



Arabian Institute For Training

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# Road Geometric Design

## INTRODUCTION

- This Road Geometric Design training course will provide the participants with a comprehensive introduction to road design and give the confidence to do this type of work once back in the working environment. It is valuable to the participants new to the subject matter or those with practical experience but lack the academic background in the subject area.
- It will also show the integration between use of software and engineering judgment to perform a better design of the roads or improve the existing designs.

This training course will highlight:

- Geometric Design as a General Concept
- Road Planning and Design
- Sustainable Urban Transport Planning
- Planning and designing of Horizontal and Vertical Alignment
- Coordination of Horizontal and Vertical Design
- Road Geometric Design for Safe Roads
- Road Safety Audit (RSA)
- Road Safety Inspection (RSI)
- Intelligent Transportations systems
- Planning and Designing Traffic Signs

## OBJECTIVES

- The road designers are the people who influence the most of our lives, as they are the ones providing the plans for the roads that we use. The roads remain for a long time and therefore any issue that was not resolved in the initial design will continue to influence the traffic and all the positive and the negative elements of it for the years to come.
  - Therefore, continual development of the engineers and their advancement is crucial for the positive development of the roads.
  - Just applying standards is not enough, the engineers must implement modern technologies, must cooperate and must consider future developments.
  - This traffic engineering course also provides them with the knowledge of use of the modern software packages, using the newest technologies and applying them in collaboration with other civil engineers in order to achieve maximum benefit.
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At the end of this training course, participants will learn to:

- Understand the Road Planning and Design application principles as well as Horizontal and Vertical Alignment
- Understand why Sustainable Urban Transport Planning is important
- Understand what Road Geometric Design for Safe Roads
- Perform base Road Safety Audit (RSA) and Road Safety Inspection (RSI)
- Recognize the possibilities in the new ITS development trends in Road Geometric Design
- Build traffic simulations of traffic signs and signal coordination
- Prepare the project for ITS introduction, sustainability, maintenance and Road Geometric Design in general

## **TRAINING METHODOLOGY**

- This Traffic Engineering training course will have subjects presented and covered by the trainer utilising a variety of proven adult learning teaching and facilitation techniques, focused on examples and best practices from the industry. This will include active participation, in class practice cases, followed by quiz, active group sessions, video materials and other activities.

## **ORGANISATIONAL IMPACT**

- This Traffic Engineering training course focuses on delivery of a practical working understanding for those looking for background and perception of the road geometric design fundamentals, supported by relevant theory, for a gratitude of the context that promotes efficiency in planning as well as design and construction. It will provide to the participants with information about the planning and using a geometric design of road alignments.
- It will cover design parameters such as: road classification, road classification and functional class systems, design vehicles, roadway cross section, design speeds, including traffic lanes, shoulders and verges.
- Similarly, includes the speed parameters: horizontal & vertical alignments, operating speed, desired & design speed and their relationship with each other.

The participants on this training course, will:

- Develop better understanding of road design requirements in modern urban development
  - Learn basic road design principles that lead to the sustainable road network
  - Improve their knowledge on BIM and easier cooperation on road projects
  - Gain the knowledge of using appropriate software for road design
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## PERSONAL IMPACT

- The participants will acquire the knowledge they need to understand traffic planning, design and regulation. This Road Geometric Design training course will feature a series of exercises and analyses that will help participants remember and later apply their skills successfully.

The participants will gain or enhance their understanding by the following:

- Learn the process of road planning and design
- Understand the impact of road design on overall urban development and sustainability
- Be guided through the design cycle of the road, with various inputs
- Perform the design themselves using the available software
- Address the traffic and environmental impact of the road design
- Adopt the adequate design for cooperative urban systems
- Calculate the life cycle cost of the road

## WHO SHOULD ATTEND?

- This Road Geometric Design training course is designed for the people involved in civil, traffic and transport planning, regulating, controlling and organization of those, as well as delegates involved into management, analytics, optimization, project management and transport optimization.

This is suitable to a wide range of professionals but will greatly benefit:

- Traffic Engineers
  - Project Managers
  - Transport Engineers
  - Strategic Development Personnel Road Geometric Design
  - Supervisors and Works Managers
  - Architects involved in Urban Design
  - Technology Engineers, CTOs and CIOs
  - Professionals in Urban and Rural Planning
  - Researchers and Practitioners in Traffic Engineering
  - People who are involved in civil, traffic and transport planning and organization
  - Researchers and Consultants involving in management, analytics, optimization, project management and transport optimization.
  - Engineers, Engineering Technologist and Project Managers working for Local Government, or State / Federal Agencies, Consultants and Contractors
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## Course Outline

### Introduction

- Geometric Design: General Concept
- Highway Classification
- Functional Class
- Basic Terms
- Design Vehicles
- Roadway Cross Section

### Road Planning

- Sustainable Urban Transport Planning
- Road Design
- Network design
- Facility design
- Town Road Improvement Project Plan

### Planning and Designing of Horizontal and Vertical Alignment

- Horizontal Alignment
- Circular Curves and Transition Curves
- Curve Widening
- Vertical Alignment
- Gradients
- Vertical Curves
- Drainage
- Coordination of Horizontal and Vertical Design

### Road Geometric Design for Safe Roads

- Safety Management
- Modifications to Road Environment
- Safety Standards for Design and Redesign
- Road Safety Audit (RSA)
- Road Safety Inspection (RSI)
- Intelligent Transportations Systems

### Traffic Signal Design

- Terminology
  - Planning and Designing Traffic Signs
  - Types of Movements
  - Types of Traffic Signals
  - Types of Vehicle
  - Detection Vehicle Detection
  - Signal Coordination
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