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**THE TOWPLOW – An AASHTO TIG Project**




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- What is a TIG Anyway?
- How does a TIG work?
- What benefits does it provide?




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- It is a group created by AASHTO
- Looks at one new technology a year (so not many of them operating at any one time)
- *“scans the horizon for outstanding advancements in transportation technology”*
- *“invests time and money to accelerate their adoption by agencies nationwide”*



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- Each year, new technologies can be nominated
- *“TIG selects a highly valuable, but largely unrecognized procedure, process, software, device, or other innovation”*
- Adopted by at least one agency
- Market ready
- Available for use by other agencies



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- Provide leadership to promote and support rapid implementation of selected technologies
- Identify and mobilize technology champions
- Seek rapid deployment of technology at the local level
- Create a partnership with all stakeholders, including industry and local governments



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- Promising new technologies are identified and rapidly evaluated
- The benefits of the new technology are clearly enumerated and shared
- Technology gets spread rapidly so as many agencies as possible can share in the benefits

  
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**TOWPLOW**  
**Clearing the Way to Keep America Moving**

Tim Jackson  
 Maintenance Liaison Engineer  
 Missouri DOT

APWA North American Snow Conference  
 The TowPlow – AASHTO Technology Implementation Group Project  
 April 10, 2011

  
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**THE CHALLENGE:**  
**Urban Gang Plowing**



**7 to 10 trucks to clear one direction of urban multi-lane roads**

  
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**THE ANSWER:**  
**Plow Wider**



“With just one truck (and operator) able to do the work of more than two conventional snow plow trucks, the benefits of the TowPlow are adding up quickly”

- excerpt from 2007 Missouri Governor's Award for Quality and Productivity

  
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**WHAT IS TOWPLOW?**

**Steerable Snow Plow Trailer Equipped With 26' Moldboard**  
**Liquid Delivery System or Granular Spreader**  
**Plows 24' Wide Path – Width of Two Traffic Lanes**



  
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**WHY TOWPLOW?**




**Higher Level of Service to Roadway Users**  
**Ready-For-Use**  
**Increased Performance and Safety**

  
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**WHY TOWPLOW?**




**Satisfies Customer Needs:**  
**Prudent Stewardship of Taxpayer Funds**  
**Roadway Safety**



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**WHERE CAN TOWPLOW BE USED?**

- Urban 5-lane Sections with Center Turn Lanes
- Climbing Lanes
- Alternate Passing Lanes
- Two Lane Roads with Paved Shoulders






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**THE BENEFITS**

**Cost-Efficiency**

- Operational Improvements
- Stretching Existing Resources
- Reduced Contracting Costs





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**THE BENEFITS**

**Quick Payoff**



$$\text{Hours to Payoff} = \frac{\text{Cost}_{TP}}{\text{Cost}_{Driver} + \text{Cost}_{Truck}}$$



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**THE BENEFITS**

**Example**

- Driver = \$35/hour
- Truck = \$40/hour (25 mph)



$$\text{Hours to Payoff} = \frac{\$75,000}{\$35 + \$40} = \frac{\$75,000}{\$75} = 1000 \text{ hours}$$




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**THE BENEFITS**

**Increased Safety**

- Potential for Traffic Accidents Reduced
- Cycle Time Lowered





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**THE BENEFITS**

**Keeps America Moving**

- Offers Economic Vitality
- Improves Mobility





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**THE BENEFITS**

**Reduces Emissions**

- Less Fuel
- Lower Carbon Footprint





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**THE BENEFITS**

**Stronger Relationships**

- Innovation
- Cost Savings
- Efficiency





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**THE BENEFITS**

**Increases Profitability**

- Lower Operating Costs
- Increased Competition
- Lower Contracting Costs





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**THE BENEFITS**

**Improves Operations**

- Decreased Cycle Time
- Higher Operating Speed
- Improved Reliability





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**THE BENEFITS**

**Improves Operations**

- Extended Plow Blade Life
- Quicker Positioning or Relocation of Equipment
- Efficient Clearance





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**THE BENEFITS**

**Improves Operations**

- Rural and Urban Area Benefits
- Builds Clearing Capacity



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**Concept Proven**

**Four MoDOT-Fabricated TowPlows (1-20' and 3-30')**



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**Expanded Use of 14' Front Plows**

**Increased Productivity**



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**Viking-Cives Group**

**Variable Pricing**



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**60+ TowPlows In Service**

**2 TowPlows in Each District**

**24 in Kansas City**



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**Road Geometry**

**350 hp & Hydraulics to Deploy TowPlow**



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**RESULTS**

**Multi-Lane Gang Plowing Operations**



**57% Fuel and Labor Savings**



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**RESULTS**

**Rural, 4-Lane Divided Highways**



**50% Fuel and Labor Savings**



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**Missouri Governor's Award for Quality and Productivity**



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**Currently 6 TowPlows with plans to add additional units**



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**Zero accidents in over two years**

**Public respects the TowPlow and visibility is not a problem**



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**Laser guidance system to aid the operator**

**The laser projects the path of the deployed TowPlow**



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**Used in both rural freeway and urban two-lane applications**





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**Acquired in 2009 after MoDOT Peer Exchange**

**Salt Spreader and Retrofit Prewet Tank & Kit**







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**Clears 204 lane-miles of I-40, Jackson to Memphis**

**Traffic Respects and Does Not Crowd Plow**





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**Küper Ceramic/Rubber Composite Blade**

**Worked Well on Hard Packed Snow**





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**Winter of 2008/2009**

**Salt Lake City**

**Northeast I-80**







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**Stainless Steel Spreader**

**Prewet Tank & Kit**

**Turnkey Ready**





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**QUESTIONS AND COMMENTS?**



**TOWPLOW**

**Clearing the Way to Keep America Moving**

**The Lead States Team** 

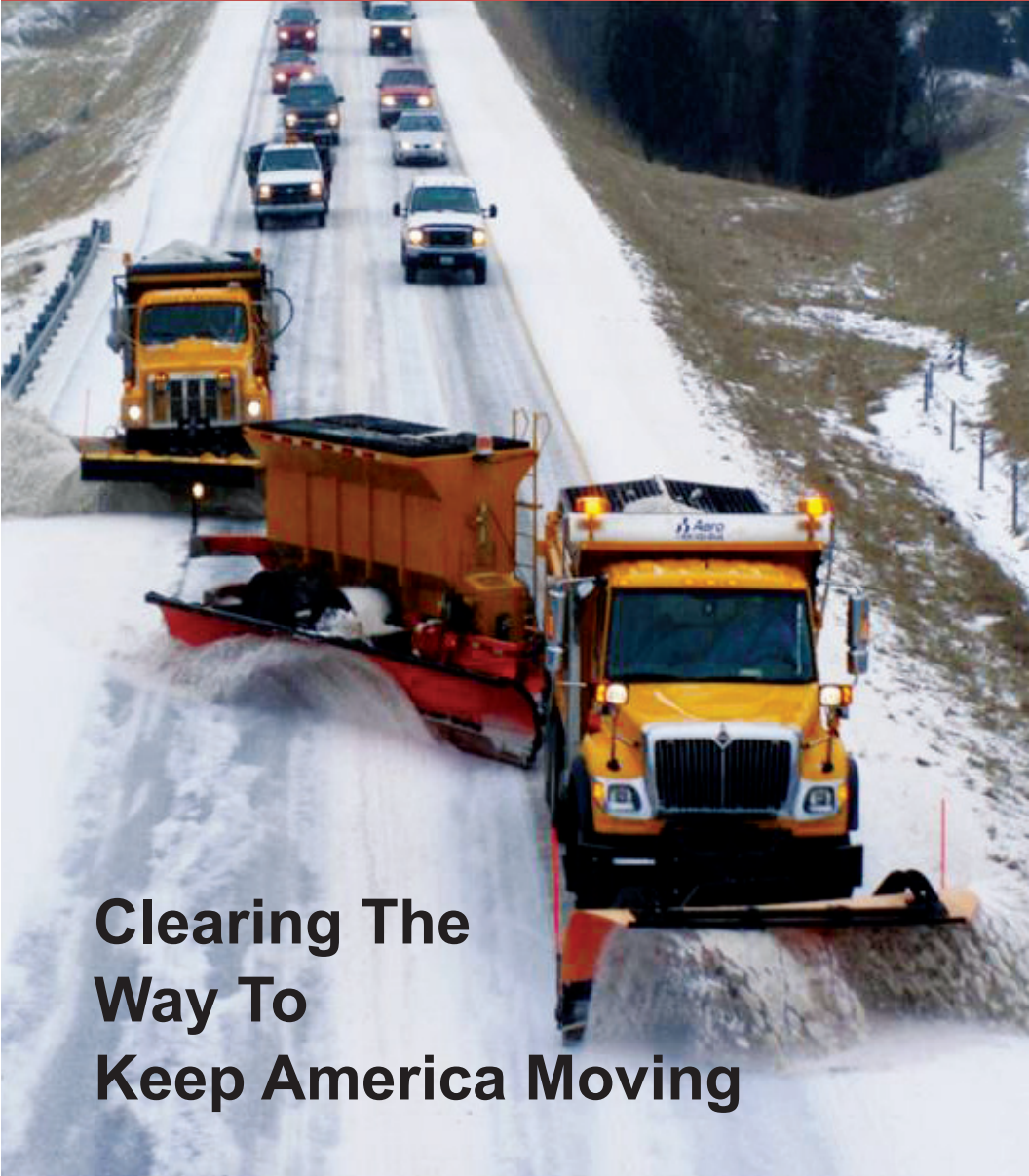
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	<b>TOWPLOW</b> <b>Clearing the Way to Keep America Moving</b>



# TOWFLOW | TIME-SAVING, SAFE ADDITION TO CONVENTIONAL SNOW PLOWING TRUCKS



**Clearing The  
Way To  
Keep America Moving**

**“With just one truck (and operator) able to do the work of more than two conventional snow plow trucks, the benefits of the TowPlow are adding up quickly”**

– excerpt from 2007 Missouri Governor’s Award for Quality and Productivity



## WHAT IS A TOWPLOW

The TowPlow is a steerable snow plow trailer equipped with a 26' moldboard and either a liquid delivery system or a granular spreader. In conjunction with a conventional snow plow truck, the combination is able to plow a path approximately 24' wide – or the width of two typical traffic lanes.

## WHY TOWPLOW? WHY NOW?

The TowPlow is a time-saving, safe addition to conventional snow plowing trucks and provides a higher level of service to roadway users.

This ready-for-use, innovative technology not only creates a method to increase performance but directly impacts two customer needs: prudent stewardship of taxpayer dollars and roadway safety.



## **Improves Cost-Efficiency**

The TowPlow embodies the “doing more with less” concept. It creates operational improvements in snow removal that contribute significantly to cost efficiencies.

With shrinking numbers and reallocations of agency personnel, the task of maintaining a nonetheless growing network of lane miles becomes ever more challenging. The TowPlow can increase productivity, allowing agencies to maintain or even increase levels

of service in the face of reduced operating budgets and fewer personnel for snow and ice removal.

Agencies that outsource snow removal operations may benefit from reduced contracting costs because contractors may realize increased efficiency and profitability from utilizing the TowPlow.

## **Increases Operator and Motorist Safety**

Fewer passes with less equipment mean lower potential for traffic accidents during snow and ice removal. Reductions in cycle time also give the traveling public more hours in which to operate on fully cleared roadways as a weather event unfolds.

TowPlow is forgiving – it pivots when it strikes an object and does not tend to rotate the tow vehicle, which reduces the potential for tow vehicle damage.

## **Keeps America Moving**

Unfettered freight and passenger travel is essential to economic vitality. Clearing more lanes in less time with less equipment improves mobility, and offers considerable economic benefits to any State.

## **Reduces Emissions**

The TowPlow reduces the number of vehicles required to clear a given roadway. In turn, this means less fuel use and a lower carbon footprint per cycle or weather event.



### **Builds Stronger Relationships With Customers**

TowPlow is a visual demonstration of the agency's commitment to innovation – communicating cost savings and other efficiencies that the public can easily understand and respect.

### **Increases Profitability**

Removing snow from a wider portion of roadway at potentially higher speeds means lower operating costs. Although contractors will have short-term

increases in capital costs, those committed to long-term snow removal services will, in the long-term, offset those increases with lower operating costs. As contractors take advantage of lower operating costs, the competitive nature of the bidding process will lead to lower contracting costs for state agencies.

## Improves Operations

TowPlow offers operational benefits beyond simple cost efficiencies:

- Decreased cycle time due to one pass clearing and wider clearing path
  - Higher operating speed potential
  - Quickly position or relocate snow removal equipment
  - Improved equipment reliability
  - Extended plow blade life due to reduced down force
  - Efficient clearance means fewer vehicle trips to resupply treatment materials
- Benefits rural and urban areas
  - Builds clearing capacity while not increasing on-road equipment fleet size

## **What is the average benefit or cost savings with a TowPlow purchase? How long does it take to break even?**

Utah, like other states, has not completed a true cost savings evaluation of the TowPlow, but recognizes other benefits. Among these are staff reductions and higher levels of service to customers as a result of the ability to maintain increased lane miles. This equates to safer roads, fewer accidents and less congestion.

In Missouri, the use of a TowPlow doubles the clearing width of a conventional truck equipped with only a front snow plow. As a result, labor and fuel costs are cut in half.

The breakeven point of the TowPlow depends on numerous factors. As a rule of thumb, the TowPlow will pay for itself in four to five years based on replacing one snow plow truck for 250 hours per year.

## **Does the use of the TowPlow require any special training for my operator?**

As with any new piece of equipment some training is needed; however, special training is not required. Operators should become familiar with the TowPlow operation in a controlled area prior to using it on the highway. The Missouri DOT has developed a 12-hour TowPlow training class.

## **How much additional operator attention does the TowPlow require? Should I have concerns about operator overload?**

Operating a TowPlow is comparable to operating a truck-mounted wing plow. In fact, some operators believe the TowPlow is easier to operate than the wing plow. The Utah DOT requires that TowPlow host trucks are equipped with automatic transmissions.



**Are there any problems with deploying or retracting the plow? How quickly can the TowPlow be engaged and disengaged**

The TowPlow can be fully deployed or retracted quicker than a wing plow can be picked up. This will vary slightly depending on the hydraulic systems on the host vehicles. Cold weather can also affect performance of hydraulic systems and slow the time for engaging and disengaging but not to a degree that limits use of the TowPlow.

**How does the public respond to a TowPlow? Are you experiencing accidents involving TowPlow operation?**

“We have been running TowPlows for two winters and we haven’t had any problems. The public seems to have an added respect for the TowPlow. We are planning to buy more.”

– Mark Fischbach  
*Twin Cities Winter  
Maintenance Superintendent  
Minnesota Department of  
Transportation*

The Utah DOT is now in its third season of running TowPlows and has not had any accidents or problems. The public does seem to give them added respect and stays farther away from them when compared to a standard snow plow.



**We are a state that uses wings. Are there any benefits for us to add a TowPlow?**

For the operator, the TowPlow has fewer controls than the traditional wing plow – two compared to three. The TowPlow allows a wider clearing path than a wing, and some states have found that they can operate a TowPlow at a faster speed than wing plows, generating additional productivity gains. There is also a significant benefit on multi-lane Interstate highways where there is a need to apply additional salt/brine to the surface area. The TowPlow, with chemical storage, enables multiple lanes to be treated with the same pass.

**Do I need any special truck horsepower, hydraulic, or cooling requirements to pull a TowPlow?**

In general, larger trucks are better to pull TowPlows.

Most trucks that pull TowPlows are tandem axle plow trucks with a minimum of 350 hp and available hydraulic circuits to operate the TowPlow. Some states use a horsepower rating and torque of 450 hp and 1650 torque. The cooling package will match the engine. Some states increase the hydraulic pump size and have independent spreader controls for both the truck and the TowPlow.

**Are there any unusual equipment maintenance issues or repairs that the TowPlow requires? What is the expected longevity of a TowPlow?**

There are no unusual maintenance or repair issues with the TowPlow. All components of the TowPlow are found routinely on other plows and trucks.

Utah DOT estimates a 20-year life cycle and is considering an increase to 25 years with a “recovery” rate of \$30.00 per hour.

### I can see value on multilane roads, but is there a benefit to using a TowPlow on a two lane/ two way highway?

The TowPlow can be used on two lane roadways where there are shoulders that need to be cleared simultaneously with the driving lane. Some two lane roads have auxiliary, climbing, or alternating passing lanes. The use of a TowPlow on these roadways allows wider sections to be cleared in one pass, rather than circling around to clear the additional pavement width.

### Have you realized any unexpected benefits?

“... the TowPlow is more forgiving to a hit than a traditional wing and consequently the truck stays more in control. Also, because we are able to plow the snow back further, you can gain up to 14 feet more (depending on your wing set up) than a traditional plow and wing.”

– Randy Reznicek  
*St Cloud District Winter  
Maintenance Superintendent  
Minnesota Department of  
Transportation*

There are operators that use the TowPlow (with the plow in the “up” position) to increase chemical capacity for pre-treating operations. This allows operators to treat more miles of roadway without refilling the truck. States that use TowPlows have experienced very positive media coverage of their operations, with stories of the states’ innovative and efficient efforts to fight snow storms.

## About TIG

Dedicated to sharing high-payoff, market-ready technologies among transportation agencies across the United States, TIG promotes technological advancements in transportation, sponsors technology transfer efforts and encourages implementation of those advancements.

For more information visit  
[www.aashtotig.org](http://www.aashtotig.org)

### HOW DO I LEARN MORE?

TIG's Lead States Team includes DOT representatives with TowPlow experience who can help you implement the use of this technology in your agency. Turn to team members for insight, expertise and advice.

For more information about the TowPlow, contact:

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