

CASE STUDY

SOIL SEALING – HIGHWAYS IN SLOVENIA

Biotechnical faculty
Department of Landscape architecture
Slovenia

Aleksander MAGYAR

Slovenian territory, which represents only 0.014% of the planet's land surface, is a home to 2% of all known species of plants and animals. Only 10% of slovenian territory is lowlands, and together with valleys only 18%.

In these areas rivers, main urban areas, economy and traffic infrastructure are concentrated, and represent the highest pressures on nature. Most of the landscape is hilly and mountainous; there are even areas with high mountains.

The management of these riches can not be simple: it requires a professional approach and the co-operation of many interests. Today 60,5% of Slovenian territory is covered by forests. Urban areas represent less than 10% of Slovenia, but tend to spread towards sensitive and universally useful land that is usually the best agricultural land as well. Slovenia is connected by a network of 1200 km of railways and 14800 km of roads, The traffic is becoming heavier because of short distances of transport and travel, Lying between Italy, Hungary and Croatia, Slovenia contains many important traffic routes for international traffic.

Road projects are generally intended to improve the economic and social welfare of people. Increased road capacity and improved pavements can reduce travel times and lower the costs of vehicle use, while increasing access to markets, jobs, education, and health services and reducing transport costs for both freight and passengers.

For all the positive aspects of road projects, they may also have significant negative impacts on nearby communities and the natural environment. People and properties may be in the direct path of road works and affected in a major way. People may also be indirectly affected by projects, through the disruption of livelihood, loss of accustomed travel paths and community linkages, increases in respiratory problems due to air pollution, and injury from road accidents. Disturbances to the natural environment may include soil erosion, changes to streams and underground water, and interference with animal and plant life.

Roads bring people, and people bring development. New roads may induce development in previously undeveloped areas, sometimes significantly affecting sensitive environments and the lifestyles of indigenous people. Roads are agents of change, and can be responsible for both benefits and damage to the existing balance between people and their environment.

As soil sealing is bound to increase in the next century in Europe, a number of countries have taken the view that the best agricultural soils should not be used for building or infrastructure developments and there are several examples of new roads being re-routed to avoid fertile soils.

Development in soil sealing are largely determined by spatial planning strategies where the effects of soil losses are often not taken into account.

TARGETS OF HIGHWAY SEALING MONITORING:

The effects which are related to sealing and the characteristics to be monitored to assess the effects are items of the monitoring instructions.

The effects are:

- decrease of soil functions
- inhibition of storm water infiltration
- floods by inhibition of water infiltration
- reduction of ground water renewal
- destruction of soil fertility
- dissection of habitats and water catchment areas
- health hazards by dust, fine dust, concentration and release of hazardous compounds
- reduction of soil gas exchange
- social effect by reduced well being and life quality

In Slovenia the state street infrastructure has passed the spatial long-term plan. Great areas in highway construction and moderate financial possibility of the state are dictating short planning.

Under highway construction predominate short – term economical interest which consider only progressive road construction costs and neglect maintaining costs and often hard mesurable environment degradation costs.

Steps to prevent and diminishing negativ impacts:

- qualitative spatial planning
- qualitative road design
- qualitative offroad space arrangement (relief intervention, vegetation, water, to open and hide view points, material and plant species choice)

The most important point is that the landscape architect is involved at an early stage, and brought into the planning team which actually decides, or at least has the possibility to influence the decision which route the highway will take; that he or she is no longer looked on as a wizard whose job is to vanish the engineers ugly scars under a magic cloak of green, but is involved at an early stage when the damage can still be prevented.

“We can not claim to have solved the problem roads in the landscape until we have found ways of translating all the needs of fast driving into a coherent landscape.”

(Crove, 1960)

The greater part of qualitative agriculture soil is located in valleys and plains. Exactly in valleys is flowing the major traffic stream. To avoid a conflict between agriculture and roads we have environmental impact assessments for highway construction. With this procedure actually we try to diminish the impacts.

The names of the soil types usually do not mean anything to road designers. The results must be presented in a form they can understand, preferably as a single number.

Every soil vulnerability study must arise from an outline, which shows modification in soil, their influence and after – effects.

Each soil type had to be classified to its stage of:

- soil profile development
- parent material composition
- textural composition
- water conditions

The final result is the production potential index which can range between 7 and 100 points. The index is then divided into five classes:

- 4 – inadmissible high impact (more than 70 points)
- 3 – high impact (56 – 69.9 points)
- 2 – moderate impact (43 – 55.9 points)
- 1 – negligible impact (30 – 42.9 points)
- 0 – no impact (less than 29.9 points)

In additional zone of 30 – 40m from the pavement at the each side of the highway was considered to be significantly affected and ansuitable for agriculture. This cone is usually affected during highway construction, can containe noise or wind barriers or vegetation, and will be polluted to a certain extent by traffic emisions. This land is therefore, lost to agriculture.

The road designers ussually provided several variations of routes for a given section of highway. At the end they choose the route which leads to least soil impact.

CONCLUSION

In the last decade without doubt the balance has incline in benefit to diminish impacts. But we should ask our self does Landscape architects designing highways or does highways designing landscapes?

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