

# THE MUMBAI MEGAPROJECT

Rev 00

Re – Imagining The Mumbai Metropolitan Region (MMR)



“ The Future Landscape Of Mumbai ” – A FLO Initiative



Bombay Chapter

Supported by  
Deutsche Bank



The Nataraja Foundation

# NOTICES

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## 1. LEGAL

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## 2. CONCEPT COMPLETENESS

The Mumbai Megaproject is fully defined by two documents as follows :

1. This Presentation and ...
2. Project Excel Workbook ( Excel Motherfile ) which contains all project calculations and financing details

City Authorities will need to go through both the documents to obtain a detailed understanding about the subject matter presented.

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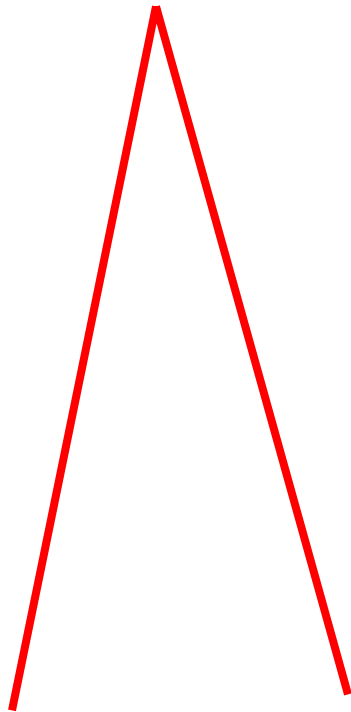
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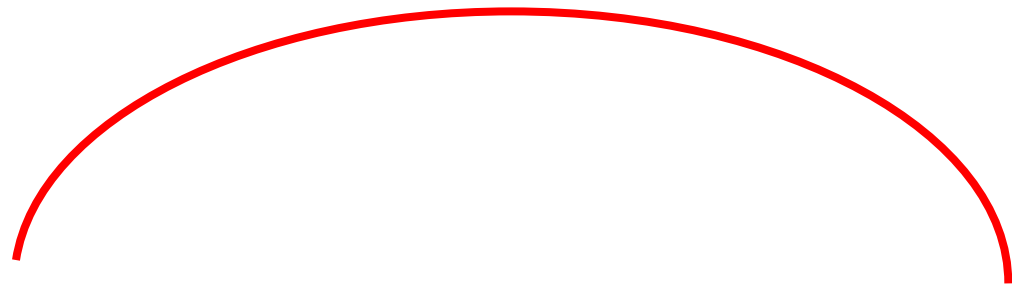
# CENTRAL DEVELOPMENT CONCEPT

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**Dubai & China Model**

Sarvodaya : “ The Rise Of All “



**Mumbai Megaproject Model**

Mumbai Megaproject is based on Gandhiji’s “ Sarvodaya ” Model

# EXECUTIVE SUMMARY



## 1. Mumbai Mega-Project Macro Description

- ❑ An executable plan to totally re-build Mumbai in 9 – 10 years ( 2014 – 2023 )
- ❑ Free Housing...Based on Dwelling Concept, For 9 Million Slum Dwellers in Mumbai
- ❑ Creation Of Financial Centers & Other Amenities ... 2 Financial Centres , Universities etc
- ❑ Transport : 210 Km of Underground Subway...60 % Reduction in Network Load
- ❑ Original Islands to be separated & Harbour to be Re-Developed into A Mega Port
- ❑ Executing Intelligent Urbanism Concepts “ Creating Large Open Spaces, Theatres, Cycling Corridors, Theme Parks and Large Public Spaces “.

## 2. Proposed Additional Investments in Maharashtra State ... Growth Catalysts

- ❑ Maharashtra High Speed Logistics Ring Corridor
  - 2700 Km , 6 Lane , High Speed Ring Road
  - Mumbai – Nashik - Nagpur – Gadchiroli – Nanded – Pune – Mumbai ... Bullet Train
- ❑ 30,000 Check Dams to restore Water Table in Maharathwada & Vidharbha
- ❑ Plantation of 2.5 Million Hectares of Dense Forest + 7,000 Acres of Mangroves
- ❑ 20,000 Acre Maharathwada Eco - SEZ + 4 Eco Cities in Tribal Areas

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**Huge Development Project ... Creation of 6 Million New Jobs in Maharashtra**

# EXECUTIVE SUMMARY



## 3. Project Macro Economic Impact

- ❑ Project Unlocks US \$ 308 Billion of Value in Mumbai to Rebuild the City
- ❑ Mumbai GDP (\$ 85 Bn) to triple by 2018, to exceed Singapore GDP @ \$ 310.69 Billion by 2024
- ❑ Infrastructure Investment Multiplier effect on Maharashtra economy > US \$ 500 Billion
- ❑ Project Repays Entire US \$ 46 Billion Debt of Maharashtra State ... Single Bullet Payment
- ❑ Project implements President Kalam's PURA Concept ... Stops Mass Migration To Cities by investing US \$ 90 Billion in Healthcare & Education across Rural India
- ❑ Rural Maharashtra Impact : US \$ 200 Billion ... ( Achieve Gandhiji's vision of Rural Growth )

## 4. Project Governance & Control Issues

- ❑ Project Execution & Control Imperatives to Minimize Funds Leakage :
  - Mumbai Governance Structure needs more clarity
  - Sophisticated IT Reporting System / Protocols to Execute Project ... Zero Funds Leakage
  - Transparent and Highly Centralized Procurement System for all Critical Items/ Contracts
  - Two Stage International Bidding ( Stage I for Urban Designs, Stage II for EPC )
  - Empowered Organization to Plan & Execute Project ... Govt. Agencies to compete for Contracts on same terms as private sector under international competitive bidding
- ❑ Procurement Standards : World Bank / EU Tendering Procedures & Reporting Formats

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**Project Brings Massive Development & Improves Governance in Maharashtra**



# MUMBAI : CURRENT STATUS



# MACRO URBAN “ QUALITY OF LIFE ” INDICATORS

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- Mumbai's Population has exceeded 14 Million ...Population density stands at 28000 Persons / sq km ... worlds highest
- Highest % of Population in Slums for any city globally ... 72 %
- **Quality of life** ... Dharavi has **800** People per Toilet .
  - ... Local Transport Networks are stretched beyond limits
  - ... Water and Power Shortage is Acute
- Huge differences in Incomes ... Growing Social Tension
- City looks like a giant garbage dump ... most filthy metropolis In India
- City Still Produces **5 %** of India's GDP ... Under Severe Constraints
- Land and Property Prices have become unaffordable for most people and Businesses ... New Businesses are avoiding Mumbai

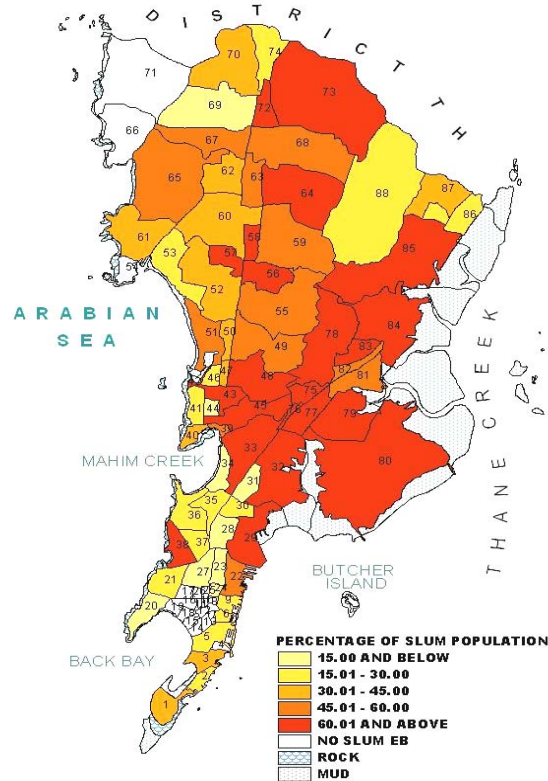
**Mumbai City Is Dying ... There can be no two opinions about this**



# Mumbai City : Current Status ... In Pictures



**GREATER MUMBAI MUNICIPAL CORPORATION  
PERCENTAGE OF SLUM POPULATION  
TO TOTAL POPULATION 2001  
(SECTIONS)**



Mumbai Slum Population : 9.0 Million  
Total Population : 14.3 Million

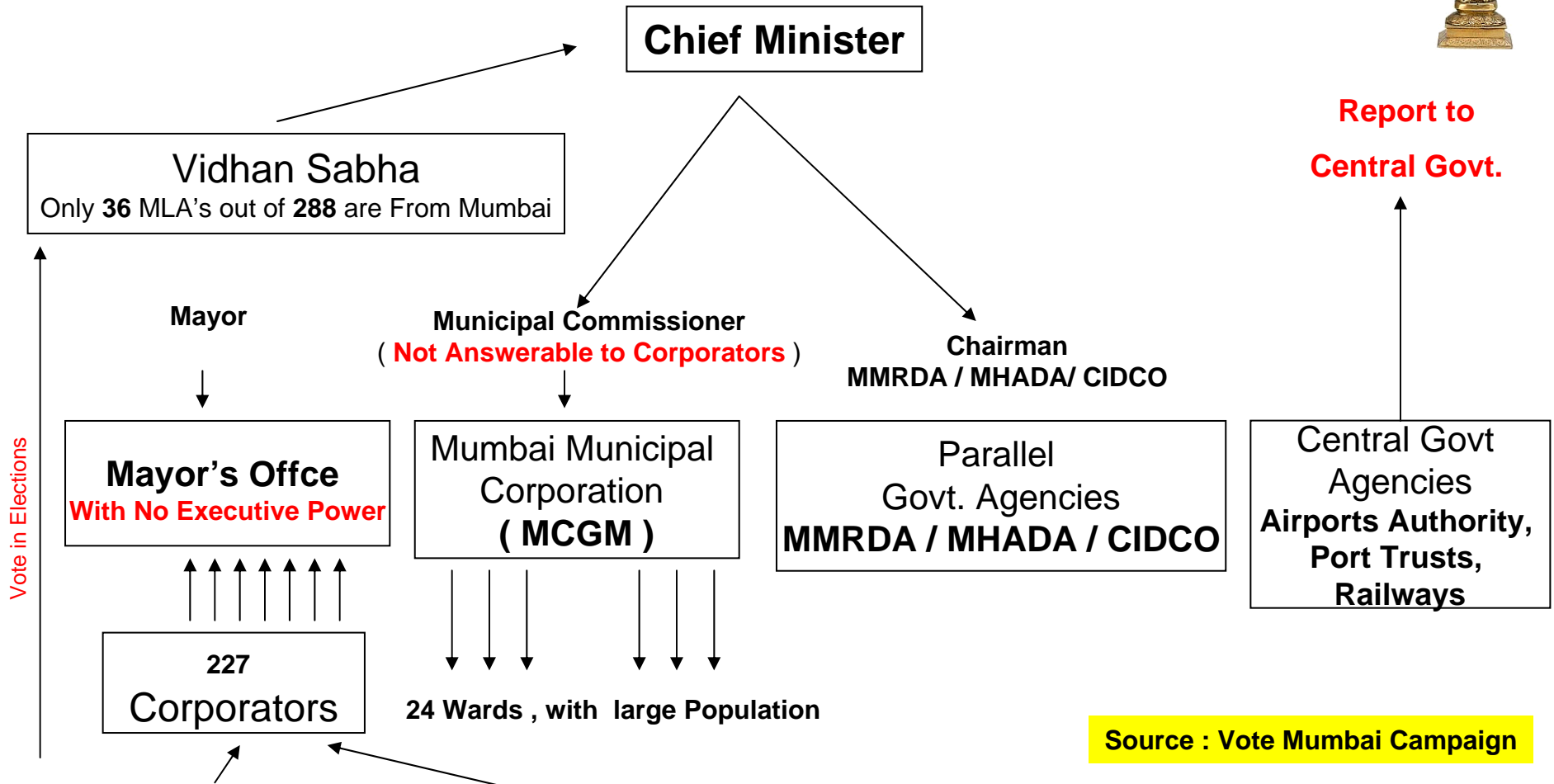
Source : 2011 Census Projections , GOI

**72 % of Mumbai's Population Lives like this in Slums**



# Showstoppers For Mumbai Re-Development

# Showstopper 1 ... Improper Governance



Source : Vote Mumbai Campaign



No large Re-Development project is possible within current structure

# Showstopper 2 ... Maharashtra's Huge Debt

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- Debt of Maharashtra State currently stands at Rs 2.09 Lakh Crores ( 2011)
- Debt is projected to increase to Rs 2.31 Lakh Crores by March 2012
- This Huge Debt prevents State Govt from doing big projects

Large projects are not possible unless Maharashtra's debt is significantly reduced



# Showstopper 3 ... Technical Incompetence



## Government Agencies Project Quality



Many roads in the city have developed potholes due to continuous rains lashing Mumbai since the onset of monsoons.



A dumper truck driver was taken by surprise when the bridge that the vehicle was plying on suddenly collapsed on Saturday. The truck fell into a *nullah* at the Dharavi T-Junction. No casualties were reported in the incident. ■ Full story on Page 3

PHOTO: Rajesh Jadhav

**Very Serious Quality issues with Government Agencies Project Management  
Skill Sets & Construction Work**

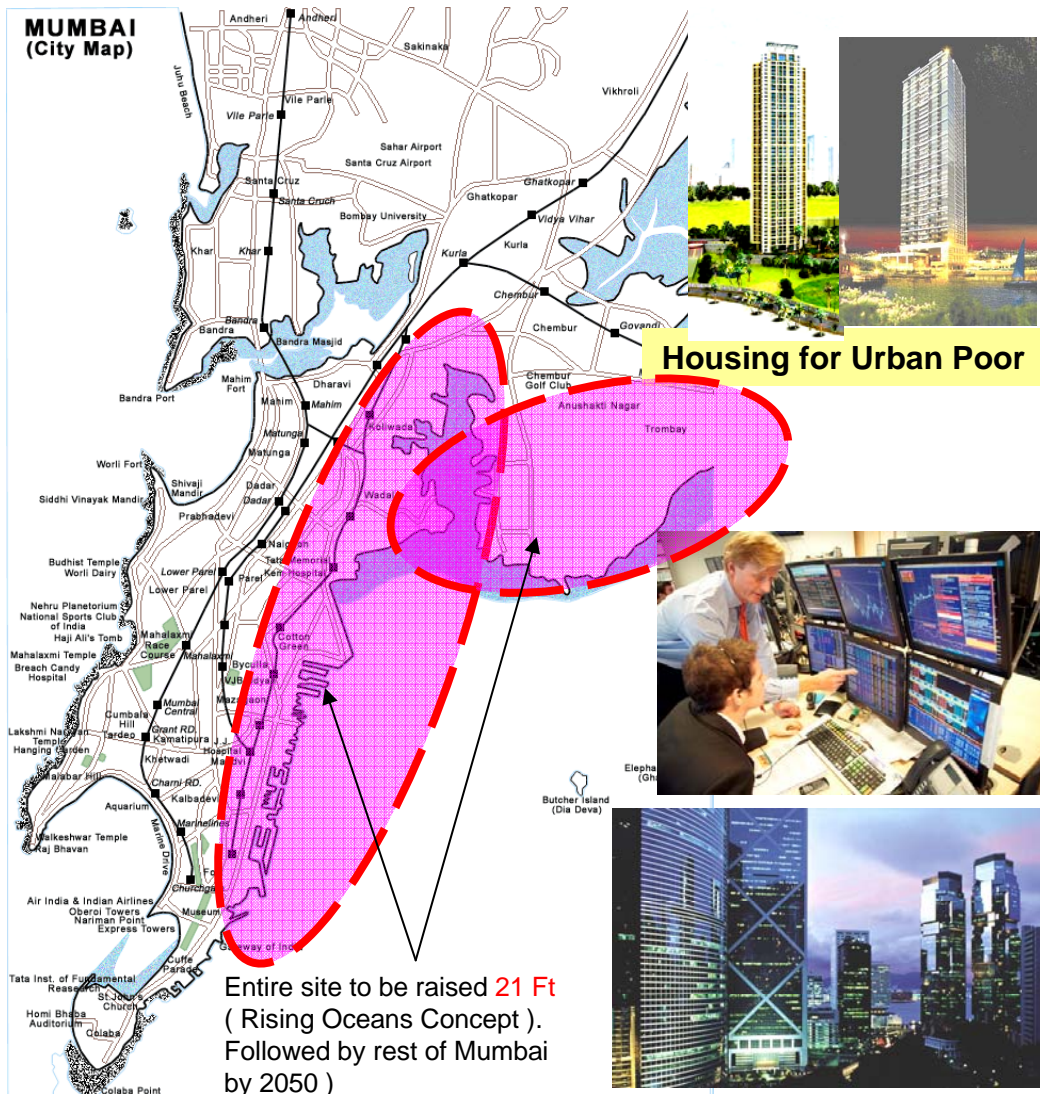


# THE MUMBAI MEGAROJECT

PROJECT CONCEPTS ... **THE 13 Major Concepts ( Out of 24 )**



# Concept 1 : Eastern Seaboard Re-location & Re-Development



**Value Unlocked through Re-zoning : \$ 70.45 Billion**  
 After providing for Entire Eastern Seaboard Re-Location and plant capacity expansion with latest technology and Environmental systems, including World class Employee Townships at New Locations in Maharashtra.

- ✓ Port Traffic is Choking City's Road and Rail network
- ✓ Mumbai Eastern Seaboard to be Re-Developed after Re-Locating :
  - Mumbai Port Trust, FCI, Railways
  - RCF, BPCL & HPCL
- ✓ All Re-Located Facilities will be provided with financing for latest equipment and capacity expansion at a new location on land provided by Govt of Maharashtra.
- ✓ Relocation Critical in order to prevent possible disasters due to leakage of lethal chemicals like Ammonia, Chlorine and to avoid Crude Oil spills that are occurring frequently
- ✓ These Industries with huge toxic chemical tanks are also prime terror targets. Pose Serious Threat.



# Concept 2 : Separation Of Islands

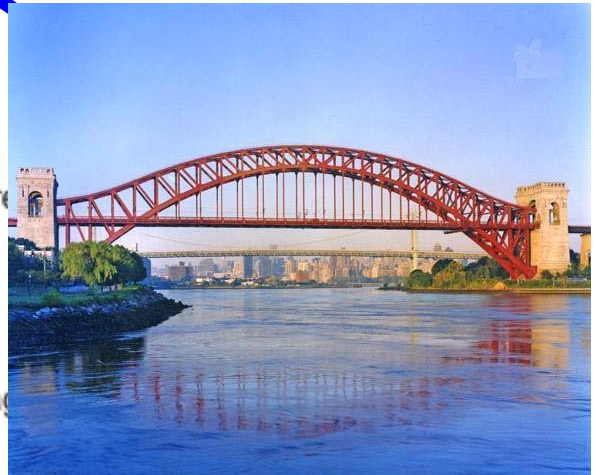


Autres îles et le continent  
 Les 7 îles à l'origine de Bombay

Carte réalisée d'après la 'Map of the Island of Bombay and Colaba to illustrate Mr Murphy's paper' by Juggumath, 1843



Limite actuel  
 Persistence



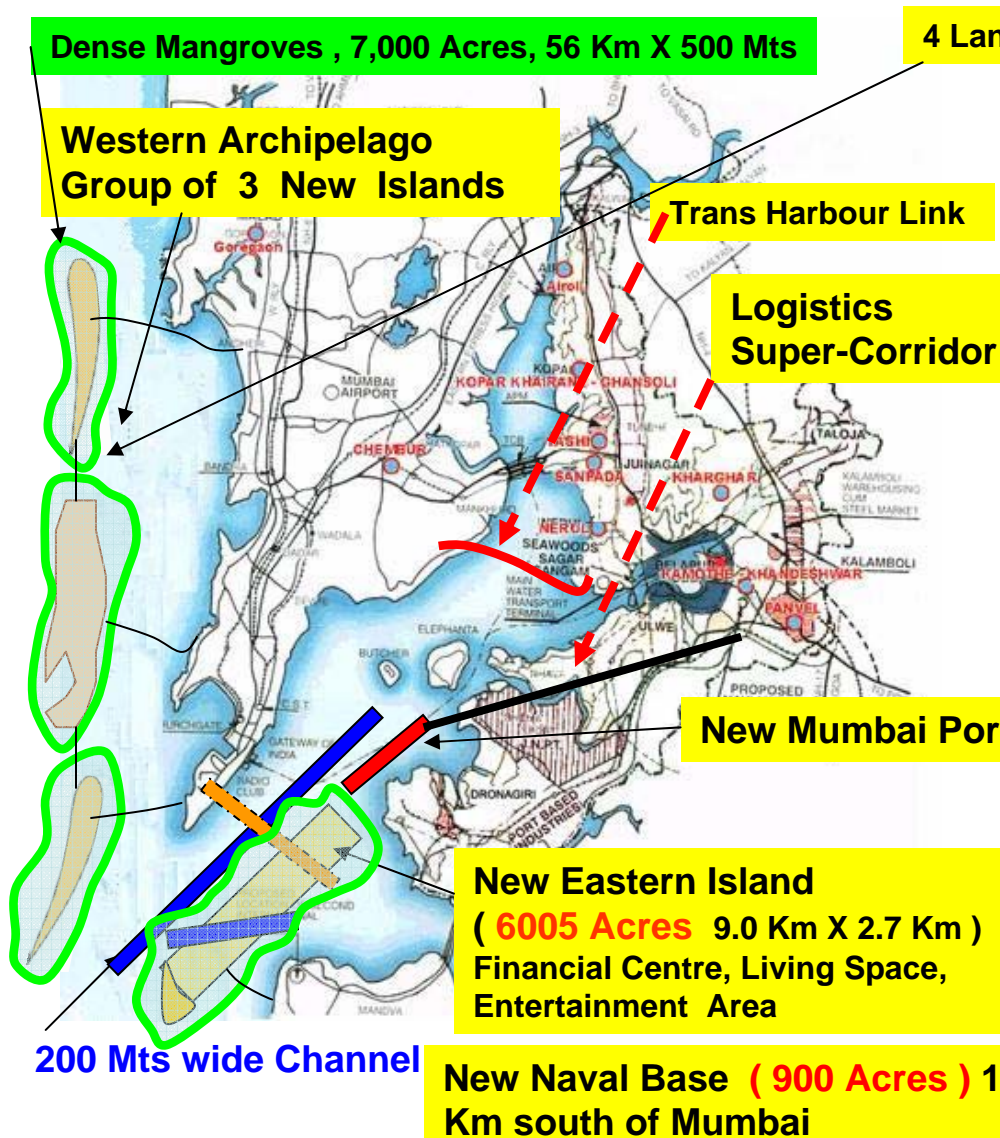
## Concepts :

1. De-Congest City
2. Prevent Flooding & Improve Sewage Disposal
3. Use water transport

**Unlock additional Value  
 Through Differential FSI's  
 ( US \$ 10 Billion )**

**Original Islands To be Separated to De-Congest City and Prevent Flooding**

# Concept 3 : The Archipelago Concept



- ✓ Archipelago concept involves creation of 4 New Islands. This will achieve two objectives
  - Create Additional Amenities/Housing
  - Allow Urban Equity Withdrawal for overall development of the state of Maharashtra & Nation through Massive Projects in Education, Healthcare, Forestry & Endangered Species Conservation

**Hydraulic Model Studies** including Tidal Prism / Near Shore Current Assessments together with detailed **Environmental Impact assessment** survey Needed to confirm location and configuration of the islands. All Islands to be **21 Ft** above MSL ( Rising Oceans Concept )

**Urban Equity Withdrawal Through Facility Creation : \$ 226.76 Billion**

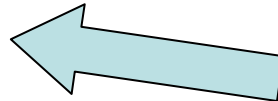


# Concept 4 : Slum Re-Habilitation & Decongestion



45 Storey Towers with Regular Maintenance

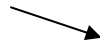
2018



Estimated Project Cost : US \$ 65 Billion



Slum Transition Accommodation



2011



- ✓ Dwelling units with 500 Sq Ft carpet area to house all existing 9 Million slum residents **In-Situ**. Any additional Migration to be settled on MMR fringes.
- ✓ Mumbai to have proper & detailed census before scheme is launched. Mapping to UID Number critical to check cheating.
- ✓ Specified Penalties for offenders ... loss of house and work permit in Mumbai.
- ✓ High speed rail link to those who choose low rise accommodation elsewhere in MMR as space is critical .
- ✓ Increasing FSI to 12–16 levels is critical

Megaproject has unique scheme for Slum Re-Habilitation. **Zero Funds Required From Govt. Of Maharashtra**

# Slum Re-Development : Megaproject Scheme Vs. Govt. Scheme



| SL. No | Parameter                   | Current Govt. Schemes   | Mumbai Megaproject Scheme  |
|--------|-----------------------------|---|--|
| 1      | <b>Coverage</b>             | Case By Case Basis based on Slum Re-Habilitation Authority ( SRA ) Clearance  | Blanket Scheme to cover all <b>9 Million</b> Slum Dwellers in Mumbai , based on Dwelling Concept   |
| 2      | <b>Proposed Carpet Area</b> | <b>269 Sq Ft per dwelling</b>   | <b>500 Sq Ft per Dwelling</b>  |
| 3      | <b>Financing</b>            | Govt. Cross Subsidy Scheme. <b>Towers</b> for Slum Dwellers on just <b>20 % of Land</b> Originally Occupied by the Slum, <b>Balance 80 % land given to Builder</b> for commercial development. Example Forjett Hill below Altamount Road and in Chandivali near Powai | Mumbai Megaproject will bear entire <b>US \$ 65 Billion</b> ( Rs 2,95,685 Crores ) Capex to provide Good Quality Housing to all 9 Million Slumdwellers on Dwelling Concept. Slum dwellers will keep 50 % of their land and <b>not just 20 %</b> as in current Govt. Schemes. All Accomodation will be provided In-Situ with No Re-Location ( <b>Important</b> ) . Megaproject will build commercial space on balance 50 % area, the rent from which will provide for maintenance of the buildings. |
| 4      | <b>No of Floors</b>         | Most Recent Govt Scheme provides for <b>20 Storey Towers</b>  | <b>45 Storey Towers.</b> All Construction will be High Intensity Earthquake Resistant and of world class standard (40 % higher cost due to Civil/Mechanical ).   |
| 5      | <b>Childrens Play Area</b>  | <b>Zero</b>   | <b>First Six Floors</b> in Each Tower will be reserved for Children Playing Area and For Healthcare and Education of Tower Residents.  |
| 6      | <b>Maintenance</b>          | Current Govt Scheme provides for Maintenance of Buildings but it has lot of grey areas and there is no Accountability if later on money is Not released for Maintenance.  | On Project Completion Megaproject Authority will fund 100 % of Maintenance (Estimated Cost = US \$ 1.97 Billion / Year ( at the rate of Rs 40,000 / Dwelling / year ). Finance will come from Rents as described above and from dividends on Megaproject Equity Investments. <b>There will be Strict Monitoring of Costs.</b>  |



# Concept 5 : The Undersea Subway Ring



Giant Tunnel Boring Machine



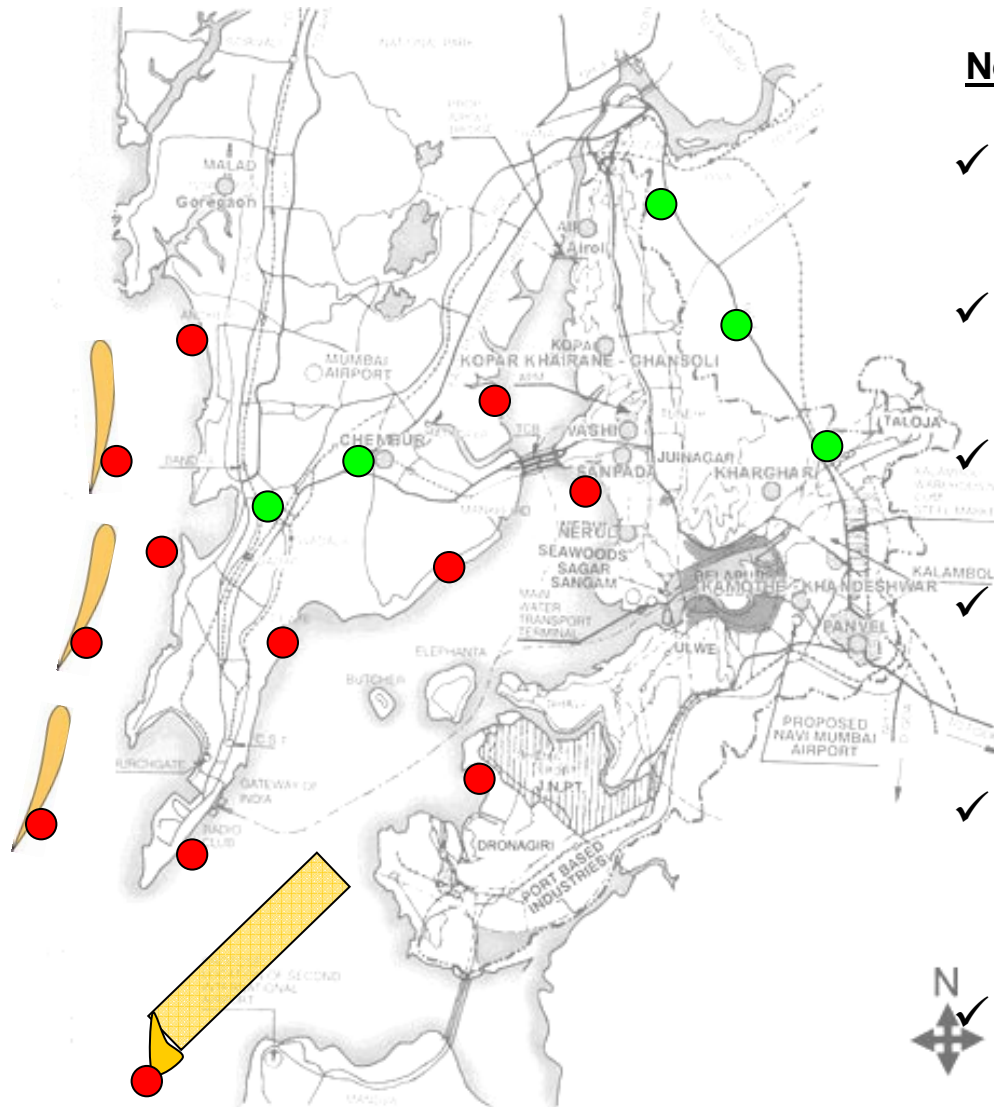
- ✓ Wholly Underground Highspeed Subway Rings to reduce transit time from **Goregaon to Uran to 30 Minutes** from **3 – 4 Hours** Currently.
- ✓ New Navi Mumbai Airport will be on the New Subway Ring
- ✓ Facilities Creation To Unlock Huge Value in MMR
- ✓ Megaproject to finance 75 % of PPP Venture

**Approx. Project Capex : \$ 34.29 Billion**

**Vastly Improved Communications Infrastructure to Augment Economic Value Of MMR**

# Concept 6A : Sewage Treatment System

( New York Lookalike )



## New Infrastructure to be built in MMR

- ✓ 12 Nos of 100 Mld of Sewage Treatment plants
- ✓ 4 Nos of 100 Mld Industrial Effluent Treatment plants
- ✓ Five solid Waste & Plastic Incenerators ... to produce power
- ✓ Three New & Large Landfills. Deonar Landfill to be totally redesigned . Methane gas to power 2,00,000 houses
- ✓ Large New System of 75 " collection headers / pipelines to be laid throughout city ( 150 Km )
- ✓ Solid biowaste to be processed into Fertilizer
- ✓ CO<sub>2</sub> to be sequestered / CO<sub>2</sub> Businesses

**Megaproject to invest US \$ 2.5 Billion in Waste Treatment System Capex under PPP**



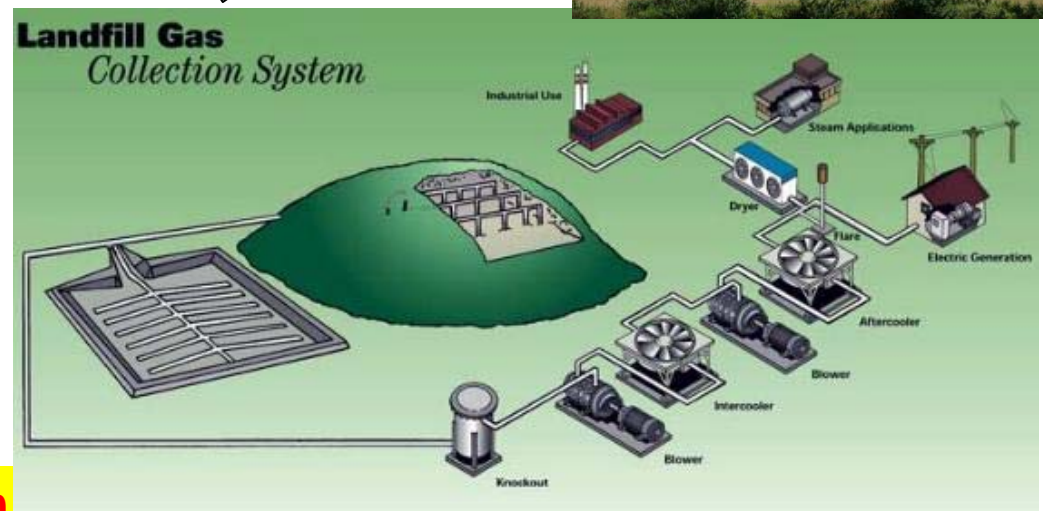
# Concept 6B : Combination Of Technologies for Waste Disposal



Today ( 2011 )



2018



**Estimated Project Cost : US \$ 4 Billion**

Megaproject To Catalyze Private Investment Through Strategic Investment In Waste Treatment & Power Generation Projects



# Concept 7: Unique PPP Scheme To Clean & Restore Mangroves



## Mangrove Destruction & Plastic Pollution



Today ( 2011 )



2016

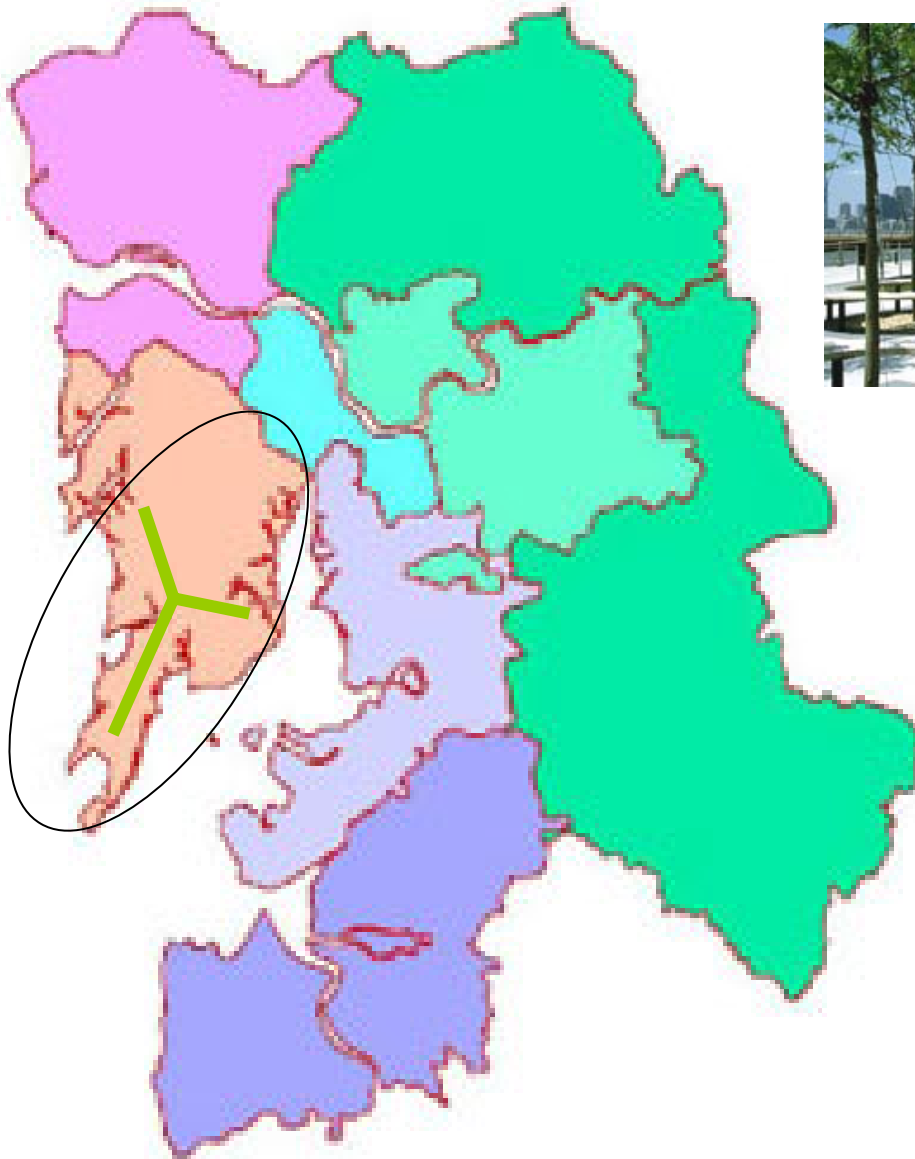


KorhnaK

**Estimated Project Cost : US \$ 300 Million**

Megaproject To Provide Grant Of US \$ 300 Million To the Bombay Natural History Society ( BNHS ) for Plantation of 7,000 Acres of Mangroves

# Concept 8 : The Central Park Concept



- ✓ Re - zoning & Differential FSI's to allow for the development of Parks within **10** minutes walking distance from anywhere within Mumbai City and Navi Mumbai
- ✓ Special Cyclist Only Corridors to be built along all arterial roads and coastal roads
- ✓ Excess Railway Land to be put to Public Use through GOI Ordinance Sales Proceeds to build Bullet Train<sub>24</sub>

**Creation of Extensive System Of Interconnected Parks and Cycling Corridors**



# Concept 9 : Heritage Conservation



Abu Simbel ( Egypt ) Lookalike restoration for some structures ??

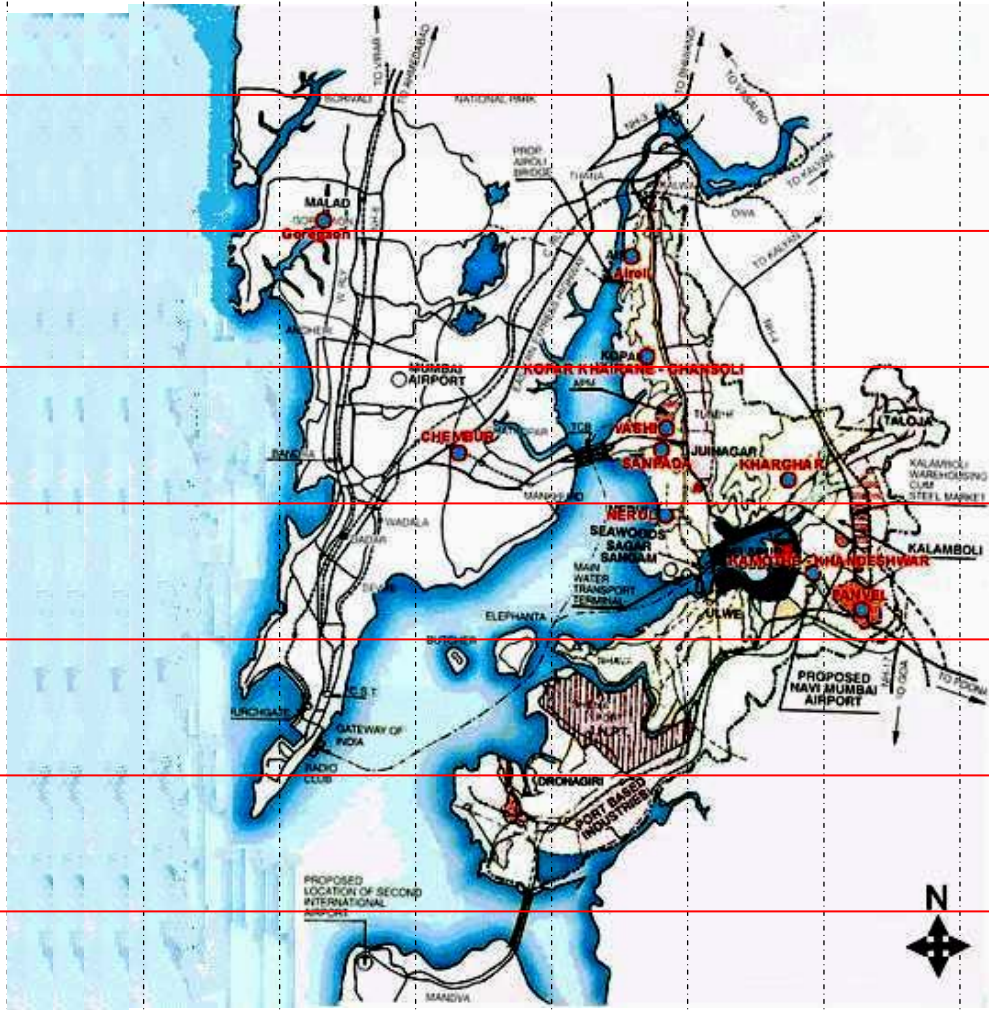
**Megaproject to allocate US \$ 600 Million For Heritage Conservation**



# **ENGINEERING , PROCUREMENT , CONSTRUCTION & PROJECT LOGISTICS**



# Concept 10 : The 72 Contractor Territories



- MMR to be divided into **72** squares for project execution purposes
- These 72 Work Areas will be put out on International Competitive Bidding
- The Megaproject will feature 12 design concepts and 12 Large projects
- The worlds largest and Best Design firms will compete with local companies & Govt Agencies to develop & design concepts for each project area. The best conceptual designs will be awarded the detailed design contracts. Evaluation will be by a panel of global experts.
- 72 Contractor Territories to be awarded to 12 Large Global Consortia with work Value of **US \$ 30 Billion** Each. Indian Companies to compete on same terms as Foreign EPC Contractors

Megaproject Will Divide 72 Areas Into 12 Large Contractor Territories  
... With Contractor having Single Point Responsibility

# Concept 11 : Town Planning As a Biddable Item



- India produces just 200 Town Planners each year
- Total Townplanners Employed in India presently is 3300...for a total of 5600 Towns
- Govt. Agencies in Maharashtra do not have required number of Town Planners for Mumbai Megaproject
- Further there is large Scale Corruption in getting permissions and the city has grown in a totally un-planned manner
- There will therefore be a separate Town Planning Round , right at the beginning of the Mumbai Megaproject. Govt Agencies to Compete on Par with Private Players
- **Megaproject Bidding Process Monitored by International Panel of Independent Experts**

| Step 1                                      | Step 2   | Step 3  | Step 4  |
|---|--|---|---|
| Global Bidding Round for Mumbai Master Plan | Global Bidding Round for 12 Large Contractor Territories ( Design ) of US \$ 30 Billion Each | Global Bidding Round for 12 Large Contractor Territories ( EPC ) For each of 12 Winning Designs | Go into Construction Phase with Worlds Best Designs at the Lowest Possible EPC Cost |

**World Bank / EU Contract Standards Applied to Above Process Will Deliver City of the 21<sup>st</sup> Century**

# Concept 12 : Highly Accountable / Visible Project System

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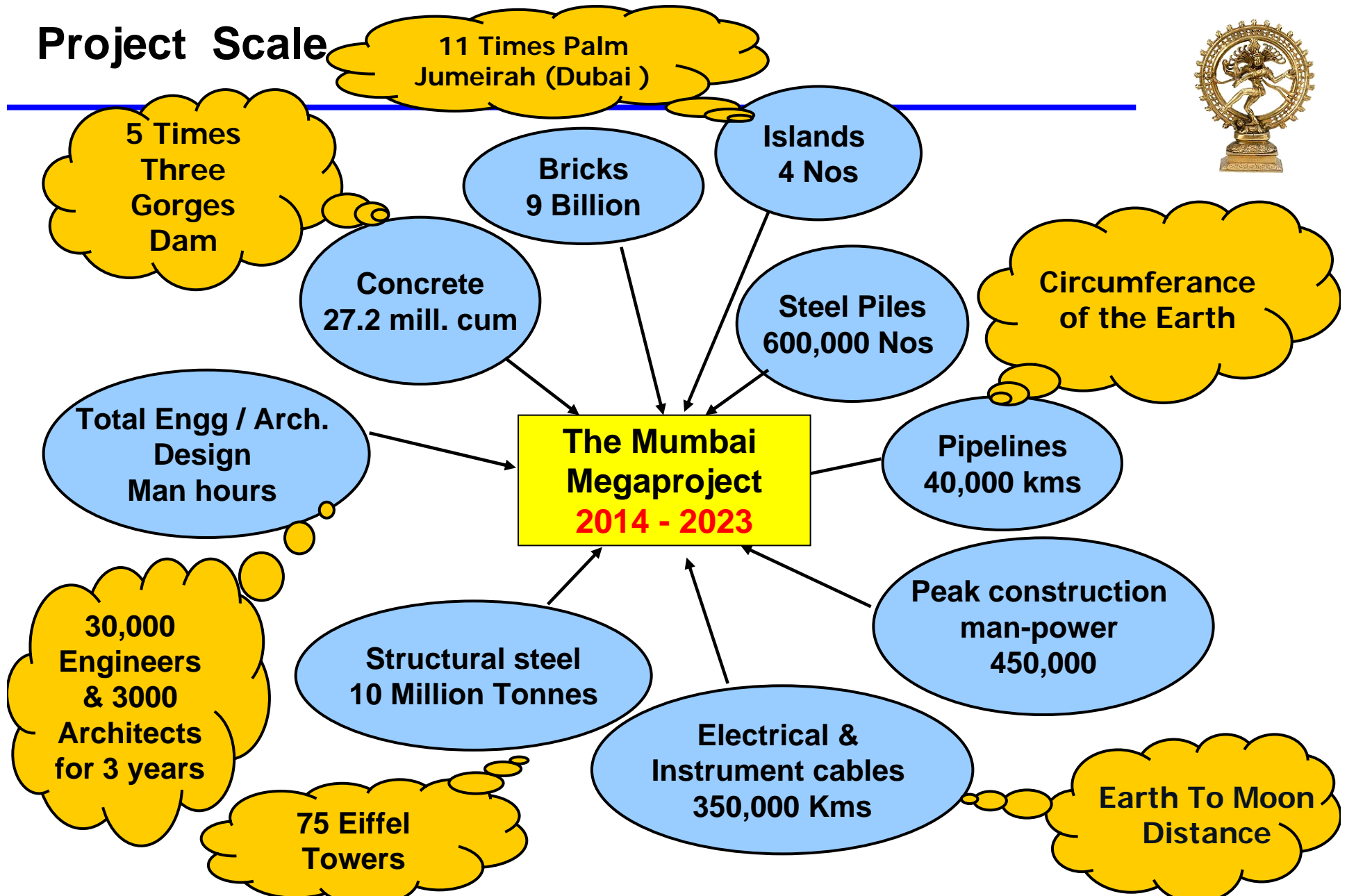


- Politically Accountable Authority Required to spearhead Megaproject
- Megaproject CEO will be Construction Expert ( Either Indian / Foreign ) with Acknowledged Leadership In The Construction Industry Globally
- Megaproject Management / Construction Team to be hired from around the world based on expert skill sets
- All Contracts to be awarded after International Competitive Bidding
- Separate Bidding Rounds For Town Planning & EPC ...World Bank / EU Standards
- All Project Activity to be controlled through Highly Advanced IT System which ensures three things :
  - ✓ Visibility / Transparency
  - ✓ Accountability & Measurement of Outcomes
  - ✓ Preservation of Context
  - ✓ Entire Decision Making Hierarchy To Be Mapped ... Deviations will Trigger A System Alert

**Above Specified Advanced IT System is Critical to Project Execution...**

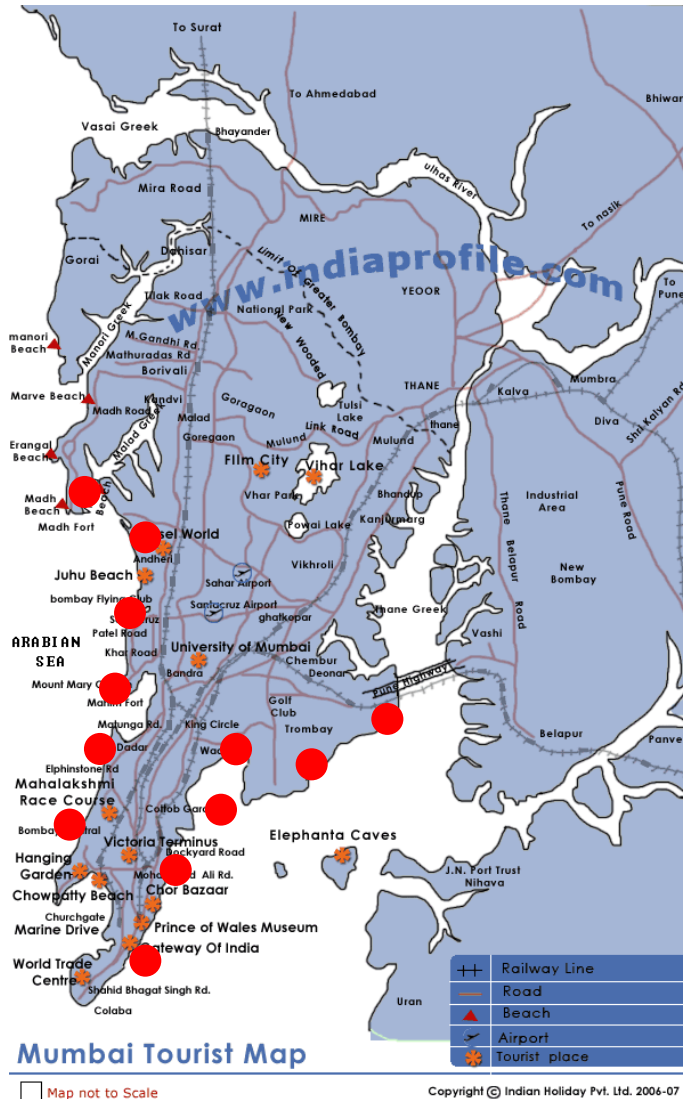


# Project Scale



**Construction Intensity : Rs 300 Crores / Day for 7 years ... 24 X 7 non stop**  
( Assuming first 3 years for Engineering / Design / Project Planning / Governance Issues )

# Concept 13 : Non-Invasive Construction Logistics



Project will have minimal impact on traffic & normal business activity

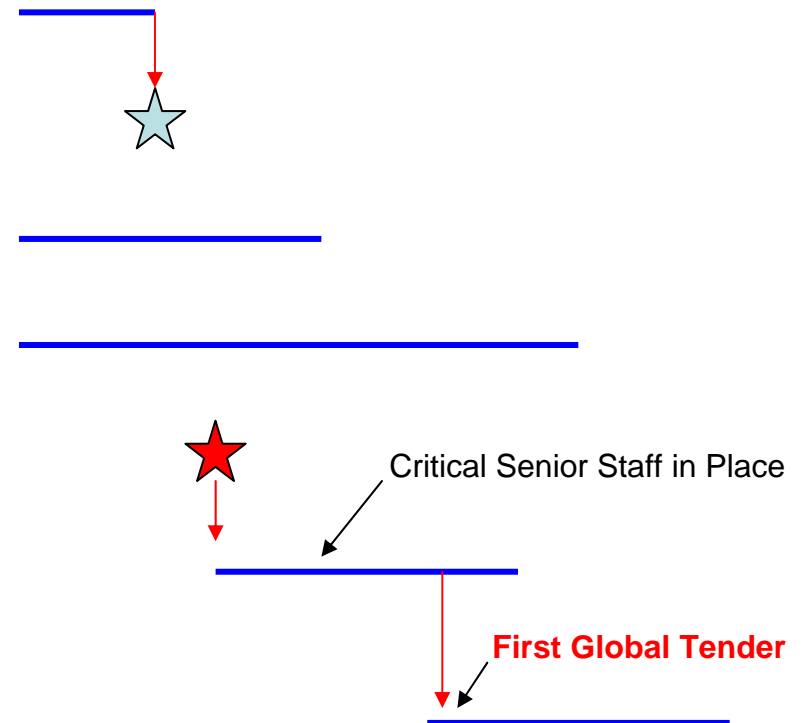
# Megaproject Startup ... Activities To Initiate Project



## BAR CHART

| 2011     |          | 2012     |          | 2013     |          | 2014     |          |
|----------|----------|----------|----------|----------|----------|----------|----------|
| 1st Half | 2nd Half | 1st Half | 2nd Half | 1st Half | 2nd Half | 1st Half | 2nd Half |

1. Govt. To Initiate Re-Location Discussions with **Mumbai Port Trust, RCF, HPCL & BPCL, FCI & Railways**
2. Appoint Surveyors / Consultants For Alternative Sites for **Port/Industrials** which allow for expansion of capacities
3. Fast Track Issue of UID Numbers to All Residents of the MMR
4. Varification of Detailed Demographic Data & Property Holdings & Mapping this to UID's for All Of Dwellings within MMR
5. Appointment of Project CEO / Staff for Megaproject. Executive Search firms to be commissioned to recruit highly specialized planning and execution team of **250 Project Managers, 2000 Engineers & 600 Architects / Townplanners** from around the world
6. State Govt. Provides suitable land to allow for expansion of Re-Located Industrials free of all encumbrances. Start Physical Relocation Of Industrials, Issue First Global Tender for New Port / Underground Subway, Master Plan etc



# Government Support Required

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- Megaproject needs politically accountable authority to spearhead project.
- State Government Needs to Order Relocation Of Harbour Based Industries & Mumbai Port Trust
- Project requires highly specialized team of owner managers ( 250 Project Managers , 2000 Engineers, 600 Architects / Townplanners Etc. Highly specialized construction team will need to be recruited internationally.
- One Time Grant of Rs 3000 Crores From JNNURM to finance Project Team Salaries

Fully Empowered Political Authority Is Critical For Project Execution ...  
Megaproject is Totally Self Financing After Initial JNNURM Grant of Rs 3000 Crores



# Mumbai 2024 ... City Of The 21<sup>st</sup> Century



A Slum School

Mumbai to be Business, Entertainment & Culture Hub of South Asia



# Mumbai Olympics 2024 ?



Can Mumbai Make A Bid For The 2024 Olympics ?



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**THANK YOU  
FOR YOUR ATTENTION**

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