



Sustainable road safety: A new (?) neighbourhood road pattern that saves VRU lives

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ABSTRACT

Both the UN (2007) and World Health Organizations (2004) have declared the enormous social and economic burden imposed on society by injuries due to road collisions as a major global problem. While the road safety problem is not new, this prominent global declaration sends an important signal of frustration regarding progress to date on reducing road collisions. It is clear that governments, communities, businesses and the public must discover ways of reducing this burden, especially as it relates to vulnerable road users (VRUs), typically meaning pedestrian and bicyclist road users. Recent comparisons of global VRU collisions statistics suggest that, in addition to mixed land use density, the layout of neighbourhood roads plays a vital role in the encouragement of walkable, safe and quiet, yet accessible and sustainable communities.

The purpose of this paper was to:

- (1) Review the literature concerning sustainable neighbourhood land use and transportation network patterns, increased VRU volumes, and road safety;
- (2) Present empirical research results on road safety related to VRU volumes; and
- (3) Present emerging research regarding more sustainable land use and transportation patterns, increased VRU volumes, and road safety.

The Dutch Sustainable Road Safety (SRS) Program has produced a number of innovative land use and transportation initiatives for vehicular road users as well as non-vehicular VRUs. Following from the Dutch initiatives, these new 3-way offset, and fused grid neighbourhood patterns appear to not only have positive effects in encouraging mode split (i.e. increasing walking and bicycling, and transit), slowing traffic, and reducing energy consumption and GHG emissions; but also, to hold potential to improve road safety.

To test the road safety hypothesis, UBCO researchers evaluated the level of road safety relative to five neighbourhood patterns – grid, culs-de-sac, and Dutch Sustainable Road Safety (SRS) (or limited access), 3-way offset, and fused grid networks. Analysis using standard transportation planning methodology revealed that they would maintain both mobility and accessibility. Analysis using standard road safety analysis methodology further revealed that these 3-way offset, and fused grid patterns would significantly improve road safety levels by as much as 60% compared to prevalent patterns (i.e. grid and culs-de-sac).

It is important to note that these results ignore the road safety effects of providing convenient off-road trails along trip desire lines to shift mode choice from auto to non-auto VRU modes. Subject to further research, it is intuitive that shifting trips from auto to pedestrian/bike modes will lead to reduced auto collisions. Hence, these initial results should be considered as conservative estimates, subject to further research. In before and after studies to date, researchers have shown that increasing bicycle use does not lead to a commensurate increase in bicycle collisions, but no predictive relationship has been found in the literature. Therefore, the next steps in this research are to develop collision prediction models that provide insight on VRU mode split and overall road safety.

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