



***METRO RAILWAY KOLKATA***

***PRESENTATION***

***FOR***

***ADVISORY BOARD OF METRO RAILWAYS***

***ON 29.6.2012***

***J.K. Verma  
Chief Engineer***

# A Journey begins

- Initial Survey for MTP by French Metro in 1949.
- Dum Dum – Tollygunge RTS project sanctioned in June, 1972.
- Foundation stone laid by Smt. Indira Gandhi, the then Prime Minister of India on December 29, 1972.
- First train rolled out from Esplanade to Bhawanipur (4 km) on 24<sup>th</sup> October, 1984.

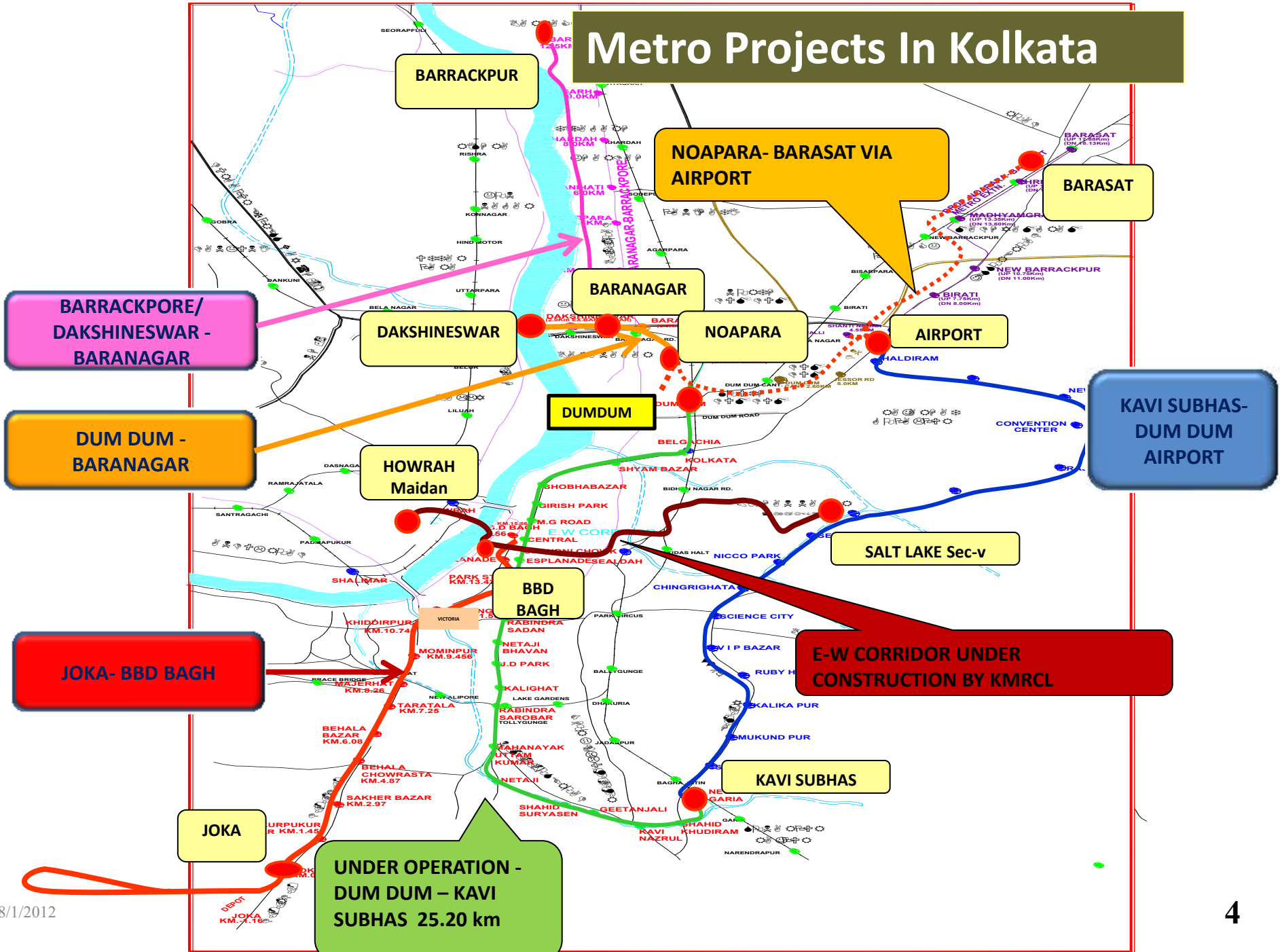
**Total corridor under operation: 25.1 km**

**Total extension projects under execution: 89 km.**

# FOUNDATION STONE LAYING CEREMONY-1972



# Metro Projects In Kolkata



**BARRACKPUR**

**NOAPARA- BARASAT VIA AIRPORT**

**BARASAT**

**BARRACKPORE/ DAKSHINESWAR - BARANAGAR**

**DAKSHINESWAR**

**BARANAGAR**

**NOAPARA**

**AIRPORT**

**DUM DUM - BARANAGAR**

**DUMDUM**

**KAVI SUBHAS- DUM DUM AIRPORT**

**HOWRAH Maidan**

**SALT LAKE Sec-v**

**E-W CORRIDOR UNDER CONSTRUCTION BY KMRCL**

**JOKA- BBD BAGH**

**BBD BAGH**

**KAVI SUBHAS**

**JOKA**

**UNDER OPERATION - DUM DUM - KAVI SUBHAS 25.20 km**

## Metro services under operation



- ❖ **Dum Dum – Tollygunge: 16.45 km (commissioned in Feb.1996)**
- ❖ **Tollygunge – Kavi Subhash: 8.65 km (commissioned in Oct.2010)**
- ❖ **Total stretch in operation: 25.10 km**
- ❖ **Underground alignment: 15.10 km (60%)**
- ❖ **Elevated/Surface alignment: 10.0 km (40%)**

➤ **No. of Stations** : **23**

• **Underground** : **15**

• **Elevated** : **6**

• **Surface** : **2**

➤ **Distance Between Stations:**

• **Average** : **1.020 Km**

• **Maximum** : **2.151 Km (Dumdum- Belgachia)**

• **Minimum** : **0.597 km (Central – Chandni Chowk)**

## Operating information



### Number of trains run:

- On week days : 270 nos.
- On Saturdays : 205 nos.
- On Sundays : 78 nos.
- Average passengers /day : 5.3 lakhs
- Max. passengers per day : 7.16 lakhs
- Passengers per km of run per day: 20,784

### Train frequency:

- Peak Period : 05 min.
- Non-Peak Period : 6,7, 8, 10, 15 min.
- Sundays : 15 min.

# Fare collection system



- New RFID(Radio Frequency Identification),
- Contactless Smart Card & token system (CSC & CST) introduced in July'11.
- Cheapest mode of transport with fare ranging from Rs.4.00 to Rs.14.00

# FARE STRUCTURE & TYPE OF TICKETS

<b>Zone</b>	<b>Distance</b>	<b>Metro Rly. Fare</b>	<b>DMRC Fare</b>
I	Upto 5 km	Rs. 4.00	Rs. 10.00
II	5 – 10 km	Rs. 6.00	Rs. 12.00
III	10 – 15 km	Rs. 8.00	Rs. 16.00
IV	15 – 20 km	Rs. 10.00	Rs. 19.00
V	20 – 25 km	Rs. 12.00	Rs. 22.00
VI	More than 25 km	Rs. 14.00	Rs. 23.00

- **Single Journey tickets (Tokens)**
- **Smart Card**
  - : Medium Multi Ride (12)**
  - : Limited Multi Ride (40 & 60)**
  - : Extended Multi Ride (80)**
- **Smart Cards in Denomination of Rs.100, 200, 300 & 500.**



# **FINANCIAL PERFORMANCE (2011-12)**

**Gross Earning: Total: Rs. 107.14 Cr.**

(Passenger: Rs. 91.36 Cr., Sundry: Rs. 15.78 Cr.)

**Expenditure:**

Salary : Rs. 112.79 Cr. (55%)

Fuel traction : Rs. 24.72 Cr. (12%)

Fuel other than traction : Rs. 25.24 Cr. (12%)

Contractual : Rs. 27.12 Cr. (13%)

Other expenses : Rs. 16.55 Cr. (8%)

**Total net working expenses: Rs. 206.42 Cr.**

Appropriation to DRF: Rs. 82 Cr.

Appropriation to Pension Fund: Rs. 36.91 Cr.

**Gross working expenses: Rs. 325.33 Cr.**

**Performance Efficiency Index (PEI): 193%**

**Operating Ratio: 303%**

**Performance Efficiency Index will be approx. 99% if fares of Metro Railway, Kolkata are brought at the level of DMRC.**

# Security Initiatives

- **At present security system is in the hands of Kolkata Police, progressively being taken over by RPF.**
- **Integrated security system which includes: Additional Cameras (including night vision), X-Ray baggage scanning system, Explosive vapour detection, vehicle scanner etc. is in progress & likely to be completed by Sept-12.**

# TRACK & ROLLING STOCK

- **Track: BG**
- **Axle Load: 17 T**
- **No. of Rakes:**
  - **18 (9 *NGEF* + 9 *BHEL*) introduced between 1984 & 1996**
  - **7 nos. AC rakes introduced since Oct. 2010.**
  - **4 additional AC rakes expected by Dec'2012.**
  - **Coach width: 2.74m**
- **Train Composition (8 coaches):**
  - **2 Driving Motor Coaches (DMC)**
  - **4 Non Driving Motor coaches (NDMC)**
  - **2 Trailer Coaches (TC)**

**Traction: 750 V DC 3<sup>rd</sup> Rail System**

## **TRACTION POWER SUPPLY TO 3<sup>RD</sup> RAIL**

- **33kV Power Supply is received from CESC at three Receiving Substations (RSS) viz. Shyambazar, Central & Jatin Das Park.**
- **Stepped down to 11 KV and fed to 15 nos. Traction substation (TSS)**
- **In the TSS, 11 kV is stepped down to 604 Volts, rectified to 750 Volts D.C. and fed to 3rd rail through DC HSCBs for traction purpose.**

# Signalling and Train Protection Arrangement

- **Automatic signalling in entire section introduced since April 2012.**
- **Multi Section Digital Axle Counter (MSDAC) are used for train detection.**
- **Design headway is 3 min. now trains are running at 5 min. headway.**
- **TPWS – Indian equivalent to ETCS L1 (European Train Control System). Being installed for each signal to avoid SPAD in case driver is not vigilant. TDC 30.09.2012**
- **Data logger has been installed at all panel stations and are networked for event logging and monitoring.**

# **Communication Arrangement**

- **Optical Fibre Cable (separate UP and DN line)**
- **Networked LED matrix Train Timing Indication Boards and GPS synchronized Clock.**
- **Centralized PA system have been provided at all 23 stations.**
- **Digital cameras at stations networked with monitoring facility at security control.**
- **Central Control is equipped with**
  - **Train Describer system, to have view of all trains in network.**
  - **Automatic train charting facility**
  - **Live Video of platforms.**

# **METRO PROJECTS UNDER EXECUTION**

## Extension from Dum Dum to Baranagar (5.2 km)



Yr. of inc. in Budget	Status of estimate	Latest anticipated cost (Cr.)	Expn. upto 31.3.12 (Cr.)	Outlay in 2012-13 (Cr.)	Total expn. upto May'12 (Cr.)	Overall financial progress	Physical progress (%age)
2010-11	Sanct.	411.06	142.4	320	155.4	49%	50%

### Work of viaduct & station buildings in progress

**The first section Dum Dum – Noapara (1.87 km) expected to be commissioned in 2012-13 (Progress 70%)**





## Extension from Noapara to Barasat (18.13 km)

Yr. of inc. in Budget	Status of estimate	Latest anticipated cost (Cr.)	Expn. upto 31.3.12 (Cr.)	Outlay in 2012-13 (Cr.)	Total expn. upto May'12 (Cr.)	Overall financial progress	Physical progress (%age)
2010-11	Sanct.	2582.55	82.13	1220	86	3.5%	10%

### Work of viaduct & station buildings awarded for 8.5 km.

#### Probable date of completion:

- ❖ Noapara – Dum Dum Cantt.(2.8km): 31.03.15
- ❖ Dum Dum Cantt. – Jessore Road (2.4km): 31.12.15,
- ❖ Jessore Road – Madhyamgram (7.11km): 30.06.16,
- ❖ Madhyamgram – Barasat (4.82km): 30.06.15,
- ❖ **Complete project: 30.06.16**

#### Constraints:

- **Shifting of 2500 unauthorized structures/encroachments along alignment.**
- **Approvals from Central/State Govt. agencies:  
AAI, Irrigation/WB, NHAI, Defence etc.**

# New Metro line from BBD Bag to Joka incl. extn. upto Diamond Park (18.72km)



Yr. of inc. in Budget	Status of estimate	Latest anticipated cost (Cr.)	Expn. upto 31.3.12 (Cr.)	Outlay in 2012-13 (Cr.)	Total expn. upto May'12 (Cr.)	Overall financial progress	Physical progress (%age)
2010-11	Part estimate for 8.5 km Sanct.	2913.51	86.25	750	94.8	4%	10%

**Work of viaduct in progress in 8 km.**

**TDC: Joka – Majerhat ( 8 km): June 2014.**

**Majerhat-BBD Bag: Dec 2016**

**Constraints:**

- **Delay in transfer & granting NOC from Ministry of Defence for construction in their area.**

# Extension from Kavi Subhash to Dum Dum Airport via Rajerhat (32 km)



Yr. of inc. in Budget	Status of estimate	Latest anticipated cost (Cr.)	Expn. upto 31.3.12 (Cr.)	Outlay in 2012-13 (Cr.)	Total expn. upto May'12 (Cr.)	Overall financial progress	Physical progress (%age)
2010-11	Part estimate sanct.	3951.98	100	1050	100	3%	5%

**Work of viaduct in progress in 28 km.**

**Tenders for construction of station buildings to be invited shortly.**

**TDC: Dec 2014**

**Constraints:**

**Approval of connectivity to Kolkata Airport from KMRCCL/ Airport Authority of India (AAI)**

## Extension from Baranagar/Dakshineswar to Barrackpur (14.5 km)



Yr. of inc. in Budget	Status of estimate	Latest anticipated cost (Cr.)	Expn. upto 31.3.12 (Cr.)	Outlay in 2012-13 (Cr.)	Total expn. upto May'12 (Cr.)	Overall financial progress	Physical progress (%age)
2010-11	Part estimate sanct.	2069.60	30	602.94	32.5	1.5%	2%

**Shifting of utilities & widening of B.T. Road along which the viaduct is planned is in progress.**

**TDC: Baranagar-Dakshineswar: June 2014**

**Baranagar-Barrackpur: Dec 2015**

**Constraints:**

**Closure of water supply pipe lines under B.T. Road by Kolkata Municipal Corporation.**

# Constraints in execution of Metro Projects



## ➤ **Shifting of unauthorized structures/encroachers from Govt. land & their rehabilitation.**

- ❖ There are about 2500 encroachments on Govt. land along the Metro extension alignment from Noapara to Barasat.

## ➤ **Delay in approval from various Central & State Govt. Ministries**

- ❖ **Civil Aviation Ministry:** For approval of alignment & NOC for construction along flight path.
- ❖ **Ministry of Defence:** Approval of alignment within Defence land & NOC for construction. Permission for survey & Geo-technical investigation was granted after eight months.
- ❖ **National Highways Authority:** Approval of alignment of Noapara – Barasat project along Belghoria Expressway is being pursued for the last one year.
- ❖ **Irrigation Deptt. of Govt. of W.B.:** For approval of alignment, no construction during monsoon.
- ❖ **Land & Land Reforms Deptt. of Govt. of W.B.:** For transfer of Govt. land.
- **Delay in shifting of utilities**
- ❖ **Kolkata Municipal Corporation:** For water supply/drainage pipe lines.
- ❖ **WBSETCL/WBSEB:** For shifting of overhead electric lines.
- ❖ **BSNL:** For communication cables.



*THANK YOU*

# Metro Projects In Kolkata

**DUM DUM – NOAPARA BY METRO RAIL, KOLKATA**

**NOAPARA- BARASAT VIA AIRPORT BY METRO RAIL, KOLKATA**

**NEW PROJECTS BY RVNL**

**BARRACKPORE-  
BARANAGAR**

**NOAPARA-  
DAKSHINESWAR**

**NEW GARIA- DUM  
DUM AIRPORT**

**JOKA- BBD BAGH**

**DEPOT NEAR BAKARAHAT AND  
CHORIAL KHAL**

**UNDER OPERATION -  
DUM DUM – KAVI  
SUBHAS 25.20 km**

**BARANAGAR**

**DUMDUM**

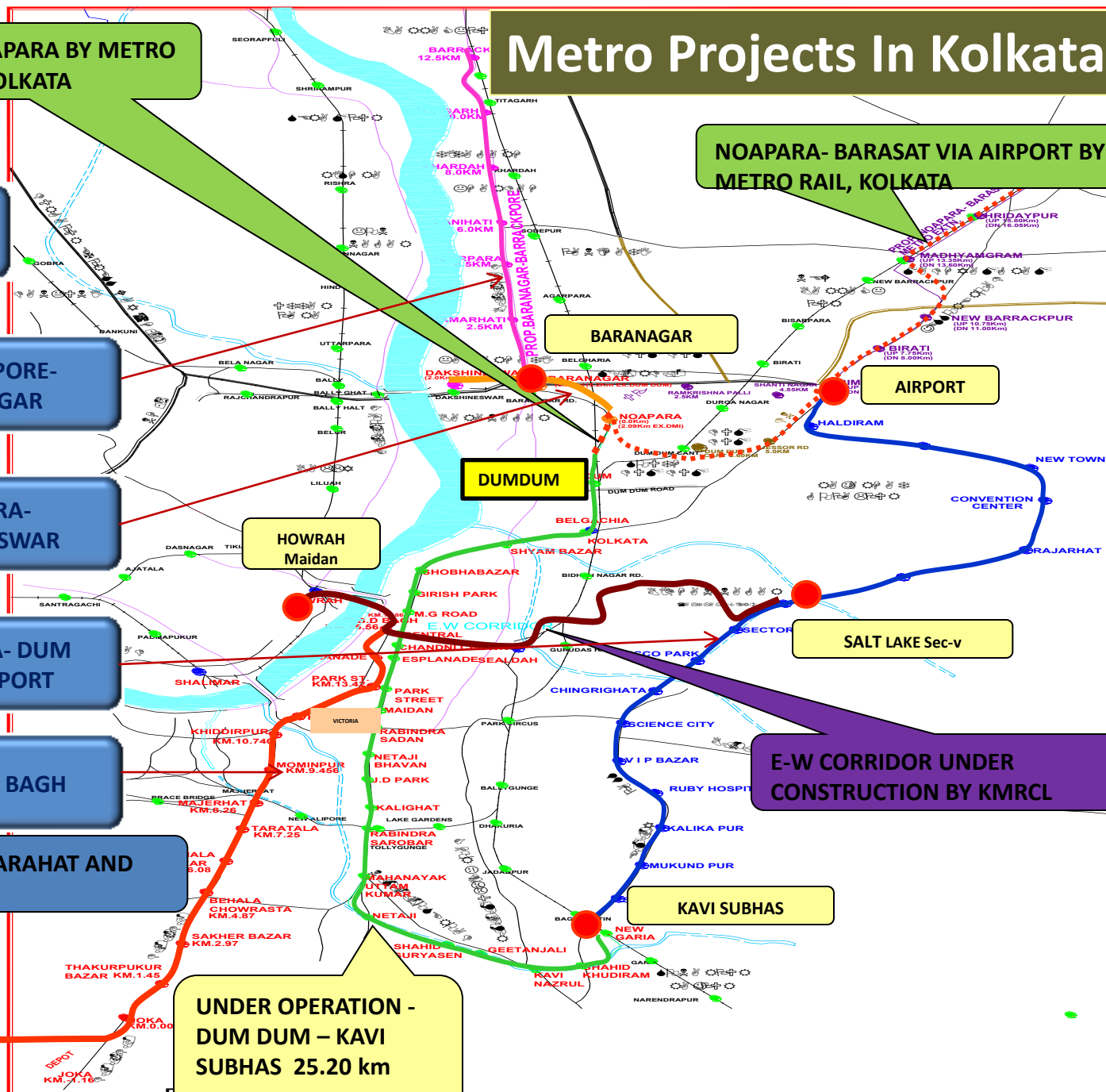
**HOWRAH  
Maidan**

**AIRPORT**

**SALT LAKE Sec-v**

**E-W CORRIDOR UNDER  
CONSTRUCTION BY KMRCL**

**KAVI SUBHAS**



# Construction in Noapara Yard





# Casting Yard at Noapara



# Launched PSC girder & deck slab in Noapara yard



# TSS building under constr. at Noapara





8/1/2012



**NEAR RAMP OF AIRPORT LINE**



**WEST SIDE OF DDC STN.**





**IN BETWEEN BR NO- 3 & DDC STN.**



# NEAR DDC STATION

8/1/2012





# GATE NO 11 NEAR BARASAT







**OPPOSITE OF BARASAT WHARF**





**IN BETWEEN BARASAT & L-XING - 11**

