

# “Integrated Mines & Minerals Management System”

**Computerization of Mines & Minerals Transportation on  
a PILOT Basis**

## CHAPTER 1

### ABOUT US

#### **About Department of Steel & Mines**

The Steel & Mines Department is a one of the important Department of Government of Orissa. It works for the development of the mineral resources of the State while enjoying regulatory powers. The main functions and activities of the Department of Steel and Mines are systematic survey and assessment of the mineral deposits of the State, their exploitation, administration of mines and mineral concession, enforcement measures for prevention of illegal mining and smuggling of minerals, assessment and collection of mining revenue, study of the impact of mining operation on environment, formulation of appropriate environmental control measures and research and exploitation of areas and minerals for meeting the needs of mineral based industries in the State and Country. The Steel and Mines Department is the administrative Department of the Directorate of Mines, the Directorate of Geology and Orissa Mining Corporation Ltd.

There are 14 Circles and 6 Chemical Labs present throughout the state. Among 14 Circles 8 Circles are under Deputy Director Mines and the rest 6 Circles have separate Mining officers. The Circles under Deputy Director of Mines are Joda, Koida, Rourkela, Sambalpur, Talcher, Jajpur Road and Koraput. The Circles under Mines Officer are Cuttack, Berhampur, Baripada, Bhawanipatna, Keonjhar, Phulbani and Bolangir. The 6 chemical labs are Jajpur Road, Bolangir, Sambalpur, Joda, Berhampur and Bhubaneswar.

In Keonjhar District there are 2 Mines Circles, one is Joda which is coming under DDM (Deputy Director Mines) and another is Keonjhar which is coming under Mines Officer. There are 100 Mines under Joda Circle out of which 30 Mines are functioning and 70 mines are defunct. Similarly there are 15 mines are coming under Keonjhar Circle out of which 3-4 are functioning.

## CHAPTER 2

### CURRENT SCENARIO

To monitor and collecting taxes for mining, transportation the Directorate of Mines is working. The main function of Directorate of Mines is to collect taxes from the lessee. The taxes are in form of Royalty, Dead Rent and Surface Rent. The taxes are fixed by the Indian Bureau of Mines (IBM), Government of India. But the tax is collected by Government of Odisha.

The Royalty is collected from the Lessee basing on the Quantity of Mineral to be transported to the Consignee / Buyer and the Grade (Quality) of the Ore / Mineral. The Dead rent is collected from the mines lessee which are not function. The dead rent is collected every year. The Surface Rent collected basing on the area that the Lessee has taken in lease.

For collecting taxes the Directorate of Mines has introduced a concept of Transit Permit and Transit Pass. To collect taxes Directorate of Mines, established weighbridges and check gates in the different areas near the Mines. The function of Weighbridge is to weight the quantity of minerals / ores transported from mines to the destination and the function of the check gate is to verify the Transit pass provided by the Directorate of Mines. Some cases private Weighbridges are established which are authorized by the Directorate of Mines. Government has engaged checking staffs to supervise the weighment and other Weighbridges and the expenditure is borne by the Weighbridge owners.

There are also railway sidings near the mines where the minerals / ores are transported to the destination through railway wagons.

## Structure of Department of Steel & Mines

The objective of the Pilot is to automate the manual process for collecting taxes by usage of ICT. A web based application will be developed by which the Transit Permit & Transit Pass will be applied and issued online. The Lessee can only transport the permitted quantity of Mineral. The Weighbridge operator and check gate operator will update each and every transaction. The system will re-consolidate the transaction and generate different kind of MIS report, which would help Directorate of Mines to take intelligent decision making while collecting taxes.

## **Project Objective**

The project has the following objectives

- Develop a suite of application for Issuing of online Transit Permit and Transit Pass.
- To check each and every transaction of Transportation of Mineral from the Mines.
- To connect all the check points like Government Weighbridges, Government Check Gates & Railway Siding with dedicated connectivity.
- To cross check all the Minerals transported at Govt. Weighbridge, Check Gate & Railway Siding.

## **Project Outcome**

- Department of Mines
  - Transparency in Issue of Transit Permit & Transit Pass
  - Tracking of mineral movement & TP Usage
  - Different types of Intelligent MIS report generation
  - Fast decision making by the Government.
- Lessee & Buyers
  - Online Request for Transit Permit & Transit Pass
  - Time saving & Cost effective in terms of travelling to mining office
  - Transparency in Issue of Transit Pass

## CHAPTER 4

### EXISTING PROCESS

The 2 circles i.e. DDM office, Joda and Mines Office Keonjhar and coming under District Keonjhar. There are 100 numbers of mines under Joda Circle and 15 mines under Mines officer Keonjhar. The DDM office, Joda and Mines office Keonjhar are directly controlling mainly the following things

#### **Transit Permit & Transit Pass:**

Any person who wishes to transport or remove any mineral from mines shall avail Permission from the concern Authority. The Permission is known as Transit Permit. The Transit Permit is given for a certain quantity of minerals that are transported. Books of triplicate Transit Pass are issued against the Transit Permit. The 1st copy (Original) of the (Transit Pass) is to be there in the Transit Pass Book. The 2nd Copy (Duplicate-1) is to be given to the Weighbridge in charge and the 3rd copy (Duplicate-2) is to be carried by the truck driver to the destination. The TP the Transit Pass is valid maximum of one month. The Lessee has to transport the Permitted quantity of Minerals in one month else another Transit Permit is to be applied.

#### **Issue of Transit Permit to the Lessee / Consignee:**

1. It is mandatory that the Lessee has to take permission to shift or transport the minerals from the Mines to the destination and the Consignee to receive the minerals
2. The Lessee has to apply in a Prescribed format (Form - J) by giving fee of Rs. 100/- of Treasury Challan to the Deputy Director Mines / Mines Officer of the Concern Circle.
3. In Case of Consignee the Permit is applied in the Form - H
4. After physical verification a Transit Permit (Form L) is issued to the Lessee and Form I to the Consignee.

## **Issue of Transit Pass (TP) to the Lessee:**

1. After getting Transit Permit the lessee gives a request for the Transit Pass (TP).
2. The TP Book is issued against the Permit. i.e. as per the quantity of Permit the number of TP books are issued.

## **Current Activities of Weighbridges, Check Gates and Railway Sidings:**

Many Critical business activities are carried out at Weighbridges, Check Gates and Railway Sidings. The activities of each are as below

### **Weighbridges:**

The Minerals that are to be transported to the destination are weighed through the Weighbridges available in every mine. When the ore loaded truck is weighed the gross weight is taken and the weight of the transported mineral is calculated and put in the transit pass. If the weighbridge is private, a person from mines office is always available to monitor and maintain the register.

### **Check Gates:**

The Minerals that are transported to the destination has to come through check gates. The check gates are always near the Weighbridges. Always it is a government check gate where a check gate operator is sitting. The check gate operator collects the Transit Pass for every transaction of Minerals / Ores shifted to the destination.

### **Railway Siding:**

The transport supervisor collects TPs from the carrier those are dumping minerals at Railway Siding. The consolidated report is prepared which contains Carrier No., TP No., Tare Weight, Gross Weight, Mineral Weight, issue Date/Time. The supervisor submits TP consolidated report along with TPs at the Station Manager for verification. Station Manager checks the consolidated report and returns the TPs to Supervisor. The rack is loaded and the weight of the mineral is taken in the running weighbridge which is far distance from the siding. The Royalty is collected based on the RR Report

## Study at Keonjhar District

Study at Joda Circle of Keonjhar District has been done from 24th May 2010 to 30 May 2010 and 7th July 2010 to 11th July 2010 at Keonjhar. During study more than 30 Mines, 4 Weighbridges & 13 Railway Sidings were covered. Discussion with Collector Keonjhar, Deputy Director Mines JODA regarding the purpose of Study at Mines, Government Weighbridges and Railway Siding were done. It was a Survey-cum-System Study of the total Mining activities with the cooperation of all mining officers and Lessee. GPS data of all location, Internet Connectivity, Mobile Network, Power Supply with Back up were captured during study. Following Mines, Govt. Weighbridges, check gates & Railway Siding of JODA & Keonjhar Circle were visited,

### MINES (JODA)

SL	CIRCLE	NAME OF MINES / PLACE	MINES NAME
1	JODA	BOLANI	M/S.SAIL
2	JODA	ROIDA C	IDCOL KIW
3	JODA	BHADRASAH	OMDC LTD.
4	JODA	THAKURANI	SARADA MINES (P) LTD.
5	JODA	THAKURANI	OMDC LTD.
6	JODA	JODA-EAST	M/S.TISCO LTD
7	JODA	KHANDBANDH	M/S.TISCO LTD.
8	JODA	BAMEBARI	M/S.TISCO.LTD.
9	JODA	JODA-WEST	M/S. TISCO.LTD
10	JODA	JODA-WEST	M/S PATTNAIK



11	JODA	MURGABEDA	M/S.D.R.PATNAIK
12	JODA	DEOJHAR	T.M. (P) LTD.
13	JODA	BALITA	DR.S.PRADHAN
<b>SL</b>	<b>CIRCLE</b>	<b>NAME OF MINES / PLACE</b>	<b>MINES NAME</b>
14	JODA	JURDI	M/S.KALINGA MINING CORPORATION
15	JODA	JHILLING & LONGLOTA	M/S. ESSAL M. LTD.
16	JODA	NUAGAON	M/S.KJS AHLUWALIA
17	JODA	THAKURANI	K.P.ENTERPRISES
18	JODA	ROIDA-L	M/S.MISL
19	JODA	JAJANGA	M/S.RUNGTA MINES LTD.
20	JODA	LANGIJHARAN	BHANJA MIN.(P) LTD.
21	JODA	JOLAHARI	MALA ROY & OTHERS
22	JODA	BALDA BLOCK	M/S.SEERAJUDIN & CO.
23	JODA	ROIDA-LL	M/S.K.N.RAM
24	JODA	GUALI	R.P.SAO
25	JODA	GUALI	T.P. SAO
26	JODA	SILJORA KALIMATI	M/S M.L.RUNGTA
27	JODA	UNCHABALI	INDRANI PATTNAIK
28	JODA	INGANIJHARAN	DR.S.PRADHAN
29	JODA	GURUDA MINES	M/S.TISCO. LTD.

30	JODA	MANMORA MINES	M/S.TISCO.LTD.
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### RAILWAY SIDING (JODA)

SL	CIRCLE	PLACE	RAILWAY SIDING
1	JODA	JODA	BANSAPANI RAILWAY SIDING
2	JODA	JURUDI	JURUDI RAILWAY SIDING
3	JODA	NAYAGAD	NAYAGAD RAILWAY SIDING
4	JODA	JODA	JODA-EAST RAILWAY SIDING
5	JODA	JODA	ESSEL RAILWAY SIDING (NEW)
6	JODA	DEOJHAR	JINDAL RAILWAY SIDING
7	JODA	DEOJHAR	DEOJHAR RAILWAY SIDING
8	JODA	BOLANI	BOLANI RAILWAY SIDING
9	JODA	BARBIL	BARBIL RAILWAY SIDING
10	JODA	BARBIL	BALAJI RAILWAY SIDING
11	JODA	BARBIL	TAURIAN RAILWAY SIDING
12	JODA	BARBIL	RASMI RAILWAY SIDING
13	JODA		DEEPAK RAILWAY SIDING

**GOVT. WEIGHBRIDGES & CHECK GATES (JODA)**

<b>SL</b>	<b>CIRCLE</b>	<b>PLACE</b>	<b>WEIGHBRIDGE / CHECK GATE</b>
1	JODA	NALDA	NALDA INTEGRATED GATE (CHECK GATE)
2	JODA	NAYAGAD	NAYAGAD GOVT. WEIGHBRIDGE
3	JODA	LAHANDA	LAHANDA GOVT. WEIGHBRIDGE
4	JODA	BELAIKADA	BELAIKADA COMBINED GATE
5	JODA	GUALI	GANDARPADA GUALI GOVT. WEIGHBRIDGE

**MINES (KEONJHAR)**

<b>SL</b>	<b>CIRCLE</b>	<b>NAME OF MINES / PLACE</b>	<b>MINES NAME</b>
1	KEONJHAR	GANDHAMARDAN - B	OMC
2	KEONJHAR	PUTULIPANI	M/S.GSI (P) LTD.
3	KEONJHAR	BAULA	FACOR MINES
4	KEONJHAR	NUASAH - BAULA	NUASAH CHROMITE MINES, IMFA
5	KEONJHAR	BANGUR - BAULA	BANGUR CHROMITE MINES - OMC

## PROPOSED GOVT. WEIGHBRIDGES & CHECK GATES (KEONJHAR)

SL	CIRCLE	PLACE	WEIGHBRIDGE / CHECK GATE
1	KEONJHAR	BIDYADHARPUR	BIDYADHARPUR GOVT. WEIGHBRIDGE
2	KEONJHAR	ANJAR	ANJAR GOVT. WEIGHBRIDGE (PROPOSED)
3	KEONJHAR	KUANAR	KUANAR GOVT. WEIGHBRIDGE (PRPOSED)
4	KEONJHAR	GHUTUR	GHUTUR COMBINED CHECK GATE (PROPOSED)

## CHAPTER 5

### GAP ANALYSIS

#### GAP in the Existing Process

- Manual Process of Transit Permit & Transit Pass makes Lessee unnecessary harassment.
- Monitoring Weight Bridge Activity towards checking
- Monitoring Actual Quantity in Check Gates
- Verification of Original Transit pass, which the Transporters or Lessee normally does Forgery in providing such documents to the authority for verification
- Difficulties to track Monthly, Quarterly and Annual returns
- Difficult to find the actual stock quantity of the Minerals

## CHAPTER 7

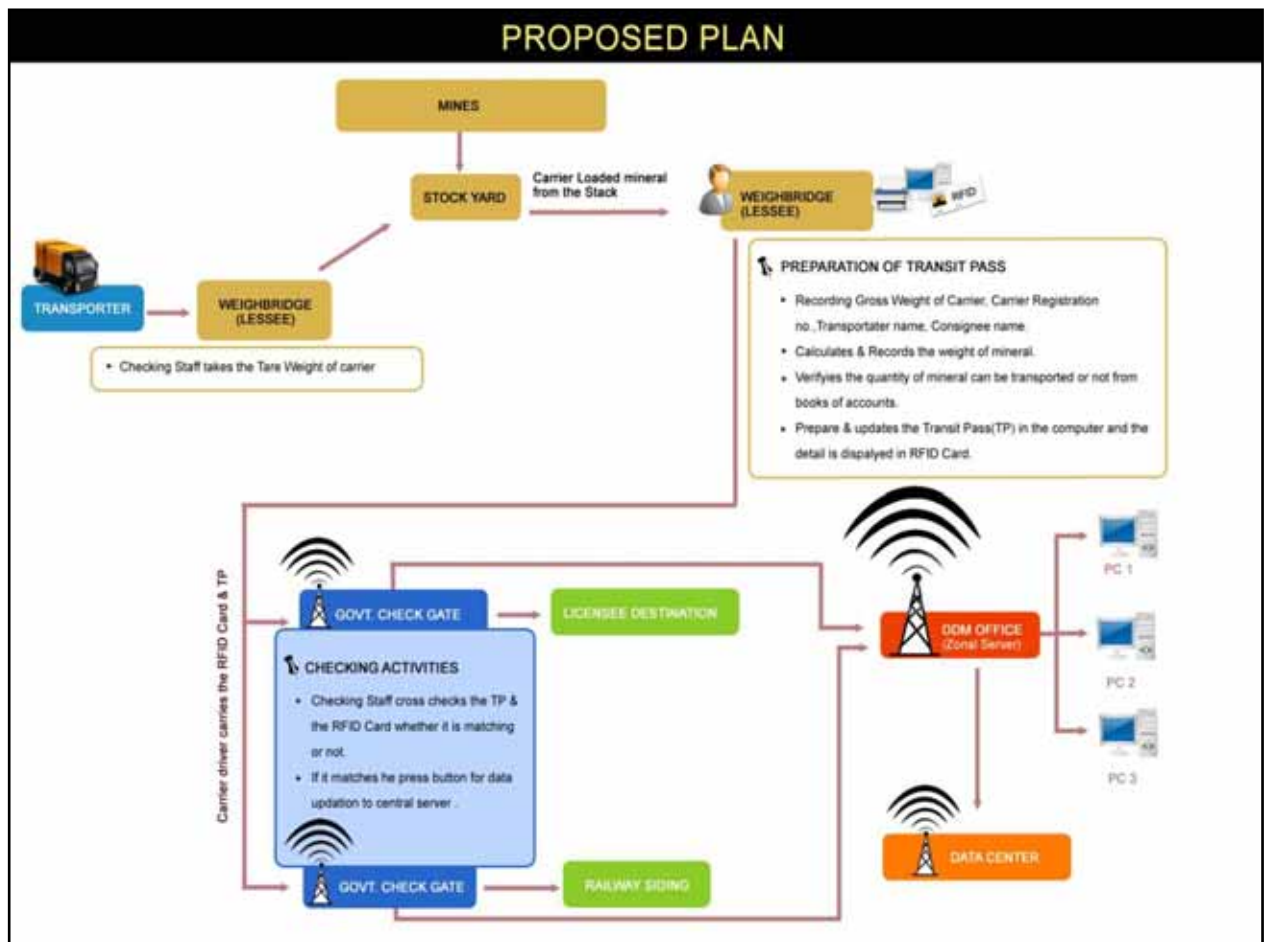
### TO BE PROCESS

#### ICT Intervention

- Plan is to sensing, control & making plan for the Mining Activity
- Required to minimize manual intervention for better productivity & continuation
- Increasing efficient monitoring, transparency and competitiveness
- Required Hybrid solution where dependency on connectivity is minimal
  - RFID card to carry information from Mines weighbridge to check gate
  - At check gate, RFID reader collects information and through CUG towers the data transmitted to central server for updation
  - After Transmitting to the central server, RFID writer will update the flag as the card is verified
- Verification by the officials any where through SMS
- Digital Signature Integration for Issue of Transit Permit.
- Bar Coded Transit Permit & Pass

## Proposed Solution:

- Issue of Transit Permit
- Issue of Transit Pass book
- Issue of RFID Card at Lessee Weighbridge.
- Data updation at Check gate & Railway siding



## Issue of Transit Permit

- Online application to issue Transit Permit, by providing required information as per Form 'J' & 'I' respectively for Lessee/ Licensee
- At the Time, apply for Transit Permit, system will ask for Digital Signature of the Representative of Lessee/ Licensee
- Application will send external mail & SMS to concerned officer regarding new request
- The concerned officer will login to the system & take action to issue Transit Permit as Form 'L' & 'H' respectively for Lessee/ Licensee
- Once the Transit Permit issued, the system will generate a unique permit no. for each request
- After issue of the Transit Permit, the system will send external mail & SMS to the concerned Lessee/ Licensee
- Then through the login authentication Lessee/ Licensee can download & take a printout copy of Transit Permit from system
- At the Time of downloading Transit Permit, system will ask the digital signature of authorized person of Lessee/ Licensee

## Issue of Transit Pass Book

- Online application to issue Transit Pass book, by selecting the Permit No. , system will generate a unique request number
- At the time, apply for Transit Pass book, system will ask for Digital Signature of the Representative of Lessee
- Application will send external mail & SMS to concerned officer regarding new request
- The concerned officer will login to the system & take action to issue of Transit Pass book
- At the Time of Issue of Transit Pass book, system will ask for Digital Signature of the issuing authority
- While issuing the Transit Pass books, the officer will enter the Book number and starting Transit Pass number of the book into the system.

- This way the Transit Pass Book no. & Pass no. will be tagged to the Transit Permit no, Lessee/ licensee details, validity of transport.
- Once tagging the transit pass no. with other info, it will help to cross check during loading & transportation.
- After Issue of the Transit Pass book, the system will send external mail & SMS to the concern Lessee/ Licensee
- Then through the login authentication lessee/ License can take a printout copy, having details of Request ID, Issued book nos. & Book specific Transit Pass Serial No
- The lessee/ license would be required to send their person to collect Transit Pass Book from the mining office

### Issue of RFID Card at Mines

- The Govt. staff (checking Staff) will be required to fill up the Transit Pass as is operating at present.
- Apart from this, he will enter the vital information in an application
  - Carrier number
  - Transit Pass number
  - Issued Date/Time
  - Tare weight of the carrier
  - Mineral weight of carrier



- The system will create a sequence of encrypted data and push it to the RFID card. The RFID card will be provided to each carrier.
- Then the RFID along with the TP copy will be given to the Carrier
- The information on the RFID card will always be updated and previous data will be erased before new data is written on it. One Card can be reused 1, 00,000 times.



- The Govt. staff (checking Staff) will be given a NFC (Near Field Communication) enabled mobile handset. They will read the RFID Card and send the information to the Central Server via SMS.

### **RFID card verification at Govt. Check gates**

- The information entered to the RFID card at the Mines Weight Bridge will be updated at the central server.
- When the truck enters the Govt. Check Gate, the checking staff will collect the Transit Pass copy and RFID card from the carrier driver for inspection.
- At the same time the weight of the carrier will be taken on the weight bridge.
- The Govt. check gate will have one RFID Card reader and the NFC enabled Mobile handset as backup that will capture the information.
- This data will be cross verified with the Transit Pass copy, actual weight with the Central Server
- Then the data will be transferred to the central server for updation and the flag will be **“Checked”**.
- The System will generate the MIS of the mineral transported through Road Transport.

### **RFID card verification at Railway Siding**

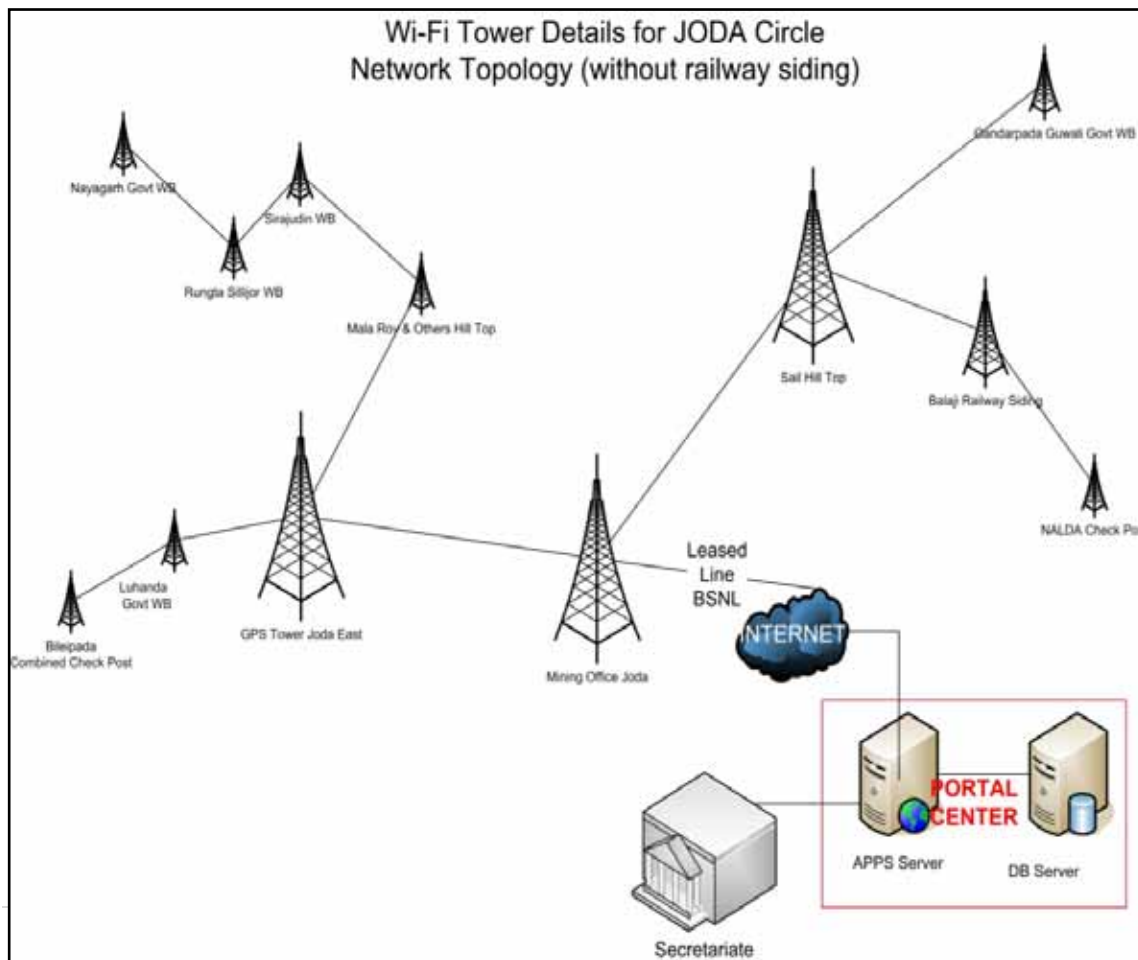
- Before dumping minerals at the railway siding the carriers should have checked by the check gate
- This check gate will have same process as mentioned in other check gates
- While checking the carrier data will be updated in the central server as well
- Once data updated system can generate MIS of mineral transported through railway siding

## Mobile inspection

- Verification by the officials any where through SMS
- NFC enabled mobile will be used for inspection.
- The officials will send the Carrier Registration No to Central Server through SMS and gets the reply within 2-3 minutes with the mineral details.
- Though the illegal transport can be checked.

## Network Solution

### Tower Location (JODA)



## CHAPTER 8

### TRAINING & CAPACITY BUILDING

Today, due to the rising expectations of Government and increased complexity of issues, government offices are the challenge to work in innovative ways to meet the Government requirements. In this context e-governance has opened up a new opportunity to governments across the board. However, as evident from the field study, due to complexity of issues and implementing Integrated Mines & Mineral Management System project is a big task for Department of Steel & Mines.

However what it requires in terms of resource is not just money, but also lots of expertise, special skills and commitment of the people involved. It will call for a well-funded and organised capacity building programme.

It assumes great significance as a good framework may be undercut, if the personnel lack training, orientation, or motivation; or if there is a lack of leadership commitment. Therefore, sincerely motivated personnel can exercise their technological skills to the highest level through continuous innovation. They need to be equipped with new skills that would enable them to work efficiently and get prepared to take risks. Special focus has to be given to behavioral skills like inter-personal skills, participatory leadership, team building and motivation.

For performing various functions, the stakeholders require enhanced capabilities. These include technical, managerial / administrative and human / behavioral capabilities. Technical capabilities relate to basic technical knowledge of different subjects concerning the delivery department. Managerial / administrative capabilities include project management skills, quality management, etc. Human capabilities are concerned with ability to deal with other people like officials, staff

members, and citizens and so on. These include abilities to lead others, motivate, generate team spirit and resolve conflicts. Some of the capabilities, as may be required in the context of e-governance, are summed-up as follows:

### ***General awareness***

- ◆ General awareness about Information Technology
- ◆ Quality in services through IT

### ***Technical Capabilities***

- ◆ Subject-based
- ◆ Laws, rules, processes, etc. governing the functioning
- ◆ Legal knowledge
- ◆ Technical knowledge based on job requirement

### ***Managerial / Administrative capabilities***

- ◆ Project management
- ◆ Financial management (Revenue model and breakeven point)
- ◆ Quality management

### ***Human/ Behavioral Capabilities***

- ◆ Leadership
- ◆ Citizen management
- ◆ Teamwork
- ◆ Roles and responsibilities
- ◆ Motivation
- ◆ Inter-personal skills and emotional intelligence