



*leadrail*

excellence in-built

*Safer*

*Swifter*

*Better*

*Leadrail's mission is to make transport "Safer, Swifter & Better"*

*Presently several advanced, innovative and sophisticated technologies and solutions are available in Urban Transport Domain and at the same time traffic gridlocks are common in several cities, especially India. Thus there is a need to introspect and develop a solution which addresses the gap.*

*The Bie-Bus solution is a more of system development and is basically developed keeping Indian City conditions in view but can be altered to suit local conditions in other countries.*

# Value Engineering of Urban Transport Systems

- **VALUE** is the reliable performance that a product or process must do to make it work and satisfy – at the reasonable cost.

What is Value?  
The Value Equation

$$\text{Value} = \frac{\text{Function}}{\text{Cost}}$$

- **FUNCTION** is sometimes referred to as Performance, it is all those things which the product, or process must do to make it work and satisfy.
- **COST** is the expenditure of a resource, which may include time, money, people, energy and material.

# Present Urban Transport Solutions

- ❶ **Mass Rapid Transit Systems are Metro rails, Mono rails, LRTs & BRTS (PRTs, APMs are not considered as MRTS)**
- ❷ **Metro rails**
  - ❶ **Capital Cost per km: \$40-70mn**
  - ❷ **Capacity: 40000-60000 pphpd**
  - ❸ **High Cost & Less network density**
  - ❹ **Proven system and High density corridors**
- ❸ **Mono Rails**
  - ❶ **Capital Cost per km: \$20-30mn**
  - ❷ **Capacity: 10000-15000 pphpd**
  - ❸ **Safety Evacuation concerns**
  - ❹ **High unit (passenger-km) cost**



# Present Urban Transport Solutions

## 📍 Bus Rapid Transit System

- 📍 Capital Cost: \$ 4-5mn
- 📍 Non availability of ROW
- 📍 Lane Enforcement issue
- 📍 Single Lane Capacity: 3000-5000 pphpd



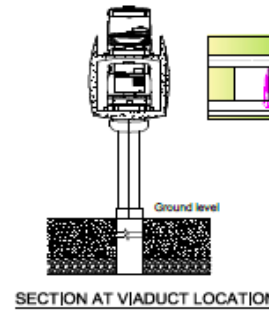
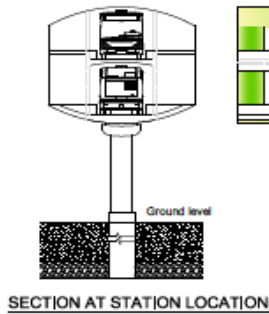
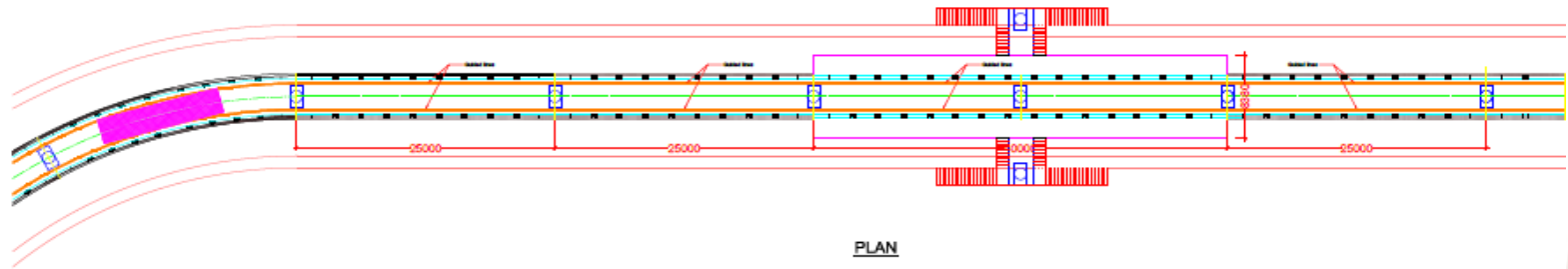
## 📍 Light Rail Transit

- 📍 Smooth Curves
- 📍 Smooth Grades
- 📍 Land Acquisition


## 📍 Need for novel solution: Safe, Affordable

## 📍 Bie-Bus: Bi-level Elevated Bus

# Novel Urban Transport: Bie Bus GAD

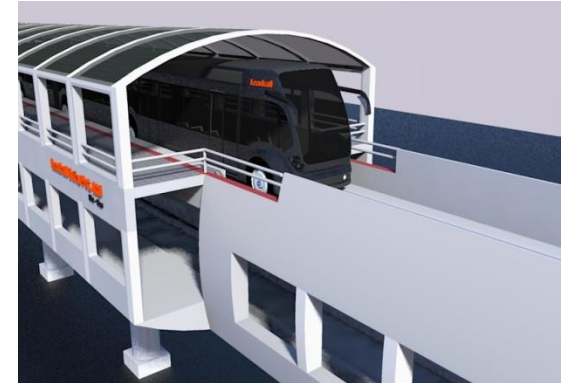


NOTE: ALL DIMENSIONS ARE IN MM

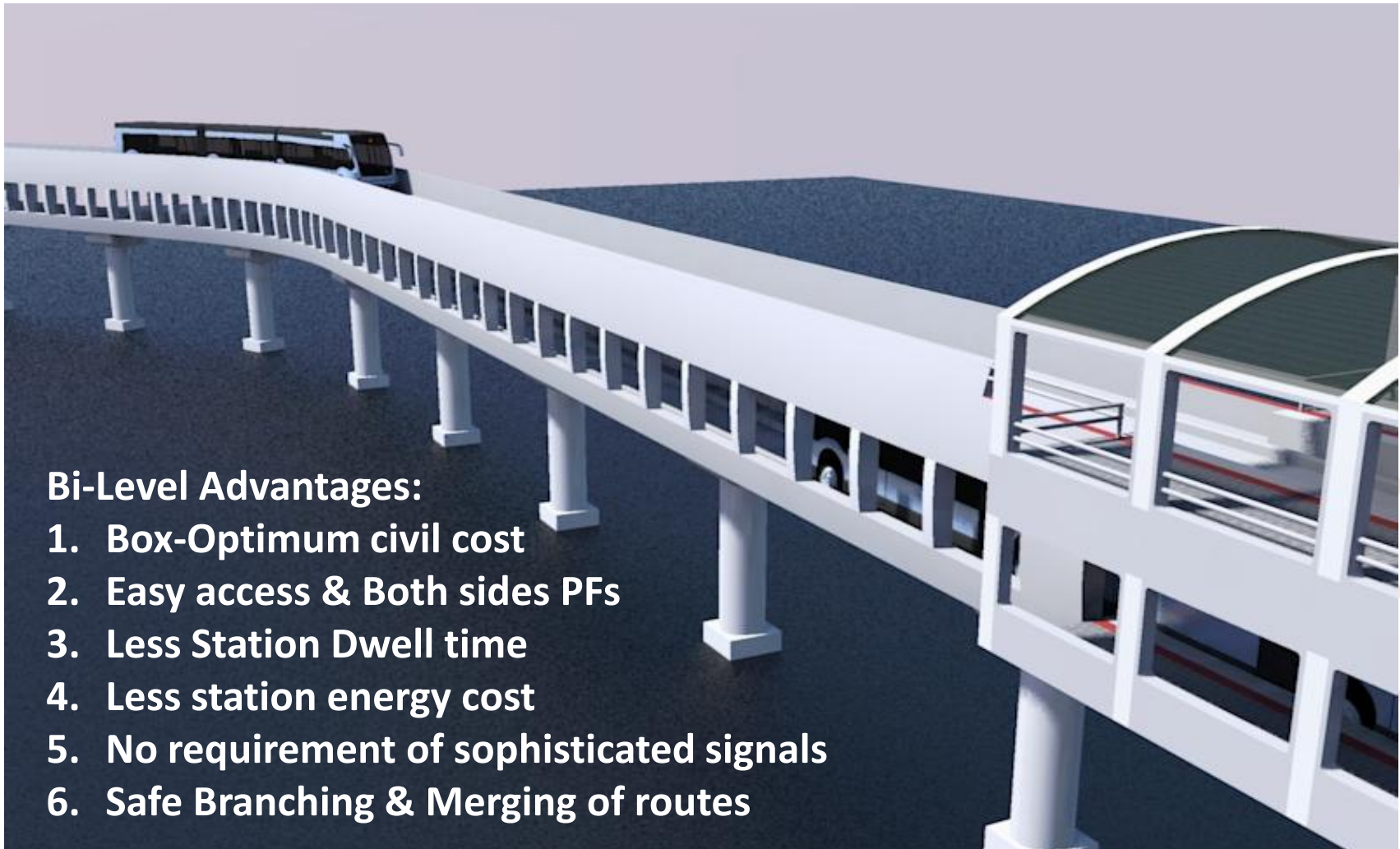
		LEADRAIL INFRA SOLUTIONS PVT LTD BANGALORE-560043 www.leadrail.com
PROJECT:	e - GBT	
TITLE:	GENERAL ARRANGEMENT DRAWING	
DRWG.NO.	AAE/Infra-GBT/001	
SCALE:	NOT TO SCALE	

# Urban Transport Solution: Bie Bus

- Elevated system on Roads
- Passes through the medians of cities
- Stations around 600 m interval
- Bi-level box superstructure
- Articulated Buses plying at two levels
  - Top Level – “TO” Direction
  - Bottom Level – “FROM” Direction
- Lateral maneuvering:
  - Mechanical Leads
  - Magnetic Deviation
- On Board Route Switching Mechanism



## Bie-Bus: Rendered View



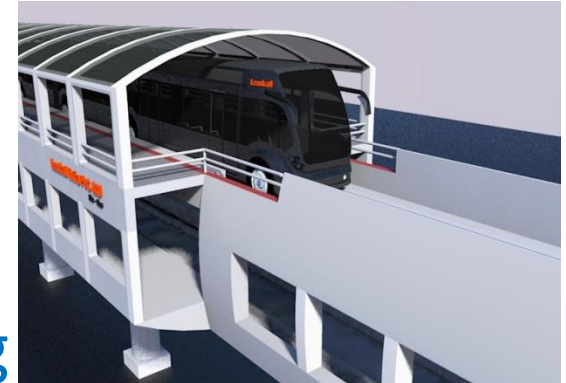
### **Bi-Level Advantages:**

- 1. Box-Optimum civil cost**
- 2. Easy access & Both sides PFs**
- 3. Less Station Dwell time**
- 4. Less station energy cost**
- 5. No requirement of sophisticated signals**
- 6. Safe Branching & Merging of routes**



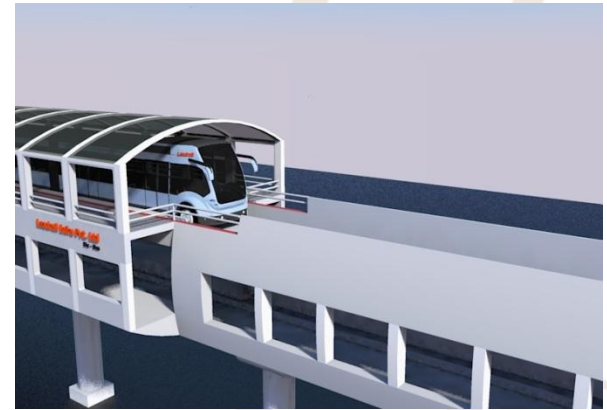
## Urban Transport Solution: Bie Bus

- Capital Cost: \$10-12 Million per km
- Capacity: 15000-18000 pphpd
- Operational speeds of 30-32 kmph
- Guided and Signal free. Self enforcing
- Robust technology and less control systems
- Pre-cast CWs & Quick Project Delivery (18 months)
- Less land acquisition (1.5 m of road median space)
- Sharp curves (40-45 m) & Steep Grades (10%)
- Wider coverage -> through narrow city roads



## Urban Transport Solution: Bie Bus

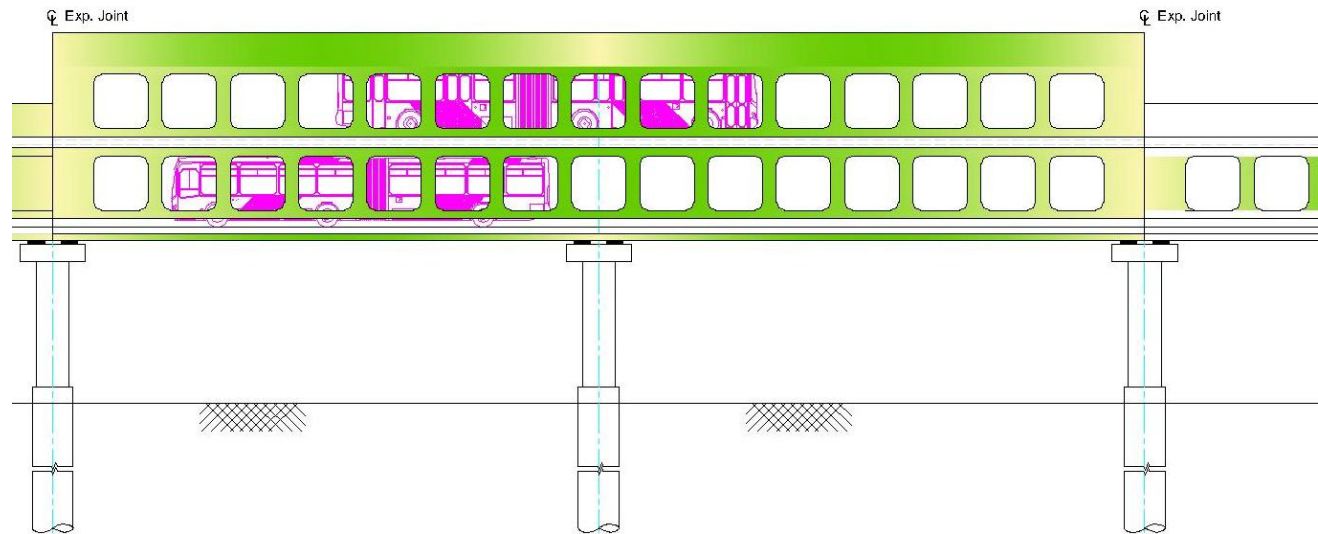
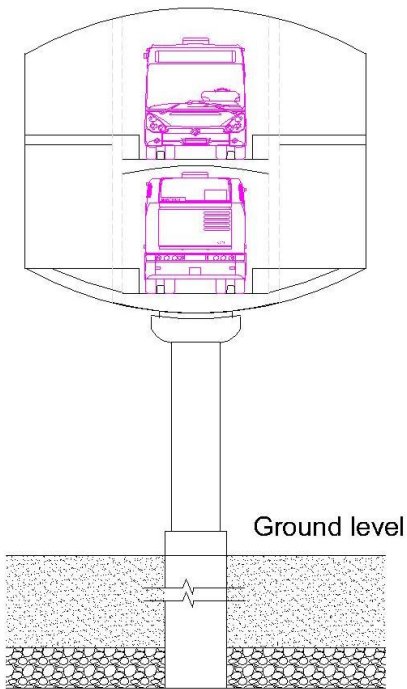
- ④ Platform level boarding and level floor (650 mm)
- ④ Both side Doors and Platforms
- ④ Less station dwell time (12 secs)
- ④ Highest safety features
  - ④ Redundancy Systems,
  - ④ Anti Rear Collision Sensors
- ④ Pre-ticketing and even smart cards
- ④ Real time information to passengers
- ④ Less noise pollution and vibration problems
- ④ Environment friendly buses like Hybrid or Electric vehicles (Option of overhead charging at stations)



## Bie-Bus: Aesthetics



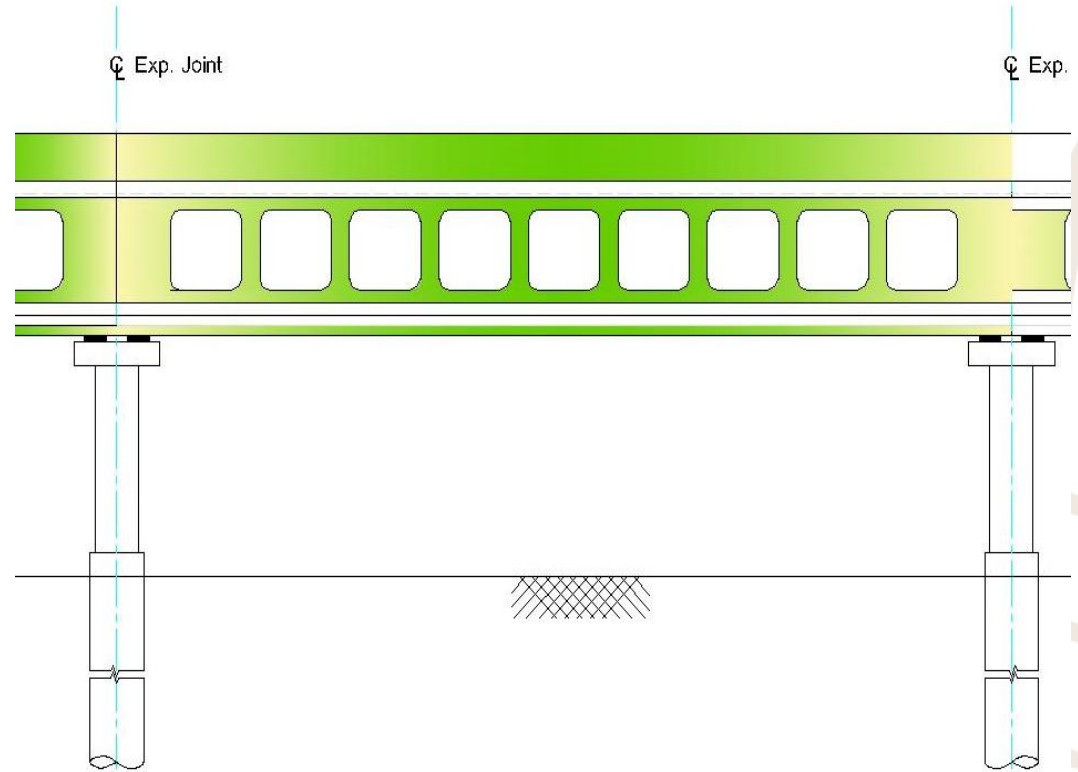
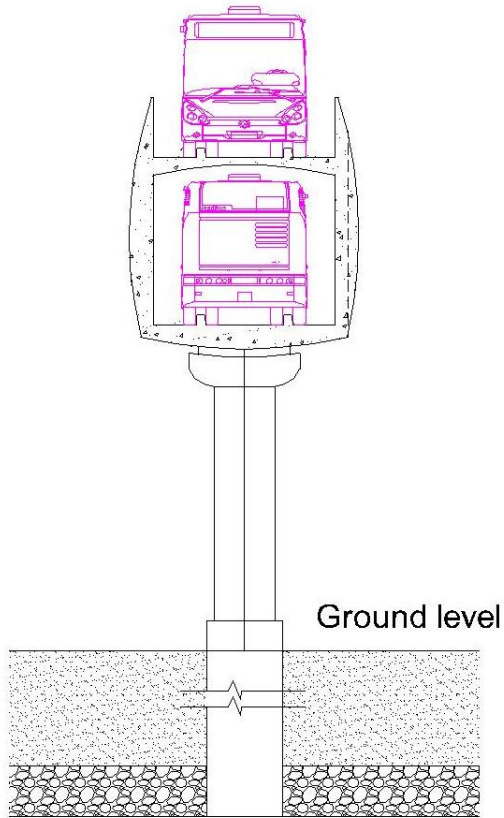
# Bie-Bus: Station Configuration



ELEVATION @ STATION LOCATION

SECTION AT STATION LOCATION

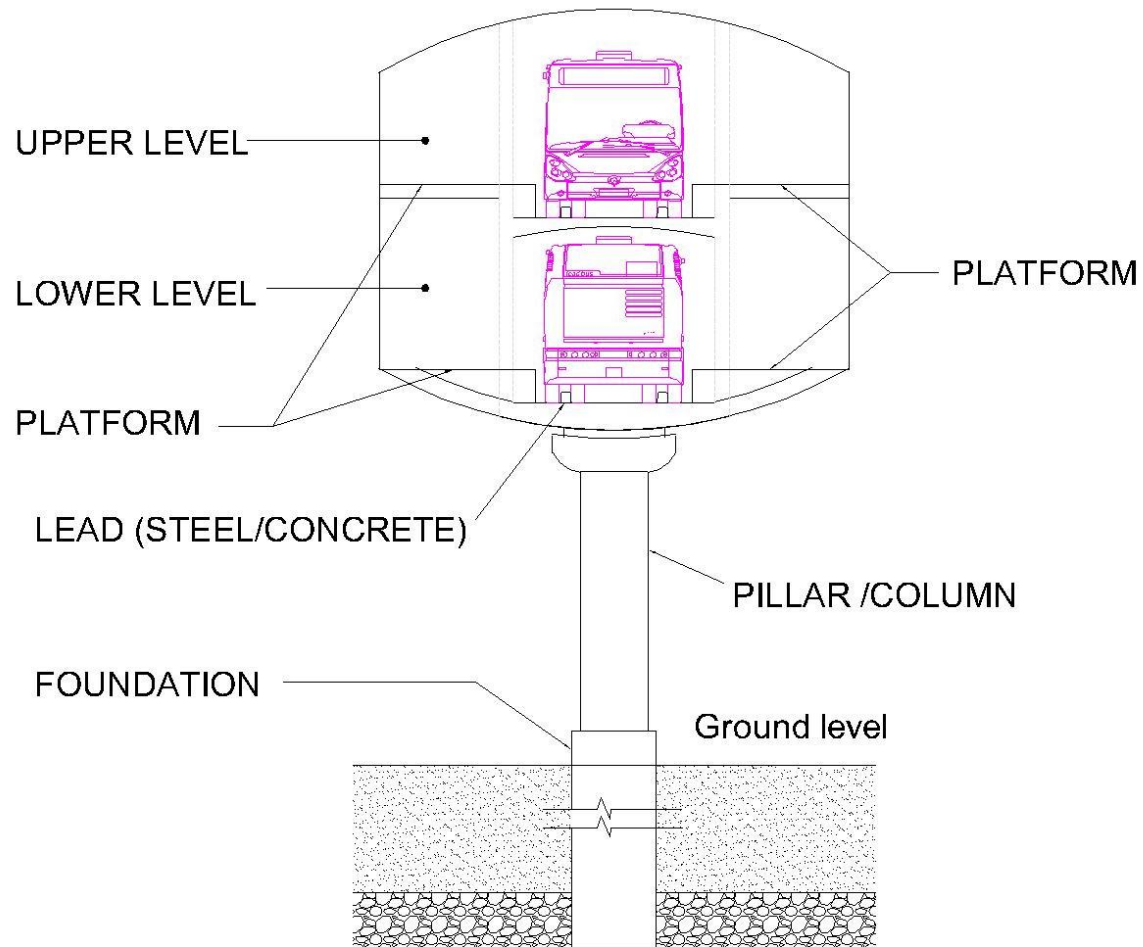
# Bie-Bus: Bi-Level Viaduct



**SECTION AT VIADUCT LOCATION**

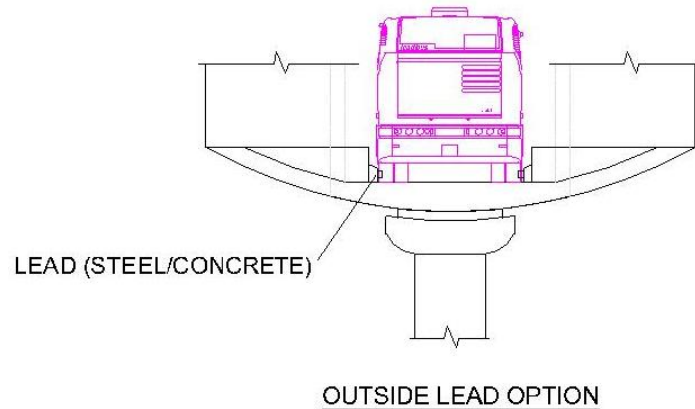
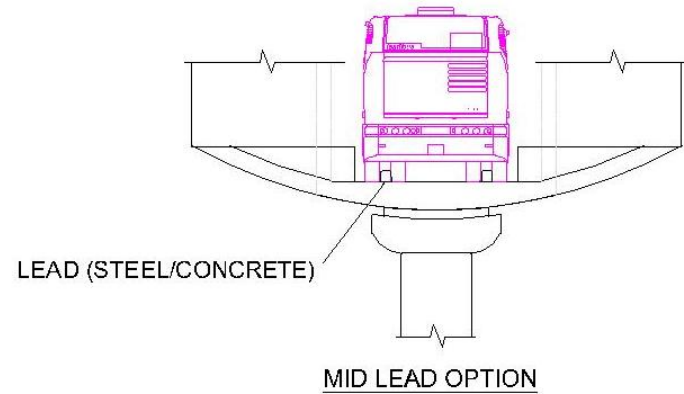
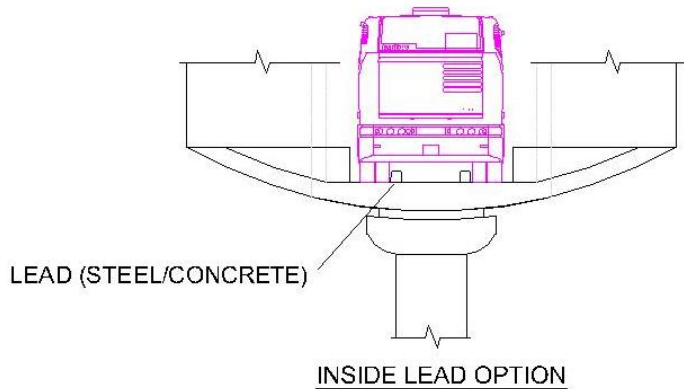
**ELEVATION @ VIADUCT LOCATION**

# Bie-Bus: Station Section

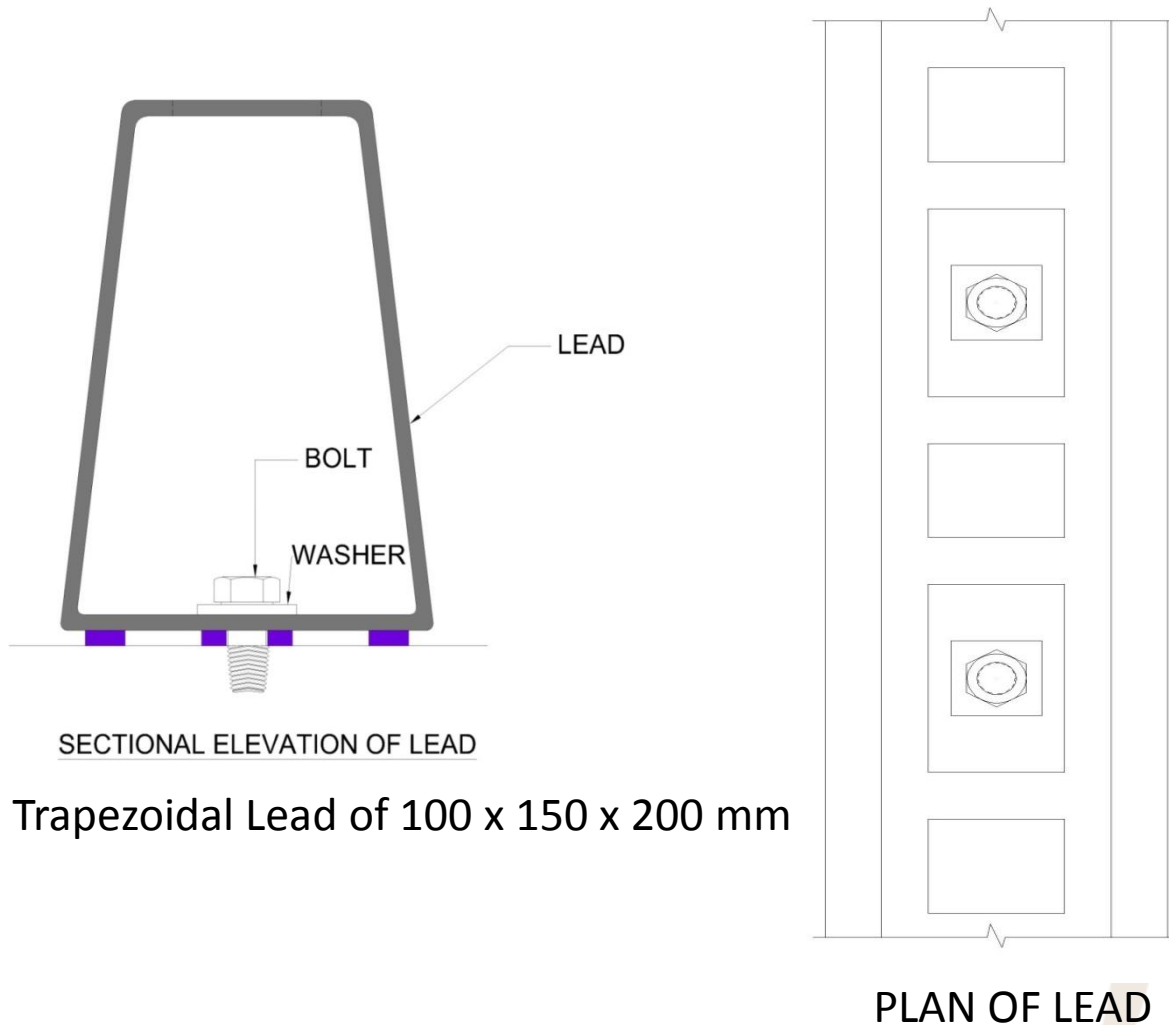


# Bie-Bus: Lead-Wheel Interface Options

## LEAD - WHEEL INTERFACE ARRANGEMENT OPTIONS



# Bie-Bus: Typical Mechanical Lead



SECTIONAL ELEVATION OF LEAD

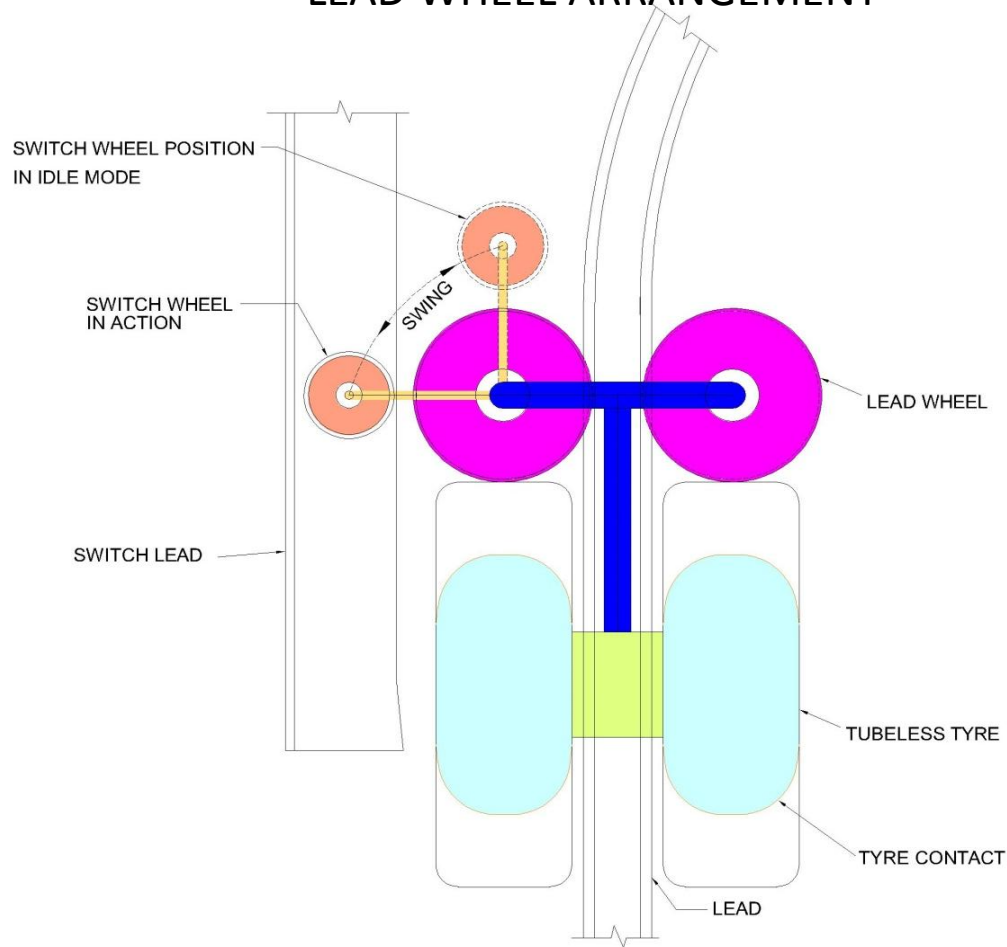
PLAN OF LEAD

Typical Hollow Trapezoidal Lead of 100 x 150 x 200 mm

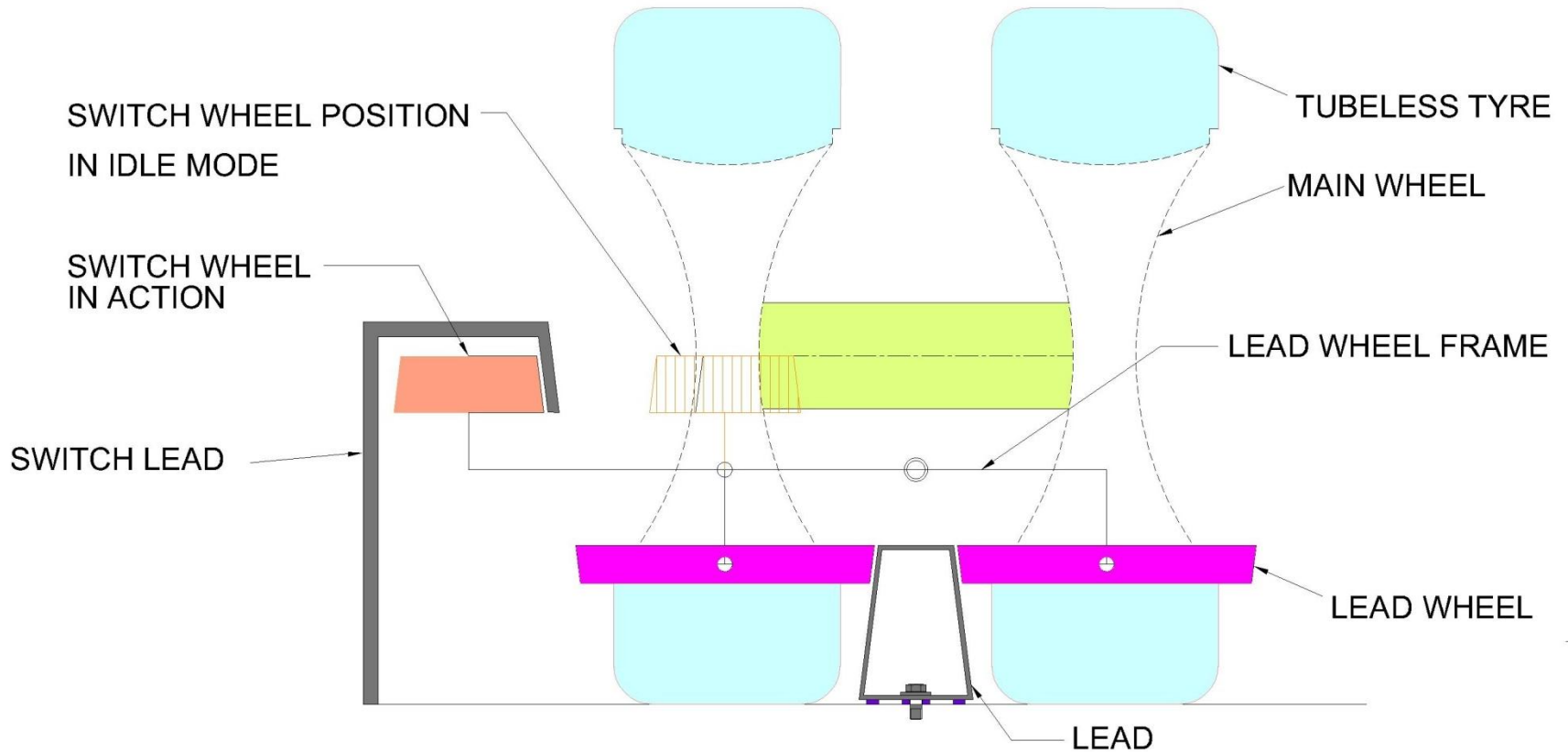


# Bie-Bus: Lead-Wheel Maneuvering

## LEAD WHEEL ARRANGEMENT



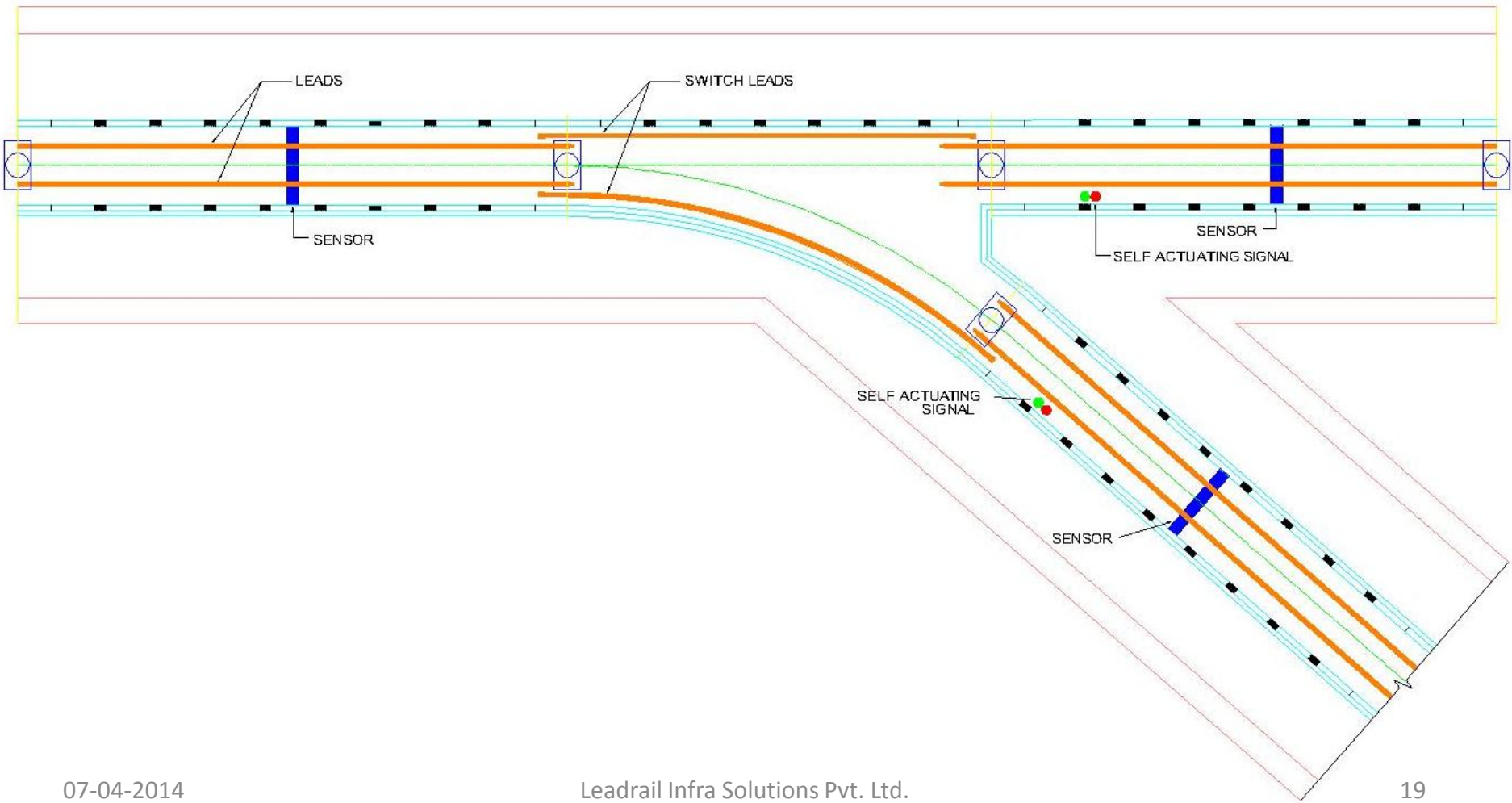
# Bie-Bus: Switch Wheel in Action



SECTIONAL ELEVATION OF LEAD-WHEEL ARRANGEMENT

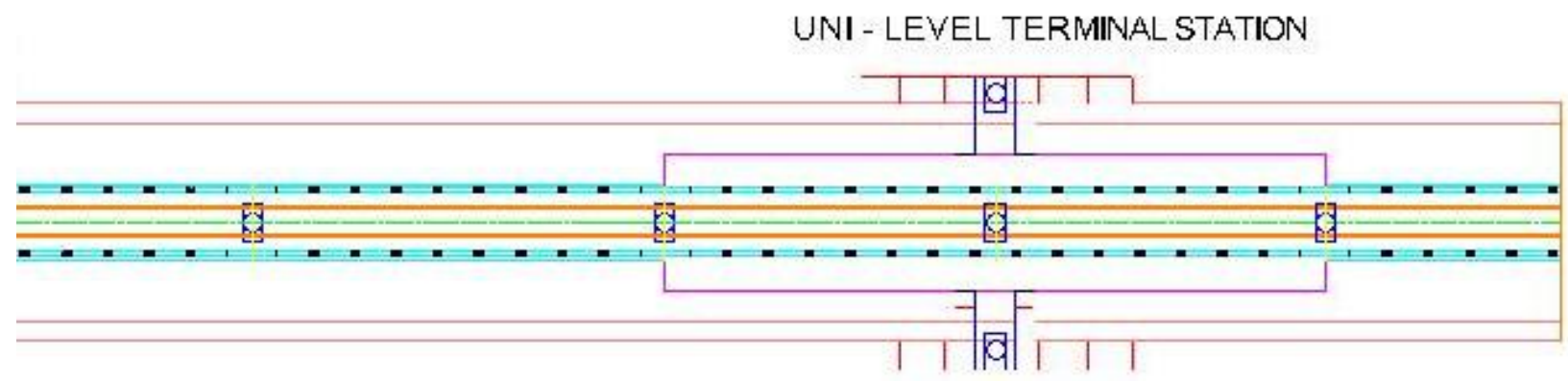
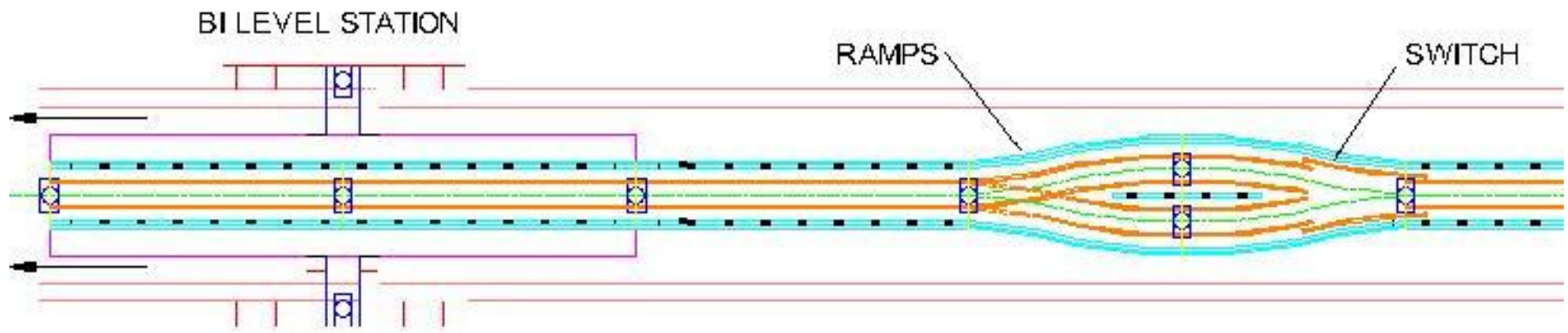
# Bie-Bus : Switching Mechanism

## CONVERGENCE / DIVERGENCE MECHANISM

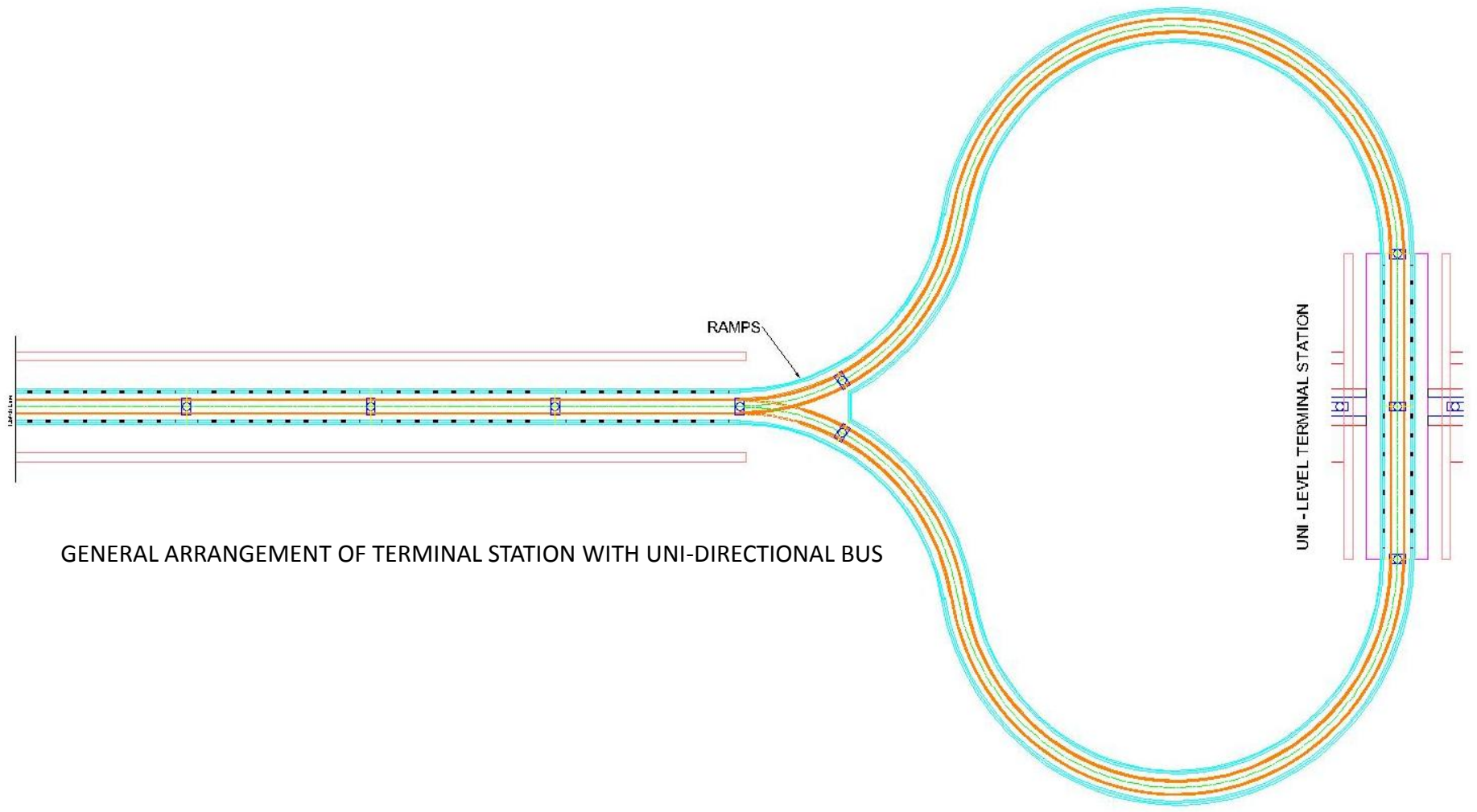


# Bie-Bus: Level Interchange Operation

## TERMINAL STATION WITH BI-DIRECTIONAL BUS

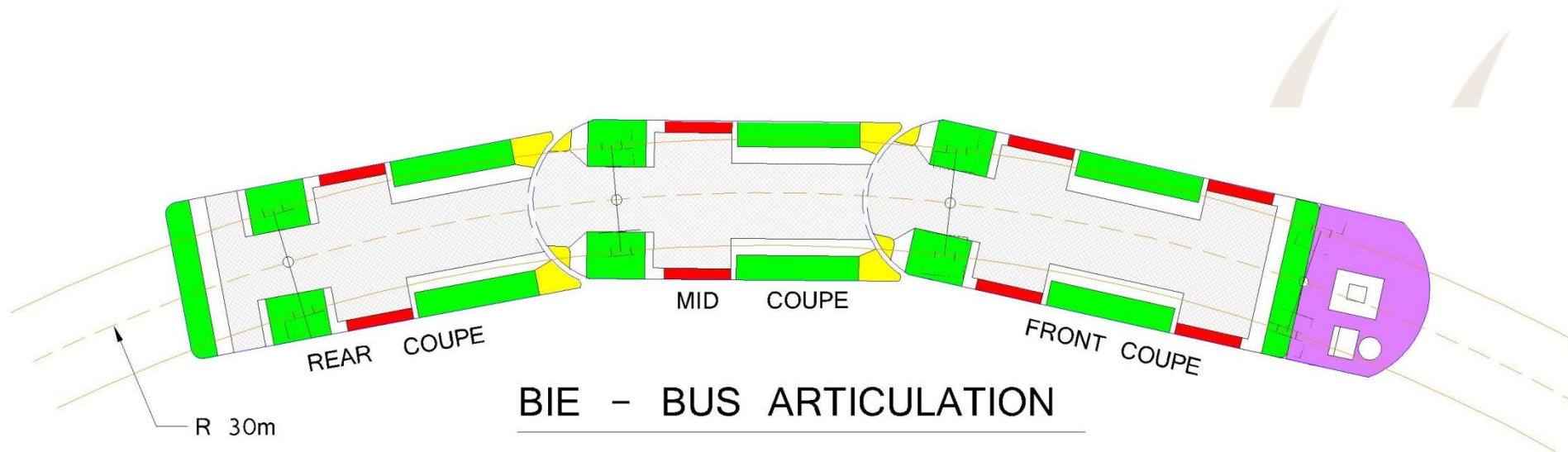


# Bie-Bus: Level Interchange Operation

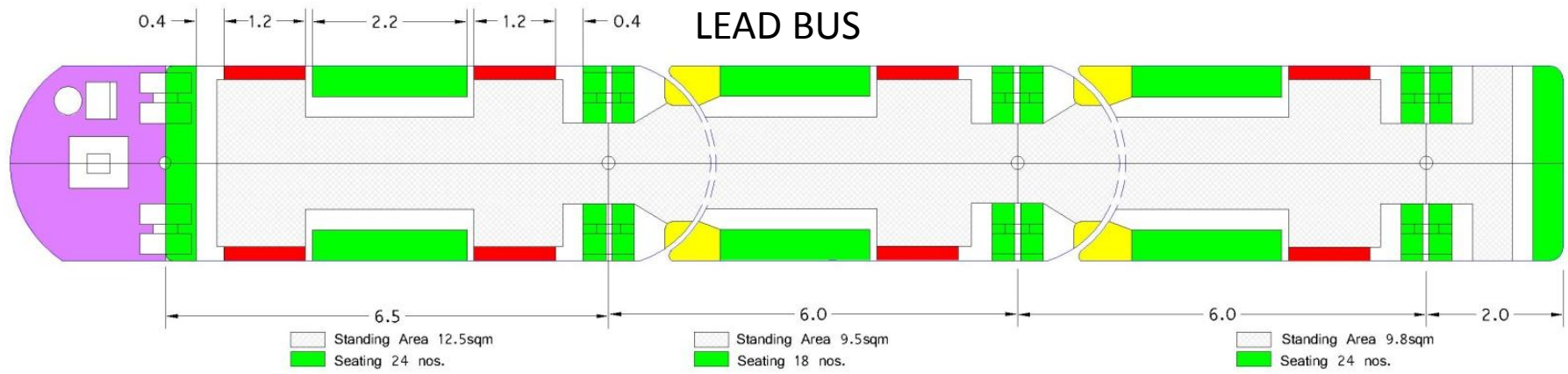


GENERAL ARRANGEMENT OF TERMINAL STATION WITH UNI-DIRECTIONAL BUS

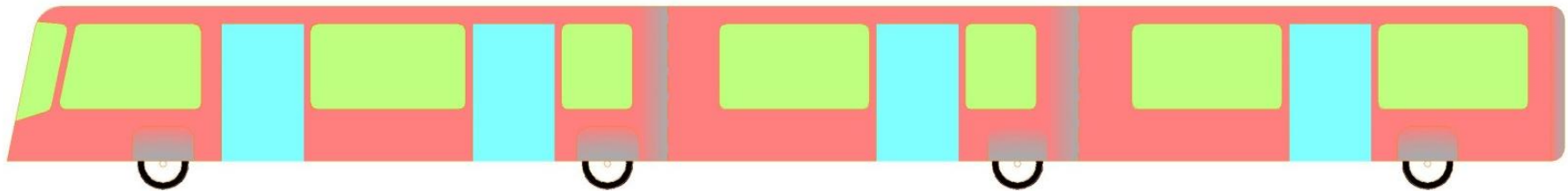
# Bie-Bus: Concentric Articulation



# Bie-Bus: Typical Floor Plan & Elevation

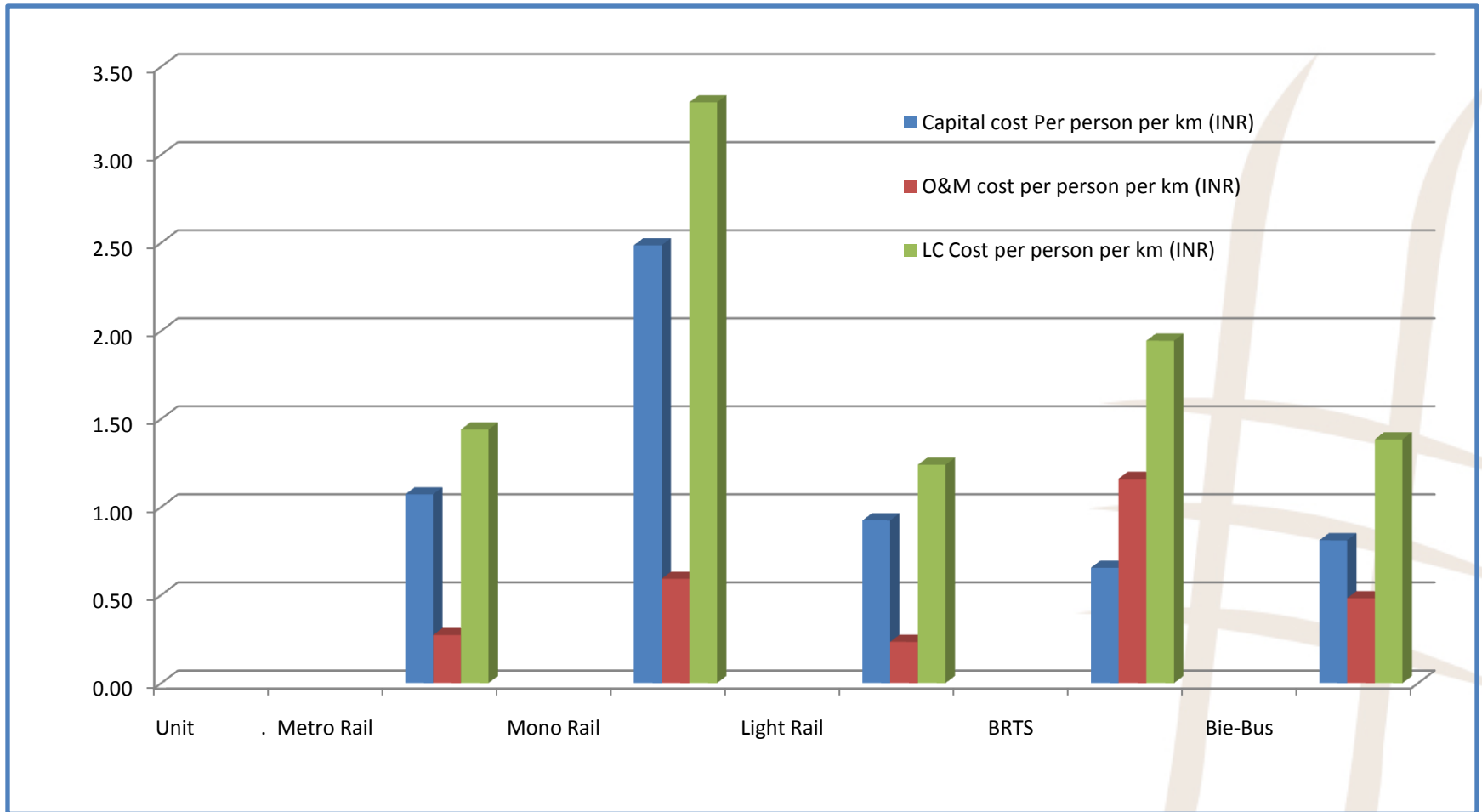


PLAN



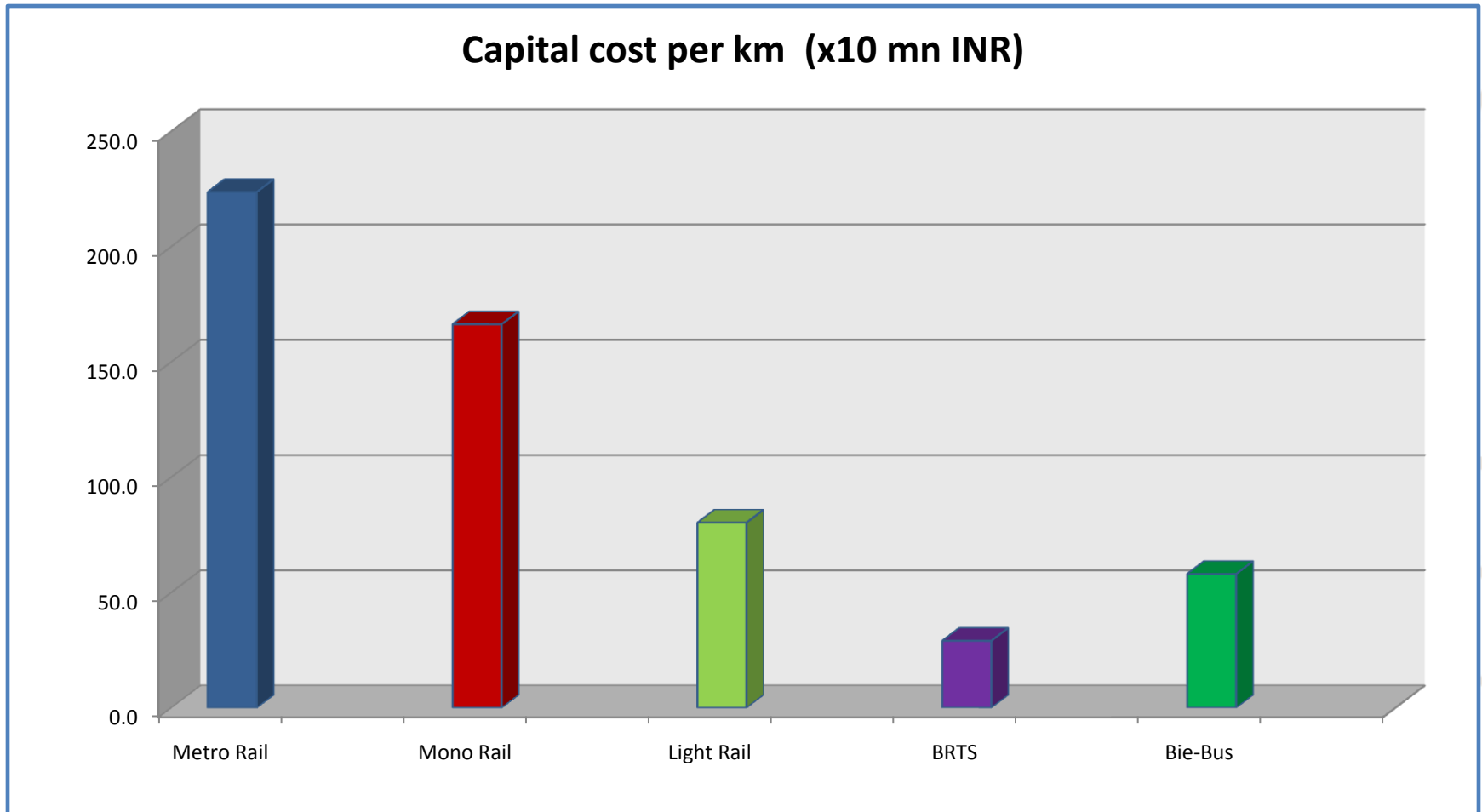
ELEVATION

# Life Cycle Costs: Regular Systems Vs Bie-Bus

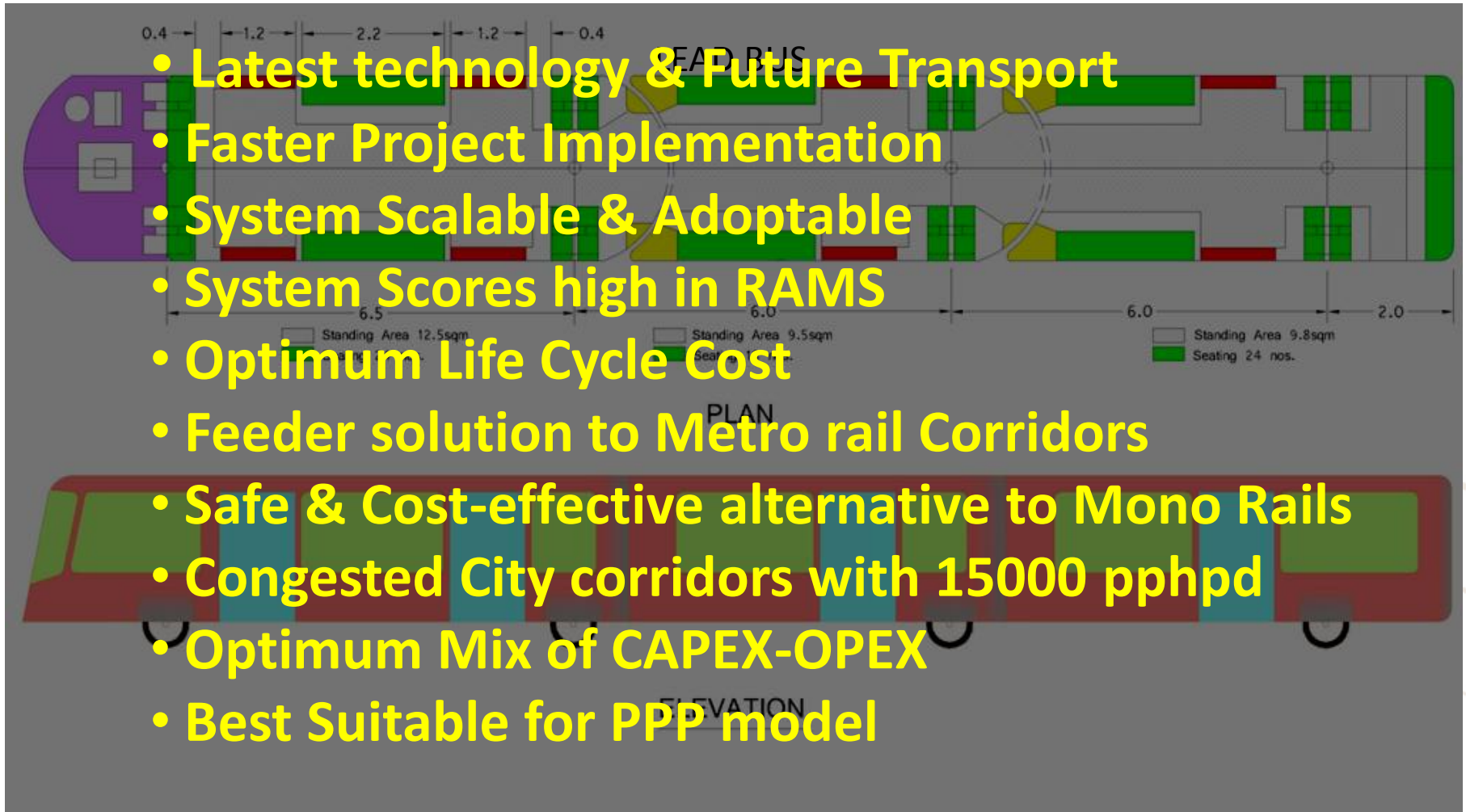




# Life Cycle Costs: Regular Systems Vs Bie-Bus



# Bie-Bus: Attractions



- Latest technology & Future Transport
- Faster Project Implementation
- System Scalable & Adoptable
- System Scores high in RAMS
- Optimum Life Cycle Cost
- Feeder solution to Metro rail Corridors
- Safe & Cost-effective alternative to Mono Rails
- Congested City corridors with 15000 pphpd
- Optimum Mix of CAPEX-OPEX
- Best Suitable for PPP model

## Bie-Bus

# Thank you!



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