Lecture T8 – Environmental Aspects

Points of Discussion

Air pollution

Noise

Intrusion

Vibration

Environmental impact studies

Air Pollution

A high percentage of pollution is generated by motor vehicles

Vehicle manufacturers are doing what they can to reduce/eliminate harmful emissions

We, as designers, can make a significant contribution towards cleaner air in our cities

Our Contribution to Breathing

Susceptible activities should not be located in high-emission areas

Traffic volumes should be limited to below congestion either by diverting traffic or modal transfer to public transport

Providing a high Level of Service

Elevated transport facilities and ventilation of tunnels

Noise

Causes annoyance, interferes with conversation and human performance and can cause health problems, e.g. impaired hearing

Sources of vehicle noise are the power train and rolling

Factors influencing noise are :

- Traffic flow, composition and speed;
- Intersections and pedestrian crossings
- Road surface, width and gradient

Intrusion

The effect on land use

The effect on communities

The effect on the visual environment

The effect on existing streets

Vibration

Body waves

Rayleigh Waves

Bridges (High amplitude vibrations are called oscillations and have been know to destroy bridges – think of Galloping Gertie.

We still have a lot to learn about vibrations as environmental effects

Environmental Impact Studies

Integrated Environmental Management

Environmental Impact Assessment

Environmental surveys

Integrated Environmental Management

The purpose of IEM is to seek a balance between meeting development needs and conserving the environment

IEM requires that environmental factors, in addition to the normal political, economic and technological factors, are incorporated into the planning process within the framework of a multi-disciplinary approach

Environmental Impact Assessment

We tend to favour using a matrix method

Specific elements of the proposed development which might cause environmental damage are tabulated against specific elements of the environment in which the development is to take place

The damage is ranked to establish the required remedial actions

Environmental Surveys

In essence, these are an exercise in public participation and are correspondingly difficult

Sight must not be lost of the fact that:

that transport exists for people and not the other way around;

that the road and its traffic play a prominent part in determining the quality of our environment,

that environmental impact must be a principal consideration in road and traffic planning;

that due attention must therefore be given to the public's reactions and the public's wishes.

Environmental Process

- A route determination / traffic impact assessment is done
- A “plan of study for scoping” is submitted for approval of the environmental authority
- All “interested and affected parties” are contacted and given the opportunity to comment and voice concerns
- The scoping consultant also identifies environmental issues
- Report is submitted to environmental authorities indicating any “fatal flaws” or issues requiring further studies

Environmental Process (cont)

- If fatal flaws cannot be avoided, project is stopped
- If further studies are required, an Environmental Impact Assessment is done
- If no negative or problem issues are identified, project is approved
- The EIA is a detailed investigation of specific issues. These could be noise, air pollution, fauna and flora, stormwater treatment, or any other of a number of environmental concerns however minor

Environmental Process (cont)

- The EIA will usually result in mitigation measures which will have to be undertaken to lessen the impact of the project. This will often influence the geometric design and can result in alignment or level changes, the construction of walls or berms and the amendment of drainage or bridge structures, height or cross-section