

FOREWORD

This report presents guidelines for developing Environmental Management Plans in the context of the Road Safety project financed by the World Bank. They have been developed to *ensure that potential negative impacts arising from the road safety project are addressed adequately*.

In practice, the Environmental Management Plan guidelines will be used to mitigate the adverse environmental impacts identified for each civil work sub-project within each batch of blackspot improvement. In addition, the implementation of the guidelines will help improve the quality of the sub-projects and will ensure the participation of concerned stakeholders.

These guidelines are provided on this website for public disclosure, in accordance with the World Bank operational policy nb. 17.50.

The public is welcome to make any comments on these guidelines and to address them to

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<p>ISLAMIC REPUBLIC OF IRAN ROAD SAFETY PROJECT ENVIRONMENTAL MANAGEMENT PLAN GUIDELINES</p>

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A. BACKGROUND

1. Introduction

Road safety performance in the Islamic Republic of Iran is very poor by international comparison, and deteriorating. The annual increase in road deaths and injuries has exceeded 15% over the last decade and death rates per capita and per vehicle are about ten to twenty times greater than the average for industrialized countries. The high vehicle fleet growth rate is also projected to continue in the longer-term and the traffic mix is becoming more dangerous with the rapid growth in motorcycles. Pedestrians are particularly vulnerable. There is a widespread consensus in the Islamic Republic of Iran that current road safety management procedures and practices are insufficient to address this situation and reduce on a sustainable basis the considerable economic and social losses that result from road accidents.

The Government of Iran is currently preparing a National Road Safety Action Plan that will specify the strategies and priority actions to be taken within the next five years to significantly reduce road accidents and injuries. Within the scope of this Action Plan, the Government has asked the World Bank to provide assistance to design and implement innovative measures, based on best practice from other countries, to better tackle road safety issues. The Government and the Bank have therefore undertaken the preparation of a project for World Bank financing which is expected to be ready for a start of implementation by the end of 2005.

2. Project description

The objectives of the Iran Road Safety Project are to:

- Reduce road deaths and injuries by 40 % over four years in targeted high-risk corridors and city areas in selected pilot provinces, with an integrated package of cost-effective, multisectoral safety interventions.
 - Prepare and disseminate resource guides, technical manuals, analysis tools and training programs to road safety agencies and professionals nationwide – based on the experience gained in the pilot provinces and national project components.
 - Develop the capability of all IRI institutions engaged in road safety by building integrated road safety management procedures and practices that can be sustained in the longer-term and transfer to Iran the know how and experience of countries that have successfully addressed road safety issues.
 - Develop and implement a national road crash data and analysis system that enables all agencies engaged in the improvement of road safety to enhance the design, implementation and effectiveness of their road safety programs.
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A summary of the project components categorized in the framework of main strategic directions for road safety in Iran, can be found in Annex 1. These components are designed to achieve the above mentioned objectives. The project components address the essential elements of a best practice safety management system through three instruments: (1) provision of technical assistance, (2) provision of goods and equipment, and (3) provision of civil works.

The provision of civil works happens within the “Safe infrastructure” component and would cover road works to remove black spots and other road hazards, introduce innovative safety features, and systematically correct deficiencies in signage, markings, visibility, road pavement, road side objects, etc, on about 1,000 km of national roads in the pilot provinces and main arteries in the pilot cities (see Annex 2). The road works would be identified, designed, and executed in three batches, the first batch representing about 15-20% of all works being designed before project approval, while the second and third batches are being identified and designed during project execution on the basis of the new methods and guidelines introduced through the project’s technical assistance and training component and early successes achieved with the first batch. The black spots identified as part of the first batch are briefly described in Annex 3.

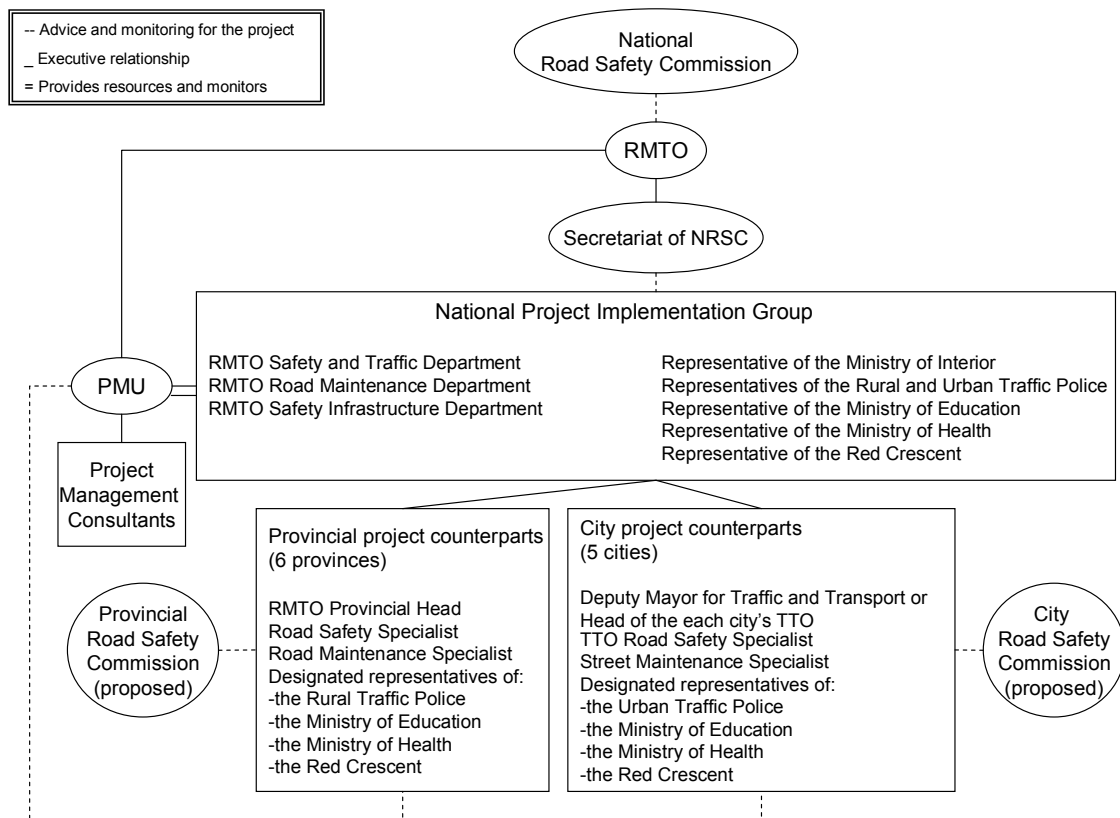
3. Institutional Arrangement

The general organization for project implementation will be as follows:

- RMTO will be the overall project implementation agency under the guidance of the National Road Safety Commission (NRSC). It will lead and monitor the activities of all agencies involved in the project. It will also be in charge of the procurement of all services, goods, and works under the project, as well as project financial management, coordination, and reporting to the Government, the NRSC, and the Bank.
 - Procurement, financial management, record keeping and accounting, detailed monitoring and preparation of reports will be carried out by a Project Management Unit (PMU). The project manager has already been designated. In its activities, the PMU will closely coordinate with RMTO’s Road Safety and Traffic Department which acts as Secretariat for the NRSC.
 - The execution of each specific project activity will be the responsibility of the concerned national agency (RMTO, Ministry of Interior, Rural and Urban Traffic Police, Ministry of Education, Ministry of Health, and Red Crescent) making use of the services, equipment and goods, and contractors provided by the PMU. In doing so, each of these agencies will work closely with its staff in the six provinces and five cities covered by the project.
 - Project leadership and coordination will be provided at the provincial level by the provincial head of RMTO and at the city level by the Deputy Mayor in charge of
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transport and traffic or the head of the city transport and traffic department. Each national agency should clarify as soon as possible which department(s) and person(s) will be the foci for its activities under the project at the national, provincial, and city levels.

This information is summarized in the chart hereafter.



In the context of the black spot improvements' civil works, these arrangements will be concretized as follow:

- PMU/RMTO, in coordination with the project counterparts in pilot provinces and cities, will identify the black spots to be improved for each batch and prepare the Terms of Reference for the recruitment of appropriate consultants and contractors.
- PMU/RMTO will recruit consultants for the detailed design and engineering of the civil works to be performed for each batch.
- PMU/RMTO will recruit contractors for the provision of goods, equipment and for the performing of the civil works of each batch.

4. Project Environmental Category

On the above projects components, only the civil works component will have the potential for any negative social or environmental impacts and none are anticipated. Black spot improvements typically include small engineering works such as installation of guard rails, signage, rumble strips, construction of traffic islands/roundabouts and segregated traffic lanes, and minor road widening and improvements to accommodate pedestrian paths, site distances, and curvature.

Accordingly, the proposed project has been placed in “Category B” in accordance with World Bank Operational Policy (OP 4.01) on Environmental Assessment (January 1999).

5. Legal and Regulatory Framework for Environmental Assessment

Environmental Impact Assessment (EIA) in Iran was enabled by Note 82 of the Law for the Second State Economical, Social and Cultural Development Plan of 1994, amended by Note 105 of the Third Development Plan. The EIA Law was approved by the Environmental High Council (EHC) through Decree 138 of 12/04/1994. Detailed requirements were then defined in the Code of Practice of 23/12/1997. The EHC has defined seventeen project types subject to EIA, seven in Decree 138, with a further 10 added in 2000 (including new roads). EHC may also require an EIA for any other large project. Screening thresholds for the first seven classified types are defined in the 1997 Code of Practice, together with the requirements for the pattern of the assessment.

The competent body for EIA as defined in Decree 138 is the Iranian Department of Environment (DOE), under the authority of the Environmental High Council. The Council is composed of senior representatives of government ministries, senior academics and advisers to the Iranian government. The DOE also has offices in each province with at least one member of professional staff who contributes to EIA at the screening stage.

Apart from the EIA law , there exist a wide range of regulations regarding environmental protection including the Environmental Protection Act of 1974 and its executive by-law dated 1975, the Clean Water Act of 1982 emended in 1994 and the executive by-law on the prevention of water pollution (1994); the Air Pollution Abatement Act of 1995 and its executive by-law dated 1997; and the Game and Fish law of 1957 with subsequent amendments made in 1975 and 1996. The DOE has also issued a number of standards, including: (1) airborne pollution standards; (2) ambient air standards; (3) exhaust emission standards; (4) emission standards for factories and workshops; and (5) effluent standards.

In addition, the Government of the Islamic Republic of Iran has ratified a number of international conventions for Environmental Protection and natural resources conservation including: (1) the Convention on Wetlands of International Importance

(1971); (2) The International Convention on World Heritage Protection (1972); (3) the Convention on International Trade in Endangered Species of Wild Fauna and Flora (1973); (4) the Vienna Convention for the Protection of the Ozone Layer (1985); (5) the Montreal Protocol for the Protection of the Ozone Layer (1987); (6) the Basel Convention on the Control of Hazardous Wastes and their Disposal (1989); (7) the International Convention on Salvage (1989); (8) the UN Framework Convention on Climate Change (1992); (9) the Rio Convention on Biological Diversity (1992); and (10) the Paris Desertification Convention (1994).

6. Capacity building and institutional assessment for environmental capacities

The Department of Environment has established an EIA Bureau under a Director General. The Bureau has a limited staff in the national offices of Tehran, many of whom could benefit from more technical training. Significant implementation of EIA began in 1998; so far several projects have been subject to environmental assessment according to the Iranian legislation. A very small number of donor-funded projects have been undertaken in the country, and there been very little involvement of international organizations in commissioning and approving EIA studies.

In conjunction with similar work undertaken by the Mediterranean Environmental Technical Assistance Program (METAP), the World Bank has financed an assessment of the EIA system in Iran. Among the main findings of this assessment are: (1) a single category of EIA is defined for large projects, broadly equivalent to the World Bank's Category A, without provisions for less intensive studies equivalent to the World Bank's Category B; (2) evaluation of alternative designs to minimize environmental impacts are not evident; (3) provision for environmental management plans or implementation of monitoring is not clearly defined; and (4) public participation in the various EA stages is not spelled out.

Local consultancy firms have limited capacities to carry out full EIA studies of high quality. Most EIA studies are undertaken by individual consultants based in universities or other institutions with the assistance of international specialists. Several academic bodies are beginning to establish a framework capable of supporting more thorough EIA studies. The Iranian Society for Scientists and Engineers has established an EIA section and most Iranian universities now include EIA as a module in their environmental courses. Under the UNDP capacity strengthening project, around 850 persons from various governmental departments, NGOs and the private sector have been trained in EIA across the country. These activities can be expected to have created a fairly wide understanding of the basic principles of EIA. Further strengthening of the national EIA capacities will be achieved through the implementation of the RSP and other World Bank projects that are under implementation such as the Environmental Management Support Program.

For transportation projects developed by the Ministry of Transportation, there has so far been no clear involvement in the EIA process. Even if the EIA report is commissioned by the Ministry of Roads and Transportation (MoRT) according to the law, its review is done by the Department of Environment. Pending on approval of the DoE, the project's detailed engineering is either approved or modified until agreement with the DoE in terms of environmental requirements. Furthermore, the supervision of the environmental concerns included in the final project design is supervised by the DoE, with no clear intervention of the MoRT. Finally, this process only applies to large new road construction projects (generally equivalent to the World Bank's "A Category") according to the Iranian Law and thus there are no legal environmental assessment requirements for small scale civil works such as those planned under the Iran Road Safety Project.

Consequently, RMTO and the Ministry of Transportation have yet to develop capacities in Environmental Assessment and establish a coordination mechanism with the DOE, in order to be able to process "Category B" (such as the Iran RSP) projects to be in accordance with the World Bank's guidelines. During the implementation phase of the Iran Road Safety Project, RMTO's capacities will be strengthened to be able to address those issues.

7. Environmental Review of the Black Spots Improvements

I. Proposed physical improvements in rural and urban areas

The first batch of black spots locations has been identified in the pilot road corridors and cities. A consultancy study was completed in January 2005 to identify the improvements to be undertaken for the first batch of black spots and have identified the following general measures on the rural corridor:

- Speed humps, rumble stripes, markings, local speed limits, etc. in town/villages, bus and taxi stops and at schools (when near but outside town/village boundaries);
 - Warning signs, background markings, roadway reflectors or rumble lines, etc. in sharp curves;
 - Warning signs, rumble stripes, local speed limits, etc. at junctions in rural areas with poor visibility and inadequate sight conditions;
 - Warning signs, double continuous lines, roadway reflectors or rumble lines, where overtaking is prohibited due to sight restraints;
 - Roadway reflectors or rumble lines between paved shoulder and carriageway;
 - Crash barriers in sharp curves, along deepest falling slopes and to protect drivers from fixed objects that cannot be removed;
 - Guide posts along the edge of the roadway in rural areas;
 - Improvements of exists and entries from side roads and fuel stations etc.
 - Improvement of layout and design of bus stops and taxi stops;
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- Improvement of the visibility and warnings of toll stations through signs, markings and lighting.
- Other improvements of the road design such as roundabouts, slight widening of the road, etc.

A more detailed review of the black spots improvements for the first batch of civil works can be found in Annex 3. This type of black spots improvements will then be replicated in other parts of the pilot corridors and cities in the second and subsequent batches of the project.

No blackspot have been selected in urban areas for the first batch. Nevertheless the January 2005 consultancy report provides with information on the general measures that will be implemented during the second, third and fourth batches of civil works. These cover the followings: grade separation of traffic flows, provision of pedestrian bridges, stop lines and speed reducers, lane markings, speed humps, rumble stripes, road signs, replacement of parking lanes with kerbed areas for pedestrians, arrangement of existing roundabouts into speed-reducing roundabouts.

II. Environmental Review and eligibility criteria

A rapid environmental review including field visits was conducted to assess impacts that might arise from these proposed black spot improvements for the first batch. For each of the black spot improvements proposed for batch one, the consultant ensured that the proposed interventions will not have any major negative social or environmental impacts.

However since the detailed designs of the improvements are not yet identified, and that the following batches of improvement under the project have not been selected, the following ineligibility criteria and environmental requirements will be observed during implementation.

- Projects that potentially involve irreversible negative environmental impacts will not be approved for inclusion in the black spot program and would include:
 - Projects that would adversely affect natural habitats and critical biodiversity;
 - Projects that would have a negative impact on cultural heritage sites;
 - Project that would have an adverse impact on vulnerable ethnic communities.
- Projects with minor environmental impacts will require the implementation of an environmental management plan (EMP) according to the provisions of these guidelines.

An environmental audit will be prepared every year for the civil works executed during that year/batch. The audit will be based on environmental guidelines that will be incorporated into the project's Operations Manual.

B. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

8. Objectives, Structure and Focus of the EMP

The objectives of the EMP are to mitigate the adverse environmental impacts identified for each civil work sub-project within each batch of black spots improvement. The implementation of the EMP will improve the quality of the sub-projects and will ensure the participation of concerned stakeholders.

The EMP will consist of the following activities:

- Review of potential environmental and social impacts related to siting, construction and operation of the civil works;
- Implementation of mitigation measures to address potential impacts;
- Monitoring of mitigation measures identified.

9. Environmental Mitigation Plan

Whilst it is considered unlikely that either the direct or indirect impacts of the engineering works proposed for the first batch of the IRI Road Safety Project will result in environmental conditions any worse than the currently prevailing situation, any environmental impact that is not presented can be mitigated.

Mitigation measures identified during and/or following field review shall be properly implemented.

Table 1 below lists the environmental impacts and mitigations measures to be implemented in order to minimize or eliminate the first batch of civil works' negative environmental impacts during their detailed design, construction and operation phases (as appropriate).

Although this mitigation plan has been prepared, and will be implemented for the first batch of civil works, it will also be used as a guidance tool for the following batches/yearly program of civil works.

For each subsequent batch of civil works under the Road Safety project, the consultant hired for the detailed design and engineering of the civil works will be required to prepare an equivalent mitigation plan, based on the model used for the first batch.

The PMU/RMTO (through its environmental/safeguard member of the team) will be responsible to supervise the implementation of the Environmental Mitigation Plan.

Table 1: Main Environmental Impacts and Proposed Mitigation Measures for first batch of civil works
Potential Environmental Impacts and Proposed Mitigation Measures for second and third batch of civil works

Stage	Issue / Potential Impact	Mitigation measure(s)	Responsibility	Supervision	Cost
Design	Global potential impacts on the physical environment during construction: air quality, hydrology, waste, soils, noise	Consider the impact of the construction and of the final product on the physical environment for the design of the civil works. Update the mitigation plan for the civil works (for second and third batches)	Design consultant	PMU/RMTO	World Bank Loan o RMTO (first batch only)
	Impact on air quality: emissions of dust and other pollutants	Bid and contract documents will include requirements to ensure: <ul style="list-style-type: none"> - Adequate watering for dust control - Prohibition of open burning - Site and stockpiles of materials are properly secured - Proper un-loading / storage of construction materials - On-site mixing of materials in enclosed or shielded areas - Hauling routes free of dust and regularly cleaned - Authorization of Supervision Engineer to discontinue construction under unfavorable conditions If circumstances suggest it is necessary, provision should be made for air quality monitoring in accordance with the requirements of the Air Quality Monitoring Plan (see next section)	Design consultant and PMU/RMTO	(No objection of the World Bank on bid and contract documents)	World Bank Loan o RMTO (first batch only)

Stage	Issue / Potential Impact	Mitigation measure(s)	Responsibility	Supervision	Cost
Design	Impact on hydrology: degradation of the surface water quality	<p>Contract documents will specify the use of good engineering practice during construction, including adequate supervision, to avoid water quality impacts:</p> <ul style="list-style-type: none"> - Minimal water usage in construction area - Minimal soil exposure time during construction - Minimal chemical usage (lubricants, solvents, petroleum products) <p>If circumstances suggest it is necessary, provision should be made for water quality monitoring in accordance with the requirements of the Water Quality Monitoring Plan (see next section)</p>	Design consultant and PMU/RMTO	(No objection of the World Bank on bid and contract documents)	World Bank Loan o RMTO (first batch only)
	Impact on hydrology: alteration of surface drainage	<p>Bid an contracts documents will include requirements to ensure:</p> <ul style="list-style-type: none"> - Adoption of appropriate hydrological impacts in the mitigation plan - Installation of adequately sized drainage channels - Stabilization of slopes to avoid erosion 	Design consultant and PMU/RMTO	(No objection of the World Bank on bid and contract documents)	World Bank Loan o RMTO (first batch only)
	Waste generation and disposal (solid / oily / hazardous)	<p>Bids and contract documents will include requirements to ensure:</p> <ul style="list-style-type: none"> - Proper transportation and disposal of solid and hazardous waste - Proper handling and disposal / recycling of oily waste 	Design consultant and PMU/RMTO	(No objection of the World Bank on bid and contract documents)	World Bank Loan o RMTO (first batch only)

Stage	Issue / Potential Impact	Mitigation measure(s)	Responsibility	Supervision	Cost
Design	Impact on soils: increased soil erosion	<p>Bid and contract documents will include requirements to ensure:</p> <ul style="list-style-type: none"> - Angle of side slopes to be limited to what is appropriate to topographic conditions - Use of less erode able materials - Lined down-drains to prevent erosion - Stabilization of embankment slopes by revegetation - Trenching where necessary to ensure successful revegetation - Seeding with rapid growing seed mix 	Design consultant and PMU/RMTO	(No objection of the World Bank on bid and contract documents)	World Bank Loan o RMTO (first batch only)
	Noise	<p>Bid and contract documents will include requirements to ensure:</p> <ul style="list-style-type: none"> - Use of equipment with adequate noise suppression - Equipment be placed as far away as practicable from sensitive land users - If circumstances require it, specific time constraints on activities be established and specified - Authorization of Supervising Engineer to discontinue construction under unfavorable conditions <p>If circumstances suggest it is necessary, provision should be made for noise monitoring in accordance with the requirements of the Environmental Noise Monitoring Plan (see next section)</p>	Design consultant and PMU/RMTO	(No objection of the World Bank on bid and contract documents)	World Bank Loan o RMTO (first batch only)
	Other impacts: potential damage of unknown valuable historic, religious, cultural, archeological and historical resources	Preparation of chance-find procedure for the protection of Archeological and Historical sites	PMU/RMTO with appropriate support of local expert	PMU/RMTO with appropriate support of local expert	

Stage	Issue / Potential Impact	Mitigation measure(s)	Responsibility	Supervision	Cost
	Other impacts : loss of natural areas, important habitats, biodiversity	Application of non-eligibility screening procedure	Design Consultant	PMU/RMTO	
Design	Potential socio-economic disruption during the works: - Demand for local infrastructure increases beyond local capacity (congestion) - Disruption of traditional lifestyles - Disruption of other services	Include design considerations for avoiding the creation of congested and unsafe road conditions at intersections and in villages or cities - Bypass (es) - Ensure access to homes / businesses / other key services	Design Consultants	PMU/RMTO	World Bank Loan o RMTO (first batch only)
	Public participation	Design-stage consultation (to anticipate, plan and ensure minimal disruptions during the works) with: - Public and private stakeholders - Neighboring communities	Design Consultants and PMU/RMTO (through provincial and cities' counterparts)	PMU/RMTO	RMTO
Construction	Impact on air quality: emissions of dust and other pollutants	Implement and supervise the contract according to design considerations on air quality.	Contractor and Supervision Consultant	PMU/RMTO	Represents good engineering practice so should be part of estimated project costs
	Impact on hydrology: degradation of the surface water quality	Implement and supervise the contract according to design considerations on hydrology.	Contractor and Supervision Consultant	PMU/RMTO	Represents good engineering practice so should be part of estimated project costs

Stage	Issue / Potential Impact	Mitigation measure(s)	Responsibility	Supervision	Cost
	Impact on hydrology: alteration of surface drainage	Implement and supervise the contract according to design considerations on hydrology.	Contractor and Supervision Consultant	PMU/RMTO	Represents good engineering practice so should be part of estimated project costs
Construction	Waste generation and disposal (solid / oily / hazardous)	Implement and supervise the contract according to design considerations on waste generation and disposal.	Contractor and Supervision Consultant	PMU/RMTO	Represents good engineering practice so should be part of estimated project costs
	Impact on soils: increased soil erosion	Implement and supervise the contract according to design considerations on soil erosion.	Contractor and Supervision Consultant	PMU/RMTO	Represents good engineering practice so should be part of estimated project costs
	Noise	Implement and supervise the contract according to design considerations on noise.	Contractor and Supervision Consultant	PMU/RMTO	Represents good engineering practice so should be part of estimated project costs
	Other impacts: damage of valuable historic, religious, cultural, archeological and historical resources	<p>Training of the construction crew and supervisors to spot potential archeological/historical finds.</p> <p>Application of chance-find procedure for the protection of Archeological and Historical sites.</p> <p>Implement and supervise the contract in accordance with design specifications for “chance finds”.</p>	PMU/RMTO and Supervision Consultant	PMU/RMTO with appropriate support of local expert	

Stage	Issue / Potential Impact	Mitigation measure(s)	Responsibility	Supervision	Cost
	Health and Safety	<p>Training of the construction crew and supervisors on health and safety guidelines.</p> <p>Application of the health and safety guidelines.</p> <p>Implement and supervise the contract in accordance with design specifications for health and safety.</p>	PMU/RMTO, Contractor, and Supervision Consultant	PMU/RMTO, and Supervision Consultant	Represents good engineering practice so should be part of estimated project costs
	<p>Socio-economic disruption:</p> <ul style="list-style-type: none"> - demand for local infrastructure increases beyond local capacity (congestion) - disruption of traditional lifestyles - disruption of other services 	<p>Construction and maintenance of bypass (es)</p> <p>Conduction of as much work as possible during low traffic periods to ensure access to homes / businesses / other key services</p>	Contractor	Supervision Consultant	Represents good engineering practice so should be part of estimated project costs
Construction	Public participation	Establishment of a public “hotline” for concerns and comments about the construction and bypass (est.) issues	Contractor / Supervision Consultant	PMU/RMTO	RMTO

10. Environmental Monitoring Plan

To ensure compliance with the Environmental Mitigation Plan, the consultant team hired for the detailed engineering, design and supervision of the civil works should include an environmental impact specialist for the following monitoring related tasks:

- Checking the overall performance of contractors against the enforceable contract provisions related to the environmental aspects of the engineering works;
- Carrying out any ongoing consultation with groups potentially affected by the engineering works;
- Ensuring that the findings of those consultations are recorded, incorporated into relevant documents, and taken into account in subsequent implementation;
- Engaging any additional environmental assistance (especially in the area of environmental quality measurements), for which an appropriate budget needs to be provided; and
- Disclosing the results of that testing to potentially affected groups and other relevant stakeholders (including PMU);

If circumstances suggest it is necessary to carry out environmental quality measurements, the following monitoring plans in Table 2, 3 and 4 give some details of the requirements.

Table 2: Air Quality Monitoring Plan

(Results to be compared to the Iranian Ambient Air Standards – excerpted from World Health Organization)

Parameters	Frequency	Approximate Cost (USD)	Responsibility
Total Suspended particles	If required at all, not less than once during the construction period		Contractor to the supervision consultant, who should report results to PMU/RMTO, potentially affected groups and other stakeholders

Table 3: Water Quality Monitoring Plan

(Results to be compared with the Iranian Effluent Standards based on Article 3 and 5 of the Regulating and Preventing Water Pollution Law)

Parameters	Frequency	Approximate Cost (USD)	Responsibility
Total Suspended Substance TSS, Chemical Oxygen Demand COD, Dissolved Oxygen Demand DO, Fat Oil	If required at all, not less than once during the construction period		Contractor to the supervision consultant, who should report results to PMU/RMTO, potentially affected groups and other stakeholders

Table 4: Environmental Noise Monitoring Plan

(Results to be compared with the Iranian Airborne Noise Pollution Standards)

Parameters	Frequency	Approximate Cost (USD)	Responsibility
Equivalent Day / Night sound level averaged over a period of 30 minutes	If required at all, not less than once during the construction period		Contractor to the supervision consultant, who should report results to PMU/RMTO, potentially affected groups and other stakeholders

As with other aspects of the EMP, although the monitoring plans will initially apply to the first batch of civil work, the provisions will equally apply to any significant engineering work in the subsequent batches.

The PMU/RMTO will be responsible for supervising the implementation of the monitoring plan.

11. Institutional arrangements

A summary of the main institutional arrangements and responsibilities under this Management Plan (including those described in the previous sections) Plan can be found in Table 5 below, and the environmental management procedure is in Annex 4.

Table 5: Main responsibilities under the Road Safety project

Name	Responsibilities	Remarks
PMU	<ul style="list-style-type: none"> - With technical support of hired environmental specialist is responsible for overall environmental management. - Ensures that environmental requirements and mitigation are included in design and contract documents. 	1 half time dedicated project environmental specialist
Environmental Specialist	Provides technical support to PMU for overall environmental management	The capacities of the environmental consultant have been reviewed by World Bank staff
Detailed engineering and design consultant	<ul style="list-style-type: none"> - Incorporate environmental considerations / requirements for minimization of negative impacts into the civil works design. - Prepare / update mitigation and monitoring plan for each batch 	- Supervision consultant needs to be provided with clear ToR of environmental assessment duty
Supervision consultant	<ul style="list-style-type: none"> - Participate to environmental/health and safety training organized by PMU - Supervise the day-to-day environmental compliance of contractors on-site and implement monitoring plan - Record the implementation and propose any additional mitigation/monitoring measure if necessary - Prepare a report on the environmental compliance for each batch of civil works, which will be submitted to the PMU - Engage any additional environmental assistance 	<ul style="list-style-type: none"> - Supervision consultant needs to be provided with clear ToR of environmental supervision duty - The staff in charge should have knowledge related to environmental management

Name	Responsibilities	Remarks
Contractor	<ul style="list-style-type: none"> - Incorporate environmental requirement in their bids and implement all mitigation outlined - Participate in training organized by PMU - Record environmental implementation in their progress report. 	Contractor's site foreman and workers need to be trained on project environmental management before construction.

12. Capacity Development and Training

In view of the limited environmental capacities within RMTO, the PMU has recruited an environmental consultant, who will be in charge of the global support of the PMU for environmental management under the IRI Road Safety Project. This global support will comprise the following duties:

- Promoting an understanding of the environmental and social requirements and guidelines of the sub-projects among the city and province counterparts, NGOs, contractors and consultants;
- Ensuring that the screening checklists are used effectively and regularly;
- Conducting site-specific review to examine the current environmental and social conditions and assess the related work of the supervision consultant of the sub-projects;
- Review the mitigation measures for construction and operation phases of the sub-projects proposed in the EMP by the detailed engineering and design consultant for each batch of civil work;
- Supervise the implementation of the monitoring plan.

In addition, a training program focused on environmental (and social) safeguard concerns should be part of the broader implementation of the project and should be included in the project's overall training schedule.

The environmental specialist of the PMU will train project detailed design and engineering supervision consultant (if needed), and the city and provincial counterparts.

Table 3 below is a proposition for environmental training program.

Table 3: Institutional Strengthening and Training for Implementation

Group	Content	Format	Input
Project detailed design and engineering, supervision consultants	The importance of impact identification and mitigation for the design of sub-projects, the implementation and monitoring of Environmental Mitigation Plans	Half day seminars	0.5 days
City and provincial counterparts	Environmental awareness, the importance of environmental issues in the approval/review of sub-project design and implementation of environmental mitigation and monitoring plans	Half day seminars	0.5 days

Other topics where training can be considered include environmental processes, methods and equipment, policies, programs, etc.

13. Cost estimates

There are three potential types of environmental costs associated with the implementation of the IRI Road Safety Project. They are:

- Mitigation costs;
- Monitoring costs; and
- Capacity development and training costs.

As outlined in section 10 of this Environmental Management Plan, the mitigation measures related to potential direct environmental impacts of the Iran RSP all represent good engineering design practice. Hence the mitigation costs are part of the estimated project costs. The three mitigation measures related to potential indirect environmental impacts associated with materials supply are all negligible.

For monitoring measures, the supervision consultant (which will be recruited according to the circumstance and volume of the project) will have to have them undertaken, as part of their duties and in accordance with the monitoring plan prepared by the detailed design consultants, and reviewed by the PMU environmental specialist. The cost of these measures shall thus be already included in the costs of the supervision consultant duties. In any case, the costs of such monitoring measures are expected to be minimal compared to other project costs.

All the probable cost of training will be estimated and paid by PMU.

14. Public consultation and disclosure

As described in the Mitigation Plan in section 9, and in accordance with the World Bank's OP 4.01 on Environmental Assessment, public consultation shall be carried out at each stage of development of sub-projects with sub-project-affected groups and local NGOs about the project's environmental and social aspects and in order to take their view into account.

In addition to the consultation process, and in accordance with the World Bank's Public Consultation and Information Disclosure Policy OP 17.50, RMTO shall make this EMP guidelines and each updated Mitigation Plan, available locally in Farsi, before the start of the civil works.

15. Integration of the EMP within the Project

A primary purpose of the Environmental management Plan is to integrate environmental considerations into all aspects of the project design and implementation. It is under the responsibility of the PMU/RMTO to ensure that this is done.

ANNEXES

ANNEX 1: COMPONENTS OF IRI ROAD SAFETY PROJECT

<i>Project components</i>	<i>Provincial and national coverage</i>
<i>Safer People (Interventions)</i>	
1. General deterrence Police enforcement targeting high-risk safety behaviors	Upgraded and evaluated in pilot provinces and national guidelines prepared and disseminated
2. Publicity and awareness campaigns supporting Police enforcement of high-risk safety behaviors	Upgraded and evaluated in pilot provinces and national guidelines prepared and disseminated
3. School-based road safety education for children	Upgraded and evaluated in pilot provinces and national guidelines prepared and disseminated
4. Driver training, testing and licensing practices	Reviewed and upgraded at national level
5. Regulations and safety procedures for managing driver fatigue, Health & driving background	Reviewed and upgraded at national level
6. Emergency medical services	Upgraded and evaluated in pilot provinces and national guidelines prepared and disseminated.
<i>Safer Vehicle (Interventions)</i>	
1. Vehicle testing practices	Reviewed and upgraded at national level
2. Commercial vehicle safety regulations and procedures for managing overloading, dangerous & oversized goods	Reviewed and upgraded at national level
<i>Safer Roads (Interventions)</i>	
1. Safe infrastructure	Upgraded and evaluated in pilot provinces (safety audits, black spots, mass action and innovative programs) and national guidelines prepared and disseminated.
<i>Safer Systems (Results focus)</i>	
1. Monitoring and evaluation systems	Upgraded and evaluated in pilot provinces and national guidelines prepared and disseminated.
2. National road crash data and analysis system	Upgraded nationwide
<i>More Effective Institutional Framework (Implementation arrangements)</i>	
1. Road safety legislation	Reviewed and upgraded at national level
2. Road safety funding processes	Reviewed and upgraded in pilot provinces and at national level
3. Promotion of National Road Safety Action Plan	Upgraded and evaluated at national level
4. Project management support	Provided for all above components

ANNEX 2: PILOT PROVINCES AND TARGETED HIGH-RISK CORRIDORS AND CITY AREAS

Province	Targeted High-Risk Corridors		Targeted City Areas
	Name	Length (km)	
Khorasan	Mashad-Quchan	120	Mashad
	Quchan-Bojnord	257	
Gilan	Rasht-Qazvin	175	Rasht
Qazvin	Qazvin-Tehran	139	—
Tehran	Tehran-Qom	148	Tehran
Qom	Qom-Salafchegun	30	—
Esfahan	Salafchegun- Esfahan	241	Esfahan
Fars		—	Shiraz

Notes:

- Total length of corridors = 1110 km
- Tehran province only consists of Azadegan Ring way which connects Karaj & Qom Express ways
- Tehran city only consists of South West part of Tehran city

ANNEX 3: BLACKSPOTS LOCATIONS AND REMOVAL MEASURES FOR THE FIRST BATCH OF CIVIL WORKS IN RURAL AND URBAN CORRIDORS

Removal of black spots on the rural corridors

It was originally envisaged that approx. 16 black spots should be identified for removal during the first year program. (The process to select the black spots for the first year program is briefly described below).

The provincial TTO's and road offices of MORT had prepared long lists of potential black spots for each of their province. Additional black spots were presented during the visit on the corridor from Rasht- Qazvin-Tehran-Qom-Esfahan. More than 90 black spots were briefly inspected.

A short list of the potential black spots was prepared according the following criteria:

- Is accident data available for the suggested black spot?
- Did the problem seem safety related or more a traffic flow problem?
- Was it possible to identify relevant measure(s)?
- Was it possible to identify measures with no or little environmental or social impact, e.g. no relocation of people or removal of buildings?
- Did the measure seem relevant for the first year program?

Based on this assessment, a short list with 47 potential black spots was identified. Then, based on a combination of number of accidents per year (density of accident and casualties) and the frequency of accidents and casualties, ***20 black spots were identified for removal during the first year program. During a field visit by the Bank mission and the RMTO, it was decided to incorporate 2 more black spots on the old Qazvin-Karaj road in the villages of Sharif Abad and Ziaran.*** These black spots were on the long-list of 90 black spots mentioned above. And their location and treatment policy of each of them has been described in annex 5.

- Gilan Province:
 - Rasht-Qazvin road, Gilan University
 - Rasht-Qazvin road, Oskoolak Curve
 - Rasht-Qazvin road, Joovin Curve
 - Rasht-Qazvin road, Inspection Situ. Lowshan
 - Qazvin Province:
 - Rasht-Qazvin road, Zamani Curve
 - Rasht-Qazvin road, Ablarzan Curve
 - Qazvin-Karaj Freeway, Sh. Rajae Power Station
 - Qazvin-Karaj Freeway, Fuel Station South Lane
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- Qazvin-Karaj old road, Bidestan
- Qazvin-Karaj old road, Sharif Abad
- Qazvin-Karaj old road, Ziaran
- Tehran Province:
 - Karaj-Tehran Freeway, Garmdareh
 - Karaj-Tehran Freeway, Peikan
 - Karaj-Tehran Freeway, Chitgar
 - Tehran-Qom old road, Salmandan T-intersection
 - Tehran-Qom old road, Tahpeh Shahrday
 - Tehran-Qom old road, Gardaneh Hasan Abad
- Qom Province:
 - Tehran-Qom Freeway, Qom Toll Plaza (West part)
 - Qom-Salalchegan road, Jondab
 - Qom-Salalchegan road, Thermal Power Station
- Markazi (central) Province:
 - Salalchegan-Esfahan road, Access to Mineral Water Factory (South of Doudehak)
- Esfahan Province:
 - Salalchegan-Esfahan road, Ghoroghchi Gardaneh

Additionally, five other black spots were found where similar concepts may be used as identified for the above black spots:

- Tehran-Qom Freeway, Hasan Abad, Tehran Province
- Qazvin-Karaj Freeway, Fuel Station North Lane, Qazvin Province
- Qazvin-Karaj Freeway, Toll Station 2, Qazvin Province
- Qazvin-Karaj Freeway, Toll Station 1, Qazvin Province
- Qazvin-Karaj Freeway, Toll Station, Tehran Province

The mission made a field trip during February 17-18, 2005 with RMTO staff to the identified accident black spots in the following provinces: Qazvin, Tehran and Qom Provinces. The mission was in agreement with the proposed black spots and discussed in details the required physical improvements to be implemented at these locations with staff from the RMTO headquarters. And the respective Provincial RMTO offices.

Proposed improvements to the pilot corridors

COWI consultants reviewed the general safety improvements works required to the pilot corridors from Rasht to Esfahan, and it was found that to reduce the effects of dangerous/careless traffic behavior it is particularly important to:

- Regulate speed inside urban areas;
- Provide additional safety features in sharp curves and at steep slopes;
- Improve markings to guide road users in all conditions.

More specifically the following measures were recommended by COWI:

- Rasht-Qazvin: the following general measures should be considered
 - Speed humps, rumble stripes, markings, local speed limits, etc. in town/villages, bus and taxi stops and at schools (when near but outside town/village boundaries);
 - Warnings signs, background markings, roadway reflectors or rumble lines, etc. in sharp curves (< 800 m radius at 80 km/h speed limit);
 - Warning signs, rumble stripes, local speed limits, etc. at junctions in rural areas with poor visibility and inadequate sight conditions;
 - Warning signs, double continuous lines, roadway reflectors or rumble lines, where overtaking is prohibited due to sight restraints;
 - Roadway reflectors or rumble lines between paved shoulder and carriageway ;
 - Crash barriers in sharp curves (< 400 m radius at 80 km/h speed limit) and along deepest falling slopes (> 3 m deep at 80 km/h speed limit), e.g. through the mountainous areas
 - Possibly guide posts along edge of roadway in rural areas.
 - These measures are to be supplemented with appropriate signs and road markings to guide and warn road users in junctions and on road sections. Especially the present 2+1 markings should be considered carefully to provide 2 lanes uphill and to prohibit overtaking from the 1 lane. The direction with 2 lanes should be changed by say every 2 km.
 - Qazvin-Tehran: on the **freeway** the following general measures should be considered
 - Enforce speed and prohibition of parking and stopping;
 - Improve visibility and warning of toll stations as suggested under black spots
 - Roadway reflectors or rumble lines between paved shoulder and carriageway
 - Crash barriers in sharp curves (< 400 m radius at 80 km/h speed limit) and along falling slopes (steeper than 1:3 slope);
-

- crash barriers to protect drivers from fixed objects that can not be removed, e.g. culvert walls and bridges endings;
 - Improve exits and entries from side roads and fuel stations etc.;
 - Improve layout and design of bus stops and taxi stops;
 - Possibly guide posts along edge of roadway
 - Qazvin-Tehran: on the old highway the following general measures should be considered
 - Speed humps, rumble stripes, markings, local speed limits, etc. in town/villages, bus and taxi stops and at schools (when near but outside town/village boundaries);
 - Warning signs, rumble stripes, local speed limits, etc. at junctions in rural areas with poor visibility and inadequate sight conditions;
 - Roadway reflectors or rumble lines between paved shoulder and carriageway;
 - Crash barriers at fixed objects and divide instead of the concrete blocks.
 - These measures are to be supplemented with appropriate signs and road markings to guide and warn road users in junctions and on road sections, e.g. give-way signs and markings, and centre and edge lines.
 - Tehran-Qom: on the **freeway** the following general measures should be considered
 - Enforce speed and prohibition of parking and stopping;
 - Improve visibility and warning of toll stations as suggested under black spots;
 - Roadway reflectors or rumble lines between paved shoulder and carriageway;
 - Crash barriers in sharp curves (< 400 m radius at 80 km/h speed limit) and along falling slopes (steeper than 1:3 slope);
 - Crash barriers to protect drivers from fixed objects that can not be removed, e.g. culvert walls and bridges endings;
 - Improve exits and entries from side roads and fuel stations etc.;
 - Improve layout and design of bus stops and taxi stops;
 - Possibly guide posts along edge of roadway.
 - Tehran-Qom: on the old highway the following general measures should be considered
 - Speed humps, rumble stripes, markings, local speed limits, etc. in town/villages, bus and taxi stops and at schools (when near but outside town/village boundaries);
 - Warning signs, rumble stripes, local speed limits, etc. at junctions in rural areas with poor visibility and inadequate sight conditions;
-

- Roadway reflectors or rumble lines between paved shoulder and carriageway;
 - Crash barriers at fixed objects and as dividers instead of New Jersey type concrete blocks.
 - These measures are to be supplemented with appropriate signs and road markings to guide and warn road users in junctions and on road sections, e.g. give-way signs and markings and centre and edge lines.
- Qom-Esfahan: the following general measures should be considered
 - Speed humps, rumble stripes, markings, local speed limits, etc. in town/villages, bus and taxi stops and at schools (when near but outside town/village boundaries);
 - Warnings signs, background markings, roadway reflectors or rumble lines, etc. in sharp curves (< 800 m radius at 80 km/h speed limit);
 - Warning signs, rumble stripes, local speed limits, etc. at junctions in rural areas with poor visibility and inadequate sight conditions;
 - Roadway reflectors or rumble lines between paved shoulder and carriageway;
 - Crash barriers in sharp curves (< 400 m radius at 80 km/h speed limit) and along deepest falling slopes (> 3 m deep at 80 km/h speed limit), e.g. through the mountainous areas;
 - Possibly guide posts along edge of roadway in rural areas.
 - These measures are to be supplemented with appropriate signs and road markings to guide and warn road users in junctions and on road sections, e.g. give-way signs and markings and centre and edge lines.

Removal of black spots and improvement of corridors in urban areas

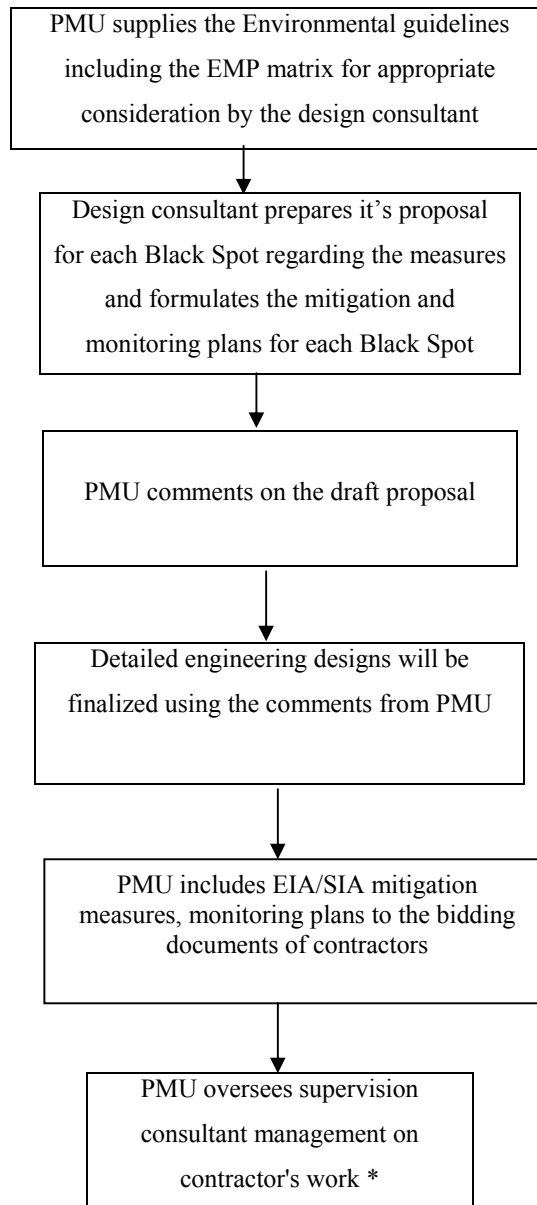
The mission discussed possible accident black spot sites in some of the pilot cities (e.g. Rasht, Tehran and Esfahan), and it was agreed with PMU that the preparation work for implementing a physical road safety improvement program in these cities during the first year of project implementation (i.e. first batch of civil works) was not sufficiently complete. Therefore, it is recommended that during the first year of the project, extensive technical assistance would be provided to the five pilot cities in order to strengthen their road safety engineering technical capacity, and start the preparation of the accident black spots and corridor work programs to be implemented during the last three years of the project period (i.e. for the second and third batches of civil works).

However, during site visits by the Bank (to Tehran only) and COWI (four of the five cities), it was found that most of the urgent road safety improvement works for these cities consist mainly of installation of pedestrian crossing (especially outside large schools), traffic calming measures (e.g., road humps), provision of traffic signs and road markings. These improvement measures are low-cost road safety schemes, and it could be possible that the cities would design (with the assistance by the international technical

experts at PMU) and implement a large number of very useful road safety engineering measures from their own budgets for the first year of implementation.



ANNEX 4: FLOW CHART OF THE ENVIRONMENTAL MANAGEMENT PROCEDURE



**for the first batch the design consultant will undertake the supervision of civil works*

ANNEX 5 : DETAILS OF BLACK SPOTS FOR THE FIRST BATCH

ITEM	PROVINCE	BLACK SPOT	TREATMENT POLICY
1	Gilan	Joovin curve	Build extra line near 300 meters & separate fast line in the village
2	Gilan	Oskoolak curve	Correct super elevation & resurfacing 500m
3	Gilan	Zamani curve	Extra line with wide = 3/65 & length = 600m Resurfacing & super elevation
4	Gazvin	Ablarzan	Cut hill , extra line & omit S curves
5	Gazvin	Sh.Rajae power station	Complete acceleration & deceleration for enter & exit access road
6	Gazvin	Fuel station	Complete acceleration & deceleration for enter & exit access road
7	Gazvin	Bidestan	Correct intersection & build U-turn
8	Tehran	Garmdareh	Correct ramps & loops
9	Tehran	Peikan	Separate acceleration & deceleration for enter & exit parking
10	Tehran	Chitgar	Correct ramps & loops
11	Tehran	Salmandan	Correct Section & Build ramps
12	Tehran	Tappeh shahrdary	Separate line & build roundabout & extra ramps
13	Tehran	Gardaneh Hasan Abad	Cut Hill , extra line & omit S curve
14	Gom	Toll plaza	Bank world Design
15	Gom	Jondab	Complete U – turn
16	Gom	Thermal power station	Complete U – turn
17	Markazi	Access to mineral water	Change the layout of the junction
18	Esfahan	Choroghchi	Extra line – correct design & resurfacing
19	Gom	Neyzar Junction	Separate old road Gom & neyzar road
20	Tehran	Freeway hasan abad	Build ramp & acceleration line
21	Tehran	Ziaran	Build roundabout
22	Tehran	Sharif abad	Complete ramps & loops & separate lines