Building Information Modeling for Sustainability

Sustainable Design Integration

AASHTO stands for American Association of State Highway and Transportation Officials, which is an organization that sets standards for transportation infrastructure, including road design and construction, and plays a role in Sustainable Design Integration by providing guidelines for environmentally friendly transportation systems. Related terms include transportation planning, infrastructure design, and environmental sustainability. In the context of Building Information Modeling for Sustainability, AASHTO standards can be used to design and evaluate the sustainability of transportation systems.

ABCD analysis is a method used to evaluate the sustainability of a project or system by analyzing its attributes, such as environmental impacts, social benefits, and economic costs. Related terms include cost-benefit analysis, life cycle assessment, and decision-making. In Sustainable Design Integration, ABCD analysis can be used to evaluate the sustainability of different design options and select the most sustainable one.

Acoustic design refers to the process of designing buildings and spaces to minimize noise pollution and improve sound quality. Related terms include sound insulation, acoustic materials, and noise reduction. In Building Information Modeling for Sustainability, acoustic design can be used to create buildings that are more comfortable and sustainable for occupants.

Adaptive reuse is the process of reusing an existing building or structure for a new purpose, rather than demolishing it and building a new one. Related terms include historic preservation, building rehabilitation, and sustainable development. In Sustainable Design Integration, adaptive reuse can be used to reduce waste, conserve resources, and preserve cultural heritage.

AEC stands for Architecture, Engineering, and Construction, which are the three main disciplines involved in building design and construction. Related terms include building information modeling, sustainable design, and project management. In the context of Building Information Modeling for Sustainability, AEC professionals work together to design and deliver sustainable buildings and infrastructure.

Air quality refers to the quality of the air in a building or outdoor environment, including factors such as pollution levels, ventilation rates, and comfort levels. Related terms include indoor air quality, outdoor air quality, and air filtration. In Sustainable Design Integration, air quality is an important consideration for maintaining occupant health and well-being.

Alternative energy refers to energy sources that are renewable and sustainable, such as solar, wind, and geothermal energy. Related terms include renewable energy, sustainable energy, and energy efficiency. In Building Information Modeling for Sustainability, alternative energy sources can be used to reduce dependence on fossil fuels and lower greenhouse gas emissions.

As-built documentation refers to the process of creating and maintaining accurate and up-to-date records

of a building's design, construction, and operation. Related terms include building information modeling, facility management, and operations and maintenance. In Sustainable Design Integration, as-built documentation can be used to optimize building performance and reduce energy consumption.

ASHRAE stands for American Society of Heating, Refrigerating, and Air-Conditioning Engineers, which is an organization that sets standards for building systems and equipment, including heating, ventilation, and air conditioning systems. Related terms include building codes, energy efficiency, and indoor air quality. In the context of Building Information Modeling for Sustainability, ASHRAE standards can be used to design and evaluate the sustainability of building systems.

Assessment criteria refer to the standards or metrics used to evaluate the sustainability of a building or system, such as energy efficiency, water conservation, and indoor air quality. Related terms include sustainability metrics, evaluation methods, and decision-making. In Sustainable Design Integration, assessment criteria can be used to evaluate the sustainability of different design options and select the most sustainable one.

BIM stands for Building Information Modeling, which is a digital representation of a building or infrastructure project that can be used to design, construct, and operate the project. Related terms include virtual design, construction management, and facility management. In the context of Building Information Modeling for Sustainability, BIM can be used to design and evaluate the sustainability of buildings and infrastructure.

Biomimicry refers to the process of using nature as a source of inspiration for design and problem-solving, such as using natural materials, forms, and patterns to create sustainable solutions. Related terms include sustainable design, innovation, and creativity. In Sustainable Design Integration, biomimicry can be used to create innovative and sustainable design solutions.

Brownfield redevelopment refers to the process of redeveloping contaminated or abandoned industrial sites, such as former factories or landfills, into new uses such as parks, housing, or commercial developments. Related terms include urban renewal, sustainable development, and environmental remediation. In Building Information Modeling for Sustainability, brownfield redevelopment can be used to revitalize urban areas and reduce environmental impacts.

Building envelope refers to the external walls, roofs, and foundations of a building that provide a barrier between the indoor and outdoor environments. Related terms include thermal insulation, air tightness, and weather resistance. In Sustainable Design Integration, building envelope design can be used to reduce energy consumption and improve indoor air quality.

Building information management refers to the process of creating, managing, and sharing information about a building or infrastructure project, including design, construction, and operation data. Related terms include building information modeling, data management, and collaboration. In the context of Building Information Modeling for Sustainability, building information management can be used to optimize building performance and reduce energy consumption.

Carbon footprint refers to the amount of greenhouse gases, such as carbon dioxide, that are emitted by a

building, process, or activity, and is a key metric for evaluating sustainability. Related terms include carbon emissions, climate change, and sustainable development. In Sustainable Design Integration, carbon footprint analysis can be used to evaluate the sustainability of different design options and select the most sustainable one.

Climate change refers to the long-term changes in the Earth's climate, including rising temperatures, sea level rise, and extreme weather events, and is a major driver of sustainable design. Related terms include global warming, sustainability, and environmental degradation. In Building Information Modeling for Sustainability, climate change is a key consideration for designing and evaluating sustainable buildings and infrastructure.

Commissioning refers to the process of verifying that a building's systems and equipment are installed, tested, and operating as intended, and is an important step in ensuring that buildings are sustainable and energy-efficient. Related terms include building commissioning, testing, and validation. In Sustainable Design Integration, commissioning can be used to optimize building performance and reduce energy consumption.

Construction management refers to the process of planning, coordinating, and controlling a construction project, including scheduling, budgeting, and quality control. Related terms include project management, construction planning, and execution. In the context of Building Information Modeling for Sustainability, construction management can be used to ensure that sustainable design principles are implemented during construction.

Cost-benefit analysis refers to the process of evaluating the costs and benefits of a project or decision, including economic, social, and environmental factors, and is a key tool for evaluating the sustainability of different design options. Related terms include decision-making, evaluation, and trade-offs. In Sustainable Design Integration, cost-benefit analysis can be used to evaluate the sustainability of different design options and select the most sustainable one.

Daylighting refers to the use of natural light to illuminate buildings, reducing the need for artificial lighting and energy consumption. Related terms include natural lighting, skylights, and light shelves. In Building Information Modeling for Sustainability, daylighting can be used to reduce energy consumption and improve indoor air quality.

Deconstruction refers to the process of carefully dismantling a building or structure to salvage materials and reduce waste, and is an important step in sustainable design. Related terms include building demolition, sustainable materials, and waste reduction. In Sustainable Design Integration, deconstruction can be used to reduce waste and conserve resources.

Design for disassembly refers to the process of designing buildings and products to be easily disassembled and recycled at the end of their life, reducing waste and conserving resources. Related terms include sustainable design, product design, and waste reduction. In Building Information Modeling for Sustainability, design for disassembly can be used to reduce waste and promote sustainable development.

Ecosystem services refer to the benefits that humans derive from natural ecosystems, including clean air and

water, soil formation, and climate regulation. Related terms include environmental sustainability, ecology, and conservation. In Sustainable Design Integration, ecosystem services can be used to evaluate the sustainability of different design options and select the most sustainable one.

Energy efficiency refers to the use of technologies and strategies to reduce energy consumption and greenhouse gas emissions, such as insulation, windows, and lighting systems. Related terms include sustainable energy, renewable energy, and energy conservation. In Building Information Modeling for Sustainability, energy efficiency is a key consideration for designing and evaluating sustainable buildings and infrastructure.

Energy modeling refers to the process of using computer simulations to analyze and predict the energy consumption of a building or system, and is an important tool for evaluating the sustainability of different design options. Related terms include building energy modeling, energy simulation, and performance analysis. In Sustainable Design Integration, energy modeling can be used to evaluate the sustainability of different design options and select the most sustainable one.

Environmental assessment refers to the process of evaluating the environmental impacts of a project or decision, including air and water pollution, habitat destruction, and climate change. Related terms include environmental impact assessment, sustainability, and conservation. In Building Information Modeling for Sustainability, environmental assessment can be used to evaluate the sustainability of different design options and select the most sustainable one.

Environmental sustainability refers to the ability of a system or process to be maintained over time without degrading the environment or depleting natural resources. Related terms include sustainable development, conservation, and environmental stewardship. In Sustainable Design Integration, environmental sustainability is a key consideration for designing and evaluating sustainable buildings and infrastructure.

Facility management refers to the process of operating and maintaining a building or facility, including repairs, upgrades, and replacement of systems and equipment. Related terms include building operations, maintenance, and management. In the context of Building Information Modeling for Sustainability, facility management can be used to optimize building performance and reduce energy consumption.

Green building refers to the design, construction, and operation of buildings that minimize environmental impacts and promote sustainability, including energy efficiency, water conservation, and indoor air quality. Related terms include sustainable building, energy efficiency, and environmental sustainability. In Building Information Modeling for Sustainability, green building principles can be used to design and evaluate sustainable buildings and infrastructure.

Green infrastructure refers to the use of natural or semi-natural systems to manage stormwater runoff, reduce urban heat islands, and promote biodiversity. Related terms include green roofs, rain gardens, and green streets. In Sustainable Design Integration, green infrastructure can be used to reduce urban environmental impacts and promote sustainable development.

Greenhouse gas emissions refer to the release of gases such as carbon dioxide, methane, and nitrous oxide into the atmosphere, which contribute to climate change and global warming. Related terms include climate

change, sustainability, and environmental degradation. In Building Information Modeling for Sustainability, greenhouse gas emissions are a key consideration for designing and evaluating sustainable buildings and infrastructure.

Heat island effect refers to the phenomenon where built-up areas, such as cities, experience higher temperatures than surrounding rural areas due to the absorption of heat by buildings and pavement. Related terms include urban heat island, cool roofs, and green roofs. In Sustainable Design Integration, heat island effect mitigation can be used to reduce urban environmental impacts and promote sustainable development.

High-performance building refers to a building that integrates sustainable design principles, energy-efficient systems, and advanced materials to minimize environmental impacts and promote occupant health and productivity. Related terms include green building, sustainable design, and energy efficiency. In Building Information Modeling for Sustainability, high-performance building principles can be used to design and evaluate sustainable buildings and infrastructure.

IEQ stands for Indoor Environmental Quality, which refers to the quality of the indoor environment, including air quality, lighting, temperature, and noise levels. Related terms include indoor air quality, thermal comfort, and acoustic comfort. In Sustainable Design Integration, IEQ is an important consideration for maintaining occupant health and well-being.

Infrastructure refers to the physical systems and structures that support human activity, including roads, bridges, water systems, and energy systems. Related terms include transportation infrastructure, public works, and civil engineering. In the context of Building Information Modeling for Sustainability, infrastructure design and evaluation can be used to promote sustainable development.

Integrated design refers to the process of collaborating with multiple stakeholders and disciplines to design and deliver a project, including architecture, engineering, and construction. Related terms include interdisciplinary design, collaboration, and integration. In Sustainable Design Integration, integrated design can be used to promote sustainable design principles and reduce environmental impacts.

LEED stands for Leadership in Energy and Environmental Design, which is a rating system for evaluating the sustainability of buildings and neighborhoods. Related terms include green building, sustainable design, and environmental certification. In Building Information Modeling for Sustainability, LEED certification can be used to evaluate the sustainability of buildings and infrastructure.

Life cycle assessment refers to the process of evaluating the environmental impacts of a product or system over its entire life cycle, from extraction to end-of-life. Related terms include life cycle analysis, sustainability, and environmental impact assessment. In Sustainable Design Integration, life cycle assessment can be used to evaluate the sustainability of different design options and select the most sustainable one.

Material selection refers to the process of choosing materials for a building or product that minimize environmental impacts and promote sustainability, including considerations such as recyclability, reusability, and durability. Related terms include sustainable materials, green materials, and material efficiency. In

Building Information Modeling for Sustainability, material selection can be used to reduce environmental impacts and promote sustainable development.

Microclimate refers to the local climate conditions in a specific area, including temperature, humidity, and wind patterns, and is an important consideration for designing and evaluating sustainable buildings and infrastructure. Related terms include urban microclimate, climate change, and environmental sustainability. In Sustainable Design Integration, microclimate analysis can be used to evaluate the sustainability of different design options and select the most sustainable one.

Net zero energy refers to a building or system that produces as much energy as it consumes over a given period, typically a year, and is a key goal of sustainable design. Related terms include zero energy building, sustainable energy, and energy efficiency. In Building Information Modeling for Sustainability, net zero energy design can be used to reduce energy consumption and promote sustainable development.

Operations and maintenance refer to the process of managing and maintaining a building or facility, including repairs, upgrades, and replacement of systems and equipment. Related terms include facility management, maintenance, and management. In the context of Building Information Modeling for Sustainability, operations and maintenance can be used to optimize building performance and reduce energy consumption.

Passive design refers to the use of natural light, ventilation, and insulation to reduce the need for mechanical systems and energy consumption. Related terms include passive solar design, natural ventilation, and energy efficiency. In Sustainable Design Integration, passive design can be used to reduce energy consumption and promote sustainable development.

Performance metrics refer to the measures used to evaluate the performance of a building or system, including energy efficiency, water conservation, and indoor air quality. Related terms include sustainability metrics, evaluation, and benchmarking. In Building Information Modeling for Sustainability, performance metrics can be used to evaluate the sustainability of buildings and infrastructure.

Recycled materials refer to materials that are reclaimed or reused from existing sources, such as recycled glass, recycled paper, and reclaimed wood. Related terms include sustainable materials, green materials, and material efficiency. In Sustainable Design Integration, recycled materials can be used to reduce waste and promote sustainable development.

Renewable energy refers to energy sources that are sustainable and renewable, such as solar, wind, and hydro power. Related terms include sustainable energy, energy efficiency, and renewable energy systems. In Building Information Modeling for Sustainability, renewable energy sources can be used to reduce dependence on fossil fuels and promote sustainable development.

Resilience refers to the ability of a system or community to withstand and recover from disruptions or shocks, such as natural disasters or climate change. Related terms include sustainable development, adaptation, and resilience planning. In Sustainable Design Integration, resilience can be used to evaluate the sustainability of different design options and select the most sustainable one.

Smart growth refers to the process of planning and developing communities in a way that is sustainable, equitable, and environmentally responsible, including considerations such as density, mix of land uses, and transportation options. Related terms include sustainable development, urban planning, and community development. In Building Information Modeling for Sustainability, smart growth principles can be used to promote sustainable development and reduce environmental impacts.

Solar orientation refers to the process of orienting a building or structure to optimize solar gains and reduce energy consumption. Related terms include passive solar design, solar energy, and energy efficiency. In Sustainable Design Integration, solar orientation can be used to reduce energy consumption and promote sustainable development.

Sustainable design refers to the process of designing buildings and systems that minimize environmental impacts and promote sustainability, including considerations such as energy efficiency, water conservation, and indoor air quality. Related terms include green building, environmental sustainability, and sustainable development. In Building Information Modeling for Sustainability, sustainable design principles can be used to design and evaluate sustainable buildings and infrastructure.

Sustainable development refers to the process of meeting the needs of the present without compromising the ability of future generations to meet their own needs, including environmental, social, and economic considerations. Related terms include sustainable design, environmental sustainability, and social responsibility. In Sustainable Design Integration, sustainable development is a key consideration for designing and evaluating sustainable buildings and infrastructure.

Thermal comfort refers to the condition of thermal neutrality and comfort in a building or space, including considerations such as temperature, humidity, and air movement. Related terms include indoor environmental quality, thermal comfort, and acoustic comfort. In Sustainable Design Integration, thermal comfort is an important consideration for maintaining occupant health and well-being.

Triple bottom line refers to the concept of evaluating the sustainability of a project or organization based on three dimensions: environmental, social, and economic. Related terms include sustainability metrics, evaluation, and decision-making. In Building Information Modeling for Sustainability, triple bottom line analysis can be used to evaluate the sustainability of different design options and select the most sustainable one.

Urban planning refers to the process of designing and managing cities and urban areas, including considerations such as land use, transportation, and infrastructure. Related terms include urban design, city planning, and community development. In Sustainable Design Integration, urban planning can be used to promote sustainable development and reduce environmental impacts.

Value engineering refers to the process of analyzing and optimizing the value of a project or system, including considerations such as cost, performance, and quality. Related terms include cost-benefit analysis, evaluation, and decision-making. In Building Information Modeling for Sustainability, value engineering can be used to evaluate the sustainability of different design options and select the most sustainable one.

Ventilation refers to the process of providing air movement and exchanging air in a building or space,

including considerations such as natural ventilation and mechanical ventilation. Related terms include indoor air quality, thermal comfort, and acoustic comfort. In Sustainable Design Integration, ventilation is an important consideration for maintaining occupant health and well-being.

Water conservation refers to the process of reducing and managing water use in a building or system, including considerations such as water efficiency, rainwater harvesting, and graywater reuse. Related terms include sustainable water management, water efficiency, and conservation. In Building Information Modeling for Sustainability, water conservation is a key consideration for reducing environmental impacts and promoting sustainable development.

Water efficiency refers to the process of reducing and managing water use in a building or system, including considerations such as low-flow fixtures, graywater reuse, and rains water harvesting. Related terms include water conservation, sustainable water management, and conservation. In Sustainable Design Integration, water efficiency is an important consideration for reducing environmental impacts and promoting sustainable development.

WELL Building Standard refers to a rating system for evaluating the health and well-being of occupants in a building, including considerations such as air quality, water quality, and lighting. Related terms include indoor environmental quality, occupant health, and well-being. In Building Information Modeling for Sustainability, WELL Building Standard certification can be used to evaluate the sustainability of buildings and infrastructure.

Zero waste refers to the goal of eliminating waste and reducing the amount of waste sent to landfills, including considerations such as recycling, composting, and reusing materials. Related terms include sustainable materials, waste reduction, and recycling. In Sustainable Design Integration, zero waste is a key consideration for reducing environmental impacts and promoting sustainable development.