

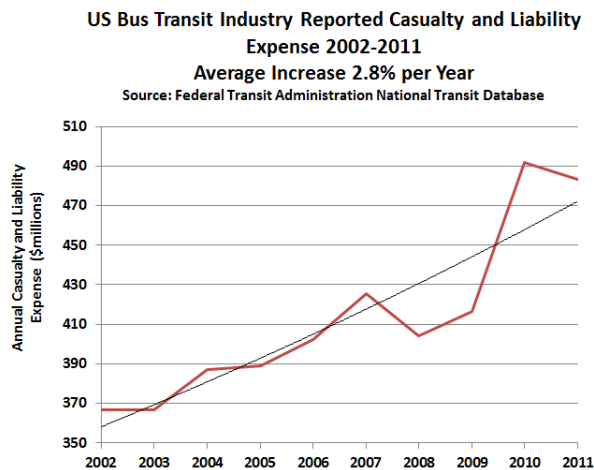
Application of Automated Driving Technology to Bus Transit – Functional Capabilities for Safety and Capacity



The Problem

Although bus transit is one of the safest ways to travel, nationwide, in 2011 alone, bus transit properties reported 3,260 collisions, 12,928 injuries, 92 fatalities, and \$483, 076, 010 in casualty and liability expenses. That amounts to an average of \$8,069 per bus.

Over the ten year period from 2002 through 2011, bus transit industry reported 897 fatalities, 134,222 injuries and a total of \$4.13 billion in casualty and liability expenses, which, as shown below, are trending higher.



The Potential to Avoid Collisions

In 2004 and 2007, the Federal Transit Administration released research reports on

the potential for technology to reduce bus crashes. These reports concluded that the systems envisioned at the time, which would warn bus drivers of impending collisions, could be effective in reducing costs.

Due to rapid advances in automated driving technology, however, automobiles are now entering the market with automated systems that not only sense that a collision is imminent, but actually take control of throttle, steering and braking functions to avoid or mitigate collisions. In particular, systems for autos are available that will initiate autonomous braking to bring a vehicle to a stop prior to collision with a pedestrian or vehicle, even if the vehicle operator does not apply the brakes manually. The Highway Loss Data Institute has concluded that forward collision avoidance technologies have reduced claims.

Collision Avoidance Systems for cars typically are bundled into optional packages that may include:

- Adaptive cruise control
- Adaptive headlights
- Autonomous emergency braking
- Blind spot detection
- Cross traffic alert/avoidance
- Driver fatigue/inattention alert
- Forward collision avoidance
- Lane departure warning
- Lane keeping assist
- Parking assist
- Pedestrian detection/avoidance
- Rear collision warning/mitigation
- Self-parking
- Side impact detection

Optional packages vary in price, but most available multi-function packages cost less than four thousand dollars.



The Partnership

We are seeking to create a partnership that includes Federal oversight and funding agencies, bus manufacturers, systems developers and integrators, standards development organizations, universities, and transit agencies, which are committed to the goal of improving bus safety, saving lives, and reducing the cost of casualty and liability claims.

The Proposed Work Plan

Given the recent advances in automotive collision avoidance systems, their moderate costs, and the increasing trend in bus casualty and liability claims, the time is ripe to revisit the application of collision avoidance technology to transit buses.

To that end, we propose a work program with four phases:

1. Create a stakeholder working group of transit agencies, bus manufacturers, technology developers, and researchers.
2. Conduct a research assessment of why casualty and liability claims are increasing and determine the potential for automated collision avoidance systems to reduce fatalities, injuries and claims.
3. Initiate the development of functional requirements and standards to allow installation of collision avoidance and driver assist technology on new transit buses and retrofit of existing buses.
4. Develop a prototype test bed that would allow developers of innovative collision avoidance and driver assist technologies to work with transit agencies and researchers to expedite development and deployment.



If you would like more information, have ideas you would like to share, or are interested in following our progress, we would like to hear from you.

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