Software Engineering

343.309
2020W
Third Semester
Hogea Eduard-Florin
Studienkennzahl - 033 521

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Group members

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Subsystems and members

Subsystem	Assigned Member
Traffic control and detection	Michael Lengauer
Traffic participants	Omar Dueñas
Control system	Lukas Wais; Mario Lischka
Road maintenance	Hogea Eduard-Florin

Subsystem IV - Road maintenance

The road maintenance subsystem deals with damaged or entirely broken road parts. This subsystem also is responsible for regular repairs of the road, which have to be scheduled some time before the actual repair, emergency repairs, which have to be dealt with as soon as possible and for the cleanup that needs to be done after a car accident or a natural disaster. If a traffic jam, an emergency or a regular repair is to be done, the maintenance subsystem delivers a schedule to the control system and if needed can change traffic lights in the field. It should work directly with the control system, giving it information based on repairs that are needed(including emergency repairs) and the state of the cleanup after a car accident or a natural disaster occurred.

Stakeholders

Some possible stakeholders of the Road Maintenance subsystem are:

- Local traffic management agencies;
  Need to be informed of the scheduled and emergency repairs so that they can give that information further (to the control system for example).
- Police / enforcement agencies; Can alter their surveillance route because of the roads blocked.
- Emergency services Freight operators; May need to take another(maybe longer) path to get to the destination if some roads are blocked because of the Road Maintenance.
- Other road users (pedestrian /cycle priorities); Pedestrians may find the road blocked when the scheduled or emergency repairs are done and need to detour.
- Local businesses;
  If an accident or some damage is caused by natural disasters, it may affect the path people take to go to the businesses, this affecting them.

- Owners and occupants of properties affected by the scheme (access, stopping, loading);
  Have to agree with the roadwork if the road in question is on their property. Directly affecting the Road Maintenance if they don't come to terms.

- Local residents.
  May not agree with the proposed changes and can be an obstacle for the subsystem.

Subsystem requirements

Id	Requirement	Description	Tags	Priority (*/**/***)
1	Getting to an emergency	The Road Maintenance crew must arrive at the emergency as soon as possible	emergency,as soon as possible	***
2	Must be able to repair road	Need to have all the materials	repair,materials	**
3	Must arrive on time	The crew and vehicles must be ready	crew,time	***
4	Materials must not be expired	Need to check the availability of the materials	materials,expire	***
5	Crew must be trained	All the personnel have to be trained properly	crew,train	***
6	Safety equipment wear	Personnel must wear their safety equipment	wear,safety	***
7	Proper equipment	The equipment should be given to the crew according to their needs on the field	equipment,field	***
8	Supervised	The workers need to be supervised by a foreman.	supervised,workers	**
9	Break	The crew must take some deserved breaks from time to time.	break	*
10	Deserved salary	Personnel must have an adequate salary so that they don't feel the need to ask for more.	salary, personnel	*

List of risks

Id	Name	Description	Mitigation	Contingency	Impact	Probability	Magnitude
1	Road breaking	Using old materials	Periodical inspection for the materials	Repairing the damages before they are too bad	0.3	0.4	0.12
2	Crew wounded	Going in the field without proper safety equipment	Training for the crew	A paramedic should always be on site	0.9	0.6	0.54
3	Work stopped	Not enough materials	Proper inspection of the materials	Someone gets the required materials	0.4	0.1	0.04
4	Accident	The workplace is not correctly signaled	Signal the place accordingly	Signal the place accordingly	1.0	0.2	0.2
5	Victim dying	Not getting in time to a car after an accident	Personnel must be always ready	Further training for the personnel	1.0	0.3	0.3

Glossary

Articulation: A machine with a jointed main frame that assists in steering the machine, allowing it to work in an angled configuration, and move forward in a straight line.

Density: The weight of material per unit of volume (generally in pounds per cubic foot or kilograms per cubic meter).

Grader: Any device either self-propelled or mounted on another machine used for final shaping and maintenance of soil or aggregate surfaces.

Gravel: A mix of stone, sand and fine-sized particles used as sub-base, base or surfacing on a road. In some regions, it may be defined as aggregate. Can come from natural or quarry sources.

Maintenance: Work done routinely on a road surface to keep the road smooth and allow water to flow off the driving surface.

Moisture Content: (in percentage) Quantity of water contained in a material.

Optimum Moisture: The percentage of water (by weight) in material that allows it to be compacted to achieve greatest density.

Paved Road: Any road that has a semi-permanent surface placed on it such as asphalt or concrete.

Pit: An area where a natural deposit of stone, sand and/or fine material is removed from the earth.

Rehabilitation: Additional and more foundational road work that extends beyond routine maintenance.

Road Grader: A road maintenance machine with a long blade used to create a flat surface during the grading process. Also referred to as a "grader" or "motor grader".

Quarry: A place, typically a large, deep pit, from which stone or other materials are or have been extracted.

Segregation: A problem that appears when the coarse and fine material separates and no longer forms a uniform blend of material.

Unpaved Roads: Typically, a reference specifically to gravel surfaced roads.