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# Infrastructure in Rio de Janeiro



# Background

- ▶ Second largest city in Brazil
- ▶ Radical topography causes problems with transportation
  - Sea
  - Mountains
  - Funneled road network





# In place now...

- ▶ Buses
- ▶ Taxis
- ▶ Private cars
- ▶ Metro
- ▶ Railroads
- ▶ Ferries



# Buses



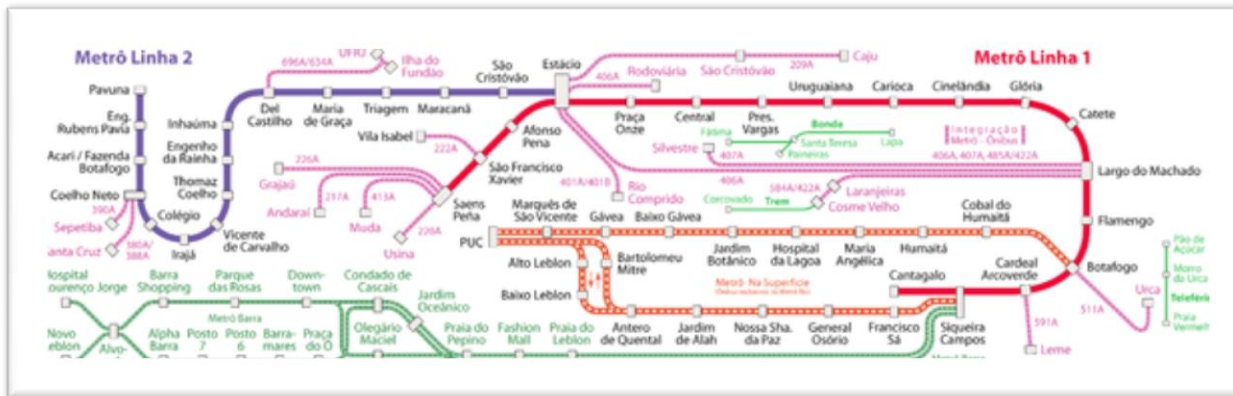
- ▶ Cheap
- ▶ Effective—throughout entire city
- ▶ Problems:
  - Decreasing quality
  - Lack of authority
  - Increasing travel time
  - Somewhat risky (pickpockets)

# Taxis and private cars

- ▶ Taxis are easily available
- ▶ Notoriously difficult to drive
- ▶ Congestion: 84% travelers stop at a node in the city
- ▶ Designed for political reasons, not U-O
- ▶ New roads increase traffic because of increased dependency on cars (double since 2000) and high incentive to switch paths
- ▶ Nicer roads have high tolls (private)



# Metro



- Small but expanding? (constant change)
- Fairly reliable
- Used mostly by tourists
- Terrain causes difficulties
- New routes immediately saturated due to high incentives to switch
  - congestion leads to longer travel times



# Railroads

- ▶ Used to be point of pride, now barely used
- ▶ Largest rail grid in Brazil
  - Both urban and suburban
  - Mostly used by lower class





# Ferries

- ▶ Rio's ports carry the third highest amount of cargo in Brazil
- ▶ Ferries carry about 175,000 travelers per day
- ▶ System is stretched beyond capacity



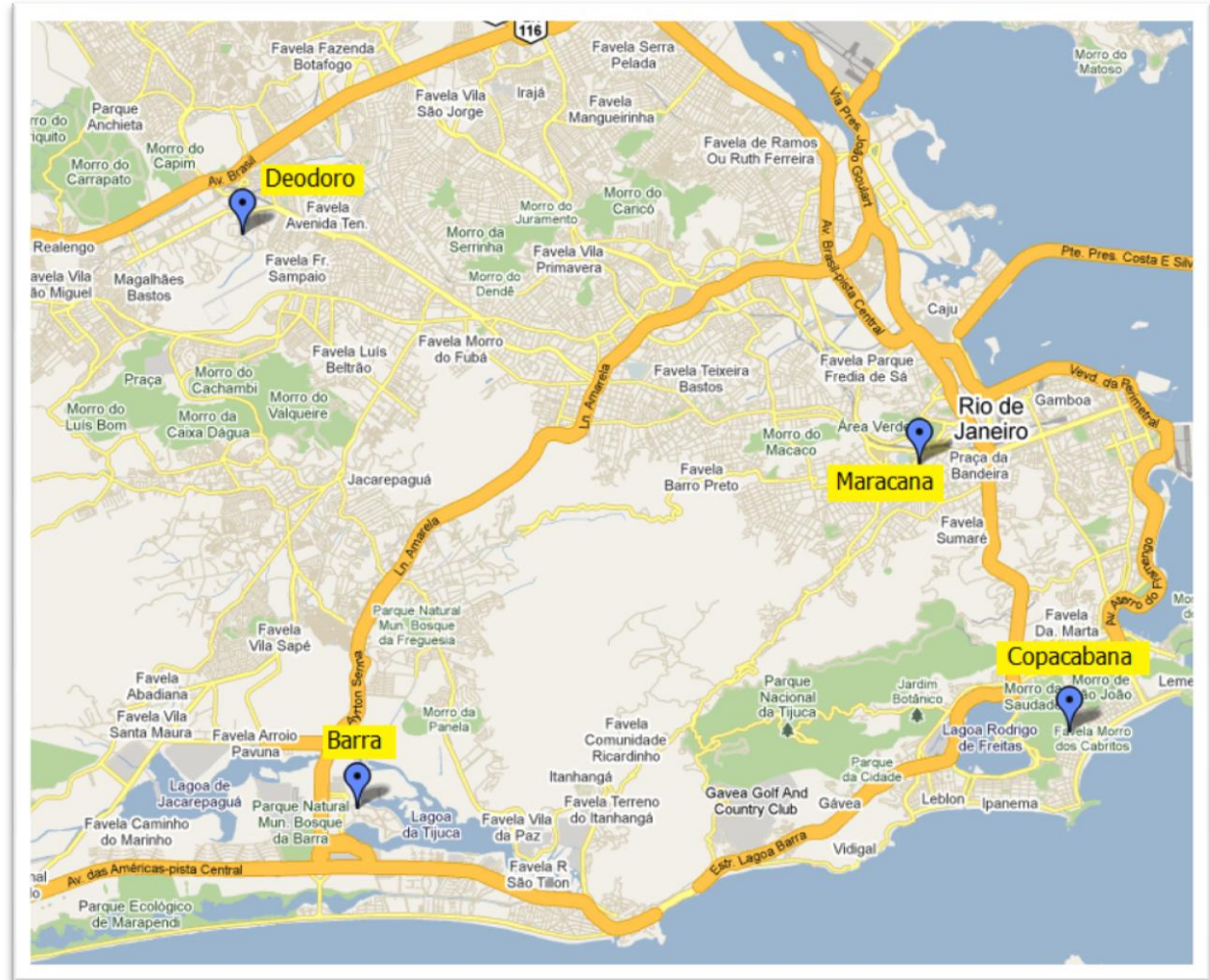
# Olympic Challenges



- ▶ 300 Individual Competitions
- ▶ 30 Competition Venues (plus training venues)
- ▶ 4 to 8 million Spectators
- ▶ 150,000 to 200,000 Accredited Persons
- ▶ Additional Traffic Flow of 1.5 to 2 million journeys per day to Rio's already 11.5 million journeys per day

# Four Zones

- ▶ Barra
  - Olympic & Media Villages
- ▶ Copacabana
  - Outdoor Sports
- ▶ Deodoro
  - Other Venues will be constructed.
- ▶ Maracana
  - Athletic Stadium & Opening Ceremonies





# Olympic Needs

- ▶ High capacity roads
- ▶ Public transport system





# Improvement Needs



- ▶ Railway improvements
- ▶ Improvements to the existing Antonio Carlos Jobim International Airport

# Planned Action

- ▶ A six-lane motorway planned to link two of the event sites
- ▶ 100 km (62 miles) of Bus Rapid Transit to connect three of the four zones
- ▶ Improvements to metro and suburban rail will connect the fourth link to Copacabana
- ▶ Improvements to runways and passenger terminals are proposed
- ▶ Half of the athletes will be able to reach their venues in less than 10 minutes.

*“The residents (of Rio) stand to gain more metro lines, more trains, more sewage treatment, more in terms of the environment, and social services”*

Sergio Cabral  
Rio's Governor

# Funding

- ▶ \$11 billion from Rio's government
- ▶ Counting on continued tourism
- ▶ Planned improvements in preparation for the 2014 World Cup



# What made Beijing have a successful Olympics?





# Background of Beijing

- ▶ Mode of transportation: Buses, Subway and Taxis
- ▶ 5 Million people use Subway everyday
- ▶ 10 Million people use Buses everyday
- ▶ 3.12 Million cars operate on roads everyday



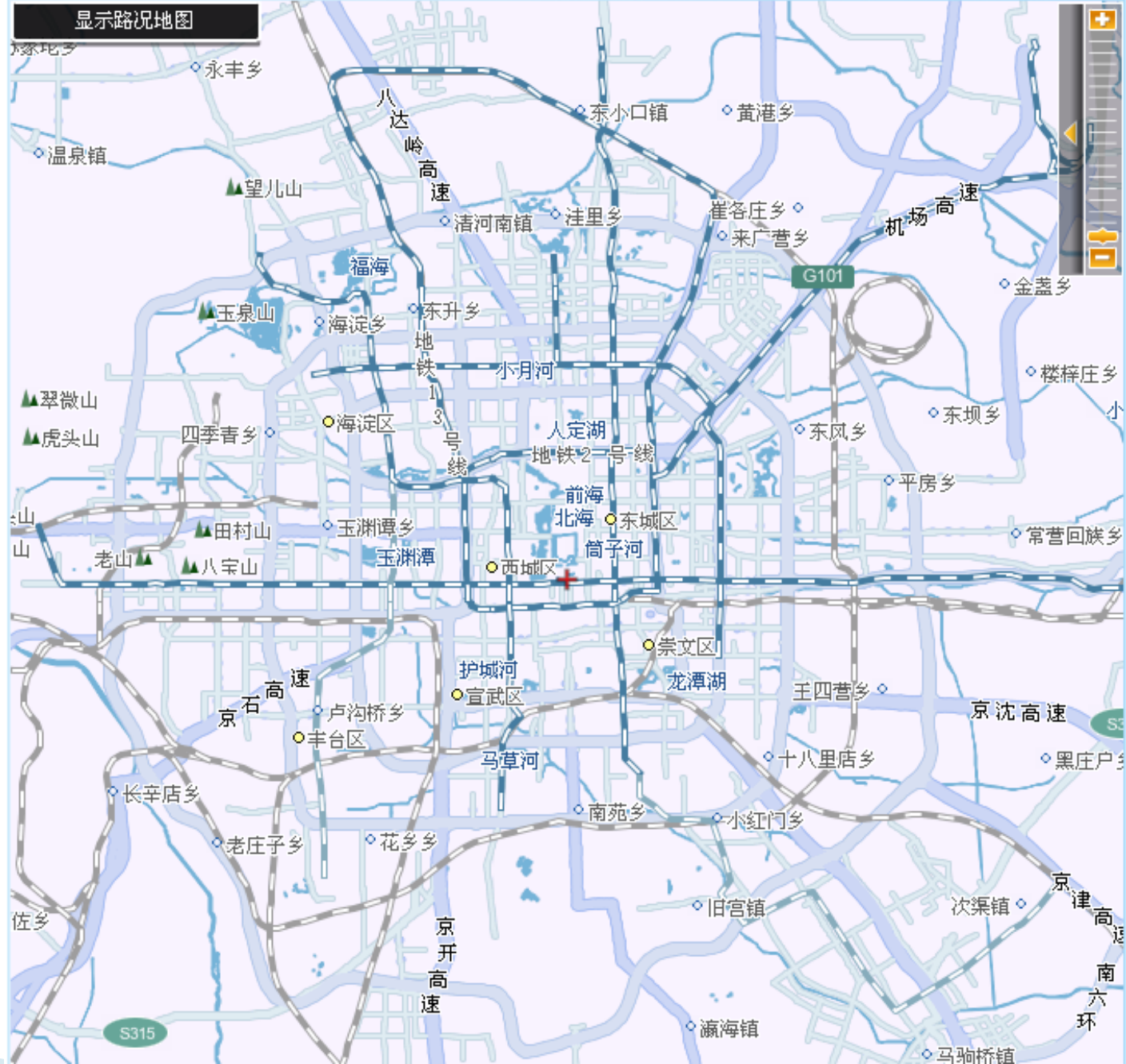
# Road situation in Beijing

- ▶ Rush hour lasting 11 hours a day
- ▶ People spend 1 hr 23 min everyday on travel to workplace.
- ▶ However, their working hours is only 6hrs 12min





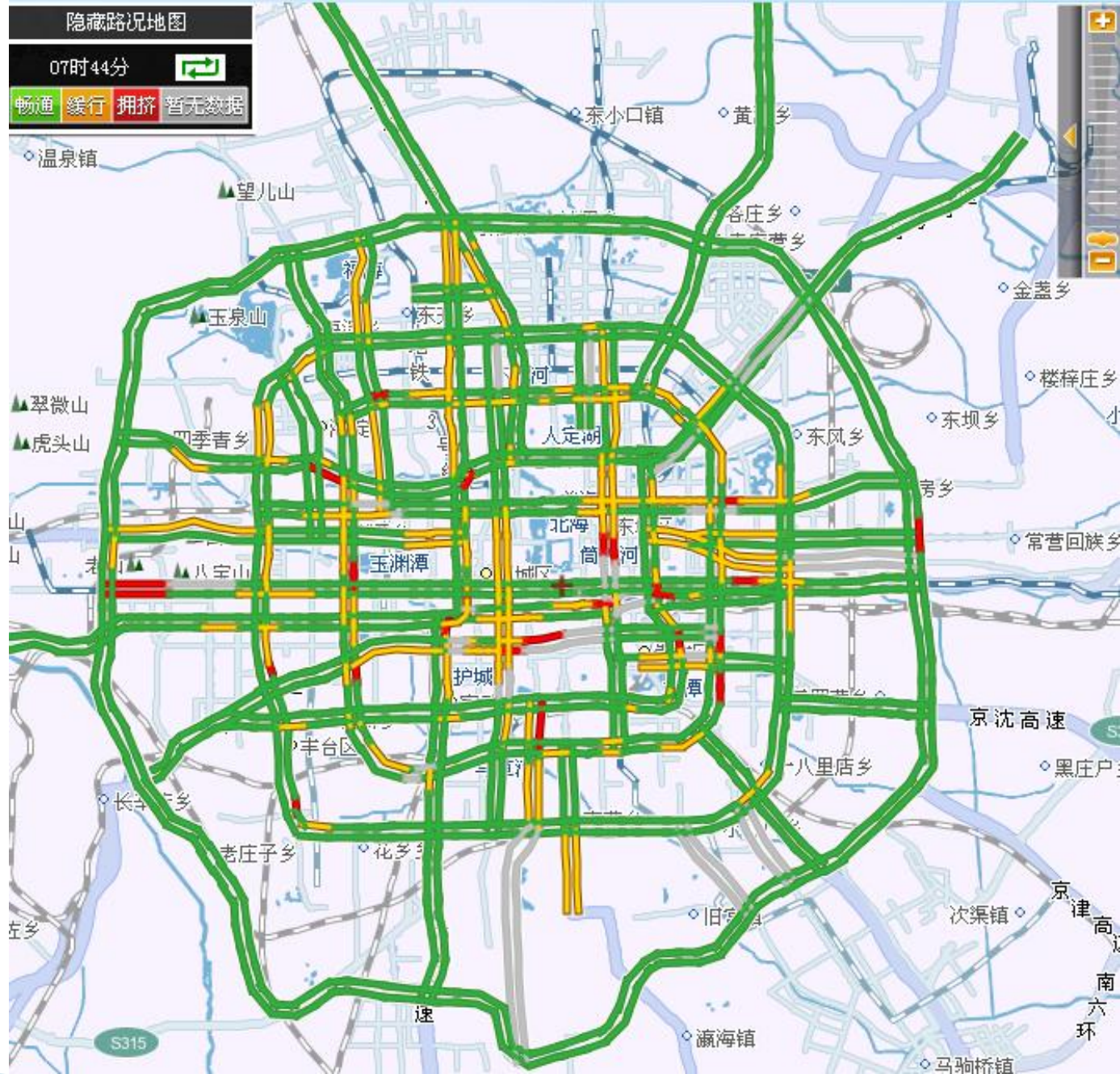
显示路况地图







7:30a.m







# Positive effects on travel post Olympic Games

- ▶ Beijing had 3 new subways lines in service before the Games. In addition, another 9 lines are under construction.
- ▶ Beijing applied security measures right before the Games, strengthened the measures during the Games, and kept them after the Olympics





# Improved Subway System

- ▶ Successful increased security measures for the Games have remained in place
  - Since June 2008, more than 55,000 suspected items have been found (explosives, cutting tools)
  - 20,000 people carrying prohibited items have been declined entry to the subway
- ▶ Dramatic increase in public transportation usage since new subway security measures put in place, increasing the building and planning of more subways and reducing the public traffic on the roads



# Public Bus Transportation



- ▶ Progress in the organization of bus stations
- ▶ New bus routes opened to link new residential communities to the rest of the city
- ▶ Daily number of passengers has increase from 9.65 million to 14.57 million
- ▶ 1 / 3 of the people in Beijing choose to take a bus  
to go out, increase of 7%



# Motor Vehicle Problems

- ▶ During the Olympics, Beijing imposed a traffic ban based on an odd-even license plate system
  - The restrictions, based on license plate numbers, took about 1 / 5 of the city's 3.61 million vehicles off the roads each weekday
- ▶ Initiative took 45% of the cars off the roads and helped clear the skies







# Motor Vehicles Continued...

- ▶ Figures released by the Beijing Transportation Research Center show that traffic jams were reduced by 5 hours and 15 minutes a day during the 6 months since the post-Olympics restrictions have been in effect
- ▶ In addition vehicular emissions were reduced by 10% every day



# Beijing's Enemy: Smog.

- ▶ Unfortunately, the ban was lifted in September and the traffic jams returned.
- ▶ The return to Beijing's traffic and smog-heavy status quo will mark the end of what may have been the world's largest pollution control experiment: a restriction on cars, factories and construction that lasted for two months and resulted in the clearest skies Beijing has seen in a decade and raised vehicle speeds 10%.



# Conclusion

- ▶ The Olympic Games hold a lot of power over a given host city's transportation networks.
- ▶ If good habits are created they should be maintained.

