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Chapter 1 : Industrial designers predict the future of transportation in years | Technology | The Guardian

Transportation Research Board Special Report No. , Future Directions of Urban Public Transportation. Papers presented at a Conference on the Future Directions of Urban Public Transportation, September , Woods Hole, Massachusetts.

Transportation systems must be integrated, easily accessible and feature low-carbon and renewable energy. National policies are needed to inform and promote development and to encourage population growth away from capital cities, towards country centres and regional towns. Summary The Australian population now exceeds 25 million and data from the Bureau of Statistics suggests that figure will more than double by Of increasing concern for current and future governments, at all levels, are questions of where all of those people are going to live and work. The current trend towards urbanisation will continue as people are drawn to employment and better prospects in Australian capital cities and larger regional centres. Nevertheless, opportunities will develop for country towns and smaller regional centres to entice people to take up jobs away from major urban centres. To enable the necessary growth, policies and management strategies will need to consider a multitude of wide-ranging issues, such as: There must also be a significant focus on attracting investment; the design and implementation of infrastructure; and development of transportation systems. There are no straightforward answers, but systems must be integrated and broad-ranging; they will need to provide shared and connected mobility options across all aspects of a community, where low-carbon is a fundamental feature of the design. Analysis Low-carbon is a term used to signify the minimal output of atmospheric carbon dioxide CO2 produced by a system, process or procedure. In the broader context, low-carbon refers not only to CO2, but to minimising or negating, the release of all greenhouse gases GHG. In urban transportation systems, low-carbon terminology describes a range of available options, which could replace vehicles that produce carbon by burning fossil fuels. Responding to the introduction of low-carbon transportation systems in a decentralised Australia, will require social commitment to a change of attitude away from the single person use of motor-cars. This process will take time and effort. In some capital cities, options are being assessed and works are already under way to reduce reliance on cars and to increase the utilisation of public transport. The demand for faster and more efficient public transport is also being addressed in Brisbane , with work already underway to link the suburbs with the CBD. Rapid urbanisation in developing countries is resulting in high levels of energy consumption and increasing CO2 emissions from urban transport. The World Bank has recognised that there is no easy solution to reducing GHG emissions from transport. Rather, countries need to take a comprehensive approach to managing atmospheric CO2. This will require a number of simultaneous changes: Using the most efficient fuel-vehicle technology system possible would be a valuable complement to that strategy. An increasing number of countries are planning to build, or transform, cities based on a low- carbon theme. The designs include enticements to reduce urbanisation and cope with population growth. The city has been designed for over 50, people using the principles of sustainable development. The emphasis is on walking and cycling as modes of low-carbon transportation, supported by energy-efficient hybrid or electric vehicles where motorised transport is required. Buildings and other structures can be traversed to reduce walking distances. They have also been designed to provide both easy access and public facilities, such as ample seating, mist sprays to cool the air and extensive gardens to provide shade trees. Strategies to achieve this include: Planners are also developing and promoting a water transportation system, where the first option for freight movement will be to use energy-efficient ships, in combination with barges. This plan will result in removing large numbers of diesel trucks from roads and highways, reducing traffic congestion, noise pollution and CO2 emissions. Introducing electrically powered bicycles and motorcycles e-motorbikes is an ambitious strategy that will eventually result in significant cultural change in Vietnam, as well as meeting the national goal of reducing GHG emissions. Motorcycle ownership in Vietnam , one of the largest markets in Asia, is estimated to exceed 37 million

machines. For city travel, e-motorbikes will enable low-cost travel in comparison to engines powered by fossil fuels , reduce noise levels and, importantly, reduce carbon emissions. While e-motorbikes have the potential to replace traditional motorcycles, policy changes will be needed to remove the remaining barriers to adopting all forms of electric vehicles in Vietnam. With a focus on using renewable energy and sustainable urban development, the city aims to address urbanisation in the United Arab Emirates. The key to the success of the project is the conservation of natural resources and support for sustainable living. The intention is that some 90, people will either live in Masdar City or will commute to it daily for work or study. Development will include office spaces, education facilities including an Institute of Technology and schools , leisure facilities, hotels and private homes in community neighbourhoods. Like buildings in Putrajaya, the Masdar City planners have designed structures to be close together, to provide shade and enable cooling breezes to flow between buildings. A significant and important feature of Masdar City is the way planners and architects have addressed the requirements for moving people and freight, using its integrated and technologically advanced Smart Transport urban transportation. This system can move people in its zero-emissions and driverless Personal Rapid Transport vehicles. Departing from and arriving at dedicated terminals, people are then able to access Group Rapid Transport buses and Light Rail assets as they require traveling to more distant locations within the city or its boundaries: The Freight Rapid Transport network uses designated transport routes to move goods to different areas, or in and out of the city. A significant characteristic of Masdar City is the almost total absence of cars, buses and trucks powered by fossil fuels. Combatting Urbanisation in Australia Planned urban decentralisation in Australia must actively promote walking and cycling as essential elements of urban transportation strategies over future generations. In the country, this shift will be difficult and economically costly as existing country towns were established and developed by pioneer settlers from European heritage. They were not used to travelling comparatively long distances and having substantial open space around them was an unfamiliar concept. With the new advantage of limited restrictions on land use, the development of Australian country centres and townships featured wide streets and frontages, big yards and space between houses. The abundant space and long distances between centres mean that for a considerable time vehicle transport will continue to be an important component of any decentralised urban transportation system. Social factors will also challenge future planning. Australians are used to distances between destinations and having space around their homes. In a future Australia, cycling and walking will become critical elements in an urban environment, as already demonstrated in many cities from both the sociological and environmental perspectives, walking and cycling trips are space efficient, require limited investment and offer mobility without imposing external costs of noise, pollution, congestion, or accidents. In dense city and urban environments, walking and cycling are often the most efficient modes of low-cost mobility, with the added potential of health and lifestyle benefits. These modes are the mainstay for short trips in cities and larger regional centres, and they are critical for providing last-mile access and connecting to public transport networks. Significant change will be needed to shift transport usage towards cycling and walking, supported by low- or zero-emissions vehicles. A transition to low-carbon systems will be needed across a range of infrastructure assets. Centres will need to preserve and enhance, as far as possible, the facilities for journeys undertaken using non-motorized means. This will serve to encourage walking and cycling as valid transport choices. The process will also require improvements in the quality of cycling and walking infrastructure, such as: Urban transportation systems relying on extensive walking or bicycle use for short trips will need to be supported with low-carbon modes of transport. These will move away from a reliance on private vehicles and enable the development of rapid public mass transit services, as well as the movement of freight. Demography, geography and size will dictate these changes as they become necessary for many years into the future. Increasing the use of rail freight and establishing more railways, with their associated infrastructure, particularly in northern Australia, were identified as an area of study in the White Paper released in Further work will be required, however, with research directed toward linking and harmonising rail freight services with new Freight Rail Transport and ancillary services in expanding and growing regional centres. Conclusion

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As the population of Australia grows, decentralisation utilising the relative abundance of available space, will increasingly provide an attractive management strategy. Strong, coherent, policy is required at the national, state and local levels to enable and facilitate that cultural shift. Enabling people to easily move about safely and in comfort will be a key strategy to affecting the cultural change. This must support a shift to the use of renewables and adoption of low-carbon technology in urban transport, through encouraging walking, cycling and integrating the transportation systems. Supporting that requirement will be technological changes to the mode and delivery of transport to provide a system that is seamless, shared, connected and that operates autonomously. Any opinions or views expressed in this paper are those of the individual author, unless stated to be those of Future Directions International.

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Chapter 2 : Future directions for research in urban transportation - University of Manitoba Libraries

Future Directions of Urban Public Transportation TRB Special Report Future Directions of Urban Public Transportation is the proceedings of a conference of the same name. Part 1: Conference Purpose (Introduction to the Conference, H.C. Neil Peterson III, Opening Remarks, Carole A. Foryst); Part 2: why is Transit in Trouble?;.

Engineering problems of transportation by highways, airways, pipelines, waterways, and railways. Transportation modes and technologies, vehicle dynamics, basic facility design, traffic stream models, capacity analysis, transportation planning, evaluation and choice, and network analysis. Highway location and design, highway engineering economics, traffic engineering, traffic measurement devices and technologies. Includes discussion of technological advances in traffic flow and capacity, such as signal systems, corridor control, automatic driver information, incident detection and autonomous vehicle operation. Transportation engineering concepts including transportation systems analysis, airport systems, airline and airport operations, marine transportation and urban public transportation systems. ENCE or permission of instructor. The study of the fundamental traits and behavior patterns of road users and their vehicles in traffic. The basic characteristics of the pedestrian, the driver, the vehicle, traffic volume and speed, stream flow and intersection operation, parking, and accidents. Factors involved and the components of the process for planning statewide and regional transportation systems, encompassing all modes. Transportation planning studies, statewide traffic models, investment models, programming and scheduling. The urban transportation planning process, interdependence between the urban transportation system and the activity system, urban travel demand models, evaluation of urban transportation alternatives and their implementation. Basic engineering components of conventional and high speed railroads and of air cushion and other high speed new technology. The study of urban rail and bus transit. The characteristics of the vehicle, the supporting way, and the terminal requirements will be evaluated with respect to system performance, capacity, cost, and level of service. ENCE or permission of both department and instructor. The planning and design of airports including site selection, runway configuration, geometric and structural design of the landing area, and terminal facilities. Methods of financing airports, estimates of aeronautical demand, air traffic control, and airport lighting are also studied. An examination of physical and statistical laws that are used to represent traffic flow phenomena. Deterministic models including heat flow, fluid flow, and energy-momentum analogies, car following models, and acceleration noise. Stochastic approaches using independent and Markov processes, Queuing models, and probability distributions. Emphasis on the application of these techniques to problems arising in transportation. ENCE Freight Transportation Analysis 3 credits Application of operations research and system analysis methods to freight transportation systems. Cost and output analysis, terminal location, freight transportation demand models, freight transportation network equilibrium models and analytic models for analyzing the operations of rail, motor carrier, water carrier and air cargo systems. ENCEC Advanced Traffic System Control This course offers some state-of-art traffic control theories and models for contending with both recurrent and non-recurrent traffic congestion patterns. The primary contents include local ramp metering control, integrated ramp system control, interchange off-ramp controls, adaptive local signal control, and dynamic corridor control that consists both freeways and arterials. Pilots and survey administration. National household travel survey and travel diary. Revealed and stated preference survey with application to transportation case studies. ENCE I Discrete Choice Analysis Methods and statistics of model estimation; maximum-likelihood estimation; individual choice theory; binary choice models; multi-dimensional choice models; sampling theory and sample design; aggregate prediction with choice models; joint stated preference and revealed preference modeling, and longitudinal choice analysis; review of state-of-the-art and future directions. This course is aimed at transportation, urban planning, and public policy graduate students with an interest in transportation and sustainability. The course will start with an overview of sustainability definitions, and major sustainability issues such as congestion, urban sprawl, energy, pollution, habitat, and livability. In

order to achieve sustainability in transportation systems, it is important to employ proper modeling methods and planning tools to understand the linkages between transportation, economic, land use, social, environmental, and ecological systems. By working on several real-world case studies, students will also develop knowledge on how to apply these models to design effective places and networks, and to promote sustainable development and growth. ENCE L Advances in Transportation Demand Analysis This course describes the new generation of discrete choice methods, focusing on the many advances that have occurred in the last ten years. Each of the major models is covered: Transportation Economics applies economic theories to transportation engineering and planning. Applications and special topics cover urban, intercity, and multimodal transportation. The application of these techniques to the determination of optimal routes and tours for various transportation and logistics applications will be stressed. In addition to introducing a wide variety of network-related problems and existing techniques for solving a number of these problems, one of the goals of the course is to help the class participants to develop skills in creating and evaluating new algorithms and heuristics. ENCE W Emergency Management in Transportation This course addresses the many facets of emergency planning and post-disaster response from a transportation optimization perspective. Topics covered include, but are not limited to, evaluation of risk and safety; evacuation of buildings, complexes and geographic regions; contraflow and other traffic control techniques for evacuation with and without notice; emergency response districting, location, routing, scheduling, dispatching and fleet management; warning systems and other techniques for improving situational awareness; crowd behavior and pedestrian issues in emergencies; issues of emergency planning related to the disabled; role of human behavior, poverty and other issues from a social science perspective; role of the military and government and non-government organizations; and legal and moral issues. As the field of transportation is interdisciplinary in nature, our students take courses in many other disciplines. Additionally, transportation-related courses are offered in Urban Planning, the Business School and in other departments within the College of Engineering.

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Chapter 3 : Public Transit | US Department of Transportation

FUTURE DIRECTIONS OF URBAN PUBLIC TRANSPORTATION. CONFERENCE PURPOSE. The specific objective of the conference is to investigate the near-term outlook and policy options for urban public transportation facilities and services over the next decade and beyond.

While autonomous vehicles may sound futuristic, self-driving cars are increasingly part of the present. Last January, Mercedes-Benz introduced the F Luxury in Motion self-driving concept car with front seats that can swivel away from the windshield to face the rear seats. And Google, which has already logged over 1. In June, the vehicles, each of which looks like a large computer mouse, began navigating city streets from Silicon Valley to San Francisco. Utopia or Something Else? If everyone rides in an autonomous vehicle, there will be few if any accidents, which will allow for lighter, more fuel-efficient vehicles. And if people share these vehicles as they move about the city, the total miles driven each day will also decrease. Autonomous vehicles could speed up commutes, allowing people to live farther apart, Bettencourt says. You can imagine mph corridors where these trains made out of cars are just moving across the city, and those would be the future highways. Why do we still insist on buying a car? Recent studies suggest car ownership in the U. A separate study by the same institute found a significant decrease in recent years in the number of young drivers across 15 countries. The decrease correlated strongly with internet access, suggesting that virtual contact via electronic devices may be reducing the need for actual contact. Rise of the Taxibot Electronic devices may not only be reducing interest in car ownership but are enabling the sharing of vehicles that make shared, self-driving vehicles possible. You see it with Uber and the proliferation of taxi booking apps or public transportation schedule routing apps, and this is at the same time you have autonomous vehicle technology that is evolving. You can marry the two. Further savings come when people not only share a car but also share the ride. Ride-sharing startups Uber and Lyft now offer UberPool and Lyft Line, carpooling services that allow people headed in the same direction to share a ride. Recieve emails about upcoming NOVA programs and related content, as well as featured reporting about current events through a science lens. Email Address Zip Code Subscribe If a private company could use an autonomous vehicle rather than paying a driver, the cost of transporting people across the city would be even less. Where demand is high, larger, driverless buses could give autonomous vehicles an added advantage. Self-driving buses could reduce the time between vehicles from five seconds to one second, allowing the tunnel to accommodate more than , passengers per hour, according to a recent study by researchers at Princeton University. Singapore and a number of European countries are now testing or preparing to test fully autonomous buses that could complement fleets of self-driving cars. Detours Ahead Before fleets of self-driving cars or buses can replace the cars of today, a number of challenges still need to be addressed. The technology, however, has been incredibly expensive. Costs continue to drop quickly. Apart from technical issues, a significant challenge may simply be gaining widespread adoption. The best case scenario of the recent OECD studyâ€”where shared autonomous cars take nine out of ten vehicles off city streetsâ€”is based on the assumption that everyone rides in an autonomous vehicle and shares each trip with others headed in the same direction. Lower costs alone may not be enough to get people to give up car ownership. If any city is likely to embrace shared autonomous cars it will likely be Singapore, an authoritarian city-state that has pioneered a number of regulations designed to limit car ownership and ease traffic congestion. For the past quarter century, Singapore has imposed heavy taxes and licensing fees for car ownership that would be difficult to pass elsewhere. Bettencourt, however, remains skeptical whether enough people, in Singapore or elsewhere, will buy into shared self-driving cars to make them a success.

Chapter 4 : Guiding Principles for Sustainable Transportation

TRB Special Report 69 Future Directions of Urban Public Transportation: Why Transit Is in Trouble H.C. Nell Peterson I/I All of us--whether we are elected officials, transit.

Transportation is a key means, but not the only means, through which access can be achieved. Access People are entitled to reasonable access to other people, places, goods and services. Strategic Directions Demand Management Reduce the need for travel while protecting social and economic needs for access by changing urban form, promoting new communications technologies, and developing more efficient packaging etc. Diversifying Options Improve access by diversifying transportation options, giving people more choices as to how they meet their access needs. People and Communities Transportation systems are a critical element of a strong economy, but can also contribute directly to building community and enhancing quality of life. Equity Nation states and the transportation community must strive to ensure social, interregional and inter-generational equity, meeting the basic transportation-related needs of all people including women, the poor, the rural, and the disabled. Health and Safety Transportation systems should be designed and operated in a way that protects the health physical, mental and social well-being and safety of all people, and enhances the quality of life in communities. Individual Responsibility All individuals have a responsibility to act as stewards of the natural environment, undertaking to make sustainable choices with regard to personal movement and consumption. Integrated Planning Transportation decision makers have a responsibility to pursue more integrated approaches to planning. Strategic Directions Urban Planning and Transportation Planning Concentrate urban growth, limit sprawl and provide for more mixed land use through urban structure and land use policies. This would reduce demand especially for automobile trips by moving origins and destinations closer together and also help reduce habitat destruction and loss of agricultural and recreational lands. Give priority to less polluting, lower impact modes of transportation in the design of transportation systems and urban areas. Pedestrian and cycling paths should be provided as attractive and safe alternatives to cars. Maintain and enhance the health and viability of urban public transit systems. Integrate transport modes, whether for passengers or goods, in order to provide more efficient goods movement, and to increase the availability of lower impact transportation options such as public transit. Protect historical sites and archaeological resources, reduce noise pollution, and consider aesthetics in the planning, design and construction of transportation systems. Decision Making Processes Ensure public and private sector stakeholders coordinate their transportation planning, development and delivery activities. These transportation decisions should also be integrated with environment, health, energy and urban land-use decisions. Make transportation-related decisions in an open and inclusive process. Inform the public about transportation options and impacts, and encourage them to participate in decision making so that the needs of different communities i. Anticipate environmental or social impacts of transportation-related decisions rather than trying to react to them after they have occurred. This will result in considerable cost savings since transportation decisions often involve costly, long-term infrastructure investments. Consider both the global and local social, economic and environmental effects of decisions. Efforts must be made to develop transportation systems that minimize physical and biological stress, staying within the assimilative and regenerative capacities of ecosystems, and respecting the habitat requirements of other species. Pollution Prevention Transportation needs must be met without generating emissions that threaten public health, global climate, biological diversity or the integrity of essential ecological processes. Land and Resource Use Transportation systems must make efficient use of land and other natural resources while ensuring the preservation of vital habitats and other requirements for maintaining biodiversity Strategic Directions Environmental Protection and Waste Reduction Minimize transportation-related air emissions and discharges of contaminants to surface fresh and salt water and ground water. Minimize the generation of waste through each phase of the life-cycle of transportation vehicles, vessels and infrastructure. Reduce, reuse and recycle.

Ensure that the rate of use of renewable resources does not exceed rates of regeneration, and non-renewable resource use is minimized. Ensure emergency management systems are in place in order to respond to spills and other transportation-related accidents. Land Use Emphasize compact urban form in order to reduce habitat destruction and loss of agricultural and recreational lands around urban areas. Minimize the impact on natural habitat and the wildlife and people it supports in the design, construction and operation of inter-city transportation systems and infrastructure, including, for example, highways, pipelines, and railways. Energy Use Reduce fossil fuel consumption and emissions through efficiencies and demand management. Promote the use of alternative and renewable energy. Economic Viability Sustainable transportation systems must be cost effective. If adjustment costs are incurred in the transition to more sustainable transportation systems they should be equitably shared, just as current costs should be more equitably shared. Fuller Cost Accounting Transportation decision makers must move as expeditiously as possible toward fuller cost accounting, reflecting the true social, economic and environmental costs, in order to ensure users pay an equitable share of costs. Strategic Directions Fuller-Cost Accounting Identify and recognize public subsidies hidden or otherwise to all modes of transport and make transportation decisions accordingly. Reflect the full social, economic and environmental costs including long term costs of each mode of transport or transport related practice as accurately as possible in market prices. Ensure users pay a fuller share of all costs, while respecting equity concerns. Research and Technological Innovation Promote research and development of innovative alternative technologies that improve access and help protect the environment. The emphasis should be on providing a wide range of transportation options. Job Creation Consider the potential economic and employment benefits that could be derived from the restructuring of our transportation systems.

Chapter 5 : Courses, Transportation Engineering Program, Clark School of Enginering, University of Maryla

*Future Directions of Urban Public Transportation (SPECIAL REPORT (NATIONAL RESEARCH COUNCIL (U S) TRANSPORTATION RESEARCH BOARD)) [Mass.) Conference on the Future Directions of Urban Public Transportation (Woods Hole] on calendrierdelascience.com *FREE* shipping on qualifying offers.*

Chapter 6 : The Future of Mass/Public Transit

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Chapter 7 : Next Future modular transportation swarms the commuting hordes

Future directions for research in urban transportation. HE O75 Planning for urban transportation: proceedings of the second annual spring conference of the Organization of Cornell Planners, March ,

Chapter 8 : Future Directions of Urban Public Transportation | Blurbs New | Blurbs | Publications

Urban transportation systems relying on extensive walking or bicycle use for short trips will need to be supported with low-carbon modes of transport. These will move away from a reliance on private vehicles and enable the development of rapid public mass transit services, as well as the movement of freight.