

Tow Plow Pilot Project

Outcome — Pilot project places in the hands of Caltrans Maintenance two innovational Tow Plow trailer units for testing and evaluation in snow fighting operations on major highways over high mountain passes.

Benefit — Expand the Caltrans level of service in snow clearing operations keeping essential highways clear while reducing operational and equipment costs.

A Tow Plow is a plow truck attachment much like a wing plow which enables a truck to clear two full lanes of highway in a single pass. The configuration and capabilities of the plow truck is the key element which will dictate the long-term success of the Tow Plow in Caltrans winter highway operations.

Tow Plow Rationale

Caltrans is responsible to ensure the highways over the Sierra Mountains remain open and clear to the motoring public throughout the winter. Caltrans operates an extensive fleet of special snow plow trucks to clear snow from the highways. These plow trucks are generally deployed in packs to clear the full width of the highway in each pass. Often an additional plow truck is added to break away and clear traffic ramps as the grouping passes.



Tow Plow Testing on Interstate 80

The Tow Plow is designed to steer out into the adjacent lane behind the plow truck with enough combined moldboard width on the highway to clear a full two lanes. This is the key value to using a Tow Plow which theoretically saves on the cost of an otherwise necessary second truck and driver. In comparison, a common plow truck fitted with a wing plow can clear approximately a lane and a half.

Tow Plow Caltrans Configuration(s)

Many snow state DOT's have successfully integrated standard Tow Plow systems into their winter operations fleet. Caltrans has a similar interest, but due to California's unique terrain, procedures and regulations, the Tow Plow needs be adapted for Caltrans use. In addition, the standard Caltrans fleet plow truck hydraulic system is not compatible with standard Tow Plow control methods.



Stock Caltrans Tow Plow In-Cab Testing Controls

Trials were conducted to determine the best Caltrans Tow Plow configuration. The Tow Plow hydraulic system was modified to allow implementation of a basic testing controller. This permitted a standard Caltrans plow truck to be used for testing. The testing system was deployed in Caltrans District 3 and operated in the Sierra Mountains on Interstate 80.

The trial period turned out to be an unusually light snow year and the Tow plow system was operated for a relatively brief period. Fortunately many important issues were resolved. Caltrans operators were satisfied with the Tow Plow performance and plowing capability, the required cable chains worked adequately on the steered axles, the required plow truck power was established to pull the Tow plow up steep mountain grades and it was proven that the standard Caltrans plow truck hydraulics could be successfully married to a Tow Plow.



Tow Plow Testing Married to Standard Caltrans Plow Truck

Turn-key Second Tow Plow Machine

The purchase of a second Tow Plow system is in progress which is intended to be a trial of an industry standard truck and Tow Plow configuration. This so called turn-key system will contain a conventional in-cab integrated controller, telemetry system and hydraulic system. This system will also have an integrated sander function to apply anti-skid treatment in both plowed lanes. Trials with this full function turn-key Tow Plow system will enable Caltrans to obtain the best possible operational efficiency to properly conduct an objective cost evaluation study.



Example Sander body Tow Plow

Ant-Skid and Anti-Ice Treatments

The trial Tow Plow was fitted with brine tanks for standard prior and post snow storm anti-ice treatment application. Caltrans does not typically apply brine on the roadway during snow plowing operations. Caltrans instead applies anti-skid treatments such as sand as needed during their plowing operations. Since the plow truck utilized in the trial operation lacked either a sander or brine application abilities, neither anti-ice or anti-skid treatments could be applied over the two lanes cleared by the Tow Plow. Consequently, additional trucks were required to apply either of these treatments. A future key consideration is to include roadway treatment capabilities in the Caltrans plow truck configuration which will have the effect of reducing the overall number of vehicles and achieve the desired cost savings.

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