



# 2009 Visible Litter Study Executive Summary

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NuStats, in cooperation with EnviroMedia Social Marketing and the Texas Department of Transportation (TxDOT), conducted a follow-up to the 2001 and 2005 Visible Litter Study (VLS) in 2009 to estimate the projected number of pieces and types of litter on Texas roadways. For this study, litter was collected from 163 research segments across Texas, each consisting of a 1,000-foot-long stretch of TxDOT-maintained roadway. In 2005, 129 sites consisting of a 750-foot-long stretch of roadway were sampled. Data from the current study were weighted for comparison with those from 2005.

The increase in number and length of sites in 2009 was designed to improve the confidence interval for the findings. Although the changes narrowed the interval from +/- 249 million pieces of litter in 2005 to +/- 200 million pieces of litter in 2009, changes in litter counts year to year are not statistically significant.

This report documents the methods and results of the 2009 Visible Litter Study. Following this Executive Summary, the remainder of this report documents the entire survey effort. Specific information on the study objectives, methods, sampling, and other study details begins in the section of this report titled Introduction.

## Study Highlights

Below are the highlights of the findings from the 2009 VLS:

**Visible litter<sup>1</sup> appears to have decreased on the Texas-maintained highway system; however, piece-for-piece, overall litter appears to have increased 33 percent<sup>2</sup>.**

- The results of the 2009 VLS indicate that approximately 1,102,000,000 items accumulate annually on the Texas-maintained highway system (comprised of Interstate Highways, U.S. Highways, State Highways, and Farm-to-Market roads). While litter seems to have increased 33 percent since 2005 (827 million items), it appears litter has decreased by 11 percent since 2001 (1.237 billion items).
- The increase in litter can be explained in part by the increase in Average Daily Traffic (ADT) counts from 2003 to 2007 for the roadway segments sampled in 2009. All sampled roadway segments show an increase in traffic from 2003 to 2007, with an overall increase of 9 percent. FM Roadway segments show the most increase in ADT counts (16 percent) followed by Interstate Highways, State Highways, and U.S. Highways. The overall Texas population<sup>3</sup> increased 7.8 percent from 22,424,884 in 2004 to 24,326,974 in 2008, while the number of people of legal driving age also increased 4.6 percent since 2005, from 17,210,146 to 17,994,671.
- The biggest increases – based on actual pieces – are in micro litter (e.g., small pieces of litter such as cigarette butts that are not easily seen on roadways). For example, the number of cigarette butts increased by 42 percent.
- Food items, which are generally more visible litter, such as fast food bags decreased by 76 percent – from 29 percent in 2005 to 7 percent in this year's study. In the past two studies, food items were among the top two most prevalent litter categories, along with tobacco.

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<sup>1</sup> Litter that can be seen from roadways: Examples include food wrappers, drink cups, and food-related bags.

<sup>2</sup> Not statistically significant.

<sup>3</sup> Population estimates as found on the official U.S. Census Bureau website.



Today, food litter falls behind tobacco (43 percent), non-alcoholic beverages (13 percent) and household/personal (9 percent).

**Tobacco products, non-alcoholic beverages, and construction/industrial-related items constitute 66 percent of all litter.**

- Two-fifths (43 percent) were tobacco-related litter. Items in this category include cigarette butts, cigarette packs, cigar butts, etc.
- More than one-tenth (13 percent) was non-alcohol-beverage-related litter. Items in this category include soda cans, cups, soda bottles, and cup pieces.
- One in ten items (10 percent) was related to construction/industrial. Items in this category include duct tape, sandpaper, wire, pipe, and paint cans.
- Seven categories (in descending order of percentage of total roadside litter composition: household/personal, food, automotive, alcoholic beverage, printed, agriculture/garden, and other) comprised the other 34 percent of litter collected.

**Cigarette butt litter, still the most commonly found litter item on Texas roadways, increased by 8 percentage points between 2005 and 2009.**

- When cigarette butts are excluded from the analysis, the data shows a decrease in litter on Interstate Highways and FM Roadways.

**Proximity of potential litter sources increases amounts of roadside litter.**

- The data suggests a causal relationship<sup>4</sup> between litter amounts and the proximity of shopping malls, gas stations, schools, fast-food restaurants, and liquor stores.

**More traffic volume equates to more litter.**

- Previous litter studies confirmed heavily traveled roads are “dirtier” than less traveled roads — increased traffic equals increased litter.<sup>5</sup> The 2009 VLS results support these findings.

**About 95 percent of Texas litter is paper, plastic, metal, rubber or leather.**

- Almost two-thirds (63 percent) of all items were made of paper and paperboard. These items ranged from paper grocery bags to miscellaneous pieces of cardboard.
- About one-fifth (19 percent) of collected items were plastic.
- About 7 percent were classified as metal, while 6 percent was rubber/leather.

**Litter does not differ substantially across sample sites.**

- A comparison from the 129 sites included in both the 2005 and 2009 studies shows the complete results, including all 163 sites, are consistent. In other words, NuStats found no substantial differences in litter counts from the additional 34 sampled sites in 2009.

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<sup>4</sup> Statistical correlation tests showed a direct relationship between litter and the proximity to a variety of shopping and food establishments, as well as schools and gas stations.

<sup>5</sup> The 2001 and 2005 Litter Studies suggested a significant correlation between litter density and traffic volume.