

## *[<sup>F1</sup>ANNEX I*

### **INDICATIVE ELEMENTS OF ROAD SAFETY IMPACT ASSESSMENTS]**

#### **Textual Amendments**

- F1** Substituted by [Directive \(EU\) 2019/1936 of the European Parliament and of the Council of 23 October 2019 amending Directive 2008/96/EC on road infrastructure safety management.](#)

1. Elements of a road safety impact assessment:
  - (a) problem definition;
  - (b) current situation and ‘do nothing’ scenario;
  - (c) road safety objectives;
  - (d) analysis of impacts on road safety of the proposed alternatives;
  - (e) comparison of the alternatives, including cost-benefit analysis;
  - (f) presentation of the range of possible solutions.
2. Elements to be taken into account:
  - (a) fatalities and accidents, reduction targets against ‘do nothing’ scenario;
  - (b) route choice and traffic patterns;
  - (c) possible effects on the existing networks (e.g. exits, intersections, level crossings);
  - (d) road users, including vulnerable users (e.g. pedestrians, cyclists, motorcyclists);
  - (e) [<sup>F1</sup>traffic (e.g. traffic volume, traffic categorisation by type), including estimated pedestrian and bicycle flows determined from adjacent land-use attributes;]
  - (f) seasonal and climatic conditions;
  - (g) presence of a sufficient number of safe parking areas;
  - (h) seismic activity.

## *[<sup>F1</sup>ANNEX II*

### **INDICATIVE ELEMENTS OF ROAD SAFETY AUDITS]**

1. Criteria at the draft design stage:
  - (a) geographical location (e.g. exposure to landslides, flooding, avalanches), seasonal and climatic conditions and seismic activity;
  - (b) types of and distance between junctions;
  - (c) number and type of lanes;
  - (d) kinds of traffic admissible to the new road;

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- (e) functionality of the road in the network;
- (f) meteorological conditions;
- (g) driving speeds;
- (h) cross-sections (e.g. width of carriageway, cycle tracks, foot paths);
- (i) horizontal and vertical alignments;
- (j) visibility;
- (k) junctions layout;
- (l) public transport and infrastructures;
- (m) road/rail level crossings<sup>[F1];</sup>
- (n) <sup>[F2]</sup>provision for vulnerable road users:
  - (i) provision for pedestrians;
  - (ii) provision for cyclists, including the existence of alternative routes or separations from high-speed motor traffic;
  - (iii) provision for powered two-wheelers;
  - (iv) density and location of crossings for pedestrians and cyclists;
  - (v) provision for pedestrians and cyclists on affected roads in the area;
  - (vi) separation of pedestrians and cyclists from high-speed motor traffic or the existence of direct alternative routes on lower class roads.]

**Textual Amendments**

**F2** Inserted by [Directive \(EU\) 2019/1936 of the European Parliament and of the Council of 23 October 2019 amending Directive 2008/96/EC on road infrastructure safety management.](#)

- 2. Criteria for the detailed design stage:
  - (a) layout;
  - (b) coherent road signs and markings;
  - (c) lighting of lit roads and intersections;
  - (d) roadside equipment;
  - (e) roadside environment including vegetation;
  - (f) fixed obstacles at the roadside;
  - (g) provision of safe parking areas;
  - (h) <sup>[F1]</sup>provision for vulnerable road users:
    - (i) provision for pedestrians;
    - (ii) provision for cyclists;

- (iii) provision for powered two-wheelers;]
- (i) user-friendly adaptation of road restraint systems (central reservations and crash barriers to prevent hazards to vulnerable users).
- 3. Criteria for the pre-opening stage:
  - (a) safety of road users and visibility under different conditions such as darkness and under normal weather conditions;
  - (b) readability of road signs and markings;
  - (c) condition of pavements.
- 4. Criteria for early operation: assessment of road safety in the light of actual behaviour of users.

Audits at any stage may involve the need to reconsider criteria from previous stages.

## *I<sup>F2</sup> ANNEX IIa*

### **INDICATIVE ELEMENTS OF TARGETED ROAD SAFETY INSPECTIONS**

- 1. Road alignment and cross-section:
  - (a) visibility and sight distances;
  - (b) speed limit and speed zoning;
  - (c) self-explaining alignment (i.e. 'readability' of the alignment by road users);
  - (d) access to adjacent property and developments;
  - (e) access of emergency and service vehicles;
  - (f) treatments at bridges and culverts;
  - (g) roadside layout (shoulders, pavement drop-off, cut and fill slopes).
- 2. Intersections and interchanges:
  - (a) appropriateness of intersection/interchange type;
  - (b) geometry of intersection/interchange layout;
  - (c) visibility and readability (perception) of intersections;
  - (d) visibility at the intersection;
  - (e) layout of auxiliary lanes at intersections;
  - (f) intersection traffic control (e.g. stop controlled, traffic signals, etc.);
  - (g) existence of pedestrian and cycling crossings.
- 3. Provision for vulnerable road users:
  - (a) provision for pedestrians;

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- (b) provision for cyclists;
  - (c) provision for powered-two-wheelers;
  - (d) public transport and infrastructures;
  - (e) level crossings (noting, particularly, the type of crossing and if they are manned, unmanned, manual, or automated).
4. Lighting, signs and markings:
- (a) coherent road signs, not obscuring visibility;
  - (b) readability of road signs (position, size, colour);
  - (c) sign posts;
  - (d) coherent road markings and delineation;
  - (e) readability of road markings (position, dimensions and retroreflectivity under dry and wet conditions);
  - (f) appropriate contrast of road markings;
  - (g) lighting of lit roads and intersections;
  - (h) appropriate roadside equipment.
5. Traffic signals:
- (a) operation;
  - (b) visibility.
6. Objects, clear zones and road restraint systems:
- (a) roadside environment including vegetation;
  - (b) roadside hazards and distance from carriageway or cycle path edge;
  - (c) user-friendly adaptation of road restraint systems (central reservations and crash barriers to prevent hazards to vulnerable road users);
  - (d) end treatments of crash barriers;
  - (e) appropriate road restraint systems at bridges and culverts;
  - (f) fences (in roads with restricted access).
7. Pavement:
- (a) pavement defects;
  - (b) skid resistance;
  - (c) loose material/gravel/stones;
  - (d) ponding, water drainage.
8. Bridges and tunnels:
- (a) presence and number of bridges;

- (b) presence and number of tunnels;
- (c) visual elements representing hazards for the safety of the infrastructure.
- 9. Other issues:
  - (a) provision of safe parking areas and rest areas;
  - (b) provision for heavy vehicles;
  - (c) headlight glare;
  - (d) roadworks;
  - (e) unsafe roadside activities;
  - (f) appropriate information in ITS equipment (e.g. variable message signs);
  - (g) wildlife and animals;
  - (h) school zone warnings (if applicable).]

### *ANNEX III*

#### **INDICATIVE ELEMENTS OF NETWORK-WIDE ROAD SAFETY ASSESSMENTS**

- 1. General:
  - (a) type of road in relation to the type and size of regions/cities it connects;
  - (b) length of road section;
  - (c) area type (rural, urban);
  - (d) land use (educational, commercial, industrial and manufacturing, residential, farming and agricultural, undeveloped areas);
  - (e) property access points density;
  - (f) presence of service road (e.g. for shops);
  - (g) presence of road works;
  - (h) presence of parking.
- 2. Traffic volumes:
  - (a) traffic volumes;
  - (b) observed motorcycle volumes;
  - (c) observed pedestrian volumes on both sides, noting 'along' or 'crossing';
  - (d) observed bicycle volumes on both sides, noting 'along' or 'crossing';
  - (e) observed heavy vehicle volumes;
  - (f) estimated pedestrian flows determined from adjacent land use attributes;
  - (g) estimated bicycle flows determined from adjacent land use attributes.

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3. Accident data:
  - (a) number, location and cause of fatalities by road user group;
  - (b) number and location of serious injuries by road user group.
4. Operational characteristics:
  - (a) speed limit (general, for motorcycles; for trucks);
  - (b) operating speed (85th percentile);
  - (c) speed management and/or traffic calming;
  - (d) presence of ITS devices: queue alerts, variable message signs;
  - (e) school zone warning;
  - (f) presence of school crossing supervisor at prescribed periods.
5. Geometric characteristics:
  - (a) cross section characteristics (number, type and width of lanes, central median shoulders layout and material, cycle tracks, foot paths, etc.), including their variability;
  - (b) horizontal curvature;
  - (c) grade and vertical alignment;
  - (d) visibility and sight distances.
6. Objects, clear zones and road restraint systems:
  - (a) roadside environment and clear zones;
  - (b) fixed obstacles at the roadside (e.g. lighting poles, trees, etc.);
  - (c) distance of obstacles from roadside;
  - (d) density of obstacles;
  - (e) rumble strips;
  - (f) road restraint systems.
7. Bridges and tunnels:
  - (a) presence and number of bridges, as well as relevant information concerning them;
  - (b) presence and number of tunnels, as well as relevant information concerning them;
  - (c) visual elements representing hazards for the safety of the infrastructure.
8. Intersections:
  - (a) intersection type and number of arms (noting in particular the type of control and the presence of protected turns);
  - (b) presence of channelisation;
  - (c) intersection quality;

- (d) intersecting road volume;
  - (e) presence of level crossings (noting, in particular, the type of crossing and whether they are manned, unmanned, manual or automated).
9. Maintenance:
- (a) pavement defects;
  - (b) pavement skid resistance;
  - (c) shoulder condition (including vegetation);
  - (d) condition of signs, markings and delineation;
  - (e) condition of road restraint systems.
10. Vulnerable road users' facilities:
- (a) pedestrian and cycling crossings (surface crossings and grade separation);
  - (b) cycling crossings (surface crossings and grade separation);
  - (c) pedestrian fencing;
  - (d) existence of sidewalk or separated facility;
  - (e) bicycle facilities and their type (cycle paths, cycle lanes, other);
  - (f) quality of pedestrian crossings with regard to the conspicuity and signposting of each facility;
  - (g) pedestrian and cycling crossing facilities on entry arm of minor road joining network;
  - (h) existence of alternative routes for pedestrians and cyclists where there are no separated facilities.
11. Pre/post-crash systems for traffic injury and gravity mitigation elements:
- (a) network operational centres and other patrolling facilities;
  - (b) mechanisms to inform road users of driving conditions in order to prevent accidents or incidents;
  - (c) AID (automatic incident detection) systems: sensors and cameras;
  - (d) incident management systems;
  - (e) systems for communicating with emergency services.]

## ANNEX IV

### ACCIDENT INFORMATION CONTAINED IN ACCIDENT REPORTS

Accident reports include the following elements:

1. [F<sup>1</sup>]location of the accident (as precise as possible), including GNSS coordinates;]
2. pictures and/or diagrams of the accident site;

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3. date and hour of accident;
4. information on the road such as area type, road type, junction type incl. signalling, number of lanes, markings, road surface, lighting and weather conditions, speed limit, roadside obstacles;
5. [<sup>F1</sup>accident severity;]
6. characteristics of the persons involved such as age, sex, nationality, alcohol level, use of safety equipment or not;
7. data on the vehicles involved (type, age, country, safety equipment if any, date of last periodical technical check according to applicable legislation);
8. accident data such as accident type, collision type, vehicle and driver manoeuvre;
9. whenever possible, information on the time elapsed between the time of the accident and the recording of the accident, or the arrival of the emergency services.