Traffic Engineer Examination

Test Plan

Effective 2018

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 (28%)
II. Design (29%)
III. Studies and Analyses (13%)
IV. Operations (30%)

BPELSG Traffic Engineering Test Plan-2017	
	Percentage of Questions on the Exam
I. Planning **Professional Activities:** **1. Perform capacity analyses of transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit).** **2. Evaluate traffic plans to ensure accommodation of current and future traffic volumes.** **3. Estimate delays and queues at intersections.** **4. Estimate traffic volumes produced by new developments.** **5. Predict future parking demands of proposed developments.** **6. Determine the costs and benefits of proposed capital improvement projects to prioritize funding.** **7. Perform level of service analyses (LOS) of transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit).** **8. Evaluate circulation and access management for public and private development.** **9. Conduct corridor analyses of alternative modes of travel to determine future transportation infrastructure.** **10. Propose improvements to transportation infrastructure to accommodate changes in travel demand.** **11. Conduct traffic impact studies to identify deficiencies.** **12. Evaluate feasibility of proposed mitigation measures.** **13. Perform safety analyses of transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit).** **14. Evaluate vehicle miles traveled (VMT) for proposed developments or roadway projects.**	**28%**
Test questions on these professional activities may include one or more of the following:	
A. Techniques for performing level of service (LOS) analyses	
B. Techniques for calculating levels of service (LOS)	
C. Strategies to reduce travel demand	
D. Trip distribution techniques associated with traffic impact analysis	
E. Trip generation analysis techniques for various land uses	
F. The techniques to compute the capacity of transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit)	
G. The techniques for evaluating the capacity of transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit)	
H. The effect of new developments on access to adjacent roadways	
I. Roadway features that affect capacity	
J. Access management principles related to the improvement of traffic flow	
K. Circulation principles related to the improvement of traffic flow	

L. Techniques to determine traffic impacts	
M. Techniques to select mitigation measures based on constraints	
N. Techniques to measure the effectiveness of proposed mitigations	
O. Essential elements needed for traffic impact studies	
P. Methods for applying principles of the planning process to 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. facilities for pedestrians, bicycles, motorists, transit)	
T. Calculating and evaluating vehicle miles traveled (VMT)	
U. Safety analyses techniques	
V. Multi-modal transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit)	
W. Techniques for conducting queue analyses	
X. Cost-benefit analysis	
II. Design **Professional Activities:** **1. Prepare plans, specifications and estimates for transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit).** **2. Verify that transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit) comply with Federal and State accessibility standards.** **3. Implement intelligent transportation system (ITS) measures.** **4. Select roadway safety devices such as guardrails, barriers, and crash cushions to improve safety.** **5. Select traffic calming devices and measures to improve traffic safety.** **6. Prepare parking facility layouts to maximize efficiency and circulation.** **7. Develop lighting systems on roadways.**	**29%**
Test questions on these professional activities may include one or more of the following:	
A. Principles and standards for the development of parking facilities	
B. Principles and standards for motorized and non-motorized transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit)	
C. Principles for the design of driveways	
D. The effects of the mixtures and sizes of vehicles on roadway geometric design	
E. Applications of design standards to roadway improvements	
F. Applications of sight distance principles to roadway design	
G. Channelization guidelines to improve traffic flow	
H. Statutes and guidelines regarding accommodations for the disabled related to the design of transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit)	
I. Techniques for designing transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit) that takes into consideration users with disabilities	

J. Principles for the design of spacing and other aspects of roadway lighting	
K. Techniques for implementing intelligent transportation systems (ITS) technology to improve traffic flow and roadway safety	
L. Principles of bicycle facilities design	
M. The design and application of traffic calming devices and measures	
N. Principles and standards of the development of roundabouts	
O. Application of roadway safety devices and measures	
P. Principles and standards associated with the design of railroad crossings	
III. Studies and Analyses **Professional Activities:** **1. Conduct field investigations of existing conditions to evaluate changes to traffic control devices and roadway designs.** **2. Identify traffic collision patterns and recommend improvements to transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit).** **3. Conduct speed-zone surveys to assess speed limits.** **4. Perform parking studies for parking management and regulation development.** **5. Conduct queuing studies for transportation facilities (e.g. facilities for pedestrians, bicycles, motorists, transit).**	**13%**
Test questions on these professional activities may include one or more of the following:	
A. Methods for performing engineering and traffic surveys	
B. Techniques for analyzing collision data	
C. Methods to enhance safety	
D. Laws governing traffic control devices	
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	
IV. Operations **Professional Activities:** **1. Perform traffic engineering assessments to recommend placement of traffic control devices.** **2. Identify the need to install new traffic control devices.** **3. Evaluate signal timing to determine operational improvements.** **4. Modify traffic signal hardware to improve safety and operations.** **5. Recommend signal phasing based on operational needs.** **6. Evaluate traffic signal coordination.** **7. Develop temporary traffic control and detour plans to minimize delay and address worker and road user safety.** **8. Manage on-street parking.**	**30%**
Test questions on these professional activities may include one or more of the following:	
A. Laws and regulations governing on-street parking	

B. Measures that remedy traffic safety and operational deficiencies	
C. State standards for the identification and placement of signing, striping and markings	
D. Warrants for the installation of traffic signals	
E. Methods to optimize traffic flow using traffic signals	
F. Methods to factor transit priority into signal timing	
G. Techniques to develop traffic signal timing plans	
H. Principles of traffic signal design	
I. Traffic signal coordination timing	
J. Standards for temporary traffic control	
K. Types of traffic signal phasing	
L. Principles governing the type and location of traffic signal detection systems	
M. Principles of traffic signal preemption	
N. Methods for traffic signal interconnection	
O. Criteria for the installation of traffic control devices	
P. Criteria for roadway safety devices	
Q. Traffic control devices at transit and railroad facilities	
R. Channelization principles	
S. Passing, stopping, decision and corner sight distances	
T. Principles of adaptive signal timing	
U. Influence of horizontal and vertical alignment of roadways on traffic control devices	