

NEW CONCESSION ORGANIZATION IN TOLL HIGHWAYS IN MEXICO

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ABSTRACT

Traditionally, toll highways organization has been assumed by a unique operator that played all the possible roles and only reported to the Administration. This THC (Toll Highway Concessionary) was paid by highway tolls.

A change was necessary, at least in Mexico Motorways, basically by two different reasons. The principal target for concessionary is economical and improvements in service are a way to get it. The highest traffic attraction will depend on quality of possible alternative routes. Mexican authorities looking for a way to change and to prioritize service and safety decided to change these roles. By other hand, it's a fact in Mexican Motorways the high toll payment evasion, sometimes, even by the own concessionary.

In any toll highway we can separate five different actions to do:

The new idea, developed by Banobras in order to apply to its highways network, is to divide these functions in different individual agents. Although some of these could be joined to get better results. To divide and to independence the different tasks and to pay depending on the real administration objectives get a better controls and checking.

External audits: AE agent

Technical direction and control: AAs agent

Operation: O agent

Maintenance: M agent

Rehabilitation: R agent

The first contract that is going to rule this new conception has begun recently. In September 2011 the new scheme will have been working for at least 6-9 months and the lessons learned will be exhibited.

Another difference with the traditional method is that any agent will be paid using several satisfaction or performance indicators looking for a more convenient and efficient way to improve quality and drivers satisfaction. These indicators have been defined for any agent, trying to get the best results, some examples are:

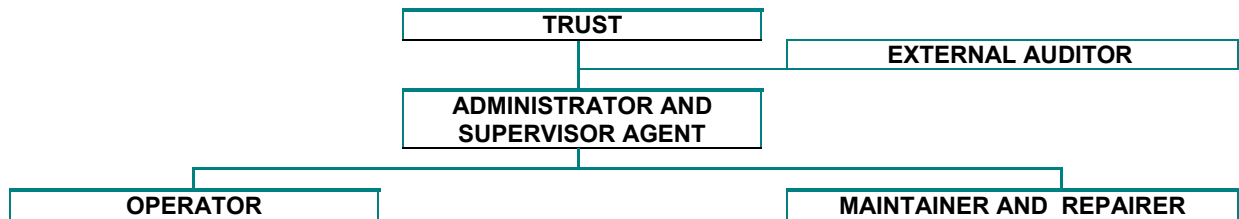
- IRI international roughness index (IRI)
- First aids time in case of accident
- Repairing time

- ...

Different models have been studied and compared depending on their advantages or disadvantages in order to get the best way to obtain the objectives and to make attractive the project for the different interested agents.

Following these schemes, Administration Agent will be responsible of economic and technical audits of the Operation, Maintenance and Rehabilitation Agents and the pays will be determined. AA will be responsible of works schedules, studies and design projects supervision. AA will be controlled by AE that will check his work periodically. AA will be responsible for the transitions between different operators or agents when concession ends.

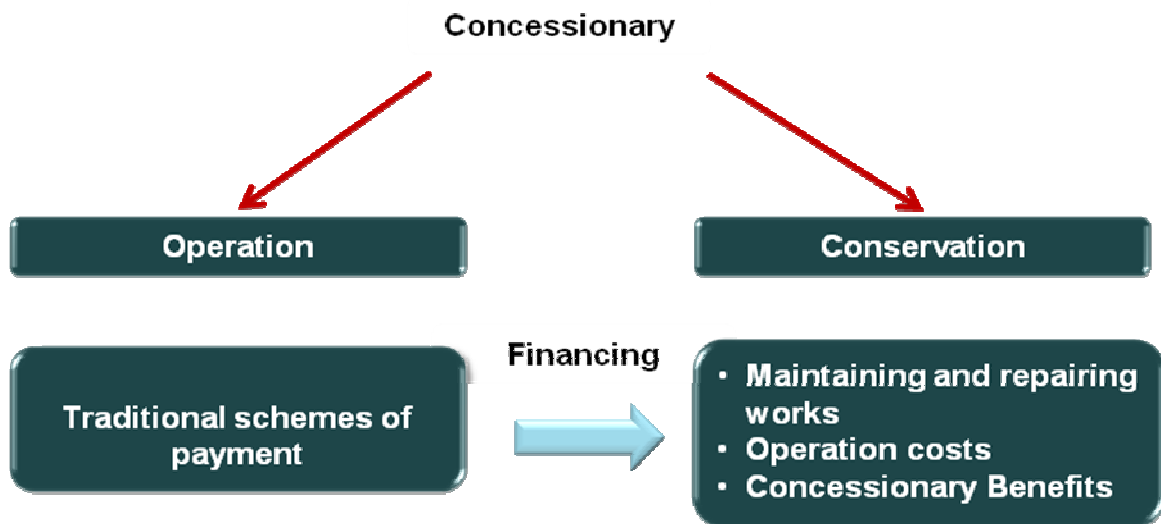
Operation, Maintenance and Rehabilitation Agents functions and relationships among all the agents have been defined according to Mexican laws, but the model could be exported to other countries and conveniently adapted be applied. The model finally selected have been:



First problems and results of his performance will be analyzed and even a visit to the concessions could be done during the congress.

1. TRADITIONAL TOLL HIGHWAYS ORGANIZATION

Traditional toll highways organization has been the next one:



The concessionary assumes the risk and it seeks for its financial benefit. The highway use is established by the supply-demand law. As users appreciate highway benefits (time, safety, comfort, ...) so the traffic demand will be higher. The concessionary will try to get the highest traffic and benefit with the lowest infrastructure investment. The highest traffic attraction will depend on quality of possible alternative routes and in some cases, when this quality is relatively poor, the incentive to achieve a high standard highway will not be paramount.

That is the reason why getting to free the logical target of the concessionary which is looking for benefits from standards and user services of the highway offers several advantages:

- Achieving high-standard performances in highways
- To assign resources in an efficient way for highway conservation and operation in better conditions.
- To stimulate the private financing participation in road development.

- To modernize the management of the road network, in order to obtain a more efficient operation and to increase the quality services that are offered.

Some disadvantages could also be considered:

- More participants are needed and relationship between them will be more complex.
- The system will be more expensive, but it could be compensated by a higher toll collection.

In Mexico the actual model for FONADIN highways differs from this. The trust (BANOBRAS) pays a fixed amount to the concessionary for normal maintenance and operation and the concessionary must give the toll-collection to BANOBRAS. Very few controls are made and it's a fact that many drivers avoid toll payment and some standards are poor. This is another reason for changing.

2. NEW TOLL HIGHWAYS ORGANIZATION

The first question we have to ask ourselves is what different tasks must be developed in highway management and how we can develop them. The answer that we have found to this is that the habitual tasks are:

- Operation: including toll collection, emergencies, user attention, etc.
- Maintenance: including ordinary maintenance and repairing, etc.
- Rehabilitation: including extraordinary repairing and maintaining, etc.
- Technical direction and control: including design and planning, vigilance, etc.
- Economical control and audits: including toll audits, investment planning, etc.

The second question is to define who must perform these tasks and establish the relationship between different agents. So, five different names have been defined for every agent acting on the highways.

- Operator (O) for operation
- Maintainer (M) for maintenance
- Repairer (R) for rehabilitation
- Administrator and Supervisor Agent (AAS, agente administrador y supervisor in Spanish version) for technical direction and control
- External Auditor (AE, auditor externo in Spanish version) for audits.

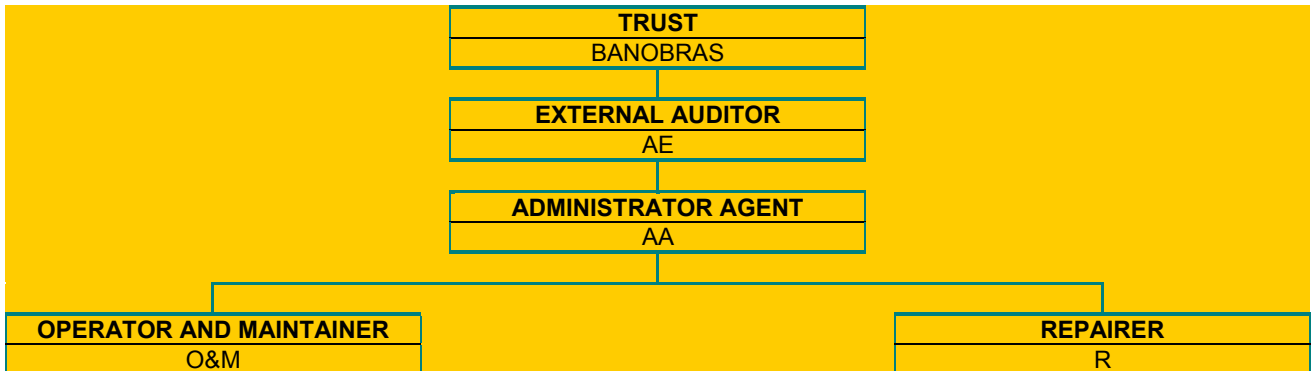
Traditionally the four first tasks were assumed by a concessionary who was usually an operator connected to a construction company with a technical service. The concessionary, often, subcontracted maintenance and repairing work and his own technical staff gave technical direction and control. So, better targets were not always considered, because every agent worked depending on a concessionary.

2.1. Different models

The main decision was to change the model to an *output and performance based contract* and to apply this philosophy to principal agents in contract. Another important decision was that every task had to be done by his specialist and so each of them would act independently.

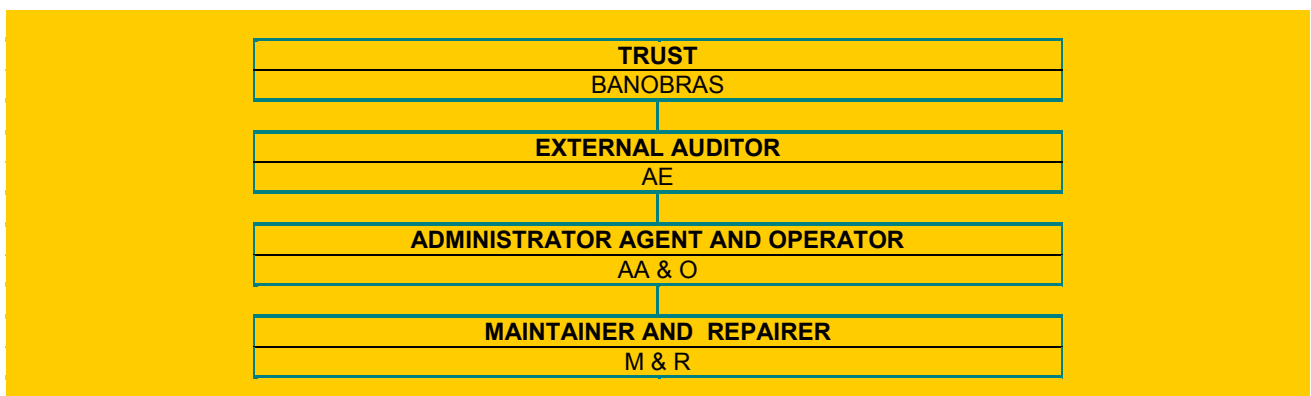
Based in the way we can distribute the different agents we can obtain different models.

2.1.1. Model 1



- Advantages
 - Two control levels are obtained: AE and AA.
 - Operation work of traffic counting and toll collection is under double supervision AE and AA.
 - Repairing work supervision by AA guarantees their quality.
 - Studies and construction designs are made by AA independently from M or R avoiding their interest.
 - Financial costs are minimum for O&M because the repairer is independent and would be contracted when it would be required.
 - Synergies are got by the O and M union.
 - Many agents implies more difficulties with corruption
 - It is part of Mexican Law (LOPSR y LAASP).
- Disadvantages
 - No synergies between M and R.
 - Two different agents for road safety (OM and R).
 - Polemic in studies and construction design being done by different agents.
 - Some risks for O&M.
 - Some delays in construction work.

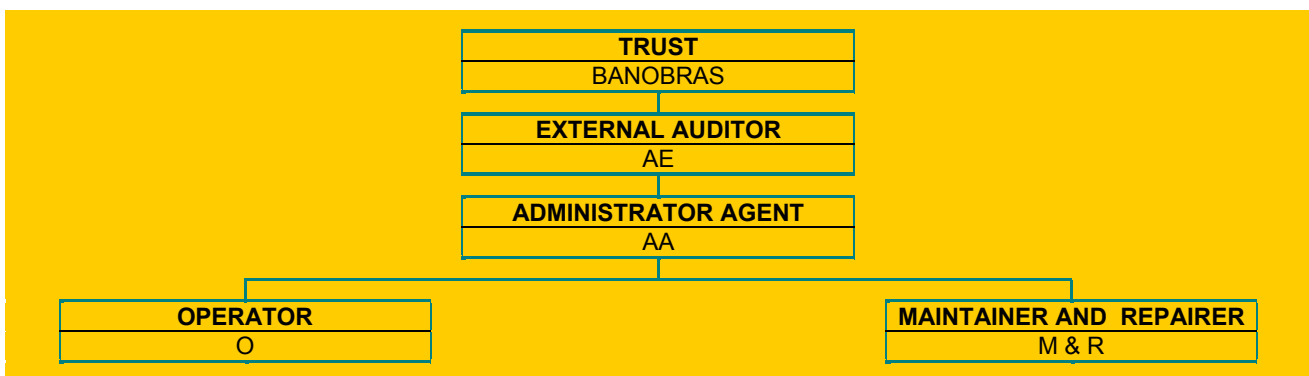
2.1.2. Model 2



- Advantages
 - Repairing work supervision by AA&O guarantees their quality.
 - Studies and construction designs are made by AA&O independently from M or R avoiding their interest.
 - Synergies are taken by M and R union. No risk for O when R does not work properly.

- More attractive business for M&R.
- Less tender process for repairing works. Time required for repairing goes down.
- M&R gets the same interests, R should work well because if not he will have to repair it in maintenance.
- Being independent M&R from O it is easier to control cash-flow and reduce corruption possibility.
- Road safety depends on an unique agent (M & R) that builds, repairs, maintains and is responsible for the road.
- The AA-O union simplifies operation projects and control.
- Disadvantages
 - Polemic in studies and construction design being done by different agents.
 - Some functions depending on O and M must be coordinated.
 - Financial costs for M&R are higher.
 - The AA and O union implies a control level lost.
 - The type of work for O and AA is different.
 - The AA and O union makes payment method and performance control more difficult.

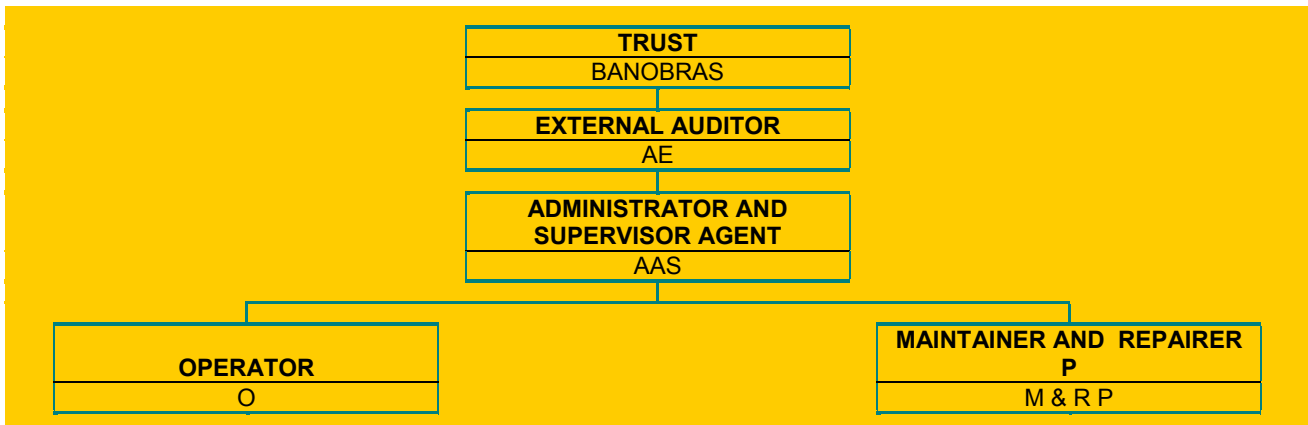
2.1.3. Model 3



- Advantages
 - Two control levels are obtained: AE and AA.
 - Operation works of traffic counting and toll collection is under double supervision AE and AA.
 - Repairing works supervision by AA guarantees their quality.
 - Studies and construction designs are made by AA independently from M&R avoiding their interest.
 - Synergies are taken by M and R union. No risk for O when R doesn't work correctly.
 - More attractive business for M&R.
 - Less tender process for repairing work. Time required for repairing is reduced.
 - The M&R gets the same interests, R should to work well because if not he will have to repair it in maintenance.
 - Being independent M&R from O it is easier to control cash-flow and corruption possibilities go down.
 - Road safety depends on an unique agent (M & R) that builds, repairs, maintains and is responsible for the road.
- Disadvantages
 - Polemic in studies and construction design being done by different agents.
 - Some functions depending on O and M&R must be coordinated.
 - Financial costs for M&R are higher.
 - Some delays in construction designs

- Less attractive business for O.

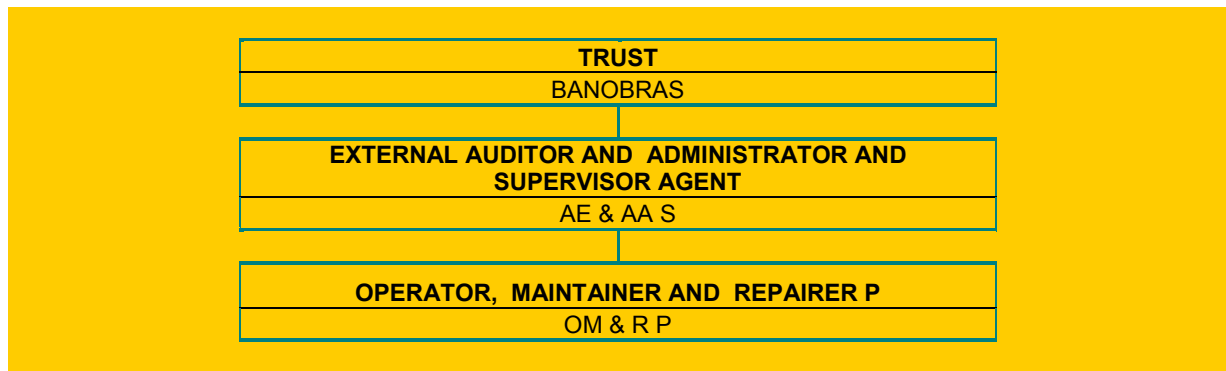
2.1.4. Model 4



P means that construction designs are made by the maintainer and repairer and so Administrator Agent is called Administrator and Supervisor Agent (AAS in Spanish version) because has to supervise construction design and work.

- Advantages
 - Two control levels are obtained: AE and AA.
 - Operation works of traffic counting and toll collection is under double supervision AE and AA.
 - Repairing work supervision by AA guarantees their quality.
 - Synergies are taken by M and R union. No risk for O when R doesn't work correctly.
 - More attractive business for M&R.
 - Less tender process for repairing work. Time required for repairing is reduced.
 - The M&R gets the same interests, R should work well because if not he will have to repair it in maintenance.
 - Being independent M&R from O it is easier to control cash-flow and corruption possibilities are reduced.
 - Road safety depends on an unique agent (M & R) that builds, repairs, maintains and is responsible for the road.
 - M&R has the responsibility for construction design redaction and so these are his own and cannot refuse to correct them
 - Polemic in studies and construction design disappear
 - Delays in construction designs also disappear.
- Disadvantages
 - Some functions depending on O and M&R must be coordinated.
 - Financial costs for M&R are higher.
 - Less attractive business for O.
 - Some construction Works could be needed not being necessary for performances. That is why AAS must be able to determinate this kind of work.

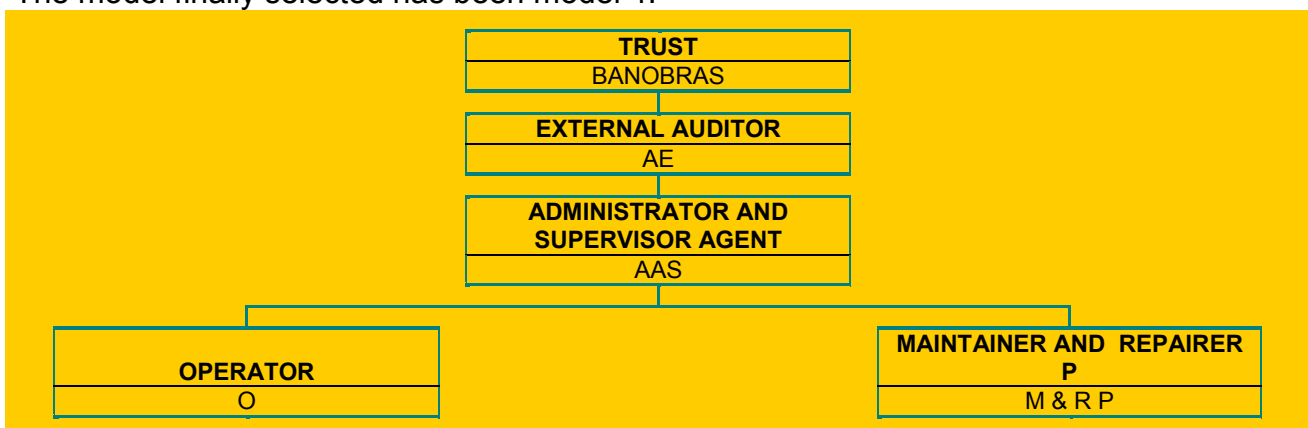
2.1.5. Model 5



- Advantages
 - Operation work of traffic counting and toll collection is under supervision OF AE&AAS.
 - Repairing work supervision by AE&AAS guarantees their quality.
 - Synergies are taken by O, M and R union.
 - More attractive business for O, M&R.
 - Less tender process for repairing works. Time required for repairing is reduced.
 - The O,M&R gets the same interests, R should to work well because if not he will have to repair it in maintenance.
 - Road safety depends on an unique agent (O, M & R) that builds, repairs, maintains and is responsible for the road.
 - M&R has the responsibility for construction design redaction and so these are his own and cannot refuse to correct them
 - Polemic in studies and construction design disappear
 - Delays in construction designs also disappear.
 - Fewer agents imply more simplicity in the relationship between them.
- Disadvantages
 - One control level is lost.
 - The O, M&R gets a stronger position.
 - Financial costs for M&R are higher.
 - Some construction work could be needed not being necessary for performances. That is why AAS must be able to determinate this kind of work.
 - The O, M and R union makes easier corruption practices possibility.

2.1.6. Selected model

The model finally selected has been model 4:



The responsibilities of the different agents are:

Administrador and supervisor agent (AAS):

- Preliminary activities:

- To collect all necessary information.
- Initial diagnostic about highway conditions.
- To establish performance indicators for the O and M&R contracts.
- Rehabilitation program
- Actual contracts analysis.
- O and M&R documentation revision
- External Audit documentation revision
- Tender of O and M&R
- O and M&R Contract control and administration
 - O and M&R permanent monitoring.
 - Payment determination based on performance indicators.
 - O and M&R Planning and procedures monitoring
 - Toll collect system and traffic counting monitoring.
 - Traffic information process and integration.
 - Transition control between concessionaries at the end of concession period.
 - Emergency assistance collaboration.
 - Public and private services vigilance.
- Advisor general services:
 - Historical inventory of works
 - Road management system.
 - Technical advisor.
 - Specialist studies and construction designs
 - Risk studies integration and recommendations.
 - Insurance policy hiring
 - Other studies (demand, econometric, etc.)
 - Concessionary coordination
 - Periodical maintenance requirements.
 - Other works requirements.
 - Repairing and upgrading work coordination.
 - Periodical diagnostic.
 - Audit observations supervision.
- Finished unit services:
 - Studies and construction design and its supervision.
 - Construction work supervision.
- Additional services: when they will be needed and be allowed by the Mexican Law.

Operator (O)

General:

- Operate the highway
- User service supplier.

With the next particular tasks:

- Regular maintenance of toll stations:
 - Buildings
 - Hydraulic installations.
 - Electric installations.
 - Sanitary installations.
 - Toll collection booths and their elements.
- Toll collection operation:
 - Toll collection and validation (i) ticket operation, supply and control, (ii) emergency ticketing, (iii) change funds (casual and specials), (iv) cash counts, (v) error prevention, (vi) fees publication and changes (vii) video storage, (viii) manual car counter, (ix) reports, etc.
 - Electronic toll collection tests.

- Cash system and equipment supply and installation.
- Regular maintenance of installations and buildings.
- Prevent maintenance for collection equipments and peripherics.
- Other services:
 - Road assistance and car cranes.
 - Communication system (SOS, call center and emergency call number 01-800).
 - Medical services coordination and Civil Protection procedures.
 - Insurances.
 - User services.
 - Shops, gas stations and parking administration.
 - Road properties vigilance and administration.
- Emergencies:
 - User assistance in crashes
 - Specific signalization.
 - Traffic detours
 - Alternative routes definition.
 - Specific procedures definition.
 - Event daily reports
 - Report collection
 - Emergency assistance collaboration.
- Administrative:
 - Car counter.
 - Users help services.
 - Users opinion polls.
 - Income, counters and funds audits help.
 - General audits help.
 - To execute audit conclusions.
 - Residence control.
 - Studies and construction design colaboration.

Maintainer (M):

- Regular road maintenance:
 - Road and margins cleaning
 - Superficial and deep patching
 - Horizontal and vertical signalization cleaning and repairing
 - Drainage cleaning and desilting
 - Structures cleaning and painting.
 - Weeding the right of way
 - Fence maintenance in right of way zone
 - Slopes and fills cleaning and maintenance.
- Regular toll stations maintenance:
 - Access and pay lanes maintenance.
- Periodical highway pavement maintenance:
 - Microcarpets
 - Superficial millings
 - Leveling
 - Cut and asphalt carpet restoring
 - Minor repairing for concrete slabs pavements.
- Other services:
 - Civil works insurances administration and recruitment
 - Heritage property insurances administration and recruitment.
 - Rest areas administration and maintenance.

- Emergencies:
 - Immediate emergency care collaboration.
 - Specific signalization help.
 - Traffic detours collaboration.
 - Alternative routes collaboration.
- Administrative:
 - Studies and construction design for maintenance work.
 - General audits help.
 - To execute audit conclusions.
 - To make and to update the inventory of fixed assets of the trust.
 - Special studies and construction design collaboration.

Repairer (R)

The repairer contractor is responsible for major upgrading and repairing works and its construction design.