

Road Safety Audit

2/16/2007

Checklist: (Detailed)

GENERAL TOPICS	Yes / No	Comment
Scope of project, function, traffic mix, road users		
Is the design consistent with the function of the road, i.e., there is no potential confusion to the driver about the road function? (appreciation of the intended function of the road, road classification is needed)		
Will the proposed design safely accommodate passenger vehicles; heavy vehicles; buses (consider also school buses)		
Will the proposed design safely accommodate pedestrians? Consider all classes, e.g., school children, elderly, disabled etc. Also, consider continuity of sidewalks/shoulders, including bridges/flyovers.		
Will the proposed design safely accommodate bicyclists? Among others, consider continuity of bicycle lanes/paths including bridges/flyovers. Check whether the proposed facility included in or related to bicycle and pedestrian facilities identified in a master plan (e.g., MPO/LDD bike/ped plan; local planning documents; bicycle PA routes; Statewide Bicycle and Pedestrian Master Plan)		
Will the project provide continuity and safe linkages with existing or proposed bicycle/pedestrian facilities? Consider whether the proposed facility is included in or related to a regional/local recreational plan (e.g., Rails-to-Trails; Greenways, Local State, National Parks)		
Will the proposed design safely accommodate motorcyclists?		

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Will the proposed design safely accommodate special vehicles (e.g., farm equipment, horse and buggy traffic)		
Will the proposed design safely accommodate snowmobiles and ATVs? Consider possible confusion to road users with regard to the adjacent trail, especially at nighttime, crossings etc)		
Is the design flexible enough to accommodate unforeseen increases in volumes or changes in traffic mix?		
Will the proposed design be consistent with adjacent roads, land forms and traffic management?		
Type and degree of access to property and developments		
Is the degree of access control consistent with the road's function and with other sections of the road?		
Will sight distances be adequate at intersections?		
Will sight distances be adequate at property accesses?		
Is the design speed (or the likely operating speed) compatible with the number and type of intersections/property accesses?		
Have the possibilities of linking multiple accesses into one service road or consolidating access points into shared use access been considered?		
Major generators of traffic		

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Are all major generators of traffic far enough away to avoid unsafe influences on design, e.g., spillover of traffic queues from the accesses onto the road, excessive pedestrian activity with potential of illegal crossings etc?		
Have existing or alternative accesses been arranged to ensure existing suburbs/attractions/communities are not cut off by the development of the project?		
Are the accesses for significant traffic generators far enough away from intersections for safety? (e.g., accesses are not blocked by vehicles stopping at intersection etc.)		
Is sight distance to and from accesses to significant traffic generators adequate?		
Will the proposed design be consistent with adjacent roads, land forms and traffic management?		
Has the potential of the project to attract the development of major traffic generators on or adjacent to the project been considered and adequately accounted for?		
Staging of construction		
If the construction is to be implemented in more than one stage, has safety been given a high priority in transitions between stages?		
If the construction is to be implemented in more than one stage, has safety been given a high priority in transitions to existing roads? (e.g., undivided vs. divided cross-section)		
If the construction will divert significant or all traffic onto alternatives routes (e.g., full road closure), has safety been given a high priority on the detours?		

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Will the proposed staging incorporate safety standards during construction?		
Future reconstruction projects		
Will the route be free of compromises in safety if there is to be future widening?		
Will the route be free of compromises in safety if there is to be the addition of a complete second roadway?		
Will the route be free of compromises in safety if there is to be future realignment?		
Will the route be free of compromises in safety if there is to be major geometric changes at intersections?		
Wider network effects		
Have any harmful safety effects of the design upon the surrounding road network been identified and adequately dealt with?		
Is the project consistent with the surrounding road network classification hierarchy?		

DESIGN ISSUES (GENERAL)	Yes / No	Comment
Route choice		
Is safety a prime consideration in route selection? Is the preferred alternative safest relative to other options?		
If the route follows existing alignment, are the negative affects avoided or minimized? (e.g., consider new road in the "old" environment)		

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If the route is on new alignment (undeveloped corridor), is the alignment choice safe?		
Does the design safely fit in with the physical constraints of the landscape? (Consider steep and high fills, steep grades and horizontal curves, bridges or intersections on curves, fixed objects on the roadside etc.)		
Impact of continuity with the existing network		
Do all proposed improvement sections/transitions connect with the existing highway system safely?		
If the standards of the proposed design differ from the adjacent sections, have the road safety implications been identified and addressed?		
Broad design standards		
Have the appropriate design standards been used (with regard to the scope of the project and its function in relation to the projected traffic volume and mix)?		
Have the appropriate design standards and guidelines for pedestrian and bicycle facilities been used (with regard to the scope of the project and its function)?		
Does the proposed horizontal and vertical alignment meet design guidelines?		
Is the alignment consistent with the design speed?		
Have the appropriate design vehicle and design controls been used?		
Design speed		

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Is the design speed consistent with the adjacent road sections?		
Has the potential that actual speeds will be greater than the design speed been avoided? (e.g., will the design discourage speeds higher than the design speed?)		
Has the appropriate design speed been selected with regard to the function of the road and road classification?		
Has the appropriate design speed been selected for design of horizontal and vertical alignment?		
Has the appropriate design speed been selected to determine visibility requirements?		
Has the appropriate design speed been selected to determine merging requirements?		
Has the appropriate design speed been selected to determine weaving requirements?		
Has the appropriate design speed been selected to determine decelerating or accelerating requirements at intersections/interchanges?		
Is sight distance adequate at intersections?		
Is sight distance adequate at entry and exit ramps?		
Is sight distance adequate at driveways to property entrances?		
Is sight distance adequate at emergency vehicle access points?		
Have any sudden changes in the speed regime or posted speed limit been avoided?		

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Is the designated speed limit, if any, on the proposed road appropriate? (e.g., not too high/low)		
Is the selected design speed consistent with expected operating and posted speed?		
Design volume and traffic characteristics		
Is the design appropriate with regard to the design volume and traffic mix?		
Will the design safely cope with unforeseen or large increases in traffic volume?		
Will the design safely cope with unforeseen or large changes in traffic mix? (consider possible effects of increases in proportions of heavy vehicles, transit, bicyclists, etc)		
Right of way		
Is there compatibility between right of way and clear zone width requirements?		
Is type and width of median chosen appropriate for right of way available?		
Is the median of sufficient width to minimize the potential for cross over crashes?		
Is the median of sufficient width to minimize the potential of fixed object crashes (consider lighting poles, overpass/underpass piers, etc)?		
Has the potential of "visual clutter" (excessive commercial signing or lighting) beyond ROW been considered and accounted for?		
Combinations of features		

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Has the poor combination of features (e.g., small radius horizontal curve at end of long tangent; at end of long steep downgrade, curve on grade/bridge etc) been avoided?		
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INTERSECTIONS	Yes / No	Comment
Location, spacing, type		
Are all aspects of intersections (e.g., spacing, type, layout, etc.) appropriate from a safety perspective with respect to the broad concept of the project, function of the road and intersecting roads?		
Are all aspects of intersections (e.g., spacing, type, layout, etc.) appropriate from a safety perspective with respect to the traffic mix on the road and intersecting roads?		
Has the potential for incorporating roundabouts at proposed intersection locations been considered?		
Is the spacing of intersections adequate to avoid spillover of queues into the upstream intersections?		
Does the spacing of signalized intersections allows for effective signal coordination (one or both directions of traffic)?		
Is the frequency of intersections appropriate for emergency vehicle access?		
Have all physical, visibility or traffic management constraints which would influence the choice of layout/type or spacing of intersections been considered?		

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Has the vertical and/or horizontal alignment been taken into account with regard to the style or spacing of intersections?		
Has the possibility of removing unnecessary or non-essential intersections and providing access more safely by changes on the surrounding road network been considered?		
Are the accesses for significant traffic generators far enough away from intersections for safety? (e.g., accesses are not blocked by vehicles stopping at intersection etc.)		
Readability' (perception) by drivers		
Has the potential of misinterpretation of traffic signals at closely spaced intersections been considered? (e.g., "seeing through" to other signal heads)		
Road users, traffic mix		
Will the angle of the intersecting roads and the sight lines be adequate for the safety of all road users?		
Is the movement of pedestrians and bicyclists safely accommodated at all intersections?		
Is the movement of heavy vehicles safely accommodated at all intersections?		
Design consistency		
Are intersection design parameters consistent within the project?		
Number of lanes		

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Is the number of lanes appropriate for safe operations and to accommodate variations in traffic patterns?		
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INTERCHANGES	Yes / No	Comment
Location, spacing		
Are there sufficient distances between interchanges? (consider need to safely accommodate acceleration and deceleration lanes, weaving sections, signage, driver orientation issues etc)		
Does the location of the interchange service the needs of the surrounding community?		
Types, layouts		
Are the interchange types/layouts appropriate with respect to the broad concept of the project, function of the road and intersecting roads?		
Have any interchange configurations that are complicated from the drivers perspective or may cause driver confusion/orientation problems been avoided?		
Ramps, terminal intersections		
Do the entrance and exit ramp designs conform to driver expectancy (no left-hand ramp accesses, bifurcations, successive circular curves with increased curvature etc)		
Are all aspects of ramp termini at intersections (e.g., type, layout, etc.) appropriate from a safety perspective with respect to the broad concept of the intersecting highway?		

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Design consistency		
Are interchange design parameters consistent?		
Number of lanes		
Is the number of lanes appropriate for safe operations and to accommodate variations in traffic patterns?		

ENVIRONMENTAL CONSTRAINTS	Yes / No	Comment
Surrounding Terrain		
Is the surrounding terrain free of physical or vegetation elements which could affect the safety of the design? (e.g., heavy planting, forestry, deep cuttings, steep or rocky bluffs which constrain the design)		
Weather, sunlight		
Has consideration been given to weather records or local experience that may indicate a particular problem? (e.g., snow, ice, wind, fog.)		
Have any negative safety effects of wind, sun angles at sunrise and sunset been considered/minimized?		
Will the design perform safely when there is a rain, mist, ice, fog, snowfall, blowing snow?		
Has the mitigation measures for effects of snow been considered with respect to prevailing winds? Snow drifting? Open terrain?		

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Do the gradients, curves and general design approaches fit in with the likely weather and environmental aspects of the terrain? (e.g., fog-prone, icing-prone, blowing snow areas)		
Noise barriers, animal fencing		
Has the need for environmental devices been considered? (e.g., noise barriers)		
Animal crossings		
Has the known animal/migration routes in surrounding areas been considered and accounted for, e.g., need for fencing and underpasses?		
Visual distractions		
Are visual distractions (e.g., scenic vistas) adequately addressed (e.g., by providing areas to stop safely)?		
Unstable land		
Has the issue of unstable land been considered (e.g., falling rock, mudflow, mine subsidence)		

SAFETY ASPECTS NOT ALREADY COVERED	Yes / No	Comment
General safety aspects not already covered		
Has the possibility of flooding been adequately dealt with?		
Has the possibility to eliminate at-grade rail crossings by grade separation been considered?		

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Are at-grade rail crossings treated adequately from safety perspective? (e.g., sightlines, visibility of crossing, angle/curvature, advance warning systems etc)		
Have other distractions (e.g., low-flying aircraft, video screens, advertising, etc.) been adequately dealt with?		
Has the need for parking (e.g., for tourist routes, trucks, picnic or rest areas) been considered?		
Has the potential of the location to attract roadside parking been considered? Can roadside parking bays be safely incorporated in the design?		
Have any consequent unusual or hazardous conditions been considered in case there will be special events? Can these conditions be mitigated?		
Have any safety or collision problems on the existing network been addressed to avoid carrying them over to the new design?		
Has the option of providing lighting for the design been considered?		
Has the need for drivers to stop been considered? (e.g., generally, rest areas, truck parking, enforcement)		
Has the adequate access for emergency vehicles been provided?		
Has the issue of drivers temporary blindness due to oncoming headlights at nighttime been adequately considered?		
Are the driver orientation problems adequately dealt with?		

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ROAD FUNCTION, CLASSIFICATION, ENVIRONMENT	Yes / No	Comment
General road function, classification, environment		
Will the nearby road function and classification remain the same after the land use development proposal is implemented?		
Will the nearby road environment remain essentially the same after the land development proposal is implemented? (e.g., no change from rural to suburban/urban etc).		
Will the traffic characteristics in the nearby roads remain essentially the same? (consider traffic mix, speed, traffic volumes, pedestrian and bicyclists flows, public transport etc).		
If the development may cause substantive changes in the road function, classification, environment or the traffic characteristics in the nearby roads: are appropriate changes to the affected roads considered such that safety will not be degraded?		

TRAFFIC MANAGEMENT	Yes / No	Comment
General Traffic Management		
Have any adverse area-wide effects been addressed?		
Will the design keep travel speeds at a safe level?		
Are the number and location of accesses appropriate?		
Are the accesses designed to avoid backup of entering traffic onto the main road?		

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Are the facilities for public transport services safely located?		
Have bicycle safety needs been addressed and are any bicycle facilities safely located with respect to vehicular movements?		
Has the safety of pedestrian movement been addressed and are pedestrian facilities adequate and safely located?		
Is traffic calming used where appropriate to improve safety?		

ALIGNMENT	Yes / No	Comment
Horizontal alignment		
Is visibility adequate for drivers and pedestrians at proposed accesses?		
Is adequate turning space provided for the volume and speed of traffic ?		
Are curve radii and forward visibility satisfactory?		
Are sight and stopping distances adequate?		
Vertical alignment		
Are gradients satisfactory?		
Are sight and stopping distances adequate?		

PARKING AND SERVICING	Yes / No	Comment
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Parking provision		
Is on-site parking adequate to avoid on-street parking and associated risks?		
Are parking areas conveniently located?		
Is adequate space provided in parking areas for circulation and intersection sight distance?		
Are the entrances designed to avoid backup of entering traffic onto the main road? Consider placement of parking gate, possible queues, etc		
Servicing facilities		
Are off-street loading/unloading areas adequate?		
Are turning facilities for large vehicles provided in safe locations?		
Is emergency vehicle access adequate?		

SIGNS AND MARKING	Yes / No	Comment
General signs and marking		
Have necessary traffic signs and road markings been provided as part of a development?		
Is priority clearly defined at all the intersection points within the development and access routes?		
Will the signs and markings be clear in all conditions; including day/night; rain; fog; etc.?		

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Do the signs and markings meet standards and guidelines		
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LANDSCAPING	Yes / No	Comment
General landscaping		
Does landscaping maintain visibility at intersections, bends, accesses and pedestrian locations?		
Has tree planting been avoided where vehicles are likely to run off the road?		

SAFETY ASPECTS NOT ALREADY COVERED	Yes / No	Comment
General safety aspects not already covered		
Has appropriate street lighting been provided?		
Are any roadside hazards appropriately dealt with?		
Has safe pedestrian access to the development been provided?		