

Sustainable Transport

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Abstract— Sustainable transportation can include using mass transit, like buses, trains, light rails, and carpools. It could also be about using fuel efficiently. It can be about how employers address transportation issues by allowing employees to telecommute, have staggered shifts, or work longer hours so they don't have to make so many trips to work or drive during rush hours. All these concepts and many others are part of sustainable transportation.

Index Terms:—1.INTRODUCTION, 2.CURRENT ISSUES, 3.GREEN VEHICLES, 4.SUSTAINABLE BUS BAY, 5.CONCLUSION

I. INTRODUCTION

The term sustainable transport came into use as a logical follow-on from sustainable development, and is used to describe modes of transport, and systems of transport planning, which are consistent with wider concerns of sustainability. Sustainable transport systems make a positive contribution to the environmental, social and economic sustainability of the communities they serve. Transport systems exist to provide social and economic connections, and people quickly take up the opportunities offered by increased mobility, with poor households benefiting greatly from low carbon transport options. The advantages of increased mobility need to be weighed against the environmental, social and economic costs that transport systems pose.

Although transport is central to the lives of people across the world, our dependence on fossil fuel-driven motor vehicles has generated a range of serious environmental, social, and economic costs. The sector currently emits nearly a quarter of the world's energy-related CO₂ and generates more than 75 per cent of the air pollution in urban areas (WRI, 2014), contributing to 3.7 million premature deaths in 2012. Moreover, with passenger travel expected to more than double, CO₂ emissions from transport are expected to grow between 30 to 110 per cent (OECD, 2015). Greening the transport sector can reduce congestion, air pollution, and improve wellbeing through better management and a shift away from fossil fuel combustion engines. It has the potential to create jobs through the development of public transport infrastructure and can help alleviate poverty by encouraging affordable transport and improving access to markets and other essential facilities



Transport becomes sustainable only when it does not harm the environment or uses fuel from renewable sources. In terms of human mobility, this means more use of public transport (including integrated mobility services), and non-motorized modes of transport like walking and cycling. For movement of goods, rail freight is more fuel efficient than trucking.

II. CURRENT ISSUES

Fossil fuels were formed from the remains of animals and tiny plants that lived in the oceans many millions of years ago. The main forms of fossil fuels are oil, coal, and gas. According to some experts, at the rate we are burning fossil fuels we will run out of oil and gas in 35-70 years and coal in less than 300 years.



Transport systems are major emitters of greenhouse gases, responsible for 23% of world energy-related GHG emissions in 2004, with about three quarters coming from road vehicles. Currently 95% of transport energy comes from petroleum] Energy is consumed in the manufacture as well as the use of vehicles, and is embodied in transport infrastructure including roads, bridges and railways.

The environmental impacts of transport can be reduced by reducing the weight of vehicles, sustainable styles of driving, reducing the friction of tires, encouraging electric and hybrid vehicles, improving the walking and cycling environment in cities, and by enhancing the role of public transport, especially electric rail.

III. GREEN VEHICLES

Green vehicles are intended to have less environmental impact than equivalent standard vehicles, although when the environmental impact of a vehicle is assessed over the whole of its life cycle this may not be the case. Electric vehicle technology has the potential to reduce transport CO₂ emissions, depending on the embodied energy of the vehicle and the source of the electricity. The primary sources of electricity currently used in most countries (coal, gas, oil) mean that until world electricity production changes substantially, private electric cars will result in the same or higher production of CO₂ than petrol equivalent vehicles.[39] The Online Electric Vehicle (OLEV), developed by the Korea Advanced Institute of Science and Technology (KAIST), is an electric vehicle that can be charged while stationary or driving, thus removing the need to stop at a charging station. The City of Gumi in South Korea runs a 24 km round-trip along which the bus will receive 100 kW (136 horsepower) electricity at an 85%

maximum power transmission efficiency rate while maintaining a 17 cm air gap between the underbody of the vehicle and the road surface. At that power, only a few sections of the road need embedded cables. Hybrid vehicles, which use an internal combustion engine combined with an electric engine to achieve better fuel efficiency than a regular combustion engine, are already common. Natural gas is also used as a transport fuel. Biofuels are a less common, and less promising, technology; Brazil met 17% of its transport fuel needs from bioethanol in 2007, but the OECD has warned that the success of biofuels in Brazil is due to specific local circumstances; internationally, biofuels are forecast to have little or no impact on greenhouse emissions, at significantly higher cost than energy efficiency measures.



In practice there is a sliding scale of green transport depending on the sustainability of the option. Green vehicles are more fuel-efficient, but only in comparison with standard vehicles, and they still contribute to traffic congestion and road crashes. Well-patronized public transport networks based on traditional diesel buses use less fuel per passenger than private vehicles, and are generally safer and use less road space than private vehicles. Green public transport vehicles including electric trains, trams and electric buses combine the advantages of green vehicles with those of sustainable transport choices. Other transport choices with very low environmental impact are cycling and other human-powered vehicles, and animal powered transport. The most common green transport choice, with the least environmental impact is walking.

IV. SUSTAINABLE BUS BAY

As part of incorporating sustainability to

transportation sector, we can consider the case of a sustainable bus bay.

announcements, advertising display case, bench, and waste bin.

Sustainable bus bay ideas:

1. Real Experience Bus Stop



This bus stop concept was proposed by a group of researchers at Massachusetts Institute of Technology to be installed next year in Florence, Italy. The Eye Stop, as it is called, features touch-screens as well as LEDs that provide Web access, tools for planning a best route, and getting directions. You can choose to have your local Eye Stop to sync with your phone to get latest updates about your frequent buses

2. Bus Stop Intelligent Series Flex



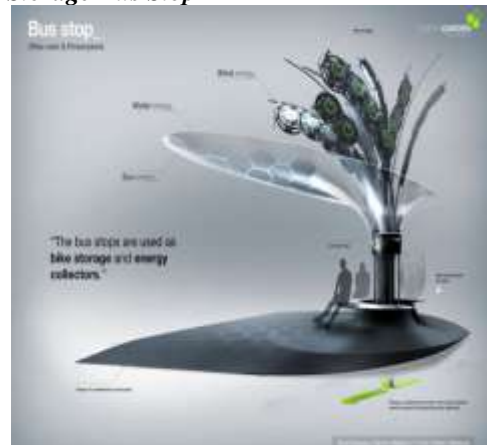
Built with sustainable materials, bus stop shelter Intelligent Series Flex blends in harmoniously with the modern urban landscape. It also features a blue spot terminal equipped with advanced technologies including telephone, Wi-Fi, solar panel roof, dynamic display for schedule updates and

3. Bird Bus Stop



This green shelter will not only serve as a bus stop but also a mini garden and an educational center. Each bus stop will have in the roof top a selection of local plants that will provide home and food for various bird species to invite them back to the city. There will also be information about birds, native plants, and the environment. This disposable shelter can be assembled from few components without glue.

4. Bike Storage Bus Stop



As part of London Garden concept for a car-free zone of 4 students from the Royal College of Art, this futuristic bus stop triples as a bike storage and an electricity house. Bikes can be folded and stored on the tree like structures on top of

the shelter. Energy generated by cycle racks from rainwater, sun, and wind can be stored in the bus stop and use for electric buses.

5. Walking Energy Bus Stop



Instead of relying on Mother Nature for renewable energy, industrial designer Laurence Kemball-Cook tried to convert energy of walking people for a green charge. When people walk over these power generating slabs known as “Pavegen,” the energy generated is converted into a small amount of electricity which will be used by the bus stop to glow at night.

6. Ecoshel Sustainable Bus Stop



To attract more people to use public transportation, British designer Tiffany Roddis has designed an environmentally friendly bus stop called the “Ecoshel.” The shelter integrates solar panels, electric generators, and pressure pads to reproduce its own electricity and heat. The Ecoshel also features an advanced route finder and GPS to guide passengers to reach their destinations on time.

V. CONCLUSION

The implementation of such strategies relies heavily on the existing spatial structure, people and material flows, and transport networks. An expectation is that the demand will shift towards modes that are more environmentally efficient and having a better energy performance. In situations where a fee structure is not effective (e.g. low income population), constraint based strategies can be more suitable than fee-based strategies. Such coercive strategies would thereby impose a limit on the number of vehicles in circulation and, correspondingly, reduce congestion and air pollution while promoting the use of alternative means of transport. Their fundamental shortfall is they assume that government entities actually know solutions to urban transport problems (such as the appropriate number of parking space), which is not necessarily the case.