GOVERNMENT OF ODISHA

ODISHA WORKS DEPARTMENT

VEHICLE AXLE LOAD REGULATION & MANAGEMENT

VOLUME III – FINDINGS, IMPLICATIONS & RECOMMENDATIONS FOR CONTROLLING OVERLOAD ON ROADS IN ODISHA

Intercontinental Consultants and Technocrats Pvt. Ltd.

In joint venture with

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Vol. III – Findings, Implications & Recommendations for Controlling Overload on Roads in Odisha

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1 Prevalent Situation of Overload on Roads in Odisha

The prevalent situation of overload on roads in Odisha was assessed based on the analysis of axle load records of 8,459 commercial vehicles obtained at 50 locations spread over various categories all over the State. Details of surveys and main features of loading can be had from Chapter 2 of the Report on "Vehicle Axle Load Regulation and Management – Volume I" - pages 2-1 to 2-22. **Table A** below gives spread of overloaded vehicles at various locations in percentage terms.

Table A: Percentage of Overloaded Vehicles at Various Locations

Sl. No.	Road Type	Percent Vehicles Overloaded	Sl. No.	Road Type	Percent Vehicles Overloaded	Sl. No.	Road Type	Percent Vehicles Overloaded
IAL-1	NH	89.12	IAL-18	NH	96.52	IAL-35	ODR	83.43
IAL-2	NH	91.81	IAL-19	NH	92.74	IAL-36	ODR	71.79
IAL-3	NH	54.32	IAL-20	NH	39.99	IAL-37	ODR	99.80
IAL-4	NH	85.27	IAL-21	NH	40.50	IAL-38	SH	100.00
IAL-5	NH	92.75	IAL-22	MDR	83.41	IAL-39	ODR	47.37
IAL-6	NH	20.83	IAL-23	ODR	67.78	IAL-40	ODR	60.00
IAL-7	SH	33.33	IAL-24	ODR	33.33	IAL-41	ODR	92.00
IAL-8	MDR	45.83	IAL-25	SH	20.88	IAL-42	ODR	60.00
IAL-9	NH	32.37	IAL-26	MDR	71.43	IAL-43	ODR	100.00
IAL-10	NH	51.85	IAL-27	ODR	75.00	IAL-44	ODR	47.37
IAL-11	NH	93.32	IAL-28	MDR	63.64	IAL-45	ODR	16.67
IAL-12	SH	55.38	IAL-29	EW	64.00	IAL-46	ODR	0.00
IAL-13	NH	86.89	IAL-30	MDR	56.92	IAL-47	Rural	100.00
IAL-14	NH	81.96	IAL-31	MDR	47.37	IAL-48	Rural	0.00
IAL-15	NH	88.96	IAL-32	SH	75.47	IAL-49	Rural	0.00
IAL-16	MDR	55.81	IAL-33	SH	49.49	IAL-50	Rural	0.00
IAL-17	NH	11.51	IAL-34	SH	0.00			

Overloading is prevalent over almost all categories of roads by all types of commercial vehicles. It is however more prevalent on higher categories of roads because of their higher inter connectivity, better riding quality, easier geometrics for better maneuverability and higher load carrying capability.

The degree of overloading varies considerably and goes even above 100% of Gross Vehicle Weight (GVW) in some cases. The average degree of overloading is 58.56% of GVW. The extent of overload is the maximum on National Highways and reduces with the category of roads. Out of the 4 Rural Roads where the axle loads were monitored, only one road recorded overloading. **Table B** below shows the representative extent of overloading in bands of percent of overloading in terms of the GVW. **Figure 1** gives a pictorial presentation of the extent of overloading at different locations.

Table B: Extent of Overloading at some of the 50 Survey Locations

No.	Location	Total Number of Vehicles			Number of Vehicles (%) with various Degree of Overloading					
					Degree of Overloading					
		Weighed	Empty	Loaded	Nil	Up to 10%	10-25%	25-50%	50-100%	> 100%
IAL-01	Sohella to Baragarh (NH-53) – 1st Day	268	2	266	12.78	11.65	31.20	42.86	1.13	0.38
IAL-01	Baragarh to Sohella (NH-53) – 2nd Day	307	29	278	8.99	6.12	25.18	50.00	8.63	1.08
IAL-02	Attabira to Sambalpur(NH 53B) – 1st Day	203	0	203	8.37	5.91	10.34	67.98	7.39	0.00
IAL-02	Sambalpur to Attabira (NH 53B) – 2nd Day	201	1	200	8.00	2.50	14.50	61.00	13.50	0.50
IAL-03	Bargarh-Bolangir-Boriguma-NH26 – 1st Day	54	3	51	47.06	13.73	11.76	25.49	1.96	0.00

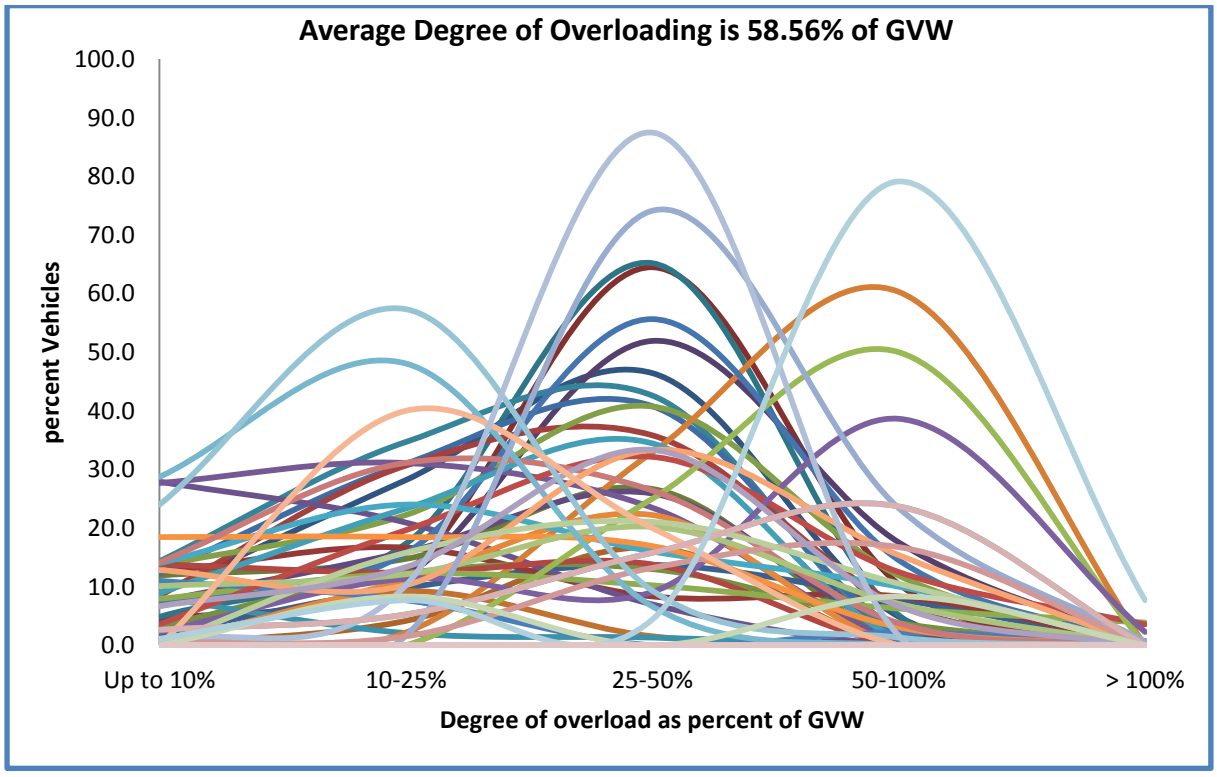

Figure 1: A Pictorial Presentation of the Extent of Overloading at Different Locations

2 Why Truckers Overload

Transporters tend to overload for the desire to enhance their profits by economising on the cost of transportation, and to meet the schedules with a smaller rolling stock fleet. Overloading helps the truckers and operators to save on transportation costs and thereby maximise their profits.

Most of the truckers are small time business people who have small fleets of one or two trucks and don't have the benefit of economy through numbers. With the prevailing situation of limited strength of rolling stock, a trucker who has to meet delivery schedules has no option but to overload. Also for the reason of meeting schedules the driver tends to over-speed. An overloaded vehicle, over-speeding is a potent recipe for serious accidents. It will not be incorrect to say that truckers put profit before safety when resorting to overloading.

The truckers normally resort to increases in vehicle dimensions – mostly height, sometimes length and rarely width – both temporarily and permanently to be able to carry the extra load. They would invariably strengthen the chassis of the truck, add some more leaf springs and use higher-ply tyres which are over- inflated to help carry the overload.

There would be no overloading if the commercial vehicles did not have enough extra engine power to carry that additional load. Most commercial vehicle manufacturers, for reasons of competition, provide engine capacity more than the normal higher capacity needed for negotiating difficult gradient situations. It is this idle engine capacity which is basically the root cause of overloading.

3 Implications of Overloading

Overloaded vehicles are very damaging for the highway infrastructure system in more than one way, as follows:

(i) Overloading of vehicles leads to higher initial cost of construction of a road

(ii) Overloading results in higher and more frequent maintenance needs of pavements

Besides damaging the roads, the overloading is bad for the vehicles also,

(iii) Overloading results in higher operating costs of vehicles due to more fuel consumption

(iv) Vehicles also deteriorate faster due to higher wear and tear on account of overloading, resulting in increased running costs.

The truckers and operators however are not much concerned about these higher operating costs as the benefits accruing to them on account of overloading are more than these damages. Though truckers are more than compensated for these additional costs, these aspects, in the end, add up to losses to the society,

(v) Higher wear and tear of the engine and other parts result in the vehicles becoming more polluting

(vi) Due to higher loading and the resultant poorer riding surfaces, overloaded vehicles are more difficult to control and therefore lead to higher rates of accidents, which also has its own dimension of societal costs.

As per the "Road Accidents in India – 2012'', compiled by the MoRTH, Govt. of India, overloaded vehicles accounted for 3,172 out of 9,285 i.e. 34 percent of the road accidents reported in Odisha during 2012. Out of the total 3701road accidents associated deaths, 1312 i.e. 35 percent had resulted from accidents involving overloaded vehicles. Also 3,536, out of 10,715 cases of serious injuries i.e. 33 percent had resulted from accidents involving overloaded vehicles. Taking Economic cost of these mishaps at Rs 11,49,677 per death and Rs 5,21,136 per seriously injured person (IRC:SP:30-2009 updated to 2012 figures based on WPI), overloading in terms of deaths and serious injuries, costs Rs 335 Crore per year to Odisha. Human suffering and other social costs are manifold more than the economic costs.

In the following sections the two aspects of higher initial cost of construction of a road and higher and more frequent maintenance needs of pavements have been discussed at length to highlight the effect of overloading on the damages to the road infrastructure.

3.1 Higher Initial Cost of Construction

As per the prevailing loading conditions at one of the Axle Load recording locations, the design load for 15 years period comes to 200 MSA. If the enforcement of legal load had been possible, the same pay load would have been carried by a larger number of vehicles, but with reduced total number of equivalent standard load applications of 100 MSA (for details see Section 2.6, page 2-13 of the Report on "Vehicle Axle Load Regulation and Management – Volume I).

The Pavement composition for the two situations - on projection basis would be as follows:

- For 200 msa design load the pavement requirement will be 50 mm BC + 175 mm DBM + 250 mm Base and 200 mm Sub-base
- For 100 msa design load condition the requirement will be 50 mm BC + 140 mm DBM + 250 mm Base and 200 mm Sub-base

The difference in cost on account of 35 mm less requirement of DBM in the situation where overloading has been prevented will be Rs 24,50,000 per kilometer for 7 meter wide road.

This gives a rough idea of how much saving on road construction cost can accrue on account of reduced thickness requirement if the truck overloading can be prevented.

3.2 Higher and More Frequent Maintenance Needs

The extra expenditure due to overloading doesn't stop with higher cost of construction. An existing pavement, under higher traffic loading, will also wear more rapidly and will require much higher and frequent maintenance. The assertion is easily explained through the following analysis.

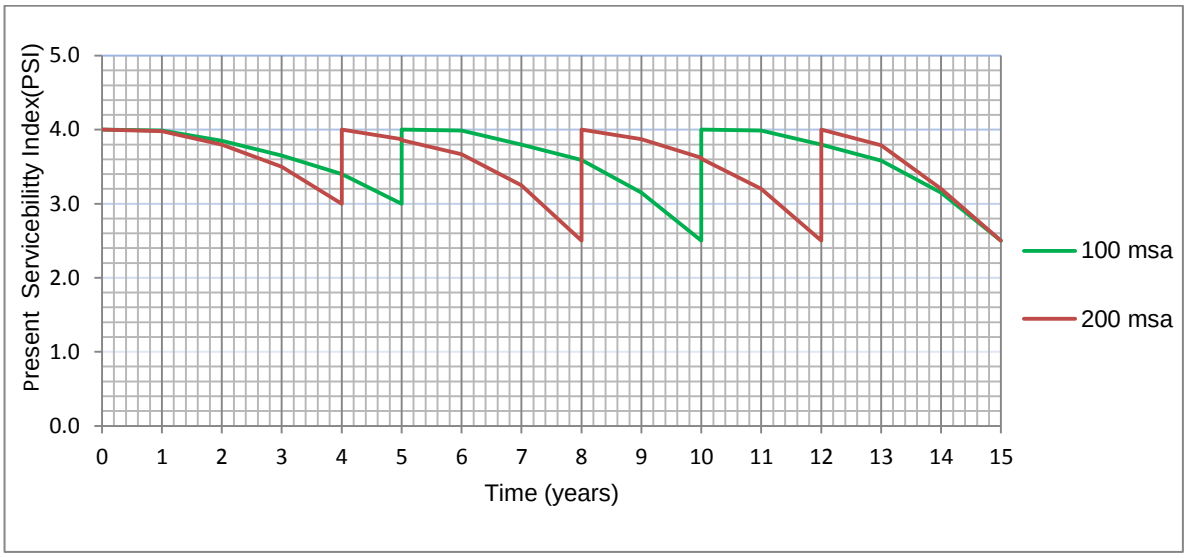

Figure 2: Serviceability – Time

In **Figure 2** are shown the serviceability versus time relationship of a road with two different traffic loading scenarios of 100 msa and 200 msa, as in the above situation. The comparison is being made of the road section, for both traffic situations starting at Present Serviceability Index (PSI) of 4.0 at year '0' and ending at PSI of 2.5 after 15 years period from 2014 to 2029. The road is designed for 100 msa and is provided 50 mm BC (Rs 10,740/m^3) + 140 DBM (Rs 9,333/m^3) + 250 mm WMM Base Course (Rs 1,537/m^3) + 200 Crushed Aggregate Sub-base (Rs 1,320/m^3) + 500 mm Prepared Subgrade (Rs 259/m^3). The total cost of construction comes to Rs 3.3 Crore per kilometre for the two lane road.

The deterioration and up-gradation traverse for the two loading conditions – the red one for the prevailing loading condition, aggregating 200 msa repetitions, and the green one, aggregating 100 msa repetitions, representing the alternate situation where a larger number of vehicles carry the same pay load within legal axle load limits. The deterioration rate for the 200 msa condition (red traverse), due to higher axle loads, is faster than that for the 100 msa condition (green traverse), with the result that while the red traverse reaches PSI level of 3.0 for a functional overlay after four years (Year 2018), the green traverse reaches that stage after 5 years (Year 2019). Also, after the functional level improvement, the red traverse reaches the strengthening level PSI of 2.5 after 8 years (Year 2022) from the starting, the green traverse reaches there after 10 years (Year 2024). While the green traverse after the single strengthening reaches PSI of 2.5 at the 15 years end point (Year 2029), ready for the next strengthening, the red traverse reaches the common end point (Year 2029) after getting another strengthening at year 12 (Year 2026) (**Figure 2**).

The financial implications of expenditure made at different times can be gauged for comparison by converting these costs to their present worth in the year 2014. The pavement in both cases received routine maintenance to the tune of Rs 1,50,000 per kilometer every year whenever other improvements were not undertaken. The functional overlay in both cases, provided 4 and 5 years after the starting point respectively, comprised of 25 mm Bituminous Concrete at the present cost of Rs 33,06,000 per kilometre.

The strengthening requirements at the respective stages were assessed for the prevalent elastic deflection of 1.0 mm and the pro-rata remaining life. The strengthening requirements so arrived at are,

(i) 25 mm Bituminous Concrete laid over 75 mm of Dense Bituminous Macadam for 93 msa after 8 years for red traverse;

(ii) 50 mm Bituminous Concrete for 33 msa after 10 years for green traverse; and

(iii) 50 mm Bituminous Concrete for 40 msa after 12 years for red traverse.

Tables C and D, give details of the yearly expenditure. In the case of pavement situation with 100 msa traffic loading spread over 15 years period, the total expenditure on routine and periodic maintenance for the 15 years period comes to Rs 1,16,40,642. Expenditure in the case of 200 msa traffic loading spread over 15 years period, the total expenditure on routine and periodic maintenance for the 15 years period comes to Rs 2,04,99,493. The extra expenditure on account of overloading comes to Rs 88,58,851.

Table C: Details of Maintenance Cost for the Road with 100 msa Load Condition over 15 Years Design Life Period

Year	Different Stages of Pavement Serviceability	Actual Cost at the Time of Implementation (Rs.)	Present Worth
2014	Routine maintenance after construction	1,50,000	1,50,000
2015	Routine maintenance	1,62,000	1,50,000
2016	Routine maintenance	1,74,960	1,50,000
2017	Routine maintenance	1,88,957	1,50,000
2018	Routine maintenance	2,04,073	1,50,000
2019	Functional Overlay	48,57,599	33,06,000
2020	Routine maintenance	2,20,399	1,38,889
2021	Routine maintenance	2,38,031	1,38,889
2022	Routine maintenance	2,57,074	1,38,889
2023	Routine maintenance	2,57,074	1,28,601
2024	First Strengthening	1,39,12,113	64,44,000
2025	Routine maintenance	2,77,640	1,19,075
2026	Routine maintenance	2,99,851	1,19,075
2027	Routine maintenance	3,23,839	1,19,075
2028	Routine maintenance	3,49,746	1,19,075
2029	Terminal serviceability reached 200msa	3,77,726	1,19,075
Total Cost		**2,22,51,080**	**1,16,40,642**

Table D: Details of Maintenance Cost for the Road with 200 msa Load Condition over 15 Years Design Life Period

Year	Different Stages of Pavement Serviceability	Actual Cost at the Time of Implementation (Rs.)	Present Worth
2014	Routine maintenance after construction	1,50,000	1,50,000
2015	Routine maintenance	1,62,000	1,50,000
2016	Routine maintenance	1,74,960	1,50,000
2017	Routine maintenance	1,88,957	1,50,000
2018	Functional Overlay	44,97,777	33,06,000
2019	Routine maintenance	2,04,073	1,38,889
2020	Routine maintenance	2,20,399	1,38,889
2021	Routine maintenance	2,38,031	1,38,889
2022	First Strengthening	1,66,39,492	89,89,800
2023	Routine maintenance	2,57,074	1,28,601
2024	Routine maintenance	2,77,640	1,28,601
2025	Routine maintenance	2,99,851	1,28,601
2026	Second Strengthening	1,62,27,088	64,44,000
2027	Routine maintenance	3,23,839	1,19,075
2028	Routine maintenance	3,49,746	1,19,075
2029	Terminal serviceability reached 200msa	3,77,726	1,19,075
Total Cost		**4,05,88,651**	**2,04,99,493**

Both roads over the 15 years period would carry the same amount of pay load and have the same pavement condition at the starting and ending points 15 years apart, with Rs 5,90,590 extra expenditure per year on average on account of overloading. The expenditure needed to maintain all the black topped roads in Odisha due to overloading can be assessed. If however this higher maintenance is not being done on account of paucity of funds, the roads must be getting further deteriorated and the investment in the road infrastructure must be getting eroded gradually.

The above analysis of colossal financial burden that overloading imposes on the road infrastructure and Supreme Court's judgment precludes the possibility of a rational 'economic regulation' intervention for controlling overloading unless the amount being considered for allowing overload with compounding is proportional to or more than the damage that the said overload will inflict on the infrastructure. Going by the extent of the damage that the overload does, the related amount would be so large that it will not be found to be acceptable by the truckers because overloading is basically done to make more profit and the 'economic regulation' intervention will reduce their profit margins to unacceptable levels.

Therefore overloading has to be controlled through enforcement of the legal axle loads and the gross vehicle weight specified in the certificate of registration.

4 Controlling Overloading

Overloaded commercial vehicles on Odisha roads, besides being a drain on highway funds primarily due to higher initial construction costs and higher and more frequent maintenance operations, are also responsible for higher vehicular pollution and more accidents on roads.

An effective axle load control system helps the Road Management Authority in many ways:

- It protects the investment made in roads and bridges by slowing down the load related distresses.
- It thereby helps to postpone periodic maintenance of the roads and therefore results in savings that enables undertaking on other road improvement works as the road budget gets further stretched.
- It helps to control abrupt road damage at sharp turnings such as at round-about by reducing the tractive forces pushing the layer materials towards the edges.
- By controlling overload related distress, load control enables identification of other causes of premature failure wherever these may occur.
- With resultant improved riding quality of roads through axle load control, it results in reducing fuel consumption and prevents excessive and premature damage to vehicles.
- The vehicles, with reduced loads and on account of better riding surfaces would benefit due to reduced operating costs, less wear and tear of vehicles and the related lower maintenance costs.
- It improves on road safety as, with reduced payloads, the weight – engine power ratios gets improved and vehicle control becomes easier.

There is therefore urgent need to control the overloading through whatever resources are possible. The related aspects are being discussed briefly in the following sub-sections.

5 Measures in Force to Control Overloading

Controlling vehicle loads, as also other traffic discipline related matters, is the responsibility of the Regional Transport Office (RTO) in Odisha as in other parts of the country.

The agency has the authority to impose penalties for overloading, compounding fees and to check erring vehicles and asking to off-load excess load. For these purposes all the RTOs have been given portable mobile wheel weighing pads. Any suspected overloaded vehicle at any place and time can be taken to a ‘Dharamkanta’ as per prescribed rule provisions.

There are 31 RTOs within the State to monitor goods movement within the boundaries of the State. There are 26 Border Check Gates for monitoring goods vehicles coming in or going out of Odisha for their loading. There are also 14 Highway Interceptors working towards controlling overload.

6 Reasons why these Measures have been Ineffective

In spite of such meaningful provisions already existing why the desired situation of keeping the axle loads within legal axle load limits is not materialising.

The prevalent measures are failing largely for the following simple reasons:

- **Absence of an efficient and systematic infrastructure arrangement for checking axle/vehicle loads in a fool-proof manner.** A system that has been seen working effectively in Kenya, Tanzania and some other countries in Africa, where no infringement was seen over observation of 4 hours, is the one that instils fear in the minds of the truckers and operators that no vehicle with overload will ever escape without being imposed penalty for overloading.

  The prevalent arrangements of monitoring vehicle loads at the border check- posts and within the State instil no such fear.

  A detailed in-depth discussion on overload control on Tanzanian roads was undertaken with Dr Frederick Addo-Abedi, the former CEO of Tanroads during whose tenure the present overload control mechanism was introduced. Enforcement through weighing mechanism with due regard to possibilities offered by appropriate Information and Communications technology applications was made full use of. Following were the main features of the evolved system:

  (i) A totally transparent system of recording and intimating axle/vehicle weights, in-terms of totally computerised weigh stations was utilised to record loads being carried by the vehicles.

  (ii) Fines for overloading were quite hefty and in consonance with the expected damage caused to the road.

  (iii) Overloaded vehicles, after paying the fines were asked to off-load the excess pay load and carry it on another vehicle at the transporter's cost. There were substantial demurrage charges also.

  (iv) To avoid connivance and to ensure that no vehicle escapes weighing, multiple weighing stations were provided on longer road lengths.

  Dr Addo-Abedi emphasised that the transformation from the situation where up-to 40% of the vehicles were seen to be overloaded significantly to practically no overload situation through enforcement only was made possible by brooking no interference from any quarter on leniency to anybody. The mantra adopted was to tell the defaulter to first pay the penalty and then ask questions or give reasons.

- **Absence of a realistic overload penalty regime.** The amount of fine, with maximum of Rs 5000/- (equivalent of about US dollars 80), that is charged in Odisha for overloading, is a very small amount in comparison to US dollar 779 fine in Tanzania and Ksh 2,00,000 (equivalent of about 2,250 US dollars) for 10,000 kg overload, to instil any fear.

In Kenya the fine gets doubled up to Ksh 4,00,000 for second offence. In Tanzania the overload penalty is kind of open ended with a fine of 35,000 US dollars for an overload of 31.5 tonnes and above.

CRIS INFAC Report of February 2006 on "Impact Analysis: Supreme Court's order on Overloading" indicates that 'penalty to the extent of Rs 5,000-7,000 per tonne is being levied in Maharashtra on overloaded trucks."

- **Absence of an effective system of removing the excess load being carried by a vehicle.** In the said African countries even after payment of penalty for overloading, no vehicle is allowed to go beyond a weighing station with excess load. The excess payload is compulsorily off-loaded, at the cost and risk of the transporter and the vehicle is allowed to proceed further only after the off-loaded material is arranged by the transporter to be carried by another vehicle within legal axle load limits. Issuance of compounding fees for overloading or charging of higher tolls, not commensurate with the damage being done to the road, tends to legitimise overloading. This practice should not be allowed in any way.
- **Absence of a mechanism to prevent vehicle modification that enables overloading.** During the axle load survey very many of the overloaded vehicles were seen with conspicuous modifications to the body and chassis of the vehicles and no measures were seen to control this menace in spite of the Supreme Court judgment of 9th November, 2005 in the Paramjit Bhasin and Others versus Union of India and Others case, that inter-alia states that "No person shall drive or cause or allow to be driven in any public place any motor vehicle or trailer – (a) the unladen weight of which exceeds the unladen weight specified in the certificate of registration of the vehicle"

7 Supreme Court's take on Overloading

Some States of the Union, like Punjab and Haryana, Gujarat, Madhya Pradesh, Rajasthan, Orissa, Maharashtra, Karnataka and Uttar Pradesh, under the provisions of Section 200 of the Motor Vehicle Act, 1988 had issued notifications that inter-alia enabled truckers to carry overload for a fee. The 9th November, 2005 ruling of Supreme Court sought to put a blanket ban on overloading.

The final verdict inter-alia states that, "even a 10 per cent overloading of goods carriage in excess of prescribed weight can reduce the life of roads and highways by 35 per cent".

8 Other States Response for Checking Overloading

Despite the order of a blanket ban on the movement of such vehicles in 2005 overloaded trucks can still be seen on Indian roads. But the ruling is slowly but surely starting to turn things around. The implementation of the blanket ban on overloaded trucks has also not had equal impact in the various Indian States. As the states have been given a partial free hand to deal with overloaded trucks, the results have, until now, been quite far from satisfactory. In terms of implementation the western States have fared the best, while central, northern and southern States have performed in the middle range of satisfaction level. States in the eastern region have not fared well so far.

Some States have allowed overloaded vehicles to carry on driving after they paid a penalty. The State of Rajasthan has drawn criticism from several agencies as it allowed overloaded trucks to carry

on after simply paying the fine. On the other hand, the State of Gujarat was commended on its use of technology to effectively monitor and weigh overloaded trucks at several points and stopping them from driving if they were overloaded. The simple measure of enforcement through rigorous checking alone has brought about the transformation.

The state of Bihar set another example by initiating criminal proceedings against those who were found to be guilty of driving overloaded trucks on its highways.

The states of Karnataka and Goa have threatened to revoke the licenses of the mineral ore mines if trucks are found carrying more than they are authorized to. The highways of Karnataka have suffered severely and high accident rate on them prompted the central and the state governments to take action.

The effect of the ban has trickled down to the various cities of India also as transport officials and police are seriously tackling overloaded vehicles.

It is not only the highways and expressways that suffer damage, as a lot of overloaded vehicles drive within the cities to avoid law officials. The Regional Transport Office of Pune (RTO) initiated a special drive against overloaded vehicles on all major roads of the city. 375 vehicles were impounded and fined by the RTO in one month, collecting Rs 62.70 Lakhs in fines from the offenders. The strict watch by several squads in the city, connecting roads and major highways of Pune-Satara, Pune-Mumbai, Pune- Nasik and Pune-Solapur seems to be paying off.

If Pune, in the western part of the country, has taken enforcement against vehicle overloading seriously, Bokaro is also trying its best to stop the practice in the eastern belt of India. The transport department of Bokaro, in the state of Jharkhand has also launched its initiative against overloaded vehicles. Being a city in the mining and industrial belt, trucks overloaded with minerals and materials from coal, steel, and cement factories used to be a common sight.

Overloading of vehicles should diminish to a very great extent when the Supreme Court directive banning overloaded vehicles from highways gets implemented in Odisha in true spirit.

9 Measures that would lead to Better Enforcement

Vehicle manufacturers, trucking industry, road engineers and law enforcement personnel should come together and do their respective needful to find lasting solution to uphold the Supreme Court's directives to control overloading on roads. Close interactions must be developed between road engineers and trucking industry managers.

The following measures would go a long way in enforcing strict overload control in Odisha:

(i) There should be sufficient number of vehicle weighing stations in the State at strategic locations to ensure that every commercial vehicle must get weighed, even repeatedly if travelling long distance. There are, for example, a number of weighing stations in Tanzania on the road from Dar-es-Salam Port to Uganda border.

Under no circumstances a vehicle carrying overload is permitted to perform further journey. Overload must compulsorily be offloaded at Owner's cost and the operator insisted to carry the material by another vehicle within legal axle load limits.

(ii) A good number of wholly computerised, efficient and completely transparent working Weigh Stations should be established in the areas where extensive overloading is being undertaken. A list of 37 probable locations is indicated in Tables 5.2 and 5.3 at pages 5-10 and 5-11of the Report on "Vehicle Axle Load Regulation and Management – Vol. I".

Cost of establishing these weigh stations, including software and hardware, as detailed in the Main Report, would easily get off-set through collection of penalties. More importantly, the savings out of reduced construction and maintenance cost of roads, on account of controlled axle loads and vehicle weights, would be many times more than the cost of constructing, running and maintaining the weigh stations.

(iii) These additional axle load control measures preferably be undertaken, in association with RTO, by a Highway Agency, like it is being done by Tanroads in Tanzania and Kenya National Highways Authority (KNHA) in Kenya.

(iv) The proposed weigh stations would undertake only axle weighing and not get involved with other vehicle operation related matters that would remain under the purview of RTOs.

(v) Vehicle modifications, disallowed by law, should be strictly dealt with. Both the vehicle owner and the agency undertaking modifications should be penalised and the modifications undertaken be got removed at cost to the owner.

(vi) Driver of the vehicle, on making repeated infringements of overloading or vehicle should also be penalised. Driver licensing system and vehicle load control authority should evolve an interface to control overloading through driver penalty.

(vii) Vehicle manufacturers should also be told to ensure that vehicles do not have unduly higher engine capacity.

Some of the prevalent rules incorporated in the Motor Vehicle Act (MVA) would need to be modified and certain additional provisions made to enforce some of the suggested controlling measures and, therefore, would need Administrative and Legislative approvals. And this should be done in the larger interests of Odisha.

Penalties for overloading should be realistic, commensurate with damage inflicted on the road through overloading. An axle load two times the legal limit does 16 times the damage done by the legal axle load. The following penalty chart, considering damaging effect of overloading, is suggested for adoption in **Table E**.

Table E: Proposed Schedule of Penalties for Overloading for Maximum Gross Vehicle Weight

GVW Overload (Kg)	Fees (Rs.)	GVW Overload (Kg)	Fees (Rs.)
500	2,500	16,500	18,500
1,000	3,000	17,000	19,000

GVW Overload (Kg)	Fees (Rs.)	GVW Overload (Kg)	Fees (Rs.)
1,500	3,500	17,500	19,500
2,000	4,000	18,000	20,000
2,500	4,500	18,500	20,500
3,000	5,000	19,000	21,000
3,500	5,500	19,500	21,500
4,000	6,000	20,000	22,000
4,500	6,500	20,500	22,500
5,000	7,000	21,000	23,000
5,500	7,500	21,500	23,500
6,000	8,000	22,000	24,000
6,500	8,500	22,500	24,500
7,000	9,000	23,000	25,000
7,500	9,500	23,500	25,500
8,000	10,000	24,000	26,000
8,500	10,500	24,500	26,500
9,000	11,000	25,000	27,000
9,500	11,500	25,500	27,500
10,000	12,000	26,000	28,000
10,500	12,500	26,500	28,500
11,000	13,000	27,000	29,000
11,500	13,500	27,500	29,500
12,000	14,000	28,000	30,000
12,500	14,500	28,500	30,500
13,000	15,000	29,000	31,000
13,500	15,500	29,500	31,500
14,000	16,000	30,000	32,000
14,500	16,500	30,500	32,500
15,000	17,000	31,000	33,000
15,500	17,500	31,500 and above	33,500
16,000	18,000		

10 Recommendations

Overloading of vehicles in Odisha can be controlled only through strict enforcement measures, since Supreme Court's directive disallows any overloading. Most of the commercial vehicles that carry overload are able do so because of lack of adequate enforcement measures.

(I) To check overloading on roads in Odisha therefore there is need for provision of adequate measures for Enforcement.

Commercial vehicle overload while transporting cargo from designated places of origin like ports in the case of imports or of production like industrial hubs, mines, mandis etc. and the places of delivery like ports for exports, industries for supply of raw materials or delivery of

finished products at places of bulk consumption like markets and big cities etc., besides carrying interstate goods. It is therefore quite easy to assess the routes on which overloaded vehicles are expected to travel. Based on these identified routes axle weighing stations should be established away from the cities, with no easy diversion routes available, so that all the commercial vehicles plying on the route get weighed. The off-city location of weigh bridges would also ensure that off-loading excess weight from large number of vehicles does not pose traffic problems or of space for holding off-loaded material and the related practical difficulties.

The 26 Border transport check gates, as listed at **Table 3.5** at page 3-8 of Vol I of the Report and as reproduced in **Table F** below, fully automated electronic static axle weigh stations should be set up.

Table F: List of Check Gates

Sl. No.	Location of Check Gates	Sl. No.	Location of Check Gates
1	Jaleswar	14	Upperijonk
2	Laxmanath	15	Raighar
3	Jamsola	16	Dandasara
4	Chakasuliapada	17	Suruli
5	Bahalada	18	Boriguma
6	Champua	19	Chatua
7	Nalda	20	Sunki
8	Biramitrapur	21	Kerada
9	Telijore	22	Chikiti Balarampur
10	Taparia	23	Girisola
11	Kanakatora	24	Laxmidunguri
12	Loharchati	25	Bileipada
13	Samardhara	26	Surala

Besides these, there are other interior locations where overloaded commercial vehicles ply and do not reach these check posts. A detailed study was undertaken to identify the interior routes which are prone to overloading. **Section 5.7**, pages 5-6 to 5-9 brings out the details of primary roads that are overload prone. The roads, totaling 2285 km, forming part of the existing network, comprising various categories have been marked on the map, **Figure 5.1** and are listed in **Appendix 5.1** of Vol I of the Report.

The routes have been studied and 37 locations, that have been divided into two phases of 12 and 25 stations for implementation for setting-up of interior fully automated electronic static axle weighing stations are indicated in **Tables 5.2 and 5.3** respectively at pages 5-10 and 5-11 of Vol I of the Report. The locations are reproduced below in **Table G & Table H**.

Table G: Location Details of Proposed First Phase Axle Weighing Stations

Sl. No.	Link No.	District	Block	Location
1	17	Koraput	Similiguda	Near Village Sunabeda (NAC)
2	23	Bolangir	Deogaon	Near Village Ratanpur -Sinkhaman
3	24	Sonapur	Tarbha	Near Village Ghatkaintara

Sl. No.	Link No.	District	Block	Location
4	32	Sambalapur	Dhankauda	Near Village Dhankauda
5	33	Deogarh	Tileibani	Near Village Kureibahal
6	25 & 26	Baudh	Harbhanga	Near Village Biranarsinghpur
7	27 & 28	Nayagarh	Nayagarh	Near Village Badapandusar
8	30	Anugul	Angul	Near Village Rantalei
9	37	Keonjhar	Ghatgaon	Near Village Harichanduapur
10	44 & 45	Mayurbhanj	Bangiriposhi	Near Village Deopata-Baghiabeda
11	42 & 43	Balasore	Remuna	Near Village Biruhan
12	40 & 41	Bhadrak	Bhandaripokhari	Near Village Adampur
13	49 & 50	Puri	Puri	Near Village Balukhanda
14	38	Jajpur	Sukinda	Near Village Sansailo
15	20 & 21	Kalahandi	Bhawanipatna	Near Village Bhawanipatna

Table H: Location Details of Proposed Second Phase Axle Weighing Stations

Sl. No.	Link No.	District	Block	Location
1	16	Koraput	Jeypore	Near Village Jogiput
2	18	Nabarangapur	Raighar	Near Village Maulibhata
3	19	Nabarangapur	Umarkote	Near Village Jamaranda
4	15	Kalahandi	Bhawanipatna	Near Village Kitpadar
5	20	Kalahandi	Bhawanipatna	Near Village Ghantabahal
6	34	Sundargarh	Kuanrmunda	Near Village Banki-Jolongbira
7	35	Sundargarh	Bisra	Near Village Purunabisra
8	36	Keonjhar	Patana	Near Village Saradhapur
9	46	Mayurbhanj	Baripada	Near Village Muduripal
10	47	Kendrapada	Aul	Near Village Lokapada
11	29	Dhenkanal	Kamakhyanagar	Near Village Rainarasinghpur Sasan
12	48	Jagatsinghpur	Raghunathpur	Near Village Purunabasanta
13	3	Cuttack	Cuttack Sadar	Near Village Naranpur
14	1	Cuttack	Cuttack Sadar	Near Village Bhandachada (WD-48)
15	6	Khordha	Balipatna	Near Village Giringo
16	7,8	Ganjam	Rangeilunda	Near Village Ganjam Ward-2
17	9	Ganjam	Purusottampur	Near Village Banae
18	10	Gajapathi	Paralak hemundi	Near Village Sariapalli-Garabandha (Inam)
19	12	Rayagada	Ray-Rayagada	Near Village Pitamahal
20	14	Rayagada	Padmapur	Near Village Kandhapendaraguda
21	13	Rayagada	Bissam Cuttack	Near Village Tediliguda
22	4	Khordha	Jatani	Near Village Harirajpur-Kantia

Strict checking at these locations will definitely reduce the practice of overloading to a very great extent. Most of the heavy commercial vehicles will get weighed and issued a slip indicating the loading condition of the vehicle.

(II) Holding of this weighing slip from these automated weighing stations should be made mandatory. Overloading of vehicles will diminish considerably.

(III) Vehicles that do carry overload should be penalised and the excess payload offloaded

The present regimen of penalties is not stringent enough to be a disincentive to overloading. There is need to bring the penalties to amounts that are commensurate to the damage potential of the loads being carried by a vehicle and be a serious deterrent to overloading.

(IV) The regimen of penalties for overload as suggested in **Table 5.7**, page 5-21, Vol I of the Report, as reproduced in **Table H** of this report should be applied.

11 Detailed Action Plan for Implementation of the Suggested Proposal for Controlling Overloading on Roads in Odisha

The implementation of the suggested measures to control overloading are sought to be introduced in a phased manner in 3 stages, as detailed below.

Stage 1 - **Action** : In conjunction with the Weigh-in-Motion (WIM) system at Luhurachati, it is recommended to create, a little distance away, in greenfield area, a fully automated, computerized Pilot Static Axle Weighing facility with offloading and storage space provision.

The WIM system at Luhurachati is being proposed to be replicated at Laxmanath check gate at Balasore.

If it is possible to alter the system specifications the WIM system should be replaced by the static weighing system. If not, Static Weighing System should also be provided a little distance away.

Who does it :

- OWD, in association with RTO, may create the static weighing system facility
- All the operations including recording axle loads & vehicle weights, offloading excess payload and its storage etc. may be outsourced under RTO supervision
- A concessionaire may be associated for operating the system

Outcome :

- Vehicles indicated by WIM to be overloaded would be weighed on the Static weighing system for possible prosecution
- The study will help to correlate axle load data obtained using WIM with that obtained from a static axle weighing facility
- The study will also help to formalize the comparative merits including initial cost and maintenance requirements of the two systems for general application later on

Costs :
- Establishing the facility, including Hardware, Software and Toll Management System (TMS) integrator, will cost around Rs. 20 lakh (Ref. Sections 5.9 to 5.11 of Volume I of the 'Report on Vehicle Axle Load Regulation & Management'
- Running costs will be met out of the penalty imposed on overloaded commercial vehicles

Benefits :
- Good correlation between the WIM and static recording will help in making a strong case for legal acceptance of the weigh – in – motion system for recording axle load data for controlling overloading
- The Static weighing system is equally transparent, less expensive, easy on maintenance and legally acceptable system for recording axle loads for controlling overload
- Comparative cost analysis and relative merits of the two systems will help in taking decision for weighing system selection for other places

Feed back : Results of the operations of stage should be watched for a period ranging from 3 to 6 months for the regimen to stabilise.

Since the penalty to be charged for overloading is not substantial compared to the profit that overloading brings to the transporter, the only disincentive would be the off-loading of the excess pay-load as directed by the Supreme Court in its judgment of 9th November 2005. This follow-up action therefore should be taken religiously.

Stage 2 - **Action** : Simultaneous to the control of overloading on inter-state commercial routes, to study the pattern of overloading within the state, Pilot automated electronic static axle weighing facility shall be created at a typical internal overloading location, say on Angul - Chhendipada SH in Angul district (Table 5-1, page 5-8, Vol. 1 Report) in the coal belt.

Who does it : Overloading by commercial traffic within the state generally happens along mining corridors and along arterials carrying forest/agricultural produce or building materials. Having gained experience of working with a concessionaire, this phase may be taken up through concessionaire only under supervision of RTO/OWD.

Outcome : This phase will help to generate data on the extent and pattern of overloading on roads occurring due to commercial vehicles plying within the state. This will help to finalize the need or otherwise of the requirement of installing weighing facilities on the selected internal routes.

Costs : An entrepreneur who has an attractive remuneration proposal for providing facilities for weighing the commercial vehicles, offloading and storage etc. should be given the offer to invest in the endeavor.

Benefits :

- Controlling overload on the road will help in reducing maintenance requirements, which would be of the order of Rs. 88,58,851 over a 15 year life cycle of the road per km i.e. Rs. 60,000 per km per year (Section 3.2, page 6, Vol. III of the Report).
- Section 4, page 8 of Vol. III of the Report lists the various savings accruing due to controlled axle loads.

Feed back : Results of the operations of stage 2 should be watched for upto 6 months for the trucking industry in the State to get used to the new system.

Off-loading of the excess pay-load, as in the previous stage operations should be undertaken religiously.

Stage 3 - **Action** : After one year of operation of Stage 1 and 2 operations a review should be taken of the effect of the new regimen over control of overloading in the area where the automated electronic static axle weighing facilities have been created vis-a vis the other corresponding areas.

It is quite likely that some improvement does take place on account of the strict enforcement of the off-loading the excess pay-load policy.

Since the controlling is being done selectively at a few places only, it is likely that some of the vehicles that can avoid the locations being controlled to other routes. Also the overload control mechanism will be successful only if the Penalties imposed for overloading are realistic.

Therefore it would be desirable to run for a limited period the experiment of imposing realistic penalties. The proposed Schedule of Penalties for overloading, commensurate with the damaging potential of overloading, as given in Table 5-7, page 5-25, Vol. I of the Report and reproduced in **Section 10** above, would need to be considered.

Feed back : The Stage 1 and 2 operations having been studied for up-to six months to one year with the existing penalty regimen and then for 6 months with the proposed realistic regimen, the results of the controlling mechanism would be studied at length and a decision taken on extending the control mechanism gradually to all the 26 border check gates and the identified 37 internal vehicle weight check points.