ANNEX XII – TRANSPORTATION - ROADS

A. INTRODUCTION

1. The mission met with representatives of the GOSL, LTTE, the Roads Development Authority (Classes A and B roads) and the Provincial Roads Administrations in the Tsunami affected Districts (classes C,D and E roads). Field inspections were undertaken by road and air in the Southern, Uva and North East Provinces.

Sri Lankan roads have a three tier hierarchy namely:

1) National roads, comprising classes A and B and assigned to the Roads Development Authority (RDA) under the Ministry of Highways.
2) Provincial roads, comprising classes C, D and E and assigned to the Provincial Councils.
3) Local government roads, both urban and rural and assigned to the urban or municipal councils and the Predeshya Sabha (rural council).

B. DAMAGE OVERVIEW

Background

2. Until recently there has been no significant investment in the road network of Sri Lanka for a very long time. Maintenance of the road network was neglected during the 20 years of Civil war and a number of roads suffered conflict damage to bridges and causeways. The result is a substandard road network whose condition has severely deteriorated due to maintenance neglect. Operating conditions and speeds are poor on many roads due to deteriorated road surfaces and reduced carriageway width. Some roads remain impassable due to conflict damage and erosion. Road conditions in the North East Province are particularly bad.

3. It is necessary to place the tsunami damage into the context of the pre-tsunami road conditions. It is estimated that approximately 60% of the entire road network was damaged due to maintenance neglect during the conflict years. The tsunami event caused damage to less than five percent of the rational roads network and approximately two percent of the provincial and local government road network. This damage occurred to roads that, in the main, were already severely damaged by lack of maintenance. In the east damage has been caused to coastal roads by heavy rain and severe flooding immediately before and after the tsunami. On most roads it is not possible to segregate tsunami damage from flood damage and from conflict related damage.

National Roads

4. Of the three categories of roads, the national roads suffered the most significant damage. Sections of these roads run close to and parallel with the coast. Bridges on these

roads span rivers and inlets draining to the sea. Damage has occurred over a total length of 690 kms of national roads. This damage is in spot locations or in discrete sections and not over the entire length of 690 kms. The sections not affected by the tsunami remained passable but in a deteriorated condition due to the conflict. Damage typically comprises bridges washed off their abutments, bridge abutment scour and displacement, culvert blow out, embankment scour, wearing surfaces unraveling and loss of road furniture. Additionally road ferry piers have been damaged and ferry vessels destroyed.

Provincial and Local Government Roads

5. Provincial roads connect smaller towns and villages to the national road network. In coastal regions, these provincial roads tend to be aligned at right angles to the coast. These roads therefore presented less of a barrier to the advancing and retreating tsunami and consequently suffered less severe and extensive damage. It is estimated that a total length of 300 kms of provincial roads has been extensively damaged, including damage to ferry piers and loss of ferry vessels.

6. Local government roads connect to provincial roads or are the urban roads in towns and municipalities. As with provincial roads, damage was less severe and a total length of approximately 1180 kms was affected by the tsunami.

Immediate Response to Damage

7. The RDA and Provincial Road Authorities have been quick to respond to the tsunami damage and temporary road repairs and placement of temporary Bailey bridges has enabled the South Coast Highway and Northern Coastal Roads to be re-opened to traffic within a week or so of the tsunami event. Immediate temporary repair works are proceeding on the East Coast Highway and most sections were opened to traffic by the second week of January 2005. The multi span steel Arugam Bay Bridge, near Puttuvill, suffered extensive embankment washout on its approaches and one pier is displaced. Temporary repairs involving a floating pontoon roadway and ramps to the bridge are being attempted and a temporary detour route has been constructed. It is planned that the remaining severed sections of the east coast roads will be temporally repaired by the end of January 2005.

8. These immediate repairs are being funded from current budget and budget deficits are likely to accrue.

C. RECONSTRUCTION AND RECOVERY NEEDS

9. ***Short Term Needs.*** In the short term there is an urgent need to consolidate the temporary road and bridge repairs before onset of the next northeast monsoon season. If this is not done then there is a grave danger that further damage may occur and that temporary repairs may fail. The work would comprise embankment stabilization, replacement of temporary bridges with permanent bridges, structural repairs to damaged bridges, drainage and culvert repairs and enlargement, abutment slope protection, reinstatement of damaged pavements, and replacement of road furniture. The road works

could be mainly completed over a six month contract period following specification of the work and contractor procurement. Permanent bridge replacement would, however, probably extend into the 2006 construction season. It would therefore be necessary to include in the short term works contracts for strengthening and protecting the temporary Bailey bridges.

10. The damaged steel multi-span Arumgam Bay Bridge is over 60 years old and is significantly corroded. It may be uneconomical to effect repairs to this bridge and a new replacement bridge is indicated. It is doubtful that this new bridge construction could be started in the short term due to lead in time for site investigation, design and procurement. This replacement bridge is therefore included in the medium term needs. Estimates of costs for the short term needs are presented for each category of road in Table C1. These costs include the costs of the immediate and temporary repair works now being undertaken. It is anticipated that these short term road and bridge works will not require resettlement or land acquisition, and that there will not be any adverse environmental impacts.

11. ***Medium Term Needs.*** Following the short term work it will be necessary to put the national roads into a uniform and maintainable condition free from seasonal flood damage and erosion. Embankments and carriageways would be widened to a uniform width to meet the national standard for that class of road, and pavements would be reinstated. Embankments would be elevated above the seasonal flood levels and protected, and drainage systems would be improved. The hydraulic capacities of culverts and bridges would be checked and where deficient larger culverts and higher, longer span bridges would be constructed. It is anticipated that the medium term works could commence in the 2006 construction season and would continue for two to three years. Investigations, designs, contractor procurement and resettlement/land acquisition procedures would commence in 2005. In the main the medium term works would follow the line of the existing road and be within the existing right of way. Environmental impacts, resettlement and land acquisition is expected to be minor.

12. Cost estimates for this medium term work are presented in Table C1. The medium term needs include the reconstruction of provincial and local government roads that join the national roads to be reconstructed. These roads, while not being damaged by the tsunami are in a much deteriorated state. The reconstruction of these roads is considered vital to extend the economic, commercial and social benefits of the national road reconstructions into the adjoining coastal and agricultural communities.

13. ***Long Term Needs.*** It is recognized that these would be a long-term need to improve the capacity and operating speeds on the national road network. These long-term improvements would reflect national and regional development planning. A National Roads Master Plan is currently being drawn up to guide network improvements and establish priorities for investment. The long-term needs of the coastal national roads affected by the tsunami are not considered in this needs assessment.

TABLE C1
Summary of Estimated Costs

Road Category	Short Term Needs		Medium Term Needs	
	LKR Millions	US$ Millions	LKR Millions	US$ Millions
National (Classes A & B)	1600	15	15,300	140
Provincial (Classes C, D & E)	300	3	1,200	11
Local government	300	3	600	6
Total	**2200**	**21**	**17,100**	**157**

D. IMPLEMENTATION

14. Conventional contract documentation and procurement procedures will militate against a rapid start to the short-term works. An innovative approach to financing, procurement, project management and supervision is required for these works. The objective would be to enable a start during the 2005 dry season. It is anticipated that nationally registered contractors would carry out the National Roads program, possibly with the aid, assistance, management skills and equipment availability of international contractors.

15. The provincial roads work program should be carried out by local contractors with the bidding, project management, procurement, and supervision procedures already established for on-going multi-lateral funded projects in the North East.

16. Local government works program are an excellent opportunity for labour intensive construction and community involvement in construction. There are already good examples of local road rehabilitations carried out by these methods. Significant social and livelihood benefits would accrue to the affected coastal communities through their direct participation in road construction.

17. For the medium term works, provincial and local government road rehabilitation can be implemented as above. The scale of expenditure on the national road network would, however, demand a more conventional approach to investigations, designs, contract preparation, contractor procurement, project management and construction supervision. Efforts must be made to secure funding to enable these procedures to commence in the short term with a view to procuring contractors and works commencement, for the medium term works, early in 2006.

18. Finally, there has to be a mechanism for determining a priority for investment in these tsunami affected road rehabilitation programs. At national regional district and local levels, consultations will be necessary to establish needs, priorities for reparations and mechanism for implementation.

Attachment 1

Damages Caused By Tidal Wave (Tsunami)
To National Road Sector- Short Term Repairs

Cost Estimate for carrying out repairs to the damaged roads and bridges immediately and for the reinforcing such temporary work

Road	Current Status	Action	Id No	Approximate Cost (Rs.Mn)
Southern Province:				
Colombo-Galle- Hambantota-Wellawaya Road (A2):				
Akurala Bridge	Damaged	Bailey bridge installed	**1**	
Seenigama and Hikkaduwa Sections (96-99 km)	Breached (30-40m long)	Filling completed	**2**	
Magalle Bridge	Damaged	Bailey bridge installed	**3**	
Goiyapana Bridge	Damaged	Bailey bridge installed	**4**	500.00
Weligama Bridge(145/3 &145/5)	Damaged	Repairs attended	**5**	
Dondra Bridge (166/1)	Approaches damaged	Repairs attended	**6**	
Talalla	Bend Damaged	Repairs attended	**7**	
North -East (East) Province:				
Ambepussa-Kurunegalla- Trincomalle Road (A6):				
197th km	Retaining wall (20m) damaged. The road is passable	Being repaired	**8**	1.00
Trincomalee-Pulmoddai Road				
22nd km- Salappawaru bridge	Approach (200m) washed off. The road is impassable	Repairs attended	**9**	2.00
Beach Road				
1st km	Culvert damaged. Half the carriageway (75m) washed off. The road is impassable	Repairs attended	**10**	2.00
Batticaloa-Trincomalee Road (A15)				
116-121 km	Washed off The road is impassable	Being repaired (25% (2km) completed)	**11**	30.00
126th km	Half the carriageway (100m) washed off. The road is impassable	Repaired attended	**11**	1.00
Thampalakamam- Kinniya Road				
8th km	Bailey bridge damaged	Repairs attended	**12**	2.00

Colombo-Ratnapura-Wellawaya -Batticaloa Road				
334/1 Bridge (Komari Bridge)	Collapsed	Bailey bridge being installed	**15**	50.00
362-364 km	Washed off	Repairs attended	**14**	18.00
375 km	Washed off	Repairs attended	**14**	6.00
380 km	Washed off	Repairs attended	**14**	6.00
392 km	Washed off	Repairs attended	**13**	6.00
393 km	Washed off	Repairs attended	**13**	6.00
394 km	Damaged	Repairs attended	**13**	2.00
394/1 culvert	Washed off	Repairs attended	**13**	1.00
394/2	Washed off	Repairs attended	**13**	1.00
395/1	Washed off	Repairs attended	**13**	1.00
Road	**Current Status**	**Action**	**Id No**	**Approximate Cost (Rs.Mn)**
396/3-Periyakallar br.cum causeway	Washed off	2-Bailey bridges being installed. 75% of the parts transported to site	**13**	3.00
398/1-Koddaiakallar br.cum causeway	Washed off	3-Bailey bridges being installed. 75% of the parts transported to site	**13**	5.00
409/5 & 410/1 Culverts	Washed off	Being repaired	**13**	5.00
412 &415 km	Part of the carriageway is damaged	Being repaired(60% completed)	**13**	6.00
Batticaloa-Trincomalee Road (A15)				
42/1 Bridge	Bailey bridge damaged	Repairs attended	**17**	50.00
46-59 km	Damaged	Being repaired(50% completed)	**17**	6.00
59/1 Bridge (Panichchankeni)	Washed off	2-Bailey bridges to be installed.	**18**	2.00
60-78 km	Washed off	Being repaired(10% completed)	**19**	54.00
Bar Road				
4/2 bridge	Washed off	Bailey bridge to be installed.	**20**	20.00
5/2 Bridge	Damaged	Bailey bridge to be installed.	**21**	20.00
3-5 k.m	Damaged	Being repaired(30% completed)	**21**	9.00
Pottuvil -Panama Road				
1-3 km	Washed off	Repairs attended	**22**	50.00
Bridge No 3/4 (Arugambay)	Damaged	Being repaired	**23**	10.00
Peradeniya-Badulla-Chenkaladi Road				
282/2 Bridge	Damaged	Being Repaired	**33**	60.00
North-Eastern (North) Province:				

Paranthan- Mukkaitive Road				
48-52 13 km & 50/1 Causeway	Damaged	To be repaired	**24**	
Beach Road				
0.9 km	Washed off & still submerged	To be repaired	**25**	
Mankulam-Mullaitivu Road				
42-49.25 km	Damaged	To be repaired	**26**	
Soran pattau-Thalayadi Road				
6.5-7.2 k.m	Damaged	To be repaired	**27**	
Point Pedro- Maruthankeny Road				
19-30 km	Damaged	To be repaired	**28**	
East Coast Road				100.00
0.8-4.74 km	Damaged	To be repaired	**29**	
Jaffna-Ponnalal- Point Pedro Road				
42.6.55.4 km	Damaged	To be repaired	**30**	
Point Pedro-Maruthankeny Road				
0.8-4 km	Damaged	To be repaired	**31**	
Mullaitivu-Kokalai Road				
0-16 km	Damaged	To be repaired	**32**	
18/1 Br.(Nayaru Bridge)	Damaged	Bailey bridge to be installed	**32**	
		Total		**1,035.00**
Approximate cost for damaged buildings in all affected areas				200.00
Approximate cost for damaged vehicles and ferryboats in all affected areas				100.00
Approximate cost for temporary works, to make all the damaged roads passable				200.00
		Grand Total		**1,535.00**
approximate cost for damage =Rs.1600 Mn.				

Attachment 2

COST OF MEDIUM TERM
REPAIRS AND REHABILITATION TO TSUNAMI DAMAGED
NATIONAL ROADS

a. Southern Coast Highway		**Distance (KM)**	**Cost (Rs.Million)**
Package I:	Panadura to Galle Section	92	3500
Package ii	Galle –Hambantota, Tissa Kirinde Section	163	3600
b. East Coast Highway		**Distance (KM)**	**Cost (Rs.Million)**
Package iii	Potuvil to Batticaloa	106	1600
Package iv	Batticaloa to Trincomalee	132	1600
Package v	Trincomalee- Mullaitivu	92	2500
c. Northern Coast Highway		**Distance (KM)**	**Cost (Rs.Million)**
Package vi	Soranpattu- Jaffna	105	2500

Total Cost for Reconstruction /Rehabilitation of Tsunami affected Highways: LKR 15.3 Billion
USD 140 Million