

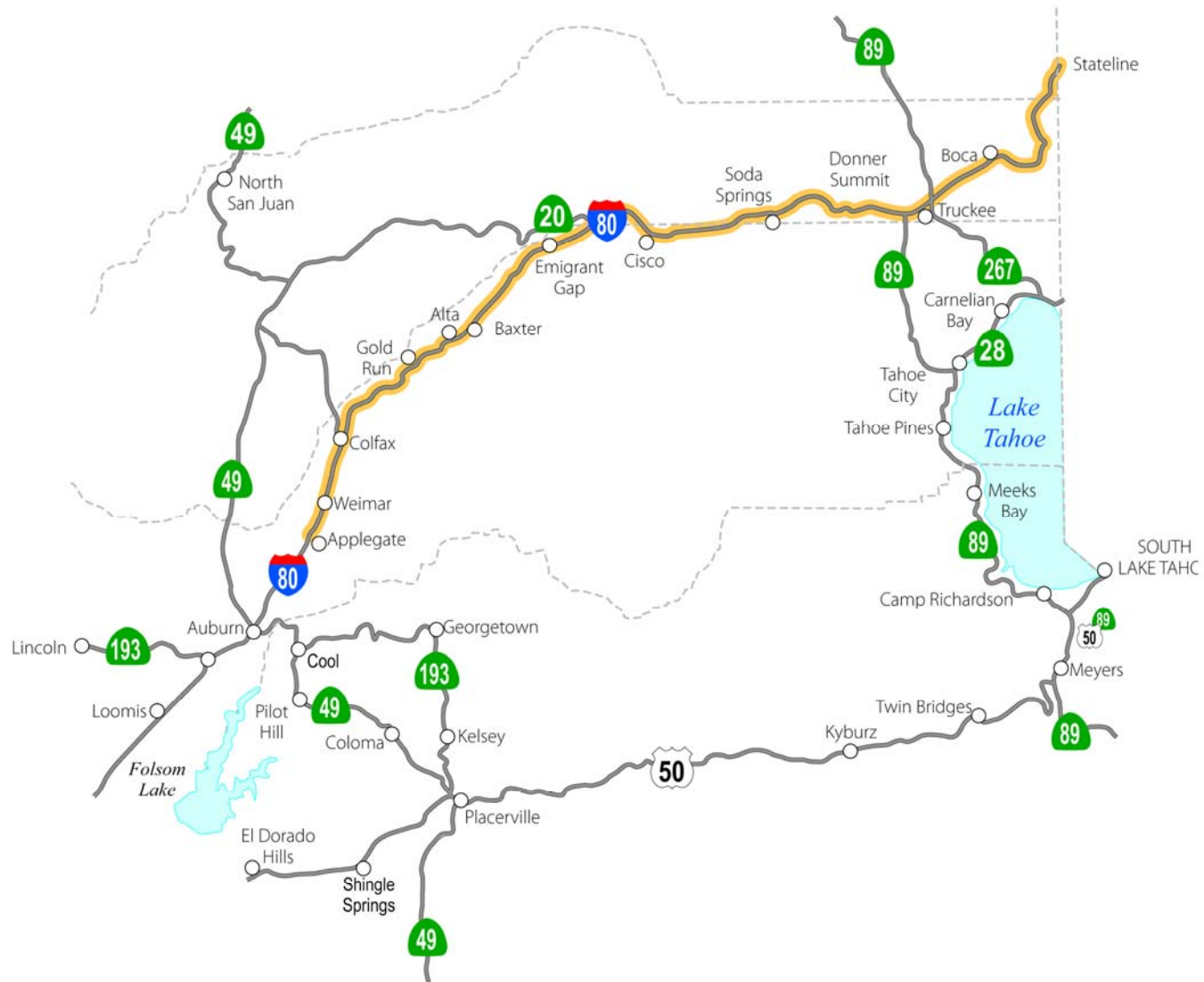


# Winter Operations on California I-80





# I-80 Snow Area Corridor





# Overview

- Safety and mobility are Caltrans primary objectives.
- Weather conditions significantly impact traffic operations, accident frequency, and levels of service.
- CT and CHP share the responsibility for ensuring the safe and efficient use of the State's highway transportation system.
- Responsible for snow removal operations on approximately 1330 lane miles of highway over ten routes in seven counties.



# Overview Continued

- Cooperation of law enforcement, CTA, local agencies and businesses.
- Great working relationship with Nevada DOT
- Department commitment to fund the I-80 snow operations.
- Seasoned/Experienced Staff.
- Equipment needs are met by our Equipment Division.
- Innovation is strongly supported and encouraged



# Winter Staffing, Facilities, Equipment

- Winter staffing is approximately 600 employees, including 150+ temporary staff.
- Twelve maintenance station facilities located in snow areas perform snow removal operations.
- Facilities include three dormitories/kitchens (Whitmore, South Lake Tahoe, Kingvale).
- Whitmore and South Lake Tahoe dorms feed and board 50 employees - Kingvale 168 employees.
- Approximately 355 units (vehicles and equipment) are used for snow removal operations (approximately 40% of the District 3 fleet).



# Communications

- Regional Traffic Management Center (RTMC) in Sacramento and Kingvale Snow Communication Center are staffed 24/7 to support winter operations.
- Operate 13 Highway Advisory Radios (HARs) along I-80 (AM1610).
- Operate 21 Overhead Electronic Changeable Message Signs (CMS) including 12 located in Nevada at Sparks, Reno, and Verdi.
- Operate 15 CCTVs along the I-80 corridor & Lake Tahoe Area.
- Caltrans Highway Internet Reporting Program (CHIRP) is the primary chain-control reporting tool.  
<http://www.dot.ca.gov/dist3/departments/mtcc/controlmp.htm>



# Winter Operations





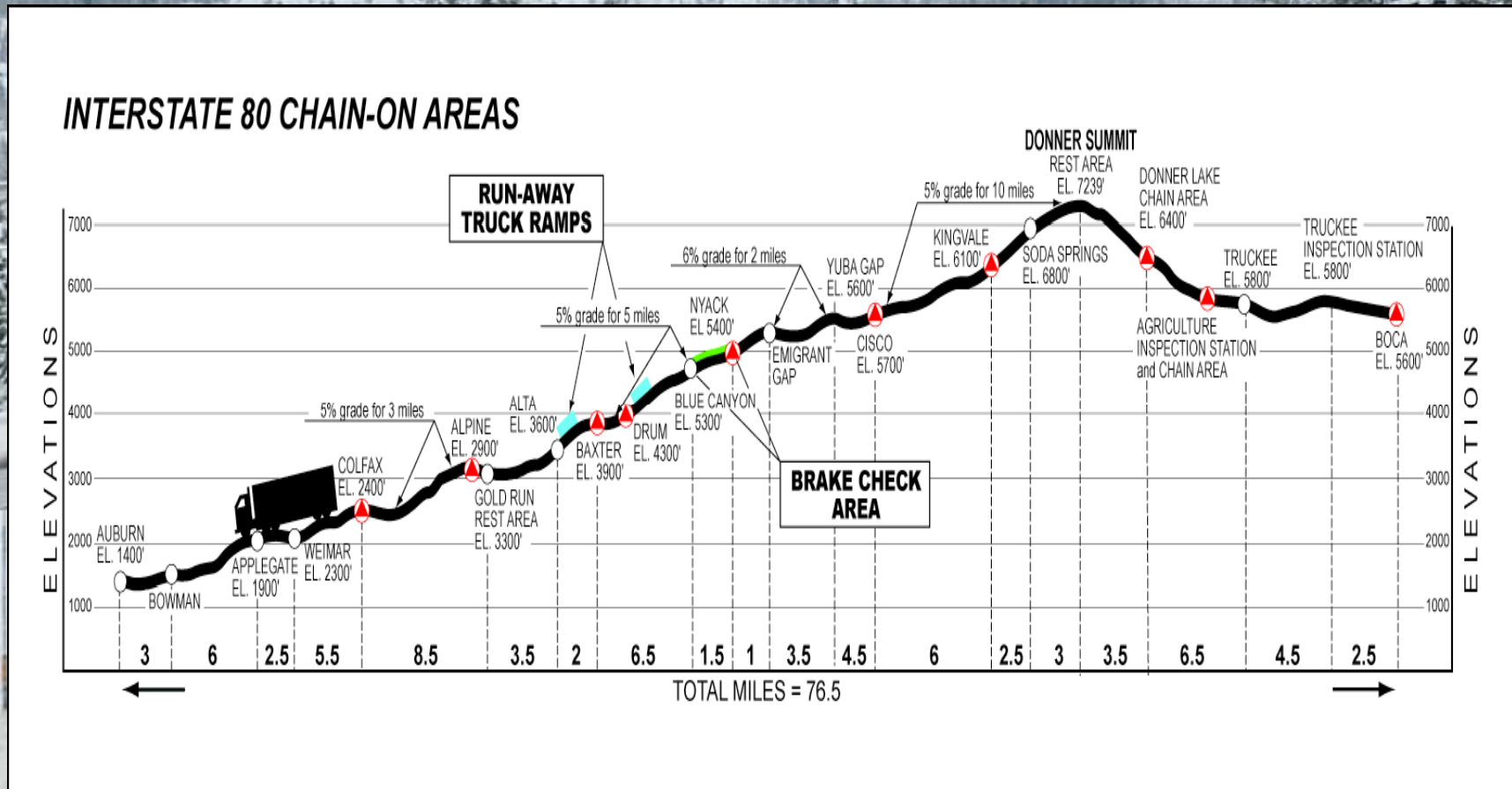
# California I-80 Challenges

- Traffic Volumes.
- Truck Issues.
- Lack of motorist snow driving skills.
- Annual Snowfall volume.
- Whiteout / Visibility.
- Traffic / Chain Control.
- Communication with the public / motorists.
- Retention of Qualified Snow Removal Personnel





# Traffic/Chain Control





# I-80 Daily Traffic Stats

- **30,000 average daily traffic (ADT)**
- **6,000 average daily trucks**

**Snow Removal is the easy part...  
traffic control to accomplish it...  
that is the challenge!**



# Why Meter Traffic ?

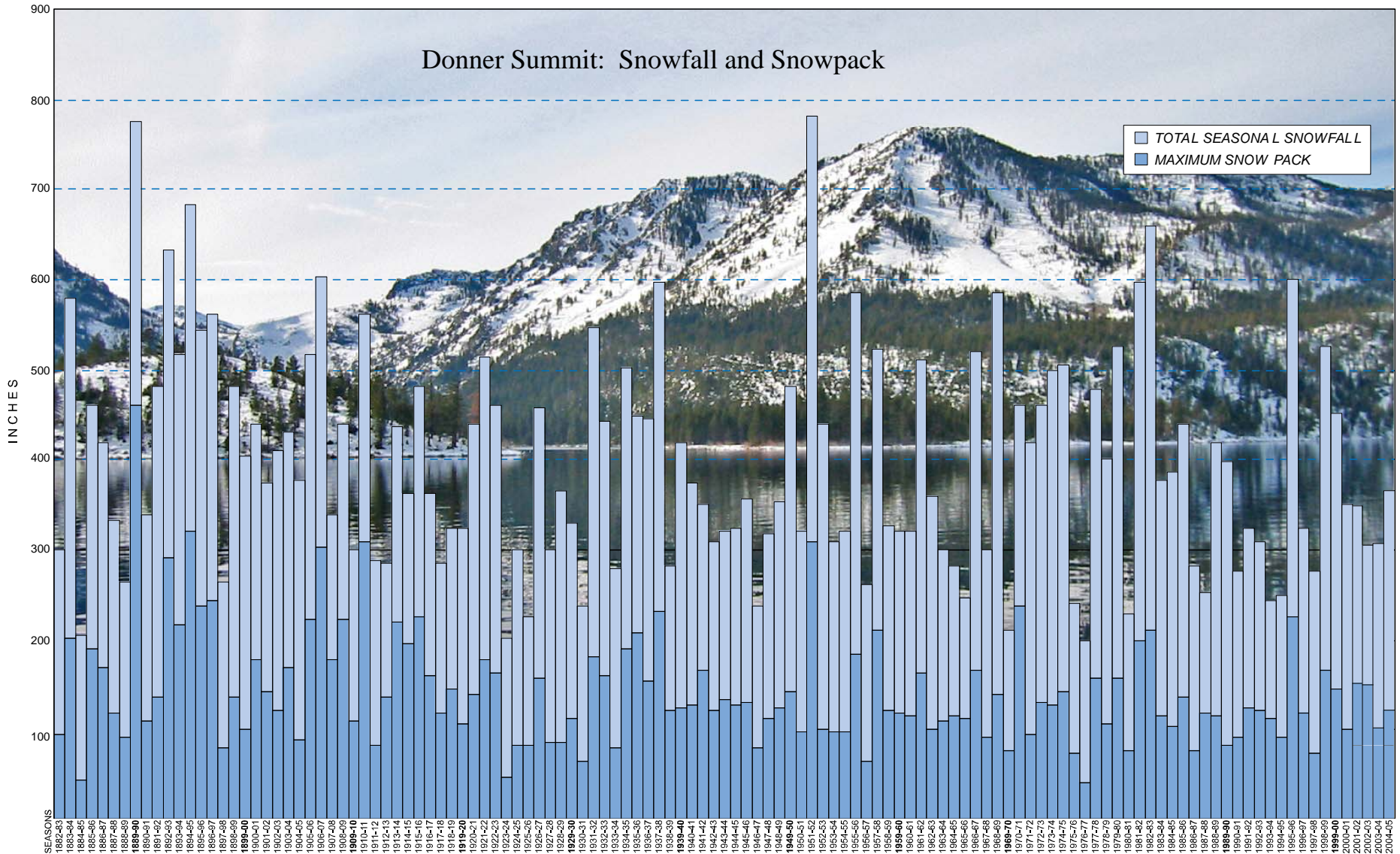


*There are currently 15,000 parking stalls at local ski areas on Donner Summit and Tahoe areas.*

*During R-2 Chain Control, traffic counts over the summit are reduced to 1500 vehicles per hour, to allow for safety and snow removal operations.*



# I-80 Average Annual Snow Fall 420"





Wet Snow + Trucks = Snow Pack





# Donner Pass Workhorse



**Sierra Cement**



Beautiful!





# Visibility – a huge problem







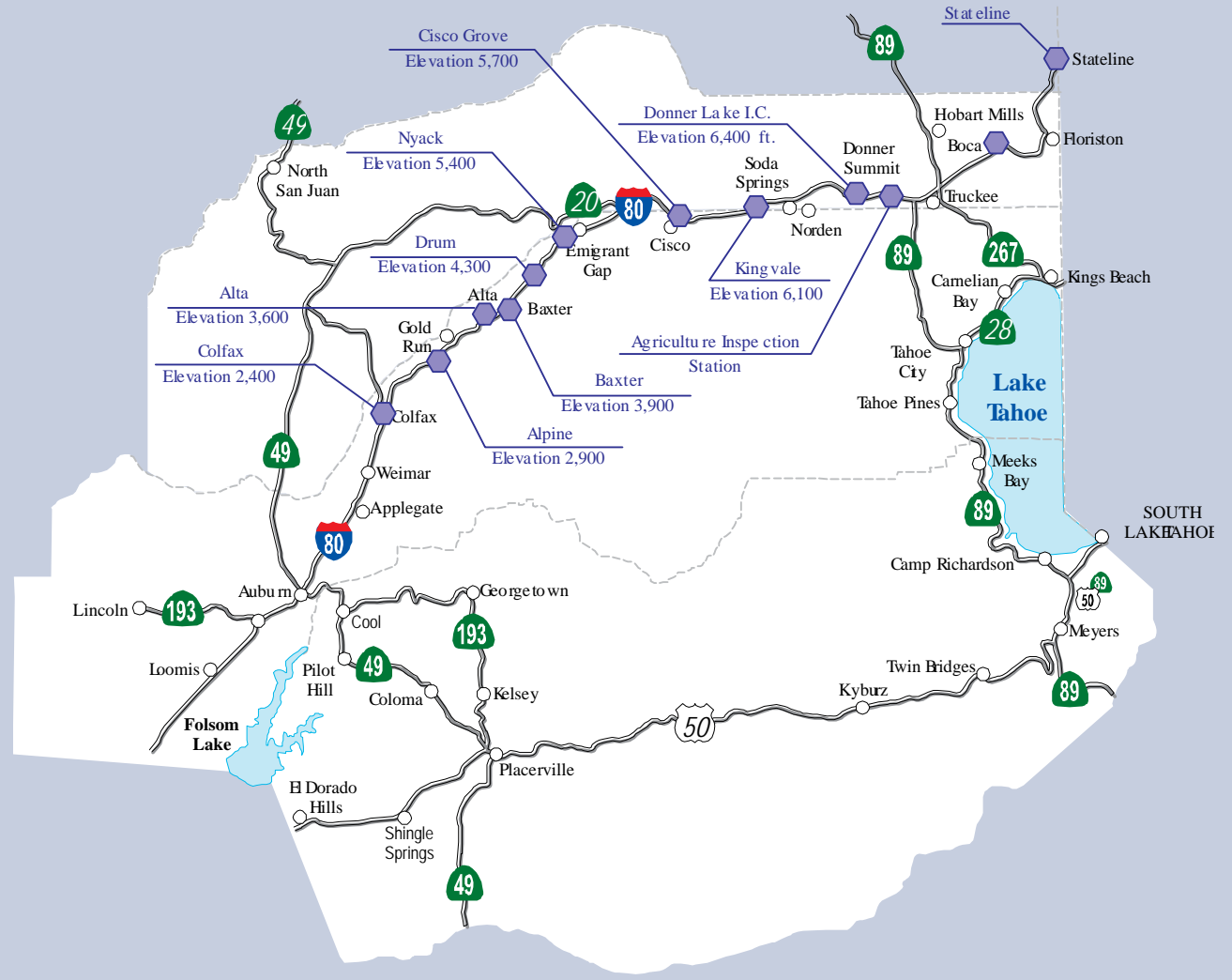
# Motorist Communications



- + Fixed CMS
- + Mobile CMS
- + HARS
- + Internet



# Interstate 80 Chain-On Areas





# Permitted Chain Installers





# I-80 Chain Control





# Light traffic day at Chain Control





# Trucks a problem then...





And now!





And again, and again.







# Our Truck Solution

During Chain Control periods I-80 is Closed to Trucks the Following Days and hours. Times are approximate.

EB Applegate:

Friday 3 pm to Saturday 1 am

WB Stateline:

Sunday 9 am to 8 pm





# Creates Smooth Sailing





# Cooperation is the Key!





# CTA / CT Pusher Program



**WORKING TOGETHER FOR CALIFORNIA**



# CTA / CT Pushers

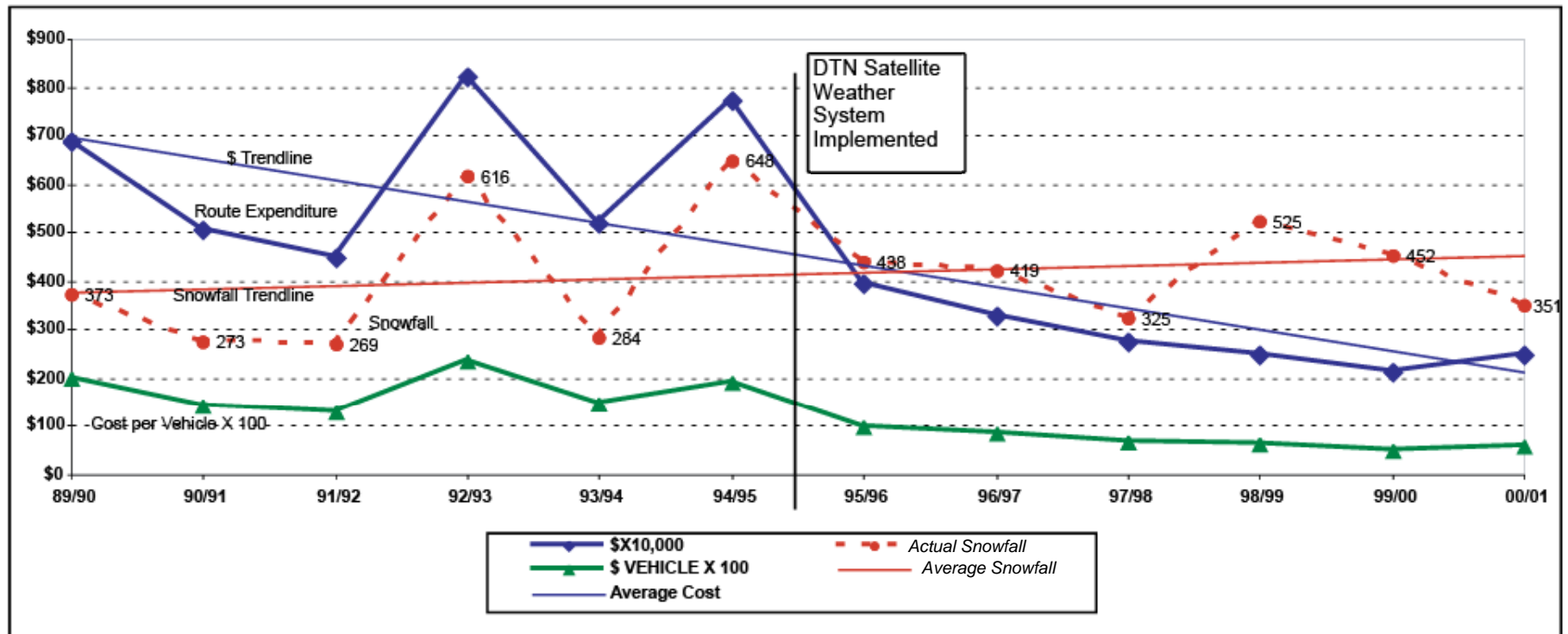




# Innovations

I-80 TOTAL COST VS. TOTAL SNOWFALL VS. COST PER VEHICLE

FISCAL YEAR	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01
\$X10,000	\$689.00	\$505.00	\$446.00	\$818.00	\$518.00	\$771.00	\$396.00	\$326.00	\$274.00	\$250.00	\$214.00	\$247.00
SNOWFALL, "	373	273	269	616	284	648	438	419	325	525	452	351
\$ VEHICLE X 100	\$200.00	\$144.00	\$127.00	\$233.00	\$147.00	\$192.00	\$99.00	\$84.00	\$66.00	\$61.00	\$50.00	\$57.00



Trendline Information: We are removing more snow for less money  
 - Increased productivity of equipment  
 - Improved storm & weather data - on time information



# Brine Operation





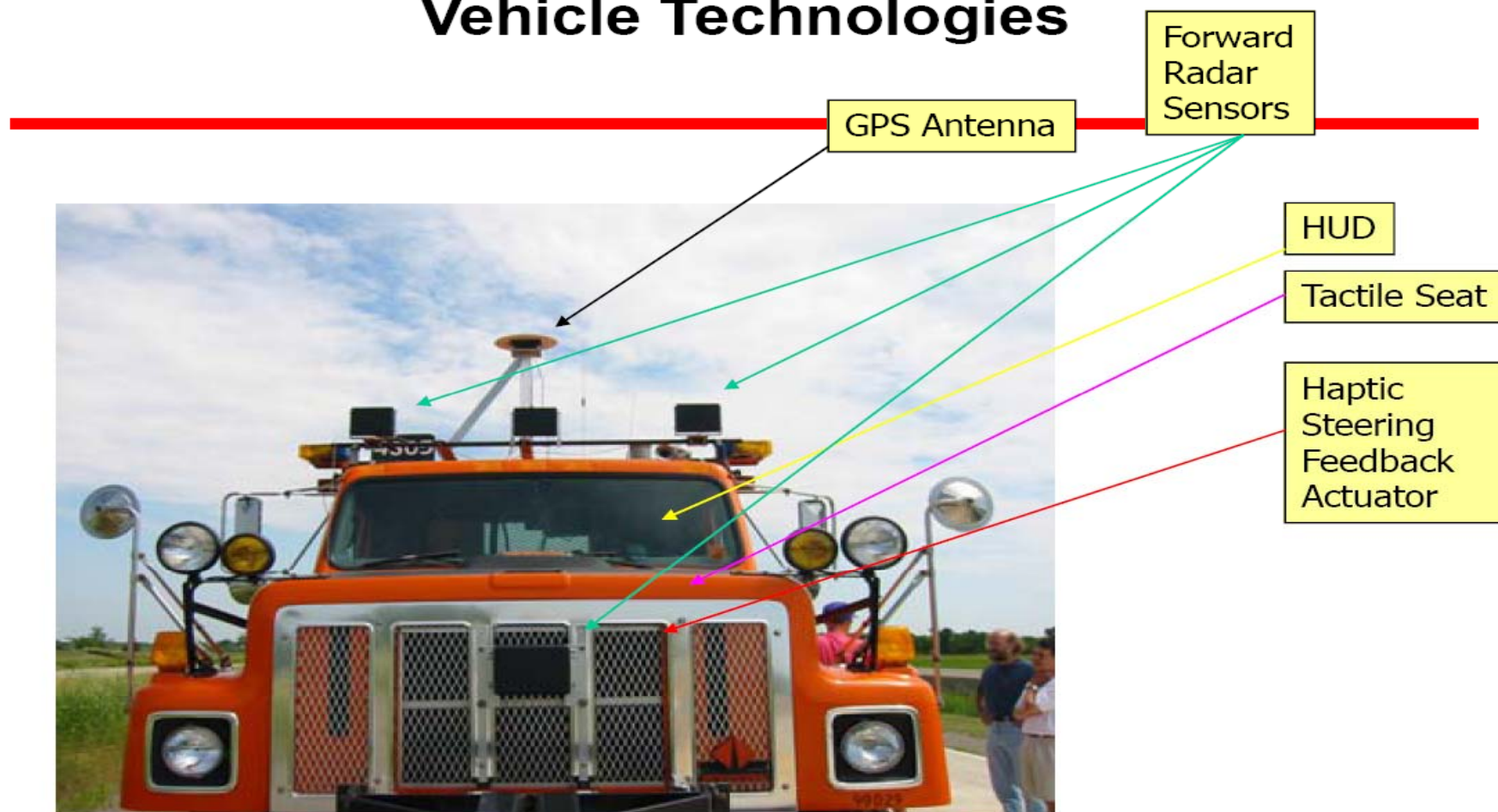
# Brine Operation





# Snow Plow Driver Assistance (GPS) System Components

## Vehicle Technologies





# TowPlow.com



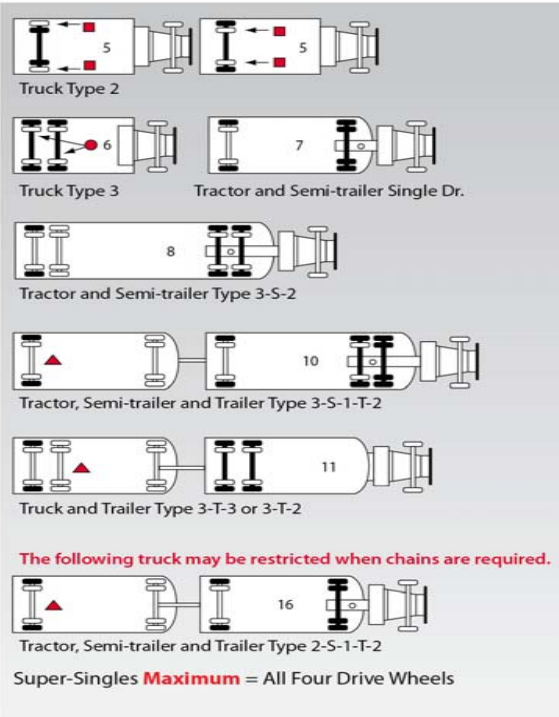


# Adjusting for individual needs

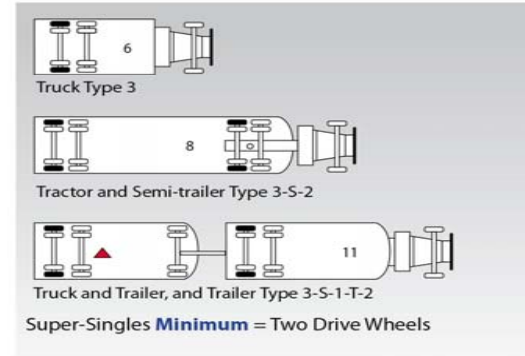
## I-80 Only Chain Requirements

**TRUCKS** - Single drive trucks must use three-railers. Cables must have minimum 1/2 inch cross-links

### Maximum



### Minimum



### LEGEND

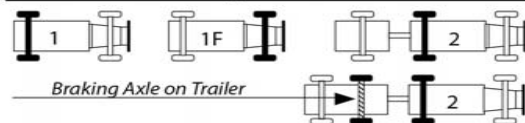
- Driving Axle
  - Non-driving Axle
  - Braking Axle on Trailer
  - Wheel With Chains or ATD
  - Wheel With No Chains
  - Chains Required On Inside, Dual if Possible
  - Drive Axle Must Be Chained
  - Chains On Trailers May Be Staggered Front and Back
  - Caltrans May Require Chains On All Drive Wheels If Conditions Warrant
  - Both Axles Must Be Chained. (four wheels with chains or ATD)
- 

### NOTES

- All vehicles, including four-wheel drive vehicles, that are towing trailers must have chains on one drive axle.
- Trailers with brakes must have chains on braking axle.
- Front-wheel drive vehicles must have chains on front (drive) axle.
- On any semi-trailer, only one set of chains is required regardless of number of axles.
- Chains are not required on tag axle.

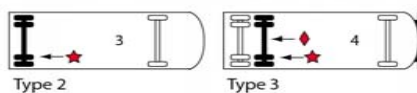


### Autos/Pickups



### Buses/Recreational Vehicles

(Articulated buses must also chain outside wheels of last axle.)





*Caltrans*

"We are here to get you there."

