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Non-motorized mobility in cities of the future: College and university campuses as a pilot project

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Introduction

The concept of "Cities of the Future" is an everlasting challenge and a somewhat elusive goal of urban planners and citizens who seek healthier, more sustainable human settlements. Ecumenopolis, Arcosanti, the British and European new towns, the City Beautiful Movement, Utopian experiments, floating cities on the sea, orbiting space colonies and the New Urbanism approach have all tried to paint pictures of what settlements of the future could be. Certainly a focus of the early Delos Symposia, Doxiadis Associates, the Athens Center of Ekistics, and the World Society for Ekistics was to bring diverse disciplines together in order to create communities that are healthy, sustainable and equitable for the citizens of all ages and abilities.

Urban scholars remind us that cities of antiquity and the towns and cities that followed were totally dependent on animal and human power for mobility. They include Knossos, Jericho, Athens, Peking, Alexandria, Venice, Florence, Constantinople, Rome, Mexico's Tenochtitlán and Chichén Itzá. With the industrial age and eventually the advent of the automobile, the many thousands of years of total non-motorized mobility came to an end. Trolleys, trams, trains, buses and cars gave pedestrians new forms of mobility. The intrusion of railroad track and roadways into the natural environment were not the greatest impacts; rather trolley tracks, rail lines and expressways opened rural landscape to development which eventually became dependent on the single occupant vehicle. Roads and freeways to the suburbs accelerated sprawl in large U.S. cities like Phoenix, Atlanta, Los Angeles, San Jose, and Detroit. Since World War II, cars have helped transform the human settlement into sprawling congested parking lots, clogged roadways, reduced density and reduced energy efficiencies. They have ex-

acerbated air, water and noise pollution, disenfranchised the majority of the population who do not drive, and placed the world in political turmoil, seeking a dwindling supply of cheap oil.

With the list of negative impacts imposed on urban environments, it should be of little wonder that cities of the future need to become substantially less dependent on the single occupant vehicle.

The future sustainable city

With this history of many decades of what the automobile and its related infrastructure have done to the cities of North America and much of the post-industrialized world ... with decreasing portal to portal speeds since the 1920s, one should be driven to ask: "What does the future hold for a sustainable city, the natural city in our lifetime or in the years to come?" To help answer the question, I did not want to rely totally on my 21 years as a city council member, or my experience teaching about environmental impacts, or as an urban consultant working on sustainability in several Australian cities. I went to the internet to see what, if any, citations or references about "Cities of the Future" are available. Clicking on Google, I found 18,500,000 sources for "Cities of the Future!" Next, I asked Google about the availability of references on "non-motorized mobility" and got 14,500 possibilities.

After reading several hundred of what seemed like very good engineering and design ideas, I tried to integrate these inputs with some of the social, ecological, and political factors that may open a pathway to future human settlements that *could* become healthier and more sustainable than they are today ... at least from my perspective. Neighborhoods, towns and cities of the future can utilize non-motorized transportation under rather specific conditions:

- The city plan and land use zoning need to encourage density (at least 20 units per acre) and encourage mixed uses. There needs to be a master plan for connecting cycleways and footpaths.
- The community should apply transportation demand management (TDM) strategies to decrease car dependency. These could include vehicle congestion pricing, increased parking, and toll fees.
- Infrastructure for pedestrians and bicycling should reflect the investment percentage which corresponds with the modal split goal: i.e. if a city seeks to have 25 percent of trips in the central city to be non-motorized modes, then 25 percent of the transportation budget should be dedicated for those purposes.
- An ongoing safety and education program is required for a town or city to shift behavior away from auto-dependency and toward increased walking and cycling.



Fig. 1: Typical scene of non-motorized transportation of a college campus. (Source: The author).



Fig. 2: Bicycle mobility embodies travel with a smile, good exercise, and clean air. (Source: The author).



Fig. 3: Successful new towns and cities of the future will separate vehicular traffic from cyclists and pedestrians. This underpass improves mobility and safety, especially in wintry conditions. (Source: The author).

If non-motorized transportation of a college campus can be extended to future cities, those human settlements will be more sustainable, more livable (fig. 1). Notice that 14 bicycles can fit into one car parking space. At an average of US\$25,000 per space the cost of providing car parking erodes the budget for research and teaching, or other community needs.

In order to inventory the community's needs and expectations about non-motorized mobility (NMM), here is a sample "opinionnaire" that could be used:

- Is your town or neighborhood optimal for walking and biking? If not, why not?
- Are footpath and bike path lighting and signage adequate? Is year-round maintenance provided for sidewalks and bike paths?
- Are appropriate safety devices in place for pedestrians and cyclists so that people of all abilities feel safe?
- Do separated bike paths and grade-separated routes (from car traffic) exist in practice and on maps?
- Are bike shops active promoters of non-motorized mobility?
- Do schools, retail areas and recreation facilities have covered or secure parking for cyclists plus good incentive programs such as Bike to Work and Bike to School Days each month?
- Is adequate enforcement of safety rules, helmet use, etc. in place? Have bicycle-mounted police been provided?
- Is there a master plan for NMM, and a bike-ped coordinator to facilitate the plan and to promote marketing of NMM to tourists and visitors?

At this point, one may think that I am about to launch into a discussion of how NMM can be implemented in the space colonies circling in L_4 or L_5 orbits, or the E-cities in Dubai and Capetown or the fantasized underground cities of tomorrow where sub-urban renewal engineers are telling us there are 100 quadrillion cubic feet of real estate under our present North American Cities. They tell us that there are 850,000 square meters under Beijing being developed with schools, hotels and restaurants.

But that is not where I want to take this discussion. Instead, my "Cities of the Future" are your hometowns next week, next month, next year. What can be done to naturalize your present city? The immediate future, in the twilight of the cheap oil economy, needs urgent attention (fig. 2).

The future of urban university campuses

I want to propose that North America and many other areas of the world have potential NMM pilot communities in most large towns and cities. They are the colleges and universities that, like many traditional cities, began as pedestrian places.

The University of Toronto (60,000 students) was founded as King's College in 1827 and assumed its present name in 1849. Like most other great institutions of higher education, it grew beyond its early physical boundaries. Not every campus has had access to mass transit, including the subway and a city bike network that is found in Toronto (fig. 3). Various policies and auto



Fig. 4: Manhattan is an example of where non-motorized mobility (NMM) is usually more efficient than cars or buses. (Source: The author).

alternatives have spared the University of Toronto from being overcome by the auto as experience on thousands of other college and university campuses across North America.

Most urban universities have spilled beyond the original campus into business or residential neighborhoods. What has exacerbated this encroachment is that more and more students are bringing more and larger automobiles and pick up trucks to campus. In interviewing nearly 400 of the 4,000 colleges and universities in the U.S., only two had no problem with insufficient parking. Many schools have at least three times the number of cars coming to campus than the number of officially designated parking places.

So the time is at hand to determine whether campuses, which are unique microcosms of our larger towns and cities, can demonstrate that neighborhoods, towns and cities of the future can become less dependent on the single occupant vehicle (fig. 4). Are campuses able to reestablish human settlements where non-motorized mobility is available to the majority of the community?

In 1961, Lewis Mumford wrote that we should "heavily tax big cars in the city and give a break to small electric cars." Last year, London implemented an experiment that Singapore has had in place for many years: a user tax for central London roads is 5 pounds or 12 dollars per day. This has resulted in 50,000 fewer cars a day, 30 percent reduction in traffic congestion, 20 per-

cent increase in bike traffic, 20 percent increase in taxi use, and 23 percent increase in bus use. Stockholm plans to introduce the central city car tax next. This month, Paris placed a ban on SUVs during rush hour.

A growing number of campuses are raising parking fees to be more in line with the real estate value of the parking lot or the cost of the parking structure. The increased fees and parking fines are being used to provide improved bike paths, bike service stations, bike storage and secure parking. Other investments from parking revenue include improved pedestrian safety and connectivity and in-pavement strobe lights for pedestrian crosswalks.

A college campus serves as a reasonable pilot or test site for NMM because it tends to be compact, normally offers a captive audience, and is innovative. Students and faculty tend to be somewhat more fit, more interested in sustainable healthy living and eager to set new trends. A campus is a good place to try out a "pedestrian bill of rights." Non-motorized travel experiments can be easily terminated if not successful or cost-effective.

Todd Litman, et al. (2002), Carlos Balsas (2002), Donald Shoup (1997) and Will Toor and Spenser Havlick (2004) have shown how successful university car calming practices have produced improved NMM. In these and other studies, there are at least half a dozen institutions that have distinguished themselves. Included in this list are University of California – Davis (31-40



Fig. 5: In a compact university town like Boulder, Colorado, USA surrounded by purchased open space or greenbelt, 64 percent of trips to downtown do not use single occupancy vehicles. Instead of supplying more roadways, the community's transportation demand management practices have encouraged more biking, walking and telecommuting – and have prevented sprawl.

percent bicycle use), University of Colorado-Boulder (strong bus-bike network) (fig. 5), Stanford University (pays 2,500 employees not to drive to campus), University of California at Santa Barbara (excellent bike path network), University of Washington at Seattle (ped, bike-U pass innovations), Lewis and Clark University (nearby campus housing for low car use owners), and University of North Carolina (conversion of parking lots to bike and ped paths).

Conclusion

To conclude, if successful models of campus non-motorized mobility can be extrapolated and extended to their host communities, and to other auto-dominated settlements, we can humbly say that Cities of the Future will be healthier, more livable, more sustainable and more natural than the cities we know today.

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