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Thirteen Most Common Trends Shaping Automobile Dependence Worldwide and the Global Implications of these Trends Kenya

[1]*Adeyemo Ajibade, [2]Dayomi Mathew, [3]Tugbobo Babatunde

[1]Principal Lecturer, Department of Architectural Technology, Lagos State Polytechnic, Ikorodu, Lagos, Nigeria.
[2]Professor, Department of Urban and Regional Planning, School of the Built Environment and Development Studies.
[3]Ph.D. Candidate, Department of Urban and Regional Planning, School of the Built Environment and Development Studies, College of Humanities, the University of KwaZulu-Natal (UKZN) South Africa.

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ABSTRACT: Walking being the oldest form of urban transport, and until the advent of major transformations in transport technology in the nineteenth century, most cities were structured in ways that supported walkability. Today, there is a change in transportation which emphasizes, the traditional pedestrian paths which are increasingly becoming non-regulated spaces when compared to the urban spaces for automobile modes. This change in emphasis is noticeable partly because urban walkability has rarely been planned for in the past few decades and ultimately may replace our automobile dependency. It has brought enormous changes to urban landscape in recent times particularly in the developed world. Automobile dependency comes in different ways, forms and degrees. For instance, there are few cities worldwide that are absolutely automobile dependent (where driving is the only form of transport). Even areas that appear to be highly automobile dependent often have a noteworthy amount of walking, cycling and transit travel among certain groups or in certain areas, although use of these modes tends to be undercounted by conventional transportation planning. Contemporarily, reducing car dependency has been discussed broadly in the scientific community by professionals in the built environment and of course by the general public. With increasing vehicular streets worldwide, it raises a swirl of questions, how did we get to this point of automobile dependency and are the alternatives more desirable? In answering this question, this paper identified and discussed extensively thirteen major distinct trends that are responsible for the automobile dependencies in most cities of the world.

Keywords: *Trends, Automobile Dependence, Worldwide, And Global Implications*

INTRODUCTION

Recently faced considerable criticism from public and professionals in the built environment; streets without active pedestrian activities (active transportation or pedestrianization) are increasingly popular in most cities of the world which makes one easily forget that cities exist for care and culture of people, not the passage of motorized transportation alone (Breines & Dean, 1974) (Lynch, 2011a, 2011b; Mills, 2013; Morris, 1979).

Barnett (2014) in his article "on life take place on foot" reiterated that, cities are for people, cars are definitely not people. The thrust of the matter is that contemporary planning of 21st century must acknowledged pedestrianization (walkability) not automobile driven communities.

Pedestrianization is very familiar and to many people, an essential mode of transport. It offers people freedom to travel without responsibility of either owing or using car for work, recreation, shopping, visiting friends and family. (Adam, 2011; Bloomberg et al., (2000); Breines & Dean, 1974; Commission, 2000; Joseph, 2002; Ozbil, 2010).

Surprisingly, the central interest is encouraging walking and other non-motorized modes in most urban landscape planning. Expectedly, this will help shape the extended mobility trends of tomorrow.

It is has been severally argued that, ancient pedestrian paths are increasingly becoming non-regulated spaces, undercounted and undervalued when compared with the urban spaces for motorized modes.

In addition, due to advent of modern transportation technologies, streets and public spaces, once meant for pedestrians, vehemently struggle with degradation and invasion from unrestrained motorized transportation.(Peter & Jeff, 2000a, 2000b; Peter & Jeffery 1989 ; Newman & Kenworthy,, 2006)

This in actual sense of it has generated a lot of controversies and counter attacks from general public, urban planners and even

*Corresponding Author Email: *adearc@yahoo.com*

novice in the built environment. Right now there are so many anti-automobile critics today who are condemning the invasion of motorized transportation in most streets and canvassing for complete banning of motorized transport.

Strange enough there are no moral justifications to condemn or disagree with their perspectives, because cities are still badly equipped to cope with the challenges of managing future urban transportation system especially the dichotomy between foot (walkability) and wheel (automobile) modes of transport. (Amphlett, 2011; Francois-Joseph & Ralf, 2014; Kellese et al., 1996; Sanyal, 2013; Sustainability, 2010).

One thing that must be clarified is that automobile transportation is not necessarily a bad innovation, well intended but turned out over time to be a major concern and misguided efforts to create more unhealthful life due to lack of balanced coordination with other modes. As a matter of fact most public space has been plagued by automobile, for travel or parking.

For instance, the major value of urban life which is public-ness, of people from different group meeting each other while walking is no longer encouraged due to popularity of automobile dependency.

The fact of the matter is that, the important public places originally designed exclusively for pedestrian are completely saturated by automobile use, without considering the fact that no public life can take place in automobile dependent streets. To most urban planner and landscape architects these are genuine concern no doubt about it.

These concerns reflect an underlying sense of isolation, lack of control over changing environmental landscape and erosion of community life by depending on automobile mode of transport.

Substantiating the above statements, Breines & Dean (1974) in their book the pedestrian revolution, streets without cars argued that cars cannot be disinvested or nether banning car entirely is the answer.

To be precise, the solution is to exploit the advantages of foot (walkability) and wheel (motorization) in areas where each operates better because in the contemporary planning of the 21st century, pedestrian-friendly environment can be seductively the backbone of transportation system.

Accordingly, many urban analysts advocated for sticking transformation in urban planning to absorb walkability and reduction of auto- mobility system (Breines & Dean, 1974) (Sanyal, 2013) (Litman, 2003; 2012).

The questions often ask is how we get to this point of resilience and overreliance on vehicular mode of transportation. To answer this question therefore this paper identified and discussed extensively thirteen major distinct trends that are responsible for the automobile dependencies in most cities of the world.

Literature Review

As earlier expatiated the primitive mode of commuting in most cities from a point of origin to a destination is by foot. Supposedly, making cities pedestrian friendly is a contemporary issue of 21st century urban planning yet, pedestrian paths

Table 1: Auto Dependency and Balanced Transportation Compared Sources: (Litman, 2012;Litman & Laube, 2002)

factor	Automobile Dependency	Balanced Transportation (Automobile + Pedestrian Modes)
Motor vehicle Ownership	High per capita motor vehicle ownership	Medium per capita motor vehicle ownership
vehicle use	High per capita motor vehicle use.	Medium per capita motor vehicle use.
Land use density	Low	Medium
Land use mix.	Single-use development	Mixed-use development patterns.
Land for transport	Large amount for roads and parking.	Medium amount devoted to roads and parking.
Road design.	Road designs favoring automobile traffic	Road designs balancing modes.
Street scale.	Large scale streets and blocks	Small to medium streets and blocks.
Traffic speeds.	Maximum traffic speeds	Lower traffic speeds.
Walking	Mainly in private malls	On public streets.
Signage.	Large scale, for high speed traffic	Medium scale, for lower-speed traffic.
Parking	Generous, free, rigid requirements.	Modest, some priced, flexible requirements
Site design	Parking paramount, in front of buildings	Parking sometimes behind buildings

are often narrow, neglected with irregular surfaces and poor maintenance thus encouraging automobile dependency in most cities, the trend according to some urban analyst call for an immediate action.

Automobile dependency in this context is defined as high levels of per capita automobile travel, oriented land use patterns and reduced transport alternatives. In a layman's language, it is the urban design approach that favors automobile and provides relatively inferior transportation alternative. Automobile dependency is not just a thing it includes various transport and land use factors, as described in Table 1 below.

MATERIALS AND METHODS

Effects of Post War Economic Boom in the World

The post-war period from 1947 to 1971, known as the 'long boom', saw a rapid increase in automobile ownership by households throughout most cities of the world. Mass-production technology pioneered by American car manufacturer Henry Ford made car ownership – formerly a luxury – affordable. Coupled with the removal of wartime petrol rationing and a booming economy approaching full employment, the levels of car ownership rose from 100 cars per 1000 persons in 1945 to almost 500 cars per 1000 persons by the early seventies (Forster 2004 cited in kieron Amphlett, 2011).

With cars easily affordable during the post-war period, people enjoyed the freedom and flexibility to travel without being reliant on foot. As the automobile became the preferred means of transport during the long-boom, the pedestrian mode system declined sharply.

Today, throughout the world uncontrollable level of motorization has succeeded in the post economic boom. More people are buying personal vehicles and doing so in large numbers.

Most national governments encourage automobile because of its economic importance, it create jobs and drive economic growth. For instance, the Chinese auto industry, now the third largest in the world, has been dubbed as one of the pillars of economic development. It employs 1.8 million people and accounts for 1.5 percent of total GDP (Shiuen & Schipper, 2005). India also considers developing its domestic automobile industry as one of its most important measures for promoting economic growth and employment

Un-controlled Urbanization

Consequently, society's undying passion for the automobile has been directly connected and intricately linked with continued increase in population of people. This trend according to many urban analysts, researchers and planners will make walkability and livability extremely impossible and increasing dependency on automobile (De Cambra, 2012).

The conventional wisdom is that urbanization ordinarily brings about social and cultural changes in community life. It also corresponds to modernization and industrial development. However, the process of urbanization is accelerating at much faster rate and creating demand for new personal mobility which in turn increases the automobile usage.

It is noticeable that, so far, as the world's population multiplied the need for both intra and inter movements accelerated even more quickly. One of the repercussions of excessive urbanization trend is unprecedented increase in car ownership. No doubt about it, there is apparent tendency for the divergences to continue, if anything automobile dependencies are tendering to widen yearly.

Available statistical information from various reliable sources is also a pointer to the fact that, automobile dependency will continue unchecked globally. For example the United Nations projected that half of the world's population would live in urban areas at the end of 2008 and by 2050 it is predicted that 64.1% and 85.9% of the developing and developed world respectively will be urbanized. Consequently, there will be about 30 megacities with a total population exceeding 10 million by 2025. By implication just over half the world's population will be living in megacities located in emerging economies. The cumulative effect is that urbanization and the development of megacities will undoubtedly provide opportunities for more people to purchase vehicles at will therefore concomitantly increasing vehicular density.

Un-controllable Level of Motorization

One of the effects of unprecedented and rapid population increases taking place worldwide is an increase in motorization level. It has been established that The uncontrolled increase in motorization level combined with limited attention to pedestrians in environmental planning has in recent times, inadvertently resulted in a continuous decrease in the overall pedestrian mode share and increase unregulated automobile reliance (Sperling & Salon, 2002; Taiyab, 2008;Peter & Jeff, 2000b)

Fortuitously, today in some communities automobile ownership is now a means of measuring affluence. Affluent people consider personal mobility to be a right, and even accumulations of cars are a way of showing off wealth in most developing countries. It is therefore interesting to note that non-motorist who is economically buoyant and equally able to afford a personal motor vehicle will continuously shift to the motorized modes and hence increasing vehicular ownership.

As earlier pointed out, the prospect of owning a car is now seen by most people as an access, mobility, comfort, and status as well as an additional measure of safety from fatal traffic accidents and freedom from the drudgery of woefully inadequate public transportation.

Not surprisingly, findings from countless transport studies show that city dwellers will generally purchase motorized vehicles as soon as they can afford to do so. In other words, public transport and non-motorized modes continue to be inevitably phased out as people get richer. (UN-Habitat, 2014a; 2014b; Adam, 2011).

Table 2: Total Cars Produced In the World Source: (OICA, 2014)

Year	Cars Produced
1999	39,759,847
2000	41,215,653
2001	39,825,888
2002	41,358,394
2003	41,968,666
2004	44,554,268
2005	46,862,978
2006	49,918,578
2007	53,201,346
2008	52,726,117
2009	47,772,598
2010	58,264,852
2011	59,929,016
2012	63,069,541
2013	65,140,268

Paradoxically, empirical studies on what the rapidly-growing car population will mean for the world's economy and environment for instance found that, the number of cars on the world's roads today surpassed one billion. A similar study from Ward's auto further confirmed that, the global number of cars exceeded 1.015 billion in 2010, jumping from 980 million the year before.

Another study also confirmed that the yearly car produced worldwide is anticipated to grow geometrically. In 1999 for example; 39,759,847 cars were produced and thirteen years after over 65,140,268 cars produced representing over 64% increase from 1999 to 2013 (Table 2).

A similar independent study conducted by IEA (year) further corroborated the trend, for instance, it revealed that the growth in vehicles per capita, in the year 2000 was 4 vehicles per 1000 people, 2010 was 40 per 1000 people and 2035 will be 310 per 1000 people. By 2035, the numbers of vehicles on the road worldwide is projected 1.7 billion.

It is worth noting that vehicular vehicles growth pattern varies from country to country. The growth of personal cars is soaring especially in the developed countries when compared with their counterparts in developing countries.

United States (developed country) still conservatively constitutes by far the largest vehicle population in the world, with 239.8 million cars, the Ward's study reported, while China (developing country) the world's second largest car population, with 78 million vehicles.

To a surprising degree, the developing world share of vehicle ownership is far behind the developed world, yet motorization trend has grown so quickly that the existing road infrastructure systems in most cities of developing countries have not been able to keep up.

For example, car ownership in Lagos and Beijing grew a staggering 230 and 300 percent respectively from 2002 to 2008. In the past 10 years, Beijing has experienced a tenfold increase of private cars and Shanghai a 25-fold increase. In Bangalore, India's new Silicon Valley, 900 new vehicles are registered every day (Pucher et al., 2007).

Therefore, if the current statistical figures emanating from various reliable sources worldwide are something to reckon with, the growth pattern of the world's automobile per capita is estimated to continue unabated to a foreseeable future no doubt about this.

Without mincing words, this will uninterruptedly affect vehicular dependence of most cities. The fact of the matter is that, increasing automobile popularity on most roads is currently a big challenge and the future of cities road system is at the verge of physically depleted.

Urban Densities

Newman & Kenworthy (1989; 2000) argued that automobile dependence is a function of city density. Consequently many changes in urban development patterns began to take place after post war economic boom; the urban density is now an important issue in the city transportation system.

Typically, urban density and urbanization are mutual exclusive. Both are independent and interdependent to one another. Specifically, densities are a major factor for the rising

automobile dependency in most cities of the world and play a crucial role in the intra-urban mobility in any city. (Kellese et al., 1996; Krambeck, 1999; Litman, 2003; 2012; Litman & Laube, 2002).

Recent empirical data have shown that when destinations are close, people would prefer to use alternative modes wherever available. Thus, the density has significant effects on level of automobile dependency, because denser cities have lower automobile usage compare to less dense area.

In a related development, denser areas have a close knit urban fabric and encourage bringing together various land use activities (such as residential, commercial, industrial, and recreational, in a lesser radius). In a very simple language, if everyone lives closer together (for instance to shopping complex and work), trips are shorter and fewer.

There is no point ignoring the fact that the dispersed development trends of most urban fringe do not favor more compact and accessible development.

And the fact that most cities have spread out uncontrollably and separated to extensive monoculture pattern (land use) promotes automobile dependency. Such classic separation from specialized destinations or center area often deters people from reaching most places except solely by the use of automobile. (Littman & Laube, 2002; Allan & Donald, 2009; Amphlett, 2011; Breines & Dean, 1974; Damian & Barbara, 2000; Dobesova, 2012; Choi, 2012; Ewing, 1999)

The moral therefore is that, we must increase density of our cities to discourage automobile dependency because the more compact the development the less are the distance that has to be covered. It has been proven scientifically that density without livability could return cities to slums or urban blight in the 21st century. (Jean-Paul et al. , 2009; Lynch, 2011a; Francois-Joseph & Ralf, 2014; Gota et al., 2010)

Weather-Ability

Everyone who lives in city especially in rapidly expanding subtropical urban regions of the world assumes that the city is unconditionally un-walkable in view of the effect of weather and humidity factors.

Most cities residents generally under an incorrect proposition and illusion that the automobile is the only possible option for commuting and avoiding the excessive humid weather. Evidently, a number of studies have supported and demonstrated that there is a significant relationship between weather-ability and automobile dependency.

For instance, it has been established that, peculiar weather conditions have expressive associations with fluctuations in volumes of pedestrian's trips and auto usage. More scientific studies have equally found that weather always has measurable effects on the amount of walking occurring and vehicular usability in a given locale.

Correspondingly, It is also an undisputable fact that, automobile dependence is inevitably induced by warm climates where people can enjoy low density suburban lifestyles, same is applicable to compact, and transit-oriented cities which are mostly in cold climates.

Similarly, empirical studies on weather-ability and walkability have confirmed that, walking rate is measured in relation to various climatic conditions such as temperature, sunlight, torrential downpours and precipitation.

Otherwise, it is widely believe and acknowledged by professionals in the built environment that street hold and throw off heat in the hot months and wider streets throw off more heat, making it impossible for pedestrian during the hot weather to walk, thus encouraging people to compulsory switch to automobile transportation

Substantiating these previous empirical findings, an independent study that was conducted over 170 days from late fall to early summer, (published in the journal environment and behavior, Canada) the study conformed to pedestrians in nine cities around the world (Santa Cruz in the Canary Islands; Kilmarnock and Glasgow in Scotland; Rousse in Bulgaria; Gliwice in Poland Oulu and Jakobstad in Finland; Sion in Switzerland; and Ithaca in the United States; from November through May, pedestrian traffic was observed between 7 a.m. and 5 p.m.)

The study found that people are less likely to walk when temperatures dip below zero, when there's too much rain, sunlight or too much snow. The study affirmed that, a 5°C increase in temperature was associated with a 14% increase in pedestrians. A shift from snow to dry conditions was associated with an increase of 23% in pedestrian traffic, and a 5% increase in sunlit area was associated with a 2% increase.

From all these studies, researchers have found a direct correlation between pedestrians travel pattern and weather.

While these findings are theoretically logical to some extent, they may not necessarily be applicable to some regions such as Africa because throughout the year round the changes between summer and winter are generally mild and invigorating without being frustratingly extreme.

Even the provision of the traditionally shaded street trees as seen in traditional African main streets, which provide most needed shade from the strong sunshine, also draw breezes down to footpath level due to air pressure differentials and serve more beneficial antidote to the heat and humidity.

Perhaps it is very important to say that despite these very friendly weather and available natural urban landscape elements in most of these regions, automobile dependence is still on a very high side and walkability very low. Generally, this is partially due to high humidity where shaded trees are not available in these regions, with frequent downpours.

Authenticating the above submissions Sanyal (2013) in his paper on "the walkable city" argued that, weather is a major factor in automobile dependency. No doubt about it but he was quick to admit that weather as an important factor in automobile dependency, its effect varies from locality to locality. He cited examples from different countries perspectives and variation in weather which usually make cities un-walkable.

He reiterated that, in Singapore, it is too hot and humid to

walk; Beijing air quality is not good and too cold in winter to walk. In Delhi, it is too hot in summer to walk and of course in London it is always drizzling all year round. Added to the list is Lagos where it is, too humid and rain makes the city equally un-walkable.

The fact of the matter is that more people will be forced to use their vehicles instead of walking to avoid extreme climatic conditions even in a temperate region, thus increasing automobile dependency.

Lack of Complementary Transportation Infrastructures

Despite the fact that most cities in the world today emerge from the coalescence and symbiotic interaction of infrastructures, people and economic activities, yet most cities are not immune to automobile dependency pattern of transportation.

Cities are suffering from serious urban ailment orchestrated by uncoordinated transportation system that provides only for vehicular needs and totally ignore the pedestrian facilities. Lack of pedestrian infrastructures deter most people from walking and cycling, thus increasing urban vehicular usage.

It is no longer a contentious issue that over decades, the advent of motor car and expansion of road network especially building of motorway network, produced sharp and speedy fall in pedestrian mode. This encourages automobile usage and facilities needed to support it.

It has been argued therefore that the need to address car dependence through better infrastructure options is clear, but urban design trend has been critically manipulated to ignore other related transportation modes (such as walkability and cycling)

For instance, transport development strategy over the last sixty years (post 1949) has focused mainly on provision of large scale automobile infrastructure which sometimes conflict with, and mostly override, the pedestrian scale.

Most metropolitan areas continually run on these old facilities which lack pedestrian utilities and not meeting the need of the people. Sidewalks are completely missing in most streets and where available too narrow to accommodate substantial number of people Still, urban landscape elements that will ordinarily stimulate walking are technically not available in most streets and major arterials. Most of the road systems and infrastructure are dysfunctional; given age-long lack of maintenance resulting in dilapidated surfaces, retarding the rate and pace of city activities and failing to offer optimum support for the ever-increasing population.

Unfortunately excessive dependence on automobile has destroyed aged old amenities in place for pedestrian, pedestrian paths are completely eliminated due to old policy of narrowing the sidewalks to accommodate automobile traffic. Already, there are obvious signs to attest to these patterns of transportation development of unrestrained automobile dependency.

Typically, the trend is making walking a dangerous mode of transportation, and it is having overbearing effects on the existing road design capacity previously dedicated to pedestrians. Today, transport trend is operating close to saturation, not sustainable and livable by implication, possibility of an impending instability, crisis, and threat of a gridlock.

Poor Land Use Planning

Despite historical antecedents of pedestrianization globally, failure to incorporate such into the Land use planning, design, conceptual framework and construction in the past years represent a major reason for increasing vehicular streets throughout the world.

Conversely, a dispersed land development pattern facilitates vehicular travel and reduces the viability of other travel modes. When land use activities are far apart from each other such encourages automobile dependency. The trend is that contemporary land use development structure hardly supports healthy and active lifestyles, thus reason for rising automobile dependency in most cities in the world.

Also, it is widely acceptable by the professionals in the built environment that the orthodox land use planning and not just the density of people will bring life to an area. In fact, life will be meaningful to people going about a full range of a normal activity without having to get into an automobile.

Lack of Consideration for Other Transport Modes in Urban Planning and Landscape Architectural Activities

Also related to the previous land use issue discussed above is lack of consideration for other transportation modes such as pedestrian mode in most previous urban planning and landscape architectural designs.

Added to this argument is the fact that little attention has been given to Pedestrianization in most comprehensive, regional and local plans in the past decades, these however have promoted automobile dependency, and leave serious gap between the demand and availability of pedestrian facilities. This is a testament to the failure of planning and planners to see beyond automobile city.

Effects of Cities Age and Changes in Structure from Walkable Environment to a Car Centric/ Carchitecture Urban Pattern

Presently, the city pedestrian centered spatial pattern continues to diminish thanks to the automobile transportation. Urban analysts are of the opinion that the city's age does affect its spatial and transportation traditions. For instance, it is agreed that cities founded before the middle of the 19th century were built around walking, while those built after are characterized as car centric cities.

To cite as an example, many countries in other parts of the world such as Asia and Africa whose cities have traditionally had high density walking oriented urban forms are developing their own characteristics style of automobile city form and structure. This according to Preston is true where there is little effective public

planning control over land uses (e.g. Bangkok, Kuala Lumpur, Lagos)

It is a fact that automobile dependence is an inevitable feature of modern life. The truth of the matter is that cities worldwide now metamorphosed from pedestrian community structure to vehicular centered city or what could be referred to as a architecture pattern.

Unsurprisingly, it is one of the legacies of the post war economic boom and in most cases responsible for the subsequent change in cities landscape structure and urban edge. It will not be out of context to infer that most cities today are still in a natural sequence the same automobile based urbanism approach left behind by post oil boom era. (Adam, 2011)

Safety of the Pedestrian

Accident involving pedestrian is higher in comparison to other modes of transport. It is arguable that growing traffic in urban areas is directly linked with a growing number of accidents and fatalities, especially in developing countries.

There are more than one million deaths per year of people involved in road crashes around the world and more than one fifth of the people killed on the world's roads each year are not travelling in a car, a majority of these deaths involve pedestrians. Globally, pedestrians constitute 27% of all road deaths and in some countries this proportion is as high as two thirds (Fig.1)

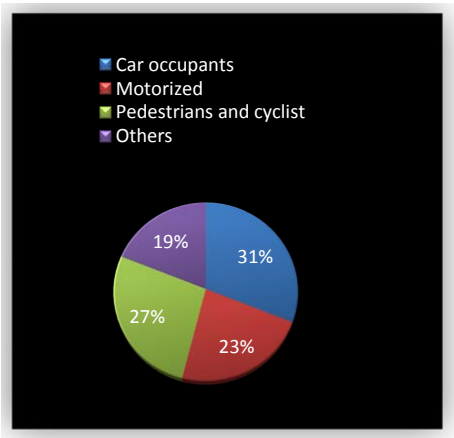

Fig.1: Distribution of Road traffic by type of road usrs global 2010 Source: (WHO, 2013)

Millions more people are injured in traffic-related crashes while walking, some of whom become permanently disabled. These incidents cause much suffering and grief as well as economic hardship for families and loved ones.

Interestingly, people prefer to take private or public buses mode of transportation that are considered safe at any time during their daily routine. Most pedestrians express their strongest safety concerns about the livability of most road system that has been overtaken by motorized transportation. They also usually express concern about difficulty in crossing streets and feeling threatened by automobile traffic.

Contemporarily there is a disappearance of humanistic activities where pedestrian facilities that help people to come together and take parts in activities such as shopping, mailing letters, eating out, and theater and meeting friends are conspicuously missing .

Safety of the pedestrian on major roads in most cities tend to be questionable, thus making people to go on their private cars, therefore increasing vehicular dependency.

It is therefore necessary to infer that as traffic increases, pedestrian feel less safe to use the streets. Associatively, it is logical to conclude that straighter, wider, and flatter nature of the street roads actually encourages drivers to drive faster thus reducing safety on the streets at least for pedestrian.(Bloomberg et al., undated; UNDESA, 2011 ; Wagga Development Control Plan, 2005; 2013)

Lack of Quantitative Data on Other Transportation Modes

Ironically much is known of motorization movements of persons and goods across the globe than any known fact about non-motorization despites being a dominant trip mode. Most of the available statistical data for planning purposes are not as detailed for other modes of transport except automobile mode. In fact there are no reliable worldwide sources for other modes of transport.

Just as the lack of quantifiable goals limits the effectiveness of policy, the lack of empirical measurements and data limits the ability of planners to justify the policies for other mode (such as walkability) rather than automobile.

This deficiency operates in this unique way, and invariably aided automobile dependencies in most cities throughout the world. Until quite recently, the numbers of pedestrians in most cities are largely unknown. In contrast vehicular data are a bound in terms of quality and quantity anywhere in the world.

Improved Technologies

Another classic reason for automobile dependency worldwide is improved technologies for vehicles appearing at a blistering urban pace.

As technology advances, innovative feature improves and new discoveries are made such continue to aid auto mobility in most part of the world. For instance, reduction in vehicle weight, night vision with pedestrian detection, automatic high-beam control and improvements in the engine design, have greatly increase the efficiency of the vehicular and offered higher-end safety options. This technological advancement has greatly enhanced dependency on automobile worldwide.

Government Policies Do Not Favor Other Modes of Transport

Shortly after post-war era when walking was replaced by

motorized transportation system nothing has been done by regulating authorities worldwide to encourage walking. Major public investments have been apportioned for automobile paths improvements.

Governments worldwide continue to build and invest more motorways, expressways and flyovers for cars while Pedestrians, cyclists, motorcyclists, and rickshaws are generally ignored or even discriminated against (Badami et al., 2004)

Enabling and encouraging more walking for transportation will require substantial action on the part of respective government. Principally it is recommended that government need to continue to invest millions of money to upgrade and construct new streets, sidewalks, and other facilities that constitute its pedestrian infrastructure.

RESULTS AND DISCUSSION

Effects of Automobile Dependency on Cities

High level of automobile dependency presents arrays of insidious environmental, social and economic problems. It is very important to note therefore that low-density, automobile-dependent development with large amounts of land for vehicular transportation ordinarily imposes various economic, social and environmental costs such as higher public service costs, and reduced pedestrian accessibility. These problems are summarized by (Newman & Kenworthy, 1999) in table 3 below. In summary therefore, much of the renewed attention on urban walkability is associated with concerns that extreme car dependent cities understandably, will continue to grow enormously and will not be sustainable in the future, due to, crash damages, increased mobility, increased road and parking expenditures, energy costs, fuel availability, congestion, pollution and other attendant environmental impacts. (Lynch, 2011a; 2011b)

With the exponential growth of cars on most streets, it will encourage automobile-oriented development, resulting to reduced travel choices, (such as spiraling decline of transit system, lack of travel choices for non-drivers can be a major barrier for welfare-to-work efforts, and for many employers who rely on lower-income workers who often have limited access to an automobile(Amphlett, 2011; Eunyoung, 2012; Litman, 2003; Lynch, 2011a, 2011b; Mills, 2013; Smith et al., 2010; Taiyab, 2008; TFL, 2005)

It is thus evident from the above that if no mitigating measures are put in place to address the insurgence of motorized mode of transportation, the foreseeable future of the intra-urban mobility would definitely be chaotic, more problematic and constantly consumed by negative impacts.

Recommendations

Moving Forward; Overcoming Automobile Dependency through Urban Planning and Design & Future Pedestrian Friendly Environment Approaches

The good news is that there are emerging and genuine concerns for improving pedestrian mode (Pedestrianization) and decreasing automobile dependency in the scientific communities worldwide. European Cities and United State are eagerly canvassing for non-motorized transportation cities and reduction of auto dependency in urban road system.

The ultimate goal of non-motorized transport mode is to

Table 3: Problems associated with automobile dependence

Environmental problems	Economic problems	Social Problems
Oil vulnerability	Congestion costs	Loss of streets life
Urban sprawl	High urban infrastructure costs for sewers, water mains, road etc.	Loss of community in neighborhood
Photochemical Smog	Loss of productive rural land	Loss of public safety
Acid rain	Loss of urban life to pavement	Isolation in remote suburb with few amenities
High greenhouse- global warming	Poor transit cost recovery	Access problems for those without cars and those with disability.
Greater storm water runoff problems	Economics and human costs of transportation accidents trauma and death	Road rage
Traffic Problems Noise, neighborhood severance, visual intrusion, physical danger	High Proportion of city wealth spent on passenger transportation	Anti-social behavior due to boredom in car dependent suburbs
Decimated transit system	Public health cost from air and other pollution Health cost =s from growing obesity due to sedentary auto life style	Enforced car ownership for lower-income households Physical and mental health problems related to lack of physical activity in isolated suburbs

increase opportunities for residents in any communities to enjoy richness of urban life. People should have the freedom and right to walk to school, walk, recreation, shop under safe, aesthetically pleasant and health conditions; above all to converse with friends without noise or threat of cars.

Fundamentally, there is a revolution going on today worldwide. Citizens are now discovering that encouraging pedestrian mode of transport can reshape neighborhood landscape into vital, attractive, comfortable and more livable places. Therefore, shifting travel from vehicular transportation to pedestrian system can reduce significantly automobile dependencies

Sardonically, while cities in western world are thriving hard to ensure reduction in automobile dependency and encourage walkability, such cannot be said of their counterparts in most developing countries. There is a serious gap in pedestrian planning in most developed countries compared to developing countries.

The priorities of governments in developing countries therefore are to ensure that these gaps are reasonably closed, in order achieve livability, sustainability and creating pedestrian friendly cities just like their counterparts in developed countries.

In fact introduction of comprehensive benefit-cost analysis by governments at various levels will increase the resources devoted to pedestrian transportation and reduced automobile dependency.

The realistic check is that this is an integrative approach to balanced urban activities especially for healthy living, working and shopping. It can bring about more accessibility for the pedestrian all time and cumulatively produced more public oriented society.

Ultimately, cities stand to gain more when all modes of transportation are integrated and pedestrian transportation in particular encouraged. We must therefore fight to restore more for the pedestrian because walking is often the only mode that many people regardless of age, status and sex can comfortably relate to.

This is a revolutionary, yet pragmatic attempt to reduced automobile dependencies in the 21st century city planning. It is also an important approach for resolving most (if not all) cities environmental, social and economic sustainability issues.

While there are divergent opinions on how best to reduce car dependency, however urban analysts unanimously agreed that conventional planning practices suggest that the current share of public resources devoted to pedestrian is not fair and efficient. Therefore recommended greater appreciation and emphasize on pedestrian mode of transport could change urban planning priorities and serve as the fundamental ingredient for future urban growth.

A 3 D approach (Density, Diversity and Design) have been recommended by professionals in the built environment to be adopted for cities future livability and walkability. This approach has proved in several other cities in the world that it can improve the conditions for walking, cycling and transit use in cities.

The 3D approach requires a strategic planning approach supported by new policies among others: support pedestrians right of way, forbid motorbikes to drive on sidewalks and in parks, and new policies that support the design of a Livable City, a city for people not cars. The 3Ds operate together; it is not possible to create a good environment for walking, cycling and public transit by focusing on one or two and ignoring non-motorized transport mode.

Also, the 3D approach is most trusted qualitative techniques for reducing overdependence on motorized transportation and creating user-friendly green environment

Density Approach

Density affects travel behavior through its impact on the distance between destinations as well as on the number of destinations that can be reached by active modes (walking/cycling) and transit, This density approach entails neotraditional planning techniques (Multimodal centers & mixed land use)(Allan & Donald, 2009; Ben-Joseph, 1995; Bloomberg et al., undated; Damian & Barbara, 2000; Ewing, 1999; Francois-Joseph & Ralf, 2014; Gota et al., 2010; Jean-Paul et al., 2009; Joseph, 2002; Ng et al., 2012; TFL, 2005; Beacon Technology, 2013)

Neo-traditional Planning Approach (Multimodal Centers & Mixed Land Use)

Good urban planning design has a vital role to play in reversing the perception that pedestrian mode of transportation is only for the second-class citizen. There is need for a new technology that will change urban design priorities. This is characterized by somewhat higher densities, a greater mix of uses, provision of public transit to accommodate the pedestrian and the bicyclist and an interconnected pattern of streets.

The creation of multimodal centers with mixed, dense land use that reduces the need to travel and are linked to quality transport systems. Residential areas can be improved by redesigning traditional streets as to encourage foot and discourage auto mobility.

The best urban planning practices must have some degree of mixtures of land uses. The mixtures usually respond to the value of publicness and encourage walkability in urban system rather than encouraging automobile usage.

Diversity

Density can only work to make cities more livable when areas are characterized by diversity. Diversity is commonly called “mixed use”, referring to the degree to which different activities (residential, commercial, retail/service) are located near each other.

Density affects travel behavior through its impact on the distance between destinations as well as on the number of destinations that can be reached by active modes (walking/cycling) and transit. When there are many jobs and households in a given area, transit becomes more viable and provides the critical mass needed to support retail development.(Acharya,

2010; Adam, 2011; Allan & Donald, 2009; Amphlett, 2011; O'Hare, 2006).

Design Approach

Density gives the city enough people to ensure diversity. Diversity focuses on creating a city that is interesting and stimulating to live in and that allows people to walk and cycle to their destinations by ensuring that there are places within a reasonable distance. The design aspect of the built environment focuses on creating functional, attractive and safe places for everyone in the community

Good urban design is the foundation upon which we can build livable cities. But urban design alone is not enough. The "design" aspect of the built environment focuses on creating functional, attractive and safe places for everyone in the community. (Amphlett, 2011; Litman, 2003; Peter & Jeff, 2000b)

Encouraging Pedestrian Structure Development

Communities worldwide are currently choosing to prioritize pedestrian safety and invest in safer designs while improving quality of life. The strategies include: Physical planning approach which entails pedestrian structure development and car restriction oriented development.

Focusing on pedestrian oriented development in locations that already exist and are underutilized can propel Pedestrianization and concomitantly reduced automobile dependency (TCRP, 1997)

Creation of Urban Regeneration and Restructure Program

In addition, there is need for immediate creation of urban regeneration and restructure program; through introduction of traffic calming approach. This will be achieved by putting existing streets space to a complete new pedestrian friendly use.

Revolutionizing Urban Space through Increasing Investment Opportunities in Pedestrian Infrastructures Facilities

Revolutionizing urban space to slow vehicle traffic and create more urban, humane environments better suited to other transportation modes. The introduction of sidewalks to accommodate urban landscape elements such as street benches and other pedestrian–scale street furniture is equally recommended at this time.

Expediently provision of safe and inviting pedestrian facilities would reduce much of today's vehicular congestion, environmental pollutants and some noticeable ecological problems.

Just as being practiced in European countries and America a more aesthetically pleasing pedestrian Island and an exclusive pedestrian districts is recommended for most central business districts and major streets roads.

Smart Growth and Transportation Demand Management

Charging motorists directly for their road and parking costs, congestion impacts, crash damages and pollution is predicted to reduce automobile use by 1/3 or more.

International comparisons also indicate that automobile travel declines significantly in regions with more efficient pricing, even if residents have high incomes. Travel Smart is one of a number of TDM strategies aimed at reducing the' impacts of car travel through reducing single occupant vehicle use, shifting to more sustainable travel modes, namely: cycling, walking and using public transport and reducing or removing the need to travel

A Well Packaged Pedestrianization Policy Is Very Essential

A policy of Pedestrianization can make an important difference to a city air quality, such policies if well implemented enhances physical wellbeing both by reducing air and noise pollution. The implementation of these techniques will improve quality of life, promote healthy city; support aesthetically balanced environment and sustainable transportation choices.

CONCLUSION

Essentially, the current transportation systems in most cities worldwide is characterized by excessive traffic congestion, unsafe roads system, pollution and environmental degradation among other problems orchestrated by excessive automobile usage.

The implication of this is that the renaissance of the streets will not, of course, cure totally urban ills. The grinding problems of poverty and crime will remain, but streets will always be very important in the life of residents. The escalating issues of overcrowding, extreme density and the need to find more space within the city's spatial and ecological limits to accommodate both vehicular and pedestrian transportation system remains a greater challenge to the future of one every fastest-growing city in world.

Going forward, the tried and tested A 3 D approach (Density, diversity and Design) road safety engineering solutions can be expected to yield minimum reductions in automobile dependency in most cities. This innovation is imperative if a falling trend in automobile dependency is to be reduced.

Areas where an improved understanding of the impact of automobile technology advances is needed and warranted for effective integrations of other non-motorized transportation must be encouraged.

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