Traffic Engineer Examination

Test Plan

Updated March 2024

Definition of Traffic Engineering:

"Traffic engineering" is that branch of professional engineering which requires such education and experience as is necessary to understand the science of measuring traffic and travel and the human factors relating to traffic generation and flow; and requires the ability to apply this knowledge to planning, operating, and evaluating streets and highways and their networks, abutting lands and interrelationships with other modes of travel, to provide safe and efficient movement of people and goods. The above definition of traffic engineering shall not be construed to permit the practice of civil, electrical, or mechanical engineering.

This area of practice is structured into four primary content areas:

I. Planning (27%)
II. Design (28%)
III. Studies and Analyses (18%)
IV. Operations (27%)

BPELSG Traffic Engineer Test Plan (Updated March 2024)	Percentage of Questions on the Exam
I. Planning **<u>Professional Activities</u>:** 1. Perform capacity analysis of transportation facilities (e.g. pedestrian, bicycle, vehicle, transit) 2. Evaluate traffic plans to ensure accommodation of current and future traffic volumes 3. Estimate delays and queues at intersections 4. Estimate traffic demands of proposed developments 5. Estimate parking demands of proposed developments 6. Determine the costs and benefits of proposed transportation projects 7. Perform level of service analysis (LOS) of transportation facilities (e.g. pedestrian, bicycle, vehicle, transit) 8. Evaluate circulation and access management for public and private development 9. Conduct corridor planning to determine future transportation infrastructure for various modes of travel and complete streets 10. Identify the steps used in the travel demand modeling process 11. Propose improvements to transportation infrastructure to accommodate changes in travel demand 12. Conduct traffic impact studies to identify deficiencies and provide information for environmental documents 13. Evaluate feasibility of proposed mitigation measures 14. Perform safety planning of transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) 15. Evaluate vehicle miles traveled (VMT) for proposed developments or roadway projects **Test questions on these professional activities may include one or more of the following:** A. Techniques for performing level of service (LOS) analysis B. Techniques for calculating levels of service (LOS) C. Essential elements needed for traffic impact studies D. Principles of travel demand modeling E. Trip generation analysis for various land uses F. Trip distribution methods associated with transportation analysis G. Techniques for calculating the capacity of transportation facilities (e.g., pedestrian, bicycle, vehicle, transit) H. Techniques for evaluating the capacity of transportation facilities (e.g., pedestrian, bicycle, vehicle, transit) I. Effect of new developments on adjacent roadways and driveways J. Roadway characteristics that affect capacity K. Access management principles related to the improvement of traffic flow L. Techniques to improve traffic circulation on transportation networks (e.g., pedestrian, bicycle, vehicle, transit)	27%

M. Techniques to determine traffic impacts N. Techniques to select mitigation measures based on constraints O. Techniques to measure the effectiveness of proposed mitigations P. Planning applications for macro- and micro-simulation models Q. Techniques for conducting traffic flow studies R. The relationship between parking demand and individual land uses S. The effects of vehicle characteristics and volumes on transportation facilities (e.g., pedestrian, bicycle, vehicle, transit) T. Principles for evaluating vehicle miles traveled (VMT) U. Strategies for transportation demand management V. Safety analysis techniques W. Techniques for planning and evaluating multimodal transportation facilities (e.g., pedestrian, bicycle, vehicle, transit) X. Techniques for conducting queuing analyses Y. Techniques for cost-benefit analysis	
II. Design **<u>Professional Activities</u>:** 1. Prepare plans, specifications and estimates for transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) 2. Verify that transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) comply with Federal and State accessibility standards 3. Prepare engineering design plans (e.g., traffic signals, geometric, ITS, temporary traffic control) 4. Implement roadside safety devices (e.g., guardrails, barriers, and crash cushions) 5. Implement traffic calming devices and measures 6. Prepare parking facility layouts to maximize efficiency and circulation 7. Implement lighting systems for roadways and intersections **Test questions on these professional activities may include one or more of the following:** A. Principles and standards for transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) B. Principles for the design of traffic control devices (e.g., signal, signage, striping, pavement marking) C. The effects of the mixtures and sizes of vehicles on roadway geometric design D. Applications of design standards to roadway improvements E. Applications of sight distance principles to roadway design F. Channelization guidelines to improve traffic flow G. Principles and standards for accessibility related to the design of transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) H. Techniques for designing transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) that takes into consideration users with disabilities I. Principles and standards for the development of parking facilities	28%

J. Techniques for implementing technology to improve traffic flow and roadway safety (e.g., speed feedback sign, transit priority, vehicle detection, ITS) K. Principles of bicycle facilities design L. The design and application of traffic calming devices and measures M. Techniques for speed management N. Principles and standards for the design of roundabouts O. Application of roadway safety devices and measures (e.g., roadway lighting, crash cushions) P. Principles and standards associated with the design of railroad crossings Q. Principles for the design of driveways	
III. Studies and Analyses **<u>Professional Activities</u>:** 1. Evaluate existing conditions to determine if changes to traffic control devices and roadway designs are recommended 2. Conduct traffic collision analyses for transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) 3. Conduct road safety analyses for transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) 4. Conduct engineering and traffic surveys to recommend speed limits 5. Perform parking studies for on- and off-street parking 6. Conduct queuing studies for transportation facilities (e.g., pedestrian, bicycle, vehicle, transit, rail) **Test questions on these professional activities may include one or more of the following:** A. Guidelines for the installation of traffic control devices B. Methods for performing engineering and traffic surveys C. Techniques for analyzing collision data D. Techniques for conducting safety studies (e.g., roadway safety audits) E. Principles for non-motorized safety improvements F. Techniques for conducting parking studies G. Techniques for conducting delay studies H. Techniques for conducting queuing studies I. Techniques for creating collision diagrams	18%
IV. Operations **<u>Professional Activities</u>:** 1. Assess the need to install new traffic control devices 2. Recommend placement of traffic control devices 3. Evaluate signal timing, phasing, and coordination for safety and operational improvements 4. Modify traffic control infrastructure for safety and operational improvements 5. Manage temporary traffic control and detour plans 6. Evaluate on-street parking and curbside management **Test questions on these professional activities may include one or more of the following:** A. Measures that improve traffic safety and operations	27%

B. Standards for the identification and placement of signing, striping and markings C. Warrants for the installation of traffic signals D. Methods to optimize traffic flow using traffic signals E. Principles of traffic signal design F. Techniques to develop traffic signal timing plans G. Principles of traffic signal phasing and sequencing H. Principles of traffic signal coordination I. Principles governing the type and location of traffic signal detection systems J. Principles of traffic signal preemption K. Principles of transit signal priority L. Advanced signal timing concepts (e.g., adaptive, responsive) M. Principles for the installation of traffic control devices N. Standards for temporary traffic control O. Applications of roadway safety devices P. Traffic control devices at transit and railroad facilities Q. Principles of channelization R. Applications of passing, stopping, decision and corner sight distances S. Applications of traffic control devices for horizontal and vertical alignment of roadways T. Principles and standards of on-street parking and curbside management	