

## QUIZ BANK

This quiz bank contains questions that were used in the pilot course to generate quizzes and tests for students. They are included here as reference for instructors to develop multiple-choice quizzes. The correct answer to each question is shown in ***bold italics***.

### SUSTAINABILITY AND SUSTAINABLE TRANSPORTATION

1. What are the primary focus areas addressed by the sustainability triple bottom line? Please select all that apply.

***Economy, Society, Environment, Politics, Religion***

2. \_\_\_\_\_ connects each element of triple bottom line sustainability.

***Equity, Equality, Economy, Environment***

3. ***True or False.*** The environment benefits the most from transportation in spite of the many governmental regulations that exist.

4. Which of the following may be affected by transportation systems? Please select all that apply.

***Energy consumption, Hydrologic cycle, Mobility and access***

5. ***True or False.*** The nation's economy is dependent on accessible and efficient movement of people and commerce.

6. ***True or False.*** Sustainability is sensitive to the context in which it is applied; therefore, there is no list of universal best practices for sustainability.

7. ***True or False.*** Since all three elements of the triple bottom line are equally important in all cases, it is not necessary to prioritize any of the elements over the others.

8. ***True or False.*** Historically, sustainability has been given lower priority when compared to the first costs of a transportation project.

9. Which levels of government are responsible for transportation infrastructure in the United States? Please select all that apply.

***National, State, Local***

10. ***True or False.*** In the transportation decision-making process, sustainability only needs to be considered during project-level planning and project-level environmental review.

11. In which part of the transportation decision-making process is capital programming used to match priority projects with funds?  
*Long-range planning; Short-range programming; Project-level planning; Construction, maintenance, and operations*
12. **True or False.** Performance measures are quantifiable criteria that can be used to track progress toward specific goals or objectives.
13. Performance measures must: (Please select all that apply.)  
***Be easily understood; Provide clear indication of moving toward the goal or objective; Be easily tracked using accessible and available data***
14. In which of the following ways may performance measures be used? Please select all that apply.  
***Description; Evaluation; Accountability; Communication***
15. **True or False.** Performance measures may be applied over different time frames, different levels of the organization, and different types of operations.
16. **True or False.** Whatever the approach, performance measures must be practical.
17. **True or False.** Sustainability characteristics of highways should be assessed throughout their life cycles, from conception through construction, operations, and maintenance.
18. **True or False.** Sustainable transportation should focus strictly on vehicle movement, without regard for the people or goods that they are moving.
19. **True or False.** While a balanced treatment of social, economic, and environmental principles is ideal for sustainable transportation, it is not always possible.

## **SUSTAINABILITY GOALS, OBJECTIVES, AND PERFORMANCE MEASUREMENT**

1. Which of the following might we want to accomplish by using sustainability performance measurement? Please select all that apply.  
***Reduce long-term costs, Build public support, Address energy consumption, Respond to regulatory requirements***

2. In which phase of the decision-making process do we want to use sustainability performance measurement?

*Long-range planning only; Short-term programming only; Construction, maintenance, and operations only; **Sustainability performance measurement may be used in all phases of decision making***

3. **True or False.** The results of sustainability performance measurement may be used to understand and describe the effect sustainability is having.
4. **True or False.** Sustainability performance measurement has little value as an accountability tool for staff and other programs.
5. **True or False.** The approach to sustainability performance measurement should evolve over time.
6. **True or False.** In addressing sustainability through the Transportation and Environmental Resource Council, the aim is not to define sustainable transportation, but rather to get a consensus on what certain common sustainability principles are and how they can be applied in the transportation sector.
7. When considering where to begin with a sustainability performance measurement program, which of the following are important questions to consider? Please select all that apply.

***Is this a new process for us? Have we defined our goals? Are there external requirements? What partners are we working with?***

8. When phasing in sustainability performance measurement, where is a good place to start? Please select the one best answer.

***Start with what you have, Start with what others have, Start by purchasing generic sustainability software, Give up and do not start at all***

9. Which of the following is *not* one of the three components of the sustainability performance measurement framework?

***Fundamental, Overarching, Auxiliary, Ancillary***

10. \_\_\_\_\_ components of the sustainability performance measurement framework are optional.

***Fundamental, Overarching, Auxiliary, Ancillary***

11. \_\_\_\_\_ components of the sustainability performance measurement framework are applied in six steps.

***Fundamental, Overarching, Auxiliary, Ancillary***

12. \_\_\_\_\_ components are items that need to be taken into consideration throughout the sustainability performance measurement framework, such as engagement of stakeholders, partners, and external agencies.

*Fundamental, **Overarching**, Auxiliary, Ancillary*

13. **True or False.** The general public is considered a stakeholder that must be considered in the sustainability performance measurement framework.

14. **True or False.** Feedback is required in order for the sustainability performance measurement framework to be successful.

15. **True or False.** Having a fundamental understanding of sustainability is necessary in order to apply the sustainability performance measurement framework.

16. With regard to understanding sustainability, it is important to address the basic principles of sustainability. Which of the following are primary principles of sustainability? Please select all that apply.

***Preserve and enhance environmental and ecological systems***

***Foster community health and vitality***

***Promote economic development and prosperity***

***Ensure equity in population groups over generations***

17. **True or False.** When developing transportation sustainability goals, it is important to map the goals to sustainability principles.

18. **True or False.** No one goal in itself is sufficient to achieve sustainability—it takes multiple goals, pursued in concert, to promote sustainability.

19. **True or False.** Equity must be addressed in the present-day context only with no regard for future generations.

20. Which of the following must be considered for equity when developing transportation sustainability goals? Please select all that apply.

***Income, Age, Ethnicity, Gender***

21. **True or False.** Sustainability objectives may be the same for different phases of work.

22. **True or False.** Sustainability objectives may be different for different phases of work.

23. The fundamental components of the sustainability performance measurement framework are applied in \_\_\_\_\_ steps.

*Three, Four, **Six**, Eight*

24. **True or False.** Sustainability goals assess progress toward each sustainability objective and provide the ongoing data to help further improve performance.

25. \_\_\_\_\_ measures determine the result or the impact of program, policy, or decision, and provide information on the achievement of sustainability goals.

*Outcome, Output, Process*

26. \_\_\_\_\_ measures produce a tangible item that results from an action and relates results or changes in terms of the system and its function.

*Outcome, **Output**, Process*

27. \_\_\_\_\_ measures identify components of a practice that are deemed to support the related goal or objective, and relate inputs and products to certain activities.

*Outcome, Output, **Process***

28. **True or False.** There is no ideal number of performance measures, so keep the number to a manageable level.

29. When implementing performance measures, what is the overarching component that relates to all of the other types of performance measure application?

*Description, Evaluation, Accountability, Decision support, **Communication***

30. Applying the SPM framework requires refinement to ensure that progress toward sustainability is achieved. What is the one element that is needed to make sure that refinement occurs?

*Fundamental components, Auxiliary components, Overarching components, **Feedback***

## SUSTAINABILITY RATING SYSTEMS

1. Until recently, most sustainability rating systems focused on \_\_\_\_\_ construction projects, such as buildings.

***Vertical**, Horizontal, Longitudinal, High-rise*

2. Which of the following are sustainability factors typically considered in infrastructure projects? Please select all that apply.

***Energy consumption, Resource requirements, Environmental impacts, Cost***

3. Rating systems typically measure infrastructure sustainability using five broad categories. Which of the following are *not* among those categories? Please select all that apply.

***Politics, Religion, Resources, Energy, Transport, Water, Waste***

4. Which of the following are prominent sustainability infrastructure rating systems? Please select all that apply.

***BEEST-on-Roads, Envision, Greenroads, INVEST***

5. ***True or False.*** The focus of the BE<sup>2</sup>ST-in-Highways rating system is to quantify the sustainability impact of using recycled materials in pavements.
6. ***True or False.*** The University of Washington developed BE<sup>2</sup>ST-in-Highways.
7. ***True or False.*** BE<sup>2</sup>ST-in-Highways allows users to weight the importance of nine sub-criteria to determine a sustainability score; however, weighting the criterion is optional.
8. Which of the following is *not* a rating result of BE<sup>2</sup>ST-in-Highways?

***Bronze, Silver, Gold, Platinum***

9. ***True or False.*** The Institute for Sustainable Infrastructure at Harvard developed the Envision sustainability rating system.
10. Envision encourages the use of \_\_\_\_\_ in the planning, design, construction, and operation phases of infrastructure projects.

***Life-cycle analysis, Operations research, Meta-heuristic theory, Theory of relativity***

11. Which of the following is not a certification used by Envision?

***Bronze, Silver, Gold, Platinum***

12. Envision distributes \_\_\_\_\_ credits under \_\_\_\_\_ categories in its rating system.

***60, 5; 5, 60; 50, 6; 6, 50***

13. The GreenLITES sustainability rating system was developed by \_\_\_\_\_.

***New York State Department of Transportation, Illinois Department of Transportation, Federal Highway Administration, CH2M Hill***

14. The GreenLITES rating system distributes \_\_\_\_\_ points across \_\_\_\_\_ sustainability categories.

***175, 5; 5, 175; 715, 15; 0, 0***

15. ***True or False.*** One of the purposes of GreenLITES is to provide a medium for the dissemination of information and funding for research.

16. Which of the following is *not* an award level in GreenLITES?  
*GreenLITES Evergreen, GreenLITES Silver, GreenLITES Gold, **GreenLITES Platinum***
17. **True or False.** GreenLITES is a mandatory, self-certification program for all NYSDOT projects.
18. Greenroads was developed by \_\_\_\_\_. Please select all that apply.  
*University of Washington, CH2M Hill, University of Wisconsin, Harvard*
19. Greenroads utilizes 11 \_\_\_\_\_ categories and six \_\_\_\_\_ categories to assess sustainability.  
*Required, Voluntary; Voluntary, Required; Energy, Atmosphere; Materials, Resources*
20. Which of the following are award levels for Greenroads? Please select all that apply.  
*Bronze, Silver, Gold, Platinum, Evergreen*
21. I-LAST stands for \_\_\_\_\_ Livable and Sustainable Transportation.  
*Illinois, Indiana, Iowa, Idaho*
22. **True or False.** I-LAST is a mandatory, web-based, third-party certification tool for infrastructure sustainability assessment.
23. I-LAST distributes \_\_\_\_\_ sustainability criteria under \_\_\_\_\_ broader criteria categories.  
*153, 17; 17, 153; 351, 71; 71, 351*
24. Which of the following are award levels issued by I-LAST? Please select all that apply.  
*Silver, Gold, Platinum, Evergreen, **None of these***
25. **True or False.** INVEST utilizes a user-friendly, web-based interface that is free to use.
26. Which of the following are award levels issued by INVEST? Please select all that apply.  
*Bronze, Silver, Gold, Platinum, Evergreen*
27. **True or False.** INVEST does not issue a third-party certification, but it does serve as unofficial recognition from the Federal Highway Administration.

28. INVEST helps to address \_\_\_\_\_ barriers, such as hindrances in policies, standards, and specifications used for sustainable transportation.

***Programmatic, construction, operations, maintenance***

29. INVEST provides a “snapshot in \_\_\_\_\_” of sustainability efforts.

***Time, Location, Size, Planning***

30. **True or False.** INVEST does not make highways sustainable, but it helps make them more sustainable than they currently are.

31. Which one of the following is *not* one of the four modules used in INVEST to evaluate the sustainability of transportation projects throughout the project lifecycle?

***System Planning for States (SPS), System Planning for Regions (SPR), System Planning for Governments (SPG), Project Development (PD), Operations and Maintenance (OM)***

32. Which of the following are goals of using INVEST to achieve sustainability goals? Please select all that apply.

***Advance better business practices, Integrate sustainability into projects and programs, Improve education and understanding of sustainability, Facilitate internal and external communication and outreach***

33. **True or False.** INVEST is primarily a one-time static assessment of sustainability for a project or program.

34. INVEST helps keep projects on track to meet sustainability goals by providing a sustainability \_\_\_\_\_ with milestones.

***Schedule, budget, quality control plan, key performance indicators***

35. **True or False.** The value of INVEST is not found in the score it produces but the outcomes it achieves and the recommendations it generates.

36. **True or False.** In general, most agencies require 30 or more employees working at least three months each to use INVEST to score an individual project or program.

37. Which of the following sustainability rating tools is the only one to address all of the components of the transportation system life cycle including system planning and programming, project planning, project design, project construction, and operations and maintenance?

***INVEST, I-LAST, Greenroads, GreenLITES, Envision***

38. What does the acronym INVEST stand for?

**Infrastructure Voluntary Evaluation Sustainability Tool**

39. Each INVEST module has \_\_\_\_\_ that are used to evaluate a particular sustainability metric or performance measure.

**Criteria, principles, objectives, tasks**

40. What is the *maximum* obtainable scoring range available for each individual sustainability metric in INVEST?

**1–5, 1–10, 1–15, 1–20**

41. Based on the sustainability linkage graphic below, which triple bottom line sustainability issues are affected by the related INVEST scoring item? Please select all that apply.



**Social, Economic, Environmental, None**

42. What minimum percentage of the total achievable score is necessary to attain a Platinum rating in INVEST?

**40%, 50%, 60%, 70%**

43. If the Project Development: Urban Basic Scorecard has a maximum of 136 points available and 60 points are achieved in the scoring process, what rating will the project receive?

**Bronze, Silver, Gold, Platinum**

44. The \_\_\_\_\_ module provides criteria to self-evaluate the development of a specific project. It covers activities throughout project-specific planning, design, and construction.

**System Planning for States, System Planning for Regions, Project Development, Operations and Maintenance**

45. The \_\_\_\_\_ module provides criteria to self-evaluate system-level planning and programming policies, processes, procedures, and practices. It is geared towards metropolitan planning organizations, council of governments, or other planning organization that perform landscape-scale planning for an area that typically does not own infrastructure.

*System Planning for States, **System Planning for Regions**, Project Development, Operations and Maintenance*

46. **True or False.** When using INVEST to rate a project, you may choose only one module and scorecard to use for that particular rating.

47. Which of the following are required input for registering a project in INVEST? Please select all that apply.

***Project/program title, State, Zip code, Lead design organization, Prime contractor***

48. **True or False.** Rating a project may only be done online at the INVEST website—there is no offline option for rating a project.

49. **True or False.** INVEST provides detailed descriptions and instructions for scoring each criterion.

50. **True or False.** The Project Development module has multiple scorecard options, so only applicable criteria are considered.

51. Who is the developer and owner of INVEST?

***Federal Highway Administration (FHWA), Texas Department of Transportation (TxDOT), Indian Nations Council of Governments (INCOG), New York State Department of Transportation (NYSDOT)***

52. What is the current version of INVEST that is in use and available on the website?

*1.1, 1.2, **1.3**, 2.0*

53. In what year was the original Beta Version of INVEST developed?

*2000, **2010**, 2012, 2015*

54. In what year did FHWA launch INVEST 1.0?

*2000, 2010, **2012**, 2015*

55. On what nationally recognized day in 2018 was INVEST 1.3 launched?

***Earth Day, Indigenous Peoples Day, New Year's Day, Independence Day***

56. Which of the following are reasons to use INVEST? Please select all that apply.

***It helps to assess the sustainability of transportation plans, project, or programs.***

***It is a free, web-based self-evaluation tool.***

***It helps to quantify, balance, and communicate sustainability benefits and trade-offs.***

***It helps to evaluate, score, and improve sustainability in transportation.***

57. Which of the following is FHWA's *primary* goal for INVEST?

***Improve the sustainability triple bottom line of highway projects and programs.***

*Establish a method for identifying best practices in highway systems.*

*Assist, aid, and encourage the implementation of sustainable practices in transportation.*

*Raise the bar in making progress toward more sustainable highways.*

*Provide a forum for exchange of best practices and emerging technologies.*

58. **True or False.** INVEST is required and is intended to encourage comparisons between transportation agencies.

59. **True or False.** INVEST strives to not “re-invent the wheel” by referencing and identifying the latest guidance and research.

60. Which of the following are approaches to achieving the sustainability goal of **advance better business practices**? Please select all that apply.

***Make a business case for sustainability, Monitor performance and benchmark with INVEST, Encourage internal communication, Facilitate external communication***

61. How many scorecard options are available for the Project Development (PD) module?

*Five, **Seven**, Ten, Twelve*

62. Which of the following information is included in each criterion write-up? Please select all that apply.

***Title, Goal, Scorecard graphic, Sustainability linkage***

63. **Yes or No.** Is it possible to translate existing evaluations done with previous versions of INVEST into the current version of INVEST?

64. Which of the following are technical assistance opportunities for those needing help with INVEST? Please select all that apply.

***Training (up to two hours), Peer-to-peer contacts, Implementation and scoring workshops (full day)***

65. **True or False.** Through the use of innovative criteria, INVEST allows users to define sustainable innovations and emerging technologies addressed in their projects that are not already represented in INVEST.

## SUSTAINABLE CONSTRUCTION PRACTICES

1. Sustainable construction practices (SCPs) assist in \_\_\_\_\_. Please select all that apply.

***Building highways, Preserving surrounding ecosystems, Meeting basic human needs, Managing resources wisely***

2. What are two of the basic requirements for sustainable construction practices (SCPs)? Please select the two that apply.

***SCPs go above and beyond standard practice, SCPs show innovation in support of people and the environment, SCPs only meet required national regulatory minimums, SCPs only use methods that have been used previously***

3. **True or False.** The contribution of highway construction to national economic and greenhouse gas metrics is relatively small.

4. Which of the following are substantial highway construction impacts? Please select all that apply.

***Greenhouse gas emissions, stormwater runoff, traffic congestion, inconvenience***

5. **True or False.** Envision is considered to be the leading entity in highway sustainability.

6. **True or False.** In highway construction, sustainability is generally considered to be less important than cost and schedule.

7. **True or False.** Durability and long life of infrastructure is integral to sustainability.

8. **True or False.** According to research, most organizations value sustainability.

9. Which of the following is the most identified sustainable construction practice (SCP)?

***Materials recycling and reuse, Accelerated bridge construction methods, Use of bicycle racks on construction sites, Diesel emissions reduction methods***

10. **True or False.** The contractor's competitive advantage resulting from implementing a new SCP is long lived.
11. What are the two levels used in the Highway Construction Framework?  
**Project delivery, Project, Human well-being, Environmental well-being, Economic well-being**
12. What are the three dimensions used in the Sustainability Framework?  
**Project delivery, Project, Human well-being, Environmental well-being, Economic well-being**
13. With regard to sustainability framework mapping, which categories of the Project Delivery level in the Highway Construction Framework are present in all dimensions and categories of the Sustainability Framework? Please select all that apply.  
**Project delivery method, Financing, Procurement, Contracting**
14. With regard to sustainability framework mapping, which categories of the Economic Well-Being dimension in the Sustainability Framework apply to all levels and categories in the Highway Construction Framework? Please select all that apply.  
**Project budget, Maintenance and operations, Economic development/employment, Climate**
15. Which of the following is the most passive and least effective contractual approach to address sustainability because there is no guarantee that any sustainable construction practices (SCPs) will occur?  
**Allowing sustainability, Mandating sustainability, Incentivizing sustainability, Pricing sustainability**
16. **True or False.** One approach to requiring SCPs in a contract is to include a performance-based metric that allows the contractor to choose from a list of which SCPs to use.
17. **True or False.** Since expenses associated with SCPs are usually very small, incentivized SCPs in the contract should be viewed as entirely supplemental income or profit.
18. A(n) \_\_\_\_\_ bid is a defined portion of the work that is priced separately, which provides the owner with the option to include that scope of work.  
**Alternate, unbalanced, unit, low**
19. **True or False.** Project delivery methods that make communication among parties easier are generally better suited to sustainable procurement and contracting.

20. *True or False.* Risks associated with SCPs may be more understood and more quantifiable than risks associated with traditional construction practices.