



INTEGRATED COMPREHENSIVE MOBILITY PLAN FOR SUSTAINABLE BHUBANESWAR

AUGUST-20, 2013



INTEGRATED COMPREHENSIVE MOBILITY PLAN FOR
BHUBANESWAR, CUTTACK AND PURI KONARK
VISION 2030

VISION

TO REGULATE, INCLUSIVELY PLAN AND DEVELOP AN EFFICIENT, EFFECTIVE AND WELL INTEGRATED TRANSPORT SYSTEM, THAT WOULD:

- ENHANCE MOBILITY IN AN ENVIRONMENTALLY ,SOCIALLY SENSITIVE MANNER
- INDUCE MODAL SHIFT IN FAVOUR OF PUBLIC TRANSPORT
- PROVIDE PEDESTRIAN TRANSPORT INFRASTRUCTURE.
- PROVIDE SEAMLESS CONNECTIVITY

GOALS

- **IMPROVE AIR QUALITY**

- MASS TRANSIT
- PEDESTRIANISATION
- “TRIP NOT MADE”

- **REDUCE URBAN SPRAWL**

- TRANSIT ORIENTED DEVELOPMENT

- **SOCIALLY EQUITABLE**

- FARES
- DURATION OF TRAVEL
- DISTANCE OF TRAVEL

ENHANCE INCLUSIVE GROWTH

BACKGROUND

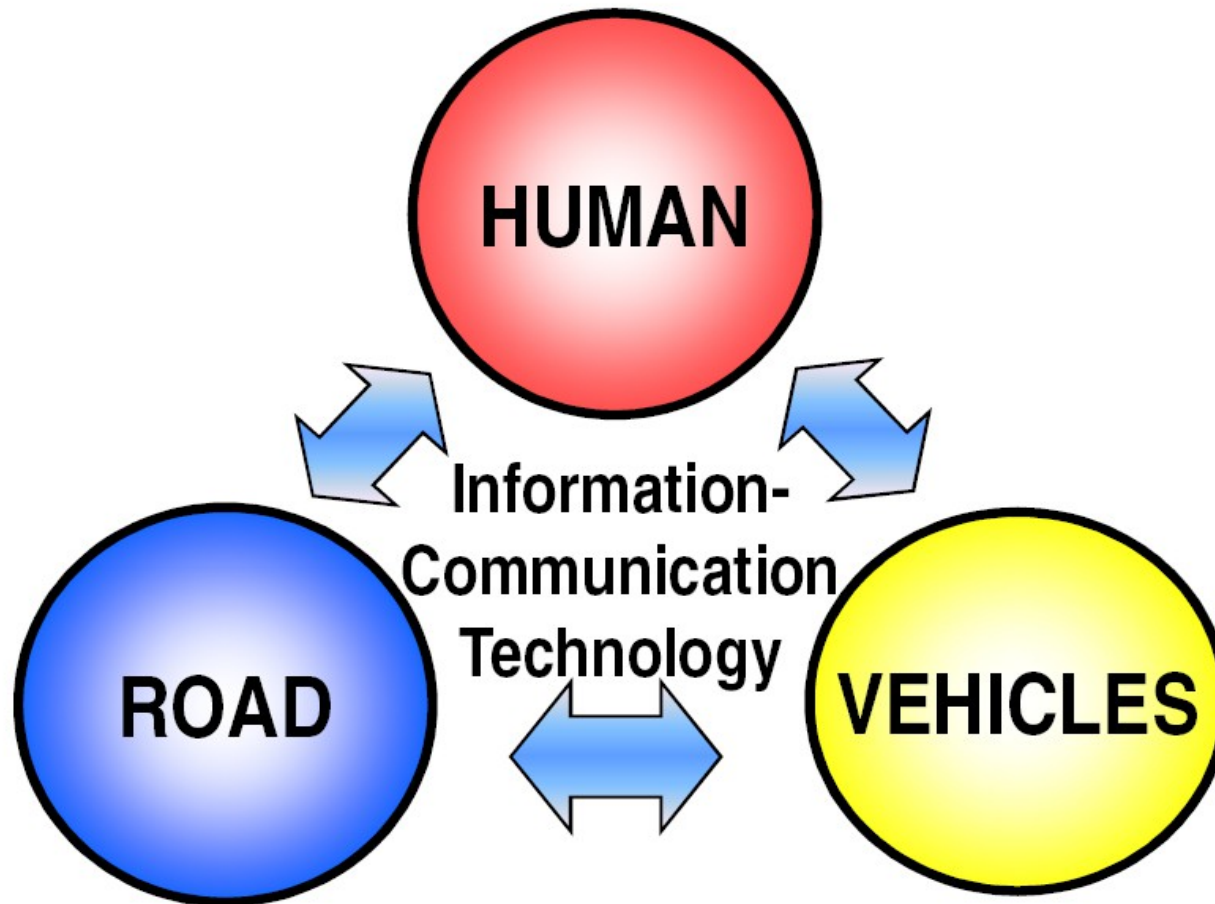
- BHUBANESWAR REPLACED CUTTACK AS THE CAPITAL OF ODISHA IN 1948
- OTTO KONIGSBERGER PLANNED FOR THE NEW CITY OF BHUBANESWAR IN 1946
- METROPOLITAN AREA FORMED BY THE TWIN CITIES - POPULATION OF 1.4 MILLION IN 2011
- BHUBANESWAR IS GROWING IT , EDUCATION & INDUSTRIAL HUB, WHEREAS CUTTACK ??



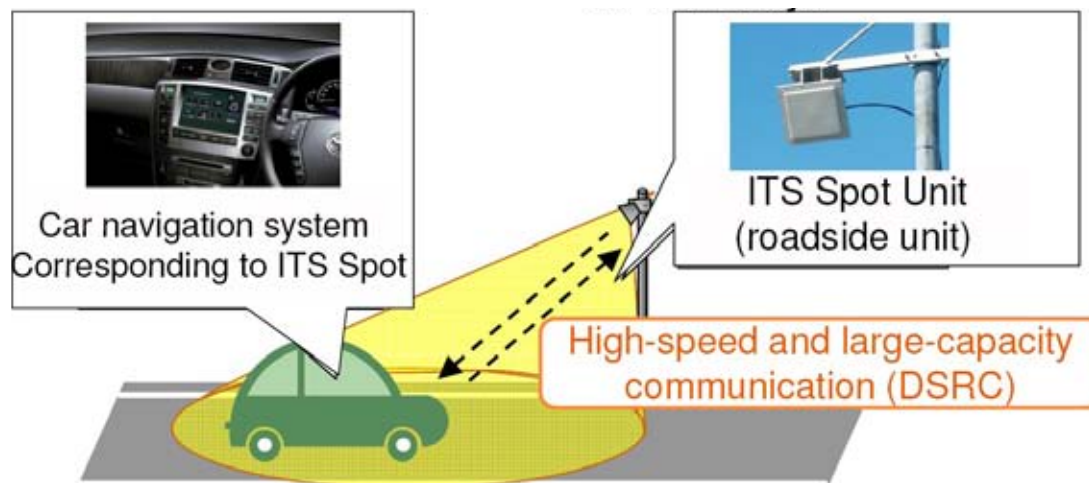
OBJECTIVES

- CONNECT THE TWO CITIES WITH ONE TRANSPORT SYSTEM
- UNIFIED MASS RAPID TRANSIT SYSTEM CORRIDOR
- A COMMON RING ROAD
- RAILWAY STATIONS HSR CORRIDOR
- UNIFIED TICKETING SYSTEM FOR ALL MODES
- INTELLIGENT TRANSPORTATION SYSTEM

INTELLIGENT TRANSPORT SYSTEM



INTELLIGENT TRANSPORT SYSTEM



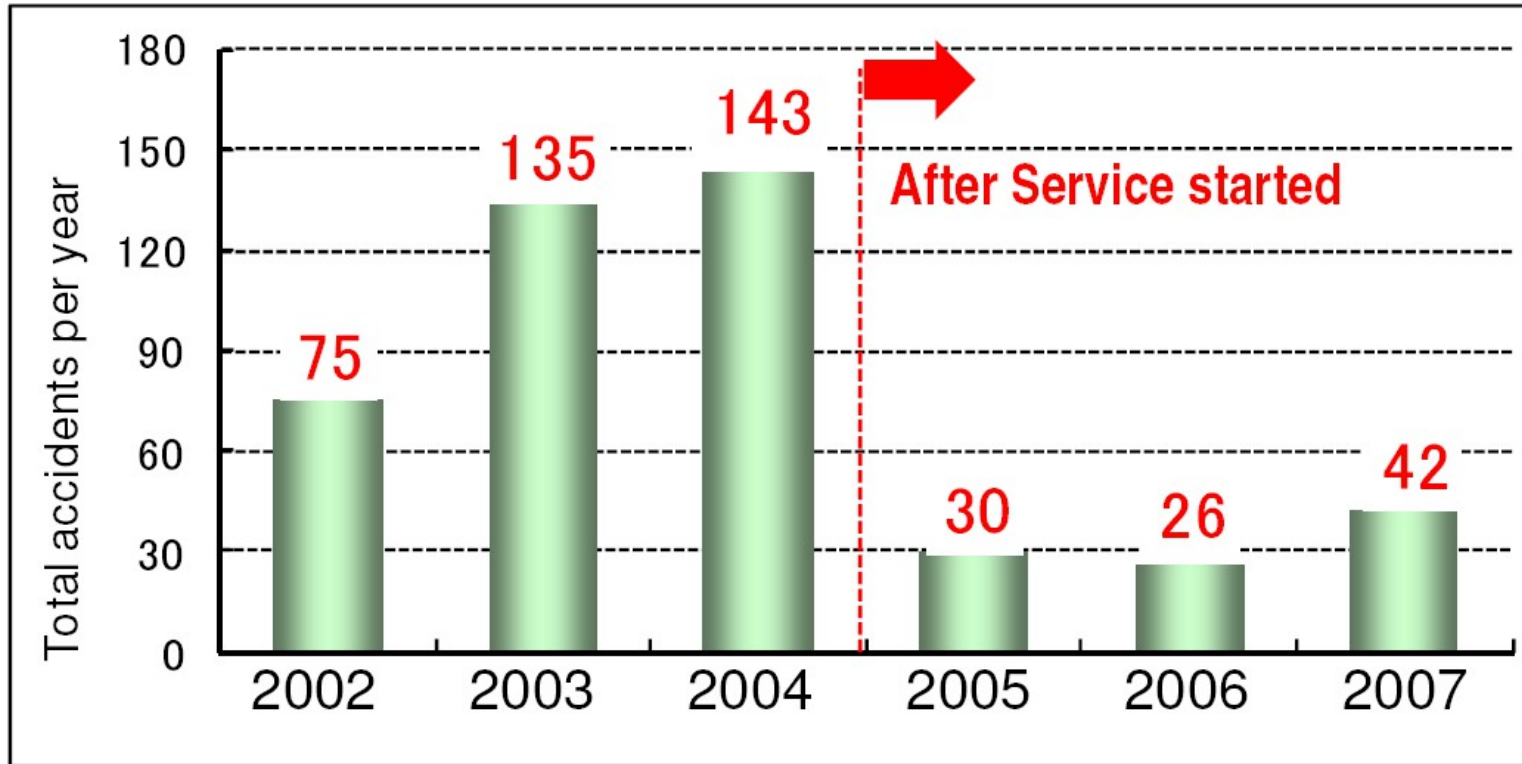
**Caution to notify traffic congestion
beyond curve**

**60% of collisions have been reduced at
Sangubashi Curve.**



INTELLIGENT TRANSPORT SYSTEM

Trend of total traffic accidents in 6 years (2002~2007)



SOURCE : –

NATIONAL INSTITUTE FOR LAND AND INFRASTRUCTURE MANAGEMENT
MINISTRY OF LAND, INFRASTRUCTURE, TRANSPORT AND TOURISM, JAPAN

INTELLIGENT TRANSPORT SYSTEM

- INTERSECTION CONTROL
- INCIDENT DETECTION
- VEHICLE CLASSIFICATION
- REVENUE COLLECTION
- PROVIDES CONGESTION MAPS
- TRAVEL TIME ESTIMATES
- PUBLIC TRANSPORT INFORMATION
- INDIVIDUAL VEHICLE MANAGEMENT
- ACCIDENT HANDLING



INTELLIGENT TRANSPORT SYSTEM – FOR FREIGHT

INTELLIGENT TRANSPORT SYSTEM – FOR CARS

CAR – NH 5 – BBSR CITY – ROAD PRICING (ITS)
MOTOR CYCLE - CRIME CONTROL

INTELLIGENT TRANSPORT SYSTEM

WEB-BASED TRAFFIC PLAN USING GIS

- DISTRIBUTION OF THE PLAN EASIER, WIDER, AND CHEAPER
- OFFERS BOTH STATIC AND DYNAMIC DIGITAL MAPS
- HELP INDIVIDUALS, KNOWLEDGE ABOUT THE TRAFFIC PLAN
- CITY PLANNER - ACCESS THE TRAFFIC DATA

RECOMMENDATION

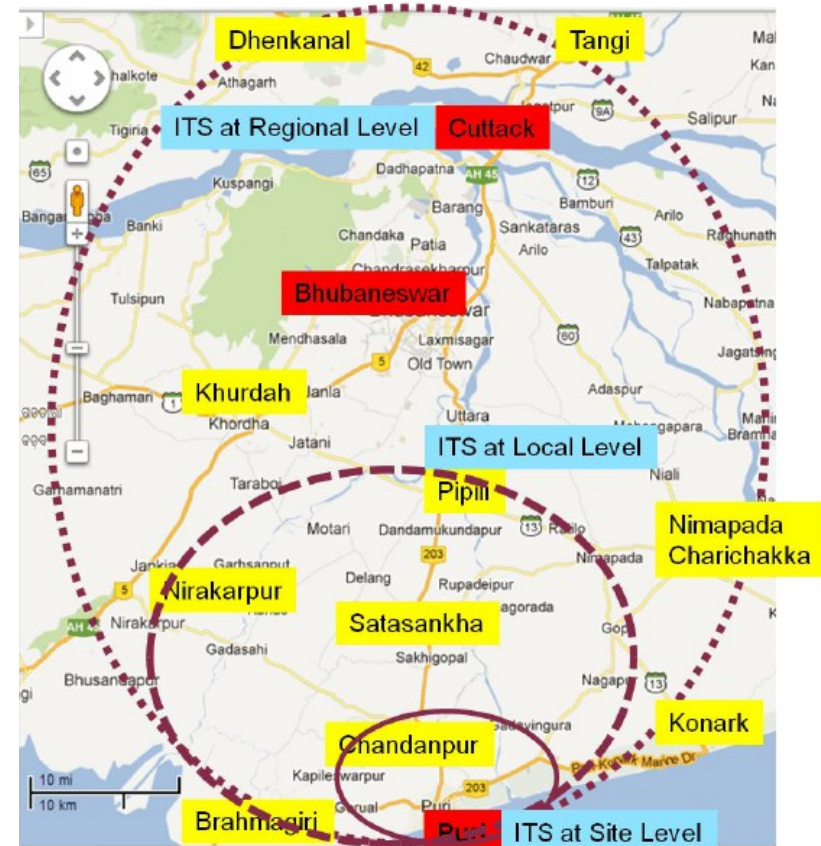
- IMPLEMENT - DESIGN BUILT MECHANISM.
- INFORMATION OF THE WEBSITE -THROUGH MEDIA.



INTELLIGENT TRANSPORT SYSTEM

INTELLIGENT TRANSPORT SYSTEM

- TRAFFIC ENFORCEMENT CAMERAS
- MOTOR VEHICLE DATA BASE - TOOL TO ENFORCE TRAFFIC LAWS.
- CAMERAS TO CAPTURE - **SPEEDING VIOLATIONS, UNAUTHORIZED USE OF A BUS LANE, AND FOR FUTURE CONGESTION PRICING SCENARIOS.**
- CAMERAS FOR **BUS LANE, RED LIGHT, SPEED LIMIT , STOP SIGN ENFORCEMENT AND NUMBER PLATE RECOGNITION SYSTEM.**
- DESIGN BUILD PROCUREMENT**



INTELLIGENT TRANSPORT SYSTEM – ADVANTAGES



SAFETY - DIRECT TRAFFIC AWAY FROM ACCIDENTS AND ALERT EMERGENCY SERVICES

PRODUCTIVITY - INCREASE THE CAPACITY OF CURRENT INFRASTRUCTURE

ENVIRONMENTAL PERFORMANCE - REDUCE CONGESTION , FUEL CONSUMPTION AND GHG EMISSIONS

LICENSE PLATE REGISTRATION NUMBER -> OWNERSHIP DETAILS - > PREVENTS CAR THEFT

HIGHWAY DESIGNED TO ENCOURAGE PEOPLE TO DRIVE LESS



Highway Expansion Encourages More Than Just Driving

In Colorado Project, Tolls, Bus Lanes And a Bike Path

BY AMY SCHWARTZ

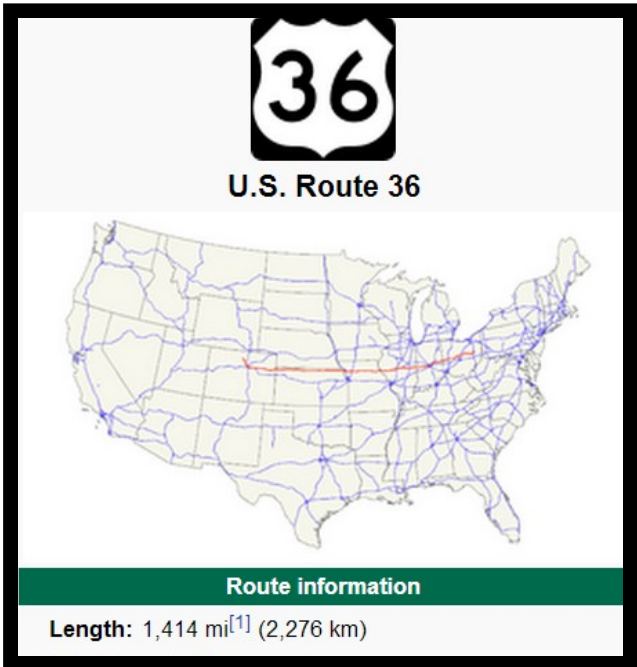
BOULDER — Driving on Boulder Road here offers a spectacular scenic view, but the scenic view is anything but idyllic. U.S. 36, the primary highway that connects the town, is crowded and often congested with cars, trucks, and buses. The road is also a major corridor for single-occupant cars and a bike path.



David E. Hunt, the executive director of the Colorado Department of Transportation, said when the first plans to build a toll road were in the state's mind, it was to build a toll road to fund a highway project. "These transportation systems need to be able to pay for themselves," he said.

U.S. 36, which opened as a toll road in 1992 at a cost of \$1.2 billion, was designed with a goal of being a model for other toll roads. It has a toll of \$1.00 per mile, and a toll of \$1.00 per mile for single-occupant cars, and a toll of \$1.00 per mile for single-occupant cars, and a toll of \$1.00 per mile for single-occupant cars.

U.S. 36 between Denver and is often crowded and often with bumper-to-bumper traffic. The system for single-occupant cars is often crowded and often with bumper-to-bumper traffic.



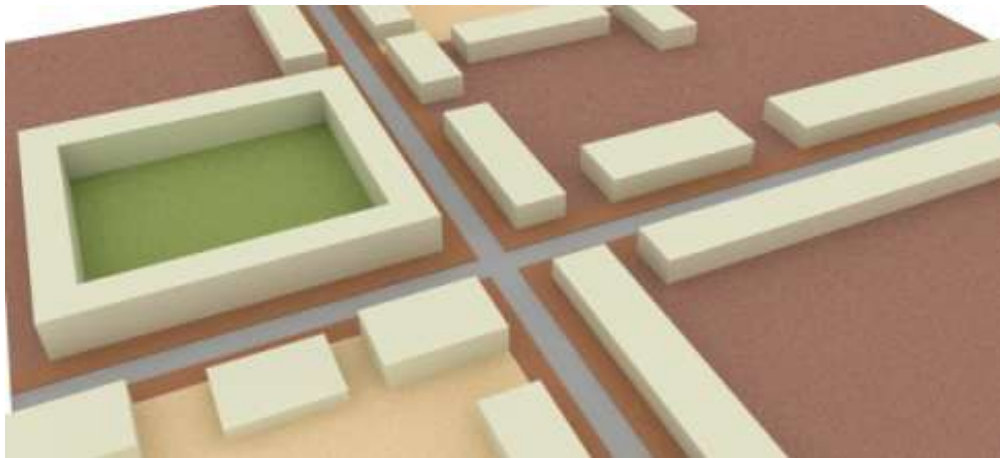
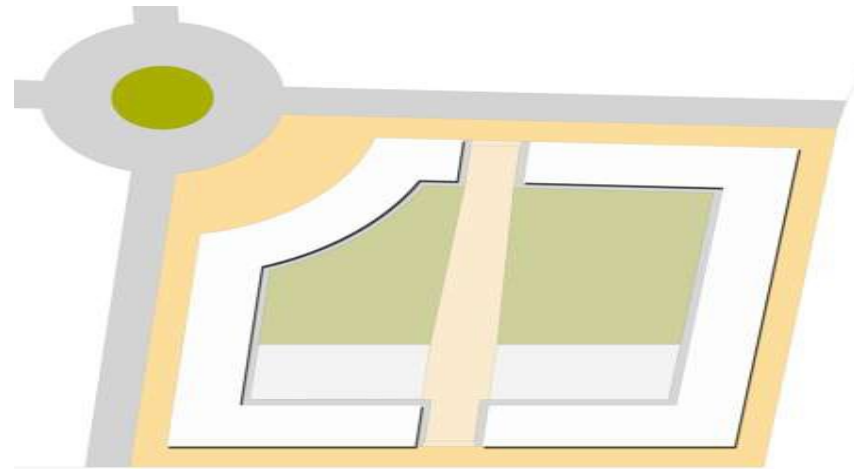
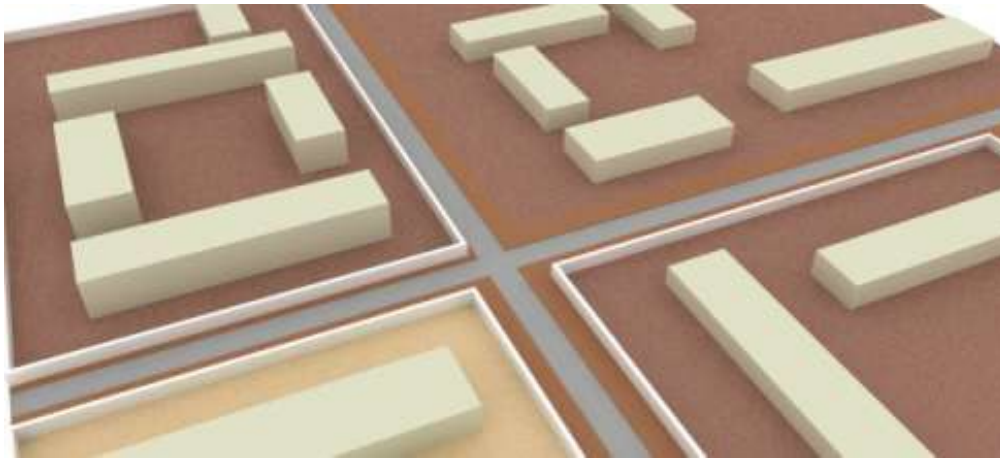
- CONGESTION PRICING
- SPECIAL LANE FOR HOV
- BRTS
- ELECTRONIC TOLL SYSTEM FOR SINGLE –OCCUPANT CARS AND BIKE PATH

THE NEW YORK TIMES 21.06.2013 PP-A12&A15



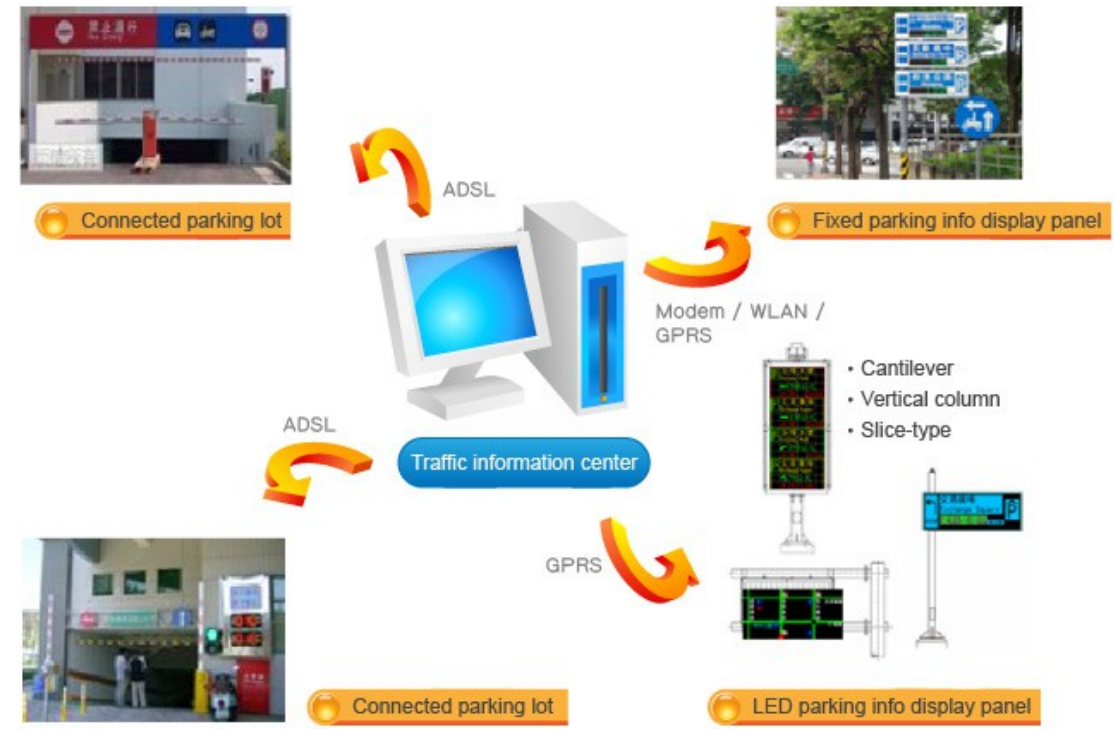
PARKING

WRAP AROUND PARKING



PARKING INFORMATION SYSTEM (PIS)

- BRIGADE'S SHOPS AND ESTABLISHMENTS ASSOCIATION – B'LORE
- SMS
- 3 DISPLAY BOARDS



ELECTRONIC PARKING SYSTEM



**ELECTRONIC PARKING IN BANGALORE AND CHENNAI
(PHONE BASE AND CREDIT CARD PAY SYSTEM)**

ALTERNATE SIDE PARKING



REVENUE COLLECTION

REVENUE COLLECTION FROM ITS

WB GOVT. COLLECTS RS 17 CR. FROM “ TRAFFIC FINES ” IN KOLKATA

REVENUE COLLECTION FROM PARKING

**ELECTRONIC PARKING SYSTEM – B’LORE – 100 SLOTS – RS 1.01 + CR. BETWEEN 2004-2009
COST - RS.36 LAKHS IN 2004
PARKING FEE IN 2004 - RS 10 / HR – MAX 2 HRS**

CITY BIKE SHARING PROGRAM



POLLUTION CONTROL MEASURES BY REGULAR MONITORING OF VEHICLES

- BHARAT II BUSES - OFF ROAD
- MONITORED ALL VEHICLE EMISSIONS RANDOM CHECKING
- STRICTLY MONITOR ISSUE AND RENEWAL OF LICENSE

CARPOOLING

The screenshot displays the SearchCarpools website interface. At the top, there's a browser address bar showing the URL: www.searchcarpools.com/view/details/1/delhi/2828/carpool-provided-from-iit-delhihaуз-khas-to-udyog-viharphase-2gurgaon. Below the browser bar, there are several promotional banners: a 'secured by: HOTSPOT SHIELD' logo, a 'DEAL OR NO DEAL' game with a 'Choose your box!' prompt and three numbered boxes (1, 2, 3), and a 'WIN £646,496.08' banner. To the right of these banners, there's a 'Page protected' status bar showing 'Data secured' and '2.52Mb'.

The main header of the website features the 'SearchCarpools' logo with the tagline 'Why Cab? Try Carpools'. Navigation links include 'Home', 'Cities', 'Promote Carpooling', 'Create Listing', 'About Us', and 'Blog'. There are also buttons for 'Login', 'Register', and 'WE'RE HIRING'. A location dropdown menu is set to 'Delhi'.

The search bar is prominently displayed with fields for 'City', 'From', 'To', 'Category', and 'Search for', followed by a 'Search' button. Below the search bar, there's a section titled 'Carpool in Delhi/NCR' and a button labeled 'Post Carpooling Requirements' with a 'FREE' tag and the text 'try it's Free! it takes hardly 25 seconds'.

The main content area shows a list of carpooling options. The first listing is titled 'Carpool Provided From Iit Delhi,haуз Khas To Udyog Vihar,phase 2,gurgaon'. It includes a profile picture of the provider, a 'Share' button, and a 'Like' button. The listing details are as follows:

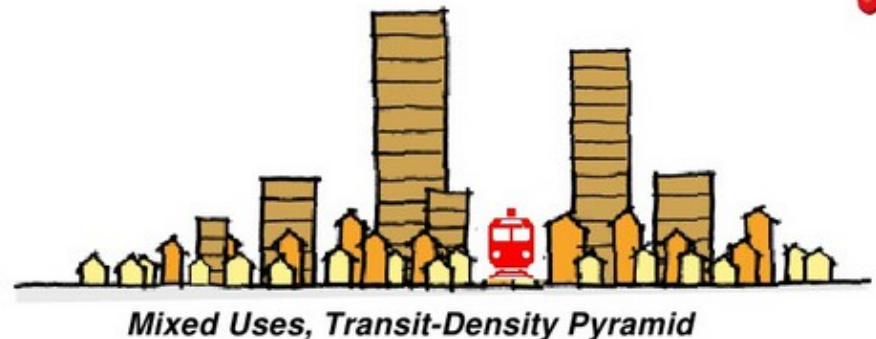
- By: Aruna
- Profession: Salaried
- Gender: Female
- Phone: Please SIGN IN or REGISTER
- From: Iit Delhi,haуз Khas
- To: Udyog Vihar Phase 2 Gurgaon
- Category: Carpool

Below the listing details, there's a form to 'Send Email' or 'Send FREE SMS'. The form fields are 'Your Name:', 'Email:', and 'Your Message:'. To the right of the form, there's a promotional banner for 'NOW, find CAB & CAB PARTNERS too, post your requirement' with a 'Register NOW' button. Below this banner, there's a Facebook link that says 'Become A Fan of SearchCarpools'.

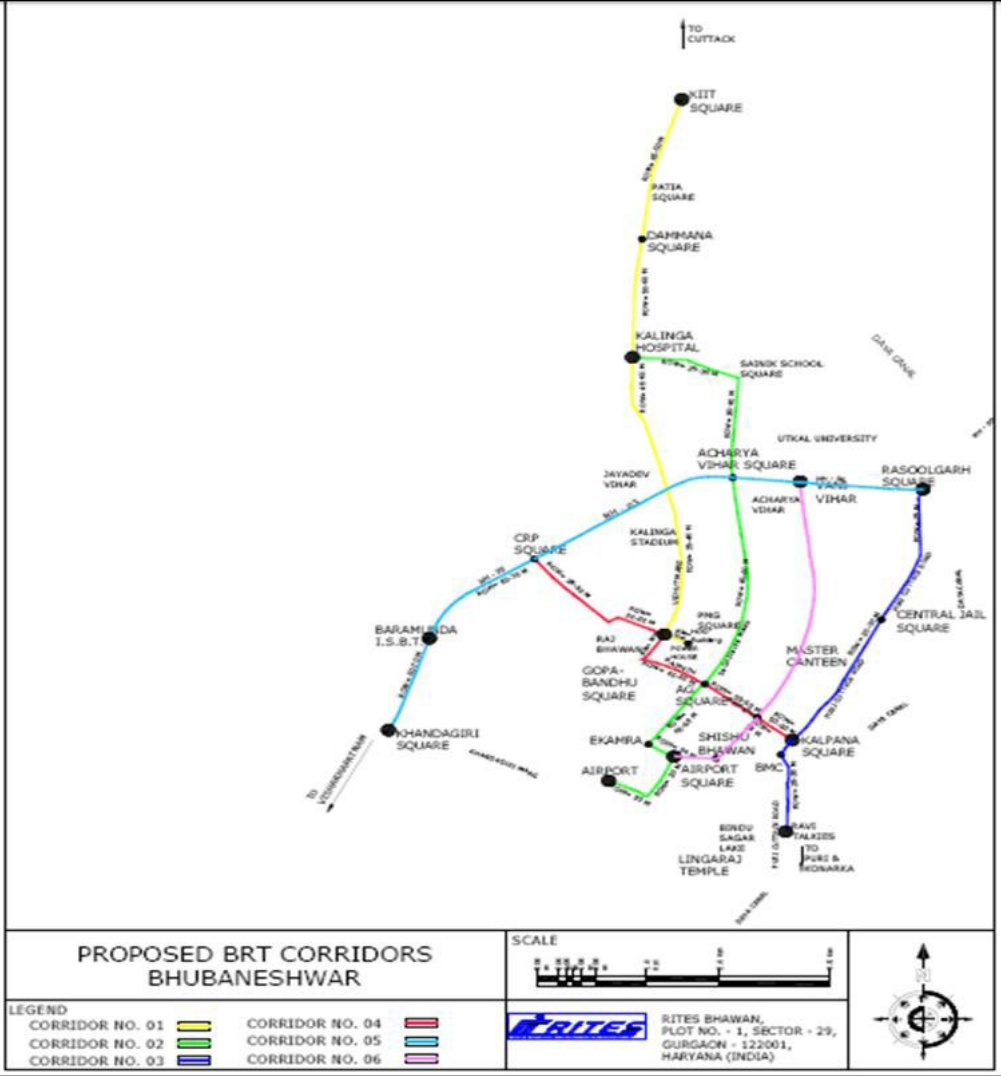
The bottom of the screenshot shows a Windows taskbar with various application icons and a system clock indicating the time is 10:29 AM on 7/23/2013.

TRANSIT ORIENTED DEVELOPMENT

SMART GROWTH - COMPACT CENTERS WITH ACCESS TO PUBLIC TRANSIT.



TRANSIT ORIENTED DEVELOPMENT



MRTS CORRIDOR TO BE IDENTIFIED BRTS SHOULD COMPLIMENT MRTS

•‘NO CONSTRUCTION ZONE’ TILL MRTS ALIGNMENT IS FIXED

•TOD AROUND MRTS NODES

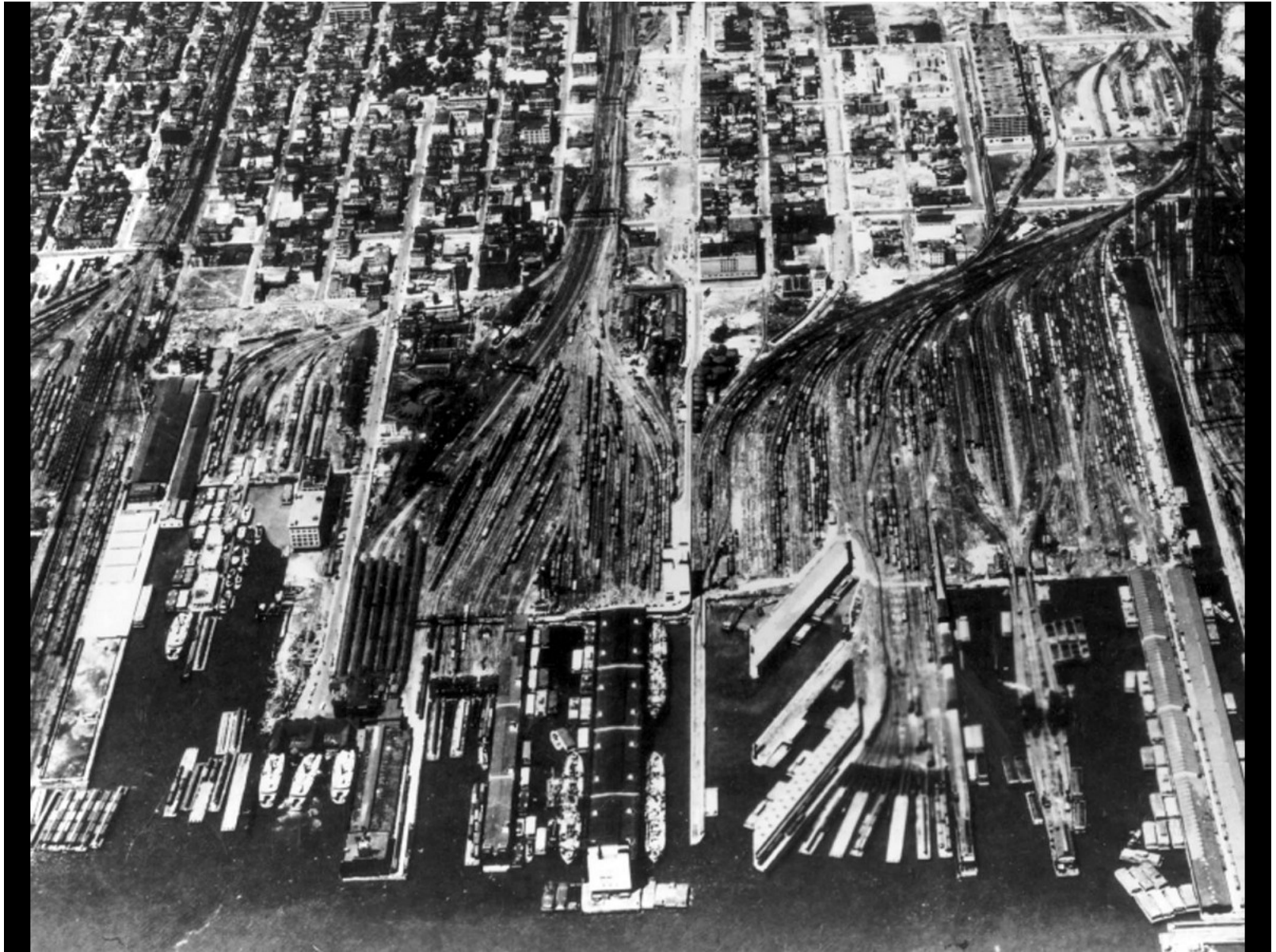
Jersey City

Redevelopment in the Shadow

















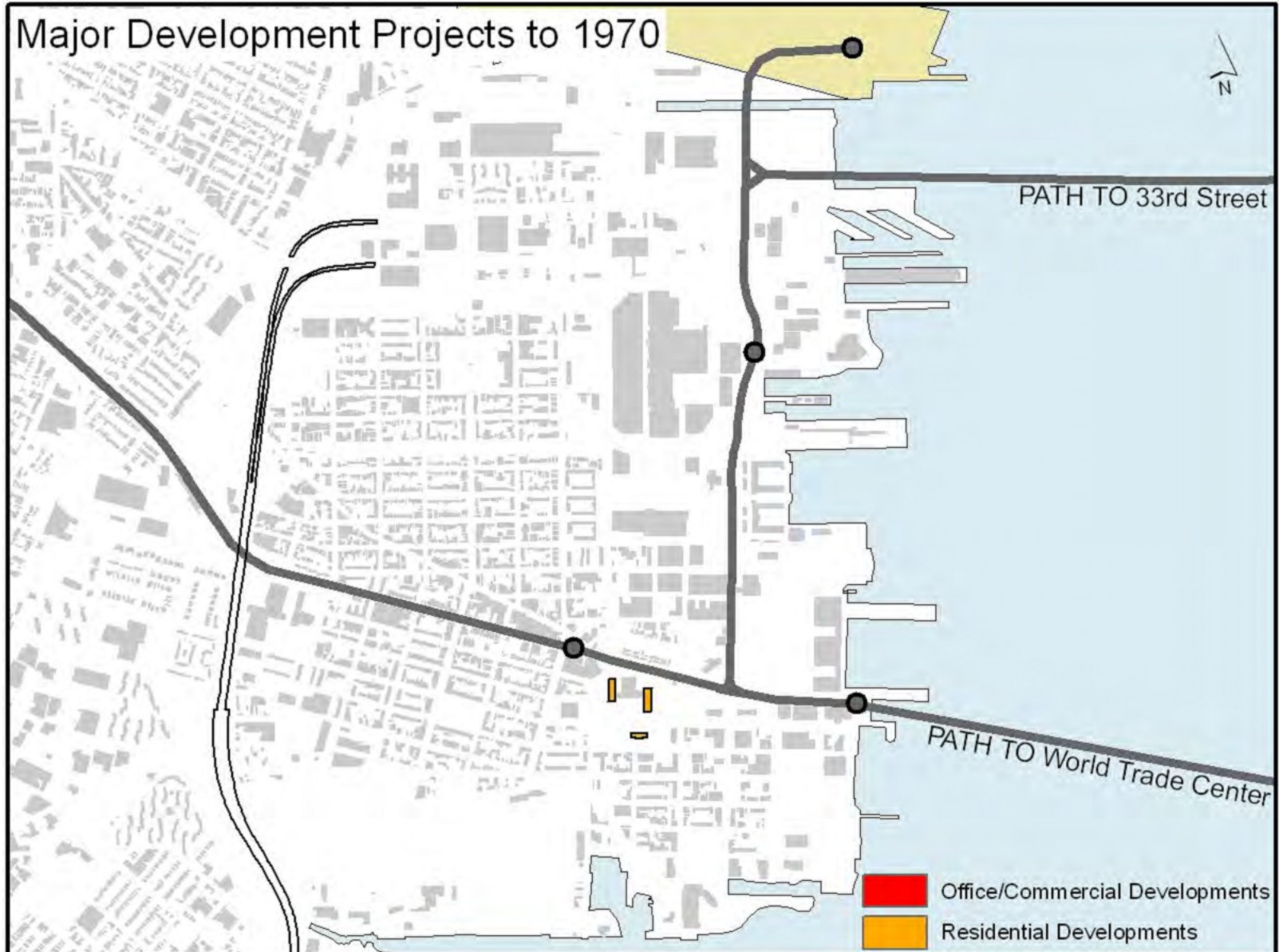




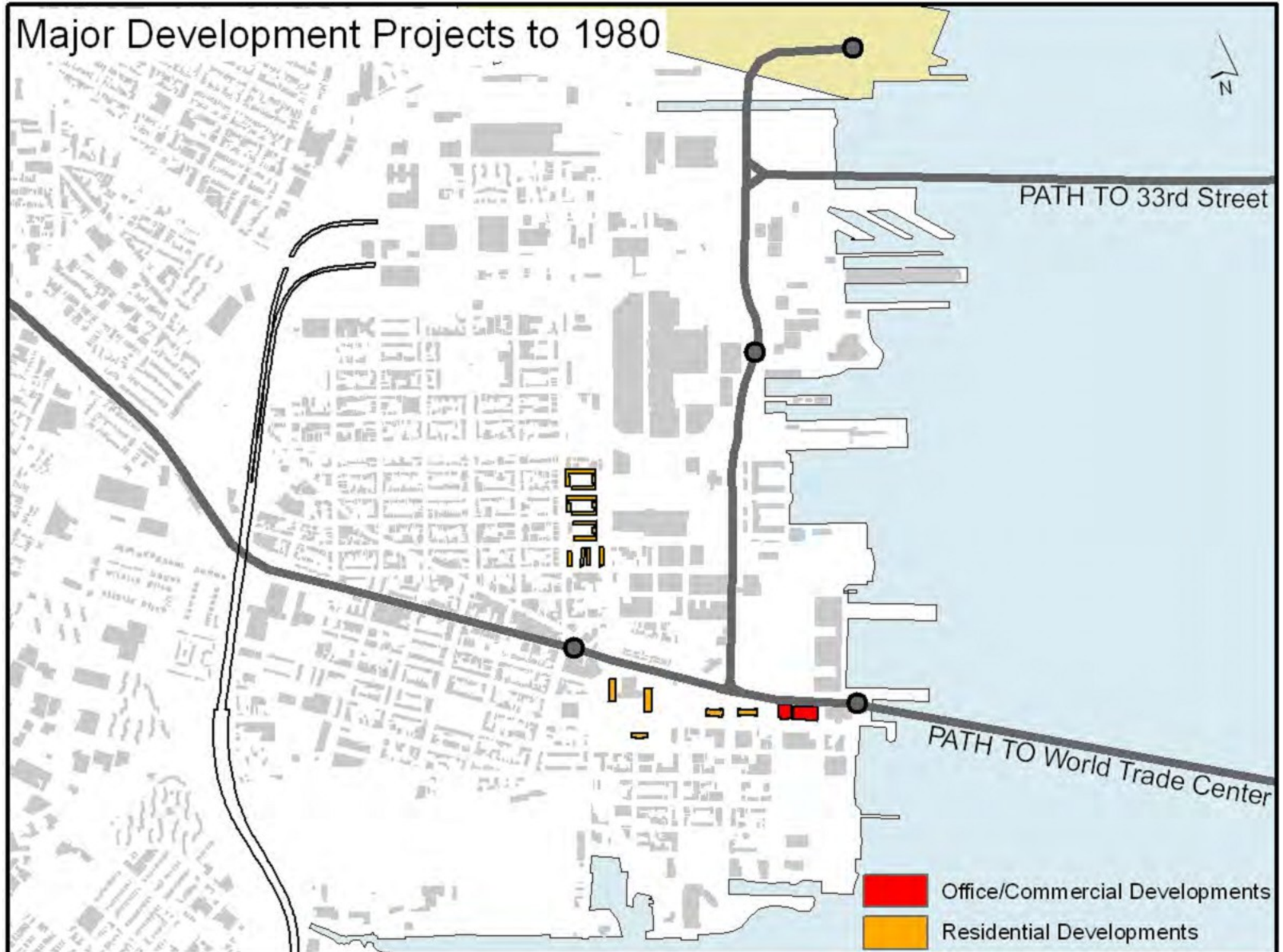




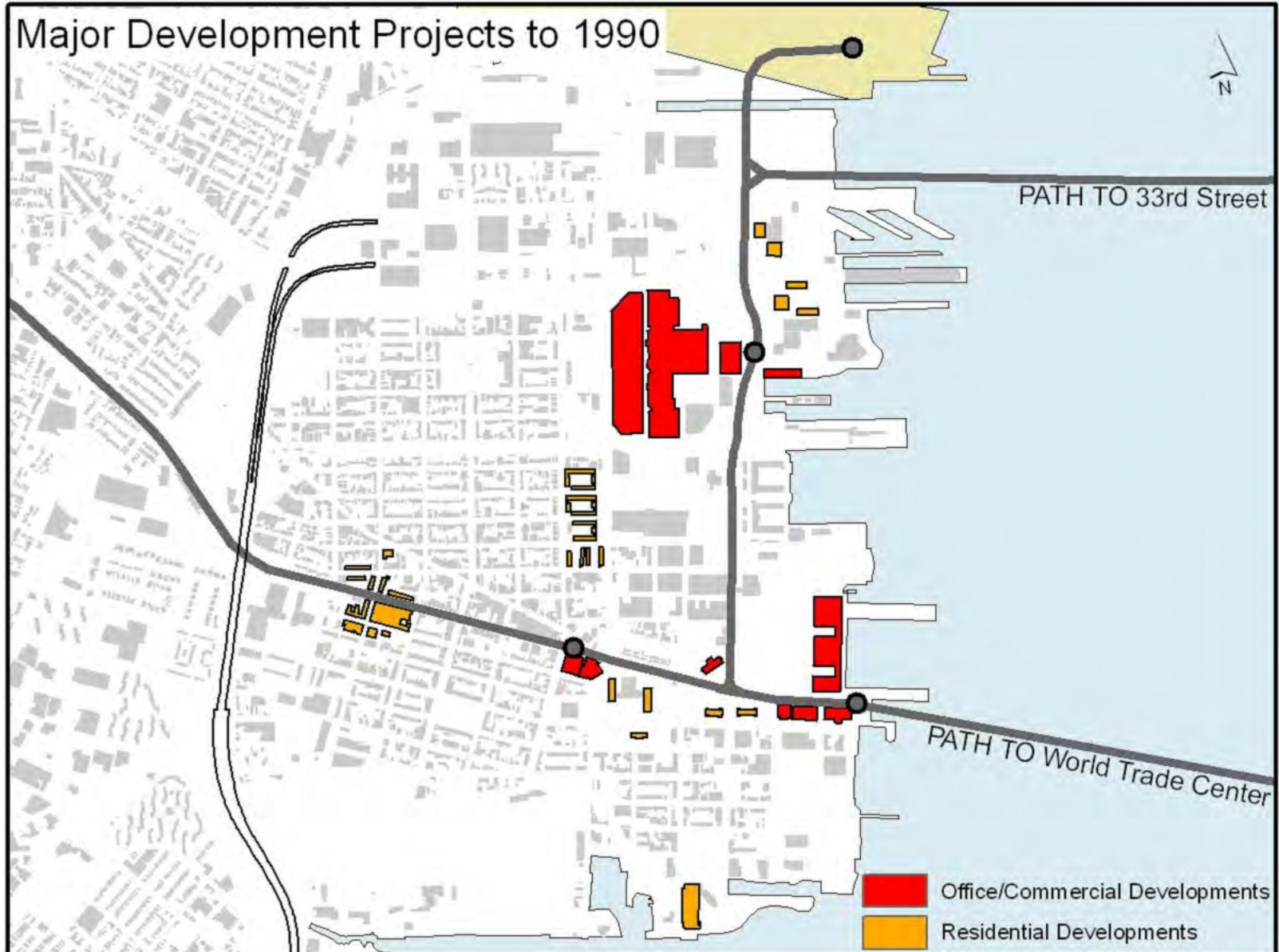
Major Development Projects to 1970



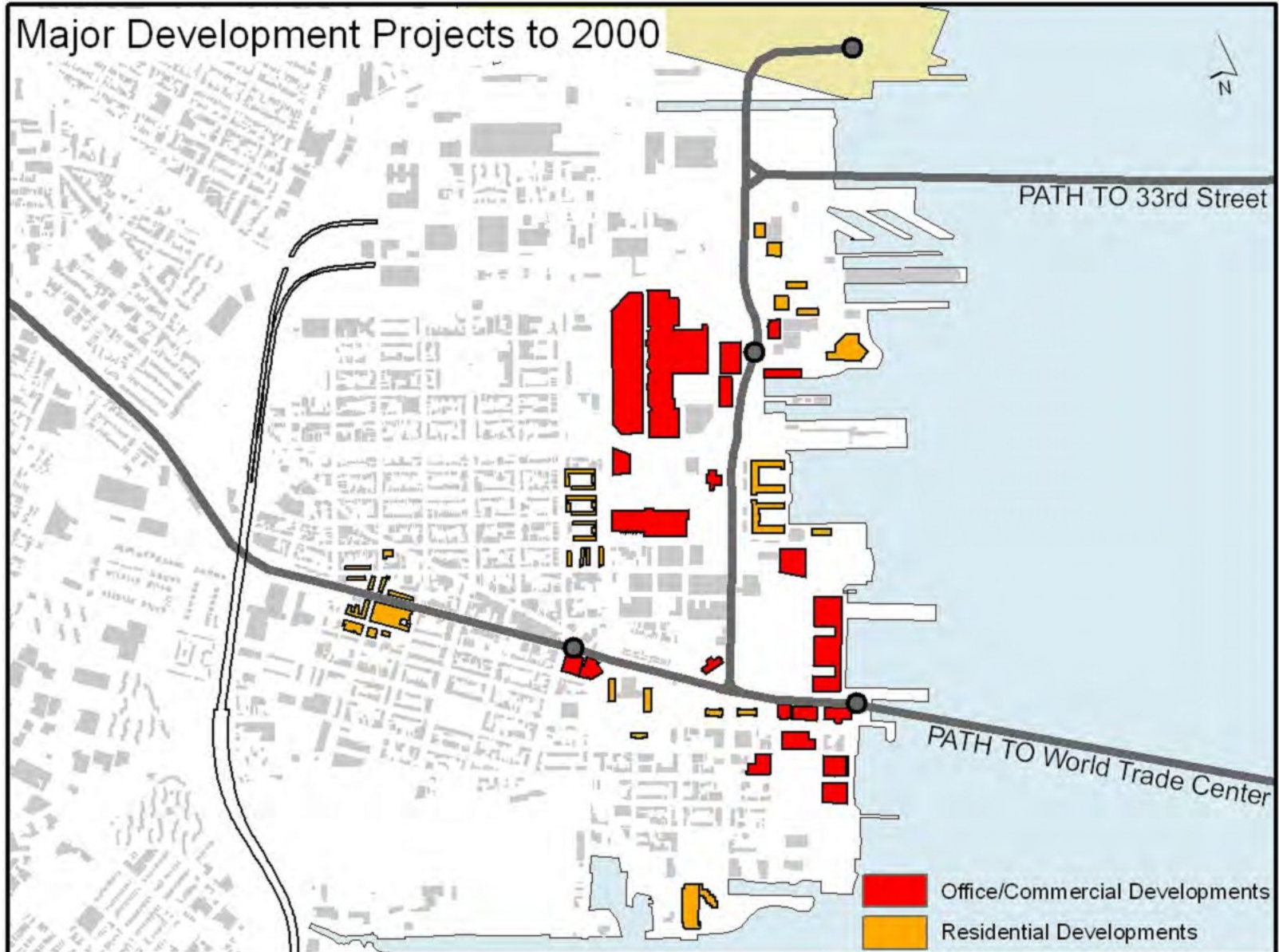
Major Development Projects to 1980



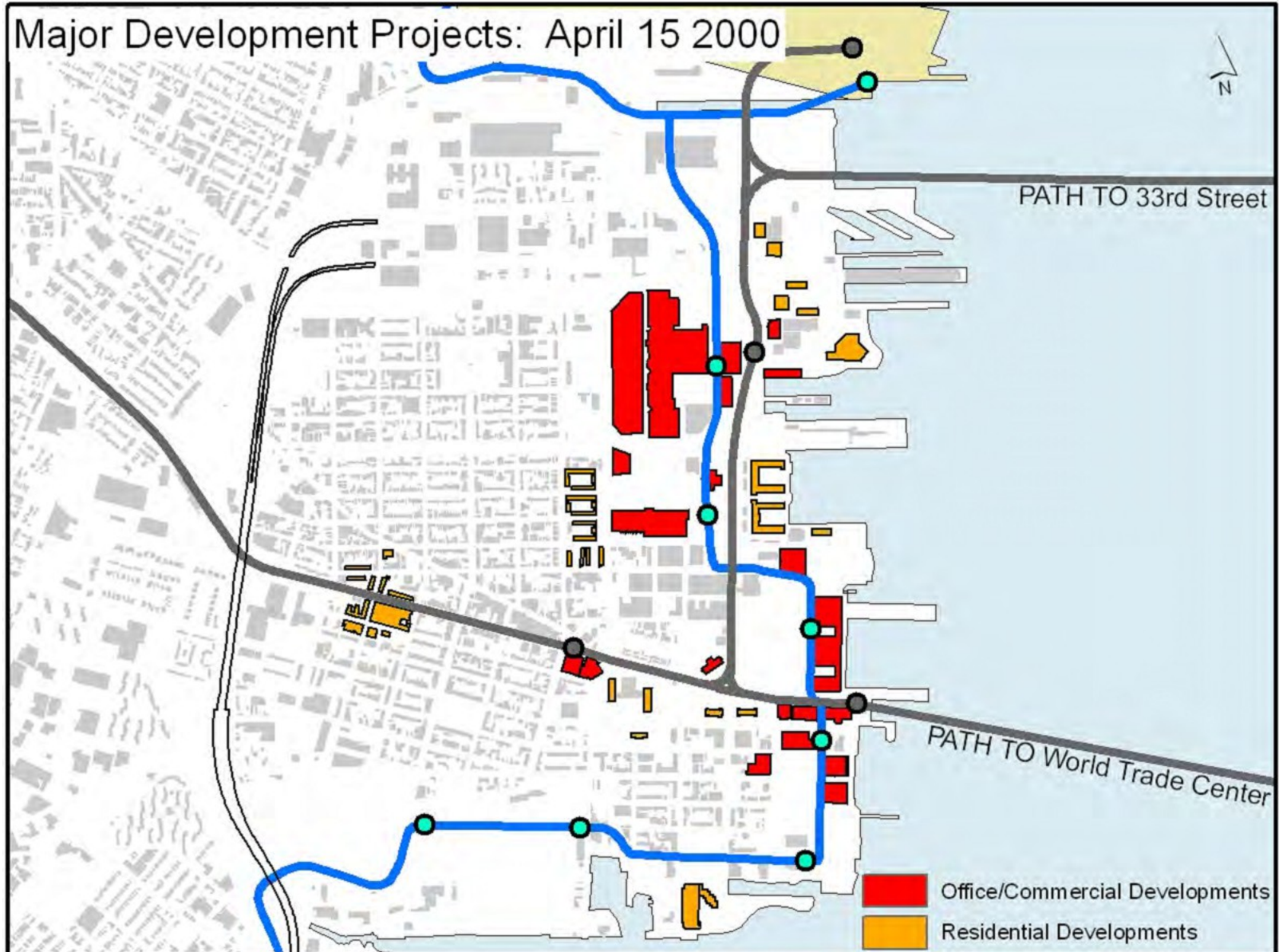
Major Development Projects to 1990



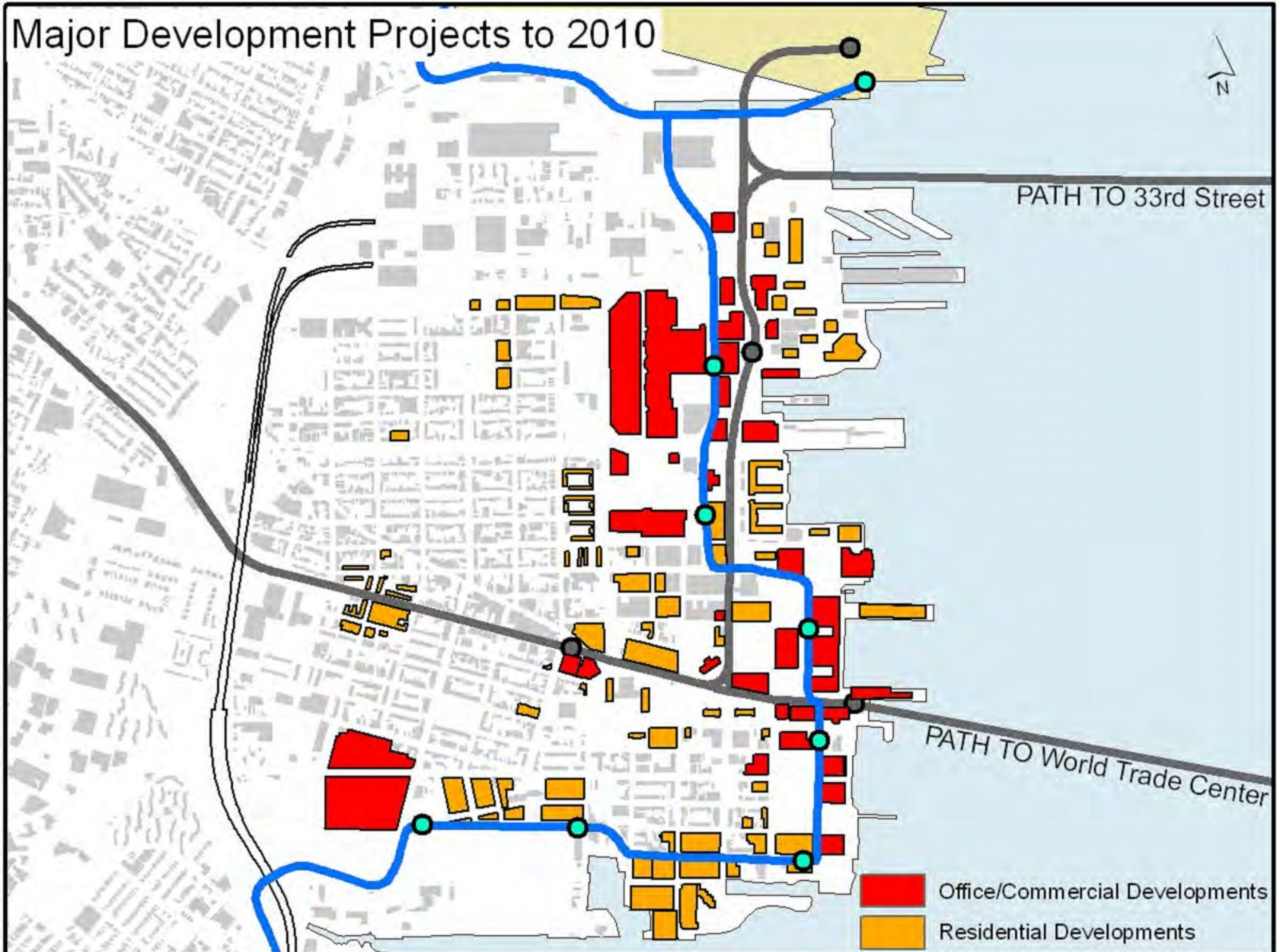
Major Development Projects to 2000



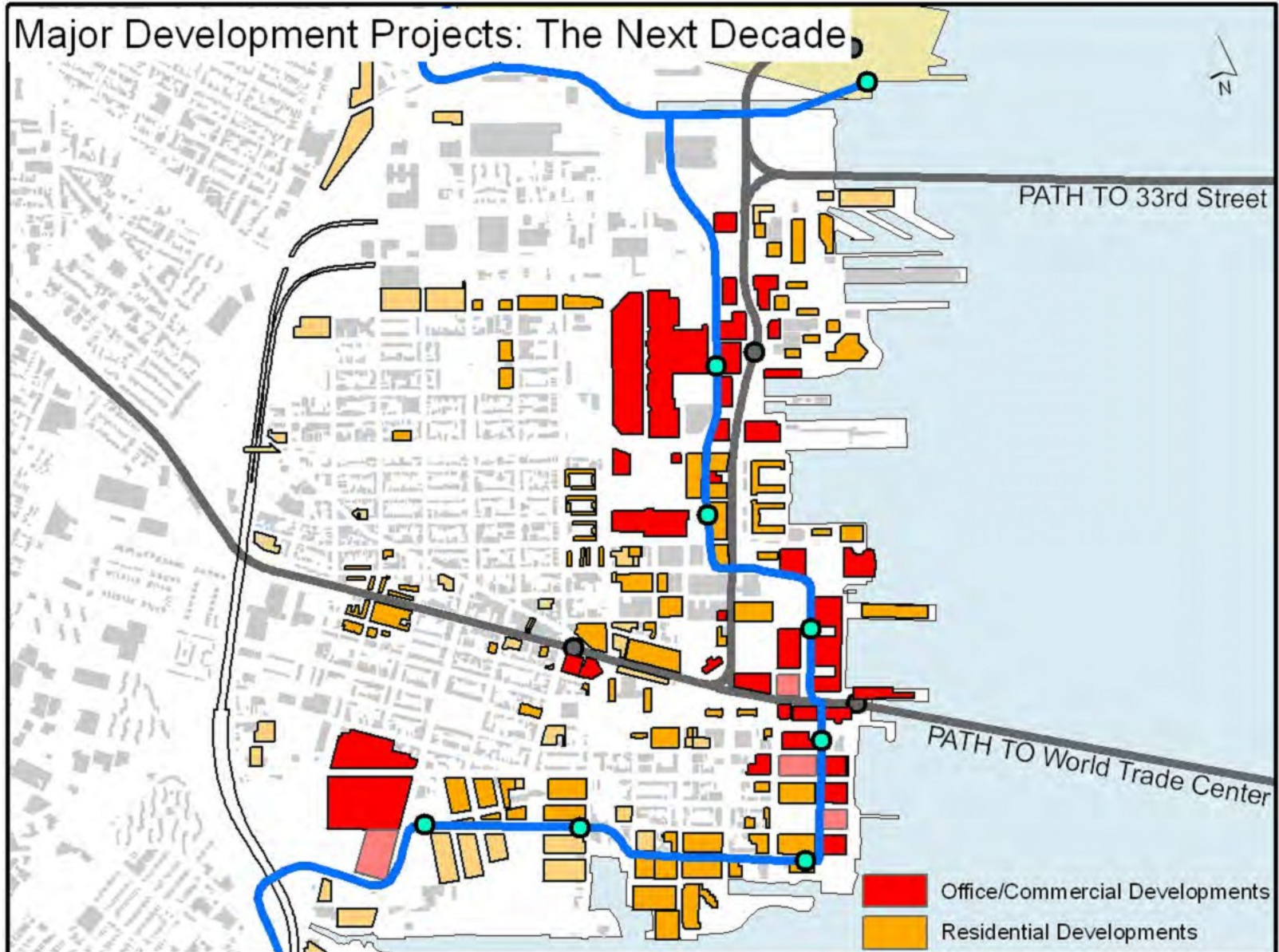
Major Development Projects: April 15 2000



Major Development Projects to 2010

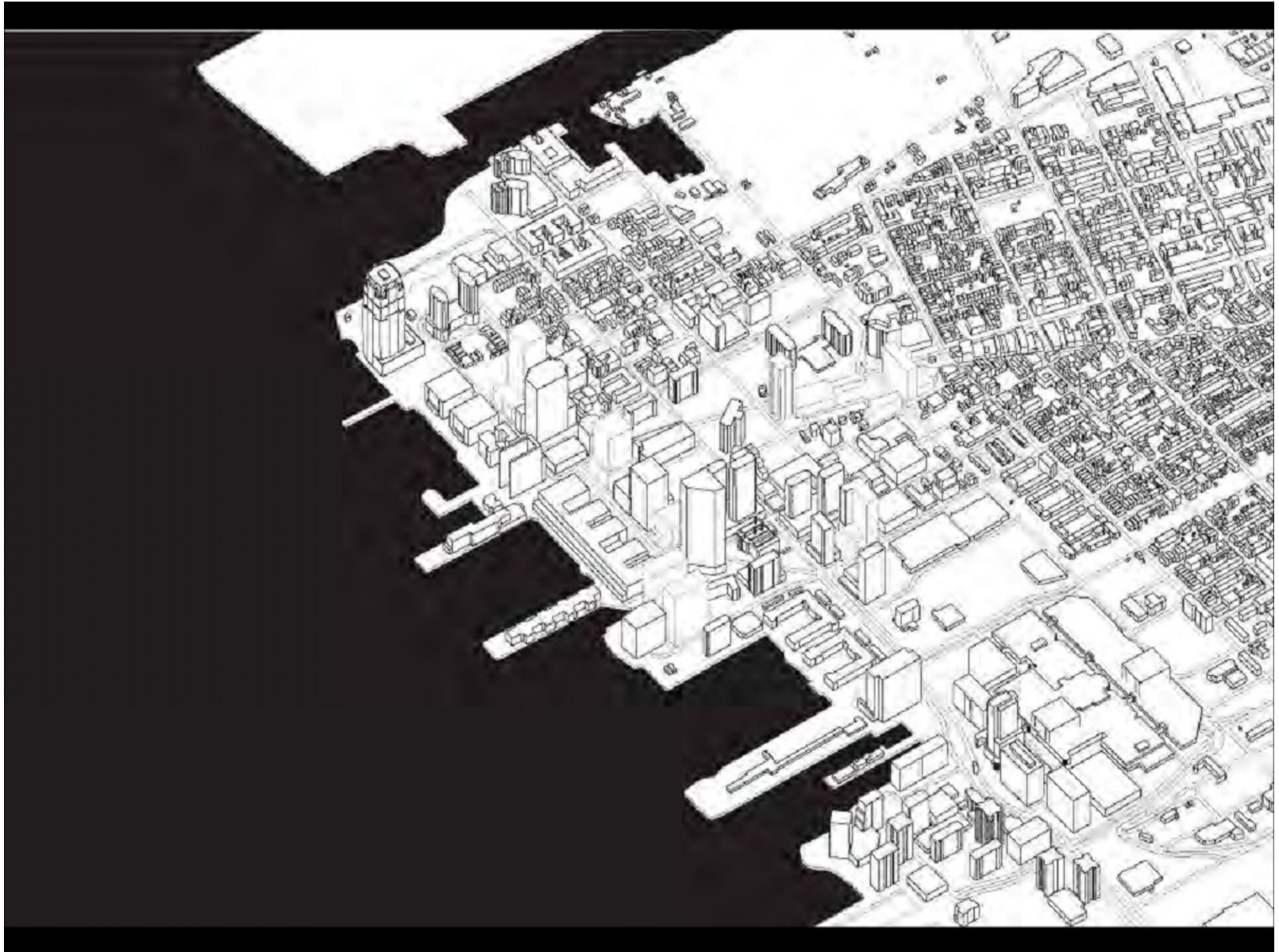


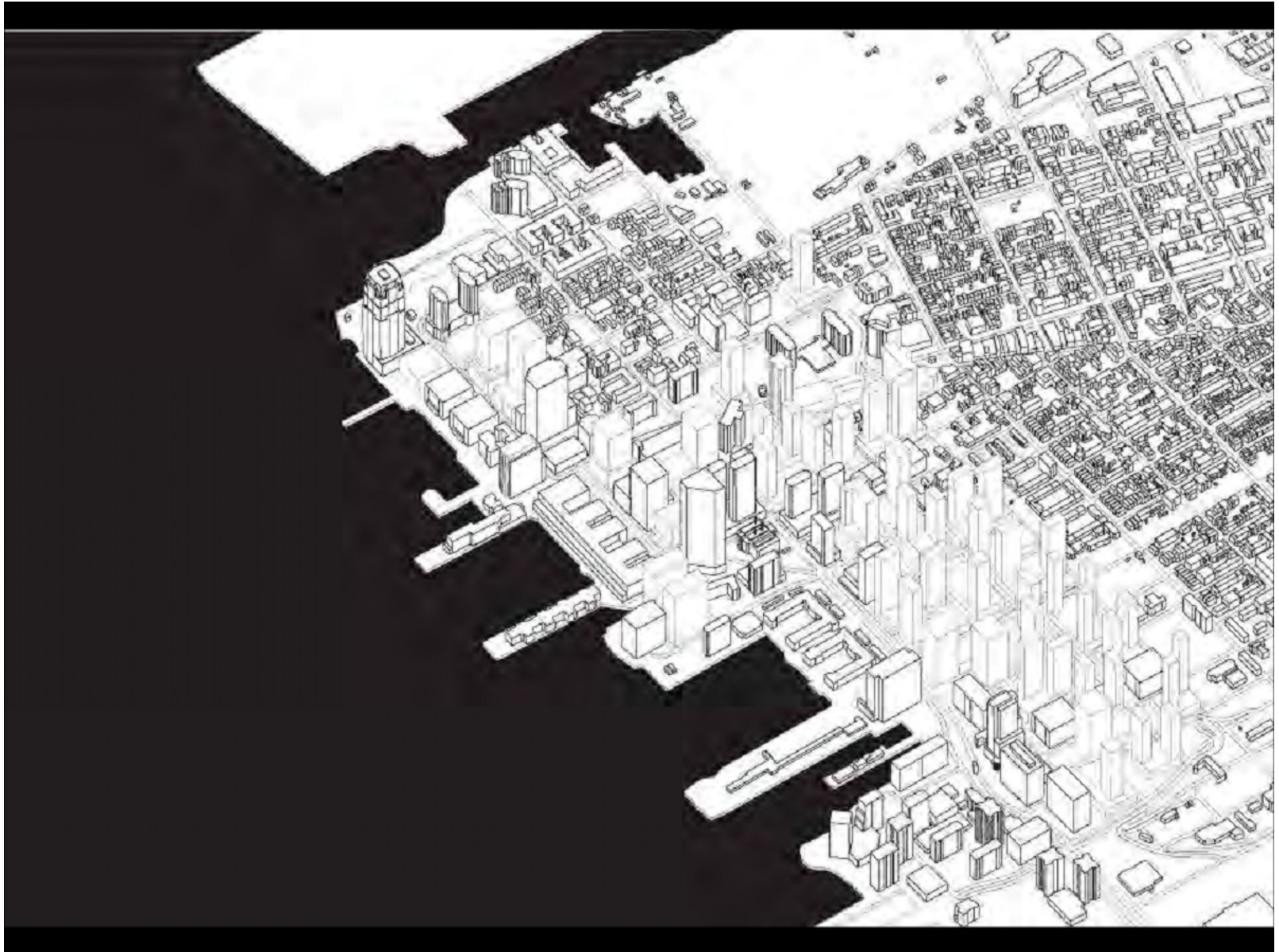
Major Development Projects: The Next Decade



Population Growth

















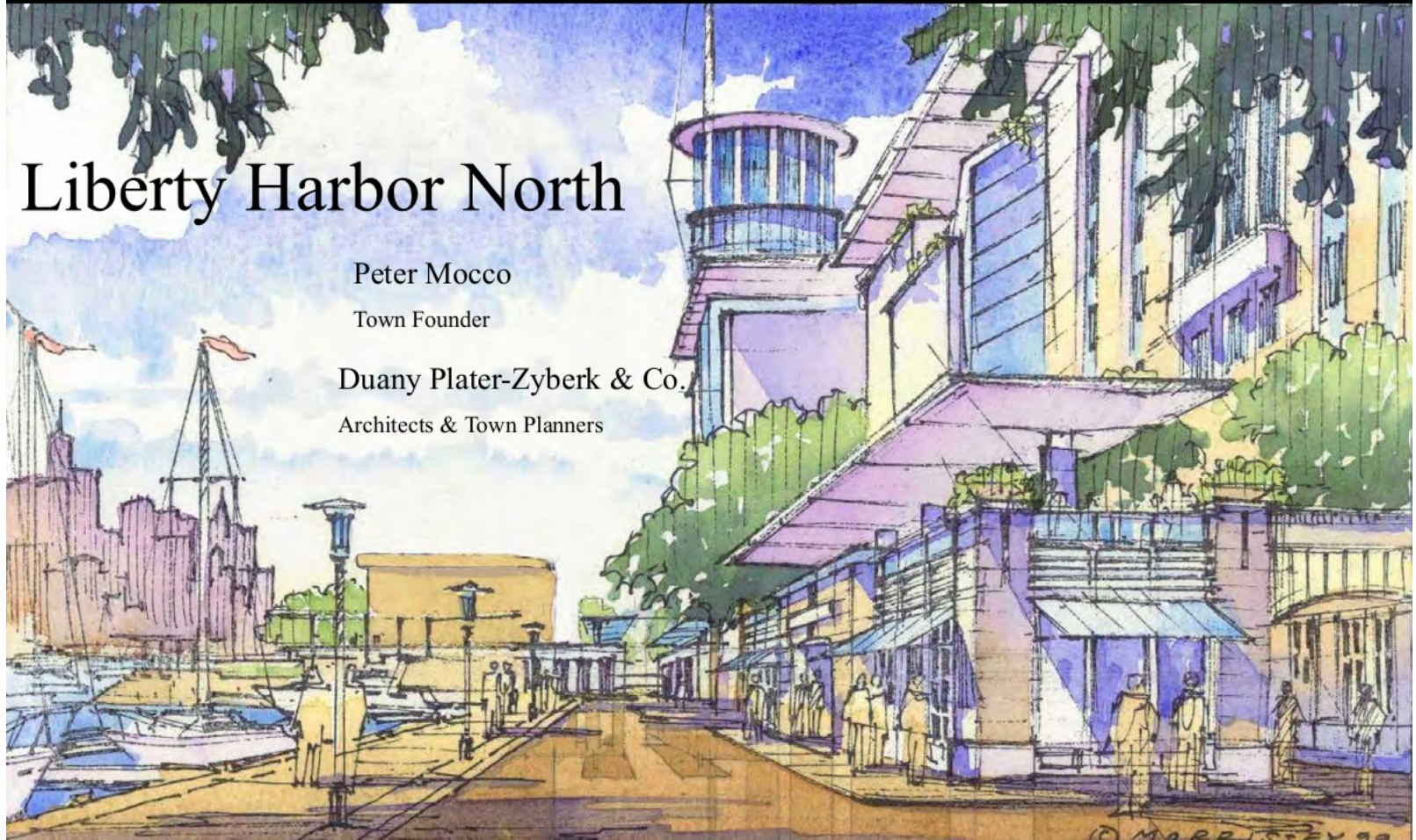
Liberty Harbor North

Peter Mocco

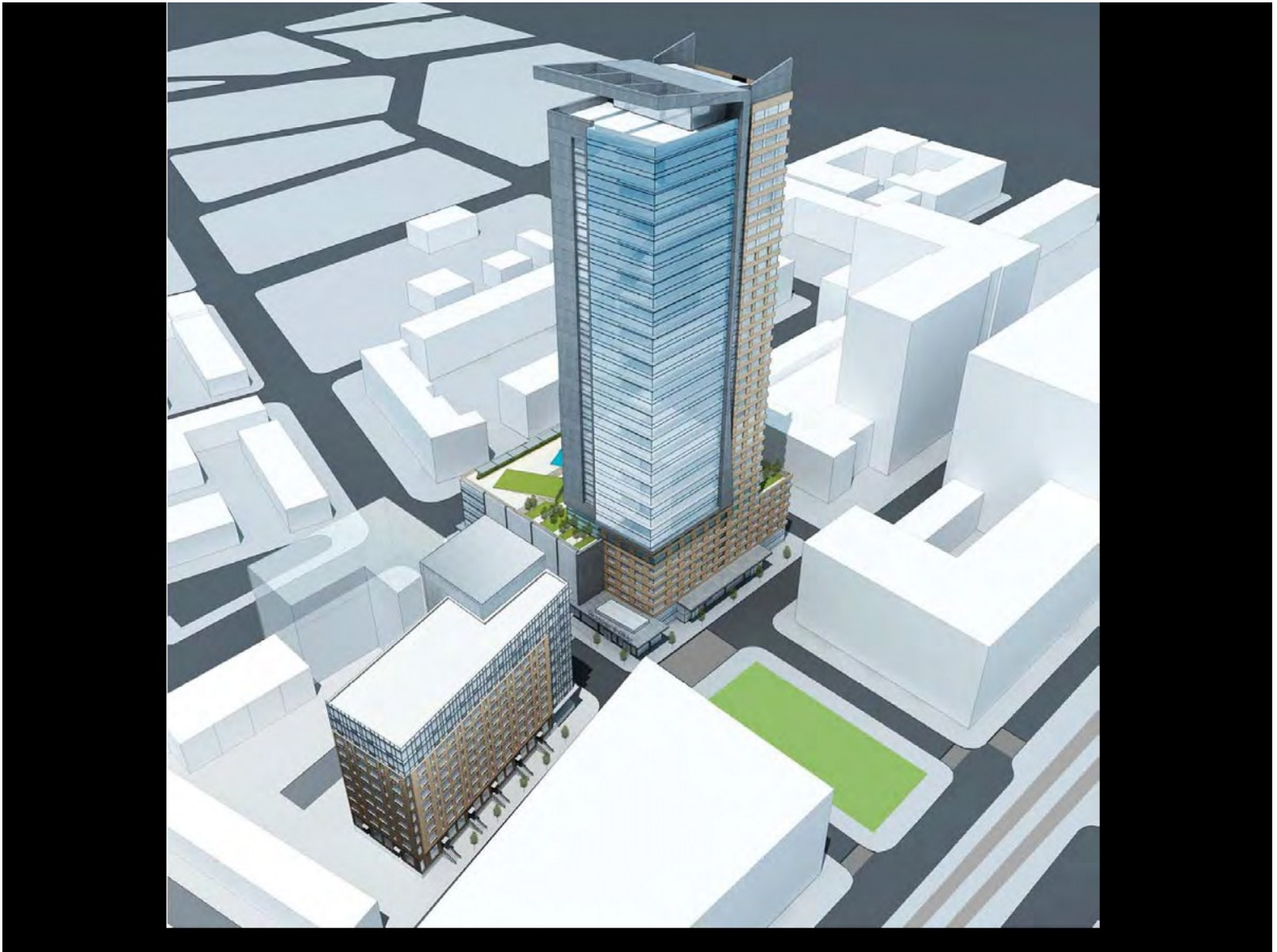
Town Founder

Duany Plater-Zyberk & Co.

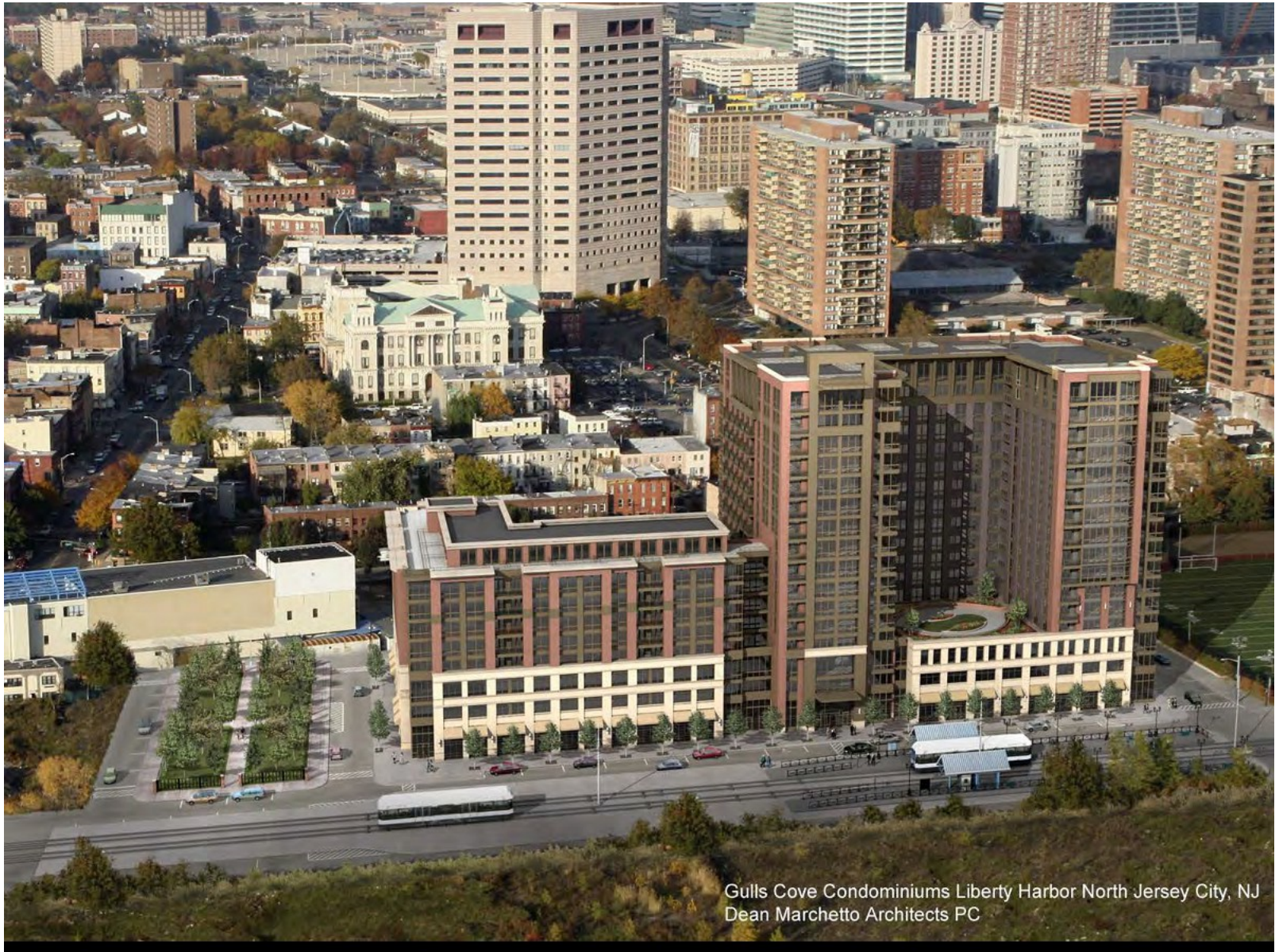
Architects & Town Planners











Gulls Cove Condominiums Liberty Harbor North Jersey City, NJ
Dean Marchetto Architects PC



RECOMMENDATION FOR REAL ESTATE AND INFRASTRUCTURE DEVELOPMENT

DETROIT IS A SYMBOL OF THE OLD ECONOMY'S DECLINE.

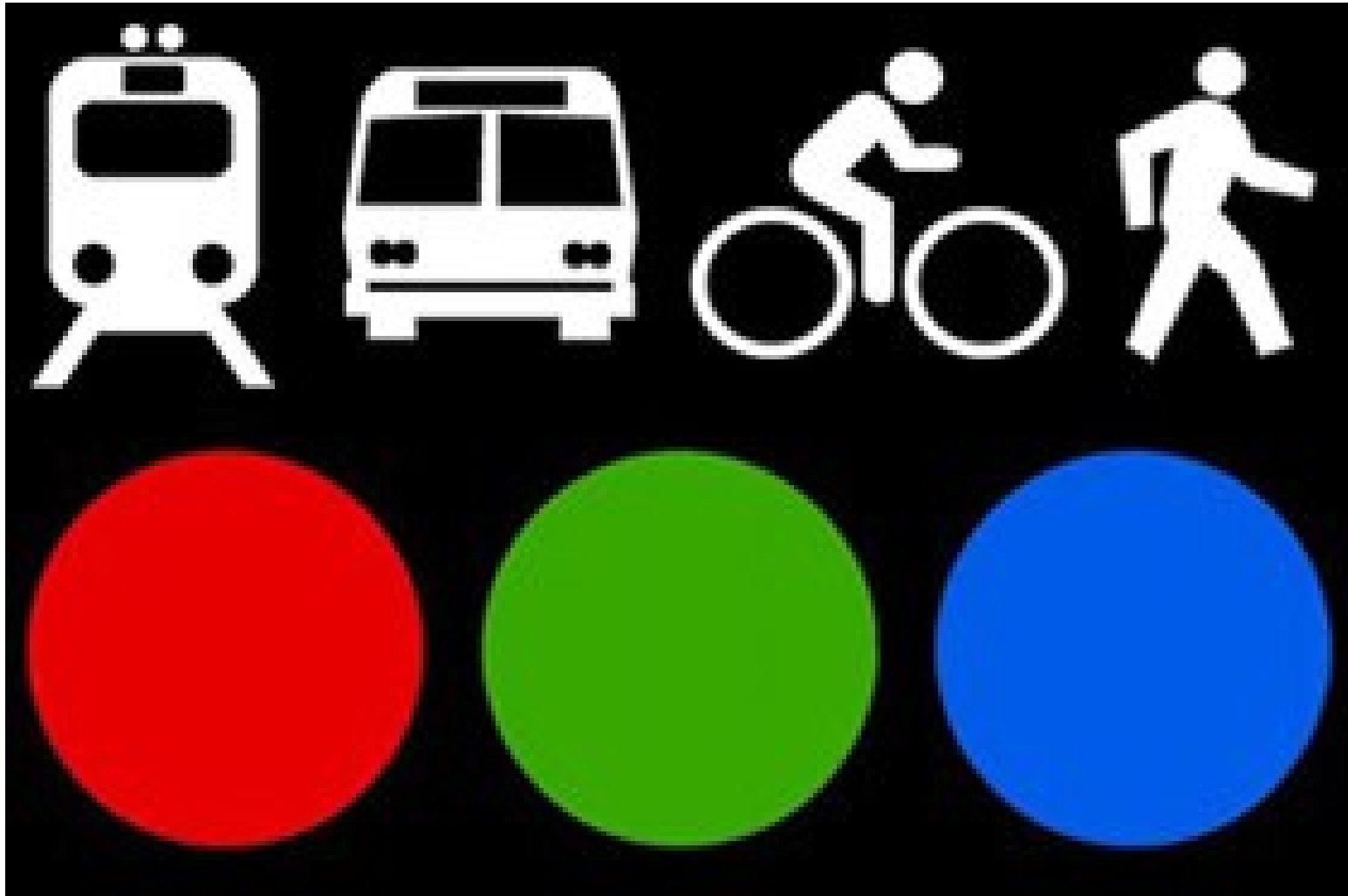
SPRAWL — MOVEMENT OF JOBS OUT OF THE CITY — TIME CONSUMING TRAVEL &
UNECONOMICAL - RESTRICTS SOCIAL MOVEMENT OF POOR

EFFECTIVE PUBLIC TRANSPORTATION SYSTEM NEARLY IMPOSSIBLE

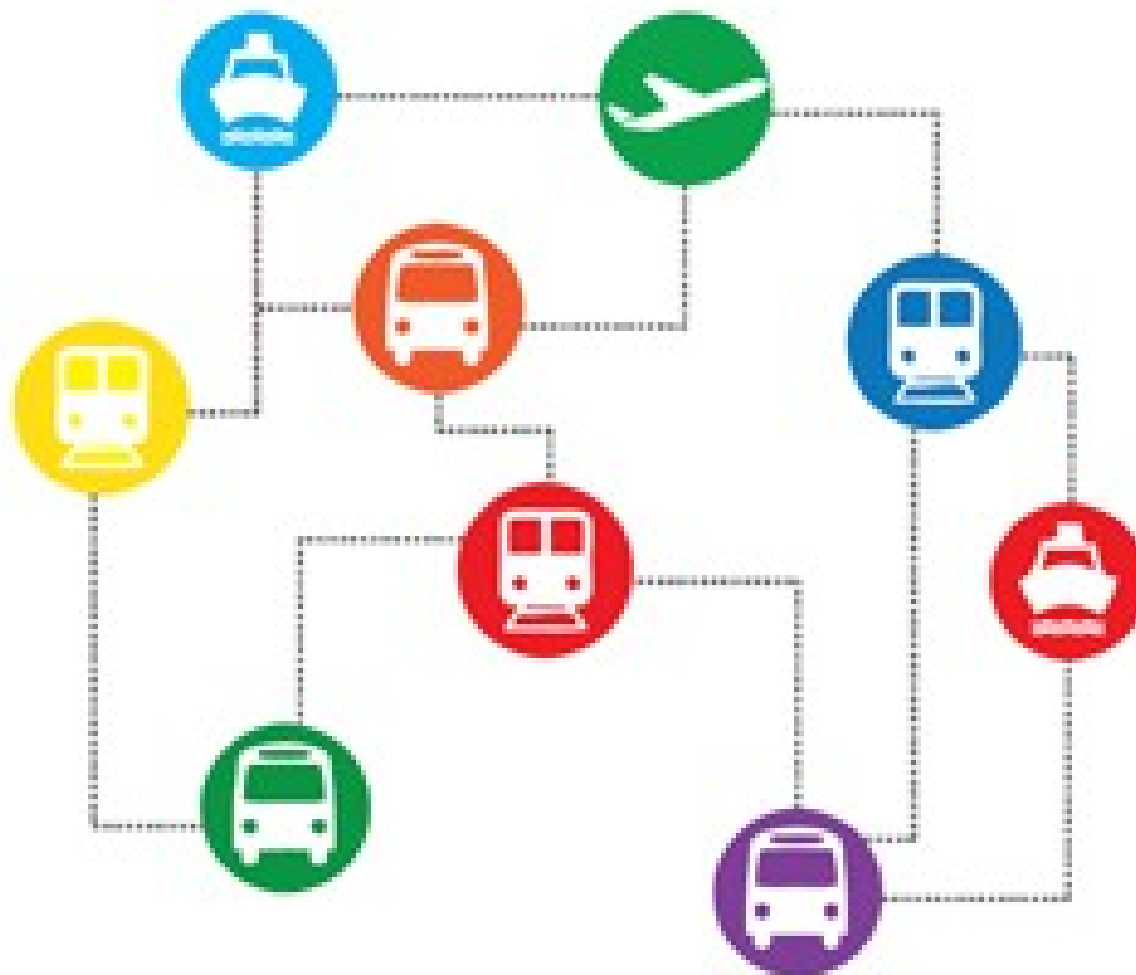
BUT NOT SAME FOR RICH



SEAMLESS



UNIFIED TICKETING



WHY UNIFIED TICKETING

- UNIFIED TICKETING IS A PIECE OF INFRASTRUCTURE THAT PROVIDES THE ABILITY FOR SMARTCARDS (AND OTHER TOKENS) TO BE USED ACROSS ALL MODES (RAIL, BUS, FERRY, TAXI) OF PUBLIC TRANSPORT TICKETING AND OTHER PAYMENTS.
- AT THE BOTTOM IS THE USER WITH SMART CARDS AND TOKENS USING IT TO TRAVEL THROUGH VARIOUS MODES.
- ALL MODES HAVE SAME KIND AND INTEGRATED CARD READER BUT VARYING OR SIMILAR FARE SYSTEM
- AT THE END IS A UNIFIED TICKETING SYSTEM WHICH CHECKS, MONITOR AND ASSIMILATES DAILY REGISTERED CARD USES, USER AND REVENUE.

Delhi Case Study, India

Delhi Metro AFC Central Clearinghouse

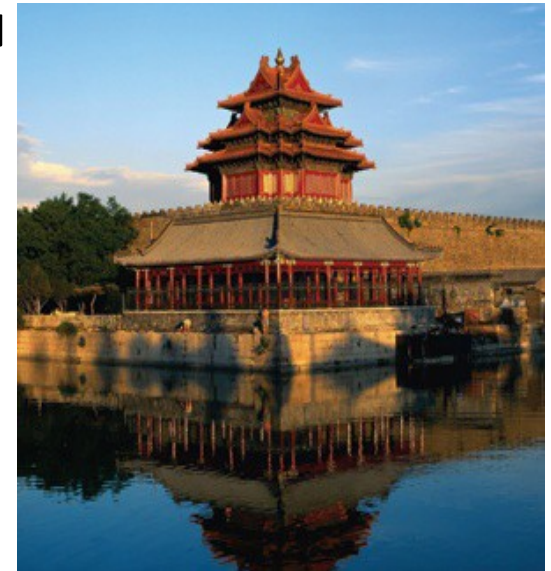
- Rapid transit light rail (metro) system
- Elevated, at-grade and under-ground sections
- ERG Central Clearing House installed for all metro Lines AFC systems
- Red Line (21 stations), Yellow Line (15 stations) and Blue Line (32 stations)
- Designed for Delhi's population of 14 million and beyond



BEIJING-CASE STUDY

BEIJING METRO AFC CENTRAL CLEARINGHOUSE IS THE MOST POWERFUL OF ITS TYPE IN THE WORLD

- SUPPORTS EXISTING BUS AND THE NEW TRAIN TICKETS
- FULL APPORTIONMENT & RECONCILIATION OF FINANCIAL POSITIONS PER LINE
- HIGH AVAILABILITY SYSTEM IMPLEMENTATION
- HOT-STANDBY DISASTER RECOVERY SYSTEM
- INTEGRATION AND TRAINING SYSTEMS
- DESIGNED AND TESTED FOR A POPULATION OF 30 MILLION
 - 10 MILLION PASSENGER JOURNEYS PER DAY
 - 25 LINES
 - 500 STATIONS
- SYSTEM WENT LIVE ON THE 9TH OF JUNE 2009
- SUPPORTS RE-USABLE AND PERSONALISED CARDS



The diagram illustrates a complex network architecture for the Beijing Metro system, centered around a cloud-based core managing Configuration Data and Usage Data.

Main Centers and their Components:

- Disaster Recovery Centre:** Includes Storage, Laser Printers, Workstations And Laptops, Windows Management Server, Adaptation Server, DMZ (Web Server, Comm Server), Backup Server, Control & Monitoring Server, Report & CD Server, Application Servers, Online Server, and Offline Server.
- Test & Training Centre:** Includes Storage, Laser Printers, Workstations And Laptops, Adaptation Server, DMZ (Web Server, Comm Server), Control & Monitoring Server, Report & CD Server, Application Servers, Online Server, and Offline Server.
- Clearing Centre:** Includes Storage, Laser Printers, Workstations And Laptops, Windows Management Server, Adaptation Server, DMZ (2 x Web Server, 2 x Comm Servers), Backup Server, Control & Monitoring Server, Report & CD Server, Application Servers, Online Server, and 2 x Offline Servers.
- Ticket Centre:** Includes Personalised Workstation, 5x Personalised PCs, Card Personalisation and Printing Machine (5x Datacard SP55), Encoding/Sorting Workstation, UPS, HP LaserJet 1300, Card Coding/Sorting Machines (7x PBG-01), MF1 Coding Encryption Machine, and SAM Card Encryption Machine.
- Manager Centre & Office:** Includes Laser Printers, Workstations And Laptops.
- Traffic Control Centre:** Represented by a building icon.
- Bank Interface:** Represented by a classical building icon.
- Yikatong System (Bus Ticket Issuer):** Represented by an icon showing people at a ticket machine.

Line Centres: A large grid of circular icons represents various Line Centres, including Line Centre 1 (Thales), Line Centre 2 (Thales), Line Centre 3 (Thales), Line Centre 4 (Samsung), Line Centre 5 (Omron/Founder), Line Centre 6 (Unassigned), Line Centre 7 (Unassigned), Line Centre 8 (Thales), Line Centre 9 (CSS), Line Centre 10 (Samsung), Line Centre 10 Extension (Samsung), Line Centre Guangji Spur (Samsung), Line Centre Xiazhi (Samsung), Line Centre Chuang (Founder), and Line Fanchuan (Unassigned).

CONCLUSION

- **IMPROVE AIR QUALITY**

- MASS TRANSIT
- PEDESTRIANISATION
- “TRIP NOT MADE”

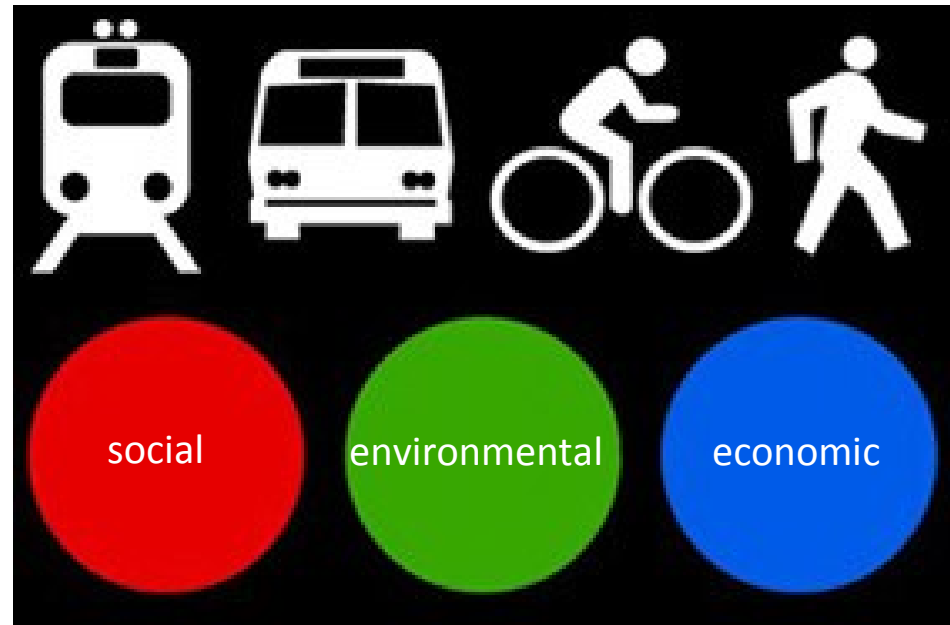
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- TRANSIT ORIENTED DEVELOPMENT

- **SOCIALLY EQUITABLE**

- FARES
- DURATION OF TRAVEL
- DISTANCE OF TRAVEL

ENHANCE INCLUSIVE GROWTH





A TRIP NOT MADE