Road Safety Professional Classification System

Level 2

Infrastructure Specialty

Domain 1: *Fundamentals*
Task 1: Describe crash frequencies, crash rates, predicted crashes, expected crashes, and excess crashes.
Task 2: Identify limitations (or pitfalls) of crash rates as a measure of safety.
Task 3: Apply the use of predicted crashes, expected crashes, and excess crashes.
Task 4: Define risk and its uses.
Task 5: Differentiate between road safety (predicted and expected crash frequencies) and risk.
Task 6: Describe crash injury severity scales and levels.
Task 7: Describe what makes crashes reportable.
Task 8: Discuss the strengths and limitations of crash reporting (e.g., how reportability criteria affect the count of crashes, proportion of reportable crashes that are reported).
Task 9: Describe the physics (e.g., relationship of speed and impact forces) of a crash.
Task 10: Discuss how speed affects crash frequency and severity.
Task 11: Describe the safety effects of posted speed as it relates to operating speed.
Task 12: Describe how human limitations in information processing lead to a reliance on expectations in driving and the consequences of roadway design violating driver expectations.
Task 13: Describe the positive guidance approach to roadway design.
Task 14: Describe human factors issues contributing to different crash types.
Task 15: Describe how the difference between nominal and substantive safety affects liability risk management, rights of road users for safety, and demands on the professional.
Task 16: Describe how crash costs are estimated and the strengths and weaknesses of these estimates.
Task 17: Describe the elements of economic analysis in policy and project development, their applicability, and their strengths and weaknesses.
Domain 2: *Road Safety Management*
Task 1: Describe steps, strengths, and weaknesses in the roadway safety management process for spot-safety analyses.
Task 2: Describe steps, strengths, and weaknesses in the roadway safety management process for systemic analyses.
Task 3: List steps, strengths, and weaknesses of the various network screening processes.
Task 4: Apply the results of network screening to select locations with potential for crash reduction.
Task 5: Describe the strengths and weaknesses of methods for diagnosing safety performance.
Task 6: Diagnose safety performance of site characteristics at a selected location.
Task 7: Identify potential treatments to address the contributing factors resulting from diagnosis.
Task 8: Conduct an economic appraisal to prioritize safety treatments from a location-specific perspective.
Task 9: Conduct an economic appraisal to prioritize safety treatments from a systemic perspective.
Task 10: Rank prioritized safety projects using different methods.
Task 11: Demonstrate how to integrate safety considerations into projects (e.g., resurfacing, reconstruction, rehabilitation, maintenance, capacity).
Task 12: Describe the pitfalls of single project evaluation.
Task 13: Discuss the strengths and weaknesses of the methods used to evaluate the safety effect of treatments (e.g., empirical Bayes before-and-after, before-and-after with comparison group, cross-sectional).

Domain 3: *Acquiring and Using Safety Data*
Task 1: Describe relevant data and their respective sources (e.g., crash, user, traffic volume/exposure, roadway inventory).
Task 2: Discuss data needs for the roadway safety management process (e.g., network screening, project prioritization).
Task 3: Describe why safety data should be linked with other databases (e.g., roadway, traffic volume).
Task 4: Analyze crash datasets to determine relationships between crash patterns and other characteristics (e.g., roadway features, users, behaviors) to establish strategic emphasis areas.
Task 5: Describe crash data processing, from initial reporting to final coding.
Task 6: Identify the key characteristics of different crash types (e.g., rear end, sideswipe).
Task 7: Identify the level of detail needed from the crash reports for the various steps of the safety management process (e.g., diagnostics, countermeasure selection, network screening).
Task 8: Describe the constraints and challenges of using safety data associated with completeness, timeliness, accuracy, and uniformity.
Task 9: Illustrate potential errors in safety data analysis and interpretation.
Domain 4: *Crash Prediction and Trend Interpretation*
Task 1: Discuss the random nature of crashes and how regression to the mean influences interpretations of data trends.
Task 2: Identify different statistical methods used to analyze safety data (e.g., crash data, roadway data, exposure data).
Task 3: Explain the attributes of different statistical methods (e.g., empirical Bayes, logistics regression) including common applications and errors related to safety data analysis.
Task 4: Explain how and why safety trends change over time.
Task 5: Identify how and where to consider potential points of treatment.
Task 6: Explain the process of developing safety performance functions (SPFs) including how to select and calibrate SPFs.
Task 7: Explain how and when to use predicted versus expected crash frequency.
Domain 5: *Target Crashes and Countermeasures*
Task 1: Identify different sources of countermeasures (e.g., online resources, engineering studies, design guides).
Task 2: Describe the different types and characteristics of available evidence-based countermeasures (e.g., engineering, behavioral, policy initiatives, enforcement, public health, EMS, education/public outreach efforts).
Task 3: Explain the importance and purpose of selecting a particular target crash type and severity for treatment.
Task 4: Describe the data requirements for evaluating the effectiveness of a countermeasure.
Task 5: Assess the safety effectiveness of a particular countermeasure based on prior research.
Task 6: Identify the process for applying a crash modification factor (CMF) and the expected change in crash frequency or severity.
Task 7: Select an appropriate countermeasure and crash modification factor (CMF) based on local/site conditions.
Task 8: Discuss the considerations, other than safety effectiveness, that influence the selection of a countermeasure (e.g., cost, modal split, public acceptance).
Task 9: Describe the factors to consider when calculating the effectiveness of applying multiple treatments at the same location.
Task 10: Describe the issues associated with selecting and/or developing a crash modification factor (CMF) in terms of data requirements, evaluation method, quality, accuracy, and confounding factors.

Domain 6: *Multimodal Transportation Safety*
Task 1: Describe the safety effects of operating speed on drivers, bicyclists, motorcyclists, and pedestrians, as well as younger and older road users.
Task 2: Define speed management strategies (e.g., design, operational) that affect the safety of all road users.
Task 3: Explain the relationship between design parameters (e.g., sight distance, turning radius, cross section) and their safety effects on all road users.
Task 4: Explain the relationship between operational parameters (e.g., signal cycle, walking speeds, traffic control devices) and their safety effects on all road users (all ages and abilities) and motor vehicle types (e.g., commercial vehicles, public transit, school buses, recreational vehicles).
Task 5: Discuss the contributing factors of crashes between motor vehicles and pedestrians and related treatments.
Task 6: List the contributing factors of crashes between motor vehicles and bicyclists and related treatments.
Task 7: List the contributing factors of crashes between pedestrians and bicyclists and related treatments.
Task 8: Identify mobility and safety tradeoffs of a multimodal system (e.g., complete streets).
Task 9: Explain the role of human factors and behavioral adaptation as they relate to the safety of multimodal facilities.
Domain 7: *Addressing Safety Problems with Policy*
Task 1: Identify national transportation safety policy initiatives that have been implemented in the United States and Canada.
Task 2: Explain how policies and standards affect the safety of road users.
Task 3: Describe the process by which an identified safety problem and research findings lead to formulation of policy.
Task 4: Develop policies that support the implementation of countermeasures to address target crash types.
Task 5: Identify the different monetary, mobility, and social effects associated with the implementation of road safety policies.
Task 6: Describe policy efforts that have improved road safety outside the United States and Canada (e.g., automated speed enforcement in France, vision zero in Sweden).
Task 7: Describe how policy affects the funding for transportation safety projects (e.g., vision zero adopted by a local agency will require additional funds).
Task 8: Describe the relationship between policy and behavioral change (e.g., red-light cameras).
Domain 8: *Safe System and Vision Zero Approaches*
Task 1: Identify and explain the role of the responsible parties (e.g., providers of infrastructure, vehicle manufacturers, road users) in Safe System and Vision Zero approaches.
Task 2: List the key principles and strategies of Safe System and Vision Zero approaches.
Task 3: Explain how the Safe System and Vision Zero approaches affect the role of engineers, behavioral safety professionals, and planners.
Task 4: Identify key steps and challenges to implement Safe System and Vision Zero approaches.
Task 5: Describe the development of a strategic road safety plan within the Safe System and Vision Zero approaches.