

<b>PIUI 8004</b>	<b>Road &amp; Metro Rail Technology &amp; Mgt.</b>	L	T	P	C
<b>Version 1.0</b>		3	0	0	3
<b>Pre-requisites/Exposure</b>	Graduate, Basics of Construction Mgt.				
<b>Co-requisites</b>	Good Command in MS Word and MS Powerpoint				

### Course Objectives

1. Urban Transport :An overview of urban transport policy, the characteristics of ROAD & METRO schemes and the influences on ROAD & METRO policies.
2. Technical Issues: A brief review of some key technical issues inherent in ROAD & METRO schemes and their potential impact on PPP design and implementation.
3. Incorporating Private Sector Participation in Metro & road Initiatives:What PPP has to offer, and an overview of the issues and stages public authorities follow to establish successful ROAD & METRO PPP arrangements.
4. Understanding and Managing Risk: Analyzing and allocating risks and responsibilities among stakeholders in the ROAD & METRO scheme and practical ways of designing risk allocation rules.
5. Public-Private Partnership, Design, Specifications and Performance Management: Setting service standards and specifications and establishing associated costs; developing of performance and payment indicators and managing compliance.
6. Funding and Finance: Large capital and system maintenance requirements require strong financing arrangements. The practical use of public and private financing mechanisms under PPP arrangement is reviewed.

### Course Outcomes

On completion of this course, the students will be able to

CO1: To understand managerial skills required for RMR Planning & formulation.

CO2: To Integrate skills required for Urban Mass Mobility planning & formulation.

CO3: Analyzing the issues & challenges in the Urban Transport and Mobility Sector

CO4: Optimizing the processes for project execution and control.

CO5: To analyze the benchmarking process as applied in Urban Transport projects.

### Catalog Description

This course explores important substantive areas and concepts in the field of urban and regional planning and current urban planning and policy issues and debates. Topics include: forces that have historically guided and are currently guiding India's urbanization; land use, growth management, transportation and traffic congestion, economic development, housing and community development, environmental planning; legal, environmental, governmental contexts.

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## Course Content

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### **Unit I: 4.5 lecture hours**

Overview of urbanization process, Urban Scenario in India , Status of Urban Infrastructure in Indian cities, Related policies and Management issues, Broad overviews of urban transportation, relevant policy considerations, and alternatives analysis , Characteristics of Road & ROAD & METRO schemes

### **Unit II: 6 lecture hours**

Various key characteristics of ROAD & METRO that influence policy, design, and contractual arrangements of PPP schemes (complexity and size, route, segregation, integration, rolling stock, service, and ticketing and barriers)

### **Unit III: 7.5 lecture hours**

Discussion about what the private sector can offer and some ideas about the effect of PPP on ROAD & METRO schemes, investment, and operations and policy enforcement , Discussion of the various PPP structures used in developing Road & ROAD & METRO schemes , The four stages of PPP development and implementation (policy development, arrangement design, developer selection, and arrangement management)

### **Unit IV: 6 lecture hours**

Risk as an important factor in determining the type, design and effective implementation of ROAD & METRO PPP projects, Analysis and allocation of responsibilities and risks in ROAD & METRO PPP projects, including macroeconomic risks, sector-specific risks, and project risks

### **Unit V: 12 lecture hours**

Descriptions of various funding sources, their advantages, and unique considerations, Detailed discussion on both project and corporate finance structures and their implications Brief overviews of refinancing gains, valuing of contingent liabilities, and “sinking funds”

### **Text Books and Journals**

1. Private Sector Participation in Light Rail Light Metro Transit Initiatives by Cledean Mandari Perott
2. Track Design Handbook for Light Rail Transit by Transportation Research Boards
3. ACCESSIBILITY IN CITIES: TRANSPORT AND URBAN FORM
4. HARVARD CASE STUDIES

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination Examination Scheme:**

Components	Presentation/Assignment/Projects etc	ESE
Weightage (%)	50	50

### **Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

Mapping between COs and POs		
	Course Outcomes (COs)	Mapped Programme Outcomes
CO1	Analyzing the issues & challenges in the Urban Transport and Mobility Sector	PO 1,2, 4,7,8,9,10, 11,13, 14
CO2	To Integrate skills required for Urban Mass Mobility planning & formulation.	PO 1,2, 3, 8,9,10, 11,14
CO3	To develop managerial skills required for RMR Planning & formulation.	PO 1,2, 3, 8,9,10, 11, 13,14

<b>CO4</b>	Optimizing the processes for project execution and control.	PO 4,5, 8,12,13, 14
<b>CO5</b>	To analyze the benchmarking process as applied in Urban Transport projects.	PO 1,2, 3, 4,8,13,14

<b>CourseOutcomes</b>	<b>CO 1</b>	<b>CO 2</b>	<b>CO 3</b>	<b>CO 4</b>	<b>CO5</b>
<b>PO 1</b>	3	3	3	2	3
<b>PO 2</b>	3	3	3	2	3
<b>PO 3</b>	2	3	3	2	3
<b>PO 4</b>	3	2	2	3	3
<b>PO 5</b>	2	2	2	3	2
<b>PO 6</b>	2	2	2	2	2
<b>PO 7</b>	3	2	2	2	2
<b>PO 8</b>	3	3	3	2	3
<b>PSO 9</b>	3	3	3	2	2
<b>PSO 10</b>	3	3	3	2	2
<b>PSO 11</b>	3	3	3	2	2
<b>PSO 12</b>	2	2	2	3	2
<b>PSO 13</b>	3	2	3	3	3
<b>PSO 14</b>	3	3	3	3	3

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14
MDSI 864	Road & Metro Rail Technology & Mgt.	3	3	3	3	2	2	2	2	3	3	3	2	3	3
		Students will demonstrate strong conceptual knowledge and execution in soft and hard infrastructure planning, development, management, financing, regulation and governance.	Students will demonstrate effective understanding of infrastructure planning and development, utility & energy management, urban transportation including metro rail, e-vehicle with charging and other modes of urban surface transportation, water supply and sewerage, smart city planning and effective financing urban infrastructure.	Students will demonstrate analytical skills to understand issues with remedial solutions relating to urban infrastructure. of soft and hard infrastructure	Students will exhibit the ability to integrate planning, construction & development, operation & management, financing, regulation and governance of urban infrastructure projects and facilities.	Students will exhibit the ability to integrate technical, economic, social and regulatory frameworks for urban infrastructure sector planning and resource management.	Students will exhibit deployable skills pertinent to urban hard and soft infrastructure sector and smart city development and management.	Students will be able to develop and evaluate alternate managerial choices and identify optimal solutions.	Students will demonstrate effective application capabilities of their conceptual understanding to infrastructure planning, development and management.	Students will be able to exhibit effective decision-making skills, employing analytical and critical thinking ability for planning, development and management of soft and hard infrastructure.	Students will demonstrate effective oral and written communication skills in the professional context.	Students will be able to work effectively in teams and demonstrate team-working capabilities.	Students will exhibit leadership and networking skills.	Students will demonstrate sensitivity towards ethical and moral issues and have ability to address them in the context of urban planning, development and management including cost effective financing and good governance.	Students will demonstrate employability traits in line with the needs of changing hard and soft urban infrastructure sector.

## Model Question Paper

<b>Name:</b>			
<b>Enrolment No:</b>			
<b>Course: MDSI 864- Road &amp; Metro Rail Technology &amp; Mgt.</b> <b>Programme: MBA UISC</b> <span style="float: right;"><b>Semester: ODD</b></span> <b>Time: 03 hrs.</b> <span style="float: right;"><b>Max. Marks:100</b></span>			
<b>Instructions:</b> <b>Section A</b> (each carrying 2 marks); Attempt all questions from <b>Section B</b> (each carrying 5 marks). Any <b>Two Questions</b> from <b>Section C</b> (carrying 15 marks). Case Study <b>Section D</b> ( 30 Marks)			
<b>Section A ( )</b> <b>Write Short Note</b>			
1	NURTC	[2]	CO1
2	Sky bus	[2]	CO5
3	VfM	[2]	CO2
4	PHPDT	[2]	CO2
5	Regenerative braking system	[2]	CO3
6	PSC	[2]	CO1
7	Kolkata metro.	[2]	CO2
8	Jaipur Metro	[2]	CO4
9	Mumbai system	[2]	CO4
10	London Tube rail.	[2]	CO2
<b>SECTION B (Attempt all Questions)</b>			
11	How a land development can be done along aMRTS project.	[5]	CO4
12	What are the parameters that decide the choice of a particular MRTS technology?	[5]	CO2
13.	What are the key requirements for a successful PPP project in Transport sector.	[5]	CO5
	Write a brief note on Smart technology that can be used as a part of Smart Mobility.	[5]	CO1
<b>SECTION C (Attempt any Two Questions)</b>			
14.	What are the generic factors that drives value for money.	[15]	CO4
15.	Explain National Urban Transport policy.	[15]	CO4

SECTION D ( Case Study)			
	<p style="text-align: center;"><b>Case Study</b></p> <p><b>Linking Public Policy and the Characteristics That Contribute to Viable Transport Systems</b></p> <p>India’s National Urban Transport Policy (launched in 2006) was the result of a tacit admission of the link between public policy and the characteristics that contribute to viable transport systems. The policy was focused on reducing the reliance on cars in urban transport and included a number of reorienting objectives, including</p> <ul style="list-style-type: none"> <li>• Incorporating urban transportation as an important parameter at the urban planning stage</li> <li>• Encouraging greater use of public transport and nonmotorized modes by offering central financial assistance for this purpose</li> <li>• Establishing quality-focused and multimodal public transport systems that are well integrated</li> <li>• Raising finances through innovative mechanisms that tap land as a resource for investments in urban transport infrastructure</li> </ul> <p>A complementary funding initiative, the Jawaharlal Nehru National Urban Renewal Mission, was launched to improve urban infrastructure, enhance governance, and provide facilities for the poor. Under this initiative, the national government provides support of up to 20 percent of the capital costs of public transport projects (up to 50 percent under a public-private partnership arrangement). In some cases, in exchange for the funding, the cities must undergo reforms, create a city development plan, and obtain financing for the remainder of the required investment through a combination of state, city, or private sector resources.</p> <p><b>Integration and Bangkok’s Skytrain</b></p> <p>Bangkok’s Skytrain project illustrates the need for integrated planning among various levels of government. During Skytrain’s development and construction period, several public institutions (including the Ministry of Transport, the Bangkok Metropolitan Authority, and the State Railway of Thailand) were each implementing transportation solutions in Bangkok. Coordinated planning between these entities was deficient or lacking entirely, and little consideration was given to integrating the systems. Unfortunately, this oversight contributed to disappointing Skytrain ridership levels at opening. Preliminary estimates suggested that somewhere between 600,000 and 700,000</p>	<b>[30]</b>	<b>CO3</b>

<p>people per day would ride the system. Actual ridership levels at opening were in the range of 150,000 passengers per day. System revenues were so low that the concession company eventually became unable to meet its financial obligations.</p> <p>Skytrain's services offered clear value to customers by enabling them to avoid Bangkok's extreme traffic at a reasonable cost. However, without supporting modes of transportation, many of Bangkok's citizens could not access the system effectively. More recent improvements in service integration (including the incorporation of dedicated feeder buses) have helped increase Skytrain's ridership to approximately 460,000 passengers per weekday. For more information about Skytrain.</p> <ol style="list-style-type: none"><li>1. Explain the role of Integrated planning for MRTS. <b>(10)</b></li><li>2. Explain the process by which you can come out with best MRTS solution. <b>(15)</b></li><li>3. Explain the role of ULB and State Govt. for Transport planning. <b>(5)</b></li></ol>		
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