



**Department of Transportation and Public Works  
(DTPW)**

**SOUTH CORRIDOR RAPID TRANSIT PROJECT  
*PROJECT ADVISORY  
GROUP MEETING #4***

June 25, 2018

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1. **Welcome and Introductions**
2. **Alternative Workshop Results**
3. **Alternative Evaluation Matrix Update**
  - STOPS Ridership Estimates
  - Traffic Impact Analysis
  - Noise & Vibration Analysis
  - Cost Estimate
  - Bus Feeder Network
4. **Preliminary Federal Transit Administration Project Justification Criteria**
5. **Recommended Alternative/Next Steps**
6. **Discussion**



# Alternative Workshop Results



## Survey Questions

### 1. Station Design

#### - Overall Results

- 44% in no response
- 35% in favor of Honeycomb Vault Design

				
1	Do you have preferences/comments suggestions on our Station Designs ?	Enclosed Center Platform Design	Honeycomb Vault Design	No Response
	Palmetto Bay Golf Course (05-22-18)	6 27%	7 32%	9 41%
	Florida City Council Chamber (05-23-18)	4 40%	5 50%	1 10%
	Southland Mall (05-24-18)	7 14%	16 33%	26 53%
<b>Total Results</b>		<b>17 21%</b>	<b>28 35%</b>	<b>36 44%</b>

### 2. Alternative Mode

#### - Overall Results

- 55 % in favor of Heavy Rail Transit / Metrorail at-grade (HRT)

					
2	Do you have preferences/comments suggestions on alternatives ?	Bus Rapid Transit Service (BRT)	Heavy Rail Transit (HRT) / Metrorail	Connected Autonomous Vehicles (CAV)	No Response
	Palmetto Bay Golf Course (05-22-18)	8 38%	7 33%	0 0%	6 29%
	Florida City Council Chamber (05-23-18)	4 40%	4 40%	1 10%	1 10%
	Southland Mall (05-24-18)	11 25%	30 68%	0 0%	3 7%
<b>Total Results</b>		<b>23 31%</b>	<b>41 55%</b>	<b>1 1%</b>	<b>10 13%</b>

# Stations – Original/Proposed Relocations



- Dadeland South (existing Metrorail Station)
  - SW 104<sup>th</sup> St. 
  - SW 136<sup>th</sup> St. (Howard Dr. / The Falls Mall)
  - SW 152<sup>nd</sup> St. (Coral Reef Dr.)
  - SW 168<sup>th</sup> St. (Richmond Dr.) 
  - SW 184<sup>th</sup> St. (Eureka Dr.)
  - Marlin Road
  - SW 200<sup>th</sup> St. (Caribbean Blvd.)
  - SW 112<sup>th</sup> Ave. (Allapattah Rd. / Target Lot)
  - SW 244<sup>th</sup> St.
  - SW 264<sup>th</sup> St. (Bauer Dr.)
  - SW 296<sup>th</sup> St.
  - SW 312<sup>th</sup> St. (Campbell Dr.)
  - NE 2<sup>nd</sup> St. (Homestead City Hall) 
  - SW 344<sup>th</sup> St. (Palm Dr.)
- *SW 112<sup>th</sup> St. – SW 117<sup>th</sup> St.  
Requested by Pinecrest*
  - *Hibiscus St. / Franjo Triangle  
Requested by Palmetto Bay*
  - *SW 177<sup>th</sup> Ave. / Krome Ave.  
Requested by Homestead*

# Updated Transit Modes Comparison



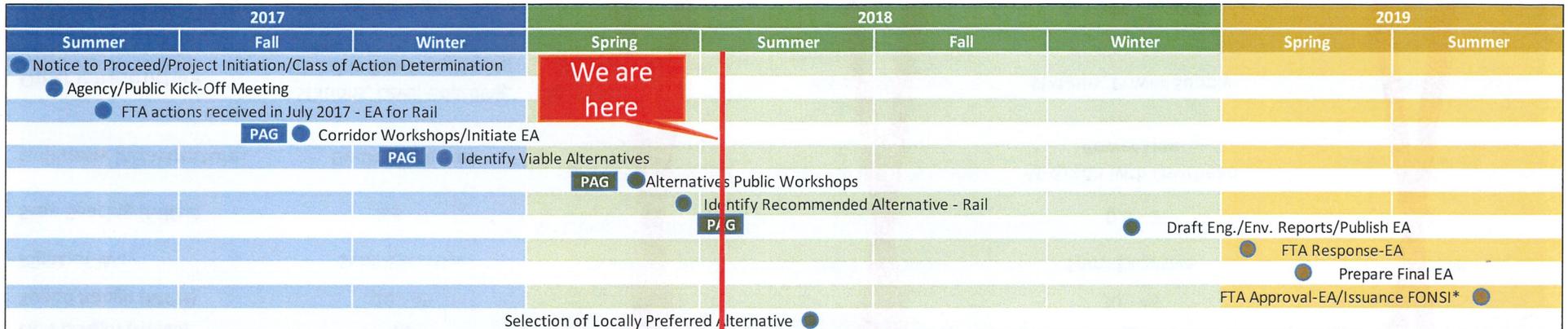
Alternative	1	2	3	4	5
<b>Name</b>	Rapid Transit Service (RTS)	Connected Autonomous Vehicles (CAV)	Light Rail Transit (LRT)	Heavy Rail Transit (HRT / Metrorail) At Grade*	to Build
<b>Project Development Duration (Years)</b>	2 - 3	3 - 4	4 - 6	8 - 10	NA
<b>Service Frequency</b>	5 - 10 Minute Peak / 15 Minute Off-Peak	On Demand	10 Minute Peak / 15 Minute Off-Peak	9 Minute Peak / 12 - 15 Minute Off-Peak	5 - 10 Minute Peak / 15 Minute Off-Peak
<b>Line Length (Miles)</b>	20	10	10	20	10
<b>Speed Range (MPH)</b>	20 - 45	30	30 - 45	30 - 45	20 - 45
<b>Right-of-Way</b>	Semi-Exclusive	Share Lanes	Semi-Exclusive	Semi-Exclusive	Semi-Exclusive
<b>Stop Spacing (Miles)</b>	0.5 - 2	On Demand with Express Service	0.5 - 2	0.5 - 2	0.5 - 2
<b>Guideway Infrastructure</b>	Dedicated Lanes	Smart Roadway and Infrastructure	At-Grade with Overhead Power Line	At-Grade with Overhead Power Line	Dedicated Lanes
<b>Other Infrastructure</b>	Stations, Level Boarding, Durable Roadway Paving	High Number of Vehicles, ITS, Boarding Zones	Stations, Power Generation and Maintenance Facility	Stations, Power Supply	Existing
<b>Preliminary Total Capital Cost (Millions)</b>	\$ 250 - 300	\$ 500 - 600	\$ 1,000 - 1,300	\$ 1,300 - 1,500	NA
<b>Operating Cost (per Revenue Hour)</b>	\$ 100 - 150	Variable	\$ 180 - 200	\$ 230 - 270	\$ 100 - 150
<b>Passenger Capacity (per train)</b>	100 - 300	Variable	250 - 300	450 - 600	60 - 100

\* Elevated Heavy Rail Transit (HRT / Metrorail) was not reevaluated due to the cost feasibility of the alternative.

# Project Schedule HRT vs. BRT

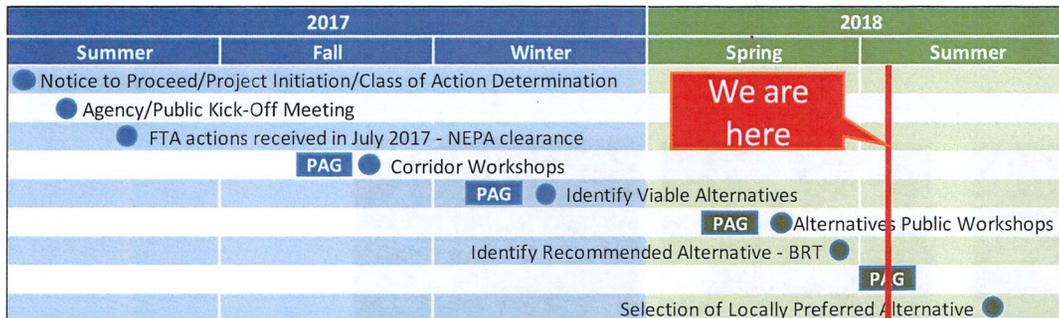


## Typical Schedule Rail<sup>1</sup>



<sup>1</sup>DTPW has received EA Class of Action determination for Rail

## Typical Schedule BRT<sup>2</sup>



<sup>2</sup>DTPW has received NEPA clearance from FTA for BRT

# Ridership Results



New/Small Start Metrics	BRT	HRT
<b>Horizon Year 2040 Forecasts</b>		
<b>Total Project Trips</b>	23-25,000	36-40,000
<b>New Transit Trips</b>	7-11,000	16-22,000
<b>Vehicle Miles Traveled (VMT) Reduction</b>	160-175,000	260-290,000

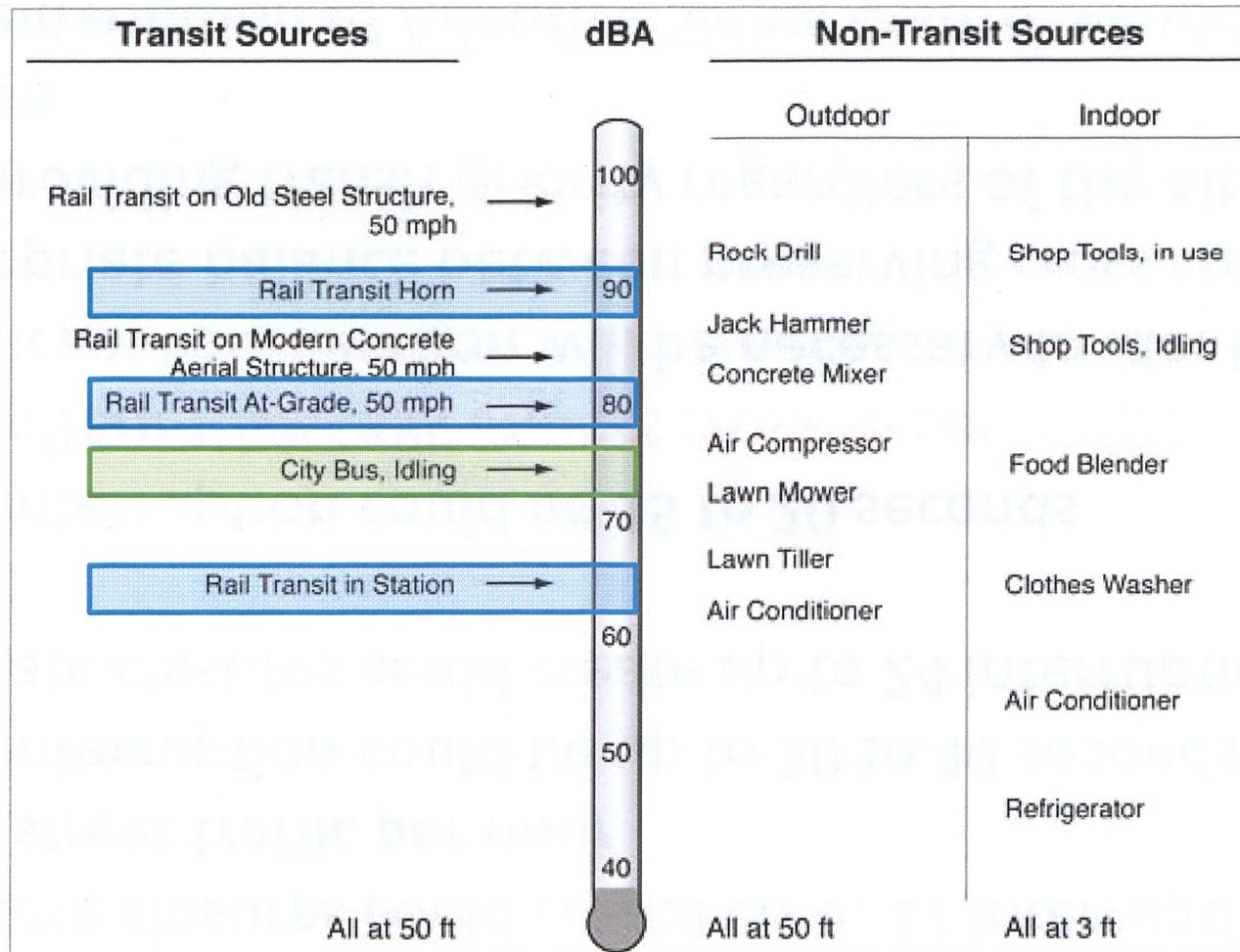
# Ridership Results



- **HRT does perform better than BRT**
- **This is primarily due to no transfer at Dadeland South, better visibility and higher capacity vehicles**
- **BRT has a more robust operating plan that provides better headways than HRT in segments**
- **Investment needed for Heavy Rail vs. Bus Rapid Transit is not justified by the ridership gains**

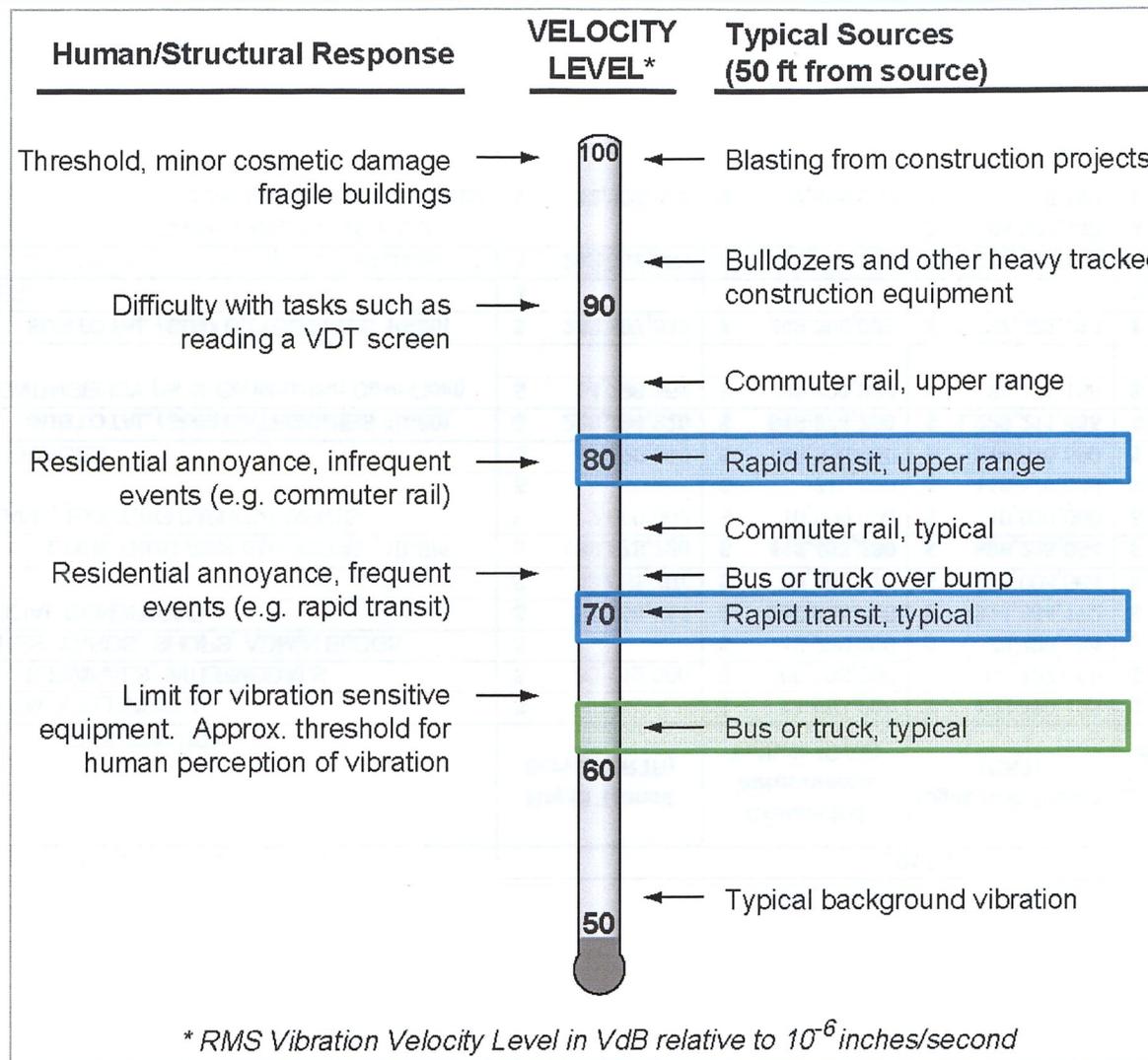
- HRT gate closures could create up to 12 interruptions to cross street traffic per hour
- Each interruption could be up to 30 to 40 seconds
- BRT gate closures could create up to 24 interruptions per hour
- Each interruption could be 15 to 20 seconds
- ***Both alternatives will impact cross street traffic***
- Significant coordination will be necessary to identify the appropriate balance between preserving cross street flows and providing transit priority regardless of the alternative chosen
- Implementation of Adaptive Signal Control would potentially minimize the cross street impacts

# Noise Analysis



Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06 [May 2006]

# Vibration Analysis



Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06* [May 2006]

# Updated Transit Modes Cost Estimates



*Preliminary Estimate*

FTA CATEGORY No.	DESCRIPTION	2017				2018
		Rapid Transit Service (RTS)	Connected Autonomous Vehicle (CAV)	Light Rail Transit (LRT)	Heavy Rail Transit / Metrorail at Grade (HRT)	Heavy Rail Transit / Metrorail Elevated (HRT)
10	GUIDEWAY AND TRACK ELEMENTS	\$ -	\$ 11,653,200	\$ 152,410,135	\$ 146,006,667	\$ 1,050,375,121
20	STATIONS, STOPS, TERMINALS, INTERMODALS	\$ 85,112,300	\$ 60,698,300	\$ 62,127,000	\$ 192,192,000	\$ 146,510,000
30	SUPPORT FACILITIES: YARDS, SHOPS, ADMIN BLDGS	\$ -	\$ 18,200,000	\$ 78,795,184	\$ 3,883,022	\$ 79,127,422
40	SITWORK & SPECIAL CONDITIONS	\$ 57,704,719	\$ 262,685,756	\$ 314,884,172	\$ 269,883,206	\$ 384,540,847
50	SYSTEMS	\$ 43,061,707	\$ 59,166,075	\$ 278,008,564	\$ 278,944,449	\$ 319,377,512
	<b>CONSTRUCTION SUBTOTAL (10-50)</b>	<b>\$ 185,878,726</b>	<b>\$ 412,403,330</b>	<b>\$ 886,225,054</b>	<b>\$ 890,909,344</b>	<b>\$ 1,979,930,902</b>
60	RIGHT-OF-WAY, LAND, EXISTING IMPROVEMENTS	\$ 2,000,000	\$ 10,000,000	\$ 10,000,000	\$ 10,000,000	\$ 10,000,000
70	VEHICLES	\$ -	\$ 715,000	\$ 118,170,000	\$ 146,379,200	\$ 136,875,200
80	PROFESSIONAL SERVICES	\$ 40,420,500	\$ 93,556,400	\$ 214,816,580	\$ 215,946,215	\$ 478,567,952
	<b>SUBTOTAL (SUM CATEGORIES 10-80)</b>	<b>\$ 228,299,226</b>	<b>\$ 516,674,730</b>	<b>\$ 1,229,211,635</b>	<b>\$ 1,263,234,759</b>	<b>\$ 2,605,374,054</b>
90	UNALLOCATED CONTINGENCY (% of Construction Base Cost)	\$ 14,298,364	\$ 31,723,333	\$ 68,171,158	\$ 68,531,488	\$ 152,302,377
	<b>SUBTOTAL (SUM CATEGORIES 10-90)</b>	<b>\$ 242,597,589</b>	<b>\$ 548,398,063</b>	<b>\$ 1,297,382,793</b>	<b>\$ 1,331,766,247</b>	<b>\$ 2,757,676,431</b>
100	FINANCE CHARGES	\$ -	\$ -	\$ -	\$ -	\$ -
	<b>TOTAL</b>	<b>\$ 242,597,589</b>	<b>\$ 548,398,063</b>	<b>\$ 1,297,382,793</b>	<b>\$ 1,331,766,247</b>	<b>\$ 2,757,676,431</b>
	Cost per Mile Including Vehicles:		-	\$ 64,869,140	\$ 58,537,456	\$ 137,883,822
	Cost per Mile Excluding Vehicles:	\$ 12,129,879	\$ 27,419,903	\$ 58,369,790	\$ 52,237,101	-



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12

# Preliminary Feeder Bus Network



Transitway Stations	Local Service (All-Stops)	BRT - Limited Stops	BRT-North Xpress	BRT-Mid Xpress	RTS-South Xpress	Circulator Service Area
Dadeland South	Stop	Stop	Stop	Stop	Stop	
SW 104 St	Stop	Stop	Stop			Circulator #1 - Killian
SW 112 St (Killian Dr)	Stop					
SW 120 St (Montgomery Dr)	Stop					
SW 124 St (Champman Field Dr)	Stop					Circulator #2 - The Falls
SW 128 St	Stop					
SW 136 St (Howard Dr / The Falls Mall)	Stop	Stop	Stop			Circulator #3 - Coral Reef
SW 144 St (Mitchell Dr)	Stop					
SW 152 St (Coral Reef Dr)	Stop	Stop	Stop			
SW 160 St (Colonial Dr)	Stop					
SW 168 St (Richmond Dr)	Stop	Stop	Stop			Circulator #4 - Perrine/Palmetto Bay
SW 173 St (Banyan St)	Stop					
W Indigo St	Stop					
SW 184 St (Eureka Dr)	Stop	Stop		Stop		Circulator #5 - Eureka/Marlin
Marlin Rd	Stop	Stop		Stop		Circulator #6 - Southland Mall
SW 200 St (Caribbean Blvd)	Stop	Stop		Stop		
SW 112 Ave (Allapattah Rd / Southland Mall)	Stop	Stop		Stop		Circulator #7 - Goulds
SW 216 St	Stop					
SW 220 St (W Old Cutler Rd)	Stop					Circulator #8 - Princeton
SW 232 St (Silver Palm Dr) / SW 127 Ave	Stop					
SW 244 St (Coconut Palm Dr)	Stop	Stop			Stop	Circulator #9 - Naranja
SW 264 St (Bauer Dr)	Stop	Stop			Stop	
SW 272 St (Epmore Dr)	Stop					Circulator #10 - Modello
SW 280 St (Waldin Dr)	Stop					
SW 296 St	Stop	Stop				Circulator #11 - Homestead
SW 312 St (Campbell Dr)	Stop	Stop			Stop	
NE 2 Dr (Homestead City Hall)	Stop	Stop			Stop	
SW 324 St / SW 4 St	Stop					
SW 328 St / SW 8 St (Lucy St)	Stop					Circulator #12 - Florida City
SW 344 St(Palm Dr / Florida City)	Stop	Stop			Stop	

- Proposed 12 circulators feeding all 14 Transitway BRT Stations
- Headways / Wait-times: 10 min. Peak and 15 min. Off-Peak
- Span of Service: 6 AM to 9 PM
- Service Area: 2-mile radius of each Transitway BRT station served
- To work in conjunction with Municipal Circulators.

# Preliminary Feeder Bus Network Map



# Final Alternative Evaluation Matrix



Build Alternative	Ridership (STOPS)	Travel Time (minutes)	Environmental Impact					COST			Non-Federal Funding Required (in millions) <sup>2</sup>	Time needed to build and begin service in years	Is a transfer required to Downtown Miami ?		
			Traffic	Noise Vibration	Contamination	Bridge Replacement	Right of Way <sup>1</sup>	Capital Cost (in millions)	Operations & Maintenance (in millions)	Life Cycle Costs					
<p><b>NO BUILD</b> Make no improvements</p>	Dadeland South to Florida City	○	○	○	○	○	○	○	○	\$0	\$0	TBD	N/A	0 years	Yes
<p><b>Dual Mode - Metrorail Extension (HRT)</b> Extend existing Metrorail running at ground level</p>	Dadeland South to Florida City	●	○	○	○	○	○	○	\$1,300 to \$1,500	\$80 to \$100	TBD	\$780 to \$900	8 to 10 years	No	
<p><b>Bus Rapid Transit (BRT)</b> running on the existing Transitway at ground level</p>	Dadeland South to Florida City	●	○	○	○	○	○	○	\$250 to \$300	\$20 to \$25	TBD	\$150 to \$200	2 to 3 years	Yes	
<p><b>Connected and Autonomous Vehicles (CAV)</b> running on the existing Transitway at ground level</p>	Dadeland South to Florida City	○	○	○	○	○	○	○	\$500 to \$600	TBD	TBD	\$500 to \$600	3 to 4 years	TBD	

1. HRT Needs Light Maintenance Facility South of 344th Street

2. HRT assumes 40% Federal Share. BRT assumes \$100 M Federal Share. CAV assumes \$ 0 Federal Share.

Updated: 25-Jun-18

Legend	Positive Impacts	Negative Impacts
None	○	○
Low	○	○
Moderate	○	○
Moderate to High	○	○
High	●	●

# Current Federal Small Starts Opportunity



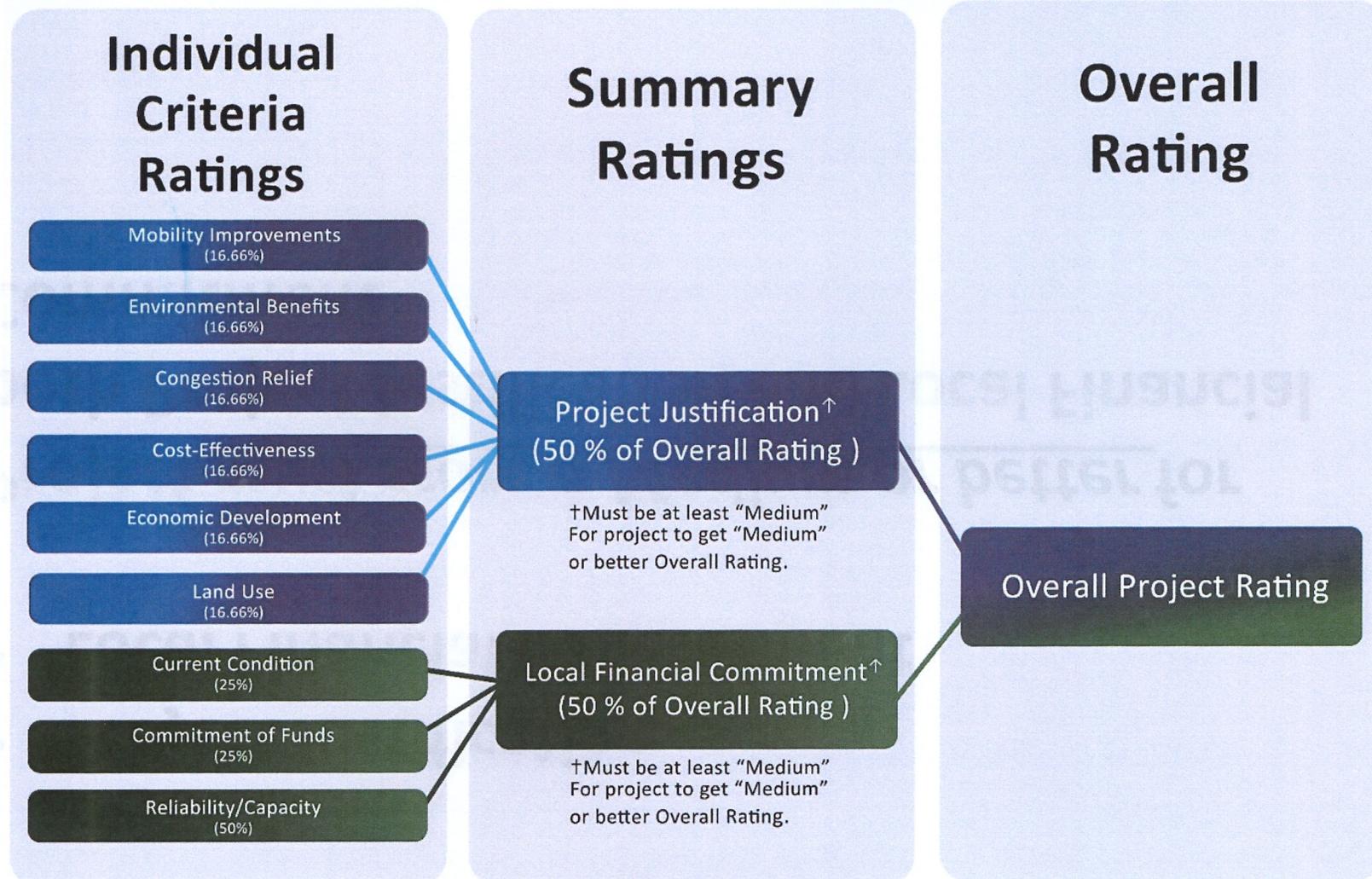
- **Small Starts program is geared toward faster delivery**
- **Project Cost under \$300 million, lower federal funding support.**
- **Opportunity to apply for federal funding in the coming Fiscal Year 2019/2020**
- **Project delivery/start of operations as early as 2 to 3 years**



- **Project Justification**
- **Local Financial Commitment**

**Project must score a Medium or better for both Project Justification and Local Financial Commitment**

# Project Justification Ratings



# Project Justification: Small Starts Criteria

## Mobility Improvements

16.66%

- Total linked trips on the proposed project, with a weight of two given to trips made by transit dependent persons

## Environmental Benefits

16.66%

- Dollar value of the anticipated direct and indirect benefits to human health, safety, energy, and the air quality environment scaled by the annualized federal share of the project (computed based on the change in vehicle miles travelled resulting from implementation of the proposed project)

## Congestion Relief

16.66%

- New transit trips resulting from implementation of the project

## Cost-Effectiveness

16.66%

- Annualized capital federal share of the project per trip on the project

## Economic Development

16.66%

- Transit supportive plans and policies
- Demonstrated performance of plans and policies
- Policies and tools in place to preserve or increase the amount of affordable housing

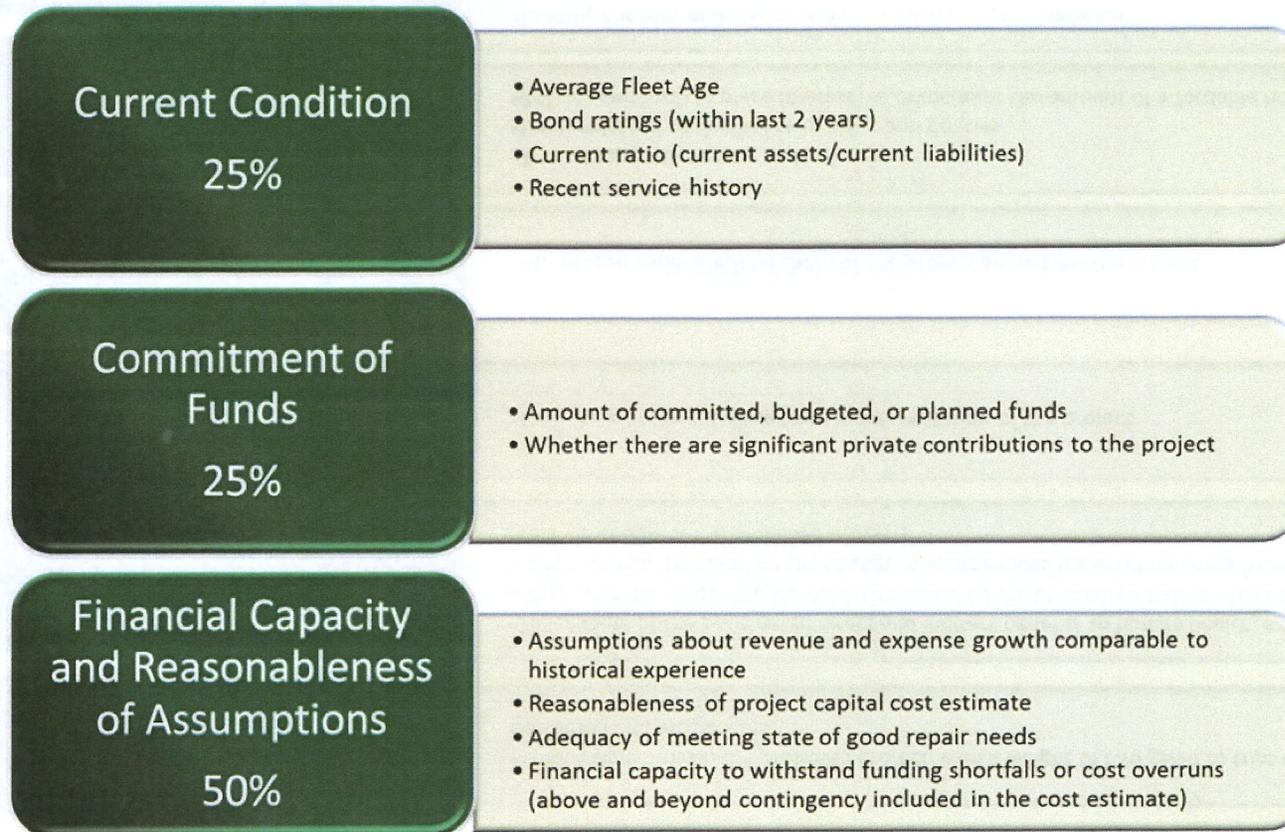
## Land Use

16.66%

- Existing corridor and station area development and character
- Existing station area pedestrian facilities, including access for persons with disabilities
- Existing corridor and station area parking supply
- Proportion of existing "legally binding affordability restricted" housing within ½ mile of station areas to the proportion of "legally binding affordability restricted" housing in the counties through which the project travels



# Project Justification: Local Financial Commitment



# Project Justification Ratings



- The project justification criteria are weighted equally. Each criterion is rated on a five-point scale from Low (1) to High (5).
- Projects must score a minimum of 15 (out of 30 maximum) points to achieve a Medium rating.

## Project Justification Criteria

- Mobility Improvements
- Cost Effectiveness
- Congestion Relief
- Environmental Benefits
- Economic Development
- Land Use



# Preliminary FTA Criteria Ratings SMALL STARTS



BRT Project Justification Criteria	Value	Preliminary Rating	Score	
Mobility Improvements	8,250,000	Medium	3	
Congestion relief	9,300	Medium	3	
Cost effectiveness	Less than \$1	High	5	
Land Use	See below	Medium or Medium-Low	2	3
<b>Subtotal</b>			<b>13</b>	<b>14</b>

Mobility Improvement: estimated annual trips

Congestion Relief: New weekday linked transit trips

Cost Effectiveness:  $(\text{Capital} + \text{O\&M Costs}) / (\text{Annual trips on project})$

Land Use: Various



# Preliminary FTA Criteria Ratings SMALL STARTS



BRT Land Use Criteria	Value	Preliminary Rating
Population Density	4,400	Medium-Low
Employment Served	39,500	Low
Affordable housing	3.18	High
Parking supply	Professional Judgement	Low
Pedestrian environment	Professional Judgement/review of aerial photos	Medium-Low

## Preliminary Small Starts Ratings for 4 of 6 Project Justification criteria (15 points need to qualify for funding):

- Mobility Improvements 3
  - Cost Effectiveness 5
  - Congestion Relief 3
  - Land Use 2 or 3
- Subtotal available data 13 or 14**

## Remaining Criteria (minimum possible score 1):

- Environmental Benefits 1 (assumes minimum)
- Economic Development 1 (assumes minimum)

## Project Justification Rating 15 or 16 = Medium

BRT Project - Project Justification rating qualifies for Small Starts funding, if Project capital cost can be kept below \$300 million

# Preliminary FTA Criteria Ratings NEW STARTS



HRT Project Justification Criteria	Value	Preliminary Rating	Score
Mobility Improvements	13,000,000	Medium	3
Congestion relief	15,100	Medium-High	4
Cost effectiveness	\$12-\$14	Medium-Low	2
Land Use	See below	Medium-High	4
<b>Subtotal</b>			<b>13</b>

Mobility Improvement: estimated annual trips

Congestion Relief: New weekday linked transit trips

Cost Effectiveness:  $(\text{Capital} + \text{O\&M Costs}) / (\text{Annual trips on project})$

Land Use: Various

## Preliminary Small Starts Ratings for 4 of 6 Project Justification criteria (15 points need to qualify for funding):

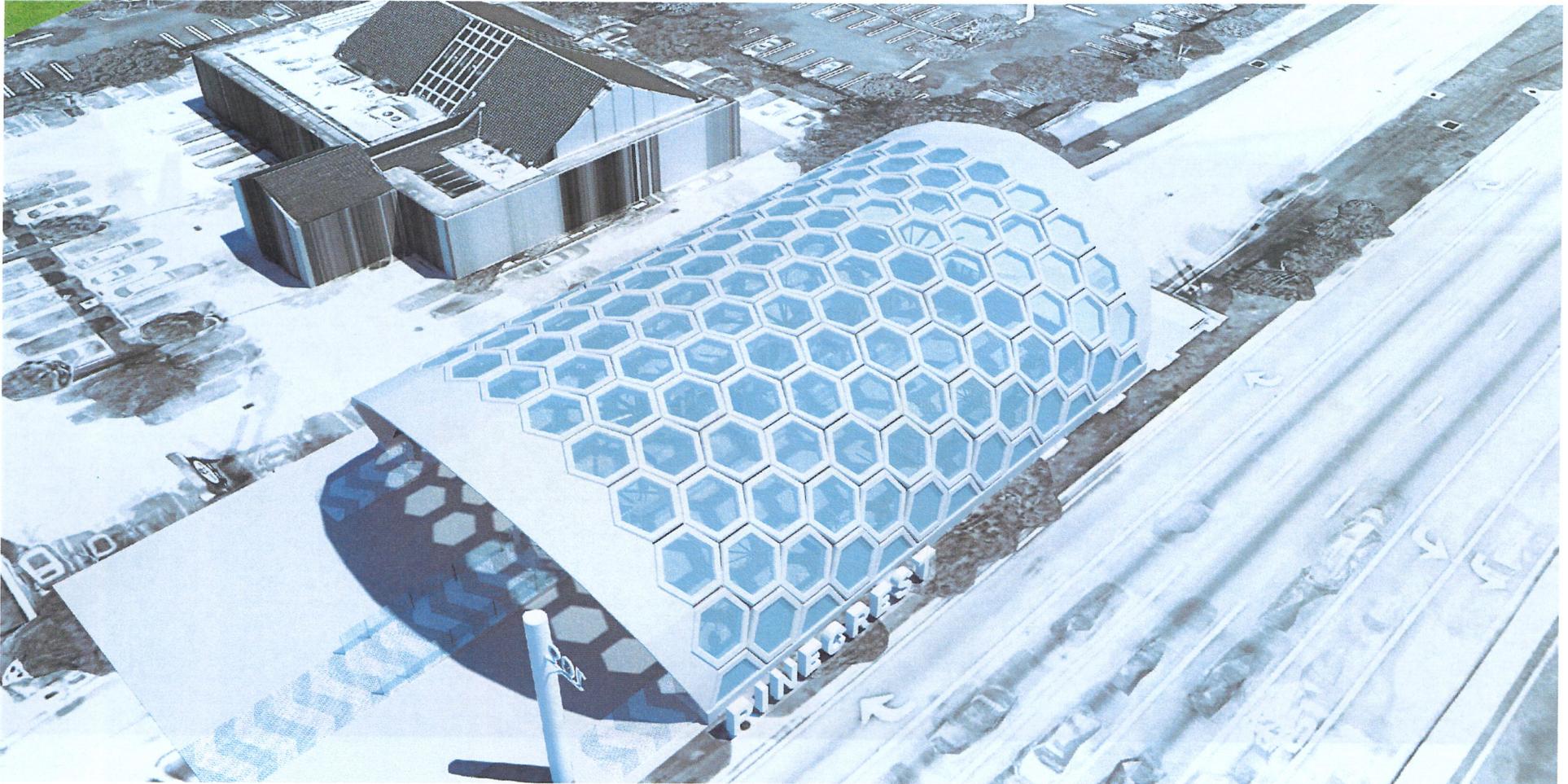
• Mobility Improvements	3
• Cost Effectiveness	2
• Congestion Relief	4
• Land Use	<u>4</u>
<b>Subtotal available data</b>	<b>13</b>

## Remaining Criteria (minimum possible score 1):

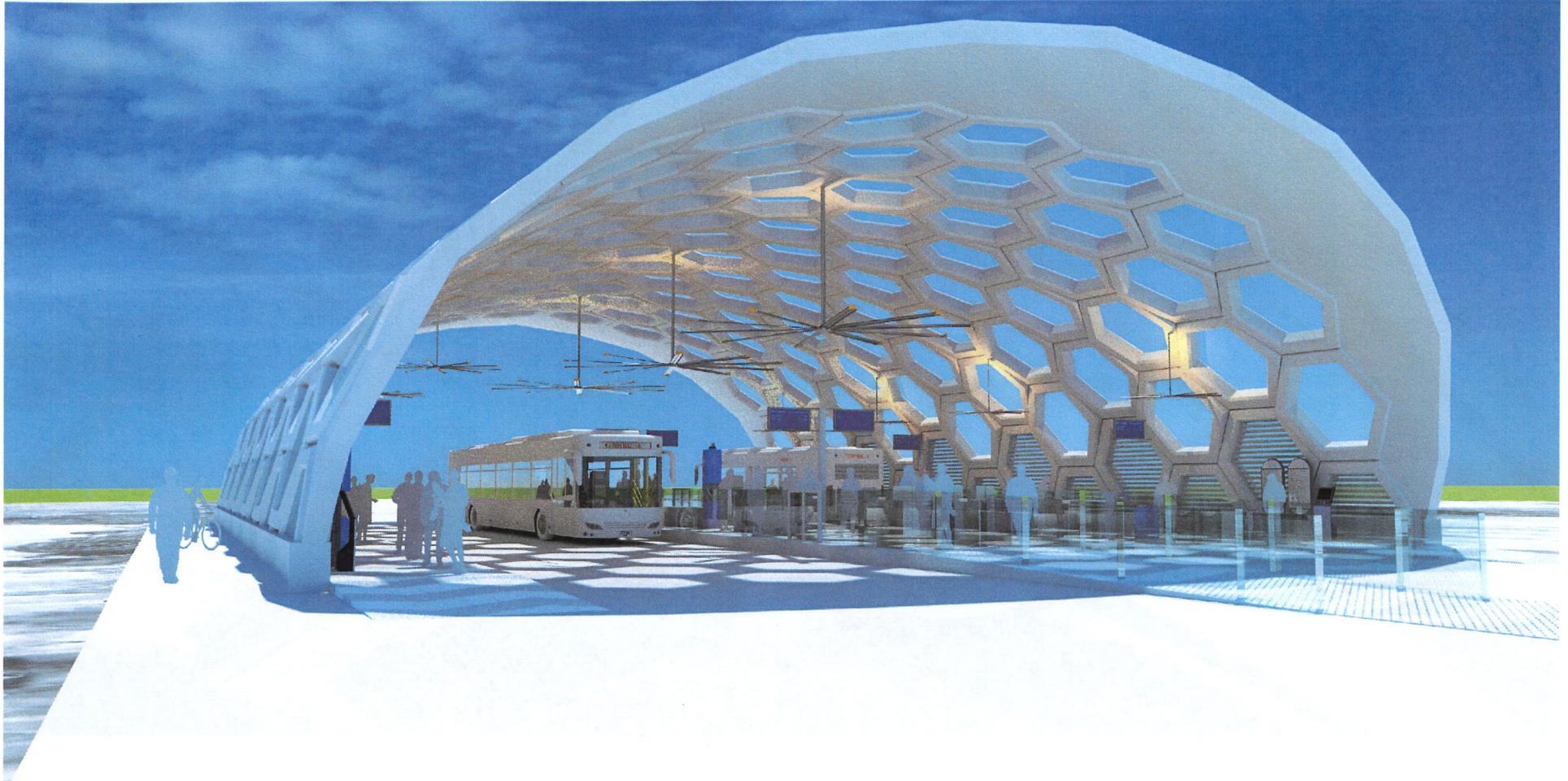
- Environmental Benefits 1 (assumes minimum)
- Economic Development 1 (assumes minimum)

**Project Justification Rating 15 = Medium**

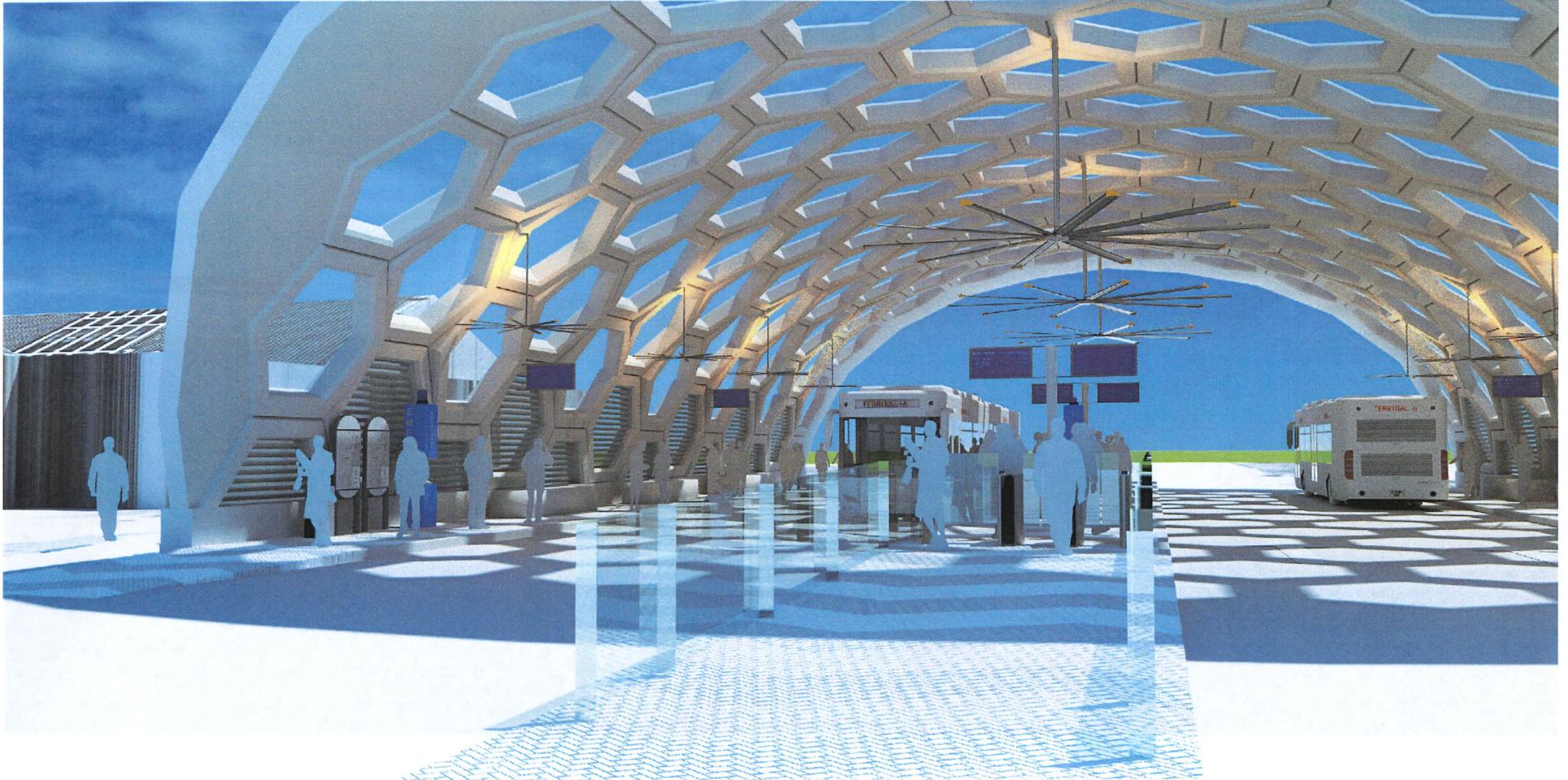
# Updated Station Designs



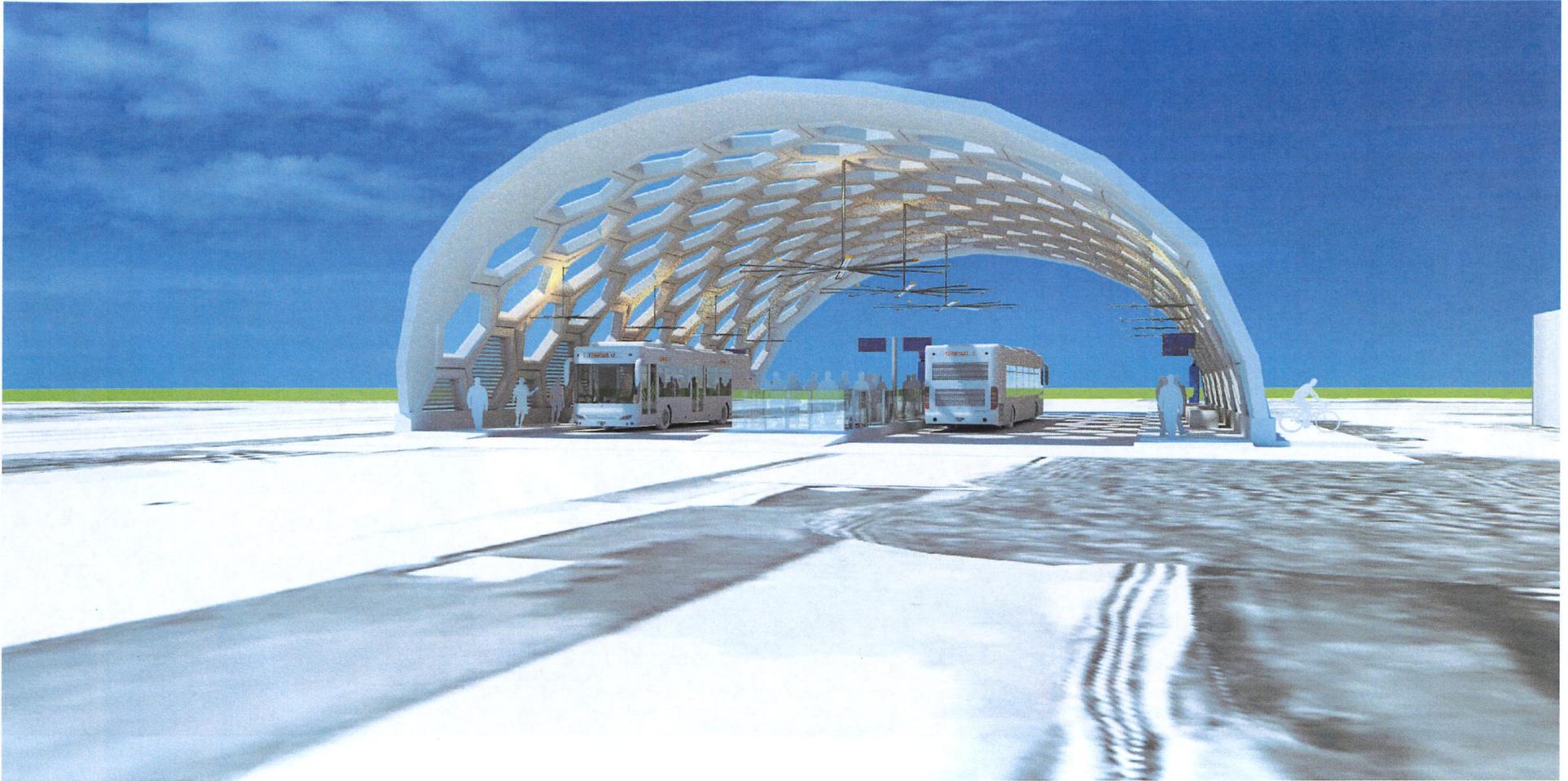
# Updated Station Designs cont.



# Updated Station Designs cont.



# Updated Station Designs cont.



# Recommended Alternative

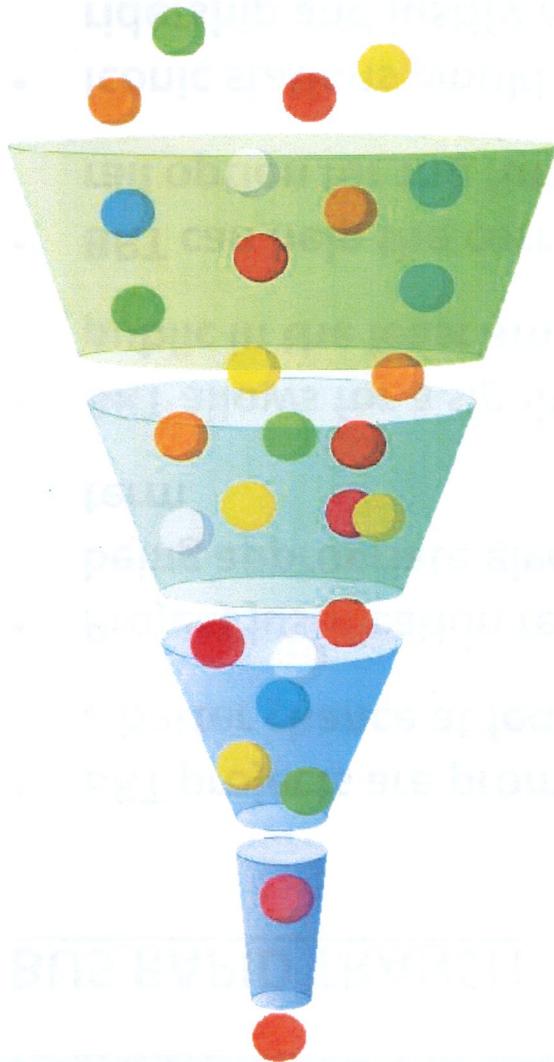


## BUS RAPID TRANSIT

- BRT projects are promoted nationally by the FTA giving the BRT alternative a better chance at federal funding
- Project justification results point toward a moderate level of investment as being appropriate given the County's limited ability to pay for O&M long term
- BRT allows for a significant operational improvement benefiting the riding public in the least amount of time
- BRT can help the corridor develop increased ridership while preserving a rail option for the future
- Iconic stations would support economic development to further bolster ridership and justify future expansion



# Selecting the Locally Preferred Alternative (LPA)



## Purpose and Need

- Identify the need for transit investment
- Determine project goals and objectives
- Define evaluation criteria

## Tier 1 Definition and Evaluation: Qualitative

- Identify the universe of alternatives
- Qualitative evaluation to determine feasibility

## Tier 2 Definition and Evaluation: Quantitative

- Define the remaining alternatives in detail:
  - Develop operating plan
  - Generate ridership forecast
  - Estimate capital and O&M costs
- Evaluate the alternatives in detail

## Selection of Locally Preferred Alternative (LPA) July 19, 2018

# Next Steps

1. Finalize Technical Reports and Complete Presentations
2. Present Recommendation to TPO Board on *July 19, 2018*
3. If LPA is BRT then submit Project Development Application:  
*September 2018*
4. If LPA is HRT then complete Environmental Assessment:  
*September 2019*



# Project Team



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