Seasonal Weight Restriction Decision Process

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Alaska Department of Transportation & Public Facilities

Seasonal Weight Restriction Process

- Need for seasonal weight restrictions
- Temperature Data Probe (TDP) program
- Web application
- Weight restriction decision process
- Weight restriction notice distribution
- Future developments

Alaska Regulation 17 ACC 25.100(a)

"The Department of Transportation and Public Facilities may prohibit the operation of vehicles upon any highway or may impose restrictions on any aspect of vehicle operation on any highway whenever the highway, in the judgment of the commissioner, may be seriously damaged or destroyed by such operation"

Objectives for Restricting Maximum Allowable Axle / Axle Group Weights

- Prevent pavement damage
- Avoid higher road maintenance costs
- Limit vehicle wear and tear

Spring Thaw Process

- Thaw starts at surface and progresses down slowly
- Moisture content rises in the critical thaw layer
- Water saturated layer of soil develops between uppermost zone of pavement and the frozen mass beneath

Pavement Damage

- Critical thaw zone top 2 feet
- Trucks and trailers press down, increasing thaw zone's pore pressure causing:
 - "Quick" foundation conditions
 - Loss of strength in granular soil mixture
 - May trigger pavement flexure or rutting

Temperature Data Probe Program

- 1980 TDP program began
- 1990 Central Region Traffic coordinated effort among ADOT&PF regions
- 2002 integrated with the Road Weather Information System (RWIS) ScanWeb (SSI)
- 2005 automated data loading into Oracle and Highway Data Port data warehouse web interface
- 2006 integrated graphical display in the RWIS public web site roadweather.alaska.gov
- Today 70 sites statewide

Temperature Data Probes

- Measurement Research Corporation 101-16
- 6' vertical thermistor string
- 15 thermistors encased in epoxy
- In-pavement pig-tail thermistor at many sites
- Air and cabinet temperatures at non-RWIS sites



TDP MRC 101-16 Profile













TDP Deployment

Two statewide networks

 RWIS: Integrated with Road Weather Information System (RWIS) sites

- Central Region Traffic Highway Data Section

Integrated with RWIS

- TDP collocated with Environmental sensor stations (ESS) – 15 level
 - No pavement surface thermistor
 - Use Surface Systems Inc (SSI) FP2000 or TS1000 for in-pavement surface temperature
 - Connected to remote processing unit
 - ESS tied to State's WAN
 - Polled hourly by RWIS servers
 - Fowarded to HQ's ftp site

Central Region Traffic

- Highway Data Section manages program
- Data collected using Campbell Scientific (CR-10X) data loggers
- Few sites are still manual
- Polled periodically, more often in Spring
- Data forwarded to HQ's ftp site



RWIS Web Application TDP Corridor Selection



RWIS Web Application TDP Corridor Map



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Fact-based Temporary Weight Restrictions

- Downward thaw progression TDP analysis
- National Weather Service 7 day forecasts
- Local maintenance and operations staff experience
- Roadway thermal structure conditions



Weight Restriction Notice Distribution



Weight Restrictions - Ketchikan Area

Category: Public Notices Sub-Category: Weight Restrictions Publish Date: 03/21/2006 **Department: Transportation & Public Facilities**

Location: Ketchikan Coastal District: N/A

Body of Notice:

Effective 03/21/06, 10:00 a.m. and until further notice the following emergency weight restrictions are in effect for listed state maintained highways and roads in Ketchikan area.

This weight restriction applies to trucks of 10,000 lbs. or more.

State roads listed: 50% of legal load D-2 Loop, D1-Loop, No. Point Higgens Spur, Potter, South Point Higgins, Wood Road, Powerhouse, North Tongass (end of pavement to Waterfall II), Shoup Street, Revilla Road, Cranberry, Knudsen Cove, North Point Higgins, Pond Reef, Shoreline, Sunset, Roosevelt Drive.

State roads listed: 75% of legal load North and South Tongass from City Limits to end of road. North City Limits start at mile 4418 N. Tongass. South City Limits start at mile 1 S. Tongass.

Legal axle loads are: Single Axles 20,000 lbs. 50%=10,000 2-axle tandem 38,000 lbs. 50%=19,000 3-axle group 42,000 lbs. 50%=21,000

For specific information, call Nick Farstad, Ketchikan Maintenance Station at (907) 225-2513.

Future Developments

- Automate manual TDP sites
- Use only 16-level installations

 Modify RWIS ESS to Linux operating system
- Collocate with other data sensors
- Provide TDP information to truckers and public via <u>http://www.roadweather.alaska.gov</u>
- Leverage with AURORA RWIS Pooled Fund TDP Project: <u>http://www.aurora-program.org</u>

Conclusion

- Fact-based seasonal weight restrictions
 - Downward thaw progression analysis
 - Roadway thermal conditions
 - NWS 7-day forecasts
 - Local M&O staff experience
- Fully automated data loading
- Integrated with RWIS program
- Allows commercial trucking opportunity to haul full loads until restrictions are warranted

Contact

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(907) 465-6998

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http://www.roadweather.alaska.gov

http://www.dot.state.ak.us/iways/roadweat her2/forms/IndexForm.html