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A high-level traffic safety policy document for a small municipality: City of Saskatoon case study☆

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ABSTRACT

Many jurisdictions have developed a high-level traffic safety policy document, such as the American "Strategic Highway Safety Plan" (SHSP) or the Canadian "Traffic Safety Action Plan" (TSAP). A SHSP and TSAP are both a scientific, data-driven, four to five year comprehensive safety document that is designed to identify a jurisdiction's areas of safety concern known as "emphasis areas" and establish target safety goals (i.e., collision reduction goal(s)) for each chosen emphasis area. A TSAP often includes additional information, such as network screening results and general safety strategies/programs for each chosen emphasis area. Most of the existing literatures focus on describing the process or outcome of the development of a state or province-level policy document and has little resources specifically for a small municipality. This study discusses the development of a TSAP for a small municipality through a case study for the City of Saskatoon. This study used the most recent ten years (2001–2010) of collision data in the City of Saskatoon, Saskatchewan. The study provides knowledge for those who wish to develop a TSAP by describing the process and highlighting the challenges in developing a TSAP for a small municipality.

1. Introduction

This paper describes and discusses the development of a high-level traffic safety policy document for the City of Saskatoon in Saskatchewan, Canada. The City of Saskatoon, with a population of approximately 250,000 is a useful case study for small municipalities wishing to develop high-level traffic safety policy.

1.1. High-level traffic safety policy documents

Many jurisdictions in North America have developed high-level traffic safety policy documents. These documents are usually known as the jurisdiction's "Strategic Highway Safety Plan" (SHSP) (United States) or "Traffic Safety Action Plan" (TSAP) (Canada). In each case, traffic safety policy is based on a scientific, data-driven, four to five year comprehensive safety plan which identifies the jurisdiction's key safety concerns and establishes appropriate target safety goals. Key safety concerns are known as "emphasis areas." In Canada, the TSAP often includes network screening results and detailed strategies/programs for each emphasis area.

The selection of a set of emphasis areas allows a jurisdiction to focus on a manageable number of safety issues. A typical emphasis area might be, for example, distracted drivers. Target safety goals represent the safety improvement vision of the jurisdiction. Elvik and Vaa (2004) reported that the adoption of quantitative target safety goals can result in better safety programs and initiatives, more effective allocation of scarce resources, and the more efficient achievement of a system-wide improvement in safety. The Federal Highway Safety Administration (FHWA, 2006) noted that target safety goals are required in a SHSP to indicate what the SHSP is intended to accomplish. It is clear that the development of target safety goals allows a jurisdiction to monitor and evaluate the overall performance of its safety improvement programs. Without target safety goals, a jurisdiction would have no way of knowing whether the level of safety has improved. The goals are expressed as the target percentage reduction in the number of emphasis area collisions over a preset time period. A typical target safety goal might be, for example, a 15% reduction in distracted driver collisions.

In the United States, the FHWA noted that the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) provided guaranteed funding for highways, highway safety and public transportation, and represents the largest surface transportation investment in American history

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(FHWA, 2005). The American Association of State Highway and Transportation Officials (AASHTO) encourages each state to develop its own comprehensive SHSP (AASHTO, 2005). Smaller jurisdictions, such as cities and counties, may also develop their own safety plans. AASHTO suggests 22 emphasis areas for consideration in the plan. The 22 emphasis areas fall into six broad categories: drivers, special users, vehicles, highways, emergency medical services (EMS), and management. Many states and counties have developed a SHSP or equivalent document (e.g., State of Alabama, 2012; Fillmore County, 2010).

In Canada, the Canadian Council of Motor Transport Administrators (CCMTA) developed a federal-level TSAP known as "Canada's Road Safety Strategy 2015" (CCMTA, 2011). This document encourages each Canadian province to develop its own TSAP and emphasis areas. Smaller jurisdictions may also develop their own safety plans. The CCMTA document suggests 10 broad emphasis areas. These emphasis areas fall into two categories: six relate to target groups (e.g., young drivers, medically-at-risk drivers); and four relate to contributing factors (e.g., impaired driving, speed and aggressive driving). Several provinces and municipalities have developed a TSAP or similar document (e.g., Government of Alberta, 2006; City of Hamilton, 2009; City of Ottawa, 2011).

1.2. Developing a high-level traffic safety policy document

The development of a SHSP or TSAP requires two fundamental steps: the identification of emphasis areas and the selection of target safety goals. The development of a TSAP may require an optional third and fourth step. The third step is a network screening, i.e., the identification of high collision locations (also known as hotspots). The fourth step is the selection of specific strategies/programs designed to improve safety in each of the plan's emphasis areas.

When selecting appropriate emphasis areas, jurisdictions rely on high-level (descriptive) collision data analysis (FHWA, 2006; Bahar et al., 2003; Council et al., 2008; Park and Young, 2012) and/or political decisions (e.g., decisions influenced by stakeholders or general public) and/or a practical approach that consists of reviewing emphasis areas chosen by other jurisdictions and selecting the most common emphasis areas that appear appropriate to the particular jurisdiction (Allsop, 2009; Elvik, 2008; Masliah et al., 2004, 2006; Masliah and Bahar, 2006).

When selecting appropriate target safety goals, jurisdictions must select goals that are specific and measurable. Each goal needs a safety measure (to assess progress toward the target safety goal), a target, and a time frame. It is clear from existing safety plans that safety measures, targets, and time frames vary from jurisdiction to jurisdiction. The result is that no set of safety measures, target safety goals, and time frames applies to every jurisdiction.

In Canada, the CCMTA (2011) considered this issue, but did not produce a set of standard safety measures, targets, and time frames for nation-wide use. The CCMTA recognized that circumstances vary, and encouraged individual jurisdictions to select their own safety measures and target safety goals.

It is interesting to consider some examples of various safety measures, targets, and time frames. In the case of safety measures, Saskatchewan Government Insurance (SGI) (SGI, 2012), for instance, selected the *total number of fatalities* and the *total number of injuries*. Alberta (Government of Alberta, 2006) also chose the *number of fatalities and injuries* as their safety measure. Two Ontario cities (City of Edmonton, 2007; City of Ottawa, 2011) used the *number of fatal/injury collisions* (as opposed to the number of fatalities and injuries) as their safety measure. The City of Edmonton (2007) used the *number of collisions* for, for example, the intersection emphasis area, and the *seatbelt wearing rate* for the seatbelt emphasis area.

In the case of targets, both the percentage reduction and the scope of the target vary. Alberta's (Government of Alberta, 2006) target safety goals range from 20% to 40%, depending on the emphasis area. The City of Edmonton's (2007) target safety goals include a 20% reduction in the number of intersection collisions, and a 95% seatbelt wearing rate. SGI (2012) suggested dual goals for fatalities and injuries in Saskatchewan: a 30% reduction in fatalities, and a 10% reduction in injuries. Cities such as Hamilton (City of Hamilton, 2009) and Ottawa (City of Ottawa, 2011) chose a single target safety goal of 10% for all their emphasis areas, but Hamilton broadened the scope of its goal to include property damage only (PDO) collisions as well as fatal and injury collisions, making the Hamilton goal far more ambitious than the Ottawa goal.

The FHWA (2006) explained underlying approaches that can be useful when selecting target safety goals. For example, one approach links a jurisdiction's target goals to the national and/or partnering agencies' safety target goals so that multiple agencies can coordinate and unify their safety target goals in a complementary and non-contradictory manner.

Marsden and Bonsall (2006) described three approaches to setting target safety goals: (1) model-based, (2) extrapolation and evidence-led judgment, and (3) aspirational. The aspirational approach, also known as "Vision Zero," was first adopted in Sweden. Vision Zero's long term goal is zero fatal/injury collisions (or zero fatalities and injuries) (Belin et al., 2012). The approach assumes that the number of PDO collisions can also be reduced during the course of effort made to reduce fatal/injury collisions. Vision Zero is not a data-driven approach as it determines target safety goals on the basis of political desire and what *should* be achieved rather than what *can* be achieved. The approach has become more and more common in North America. The City of Hamilton (2009) and City of Ottawa (2011) both adopted the Vision Zero approach when determining the percentage reduction targets required to reach Vision Zero over their safety plans' time frames.

Many plans choose a five-year time frame for achieving their target safety goals. Examples include Saskatchewan (2011–2015) (SGI, 2012), and the City of Edmonton (2006–2010) (City of Edmonton, 2007). In some plans, for example, the Alberta plan (Government of Alberta, 2006), the time frame for achieving the target safety goals is not clearly specified. The third step of a TSAP is the network screening to identify high collision locations/hotspots. Many network screening methods, each with its own advantages and disadvantages, are available, including 13 methods discussed in AASHTO's Highway Safety Manual (AASHTO, 2010).

The fourth step of a TSAP is the selection of strategies/programs designed to reduce the number of collisions in each emphasis area. Numerous strategies/programs can be considered, including those described in the National Cooperative Highway Research Program (NCHRP) 500 series (NCHRP, 2012).

1.3. Study objectives

As indicated above, there are many SHSPs, many TSAPs, and much discussion about the selection of emphasis areas and target safety goals, but small jurisdictions will find that there is very little information on the challenges involved in developing a SHSP or TSAP for a small jurisdiction. Typical challenges include data availability and the need for a small jurisdiction's SHSP or TSAP to reflect the policies already set by higher level federal and state/provincial level authorities.

The objective of the study presented in this paper is to provide information useful to small jurisdictions wishing to develop a high-level traffic safety policy document. The paper discusses the processes used and challenges encountered when developing a