

TRAFFIC ENGINEER EXAMINATION CONTENT OUTLINE

CONTENT AREA: PLANNING (31%)

<p>Summary of Activities: This area assesses the candidate’s ability to apply knowledge of various techniques such as level of service analyses, trip generation, traffic distribution, and parking demand analyses of existing roadways to perform tasks involving, for example, capacity analyses, evaluation of traffic plans, estimating traffic volumes, access management, and parking analyses.</p>	
TASK STATEMENTS	KNOWLEDGE STATEMENTS
<ol style="list-style-type: none"> 1. Perform capacity analyses of existing roadways to determine the need for reducing congestion. 2. Evaluate traffic plans to ensure accommodation of current and future peak-hour traffic volumes. 3. Estimate delays at intersections based on projected traffic volumes to evaluate the need to change roadway networks. 4. Estimate increased traffic volumes produced by new developments to evaluate the need for roadway mitigations. 5. Predict future parking demands of proposed developments to determine sizes of parking facilities. 6. Predict future traffic volumes using a forecasting model for traffic impact studies. 7. Determine the costs and benefits of proposed capital improvement projects to prioritize funding. 8. Perform level-of-service analyses (LOS) of facilities to determine the need for roadway mitigations. 9. Develop access management plans for public and private properties. 11. Perform analyses of the impacts of trip generation demands on roadways, railways, public transit, sidewalks, and bicycle facilities to minimize delays and congestion. 12. Conduct corridor analyses of alternative modes of travel to determine optimum transportation infrastructures. 13. Propose improvements to transportation infrastructures to 	<ol style="list-style-type: none"> 1. Knowledge of techniques for performing level-of-service (LOS) analyses for transportation facilities. 2. Knowledge of techniques for calculating levels of service (LOS) for transportation facilities. 3. Knowledge of strategies used to reduce travel demand. 5. Knowledge of trip distribution techniques associated with traffic impact analysis. 6. Knowledge of the use of trip generation analysis techniques for various land uses. 7. Knowledge of the techniques needed to compute the highway capacity of roadways. 8. Knowledge of techniques for evaluating the current and projected traffic capacity of roadways. 9. Knowledge of techniques for calculating roadway segment capacity volumes. 10. Knowledge of techniques for calculating roadway segment capacity thresholds. 11. Knowledge of the effect of new developments on access to adjacent roadways. 12. Knowledge of roadway features that affect capacity. 13. Knowledge of access management principles related to the improvement of traffic flow. 14. Knowledge of techniques used to determine traffic impacts for existing and future conditions. 15. Knowledge of techniques used to select mitigation measures based on constraints. 16. Knowledge of techniques to measure the effectiveness of proposed roadway mitigations.

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<p>accommodate changes in travel demand due to new developments.</p> <p>14. Conduct traffic impact studies to determine transportation improvements.</p> <p>15. Identify constraints to proposed mitigation measures to evaluate their plausibility.</p> <p>17. Perform analyses of roadways and ramp areas to identify delays and collision locations.</p>	<p>17. Knowledge of essential elements needed for traffic impact studies.</p> <p>18. Knowledge of methods for applying principles of the planning process to macro- and micro-simulation models.</p> <p>19. Knowledge of techniques for conducting traffic flow studies.</p> <p>22. Knowledge of the relationship between parking demand and individual land uses.</p> <p>23. Knowledge of the effects of vehicle characteristics and volumes on roadway infrastructure.</p>
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CONTENT AREA: ROADWAY DESIGN (19%)

<p>Summary of Activities: This area assesses the candidate’s ability to apply knowledge of principles, standards, and guidelines such as those needed to develop parking facilities, driveways, roadway improvements, design of spacing and other facets of roadway lighting, roadway and transportation facilities, roundabouts, bicycle facilities improvements, and Intelligent Transportation Systems.</p>	
TASK STATEMENTS	KNOWLEDGE STATEMENTS
<p>18. Develop changes to roadway networks to mitigate the impacts of new developments on residential streets.</p> <p>19. Select traffic calming devices to mitigate cut-through traffic, collisions, and speeding.</p> <p>20. Verify that transportation facilities comply with Federal and State accessibility standards.</p> <p>21. Implement Intelligent Transportation System (ITS) measures to reduce congestion.</p> <p>22. Prepare plans, specifications, and estimates for traffic signal projects.</p> <p>23. Design roundabouts to minimize delays and improve safety at intersections.</p> <p>26. Design bicycle facilities improvements according to Federal and State standards and guidelines to promote alternative transportation modes.</p> <p>27. Select roadway safety devices such as guardrails, barriers, and crash cushions to minimize injuries.</p> <p>28. Develop roadway, interchange and intersection designs and constraints based on traffic demands and physical constraints to optimize safe travel.</p> <p>29. Prepare parking facility layouts to maximize efficiency and circulation.</p> <p>30. Develop lighting systems on roadways to optimize travel flow and safety.</p> <p>32. Develop illuminated pedestrian and overhead pedestrian crossings for safe public travel.</p>	<p>24. Knowledge of principles and standards for the development of parking facilities.</p> <p>25. Knowledge of standards for non-motorized transportation facilities.</p> <p>26. Knowledge of principles for the design of driveways.</p> <p>27. Knowledge of the effects of the mixtures and sizes of vehicles on roadway geometric design.</p> <p>29. Knowledge of applications of design standards to roadway improvements.</p> <p>30. Knowledge of applications of sight distance principles to roadway design.</p> <p>31. Knowledge of channelization guidelines to improve traffic flow.</p> <p>32. Knowledge of statutes and guidelines regarding accommodations for the disabled related to the design of traffic-related facilities.</p> <p>33. Knowledge of techniques for designing traffic facilities that takes into consideration roadway users with disabilities.</p> <p>34. Knowledge of principles for the design of spacing and other aspects of roadway lighting.</p> <p>37. Knowledge of techniques for implementing Intelligent Transportation Systems (ITS) technology to improve traffic flow and roadway safety.</p> <p>39. Knowledge of principles of bicycle facilities design.</p> <p>41. Knowledge of the design and application of traffic calming devices.</p>

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CONTENT AREA: STUDIES AND ANALYSES (11%)

<p>Summary of Activities: This area assesses the candidate's ability to apply knowledge of methods for performing Engineering and Traffic Surveys; techniques for analyzing collision and other types of data; and laws, principles, and standards regarding safety and traffic control devices to conduct, for example, speed-zone surveys, studies of traffic collision data, parking studies, and various types of field investigations of roadway conditions.</p>	
TASK STATEMENTS	KNOWLEDGE STATEMENTS
<p>34. Conduct speed-zone surveys to assess whether speed limits should be changed.</p> <p>35. Conduct studies of traffic collision data to identify causes of collisions on roadways and at intersections.</p> <p>36. Create diagrams of traffic collisions to support recommendations for their reduction at intersections and on roadways.</p> <p>37. Perform parking studies of vehicle inventory and other types of data for parking management and regulations development.</p> <p>38. Conduct field investigations of existing conditions to evaluate changes to traffic control devices and roadway designs.</p>	<p>42. Knowledge of methods for performing Engineering and Traffic Surveys.</p> <p>43. Knowledge of techniques for analyzing collision data for treatment identification and safety improvement.</p> <p>44. Knowledge of laws governing traffic control devices.</p> <p>45. Knowledge of principles and standards for pedestrian safety improvements.</p> <p>46. Knowledge of techniques for conducting parking use studies.</p> <p>47. Knowledge of techniques for conducting delay studies.</p>

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CONTENT AREA: TRAFFIC CONTROL (39%)

<p>Summary of Activities: This area assesses the candidate’s ability to apply knowledge of existing laws, standards, and principles for evaluating and implementing the use of traffic control devices, signal design, signal operations, and parking regulations for such tasks as managing on-street parking, performing traffic engineering assessments, modifying traffic signal hardware, and developing channelization designs for turning movements at intersections.</p>	
TASK STATEMENTS	KNOWLEDGE STATEMENTS
<p>39. Manage on-street parking by establishing parking regulations involving, for example, the California Vehicle Code, to promote the use of public parking spaces.</p> <p>40. Perform traffic engineering assessments to recommend placements of traffic signs.</p> <p>41. Evaluate signal timing to determine the need to improve the efficiency of traffic corridors.</p> <p>42. Modify traffic signal hardware to improve safety and operations.</p> <p>43. Evaluate the need for new traffic signals using warrants.</p> <p>44. Evaluate traffic control devices to improve pedestrian safety, including those in school areas.</p> <p>45. Design pavement markings on public/private property according to Federal and State standards.</p> <p>46. Evaluate the horizontal and vertical alignment of roadways to determine the need for traffic control devices.</p> <p>47. Determine signal phasing based on turning movement counts and collision history.</p> <p>48. Synchronize signals using traffic counts and computer models to optimize traffic flow.</p> <p>49. Design the placement and arrangement of traffic signals according to State standards for roadway safety.</p> <p>50. Select appropriate traffic control devices for development of transit and railroad facilities.</p> <p>51. Develop temporary traffic control and detour plans to minimize delay and address</p>	<p>48. Knowledge of laws governing curb parking.</p> <p>49. Knowledge of measures that remedy traffic safety and operational deficiencies.</p> <p>50. Knowledge of State standards for the identification and placement of signing, striping, and marking elements.</p> <p>51. Knowledge of warrants for the installation of traffic controls.</p> <p>52. Knowledge of methods to optimize the use of traffic signals for traffic flow.</p> <p>53. Knowledge of methods to factor transit priority into signal timing.</p> <p>54. Knowledge of techniques to develop traffic signal timing plans.</p> <p>55. Knowledge of principles of traffic signal design.</p> <p>56. Knowledge of traffic signal coordination timing to improve traffic flow.</p> <p>57. Knowledge of standards for guiding traffic through construction and maintenance zones.</p> <p>58. Knowledge of types of traffic signal phasing to improve safety and operations.</p> <p>59. Knowledge of principles governing the type and location of traffic signal detection systems.</p> <p>60. Knowledge of principles of traffic signal preemption.</p> <p>61. Knowledge of methods for traffic signal interconnection.</p>

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<p>worker and road user safety.</p> <p>52. Develop channelization designs for turning movements at intersections.</p> <p>53. Calculate passing, stopping, and decision sight distances to determine the appropriate pavement markings and/or signs for roadway conditions.</p> <p>54. Create signal timing plans to accommodate variable congestion, special events, and incident management.</p> <p>55. Create preemption and priority signal timing plans for railroad, transit, and emergency vehicles.</p> <p>57. Determine warning sign type, use, and placement based on roadway characteristics for safe roadway usage.</p>	
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