Supplementary Materials

Table S1. Characteristics of the environmental assessments carried out in the reviewed studies

Source	Assessment method	Standards / Guidelines	Type of data	Data quality assessment?	Software	No. of impact categories	Impact assessment method	Allocation method	Sensitivity analysis
[103]	LCA	Not specified	Not specified	No	Not specified	1	Not specified	Not specified	No
[104}	LCA	ISO 14040	Primary and secondary	No	SimaPro 8.4	3 (endpoint)	ReCiPe 2016 Endpoint (E) V1.00	Not specified	No
[105]	LCA	Not specified	Not specified	No	ECO-comparator applied to Road Construction and Maintenance	12	Not specified	Not specified	No
[106]	LCA	ISO 14040 ISO 14044	Secondary	No	Not specified	2	Not specified	Cut-off	No
[113]	LCA	ISO 14040 EN 15804 prEN 17392 (withdrawn)	Primary and secondary	No	Not specified	2	Not specified	Not specified	Service life of layers, production temperature of - modified asphalt
[114]	LCA	ISO 14040	Secondary	No	Not specified	6	Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI) – including normalization and weighting factors	Not specified	No
[115]	LCA	Not specified	Primary and secondary	No	Not specified	2 - emissions are calculated instead of impacts	No impacts are calculated	Not specified	No

Source	Assessment method	Standards / Guidelines	Type of data	Data quality assessment?	Software	No. of impact categories	Impact assessment method	Allocation method	Sensitivity analysis
[116]	TBL-LCA based on Economic Input/Output (EIO)	Not specified	Secondary	No	Not specified	10	Does not apply	Does not apply	Rate of WMA additives, transport distance of pavement materials to mixing sites and mixing energy amount
[117]	TBL-LCA based on Economic Input/Output (EIO)	Not specified	Not specified	No	Not specified	10	Does not apply	Does not apply	No
[119]	LCA	Not specified	Secondary	No	SimaPro	13	Not specified	Not specified	No
[120]	LCA	Not specified	Not specified	No	SimaPro	10	Tool for Reduction and Assessment of Chemicals and Other Environmental Impacts (TRACI)	Not specified	No
[121]	LCA	Not specified	Not specified	No	Suggested - SimaPro, OpenLCA, GaBi	9	CML 2001 Cumulative Energy Demand (CED) ReCiPe hierarchist	Not specified	Yes - in combined results
[122]	LCA	Not specified	Secondary	No	Not specified	3 - emissions are calculated instead of impacts	No impacts are calculated	Not specified	No
[123]	LCA	Not specified	Secondary	No	Not specified	3 - emissions are calculated instead of impacts	No impacts are calculated	Not specified	No
[127]	LCA	Not specified	Secondary	No	Not specified	Not specified	Not specified - it was highlighted that normalization and weighting of results shall be carried out	Not specified	No

Source	Assessment method	Standards / Guidelines	Type of data	Data quality assessment?	Software	No. of impact categories	Impact assessment method	Allocation method	Sensitivity analysis
[126]	LCA	UNEP/SETAC guideline	Secondary	No	Not specified	5	Tool Reduction and Assessment of Chemical and other environmental Impacts 2.0-TRACI 2.0	Not specified	No
[125]	LCA	Not specified	Secondary	Yes – Data Quality Index	Not specified	6	Tool Reduction and Assessment of Chemical and other environmental Impacts 2.0-TRACI 2.0	Not specified	No

Table S2. Characteristics of the economic assessments carried out in the reviewed studies

Source	Assessment method	Standards / Guidelines	Stakeholder(s)	Data type	Software	No. of indicators	Discount rate	Externalities?	Sensitivity analysis
[103]	LCC	Not specified	Not specified	Not specified	Not specified	2	Not specified	Not specified	No
[104}	LCC	Cost breakdown by the American Society for Testing and Materials	Not specified	Not specified	Microsoft Excel	1	Not specified	Not specified	No
[105]	LCC	Not specified	Not specified	Not specified	Not specified	1	Not specified	Not specified	Not specified
[106]	Cost-Benefit Analysis (CBA)	Cost Benefit Guidelines of the EU-Commission	Road agency	Secondary	Not specified	1	4%	Yes Indirect costs - environmental and social costs	No
[113]	LCC	EN 15643-4 (withdrawn) ISO 15686-5	Not specified	Primary and secondary	Not specified	1	3%	Not specified	Yes - Discount rate
[114]	LCC	Not specified	Road agency Users	Secondary	RealCost 2.5	1	4%	No	Yes - discount rate, queue dissipation capacity, value of time for passenger cars and trucks, work zone capacity, agency construction costs

Source	Assessment method	Standards / Guidelines	Stakeholder(s)	Data type	Software	No. of indicators	Discount rate	Externalities?	Sensitivity analysis
[115]	LCC	Not specified	Road agency Users	Primary and secondary	Not specified	3	Six discount rates: 8%, 20%, 30% 35%, 40%, 50%	No	Yes - Increase in fuel price, discount rate, traffic growth factor and construction cost
[116]	TBL-LCA based on Economic Input/Output (EIO)	Not specified	Not specified	Not specified	Does not apply	3	Does not apply	Does not apply	No
[117]	TBL-LCA based on Economic Input/Output (EIO)	Not specified	Not specified	Primary	Not specified	3	Does not apply	Does not apply	Yes Same as in environmental
[119]	LCC	Not specified	Road agency	Primary and secondary	Not specified	1	None was used	No	No
[120]	LCC	Not specified	Not specified	Not specified	Not specified	Not specified	Not specified	Yes Indirect costs - social costs of carbon	No
[121]	LCC	Bids, authorities' guidelines	Road agency Users	Secondary	HCM, RealCost, QUADRO, Visum	1	Not specified	No	Yes - in combined results
[122]	Evaluation of economic opportunity and value of transportation assets	Not specified	Not specified	Secondary	Not specified	2	Not specified	Not specified	Not specified
[123]	LCC	Not specified	Not specified	Secondary	Not specified	Not specified	No	No	No

Source	Assessment method	Standards / Guidelines	Stakeholder(s)	Data type	Software	No. of indicators	Discount rate	Externalities?	Sensitivity analysis
[127]	LCC	Not specified	Road agency	Secondary	Not specified	1	4% (most likely value), 3% (min. value) and 7% (max. value)	No	No
[126]	LCC	UNEP/SETAC guideline (2012) Swarr (2011)	Road agency Users	Secondary	Not specified	1	5.50%	No	No
[125]	LCC	Not specified	Road agency Users	Not specified	RealCost 2.5	Not specified	Does not apply	No	No

Table S3. Characteristics of the social assessments carried out in the reviewed studies

Source	Assessment method	Standards / Guidelines	Stakeholder(s)	Data type	Software	No. of sub-categories	No. of indicators
[103]	Selected social indicators	Not specified	Does not apply*	Not specified	Not specified	Does not apply	0*
[104}	S-LCA	S-LCA guidelines, PSIA Handbook	Consumers Local community Society Value Chain Actors	Primary and secondary	Not specified	User: 7 Local community: 6 Society: 2 Value chain actors: 2	5**
[105]	Selected social indicators	Not specified	Workers Local community	Not specified	Not specified	Does not apply	6
[106]	Selected social indicators	Not specified	Local community	Not specified	Not specified	Does not apply	1
[113]	Selected social indicators	Not specified	Workers	Primary and secondary	Not specified	Does not apply	1
[114]	S-LCA	S-LCA Guidelines	Local community	Not specified	Not specified	1	1
[115]	Selected social indicators	International Road Assessment Programme methodology	Consumers	Primary and secondary	iRAP	Does not apply	1
[119]	S-LCA	Not specified	Not specified	Secondary	SimaPro	Not specified	5**
[120]	Selected social indicators	Not specified	Consumers Local community	Not specified	Does not apply	Does not apply	6
[121]	Selected social indicators	Directive 2008/96/EC on road infrastructure safety management CNOSSOS-EU method for strategic noise mapping	Consumers Local community	Secondary	Not specified	Does not apply	4
[122]	Selected social indicators	Not specified	Consumers Local community	Secondary	Not specified	Does not apply	2
[123]	Selected social indicators	Not specified	Consumers Local community Workers	Secondary	Not specified	Does not apply	2
[127]	S-LCA	Not specified	Worker Local community Society Consumer	Not specified	Not specified	Worker: 3 Local community: 2 Society: 2	9

Source	Assessment method	Standards / Guidelines	Stakeholder(s)	Data type	Software	No. of sub-categories	No. of indicators
[126]	S-LCA	UNEP/SETAC guideline (2012)	Worker Local community Society Consumer	Primary and secondary	Not specified	Worker: 3 Local community: 2 Society: 2 Consumer: 1	10
[125]	S-LCA	ISO 14040 S-LCA Guidelines	3 stakeholders, but not specified	Primary and secondary	Not specified	12	16

Table S4. Integration approaches and result interpretation of the three sustainability dimensions in the reviewed studies

Source	Combined interpretation of results?	Interpretation method	Weighting approach	Weight distribution	Visualization approach of combined results
[103]	Yes	Index – Road Sustainability Index (RSI)	Examination of selected rating systems for road projects	Two sets of weighting: (1) Environment 50%, economy 25%, society 25% (2) Environment 34%, economy 33%, society 33%	Bar chart with the values for each dimension presented in a single bar for all assessed alternatives
[104}	Yes	Index	AHP for individual indicators and for sustainability dimensions	Environment: 29.50% Economic: 27,68% Social: 42.82%	No visualization
[105]	Not specified	DPSIR (Driver, Pressure, State, Impact, Response) framework within a performance management framework	No weighting	No weighting	No visualization
[106]	Yes	Monetarization of results through application of CBA	No weighting	No weighting	Bar chart showing monetarized impacts and life cycle costs
[113]	Yes	Trade-offs – Focus of savings achieved through analyzed alternative for all dimensions and possible trade-offs	No weighting	No weighting	Pie charts with total indicators for each variant. Disaggregation based on road structure (surface, binder and base layers), but no disaggregation based on life cycle stages.
[114]	Yes	Ranking of alternatives based on weights assigned by decision-makers	Traditional and modified AHP for the individual indicators and for the sustainability dimensions	Traditional AHP: - Environment: 8% - Economic: 54% - Social: 38% Modified AHP: - Environment: 10% - Economic: 45% - Social: 45%	Radar chart with ranking of the different alternatives done by decision-makers
[115]	Yes	Trade-offs – Focus of trade-offs between sustainability dimensions. Aggregation of results into an index was recommended, but not carried out	No weighting	No weighting	No visualization
[116]	Yes	MCDM – Technique for Order of Preference by Similarity to Ideal	Fuzzy entropy based on the opinion of the decision makers	Weights are given for life cycle stages and indicators in vector form	No visualization

Source	Combined interpretation of results?	Interpretation method	Weighting approach	Weight distribution	Visualization approach of combined results
		Solution (TOPSIS) method, intuitionistic fuzzy entropy method, intuitionistic fuzzy weighted geometric averaging operator, and intuitionistic fuzzy-weighted arithmetic averaging operator			
[117]	Yes	MCDM - Compromise Programming	Weights of the environmental dimension: Building for Economic and Environmental Sustainability (BEES) software, v.4.0	Several weighting sets are provided. The economic and social dimensions are aggregated into a 'socio-economic weight'	Bar chart showing the most appropriate allocation of pavement alternatives based on different sets of weights
[119]	Yes	Index – Green Road Score	- Aggregation of environmental KPI to category score: Weights of the BEES framework - Weights of sustainability dimensions based on the priorities of local governments	Environment: 40% Economic: 50% Social: 10%	No visualization
[120]	No	Separate analysis of the results for each sustainability dimension	No weighting	No weighting	No visualization
[121]	Yes	MCDM – PROMETHEE-II method	Subjective (based on preference of the consulted decision-makers) and Objective (used for the sensitivity analysis, based on the Entropy and mean weight methods)	Environment: 69.47% Economic: 9.78% Social: 20.76%	No visualization
[122]	Yes	Index – Socio-Eco-Efficiency	Data Envelopment Analysis (DEA)	Not specified	Bar chart showing the calculated index
[123]	Yes	Trade-offs – Consideration of the influence of selected parameters in the defined sustainability indicators	No weighting	No weighting	Bar chart of relative difference in the outcome compared to a baseline scenario

Source	Combined interpretation of results?	Interpretation method	Weighting approach	Weight distribution	Visualization approach of combined results
[127]	Yes	Index – Improved AHP-ISD (Integrated Sustainability Degree) (probabilistic)	AHP	Environment: 25,6% Economic: 43.0% Social: 31.3%	Bar chart showing the probabilistic distribution of ISDs for the pavement alternatives
[126]	Yes	MCDM – Combination of VIKOR (VIseKriterijumska Optimizacija I Kompromisno Resenje) and AHP	AHP	Environment: 25.6% Economic: 43.0% Social: 31.3%	No visualization
[125]	Yes	MCDM – TOPSIS	AHP	Not specified	No visualization

Table S5. Characteristics of the sustainability rating systems proposed or presented in the reviewed studies

Source	Criteria structure	Categories (weighting)	Evaluation
{102]	Indicator → Sub-category → Category	Environmental impacts (20%) Mobility for all (20%) Transportation planning (19%) Materials and resources (19%) Leadership (22%)	Each indicator gets a score, which are added and weighted to determine the score of the sub-category. The weighted addition of the score of the sub-categories comprise the score of the category. The addition of the category-level results comprises the result of the assessment. Four performance levels are considered: Level A (≥ 80%), level B (≥ 70 and ≤ 79%), level C (≥ 60 and ≤ 69%) and level D (≥ 50 and ≤ 59%).
[69]	Evaluation standards and criteria	Environmental quality Economic quality Socio-cultural quality Technical quality Process quality	Partial results are obtained for each indicator in their respective category. The addition of the results at category level comprise the final result, which can lead to a certification. The performance levels are not specified.
[107]	Indicators → Theme	Planning (11%) Participation (10%) Mobility/Safety (14%) Environmental impact (20%) Access and equity (12%) Natural resources (12%) Financial competency (10%) Innovation and quality (11%)	Indicators are evaluated using a 100-point scale. The final result is a weighted aggregation of the score and is expressed in a scale of 100 points.
[108]	Micro-indicators (units) → Macro-indicators → Sustainability dimensions	Environment (35.02%) Society (31.00%) Economy (33.98%)	The results of all indicators are aggregated, and based on this, one or several sustainability indexes are developed.
[109]	Not specified	Environmental criteria Economic criteria Social criteria Technical criteria	Two levels of achievement: light (basic, covering a minimum range of criteria) and complete (covering the whole range of requirements)
[110]	Performance measures → Indicators → Objectives → Goals → Sustainability dimensions (environment, social, economic, financial, technological, corporate)	Environment Social Economic Financial Technological Corporate	An index is calculated for each sustainability dimension. Each sustainability dimension has a different weight. The end result can be calculated using an outcome-based approach - an indicator is calculated - or a process-based approach - the qualitative performance of the agency is assessed. The results are connected to weighted objectives, corresponding to weighted goals. The goals form the sustainability indices. With their respective weighting, the sustainability indices comprise the Sustainable Composite Index (SCI).

Source	Criteria structure	Categories (weighting)	Evaluation
[111]	Sustainability indicators → Sustainability aspects	Social Economic Environmental	Not specified - the case study was only used to form a committee to assign the ranking to the different indicators
[112]	Standardized questions → Principles → Themes	Ecology / Planet Social / People Economy / Profit	Each theme is assessed by answering a set of standardized questions. With the answer to the questions, a sustainability score can be calculated and visualized in a 'synergy wheel'.
[118]	Project requirements or Voluntary Credits → Categories	Project requirements Environment and water Access and equity Construction activities Materials and resources Pavement technologies Custom credits	Compliance with a series of project requirements (mandatory, no points awarded), voluntary credits (a maximum of 108 points can be awarded) and custom credits (10 credits can be awarded). There are four achievement levels: Certified (30–40% of the total Voluntary Credit points), Silver (40–50% of the total Voluntary Credit points), Gold (50–60% of the total Voluntary Credit points), Evergreen (>60% of the total Voluntary Credit points).
[124]	Secondary indicators → First grade indicators	Quality: - Society and economy (60%) - Service (40%) Load: - Resource: (40%) - Environment (60%)	Questionnaires and AHP are used to assign weights to the indicators. Based on this, a Sustainable Development Index (SDI) is calculated. The SDI is the ratio of the Quality indicators (society and economy, service) divided by the Load indicators (resource, environment)

Table S6. SRS indicators

Source	Indicator	Category (as in SRS)	Indicator type	Comment
ENVIRONMENT				
Biodiversity				
[112]	Biodiversity	Ecology / planet	Semi-quantitative	
[108]	Biodiversity protection	Environment	Qualitative	Best practice
[118]	Connect habitat across roadways	Environment & Water	Qualitative	Best practice
[108]	Barrier effect	Environment	Semi-quantitative	Best practice
[102]	Provide right-of-way wildlife barriers	Environmental impacts	Qualitative	Best practice
[118]	Create new habitat beyond what is required	Environment & Water	Qualitative	Best practice
[102]	Increase tree species through preservation and new planting	Environmental impacts	Semi-quantitative	Best practice
[112]	Ecological structures	Ecology / planet	Semi-quantitative	
[111]	Habitat loss and damage	Environmental	Semi-quantitative	
[124]	Ecological investigation	Environment	Qualitative	
[107]	Preserve habitat and ecological	Environmental impact	Qualitative	Best practice
[102]	Protect, Enhance or restore wildlife habitat	Environmental impacts	Semi-quantitative	Best practice
[112]	Room for flora and fauna	Ecology / planet	Qualitative	
[118]	Use native low/no water vegetation	Environment & Water	Qualitative	Best practice
Climate mitigation and adaption				
[109]	% of budget associated to climate resilience mitigation and adaption measures	Technical criteria	Quantitative	
[108]	Adaptation and vulnerability to climate and environmental change	Economy	Qualitative	Best practice
[112]	Climate proofing	Ecology / planet	Qualitative	Best practice
[102]	Natural hazard risk and adaptation	Environmental impacts	Semi-quantitative	Best practice
[102]	Risk assessment and mitigation	Leadership	Semi-quantitative	Best practice
Environmental impacts				
[111]	Air Pollution	Environmental	Quantitative	
[102]	Air Quality and Emissions	Environmental impacts	Quantitative	
[107]	Dust control during construction	Environmental impact	Qualitative	Best practice

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[118]	Reduce air emissions systematically	Access & Quality	Quantitative	Best practice
[107]	Use low emission equipment	Environmental impact	Qualitative	Best practice
[107]	Use low emission material	Environmental impact	Qualitative	Best practice
[108]	CO_2 emissions	Environment	Quantitative	
[107]	Competent material selection by LCA	Natural resources	Quantitative	
[118]	Conduct a detailed LCA of the entire project	Materials & Resources	Quantitative	
[109]	Environmental impacts of infrastructure (Following EN 15804)	Environmental criteria	Quantitative	
[102]	Environmentally labelled products and supply chains	Materials and resources	Qualitative	Best practice
[108]	Ecological footprint	Environment	Quantitative	
[107]	Reduced construction footprint	Natural resources	Quantitative	
[111]	Ecological impacts	Environmental	Quantitative	
[118]	Paving emission reduction - Use pavers that meet NIOSH requirements	Construction activities	Semi-quantitative	Best practice
[118]	Equipment Emission Reduction - Meet EPA Tier 4 standards for non-road equip	Construction activities	Semi-quantitative	Best practice
[111]	Erosion	Environmental	Quantitative	
[107]	Low impact snow removal material / process	Environmental impact	Qualitative	Best practice
[107]	Minimize disturbance in water bodies	Environmental impact	Qualitative	Best practice
[107]	Pre-construction hydrological condition	Environmental impact	Quantitative	
[111]	Water Pollution	Environmental	Quantitative	
Land use				
[107]	Buffer between water body and road edge	Environmental impact	Semi-quantitative	Best practice
[112]	Expansion (use of space)	Social / people	Qualitative	
[112]	Multiple land use	Social / people	Semi-quantitative	
[112]	Restructuring (use of space)	Social / people	Qualitative	
[112]	Spatial quality values: experience, use and future	Social / people	Qualitative	
Resource and energy consumption				
[112]	Consequences of extraction of resources	Ecology / planet	Semi-quantitative	
[124]	Environmentally friendly materials	Resource	Semi-quantitative	Best practice
[102]	Energy and Fuels	Environmental impacts	Quantitative	

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[108]	Energy consumption	Economy	Quantitative	
[112]	Exchange of energy	Ecology / planet	Qualitative	
[118]	Improve energy efficiency of operational systems	Materials & Resources	Quantitative	Best practice
[112]	Reduction of energy consumption	Ecology / planet	Quantitative	
[112]	Robustness of energy networks	Ecology / planet	Semi-quantitative	
[108]	Use of renewable energies	Economy	Quantitative	
[112]	Use of renewable energy	Ecology / planet	Quantitative	
[102]	Use of renewable Energy	Environmental impacts	Quantitative	
[118]	Use of alternative fuels in construction equipment	Construction activities	Qualitative	Best practice
[112]	Use of fossil fuels	Ecology / planet	Quantitative	
[124]	Land resources	Resource	Qualitative	
[112]	Linkage with existing regional or other construction needs	Social / people	Qualitative	
[108]	Material consumption	Environment	Quantitative	
[111]	Material consumption	Environmental	Quantitative	
[109]	Materials to be used	Environmental criteria	Semi-quantitative	
[118]	Perform LCI of pavement section with software tool	Project requirements	Quantitative	
[102]	Use local Materials	Materials and resources	Semi-quantitative	
[108]	Use of regional materials	Society	Quantitative	
[118]	Use of regional materials to reduce emissions	Materials & Resources	Qualitative	Best practice
[124]	Material saving	Resource	Qualitative	Best practice
[124]	Resource recovery	Resource	Quantitative	Best practice
[118]	Reuse existing pavement sections	Materials & Resources	Qualitative	
[107]	Reused material	Natural resources	Qualitative	Best practice
[118]	Use of recycled materials for new pavement	Materials & Resources	Qualitative	Best practice
[102]	Use of recycled asphalt pavement (RAP) in the construction instead of new hot mix asphalt pavements	Materials and resources	Quantitative	
[124]	Sustainable wood	Resource	Quantitative	Best practice
[118]	Use a surface that retains less heat	Pavement technologies	Qualitative	Best practice
[118]	Use permeable pavement as a Low-Impact Development technique	Pavement technologies	Qualitative	Best practice

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[118]	Use warm mix asphalt in place of hot mix asphalt	Pavement technologies	Qualitative	Best practice
[118]	Develop data on water use in construction	Construction activities	Semi-quantitative	Best practice
[107]	Water efficient	Environmental impact	Qualitative	Best practice
[112]	Water quality	Ecology / planet	Quantitative	
[108]	Water resource protection	Environment	Qualitative	Best practice
[112]	Water safety	Ecology / planet	Quantitative	
[108]	Reduced water use	Natural resources	Quantitative	
[111]	Water saving	Environmental	Quantitative	
[112]	Water shortage	Ecology / planet	Quantitative	
Waste				
[107]	Construction waste management plan	Environmental impact	Qualitative	Best practice
[118]	Have a plan to divert C&D waste from landfill	Project requirements	Qualitative	Best practice
[111]	Hazardous waste	Environmental	Quantitative	
[118]	Provide plan for on-site recycling and trash	Construction activities	Qualitative	Best practice
[107]	Recycled material	Natural resources	Qualitative	Best practice
[108]	Waste management	Environment	Quantitative	
SOCIETY				
Accessibility to structure				
[102]	Access and Affordability	Transportation planning	Qualitative	Best practice
[112]	Accessibility and connectivity	Economy/Profit	Qualitative	Best practice
[108]	Accessibility	Society	Qualitative	Best practice
[107]	Facility to disabled and aging people	Access and equity	Qualitative	Best practice
[118]	Provide/improve pedestrian accessibility	Access & Quality	Qualitative	Best practice
[107]	Access management plan	Planning	Qualitative	Best practice
Accessibility to information				
[107]	Access to information	Access and equity	Qualitative	Best practice
[118]	Publicize sustainability information for project	Project requirements	Qualitative	Best practice
[102]	Effective communication	Leadership	Qualitative	Best practice

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[102]	Knowledge sharing	Leadership	Qualitative	Best practice
Adaptability				
[112]	Adaptiveness for mobility policies	Economy/Profit	Qualitative	Best practice
[108]	Functionality and flexibility	Society	Qualitative	Best practice
Comfort and user amenities				
[107]	Bicycle path and dedicated access	Access and equity	Qualitative	Best practice
[102]	Install bikeway signs	Transportation planning	Qualitative	Best practice
[102]	Provide bike spaces at Park-and-Ride places and transit stations	Transportation planning	Qualitative	Best practice
[102]	Restore or pave shoulders for bicycling	Transportation planning	Qualitative	Best practice
[112]	Available services for citizens	Economy/Profit	Qualitative	
[109]	Comfort	Social criteria	Semi-quantitative	
[118]	Have a construction noise mitigation plan	Project requirements	Qualitative	Best practice
[102]	Improved shading through vegetation at Park-and-Ride places	Transportation planning	Qualitative	Best practice
[107]	Pedestrian path and dedicated access	Access and equity	Qualitative	Best practice
[102]	Pedestrian paths and sidewalks	Mobility for all	Qualitative	Best practice
[112]	Positive contribution and limitation risks (wellbeing)	Social / people	Semi-quantitative	
[108]	Visual impact	Society	Qualitative	
[111]	Aesthetical and visual impacts	Environmental	Qualitative	
[118]	Provide views of scenery or vistas	Access & Quality	Qualitative	Best practice
[102]	Installation of coordinated signal system	Transportation planning	Qualitative	Best practice
[102]	Responsive Traffic Signals	Transportation planning	Qualitative	Best practice
[102]	Retrofit existing street lighting, existing sign and traffic signals lighting with high efficiency types	Materials and resources	Qualitative	Best practice
[102]	Sidewalks lighting and design	Mobility for all	Qualitative	Best practice
Cultural heritage				
[112]	Archaeology	Ecology / planet	Qualitative	
[102]	Accessibility for Archaeology and Historical places that exists along the road	Environmental impacts	Qualitative	Best practice
[102]	Accessibility for Culture and Recreation places	Mobility for all	Qualitative	Best practice
[124]	Cultural heritage	Environment	Qualitative	

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[118]	Promote art/culture/community values on roadway	Access & Quality	Qualitative	Best practice
[118]	Respect for local customs	Society	Qualitative	Best practice
[111]	Measure of negative impacts from construction operations on any cultural heritage	Social	Semi-quantitative	
Education				
[111]	Supply rate of training course to employees to provide a safe and reliable workplace	Social	Quantitative	
[111]	Time of training course to different levels of employees	Social	Quantitative	
[111]	Number of training course to different levels of employees	Social	Quantitative	
[118]	Provide environmental training	Construction activities	Qualitative	Best practice
Employment				
[112]	Accessibility of job market for citizens	Economy/Profit	Semi-quantitative	
[112]	Employment opportunities for citizens	Economy/Profit	Semi-quantitative	
[112]	Local expertise	Social / people	Semi-quantitative	
[112]	Development of labour force	Economy/Profit	Semi-quantitative	
[111]	Provision of direct and indirect jobs	Social	Quantitative	
[107]	Access for all to work	Access and equity	Qualitative	Best practice
Health and safety				
[111]	Health	Social	Quantitative	
[108]	Health and safety	Society	Semi-quantitative	
[102]	Inclusion of transit vehicle priority	Transportation planning	Qualitative	Best practice
[111]	Number of accidents	Social	Quantitative	
[107]	Optimized conflict points at intersection	Mobility / Safety	Qualitative	Best practice
[107]	Optimized signal control	Mobility / Safety	Qualitative	Best practice
[118]	Perform roadway safety audit	Access & Quality	Qualitative	Best practice
[112]	Physical and social safety	Social / people	Semi-quantitative	
[109]	Safety (EU harmonized safety audit and safety inspection, Directive 2008/96EC)	Social criteria	Quantitative	
[107]	Safety audit and installation of safety	Mobility / Safety	Qualitative	Best practice
[102]	Safety Management	Leadership	Qualitative	Best practice
[107]	Safety measures for construction workers	Mobility / Safety	Qualitative	Best practice

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[111]	Supply rate of on-site supervision to provide a safe and reliable workplace	Social	Quantitative	
Impacts on local community				
[112]	Demographical composition and trends	Social / people	Quantitative	
[111]	Impacts on Tourism development	Social	Semi-quantitative	
[102]	Light Pollution Reduction	Environmental impacts	Semi-quantitative	Best practice
[118]	Discourage light pollution	Environment & Water	Qualitative	Best practice
[107]	Low vibrating equipment	Environmental impact	Qualitative	Best practice
[107]	Mitigate light pollution	Environmental impact	Semi-quantitative	Best practice
[107]	Mobility at construction zone	Mobility / Safety	Qualitative	Best practice
[109]	Noise	Social criteria	Quantitative	
[107]	Noise control measures	Environmental impact	Qualitative	Best practice
[111]	Noise Emissions	Environmental	Quantitative	
[108]	Noise pollution	Environment	Semi-quantitative	
[112]	Prevention of nuisance	Social / people	Qualitative	Best practice
[102]	Replace signs with retro reflective signs to reduce sign Lighting	Materials and resources	Qualitative	Best practice
[118]	Use a quiet pavement to reduce noise	Pavement technologies	Qualitative	Best practice
Impacts on society				
[124]	Promotion of political stability	Society and economy	Qualitative	Best practice
[124]	Promotion of regional economy	Society and economy	Qualitative	Best practice
[124]	Promotion of society	Society and economy	Qualitative	Best practice
[108]	Social need and urgency of the project	Society	Qualitative	
[112]	Social wellbeing	Social / people	Qualitative	
Innovation				
[112]	Capacity for innovation and adaption	Economy/Profit	Qualitative	
[107]	Funding plan for research and development	Financial competency	Qualitative	Best practice
[112]	Innovation strategies and technologies	Leadership	Qualitative	Best practice
[108]	Innovative elements	Economy	Qualitative	Best practice
[107]	Innovative ITS application	Innovation and quality	Qualitative	Best practice

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[107]	Innovative project delivery system	Innovation and quality	Qualitative	Best practice
[107]	Innovative rapid construction technique	Innovation and quality	Qualitative	Best practice
[102]	Provide environmental or technological advancements through partnerships while advocating environmental stewardship	Leadership	Qualitative	Best practice
Public engagement				
[108]	General and social interest of the project	Society	Semi-quantitative	
[107]	Involvement in design decision	Participation	Qualitative	Best practice
[107]	Involvement in financial planning	Participation	Qualitative	Best practice
[107]	Measure of Stakeholder satisfaction by using Stakeholder Management models	Social	Quantitative	Best practice
[107]	Participation in alignment selection	Participation	Qualitative	Best practice
[107]	Public involvement in facility upkeep	Participation	Qualitative	Best practice
[107]	Public involvement in need assessment	Participation	Qualitative	Best practice
[107]	Public involvement in planning decision	Participation	Qualitative	Best practice
[107]	Public outreach policy information	Participation	Qualitative	Best practice
[108]	Public participation	Society	Qualitative	Best practice
[112]	Public support	Social / people	Semi-quantitative	
ECONOMY				
Costs				
[109]	Agency costs (according ISO 15656-5, including initial costs, maintenance costs and salvage value)	Economic criteria	Quantitative	
[118]	Conduct an LCC for stormwater Best Management Practice / Low-Impact Development selection	Environment & Water	Quantitative	Best practice
[111]	LCC	Economic	Quantitative	
[108]	LCC	Economy	Quantitative	
[118]	Perform LCC for pavement section	Project requirements	Quantitative	
[111]	Net Present value	Economic	Quantitative	
[111]	Cost-Benefit ratio	Economic	Quantitative	
[108]	Cost-Benefit ratio	Economy	Quantitative	
[112]	Cost-Benefit ratio	Economy/Profit	Quantitative	

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[111]	Debt-Asset ratio	Economic	Quantitative	
[111[	Payback period	Economic	Quantitative	
[107]	Cost effective material and process	Financial competency	Qualitative	Best practice
[108]	Costs incurred by users	Economy	Quantitative	
Economic profit				
[112]	Area potential	Economy/Profit	Semi-quantitative	
[112]	Business climate	Economy/Profit	Semi-quantitative	
[108]	Increased economic value of the environment	Economy	Quantitative	
[111]	Internal rate of return	Economic	Quantitative	
[112]	Value capturing	Economy/Profit	Semi-quantitative	
Finance				
[112]	Economic policy	Economy/Profit	Qualitative	
[111]	Financial risk	Economic	Quantitative	
[102]	Financial sustainability	Leadership	Cannot be classified	
[111]	Investment planning: Compliance with the Investment plan	Economic	Qualitative	
[107]	Sustainable capital investment	Financial competency	Semi-quantitative	Best practice
OTHERS				
Design				
[107]	Context sensitive and consistent design	Mobility / Safety	Qualitative	Best practice
[107]	Cost effective design alternative	Financial competency	Qualitative	Best practice
[107]	Cost effective alignment	Financial competency	Qualitative	Best practice
[108]	Design for Dismantling (DfD)	Economy	Qualitative	Best practice
[118]	Design pavements for long-life	Pavement technologies	Qualitative	Best practice
[102]	Improved intersection designs for pedestrians	Mobility for all	Qualitative	Best practice
[124]	Integrate into network	Function of transport	Qualitative	
[112]	Integrated design	Social / people	Qualitative	Best practice
[107]	Integration with land use plan	Planning	Qualitative	Best practice
Maintenance activities				

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[107]	Asset management / site maintenance plan	Planning	Qualitative	Best practice
[107]	Funding plan for maintenance	Financial competency	Qualitative	Best practice
[118]	Have a site maintenance plan for environment, utilities	Project requirements	Qualitative	Best practice
[102]	Maintenance Access	Transportation planning	Qualitative	Best practice
[102]	Maintenance Management System	Leadership	Qualitative	Best practice
Management				
[107]	Application of lean technique	Innovation and quality	Qualitative	Best practice
[118]	Complete an environmental review process	Project requirements	Qualitative	Best practice
[111]	Compliance with project budget	Economic	Qualitative	Best practice
[107]	Consistency with state / regional plans	Planning	Qualitative	Best practice
[108]	Disaster risk management (flooding, earthquakes)	Society	Qualitative	Best practice
[107]	Environmental management plan	Planning	Qualitative	Best practice
[118]	Environmental Management System - Have ISO 14001 certification for general contractor	Environment & Water	Qualitative	Best practice
[118]	Environmental management	Environment	Qualitative	Best practice
[107]	Funding pan for administrative expense	Financial competency	Qualitative	Best practice
[118]	Have a formal contractor quality control plan	Project requirements	Qualitative	Best practice
[118]	Have a pavement preservation system	Project requirements	Qualitative	Best practice
[118]	Offer an extended warranty on pavement	Construction activities	Semi-quantitative	Best practice
[124]	Operation	Function of transport	Qualitative	
[102]	Pavement Management System	Leadership	Qualitative	Best practice
[118]	Pavement performance tracking - Relate construction to performance data	Pavement technologies	Qualitative	Best practice
[118]	Plan for context sensitive solutions	Access & Quality	Qualitative	Best practice
[108]	Project and strategic Management	Economy	Qualitative	Best practice
[107]	Quality management plan implementation	Innovation and quality	Qualitative	Best practice
[118]	Quality Management System - Have ISO 9001 certification for general contractor	Construction activities	Qualitative	Best practice
[102]	Sustainability leadership and commitment	Leadership	Qualitative	Best practice
Mobility				
[102]	Comprehensive transportation plan	Transportation planning	Qualitative	Best practice

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[112]	Efficient infrastructure use	Economy/Profit	Qualitative	Best practice
[102]	Electric vehicle infrastructure	Materials and resources	Qualitative	Best practice
[111]	Extension of public transportation services and proximity to it	Social	Semi-quantitative	
[118]	Implement ITS solutions	Access & Quality	Qualitative	Best practice
[102]	Improve Community Mobility and Access	Mobility for all	Qualitative	Best practice
[102]	Increased use of public transit to ensure reduction in vehicle trips	Transportation planning	Semi-quantitative	Best practice
[102]	Intelligent Transportation System (ITS) for System Operations	Transportation planning	Qualitative	Best practice
[118]	Provide/improve transit/HOV accessibility	Access & Quality	Qualitative	Best practice
[112]	Robustness of transport system within/between modalities	Economy/Profit	Semi-quantitative	
[102]	Separation of Modes (e.g., pedestrians and cyclists are physically separated from motorized transportation9	Mobility for all	Qualitative	Best practice
Soil and earthwork				
[102]	Allow the Use of soil stabilization with cementitious and recycled Materials	Materials and resources	Quantitative	
[112]	Diversity of soil types	Ecology / planet	Quantitative	
[107]	Earthwork balance	Natural resources	Qualitative	Best practice
[118]	Earthwork balance - Balance cut/fill quantities	Materials & Resources	Semi-quantitative	Best practice
[108]	Ecological value of soil	Environment	Semi-quantitative	
[124]	Landform	Environment	Qualitative	
[111]	Landscape respect	Environmental	Qualitative	
[112]	Soil biodiversity	Ecology / planet	Quantitative	
[111]	Soil contamination	Environmental	Quantitative	
[112]	Soil quality	Ecology / planet	Quantitative	
[112]	Soil subsidence	Ecology / planet	Quantitative	
[107]	Context sensitive landscape	Environmental impact	Qualitative	Best practice
[102]	Water efficient Landscaping	Environmental impacts	Qualitative	Best practice
Stormwater				
[118]	Have a stormwater pollution prevention plan	Project requirements	Qualitative	Best practice
[118]	Study feasibility of Low-Impact Development techniques for stormwater	Project requirements	Qualitative	Best practice
[118]	Treat stormwater on-site	Environment & Water	Quantitative	Best practice

Source	Indicator	Category (as in SRS)	Indicator type	Comment
[112]	Water flooding	Ecology / planet	Semi-quantitative	
[118]	Reduce runoff quantity	Environment & Water	Quantitative	Best practice
Traffic				
[107]	Delay reduction from base year average	Mobility / Safety	Quantitative	
[102]	Timing plans developed for weekend or special events	Transportation planning	Qualitative	Best practice
[124]	Traffic capacity	Function of transport	Quantitative	
[107]	Transit and High Occupancy Vehicle (HOV) access for all	Access and equity	Qualitative	Best practice
[111]	Vehicle traffic congestion	Social	Quantitative	