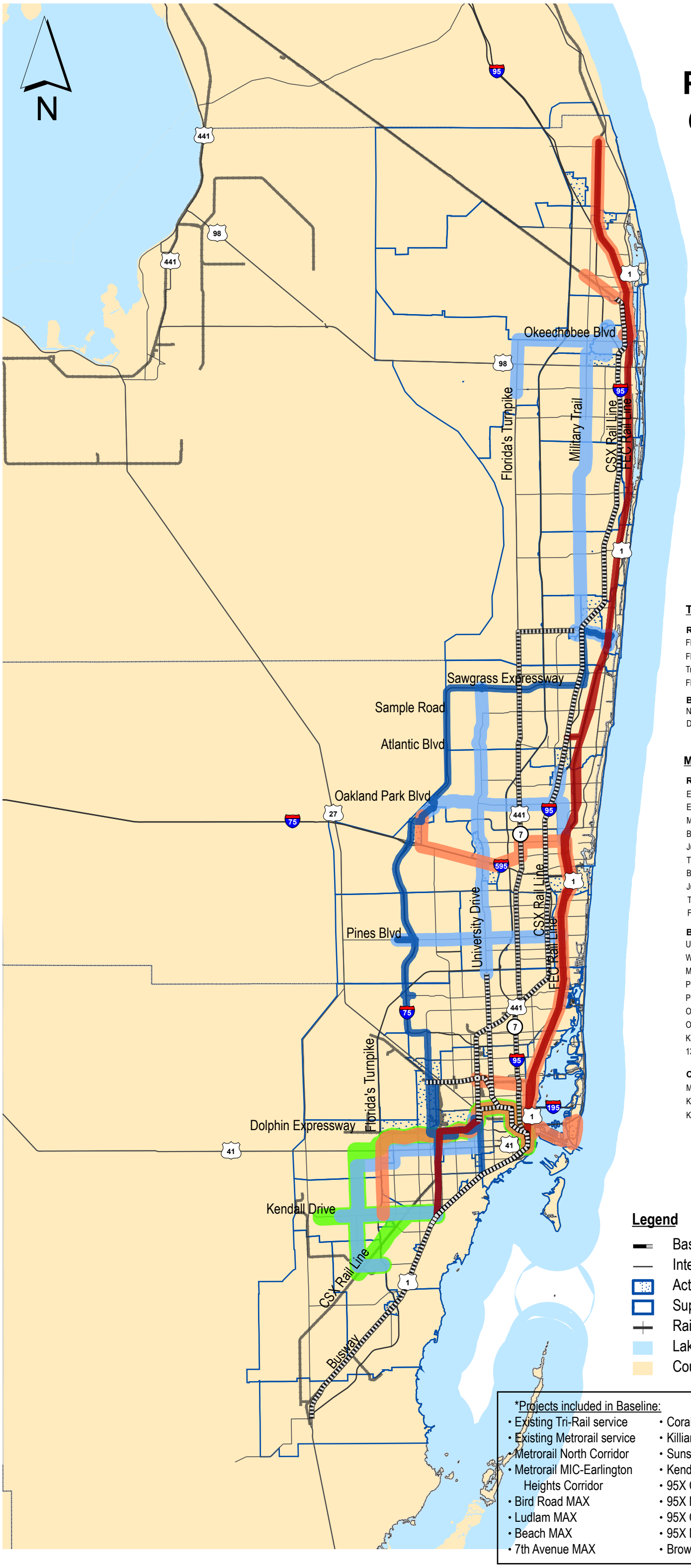
FIGURE 2
PRELIMINARY CONNECTIVE NETWORK



Top Scoring Alternatives

Rail
- FEC Complete (30 K)
- FEC Shorter Line (30 L)
- Tri-Rail Extension to Dadeland (32 K)
- FEC West Palm Beach to Miami (32 A)

Bus
- North-South Premium Bus (31 A)
- Douglas Road Rapid Bus (31 S)

Medium Scoring Alternatives

Rail
- East-West Metrorail Extension to FIU (30 C)
- East-West Metrorail Extension to Kendall (30 D)
- Miami Beach LRT (30 F)
- Broward East-West LRT (30 G)
- Jupiter Extension (30 I)
- Tri-Rail Split to CBD (30 J)
- Broward East-West LRT - College to Dntn Ft. Lauderdale (30T)
- Jupiter Alternative - CR (30 V)
- Tri-Rail Extension to the VA Hospital (31U)
- FEC Ft. Lauderdale to Miami (32 B)

Bus
- University Drive Rapid Bus (31 D)
- Wellington Rapid Bus (31 K)
- Military Trail Rapid Bus (31 L)
- Pines Rapid Bus to University - Line A (31 N)
- Pines Rapid Bus to FEC - Line B (31 N)
- Oakland Park Rapid Bus to Dntn Ft. Lauderdale- Line A (31 O)
- Oakland Park Rapid Bus to Cypress Creek - Line B (31 O)
- Kendall Drive Rapid Bus (31 Q)
- 137th Avenue Rapid Bus Line A (31R)

Combined Rail/Bus
- Metrorail East-West Extension with 137th Avenue Rapid Bus (31 T)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line A (32 G)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line B (32 G)

Legend

- Baseline Premium Transit*
- Interstate/Toll Road/US Road/State Road
- Activity Centers
- Superzones
- Railroad
- Lake Okeechobee
- County

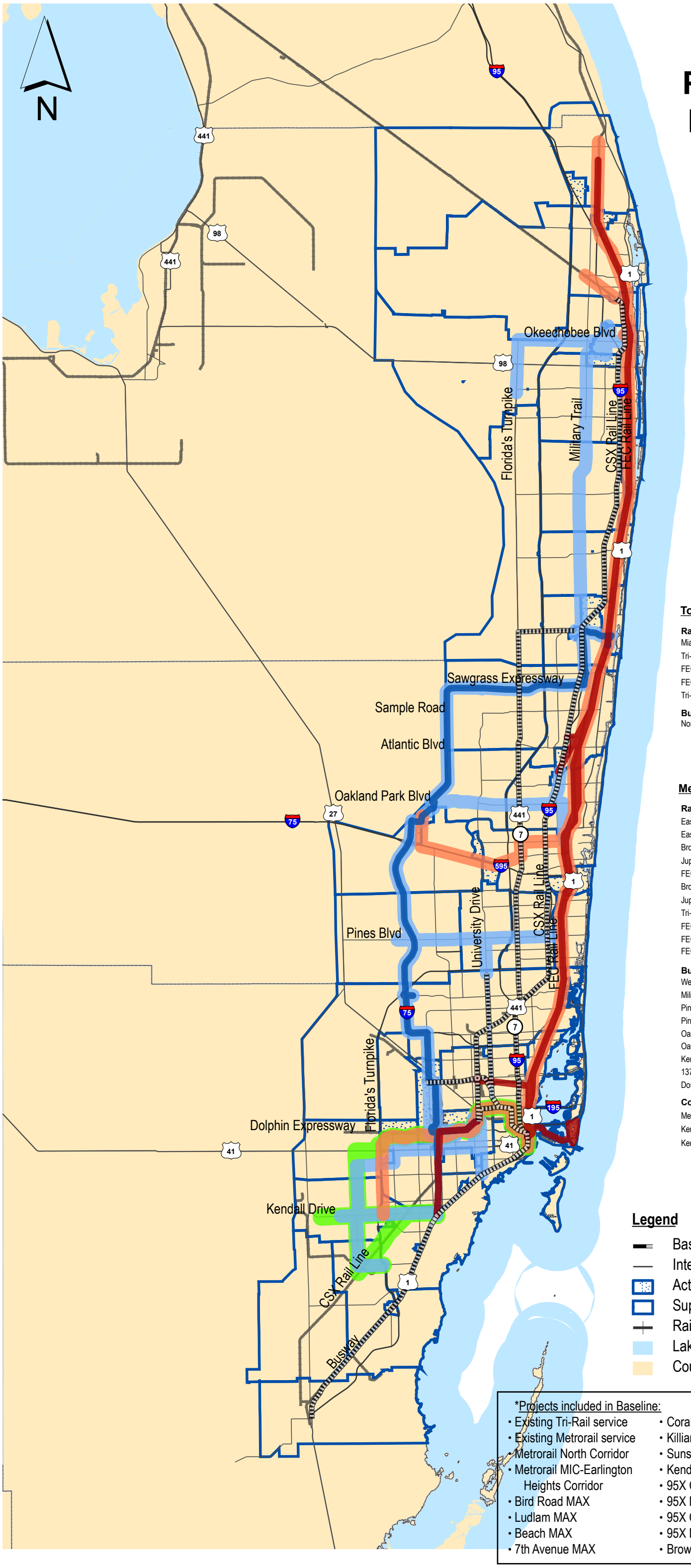
*Projects included in Baseline:

- Existing Tri-Rail service
- Existing Metrorail service
- Metrorail North Corridor
- Metrorail MIC-Earlington Heights Corridor
- Bird Road MAX
- Ludlam MAX
- Beach MAX
- 7th Avenue MAX
- Coral Way MAX
- Killian KAT
- Sunset KAT
- Kendall KAT
- 95X Civic Center
- 95X Norwood-Brickell
- 95X Carol City-Omni
- 95X Norwood-West
- Broward SR 7 Fast Bus

5 Miles

Source: South Florida Regional Transportation Authority Strategic Regional Transit Plan, 2008

FIGURE 3
PRELIMINARY PRODUCTIVE NETWORK



Top Scoring Alternatives

Rail
- Miami Beach LRT (30 F)
- Tri-Rail Split to CBD (30 J)
- FEC Shorter Line (30 L)
- FEC-Tri-Rail A & FEC: Jupiter-MIC, Boca-Govt Center (32 J)
- Tri-Rail Extension to Dadeland (32 K)

Bus
- North-South Premium Bus (31 A)

Medium Scoring Alternatives

Rail
- East-West Metrorail Extension to FIU (30 C)
- East-West Metrorail Extension to Kendall (30 D)
- Broward East-West LRT (30 G)
- Jupiter Extension (30 I)
- FEC Complete (30 K)
- Broward East-West LRT - College to Dntn Ft. Lauderdale (30T)
- Jupiter Alternative - CR (30 V)
- Tri-Rail Extension to the VA Hospital (31U)
- FEC West Palm Beach to Miami (32 A)
- FEC Ft. Lauderdale to Miami (32 B)
- FEC-Tri-Rail: Jupiter to Pompano to MIC (32 I)

Bus
- Wellington Rapid Bus (31 K)
- Military Trail Rapid Bus (31 L)
- Pines Rapid Bus to University - Line A (31 N)
- Pines Rapid Bus to FEC - Line B (31 N)
- Oakland Park Rapid Bus to Dntn Ft. Lauderdale- Line A (31 O)
- Oakland Park Rapid Bus to Cypress Creek - Line B (31 O)
- Kendall Drive Rapid Bus (31 Q)
- 137th Avenue Rapid Bus Line A (31R)
- Douglas Road Rapid Bus (31 S)

Combined Rail/Bus
- Metrorail East-West Extension with 137th Avenue Rapid Bus (31 T)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line A (32 G)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line B (32 G)

Legend

- Baseline Premium Transit*
- Interstate/Toll Road/US Road/State Road
- Activity Centers
- Superzones
- Railroad
- Lake Okeechobee
- County

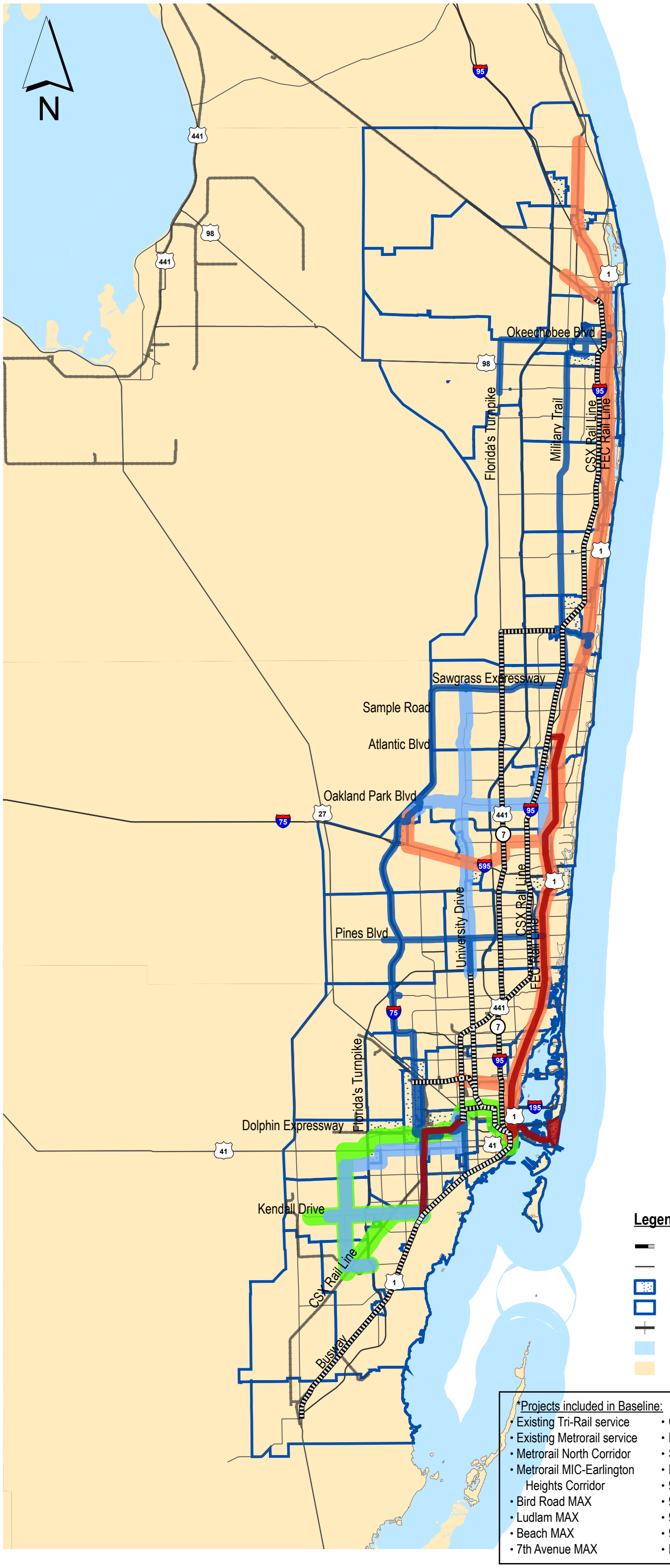
*Projects included in Baseline:

- Existing Tri-Rail service
- Existing Metrorail service
- Metrorail North Corridor
- Metrorail MIC-Earlington Heights Corridor
- Bird Road MAX
- Ludlam MAX
- Beach MAX
- 7th Avenue MAX
- Coral Way MAX
- Killian KAT
- Sunset KAT
- Kendall KAT
- 95X Civic Center
- 95X Norwood-Brickell
- 95X Carol City-Omni
- 95X Norwood-West
- Broward SR 7 Fast Bus

5 Miles

Source: South Florida Regional Transportation Authority Strategic Regional Transit Plan, 2008

FIGURE 4
PRELIMINARY VALUE NETWORK



Top Scoring Alternatives

Rail
- Miami Beach LRT (30 F)
- FEC Shorter Line (30 L)
- Tri-Rail Extension to Dadeland (32 K)

Bus
- North-South Premium Bus (31 A)
- Wellington Rapid Bus (31 K)
- Military Trail Rapid Bus (31 L)
- Pines Rapid Bus to University - Line A (31 N)
- Pines Rapid Bus to FEC - Line B (31 N)
- Douglas Road Rapid Bus (31 S)

Medium Scoring Alternatives

Rail
- Broward East-West LRT (30 G)
- Jupiter Extension (30 I)
- Tri-Rail Split to CBD (30 J)
- FEC Complete (30 K)
- Broward East-West LRT - College to Dntn Ft. Lauderdale (30T)
- Jupiter Alternative - CR (30 V)
- FEC West Palm Beach to Miami (32 A)
- Tri-Rail Extension to the VA Hospital (31U)
- FEC Ft. Lauderdale to Miami (32 B)

Bus
- University Drive Rapid Bus (31 D)
- Oakland Park Rapid Bus to Dntn Ft. Lauderdale- Line A (31 O)
- Oakland Park Rapid Bus to Cypress Creek - Line B (31 O)
- Kendall Drive Rapid Bus (31 Q)
- 137th Avenue Rapid Bus Line A (31R)

Combined Rail/Bus
- Metrorail East-West Extension with 137th Avenue Rapid Bus (31 T)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line A (32 G)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line B (32 G)

Legend
- Baseline Premium Transit*
- Interstate/Toll Road/US Road/State Road
- Activity Centers
- Superzones
- Railroad
- Lake Okeechobee
- County

*Projects included in Baseline:
- Existing Tri-Rail service
- Existing Metrorail service
- Metrorail North Corridor
- Metrorail MIC-Earlington Heights Corridor
- Bird Road MAX
- Ludlam MAX
- Beach MAX
- 7th Avenue MAX
- Coral Way MAX
- Killian KAT
- Sunset KAT
- Kendall KAT
- 95X Civic Center
- 95X Norwood-Brickell
- 95X Carol City-Omni
- 95X Norwood-West
- Broward SR 7 Fast Bus

5 Miles

Source: South Florida Regional Transportation Authority Strategic Regional Transit Plan, 2008

2.0 NETWORK ANALYSIS

The results of the preliminary network composition were separated into travel markets and analyzed to determine which alignment within each travel market best met the network characteristics.

Travel Markets

Duplication of service as well as failure to provide adequate service can be detrimental to the success of a transit system. Those travel markets served by a single surviving alignment were maintained; this most often occurred with rapid bus options. To identify areas containing service duplication, the following travel markets were identified across the South Florida region:

- Miami East-West
- Miami Beach
- Broward East-West
- Jupiter Tri-Rail Extensions
- Miami Tri-Rail Extensions
- FEC (Florida East Coast Railroad)
- Kendall

Connective Network

Alternatives' ability to maximize existing regional community assets was taken into account when analyzing the Connective Network. Alignments within travel markets were compared based on the number of RACs served and the connections to other modes and modal facilities, in addition to the ability to connect multiple jurisdictions. The following alignments were included in the final Connective Network:

- 31T Metrorail Extension plus 137th Avenue Rapid Bus
- 30F Miami Beach LRT
- 30G Broward East-West LRT
- 31U Tri-Rail Extension to the VA Hospital
- 30K FEC Complete
- 32G Kendall Hybrid BRT-DELRT SW 137th Augmented
- 31A North-South Premium Bus
- 31D University Drive Rapid Bus
- 31K Wellington Rapid Bus

- 31L Military Trail Rapid Bus
- 31N Pines Rapid Bus
- 32O Oakland Park – Cypress Creek Rapid Bus

Productive Network

The productive network was analyzed for performance in terms of ridership. Alignments serving similar markets were compared and services attracting fewer riders to the system were eliminated. The following alignments were included in the ultimate Productive Network:

- 30D East-West Metrorail Extension South to Kendall
- 30F Miami Beach LRT
- 30G Broward East-West LRT
- 30V Jupiter Extension
- 32K Tri-Rail Extension to Dadeland
- 32A FEC West Palm Beach to Miami
- 32G Kendall Hybrid BRT-DELRT SW 137th Augmented
- 31S North-South Premium Bus with Douglas Road
- 31K Wellington Rapid Bus
- 31L Military Trail Rapid Bus
- 31N Pines Rapid Bus
- 32O Oakland Park – Cypress Creek Rapid Bus

Value Network

Cost is a major factor when determining if a system can be built. Alignments within travel markets were evaluated to determine which alignments were most value in terms of capital costs per mile, per trip costs (including operations and annualized costs), and subsidy needed per trip (includes estimated farebox recovery). The final Value Network included the following alignments:

- 31R 137th Rapid Bus
- 30F Miami Beach LRT
- 32L Broward East-West LRT Sawgrass to CBD
- 30V Jupiter Extension
- 30L FEC Shorter Line

- 32Q Kendall Drive BRT Only Modified Service
- 31A North-South Premium Bus
- 31D University Drive Rapid Bus
- 31K Wellington Rapid Bus
- 31L Military Trail Rapid Bus
- 31N Pines Rapid Bus
- 32O Oakland Park – Cypress Creek Rapid Bus
- 32P Sample Road Modified Rapid Bus

The final networks were tested using the adopted 2030 Land Use Base; plus three alternative land use scenarios to determine how modified transit-oriented land use policies would benefit the proposed transit system. The network analysis also shows the alternatives' performance in a comprehensive transit system versus performance as an individual alignment.

3.0 FINAL NETWORK COMPOSITION

Each alternative was tested individually and within a network using the adopted 2030 socio-economic data. The resulting ridership data was used to compare each alignment's individual performance to performance in a network. If ridership showed a large increase when placed in the network, the alternative was a benefit to the complete transit system. Conversely, a large decrease in ridership demonstrated some riders were served by another project in the network.

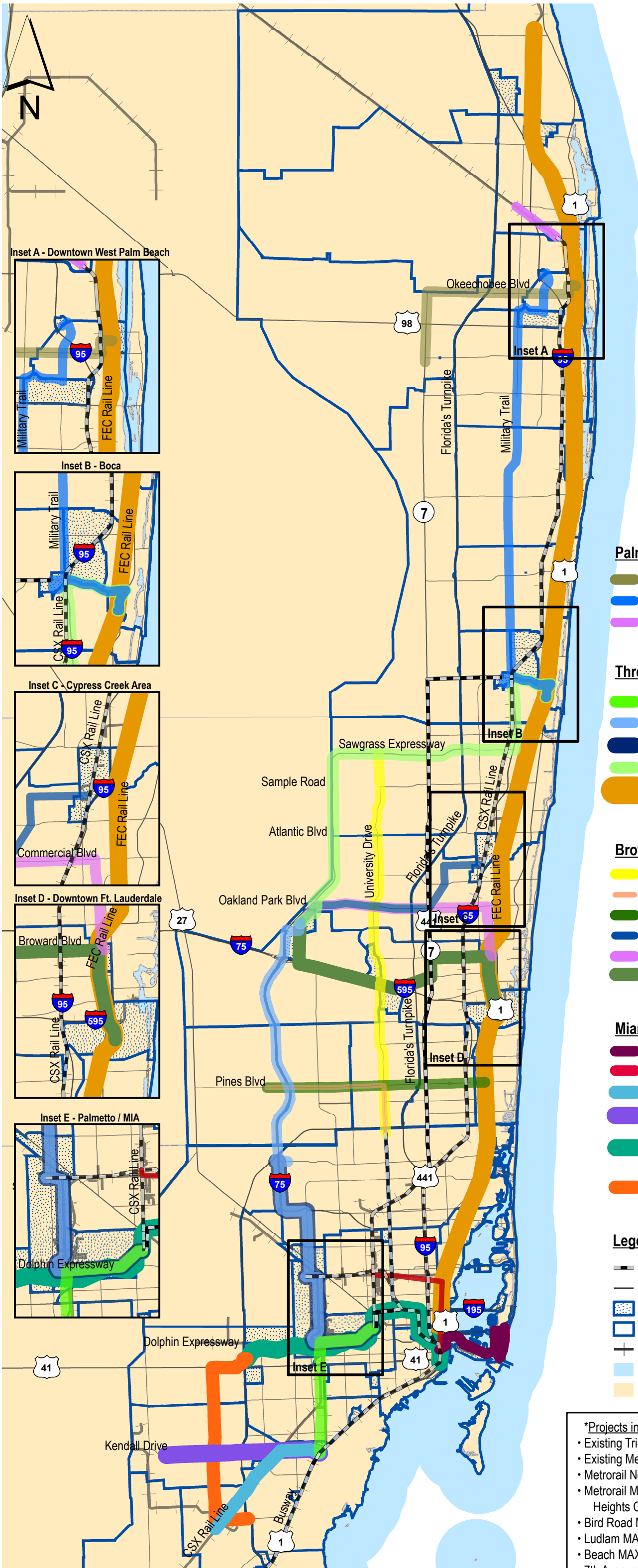
Once the results from network testing were compared to the individual alignment results, each network was adjusted to ensure maximum performance and a comprehensive system. Additional changes to the networks resulted from outreach efforts conducted by SFRTA.

Table 3 lists the alternatives included in each network. **Figures 5**, **6**, and **7** map the final three networks. **Table 4** shows the percentage change between alternatives' ridership performance individually and in a network.

Table 3 – Final Network Composition

	Alternative	Name	Mode	Connective	Productive	Value
Miami East-West	30D	East-West Metrorail Extension South to Kendall	Metrorail		✓	
	31R	137th Rapid Bus	BRT			✓
	31T	Metrorail Extension plus 137th Avenue Rapid Bus	Combined Metrorail/BRT	✓		
Miami Beach	30F	Miami Beach LRT	LRT	✓	✓	✓
Broward East-West	30G	Broward East-West LRT	LRT	✓	✓	
	32L	Broward E-W LRT Sawgrass to CBD	LRT			
		Broward E-W LRT SR 7 to Dntn Ft. Lauderdale and SFEC to US 1	LRT			✓
Jupiter Tri-Rail Extensions	30V	Jupiter Extension (7 Stations)	Commuter Rail		✓	✓
	31U	Tri-Rail Extension to VA Hospital	Commuter Rail	✓		
Miami Tri-Rail Ext	30J	Tri-Rail Split to Miami CBD	Commuter Rail	✓	✓	
	32K	Tri-Rail Extension to Dadeland	Commuter Rail		✓	
FEC	30K	FEC Complete	Commuter Rail	✓		
	30L	FEC Shorter Line	Commuter Rail			✓
	32A	FEC West Palm Beach to Miami	Commuter Rail		✓	
Bus	31A	North-South Premium Bus	BRT	✓		✓
	31S	North-South Rapid Bus with Douglas Road	BRT		✓	
	31D	University Drive Rapid Bus	BRT	✓		✓
	31K	Wellington Rapid Bus	BRT	✓	✓	✓
	31L	Military Trail Rapid Bus	BRT	✓	✓	✓
	31N	Pines Rapid Bus	BRT	✓	✓	✓
	32O	Oakland Park - Cypress Creek Rapid Bus	BRT	✓	✓	✓
	32P	Sample Road Modified Rapid Bus	BRT			✓
Kendall	32G	Kendall Hybrid BRT-DELRT SW 137th Augmented	Combined DELRT/BRT	✓	✓	
	32Q	Kendall Drive BRT Only Modified Service	BRT			✓
		Total Projects		13	13	13

FIGURE 5
CONNECTIVE NETWORK



Palm Beach County Alternatives

- Wellington Rapid Bus (31 K)
- Military Trail Rapid Bus (31 L)
- Tri-Rail Extension to the VA Hospital (31 U)

Three County Alternatives

- North-South Premium Bus - Dadeland South (31 A)
- North-South Premium Bus - Palmetto Line B (31 A)
- North-South Premium Bus - Palmetto Line A (31 A)
- North-South Premium Bus - Sawgrass to Boca (31 A)
- FEC Complete (30 K)

Broward County Alternatives

- University Drive Rapid Bus (31 D)
- Pines Rapid Bus to University - Line A (31 N)
- Pines Rapid Bus to FEC - Line B (31 N)
- Oakland Park Rapid Bus to Dntn Ft. Lauderdale- Line A (32 O)
- Oakland Park Rapid Bus to Cypress Creek - Line B (32 O)
- Broward East-West LRT (30 G)

Miami-Dade County Alternatives

- Miami Beach LRT (30 F)
- Tri-Rail Split to Miami CBD (30 J)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line A (32 G)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line B (32 G)
- Metrorail East-West Extension with 137th Avenue Rapid Bus - Line A (31 T)
- Metrorail East-West Extension with 137th Avenue Rapid Bus - Line B (31 T)

Legend

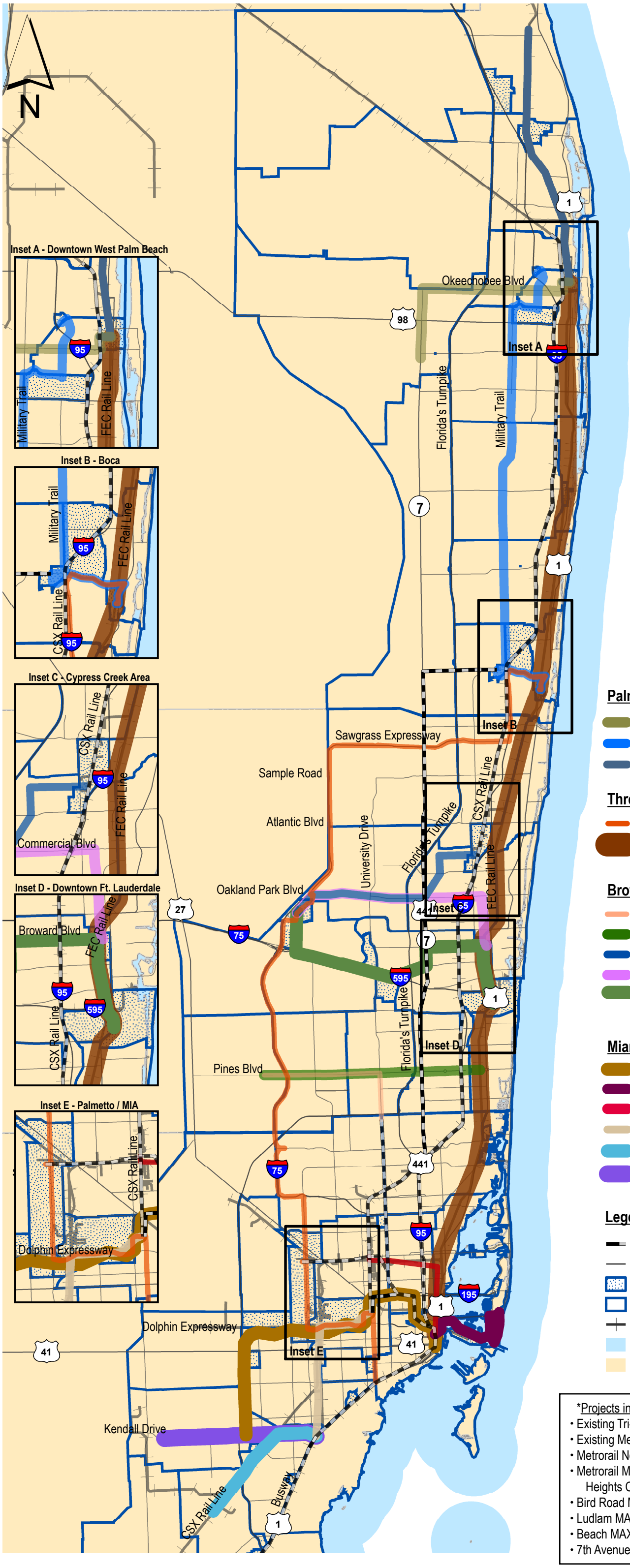
- Baseline Premium Transit *
- Interstate/Toll Road/US Road/State Road
- Activity Centers
- Superzones
- Railroad
- Lake Okeechobee
- County

*Projects included in Baseline:

- Existing Tri-Rail service
- Existing Metrorail service
- Metrorail North Corridor
- Metrorail MIC-Earlington Heights Corridor
- Bird Road MAX
- Ludlam MAX
- Beach MAX
- 7th Avenue MAX
- Coral Way MAX
- Killian KAT
- Sunset KAT
- Kendall KAT
- 95X Civic Center
- 95X Norwood-Brickell
- 95X Carol City-Omni
- 95X Norwood-West
- Broward SR 7 Fast Bus

Source: South Florida Regional Transportation Authority Strategic Regional Transit Plan, 2007

FIGURE 6
PRODUCTIVE NETWORK



Palm Beach County Alternatives

- Wellington Rapid Bus (31 K)
- Military Trail Rapid Bus (31 L)
- Tri-Rail Extension to Jupiter (30 V)

Three County Alternatives

- Douglas Road Rapid Bus (31 S)
- FEC West Palm Beach to Miami (32 A)

Broward County Alternatives

- Pines Rapid Bus to University - Line A (31 N)
- Pines Rapid Bus to FEC - Line B (31 N)
- Oakland Park Rapid Bus to Dntn Ft. Lauderdale- Line A (32 O)
- Oakland Park Rapid Bus to Cypress Creek - Line B (32 O)
- Broward East-West LRT (30 G)

Miami-Dade County Alternatives

- East-West Metrorail Extension to Kendall (30 D)
- Miami Beach LRT (30 F)
- Tri-Rail Split to Miami CBD (30 J)
- Tri-Rail Extension to Dadeland (32 K)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line A (32 G)
- Kendall Hybrid BRT-DELRT SW 137th Ave - Line B (32 G)

Legend

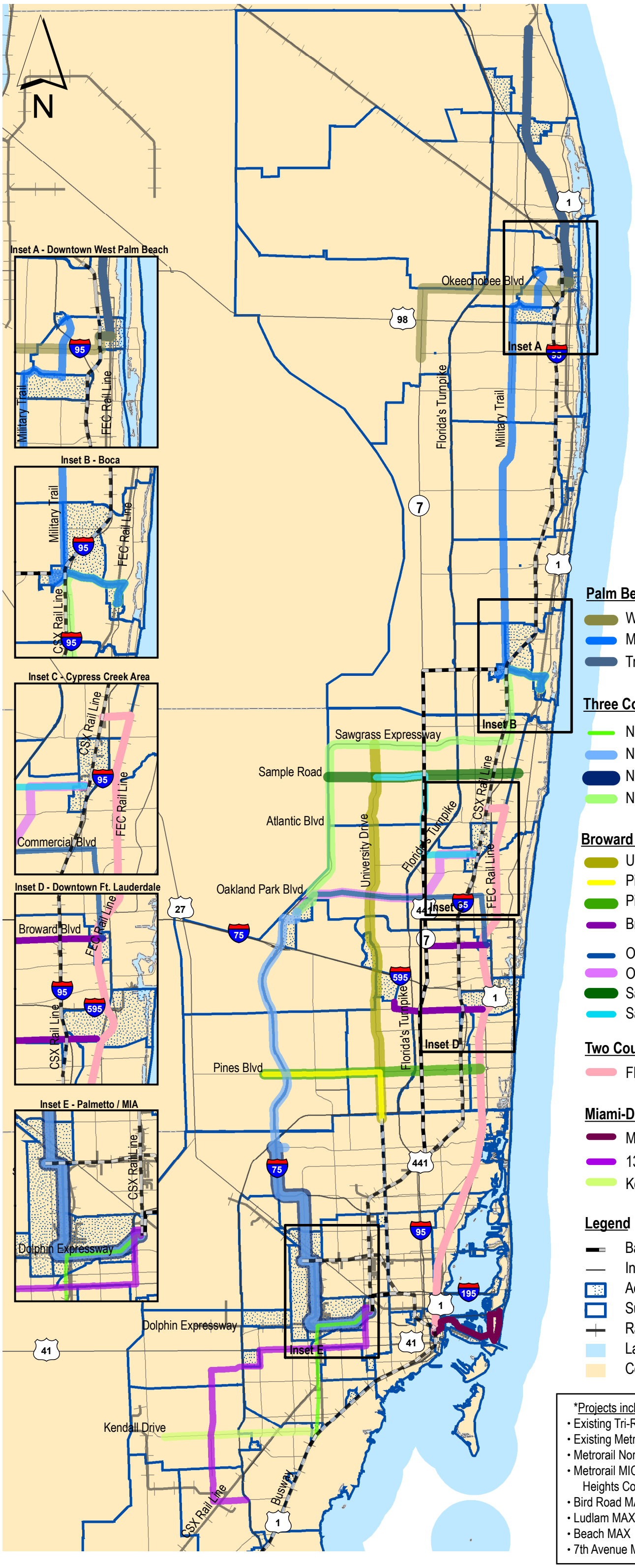
- Baseline Premium Transit *
- Interstate/Toll Road/US Road/State Road
- Activity Centers
- Superzones
- Railroad
- Lake Okeechobee
- County

*Projects included in Baseline:

- Existing Tri-Rail service
- Existing Metrorail service
- Metrorail North Corridor
- Metrorail MIC-Earlington Heights Corridor
- Bird Road MAX
- Ludlam MAX
- Beach MAX
- 7th Avenue MAX
- Coral Way MAX
- Killian KAT
- Sunset KAT
- Kendall KAT
- 95X Civic Center
- 95X Norwood-Brickell
- 95X Carol City-Omni
- 95X Norwood-West
- Broward SR 7 Fast Bus

Source: South Florida Regional Transportation Authority Strategic Regional Transit Plan, 2007

FIGURE 7
VALUE NETWORK



Palm Beach County Alternatives

- Wellington Rapid Bus (31 K)
- Military Trail Rapid Bus (31 L)
- Tri-Rail Extension to Jupiter (30 V)

Three County Alternatives

- North-South Premium Bus - Dadeland South (31 A)
- North-South Premium Bus - Palmetto Line B (31 A)
- North-South Premium Bus - Palmetto Line A (31 A)
- North-South Premium Bus - Sawgrass to Boca (31 A)

Broward County Alternatives

- University Drive Rapid Bus (31 D)
- Pines Rapid Bus to University - Line A (31 N)
- Pines Rapid Bus to FEC - Line B (31 N)
- Broward East-West LRT - SR 7 to Dntn Ft. Lauderdale and SFEC to US 1 (New Alt)
- Oakland Park Rapid Bus to Dntn Ft. Lauderdale- Line A (32 O)
- Oakland Park Rapid Bus to Cypress Creek - Line B (32 O)
- Sample Road Modified Rapid Bus - Line A (32 P)
- Sample Road Modified Rapid Bus - Line B (32 P)

Two County Alternatives

- FEC Shorter Line (30 L)

Miami-Dade County Alternatives

- Miami Beach LRT (30 F)
- 137th Avenue Rapid Bus (31 R)
- Kendall Drive BRT Only - Modified (32 Q)

Legend

- Baseline Premium Transit*
- Interstate/Toll Road/US Road/State Road
- Activity Centers
- Superzones
- Railroad
- Lake Okeechobee
- County

*Projects included in Baseline:

- Existing Tri-Rail service
- Existing Metrorail service
- Metrorail North Corridor
- Metrorail MIC-Earlington Heights Corridor
- Bird Road MAX
- Ludlam MAX
- Beach MAX
- 7th Avenue MAX
- Coral Way MAX
- Killian KAT
- Sunset KAT
- Kendall KAT
- 95X Civic Center
- 95X Norwood-Brickell
- 95X Carol City-Omni
- 95X Norwood-West
- Broward SR 7 Fast Bus

5 Miles

Source: South Florida Regional Transportation Authority Strategic Regional Transit Plan, 2008

Table 4 – Daily Trips Percentage Change (Network vs. Independent) – Tested Alternatives

		Name	Mode	Productive			Connective			Cost-Effective			Capital Cost per Mile (w/ Right-of-Way) (in millions)	Capital Cost per Mile (w/o Right-of-Way) (in millions)	Annual Cost per Trip	Subsidy per Trip	Total Capital Cost (w/ Right-of-Way) (in millions)	Total Capital Cost (w/o Right-of-Way) (in millions)
				Net	Ind	% Ch	Net	Ind	% Ch	Net	Ind	% Ch						
Miami East-West	30D	East-West Metrorail Extension South to Kendall	Metrorail	37,375	35,650	4.8%							$144.25	$120.49	$37.70	$3.50	$2,077.14	$1,735.04
	31R	137th Rapid Bus	BRT							8,961	8,915	0.5%	$23.25	$15.33	$38.91	$2.85	$548.78	$361.88
	31T	Metrorail Extension plus 137th Avenue Rapid Bus	Combined Metrorail/BRT				40,484	36,660	10.4%				$181.36	$56.53	$23.26	$2.21	$1,595.93	$1,277.53
Miami Beach	30F	Miami Beach LRT	LRT	14,390	13,535	6.3%	14,356	13,535	6.1%	14,236	13,535	5.2%	$56.74	$40.90	$12.14	$1.99	$487.94	$351.74
Broward East-West	30G	Broward East-West LRT	LRT	23,083	26,018	-11.3%	20,352	26,018	-21.8%				$75.18	$59.34	$17.94	$1.21	$1,563.78	$1,234.28
	32L	Broward E-WLRT Sawgrass to CBD	LRT							18,369	22,336	-17.8%	$82.07	$66.23	$19.50	$1.17	$1,469.10	$1,185.60
Jupiter Tri-Rail Extensions	30V	Jupiter Extension (7 Stations)	Commuter Rail	28,060	32,312	-13.2%				29,680	32,312	-8.1%	$41.60	$25.75	$23.38	$1.62	$557.39	$345.09
	31U	Tri-Rail Extension to VA Hospital	Commuter Rail				16,685	26,525	-37.1%				$44.97	$29.12	$33.87	-$1.11	$125.92	$81.52
Miami Tri-Rail Ext	32K	Tri-Rail Extension to Dadeland	Tri-Rail	28,060	32,301	-13.1%							$39.57	$23.73	$17.92	$0.78	$423.36	$253.86
FEC	30K	FEC Complete	Commuter Rail				46,809	46,450	0.8%				$41.13	$25.29	$27.51	$3.29	$3,426.53	$2,107.03
	30L	FEC Shorter Line	Commuter Rail							30,881	32,406	-4.7%	$40.25	$24.41	$16.71	$1.77	$1,634.05	$990.95
	32A	FEC West Palm Beach to Miami	Commuter Rail	39,545	38,347	3.1%							$41.20	$25.36	$27.49	$3.30	$2,723.51	$1,676.51
Bus	31A	North-South Premium Bus	BRT				16,725	18,556	-9.9%	20,773	18,556	11.9%	$7.15	$3.98	$11.82	$0.88	$700.65	$390.15
	31S	North-South Rapid Bus with Douglas Road	BRT	16,063	17,927	-10.4%							$7.25	$4.08	$15.09	$1.57	$670.38	$377.38
	31D	University Drive Rapid Bus	BRT				8,072	10,645	-24.2%	8,103	10,645	-23.9%	$22.73	$14.81	$27.51	$1.52	$522.79	$340.59
	31K	Wellington Rapid Bus	BRT	6,343	7,748	-18.1%	6,767	7,748	-12.7%	6,204	7,748	-19.9%	$22.73	$14.81	$10.66	$0.26	$316.01	$205.91
	31L	Military Trail Rapid Bus	BRT	12,757	9,064	40.7%	12,758	9,064	40.8%	10,811	9,064	19.3%	$22.65	$14.73	$14.47	$0.09	$729.35	$474.35
	31N	Pines Rapid Bus	BRT	11,087	10,658	4.0%	10,407	10,658	-2.4%	10,283	10,658	-3.5%	$23.17	$15.25	$13.61	$1.60	$370.73	$244.03
	32O	Oakland Park - Cypress Creek Rapid Bus	BRT	8,070	10,232	-21.1%	8,242	10,232	-19.4%	7,712	10,232	-24.6%	$15.84	$12.70	$19.75	$2.07	$467.20	$374.70
	32P	Sample Road Modified Rapid Bus	BRT							8,067	8,399	-4.0%	$15.80	$12.64	$15.75	$1.20	$371.40	$297.00
Kendall	32G	Kendall Hybrid BRT-DELRT SW 137th Augmented	Combined DELRT/BRT	13,003	11,978	8.6%	12,143	11,978	1.4%				$85.98	$21.59	$12.29	$0.95	$515.87	$328.17
	32Q	Kendall Drive BRT Only Modified Service	BRT							11,008	9,085	21.2%	$23.24	$15.32	$6.29	$0.00	$213.80	$140.90
		Daily Network Ridership		237,836			213,800			185,088								
		Daily Tri-Rail Ridership		28,060			16,685			29,680								

4.0 LAND USE ANALYSIS

The forecast for growth in the South Florida Region through the year 2030 shows a fairly even distribution of employment and residential development. To determine if changing existing land use policies to better serve transit would create higher ridership, each of the resulting preliminary networks was tested using three alternative land use scenarios for the year 2030: Scenario 1, RACs or Community Redevelopment Areas (CRAs); Scenario 2, RACs and CRAs; and Scenario 3, Transit Station Areas (SAs).

The land use scenarios were designed using Donor Zones and Receiving Zones. A portion of the growth in population and employment in the South Florida region between the base year of 1999 and horizon year of 2030 is considered transferable from Donor Zones to Receiving Zones that relates to the proposed land use policies. Three types of planning areas are considered to be desirable for an increase in population and/or employment: RACs, CRAs, and SAs.

While the construction of the Alternative Land Use Scenarios are exaggerated realities, the results show concentrating growth, through any of the scenarios, produced a higher propensity for transit use.

Regional Activity Centers

Demographic data for the Year 2030 was used to identify major destinations with potential as transit hubs. Traffic Analysis Zones (TAZs) representing geographic areas that exhibited multi-use trip generation characteristics were grouped together to form Regional Activity Centers (RACs). Areas with a high concentration of jobs in 2000, and those that were projected to experience significant employment growth between the years 2000 and 2030 were designated as major employment centers. Furthermore, Developments of Regional Impact were also mapped to assist in identifying multi-use trip generators.

Eighteen RACs and 22 employment centers were initially identified in the South Florida region. Because approximately 90 percent of the initial RACs overlapped employment centers, they were subsequently merged and their boundaries restructured. Twelve additional RACs were added to the initial list based on preliminary model outputs from Southeast Regional Planning Model, Version 5 (SERPM V). In conclusion, the study identified 34 RACs in the region. Nine of the 34 RACs are found in Palm Beach County, seven in Broward County, and 18 in Miami-Dade County.

Community Redevelopment Areas

A CRA is designated by the state as an instrument for local governments to initiate the process of redevelopment. Areas designated as CRAs within the South Florida region were identified as areas subject to redevelopment in the future.

Transit Station Areas

SAs consist of those stations attributed to fixed guideway transit with dedicated rights-of-way, including some bus rapid transit, commuter rail, light rail, and Metrorail.

4.1 LAND USE METHODOLOGY

Varying distributions of population and employment demonstrate the effect of concentrating growth as well as the effect of mixed use development on transit ridership. Areas that are not designated as RACs, CRAs, or SAs are designated as potential Donor Zones. Of these potential Donor Zones, only zones that demonstrate growth between the base year 1999 and horizon year 2030 contribute a portion (25%) of their growth, aggregated into a Donor Pool, then allocated as specified in each of the three scenarios. Allocation to the Receiving Zones is proportionate in all CRAs, all RACs, or all SAs relative to their respective employment and household characteristics in 1999. To ensure a realistic analysis, employment and households allocations remained within the county from which they were donated.

Scenario 1 – Regional Activity Centers <u>or</u> Community Redevelopment Areas Scenario

In this scenario, all zones designated as CRAs receive 100% of the Donor Pool's household contributions, while those designated as RACs receive 100% of the employment contributions. Other Receiving Zones (SAs) do not receive anything from the Donor Pool.

Scenario 2 – Regional Activity Centers <u>and</u> Community Redevelopment Areas Scenario

In this scenario, zones designated as CRAs receive 67% of household contributions and 33% of employment contributions, while RACs receive 33% of household contributions and 67% of employment contributions.

Scenario 3 – Transit Station Areas Scenario

In this scenario, 100% of the household and employment contributions are allocated to SAs throughout the region.

Tables 5, **6**, **7**, and **8** show the cost performance of each network using the 2030 Base Land Use Scenario and three additional Scenarios.

5.0 SUMMARY

Based on the network analysis using the 2030 Base Land Use Scenario, the Value Network is recommended as a starting point for a Preferred Network. The Value Network demonstrated ridership similar to other networks, while maintaining lower capital costs. While portions of each network could be modified to perform better or accommodate locally recommended changes, the Value Network will be presented to the SFRTA PTAC and Board for discussion.

Table 5 – Evaluation of Three Networks: No Changes in 2030 Land Use (Preliminary Networks)

	Connective	Productive	Value
Total Capital Cost ($B)	$10.8	$10.9	$8.5
Annualized Capital Cost ($M)	$809	$809	$654
Annual O&M Cost ($M)	$97	$99	$72
Total Annual Cost ($M)	$907	$907	$726
Annual Passenger Trips (M)	41.2	40.3	37.6
O&M Cost Per Trip	$2.36	$2.46	$1.91
Total Annual Cost Per Trip	$22.00	$22.52	$19.30
Annual Fare Revenue ($M)	$22.9	$22.3	$20.8
Farebox Recovery	23%	23%	29%
Operating Subsidy Per Trip	$1.53	$1.60	$1.15

Table 6 – Evaluation of Preliminary Connective Network with Land Use Scenarios

	Original	Scenario 1	Scenario 2	Scenario 3
Total Capital Cost ($B)	$10.8			
Annualized Capital Cost ($M)	$809			
Annual O&M Cost ($M)	$97			
Total Annual Cost ($M)	$907			
Annual Passenger Trips (M)	41.2	66.0	64.9	67.4
O&M Cost Per Trip	$2.36	$1.48	$1.51	$1.45
Total Annual Cost Per Trip	$22.00	$13.74	$13.98	$13.46
Annual Fare Revenue ($M)	$22.9	$36.0	$35.6	$36.3
Farebox Recovery	23%	37%	36%	37%
Operating Subsidy Per Trip	$1.53	$0.76	$0.78	$0.74

AC = Activity Center, CRA = Community Redevelopment Area, SA = Station Area
Land Use Scenario 1 = 100% of employment in ACs, 100% of household CRAs
Land Use Scenario 2 = 67% of employment in ACs, 33% of employment in CRAs
33% of households in ACs, 67% of employment in CRAs
Land Use Scenario 3 = 100% of employment and households in SAs

Table 7 – Evaluation of Preliminary Productive Network with Land Use Scenarios

	Original	Scenario 1	Scenario 2	Scenario 3
Total Capital Cost ($B)	$8.5			
Annualized Capital Cost ($M)	$654			
Annual O&M Cost ($M)	$72			
Total Annual Cost ($M)	$726			
Annual Passenger Trips (M)	37.6	60.7	59.8	62.1
O&M Cost Per Trip	$1.91	$1.19	$1.21	$1.16
Total Annual Cost Per Trip	$19.30	$11.96	$12.14	$11.96
Annual Fare Revenue ($M)	$20.8	$34.4	$33.9	$34.5
Farebox Recovery	29%	48%	47%	48%
Operating Subsidy Per Trip	$1.15	$0.50	$0.51	$0.48

AC = Activity Center, CRA = Community Redevelopment Area, SA = Station Area
Land Use Scenario 1 = 100% of employment in ACs, 100% of household CRAs
Land Use Scenario 2 = 67% of employment in ACs, 33% of employment in CRAs
33% of households in ACs, 67% of employment in CRAs
Land Use Scenario 3 = 100% of employment and households in SAs

Table 8 – Evaluation of Preliminary Value Network with Land Use Scenarios

	Original	Scenario 1	Scenario 2	Scenario 3
Total Capital Cost ($B)	$10.9			
Annualized Capital Cost ($M)	$809			
Annual O&M Cost ($M)	$99			
Total Annual Cost ($M)	$907			
Annual Passenger Trips (M)	40.3	63.7	62.5	65.1
O&M Cost Per Trip	$2.46	$1.56	$1.59	$1.53
Total Annual Cost Per Trip	$22.52	$14.26	$14.52	$13.94
Annual Fare Revenue ($M)	$22.3	$35.5	$34.9	$35.8
Farebox Recovery	23%	36%	35%	36%
Operating Subsidy Per Trip	$1.60	$0.82	$0.84	$0.79

AC = Activity Center, CRA = Community Redevelopment Area, SA = Station Area
Land Use Scenario 1 = 100% of employment in ACs, 100% of household CRAs
Land Use Scenario 2 = 67% of employment in ACs, 33% of employment in CRAs
33% of households in ACs, 67% of employment in CRAs
Land Use Scenario 3 = 100% of employment and households in SAs