

**BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL  
PRINCIPAL BENCH AT NEW DELHI**

**IN**

**O.A NO. 1030 OF 2018**

**IN THE MATTER OF:-**

News item published in "The Times of India" Authored by Vijay

Pinjarkar

Titled

"String of new road projects in Maha to cut off tiger corridors"

**AFFIDAVIT ON BEHALF OF**

**(MINISTRY OF ROAD TRANSPORT & HIGHWAYS)**

Through:

**Place:** \_\_\_\_\_  
**Date:** 01.2020

**ARDHENDUMAULI KUMAR PRASAD**  
Senior Central Government Standing Counsel  
National Green Tribunal  
A-52, SECTOR-17A, NOIDA, U.P.- 201301  
PH: 0120-2488800-01-02, 9311612800  
mail@ardhendumauli.com

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FILED BY

**Place:** \_\_\_\_\_  
**Date:** 01.2020

**ARDHENDUMAULI KUMAR PRASAD**  
Senior Central Government Standing Counsel  
National Green Tribunal  
A-52, SECTOR-17A, NOIDA, U.P. – 201301  
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**IN THE MATTER OF:-**

News item published in "The Times of India" Authored by Vijay  
Pinjarkar  
Titled

"String of new road projects in Maha to cut off tiger corridors"

**AFFIDAVIT ON BEHALF OF THE  
(MINISTRY OF ROAD TRANSPORT & HIGHWAYS)**

**MOST RESPECTFULLY SHOWETH:**

I, Pankaj Kumar Mourya, aged about 40 years, working as  
Superintending Engineer do hereby solemnly affirm and declare  
an oath as under:

1. That I am presently working as the superintending Engineer  
with Ministry of Road Transport & Highways, Government  
of India, New Delhi and as such I am well conversant with  
the facts and circumstances of the present case and duly  
authorized and competent to swear this Affidavit on behalf  
of Ministry of Road Transport & Highways, Government of  
India, New Delhi.
2. That I have read and understood the contents of the order  
dated 06.01.2020 as passed by this Hon'ble Tribunal and  
filing this affidavit in order to explain the compliances made  
by the answering respondent in relation thereto.
3. That the deponent craves liberty to raise additional  
submissions or file additional affidavits in case need arises  
during the course of arguments.



## **BRIEF SUBMISSIONS**

### **IT IS MOST RESPECTFULLY SUBMITTED:**

4. That based on deliberations during the meeting convened by NTCA on 07.10.2019, this Ministry vide letter dated 17.10.2019 addressed to the Secretary (Works), Public Works Department, Government of Maharashtra has already agreed for following 4 projects: -

| Sr. No. | Name of road              | NH No.           | Tentative cost (Cr.) of flyovers  |
|---------|---------------------------|------------------|-----------------------------------|
| 1       | Nagbhid-Bramhapuri-Armori | NH353D           | 26.85+<br>14.40<br>= <b>41.25</b> |
| 2       | Malewada-Chimur           | NH353E           | 0                                 |
| 3       | Chimur-Warora             | NH353E           | <b>56.65</b>                      |
| 4       | Gadchiroli-Mul            | NH 930           | <b>2.91</b>                       |
|         |                           | <b>Sub-total</b> | <b>Rs. 100.81 Cr.</b>             |

It is further stated that as per the order dated 06.01.2020 passed by this Hon'ble Tribunal, this Ministry shall implement the mitigation measures within a time schedule of 3 years for the above mentioned roads/ stretches.

A True Copy of the letter no. 12037/01/2019-MAH (Z-4) dated 17.10.2019 addressed to the Secretary (Works), Public Works Department, Government of Maharashtra and the chief wildlife warden, government of Maharashtra is marked and annexed herewith as **Annexure-R1**.



5. That as far as remaining 2 roads (National Highways) namely Mul-chandrapur & Bamni-Navegaon mentioned in the order dated 06.01.2020 are concerned, this Ministry vide its above letter dated 17.10.2019 has also stated that due to already huge committed liability for ongoing National Highway projects in the State of Maharashtra, this Ministry is unable to fund any additional expenditure over and above Rs. 100.81 Cr. for 4 stretches mentioned in para 2 above for such Mitigation Measures.

6. That with regards to the possibility of funding the mitigation measures through State PWD, as mentioned in per para 6 of the order dated 06.01.2020 passed by this Hon'ble Tribunal, it is stated that also to apprise that as per para 4 of minutes of meeting circulated by NTCA vide letter dated 07.05.2019, it was apprised to this Ministry that "The Maharashtra State Wildlife Board in 14<sup>th</sup> meeting dated 05.12.2018 requested NHAI to include mitigation measures while upgrading roads in Tadoba-Andhari Tiger Reserve Landscape. The Chairman of SBWL also assured State Governments funding in case if NHAI declines implementation of mitigation structures". Accordingly, this Ministry vide its letter dated 17.10.2019 (Annexure-R1) had requested Secretary (PWD) and Chief Wild life Warden, Maharashtra to fund the above 2 projects namely Mul-Chandrapur & Bamni-Navegaon. Forest Department/SBWL,



Maharashtra despite their initial commitments, during its meeting dated 05.12.2018 denied for funding the project. A True Copy of the summary record of the meeting held on 30.09.2019 at NTCA, Hqrs as circulated by NTCA is Annexed herewith as **Annexure-R2**.

7. It is further submitted that as far as non structural measures like landscaping, light & sound barrier, fencing, vegetative canopy etc. are concerned, the exact cost for the same has not been furnished by NTCA although requested vide this Ministry's letter dated 29.05.2019. Without knowing the cost implication of such measures, it is difficult to get fund approval for the same from competent authority. A True Copy of the letter No. 12037/01/20109-MAH (Z-4) dated 29.05.2019 addressed to Deputy Inspector General, National Tiger Conservation Authority, MoEF&CC is marked and annexed herewith as **Annexure-**

**R3.**

8. That this Hon'ble Tribunal vide its order dated 06.01.2020 has recorded an option of construction of vehicular flyovers as a structural mitigation measure. However, under para 8 of above order dated 06.01.2020, " If the MORT&H and State of Maharashtra have any objections to the safeguards proposed by the NTCA, it will be open to them to move this tribunal within fifteen days from today. Otherwise the said measures will be treated final". In this regard, the



reference is invited to discussion held in NTCA meeting dated 30.09.2019 (Para 3 of Minutes of meeting circulated vide letter dated 07.10.2019, Annexure R-2), wherein it is recorded that "Option of overpasses as animal crossing structures was discussed in the meeting. Participants agreed that overpasses give more natural passage for animal movement than underpasses. It was decided that MoRTH will look into feasibility of provisioning alternative designs for animal overpasses to see the possibility of cost reduction and communicate the same to NTCA within 15 days". This alternative measure of animal overpass has also been elaborated in the chapter 6 of "Manual of Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife" published by Ministry of Environment forest & climate change, National Highways Authority of India and World Bank Group. A True Copy of the Chapter 6 of Manual of Eco-Friendly Measures to Mitigate Impacts of Linear Infrastructure on Wildlife published by Ministry of Environment Forest and Climate Change, National Highways Authority of India and World Bank Group is Annexed herewith as **Annexure-R4**.

9. That accordingly, further assessment has been conducted by Ministry of Road Transport & Highways, wherein it has been observed that depending upon site conditions like height of embankment, bearing capacity of foundation soil,



span and width of structures, Right of way, Formation width, drainage requirements and safety requirements of traffic, at some of the locations the provision of animal overpass may be cheaper and elsewhere the provision of vehicular flyover may be cheaper. Considering optimum utilization of public money, the Hon'ble National Green Tribunal is requested to allow the type of structure to be constructed under structural mitigation measures to be finalized in consultation and consent of NTCA to fulfill its intended functional subject to condition that NOC shall be provided by forest department for construction of such structures including earthen ramp on either side of animal overpasses to be used by animals for crossing the roads.

In view of the above submissions, it is respectfully submitted that the application may kindly be disposed with appropriate orders as deemed fit and proper in the interest of justice and on the basis of replies filed by other respondents.



**DEPONENT**

पंकज कुमार मौर्य/Pankaj Kumar Mounya  
अधीक्षक अभियंता/Superintending Engineer  
सड़क परिवहन एवं राजमार्ग मंत्रालय  
Ministry of Road Transport & Highways  
नई दिल्ली/New Delhi-110001

## VERIFICATION

I, Pankaj Kumar Mourya, the above named deponent verifies that the facts stated above are true and correct to the best of my knowledge and belief and nothing material has been concealed therefrom.

Verified at New Delhi on this 17<sup>th</sup> day of January, 2020.

Identify the Deponent by signature



### DEPONENT

पंकज कुमार मौर्या / Pankaj Kumar Mourya  
अधीक्षण अभियंता / Superintending Engineer  
सड़क परिवहन एवं राजमार्ग मंत्रालय  
Ministry of Road Transport & Highways  
भारत सरकार / Government of India  
नई दिल्ली / New Delhi-110001

### Through:

(ARDHENDUMAU LI KUMAR PRASAD)

Advocate,

Place: \_\_\_\_\_.

Dated: 17<sup>th</sup> 01.2020.



**ATTESTED**  
  
NOTARY PUBLIC  
DELHI (INDIA)  
17 JAN 2020

**IMPORTANT TIME BOUND MATTER**

No.12037/01/2019-MAH (Z-4)

Government of India  
Ministry of Road Transport and Highways  
Transport Bhavan, 1, Parliament Street, New Delhi -110001

Dated the 17<sup>th</sup> Oct, 2019

To,

1. The Secretary (Works)  
Public Works Department  
Government of Maharashtra  
Mantralaya  
Mumbai - 400 032
2. The Chief Wildlife Warden  
Govt. of Maharashtra

Subject: Site appraisal report to suggest mitigation measures for road projects cutting through tiger corridor in the Eastern Vidharbha Landscape in the State of Maharashtra- Funding for Mitigation Measures reg.

Sir,

Kindly refer to para 2 of Minutes of Meeting dated 07.10.2019 attached herewith vide which summary record of meeting held on 30.09.2019 at National Tiger Conservation Authority (NTCA), New Delhi was submitted to this Ministry for further necessary action.

2. This Ministry vide letter dated 29.05.2019 has already in-principally agreed for mitigation measures amounting to Rs. 100.81 Cr. for project listed at Sl. No. 1, 2, 3 & 4 (refer Annexure below) subject to approval of competent authority. However, NTCA vide above Minutes of Meeting has directed for additional lump sum expenditure of approximately Rs.700 Cr. for the roads namely Mul-Chandrapur & Bamni-Navegaon also.

3. The MOM dated 07.10.2019 has been examined in Ministry and undersigned has been directed to convey that due to already huge committed liability for ongoing National Highway projects in the State of Maharashtra, this Ministry is unable to fund any additional expenditure over and above Rs. 100.81 Cr. for such mitigation measures. Accordingly, it is requested that in view of direction recorded under para 2 of Minutes of Meeting dated 07.10.2019, State Govt. may fund the expenditure towards any mitigation measure for the roads namely Mul-Chandrapur & Bamni-Navegaon as desired by NTCA. **An early decision is solicited in this regard as the matter is under Hon'ble NGT and a report has to be filed by NTCA in Hon'ble NGT within the month of October 2019 and they have requested for submission of action plan by 24th October 2019.**

Encl: As above

  
(P K Mourya)  
Superintending Engineer (Zone-IV)  
For Director General (Road Development) & SS

**Copy to:**

- (i) Principal Chief Conservator of Forest (Head of Forest Force), Maharashtra State, Van Bhavan, Ramgiri Road, Near Police Gym Khana, Civil Line Nagpur -440001, email - pccfwngp@mahaforest.gov.in
- (ii) ADG, Wildlife, MoEF&CC, New Delhi
- (iii) The Chief Engineer (Regional Officer), Ministry of Road Transport & Highways, Room No-508, 5<sup>th</sup> Floor, Konkon Bhawan, CBD Belapur, Navi Mumbai-400614-with a request to pursue the matter with State Govt. for early decision.
- (v) Shri Sujay Dodal, Joint Secretary (Forests) Revenue and forest Department, Mantralaya, Mumbai-32 email - [ms325@ifs.nic.in](mailto:ms325@ifs.nic.in)
- (vi) Chief Engineer, PWD, NH, Maharashtra

  
(P K Mourya)  
Superintending Engineer (Zone-IV)  
For Director General (Road Development) & SS

## ANNEXURE

### Tentative cost of structural mitigation measures

| Sr. No. | Name of road            | NH No.   | Length of Project (km) | Length of Tiger Corridor (in km) | Proposed Flyover (excluding approaches) | Tentative cost (Cr.) of flyovers | Status                                                                   |
|---------|-------------------------|----------|------------------------|----------------------------------|-----------------------------------------|----------------------------------|--------------------------------------------------------------------------|
| 1       | Nagbhid-Bramhapuri-Amon | NH353D   | 39.37                  | 5                                | 450 m                                   | 41.25                            | Agreed in-principle by MoRT&H subject to approval of competent authority |
| 2       | Malewada-Chimur         | NH353E   | 30.53                  | 0                                | 0                                       | 0                                |                                                                          |
| 3       | Chimur-Warora           | NH353E   | 51.65                  | 1.5                              | 750                                     | 56.65                            |                                                                          |
| 4       | Gadchiroli-Mul          | NH 930   | 41.62                  | In fragments                     | 30 m                                    | 2.91                             |                                                                          |
| 5       | Mul-Chandrapur          | NH 930   | 39.67                  | 28.5                             | 4800 m                                  | 402.07                           | Not agreed                                                               |
| 6       | Bamni-Navegaon          | NH 353 B | 42.25                  | 14                               | 3300 m                                  | 256.23                           | Not Agreed                                                               |
|         | Sub-total               |          | 245.09                 |                                  | 9330 m                                  | 759.11 Cr.                       |                                                                          |

भारत सरकार  
Government of India  
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय  
Ministry of Environment, Forest and Climate Change  
राष्ट्रीय व्याघ्र संरक्षण प्राधिकरण  
National Tiger Conservation Authority

F. No. 12-1/2009-NTCA (Vol.II)

New Delhi, the October 07, 2019

OFFICE MEMORANDUM

Sub: Summary record of the meeting held on 30.09.2019 at NTCA, Hqrs, New Delhi – reg.

Please find enclosed herewith a copy of the summary record of the meeting held on 30.09.2019 in context of mitigation measures for road projects cutting through Tiger corridors in the Eastern Vidharbha Landscape under Chairmanship of the ADG (Wildlife), Ministry of Environment, Forests and Climate Change and the ADG (PT) & Member Secretary (NTCA), New Delhi in Conference Hall of the NTCA, for information and necessary action.

These issues with approval of the competent authority.

Encl: As above.

  
(Nishant Verma)  
Deputy Inspector General of Forests (NTCA)  
Tel. (EPABX): + 91 11 24364837-39  
FAX: +91 11 24367836  
Email: dig2-ntca@nic.in

Distribution:

1. The Chief Wildlife Warden, Govt. of Maharashtra
2. The Field Director, Tadoba-Andhari Tiger Reserve, Maharashtra
3. The AIGF, NTCA, Regional Office, Nagpur.
4. Dr. Bilal Habib, Scientist – E, Wildlife Institute of India, Dehradun.
5. The Superintendent Engineer, Ministry of Roads, Transport and Highway.
6. The Executive Engineer, Ministry of Roads, Transport and Highway.
7. The IGF, NTCA, Hqrs. New Delhi.
8. The DIGF/ AIGs, NTCA, Hqrs. New Delhi.

Copy forwarded for kind information and necessary action:

1. The Director, Wildlife Institute of India, Dehradun.
2. PPS to ADGF (WL), MoEF&CC, New Delhi
3. PS to ADG (PT) & MS (NTCA).

  
(Nishant Verma)  
Deputy Inspector General (NTCA)

Summary record of the meeting held on 30.09.2019 at 1130 hrs. at NTCA Hqrs. New Delhi regarding mitigation measures for road projects cutting through Tiger corridors in the Eastern Vidarbha Landscape.

The meeting in context of the mitigation measures for road projects cutting through Tiger corridors in the Eastern Vidarbha Landscape was held on 30.09.2019 at NTCA Hqrs., New Delhi under the chairmanship of the ADG (Wildlife), MoEF&CC & ADG (PT) & MS (NTCA), New Delhi. The meeting was attended by the following officials:

- a) Shri M. S. Negi, ADG (WL), MoEF&CC.
- b) Dr. Anup Kumar Nayak, ADG (PT) & MS (NTCA)
- c) Shri Nitin Kakodkar, PCCF (WL) & CWLW, Maharashtra
- d) Dr. Amit Mallick, IGF, NTCA
- e) Shri Nishant Verma, DIGF, NTCA
- f) Dr. Vaibhav C. Mathur, AIGF, NTCA
- g) Shri Kamdi Hemant Bhaskar, AIGF, NTCA, Regional Office, Nagpur
- h) Dr. Bilal Habib, Scientist-E, Wildlife Institute of India, Dehradun
- i) Shri P.K. Mourya, Superintendent Engineer, Ministry of Roads, Transport and Highway (MoRTH)
- j) Shri Naresh Kumar Chopra, Executive Engineer, Ministry of Roads, Transport and Highway.

At the outset, the ADG (PT) & MS (NTCA) welcomed the ADG (WL), MoEF&CC and the participants and reviewed the progress of action plan as required to be submitted in Hon'ble National Green Tribunal by 31<sup>st</sup> October, 2019. He briefed that the Ministry of Roads, Transport and Highway has partially agreed for implementation of mitigation measures subject to approval of the competent authority for variation proposal and cost quantification of additional non-structural mitigation measures. The summary of concurrence for implementation of mitigation measures for all 9 (nine) roads are given in the table below:

| S. No. | Road                                                          | Nomenclature as per PWD/NH              | Status of concurrence for construction of mitigation measures                     |
|--------|---------------------------------------------------------------|-----------------------------------------|-----------------------------------------------------------------------------------|
| 1      | Nagbhir-Bramhapuri-Armori                                     | NH 253 D                                | Agreed by MoRTH                                                                   |
| 2      | Malewada-Chimur                                               | NH 353 E                                | No mitigation prescribed                                                          |
| 3      | Chimur-Warora*                                                | NH 353 E                                | Agreed by MoRTH                                                                   |
| 4      | Mul-Chandrapur*                                               | NH 930                                  | Not agreed by MoRTH                                                               |
| 5      | Bamni-Navegaon*                                               | NH 353 B                                | Not agreed by MoRTH                                                               |
| 6      | Gadchiroli-Mul                                                | NH 930                                  | Agreed by MoRTH                                                                   |
| 7      | Chimur-Kanpa                                                  | MSH 314<br>(Principally declared as NH) | No mitigation prescribed. This road will be tackled after final declaration of NH |
| 8      | Hinganghat-Nandori-Kora-Khadsangi-Neri-Pendhri-Sindewahi-Mul* | MSH 322<br>(Principally declared as NH) | This road will be tackled after final declaration of NH                           |
| 9      | Nagbhir-Mul*                                                  | MSH 9                                   | Budgeting is done by PWD along with mitigation measures                           |

\* indicates priority roads necessary for maintaining functional connectivity of tiger corridors.

Therefore, from the above table, it is clear that there are only two roads i.e. Mul Chandrapur & Bamni-Nagegaon road for which MoRTH has not agreed for implementing mitigation action plan. However, the mitigation measures proposed are very important as these two roads passes through major portion of the tiger corridors connecting Tadoba-Andhari Tiger Reserve to the Southern and Eastern connecting tiger reserves.

*Handwritten signature/initials*

The participants agreed over critical importance of these mitigation measures and discussed the various activities for reducing cost of the animal crossing structures and to seek additional funding to the make the mitigation plan practically implementable. The decisions taken in the meeting are as under:

1. The members of the joint team submitted that there is no change in the dimension, number and location of the mitigation structures proposed in the action plan. It was decided that the joint team shall submit its final report within 7 days.

(Action: AIGF, NTCA, R.O., Nagpur)

2. The Maharashtra State Wildlife Board in 14<sup>th</sup> meeting dated 05.12.2018 requested NHAI to include mitigation measures while upgrading roads in Tadoba-Andhari Tiger Reserve Landscape. The Chairman of SBWL also assured State governments funding in case if NHAI declines implementation of mitigation structures. It was decided that the provisioning of funds shall be worked out by MoRTH exploring the option of utilizing State Govt. funds including provision of Central Road and Infrastructure Fund (CRIF) etc. for construction of mitigation structures prescribed for the two high priority roads i.e. Mul Chandrapur & Bamni-Nagegaon road. Moreover, the State Forest Department shall also explore the provisioning of funds for mitigation measures for the above roads through State CAMPA / TCF etc. The inputs in this respect shall be submitted to NTCA within 7 days.

3. Option of overpasses as animal crossing structures was discussed in the meeting. Participants agreed that overpasses give more natural passage for animal movement than underpasses. It was decided that MoRTH will look into feasibility of provisioning alternative designs for animal overpasses to see the possibility of cost reduction and communicate the same to NTCA within 15 days.

(Action: MoRTH & CWLW, Govt. of Maharashtra).

4. It was decided that the proposed mitigation measures may be implemented in phased manner to spread the cost. The joint team shall submit the phased implementation plan for the above two roads in view of ecological considerations for maintaining connectivity to NTCA Hqrs and MoRTH within 7 days. MoRTH in term shall provide 5 years phased implementation plan for mitigation measures over the two roads within 15 days. The team members shall provide technical inputs to MoRTH for prioritizing mitigation structures to make phased implementation plan.

(Action: MoRTH)

(Action: AIGF, NTCA, R.O, Nagpur & Dr. Bilal Habib, Scientist, WII & MoRTH).

5. It was decided that the nonstructural mitigation measures including provision of night traffic on the priority roads shall be provided by State Forest Department in coordination with WII to MoRTH for their implementation on priority basis. Moreover, the quick survey shall be carried out by the joint team to finalize the spatial locations of the mitigation structures proposed.

(Action: CWLW, Govt. of Maharashtra & MoRTH)

6. Since, the final report it to be submitted to Hon'ble NGT within the month of October, 2019. It was decided that the requisite action shall be taken by the concerned officials within decided time frame so that the final action plan can be submitted by **24.10.2019**.

The meeting ended with vote of thanks by the Chair.

*Kushwaha 27/10/19*

Government of India

Ministry of Road Transport and Highways

Transport Bhavan, 1, Parliament Street, New Delhi -110001

Dated the 29<sup>th</sup> May, 2019

To,

Deputy Inspector General  
Ministry of Environment, Forest and Climate Change,  
National Tiger Conservation Authority, New Delhi  
(Kind Attention: Sh. Nishant Verma, Email: dig2-ntca@nic.in)

Subject: Site appraisal report to suggest mitigation measures for road projects cutting through tiger corridor in the Eastern Vidharbha Landscape in the State of Maharashtra- submission of comments reg.

Sir,

Kindly refer to Site appraisal report submitted by NTCA constituted committee vide letter no. 12-1/2009-NTCA (VoII) dated 15.05.2019, Following comments are offered on behalf of MoRTH after approval of competent authority: -

- (i) Nagbhid-Bramhapuri-Armori: - The tentative cost of mitigation measure in the form of flyover proposed by NTCA is Rs. 41.25 Cr. (excluding centages). This Ministry agrees for implementation of above mitigation measures as proposed by NTCA for this stretch subject to approval of competent authority for the variation proposal & cost quantification of additional measures given under para (vii) below. NGT may be requested to allow the present on-going works.
- (ii) Malewada-Chimur: - The tentative cost of mitigation measure in the form of flyover proposed by NTCA is Rs. 0.00 Cr. (excluding cost of additional measures). This Ministry agrees for implementation of above mitigation measures as proposed by NTCA for this stretch. NGT may be requested to allow the present on-going works.
- (iii) Chimur-Warora: - The tentative cost of mitigation measure in the form of flyover proposed by NTCA is Rs. 56.65 Cr. (excluding centages). This Ministry agrees for implementation of above mitigation measures as proposed by NTCA for this stretch subject to approval of competent authority for the variation proposal & quantification on cost of additional measures given under para (vii) below. NGT may be requested to allow the present on-going works.
- (iv) Mul-Chandrapur: - The project was sanctioned by Ministry having civil cost construction of Rs. 122.24 Cr. The awarded cost of the project is Rs. 110.01 Cr. The tentative cost of mitigation measure in the form of flyover proposed by NTCA is Rs. 402.07 Cr. (excluding centages and cost of additional measures). There is increase of 330% in the sanction civil cost of the project due to above mitigative measures excluding additional measures. Revised cost estimates for this road project will be considered by Project Appraisal committee after following due process before conveying about their approval. It is however stated that it is not possible for M/o RT&H for continuing with present contracts, if the condition for the construction of flyovers is insisted. The present contracts needs to be foreclosed which obviously delay the completion of road improvement works on this stretch as it will require the execution of work through new contracts as well as depending upon the inter-se-priority of NH works & fund availability for Maharashtra state. Alternatively, since, only improvement of riding quality of existing road has been incorporated in the scope of this work in the sections, which are passing through wildlife corridor zones, NGT may be requested to allow the execution of on-going works with non-structural measures for reducing mortalities as suggested in the booklet titled eco-friendly measures to mitigate impacts of linear

Sh. Nishant Verma  
Dig2-NTCA

Sh

Sh

infrastructure on wildlife issued by Wildlife Institute of India for minimizing conflict of human with animals.

(v) Bamni-Navegaon: - The project was sanctioned by Ministry having civil cost construction of Rs. 180.00 Cr. The tentative cost of mitigation measure in the form of flyover proposed by NTCA is Rs. 256.23 Cr. (excluding centages and cost of additional measures). There is increase of 143% in the sanction civil cost of the project due to above mitigative measures excluding additional measures. Revised cost estimates for this road project will be considered by Project Appraisal committee after following due process before conveying about their approval. It is however stated that it is not possible for M/o RT&H for continuing with present contracts, if the condition for the construction of flyovers is insisted. The present contracts needs to be foreclosed which obviously delay the completion of road improvement works on these two stretches as it will require the execution of work through new contracts as well as depending upon the inter-se-priority of NH works & fund availability for Maharashtra state. Alternatively, since, only improvement of riding quality of existing road has been incorporated in the scope of both works in the sections, which are passing through wildlife corridor zones, NGT may be requested to allow the execution of on-going works with non-structural measures for reducing mortalities as suggested in the booklet titled eco-friendly measures to mitigate impacts of linear infrastructure on wildlife issued by Wildlife Institute of India for minimizing conflict of human with animals.

(vi) Gadchiroli-Mul: - The tentative cost of mitigation measure in the form of flyover proposed by NTCA is Rs. 2.91 Cr. (excluding centages and cost of additional measures. This Ministry agrees for implementation of above mitigation measures as proposed by NTCA for this stretch. NGT may be requested to allow the present on-going works.

(vii) There is further cost implication due to adoption of additional measures like landscaping, light & sound barrier, fencing, vegetative canopy etc. the actual cost implementation for such mitigative measures is not furnished in the report. Accordingly, it is difficult to make any comment without knowing the cost implication of such measures.

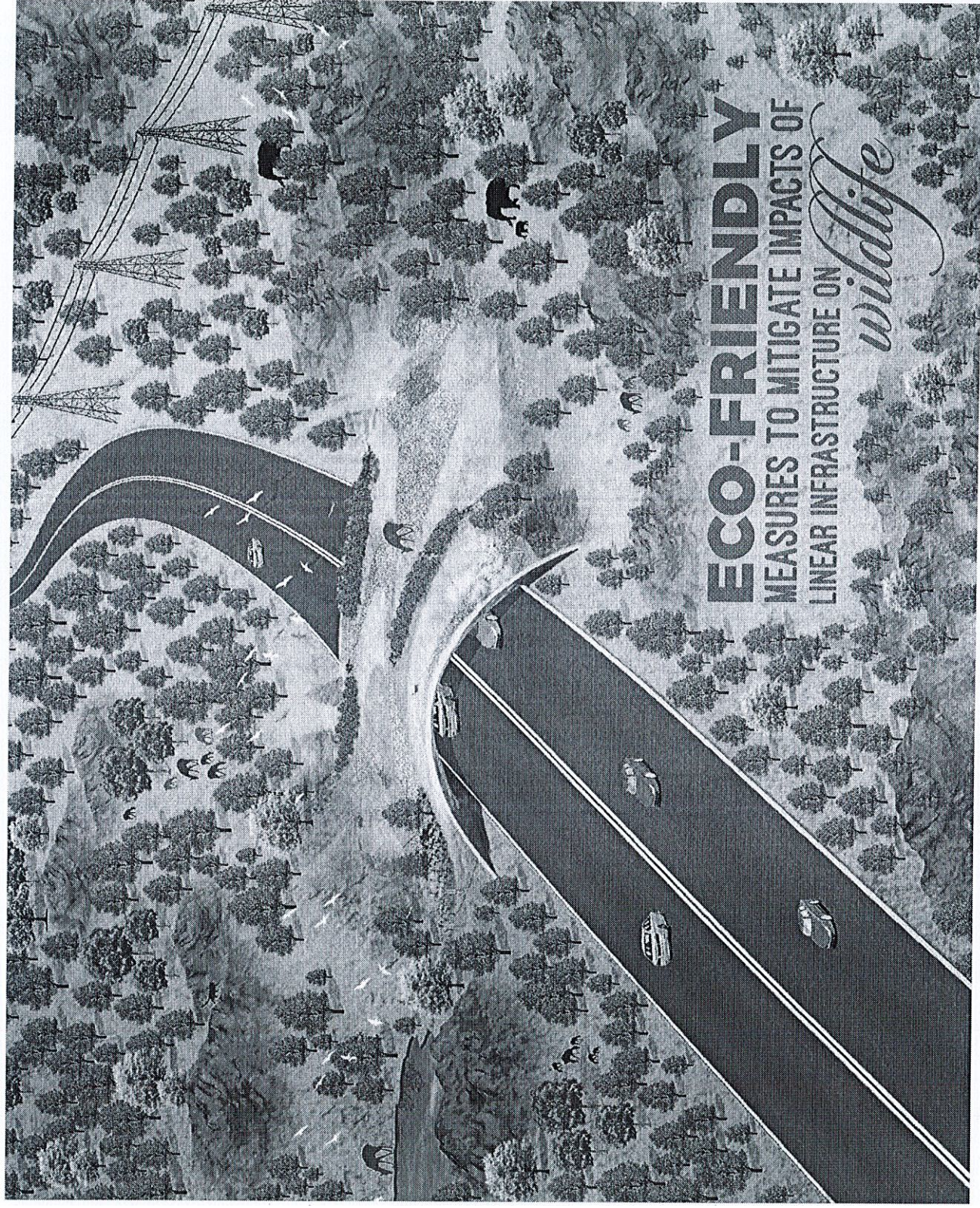
(viii) The proposed lump sum provision @5% to be kept as corpus by user agency is not agreed to.

(P K Mourya)  
Superintending Engineer (Zone-IV)

Copy to:

- (i) Principal Chief Conservator of Forest (Head of Forest Force), Maharashtra State, Van Bhavan, Ramgiri Road, Near Police Gym Khana, Civil Line Nagpur -440001, email - [pccfwlngp@mahaforest.gov.in](mailto:pccfwlngp@mahaforest.gov.in)
- (ii) ADG, Wildlife, MoEF&CC, New Delhi
- (iii) The Chief Engineer (Regional Officer), Ministry of Road Transport & Highways, Room No-508, 509, 5th Floor, Konkon Bhawan, CBD Belapur, Navi Mumbai-400614
- (iv) Shri. Chandrasekhar RO-NHAI, Nagpur, Plot No. 159, Bunglow No. 2, Shubhankat Apartment, Ambezogoi, Vermalayout Ramnagar, Nagpur-440033
- (v) Shri Sujay Dodal, Joint Secretary (Forests) Revenue and forest Department, Mantralaya, Mumbai-32 email - [ms325@ifs.nic.in](mailto:ms325@ifs.nic.in)

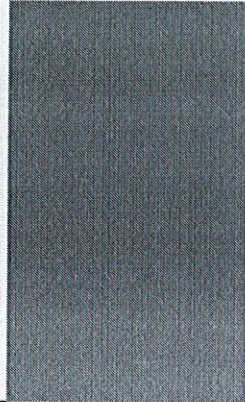
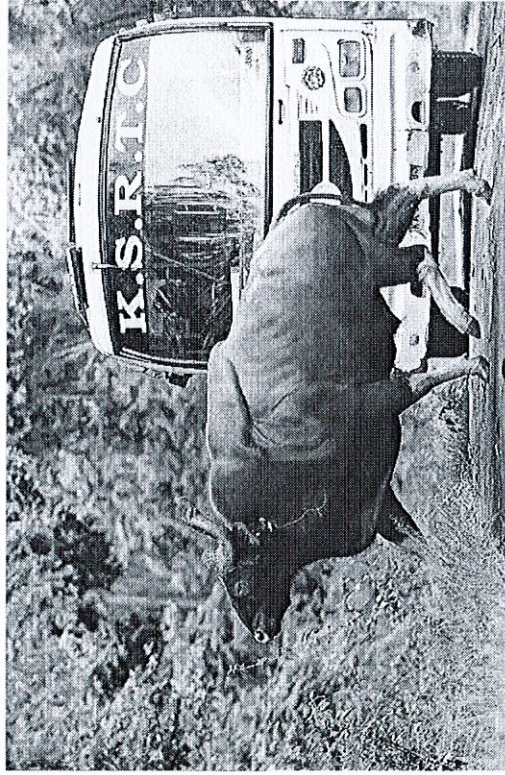
(P K Mourya)  
Superintending Engineer (Zone-IV)



# ECO-FRIENDLY

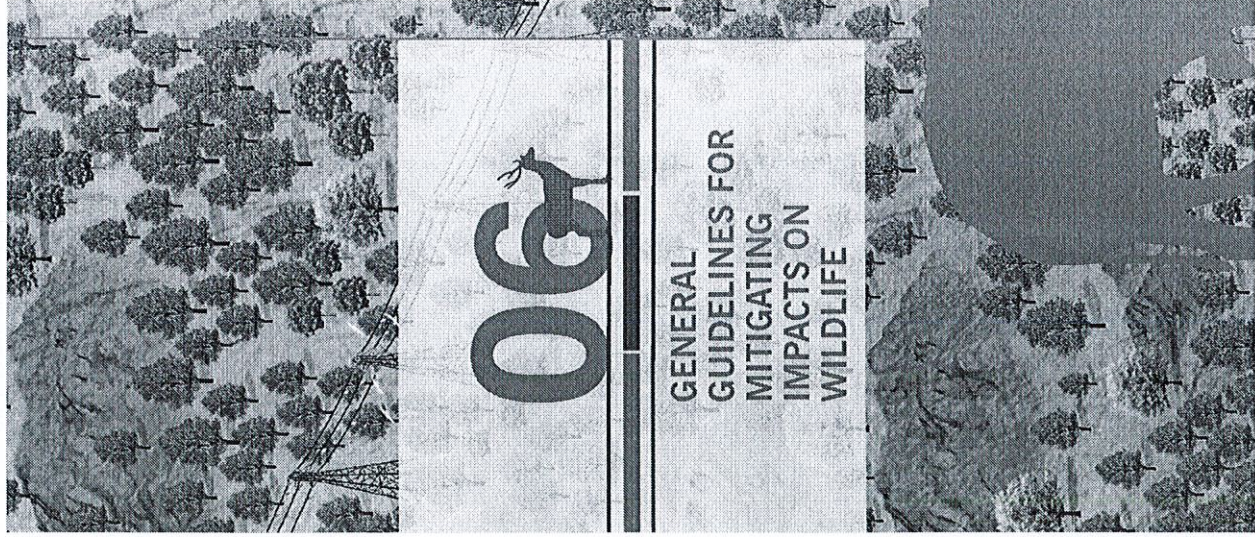
MEASURES TO MITIGATE IMPACTS OF  
LINEAR INFRASTRUCTURE ON





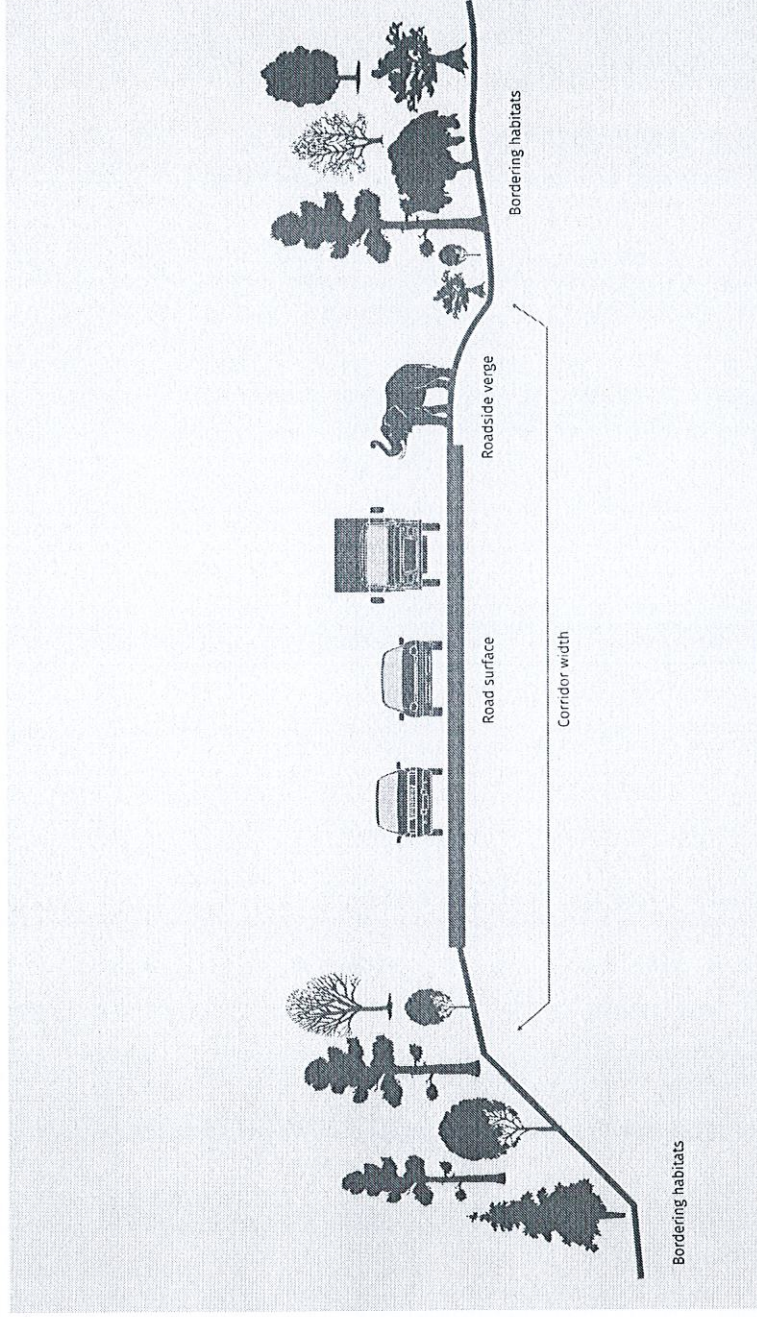
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण  
सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार  
National Highways Authority of India  
Ministry of Road Transport and Highways, Government of India





Transportation planners know that highway and railway systems must accommodate other elements of human infrastructure (e.g. water supply systems, sewer systems, electric and gas utilities). Biologists and natural resource planners can define networks of core conservation areas and connectivity zones, effectively defining the ecological infrastructure for a region. They can then work with transportation agencies to ensure that transportation systems are designed to accommodate this ecological infrastructure.

Traditionally, highway impacts on wildlife have been viewed in terms of road mortality and threats to selected populations of animals. Viewing this issue from a wider perspective, however, it is clear that both highways and railways have the potential to undermine ecological processes at a landscape scale through the fragmentation of wildlife populations, restriction of wildlife movements, and the disruption of gene flow and meta-population dynamics. 'Smart' or 'green' linear infrastructure must aim to reduce mortality and make linear structures conducive to safe movement of animals across the landscape (Figure 6.1).



**Figure 6.1.** Components of a road transportation corridor. **Source:** Illustration by N. S. Bist

Many questions remain about how to design roads, highways, and passage structures for wild animals that will effectively mitigate the impact of roadways on animal movements and wildlife populations. Based on learning from projects around the world, current approaches to mitigation should aim to achieve at least two important and measurable conservation outcomes that should prevent decline in wild animal populations in the long term, namely (i) increased population viability and (ii) a significant reduction in infrastructure-induced mortality of animals.

Mitigation measures essentially fall into two categories, as illustrated for roads in Figure 6.2:

- (1) regulatory or prescriptive measures that are intended to alter human behaviour, and
- (2) measures to manage habitat on or near the site that are intended to influence animal responses.

TRANSPORTATION-INDUCED IMPACTS

Measures to alter human behaviour

Regulatory or prescriptive measures

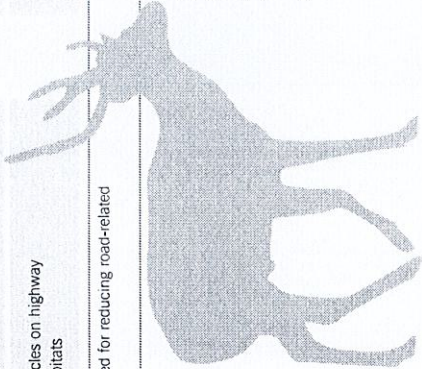
|   |                                                                                                     |
|---|-----------------------------------------------------------------------------------------------------|
| 1 | Speed control                                                                                       |
| 2 | Temporary road closure                                                                              |
| 3 | Control on feeding of wild animals on the road                                                      |
| 4 | Regulatory guidelines for laying/upgrading road through sensitive habitats and wilderness areas     |
| 5 | Prescriptions for width of verge to be retained in different landscapes and habitats                |
| 6 | Restrictions on stopping/parking of vehicles on highway segments passing through sensitive habitats |

Measures to alter animal responses

On-site construction and habitat

|                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Clearing vegetation for improving visibility along road                                                                                                   |
| Erection of animal-proof fencing to prevent animals entering road                                                                                         |
| Installation of wildlife detection systems                                                                                                                |
| Increasing permeability of a road corridor by facilitating movement through construction of appropriately designed and positioned culverts or underpasses |
| Retrofitting existing drainage culverts to facilitate wildlife crossing by animals                                                                        |
| Maintenance of hedgerows along the road to serve as movement corridors                                                                                    |

**Figure 6.2.** Mitigation approaches recommended for reducing road-related mortality of animals.



Measures specifically to address habitat fragmentation effects of transportation infrastructure fall into two broad categories: engineering (structural) options and non-structural options. These two groups of options are discussed in separate sections below, and presented and evaluated in Table 6.2.

## ENGINEERING OPTIONS

There are several types of crossing structures that are used to mitigate impacts of highway and railway corridors on animal movement and safety, each with different levels of effectiveness and cost. Fundamentally, these structures are designed either to allow animals to travel below the infrastructure (underpasses) or over it (overpasses). The crossing structures are primarily about maintaining connectivity and animal movement, and less about reducing animal mortality. These different types of structures are presented in Table 6.1.

Table 6.1. Types of structures to enable animal crossing.

### Land bridge

Also known as an ecoduct or a wildlife bridge, it is a 30-70 m wide bridge that extends above roads or railway lines. The bridge is typically enhanced with habitat features such as native vegetation, rocks and logs.

These structures allow for natural movement of wild animals as they are less confining, quieter, have ambient natural conditions of rainfall, light and temperature, and can be used by a wide range of fauna.

#### Design considerations:

- The bridge may be rectangular or hour-glass shaped.
- Human activities and disturbance (noise and artificial light) should be minimised.
- Fencing should be used to funnel the animals towards the structures and away from the road or rail.

Acceptability to wild animals should be achieved by planting and maintaining native vegetation.



Source: Photograph by Benjamin P. Y.H. Lee (University of Hert).