Havana transport
Complex Projects | Havana Studio
Sun Yuwei | 16 December 2016
While others countries were busy dealing with traffic booming these years, Cuba was going backwards on urban transport. Even around Revolution Square, few cars pass by in daytime. To compare, bus stops are filled with anxious people waiting for a bus. Even though they do not know when it will come. And this is their daily life.

Next to this spacious but empty road, a chair was set confronting portrait of Che. I do not know who put this chair here. But I would like to know what he or she was thinking. Is this current condition of Cuba what Che was fighting for? Would he do same thing if he know the consequences? Or today is a hard period towards right direction?

Is now the last page of revolution chapter in Cuban history? If so, what is going to happen?
Vedado is a well-organized area which is only 5 km far from central Havana. In history this area is developed by rich people in Havana and they build their villas here as this is a beautiful area with suitable distance to Havana. Now Havana is quite full. Vedado is very good choice for new projects serving Havana to build inside, as its distance, context and urban planning are all suitable.

Infrastructure in Havana is very inconvenient, people need hours per day to reach their workplaces. Now Cuba has decided to develop. In this condition, infrastructure is one of most basic preparation for development. As I regard Vedado as new central district of Havana, it need to develop firstly its infrastructure. So for now I would like to design a Transportation Hub for Vedado mixing maybe commercial and exhibition spaces, so that Vedado can connect itself to old Havana as well as other part of the city.

As for location, I want to involve water transportation in my design besides ground transportation, so joint of Malecon and the river is a suitable position.

Old Havana has a lot of historical buildings need to be protected and streets there are quite narrow. There is hardly adequate space left for new developments. It can be more developed into tourism area. And Vedado is now already commercial center of Havana and many hotels built in this area. And it can also develop more on cultural aspect.

25 years later, Vedado would be a fully developed district and would be city center for locals in commercial and leisure aspect. Cuba would have a loop in future, Vedado as the center of center will definitely develop fast. However this still need time. Cuba is still weak in many aspects. For instance it cannot build underground now. So for me, I would leave enough potential to fit the following rapid changing years.

City people merely reside in residential areas in contrast to living in rural or village neighborhoods as was true in the past. City people are mobile. They can and do pick and choose from the entire city (and beyond) for everything from a job, a dentist, recreation, or friends. to shops, entertainment, or even in some cases their children's schools. City people are not stuck with the provincialism of a neighborhood, and why should they be? Isn't wide choice and rich opportunity the point of Cities?

—— Isaacs
CUBA
THE LOVELIEST LAND THAT HUMAN EYES HAVE EVER SEEN

1927

2010
Public Transportation in Cuba: Moving Backwards

Long lines of people at bus stops aren’t anything new. My friends tell me that, in the 70s and 80s, going to the beach on a bus was a veritable odyssey, and getting home meant a pitched battle— involving yelling, insults and even showing among those scrambling to board the sparse buses.

When I arrived in Cuba as a special press envoy in 1989 (before the economic crisis hit), I was very much amused by an enormous billboard which showed a Cuban bus with the chaos and agony of Picasso’s Guernica painted inside it.

Cuba’s public transportation system has never fully met people’s needs in more than 60 years.

In the good old days, those with power got around in cars and those with money relied on Lanchas, a private taxi company that did pretty much the same thing privately-owned cabs do today. All the while, the vast majority of Cubans counted for a spot inside the country’s buses (1).

Printing a spare part for a Caterpillar engine entails buying it in the United States, secretly transporting it to Canada, shipping it to the Dominican Republic of Panama and then to the island—a rather long journey that makes Cuba lose a fair amount of time and a lot of money.

The problem, however, is even more complex. The Ministry of Transportation isn’t only incapable of administering its own companies properly, it also proves unable to organize private transportation, which operates with less regulations than it would in a country with a market economy.

Though Cuba is a social-planned economy, I know of capitalist societies in which authorities exercise greater control and organize and monitor activities in the sector more rigorously in the sphere of public transportation.

The Cuban Ministry of Transportation takes no action, even though they know boteros buy diesel on the black market at one fourth its gas station price and continue to charge each passenger more or less what the majority of Cubans earn in an entire day of work.

What’s more, there are more and more road accidents, but boteros are only required to take a one-week course and their vehicles are not subjected to regular inspections to verify their condition, as is common in many other parts of the world.

Every day, bus drivers, Cuba’s notorious guarapo, harangue passengers with a phrase that could well become the slogan of the country’s public transportation system: “Come on people, keep moving. Let’s take a few more steps backward”.

Transportation in Cuba, or the Hours of National Despair

June 22, 2015 | Print | Email | 1 Share 28 | Tweet | 1 | share | 70

Naty Gabriela González

HAVANA TIMES — I get on a bus and see people run and climb to the open door, trying to keep their heads from being mangled. I see a mother hold her kid onto her shoulder and grab hold of another passenger’s waist, struggling to hold on to his neighbor with calloused hands. I get to the door and it closes behind me. We all look at each other, repeating the tired phrase of: “It isn’t easy.”

I poorly try to squeeze past the crowd and they yell at me, saying there’s no room—that, if I want to get through, I have to turn over them. Someone asks me to let them through and I say nothing. We do this and shove each other around.

The driver gets out, takes the keys and leaves a woman in the middle of the road, who yells, drops her purse and sees the discouraging spectacle of the other passengers thronging together and going who knows where. Why do I keep quiet? Why don’t I snap back? Why do we shove each other around?

This is not a diary entry. This is a passage of the story that repeats itself every day at the bus stop, when one returns home, when one goes to work, when one goes to university. Many are the debates that Cuba’s public transportation has generated since the Special Period crisis, when it was at its worst (early/mid 1990’s), and following the purchase of Yutong-brand buses from China some years back, which improved the situation considerably for a while.

A section of the National Highway partially built in the 1980s.
Vedado in Havana

5km

10 minutes drive along Malecon

Vedado in Havana
Transport methods in Havana

- **Bike**
  - Passengers: 1 person
  - Area: all of Havana
- **Walk**
  - Costs: 10 cuban pesos
  - Passengers: 4-6 people
  - Area: all of Havana
- **Personal car**
  - Passengers: 4-6 people
  - Area: all of Havana
- **Geta**
  - Costs: free
  - Passengers: 4-6 people
  - Area: towards the outskirts of Havana
- **Taxi**
  - Costs: 4 CUC for 10 minute ride
  - Passengers: 4-6 people
  - Area: all of Havana
- **Almendrones**
  - Costs: 10 cuban pesos
  - Passengers: 6-10 people
  - Area: fixed routes through Havana
- **Omnibus / Guaguas**
  - Costs: 1 peso
  - Passengers: 50-70 people
  - Area: all of Havana
- **Ferry**
  - Costs: 1 peso
  - Passengers: 70-100 people
  - Area: cross Havana bay
- **Bike**
  - Costs: 10 cuban pesos
  - Passengers: 1 person
  - Area: all of Havana
- **Walk**
  - Costs: 4 cuban pesos
  - Passengers: 2-4 people
  - Area: all of Havana
- **Personal car**
  - Costs: 50 pesos
  - Passengers: 4-6 people
  - Area: all of Havana
- **Geta**
  - Costs: free
  - Passengers: 4-6 people
  - Area: towards the outskirts of Havana
- **Taxi**
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Map representations of various transportation methods in Havana.
Cuba government imported a million Chinese bikes after Soviet Union collapse in order to solve transport problem. At that time, bike lanes, spare parts shops, guarded parking and neighborhood mechanics were ubiquitous. But barely a decade into the bicycle revolution, ships carrying Venezuelan petroleum sailed into Havana harbour, courtesy of late President Hugo Chávez. He offered interest-free loans to help the Cuban economy out of crisis and traded oil for Cuban doctors. Putting the bike at the center of transport policy eventually fell out of favour. The once ubiquitous Chinese bicycles have disappeared rapidly from the streets of Havana, mostly bought up by Cubans from the provinces, where public transportation still leaves a lot to be desired.
Everyone who went through the Special Period knows at least something about bikes. To keep Cubans moving through years of extreme austerity, the government imported a million Chinese bikes and kicked off an unexpected cycling boom.

It was easy being a cyclist in Havana during the early 1990s: centralized planning meant bike lanes, spare parts shops, guarded parking and neighborhood mechanics were ubiquitous. Soon lawyers, doctors, and even central government workers were fixing flats, straightening wheels and replacing spokes with their neighborhood mechanic.

But barely a decade into the bicycle revolution, ships carrying Venezuelan petroleum sailed into Havana harbour, courtesy of late President Hugo Chávez. He offered interest-free loans to help the Cuban economy out of crisis and traded oil for Cuban doctors. Putting the bike at the center of transport policy eventually fell out of favour.
Ernesto Peña is one of the few bike mechanics who still work in Central Havana, practicing his trade from whatever small space he can eek out. For the past few years, he’s been working from his living room and the narrow walkway that leads to his front door – with no advertising and no sign out front. “People find me by word of mouth,” Ernesto explains. “I’ve been working on these things for twenty years so the clients know me.” He simply can’t afford a bigger workspace, he says.

“When the workshops were state-owned, we didn’t make enough money as workers,” Ernesto explains. “Then the parts ran out, so eventually they were closed.”

Subsidies for cycling dried up and what was once a total necessity became a niche pursuit once again.

A folding travel bike in this shop: 125 peso

In September 2014, Nayvis opened Taller Velo (Velo Workshop) behind the famous Coppelia ice cream parlor. Unlike Ernesto’s crowded shop, Taller Velo is more spacious, with bike racks and a well-stocked workspace. Nayvis has her eyes on the future and is closely watching the evolution of Cuban cycling culture. “Havana residents are still riding bikes, but not the old Chinese commuters,” she explains. “They’re riding new mountain bikes or road bikes so we’re specializing in servicing newer models.” Since 2011, the government has allowed citizens to open privately-owned small businesses such as Taller Velo. Nayvis is taking full advantage: attracting new customers through advertising, giving out smart business cards (even ambushing cyclists as they ride past on the street to hand them over) and is building a web and social media presence.

New bike shop in Havana

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Old bike shop in Havana

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A folding travel bike in this shop: 125 peso

repair prices (peso)

- Pedales... 20.00
- Ruedina... 50.00
- Limpieza Bici... 35.00-50.00
- Amarrar/Desamar... 60.00-120.00
- Ajusta de Frenos... 5.00-30.00

RESPIRACIÓN

- Enfriado x Llanta... 10.00-30.00
- Enfriado x Llanta y Enfriado... 50.00
- Reparaciones x Partes o Piezas... 5.00-100.00
- Ponche Frío... 5.00-10.00
- Descamar o Cambiar de Gomas o Cuerdas... 10.00

PINTURA

- new bike price
- Bidi Completa (Sin diseño exclusivo)... 480.00
Cuba will encourage cycling and maintain buses

Directorate General of Transport, Havana

Havana, Cuba: The public transport system has been characterized over the years by its instability, inadequate and poor quality, even in times of increased capacity transportation. As a strategic line approved, there are fundamental elements to ensure an improvement of transport in general, highlighting the separation of duties functions of business: public transport; encourage the use of non-motorized transport, such as cycling; maintain public socio-cultural services and rail transport services (under the state scheme, applying new organizational forms); Cooperatives organize additional transport services, including the launch of Regio, the public taxi service, transportation workers of state agencies and private carriers; among other policies that make a document of 16 important points, "be added." The Director General of Transport, Havana noted that this series of organizational actions will enable an increase in public transportation of passengers, with greater efficiency in the socio-economic environment of the country and the foundation for sustainable long-term development, to ensure mobility of the population.

Cycling projects works well in US

China is promoting cycling

two month since August, hundreds million dollars investment

The bicycle is also eminently suitable as pre- or post-transportation in journeys over a longer distance - in combination with public transport. The combination offers great advantages: the bicycle carries the traveler without any waiting, from the front door to the bus stop or station (which public transport generally does) and public transport then takes the traveler quickly and comfortably over greater distances to the destination (which the bicycle does with difficulty). Thus the two transport methods resolve each other's weaknesses, together forming a strong chain.

Cycling facts and figures

48% of traffic movement is by bike in Amsterdam city center

<table>
<thead>
<tr>
<th>City</th>
<th>Number of bikes</th>
<th>% of traffic movement by bike</th>
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</thead>
<tbody>
<tr>
<td>Amsterdam</td>
<td>126,000</td>
<td>48%</td>
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</table>

Cycling projects works well in US

Europe is promoting cycling

Clean traffic

Europe is promoting cycling

Cycling is an efficient way of using space and resource in urban areas, and is healthy, clean and cheap. It has downplayed any vision of what we acknowledge that allows half of all car trips in cities are less than five kilometers.

The European Commission has been working on a new integrated cycling strategy, as a climate-friendly transport mode. It is looking to reduce greenhouse gas emissions by 2050, while improving air quality and reducing urban congestion. The strategy aims to promote cycling as a means of transport, as a healthy and environmentally friendly alternative to motorized transport.

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The Almendrones is a kind of taxi with fixed routes, which mostly correspond to the routes of the public bus network. They cost around 10 cuban pesos, depending on the distances, and have a capacity of 6-10 people, depending on the vehicle size. The vehicles are all types of american pre-1960 classics, running with highly improvised engines and diesel, to beat the high gas prices. They are the only affordable taxi system for local people, although they are 10 times more expensive than a bus. The system is not driven by state, the fixed routes and the fixed prices are gradually decide by drivers.
Almendrones routes
On around 130 points spread out all over the city, a blue uniformed civil servant stops state owned passenger cars, to fill them up with people waiting for a lift at the marked point. Every getting into and getting out of the vehicles is written down by the GETA servant. This is one of the compensatory mobility systems for the public transport, which exists since the Special Period, but is only since three years that well organized. This service is for free and only for locals.
The predominant part of the Cubans can’t afford travelling by taxi. It is the most expensive way getting around in Havana. Except in case of emergency or special occurrences it actually never happens that the Habaneros drive by taxi. This method is mostly used by foreigners and tourists. The good thing about this service is, that they are able to reach every rural street grid within the city, on the contrary to other public vehicles driving within Havana. The authorized taxi service is offered almost always only for CUC, the peso convertible. A 10 min. ride costs about four CUC. Five firms are offering this service: Pana Taxi, Havana Taxi, Fenix, Okay and Panatrans. There are price differences between the companies.
The Omnibus network consists of medium-sized vehicles with a capacity of about 50-70 people. The public bus system is the most cheap way to travel in Havana, which is less than one Cuban peso per trip. Although the spatial network is quite dense, the crucial problem is the lack of vehicles, which leads to unacceptable waiting times and highly overcrowded buses.

As for waiting time problem in Cuba, bus stops gradually become place to socialize. Sometimes residents live nearby may come to bus stop only for chatting. These “stations” has become important public spaces in contemporary Havana.
Havana bus network worked well in history
The Amount of transportation

<table>
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<tr>
<th>Year</th>
<th>Million</th>
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<tbody>
<tr>
<td>1960</td>
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<tr>
<td>1970</td>
<td>1500</td>
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<td>2010</td>
<td>3500</td>
</tr>
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<td>2020</td>
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End of Soviet Union (1991)
In fact, the spatial network of the public transport system in Havana is quite dense. The problem is the lack of buses since the collapse of the Soviet Union. Under the embargo of the US, the lack of public buses in Cuba is serious, which leads to long waiting times and crowded buses.

-- Rough Guides: The Rough Guide to Havana
Cuba government in 1999 introduced tough new legislation to control the building, repair and movement of small boats around its shores to block illegal migration to the United States. As a result, Cuba as an island had very little water transport in past decades. Sea was a barrier for Cuba since embargo, now it may be converted into a path, a road, a connection.
History ferry routes to Havana
Current ferry routes in Havana
According to the Decree-Law passed on July 19, 1999, which will be in force ensuing its publication in the Official Gazette, the following acts shall be considered violations:

- Building boats in the absence of due authorization from the corresponding Port Authority.
- Repairing boats without due authorization from the corresponding Port Authority.
- Using materials and means from illegal sources for the building, repair and operation of boats.
- Owning or operating boats which are not duly registered with the corresponding Port Authority Registry.
- Transporting boats on land without a permit issued by the appropriate Port Authority or violating the conditions set forth therein.
- Being in the possession of boats for which the legitimacy of ownership cannot be ascertained.
- Entering or leaving port or navigating in territorial waters without the corresponding dispatch or authorization from the Port Authority or violating the conditions set forth therein.
- Loading or unloading persons or objects regardless of the established regulations or in unauthorized places.
- Violating the regulations for access to boats located in port.
- Failing to comply with the physical safety and security of boats.
- Violating the conditions set forth therein.
- Transferring control of a boat without prior authorization from the corresponding Port Authority.
- Navigating in restricted areas without the proper authorization or failing to comply with the conditions set forth therein.
- Failing to comply with the physical safety and security of boats.
- Violating the regulations for access to boats located in port.

The tougher legislation was clearly a response to a reported increase in recent months of Cubans trying to migrate illegally from their communist-ruled island to the United States, either using their own boats or helped by migrant smugglers operating from the United States.

Cuba and the United States have made public commitments to prevent such attempts in line with accords they signed in 1994 and 1995 to promote safe, legal and orderly migration by Cubans to the United States.

“Cuba has a duty to block illegal departures with all the seriousness and responsibility with which we always assume our commitments,” Gramma said.

It said U.S. authorities had also taken measures to halt the growing clandestine transport of illegal migrants from Cuba by U.S.-based smugglers using fast motor launches.

The latest move by Cuba’s communist authorities followed a number of recent dramatic incidents in which would-be Cuban migrants seeking to flee the island were involved in sometimes tense confrontations with Cuban and U.S. Coast Guards.

Earlier this month Cuban authorities blocked an attempt by a group of Cubans to leave illegally in a wooden boat from the port of Puerto Padre, 420 miles (700 km) east of Havana.

The would-be migrants, who were eventually detained, had reprovisioned and repaired their boat on Puerto Padre seafront watched by a large crowd of supporters. The Cuban government denied U.S. news reports that a riot broke out when the authorities initially tried to intervene.

The Cuban statement said these illegal migration attempts using small and medium-sized boats “not only create disorder, threats to fishing and to maritime traffic, but they also use materials and equipment obtained illicitly to build or adapt vessels and use them without authorization.”

The new rules also penalised Cubans who used materials obtained by unlawful means to build or repair boats.

Cuban authorities also justified the new measures as a form of clamping down on illegal fishing, which they said was damaging fisheries stocks and costing the island more than $20 million in lost catches each year.

The fines decreed in the legislation ranged from 500 Cuban pesos to 10,000 Cuban pesos, a small fortune in a country where the average monthly wage is a little more than 200 pesos.

One U.S. dollar is worth 22 pesos in Cuba’s authorised internal exchange market.

In cases where the offenders were foreigners or Cubans operating in hard currency, the fines would also be in hard currency, the law said.
Time line of cuban water transport
Cuba in 18 century map.
Cuba is literally a rolling car museum. Everywhere you look is an old-school American brand vehicle, ranging from Oldsmobile to Chevrolet, Buick to Ford with a nice sampling of Chrysler’s old Plymouth brand. There’s even a few Russian Volgas thrown in the mix. These are all vehicles that the majority of American car lovers would spend hundreds of thousands of dollars on—and they are used as Cubans’ everyday vehicles.

Though the island floats only 90 miles away from Key West, Florida, Castro had placed a ban on foreign vehicle imports, making it nearly impossible to buy a brand-new, foreign-made vehicle. It also made it difficult to buy new parts and fuel for the old-school American cars Cuba is known for. It is common to stop and fix a car by its diver on street.
Old cars always break down in middle of streets.
Cuba has 60,000 50-year-old American cars.

No official figures are available on Cuba’s automobile fleet, but experts believe there are around 60,000 American cars still circulating on the island. Mixed in with them are Soviet-made Ladas and Moskvich cars made in the 1970s and ’80s and more modern, usually Asian-made, vehicles imported by the government.

Mint condition Cadillacs, Chryslers and Oldsmobile convertibles can still be seen carrying tourists around Havana, but most of the rolling relics from pre-revolutionary Cuba are now used for collective public transportation.
**Cuba** Automobile ownership rank 136 in world

Cuba don't have enough oil for cars

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**The Cuba-Venezuela Oil Relationship**

In 2000, Cuba and Venezuela agreed to a services-for-oil trade deal, later implemented via Petrocaribe, Venezuela’s oil alliance with 19 Caribbean and Latin American nations. We look at the numbers tying the two and the effects of Venezuela’s worsening economy on Cuba’s finances. Many of these figures come from research by energy expert and University of Texas at Austin Professor Jorge R. Piñón.

**The Petrocaribe Deal**

$5.4 billion

Annual value of labor of the 40,000 Cuban doctors, teachers, and military advisors who are supposed to be working in Venezuela in exchange for oil, per the 2000 contract. By early 2016, however, a majority of them had returned to the island as conditions in Venezuela deteriorate.

105,000

Average number of barrels of crude oil Cuba imported daily from Venezuela between 2007 and 2014, about triple the amount of any other Petrocaribe country.

1%

Interest charged to Cuba, to be paid over 25 years, on oil shipments Cuba finances rather than pays upfront, when the price of oil is above $40. Below that, the interest goes up to 2% and must be paid within 17 years, and Cuba must pay for more oil upfront.

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<table>
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<th>11,210,064</th>
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<tr>
<td>Urbanisation</td>
<td>%</td>
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<tr>
<td>Area</td>
<td>km²</td>
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<tr>
<td>Road density</td>
<td>km/km²</td>
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<tr>
<td>Automobile ownership</td>
<td>no./1000 individals</td>
<td>37 (est.)</td>
<td>28–38</td>
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</table>
Price of new cars are very high in Cuba

According to the resolution issued by the Ministry of Finances, retail car prices have been established on the basis of the following criteria:

For new vehicles, eight times market price (the cost of the vehicle plus expenses paid to transport it to the dealerships) plus the tax amount.

As a side note: “The cars taken in will be used to create a fund destined primarily to the development of public transportation around the country.”

This is why, in Cuba today, a 2013 500 Peugeot (one of the newest models being offered) is sold at 271,560 CUC (over 290,000 USD); a price you will not find across anywhere else in the world. I invite you to comment on this issue and, in the meantime, to continue catching the old 1950s cubic.

Cuba sells 50 new cars in first 6 months

$262,000?

HAVANA, 1 July - Cuban dealers sold 50 cars and four motorcycles nationwide in the first six months of the year under a new law that removed limits on auto purchases for the first time in half a century but came with prices so high few people could afford them.

Long-frustrated Cubans welcomed the law that took effect in January until they saw sticker prices were marked up 400 percent or more, pricing family sedans like European sports cars. Cuba has said it would invest 75 percent of the proceeds from new car sales in its woeful public transportation system. But retail sales at the country’s 11 national dealerships reached just $1.28 million in the first six months of the year, the official website Cubadebate.com reported on Monday, citing Nestor Vazquez, vice president of the state enterprise Corporacion CIMEX.

Most of the sales this year appeared to be of the second-hand variety considering the average sale price of $23,759 per vehicle, including the motorcycles. A Havana Peugeot dealership was pricing its 2013 model 206 at $91,000 when the new rules came into effect, and it wanted $262,000 for the sportier 508. Such prices drew howls of protest from the few Cubans who could even consider buying a car.
Transport Problems in Havana

- embargo
- black market
- low frequency
- crowd bus
- expensive new ones
- old car
- low ownership
- decaying infrastructure
- hijack
- limited routes
- illegal boat
- long waiting time
- bad road condition
- parts ran out
- no workers
- engine
- oil shortage
- Havana transport Problem
Peter Jones, Key Issues for Havana Mobility Strategy, UCL.

Typical Roads Policy Trajectory and Cuba shortcut

Development

Number of cars

Emphasis on meeting the needs of cars

‘Vehicle’ focus

‘Personal movement’ focus

‘Activity/Quality of life’ focus

Time

Integrate

bus

cycling

water taxi

car
Site in Havana
Elements in Site

- tunnel
- public transport routes
- Almendares River
- park
- Malecon Seawall
- fort
- fisherman warehouse
Tunnel

Linea tunnel to Miramar
before tunnel, there was a bridge for train.
after train canceled, bridge also teared down.
La longitud del túnel no es de 184 metros, sino de 213,6 metros, y la altura es de 1.500 metros.

En cuanto a la circulación, se tienen previstos por la circulación en sentido de una dirección y luego en sentido contrario.

El propio proyecto está en estudio por la Dirección de Tráfico, y se estima que la primera cuenta entre 50 y 54 kilómetros por hora, y la segunda 40 km/h.
Bus Stop
‘TUNEL DE LINEA’

Public Transportation
- Almendrones
- Bus
- Site

Malecon
Linea
Calle 24
Avenida 31
Avenida 23
Malecon Seawall
Santa Orense de Lusa de la Chorrera fortress was built to protect the mouth of the Almendares River, which was navigable at the time. Comprisingstorehouses, barracks for fifty men, and a drawbridge, it was severely damaged by the British in 1762.
Almendares River
Next to site, two tunnels connect Vedado and Miramar.

Along water front, public space is disconnected because of two tunnels.
National Center of Traffic Engineering
Import Company
Floodline and Flood Intensity

- north atlantic ocean
- light flooding area
- moderate flooding area
- severe flooding area
- interior city blocks

Floodline distance is 600m from coastline to interior of the city
TYPOLOGY

1. Motorcycle

2. Fixed-bed truck

3. Fixed-bed truck

4. Off-road truck

5. 4 × 2 truck

6. 6 × 2 (or 6 × 4) truck

7. 8 × 4 truck

8. Articulated truck, l = 15 m (UK max. o/a length = 13 m)

9. Mercedes 560 SEL

10. Articulated silo truck with tipper

11. Skip truck

12. Roll-on roll-off hooklift tipper truck

13. Rear-loader refuse collection vehicle

14. Concrete pump truck, l = 11.8 m

15. Turntable ladder fire engine, l = 11.92 m

16. VW stretched truck with platform body

17. VW Joker

18. VW Karman-Cheetan, Gipsy

19. Standard public service bus

20. 12.00
Cuban ‘STOP’ typology
Cuban ‘STOP’ typology
BICYCLE PARKING

Dimensions of bicycles → ①、②. Note allowances for baskets and children’s seats. Include space for special types: recumbent bikes up to 2.35m long; tandems up to 2.60m; bicycle trailers (with shaft) approx. 1.80m long, 1.08m wide, bikes adapted for disabled people and for delivering goods.

Offer comfortable parking → ③ wherever possible; narrow parking can cause injury, soiling and damage during loading/unloading. Double rows with overlapping front wheels can save space.

Bicycle stands must give steady support, even when loading the bike. Locking should be possible using only one U-lock, securing the front wheel and the frame to the stand at the same time. Tubular stands are therefore suitable → ④. Provide an intermediate bar for children’s bikes. Stands should be 1.20m apart with access lanes 1.50-1.80m wide → ⑤ → ⑦. Cycle stands which do not provide sensible locking opportunities only suitable for internal use in areas of restricted access.

General installation design should be clear and user-friendly: close to the destination, easy to find and approach. For long-term parking, consider rooftop and lighting → p. 219. Supervision is advisable at railway stations, sports grounds, shopping centres etc.

BUS STATIONS

Special provision has to be made for the widening of curves to match the turning circles of buses → ⑥ → ⑧. Bus stops require shelters and special layouts (see also figures ① → ⑩ on the next page).

Ramps should be provided at the front to allow easy access up to a 30-40cm high step → ⑩ → ⑩. Short stay car parking space should be incorporated for passengers on the edge of towns (i.e. park and ride).

Apartment
1 per 35m² total living area

Visits to apartments
1 per 200m² total living area

Custodian’s apartments
1 per block

Secondary schools
0.7 per pupil place

Colleges of further education
0.5 per student place

Lecture theatres
0.7 per seat

Libraries
1 per 4000

College canteens
0.3 per seat

Places of work
0.3 per employee

Shops for daily supplies
1 per 25m² retail area

Shopping centres
1 per 80m² retail area

Retail units for
1 per 30m² retail area

Professional offices, doctors’ practices
0.2 per client or premises

Sports arenas, halls, indoor swimming pools
0.6 per clotheslocker

Regional gathering places
1 per 20 visitor places

Other gathering places
1 per 7 visitor places

Local restaurants
1 per 7 seats

Bar gardens
1 per 2 seats

Guide values for capacity of cycle parking

If several units happen at the same time in a building, then the totals for the different uses should be added up.

① Basic bicycle dimensions
② Bicycle with basket/child’s seat
③ Bicycle parking: ample space
④ Close packed
⑤ Basic layout parallel in straight lines
⑥ Parallel, herringbone formation
⑦ Stepped, parallel straight formation
⑧ Stepped, herringbone formation
⑨ With tubular stands
⑩ Front wheel overlapping
⑪ Front wheel overlapping with central access
⑫ Single-decker bus
⑬ Double-decker bus
⑭ Bus stop
⑮ Bus dimensions
⑯ Space requirement for platforms
⑰ Space for parking spaces
⑱ Standard interlocking layout
⑲ Radial layout providing more room at the front
⑳ Small semi-circular platform outside loop; no pedestrian crossing necessary

② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑰ ⑱ ⑲ ⑳
VEHICLE DIMENSIONS

The illustrations show dimensions, turning radii and weights of typical vehicles with particular reference to space requirements and regulations for garages, parking places, entrances and passages.

1. Bicycle
2. Motorcycle
3. Mini
4. VW Polo Coupe
5. VW Golf
6. VW Passat
7. VW Passat Variant
8. Audi 80
9. Audi 100
10. BMW 'E' series
11. Mercedes 190
12. Mercedes 560 SEL
13. Rolls Royce
14. American limousine
15. VW (high roof) Kombi
16. VW stretched truck with platform body
17. VW Joker
18. VW Karman Ghia, Gipsy
19. Short wheelbase, 3-door Mercedes station wagon
20. Long wheelbase 5-door Mercedes station wagon
21. Pick-up van
22. Fixed-bed truck
23. Articulated trailer truck
24. Skip truck
25. Roll-on roll-off hooklift tipper truck
26. 4 - 2 truck
27. 6 - 2 (or 6 - 4) truck
28. 8 - 4 truck
29. Truck with trailer, l = 19 m
30. Truck with tandem trailer, l = 18 m, w = 2.50 m
31. Long-distance high-deck coach
32. Standard articulated bus, w = 2.50 m
In accordance with the regulations applicable to garages:
- small garages are defined as those with <100 m² effective area;
- medium garages are those with 100-1000 m² effective area;
- large garages are those with >1000 m² effective area.

Underground garages are defined as those with the floor level on average 1-3 m below the surface of the ground.

Separate entrances and exits must be provided for large garages.

These garages are normally located close to points of major traffic congestion such as railway stations, airports, shopping centres, theatres, cinemas, office and administration blocks and large residential buildings.

Medium and large garages must be located in easily accessible areas, have a clear headroom of 2.0 m, even below the main beams, ventilation ducts and other structural components. On the ground floor, the clear headroom is normally larger, as the space is often used for other purposes.

To accommodate small transport vehicles, the height should be 2.5 m. Floor loadings must be in accordance with local standards. Open garages have openings which cannot be closed up to 1 m from the sides to the total area of the outside walls leading directly into the open air and divided in such a way that there is continuous through-ventilation, even in the presence of weather screening.

There is an interesting example of a car park in the centre of Geneva beneath the River Rhine. The entrance and exit points are on the approaches to the Rhine bridge. Vehicles can easily filter in and out of the traffic flow by means of access ramps on both sides. All car stores are connected by a right-hand drive up a central sloping ramp. No staff are necessary as there are automatic parking ticket machines in use.

The criteria for the quality of multi-storey carparks are: safety in use, clear visibility, parking-space marking to enable drivers to reorientate the location of their vehicles, and integration into the context of town planning.

Other factors to be considered are: natural lighting and ventilation, clear views to the outside, plants and greenery and a simple system of collecting charges.
Examples - ① - ⑧ show how parking spaces can be creatively integrated into their surroundings without restricting their use. Parking spaces can be completely or partially sunken or provided with roof planting to increase the area of open space. - ① - ⑤. Planting not only enhances the look of the area, but also provides shade and improves the environment by absorbing dust.

There are various ramp systems for gaining access to upper and lower floors of car parks. The gradients of the ramps should not exceed 15%, or in the case of small garages 20%. A horizontal run of more than 5m must be included between an area carrying general traffic and ramps with more than 5% gradient. For car parks the run must be more than 3m long, and the ramps can be up to 10% gradient. The options available for the arrangement and design of ramps can be summarised under four main headings - ⑦ - ⑧:

1) straight, parallel and continuous multi-storey ramps with intermediate landings, with separate ramps for up and down traffic located at opposite ends - ⑦ - ⑧.
2) sloping floors, with a full width ramp with no loss of space. The entire car park structure consists of sloping levels. A space-saving system is shown - ⑨ - ⑩ with a gradient of more than 6%.
3) offset half storys (D/Hurry ramps); parking areas are offset half storys, height gain is by the use of short ramps - ⑩ - ⑪.
4) spiral ramps - a relatively expensive design which lacks good visibility. The circular shape makes poor use of remaining areas - ⑩ - ⑪ and - ① - ② and ③ - ④. Spiral ramps must have a transverse gradient of more than 3%. The radius of the inner rims must be more than 5m. In large garages where special pedestrian routes are not provided, the ramps that are used by both vehicles and pedestrians must have a raised pavement at least 60cm wide. Medium-sized and large garages must have the following minimum widths of lanes at entrances and exits:

- 3m when used by vehicles up to 2m wide;
- 3.5m when used by wider vehicles.

CAR-PARKS

All the load bearing structures of multi-storey car parks (floors, walls, support columns, bracing) must be fire-resistant. Garages open to the air must be of fire retardant design. The recommended clearance height in multistorey garages is 2.0m, plus structures above the access lanes, which means a height per storey of 2.75-3.5m, depending upon the choice of design. A relatively new column pattern can, with careful planning and design, reduce building costs and height without any loss of function - ① - ②. Long span structures with no columns take up 7-12% less floor area than those with conventional support columns - ③.

Gradients and ramps must be appropriately shaped and designed - ③ - ④. Straight or spiral parking ramps are constructed by sloping the floor. With a spiral shape - ⑤, you can have vehicles on both sides of the ramp. In ⑤ it can be seen that the area required for a given number of cars to be parked, including the area required for manoeuvring, can be determined at the preliminary design stage. Layouts of multistorey garages and arrangements of ramps are shown - ⑥. These include two offset double rows of parked vehicles, four rows, six rows, parking in a corner, ramps in the direction of traffic, a multistorey car park with ramps and finally one with parking on a continuous helical ramp. Reinforced concrete structures (with concrete mixed on site, pre-cast sections or hybrid construction) best meet the requirements for fire protection. As a rule, steel structures provide the main and subsidiary support systems and must be protected from fire with concrete, fire resistant cladding or other fireproofing coatings. In garages, high loads should be allowed for – in addition to permitted superimposed loads of motor vehicles of 5.5kN/m², and of ramps 5.4kN/m². Roofs with garden on top have to be designed for a loading of 104kN/m².
<table>
<thead>
<tr>
<th>Transport Means</th>
<th>Underground</th>
<th>Train</th>
<th>bus</th>
<th>car</th>
<th>bike</th>
<th>people</th>
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<td>R=300m</td>
<td>R=100m</td>
<td>R=12m</td>
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<td>R=6m</td>
<td>R=0.5m</td>
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<tr>
<td></td>
<td>50m*2.5m</td>
<td>40m*5.2m</td>
<td>10m*2.5m</td>
<td>4.5m*2m</td>
<td>1.8m*0.5m</td>
<td>0.2m*0.5m</td>
</tr>
</tbody>
</table>
Fishermen warehouses in the port of Cangas / Irisarri + Piñera

Architects: Irisarri + Piñera
Location: Cangas, Pontevedra, Spain
Area: 897 sqm
Project Year: 2003
Photographs: Manuel Gonzalez Vicente
Bus Station in Osijek / Rechner
Architects: Rechner
Location: Osijek, Croatia
Site area: 21,199 sqm
Built area: 11,066 sqm
Completion: 2011
Faaborg Harbor Bath / URBAN AGENCY + JDS + CREO ARKITEKTEN

Architects: JDS, URBAN AGENCY, CREO ARKITEKTEN A/S
Location: Faaborg, Denmark
Area: 20100.0 sqm
Project Year: 2014
KKA Designs Electric Vehicle Charging Stations in Sweden

Architects: Kjellgren Kaminsky Architecture
Project Year: 2013

1. car parking in Cuba= car museum
2. new energy cars, people need to WAIT while charging. This is same as Cubans waiting for buses. maybe combine these behaviours.
3. extrude along ROUTE= space
Jean-Jacques Bosc Bridge

Architect: OMA
Location: Bordeaux, France
Scale: 44m by 545m
Project Year: scheduled for completion in 2018

"a generous new public space"
"an urban planning intervention" for the city
"La Línea Borrosa" Proposes a Shared Space at the US-Mexico Border

Student Patrick Cordelle
Location Tijuana, Baja California, Mexico
School California Polytechnic State University, San Luis Obispo
Studio Studio 400
Professor Karen Lange
Project Year 2015
1111 Lincoln Road Car Park
Herzog & de Meuron

Building Components:
- Car Park Structure, Existing Building, Suntrust Building, Promenade and Public Plaza

Site Area: 2,510sqm
Building Footprint: 2,125sqm
Building Dimensions: Length 51.5m, Width 49.5m, Height 37.8m
Gross Floor Area: 22,575sqm

Program:
- Car Park: 300-space multilevel parking facility
- Retail Concept Stores: Car park structure (ground floor and level 5): Total Area: 3,716sqm
- Residencies: Car park structure: 1 roof house and garden (approx. 490sqm)
- Restaurants
- Event Space: Level 7: 2,360sqm / 25,400sqft including circulation
- Promenade and Public Plaza: Mature cypress and oak trees, black and white pavement pattern composed of pedra portuguesa stones
- Glass pavilion by artist Dan Graham
Fun Palace

Cedric Price

year of concept: 1964
possible site: London
scale: 237m x 110m

Price thought of the Fun Palace in terms of process, as events in time rather than objects in space, and embraced indeterminacy as a core design principle.
Boxpark Croydon / BDP

Architects: BDP
Location: Croydon, United Kingdom
Area: 2622.0 m²
Project Year: 2016
Photographs: Nick Caville
Transport Hub + Bridge
Cuba

Come to Cuba