

# Editorial on Transportation Engineering

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## Introduction

Transportation engineering, also known as transport engineering, is the application of technology and science principles to the planning, functional design, operation, and management of facilities for any mode of transportation in order to ensure the secure, reliable, rapid, comfortable, convenient, economical, and environmentally friendly transportation of people and goods. Transportation engineering's planning dimensions are related to aspects of urban planning and include technical forecasting decisions as well as political considerations. The estimation of trip generation (number of purposeful trips), trip distribution, and other technical aspects of passenger travel forecasting are typically done using an urban transportation planning model (destination choice, where the traveller is going). Other aspects of traveller decisions, such as auto ownership, trip chaining (the decision to connect individual trips together in a tour), and the option of residential or business venue, can be included in more sophisticated forecasting (known as land use forecasting). Since passenger trips often reflect the peak of demand on any transportation system, they are the subject of transportation engineering. While facility planning and design remain at the center of the transportation engineering industry, operations planning, logistics, network analysis, funding, and policy analysis are also essential to those employed in highway and urban transportation, according to details of the scope of various committees.

The planning, design, building, repair, and operation of transportation facilities are all part of transportation engineering. Air, highway, railroad, pipeline, water, and even space transportation are all provided by the facilities. The sizing of transportation facilities is one of the design dimensions of transportation engineering. Before any planning can begin, an engineer must conduct an inventory of the region or, if necessary, the previous system in operation. Population, land use, economic activity, transportation infrastructure and services, traffic habits and volumes, laws and ordinances, regional financial resources, and community values and preferences must all be included in this inventory or database.

Traffic engineering is used in operations and management to ensure that vehicles travel safely on the road or track. Signs, signals, markings, and tolling are examples of older techniques. Intelligent transportation systems, such as advanced traveller information systems (such as variable warning signs) and advanced traffic control systems, are newer technologies (such as ramp meters) and the incorporation of vehicle infrastructure. Transportation engineering includes human factors, especially when it comes to the driver-vehicle interface and the user interface of road signs, signals, and markings.

Railway engineers are in charge of the design, development, and maintenance of fixed-guide way railroads and mass transit systems (such as light rail or monorails). Determine horizontal and vertical orientation design, station position and design, and construction cost estimation are all common tasks. Train dispatching is a specialized area of railroad engineering that focuses on train movement control.

Through reinvesting and revitalizing the rail system to meet future demands, railway engineers also seek to create a cleaner and safer transportation network. Railway engineers in the United States collaborate with elected officials in Washington, D.C. Airport engineers plan, design, and construct airports. When designing airport facilities, airport engineers must consider the impacts and demands of aircraft. These engineers must use wind direction analysis to assess runway orientation, as well as the size of the runway boundary and safety zones. Engineers who work in this field include:

- Estimate the public's transit needs and then secure money for programs.
- For safety and capability, examine areas with high traffic levels and high collision
- Plan, design, construct, and operate highways, roads, and other vehicular facilities, as well as the bicycle and pedestrian realms that surround them.

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