

Promoting Physical Activity
in
Urban Design

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abstract.

The aim of this thesis is to improve the health and well being of the population by proposing neighborhood design strategies that enables its residents to incorporate healthy activity into their daily lives. Also good quality, accessible green space and infrastructure can provide many potential health and well- being benefits.

Many communities today are suffering from a growing dependence on automobiles as the main mode of transportation. The main cause of this dependence is through low-density, sprawling development patterns. The use of low-density development leads to a disconnection between pedestrians and neighborhood cores by creating neighborhoods that expand outside of residents' walking zone comfort, which do not respond well to social, environmental, and economical factors. We need to make it easier and more convenient for people to enjoy the freedom of being able to travel shorter distances or less often by car. And we need to build more transit-friendly, walkable, and greener neighborhoods.

thesis.

Introduction

Physical inactivity is one of the most important public health issues in auto-based environment. We live in a nation that has become overly dependent on the automobile and have built in primarily low-density development patterns over the last half-century. It is now common to go through the day without walking more than a few hundred feet—from the living room to the garage, the parking lot to the office, and the school steps to the curb, and the parking space to the store—. This lifestyle has had a wide range of consequences, perhaps most dramatically to our health. Being Physically Active Is Important to Good Health. In order to live sustainably into the future, we must begin to rethink neighborhoods and communities in order to promote walkability and opportunities for incorporating regular physical activity into daily life. There are significant correlations between the built environment and health.

The aim of this master thesis is to reduce our dependence on automobiles and create a safe and comfortable environment for pedestrians.

Physical Activity and Health

According to WHO¹ "health is the state of complete physical, mental, and social well-being and not merely the absence of disease and infirmity" (Fig.1.1).



(Fig. 1.1) Components of health

Physical activity is any activity that you may do to improve or maintain your physical fitness as well as your health in general.

Many Researches show that regular physical activity can help reduce risk for several diseases and health conditions and improve overall quality of life. The AHA² recommends at least 150-minutes of moderate activity each week. This is 30 minutes at least 5 days a week, but three 10-minute periods of activity are as beneficial to your overall fitness as one 30-minute session. This is achievable! Physical activity may also help encourage you to spend some time outdoors. Physical activity is proven to improve both mental and physical health.

1-World Health Organization. Constitution of the WHO. WHO Basic Documents, Geneva 1948.

2-American Heart Association



Physical activity boosts mental wellness.¹

Regular physical activity can relieve tension, anxiety, depression and anger. You may notice a “feel good sensation” immediately following your physical activity, and most people also note an improvement in general well-being over time as physical activity becomes a part of their routine.

Physical activity improves physical wellness.¹

Too much sitting and other sedentary activities can increase your risk of cardiovascular disease. Becoming more active can help lower your blood pressure and also boost your levels of good cholesterol.

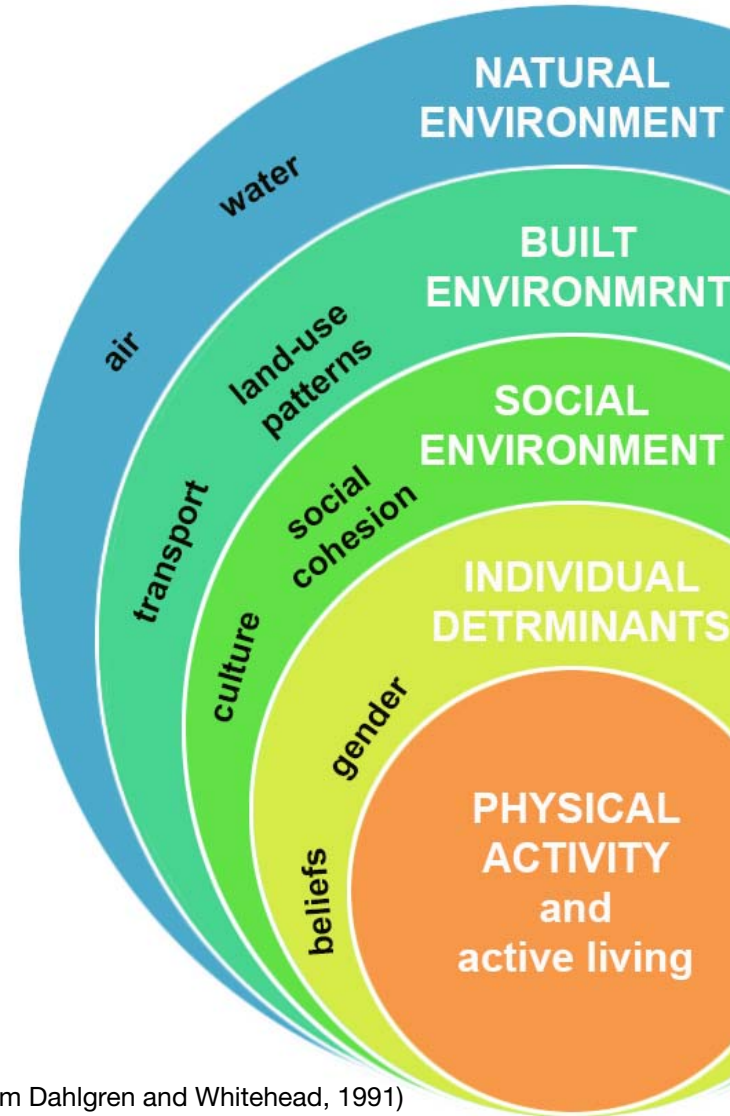
Physical activity prolongs your optimal health.¹

Without regular physical activity, the body slowly loses its strength, stamina and ability to function well. People who are physically active and at a healthy weight live about 7 years longer than those who are not active and are obese.

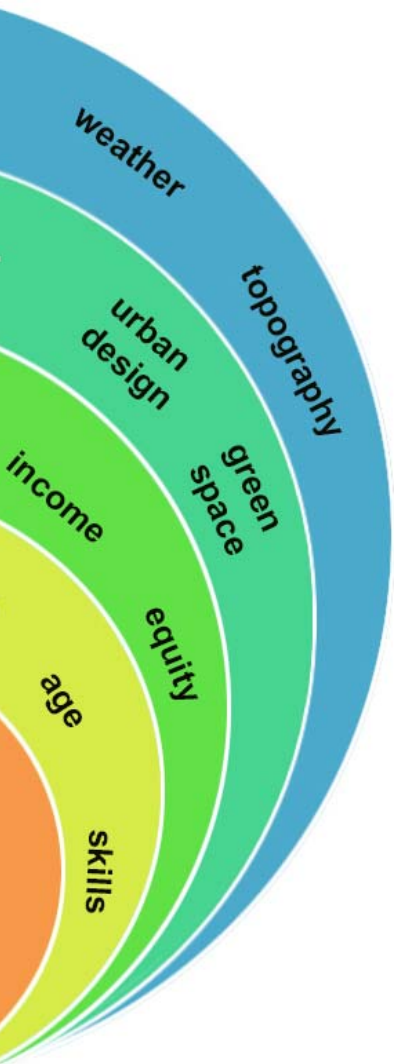
¹-American Heart Association

WALKING AS A WAY OF LIFE

MOVEMENT FOR HEALTH AND HAPPINESS



(Adapted from Dahlgren and Whitehead, 1991)



Physical Activity and Built Environment

The health and well being of individuals and populations across all age groups is influenced by a range of factors both within and outside the individual's control. The model, which captures the interrelationships between these factors, is the Dahlgren and Whitehead (1991) 'Policy Rainbow' describes the layers of influence on an individual's potential for health (Fig. 1.2).

The built environment includes all of the physical parts of where we live and work (e.g., homes, buildings, streets, open spaces, and infrastructure). The built environment influences a person's level of physical activity. Architects and urban designers can help to significantly improve the health and well being of the population by creating an environment that enables all city residents to incorporate healthy activity into their daily lives.

W a l k a b l e U r b a n i s m

“A good city is like a good party. People don’t want to leave early”.

¹
Jan Gehl

“Walkability” is excellent shorthand for good urban design. People react to cues in the environment. If a space is designed for people if it’s welcoming, safe and comfortable they will walk. If a place is designed for cars, people will drive if they can. Although physical planning is tremendously complex and involves a host of actors, trade-offs and compromises, walkability is an intuitive measure of placemaking success.

Walkability emerges from the mix and density of land uses, the placement and orientation of buildings, the safety and quality of streets, the accessibility of transit, and the design and interconnection of open spaces.

It also depends on the real estate development market’s willingness to build with these elements in mind and the public sector’s ability to invest in them. A walkable place only happens when the entire placemaking ecosystem succeeds.

1-Danish architect and urban design.Born:1936.

Characteristics Of Walkable Design

General characteristics of walkable communities address the following elements:

Coherence:

A clear, understandable and organized sidewalk, street and land-use system consistent with the scale and function of the surrounding urban context. The sidewalk and street system should link points of interest and activity, provide clean lines of sight and travel, and include simple instructive signage.

Continuity:

A pattern of design and usage that unifies the pedestrian system.

Equilibrium:

A balance among transportation modes that will accommodate and encourage pedestrian participation.

Safety:

Pedestrian protection from automobiles and bicycles. Adequate time to cross intersections without interference. Physical separation from fast-moving cars. Signalization protection when crossing intersections.

Comfort:

Secure and negotiable paving materials for sidewalks and crosswalks. Unobstructed passage on the sidewalk and at corners. Signals timed to enable safe and quick crossings.

Sociability:

A sense of hospitality and suitability for individual and community interactions. Sidewalks should provide for a variety of uses and activities characteristics of the diverse urban scene.

Accessibility:

The opportunity for all individuals to utilize the pedestrian environment as fully as possible.

Efficiency:

Simplicity and cost-effectiveness in design and function. Minimum delay along a walking route.

Attractiveness:

Clean, efficient and well-maintained surroundings, with adjacent storefronts and activities that provide sidewalk interest.

Benefits of walkable urbanism

What is so great about designing neighborhoods with a greater sense of walkability?
What are the benefits of walkable communities?

Walkable communities are urban places that support walking as an important part of people's daily travel through a complementary relationship between transportation, land use and the urban design character of the place. In walkable communities, walking is a desirable and efficient mode of transportation. Although nearly every human environment can accommodate some degree of walking, walkable communities give additional value and support to make walking an enjoyable experience.

The benefits can be seen across various subtopics and respond to environmental, economic, and social conditions. First of all, walkable communities promote healthier and more sustainable lifestyles for their residents. Urban environments provide more activity in less space and compact mixed-use areas facilitate "access by proximity," resulting in less driving and more walking, cycling and transit use. Walkability also reduces the use of cars, reducing residents' expenses on gas and helping decrease CO2 emissions. Walkable environments also support access and independence for people with limited mobility, including the elderly, the disabled and those without access to a car. By designing for walkable streets, communities create a safer environment for pedestrians and bicyclists. Through the implementation of sidewalks, crosswalks, and street buffers, pedestrians feel more comfortable traveling within the community. Compact urban neighborhoods offer public places for people to interact with one another, to gather together and to build community. These activities create a positive sense of place and interconnectedness. All of these reasons argue for walkable communities in order to promote healthy, safe, and thriving communities that help increase environment, economic and social awareness among community members.

Urban Agriculture

Many cities and towns are now looking at how they can be more sustainable, and promoting urban agriculture is one step toward a goal of increased overall sustainability. Urban agriculture also fits with increasing interest in enhancing and developing food systems that can contribute to a community's overall economic, social, environmental and nutritional development. Urban agriculture is one strategy for achieving sustainable food systems and can be seen as a way to address key citizen issues such as increasing access to healthy foods, encouraging community economic development or green economy goals, and strengthening community relationships.

increasing amount of abandoned land in lower-income sections of many cities in the United States, the vision projects a scene where many of these vacant lots are transformed into working farms—where inner-city residents grow food in the soil, in raised planting beds or in greenhouses, then market their produce at farmer's markets, to local restaurants, or to city and suburban residents eager for fresh, locally-grown food.



Photo Source:Google

A Neighborhood Full of Nature

Humans have an innate attraction to nature. (Jackson, L. 192, Dannenberg et al 230-231) Because humans spent more than 99 percent of the last 2 million years living within natural settings, (Dannenberg et al 230-231) it would logically follow that they would still do best in dwelling places that are connected to nature.

Going back to the 1800s, people intuitively believed in the benefits of nature. Frederick Law Olmstead¹, as a landscape architect who designed urban parks, believed in the physical and mental health benefits of green space. Understanding the benefits of interacting with nature is important for maintaining and improving human well-being in a rapidly urbanising world. Good quality, accessible green space and infrastructure can provide many potential health and well-being benefits. The most significant of these can be grouped into three broad categories²: (1) increased life expectancy and reduced health inequality; (2) improvements in levels of physical activity and health; (3) promotion of psychological health and mental well-being. Associations have been found between access to green space and raised levels of physical activity, which in turn improves individuals' health. Green space can also have a beneficial impact on mental well-being and cognitive function. The evidence strongly suggests that, at their best, green spaces can help reduce health inequalities and that both the improvement of existing, and creation of new, green infrastructure should be prioritised, especially in areas of greatest need.

1-An American landscape architect (1822-1903)

2-Benefits of green infrastructure Report by Forest Research

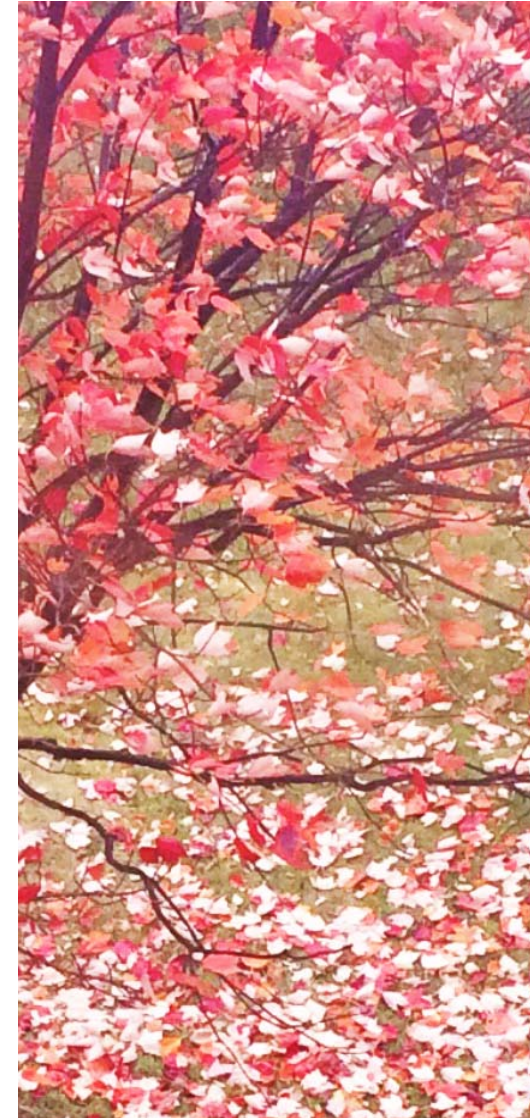




Photo by Fatemeh Shanehsazzadeh

case study.



River Street, Batavia IL¹

Woonerf is a Dutch word to mean a street designed to eliminate the the separations between walking, biking and automobiles in order to improve the livability of the street. Simply put it is a shared street. The concept of the Woonerf was developed by Dutch traffic specialist Hans Monderman.

the city of **Batavia** in the western suburbs has built a great example of one.

A stretch of Batavia's River Street, which runs parallel to the river, has no curbs, traffic stripes or crosswalks. Instead, red and brown bricks go from buildings on one side of the street to the other and pedestrians and cyclists share the street with slow-moving cars.

Active Trans' annual awards gala, in 2014 gaved Batavia an award for creating such a bold and attractive space on one of its downtown streets. In addition the project won the Best Street Award from the Illinois Chapter of the Congress of New Urbanism and was also awarded the Lieutenant Governor's Award for Excellence in Downtown Revitalization at the Illinois Main Street Conference.

1-<http://activetrans.org>



Mackinac Island¹

Mackinac Island is a city in Mackinac County in the U.S. state of Michigan. Mackinac Island, where cars have been banned since 1898. A unique local ordinance prohibits the use of any motor vehicles on the island. The most common means of travel are foot, bicycle, or horseback. Certain enumerated exceptions include emergency vehicles, electric wheelchairs for those with disabilities, snowmobiles in winter, and golf carts for on-course use only. The design of parts of the town, though, is unmistakably 19th century American hypertrophic, with a wide main street that looks much like any other from its era. Despite the lack of cars, there are raised sidewalks on each side of the street, and a blacktop-paved carriageway. The street is still designed for the benefit of wheeled vehicles, not people on foot. Subconsciously obeying these spatial cues, people walking about the town (see photo at right) appear to mostly remain on the sidewalks, while the street itself accommodates wheeled – although not motorized – traffic.



So, although the town is in fact car-free, this has meant less than might be expected in terms of how people make use of public urban space. The example of Mackinac Island shows that the absence of cars, alone, is not necessarily sufficient to create a pedestrian-friendly urban space. Design matters too.

1- <http://oldurbanist.blogspot.com> (Charlie Gardner).
Photo source: Google

site.

Detroit

Detroit



Figure/Grand Detroit
Visualizing the Urban Fabric of Detroit Over Time

Detroit's population peaked in the 1950 census at 1.85 million, making it at the time the fourth-largest city in the U.S. It's been straight downhill since then. In 2010, Detroit had just under 714,000 people, ranking 18th largest in the country. Detroit just keeps circling the drain. It lost almost one-third of its population between 2000 and 2010. As Detroit has lost population, the suburbs grew at an average rate of 27 percent. Nowhere is this scenario described more clearly than in Detroit, where suburban sprawl has adversely affected urban form. In *Walkable City*, Jeff Speck stated that: "Long gone are the days when automobiles expanded possibility and choice for the majority of Americans. Now, thanks to its ever-increasing demands for space, speed, and time, the car has reshaped our landscape and lifestyles around its own needs. It is an instrument of freedom that has enslaved us." Dependence to the automobile has helped to accelerate the affects of sprawl and has left a decrepit city in its wake. Residential neighborhoods have increased vacancies. This much of almost vacant land, and for those whom remain concerns of safety has amplified. Safety becomes more of an issue when buildings are not close together it is not perceived that there are eyes on the street at all times. Businesses have lost their customers from the local residential areas and are forced to either close or depart from the city. Old abandoned buildings lay awaiting demolition, only to become overabundant and unneeded parking lots.

Underutilized Land

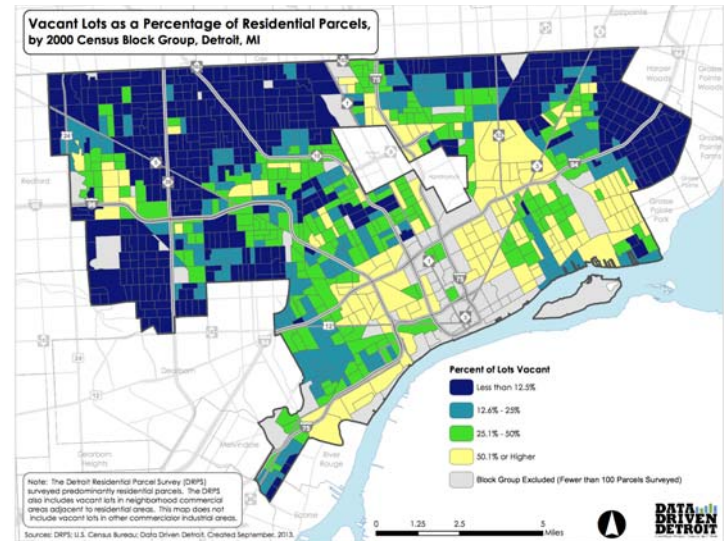


Need for more Open Space and Recreational Resources.¹

Detroit with all vacancy and surplus land, still falls well below the national average for park space acreage per resident. The still-new 31-acre William G. Milliken state park and Harbor, as well as historic Belle Isle and Campus Martius, offer a glimpse into what is possible for Detroit's transformation into greener city of beautiful vistas, playing field, urban woodland, bicycle paths and walking trail, as well as lakes and ponds, stream, playground, and pocket parks.

1-Detroit Future City
 2012 Detroit Strategic Framework Plan

Today, however, Detroit lags behind national standard and comparable cities in park availability. Park and recreation centers are also poorly distributed across the city, relative to population densities: Areas of high-vacancy often have an abundance of open space that is being underused, while more populated areas lack enough parks to serve their residents. Care for parks and playgrounds is also an issue: Most current open space designed for traditional, high levels of maintenance, which is not affordable for limited park budgets.

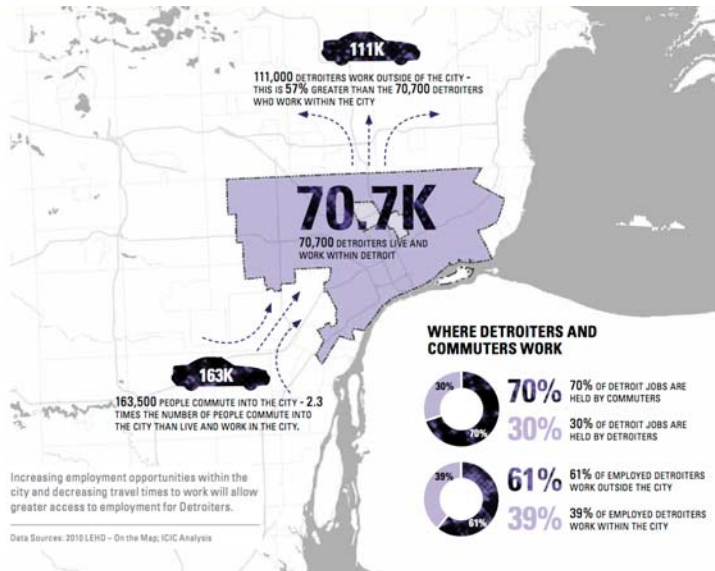


Access and Mobility

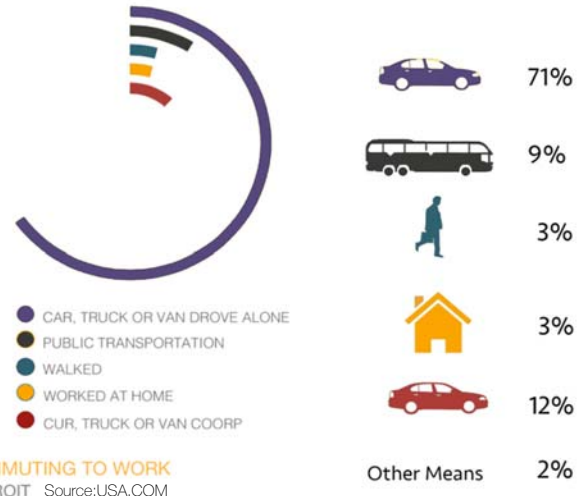


Public transportation options in the city of Detroit are limited. Without a subway system, city residents rely on buses to get around the metro area. In downtown Detroit, residents can use the People Mover, an elevated tram system, to get around, as it stops at major points of interest in the city. Outside of the city of Detroit, public transportation is rarely used and nearly all residents own a private vehicle. However, given the high rate of car insurance, owning a vehicle isn't affordable for everyone.

Economic Growth



Commuting to Work



Detroit Walk Score



Walk Score is one of the most popular indexes for ranking the walkability of streets, neighborhoods, and cities. According to the Walk Score website the methodology for their rankings is based on a program that analyzes hundreds of walking routes to nearby amenities. Walk Score also measures pedestrian friendliness by analyzing population density and road metrics such as block length and intersection density. Data sources include Google, Education.com, Open Street Map, the U.S. Census, Localize, and places added by the Walk Score user community. An algorithm has been created to award points based on the distance to amenities in each category. Amenities within a 5 minutes walk (.25 miles) are given maximum points. Amenities that are located at further distances are awarded fewer points; with zero points given after a 30-minute walk. Chart A equates their numerical rankings to a description of the pedestrian environment. I investigated Detroit's Walk Score according to American's ranking walk score of most walk able cities released by walk score website. Detroit's Walk Score is now 52.2, up 2.2 points since 2011. Downtown Detroit has become noticeably more walk able over the past few years. According to Walk Score, Detroit is the 18th most walk able large city in the U.S. with 713,777 residents. Detroit has some public transportation and is somewhat bike able.

The End of Car Culture

The highest rate of vehicle ownership in America occurred in 2007, when the average household owned 2.07 vehicles, according to research by Michael Sivak for the University of Michigan Transportation Research Institute. Recently, the average number of cars per household dipped below 2—at the end of 2012, it was 1.98.

Detroit is the most growth in car-free households between 2007-2012 by 5% rate.

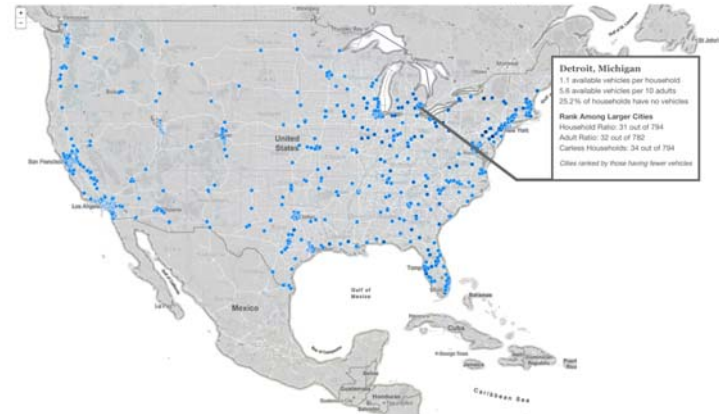
Growth in car-free households reflects a number of local factors, including the quality of transit, walkability, and income levels, among other factors, according to Sivak. But he says wider social trends are at work as well.

Growth in car-free households in U.S

Percentage point increase in Car-Free Households, 2007-2012				
		car-free share in 2007	share in 2012	increase
#1	Detroit	21.2%	26.2%	5%
#2	Indianapolis	7.6%	10.3%	2.7%
#3 (tie)	New York City	54.1%	56.5%	2.4%
	Washington DC	35.5%	37.9%	2.4%
#5	Chicago	25.6%	27.9%	2.3%
#6 (tie)	San Francisco	29.5%	31.4%	1.9%
	Baltimore	29.3%	31.2%	1.9%
#8	Jacksonville	7.3%	9.0%	1.7%
#9	Milwaukee	18.4%	19.9%	1.5%
#10	Seattle	15.3%	16.6%	1.3%

Source data: University of Michigan Transportation Research Institute

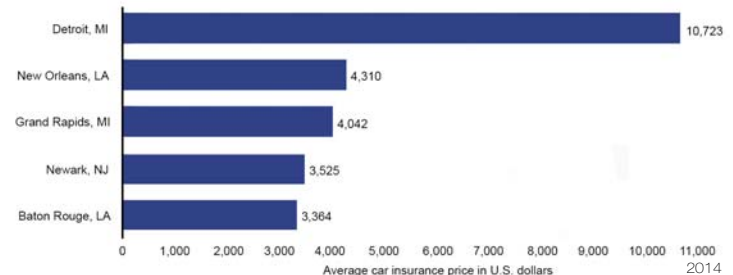
Car Ownership in U.S Cities



Source:Governing.com

Automobile Insurance Cost U.S

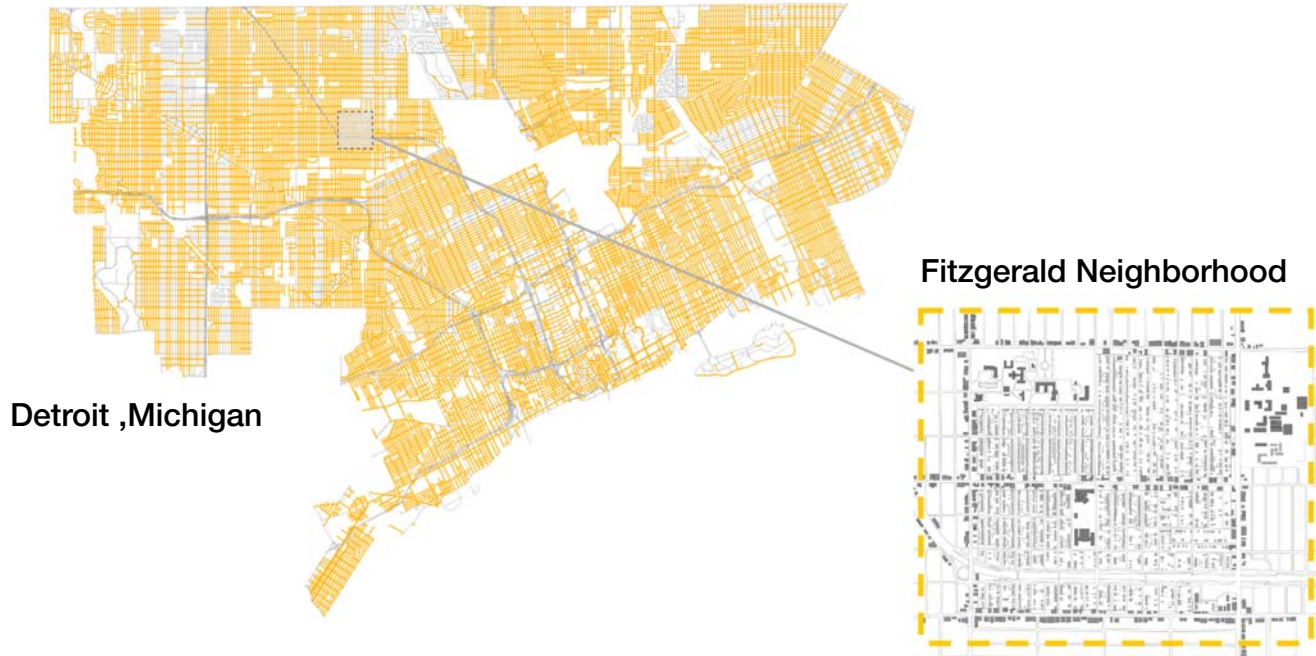
Detroit, Michigan has the highest auto insurance premiums at an average of 165 percent above the national average per year , according to a new study by InsuranceQuotes.com.



Source:Statista.com

site.

Fitzgerald



Fitzgerald Neighborhood

Fitzgerald neighborhood is located west of Livernois between Puritan and McNichols. It's area is 0.994 square miles with 7,866 Population.

This neighborhood shows an extreme variation of vacancy conditions from moderate to high.

As a result, many Moderate Vacancy areas are on the verge of losing their largely residential character.

This area have weak residential markets with very low demand and high foreclosure rates. They tend to be located adjacent to areas of High-Vacancy.

Fitzgerald Demographic and Land Use



7,866

Population



7,898

People / sq mile



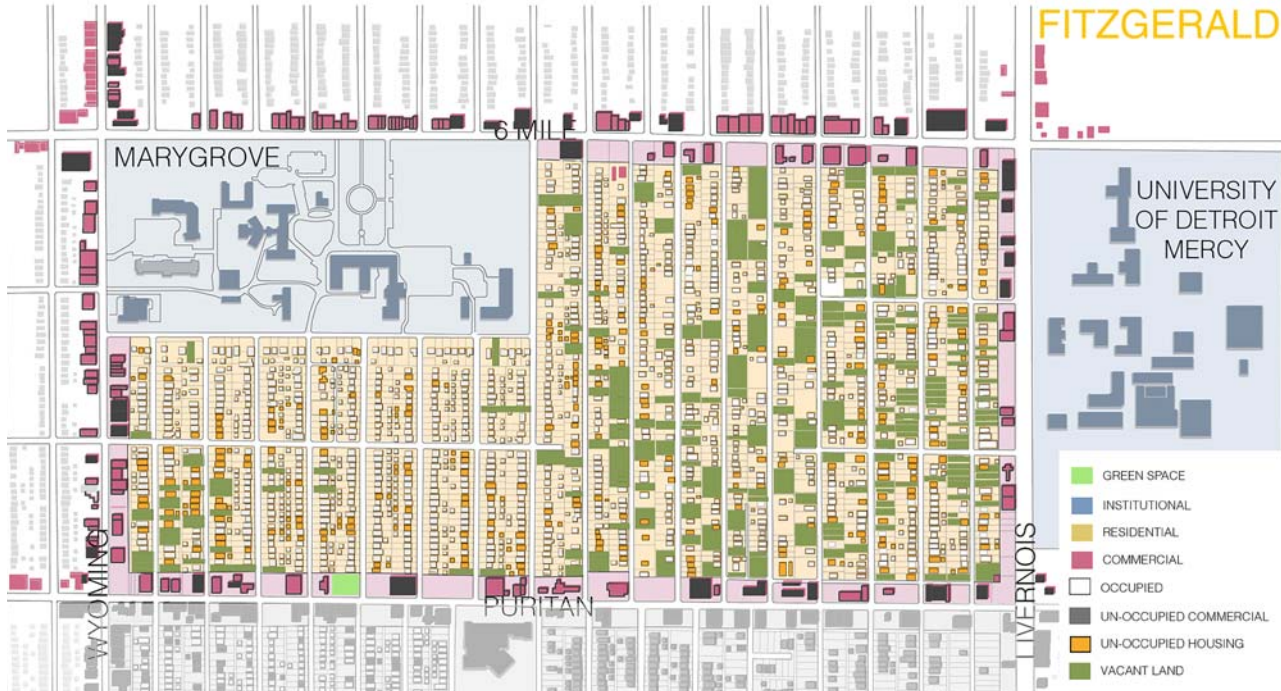
31.7

Median age



0.8:1

Male/Female ratio



Neighborhood Analysis

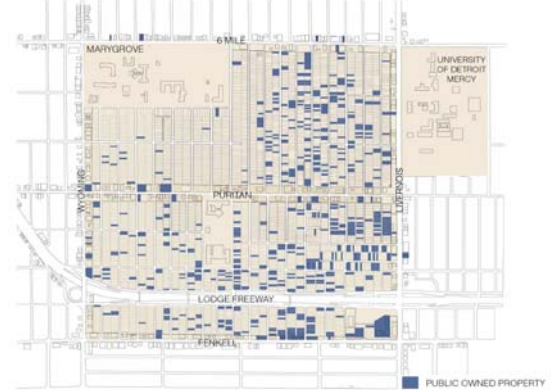
VACANCY

SOURCE: LOVELAND + GOOGLE STREET VIEW + WINDSHIELD SURVEY

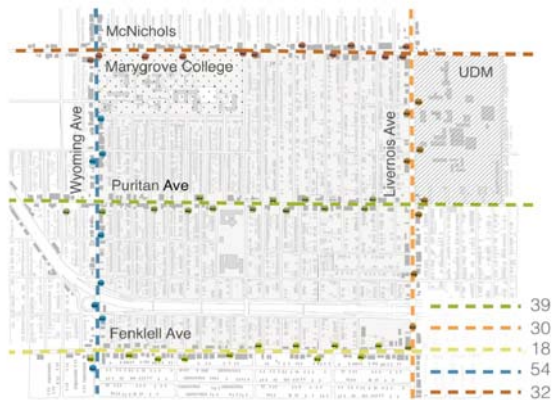


LAND OWNERSHIP

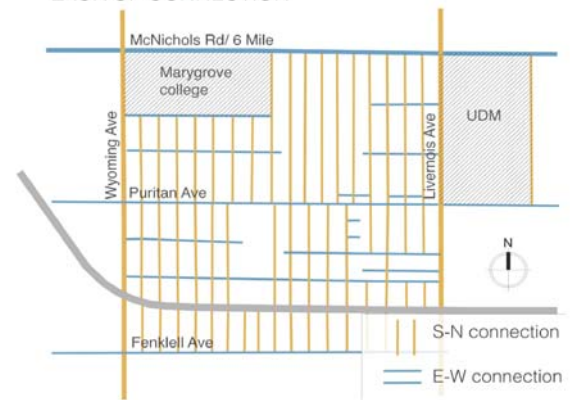
SOURCE: CITY OF DETROIT MAPPING



PUBLIC BUS STOPS



MAIN SOUTH-NORTH CONNECTION LACK OF CONNECTION



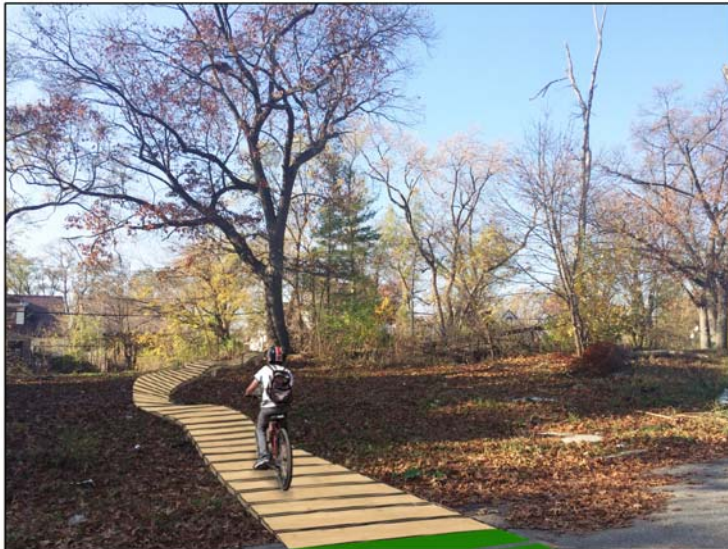
Neighborhood Weakness and Strength

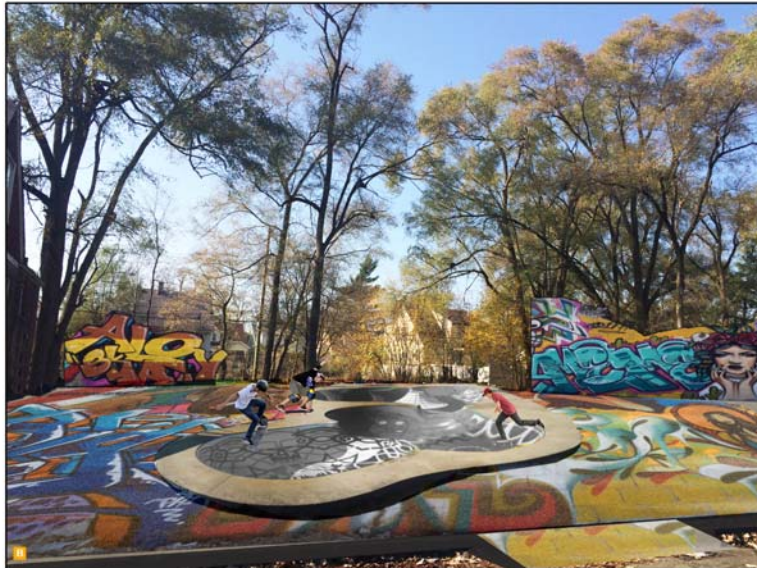


sketch problem.

SITES / FITZGERALD

■ FITZGERALD OPPORTUNITY SITES





Sketch Problem

Regarding my Sketch problem, I thought walking in the neighborhood might be the best solution in order to find out the best type of usage of the vacant land.

After spending some times in this community and talking to the neighborhood's residents, I was pretty sure for the first step, this community needs more organization for its vacant lands. Therefore I tried to figure out some of those vacant land with different usage.

I prefer to propose to use as a different kind of sport field or Playground for some of vacant lands in order to improve the physical activity and at the same time happiness in the neighborhood. Also, I tried to complete my land concept by considering different age groups and different spot of the neighborhood.

precedent



Sketches:



design.

“ We often forget that we are nature. Nature is not something separate from us. So when we say
that
we have lost our connection to **nature**, we have lost our connection to **ourselves**.”
Andy Goldsworthy

Creation Design Idea

The design of a community's built environment influences the physical and mental health of its residents. At the time of developing my design Idea, I was thinking about the best solution that not only improve physical activity that involved in the daily routine of the neighborhood's residents, but also creating an environment that can have a positive effect on peoples' mental health. I tried to use the out home environment as a stress reduction filter for people going back home, so it can help them to join their family with more energy and less stress from the whole day work.

To achieve these goals the best solution that I reached based on my researches was designing the neighborhood in a way to limit the car entrance and also make a green environment so residents can have a short distance walk in a very pleasant and safe environment before they reach to their home. This can, not only improve the daily physical activity in the community but also provide a better environment to meet and know the neighbors and provide a friendly environment. All these factors can help to improve the well-being criteria of this community.

Design Strategies

-Car entrance to the neighborhood is forbidden except for the emergency vehicle.

-proposing in different location surrounding the neighborhood mixed use buildings with access in 5 minutes walking distance from any place in the neighborhood to use:

- a. First floor: Store
- b. 2nd and 3rd floor: Parking
- c. 4th floor: Green house

-Changing the current neighborhood fabrication to use for pedestrians and bikes.

-Designing new pedestrian and bike path

-using some vacant lands as an agriculture land.

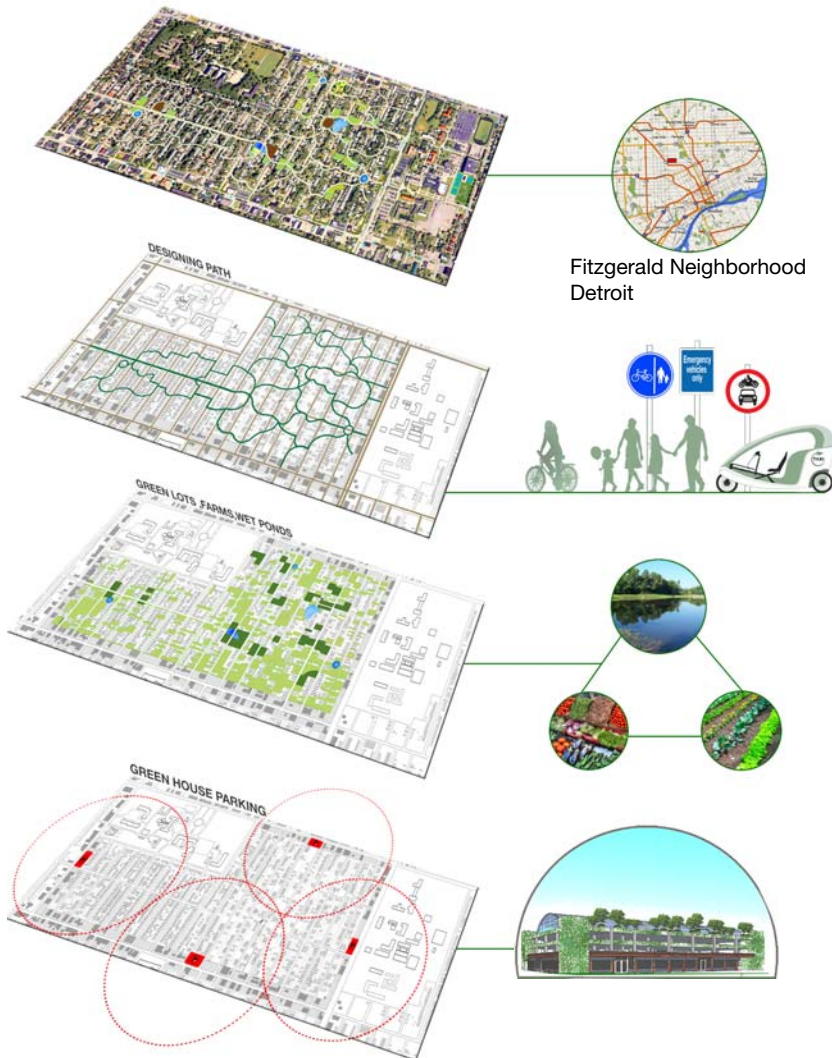
- a. This helps to create a productive community
- b. It can be considered as a job opportunity and help the neighbor economy.

-proposing “Water Pond” in order to save the raining water and using it for the neighbor agriculture.

-Designing “Gathering Centers” in order to use it for different events and also as a center for selling the neighbor agriculture products.

-Small markets as restaurant and café can be helpful for increasing the social activity.

-Adding sport fields in the neighbor to increase the happiness and activity.







FITZGERALD

A-GATHERING SPACE -FARMER'S MARKET

B-BASKETBALL FIELD

C- PLAYGROUND

D-SKATE FIELD

E-FARM

F-COMplete STREET/PARKING

G-GREENERY MASS

-  WET POND
-  GREEN SPACE
-  AGRICULTURE LAND
-  OCCUPIED
-  UN-OCCUPIED HOUSING



In this project, my first struggle was to change the pattern of street from Orthogonal grid to Organic grid, in order to change them in to a walking/biking path.

On the next step, I thought about changing the road paving from asphalt to natural paving like grass, stone, wood or sand. This change can help to induce the real nature in the environment.

I used the green spaces in the vacant lands as a useful source and I tried to organize and shape them according to my landscape design.

Elements like biking path, areas for gathering and enjoying the nature while kids are playing in that area helped me to provide a very warm and safe environment which helps that community.



Growing Food in the City

The Production Potential of Detroit's Vacant Land

Because of the high level of vacant land, Detroit is well-positioned to consider the possibility of becoming an agricultural city.

Even with a limited growing season, significant quantities of the fresh fruits and vegetables eaten by Detroiters could be grown locally. Also, investments in produce storage facilities and in hoop houses could significantly extend the productive capacity of urban farms and gardens and the potential to supply food locally.



Farmers Market

Entering a farmers market is a breath of fresh air, devoid of the fluorescent buzz and stale smells of your average big-box grocery store. Aesthetics aside, farmers markets play an important role in the fabric of a community. Furthermore, the very nature of the buying and selling process creates a level of socialization non-existent at a regular supermarket, transforming farmers markets from just another place to buy food to an engine for community life.



Complete Streets Make Active Living Easy

Complete Streets provide opportunities for increased physical activity by incorporating features that promote regular walking, cycling and transit use into just about every street. The most effective policy avenue for encouraging bicycling and walking is incorporating sidewalks and bike lanes into community design—essentially, creating Complete Streets. The continuous network of safe sidewalks and bikeways provided by a Complete Streets policy is important for encouraging active travel.



Greenery Mass

Using greenery mass in surrounding neighborhood in vacant space that will be used as a commercial space in the future could be a good temporary solution in order to omit the vacant spaces in the neighborhood and also improve the visionary seen.

Conclusion

As a society, we are now beginning to see the outcomes of countless planning decisions that were made decades ago throughout urban areas. Many of these decisions led to the creation of our current neighborhood and community systems that are in use throughout the United States today. The movement of people to suburban where suburban sprawl has adversely affected urban form. Dependence to the automobile has helped to accelerate the affects of sprawl and has left a decrepit city in its wake. Residential neighborhoods have increased vacancies, which do not respond well to social, environmental, and economical factors. We need to make it easier and more convenient for people to enjoy the freedom of being able to travel shorter distances or less often by car. And we need to build more transit-friendly, walkable neighborhoods. The integration of better transportation solutions and smarter land use—fostering good growth over gridlock—will make our communities more sustainable while strengthening transportation infrastructure, lessening traffic congestion, decreasing oil dependence, reducing harmful air and global warming pollution, and improving our quality of life. We must rethink the ways in which our physical environments, homes, offices, neighborhoods, regions are designed and constructed, understand how they impact health, and ensure that they foster equity and sustainability.

In order to reverse these trends, we must begin to look at neighborhood design sustainably, including economical, environmental, and social factors. By designing for communities, which promote walkability and greenery, we can provide healthy, thriving, and sustainable neighborhoods and will begin to lessen our dependence on the automobile. By implementing smart design decisions to transform streets, also begin to transform urban neighborhoods, creating walkable, green, diverse, and thriving areas that residents are attracted to.

References

Ewing, Reid H; Bartholomew, Keith. "Pedestrian- & transit-oriented design"
Publisher: Washington, D.C.: Urban Land Institute, ©2013.

Speck, Jeff. "Walkable city: how downtown can save America, one step at a time"
Publisher: New York, NY: Farrar, Straus and Giroux, c2012.

DETROIT FUTURE CITY2012 Detroit Strategic Framework Plan
Printed by: Inland Press, 2nd Printing: May 2013

McNally, Kevin. "Design Guidelines for Walkable Communities "
Niehoff Studio ,Winter 2010

"Getting to Great Places(How better urban design can strengthen San Jose's future)"
Lead Author Benjamin Grant
SPUR San Jose Director
Leah Toeniskoetter

"Creating Walkable Communities"
PRODUCED BY: Bicycle Federation of America Campaign to Make
America Walkable 1998

Cervero, Robert. "Mixed Land Uses and Commuting: Evidence from the American Housing Survey." Transportation Research Part A: Policy and Practice. Vol. 30, Issue 5, Sept. 1996: 361-377. Web. 9 Sept. 2013.

Jackson, Laura E. "The Relationship of Urban Design to Human Health and Condition." Landscape and Urban Planning. 64 (2003): 191-200. Web. 1 June 2013.

Frumkin, Howard, Frank, Lawrence, and Jackson, Richard. *Urban Sprawl and Public Health: Designing, Planning, and Building for Healthy Communities*. Washington DC: Island Press, 2004.

Dannenberg, Andrew L., Frumkin, Howard, and Jackson, Richard J. *Making Healthy Places: Designing and Building for Health, Well-being, and Sustainability*. Washington DC: Island Press, 2011. Print.

Rudofsky, Bernard. *Streets For People: A Primer for Americans*. Garden City, N.Y. Doubleday.1969. Print.

World Health Organization, *Constitution of the World Health Organization*,45thed.(2006),online:WHO, <http://www.who.int/governance/eb/who_constitution_en.pdf>. [WHO, Constitution].

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