

**Report No. UT-24.21**

# **UTAH ROADSIDE LITTER SOLUTIONS**

## **Prepared For:**

Utah Department of Transportation  
Research & Innovation Division

**Final Report  
December 2024**

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## **TABLE OF CONTENTS**

EXECUTIVE SUMMARY .....	1
INTRODUCTION .....	2
1.1 Problem Statement .....	2
1.2 Objectives .....	2
1.3 Scope .....	2
1.4 Outline of Report .....	3
2.0 Identify Haulers .....	4
2.1 Overview .....	4
2.2 Outreach .....	5
2.2.1 Hotspot #1 .....	5
2.2.2 Hotspot #2 .....	6
2.2.3 Hotspot #3 .....	6
2.2.4 Hotspots #4 and #5 .....	6
2.2.5 Hotspot #6 .....	7
2.2.6 Hotspot #7 .....	7
2.2.7 Hotspot #8 & #9 .....	7
3.0 Outreach .....	8
3.1 Overview .....	8
3.2 Outreach to Landfill Operators and Waste Haulers .....	8
3.3 Key Findings: .....	9
3.3.1 Cause and Composition .....	9
3.3.2 Existing Efforts .....	10
3.3.3 Enforcement .....	11
3.3.4 Commercial Haulers .....	11
3.3.5 Suggested Solutions .....	12
3.3.6 Recommendations .....	14
3.4 AASHTO RAC Survey .....	14
4.0 Litter Campaign Concept .....	25

4.1 Media Campaign Objective .....	26
4.2 Initial Communication Approach/Direction .....	27
4.3 Media Campaign Program Elements .....	28
5.0 Cost Estimates.....	29
5.1 Introduction.....	29
5.2 Large-Scale Litter Campaign.....	29
5.2.1 Create Campaign Brand.....	30
5.2.2 Statewide Partner Programs .....	30
5.2.3 Statewide School Program .....	31
5.2.4 Statewide Community Outreach/Displays .....	32
5.2.5 Program/Campaign Focused on Reducing Litter from Unsecured Loads .....	32
5.2.6 Annual Statewide Spring-Cleaning Event .....	33
5.2.6 Total Program Costs .....	34
6.0 Recommendations and Implementation.....	35

## **LIST OF TABLES**

Table 1 Types of Highway Litter in Utah (UDOT Research Report UT-21.01).....	19
Table 2 Cost Estimates for Campaign Brand Development .....	30
Table 3 Cost Estimates for Developing a Statewide Partner Program .....	31
Table 4 Cost Estimates for Developing a Statewide School Outreach.....	32
Table 5 Cost Estimates for Developing Community Displays .....	32
Table 6 Cost Estimates for a Focused Program on Unsecured Loads .....	33
Table 7 Cost Estimates for the Annual Statewide Spring-Cleaning Event.....	34
Table 8 Cost Estimates for the Large-Scale Campaign with Five Program Elements (High).....	34

## **LIST OF FIGURES**

Figure 1 State DOT Litter Mitigation Strategies (AASHTO RAC Questionnaire).....	16
Figure 2 Top Sources of Highway Litter (AASHTO RAC Questionnaire).....	17
Figure 3 Top Sources of Highway Litter in Utah (UDOT Research Report UT-21.01) .....	18
Figure 4 State DOT Litter Outreach Efforts (AASHTO RAC Questionnaire).....	20
Figure 5 State DOT Media Utilized for Public Messaging (AASHTO RAC Questionnaire) .....	22
Figure 6 Entities Responsible for Litter Pickup (AASHTO RAC Questionnaire) .....	22

## **LIST OF ACRONYMS**

AASHTO	American Association of State Highway and Transportation Officials
AASHTO RAC	AASHTO Research Advisory Committee
DOT	Department of Transportation
UDOT	Utah Department of Transportation
WIWMD	Wasatch Integrated Waste Management District
WM	Waste Management Company



## **EXECUTIVE SUMMARY**

Roadside litter is increasing in the state of Utah, especially along landfill haul routes frequented by Trash/Recycling Vehicles and Construction Debris Haulers. These "hotspot" areas pose health and safety concerns for the public and water resources. Litter cleanup creates an added burden for limited state forces and the cost is shouldered by the Utah taxpayer.

The objective of this project is to build upon past research efforts at UDOT to include analyzing the waste management industry's operational techniques/behavior, vehicle retrofits/solutions, and education or media campaigns. This research project initially focused on Trash/Recycling Vehicles and Construction Debris Haulers to seek solutions to highway litter from these sources. During outreach to industry stakeholders the research learned that unsecured loads are a major litter source as well. The research also reached out to many state DOTs to learn of other approaches to highway litter mitigation. A review of potential mitigation technologies was undertaken. In the end, it was determined that the most effective intervention to mitigate highway litter needed to focus on public education.

The research concludes with examples of several media and public outreach campaigns that UDOT can initiate to address this problem. A large-scale litter campaign is envisioned with five programs coordinated around a campaign brand:

- 1) Establishing a statewide partner program (start-up costs \$750,000);
- 2) Developing a statewide school program (start-up costs \$200,000);
- 3) Developing community outreach and displays (start-up costs \$150,000);
- 4) Initiating a campaign focused on unsecured loads (start-up costs \$500,000); and,
- 5) Establishing an annual statewide spring-cleaning day (start-up costs \$300,000).

## **1.0 Introduction**

### **1.1 Problem Statement**

Roadside litter is increasing in the state of Utah, especially along landfill haul routes frequented by Trash/Recycling Vehicles and Construction Debris Haulers. These "hotspot" areas pose health and safety concerns for the public and water resources. In addition, litter cleanup creates an added burden for limited state resources and the cost is shouldered by the Utah taxpayer.

Two UDOT research projects have focused on highway litter in Utah: Reducing Highway Litter (Report No. UT-13.11) and Sources of Highway Litter in Utah (Report No. UT-21.01). An executive report titled Highway Litter Mitigation (Report No. UT-21.25) was also developed and provides a summary and recommendations.

Sources of Highway Litter in Utah (Report No. UT-21.01) estimated that the primary contributors of litter along roadways are Trash/Recycling Vehicles (43%) and Construction Debris Haulers (11%). Litter from Motorists ("the general public") was estimated to account for 27% of all highway litter.

This project proposes to build on that information with an emphasis on litter mitigation. Areas of research include analyzing the waste hauler and landfill operational techniques/behavior, potential technology solutions, and education or media campaigns. This research project initially focused primarily on Trash/Recycling Vehicles and Construction Debris Haulers. However, education and media campaigns could also reach the Unsecured Vehicles audience (10%), as well as the general public who contributes 27% of roadside litter.

### **1.2 Objectives**

The objective of this project is to build upon past research efforts applicable to this Roadside Litter Solutions problem statement with an emphasis on developing solutions to mitigate highway litter in the future

### **1.3 Scope**

The scope of work consists of seven tasks, as follows:

- Task 1: Project Management, including TAC meetings and ongoing communications with the UDOT project champion and research project manager.
- Task 2: Identify Trash/Recycling Vehicles and Construction Debris Haulers in each UDOT hotspot. The research team reached out to landfill operators to compile a list of major haulers within each of the 9 hotspot locations. Input on contacts was sought from UDOT staff.
- Task 3: The research team met onsite and virtually with industry representatives to better understand operations, behavior, policies, equipment and brainstorming retrofits and solutions. The research team also conducted a survey through AASHTO RAC on DOT best practices for highway litter mitigation.
- Task 4: The research team developed a media campaign concept and recommended targeted activities focused on Trash/Recycling Vehicles, Construction Debris Haulers and Unsecured Vehicles to reduce/mitigate highway litter at the source.
- Task 5: The research team developed cost estimates for implementation and ongoing annual costs thereafter. Costs will include any media-related activities and/or activities targeted to source reduction. It was originally thought that truck technologies would be discovered that would assist with mitigation, but these solutions were not established in online research or in conversations with industry stakeholders.
- Task 6/7: Document findings and implementation steps in a final report. Present results and make recommendations to UDOT. Key findings of the research were presented at the 2024 UDOT Annual Conference.

## **1.4 Outline of Report**

The report consists of five sections:

- Identify Haulers
- Stakeholder Outreach
- Litter Campaign Concepts
- Cost Estimates for Media Campaign Elements
- Recommendations and Implementation

## **2.0 Identify Haulers**

### **2.1 Overview**

Task 2 of the UDOT Highway Litter Solutions project involved identifying the major trash/recycling haulers and construction debris haulers associated with each of nine specified UDOT highway litter hotspots. The table below lists the nine hotspot locations along with other related information.

<b>Hotspot#</b>	<b>Description</b>	<b>City</b>	<b>Proximate Landfill/Transfer Facility</b>
1	SR 193	Layton	Wasatch Integrated Waste Mgt District
2	21st St-Wall St.	Ogden	Moulding Company
3	I-215	West Valley City	Wasatch Front Waste Landfill, Trans-Jordan Landfill
4	SR 201 Site A	Salt Lake City	Salt Lake Valley SWMF-Transfer Station/Landfill
5	SR 201 Site B	Salt Lake City	Salt Lake Valley SWMF-Transfer Station/Landfill
6	I-15 NB Exit 278	American Fork	Northpointe Solid Waste Special Service District
7	I-15 SB Exit 263	Provo	South Utah Valley Solid Waste District
8	I-15	St. George	Washington County MSW
9	SR 7	St. George	Washington County MSW

## 2.2 Outreach

For this task, a list of landfills, recycling facilities, and transfer stations was compiled based on geographic proximity to the hotspot locations. Using data and mapping from the Utah Department of Environmental Quality<sup>1</sup> compiled in their permitting system, representatives of these facilities were contacted by email and by phone to obtain information on the top haulers to each site. The following narrative provides the details of this outreach effort for each hotspot location.

### 2.2.1 Hotspot #1

This hotspot is on SR193 (~MP 6.9-7.0) near the I-84 @ US 89 interchange and is proximate to Hill Air Force Base (AFB). The landfill facility closest to this location is managed by the Wasatch Integrated Waste Management District (WIWMD) in Layton. The project team also learned that Hill AFB no longer has a landfill and uses the Wasatch Integrated Waste Management landfill. The project team reached out to them and made contact via email.

The top haulers associated with this landfill were identified as:

- Ace Recycling and Disposal - <https://www.acedisposal.com/>
- Republic Services - <https://www.republicservices.com/>
- Robinson Waste Services - <https://www.robinsonwasteservices.com/>
- WM (Waste Management Co.) - <https://www.wm.com/>

The top construction debris haulers were identified as:

- C & C Construction Containers - <https://www.facebook.com/cncconstructioncontainers/>
- Arrow Disposal - <https://arrowdisposalinc.com/>

Important observations provided by the WIWMD staff, as follows:

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<sup>1</sup> <https://deq.utah.gov/waste-management-and-radiation-control/statewide-recycling-data-initiative>

1. Regarding construction debris hauling, the majority of this comes from small businesses with dump trailers.
2. It is observed that the majority of the litter is coming from the “self-haul” traffic. Self-haul traffic refers to the residential fraction of the waste haulers. This is the pickup trucks and small trailers that come into the facility. The Trash Haulers that are visiting the landfills do a great job in containing their loads. WIWMD requires loads be covered or secured when entering the landfill; enforcement on individuals is a constant endeavor.

### 2.2.2 Hotspot #2

This hotspot is near the 21st/Wall Street intersection in Ogden (~MP 1.2). This location is close to a construction debris landfill operated by a private company, Moulding and Sons. The project team reached out to them multiple times by phone and email and was unable to make contact.

### 2.2.3 Hotspot #3

This hotspot is at the I-215 west side (MP 16.6-16.7). The landfill facility most proximate to this location is managed by Wasatch Front Waste in West Valley City. Another landfill that may impact this site is the Trans-Jordan Landfill in South Jordan. The project team reached out to them and made contact via email.

The Wasatch Front Waste Landfill receives waste from two main haulers: Wasatch Front Waste and Recycling District and Waste Management Co.

### 2.2.4 Hotspots #4 and #5

This hotspot is along SR 201 (MP 14.7-14.9 and MP 13.1-13.3). The landfill closest to this location is managed by Salt Lake Valley SWMF-Transfer Station, 502 West 3300 South. The project team reached out to them and made contact via phone call.

The top haulers were identified as Ace, Republic, and Waste Management. In addition to these, it was stated that Salt Lake City is a major contributor to the landfill and that other municipal haulers use this facility.

#### 2.2.5 Hotspot #6

This hotspot is proximate to the I-15, Exit 278 interchange in American Fork (MP 278.0-278.2). This area of Utah County is served by the Northpointe Solid Waste Special Service District with a landfill in Lindon. The project team reached out to them and made contact via email.

The top haulers were identified as Waste Management and Republic, with B&B Waste being the next largest hauler. The main haulers of construction debris were identified as Grant Mackey, M&T Enterprises, and Fullmer Excavation.

#### 2.2.6 Hotspot #7

This hotspot is proximate to SB I-15 near Exit 263 (MP 263.5). This area of Utah is serviced by the South Utah Valley Solid Waste District Springville Transfer Station. The project team reached out to them and made contact via email. The top haulers were identified as Waste Management, Republic, and Ace.

#### 2.2.7 Hotspot #8 & #9

These hotspots are near the landfill serviced by Washington County Solid Waste. The project team reached out to them and made contact via email. The top haulers were identified as Republic Services, Empire Waste, and Arrowhead Waste.

### **3.0 Outreach**

#### **3.1 Overview**

Task 3 of the UDOT Highway Litter Solutions project involved conducting outreach with landfill operators and waste haulers. The objective was to gather and analyze perceptions and insights regarding litter hotspots, potential mitigation, collaboration, and communications efforts. The outreach involved conducting 60-minute remote interviews with respondents as well as an in-person tour of one the municipal landfills.

In addition, the research team initiated a survey of state DOTs regarding their approaches to mitigating highway litter.

#### **3.2 Outreach to Landfill Operators and Waste Haulers**

The outreach involved conducting 60-minute remote interviews with respondents as well as an in-person tour of one the municipal landfills. The table below lists the interview participants:

<b>Organization</b>	<b>Name</b>	<b>City</b>	<b>Hotspot#</b>
Metro Waste	Rob Richards	Fairfield	6
North Pointe Solid Waste	Neil Schwendiman	Lindon	6
Salt Lake County Solid Waste	Patrick Craig	Salt Lake City	4 & 5
Trans-Jordan Landfill	Jaren Scott	South Jordan	3



Washington County Solid Waste	Kevin Kunz	Washington	8 & 9
Waste Management	Chris Anderson	Salt Lake City	4 & 5
Waste Management	Jose Flores	Salt Lake City	4 & 5

### **3.3 Key Findings:**

#### **3.3.1 Cause and Composition**

- Respondents said litter in the vicinity/hotspots is 90-95 percent unintentional.
- Plastic bags and similar lightweight materials were cited in all interviews as the most prevalent and widespread forms of litter in or near hotspots.
- Wind plays a significant role in the number of bags and other materials blowing out of vehicles. The quantity of litter increases when there is heavy wind.
- Rural landfills indicated that the speed at which drivers travel near the hotspots also plays a role in litter escaping vehicles.
- Landfill operators estimate that 70-75 percent of the litter in the hotspots comes from the general public versus commercial haulers. While the quantity that commercial haulers transport is exponentially more than the public, they only lose a very small percentage.
  - “While each day I get 25 tons of waste from the general public and 2,500 tons from the commercial side, the sheer amount of litter from the general public still far outweighs what comes from the commercial trucks.”
- Respondents felt the greatest cause of litter in the hotspots was the general public and small contractors not properly securing or tarping their loads. They said many people have good intentions but aren’t as successful at doing this.

- “There will always be good people with the right intentions who aren’t educated on how to do things properly.”
- Respondents indicated overloading vehicles, especially makeshift trailers, contributed significantly to the litter issues in the hotspots.
- Landfill operators believe small contractors have more incentives for cutting corners and overloading vehicles with refuse since “time is money.”
- The issue of securing items both big and small was universal among most respondents. While the litter around landfills is largely plastic and other lightweight materials, respondents were concerned with the larger items they see on I-15 and other highways that weren’t secured and pose safety threats.
- There are differences between urban and rural landfills. For example, Southern Utah has many people who “just dump things in the desert.” There are reduced landfill fees, and even no fees in some rural areas, to encourage people to properly dispose of waste in landfills.
- Salt Lake City is a bit of an outlier with no tarping requirements and significant issues with illegal dumping and homelessness. While there were issues with illegal dumping at all of the landfills, the facilities other than Salt Lake City said that illegal dumping was less pervasive and only contributed to approximately five percent of the total litter in the vicinity.

### 3.3.2 Existing Efforts

- Each landfill spends significant time and resources to keep the entrance and areas leading up to the facility clean. Landfills spend between \$20-\$100k+ each per year cleaning up litter on the road leading up to their entrances.
  - “If we didn’t clean the roads coming into the landfill each week, it would look like a bomb went off.”

- One landfill has created and teaches a third-grade curriculum. A community outreach coordinator visits elementary schools and teaches the curriculum, which includes topics such as securing items, recycling, and how a landfill works. This landfill also hosts regular field trips. They believe beginning to educate youth at a young age is important and additionally that the message is communicated most effectively to adults (their parents and grandparents) through their children.

### 3.3.3 Enforcement

- All of the landfills outside of Salt Lake City have requirements to properly tarp and/or secure items in vehicles. The non-Salt Lake City landfills all mentioned challenges surrounding enforcement of this requirement.
- The landfills with tarping/securing requirements have these requirements posted on the arrival driveway. Further, landfills issue a warning on the first offense and record the offender's license plate. On each subsequent offense, they charge double the fee.
- While most landfills have tarping/securing rules as part of their conditional use permits, enforcing these are onerous and require a lot of time and energy. Frontline employees spend significant amounts of time arguing with offenders who don't want to pay the fine. This also creates delays for other people waiting in line.
- Respondents indicated they have not seen any enforcement from local police or the Utah Highway Patrol for many years. They all acknowledged law enforcement has more important things to do.
- About half of the respondents said stronger enforcement of tarping/securing laws would have a strong impact on reducing litter.

### 3.3.4 Commercial Haulers

- In all of the interviews, respondents indicated that commercial haulers generally do a good job in taking steps to reduce items escaping from their trucks. They claim there is only a small quantity of litter escaping from commercial vehicles and that this is very difficult to prevent.

- “They [commercial haulers] are held to higher standards, have good relationships with us and typically do the right thing.”
- It was mentioned in multiple interviews with landfill operators that there is primarily one issue with commercial haulers, which is when they sometimes forget to close the hopper (top door on their truck), litter escapes. One landfill has cameras and charges double if the door is open. Another landfill will contact the waste company if someone witnesses issues with this and the commercial hauling companies do a good job “policing it internally.”
- It was mentioned that there are sometimes issues with roll-off containers that are overloaded, which makes it difficult to properly tarp. This suggests that regulations targeted to roll-off containers might be effective.
- None of the respondents were aware of any new technology or other techniques that could help reduce the small percentage of litter that escapes from commercial vehicles.

### 3.3.5 Suggested Solutions

- Most of the respondents expressed appreciation to UDOT for reaching out and asking for their perspectives and input. All of the landfill respondents said they would welcome the opportunity to work together with UDOT on solutions.
- Many landfill operators said it would be helpful if the state (legislature, UDOT, DEQ, etc.) would establish consistent statewide guidelines/regulations for tarping/securing. This would create opportunities to communicate these and make enforcement for their frontline personnel easier, especially since rules/regulations would be coming from a more authoritative source than the landfill.
- Most landfill operators and haulers said that communication was a key aspect of reducing litter.
  - “I believe communications would play the biggest role in reducing litter.”
- Suggestions of grassroots communication efforts targeting specific audiences was mentioned in multiple interviews.

- One landfill operator said a cultural shift is necessary and that a statewide anti-litter initiative would be helpful all around.
- While there is already lots of signage in and around the entrance of the landfills, the respondents said there is opportunity to add signs at their facility if UDOT develops a campaign.
- Respondents suggested creating a steering committee or other group to collaborate and/or provide additional input and feedback on a campaign and other efforts.
- Several respondents recommended UDOT get involved with the Beehive Chapter of SWANA (the Solid Waste Association of North America), especially with its statewide conference which takes place every two years.
- Since the next SWANA conference isn't scheduled until 2026, respondents recommended organizing a litter summit and inviting landfill operators and waste haulers to meet and collaborate on how they can work together to more effectively combat the issue.
- One respondent suggested soliciting haulers to get involved with Keeping Utah Beautiful or organizing a consortium to create and invest in an initiative to help reduce litter.
- One respondent said the mere presence of a law enforcement vehicle in the vicinity of the landfill would have an impact.
- Another respondent recommended that funds be identified and used to conduct periodic enforcement blitzes. There is a perception among the public that there is no enforcement except for at the gates of the landfills and "doing something periodically with law enforcement would quickly change this perception."
- One landfill operator recommended that fines from potential new regulation could go back to UDOT to help fund litter clean-up and communication efforts.
- One respondent suggested that second-time tarping offenders be required to do an hour of community service cleaning up litter.
- A rural landfill operator recommended that litter abatement efforts have a statewide theme/focus with local implementation.
  - "A one-size-fits-all approach, especially with grassroots efforts, doesn't resonate in Southern Utah, where many people believe leaders in more populated areas

don't understand their needs or how to communicate with them. They are independent and don't like being told what to do.”

### 3.3.6 Recommendations

- Efforts should focus primarily on residents and small contractors properly tarping and securing items since they contribute the most litter in the hotspot areas.
- UDOT should explore some legislative or other options to help create more consistent statewide regulations surrounding properly tarping and securing items.
- A steering committee, including landfill operators and waste haulers, should be created to provide input and feedback as well as to help execute and evangelize campaign/litter mitigation efforts.
- UDOT should contact law enforcement to better understand enforcement and how they might work together.
- UDOT should consider a broad public campaign/effort surrounding securing and tarping items in vehicles with a focus on landfills and safety.

## **3.4 AASHTO RAC Survey**

Task 3 of the UDOT Highway Litter Solutions project involves outreach with waste industry representatives and landfill managers, as well as outreach, through an online survey, to state DOTs, as administered through the AASHTO Research Advisory Committee (RAC).

The survey was implemented in Google Forms and sent as a hyperlink in an email to the AASHTO RAC representatives from each state DOT. The survey consisted of 14 questions and was initiated on February 23, 2024, with a soft close on March 5.

The following DOTs responded to the survey:

- ✓ Arkansas
- ✓ California
- ✓ Colorado
- ✓ Connecticut
- ✓ Delaware
- ✓ Georgia

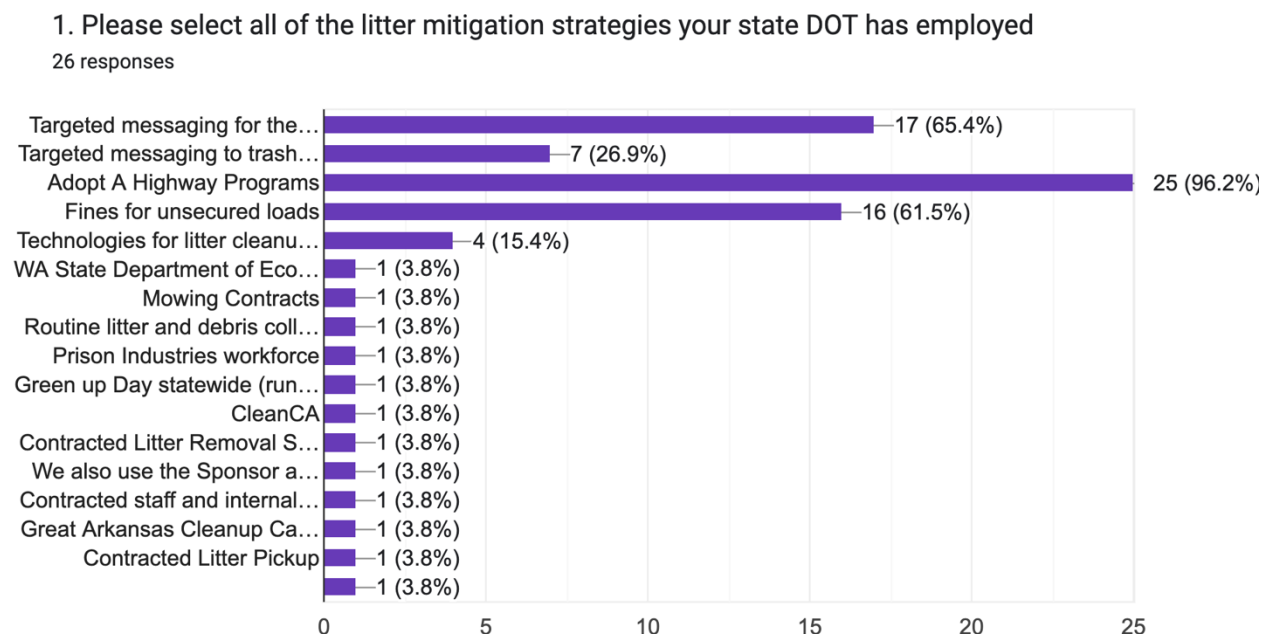
- ✓ Indiana
- ✓ Iowa
- ✓ Kentucky Transportation Cabin
- ✓ Louisiana
- ✓ Michigan
- ✓ Mississippi
- ✓ Montana
- ✓ Nevada
- ✓ New Jersey
- ✓ New York State
- ✓ Oklahoma
- ✓ Pennsylvania
- ✓ South Dakota
- ✓ Texas
- ✓ Utah
- ✓ Vermont
- ✓ Washington
- ✓ Wyoming

Two responses, from different DOT functional areas, were obtained from Utah, California and Pennsylvania. The following section summarizes the AASHTO RAC survey on Highway Litter and provides key findings.

1. Please select all of the litter mitigation strategies your state DOT has employed

- ☐ Targeted messaging for the general public
- ☐ Targeted messaging to trash/recycling and construction debris haulers
- ☐ Adopt A Highway Programs
- ☐ Fines for unsecured loads
- ☐ Technologies for litter cleanup or prevention
- ☐ Other...

The chart below provides the summary response to this question, showing that targeted messaging to the general public, adopt-a-highway programs, and fines for unsecured loads are the most widely used approaches to litter mitigation.



**Figure 1 State DOT Litter Mitigation Strategies (AASHTO RAC Questionnaire)**

Several State DOTs replied “Other” to this question with state-specific approaches. These responses are roughly sorted into Public Messaging (WA, CA), volunteer clean-up efforts (AR, VT), and contracted or directed labor for litter pickup (5 states).

Specific programs mentioned are Keeping Utah Beautiful (<https://www.udot.utah.gov/connect/public/litter-clean-up/>), CleanCA (CA), Green Up Day (VT), and Great Arkansas Clean Up.

2. If you selected "Technologies" from the list above, please describe below.

Five states selected “Technologies” as one of their top strategies and were asked to provide additional information, summarized below:

- Two DOTs reported maintaining online databases tracking organizations participating in Adopt-a-Highway programs and tracking the quantities of litter collected.



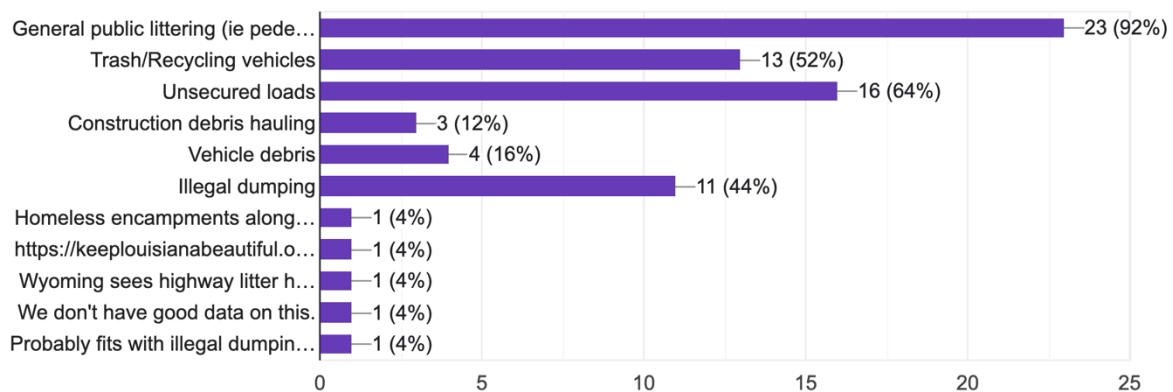
- Litter pick-up equipment (e.g., Barber Road Rakes)
- Litter Reporting Hotline (Oklahoma, 888-5-LITTER, <https://www.odot.org/beauty/litter/index.htm>)

3. Of the strategies selected above (Q1-2), which one has been most effective for your DOT?

In response to this question, Adopt-a-Highway programs were mentioned most often (8 DOTs), followed by messaging programs targeted to the general public (4 DOTs). One DOT mentioned that no one program can be pointed to, but rather it is the combined effect of many programs.

4. To the best of your knowledge, please select the top three sources of highway litter in your state:

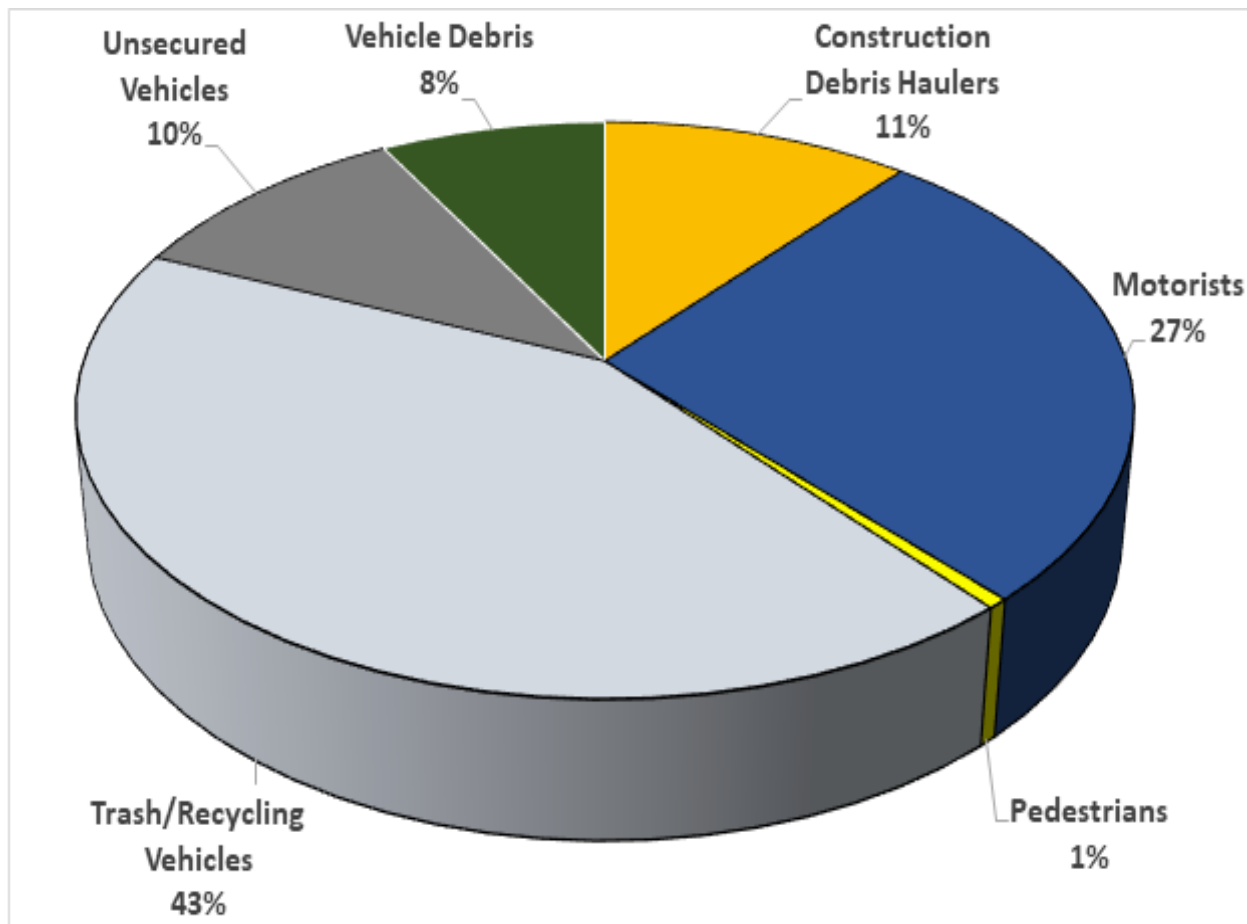
25 responses



**Figure 2 Top Sources of Highway Litter (AASHTO RAC Questionnaire)**

When asked about the top sources of highway litter the great majority of DOTs (92%) pointed to the general public. This was followed by unsecured loads (64% of DOTs) and trash/recycling vehicles (52% of DOTs). Illegal dumping was also frequently cited at 44% of responding DOTs.

For comparison, UDOT conducted a study of highway litter sources in 2021 (UT-21.01). Figure 3 summarizes the sources of highway litter at 9 litter hotspots surveyed as part of that study.



**Figure 3 Top Sources of Highway Litter in Utah (UDOT Research Report UT-21.01)**

5. Are there litter items/types that are more prevalent or noticeably more of an issue than others? (e.g., specific types/examples of litter like plastic bags, paper, lumber, vehicle parts, soda cans, etc.).

23 DOTs responded to this question with a variety of responses, including plastic refuse, food containers and packaging, and vehicle parts. For comparison, the table below shows the components of highway litter across 9 litter hotspots in Utah (2021 Sources of Highway Litter study).

<b>Component</b>	<b>Items</b>	<b>Percent</b>
Unidentifiable Plastic Pieces	858	17.0%
Unidentifiable Paper Pieces	545	10.8%
Unidentifiable Paperboard/Cardboard	385	7.6%
Polystyrene Bulk Packing	259	5.1%
Plastic Packaging - Other (Film, etc.)	224	4.4%
Plastic Water Bottles	217	4.3%
Tires - Pieces	201	4.0%
Corrugated Boxes/Pieces	192	3.8%
Polystyrene Foam Insulation	190	3.8%
C&D - Wood	156	3.1%
	<b>3,227</b>	<b>63.8%</b>

**Table 1 Types of Highway Litter in Utah (UDOT Research Report UT-21.01)**

The second part of the survey involved questions pertaining to public outreach and messaging about highway litter.

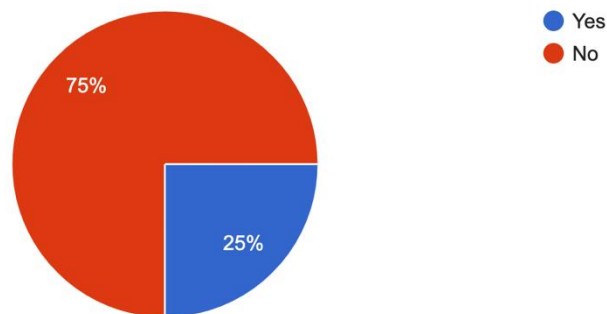
6. In communicating with the public about litter, are there specific demographics (age, gender, sociodemographics) that you have targeted?

The most prevalent response to this question was that messaging was targeted to all ages and demographics, and to the general public. More specific responses to this question included the following:

- Annual art contest for school-age children, K-12.
- Keep DE Litter Free campaign
- Messaging targeted to ages 18-44
- Messaging focused on urban areas

7. Has your state DOT made special outreach efforts to the waste hauling industry?

24 responses



**Figure 4 State DOT Litter Outreach Efforts (AASHTO RAC Questionnaire)**

8. If yes, please describe these efforts and, if appropriate, provide links to any documentation.

- We have contacted major trash haulers and landfill owners for problem areas. (Arkansas DOT)
- Waste Hauling Industry representatives recently participated in the Governor's Task Force on Litter Abatement. (LADOT)
- On a case-by-case basis, approached trash companies regarding their equipment losing litter while traveling highways. Often, we provide video evidence. We then partner with the truck companies to clean up debris and prevent further issues. (TxDOT)
- Conversations with trash hauling companies at district level. (Nevada DOT)
- Calls and written letters to landfills and waste haulers in specific areas to look for solutions and improve covering and handling loads. (Iowa DOT)
- Public messaging campaign. Looking into tougher legislation. (Mississippi DOT)

Three state DOTs – Arkansas, Iowa and Texas – reported specific efforts to engage the waste hauling industry. Respondents from each DOT were contacted to obtain more details on the efforts with the waste haulers.

Arkansas DOT reported a case where there was excessive trash at an interstate interchange accessing two commercial landfills. The DOT set up a meeting with the Regional Solid Waste Director, landfill operators, a county judge, the County Road Superintendent, and law enforcement to discuss available options to address this specific litter issue.

ARDOT reported:

“We developed a plan with multiple groups to address trash at various times of the year on a consistent basis. Regional Solid Waste Director – Contacted local waste haulers to be mindful of tarping loads to limit loss of trash on their trucks. Landfill Operators committed to having employees pick up litter on a regular schedule that coincided with ARDOT Mowing Litter Pickup. Law enforcement committed to using inmates to pick up trash along the County Road from interchange to landfills.”

ARDOT reports that the trash is still an issue, but various partners have been more committed to picking up litter and public complaints have been minimal.

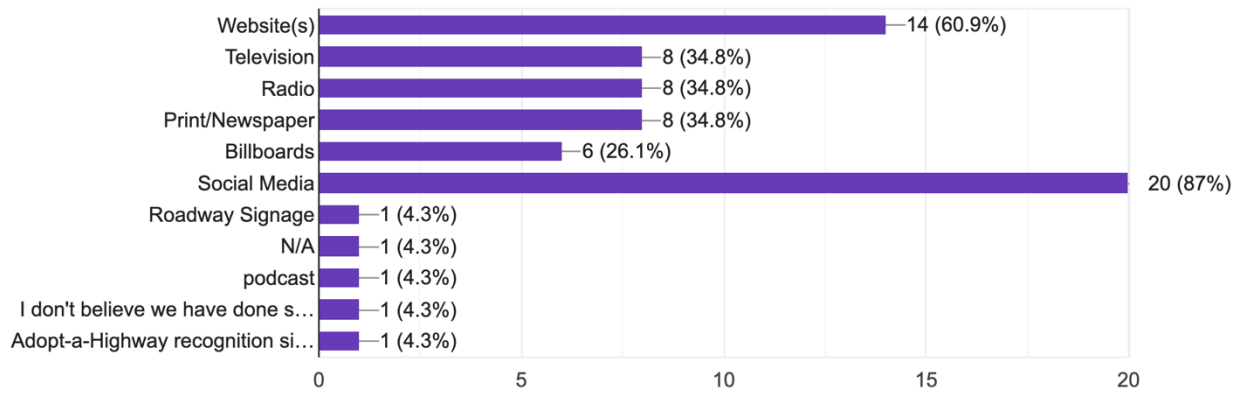
Iowa DOT replied that they “...have landfills along certain state routes. In those areas we get a concentrated amount of waste hauling. Our district staff in those areas would just reach out to the landfill and ask them to remind anyone hauling to cover their loads properly. In addition, specific garbage services that were observed not properly transferring garbage or overfilling dumpsters were contacted and asked to improve their processes.

While this is not foolproof, it is just another way to try to prevent litter from migrating onto the ROW.”

TxDOT reported: “On a case-by-case basis, approached trash companies regarding their equipment losing litter while traveling highways. Often, we provide video evidence. We then partner with the truck companies to clean up debris and prevent further issues.”

9. What types of media do you use for public messaging about litter? (Select all that apply)

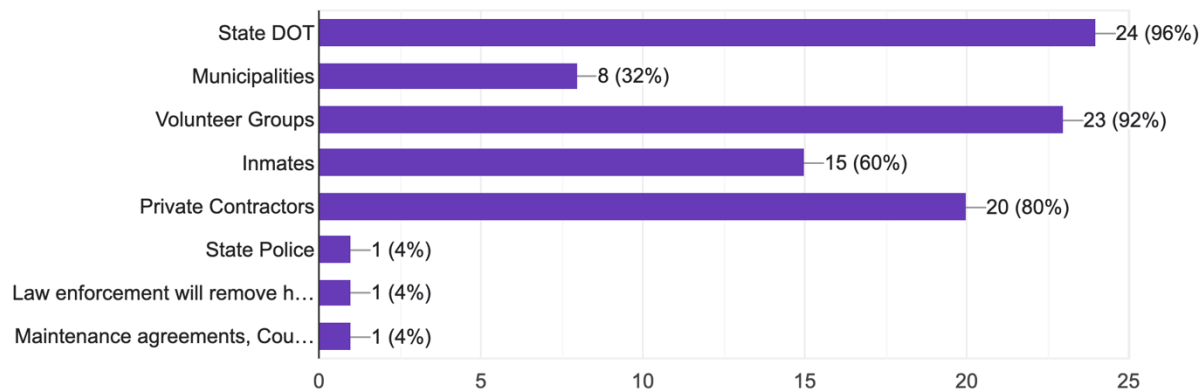
23 responses



**Figure 5 State DOT Media Utilized for Public Messaging (AASHTO RAC Questionnaire)**

10. Who collects highway litter in your jurisdiction (select all that apply):

25 responses



**Figure 6 Entities Responsible for Litter Pickup (AASHTO RAC Questionnaire)**

DOTs are the most prevalent group charged with highway litter cleanup (96%) and most DOTs also engage volunteer groups (92%). 80 percent of DOTs contract for litter removal and 60% engage services from state prisons.

11. If your state imposes fines for unsecured loads, please describe the fines/fine structure (or provide link to this information):

21 DOTs responded to this question. In most cases, fines for unsecured loads are described in state statutes and include a specified monetary penalty and, in some cases, are considered a misdemeanor with jail time. Some states impose larger fines, \$500-\$1000 for an incident (Wyoming, Kentucky, Pennsylvania, Vermont) while other states indicated much lesser to minimal fine amounts (Iowa, Montana). Enforcement is typically done by State Police with some fines determined in court.

One state (Mississippi) reported legislative activity to make the company liable and not just the driver.

12. Is there any advice you would recommend to another DOT embarking on a litter mitigation program? Any additional insights not addressed in the questions above would be appreciated!

Eleven DOTs responded to this final, open-ended question. The responses are replicated here.

- Education of the public - Especially our youth, that littering is wrong.
- When using volunteers (adopt-a-highway), focus on safety and hazmat instances (finding needles, etc.)
- Education is key. Otherwise, you're allocating funding to a never-ending problem. LADOTD recently conducted a litter study (<https://keeplouisianabeautiful.org/litter-study/>)
- Municipal maintenance agreements with local jurisdictions are helpful in high litter areas. Targeted contracts using our state operations funds are very effective. Local inmates are also a helpful resource. Adopt-a-highway agreements helpful with the gaps.
- Nothing that we can recommend beyond strategies mentioned and the problem is never ending.
- There are private companies who at no cost to the state will find sponsors for Adopt-a-Highway Program and pick up sections of road. It has not worked well in MT to date.

- Enforcement of penalties
- It may be helpful to hold an annual or biannual meeting to discuss and share information from state to state. Also, in regard to mitigation, enforcement and education seems to be crucial. Educating our youth is important as they are our future.
- We have contractual litter pickup, but it can be hard for them to staff unless we can guarantee a certain amount of work each year, so if you can budget an appropriate amount of funds annually, that will help the contractual litter pickup.



#### **4.0 Litter Campaign Concept**

Litter has been an issue for decades in Utah and around the country. Because of the size of the state, the sheer volume of vehicles, and other factors, it is difficult to ascertain the actual amount of refuse on Utah roads, and how significantly this has been increasing. However, the current perception among the public and state leaders is there has been an uptick in litter and further action is needed to address the issue.

Over the past 40 years, the Utah Department of Transportation (UDOT) has developed and executed several litter abatement communication campaigns including, “Don’t Waste Utah,” “LitterHurts,” “Keep it Clean Utah,” as well as various efforts such as Adopt a Highway and corporate-litter-cleanup sponsorship programs. As discussed previously, UDOT has also sponsored research, including “Reducing Highway Litter” (2013) and “Sources of Highway Litter” (2021). This current research seeks to develop recommendations for a new communications campaign concept as the key initiative to undertake in addressing highway litter in Utah.

While this study is focused on nine hotspot locations near landfills statewide, the issue of litter is broad and likely will require a holistic approach to foster the cultural and behavioral change necessary to reduce refuse on our roads. This chapter proposes a “media campaign concept” for messaging targeted to specific sources of highway litter, namely small commercial haulers and unsecured loads.

The campaign concept strategy is based on the following findings, which are from sources including interviews with landfill operators and waste haulers, data from a 2021 litter study and the Utah Foundation’s Personal Quality of Life Index:

- Respondents said litter in the hotspots is 90-95 percent unintentional.
- Landfill operators estimate that 70-75 percent of the litter in the hotspots comes from the public and small contractors versus commercial haulers. While the quantity of waste that commercial haulers transport is significantly more than the public, only a very small percentage of their loads escape. It was determined the greatest opportunity for change is with the public, particularly those hauling loads that have not been properly secured, and small contractors.

- Plastic bags and similar lightweight materials were cited in all interviews as the most prevalent and widespread forms of litter in or near hotspots.
- The issue of securing items both big and small was universal among most interview respondents. While the litter around landfills is largely plastic and other lightweight materials, respondents were also concerned with the larger items they see on I-15 and other highways that weren't secured and pose safety threats.
- According to 2021 data, unsecured items cause approximately 1,800 crashes annually on Utah roads.
- UHP receives 70 calls per day, and approximately 25,000 calls each year, regarding road debris.
- There was a 17% increase in debris-related calls to UHP over a five-year period from 2016 to 2021.
- While most landfills, aside from Salt Lake City, have tarping/securing requirements, there are no consistent statewide guidelines/regulations.
- Landfill operators indicated they have not seen any enforcement from local police or the Utah Highway Patrol for many years. About half of the respondents said stronger enforcement of tarping/securing laws would have a strong impact on reducing litter.
- UDOT spends approximately \$2.3 million annually on litter cleanup. The total number spent in the state of Utah by all municipalities/government entities is likely exponentially higher (all entities combined in Louisiana spend almost \$100 million annually on litter cleanup and abatement efforts).
- In the Utah Foundation's "Personal Quality of Life Index," the beauty of natural surroundings, including the appearance and cleanliness of roads, ranked as one of the top factors by the general public.

#### **4.1 Media Campaign Objective**

Develop a media campaign to educate the public on the issue of litter in Utah and how they can help make our roads cleaner and safer. Key audiences include:

- General public

- Small contractors
- Political leaders

## **4.2 Initial Communication Approach/Direction**

- Align campaign strategy with the Utah Foundation's Personal Quality of Life Index. This could include conducting focus groups to further understand the public's perception of litter as it relates to the attractiveness of natural surroundings and quality of life. The Quality-of-Life Index found that among the top four factors people use to rank their overall feelings about the community is the attractiveness of natural surroundings. This includes the cleanliness of roads<sup>2</sup>.
- Focus the campaign concept on Utah rising with the 2034 Olympic Winter Games, the new NHL franchise, MLB baseball possibly coming, etc., and the need to elevate our game in keeping our community clean and safe.
- Use Governor Cox and other luminaries: Ryan Smith (Utah Jazz/RSL/Utah NHL owner), Gail Miller (Chair, Larry H. Miller Group of Companies), Frasier Bullock (President/CEO Salt Lake Committee for the Olympic Winter Games), Will Hardy (Utah Jazz coach), Pablo Mastroeni (Real Salt Lake coach) Andre Tourigny (Utah NHL coach), Jazz, NHL, RSL, and Olympic athletes to evangelize the message.
- Execute ongoing promotion of Keeping Utah Beautiful and corporate sponsorship program.
- Communicate the need to secure items big and small to prevent litter and crashes.
- Educate regarding how to properly tarp and secure items, including how-to's on social media and point-of-purchase instructions at big box retailers and landfills.
- Conduct enforcement blitzes surrounding key landfill hauling periods (start of spring, Memorial and Labor Days, etc.).

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<sup>2</sup> [www.utahfoundation.org/wp-content/uploads/rr802.pdf](http://www.utahfoundation.org/wp-content/uploads/rr802.pdf)

- Create a litter abatement advisory committee, including UDOT, DPS, DEQ, landfill operators, municipalities with landfills, etc. Work with these groups to quantify (and in some cases unify) statewide efforts and cleanup costs.
- Organize an annual litter symposium to track progress, collaborate on solutions, and communicate about the issue to keep it top of mind with key stakeholders, including the public.
- Create an annual statewide spring-cleaning event to educate and mobilize the public to pick up litter after the winter snow has melted. Make communications explicit in this effort.

#### **4.3 Media Campaign Program Elements**

A large-scale litter campaign is envisioned with five programs coordinated around a campaign brand:

- 1) Establishing a statewide partner program;
- 2) Developing a statewide school program;
- 3) Developing community outreach and displays;
- 4) Initiating a campaign focused on unsecured loads; and,
- 5) Establishing an annual statewide spring-cleaning day.

The next chapter provides descriptions of each program element and cost estimates for implementing them.

## **5.0 Cost Estimates**

### **5.1 Introduction**

Task 5 of the UDOT Highway Litter Solutions project involves developing cost estimates for implementing the research recommendations (and annual recurring costs). The scope of work originally posited that the costs would include any media-related activities and/or activities targeted to source reduction, and that is the focus of this chapter.

The scope of work originally alluded to cost estimates for haul-truck technology improvements. The research, which has included the outreach efforts described in Chapter 3, has not identified technologies or retrofits to waste-hauling vehicles and, for this reason, no cost estimates on technologies are included in this chapter.

### **5.2 Large-Scale Litter Campaign**

This section provides cost estimates for a large-scale advertising and outreach campaign described in Chapter 4 and similar to the classic Don't Waste Utah or Don't Mess with Texas campaigns. The program elements include identified outreach tactics, as follows.

- create campaign brand;
- develop statewide partner programs;
- develop statewide school program;
- develop community outreach and displays;
- develop program focused on unsecured loads; and,
- create an annual spring-cleaning event integrated with these components.

Program costs are presented as “Start Up Costs,” which are those costs associated with program launch, and include branding and messaging, and ongoing annual budgets to manage the program and media purchases through years 1 through 5. Program costs are also given a “Medium” to “High” cost range.

### 5.2.1 Create Campaign Brand

The first step is to develop an overarching campaign brand for all UDOT anti-litter efforts. The campaign brand will include the following elements:

- Incorporate this initiative within the ongoing Keep Utah Beautiful program and corporate sponsorship program.
- Focus the brand and campaign concepts on Utah rising and the need to elevate our game in keeping our community clean and safe.
- Use Governor Cox and other luminaries to evangelize the message.
- Align campaign strategy with the Utah Foundation's Personal Quality of Life Index.
- Create a litter abatement advisory committee, including UDOT, DPS, DEQ, landfill operators, municipalities with landfills, etc.
  - Work with these groups to quantify (and in some cases unify) statewide efforts and cleanups costs.
  - Organize an annual litter symposium to track progress, collaborate on solutions and communicate about the issue to keep it top of mind with key stakeholders, including the public.

The cost to develop the brand, including look and feel, style guide, etc., is shown in Table 2.

Program Element	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Campaign Brand Development-High	\$750,000	\$3,000,000	\$2,200,000	\$2,420,000	\$2,662,000	\$2,928,000	\$13,960,000
Campaign Brand Development-Medium	\$550,000	\$1,500,000	\$1,100,000	\$1,210,000	\$1,331,000	\$1,464,000	\$7,155,000

**Table 2 Cost Estimates for Campaign Brand Development**

### 5.2.2 Statewide Partner Programs

The statewide partner program involves collaborating with big box retailers, landfill operators, waste hauling companies, law enforcement and municipalities. Elements include:

- Litter abatement advisory committee, including UDOT, DPS, DEQ, landfill operators, municipalities with landfills, etc.
- Work with these groups to quantify (and in some cases unify) statewide efforts and cleanups costs
- Point-of-purchase signs
- Instruction and trainings
- Coordination and enforcement before peak periods
- Annual litter summit to track progress, collaborate on solutions and communicate about the issue to keep it top of mind with key stakeholders, including the public.

Program Element	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Statewide Partner Program-High	\$200,000	\$200,000	\$220,000	\$242,000	\$266,000	\$293,000	\$1,421,000
Statewide Partner Program-Medium	\$100,000	\$100,000	\$110,000	\$121,000	\$133,000	\$146,000	\$710,000

**Table 3 Cost Estimates for Developing a Statewide Partner Program**

### 5.2.3 Statewide School Program

The statewide school program involves educating students regarding the litter issue to both engage them in the solution as well as to establish a culture of clean roads and communities. This program coordinates well with the next two, Statewide Community Outreach and Annual Spring-Cleaning event. Elements include:

- Curriculum
- Workbooks
- Traveling assembly
- Annual essay contest

Program Element	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Statewide School Prog/Assembly-High	\$150,000	\$400,000	\$300,000	\$330,000	\$363,000	\$399,000	\$1,942,000
Statewide School Prog/Assembly-Medium	\$100,000	\$250,000	\$150,000	\$165,000	\$182,000	\$200,000	\$1,047,000

**Table 4 Cost Estimates for Developing a Statewide School Outreach**

#### 5.2.4 Statewide Community Outreach/Displays

Statewide community outreach/displays involves meeting people where they are (fairs, farmers markets, safety, and other community events) and working to help inform, educate, and motivate key audiences to be part of the solution. Elements include:

- Dynamic booths/displays
- Collateral
- Branded swag (e.g., straps, litter bags, etc.)
- Community ambassadors

Program Element	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Statewide Community Displays-High	\$500,000	\$400,000	\$300,000	\$330,000	\$363,000	\$399,000	\$2,292,000
Statewide Community Displays-Medium	\$200,000	\$250,000	\$150,000	\$165,000	\$182,000	\$200,000	\$1,147,000

**Table 5 Cost Estimates for Developing Community Displays**

#### 5.2.5 Program/Campaign Focused on Reducing Litter from Unsecured Loads

Key points from the outreach to landfill operators and described in the Media Campaign Concept of Task 4 focused on the need to reduce litter from unsecured loads. This was a key message from the landfill operators and was also a finding of the 2021 research on litter sources, which found that 21% of highway litter came from Unsecured Vehicles (10%) and from Construction Debris Haulers (11%). Key elements include:

- Communicate the need to secure items big and small to prevent litter and crashes.
- Educate regarding how to properly tarp and secure items, including how-to's on social media and point-of-purchase instructions at big box retailers and landfills.



- Conduct enforcement blitzes surrounding key landfill hauling periods (start of spring, Memorial and Labor Days, etc.).

The costs for this type of media campaign are summarized in Table 6.

Program Element	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Campaign on Unsecured Loads-High	\$375,000	\$500,000	\$550,000	\$605,000	\$666,000	\$733,000	\$3,429,000
Campaign on Unsecured Loads-Medium	\$260,000	\$350,000	\$385,000	\$424,000	\$466,000	\$513,000	\$2,398,000

**Table 6 Cost Estimates for a Focused Program on Unsecured Loads**

### 5.2.6 Annual Statewide Spring-Cleaning Event

This program element envisions a statewide organization focused on trash cleanup, and on promoting stewardship of the state’s natural environment. The program would culminate in an annual statewide event occurring after snowmelt (March/April) when volunteers throughout the state collect trash from roadsides and public spaces in their communities.

A statewide organization focused on trash cleanup, and on promoting stewardship of the state’s natural environment, is Green Up Vermont (GUV, <https://greenupvermont.org/about-guv/>). The culminating annual event of GUV is Green Up Day, a statewide event, usually occurring in May, when volunteers throughout the state collect trash from roadsides and public spaces in their communities. For the 2024 Green Up Day:

- 250 Vermont towns participated with over 30,000 volunteers engaged statewide.
- Volunteers covered over 9,000 miles of roadways and collected over 400 tons (1,329,697 lbs.) of litter and over 15,000 tires.
- Annual program tasks include marketing and campaigns, public education, volunteer coordination, fundraising, and efforts focused on the Green Up Day such as managing the volunteer network and distributing trash bags and gear.
- Each municipality is responsible for the collection and disposal costs of the collected litter.

- GUV provides positive marketing for corporations and other supporters that shows the environmental impact year-round.
- GUV is also assisting with other clean-up efforts associated with severe flooding that has occurred recently in the state.

This program element can be closely coordinated with the Statewide Partners and Schools programs. Annual program tasks include marketing and campaigns, public education, volunteer coordination, fundraising, and efforts focused on the Green Up Day such as managing the volunteer network and distributing trash bags and gear.

Start-up and 5-year annual program costs are summarized in Table 7.

Program Element	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Statewide Spring Cleaning Event-High	\$300,000	\$400,000	\$440,000	\$484,000	\$532,000	\$585,000	\$2,741,000
Statewide Spring Cleaning Event-Medium	\$200,000	\$300,000	\$330,000	\$363,000	\$399,000	\$439,000	\$2,031,000

**Table 7 Cost Estimates for the Annual Statewide Spring-Cleaning Event**

#### 5.2.6 Total Program Costs

If all elements of the program described above are put into effect, the annual costs (high) over a five-year period are shown in **Table 8**.

Program Element	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Campaign Brand Development-High	\$750,000	\$3,000,000	\$2,200,000	\$2,420,000	\$2,662,000	\$2,928,000	\$13,960,000
Statewide Partner Program-High	\$200,000	\$200,000	\$220,000	\$242,000	\$266,000	\$293,000	\$1,421,000
Statewide School Prog/Assembly-High	\$150,000	\$400,000	\$300,000	\$330,000	\$363,000	\$399,000	\$1,942,000
Statewide Community Displays-High	\$500,000	\$400,000	\$300,000	\$330,000	\$363,000	\$399,000	\$2,292,000
Campaign on Unsecured Loads-High	\$375,000	\$500,000	\$550,000	\$605,000	\$666,000	\$733,000	\$3,429,000
Statewide Spring Cleaning Event-High	\$300,000	\$400,000	\$440,000	\$484,000	\$532,000	\$585,000	\$2,741,000
Total High	\$2,275,000	\$4,900,000	\$4,010,000	\$4,411,000	\$4,852,000	\$5,337,000	\$25,785,000

**Table 8 Cost Estimates for the Large-Scale Campaign with Five Program Elements (High)**

## **6.0 Recommendations and Implementation**

The key finding of this research is to focus on communications and public education as the primary method for mitigating highway litter in Utah. A large-scale litter campaign is envisioned with five programs coordinated around a campaign brand:

- 1) Establishing a statewide partner program (start-up costs \$750,000);
- 2) Developing a statewide school program (start-up costs \$200,000);
- 3) Developing community outreach and displays (start-up costs \$150,000);
- 4) Initiating a campaign focused on unsecured loads (start-up costs \$500,000); and,
- 5) Establishing an annual statewide spring-cleaning day (start-up costs \$300,000).

The campaign brand would be developed initially with a start-up cost of \$750,000 and is envisioned as coordinating with the existing Keep Utah Beautiful program. The other program elements can be introduced in phases, with developing program partners being a logical early initiative.

It is recommended that another early-stage initiative be the annual statewide spring-cleaning day. This culminating event is designed to engage all Utahns in the commitment to Keep Utah Beautiful. With persistent commitment, this annual event will help develop a core anti-litter culture in Utah. Pursued persistently, year over year, this event will generate dividends in the form of cleaner highways and public spaces.