सीएसआईआर–केन्द्रीय सड़क अनुसंधान संस्थान
(वैज्ञानिक एवं औद्योगिक अनुसंधान परिषद)
पी.ओ. सीआरआरआई, मथुरा रोड, नई दिल्ली 110025

CSIR-Central Road Research Institute
(Council of Scientific & Industrial Research)
PO CRRI, Delhi-Mathura Road, New Delhi 110 025 (India)
Website : www.crridom.gov.in

डा. पूर्णिमा परिदा
प्रमुख, परिवहन योजना

Dr. Purnima Parida,
Head, Transportation Planning

No. p61/TP/15
Dated: 16/04/2015

The General Manager
Nuagaon Iron Ore Mines
M/s KJS Ahluwalia
At/Po.Barbil, Dist:Keonjhar
Odisha-758035

Sub: **Authentication of "Traffic study report for Nuagaon Iron Ore Mines of M/s KJS Ahluwalia, district Keonjhar, Odisha.**

Ref: **1. Your letter dated 10th April 2015.**
2. Final report on "Study for feasibility of mineral transportation in Joda, Barbil, Odisha" submitted vide No. p61/TP/14 dated 14.08.2014

Sir,

With reference to the above cited subject and your request vide letter dated 10th April 2015 we herewith authenticate that the traffic study report specific to Nuagaon Iron ore Mines, M/s KJS Ahluwalia, in the district Keonjhar of Odisha, is the extract of report on **"Study for feasibility of mineral transportation in Joda, Barbil, Odisha" conducted by CSIR-Central Road Research Institute (CRRI), New Delhi submitted vide letter No. p61/TP/14 dated 14.08.2014.** While preparing the report authentic information/data from various govt. authorities like NHAI, real time traffic data from Integrated Mines and Minerals Management System (I3MS), Department of Steel & Mines, Govt. of Odisha, Regional Transport Officer, Public Works Department of the Govt. of Odisha was taken in to consideration.

Thanking You,

Yours Sincerely

(Dr. Purnima Parida)

Encl: As Above

☎: (O) 91-11-26310339, 26312268 91-11-26845943, 26830480
email: purnima.crri@nic.in & punam31@gmail.com

TRAFFIC STUDY

NUAGAON IRON ORE MINE

M/S KJS AHULUWALIA

Keonjhar District

Odisha

1.1 GENERAL

Nuagaon iron ore mining lease of 767.284 hectares of Sri. K.J.S. Ahluwalia is being worked for a rated capacity of 5.62 Million Tonnes Per annum (MTPA) and beneficiation plant capacity 2 MTPA after obtaining necessary clearance from IBM, Environmental clearance from MOEF and other statutory clearances.

Nuagaon mining lease is located in villages Nuagaon, Guali, Topadihi, Barpada and Katasahi in Keonjhar district of Orissa State NH-215 passes through the lease area.

MoEF while giving environmental clearance to the proposal had laid certain specific conditions. For 5.62 MTPA iron ore production, the Ministry vide **specific condition no. V of the** laid down that "**Alternative transport system such as dedicated Railway siding for transportation of mineral from their mine shall be studied and put in place at the earliest but not later than five years. No mineral transportation by road shall be permitted beyond 5 years.**"" For 2 MTPA beneficiation plant, the Ministry vide **specific condition no. VIII** laid down that **"Mineral transportation after the 5th year shall be carried out only by rail".**

The traffic study with respect to Nuagaon Iron Ore Mines is the extract of Traffic study for feasibility of Mineral transportation in Joda-barbil, Odisha done by Central Road Research Institute (CRRI), New Delhi.

INTRODUCTION

General

The mining industry in India is emerging as a giant in the field of Iron and Steel. The National steel policy envisages production of 110 million ton steel by 2020. Mining in Odisha is the second largest employer in India. Particularly, Keonjhar district is one such area which has seen a huge upsurge in mineral based industries. Keonjhar is one of the major mineral producing district of Odisha. It has a population of almost 1.8 million people (2011 census) and a population density of 217 (sq km). There is in need of proper traffic and transportation study to investigate the feasibility of mineral transportation by considering the future demand of Iron ore. Concerned with the problems of mineral transportation in the study area (Joda & Barbil), M/s Thriveni Consultancy Services has approached CSIR-Central Road Research Institute (CRRI) to conduct feasibility of mineral transportation on the existing road network.

As per provisional reports of Census of India, in the year 2011 the population of Keonjhar district was 18 Lakhs. Total registered motor vehicle in Odisha state in the year 2011 was 33.1 lakhs and the Compound Annual Growth Rate (CAGR) of registered vehicles in Odisha State was 11.4% (Road Transport Year Book 2007-09, MORTH, 2011. Freight vehicles growth from 2004 to 2011 in Odisha state observed is almost double from the national average. The freight vehicle growth in comparison with the national level is given in Table 1

Table 1 Freight Vehicle Growth in Odisha and India (Numbers)

Year	Odisha	India
2004-05	62,486	2,718,597
2005-06	74,432	2,951,779
2006-07	83,093	2,945,046
2007-08	91,154	3,166,553
2008-09	100,279	3,347,558
2009-10	109,804	3,504,491
2010-11	119,145	3,760,864
Growth	11.36%	5.56 %

(Source: Road Transport Year Book, MoRTH 2009 and MoRTH 2011)

Further, it was observed from the classified vehicle registration data that the percentage of truck traffic to the total traffic is about 24% for the year 2010 and 2011. The same for the year 2012 and 2013 is about 8%. This can be attributed to the closing of illegal mines in the Keonjhar and Barbil area.

Existing Road Network

The Keonjhar district emerged as one of the district on 1st January, 1948. The district is bounded by Mayurbhanj district and Bhadrak district to the east, Jajpur district to the south, Dhenkanal district and Sundargarh district to the west and West Singhbhum district of Jharkhand State to the north. Covering a geographical area of 8240 sq km. The existing road network in Keonjhar district includes 287km length of National Highway road network, 79 km length of State Highway, 78 km length of Major District roads and 367 km length of Other District roads. Also having 155 km length of Rail network. The entire study area falls in the Joda area; this is one of the block in Keonjhar district.

Existing Railway Network

The major parts of the minerals are transport to the different industries through the public railway sidings, which are existed within the 20-30 KM vicinity from the Nuagaon Iron Ore Mines. The public sidings with existing capacity rake capacity are given below.

PUBLIC RAILWAY SIDING IN THE AREA AND THEIR CAPACITY		
Name of siding	**Number of loading line**	**Rake Capacity/Year (considering 3 rakes/line/day)**
Joruri	2	**2190**
Banspani	3	**3285**
Nayagarh	3	**3285**
Bolani	1	**1095**
Barbil	3	**3285**
Deojhar	1	**1095**

As per the data from railway authority all the railway sidings are under utilisation considering the peak year production & dispatch during 2009-10. Further to augment the facility railway is making double laning of Jakhapura - Keonjhar-Noamundi railway line & tri-lanning of railway line from Noamundi to Tata-Nagar.

OBJECTIVE AND SCOPE OF THE STUDY

- The main objective this study is to conduct appropriate field and traffic studies to study the feasibility of mineral transportation on National Highway (NH 215) and various State Highways passing through Study Area (Joda Barbil)
- To estimate freight and passenger traffic volume on study road network and estimation of delay at the intersections.
- Traffic data analysis and demand forecasting up to 10 years span with 5years span interval phase wise as per IRC guidelines.
- Estimation of future traffic and its distribution at peak hours for each intersection for the next 10 years.
- Short term and Long term improvement plans and suggestions for Identified Intersections on study corridor to minimize the freight traffic congestion.

With respect to Nuagaon Iron Ore Mines two intersections are taken on NH-215 for the detailed study.

METHODOLOGY

Initially, reconnaissance survey was carried out to understand the study requirements of the selected intersections and road corridors, site constraints, available carriageway and Right of Way (ROW) width and physical inspection of encroachment if any. The study team also held discussions with client officials to understand Secondary data requirements which includes existing operating Iron mining locations and railway sidings in the study area, Existing capacity of mines and railway sidings and entry and exist truck information data at various railway sidings in Joda Barbil. Further various traffic studies required for junction improvements like classified traffic volume, speed and delay surveys and video graphic surveys were carried out to assess the existing traffic situations on identified intersection of study rod network.

Four stage travel demand model was adopted for modeling truck demand for base and horizon year. Mineral production data of each zone was considered as production of each zone and truck data at each railways siding considered as attractions of each zone. Truck assignment was done by considering all or Nothing (AON) assignment and User Equilibrium (UE) methods. These entire procedures were done through VISUM software (VISUM). The developed base year model was validated by comparing with field traffic data. Further, horizon year truck demand was estimated by considering the future capacity enhancement of each mine. Keeping in view the ground conditions and traffic characteristics the intersection improvement plans for all the identified intersections were arrived at. The improvement plans have been conceived conforming to IRC SP- 41 and IRC 65

TRAFFIC DATA COLLECTION

Turning Movement Traffic Data Collection: Turning movement traffic surveys were carried out on normal working days of the week for a 24-hour period from 9:00 AM to 9:00 AM at identified 3 intersections were carried out.

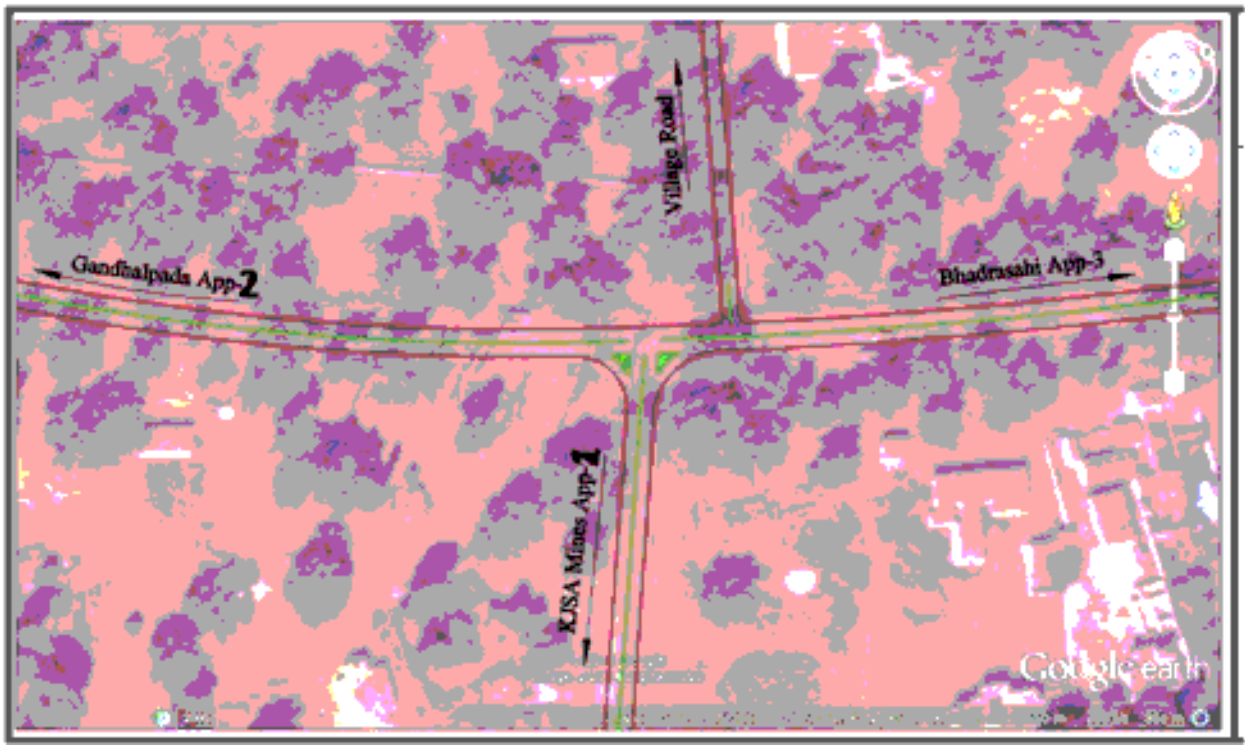
Traffic data Collection and analysis

SI No.	Name of the Intersection	Date of Survey	Survey Period
1	KJSA Mines Intersection	24.02.2014	24 hours
2	Rugudih Intersection	24.02.2014	24 hours
3	Bhadrasahi Intersection	21.02.2014	24 hours

Junction wise detail traffic analysis given below.

KJSA Mines Intersection

This is a three arm intersection formed by meeting of KJSA Mines road with NH-215. Heavy truck traffic movement at this intersection was observed due to mines which are in close vicinity to this intersection. Particularly Heavy movement of truck traffic is observed during field survey, from mines towards Rugudih and vice versa. Large traffic delay is prominent during evening peak hours at this intersection. Figure below shows the top view of the KJSA Intersection.



The hourly variation of the total traffic volume observed at this intersection along with the vehicle composition is presented in **Figure1.1 below**. Some of the main observations from these figures are discussed as follows

Observations from traffic flow vehicular composition:

The total traffic volume observed at this intersection during 24 hours survey period is 8944 vehicles (22274 PCUs). The morning peak hour traffic is about 353 vehicles (658 PCUs) found between 10:00 AM to 11:00 AM. Evening Peak hour traffic about 650 vehicles (1563 PCUs) observed between 19:00PM to 20:00 PM.

From Figure 1.2 It can be observed that truck traffic including 2 Axial and 3 Axial (76%) are having predominant share than the 2 wheeler (11%) followed by car (8%) and LCV 3%. Cycle share is 2%.

Observations from Turning Movement flow:

The turning movement traffic flow during morning peak hour and evening peak hour is presented in **Figure 1.3**, from this it can be inferred that the maximum amount of traffic is plying in the directions of Rugudih to KJSA mines (658 PCUs) and evening peak hour flow in this direction is (1563 PCUs) higher than the morning peak hour traffic.

Total Traffic details at KJSA Junction – 24.02.2014													
Time	2 Axle Trucks	3 Axle Trucks	Multi Axles Vehicles	Mini Bus	Bus	Car	2W	LCV	Cycles	Auto	Others	Grand Total (vehicles)	Grand Total (PCUs)
8:00-9:00	130	6	0	4	2	39	66	19	5	0	4	275	547
9:00-10:00	135	8	0	4	2	111	30	4	3	0	4	301	599
10:00-11:00	160	6	0	0	0	46	100	26	11	1	3	353	658
11:00-12:00	168	1	0	1	2	41	80	8	6	0	2	309	623
12:00-13:00	165	13	0	1	0	46	97	14	4	0	7	347	695
13:00-14:00	153	11	0	1	1	43	101	17	2	1	4	334	642
14:00-1500	162	12	0	0	1	26	67	19	2	1	2	292	627
15:00-1600	179	14	0	0	2	39	57	11	3	0	2	307	683
16:00-17:00	230	13	0	0	1	36	63	22	11	0	1	377	844
17:00-18:00	232	54	0	0	2	53	65	19	16	2	2	445	1000
18:00-19:00	258	70	4	1	3	49	61	22	14	1	4	487	1157
19:00-20:00	433	23	1	0	1	62	74	38	14	0	4	650	1563
20:00-21:00	392	33	5	0	0	40	37	11	4	1	2	525	1388
21:00-22:00	294	31	0	0	0	22	17	5	1	0	2	372	1026
22.00-23.00	245	50	0	0	1	11	10	3	1	0	0	321	909
23.00-00.00	314	36	0	0	0	3	3	3	0	2	0	361	1061
00.00-01.00	387	92	0	0	0	1	2	0	0	0	5	487	1469
01.00-02.00	379	66	0	0	1	0	1	0	0	0	0	447	1339
02.00-03.00	385	62	0	0	0	0	0	0	0	0	1	448	1347
03.00-04.00	287	59	1	0	0	1	0	0	0	0	0	348	1044
04.00-05.00	309	75	1	0	0	3	2	0	0	0	0	390	1161
05.00-06.00	238	39	0	0	0	3	1	2	1	0	1	285	844
06.00-07.00	142	54	0	0	0	29	35	13	14	0	0	287	661
07.00-08.00	68	38	0	0	0	36	33	11	10	0	0	196	392
Total	**5845**	**866**	**12**	**12**	**19**	**740**	**1002**	**267**	**122**	**9**	**50**	**8944**	**22274**
Percentage	**65.4%**	**9.7%**	**0.1%**	**0.1%**	**0.2%**	**8.3%**	**11.2%**	**3.0%**	**1.4%**	**0.1%**	**0.6%**	**100.0%**	

Fig- 1.1

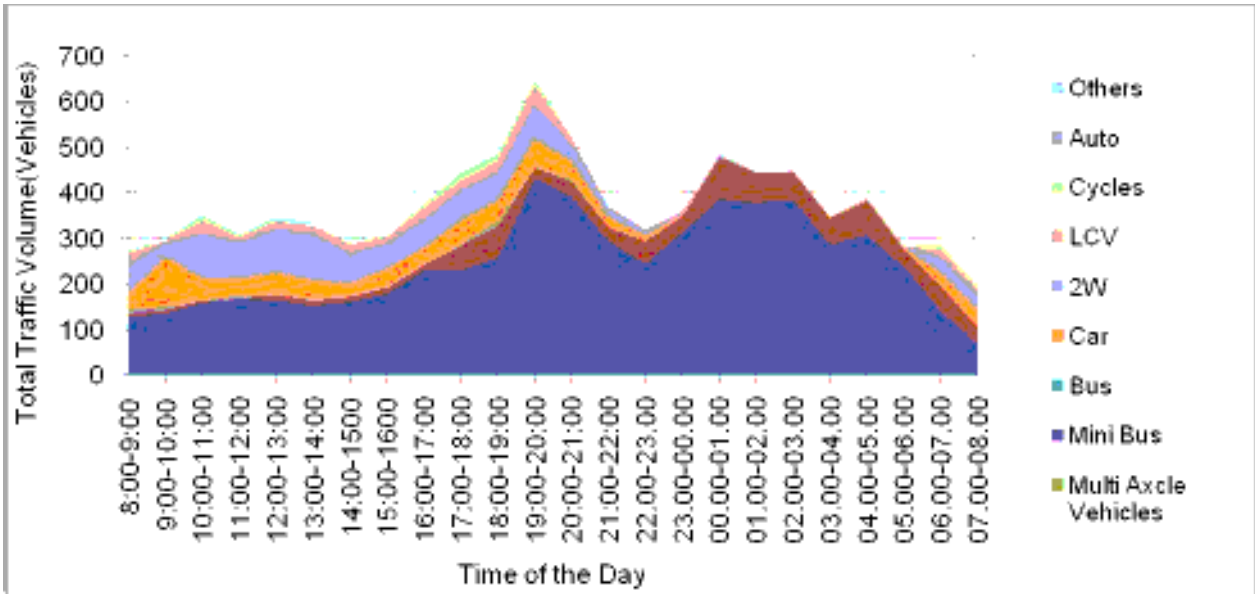

Total Traffic Volume(Vehicles)
700
600
500
400
300
200
100
0
8:00-9:00
9:00-10:00
10:00-11:00
11:00-12:00
12:00-13:00
13:00-14:00
14:00-1500
15:00-1600
16:00-17:00
17:00-18:00
18:00-19:00
19:00-20:00
20:00-21:00
21:00-22:00
22.00-23.00
23.00-00.00
00.00-01.00
01.00-02.00
02.00-03.00
03.00-04.00
04.00-05.00
05.00-06.00
06.00-07.00
07.00-08.00
Time of the Day
Others
Auto
Cycles
LCV
2W
Car
Bus
Mini Bus
Multi Axcle Vehicles

Fig-1.2

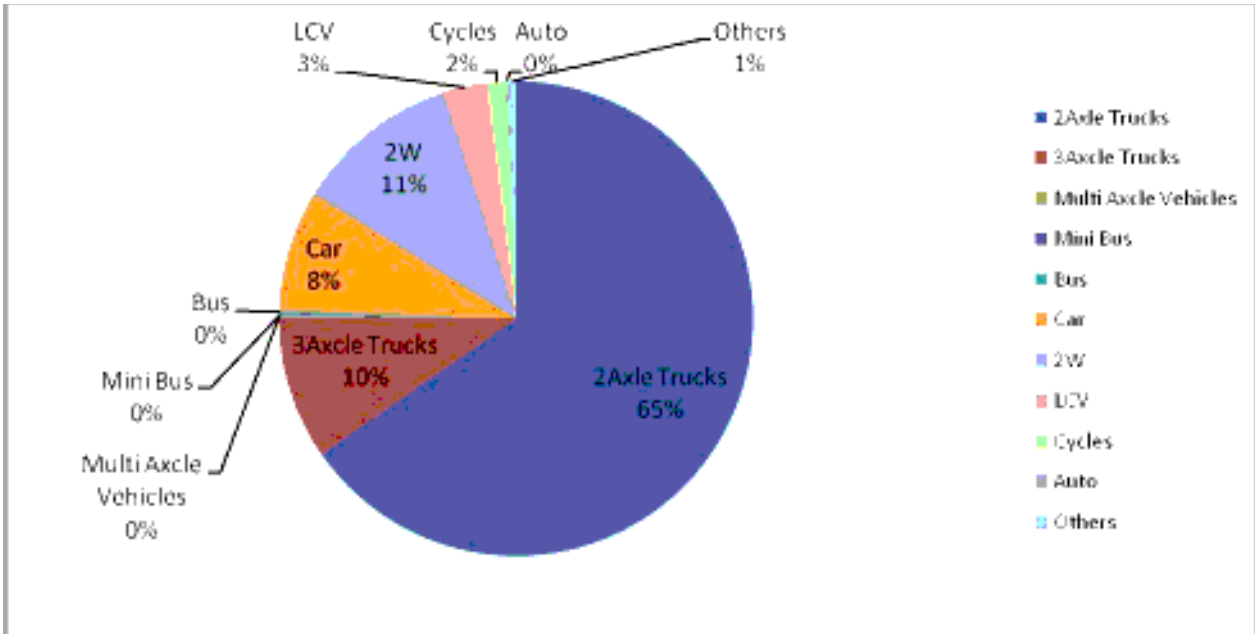
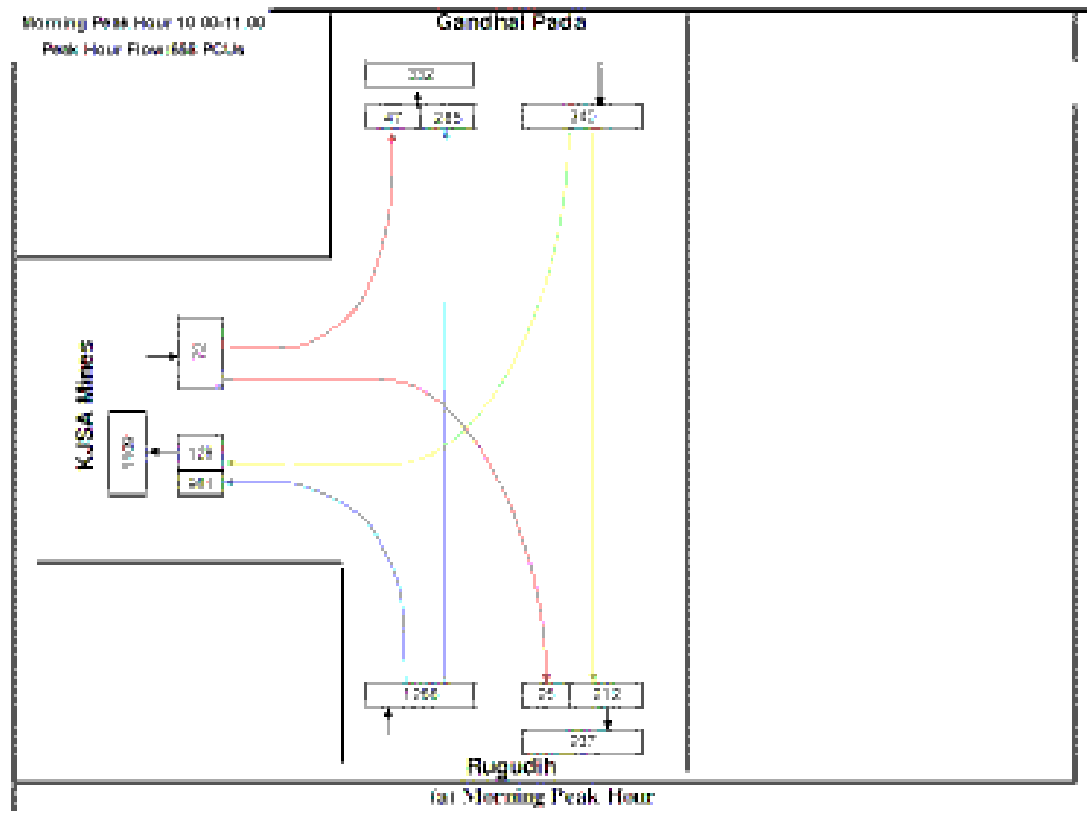
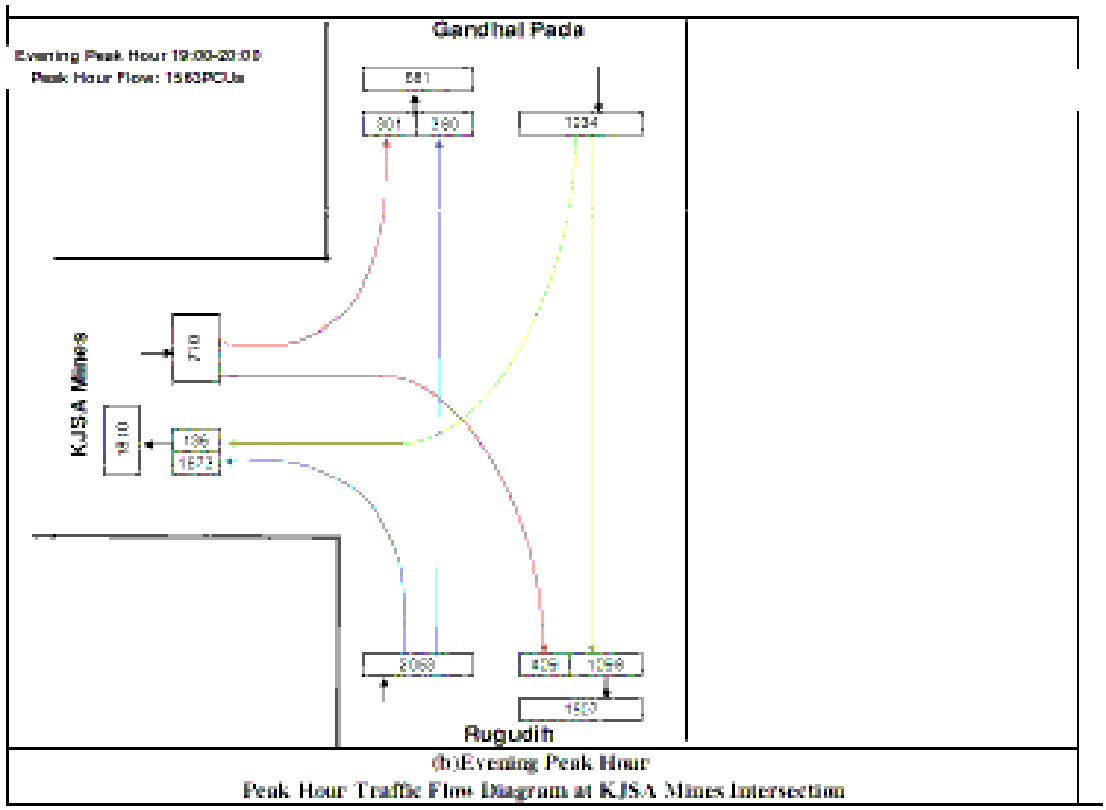

LCV 3%
Cycles 2%
Auto 0%
Others 1%
2W 11%
Car 8%
Bus 0%
3Axcle Trucks 10%
2Axle Trucks 65%
Mini Bus 0%
Multi Axcle Vehicles 0%
2Axle Trucks
3Axcle Trucks
Multi Axcle Vehicles
Mini Bus
Bus
Car
2W
LCV
Cycles
Auto
Others

Fig-1.3

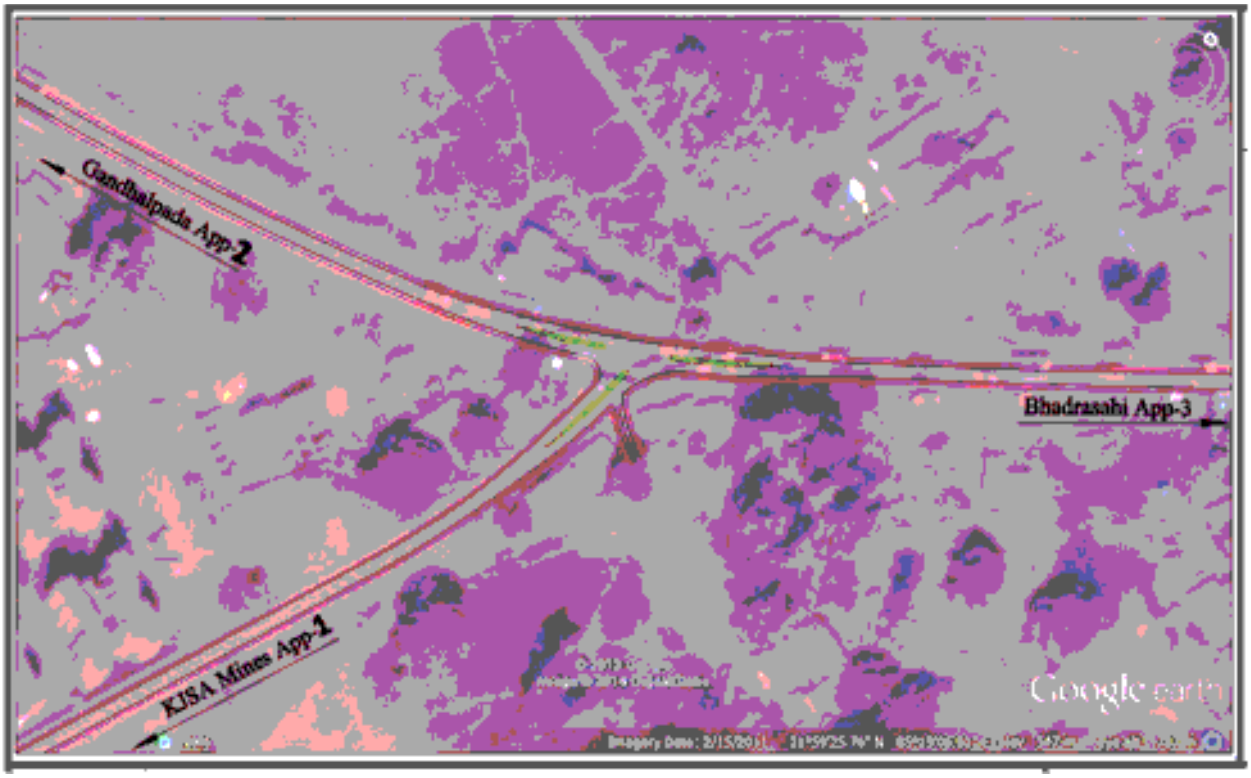




Peak Hour Traffic Flow Diagram at KJSA Mines Intersection

Rugudih Intersection

This is a three arm intersection which lies on NH-215 and formed by meeting of Bhadrasahi to Gandhalpada road and KJSA Mines road. Due to mines in close vicinity, truck movement is heavy for the entire day. **Figure below** shows the top view of the Rugudih Intersection.



The hourly variation of the total traffic volume observed at this intersection along with the vehicle composition is presented in **Figure 2.1 and 2.2** .Some of the main observations from these figures are discussed as follows

Observations from traffic flow vehicular composition*:*

The total traffic volume observed at this intersection during 24 hours survey period 10,284 vehicles (24,120 PCUs). The Morning peak hour of the traffic volume is about 456 vehicles (707 PCUs) observed between 11:00 AM to12:00 AM and Evening Peak hour traffic about 703 vehicles (2,120 PCUs) observed between 2:00 PM to 3:00 PM.

From the **Figure 2.2** it can be observed that truck traffic (71.0%) are having predominant share than the 2 wheelers (18.0%) and car (8%). The bus and mini bus share is less than 1%. Cycle share is (1.0%).

Observations from Turning Movement flow:

The turning movement traffic flow during morning peak hour and evening peak hour is presented in **Figure 2.3,** from this it can be inferred that the traffic is plying in the directions of KJS Ahluwalia to Bhadrasahi (707 PCUs) between 11:00 to 12:00 AM and evening peak hour flow in this directions is (2,120 PCUs) between 2:00 to 3:00 PM which is greater than the morning peak hour.

Total traffic details at Rugudi Junction – 24.02.2014

Time	2 Axle Trucks	3 Axle Trucks	Multi Axle Vehicles	Mini Bus	Bus	Car	2W	LCV	Cycles	Auto	Others	Grand Total (vehicles)	Grand Total (PCUs)
8:00-9:00	105	49	0	0	0	41	83	10	4	0	0	292	562
9:00-10:00	141	17	0	1	0	54	86	11	2	0	0	312	590
10:00-11:00	116	5	0	0	1	73	209	22	6	0	0	432	580
11:00-12:00	158	8	1	0	1	76	181	19	12	0	0	456	707
12:00-13:00	74	11	0	0	1	66	202	29	4	0	0	387	471
13:00-14:00	91	6	0	1	1	49	124	8	0	0	0	280	419
14:00-1500	118	9	3	0	0	45	88	13	2	0	1	279	510
15:00-1600	152	4	2	2	3	78	151	14	5	0	0	411	666
16:00-17:00	118	6	1	0	1	68	154	17	4	0	2	371	564
17:00-18:00	104	25	3	0	1	64	187	27	7	0	0	418	605
18:00-19:00	204	45	7	0	0	58	143	22	6	0	0	485	944
19:00-20:00	190	94	7	0	0	34	84	11	1	0	0	421	977
20:00-21:00	56	45	3	0	0	14	10	0	1	0	0	129	336
21:00-22:00	216	169	2	0	0	25	43	3	0	0	0	458	1215
22.00-23.00	308	170	0	0	1	25	13	3	0	0	0	520	1473
23.00-00.00	295	117	2	0	0	21	5	3	0	0	0	443	1273
00.00-01.00	376	175	0	0	0	10	6	3	0	0	1	571	1677
01.00-02.00	299	127	2	0	0	21	4	10	0	0	0	463	1325
02.00-03.00	403	282	11	0	4	1	1	1	0	0	0	703	2120
03.00-04.00	271	238	0	0	0	1	1	1	1	0	0	513	1531
04.00-05.00	256	266	3	0	0	5	2	3	3	0	0	538	1592
05.00-06.00	324	269	3	0	3	4	11	8	3	0	0	625	1825
06.00-07.00	201	154	14	0	4	7	14	15	3	0	0	412	1178
07.00-08.00	149	151	5	0	5	19	22	11	3	0	0	365	986
Total	**4725**	**2442**	**69**	**4**	**26**	**859**	**1824**	**264**	**67**	**0**	**4**	**10284**	**24120**
Percentage	**45.9%**	**23.7%**	**0.7%**	**0.0%**	**0.3%**	**8.4%**	**17.7%**	**2.6%**	**0.7%**	**0.0%**	**0.0%**	**100.0%**	

Fig-2.1

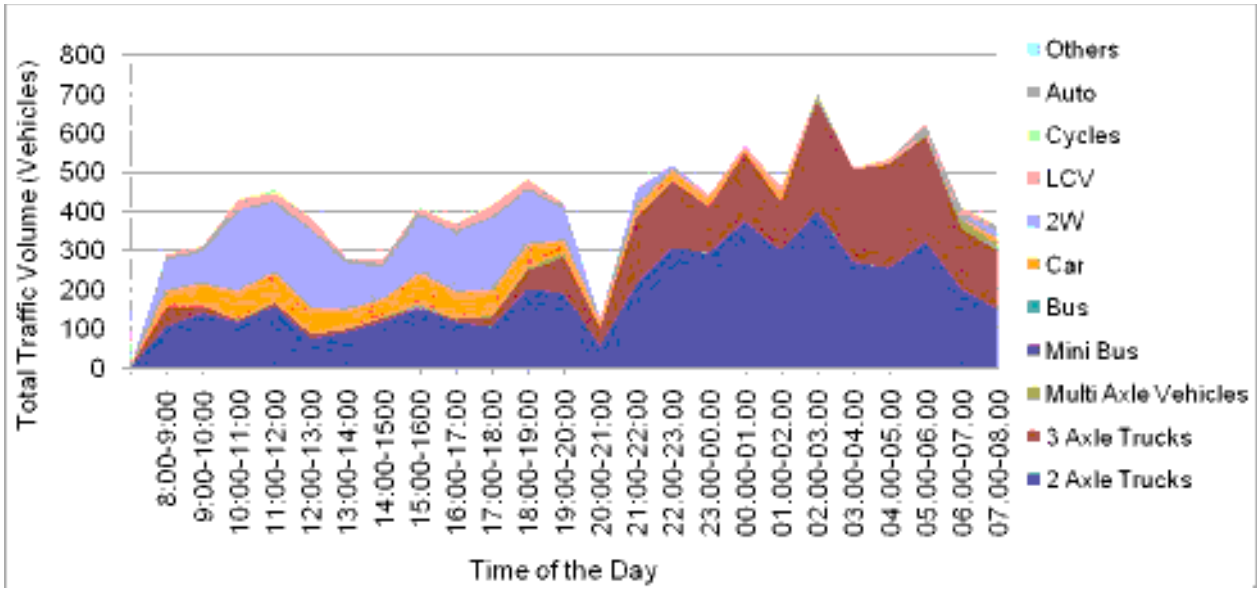

Total Traffic Volume (Vehicles)
800
700
600
500
400
300
200
100
0
8:00-9:00
9:00-10:00
10:00-11:00
11:00-12:00
12:00-13:00
13:00-14:00
14:00-1500
15:00-1600
16:00-17:00
17:00-18:00
18:00-19:00
19:00-20:00
20:00-21:00
21:00-22:00
22.00-23.00
23.00-00.00
00.00-01.00
01.00-02.00
02.00-03.00
03.00-04.00
04.00-05.00
05.00-06.00
06.00-07.00
07.00-08.00
Time of the Day
Others
Auto
Cycles
LCV
2W
Car
Bus
Mini Bus
Multi Axle Vehicles
3 Axle Trucks
2 Axle Trucks

Fig-2.2

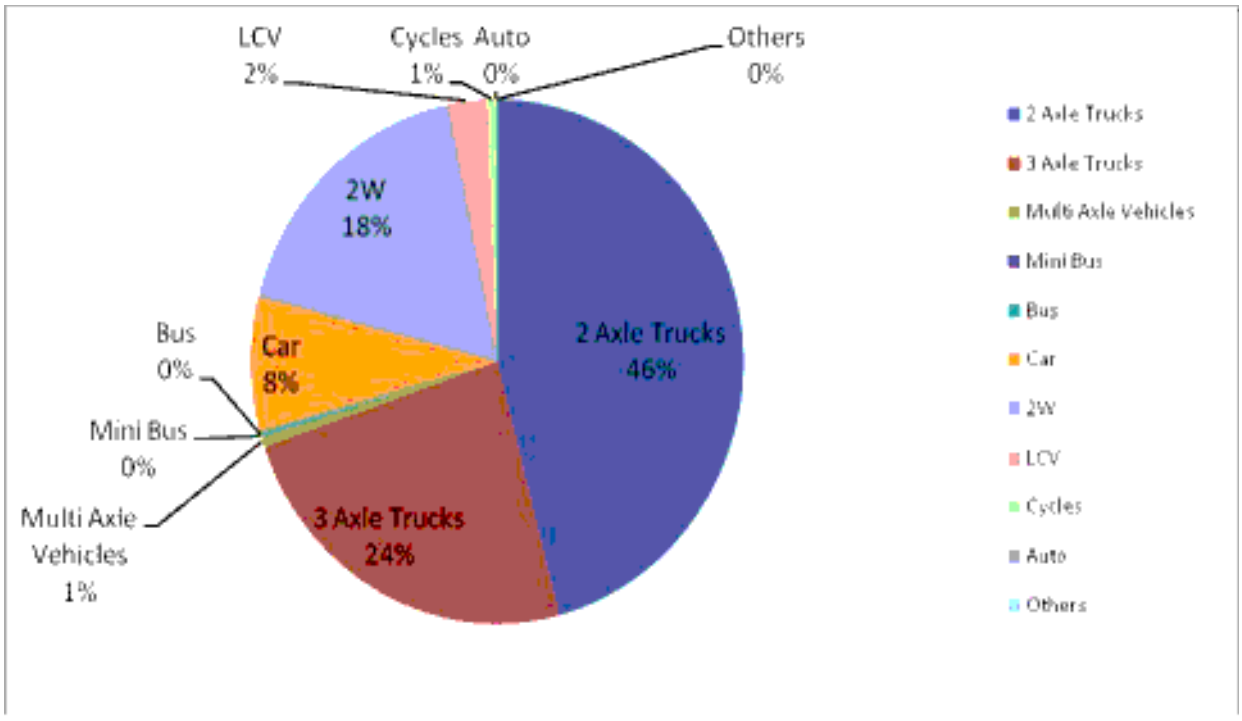
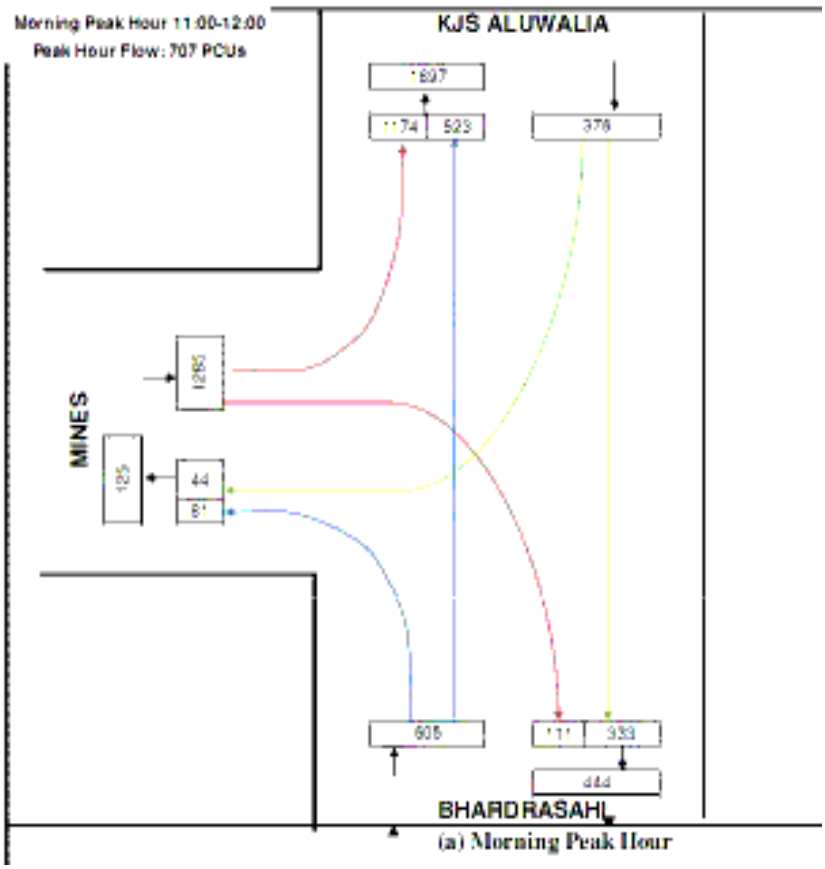
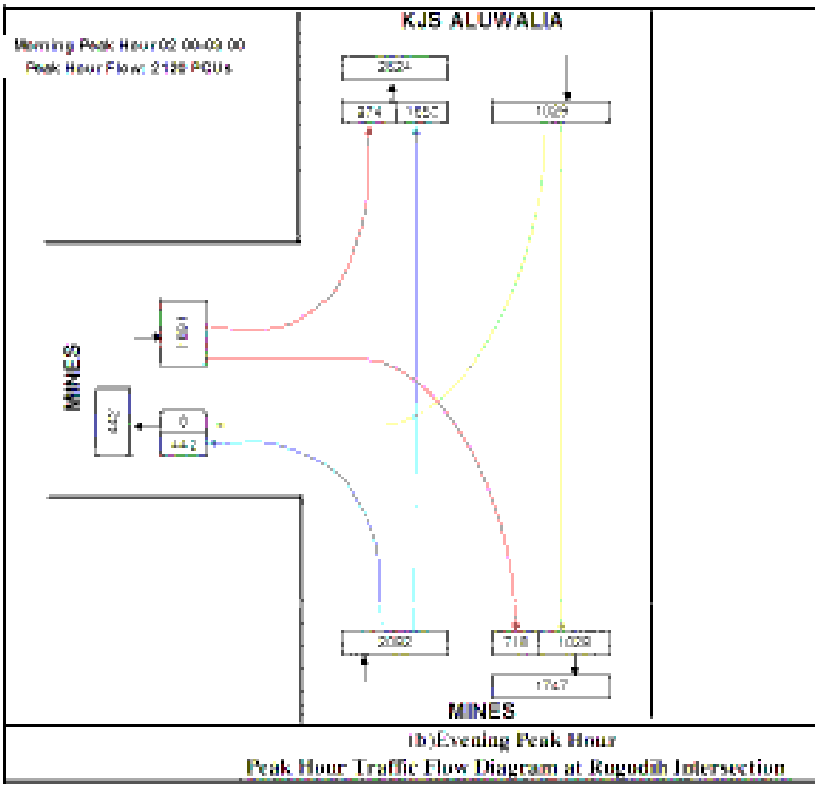

LCV
2%
Cycles
1%
Auto
0%
Others
0%
2W
18%
Bus
0%
Car
8%
2 Axle Trucks
46%
Mini Bus
0%
Multi Axle
Vehicles
1%
3 Axle Trucks
24%
2 Axle Trucks
3 Axle Trucks
Multi Axle Vehicles
Mini Bus
Bus
Car
2W
LCV
Cycles
Auto
Others

Fig-2.3

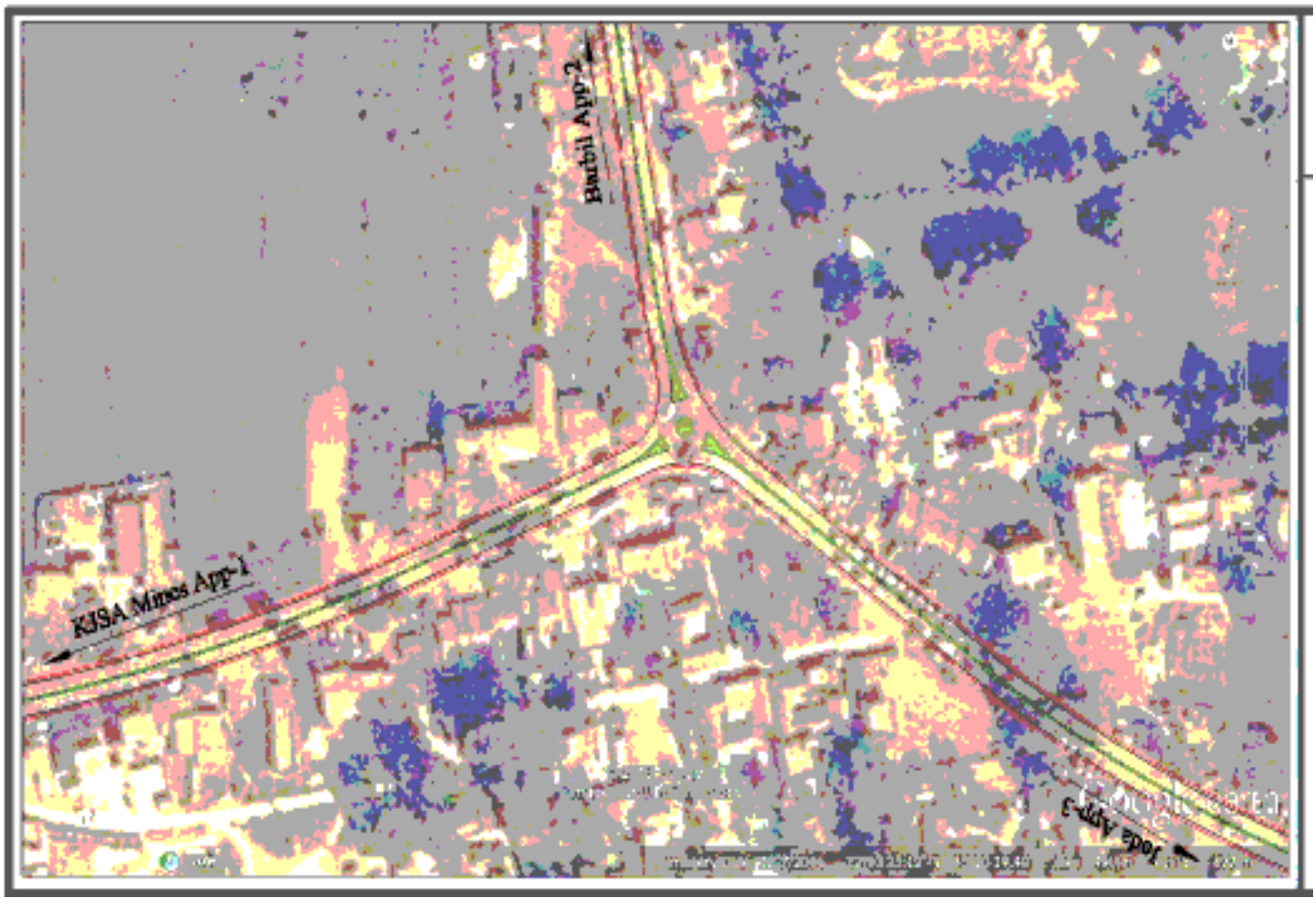




Peak Hour Traffic Flow Diagram at Rugudih Intersection

Bhadrasahi Intersection

This is a three arm intersection falling on NH-215. This intersection is formed by meeting of Barbil road with NH-215. BRPL mineral industry is located near to this intersection. A statue of “Biju Patnaik” former chief minister of Odisha is located at the centre of Intersection which forms this intersection a rotary intersection. Figure below shows the top view of the Bhadrasahi Intersection. Truck traffic movement is more at this intersection thought the entire day and night.



The hourly variation of the total traffic volume observed at this intersection along with the vehicle composition is presented in **Figure 3.1 and 3.2**. Some of the main observations from these figures are discussed as follows

Observations from traffic flow vehicular composition:

The total traffic volume observed at this intersection during 24 hours survey period is 20,663 vehicles (35,554 PCUs). The morning peak hour traffic is about 814 vehicles (1,337 PCUs) found between 08:00 AM to 09:00 AM. Evening Peak hour traffic about 1,000 vehicles (2,753 PCUs) observed between 12:00 AM to 1:00 AM.

From the **Figure 3.2** it can be observed that two wheelers (30.1%) are having predominant share than the cars (21.7%) followed by Autos 0.5%. Cycle share is1.0% and share of buses and minibus is about 1.3% and 0.4%.The percentage of 2Axle Trucks is 22.4% ,3Axle Trucks is 16% ,Multi Axle Trucks is vehicles was about 0.5%.

Observations from Turning Movement flow:

The turning movement traffic flow during morning peak hour and evening peak hour is presented in **Figure 3.3**, from this it can be inferred that the maximum amount of traffic is plying in the directions of Joda to Nalda Gate (1,274 PCUs) and evening peak hour flow in this direction higher than the morning peak hour traffic.

Total traffic details at Bhadrasahi junction – 21.02.2014

Time	2Axle Trucks	3Axcle Trucks	Multi Axcle Vehicles	Mini Bus	Bus	Car	2W	LCV	Cycles	Auto	Others	Grand Total (vehicles)	Grand Total (PCUs)
8:00-9:00	185	36	10	12	18	168	225	86	34	22	18	814	1337
9:00-10:00	51	3	2	4	13	236	496	83	24	6	6	924	879
10:00-11:00	24	0	1	7	14	250	693	83	18	7	10	1107	926
11:00-12:00	12	1	0	4	11	286	618	81	11	5	6	1035	841
12:00-13:00	14	9	0	3	19	284	465	64	14	4	8	884	802
13:00-14:00	16	1	0	1	9	190	369	47	10	2	5	650	562
14:00-1500	23	6	0	5	14	227	427	54	8	3	4	771	689
15:00-1600	18	1	1	1	15	221	454	60	10	2	6	789	689
16:00-17:00	27	3	0	6	11	294	497	83	19	4	4	948	837
17:00-18:00	144	7	2	4	17	349	547	95	21	2	12	1200	1369
18:00-19:00	219	5	0	5	10	461	504	74	12	7	17	1314	1649
19:00-20:00	265	75	1	2	13	322	312	71	0	0	2	1063	1663
20:00-21:00	349	164	0	0	5	92	101	16	0	1	0	728	1722
21:00-22:00	250	190	9	4	18	134	74	65	2	11	3	760	1719
22.00-23.00	267	267	13	1	2	83	41	32	0	4	2	712	1836
23.00-00.00	335	244	16	2	1	89	36	36	0	4	4	767	2004
00.00-01.00	422	437	8	3	1	71	35	21	0	0	2	1000	2753
01.00-02.00	294	139	0	0	0	7	6	3	0	0	1	450	1320
02.00-03.00	317	164	2	0	1	13	5	7	0	0	0	509	1481
03.00-04.00	262	220	3	2	10	70	25	36	0	0	0	628	1629
04.00-05.00	275	309	7	1	10	75	40	40	0	1	2	760	1983
05.00-06.00	300	362	14	4	12	102	63	58	5	2	2	924	2328
06.00-07.00	284	348	4	8	25	143	99	78	14	3	9	1015	2375
07.00-08.00	273	325	6	4	16	114	85	67	13	4	4	911	2167
Total	**4626**	**3316**	**99**	**83**	**265**	**4281**	**6217**	**1340**	**215**	**94**	**127**	**20663**	**35554**
Percentage	**22.4%**	**16.0%**	**0.5%**	**0.4%**	**1.3%**	**20.7%**	**30.1%**	**6.5%**	**1.0%**	**0.5%**	**0.6%**	**100.0%**	

Fig -3.1

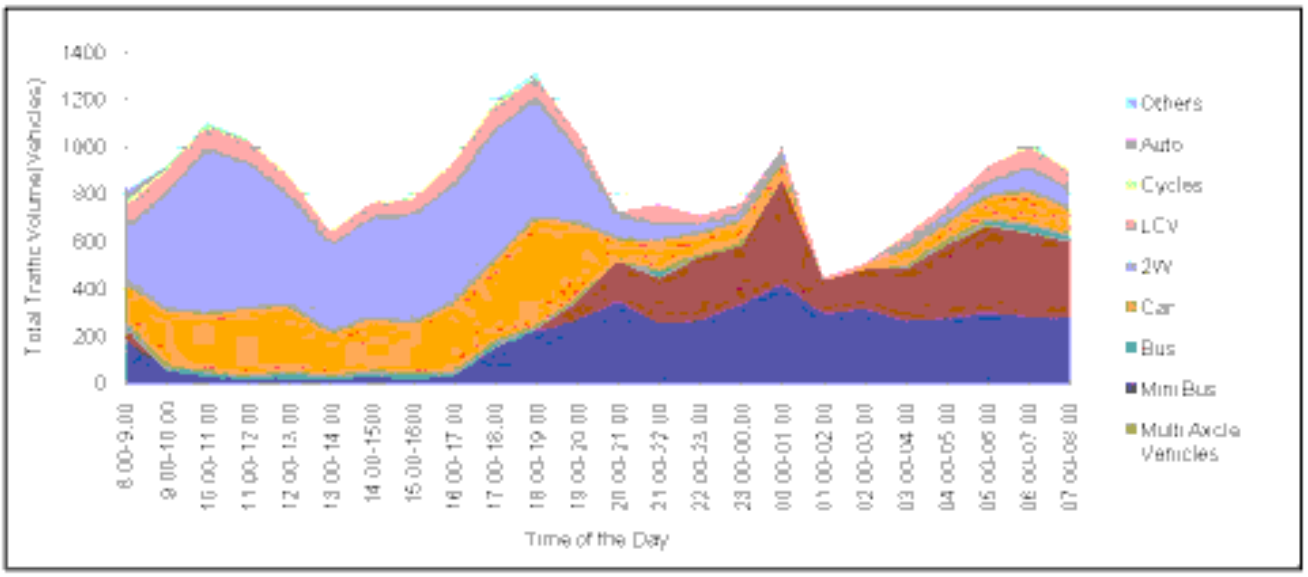

Total Traffic Volume(Vehicles)
1400
1200
1000
800
600
400
200
0
Time of the Day
Others
Auto
Cycles
LCV
2W
Car
Bus
Mini Bus
Multi Axcle Vehicles

Fig-3.2

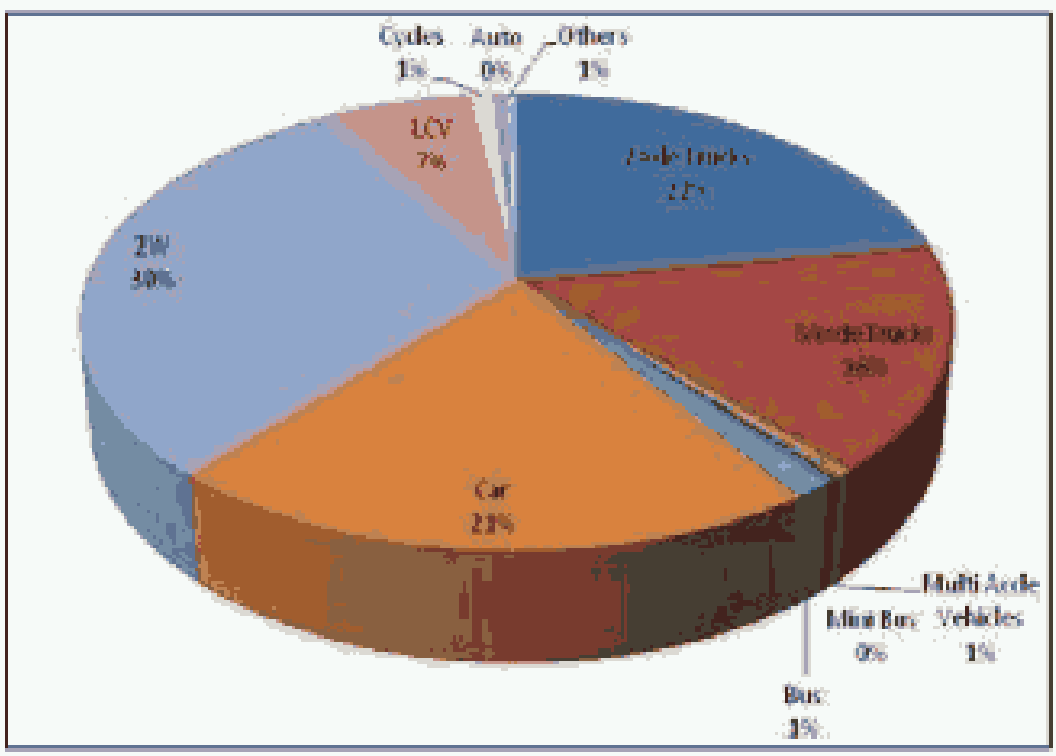
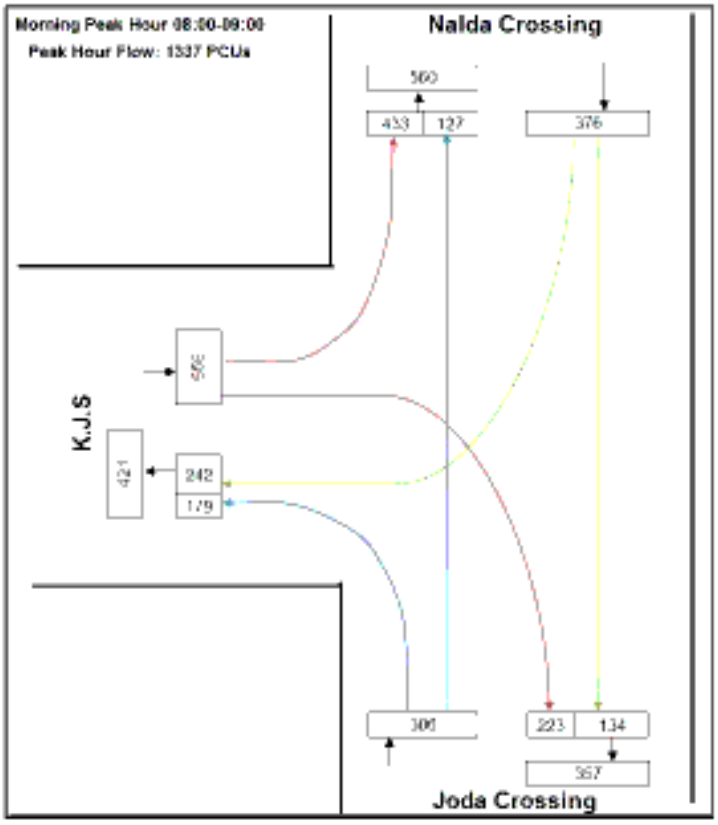
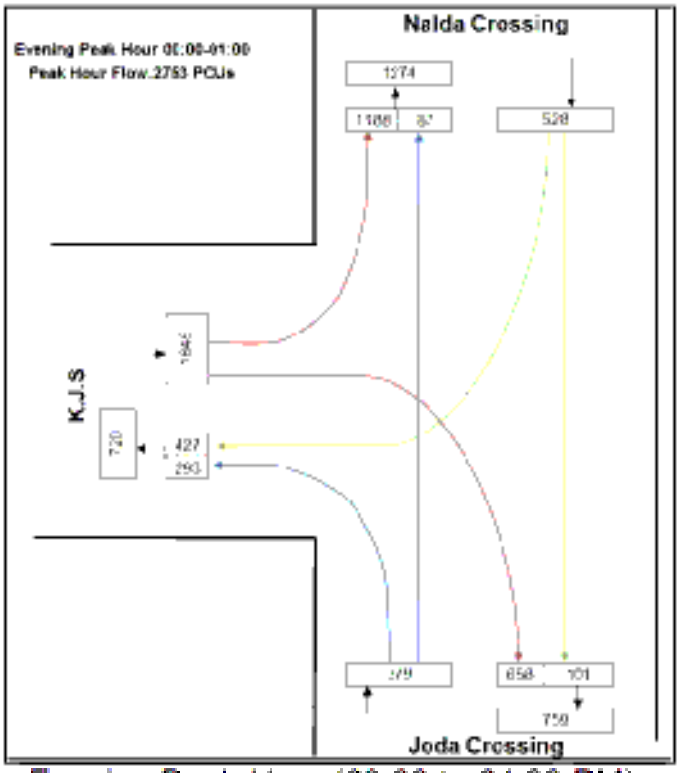

Cycles 1%
Auto 0%
Others 1%
LCV 7%
2W 30%
Car 23%
Bus 1%
Mini Bus 0%
Multi Axcle Vehicles 1%

Fig-3.4



Morning Peak Hour (08:00AM to 09:00AM)



Evening Peak Hour (00:00 to 01:00 PM)

SUMMARY OF TRAFFIC IN ALL THE THREE JUNCTION

Intersection No	Name of the Intersection	Survey Period	All Traffic (PCU)	Peak Hour Traffic (PCU)
1	Near KJSA Mines Intersection	24 Hours	22274	1563
2	Rugudih Intersection	24 Hours	24120	2120
3	Bhadrasahi Intersection	24 Hours	35554	2753

PERFORMANCE EVALUATION OF ROAD NETWORK

Volume- Capacity Ratio for Base Year

Volume - Capacity ratio has been determined for various road links falling in the influence region of the study area. The Volume - Capacity (V/C) ratio is one of the simplest methods for arriving at the Level of Service (LOS) offered by the road. The capacities have been obtained according to the type of road. In this study capacity values for assessing the V/C has been considered from IRC SP 30, Manual on Economic Evaluation of Highway Projects in India and the same has been presented in Table 4.

Table 4 Capacity Values for Assessing the Effect of Congestion

S.No	Road Details	Maximum Capacity PCU/Hr
1	Single Lane (3.75 mts Carriageway)	600 (both directions)
2	Intermediate Lane (5.5mts Carriageway)	1600 (both directions)
3	Two Lane (7 mts Carriage way)	3000 (both directions)
4	Four Lane (7mts Carriageway on each direction)	4300 (one direction viz the major Flow)

Source: IRC SP 30 Manual on Economic Evaluation of Highway Projects in India

Estimation of Volume by Capacity Ratio for Base Year (2014)

The volume by capacity ratio for base year 2014 is estimated by considering capacity volume of each line as discussed in earlier sections. It can be inferred that the V/C ratio is less than 0.7 on all the approach roads of intersections

Volume - Capacity Ratio for Major road Links in the Study Area for Base Year- Intersections

Name of the Intersection	Approach -1				Approach-2				Approach-3			
	Width of Carriage way	Peak hour Volume (PCU)	Capacity (PCU)	V/C	Width of Carriageway	Peak hour Volume (PCU)	Capacity (PCU)	V/C	Width of Carriageway	Peak hour Volume (PCU)	Capacity (PCU)	V/C
KJSA Mines	6.0	983	1600	0.61	7.0	751	3000	0.25	7.0	1391	3000	0.46
	Mines road				**Towards Gadhalpada (NH-215)**				**Towards Bhadrasahi (NH-215)**			
Rugudih	6.0	929	1600	0.58	7.5	1563	3000	0.52	7.5	1748	3000	0.58
	Village road connecting to Mines				**Gadhalpada road (NH-215)**				**Towards Bhadrasahi (NH-215)**			
Bhadrasahi	7.1	2565	3000	0.86	7.5	1802	3000	0.60	6.8	1138	3000	0.38
	From Rugudi (NH-215)				**Towards Barbil**				**Towards Joda (NH-215)**			

The V/C ratio of intersection points i.e. KJSA Mines, Rugudih and Bhadrasahi are 0.44, 0.56 and 0.61 respectively. **The average V/C ratio in this stretch of the road is 0.53**. This indicates that LOS of the above road links in the influence region of the study area falls under **LOS category slightly above than "B". As per IRC 64:1990**, LOS B indicates that the V/C value is less than 0.50.

Estimation of Volume - Capacity Ratio by Considering Ongoing Improvements In the study road network,

Road widening on NH 215:

NH215 is widening from two lane road to four lane divided carriageway. Due to this the capacity will be increased on various approach arms of intersection falling on NH215. The corresponding Volume by Capacity ratio has been estimated based on the revised capacity on all approach arms falling on NH 215 and presented in Table given below.

Volume - Capacity Ratio for Major road Links in the Study Area for ongoing improvements

Name of the Intersection	Approach -1				Approach-2				Approach-3			
	Width of Carriage way	Peak hour Volume (PCU)	Capacity (PCU)	V/C	Width of Carriageway	Peak hour Volume (PCU)	Capacity (PCU)	V/C	Width of Carriageway	Peak hour Volume (PCU)	Capacity (PCU)	V/C
KJSA Mines	7.0	983	3000	**0.33**	7.0 m on each side	376	4300	**0.09**	7.0 m on each side	696	4300	**0.16**
	Mines road				**Towards Gadhalpada (NH-215)**				**Towards Bhadrasahi (NH-215)**			
Rugudih	6.0	929	1600	**0.58**	7.0 m on each side	782	4300	**0.18**	7.0 m on each side	874	4300	**0.20**
	Village road connecting to Mines				**Gadhalpada road (NH-215)**				**Towards Bhadrasahi (NH-215)**			
Bhadrasahi	7.0 m on each side	1283	4300	**0.30**	7.5m	1802	3000	**0.60**	7.0 m on each side	1138	4300	**0.26**
	From Rugudi (NH-215)				**Towards Barbil**				**Towards Joda (NH-215)**			

By considering the expansion of NH-215 it can be inferred that the V/C ratio is less than 0.7 on all approach roads.

The V/C ratio of intersection points i.e. KJSA Mines, Rugudih and Bhadrasahi are 0.19, 0.32 and 0.38 respectively. **The average V/C ratio in this stretch of the road is 0.29**.

As per the detailed study conducted as above on transportation, one can conclude that the existing public railway sidings which are connected through NH-215 (expansion to 4 lanes) is adequate enough to facilitate the transportation.

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण

(सड़क परिवहन और राजमार्ग मंत्रालय)

National Highways Authority of India

(Ministry of Road Transport & Highways)

परियोजना कार्यान्वयन इकाई (Project Implementation Unit)

Badadera, Mandua, Keonjhar 758014 Odisha

[illegible]

[illegible]

Sub: Study for feasibility of Mineral Transportation in Joda Barbil, Odisha [illegible] request for information of Right of details and Time series data of Traffic Volume [illegible] roads in Joda Barbil, Odisha and West Singh Bhum in Jharkhand

Ref: [illegible] letter No [illegible] dt. 22.07.2014

Sir,

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] Dy. G.M. [illegible] Project Director

[illegible]

Corporate Office: G 5 & 6, Sector 10, Dwarka, New Delhi 110 075, Phone [illegible]

Fax: [illegible] Website: [illegible]

For Kamaljeet Singh Ahluwalia

Sanja Kishore Jena
D. G. M. Planning
Authorised Signatory