### 8.7.2 Temporal spatial probability and vulnerability

Table 14 lists the activities required to assess the temporal spatial probability of the elements at risk.

Table 14: Activities required for assessing the temporal spatial probability of the elements at risk.

| Method for assessing Temporal Spatial Probability | Activity |
|---|---|
| **Basic** | *Life Loss Risks*<br>For persons at risk in residential areas assume the temporal-spatial probability is 1.0.<br>For other type of developments such as factories and schools, make an approximate assessment of temporal-spatial probability from the likely pattern of use of the buildings.<br>For roads and railways and other situations with transient populations at risk; make an approximate assessment of temporal spatial probability from the traffic volumes and velocities.<br>*Property loss risks*<br>For buildings the temporal spatial probability is 1.0.<br>For vehicles, make an approximate assessment of temporal-spatial probability from the traffic volumes and velocities. |
| **Intermediate** | *Life Loss Risks*<br>For all situations estimate temporal-spatial probability taking account of the nature of development, living and work pattern, existence of protected places (e.g. reinforced shelters), traffic (where relevant) and the intensity of landsliding.<br>*Property loss risks*<br>As for basic assessment although in more detail (e.g. allowing for the variability of trajectories of rock falls). |
| **Sophisticated** | As above, with greater detail in the assessment, particularly the temporal/spatial distribution of the elements at risk. |

Vulnerability is generally assessed empirically for persons and property using published information (e.g. AGS 2007a). More sophisticated methods are not as yet available.

### 8.7.3 Preparation of landslide risk zoning maps

Landslide risk zoning maps are prepared using the hazard zoning maps and allowing for the elements at risk, the spatial-temporal probability and vulnerability. Separate zoning maps will be required for life loss risk and property loss risk. The risk zoning maps should be at the same scale as the susceptibility and hazard zoning maps. They should also show the topography and cadastral information as well as the risk zoning classification of the area.

For life loss, the risk should be expressed as individual risk (annual probability of the person losing his/her life). For property loss, the map may show annualised loss ($/year) but the report should also list the pairs of loss value and annual probability of the loss (e.g. 0.001 annual probability of $10 million loss).

For new development there will have to be an assessment made regarding the proposed development and the elements at risk. The risk will be unique to this proposed development.

If there are several landslide hazards (e.g. rock fall and shallow landslides) the risks are summed to give the total risk. However, it may be useful to present maps showing the risk from each type of landslide, as well as the total risk.

## 8.8 THE NEED FOR DOCUMENTATION OF THE LANDSLIDE ZONING PROCESS

It is essential that the landslide zoning process be well documented in a report. The report should include

- Zoning maps and legends.
- The definitions of the susceptibility, hazard and risk zones.
- The basis upon which the zoning has been carried out including data sources, zoning methodology, the time period covered by the landslide inventory if one has been used to assess landslide frequency.
- A description of any limitations of the zoning including accuracy of zone boundaries.
- Other information to explain the use of the landslide zoning as required for the particular project.

This informs those who are using the landslide zoning and facilitates peer review.