# CLOSEOUT REPORT

Submitted by the AASHTO TIG Lead States Team for
the following technology:

# TOWPLOW


Lead States Team Members and Agencies:

Tim Chojnacki, Chair – Missouri DOT
Jim Carney – Missouri DOT
Greg Duncan – Tennessee DOT
Bill Hoffman – Nevada DOT
Steve Lund – Minnesota DOT
Steve McCarthy – Utah DOT
Wess Murray – Missouri DOT


Date: March 6, 2012

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Where the names of products or manufacturers appear herein, their inclusion is considered essential to the objectives of this report. AASHTO does not endorse products or manufacturers.

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## Introduction

The TowPlow was selected as a focus technology by the AASHTO Technical Implementation Group (TIG) Executive Committee in December of 2009. A Lead States Team (LST) was identified and charged with providing transportation agencies enough information about TowPlows to allow them to make sound implementation decisions regarding this technology.

The LST held a preliminary teleconference on July 8, 2010 and a face to face kickoff meeting on August 17-18, 2010. See Appendix A for the kick-off meeting agenda. Outcomes from the meeting and follow-up teleconferences were a market analysis (Appendix B), a marketing plan (Appendix C), and marketing media (Appendix D). The AASHTO TIG Executive Committee approved the proposed work plan and a budget of $38,100 at its October 28, 2010 meeting.

Tasks of the LST have included development of a brochure, a long and short version PowerPoint presentation, trade journal articles, website additions and updates, and presentations at various conferences and meetings across the country.

This closeout report is divided into five sections:

Marketing Activities,
Transition Plan,
Lessons Learned,
Performance Measurement, and
Final Expenditure Summary.

## Marketing Activities

The TowPlow gives transportation agencies the opportunity to build stronger relationships with their customers. TowPlow is a visual demonstration of the agency's commitment to innovation. The image of a TowPlow in operation clearly communicates cost savings and other efficiencies that the public can both understand and respect. It has the added benefit of being a "made for TV" maintenance operation that allows local news outlets to convey both basic information about the benefits of the technology and information that allows motorists to operate more safely when TowPlows are in use.

The LST conducted outreach through presentations at conferences and workshops, provided information on the AASHTO TIG website, distributed marketing materials and submitted articles for trade journals.

### *Hosted Demonstration Workshops*

| Date (in chronological order) | Workshop Title | Location | Total Attendance |
|---|---|---|---|
| | No workshops held | | |

Although the LST did not develop demonstration workshops, individual team members did participate in equipment demonstrations with neighboring states, including Idaho, Arkansas, Oklahoma, Kansas, Kentucky, Virginia, and North Carolina. Wess Murray and another MoDOT employee also trained Iowa DOT personnel on the use of the equipment.

***Presentations at Conferences and Meetings***

| Date (in chronological order) | Conference or Meeting Name, Location | Presenter Name, Organization | Presentation Title | Written paper? (Y/N) |
|---|---|---|---|---|
| Sep. 23, 2010 | AMOTIA 2nd Annual Meeting, Nashville, TN | Greg Duncan, Tennessee DOT | Informal presentation | N |
| Oct. 6, 2010 | AASHTO Equipment Management Technical Service Program Combined Northeast/Midwest States Regional Meeting, Pittsburgh, PA | Tim Chojnacki, Missouri DOT | Informal presentation | N |
| Feb. 28, 2011 | WASHTO Regional SCOM Meeting, Omaha, NE | Jim Carney, Missouri DOT/Brad Darr, North Dakota DOT | AASHTO TIG Project – TowPlow: Clearing the Way to Keep America Moving | N |
| April 10, 2011 | American Public Works Association (APWA) Snow Conference, Spokane, WA | Tim Jackson, Missouri DOT (on behalf of TowPlow LST) | AASHTO TIG Project – TowPlow: Clearing the Way to Keep America Moving | N |
| June 14, 2011 | AASHTO Equipment Management Technical Service Program Southeast States Regional Meeting, Morgantown, WV | Steve McCarthy, Utah DOT | AASHTO TIG Project – TowPlow: Clearing the Way to Keep America Moving | N |
| July 18, 2011 | AASHTO Subcommittee on Maintenance (SCOM) Meeting, Louisville, KY | Jim Carney, Missouri DOT | AASHTO TIG Project – TowPlow: Clearing the Way to Keep America Moving | N |
| Aug. 29, 2011 | AASHTO Equipment Management Technical Service Program Western States Regional Meeting, Seattle, WA | Steve McCarthy, Utah DOT | AASHTO TIG Project – TowPlow: Clearing the Way to Keep America Moving | N |

| | | | | |
|---|---|---|---|---|
| Sep. 20, 2011 | Winter Maintenance Peer Exchange, Bozeman, MT | Greg Duncan, Tennessee DOT | AASHTO TIG Project – TowPlow: Clearing the Way to Keep America Moving | N |
| Sep. 28, 2011 | American Public Works Association (APWA) Western States Snow & Ice Conference, Estes Park, CO | Tim Chojnacki, Missouri DOT | TowPlows – We've Tried Them and Love Them (AASHTO TIG Project – TowPlow: Clearing the Way to Keep America Moving) | N |

***Comments and Observations on Presentations***

The LST team continued to update the message over time so that the presentation did not become dated. At the 2010 AASHTO meeting, a presentation was made that focused on the TIG team process; later presentations focused on the TowPlow operations and benefits. Presentations given at the end of 2011 included more detailed costs and benefit analyses, since the audiences saw the previous presentations and wanted that information.

The audiences were mainly concerned with the initial cost and benefit/cost analyses. The audiences did not seem as concerned with perceived safety and operational difficulties.

## *Publications*

| Date Produced | Publication Type | Total Number Produced | Recipients and Distribution Method |
|---|---|---|---|
| March 25, 2011 | Brochure | 350 | Taken to meetings/conferences |

Although the LST did not produce publications directly, many articles and news reports were published that mentioned the technology and LST activities. A sample of those articles is shown in the bibliography (see Appendix E).

## Performance Measurement

According to the LST surveys, the number of TowPlows currently owned has increased significantly from 76 to 113. A discussion with the TowPlow manufacturer indicated the number of TowPlows in use in North America is significantly higher than the 113 enumerated in our survey. This difference is due to turnpike authority and contractor ownership as well as some states that did not respond to the survey. In addition, the final survey indicates that more states are planning to or have purchased TowPlows.

The following table compares responses to the initial and final technology experience surveys.

| Survey Information | Initial Survey (2010) | Final Survey (2012) |
|---|---|---|
| # of survey recipient organizations | 52 | 52 |
| # of survey responses received | 32 | 30 |
| # of agencies that have not used this technology | 18 | 14 |
| # of agencies with limited knowledge of this technology | 1 | 1 |
| # of agencies interested in receiving more information about this technology | 8 | N/A |
| # of agencies that saw information presented at a conference/meeting | 17 | 11 |
| # of agencies fairly familiar with this technology but have not yet tried it | 13 | 12 |
| # of agencies planning to try this technology on an upcoming project | 4 | 7 |
| # of agencies that have tried this technology and are evaluating its benefits | 8 | 12 |
| # of agencies currently using this technology on a limited basis | 6 | 7 |
| # of agencies currently using this technology on a routine basis, in one area | 2 | 4 |
| # of agencies currently using this technology on a routine basis throughout the state | 3 | 2 |
| # of TowPlows currently owned | 76 | 113 |
| # of agencies that plan to adopt this technology on a limited basis | 9 | 10 |

| | | |
|---|---|---|
| # of agencies that plan to adopt this technology on a routine basis, in one area | 2 | 3 |
| # of agencies that plan to adopt this technology on a routine basis throughout the state | 4 | 6 |
| # of agencies who do believe that this technology will provide substantial benefit | 16 | 19 |
| # of agencies who do NOT believe that this technology will provide substantial benefit | 10 | 8 |
| # of agencies who have tried this technology and plan to use it in the future | 11 | 14 |
| # of agencies who have tried this technology and do NOT plan to use it in the future | 1 | 1 |
| | | |

***Summary Responses from Surveys***

The number of agencies who believe that this technology will provide substantial benefits has increased according to the final survey.

Based on the survey trends, the LST expects additional states to use this technology in the future mainly because there is momentum towards adopting it.

States that are not likely to implement the TowPlow in their winter operations cite two basic factors. States that do not receive much snowfall, believe that their investment could be better spent on additional trucks that can do other tasks in addition to plowing snow. The other factor cited by a few states is the high initial cost of the TowPlow. It is often difficult for states to overcome initial costs, even where long-term benefits exist.

# Lessons Learned

### *Effective Tools and Methods*

The Powerpoint presentations and brochures, as well as face-to-face testimonials, were all effective.

### *Unique Tools and Methods*

Using MoDOT's short video clips in equipment training helped explain TowPlow operations. Although the LST did not hold a formal workshop, LST members did share their experiences with neighboring states. The LST believes this was just as effective as a formal workshop.

### *Ineffective Tools and Methods*

None identified.

### *General Comments*

Having three MoDOT members (the nominating DOT) was very beneficial for this LST. In addition, having members with experience on the AASHTO Subcommittee on Maintenance (SCOM) Safety and Reliability Technical Working Group (TWG) and Equipment TWG was also very beneficial. Finally, the Nevada DOT member helped in identifying barriers for adopting this technology, since the Nevada DOT did not own a TowPlow; this helped other states overcome these barriers.

The LST recommends having a standing agenda item concerning AASHTO LST activities for committees that have members from upper management (i.e., SCOH).

# Transition Plan

### *Reference Materials*

| Reference | Publisher | URL (if available on web) |
|---|---|---|
| Brochure | LST | http://tig.transportation.org/Documents/TowPlow/TowPlow-brochure-final.pdf |
| Powerpoint Presentation – Long Version | LST | http://tig.transportation.org/Documents/TowPlow/TowPlow-PowerPoint-Long-Version.pptx |
| Powerpoint Presentation – Short Version | LST | http://tig.transportation.org/Documents/TowPlow/TowPlow-PowerPoint-Short-Version.pptx |
| TowPlow LST Website | LST and AASHTO | http://tig.transportation.org/Pages/TowPlow.aspx |
| MoDOT Video Clips | MoDOT | http://www.youtube.com/watch?v=YJEgkbq_b2Q<br><br>Also, several other videos can be found using the query below:<br><br>http://www.youtube.com/results?search_query=towplow |
| MoDOT Training Materials | MoDOT | http://tig.transportation.org/Documents/TowPlow/TowPlow-training-manual.pdf<br><br>http://tig.transportation.org/Documents/TowPlow/TowPlow-training-operators.pptx<br><br>http://tig.transportation.org/Documents/TowPlow/TowPlow-training-course.pdf<br><br>http://tig.transportation.org/Documents/TowPlow/TowPlow-training-operator-checklist.pdf<br><br>http://tig.transportation.org/Documents/TowPlow/TowPlow-training-inspection.pdf |

### *Technology Transfer*

| Contact | Office Name, Location | Phone | Email |
|---|---|---|---|
| | , | | |

In the case of snow and ice equipment, the FHWA is not the primary organization to “carry the baton” for this technology.

### *Primary On-going Implementation Responsibility*

| Contact | Committee Name, Organization | Phone | Email |
|---|---|---|---|
| Steve Lund | Safety and Reliability Technical Working Group AASHTO Subcommittee on Maintenance | (651)366-3566 | Steven.Lund@state.mn.us |
| Erle Potter | Equipment Technical Working Group, AASHTO Subcommittee on Maintenance | (804)786-0584 | Erle.Potter@vdot.virginia.gov |

### *Other Planning Efforts for On-going Implementation*

| Contact | Committee Name, Organization | Responsibility Discussed and Response |
|---|---|---|
| R. Mark DeVries | APWA Winter Maintenance Subcommittee | Tim Chojnacki contacted Mr. DeVries on 3/19/12. Mr. Devries was receptive to including a link to the AASHTO TIG TowPlow website on the APWA Winter Maintenance subcommittee webpage following some current revamping of the page. |
| Cliff Spoonemore | Wyoming DOT (Clear Roads Chair) | Tim Chojnacki contacted Mr. Spoonemore on 3/16/12. The issue of including a link to the AASHTO TIG TowPlow website on the Clear Roads webpage will be discussed at the upcoming Clear Roads Spring meeting to be held March 26-29, 2012 in Salt Lake City, Utah. In general, Mr. Spoonemore was receptive of the request. |
| | | |
| | | |

### *Specific Future Actions*

| Future Activity | Time Frame | Recommended Organization to Perform |
|---|---|---|
| Keep AASHTO Technical Working Groups Updated Annually | Three to Five Years | MoDOT |
| Continue to Identify State Contacts and Annually update the list in Appendix F | Ongoing | MnDOT - Steve Lund<br>VDOT - Erle Potter |
| | | |
| | | |

### *On the Web*

http://tig.transportation.org/Pages/TowPlow.aspx

## Final Expenditure Summary

### *Remaining Expense Claims*

| Date of Expense | Service Type | Claimant | Estimated Claim Amount |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| TOTAL ESTIMATED REMAINING EXPENSE CLAIMS | | | $ 0.00 |

### *Total Expenses*

*(Provide an estimate of the final total of expenses (to AASHTO TIG) which were incurred in executing the entire marketing plan. The AASHTO office can provide your team a current total spent to date.)*

| **Item** | **Cost** |
|---|---|
| Travel | $ 5,606.08 |
| Printing & Banner | $ 1,430.20 |
| Professional Services | $ 7,957.50 |
| **Total** | **$ 14,993.78** |

# Appendix A: Kickoff Meeting Agenda

# Initial Meeting
# TowPlow (TP) Lead States Team

**Missouri Department of Transportation**
**600 N.E. Colbern Rd.**
**Lee's Summit, MO 64086**
**August 17-18, 2010**

**Tuesday, August 17: 8:00 AM to 5:00 PM**

**Task Assignment and Background**
**Lead Person**

Welcome……..…..… Tim Chojnacki
Self Introductions (including experience with technology)…..……...All
Initial Process Questions from Team Members……...……..……. Paul Krugler
Agenda Review and Goals of the Meeting……..… Tim Chojnacki and Paul Krugler
Overview of the Marketing Plan Development
Process……...Monica Worth

**Brainstorm Market Analysis and Marketing Plan**

Development of Concepts for Market Analysis and Marketing Plan
…….…….……...Monica Worth

- Benefits/Challenges
  - "Why This Technology, Why Now?"
    - Discussion of benefits
    - Potential partners
      - Who else wants this technology now?
  - "Why *Not* This Technology, Why *Not* Now?"
    - Discussion of potential challenges
- Goals/Audience/Tools/Delivery
  - What are we trying to accomplish?
    - What is to be the ultimate impact of this team?
  - Who do we need to reach in order to get there?
  - What do they need to learn to take action?
    - How do they get their information?
- High Value Goals & Actions (Develop Work Plan Tasks)
  - What specific goals and actions will most effectively and measurably accelerate adoption of this technology within 1–3 years?

**Detailed Development of Market Analysis and Marketing Plan Documents.……**Paul Krugler and Monica Worth

Marketing Analysis
-see Lead States Team Guidebook page 15 and Appendix E
"Work Plan" Section of Marketing Plan
-see Lead States Team Guidebook page 16

**Wednesday, August 18: 8:00 AM to Noon**

**Review Draft Market Analysis and Marketing Plan ……..**. Tim Chojnacki and Monica Worth

Revisions and/or additions

**Completion of Marketing Plan** …….……...…..…… Paul Krugler and Monica Worth

Develop Schedule of Activities (schedule/milestones, assignments/leads)
Develop Communication Plan
Develop Performance Measurement Plan
Develop Annual FY Budgets

**Meeting Wrap Up/Review**

What Are the Next Steps? …….……..…. Tim Chojnacki and Paul Krugler

Travel Claim Submittal Guidance ……. Paul Krugler

**Adjourn at Noon**

# Appendix B: Market Analysis

# AASHTO TIG
# Lead States Team
# Marketing Analysis

# for

# TOWPLOW

September 3, 2010

## MARKETING ANALYSIS

### What is the need for this technology?

***Cost-Efficiency***

In an environment of historic cost cutting and budget restrictions, the TowPlow embodies the "doing more with less" concept. It creates a host of operational improvements in snow removal that contribute significantly to cost efficiencies. With the TowPlow, an agency can either maintain the same level of service with less staff or clear more miles of roadway with existing personnel.

The time required for snow removal cycles decreases as a result of the ability to clear up to two lanes in a single pass and the potential exists to achieve this at higher operating speeds.

*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.*

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

***Safety***

The TowPlow has the potential to increase both operator and motorist safety as compared to traditional plowing methods. Fewer passes with less equipment reduces the potential for traffic accidents during snow and ice removal. Plus, reductions in cycle time give the travelling public a greater number of hours in which to operate on fully cleared roadways as a weather event unfolds.

The TowPlow is also a more "forgiving" piece of equipment in terms of any encounters with fixed objects. It moves more freely than fixed plows and traditional wing plows should it strike an object. The TowPlow pivots when it strikes an object and does not tend to rotate the tow vehicle, which reduces the potential for tow vehicle damage and operator injury.

Because the operator is able to better control the TowPlow and adjust to varied situations, the operator has options to clear areas that might not be feasible using traditional operations. For instance, the TowPlow is quickly maneuvered, allowing clearing of bus turnouts, climbing or auxiliary lanes, and other variable lengths and widths of roadway. TowPlow drivers note quieter operation. The reduced number of passes required to clear lanes means a potential reduction in operator fatigue.

***Mobility***

Keeping America moving is always a priority in winter maintenance operations. Unfettered freight and passenger travel is essential to economic vitality. Clearing more lanes in less time with less equipment improves mobility, and thus offers considerable economic benefits to any State. The public expects and demands not to be caught behind maintenance vehicles, particularly on urban and rural Interstate highways. Traditional snowplows operate at lower speeds resulting in slower public travelling speeds and increased delay. TowPlows, on the other hand, can operate at higher speeds improving travel time reliability for the motoring public. This not only reduces delays in a real sense, but increases public acceptance of plowing operations.

***Environmental/Carbon Footprint***

The TowPlow allows for a reduction in the number of vehicles required to clear a given roadway. This means less fuel consumption and a lower carbon footprint per cycle or weather event.

***Public Relations***

The TowPlow gives transportation agencies the opportunity to build stronger relationships with their customers. TowPlow is a visual demonstration of the agency's commitment to innovation. The image of a TowPlow in operation clearly communicates cost savings and other efficiencies that the public can both understand and respect. It has the added benefit of being a "made for TV" maintenance operation that allows local news outlets to convey both basic information about the benefits of the technology and information that allows motorists to operate more safely when TowPlows are in use.

***Contractor Incentives***

Contractors can easily recognize the benefit of doing more with less. If a snow removal contractor can envision the operating benefits of TowPlow, the potential for increased profitability becomes clear: removing snow from a wider portion of roadway at potentially higher speeds means lower operating costs. The contractor will have a short term increase in capital cost, which will be offset by lower operating costs. The contractor must therefore be committed to snow removal services over a period of time.

In turn, state agencies can realize savings on contracted services. Once contractors take advantage of the lower operating cost, the competitive nature of the bidding process will lead to lower contracting costs for the state.

***Operational Improvements***

*TowPlow offers operational benefits beyond simple cost efficiencies. A sample of some of these operational efficiencies includes:*

*-Decreased plow truck cycle time due to one pass clearing and wider clearing path*

*-Potentially higher operating speeds*

*-Ability to quickly position or relocate snow removal equipment in preparation for an event.*

*-Equipment reliability due to TowPlow's long service life (estimated at 30 years, or twice the life of the average plow vehicle)*

-Extended plow blade life due to reduced down force
*-Fewer snow removal vehicles on the road and more efficient clearance mean fewer vehicle trips to resupply treatment materials.*

*Both rural and urban areas benefit from TowPlow operations.*

In gang-plowing operations, TowPlow's 24' (or two lane) clearing capability means two trucks with TowPlows can do the work of three and sometimes four trucks with other equipment.

The TowPlow offers advantages in congested urban areas with left turn lanes, islands and commercial entrances. At a minimum, one less pass is needed due to the width and maneuverability of the TowPlow unit. In some cases, snow clearing can be accomplished with half the trucks and operators, creating substantial savings.

On rural divided four-lane highways, one TowPlow and one conventional snowplow can clear both the driving and passing lanes and the shoulder in a single pass. On two-lane roadways with paved shoulders, one TowPlow can clear the driving lane and the shoulder.

In addition, with TowPlow's capability to clear up to 24' in one pass, the opportunity for snow to be redeposited on the roadway as an unintended result of clearing operations becomes less of an issue since snow can be pushed farther off the road.

The TowPlow can be equipped with liquid tanks or granular spreaders and can be used as an anti-icing or de-icing treatment device.

It is important to note that, while snow-belt states may realize great benefits through the use of TowPlow, there are significant benefits for "fringe" snow states as well. In smaller snow removal operations, the TowPlow builds clearing capacity while not increasing the size of the on-road equipment fleet. It allows states to establish a cost-efficient "stand by" capability, which helps them get ahead quicker during occasional snow events. This is critical to public safety, mobility, and perceptions.

## Who are the broad target audiences for the TowPlow LST?

| Agency | Primary Target | Secondary Target |
|---|---|---|
| State DOTs | X | |
| Public Works and other Government Agencies | | X |
| Toll Authorities and CDAs | | X |
| Industry Associations (AMOTIA) | | X |
| | | |
| | | |

**Who will be the decision makers for the TowPlow technology in primarily targeted agencies?**

| Agency | Decision-Making Office |
|---|---|
| State DOTs | Highway Commissioners/Chief Engineers/Executive Directors<br>Maintenance/Fleet Management (State and Regional/District)<br>Maintenance Supervisors<br>Field Personnel<br>Public Information Officers |
| Counties and Cities | Public Works Directors |
| | |

**What information will decision makers want to know to reach a conclusion about trying or adopting this technology?**

| Information | Interest Level | |
|---|---|---|
| | Critical | Desirable |
| <u>Cost and Savings Information:</u> | | |
| Purchase and implementation costs | X | |
| Maintenance costs and system rental rates | | X |
| How long will it take to recoup cost through savings being obtained? | X | |
| Cost / Benefit ratio | X | |
| Availability | X | |
| Patent Issue Resolution | X | |
| Estimated savings per hour, per route | | X |
| <u>Operator and Compatibility Information:</u> | | |
| Compatibility with existing equipment | X | |
| Changes to truck configuration | X | |
| Ease of use | X | |
| Expected useful life of TowPlow | | X |
| Case histories - Success / Failure Testimonials | X | |
| Videos and news clips of the equipment in operations | | X |
| Demo's during winter months, ride-a-longs with neighboring states that have TowPlows. | | X |

| | | |
|---|---|---|
| TowPlow mobility to shift snow removal resources | | X |
| Safety – public and worker | X | |
| Environmental/Carbon footprint | | X |
| Improved public mobility and level of service | X | |
| | | |
| | | |

**What are actual and perceived barriers to be overcome for an agency to decide to do a trial or to make use of TowPlow a standard operating procedure in their state?**

| Barrier | Type | |
|---|---|---|
| | Actual | Perceived |
| <u>Budget and Purchasing Constraints:</u><br>Shrinking equipment budgets<br>Single source – proprietary issue<br>Cost for equipment with only partial year use | <br>X<br>X<br> | <br><br><br>X |
| <u>Operational Concerns:</u><br>Increased difficulty in operation<br>Difficult maneuvering in traffic<br>Operation not possible in difficult terrain,<br>Equipment incompatibility with existing trucks | <br><br>X<br><br> | <br>X<br><br>X<br><br>X |
| Possible incorrect thought that my state doesn't have enough snow events to warrant the investment. | X | X |
| Thought that snow accumulation has to be fairly deep for TowPlows to pay off. | | X |
| How much operator training is needed? If specialty training is needed, who provides the training? | X | |
| | X | |

| | | |
|---|---|---|
| Current state specs for contracted maintenance may need modification. | | |
| Safety concerns are increased using TowPlow | | X |
| Paradigms (we always have done it another way)<br>Potential resistance from current work force to utilize equipment. | X<br>X | |
| | | |
| | | |

**What marketing opportunities already exist?**

| Opportunity | Location - Date |
|---|---|
| American Public Works Association (APWA) Snow Conference | Spokane, Washington – April 10-13,2011 |
| AASHTO Subcommittee on Maintenance (SCOM) Meetings | Louisville, KY – July 2011 |
| Peer Presentation at AASHTO Standing Committee on Highways (SCOH) Meetings | May 2011 |
| AMOTIA Annual Meeting | Nashville – September 2011 |
| Four Regional SCOM Meetings WASHTO | Omaha, NE – February 2011 |
| All four Regional Equipment Fleet Managers Meeting AASHTO EMTSP | 2011 |
| Winter Maintenance Peer Exchange | Montana – September 2011 |
| TRB Winter Maintenance Committee | January 2011 and/or 2012 |
| Pacific Northwest Snow Fighters Conference | Joint meeting with APWA (above) |
| Rocky Mountain Snow and Ice Conference | September 2011 |
| Rocky Mountain Fleet Management Meeting | September 2010 and 2011 |
| Toll Authority Conference (IBTTA) | Nashville – Oct/Nov 2011 |
| SCOM Newsletter | Periodic |
| Focus Article | Periodic |
| Trade Magazine Articles | Periodic |
| DOT Internal Publications | Periodic |
| | |
| | |

**Who are our potential partners in marketing this technology?**

| Potential Partner | Possible Supporting Activities |
|---|---|
| AASHTO Subcommittee on Maintenance (SCOM) | Agenda presentations, peer exchange |
| Industry | Reach contractors |
| FHWA | Focus Articles |
| Vendor - Inventor | Training Materials, Field Demonstrations, Compatibility to existing equipment |
| APWA | Publications |
| Salt Institute | Publications |
| | |
| | |

# Appendix C: Marketing Plan

# AASHTO TIG
# Lead States Team
# Marketing Plan

# for

# TOWPLOW

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**Lead States Team:**

Tim Chojnacki , Chair, Missouri DOT
Steve Lund , Minnesota DOT
Bill Hoffman , Nevada DOT
Greg Duncan , Tennessee DOT
Steve McCarthy , Utah DOT
Wess Murray , Missouri DOT
Jim Carney , Missouri DOT

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September 3, 2010

**WORK PLAN**

| **Task 1.** | Title: **Web Site Information Development** |
|---|---|

Task Description:

Prepare TowPlow information suitable for populating the TowPlow lead states team area of the AASHTO TIG web site. This information should include a description of the technology and its value, photography, lead states team contact information, as well as all communication tools developed by the lead states team. (Lead - Tim Chojnacki)

| **Task 2.** | Title: **Identify Existing and Potential TowPlow Champions** |
|---|---|

Task Description:

Contact states currently using TowPlow to determine who best contact is for additional information. Develop list of personnel other than SCOM members who are key in their states and potential champions. This information will come from a review of peer exchange attendance and personnel knowledge of lead states team members. (Lead - Bill Hoffman)

| **Task 3.** | Title: **Create Communications Tools** |
|---|---|

Task Description:

Task 3.a. Prepare a tri-fold brochure for distribution at conferences attended by team members, by mail, and for making available on the AASHTO TIG web site. (Lead - Tim Chojnacki, subcontractor assistance, printing by AASHTO or subcontractor)

Task 3.b. Prepare a PowerPoint presentation suitable for presentation to upper State DOT management. Estimated length is 7 to 15 minutes. (Lead - Tim Chojnacki, subcontractor assistance)

Task 3.c. Prepare a PowerPoint presentation suitable for presentation to State Maintenance Engineers and State Fleet Managers. Estimated length is 20 to 30 minutes. (Lead - Tim Chojnacki, subcontractor assistance)

Task 3.d. Prepare a frequently asked questions (FAQ) sheet for distribution at conferences, by mail, and to be placed on the AASHTO TIG web site. (Lead - Steve Lund)

Task 3.e. Gather testimonials from State Maintenance Engineers and TowPlow operators and possibly a SCOH member. (Lead - Wess Murray and Jim Carney)

Task 3.f. Prepare a short demonstration video for inclusion in PowerPoint presentations. (Lead - Wess Murray and Jim Carney)

Task 3.g. Develop trade journal article(s). (Lead - Bill Hoffman)

| **Task 4.** | Title: **Presentations at Conferences and Meetings** |
|---|---|

Task Description:

A member of the lead states team will make a presentation and may also provide a booth/exhibit at primarily targeted conferences. Secondary targets will be attended to supplement information sharing when a team member is already attending the conference or as needed to fill a remaining gap in information transfer.

| Opportunity | Location - Date | Responsibility to get on Program |
|---|---|---|
| **Primary Conference Targets** | | |
| American Public Works Association (APWA) Snow Conference | Washington – April 2011 | Bill Hoffman |
| Peer Presentation at AASHTO Standing Committee on Highways (SCOH) Meetings | May 2011 | Steve McCarthy |
| AASHTO Subcommittee on Maintenance (SCOM) Meetings | Louisville, KY – July 2011 | Bill Hoffman |
| All four Regional Equipment Fleet Managers Meeting AASHTO EMTSP | June through September 2011 | Steve McCarthy |
| Winter Maintenance Peer Exchange | Montana – September 2011 | Bill Hoffman |
| AMOTIA Annual Meeting | Nashville – September 2010<br>Other – September 2011 | Greg Duncan |
| WASHTO Regional SCOM Meeting | Omaha, NE – February 2011 | Bill Hoffman |
| TBD Conferences | TBD | TBD |
| | | |
| **Secondary Conference Targets** | | |
| TRB Winter Maintenance Committee | January 2011 and/or 2012 | Bill Hoffman |
| Pacific Northwest Snow Fighters Conference | Joint meeting with APWA (above) | Steve McCarthy and Bill Hoffman |
| Rocky Mountain Snow and Ice Conference | September 2011 | Steve McCarthy |
| Rocky Mountain Fleet Management Meeting | September 2010 and 2011 | Steve McCarthy |
| Toll Authority Conference (IBTTA) | Oct/Nov 2011 | Tim Chojnacki |
| | | |
| | | |

| **Task 5.** | Title: **Publish Articles** |
|---|---|

Task Description:

Task 5.a. Contact target trade journals and provide article for their consideration. (Lead - Steve Lund)

Task 5.b. Contact FHWA and request their development of an article for Focus. (Lead – Jim Carney)

Task 5.c. Provide article to those responsible for content of the SCOM Newsletter. (Lead – Jim Carney)

| **Task 6.** | Title: **Quantification of TowPlow Benefits Compared to Costs** |
|---|---|

Task Description:

Gather information and credibly estimate savings which can be enjoyed given several scenarios of current equipment and operations. Estimate is to be based on:

Task 6a – existing information.

Task 6b – information to be gathered during the 2010/2011 winter.

(Lead - Greg Duncan, minor TTI assistance offered)

| **Task 7.** | Title: **Distribute Operational Guidelines and Training Materials** |
|---|---|

Task Description:

Contact other states indicating TowPlow experience on initial survey. Gather and review information from lead states team states and other states with TowPlow experience and distribute selected materials to interested states. Missouri DOT is currently developing this type of information for their agency. There may be other states doing the same. (Lead – Jim Carney)

| **Task 8.** | Title: **Document Technical Details Necessary for TowPlow Deployment** |
|---|---|

Task Description:

Prepare a document describing accessory options, truck requirements, and other information needed by agencies preparing to acquire initial TowPlow equipment. (Lead – Wess Murray and Steve McCarthy)

| **Task 9.** | Title: **Final Survey** |
|---|---|

Task Description:

A survey will be developed, distributed, and the information analyzed to determine nationwide use level among State DOTs at conclusion of lead states team activities. (Lead - Tim Chojnacki)

| **Task 10.** | Title: **Prepare and Submit Closeout Report** |
|---|---|

Task Description:

A Closeout Report will be developed to document the work of the lead states team and the level of increase in nationwide use of TowPlow. A closeout meeting of the lead states team will be held to finalize this report. (Lead - Tim Chojnacki)

**Activity Schedule**

| | |
|---|---|
| **O** | Original Schedule |
| **R** | Revised Schedule |
| **X** | Work Completed |

Revision Date:

| Activity | FY 2011 | | | | | | | | | | | | FY 2012 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J |
| Task 1. | | | X | X | | | | | | | | X | X | | | | | | | | | | | |
| Task 2. | | | X | | | | | | | | | | | | | | | | | | | | | |
| Task 3a. | | | X | X | X | | | | | | | | | | | | | | | | | | | |
| Task 3b. | | | X | X | X | | | | | | | | | | | | | | | | | | | |
| Task 3c. | | | X | X | X | | | | | | | | | | | | | | | | | | | |
| Task 3d. | | | X | X | X | X | | | | | | | | | | | | | | | | | | |
| Task 3e. | | | | X | X | | | | | | | | | | | | | | | | | | | |
| Task 3f. | | | X | X | X | X | | | | | | | | | | | | | | | | | | |
| Task 3g. | | | X | X | | | | | | | | | | | | | | | | | | | | |
| Task 4. | | | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | |
| Task 5a. | | | | | X | | | | | | | | | | | | | | | | | | | |
| Task 5b. | | | X | | | | | | | | | | | | | | | | | | | | | |
| Task 5c. | | | | | X | | | | | | | | | | | | | | | | | | | |
| Task 6a. | | | X | X | X | X | | | | | | | | | | | | | | | | | | |
| Task 6b. | | | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | |
| Task 7. | | | X | X | X | | | | | | | | | | | | | | | | | | | |
| Task 8. | | | X | X | X | | | | | | | | | | | | | | | | | | | |
| Task 9. | | | | | | | | | | | | | | | | X | X | X | | | | | | |
| Task 10. | | | | | | | | | | | | | | | | | | X | X | | | | | |

## COMMUNICATIONS PLAN

| Communication Targets | Method(s) | Purpose |
|---|---|---|
| State DOT Upper Management | SCOH Meeting Presentation and Brochure | Answer high-level questions and provide information for their assessment of desirability of use of TowPlow in their state. |
| State Maintenance Engineers and Equipment Fleet Managers | Annual and Regional SCOM Meetings | Answer technical questions and provide information for their assessment of desirability of use of TowPlow in their state. |
| Snow Removal Contractors | APWA Snow Conference and AMOTIA Annual Meeting | Promote use of TowPlow on state contract snow removal. |
| Public Works Directors | APWA Snow Conference | Allow cities, counties and others to learn, adopt, and benefit from TowPlow |
| Maintenance Equipment Operators | Testimonials from peers in brochure and articles | Win confidence in equipment. |
| Viking-Clives | Telephone, email. | Determine assistance concerning training and equipment demonstrations. |
| | | |
| | | |

## PERFORMANCE MEASUREMENT PLAN

| Performance Measure | Measurement Method |
|---|---|
| Number of agencies that have obtained or have made the decision to obtain and use this equipment as of the date of the final survey, relative to the number since initiation of the lead states team. | Initial and final surveys of all AASHTO agencies. |
| Number of agencies that report being knowledgeable of this technology as of the date of the final survey, relative to the number since initiation of the lead states team. | Initial and final surveys of all AASHTO agencies. |
| | |

## ANNUAL BUDGETS

### FY 2011 Annual Lead States Team Budget

**Focus Technology:** TowPlow

**Budget Period:** July 1, 2010 through June 30, 2011

| Cost Type / Description | Estimated Non-reimbursed Costs to Lead States | Costs to be Reimbursed by AASHTO | Additional Description | Subtotals of Costs to AASHTO |
|---|---|---|---|---|
| **Labor** | | | | |
| Lead States Team Members | | | | |
| Others from Lead States | | | | |
| Other | | | | |
| **Total Labor** | $ - | | | |
| **Expendable Goods & Supplies** | | | | |
| Describe item | | | | |
| Describe item | | | | |
| Insert additional goods and supplies rows here | | | | |
| **Total Expendable Goods & Supplies** | $ - | | | $ - |
| **Operating and Other Expenses** | | | | |
| Travel and Marketing Expert for Initial Meeting | | $ 10,000 | | |
| Travel for Task #4 - Conference Presentations | | $ 6,000 | | |
| Travel for Task # | | | | |
| Travel for Task # | | | | |
| Insert additional travel rows here | | | | |
| Long Distance Telephone Charges | | | | |
| Reproduction | | | | |
| Shipping | | | | |
| Insert additional operating or rental rows here | | | | |
| Equipment Rental | | | | |
| **Total Operating and Other Expenses** | $ - | | | $ 16,000 |
| **Equipment Purchases** | | | | |
| Describe item | | | | |
| Describe item | | | | |
| Insert additional equipment purchase rows here | | | | |
| **Total Equipment Purchases** | $ - | | | $ - |
| **Subcontracts**** | | | | |
| Worth & Associates (Task 3a.,3b.,3c.) | | $ 7,500 | | |
| Printing not done by AASHTO office (Task 3a.) | | $ 1,000 | | |
| To be determined (Task 6) | | $ 2,000 | | |
| **Total Subcontracts** | $ - | | | $ 10,500 |
| **TOTAL LEAD STATES CONTRIBUTION** | $ - | | | |
| **TOTAL AASHTO BUDGET REQUEST FOR THIS FISCAL YEAR** | | | | $ 26,500 |

* AASHTO's fiscal year is July 1 through June 30.

** Subcontracts should be established directly with AASHTO. Contact the AASHTO TIG Program Manager for assistance.

**Notes:**

1. The proposed AASHTO reimbursed budget is not to include salary and fringe benefits for lead states team members providing services.

2. Travel expenses for lead states team members representating industry are not reimbursable by AASHTO.

3. Appropriate indirect charges may be included in the individual cost estimates above.

## FY 2012 Annual Lead States Team Budget

**Focus Technology:** TowPlow

**Budget Period:** July 1, 2011 through June 30, 2012

| Cost Type / Description | Estimated Non-reimbursed Costs to Lead States | Costs to be Reimbursed by AASHTO | Additional Description | Subtotals of Costs to AASHTO |
|---|---|---|---|---|
| **Labor** | | | | |
| Lead States Team Members | | | | |
| Others from Lead States | | | | |
| Other | | | | |
| **Total Labor** | $ - | | | |
| **Expendable Goods & Supplies** | | | | |
| Describe item | | | | |
| Describe item | | | | |
| Insert additional goods and supplies rows here | | | | |
| **Total Expendable Goods & Supplies** | $ - | | | $ - |
| **Operating and Other Expenses** | | | | |
| Travel for Task #4 - Conference Presentations | | $ 6,600 | | |
| Travel for Task # | | | | |
| Travel for Task # 10 - Closeout Meeting | | $ 5,000 | | |
| Insert additional travel rows here | | | | |
| Long Distance Telephone Charges | | | | |
| Reproduction | | | | |
| Shipping | | | | |
| Insert additional operating or rental rows here | | | | |
| Equipment Rental | | | | |
| **Total Operating and Other Expenses** | $ - | | | $ 11,600 |
| **Equipment Purchases** | | | | |
| Describe item | | | | |
| Describe item | | | | |
| Insert additional equipment purchase rows here | | | | |
| **Total Equipment Purchases** | $ - | | | $ - |
| **Subcontracts**** | | | | |
| Describe subcontract | | | | |
| Describe subcontract | | | | |
| Insert additional subcontract rows here | | | | |
| **Total Subcontracts** | $ - | | | $ - |
| **TOTAL LEAD STATES CONTRIBUTION** | $ - | | | |
| **TOTAL AASHTO BUDGET REQUEST FOR THIS FISCAL YEAR** | | | | $ 11,600 |

* AASHTO's fiscal year is July 1 through June 30.

** Subcontracts should be established directly with AASHTO. Contact the AASHTO TIG Program Manager for assistance.

**Notes:**

1. The proposed AASHTO reimbursed budget is not to include salary and fringe benefits for lead states team members providing services.

2. Travel expenses for lead states team members representating industry are not reimbursable by AASHTO.

3. Appropriate indirect charges may be included in the individual cost estimates above.

# Appendix D: Marketing Media

# TOWPLOW

## 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.

## 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:**

Tim Chojnacki (Chair)
Missouri DOT
Tim.Chojnacki@modot.mo.gov

Steve Lund
Minnesota DOT
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Jim Carney
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# Appendix E: Bibliography

**Tow Plow Bibliography**

AASHTO Technology Implementation Group

Note: the first nine articles credit the AASHTO TIG for this technology. The total number of news stories about TowPlow are too numerous to list.


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10. USA Today News Story dated 12/21/2010 http://www.usatoday.com/news/nation/2010-12-21-plowingroads21_ST_N.htm

11. Maryland news story on TowPlow dated 11/17/11, WUSA Channel 9 http://www.wusa9.com/news/article/175283/158/Motorists-Warned-To-Steer-Clear-Of-The-Tow-Plow

# Appendix F: State Contact List

**[see the attached Excel Worksheet]**