



An **Emergency-Vehicle Transponder** contains electronic circuits designed by NASA's Jet Propulsion Laboratory. The transponder is packaged such that it can be easily mounted in the vehicle in less than one hour.

system are collected to determine the location and the heading of the vehicle. Then acceleration, speed, position, and heading data are processed and combined with a vehicle-identification number and the resulting set of data is trans-

mitted to monitoring and control units located at all intersections within communication range.

When the unit at an intersection determines that this vehicle is approaching and has priority to preempt the intersec-

tion, it transmits a signal declaring the priority and the preemption to all participating vehicles (including this one) in the vicinity. If the unit at the intersection has determined that other participating vehicles are also approaching the intersection, then this unit also transmits, to the vehicle that has priority, a message that the other vehicles are approaching the same intersection. The texts of these messages, plus graphical symbols that show the directions and numbers of the approaching vehicles, are presented on the display panel of a computer that is part of the transponder.

This work was done by Conrad Foster and Aaron Bachelder of Caltech for NASA's Jet Propulsion Laboratory. Further information is contained in a TSP (see page 1).

In accordance with Public Law 96-517, the contractor has elected to retain title to this invention. Inquiries concerning rights for its commercial use should be addressed to:

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Refer to NPO-30607, volume and number of this NASA Tech Briefs issue, and the page number.

Automated Announcements of Approaching Emergency Vehicles **Pedestrians would be given advance warning.**

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Street intersections that are equipped with traffic lights would also be equipped with means for generating audible announcements of approaching emergency vehicles, according to a proposal. The means to generate the announcements would be implemented in the intersection-based subsystems of emergency traffic-light-preemption systems like those described in the two immediately preceding articles and in "Systems Would Preempt Traffic Lights for Emergency Vehicles" (NPO-30573), *NASA Tech Briefs*, Vol. 28, No. 10 (October 2004), page 36.

Preempting traffic lights is not, by itself, sufficient to warn pedestrians at affected intersections that emergency vehicles are approaching. Automated visual displays that warn of approaching emergency vehicles can be helpful as a supplement to preemption of traffic lights, but experience teaches that for a

variety of reasons, pedestrians often do not see such displays. Moreover, in noisy and crowded urban settings, the lights and sirens on emergency vehicles are often not noticed until a few seconds before the vehicles arrive.

According to the proposal, the traffic-light preemption subsystem at each intersection would generate an audible announcement — for example, "emergency vehicle approaching, please clear intersection" — whenever a preemption was triggered. The subsystem would estimate the time of arrival of an approaching emergency vehicle by use of vehicle identity, position, and time data from one or more sources that could include units connected to traffic loops and/or transponders connected to diagnostic and navigation systems in participating emergency vehicles. The intersection-based subsystem would

then start the announcement far enough in advance to enable pedestrians to leave the roadway before any emergency vehicles arrive.

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