

# INNOVATION

## Snowplowing Into the 21<sup>st</sup> Century – Solutions for Gang Plowing in Kansas City and St. Louis

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*Department of Transportation, Viking Cives*

Owen Hasson  
Wess Murray

Kory Krause  
Steve Rider

Bob Lannert

The Missouri Department of Transportation (MoDOT) is known nationally as one of the most aggressive agencies in keeping roads open during snowstorms. However, this approach requires a large amount of staff time and equipment. Expansion of interstate routes within that state from three to five lanes has further complicated snow removal operations. Each winter, MoDOT operates more than 1,700 snowplow trucks requiring more than 3,000 operators for 24-hour service.

The implementation of the TowPLows, a trailer plow pulled behind MoDOT snowplow trucks, began as an idea of one of MoDOT's technical experts. Based on his farming experience and knowledge of newer farming equipment technologies, he questioned why the concepts of wide farming equipment could not be used to dramatically increase snowplowing on Missouri highways.

MoDOT snowplow trucks, plow 10 to 11 feet wide, but require overlapping when operating in gang plowing. This approach often requires eight or more trucks to clear five lanes. The challenge was to find a method to clear two lanes (24 feet or more) with one truck and operator.

The development process had numerous obstacles to overcome and took nearly five years. However, with the help of Viking Cives, MoDOT's snowplow contractor, the first TowPLow was placed in service January 2005 in Kansas City. MoDOT now has more than a dozen in service. With just one truck able to do the work of more than two conventional snowplow trucks, the benefits of TowPLow are adding up quickly. TowPLow is an effective approach allowing MoDOT to provide superior customer service today and in the future.

*For additional information on this team's accomplishment please contact Carlis Callahan at 573-526-6752 or at [Carlis.Callahan@modot.mo.gov](mailto:Carlis.Callahan@modot.mo.gov).*



State of Missouri  
2007 Governor's Award for Quality and Productivity

NOMINATION FORM

**I. GENERAL INFORMATION**

Department: Missouri Department of Transportation (MoDOT)

**1. Project or team name.**

Snowplowing into the 21<sup>st</sup> Century - Solutions for Gang Plowing in Kansas City and St. Louis

**2. List the name of all team members, job titles and organization.**

Bob Lannert – Maintenance Liaison Engineer – Maintenance Operations- Central Office, MoDOT  
Steve Rider – MoDOT's Snowplow Contractor – Vice President - Viking Cives, Morely, Missouri  
Kory Krause - MoDOT's Snowplow Contractor – Designer -Viking Cives  
Wess Murray – District 4 Superintendent - Maintenance Operations, Kansas City, MoDOT  
Owen Hasson – District 6 Superintendent - Maintenance Operation, St. Louis, MoDOT

**3. Nomination category.**

(Check only one)

☒ INNOVATION

☐ CUSTOMER SERVICE

☐ PROCESS IMPROVEMENT

☐ TECHNOLOGY IN GOVERNMENT

☐ EFFICIENCY

**4. Why did you select this nomination category?**

This innovation has impacted urban gang plowing, snow removal efforts and will eventually impact statewide snow removal. Most all snowplow trucks clear only 10 to 11 feet with special wing plow trucks clearing up to 16 feet. The TowPLow has enabled one truck and operator to clear more than 24 feet. Missouri was the only user in the world, who cleared two lanes of interstate pavement with only one truck last winter. This innovation again proved itself when two Kansas City units cleared I-70 from shoulder to shoulder in the November 30, 2006 storm. One TowPLow truck replacing two or more trucks has proven to be a new innovative solution for 21<sup>st</sup> century snowplowing challenges.

**II. BACKGROUND**

**1. When did the team begin?**

MoDOT technical staff identified the situation in 1996, when viewing photographs of gang plowing. MoDOT was using six to 10 trucks to plow multi-lane interstate routes in St. Louis. Most people saw several MoDOT trucks doing a great job, clearing five lanes or more. The question: Where else are we not plowing when we have eight trucks plowing in one gang at one location? The implementation did not start as a team, but as an evolution over time. The process became a working partnership between MoDOT and Viking Cives to meet MoDOT's snowplowing performance expectations to plow more with one truck. This group dynamically evolved and interacted in 2004.

**2. When did the team implement this project?**

The first TowPLow was deployed in Kansas City, Missouri, January 2002.

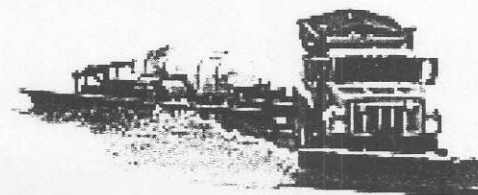


FIGURE OF TOWPLOW

**3. How long has the project been implemented?**

☐ 0 - 3 Months

☐ 4 - 6 Months

☐ 7 - 9 Months

☐ 10 - 12 Months

X 12 or more

X On-going Project

**III. RESULTS/ACCOMPLISHMENT**

**1. What did the team accomplish?** (Use specific data and examples to identify accomplishments and whom benefited: i.e. agency, division, department, citizens, individuals, etc. Information must be included for nomination to be considered for GAQP.)

Using TowPLows benefits MoDOT by allowing one operator and one snowplow truck to do the work of two to three standard snowplow trucks in gang plowing situations. MoDOT has built hundreds of additional lane miles over the last 20 years and needed additional snowplow trucks and staff to plow these lanes. TowPLows will help eliminate the demand for additional trucks and the two operators per truck required to operate two shifts per day in snow removal. TowPLows help ensure our highway system is available during snowstorms for just-in-time commerce, as well as routine travelers.

**2. Which of the following describes the benefits of the accomplishment?** (Check all that apply and provide an explanation)

X cost reduction

X time savings

X improved process

☐ other: describe

**III. RESULTS/ACCOMPLISHMENT (continued)**

**3. Explain how the accomplishments of the team are beyond regular duties and responsibilities** (150 words or less).

The trailer plow concept, now known as a TowPLow, was a concept never seen nor utilized in the world. However, once MoDOT technical experts shared the concept with urban field superintendents, the benefits of clearing up to 26 feet of pavement with only one truck sold the concept. MoDOT partnered with Viking Cives to overcome the design problems and operating challenges. The team encountered many doubtful, unbelievers. Managers, operators, and other staff often questioned its concept and value until they actually saw it work. The TowPLow has become a tool in urban areas and is about to prove itself in high-speed rural interstate plowing in Missouri. Viking Cives also has convinced other states to use the TowPLow.

**IV. MEASUREMENT/EVALUATION**

**1. Explain how the team measured and evaluated this project** (Describe in detail the process and results).

The goal was to double snow removal production by using existing trucks and manpower. The implementation of TowPLows indicates production may more than double for the same manpower. One TowPLow combination actually replaces about 2.5 conventional snowplow trucks in gang plowing and improves safety when compared to special snowplow trucks with wing plows in gangs.

A conventional snowplow truck clears 10 to 11 feet. A special snowplow truck with a wing plow can clear a maximum of 16 feet. A truck with a TowPLow clears 26 feet and may eventually plow at speeds well above the common plowing speeds of 30 to 40 mph. A future goal is to safely plow rural interstate routes at speeds approaching 60 mph. Plowing faster can reduce rear end accidents with snowplow trucks and increase public safety by providing a higher level of service with fewer trucks. Fewer snowplow trucks, traveling faster, will reduce the likelihood of traffic hitting snowplow trucks.

**2. Are the benefits derived from this project:** (Check only one.)

X Recurring ☐ One-time

**3. Please explain in 300 to 500 words.**



Most snowplow trucks have an expected life of 15 to 17 years. The TowPLow has an expected life of 30 years or more, and can be readily hooked to most existing or future replacement trucks. Every TowPLow replaces at least two trucks and four operators, since every snowplow truck requires two operators to work 24 hours shifts. Therefore existing trucks can be removed from gangs and used elsewhere. The TowPLow also may facilitate the ability to blend contractors' trucks into MoDOT's snow removal activities, supplementing efforts without adding additional state employees to operate snow equipment.

The TowPLow may prove to safely plow at high speeds on rural interstate routes and provide a solution to clear I-70 across the state, when it eventually has three lanes and two shoulders, totaling 60 feet of pavement in each direction. Three lanes and two shoulders would require six to eight standard trucks, where three TowPLow trucks can clear all lanes and shoulders in one pass.

MoDOT plans to have over 20 in service for winter 07/08 in several urban areas with a few on rural interstates and other divided highways.

#### V. RECOGNITION/AWARDS

1. Has this project ever been nominated for the Governor's Award for Quality and Productivity? If yes, when?

No

2. If yes, for which category was it nominated?

3. Has this project received any other awards or recognition in the past? If yes, describe.

No.

#### VI. NOMINATOR'S INFORMATION

##### NOMINATING DEPARTMENT

Name	Signature	Telephone Number	E-Mail Address
CARIS CALLAHAN	<i>Caris Callahan</i>	(573) 522-9757	CARISCALLAHAN@moDOT.mo.gov

#### VII. DEPARTMENT COORDINATOR INFORMATION

##### DEPARTMENT

Name	Signature	Telephone Number	E-Mail Address
GLORIA ANDREWS	<i>Gloria Andrews</i>	(573) 526-3637	GLORIA.Andrews@moDOT.mo.gov

#### VIII. DEPARTMENT DIRECTOR APPROVAL

DEPARTMENT DIRECTOR'S NAME	DEPARTMENT DIRECTOR'S SIGNATURE*
Pete Rahn	<i>Pete Rahn</i>

**Nomination must be signed ONLY by the Department Director to be eligible for consideration.**  
**Nominations not signed by the Department Director will be returned.**

