Multi-Modal Corridor Considerations

To create a successful, long-term multi-modal rail corridor, planners must consider:

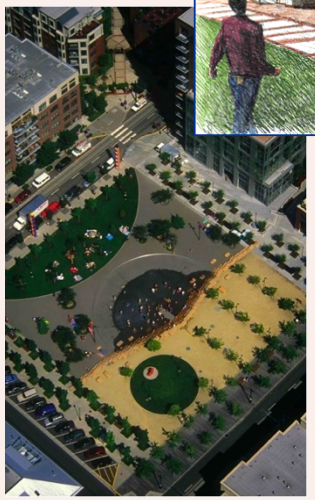
- The width of the available rail right-of-way (ROW), particularly in Segment 2
- The need to preserve adequate space within the ROW to accommodate current and future operational, maintenance and security
- Where the rail corridor width is not sufficient or privately owned, any bike/pedestrian facilities would need to be located outside the ROW
- A separate bike/pedestrian bridge over the Little Miami River

Station Area Development Opportunities

Rail stations can help create attractive development patterns frequently referred to as Transit Oriented Developments (TODs).

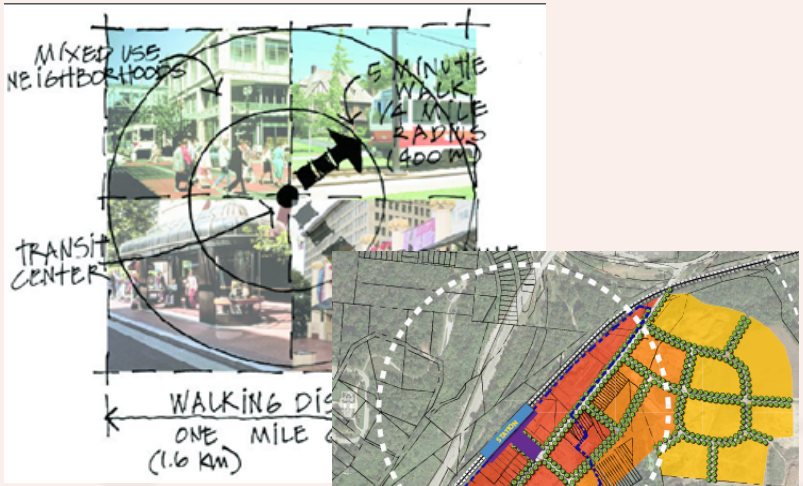
TODs are compact, mixed-used community spaces that integrate housing, office, retail, entertainment and/or other amenities into walking neighborhoods. TODs:

- **Reinforce** traditional neighborhoods
- **Revitalize** by-passed properties and can increase their value
- **Redefine** development patterns by focusing growth along corridors served by transit
- **Expands mobility choices** beyond travel by automobile and supports bicycling and walking



Oasis Station Area Planning

Station area planning has been initiated for several potential station location options. These plans consider:



- **Defined centers** around which the community can continue to grow and thrive
- **Compact, walkable areas** supporting a diverse mix of uses, including residential, retail and commercial
- Civic and/or **public spaces** for increased interaction
- Areas for **pedestrian and bicycle use**
- A **connected** neighborhood street and sidewalk network
- **Opportunities** for increased transit ridership

Oasis Rail Vehicle Considerations

When evaluating rail vehicle types to use on the Oasis line, planners looked for trains that are:

- Appropriate for:
  - Regional service
  - Oasis station spacing
  - Oasis ridership projections
- Able to share existing freight tracks
- Able to be used as a single car or multiple car train
- Efficient at variable speeds
- Have an on board power source
- Cost-effective, proven
- Comfortable, quiet, attractive

Diesel Multiple Unit (DMU) Technology

Planners identified modern, low-emission Diesel Multiple Unit (DMU) rail vehicles as the best option for Oasis Rail Transit. These vehicles:

- Are quiet, low-emission, neighborhood friendly
- Are comfortable, sleek, attractive
- Are self-propelled and efficient
- Can travel on existing tracks
- Have level boarding access to enhance vehicle access
- Don't require overhead electric lines or electrified tracks

DMUs are in service throughout North America

Types of DMUs

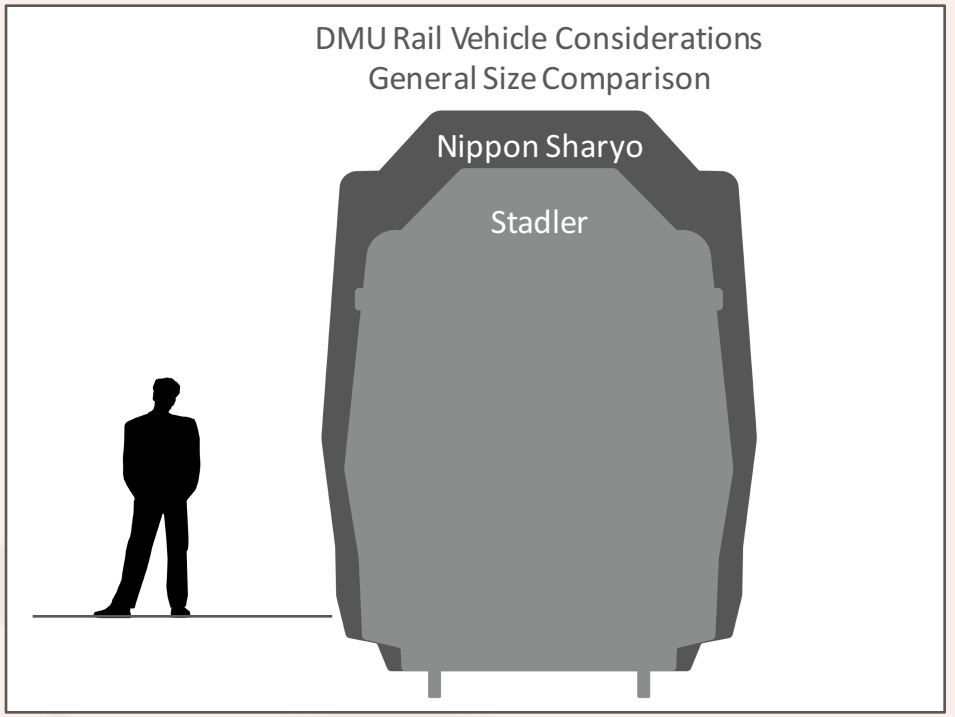
Two types of DMU trains are under consideration for the Oasis Rail Transit line:

Alternatively-Compliant vehicles

- These vehicles require a waiver from the Federal Rail Administration (FRA) in order to operate on tracks shared with freight trains
- The Stadler vehicle is an Alternatively Compliant train
- Stadler-type trains were identified as the preferred vehicle for the Oasis line

FRA-Compliant vehicles

- These vehicles are approved by the FRA to operate on tracks shared with freight trains
- The Nippon-Sharyo vehicle is an FRA-Compliant train



The above Stadler vehicle is an Alternatively-Compliant train

The above Nippon Sharyo vehicle is an FRA-Compliant train

Estimated Annual Operating Cost

Alternative	Service Summary (no. of trips)	Train Length (no. of cars)	Est. Annual Operating Cost*
Stadler-Type (Alternatively Compliant)	Peak Period: 6 in peak direction, 2 reverse	2	$8,900,000
	Off Peak Period: 3 round trips	2	
Nippon Sharyo-Type (FRA Compliant)	Peak Period: 6 in peak direction, 2 reverse direction	3, 4	$9,700,000
	Off Peak Period: 3 round trips	3	

**Annual Operating Cost estimates are based on providing basic service only.*

When estimating the annual operation costs for basic service, planners considered the use of the two different rail vehicles under review:

- Stadler-type vehicle: **requires an FTA waiver** to be able to operate on the same tracks used by freight traffic
- Nippon Sharyo-type vehicle: These FRA-Compliant vehicles **are already approved** to share the same tracks used by freight traffic

Estimated Capital Cost

	Shared Tracks Stadler-type Vehicle	Shared Tracks Nippon Sharyo-type Vehicle	Parallel Tracks Stadler-type Vehicle
Cost Category	**Cost Estimate**	**Cost Estimate**	**Cost Estimate**
Guideway and Track Elements	$49,800,000	$49,800,000	$71,600,000
Stations	$23,900,000	$28,900,000	$23,900,000
Maintenance Facility	$20,200,000	$20,200,000	$20,200,000
Sitework and Special Conditions	$8,900,000	$8,900,000	$15,300,000
Systems	$20,300,000	$20,300,000	$20,300,000
Right of Way / RR Agreements	$34,800,000	$34,800,000	$34,800,000
Vehicles	$77,000,000	$61,700,000	$77,000,000
Professional Services	$36,200,000	$36,200,000	$41,000,000
Unallocated Contingency	$17,200,000	$16,200,000	$19,500,000
Finance Charges	$1,500,000	$1,500,000	$2,000,000
TOTAL (Present Day, 2015)	**$289,800,000**	**$278,500,000**	**$325,600,000**
TOTAL (Year of Expenditure)*	**$340,000,000**	**$327,000,000**	**$382,000,000**

** For this analysis, the year of expenditure represents completion of construction in 2020*

Economic and Financial Analysis

The Benefit-Cost Analysis compares the monetized costs and benefits associated with a project.

A Benefit-Cost Ratio exceeding 1.0 indicates that overall project benefits exceed the costs.

The Benefit-Cost Ratio for the Oasis Rail Transit Project is 1.10 to 1.19.

Metrics ($ million)		Alternatives for Segments 3 and 4	
		Shared Track	Parallel Track
Total Benefits		$473.9	$475.3
Mobility	*Travel Time Improvements*	*$24.7*	
	Travel Cost Savings	*$133.4*	
	Transportation Reliability Improvements	*$9.6*	
Econ. Development	*Station Area Development*	*$212.8*	
Other	*Residual Value*	*$14.3*	*$15.7*
	Fare Revenue	*$41.0*	
Sustainability and Safety	*Safety Improvements*	*$34.3*	
	Reduced Environment Impact	*$3.8*	
Total Costs (Present Value)		($398.8)	($431.3)
Net Present Value		$75.1	$44.0
Payback Period		30 years	31 years
Benefit-Cost Ratio		1.19	1.10

Note: All benefits and costs are accumulated over 30 years and discounted at four percent annually. The values are in millions of 2015 U.S. dollars. The costs represent lifecycle costs discounted to present value. It includes both capital and Operations & Maintenance costs.

Economic/Financial Analysis Conclusions

Conclusions of the Economic and Financial Analysis include:

- **Using a shared track in Segments 3 and 4 will offer a greater return on investment due to lower construction costs**
- **The Oasis project is expected to:**
  - Earn $.10 to $.19 for every dollar invested
  - Generate over $473 million in accrued benefits over 30 years
- **Initial investments will be paid back within 30 years**
- **The Oasis line will create jobs**
  - Short-term: more than 2,200 new jobs expected over the four-year construction period
  - Long-term: 260 new jobs in region

Funding Options

Funding for the construction of public projects such as Oasis Rail Transit typically comes from a combination of federal, state, and local resources. Potential options include, but are not limited to:

Federal

- FTA Capital Investment Grant Program – FTA New Starts (up to 50% of capital costs)
- FTA Formula Funds
- FHWA Funds
  - Congestion Mitigation and Air Quality (CMAQ) Improvement Program
  - Surface Transportation Program (STP)
  - Transit Alternatives Program (TAP)
- U.S. Dept. of Transportation TIGER Grants

State

- State Departments of Transportation
- Grants to Transportation Improvement Districts (TIDs)

Local/Regional Area

- Value Capture at Station Areas
  - Special Assessment Districts
  - Tax Increment Districts
- Foundations/Local Business and Community Support
- Public Private Partnerships (P3s)
- Reallocation of Existing City, County, TID Resources
- New contributions from local jurisdictions

More information about possible funding options is available in the *Oasis Funding Analysis and Strategy Report, Feb. 9, 2016*, now posted on the Eastern Corridor website.

Oasis Next Steps

The overall assessment of Oasis Rail Transit options indicates that the project is worthy of advancing for more detailed analysis.

Federal Transit Administration (FTA) funding will be necessary to advance the project. In order to pursue this funding, the region must:

- Identify a project sponsor
- Secure funding to complete the FTA Project Development phase
- Prepare and submit an application to the FTA to enter the Project Development process

The FTA Project Development phase must be completed within a two-year timeframe. Starting complex Project Development activities prior to submitting an application would facilitate timely completion within FTA's schedule requirements.