Report No.: 405160-31
Report Date: May 2013

MAILBOX HAZARD AND RISK ASSESSMENT

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Contract No.: T4541-BE

Sponsored by
Roadside Safety Research Program Pooled Fund
Study No. TPF-5(114)

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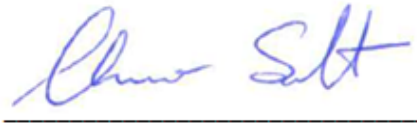

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Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.

4. Title and Subtitle	5. Report Date
MAILBOX HAZARD AND RISK ASSESSMENT	May 2013
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
Chiara Silvestri Dobrovolny, Kierstyn M. White and Garret Haegelin	Report No. 405160-31

9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Texas Transportation Institute Proving Ground 3135 TAMU College Station, Texas 77843-3135	11. Contract or Grant No. T4541-BE

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
Washington State Department of Transportation Transportation Building, MS 47372 Olympia, Washington 98504-7372	Final Report March 2011 – January 2013
	14. Sponsoring Agency Code

15. Supplementary Notes

Research Study Title: Task Order #31 – Mailbox Hazard and Risk Assessment
Name of Contacting Representative: Jeff Jeffers

16. Abstract

Mailboxes are the closest obstacle permitted next to the travel lanes. Little, however, is known about the actual crash history. Although the Federal Highway Administration and the United States Postal Service encourage the use of crashworthy mailboxes, in the State of Alaska mailboxes are treated as a right of the property owner, and do not require a permit. Without a permitting process the department does not have a formal program to review mailbox crashworthiness with property owners. At least one state's Department of Transportation policy is to install all roadside mailboxes, thereby establishing and enforcing crashworthiness outside of project funding.

The first purpose of this research is to evaluate the risk presented by mailbox supports. The second goal is to identify state permitting requirements and enforcement policies as they relate to mailbox supports. The third objective is to provide agencies with guidance for policy options to prioritize safety initiatives that may lead to reduction of risk and/or reduced crash severity.

In order to prioritize and comply with the roadside safety needs, the current level of crash risk against mailboxes was examined and compared with other roadside fixed object obstacles. Proportions of injury/fatality crashes were calculated to evaluate whether policies for stricter control of the run-of-the-way would affect any outcomes.

The information compiled from this research will enable policy makers to evaluate what policy changes may be optimal to affect a reduction of severe crashes. With this report, the authors want to provide with survey results on current state agencies permitting requirements and enforcement policies related to mailbox supports. In addition, this report includes guidance for policy options aimed at prioritizing safety initiatives for the reduction of mailbox supports risk and/or crash severity.

17. Key Words	18. Distribution Statement
Mailbox, Risk Assessment, Crash Rate, Crashworthiness, Support, Postal Service	

19. Security Classif.(of this report)	20. Security Classif.(of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	264	

SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
	NOTE: volumes greater than 1000 L shall be shown in m^3			
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
°C	Celsius	1.8C+32	Fahrenheit	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380.
(Revised March 2003)

ACKNOWLEDGMENTS

This research project was performed under a pooled fund program between the State of Alaska Department of Transportation and Public Facilities, California Department of Transportation (Caltrans), Louisiana Department of Transportation and Development, Minnesota Department of Transportation, Pennsylvania Department of Transportation, Tennessee Department of Transportation, Texas Department of Transportation, Washington State Department of Transportation, West Virginia Department of Transportation, and the Federal Highway Administration. The authors acknowledge and appreciate their guidance and assistance.

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Revised October 2012

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TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

LIST OF FIGURES

Page

LIST OF TABLES

Page

CHAPTER 1. INTRODUCTION

INTRODUCTION

Mailboxes are the closest obstacle permitted next to the travel lanes. Little, however, is known about the actual crash history. Although the Federal Highway Administration (FHWA) and the United States Postal Service (USPS) encourage the use of crashworthy mailboxes, in the State of Alaska mailboxes are treated as a right of the property owner, and do not require a permit. Without a permitting process the department does not have a formal program to review mailbox crashworthiness with property owners. The opportunity for affecting general improvement occurs during capital projects for shoulder widening and realignment. On those projects, the department removes existing mailboxes and installs approved mailbox supports at little or no expense to the property owner. At least one state's Department of Transportation (DOT) policy is to install all roadside mailboxes, thereby establishing and enforcing crashworthiness outside of project funding.

In order to prioritize and comply with the roadside safety needs, the current level of crash risk against mailboxes needs to be examined and compared with other roadside point obstacle such as signs, luminaires, utility poles, trees, guardrail end treatments, and other fixed objects. Proportions of injury/fatality crashes need to be calculated to evaluate whether policies for stricter control of the run-of-the-way would affect any outcomes.

OBJECTIVES / SCOPE OF RESEARCH

The first purpose of this research is to evaluate the risk presented by mailbox supports. The second goal is to identify state permitting requirements and enforcement policies as they relate to mailbox supports. The third objective is to provide agencies with a guidance for policy options to prioritize safety initiatives that may lead to reduction of risk and/or reduced crash severity.

The information compiled from this research will enable policy makers to evaluate what policy changes may be optimal to affect a reduction of severe crashes. With this report, the authors want to provide with survey results on current state agencies permitting requirements and enforcement policies related to mailbox supports. In addition, this report includes guidance for policy options aimed at prioritizing safety initiatives for the reduction of mailbox supports risk and/or crash severity.

CHAPTER 2. LITERATURE REVIEW

BACKGROUND

Although mailboxes are the closest obstacle allowed to the travel lane, their current level of crash risk is unknown. Fitzpatrick et al. (1974) collected accident data from four states (Michigan, Missouri, Texas and Washington) for the year 1972 and found that accidents against mailboxes represent a significant percentage of total fixed-object collisions. The Wisconsin Transportation Bulletin (1993) reported that limited data available suggests that, yearly, 70 to 100 highway deaths in the USA are related to mailboxes. The United State Postal Service has set some standards for residential mailbox installation and maintenance, and the AASHTO guide gives recommendations for both mailbox location and support types use (USPS, 2012; AASHTO, 1994). Some states, however, do not require a permit for mailbox installation, thus the level of the device crashworthiness cannot be verified.

The Texas A&M Transportation Institute (TTI) has been involved in various projects aimed at reducing the probability of injury when mailboxes are impacted by a vehicle. Already back in 1980, Ross et al. (1980) performed seven full-scale crash tests to evaluate the impact behavior of rural mailbox installation. Three tests (out of the seven performed) involved multiple boxes mounted on boards with wood-post supports, two tests considered single box installation with steel pipe and breakaway mechanism, and the last two tests involved steel-pipe, multiple box support in the shape of an inverted U. Test results encourage the use of breakaway devices which showed to allow for minimal vehicle damage and potential occupant injury. On the other side, wood posts as mailbox supports seemed to present a problem especially when installed on roadway sections with allowed speed vehicle higher than 40 mi/h (64.4 km/h). Concerns were directed to the brittle property of wood support under impact, which would fracture at bumper height and keep the upper part of the post connected to the mailbox to ultimately impact the windshield.

Later in 1984, TTI performed a test and evaluation of neighborhood mailboxes, which are typically twelve to sixteen boxes housed in a metal framework and supported by a single vertical post, attached to a concrete footing (Campise and Hayes, 1984). In neighborhoods, having one big mailbox for everyone will make is easier on the mail carrier. A neighborhood mailbox was impacted with a 1978 Honda at 60 mph. The vehicle exhibited a violent rollover and thus, did not meet the criteria of NCHRP Report 230 (Michie, 1981). Recommended criteria on these mailboxes have been made due to the results from the crash tests. This recommended criterion puts some limits on the supports to make these mailboxes acceptable. Until the changes are made to this type of mailbox, it was concluded that it should not be permitted on high-speed roadways. Authors believed a breakaway support would have made this a safer mailbox.

In 1993, tests were conducted by TTI to evaluate the performance of a new universal bracket which was designed by the Texas Department of Transportation (TxDOT) to attach different sizes of mailbox to the support post (Ross et al., 1993a). The hope for this new design was to reduce cost and to make the installation process easier. The universal bracket was designed such that it would fit any of the three standard mailbox sizes. A total of 11 crash tests were performed. Three categories were evaluated in each crash test: Structural Adequacy, Occupant Risk, and Vehicle Trajectory.

Three of the 11 tests were conducted with a modified version of the universal bracket. In some of the tests, minor errors occurred such as separation of the mailbox and the bracket. Tests were evaluated according to NCHRP Report 230. Only size no. 1½ vandal-proof mailbox demonstrated unacceptable performance.

New ideas for how to make roadways safer are being thought of everyday. In order to make sure these ideas are safe, full-scale crash tests are performed. These tests show the performance of the design and how to improve it. A new swing-away mailbox support was designed by the Minnesota Department of Transportation to help in areas with snow and ice. TTI (Mak and Menges, 1996) conducted evaluation tests on the swing-away mailbox support designed by the Minnesota Department of Transportation in accordance with the guidelines set by the 1985 American Association of State Highway and Transportation Officials (AASHTO) (AASHTO, 1985). Four full-scale crash tests were completed. One of the major components of this support is the cantilever arm which is supposed to allow a snow plow to operate without damaging the mailbox support. The swing-away mailbox support can hold one mailbox or a triple mailbox assembly. These both were part of the four crash tests. Crashes number 1, 2, and 3 caused little to no damage to the vehicle. These involved the single mailbox swing-away support and were said to have successfully passed the crash test. Crash number 4 caused much more damage to the car where the windshield shattered and pushed back in the occupant compartment. Crash number 4 was determined to have failed the crash test. The Minnesota swing-away mailbox resulted in successfully meeting the evaluation criteria for a single mailbox assembly required by NCHRP 350, but not for a triple mailbox assembly (Ross et al., 1993b).

More recently, TTI conducted a study to evaluate temporary barrel-mounted mailboxes to be used in work zones (Bligh et al., 2000). A mailbox on a plastic drum was impacted head-on by a Geo Metro at 56.7 mi/h (91.3 km/h). Based on the NCHRP Report 350 guidelines, the temporary mailbox support performed acceptably, since the mailbox on plastic drum did not penetrate the occupant compartment and both the occupant risks and vehicle trajectory requirements were met. In the same period, TTI evaluated the performance of molded plastic mailboxes on three different types of support posts, including a 4x4 wood, a 2 lb/ft U-channel, and a 3-inch diameter schedule 40 pipe (Bligh et al., 2001). The device met the NCHRP 350 requirements for all three support types. The 4x4 timber support, however, appeared to be the best alternative from a functional and impact performance standpoint, having resulted in the least amount of windshield damage to the test vehicle. A 4x4 wood support post was thus recommended by TTI researchers for use with molded plastic mailboxes.

Tahan et al. (2004) evaluated safety performance of security mailboxes using both crash testing and finite element computer simulations. Four different mailboxes were evaluated in this research study: Belaire 20, Belaire 16, Senator 16, and Senator 16 XL. Three different mounts and two different supports posts were tested for an overall total of 24 tests performed with different combinations of mailbox, mounts, and support posts. Along with the crashes, 24 finite element computer simulations were performed to support the investigation of the mailbox safety. Tests and computer simulations were performed with use of a passenger car (Geo Metro), at a nominal speed of 62 mph. None of the tests showed the potential for the mailbox or support to obstruct the occupant compartment.

In 2006, the Maintenance Division of Texas Department of Transportation (TxDOT) felt it was necessary to try out a newly designed multiple-mailbox system from Shur-Tite (Sheikh et al., 2006). In order to be used on Texas roadways it had to pass a full-scale vehicle crash test stated in the National Cooperative Highway Research Program criteria. Two tests were done using 1800 lb. vehicles. One test was done at 22 mph and the other at 62 mph. The Shur-Tite multiple mailbox system consists of four mailboxes: two small and two large. The two small mailboxes are mounted directly on the bracket mount and the two large mailboxes are mounted on bracket extensions. On impact the support was pulled out of the ground and ended up 73 feet from the original spot. All the mailboxes stayed intact but were deformed and the vehicle ended up with little damage to the bumper and the hood. The Shur-Tite multiple mailbox system passed the crash test and met the characteristics TxDOT was looking for.

USPS REGULATION

There are multiple factors that come into play with making a mailbox safe and convenient for the mail carrier and other vehicles. USPS has provided a set of guidelines for a good mailbox. This is what USPS suggests for the placement of a mailbox: "Your local postmaster must approve the location of your mailbox. Put a roadside mailbox where a carrier can reach inside without leaving the truck. That means positioning it about 41" to 45" off the ground and back about 6" to 8" from the curb. If you live in the city and are attaching the box to your house, just make sure it can be accessed easily from your sidewalk, steps, or porch. Because city carriers often shoulder heavy bags, put your mailbox about 4' from the ground. That way, your carrier won't have to stretch or bend to reach it. And remember to keep the path to your mailbox clear in inclement weather." (USPS, 2012)

As far as the post, USPS has different recommendations. If a wooden post is used, it cannot be any larger than a 4"x4". If still or aluminum is used then it must be a 2" pipe. In order for it to give way if obstructed by a vehicle, it must be buried less than 24" deep. USPS recommends not to use dangerous supports such as heavy metal pipes, concrete posts, and farm equipment. If living in an area where there is a lot of snowfall, then a semi-arch or extended arm-type support should be used so a snow plow can still dismiss the snow around the mailbox. USPS would like the owner to make a routine mailbox check to keep everything up to date and working. The following suggestions are listed by USPS: "replace loose hinges on the door, repaint rusty or peeling parts, remount the post if its loose, and replace missing or faded house numbers."

USPS mailbox guidelines are reported in details in Appendix A.

AASHTO: A GUIDE FOR ERECTING MAILBOXES ON HIGHWAYS

The "AASHTO A Guide for Erecting Mailboxes on Highways" addresses various issues involving mailbox placement and design, to increase roadside safety (AASHTO, 1994). It suggests in detail where to safely place a mailbox with respect to the road geometry. This document describes what side of the roadway a mailbox should be in certain cases and recommends avoiding placing mailboxes on high-speed, high-volume highways, near intersections, or beyond sharp vertical crests. The AASHTO guide also describes the recommended dimensions and surface type of mailbox

turnouts in specific cases. In addition to general roadway placement guidelines, this guide specifies certain distances a mailbox should be placed from the edge of a roadway for various conditions.

The mailbox support and attachment designs are major factors in the safety of the unit. In general, the AASHTO guide declares that all exposed mailboxes should be firmly attached to supports that yield or break away safely if struck by a vehicle. It goes on to define recommended material of the mailbox and support as well as the dimensions of the mailbox, support, and mailbox support hardware. It also recommends height of the mailbox, distance to embed the support in the ground, and the amount of weight the mailbox should be able to hold. Finally, this document states that multiple mailboxes must meet the same criteria as single mailboxes.

AASHTO guide for erecting mailboxes on highways is reported in Appendix B.

MAILBOXES NCHRP REPORT 350 OR MASH CRASH TESTED

Below is a list of FHWA letters of acceptance for mailbox support systems:

- http://shur-tite.com/wp-content/uploads/2012/03/MMS_FHWA-Acceptance-Letter.pdf
- http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/breakaway/pdf/ss119.cfm
- http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/breakaway/pdf/ss144.pdf
- http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/breakaway/pdf/ss125.pdf
- http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/breakaway/pdf/ss114.pdf

FHWA letters of acceptance for mailbox support systems are reported in Appendix C.

CHAPTER 3. IDENTIFICATION OF PERMITTING REQUIREMENTS AND ENFORCEMENT POLICIES RELATING TO MAILBOX

The researchers prepared a survey intended for State Departments of Transportation and aimed at gaining information regarding state permitting requirements and enforcement policies as they relate to mailbox supports.
The survey addressed data concerning:

- type of mailbox supports (single and multiple) currently in use;
- placement of mailbox supports with respect to the roadway;
- standards for permanent mailbox supports;
- crashworthiness of mailbox supports;
- crash data involving mailbox supports;
- crash data involving fixed objects.

A copy of the survey sent to the DOTs is attached to this report as Appendix D. Pictures and a brief description of the mailbox supports and of the support foundations types included in the survey questions are listed in Tables D1, D2, and D3. Also, complete answers to survey questions are reported in Appendix E.

Out of 50 States contacted, a total of 28 States participated in this research study and answered either partially or fully the questions of the survey. Figure 3.1 illustrates the participating States and Table 3.1 reports the names of States Agencies which responded to the survey.

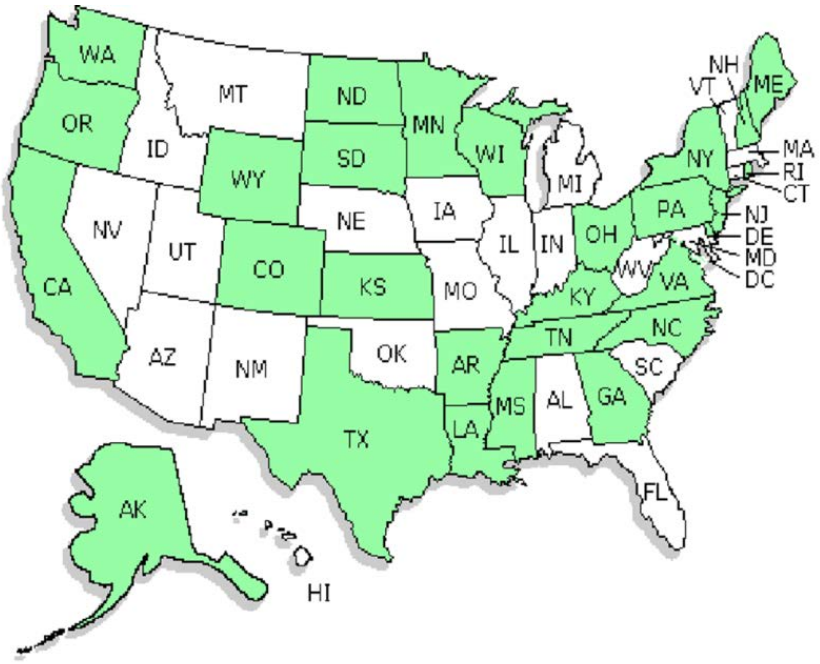


Figure 3.1. Summary of States that Replied Partially or Fully to the Survey (Colored in Green).

Table 3.1. States and Agencies which Responded to the Survey.

Agency	State
Alaska DOT&PF	AK
Arkansas Highway and Transportation Department	AR
California DOT	CA
Colorado DOT	CO
Delaware DOT	DE
Georgia DOT	GA
Kansas DOT	KS
Kentucky Transportation Cabinet	KY
Louisiana DOTD	LA
Maine DOT	ME
Minnesota DOT	MN
Mississippi DOT	MS
North Carolina DOT	NC
North Dakota DOT	ND
New Hampshire DOT	NH
New Jersey DOT	NJ
New York SDOT	NY
Ohio DOT	OH
Oregon DOT	OR
Pennsylvania DOT	PA
Rhode Island DOT	RI
South Dakota DOT	SD
Tennessee DOT	TN
Texas DOT	TX
Virginia DOT	VA
Washington State DOT	WS
Wisconsin DOT	WI
Wyoming DOT	WY

MAILBOX SUPPORT POLICY

The first part of the survey aimed at collecting States policy/standard or recommendation for mailbox support installation. Also, it was asked if the owner was responsible for the installation of the mailbox support system. From survey answers collection, it resulted that out of the 28 States that participated to the survey, a total of 19 States (67.8%) answered they have standards for mailbox support installation, while 7 States (25%) reported they don't have standards. Two States, additionally, answered "Other", but one did not give additional information when answering the question. A total of 14 States (50%) reported they follow the USPS standards.

Sixteen States reported that the mailbox support owner is responsible for installation of the system, while 6 States stated the owner is not responsible. Six other States answered this question by giving details on the owner's responsibility: it appears that, for these States, generally the DOT (or the Contractor) becomes responsible for mailbox support installation on construction projects. At that point, usually, the DOT/Contractor becomes responsible to bring the existing installation up to standard at their cost.

It is interesting to note that, although some States answered they have State standards for mailbox support installation, they also noted that the owner is responsible for its installation. A common comment made by the DOTs was that the owner is responsible for first installation of the mailbox support, while the State can replace it only during road projects. Only at that point the State DOT has the authority to modify the mailbox support type and installation according to the standards the State might have. States answers are summarized in Table 3.2.

Table 3.2. Summary of States Answers from Questions # 2, 3, 4, and 5.

State DOT	Does your State have standards for mailbox support installation?	Does your State follow USPS standards?	Provide own State standards and policies	Owner responsible for installation?
AK	Yes	Yes	http://www.dot.state.ak.us/stwddes/dcsprecon/stddwgeng.shtml	Yes
AR	Yes	Yes	http://www.arkansashighways.com/roadway_design_division/usunits/33--MB-1.pdf	Yes
CA	Other	Yes	AASHTO Roadside Design Guide	No
CO	Yes	Other	http://www.coloradodot.info/business/designsupport/standard-plans/2006-m-standards/2006-m-standards-pdfs/11-mailbox-supports/mailbox-supports-m-210-1-all.pdf	Other
DE	Yes	Yes	http://www.deldot.gov/information/pubs_forms/manuals/subdivisions/pdf/standards_and_regulations_031108.pdf	Yes
GA	Yes	Yes	www.ga.gov	Yes

Table 3.2. Summary of States Answers from Questions # 2, 3, 4, and 5 (Continued).

State DOT	Does your State have standards for mailbox support installation?	Does your State follow USPS standards?	Provide own State standards and policies	Owner responsible for installation?
KS	No	N/A	N/A	Yes
KY	Yes	Other	http://transportation.ky.gov/Organizatia-Resources/Policy%20Manuals%20Library/Maintenance.pdf	Yes
LA	Yes	Yes	http://www.dotd.la.gov/highways/standardplans/DirListing.aspx?txtPath=/highways/standardplans/Standard Plans/Mailboxes	Other
ME	Yes	No	N/A	Yes
MN	Yes	Yes	http://dotapp7.dot.state.mn.us/edms/download?docId=1062364	No
MS	Other	Other	N/A	Other
NC	Yes	Yes	N/A	Yes
ND	Yes	Yes	http://www.dot.nd.gov/divisions/design/docs/standards/D766-01.pdf	No
NH	No	N/A	N/A	Yes
NJ	No	N/A	N/A	Yes
NY	No	N/A	N/A	Yes
OH	Yes	Other	http://www.dot.state.oh.us/Divisions/Engineering/Roadway/roadwaystandards/Pages/locationanddesignmanuals.aspx	No
OR	Yes	Yes	ftp://ftp.odot.state.or.us/techserv/roadway/web_drawings/roadway/rev_05/rd101.pdf	Other
PA	No	N/A	N/A	Yes
RI	Yes	No	N/A	No
SD	Yes	Yes	http://www.sddot.com/pe/roaddesign/docs/rdmanual/rdmch16.pdf on page 16-55	Other
TN	No	N/A	N/A	Yes
TX	Yes	Yes	http://www.txdot.gov/insdtdot/orgchart/cmd/cserve/standard/maintcad.htm	No
VA	Yes	Yes	http://www.extranet.vdot.state.va.us/LocDes/Electronic%20Pubs/2008Standards/Section600/603_01.pd	Yes
WS	Yes	No	http://www.wsdot.wa.gov/Design/Standards/Plans.htm#SectionH	Other
WI	No	N/A	N/A	Yes
WY	Yes	Yes	http://www.dot.state.wy.us/webdav/site/wydot/shared/Engineering_Services/Standard%20Plans/202-1%20%20.pdf	Yes

States Standards/Policies

Researchers collected all the document links the States provided and summarized each participating State's mailbox installation policy. As noted, some of the States recommend following the USPS or the AASHTO policies. In some cases, however, States standards vary from the USPS and AASHTO policies. For those cases, State's installation recommendation details are reported .

Alaska

- USPS Standards

Arkansas

- Use own standards
- Metal pipe for support shall be 2" outside diameter steel with a wall thickness of 0.145" and weight of 2.72 lbs/ft outside diameter and weight shall have tolerance of +/- 5%
- Wood or metal and anti-twist plates may be used but only on metal posts

California

- USPS Standards

Colorado

- Use own standards
- Semi-arch or extended arm which allows snow plows to sweep near/under mailboxes w/o damaging supports and provides easy access to the mailboxes by carriers and customers. 4"x4" wood post or a 2" diameter standard steel or aluminum
- Pipe buried no more than 24". This type of post should safely break away without causing damage or injury if struck.
- 48" from the bottom of the mailbox to the ground. Should be placed on the right hand side of the road and in direction of travel.
- Minimum of 8' from the edge of the highway on State Highways

Delaware

- USPS Standards

Georgia

- AASHTO Standards

Kansas

- Standards were not found

Kentucky

- Use own standards
- Wooden post no larger than 4"x4" in section and 5" in diameter. Larger wood posts may be used if holes are drilled near the ground line to render resistance no greater than above. Metal pipes no larger than 1.5" inside diameter. 2" perforated channel

Louisiana

- USPS Standards

Maine

- USPS Standards

Minnesota

- USPS Standards

Mississippi

- Standards were not found

New Hampshire

- USPS Standards

New Jersey

- Standards were not found

New York

- AASTHO Standards

North Carolina

- USPS Standards

North Dakota

- Uses own standards
- Hardware details shall consist of the "V-Loc Mailbox Support System" manufactured by Tapco and Traffic and Parking Control Co. Inc. size must not exceed 4" by 4" for a wooden post or 2" diameter for a steel pipe post for roadside barrier safety
- Mailboxes should be installed at least 42" high to provide clearance for the plow wing. 8-12" from the curb face. Must be located on the right hand side of the road in the direction of travel.

Ohio

- Uses own standards
- The support structure (post) shall be either a wooden post (no larger than 4 inch x 4 inch square or 4 inch diameter round) or a metal post with a strength no greater than a 2 inch diameter standard strength steel pipe
- pipe buried no more than 24"
- Sufficient strength to prevent the box from separating from the post top if struck by a vehicle.
- Placed at an offset from the edge of the pavement so that the road- side face of the mailbox is no closer than 3' from the edge of the pavement

Oregon
- AASTHO Standards

Pennsylvania
- Standards were not found

Rhode Island
- Standards were not found

South Dakota
- USPS Standards

Tennessee
- USPS Standards

Texas
- USPS Standards

Virginia
- USPS Standards

Washington
- USPS Standards

Wisconsin
- Uses own standards
- Pipes should be 1.5" inside diameter. 4"x4" square wood and no larger than 4" diameter. Metal channels should weight no more than 2 lbs.
- Pipe buried no more than 24”
- Attach the mailbox firmly to the support post using adequately strong bolts and plates.
- 42-48” above ground level.

Wyoming
- USPS Standards

SINGLE MAILBOX SUPPORT SYSTEMS

Single Mailbox Support System Types

One section of the survey was designed to obtain information regarding which types of single and multiple mailbox supports are currently used by the State DOTs. The researchers identified certain types of mailbox support systems (made of wood, polyurethane and steel) and included them in the survey so that each participating State could check the system currently in use (or anyhow allowed) in its territory. The States, however, were also given the option to include any other support system that was not identified by the authors with a literature review, but still allowed for installation. Tables 3.3 through 3.6 and Figures 3.2 through 3.4 list the identified single mailbox support systems made of different materials, and report the States answers about which systems are utilized by the DOTs. Table 3.7 and Figure 3.5 report States answers about the foundation types utilized by the DOTs for single mailbox support systems.

State DOTs were inquired about whether the single mailbox support systems in use in their territory have been tested for crashworthiness according to the criteria reported by the "Recommended Procedures for the Safety Performance Evaluation of Highway Features" (NCHRP Report 350) (Ross et al., 1993b). Results are reported in Table 3.8.

Table 3.3. Single Wood Mailbox Support Systems used by States DOTs.

State	Single Wood	
	MailMaster Deluxe, 4" x 4" 	Other
AK	X	X
AR	X	
CO		
CA		
DE	X	
GA	X	
KS	X	X
KY		X
LA		X
ME		X
MN	X	
MS		X
NC	X	
ND		X
NH	X	X
NJ		X
NY	X	X
OH		X
OR		X
PA	X	
RI		X
SD		X
TN		
TX	X	
VA		
WA		X
WI		
WY		

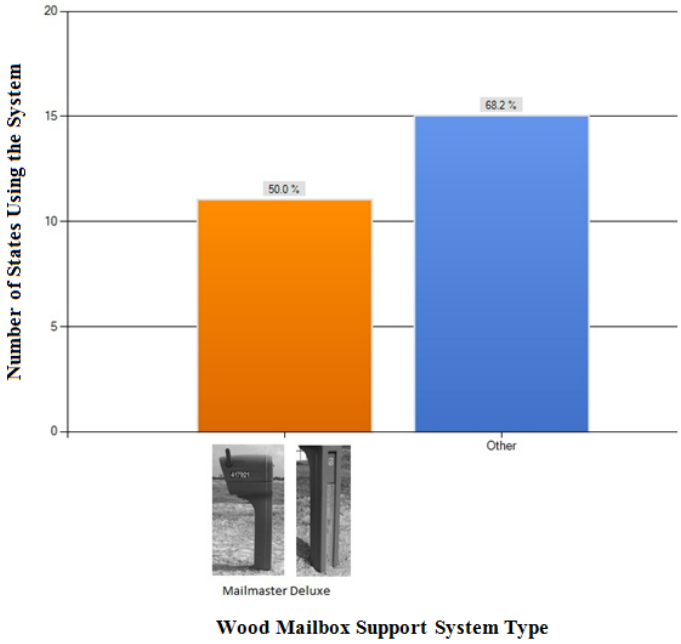


Figure 3.2. Number and Percentage of Participating States using the Identified Single Wood Mailbox Support System Type.

Table 3.4. Single Polyurethane Mailbox Support Systems used by States DOTs.

State	Single Polyurethane	
	Simulated Stone Column, 20" x 20" x 62" 	Other
AK	X	X
AR	X	
CO		
CA		
DE		
GA		
KS	X	
KY		X
LA		X
ME		X
MN		
MS		X
NC	X	
ND		X
NH	X	X
NJ		X
NY	not used	not used
OH		X
OR		
PA	X	
RI		X
SD		
TN		
TX		X
VA		X
WA		
WI		
WY		

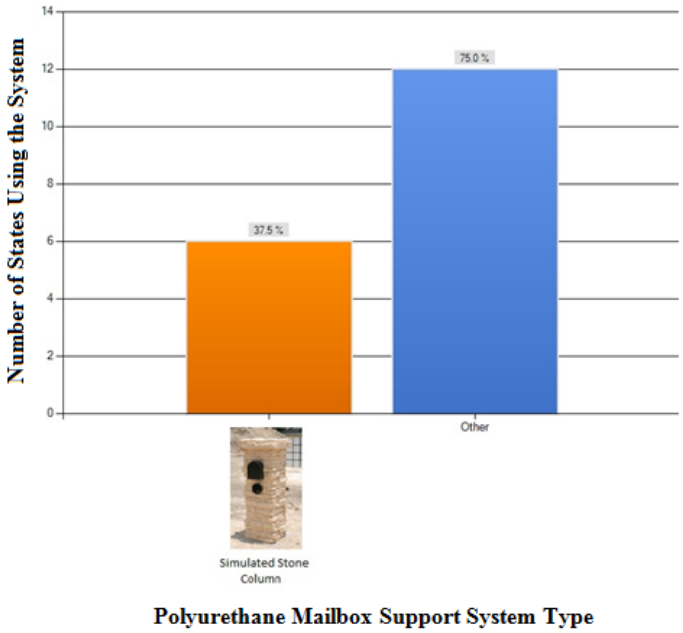
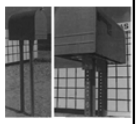


Figure 3.3. Number and Percentage of Participating States using the Identified Single Polyurethane Mailbox Support System Type.

Table 3.5. Single Steel Mailbox Support Systems used by States DOTs.

State	Single Steel											
	MailMaster Deluxe, 2 lb/ft U-channel 	Non-proprietary, 2 lb/ft winged channel 	Non-proprietary, Two 2 lb/ft winged channel 	Swing Away, 3 lb/ft U-channel 	Rubbermaid Deluxe, 3-in diameter, Sch-40 pipe 	2-3/8" O.D., 14 ga, swaged elbow N/A	2-3/8" O.D., 14 ga (vertical) N/A	Non-proprietary, 2-3/8" O.D., 13 ga steel pipe 	NEX Tube, 2-3/8" O.D., 14 ga steel NEX pipe 	Friend Town and Country 	Shur-Tite Steel Mailbox Post, 2-3/8" O.D., 16 ga steel pipe 	Other
AK	X	X	X	X	X	X	X	X	X	X	X	X
AR						X	X		X	X		X
CO								X		X		
CA												
DE	X		X		X						X	
GA		X						X	X			
KS	X		X		X	X	X		X	X	X	X
KY												X
LA												X
ME												
MN				X								
MS												X
NC	X	X	X					X	X			
ND												X
NH	X	X	X	X	X	X	X	X	X	X	X	X
NJ												X
NY												X
OH												X
OR								X				
PA	X	X	X	X	X	X	X	X	X	X	X	X
RI							X					
SD												
TN												
TX		X			X		X		X		X	
VA												X
WA		X		X				X		X		
WI												
WY		X		X			X	X				X

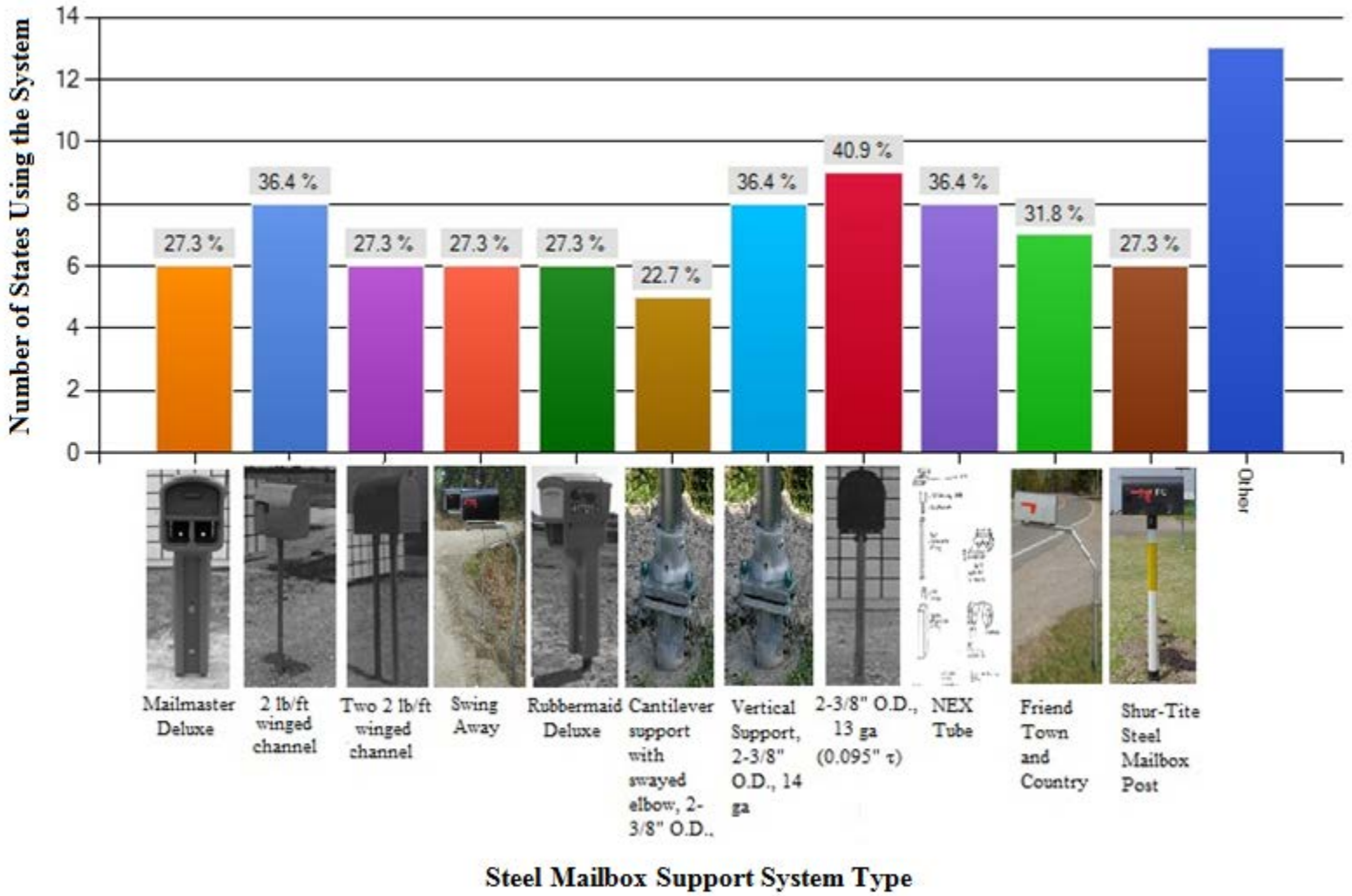
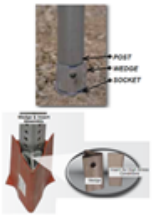


Figure 3.4. Number and Percentage of Participating States using the Identified Single Steel Mailbox Support System Types.

Table 3.6. Other Types of Single Mailbox Support Systems used by States DOTs.

State	Single Other	
	Shur-Tite Flex Mailbox Post, 2-3/8" O.D. 	Other
AK	X	X
AR		
CO		
CA		
DE		
GA	X	
KS	X	
KY		X
LA		X
ME		X
MN		
MS		X
NC	X	
ND		X
NH	X	X
NJ		X
NY		
OH		
OR		
PA	X	
RI		
SD		
TN		
TX	X	
VA		X
WA		
WI		
WY		

Table 3.7. Foundation Types Allowed in the States for Single Mailbox Support Systems.

State	Single Foundations					
	Frangible Base 	Wedge and socket 	Direct Embedding 	Frangible Steel Nested 	Slip Base 	Other
AK	X	X	X	X	X	
AR						
CO		X	X	X	X	
CA						
DE		X	X	X	X	
GA		X			X	
KS			X	X	X	X
KY						
LA						X
ME						X
MN			X			
MS						X
NC	X	X	X	X	X	
ND						X
NH	X	X	X	X	X	
NJ						X
NY						
OH	X					
OR		X	X			
PA	X	X	X	X	X	X
RI						
SD						
TN						
TX		X	X			
VA						
WA			X			
WI						
WY		X	X			

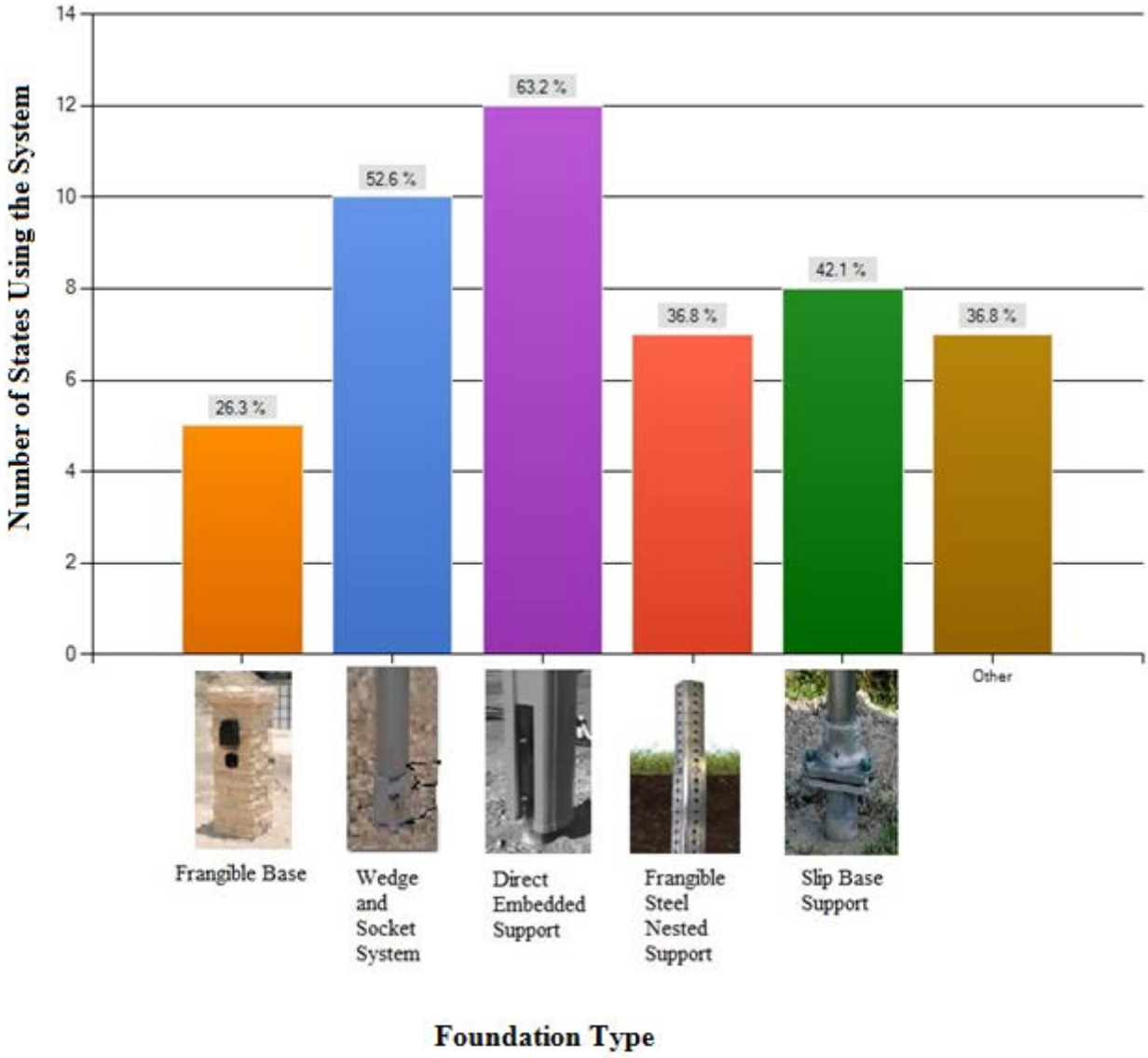


Figure 3.5. Number and Percentage of Participating States using the Identified Foundation Types for Single Mailbox Support System Types.

Table 3.8. Single Mailbox Support Types NCHRP Report 350 Tested.

State DOT	Mailbox Installation Policy	NCHRP Report 350 Crashworthy	Comments from State
AK	Yes	Don't know	Hasn't been tested
AR	Yes	Yes	
CO	Yes	Don't know	Hasn't been tested
DE	Yes	Don't know	Hasn't been tested
GA	Yes	Yes	
KY	Yes	Don't know	Hasn't been tested
LA	Yes	Yes	
ME	Yes	Yes	
MN	Yes	Yes	
NC	Yes	Don't know	Hasn't been tested
ND	Yes	Yes	
OH	Yes	Yes	
OR	Yes	Yes	
RI	Yes	N/A	
SD	Yes	Yes	
TX	Yes	Yes	
VA	Yes	Don't know	Hasn't been tested
WS	Yes	Yes	
WY	Yes	Yes	
KS	No	Yes	
NH	No	Don't know	Hasn't been tested
NJ	No	Don't know	Hasn't been tested
NY	No	Don't know	Hasn't been tested
PA	No	Don't know	Hasn't been tested
TN	No	Don't know	Hasn't been tested
WI	No	N/A	
CA	Other	N/A	
MS	Other	Don't know	Hasn't been tested

Placement Regulation for Single Mailbox Supports

Part of the survey was designed to request information to State DOTs regarding possible regulation for placement of mailbox supports. Questions were addressed to identify policy/recommendation about single mailbox systems installation for minimum vertical height from the road surface (Table 3.9), roadway annual average daily traffic (AADT) and design speed influence on selection and placement of the support systems (Tables 3.10 and 3.11 and Figures 3.6 and 3.7), minimum distances from the front face of curb and from the road edge (Table 3.12).

From the results collected, it appears that 13 States (46% of participating States) require a minimum vertical height between 41 and 45 inches for multiple mailbox systems installation from the road surface, which is also the USPS requirement (Figure 3.8). Three States (11% of participating States) ask for a minimum vertical height between 42 and 48 inches. One State extended the vertical height recommendation installation to a height between 38 and 48 inches, while a couple of other States have requirements of 39 and 42 inches.

Twelve States (43% of participating States) have suggestions for placement of the single mailbox support system from the front face of the curb (Figure 3.9). While only one State responded that any distance between zero to 12 inches is allowed, the remaining 11 States suggest to place the single mailbox system at a distance between six and 12 inches from the front face of the curb.

Eleven States (39% of participating States) have suggestions for placement of the single mailbox support system from the road edge (Figure 3.10). The general requirement for single mailbox support system placement varies from six to 12 inches from the front face of the road edge.

Table 3.9. DOTs Suggestions for Minimum Vertical Height from the Road Surface for Single Mailbox Installation.

State DOT	Mailbox Installation Policy	Min Vertical Height from Road Surface (in)	Comments from State
AK	Yes	38 < x < 48	
AR	Yes	41 < x < 45	Same as USPS
CO	Yes	42 < x <48	
DE	Yes	41 < x < 45	Same as USPS
GA	Yes	41 < x < 45	Same as USPS
KY	Yes	N/A	No Standard
LA	Yes	41 < x < 45	Same as USPS
ME	Yes	N/A	
MN	Yes	41 < x < 45	Same as USPS
NC	Yes	41 < x < 45	Same as USPS
ND	Yes	42 < x <48	http://www.dot.nd.gov/divisions/design/docs/standards/D766-01.pdf
OH	Yes	42 < x <48	
OR	Yes	42	
RI	Yes	N/A	
SD	Yes	41 < x < 45	Same as USPS
TX	Yes	41 < x < 45	Same as USPS
VA	Yes	41 < x < 45	Same as USPS
WS	Yes	39	
WY	Yes	41 < x < 45	Same as USPS
KS	No	41 < x < 45	Same as USPS
NH	No	N/A	No Standard
NJ	No	N/A	No Standard
NY	No	N/A	
PA	No	N/A	
TN	No	41 < x < 45	Same as USPS
WI	No	N/A	
CA	Other	41 < x < 45	Same as USPS
MS	Other	N/A	

Table 3.10. DOTs Policy about Influence of Roadway AADT on Selection and Placement of Single Mailbox Support Systems.

State DOT	Mailbox Installation Policy	Roadway AADT Influence on Selection & Placement	Comments from State
AK	Yes	Yes	Chart in Mailbox Location provides guidance considering AADT and Speed. This guidance has been revised in a draft revision, not yet released, but doesn't change the essential conditions. http://www.dot.state.ak.us/stwddes/dcstraffic/assets/pdf/metal_mailbox_support_design.pdf
AR	Yes	No	
CA	Other	N/A	
CO	Yes	No	
DE	Yes	No	
GA	Yes	No	
KS	No	No	
KY	Yes	No	
LA	Yes	No	
ME	Yes	No	
MN	Yes	No	
MS	Other	Other	
NC	Yes	No	
ND	Yes	No	
NH	No	No	
NJ	No	N/A	
NY	No	No	
OH	Yes	No	
OR	Yes	No	
PA	No	No	
RI	Yes	N/A	
SD	Yes	No	
TN	No	No	
TX	Yes	No	
VA	Yes	No	
WS	Yes	Other	"It depends on type of highway facility. See Design Manual Chapter 530: http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm#Individualchapters
WI	No	N/A	
WY	Yes	No	

It appears that most of the participating States do not have any policy for regulation of single mailbox support systems selection and installation according to the roadway AADT. Only two out of 28 States (Alaska and Washington) indicated guidance for mailbox systems selection and location according to AADT consideration. Their regulations are reported below and in Figure 3.6.

Washington State

Extract from "http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm#Individualchapters" (WSDOT Design Manual, 2012):
"In urban areas where sidewalks are prevalent, contact the postal service to determine the most appropriate mailbox location. Locate mailboxes on limited access highways in accordance with Chapter 530, Limited Access. A turnout, as shown in Exhibit 1600-6, is not needed on limited access highways with shoulders of 6 feet or more where only one mailbox is to be installed. On managed access highways, mailboxes are to be on the right-hand side of the road in the postal carrier's direction of travel. Avoid placing mailboxes along high-speed, high-volume highways. Locate Neighborhood Delivery and Collection Box Units (NDCBUs) outside the Design Clear Zone."

For more information, please refer to the above reported link to the Washington State Design Manual Chapter 530 (WSDOT Design Manual, 2012).

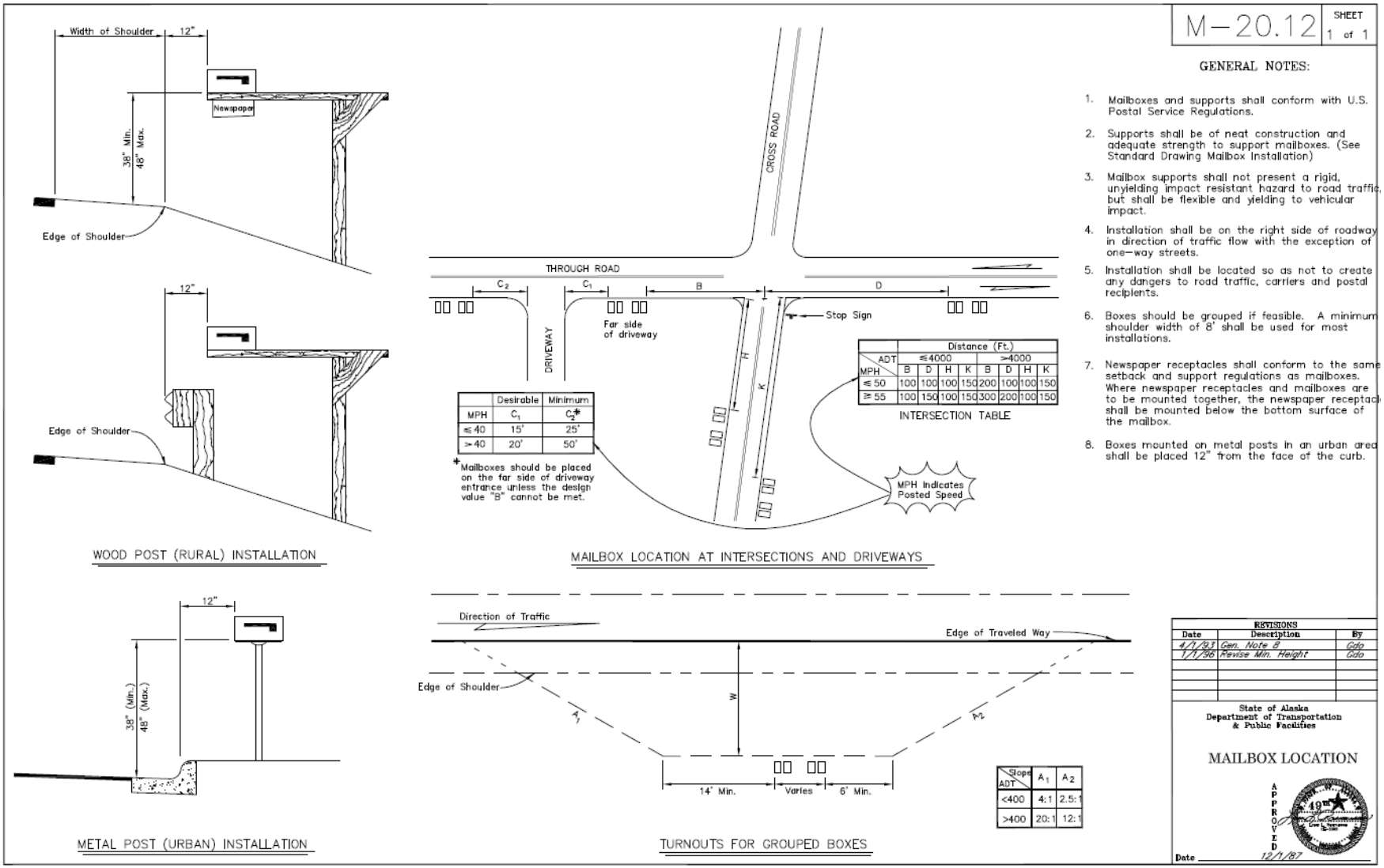


Figure 3.6. Alaska Policy about Influence of Roadway AADT and Design Speed on Selection and Placement of Mailbox Support Systems (AKDOT Design & Construction Standards, 2012).

Table 3.11. DOTs Policy about Influence of Roadway Design Speed on Selection and Placement of Single Mailbox Support Systems.

StateDOT	Mailbox Installation Policy	Roadway Design Speed Influence on Selection & Placement	Comments from State
AK	Yes	Yes	Chart in Mailbox Location provides guidance considering AADT and Speed. This guidance has been revised in a draft revision, not yet released, but doesn't change the essential conditions. http://www.dot.state.ak.us/stwddes/dcstraffic/assets/pdf/metal_mailbox_support_design.pdf
AR	Yes	No	
CA	Other	N/A	
CO	Yes	No	
DE	Yes	No	
GA	Yes	No	
KS	No	No	
KY	Yes	No	
LA	Yes	No	
ME	Yes	No	
MN	Yes	Yes	http://dotapp7.dot.state.mn.us/edms/download?docId=1062364
MS	Other	N/A	
NC	Yes	No	
ND	Yes	No	
NH	No	No	
NJ	No	No	
NY	No	No	
OH	Yes	No	
OR	Yes	No	
PA	No	No	
RI	Yes	N/A	
SD	Yes	No	
TN	No	No	
TX	Yes	No	
VA	Yes	No	
WS	Yes	Other	http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm#Individualchapters
WI	No	N/A	
WY	Yes	No	

It appears that most of the participating States do not have any policy for regulation of single mailbox support systems selection and installation according to the roadway design speed. Only three out of 28 States (Alaska, Minnesota and Washington) indicated guidance for mailbox systems selection and location according to design speed consideration. Their regulations are reported below and in Figure 3.6.

Washington State

Extract from "http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm#Individualchapters" (WSDOT Design Manual, 2012):
"In urban areas where sidewalks are prevalent, contact the postal service to determine the most appropriate mailbox location. Locate mailboxes on limited access highways in accordance with Chapter 530, Limited Access. A turnout, as shown in Exhibit 1600-6, is not needed on limited access highways with shoulders of 6 feet or more where only one mailbox is to be installed. On managed access highways, mailboxes are to be on the right-hand side of the road in the postal carrier's direction of travel. Avoid placing mailboxes along high-speed, high-volume highways. Locate Neighborhood Delivery and Collection Box Units (NDCBUs) outside the Design Clear Zone."

For more information, please refer to the above reported link to the Washington State Design Manual Chapter 530.

Minnesota

The Minnesota policy reported in Figure 3.7 provides guidance to location and installation of accepted mailbox supports on highways with speed limits of 40 mph (65 km/h) or greater (Mn/DOT Road Design Manual, 2012).

11-11.0 ROADSIDE APPURTENANCES

11-11.01 Mailbox Supports

Mn/DOT has developed this policy regarding mailbox supports on the Trunk Highway System. Minnesota Rules Chapter 8818, "Mailbox Installation and Support Standards" is used as a reference to the Mn/DOT policy.

This policy provides guidance to location and installation of accepted mailbox supports on highways with speed limits of 40 mph (65 km/h) or greater.

11-11.01.01 Policy

1. Mailbox installations and supports that have been accepted by the FHWA as meeting the NCHRP Report 350 crash worthiness criteria, meet Minnesota Rules Chapter 8818, U.S. Post Office recommendations, and are in compliance with Mn/DOT Policy are acceptable. To obtain a drawing with an example of a crash tested mailbox support, which satisfies the above requirements, contact the Design Standards Unit, Office of Technical Support.
2. All mailbox supports should be a breakaway design and support a standard mailbox size T2 with a 10 lb (4.5 kg) load.
3. Mailbox supports should consist of corrosion resistance materials, which, in accordance with project/site specific conditions, may be required to include, but not limited to, the following:
   a) Post, pipes and other steel components galvanized per Spec. 3392.
   b) Pipes conforming to Spec. 3362, Schedule 40 of ASTM A53/A53M.
   c) All fasteners conforming to Spec. 3391.
4. The installation should include the following:
   a) Location of the face of mailbox should be 8 in. to 12 in. (200 mm to 300 mm) outside the edge of the shoulder or 6 in. to 12 in. (150 mm to 300 mm) behind the face of the curb.
   b) The height of the mailbox bottom should be 42 in. to 48 in. (1 m to 1.2 m) above the pavement in rural and urban areas. Postal Service regulations will determine the height. The local mail carrier post office should be consulted to determine if any changes need to be made to the installation regarding height and offset distances.
   c) Adequate embedment depths of the mailbox support should be provided so that the structure does not sag or fall over. The embedment depths will vary from each installation by the type of support, the location of the structure on inslope, the steepness of the inslope, and soil condition or type. The details for the supports should include the proper embedment depths in the plans or have provisions in the plans for the embedment depth to be decided in the field. Preferably, the embedment depth shall not be less than 48 in. (1.2 m).
   d) The spacing between mailboxes should be a minimum of 30 in. (760 mm) from center to center of the supports. A multiple mailbox support can be considered if two or more mailboxes are at one location.
5. Alternate support designs may be approved by the Design Standards Engineer or the Project Engineer in consultation with the Design Standards Engineer.

Figure 3.7. Minnesota Policy about Mailbox Supports (Mn/DOT Road Design Manual, 2012).

Table 3.12. DOTs Suggestions for Minimum Distances from Front Face Curb and Road Edge for Single Mailbox Support System Installation.

State DOT	Mailbox Installation Policy	Min Distance from Front Face of Curb (in)	Min Distance from Front Face of Road Edge (in)	Comments from State
AK	Yes	12	12	Beyond the shoulder, 12 inches from hinge point of the shoulder (road edge)
AR	Yes	No requirement	No requirement	
CO	Yes	8-12	8-12	
DE	Yes	6-12	8-12	
GA	Yes	6-8	6-8	
KY	Yes	No requirement	No requirement	
LA	Yes	No requirement	No requirement	
ME	Yes	No requirement	No requirement	Give min distance to post
MN	Yes	6-8	6-8	
NC	Yes	6-8	6-8	
ND	Yes	N/A	N/A	
OH	Yes	No requirement	N/A	at the face of graded shoulder, or 1' past treated shoulder (road edge)
OR	Yes	6-12	8-12	If no turnout then it can be 0
RI	Yes	N/A	N/A	
SD	Yes	6-8	8 ft. when shoulder/constructi on is present	
TX	Yes	6-8	N/A	ftp://ftp.dot.state.tx.us/pub/txdot-info/cmd/cserve/standard/maintcad/mb09(2).pdf
VA	Yes	6-10	N/A	Shall be placed as to not interfere with safety, maintenance and use of highway (road edge)
WS	Yes	0-12	6-8	
WY	Yes	No requirement	8-12	

Table 3.12. DOTs Suggestions for Minimum Distances from Front Face Curb and Road Edge for Single Mailbox Support System Installation (Continued).

State DOT	Mailbox Installation Policy	Min Distance from Front Face of Curb (in)	Min Distance from Front Face of Road Edge (in)	Comments from State
KS	No	6-8	No requirement	Require an 8 foot turnout
NH	No	No requirement	No requirement	
NJ	No	N/A	6-8	
NY	No	No requirement	No requirement	
PA	No	N/A	N/A	
TN	No	No requirement	No requirement	
WI	No	N/A	N/A	
CA	Other	N/A	N/A	
MS	Other	N/A	N/A	

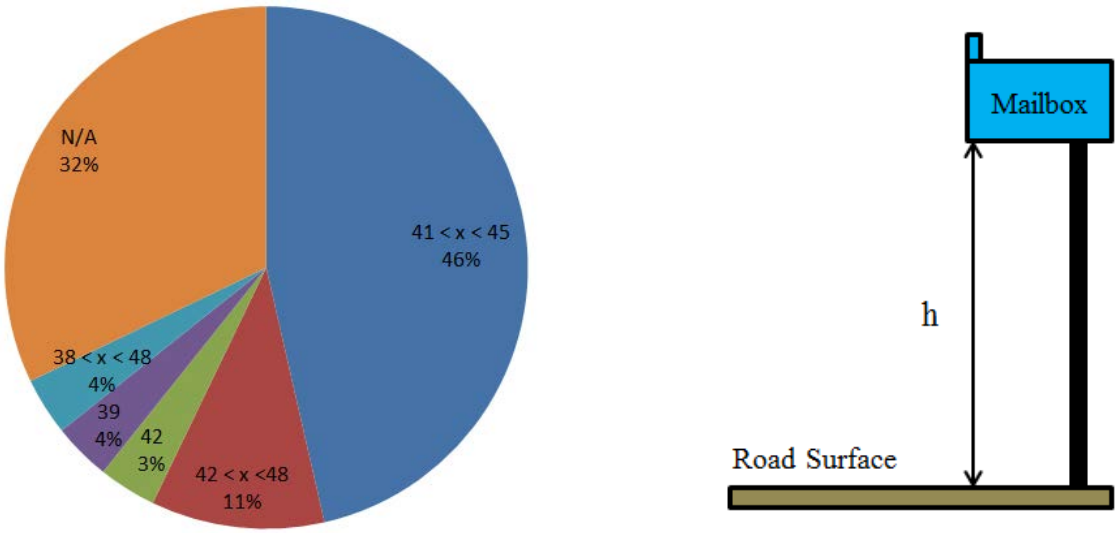


Figure 3.8. Minimum Vertical Heights (h) in Inches from Road Surface to Bottom of Single Mailbox Recommended by the Participating state DOTs.

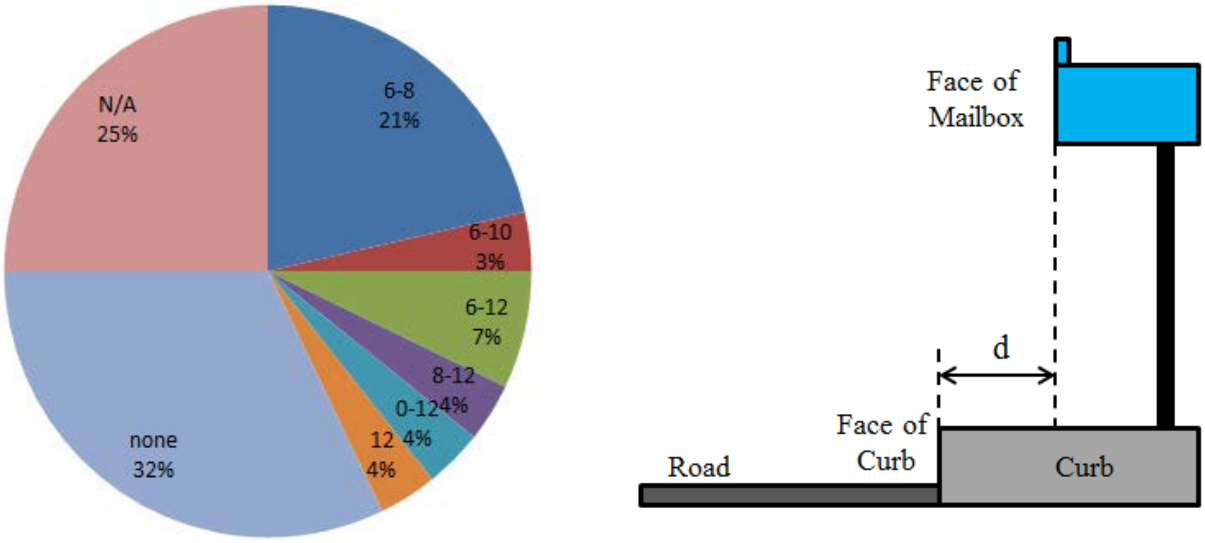


Figure 3.9. Minimum Distance (d) in Inches from Curb Front Face to Single Mailbox Support Recommended by the Participating state DOTs.

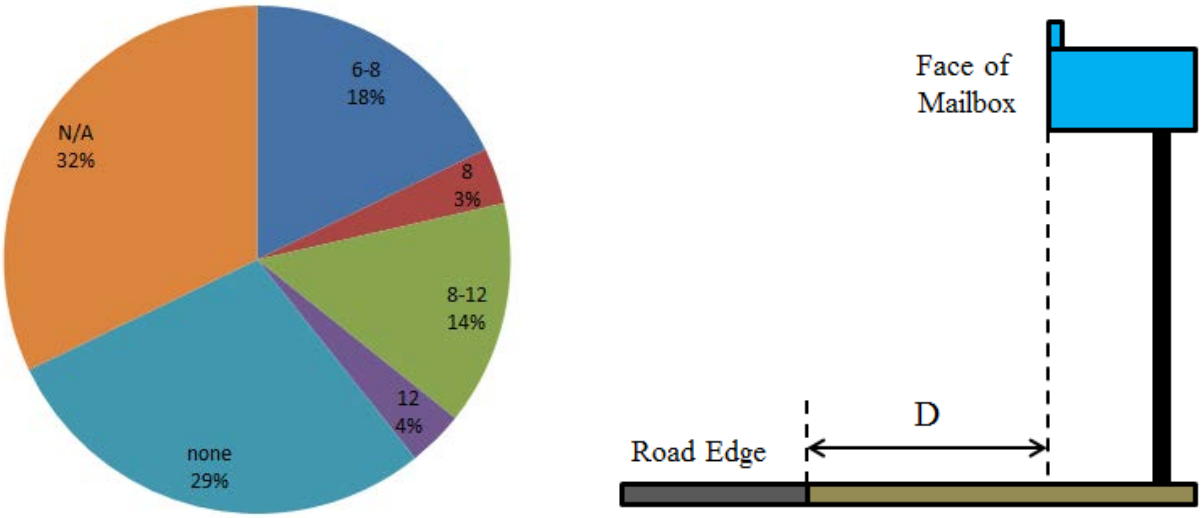


Figure 3.10. Minimum Distance (D) in Inches from Road Edge to Single Mailbox Support Recommended by the Participating state DOTs.

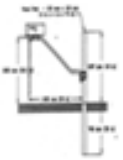
MULTIPLE MAILBOX SUPPORT SYSTEMS

Multiple Mailbox Support System Types

Tables 3.13 and 3.14 and Figures 3.11 and 3.12 list the identified multiple mailbox support systems made of different materials, and report the States answers about which systems are utilized by the DOTs. Table 3.15 and Figure 3.13 report States answers about the foundation types utilized by the DOTs for multiple mailbox support systems.

State DOTs were inquired about whether the multiple mailbox support systems in use in their territory have been tested for crashworthiness according to the criteria reported by the "Recommended Procedures for the Safety Performance Evaluation of Highway Features" (NCHRP Report 350) (Ross et al., 1993b). Results are reported in Table 3.16. Six out of the 8 States with no policy for mailbox support installation answered that the systems used have not been crash tested or that they don't know if the systems are crashworthy (Table 3.16). Only one DOT affirmed that all the multiple mailbox support systems used in its State were NCHRP Report 350 crashworthy.

Table 3.13. Multiple Wood Mailbox Support Systems used by States DOTs.

State	Multiple Wood	
	Swing-A-Way 	Other
AK	X	X
AR		
CO		
CA		
DE	X	
GA	X	
KS		X
KY		
LA		
ME		X
MN		
MS		X
NC		
ND		X
NH	X	X
NJ		X
NY		
OH		
OR		
PA		X
RI		
SD		
TN		
TX		X
VA		X
WS		
WI		
WY		

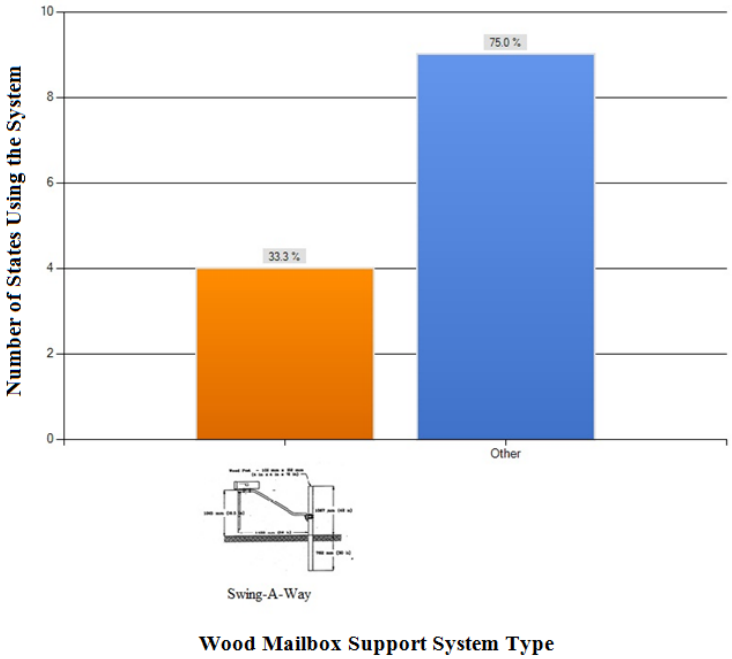
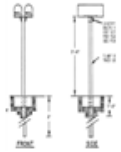
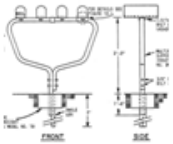


Figure 3.11. Number and Percentage of Participating States using the Identified Multiple Wood Mailbox Support System Type.

Table 3.14. Multiple Steel Mailbox Support Systems used by States DOTs.

State	Multiple Steel									
	Dual S-Square Mailbox 	Dual, vertical support, 2-3/8" O.D., 14 ga	Dual 2 lb/ft winged channel 	Dual 1.66" O.D.,16 ga 	Dual 2-7/8" O.D., 11 ga	Shur-Tite Mailbox Double Adapter 	Multiple S-Square Mailbox 	Multiple Non-proprietary 	Shur-Tite Multiple Mailbox Post 	Other
AK	X	X	X	X	X	X	X	X	X	X
AR	X	X								X
CO							X		X	
CA										
DE			X	X						
GA	X						X	X	X	
KS	X	X		X	X	X	X	X	X	X
KY										
LA										X
ME										X
MN		X							X	
MS										X
NC	X	X	X	X		X				
ND										X
NH	X	X	X	X	X	X	X	X	X	
NJ										
NY										
OH										
OR										X
PA	X	X	X	X	X	X	X	X	X	X
RI										
SD										
TN										
TX	X	X	X	X		X	X	X	X	
VA										X
WA								X		
WI										
WY			X	X	X			X		

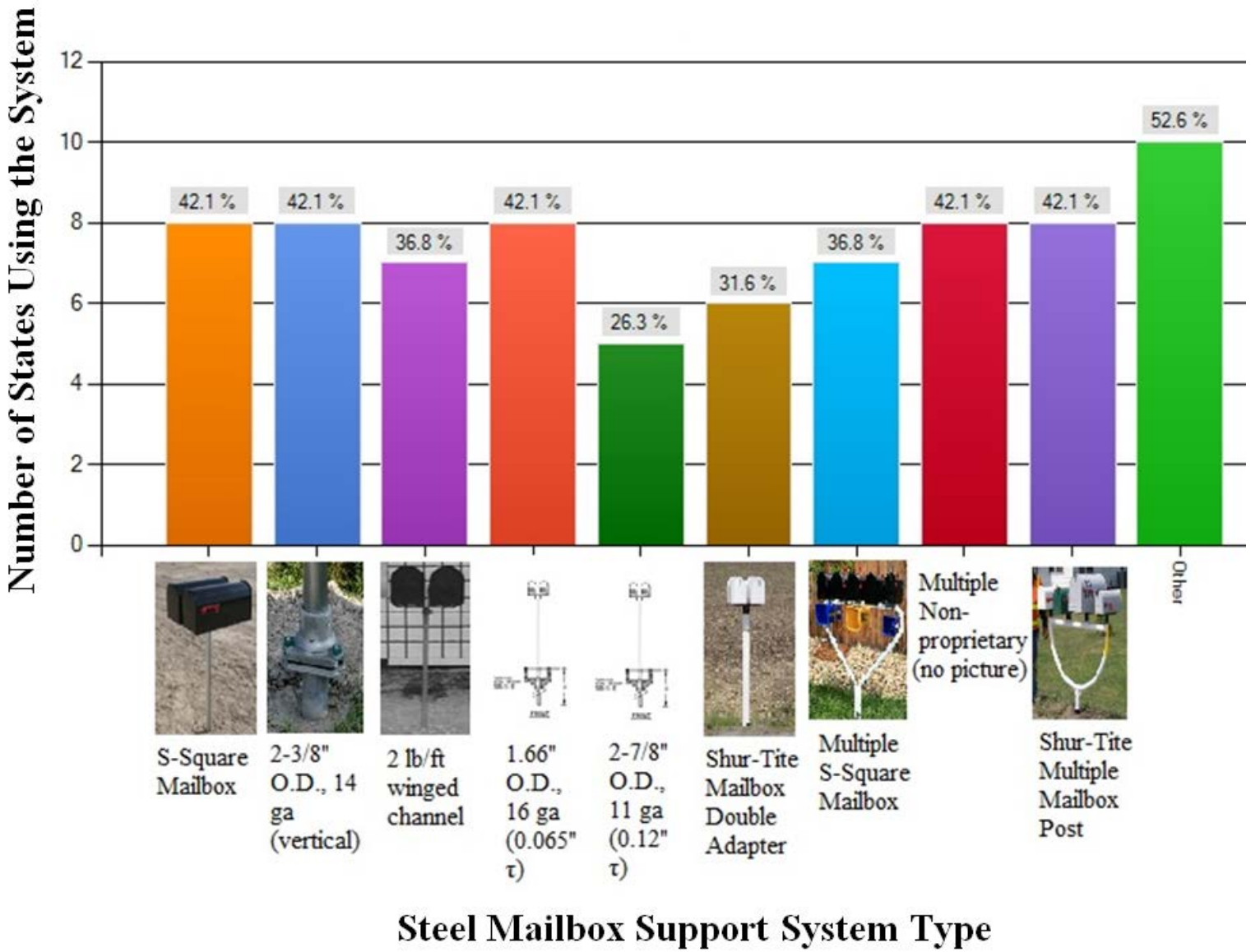
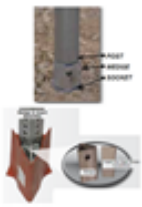


Figure 3.12. Number and Percentage of Participating States using the Identified Multiple Steel Mailbox Support System Types.

Table 3.15. Foundation Types Allowed in the States for Multiple Mailbox Support Systems.

State	Multiple Foundations					
	Frangible Base 	Wedge and Socket 	Direct embedding 	Frangible Steel nested 	Slip Base 	Other
AK	X	X	X	X	X	
AR						
CO		X	X	X	X	
CA						
DE		X	X	X	X	
GA		X		X	X	
KS	X		X	X	X	
KY						
LA						X
ME						X
MN			X			
MS						X
NC	X	X	X	X	X	
ND						X
NH	X	X	X	X	X	
NJ						
NY						
OH						
OR		X				
PA	X	X	X	X	X	X
RI						
SD						
TN						
TX		X	X	X		
VA						X
WA		X				
WI						
WY		X	X			

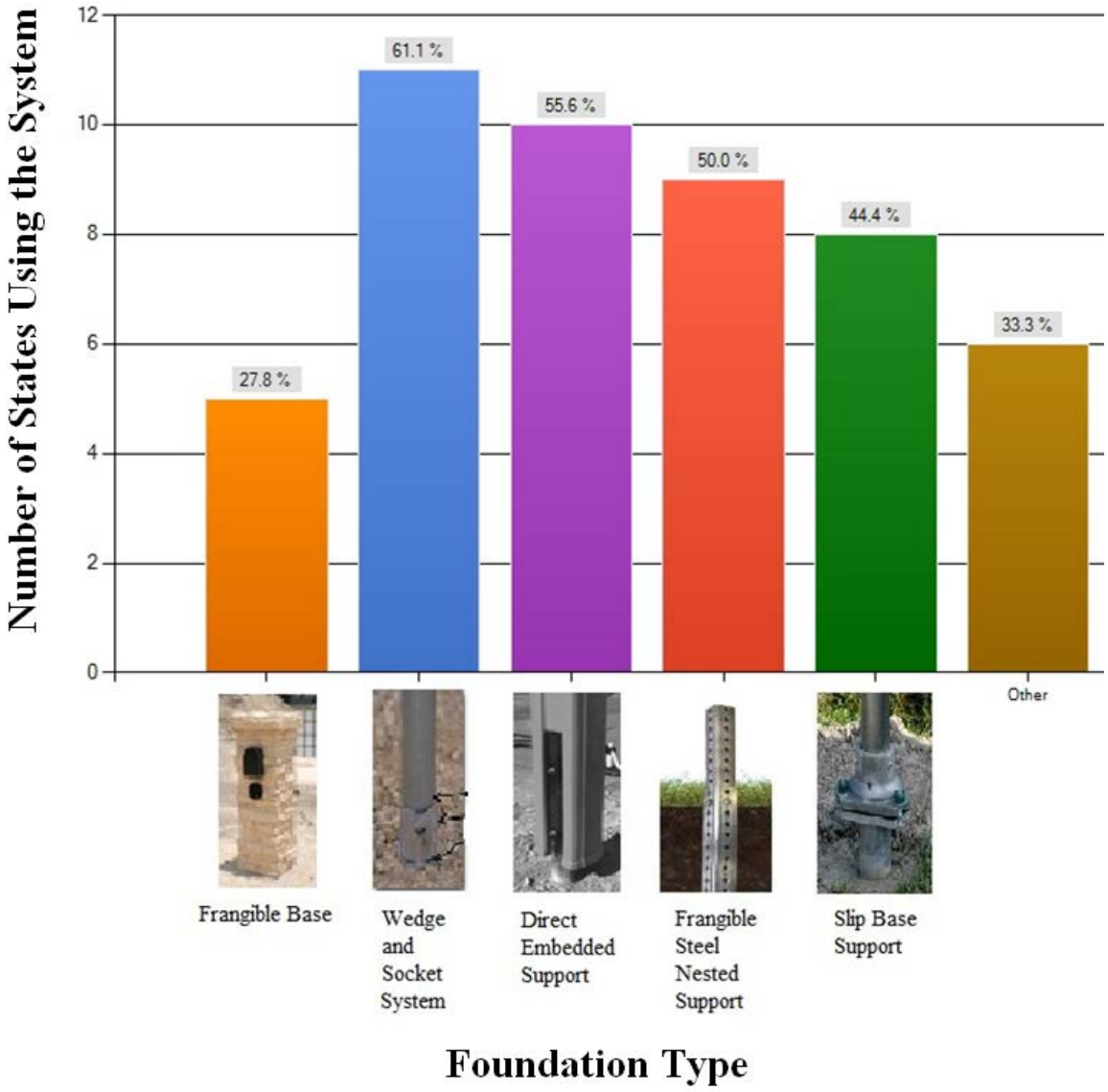


Figure 3.13. Number and Percentage of Participating States using the Identified Foundation Types for Multiple Mailbox Support System Types.

Table 3.16. Multiple Mailbox Support Types NCHRP Report 350 Tested.

State DOT	Mailbox Installation Policy	NCHRP Report 350 Crashworthy	Comments from State
AK	Yes	Don't know	Hasn't been tested
AR	Yes	Yes	
CO	Yes	Don't know	Hasn't been tested
DE	Yes	Don't know	Hasn't been tested
GA	Yes	Yes	
KY	Yes	Don't know	Hasn't been tested
LA	Yes	Yes	
ME	Yes	Yes	
MN	Yes	Yes	
NC	Yes	Don't know	Hasn't been tested
ND	Yes	Yes	
OH	Yes	Yes	
OR	Yes	Yes	
RI	Yes	N/A	
SD	Yes	Yes	
TX	Yes	Yes	
VA	Yes	Don't know	Hasn't been tested
WS	Yes	Yes	
WY	Yes	Yes	
KS	No	Yes	
NH	No	Don't know	Hasn't been tested
NJ	No	N/A	
NY	No	Don't know	Hasn't been tested
PA	No	Don't know	Hasn't been tested
TN	No	Don't know	Hasn't been tested
WI	No	N/A	
CA	Other	N/A	
MS	Other	Don't know	Hasn't been tested

Placement Regulation for Multiple Mailbox Supports

Authors designed certain survey questions in order to obtain information on policy/recommendation about multiple mailbox systems installation for minimum vertical height from the road surface (Table 3.17), roadway annual average daily traffic (AADT) and design speed influence on selection and placement of these support systems (Tables 3.18 and 3.19), minimum distances from the front face of curb and from the road edge (Table 3.20).

From the results collected, it appears that 11 States (39% of participating States) require a minimum vertical height between 41 and 45 inches for multiple mailbox systems installation from the road surface, which is also the USPS requirement (Figure 3.14). Two States have requirements of 42 inches, while four other States have suggestions for a minimum vertical height of 39, 40, between 42 and 48 inches, and between 38 and 48 inches, respectively.

Twelve States (43% of participating States) have suggestions for placement of the multiple mailbox support systems from the front face of the curb (Figure 3.15). While only one State responded that any distance between zero to 12 inches is allowed, the remaining 11 States suggest placing the mailbox system at a distance between six and 12 inches from the front face of the curb.

Eleven States (39% of participating States) have suggestions for placement of the multiple mailbox support systems from the road edge (Figure 3.16). While only one State responded that placement of the multiple mailbox system is allowed at any distance from the road edge in its territory, the other States require a distance between six to 12 inches from the front face of the road edge.

Table 3.17. DOTs Suggestions for Minimum Vertical Height from the Road Surface for Multiple Mailbox Installation.

State DOT	Mailbox Installation Policy	Min Vertical Height from Road Surface (in)	Comments from State
AK	Yes	38 < x < 48	
AR	Yes	41 < x < 45	Same as USPS
CO	Yes	42	
DE	Yes	41 < x < 45	Same as USPS
GA	Yes	41 < x < 45	Same as USPS
KY	Yes	No requirement	
LA	Yes	41 < x < 45	Same as USPS
ME	Yes	40	
MN	Yes	41 < x < 45	Same as USPS
NC	Yes	41 < x < 45	Same as USPS
ND	Yes	N/A	http://www.dot.nd.gov/divisions/design/docs/standards/D766-01.pdf
OH	Yes	42 < x < 48	
OR	Yes	42	
RI	Yes	N/A	
SD	Yes	41 < x < 45	Same as USPS
TX	Yes	41 < x < 45	Same as USPS
VA	Yes	41 < x < 45	Same as USPS
WS	Yes	39	
WY	Yes	41 < x < 45	Same as USPS
KS	No	41 < x < 45	Same as USPS
NH	No	No requirement	
NJ	No	N/A	
NY	No	No requirement	
PA	No	N/A	
TN	No	No requirement	
WI	No	N/A	
CA	Other	N/A	
MS	Other	N/A	

Table 3.18. DOTs Policy about Influence of Roadway AADT on Selection and Placement of Multiple Mailbox Support Systems.

State DOT	Mailbox Installation Policy	Roadway AADT Influence on Selection & Placement	Comments from State
AK	Yes	Yes	See http://www.dot.state.ak.us/stwddes/dcstraffic/assets/pdf/metal_mailbox_support_design.pdf. Also, where possible, regions encourage gangbox installations on a side street.
AR	Yes	No	
CA	Other	N/A	
CO	Yes	No	
DE	Yes	No	
GA	Yes	No	
KS	No	No	
KY	Yes	No	
LA	Yes	No	
ME	Yes	No	
MN	Yes	No	
MS	Other	Other	
NC	Yes	No	
ND	Yes	No	
NH	No	No	
NJ	No	N/A	
NY	No	No	
OH	Yes	No	
OR	Yes	No	
PA	No	No	
RI	Yes	N/A	
SD	Yes	No	
TN	No	No	
TX	Yes	No	
VA	Yes	No	
WS	Yes	Other	http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm#Individualchapters
WI	No	N/A	
WY	Yes	No	

Table 3.19. DOTs Policy about Influence of Roadway Design Speed on Selection and Placement of Multiple Mailbox Support Systems.

State DOT	Mailbox Installation Policy	Roadway Design Speed Influence on Selection & Placement	Comments from State
AK	Yes	Yes	Chart in Mailbox Location provides guidance considering AADT and Speed. This guidance has been revised in a draft revision, not yet released, but doesn't change the essential conditions. http://www.dot.state.ak.us/stwddes/dcstraffic/assets/pdf/metal_mailbox_support_design.pdf
AR	Yes	No	
CA	Other	N/A	
CO	Yes	No	
DE	Yes	No	
GA	Yes	No	
KS	No	No	
KY	Yes	No	
LA	Yes	No	
ME	Yes	No	
MN	Yes	Yes	http://dotapp7.dot.state.mn.us/edms/download?docId=1062364
MS	Other	N/A	
NC	Yes	No	
ND	Yes	No	
NH	No	No	
NJ	No	No	
NY	No	No	
OH	Yes	No	
OR	Yes	No	
PA	No	No	
RI	Yes	N/A	
SD	Yes	No	
TN	No	No	
TX	Yes	No	
VA	Yes	No	
WS	Yes	Other	http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm#Individualchapters
WI	No	N/A	
WY	Yes	No	

It appears that most of the participating States do not have any policy for regulation of multiple mailbox support systems selection and installation according to the roadway AADT. Only two out of 28 States (Alaska and Washington) indicated guidance for mailbox systems selection and location according to AADT consideration. Their regulations were reported already in the "Placement Regulation for Single Mailbox Supports" section above and in Figure 3.6.

It appears that most of the participating States do not have any policy for regulation of multiple mailbox support systems selection and installation according to the roadway design speed. Only three out of 28 States (Alaska, Minnesota and Washington) indicated guidance for mailbox systems selection and location according to design speed consideration. Their regulations were reported already in the "Placement Regulation for Single Mailbox Supports" section above and in Figure 3.6.

Table 3.20. DOTs Suggestions for Minimum Distances from Front Face Curb and Road Edge for Multiple Mailbox Support System Installation.

State DOT	Mailbox Installation Policy	Min Distance from Front Face of Curb (ft)	Min Distance from Front Face of Road Edge (ft)	Comments from State
AK	Yes	12	12	
AR	Yes	No requirement	No requirement	
CO	Yes	8-12	8-12	
DE	Yes	6-12	8-12	
GA	Yes	6-8	6-8	
KY	Yes	No requirement	No requirement	
LA	Yes	No requirement	No requirement	
ME	Yes	No requirement	No requirement	
MN	Yes	6-8	6-8	
NC	Yes	6-8	6-8	
ND	Yes	N/A	N/A	http://www.dot.nd.gov/divisions/design/docs/standards/D766-01.pdf
OH	Yes	No requirement	N/A	at the face of graded shoulder, or 1' past treated shoulder
OR	Yes	6-12	8-12	
RI	Yes	N/A	N/A	
SD	Yes	8-12	8	AASTHO
TX	Yes	6-8	N/A	ftp://ftp.dot.state.tx.us/pub/txdot-info/cmd/cserve/standard/maintcad/mb09(2).pdf
VA	Yes	6-12	N/A	Shall be placed where interference with safety, maintenance, and use of highway
WS	Yes	0-12	6-8	
WY	Yes	No requirement	8-12	

Table 3.20. DOTs Suggestions for Minimum Distances from Front Face Curb and Road Edge for Multiple Mailbox Support System Installation (Continued).

State DOT	Mailbox Installation Policy	Min Distance from Front Face of Curb (ft)	Min Distance from Front Face of Road Edge (ft)	Comments from State
KS	No	6-8	0	8 foot turnout required
NH	No	No requirement	No requirement	
NJ	No	N/A	N/A	
NY	No	No requirement	No requirement	
PA	No	N/A	N/A	
TN	No	No requirement	No requirement	
WI	No	N/A	N/A	
CA	Other	N/A	N/A	
MS	Other	N/A	N/A	

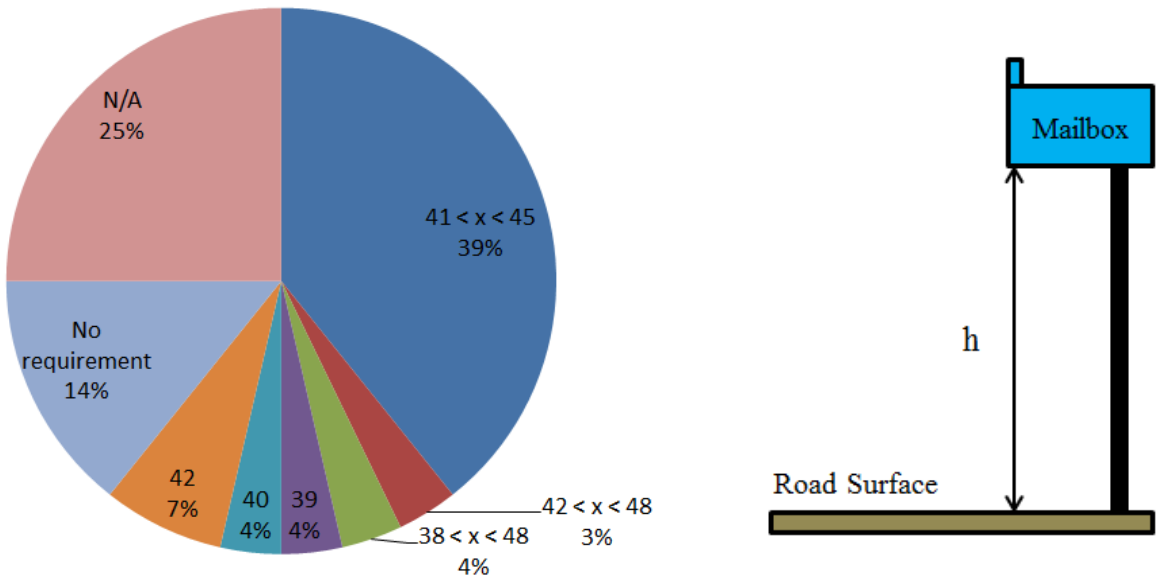


Figure 3.14. Minimum Vertical Heights (h) in Inches from Road Surface to Bottom of Multiple Mailbox Recommended by the Participating state DOTs.

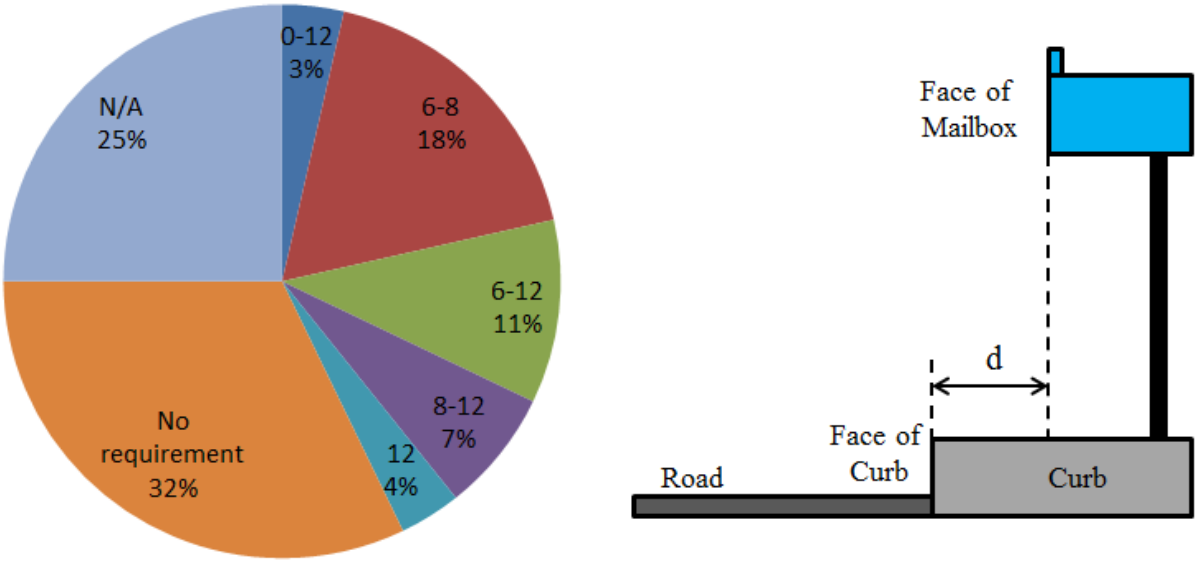


Figure 3.15. Minimum Distance (d) in Inches from Curb Front Face to Multiple Mailbox Support Recommended by the Participating state DOTs.

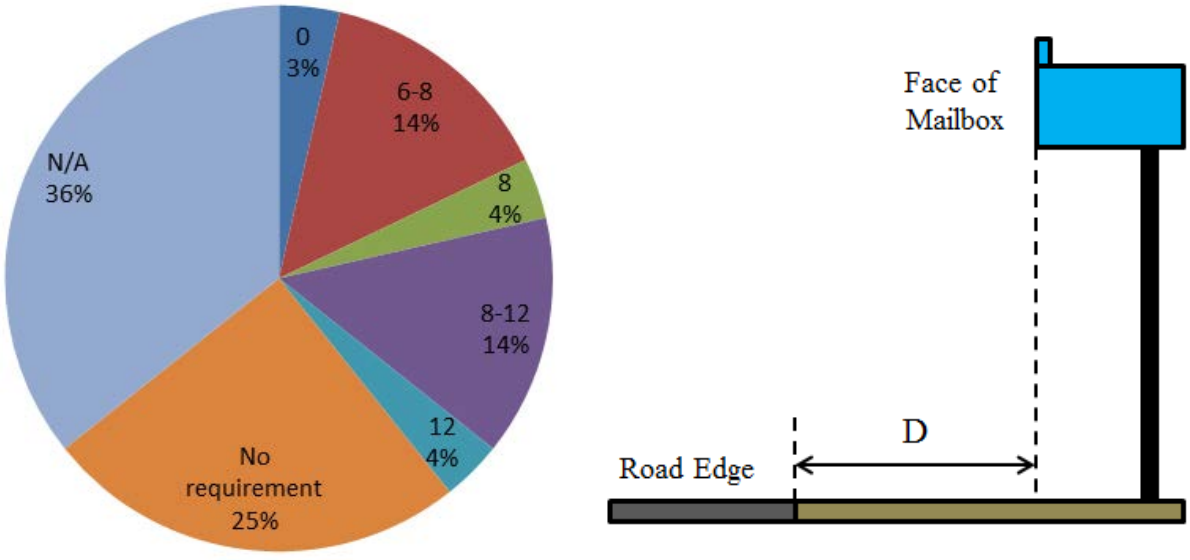


Figure 3.16. Minimum Distance (D) in Inches from Road Edge to Multiple Mailbox Support Recommended by the Participating state DOTs.

CHAPTER 4. CRASH DATA ANALYSIS

The authors designed the last part of the survey with the scope of obtaining information about fixed objects and mailbox supports related crashes. At first, State DOTs were asked whether "mailbox" was coded as an object struck in their State crash database. Also, DOTs were inquired whether they had electronic crash data that could be accessed for the scope of this research study. When both questions were answered affirmatively, the authors contacted the State DOT with the scope of retrieving the crash data. In most cases, a DOT representative collected the data requested and sent the results to the researchers by email as form of an Excel sheet. In a few cases, a DOT representative provided a website link to the authors, where crash data could be obtained by running an available program.

Out of the 28 States that participated to the survey, 20 States answered their crash database contains "mailbox" as an object struck (71% of participating States), while three States do not have the code "mailbox" in their crash database (11%), and five States did not answered the question or did not know (18%) (Figure 4.1). Out of the 20 States which contain "mailbox" as an object struck, 18 States gave availability of their electronic crash data for the purpose of this survey (90% of the States with a "mailbox" code in their crash database) (Figure 4.2). Survey answers indicated that crash data could have been retrieved via email from 12 States, and obtained by running some sort of program on internet for other four States. Finally, four States indicated there was not possibility of retrieving crash data for the scope of this research study. Results are summarized in Table 4.1. Authors had difficulties retrieving crash data from website links of two State DOTs: Ohio and Oregon. Thus, mailbox supports and fixed objects crash data related were retrieved from 14 States (Figure 4.3).

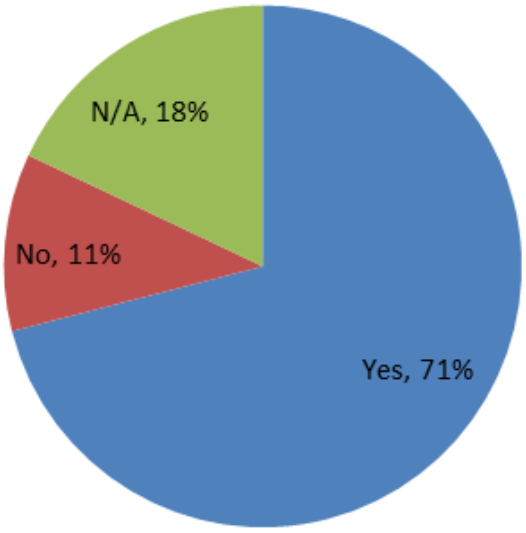


Figure 4.1. "Mailbox" Coded as Object Struck in State DOTs Databases.

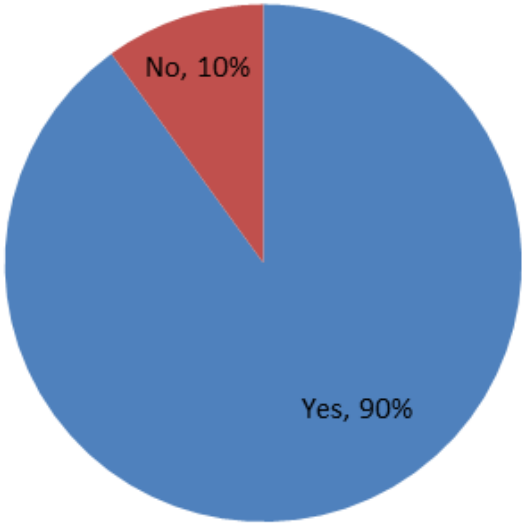


Figure 4.2. Electronic Crash Data Availability from States Containing "Mailbox" Coded as Object Struck in Their Crash Databases.

Table 4.1. DOTs Answers to Survey Part on Crash Data Availability.

State DOT	"Mailbox" as Object Struck	Availability of Crash Data	How Crash Data were Retrieved
AK	Yes	Yes	Email
CO	Yes	Yes	Email
DE	Yes	Yes	Email
GA	Yes	No	No data
KS	Yes	Yes	Email
KY	Yes	Yes	Internet
LA	Yes	Yes	Email
ME	Yes	Yes	Email
MN	Yes	Yes	Email
MS	Yes	Yes	Email
NC	Yes	Yes	No data
ND	Yes	Yes	Email
OH	Yes	Yes	Internet
OR	Yes	Yes	Internet
PA	Yes	Yes	Email
SD	Yes	Yes	No data
TX	Yes	Yes	Email
VA	Yes	Yes	Email
WS	Yes	Yes	Internet
WY	Yes	Yes	Email
AR	No	No	No data
NY	No	No	No data
TN	No	No	No data
CA	N/A	N/A	No data
NJ	N/A	N/A	No data
RI	N/A	N/A	No data
WI	N/A	N/A	No data
NH	Don’t know	No	No data

Figure 4.3. Summary of States with Crash Data Availability (Colored in Blue).

At this point, researchers re-analyzed the answers from the State DOT which participated to the survey. In particular, the authors aimed at understanding to which level each DOT has authority on the selection of the mailbox support system and on its placement relatively to the road.

In fact, the State DOT might have guidance for placement of these systems, but it is the owner of the mailbox who can choose the type of support and where to place it for the first installation. In other words, the State DOT gives suggestions about selection and placement, but cannot enforce the single individual to follow these suggestions for the mailbox installation.

Some State DOTs commented that the DOT has the authority to replace the mailbox system on construction projects. When the State needs to make improvements to the State highway and the mailboxes are part of the project scope, then the DOT (or the contractor) will install mailbox or bring the existing installation up to standard at their own cost.

After discussing these considerations with the sponsor, the authors decided to re-evaluate the authority of each State DOT on mailbox support systems selection and installation, according to the existence of State DOT guidance and to the DOT authority on enforcing the guidance on the single mailbox owner. Results are reported in Table 4.2. Detail explanation of the guidance for those DOTs that provided with crash data for this research study is reported in Appendix F.

Table 4.2. Mailbox Systems Installation Guidance for the State DOTs with Available Crash Data for this Survey Project.

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement/ Statute
AK	✓	✗	✓	✗	N/A	✗	✓	✓	✗
CO	✓	✗	✓	✗	N/A	✗	✓	✓ Owner can re-replace the new with the old mailbox system	✗
DE	✓	✗	Only for material & geometry	✗	N/A	✗	✓	✓	✗
KS	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
KY	✓	✗	✓	✗	✓	N/A	N/A	N/A	✗
LA	Other	✗ For State roads, permit needed, but no checking	✓	✗	✓	N/A	✓	✓	✗
ME	✓	✗	Must be breakaway or guidance on material/ geometry	✗	✓	✓	N/A	N/A	✗

Table 4.2. Mailbox Systems Installation Guidance for the State DOTs with Available Crash Data for this Survey Project (Continued).

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement/ Statute
MN	✗	✗	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	N/A	✓	✓
MS	Other	✓ Specifications are part of driveway permit	✓	N/A	N/A	N/A	N/A	N/A	N/A
ND	✗	✗	✗	✗	N/A	N/A	Only if need to move the MB system	Maybe necessary crash data analysis before changing MB system	✗
PA	✓	✗	✗	✗	✗	N/A	N/A	N/A	Maybe some municipalities have some authority
TX	✗	✗	✓	N/A	✓	N/A	✓	✓	✓ County and City govmt might have control of some roads

Table 4.2. Mailbox Systems Installation Guidance for the State DOTs with Available Crash Data for this Survey Project (Continued).

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement/ Statute
VA	✓	✗	Only for material & geometry	N/A	✓	N/A	N/A	N/A	✗
WS	Other	✗	N/A	✗	✓	N/A	N/A	N/A	✗
WY	✓	✓	✓	✓	✓	N/A	✓	✓	✗

When mailbox and other fixed objects crash data were received, the authors noticed the variety of crash data properties from the different DOTs (Tables 4.3 and 4.4). It immediately appeared impossible to make a complete comparison among the crash data obtained by the DOTs. In fact, some States record properties in their crash database that other States don't. Especially, the authors were concerned about the fact that some DOTs include only the first harmful event, while others have first, second, third and even more harmful events in their databases. Certain DOTs record both first and most harmful events (Table 4.5). A First Harmful Event can be defined as the first collision or non-collision event used to define collision type and location. The Most Harmful Event can be defined as the event which results in the most severe injury or, if not injury, the greatest property damage

Having recorded both first and most harmful events allows researchers for a better understanding of what is the cause of the accident, and what it would be the cause of injuries, fatalities and property damage (if any).

Table 4.3. Different Properties of Available Crash Data per State DOT.

Data	AK	CO	DE	KS	KY	LA	ME	MN	MS	ND	PA	TX	VA	WS	WY
Year	X	X		X	X	X	X	X	X	X	X	X		X	X
Road Junction	X				X			X	X	X				X	
# of Vehicles	X				X				X				X	X	
Accident Severity	X			X	X	X		X	X	X		X	X		
Total Injury	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Major Injury	X											X		X	
Minor Injury	X											X		X	
Total Fatality	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Event Type (FO)	X	X		X	X	X	X	X	X	X	X		X	X	
Event Location	X				X				X			X			
Weather	X		X		X	X		X	X	X		X	X	X	X
Road Character	X	X		X	X	X	X	X	X	X	X	X		X	
Surface Condition	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Light	X		X		X	X		X	X	X		X	X	X	X
Rural/Urban	X	X					X	X		X	X	X			
Paved/Unpaved	X									X					
Total Property Damage	X	X		X	X			X		X			X	X	
FHE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MHE		X	X		X	X		X		X	X				X
Crash Type					X		X			X		X	X		
Driver Action			X		X			X				X		X	X
Direction					X			X	X				X		
Manner of Impact			X		X					X		X			

Table 4.4. Number of Years of Available Crash Data from the Participating State DOTs.

Years of Crash Data	Total # of States
3 years	3 (CO, VA, WY)
4 years	1 (PA)
5 years	9 (AK, KS, KY, LA, ME, MN, ND, TX, WS)
6 years	2 (DE, MS)

Table 4.5. Years Range of Available Crash Data and Type of Harmful Events from the Participating State DOTs.

State	First Harmful Event (FHE)	Most Harmful Event (MHE)	Years
Alaska	X		2005-2009
Colorado	X	X	2008-2010
Delaware	X	X	2005-2010
Kansas	X	X	2007-2011
Kentucky*	X		2006-2010
Louisiana	X	X	2006-2010
Maine**			2006-2010
Minnesota	X	X	2006-2010
Mississippi	X		2006-2011
North Dakota	X	X	2007-2011
Pennsylvania	X	X	2007-2010
Texas	X		2007-2011
Virginia	X		2009-2011
Washington	X		2006-2010
Wyoming	X	X	2008-2010

*KY DOTs provided with mailbox crash data only
**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it

With all these considerations, the authors decided to compare the crash data available in terms of mailbox and other fixed objects total crashes, fatalities and injuries.

Table 4.6 reports the total number of crashes of all types that were recorded in the different States and differentiates between the number of crashes involving fixed objects and the number of crashes involving mailboxes. Also, an additional differentiation was made for total crashes against mailboxes that included at least First Harmful Event (All FHE), at least Most Harmful Event (All MHE), FHE and MHE for the same crash event (FHE+MHE), only FHE (Just FHE), and only MHE (Just MHE).

Rates of mailbox related crashes for all possible combinations of FHE and MHE were calculated with respect to the total number of mailbox related crashes and reported in Table 4.7.

Frequency of mailbox related crashes was studied in Table 4.8, where the total number of mailbox crashes was related to the total number of crashes of all types occurred in each State. Also, a frequency was evaluated for only those mailbox related crashes which had mailbox hit as a first harmful event. In this case, the authors were looking for those accidents that had a mailbox as the first object struck during the crash event. For example, Minnesota had 611 mailbox related crashes in the 2006-2010 period, which had a mailbox listed as the first object hit in the crash event. That is, between the years 2006 and 2010, 0.16% of all the crashes recorded in Minnesota involved hitting a mailbox as a first harmful event.

Frequency of mailbox related crashes with respect to fixed objects related crashes was studied in Table 4.9, where the total number of mailbox crashes was related to the total number of fixed object crashes occurred in each State. For example, between the years 2006 and 2010, 1.19% of all fixed object related crashes recorded in Minnesota involved hitting a mailbox as a first harmful event.

Table 4.10 shows States data related to the number of fatalities, injuries, fatal crashes and injury crashes recorded for mailbox related crashes. For this evaluation, only crashes that had a mailbox listed as at least an MHE were considered, since the researchers wanted to make sure that the fatality/injury occurred because of the interaction between the vehicle and the mailbox. Some States only had FHE in their crash database. In those cases, severity in terms of fatality and injury data cannot be computed because it is not possible to identify the MHE.

In Table 4.11, the number of fatalities recorded from all those crashes that included a mailbox as a MHE was related to the total number of fatalities recorded from all crashes in a given year period. For example, 0.099% of all the fatalities recorded in the state of Pennsylvania in the years 2007-2010 appeared to be caused by hitting a mailbox.

In Table 4.12, mailbox fatality frequency was evaluated comparing the number of mailbox related crashes which resulted being a fatal accident to the total number of crashes which involved hitting a mailbox. There could be the case where multiple fatalities occurred during the same crash event, and that those multiple fatalities were due all to interaction between vehicle and mailbox. It can be noted that for the States here studied, the number of fatalities coincide with the number of crashes which resulted in fatalities. As an example, in the State of Pennsylvania, in the years 2007-2010, 0.203% of the total crashes involving hitting a mailbox resulted to be a fatal accident.

In Table 4.13, the number of injuries recorded from all those crashes that included a mailbox as a MHE was related to the total number of injuries recorded from all crashes in a given year

period. For example, 0.050% of all the injuries recorded in the state of North Dakota in the years 2007-2010 appeared to be caused by hitting a mailbox.

In Table 4.14, mailbox injury frequency was evaluated comparing the number of mailbox related crashes which resulted being a injury accident to the total number of crashes which involved hitting a mailbox. There could be the case where multiple injuries occurred during the same crash event, and that those multiple injuries were due all to interaction between vehicle and mailbox. It can be noted that for the States here studied, the number of injuries coincide with the number of crashes which resulted in injuries. As an example, in the State of Wyoming, in the years 2008-2010, 5.26% of the total crashes involving hitting a mailbox resulted to be an accident which caused at least an injury.

Table 4.6. Comparison of States Total Crashes for All Types of Events, Mailbox (MB) Related and Fixed Objects (FO) Related.

State DOT	Total # Crashes	Total # FO Crashes	Total MB Crashes	All FHE MB-Crashes	All MHE MB-Crashes	FHE+MHE MB-Crashes	Just FHE MB-Crashes	Just MHE MB-Crashes
AK ('05-'09)*	59,939	4,211	204	204	N/A	N/A	N/A	N/A
CO ('08-'10)	306,609	29,156	350	338	257	245	93	12
DE ('05-'10)	117,179	17,453	724	656	305	237	419	68
KS ('07-'11)	323,884	55,431	1,406	1,351	299	244	1,107	55
KY ('06-'10)*	755,302	115,002	4,955	4955	N/A	N/A	N/A	N/A
LA ('06-'10)	782,919	30,901	2,921	1,496	2,271	846	650	1,425
ME ('06-'10)**	153,674	31,659	1,461	N/A	N/A	N/A	N/A	N/A
MN ('06-'10)	377,740	N/A	1,115	611	844	340	271	504
MS ('06-'11)*	108,437	24,722	565	565	N/A	N/A	N/A	N/A
ND ('07-'11)	86,188	6,639	191	136	137	82	54	55
PA ('07-'10)	626,898	N/A	3,448	3,308	809	669	2,639	140
TX ('07-'11)*	2,153,504	425,519	12,727	12,727	N/A	N/A	N/A	N/A
VA ('09-'11)*	220,126	24,130	253	253	N/A	N/A	N/A	N/A
WS ('06-'10)*	555,874	93,277	2,521	2,521	N/A	N/A	N/A	N/A
WY ('08-'10)	82,047	N/A	95	93	78	76	17	2

FHE+MHE = both for the same collision event
*DOT crash database contains only FHE
**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.7. Proportions for States MB Related Crashes Types.

State DOT	Total MB Crashes	All FHE MB-Crashes (%)	All MHE MB-Crashes (%)	FHE+MHE MB-Crashes (%)	Just FHE MB-Crashes (%)	Just MHE MB-Crashes (%)
AK ('05-'09)*	204	100%	N/A	N/A	N/A	N/A
CO ('08-'10)	350	97%	73%	70%	27%	3%
DE ('05-'10)	724	91%	42%	33%	58%	9%
KS ('07-'11)	1,406	96%	21%	17%	79%	4%
KY ('06-'10)*	4,955	100%	N/A	N/A	N/A	N/A
LA ('06-'10)	2,921	51%	78%	29%	22%	49%
ME ('06-'10)**	1,461	N/A	N/A	N/A	N/A	N/A
MN ('06-'10)	1,115	55%	76%	30%	24%	45%
MS ('06-'11)*	565	100%	N/A	N/A	N/A	N/A
ND ('07-'11)	191	71%	72%	43%	28%	29%
PA ('07-'10)	3,448	96%	23%	19%	77%	4%
TX ('07-'11)*	12,727	100%	N/A	N/A	N/A	N/A
VA ('09-'11)*	253	100%	N/A	N/A	N/A	N/A
WS ('06-'10)*	2,521	100%	N/A	N/A	N/A	N/A
WY ('08-'10)	95	98%	82%	80%	18%	2%

FHE+MHE = both for the same collision event
*DOT crash database contains only FHE
**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.8. Frequency for States MB Related Crashes with Respect to All Type Crashes.

State DOT	Total Crashes (All Types)	Total MB Crashes	All FHE MB-Crashes	Frequency Total MB-Crashes w respect to total crashes	Frequency FHE MB-Crashes w respect to total crashes
AK ('05-'09)	59,939	204	204	0.34%	0.34%
CO ('08-'10)	306,609	350	338	0.11%	0.11%
DE ('05-'10)	117,179	724	656	0.62%	0.56%
KS ('07-'11)	323,884	1,406	1,351	0.43%	0.42%
KY ('06-'10)	755,302	4,955	4955	0.66%	0.66%
LA ('06-'10)	782,919	2,921	1,496	0.37%	0.19%
ME ('06-'10)*	153,674	1,461	N/A	0.95%	N/A
MN ('06-'10)	377,740	1,115	611	0.30%	0.16%
MS ('06-'11)	108,437	565	565	0.52%	0.52%
ND ('07-'11)	86,188	191	136	0.22%	0.16%
PA ('07-'10)	626,898	3,448	3,308	0.55%	0.53%
TX ('07-'11)	2,153,504	12,727	12,727	0.59%	0.59%
VA ('09-'11)	220,126	253	253	0.11%	0.11%
WS ('06-'10)	555,874	2,521	2,521	0.45%	0.45%
WY ('08-'10)	82,047	95	93	0.12%	0.11%

*Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.9. Frequency for States MB Related Crashes with Respect to FO Crashes.

State DOT	Total FO Crashes	Total MB Crashes	All FHE MB-Crashes	Frequency Total MB-Crashes w respect to FO crashes	Frequency FHE MB-Crashes w respect to FO crashes
AK ('05-'09)	4,211	204	204	4.84%	4.84%
CO ('08-'10)	29,156	350	338	1.20%	1.16%
DE ('05-'10)	17,453	724	656	4.15%	3.76%
KS ('07-'11)	55,431	1,406	1,351	2.54%	2.44%
KY ('06-'10)	115,002	4,955	4955	4.31%	4.31%
LA ('06-'10)	30,901	2,921	1,496	9.45%	4.84%
ME ('06-'10)*	31,659	1,461	N/A	4.61%	N/A
MN ('06-'10)	N/A	1,115	611	N/A	N/A
MS ('06-'11)	24,722	565	565	2.29%	2.29%
ND ('07-'11)	6,639	191	136	2.88%	2.05%
PA ('07-'10)	N/A	3,448	3,308	N/A	N/A
TX ('07-'11)	425,519	12,727	12,727	2.99%	2.99%
VA ('09-'11)	24,130	253	253	1.05%	1.05%
WS ('06-'10)	93,277	2,521	2,521	2.70%	2.70%
WY ('08-'10)	N/A	95	93	N/A	N/A

*Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.10. Fatalities and Injuries for MB Related Crashes.

State DOT	All MHE MB-Crashes	Fatal MB-Crashes	MB Fatalities	Injury MB-Crashes	MB Injuries
AK ('05-'09)*	N/A	N/A	N/A	N/A	N/A
CO ('08-'10)	257	0	0	9	9
DE ('05-'10)	305	1	1	38	38
KS ('07-'11)	299	2	2	35	35
KY ('06-'10)*	N/A	N/A	N/A	N/A	N/A
LA ('06-'10)	2,271	3	3	250	289
ME ('06-'10)**	N/A	N/A	N/A	N/A	N/A
MN ('06-'10)	844	0	0	114	118
MS ('06-'11)*	N/A	N/A	N/A	N/A	N/A
ND ('07-'11)	137	0	0	8	8
PA ('07-'10)	809	7	7	259	277
TX ('07-'11)*	N/A	N/A	N/A	N/A	N/A
VA ('09-'11)*	N/A	N/A	N/A	N/A	N/A
WS ('06-'10)*	N/A	N/A	N/A	N/A	N/A
WY ('08-'10)	78	0	0	5	9

*DOT crash database contains only FHE
**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.11. Fatality Rate for MB Related Crashes with Respect to Total Number of Fatalities from All Types of Crashes.

State DOT	Total Fatalities -All Crash Types- (#)	MB Fatalities (#)	MB Fatality Rate w respect to total fatalities in all crashes (%)
AK ('05-'09)*	367	N/A	N/A
CO ('08-'10)	1,454	0	0.000%
DE ('05-'10)	741	1	0.135%
KS ('07-'11)	2,085	2	0.096%
KY ('06-'10)*	4,228	N/A	N/A
LA ('06-'10)	4,434	3	0.068%
ME ('06-'10)**	846	N/A	N/A
MN ('06-'10)	2,284	0	0.000%
MS ('06-'11)*	4,352	N/A	N/A
ND ('07-'11)	530	0	0.000%
PA ('07-'10)	7,064	7	0.099%
TX ('07-'11)*	16,620	N/A	N/A
VA ('09-'11)*	2,090	N/A	N/A
WS ('06-'10)*	2,676	N/A	N/A
WY ('08-'10)	790	0	0.000%

*DOT crash database contains only FHE

**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.12. Fatal Crash Rate for MB Related Crashes with Respect to Total Number of MB Related Crashes.

State DOT	Total MB-Crashes (#)	Fatal MB-Crashes (#)	MB Fatality Severity w respect to total MB-crashes (%)
AK ('05-'09)*	204	N/A	N/A
CO ('08-'10)	350	0	0.000%
DE ('05-'10)	724	1	0.138%
KS ('07-'11)	1,406	2	0.142%
KY ('06-'10)*	4,955	N/A	N/A
LA ('06-'10)	2,921	3	0.103%
ME ('06-'10)**	1,461	N/A	N/A
MN ('06-'10)	1,115	0	0.000%
MS ('06-'11)*	565	N/A	N/A
ND ('07-'11)	191	0	0.000%
PA ('07-'10)	3,448	7	0.203%
TX ('07-'11)*	12,727	N/A	N/A
VA ('09-'11)*	253	N/A	N/A
WS ('06-'10)*	2,521	N/A	N/A
WY ('08-'10)	95	0	0.000%

*DOT crash database contains only FHE
**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.13. Injury Rate for MB Related Crashes with Respect to Total Number of Injuries from All Types of Crashes.

State DOT	Total Injuries -All Crash Types- (#)	MB Injuries (#)	MB Injury Rate w respect to total injuries in all crashes (%)
AK ('05-'09)*	25,362	N/A	N/A
CO ('08-'10)	39,590	9	0.023%
DE ('05-'10)	46,520	38	0.082%
KS ('07-'11)	105,021	35	0.033%
KY ('06-'10)*	199,076	N/A	N/A
LA ('06-'10)	377,362	289	0.077%
ME ('06-'10)**	58,082	N/A	N/A
MN ('06-'10)	115,860	118	0.102%
MS ('06-'11)*	182,272	N/A	N/A
ND ('07-'11)	16,115	8	0.050%
PA ('07-'10)	455,014	277	0.061%
TX ('07-'11)*	426,634	N/A	N/A
VA ('09-'11)*	131,427	N/A	N/A
WS ('06-'10)*	257,556	N/A	N/A
WY ('08-'10)	28,139	9	0.032%

*DOT crash database contains only FHE
**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.14. Injury Crash Rate for MB Related Crashes with Respect to Total Number of MB Related Crashes.

State DOT	Total MB-Crashes (#)	Injury MB-Crashes (#)	MB Injury Severity w respect to total MB-crashes (%)
AK ('05-'09)*	204	N/A	N/A
CO ('08-'10)	350	9	2.57%
DE ('05-'10)	724	38	5.25%
KS ('07-'11)	1,406	35	2.49%
KY ('06-'10)*	4,955	N/A	N/A
LA ('06-'10)	2,921	250	8.56%
ME ('06-'10)**	1,461	N/A	N/A
MN ('06-'10)	1,115	114	10.22%
MS ('06-'11)*	565	N/A	N/A
ND ('07-'11)	191	8	4.19%
PA ('07-'10)	3,448	259	7.51%
TX ('07-'11)*	12,727	N/A	N/A
VA ('09-'11)*	253	N/A	N/A
WS ('06-'10)*	2,521	N/A	N/A
WY ('08-'10)	95	5	5.26%

*DOT crash database contains only FHE

**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.15 shows frequency of fixed objects related crashes. In this case, only those fixed object related crashes which involved hitting a fixed object as a first harmful event were considered. Although certain States gave availability of crash database regarding fixed objects, it was not possible to sort the data with some program such as Excel. Crash and injury data had to be counted manually and related to the report number (since multiple lines might have been related to the same crash event). Or, in other cases, report numbers from one Excel file for MHE data had to be manually connected to the same report number for injury count from another Excel file. Such an evaluation for mailbox object was possible considering the limited numbers of mailbox related crashes. However, the same type of evaluation was not feasible for all fixed objects due to the considerable numbers of data.

Table 4.16 reports results from evaluation of rate of fixed objects related fatalities with respect to the total number of fatalities occurred in crashes of all types. In this case, only those fixed object related crashes which involved hitting a fixed object as a most harmful event were considered. Also, severity in terms of fatality for fixed object related crashes was calculated. For example, Colorado resulted having 158 fatalities due to vehicle and fixed object impact in a 3-year period (2008-2010). This represented 10.87% of the total fatalities recorded in Colorado in the same period due to any type of collision event. However, only 142 were the crashes that resulted in a fatality after involving a fixed object. That represented 0.54% of the total crashes which involved somehow a fixed object. In other words, 0.54% of fixed object related crashes resulted in a fatal collision.

Table 4.17 reports results from evaluation of rate of fixed objects related injuries with respect to the total number of injuries occurred in crashes of all types. In this case, only those fixed object related crashes which involved hitting a fixed object as a most harmful event were considered. Also, severity in terms of injury for fixed object related crashes was calculated. For example, Colorado resulted having 3,156 injuries due to vehicle and fixed object impact in a 3-year period (2008-2010). This represented 7.97% of the total injuries recorded in Colorado in the same period due to any type of collision event. However, only 2,689 were the crashes that resulted in an injury after involving a fixed object. That represented 10.26% of the total crashes which involved somehow a fixed object. In other words, 10.26% of fixed object related crashes resulted in an injury collision.

Appendix G provides with more detailed data on fixed object related crashes for each state and each year of crash data availability.

Table 4.15. State Frequency of FO Related Crashes.

State DOT (Year)	Total # Crashes (All Types)	Total # FO Crashes (FHE)	Frequency (FHE FO crashes w/ respect to total crashes of ALL types)
AK ('05-'09)	59,939	4,211	7.03%
CO ('08-'10)	306,609	29,156	9.51%
DE ('05-'10)	117,179	17,453	14.89%
KS ('06-'10)	323,884	55,431	17.11%
KY ('06-'10)*	755,302	115,002	15.23%
LA ('06-'10)	782,919	30,901	3.95%
ME ('06-'10)**	153,674	31,659	20.60%
MN ('06-'10)	377,740	N/A	N/A
MS ('06-'11)	108,437	24,722	22.80%
ND ('07-'11)	86,188	6,639	7.70%
PA ('07-'10)	626,898	N/A	N/A
TX ('07-'11)	2,153,504	425,519	19.76%
VA ('09-'11)	220,126	24,130	10.96%
WS ('06-'10)	555,874	93,277	16.78%
WY ('08-'10)	82,047	N/A	N/A

* KY DOT = only mailbox crash data
**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.16. State Proportions of FO Related Fatalities and Fatal FO Related Crashes.

State DOT (Year)	Total # Fatalities (ALL Crash Types)	Fatalities FO (MHE) * = FHE data only	Severity FO Fatalities (MHE) w/ respect to total # fatalities in ALL crashes	All MHE FO-Crashes	Total # FO Fatal Crashes	Severity FO Fatal Crashes (MHE) w/ respect to total # FO crashes
AK ('05-'09)	367	*N/A**	N/A	N/A	N/A	N/A
CO ('08-'10)	1,454	158	10.87%	26,206	142	0.54%
DE ('05-'10)	741	150	20.24%	13,670	N/A	N/A
KS ('07-'11)	2,085	138	6.62%	14,137	138	0.98%
KY ('06-'10)*	4,228	*N/A**	N/A	N/A	N/A	N/A
LA ('06-'10)	4,434	1,143	25.78%	88,106	1,045	1.19%
ME ('06-'10)**	846	*N/A**	N/A	N/A	N/A	N/A
MN ('06-'10)	2,284	N/A	N/A	N/A	N/A	N/A
MS ('06-'11)	4,352	*N/A**	N/A	N/A	N/A	N/A
ND ('07-'11)	530	38	7.17%	5,206	38	0.73%
PA ('07-'10)	7,064	N/A	N/A	N/A	N/A	N/A
TX ('07-'11)	16,620	*N/A**	N/A	N/A	N/A	N/A
VA ('09-'11)	2,090	*N/A**	N/A	N/A	N/A	N/A
WS ('06-'10)	2,676	*N/A**	N/A	N/A	N/A	N/A
WY ('08-'10)	790	N/A	N/A	N/A	N/A	N/A

* KY DOT = only mailbox crash data

**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.17. State Proportions of FO Related Injuries and Injury FO Related Crashes.

State DOT (Year)	Total # Injuries (ALL Crash Types)	Injuries FO (MHE) * = FHE data only	Severity FO Injuries (MHE) w/ respect to total # injuries in ALL crashes	All MHE FO-Crashes	Total # FO Injury Crashes	Severity FO Injury Crashes (MHE) w/ respect to total # FO crashes
AK ('05-'09)	25,362	N/A*	N/A	N/A	N/A	N/A
CO ('08-'10)	39,590	3,156	7.97%	26,206	2,689	10.26%
DE ('05-'10)	46,520	4,269	9.18%	13,670	N/A	N/A
KS ('06-'10)	105,021	3,675	3.50%	14,137	3,675	26.00%
KY ('06-'10)*	199,076	N/A*	N/A	N/A	N/A	N/A
LA ('06-'10)	377,362	42,141	11.17%	88,106	31,925	36.23%
ME ('06-'10)**	58,082	N/A*	N/A	N/A	N/A	N/A
MN ('06-'10)	115,860	N/A	N/A	43,534	N/A	N/A
MS ('06-'11)	182,272	N/A*	N/A	N/A	N/A	N/A
ND ('07-'11)	16,115	1,054	6.54%	5,206	1,054	20.25%
PA ('07-'10)	455,014	N/A	N/A	N/A	N/A	N/A
TX ('07-'11)	426,634	N/A*	N/A	N/A	N/A	N/A
VA ('09-'11)	131,427	N/A*	N/A	N/A	N/A	N/A
WS ('06-'10)	257,556	N/A*	N/A	N/A	N/A	N/A
WY ('08-'10)	28,139	N/A	N/A	N/A	N/A	N/A

* KY DOT = only mailbox crash data

**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 4.18 shows the injury severity code typical of the States that have provided with crash data. Table 4.19 reports the injuries values for mailbox related crashes that were calculated for each State. Also, in Table 4.20 rates were evaluated for mailbox crashes related injuries for each state, according to the number of years the State provided with crash data for this project. Appendix H provides with a more detail crash data analysis: crash severity is detailed collected for each State for each year of crash data available.

Table 4.18. Injury Severity Codes.

State DOT	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible injury	Major Injury	Minor Injury	PDO/No Injury
AK	Yes	Equivalent to major injury	Equivalent to minor injury	N/A	Yes	Yes	Yes
CO	Yes	One Category					Yes
DE	Yes	One Category					N/A
KS	Yes	One Category					Yes
KY	Yes	One Category					N/A
LA	Yes	One Category					Yes
ME	Yes	Yes	Yes	Yes	N/A	N/A	N/A
MN	Yes	Yes	Yes	Yes	N/A	N/A	Yes
MS	Yes	One Category					Yes
ND	Yes	Yes	Yes	Yes	N/A	N/A	Yes
PA	Yes	One Category					N/A
TX	Yes	Yes	Yes	Yes	N/A	N/A	Yes
VA	Yes	One Category					Yes
WS	Yes	N/A	N/A	N/A	Yes	Yes	Yes
WY	Yes	One Category					N/A

Table 4.19. Injuries Values for Mailbox Supports Related Crashes (MHE).

State DOT	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible injury	Major Injury	Minor Injury	PDO/No Injury
CO	0	9					303
DE	1	38					N/A
KS	2	35					1171
LA	3	289					334
MN	0				N/A	N/A	646
ND	0	1	5	2	N/A	N/A	129
PA	2	92					N/A
WY	0	9					N/A

3

Table 4.20. Injuries Proportions for Mailbox Supports Related Crashes per Year.

State DOT	Fatality	Incapacitating Injury	Non-Incapacitating Injury	Possible injury	Major Injury	Minor Injury	PDO/No Injury
CO	0	3					303
DE	0.17	6.3					N/A
KS	0.4	7					1171
LA	0.6	57.8					334
MN	0				N/A	N/A	646
ND	0	0.2	1	0.4	N/A	N/A	129
PA	1.5	23					N/A
WY	0	3					N/A

CHAPTER 5. CONCLUSIONS

Table 1 summarizes mailbox systems installation requirements for State DOTs that provided with crash data for this project. These requirements are related to installation location with respect to the road surface and with respect to the face curb and/or road edge. Mainly, these requirements are those reported by United States Postal Service (USPS) and don't take into account request for crashworthy and/or NCHRP Report 350 crash tested mailbox support usage. Roadway AADT and design speed are rarely considered as a factor of influence in the decision of the location for the mailbox installation.

For those State DOTs that gave availability of crash data, the authors researched whether the identified single and multiple mailbox support systems have been tested according to NCHRP Report 230 or 350 (Tables 5.2 and 5.3). It resulted that all the mailbox supports included in the survey have met NCHRP criteria, whether it was 230 or 350. Still, for both single and multiple mailbox supports, some DOTs have expressed usage of certain supports that were not reported in the survey: for these cases, NCHRP Report 230 or 350 crashworthy eligibility was not investigated by the researchers.

Table 5.4 summarizes State guidance and frequency of mailbox related crashes, where hitting a mailbox was recorded as first harmful event. Table 5.5 shows State guidance and severity of mailbox fatality calculated as the percentage of crashes resulted in a fatality after hitting a mailbox with respect to the total number of crashes which involved hitting a mailbox, but not necessarily resulted in a fatality and/or injury. Table 5.6 shows State guidance and severity of mailbox injury calculated as the percentage of crashes resulted in an injury after hitting a mailbox with respect to the total number of crashes which involved hitting a mailbox, but not necessarily resulted in a fatality and/or injury.

Table 5.1. Summary of Mailbox Systems Installation Requirements for State DOTs that provided with Crash Data for this Project.

State DOT (Year)	Min Vertical Height from Road Surface (in)		Min Distance from Front Face Curb (in) *	Min Distance from Road Edge (in)*	Roadway AADT Influence*	Roadway Design Speed Influence*
	SMS	MMS				
AK (‘05-‘09)	38 < x < 48	38 < x < 48	12	12	Yes	Yes
CO (‘08-‘10)	42 < x <48	42	8 – 12	8 – 12	No	No
DE (‘05-‘10)	41 < x < 45	41 < x < 45	6 – 12	8 – 12	No	No
KS ('06-'10)	41 < x < 45	41 < x < 45	6 – 8	No req.	No	No
KY (‘06-‘10)	N/A	No req.	No req.	No req.	No	No
LA (‘06-‘10)	41 < x < 45	41 < x < 45	No req.	No req.	No	No
ME (‘06-‘10)	N/A	40	No req.	No req.	No	No
MN (‘06-‘10)	41 < x < 45	41 < x < 45	6 – 8	6 – 8	No	Yes
MS (‘06-‘11)	N/A	N/A	N/A	N/A	N/A	N/A
ND (’07-’11)	42 < x <48	N/A	N/A	N/A	No	No

SMS = Single Mailbox Support
MMS = Multiple Mailbox Support
***** Same Results from SMS and MMS

Table 5.1. Summary of Mailbox Systems Installation Requirements for State DOTs that provided with Crash Data for this Project (Continued).

State DOT (Year)	Min Vertical Height from Road Surface (in)		Min Distance from Front Face Curb (in) *	Min Distance from Road Edge (in)*	Roadway AADT Influence*	Roadway Design Speed Influence*
	SMS	MMS				
PA (‘07-‘10)	N/A	N/A	N/A	N/A	No	No
TX (‘07-‘11)	41 < x < 45	41 < x < 45	6 – 8	N/A	No	No
VA (‘09-‘11)	41 < x < 45	41 < x < 45	6 – 10	N/A	No	No
WA (‘06-‘10)	39	39	0 – 12	6 – 8	Yes	Yes
WY (‘08-‘10)	41 < x < 45	41 < x < 45	No req.	8 – 12	No	No

SMS = Single Mailbox Support
MMS = Multiple Mailbox Support
***** Same Results from SMS and MMS

Table 5.2. Single Mailbox Support Types for State DOTs that provided with Crash Data for this Project.

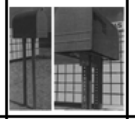
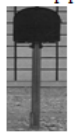
State	Single Wood		Single Polyurethane		Single Steel											
	MailMaster Deluxe, 4" x 4" 	Other	Simulated Stone Column, 20" x 20" x 62" 	Other	MailMaster Deluxe, 2 lb/ft U channel 	Non-proprietary, 2 lb/ft winged channel 	Non-proprietary, Two 2 lb/ft winged channel 	Swing Away, 3 lb/ft U-channel 	Rubbermaid Deluxe, 3-in diameter, Sch-40 pipe 	2-3/8" O.D., 14 ga, swaged elbow N/A	2-3/8" O.D., 14 ga (vertical) N/A	Non-proprietary, 2-3/8" O.D., 13 ga steel pipe 	NEX Tube, 2-3/8" O.D., 14 ga steel NEX pipe 	Friend Town and Country 	Shur-Tite Steel Mailbox Post, 2-3/8" O.D., 16 ga steel pipe 	Other
AK	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
CO												X		X		
DE	X				X		X		X						X	
KS	X	X	X		X		X		X	X	X		X	X	X	X
KY		X		X												X
LA		X		X												X
ME		X		X												
MN	X							X								
MS		X		X												X
ND		X		X												X
PA	X		X		X	X	X	X	X	X	X	X	X	X	X	X
TX	X			X		X			X		X		X		X	
VA				X												X
WS		X				X		X				X		X		
WY						X		X			X	X				X

Table 5.3. Multiple Mailbox Support Types for State DOTs that provided with Crash Data for this Project.

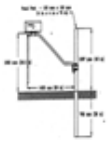
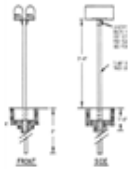
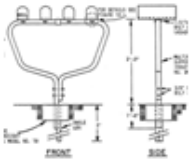
State	Multiple Wood		Multiple Steel									
	Swing-A-Way 	Other	Dual S-Square Mailbox 	Dual, vertical support, 2-3/8" O.D., 14 ga	Dual 2 lb/ft winged channel 	Dual 1.66" O.D.,16 ga 	Dual 2-7/8" O.D., 11 ga	Shur-Tite Mailbox Double Adapter 	Multiple S-Square Mailbox 	Multiple Non-proprietary 	Shur-Tite Multiple Mailbox Post 	Other
AK	X		X	X	X	X	X	X	X	X	X	X
CO									X		X	
DE	X				X	X						
KS		X	X	X		X	X	X	X	X	X	X
KY												
LA												X
ME		X										X
MN				X							X	
MS		X										X
ND		X										X
PA		X	X	X	X	X	X	X	X	X	X	X
TX		X	X	X	X	X		X	X	X	X	
VA		X										X
WS										X		
WY					X	X	X			X		

Table 5.4. Guidance and Mailbox Related Crashes for State DOTs that provided with Crash Data for this Project.

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	Frequency MB Crashes (FHE)
AK	✓	✗	✓	✗	N/A	✗	✓	✓	✗	0.34%
CO	✓	✗	✓	✗	N/A	✗	✓	✓ Owner can re-replace the new with the old mailbox system	✗	0.11%
DE	✓	✗	Only for material & geometry	✗	N/A	✗	✓	✓	✗	0.56%
KS	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.42%
KY	✓	✗	✓	✗	✓	N/A	N/A	N/A	✗	0.66%
LA	Other	✗ For State roads, permit needed, but no checking	✓	✗	✓	N/A	✓	✓	✗	0.19%
ME	✓	✗	Must be breakaway or guidance on material/ geometry	✗	✓	✓	N/A	N/A	✗	N/A

Table 5.4. Guidance and Mailbox Related Crashes for State DOTs that provided with Crash Data for this Project (Continued).

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	Frequency MB Crashes (FHE)
MN	✗	✗	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	N/A	✓	✓	0.16%
MS	Other	✓ Specifications are part of driveway permit	✓	N/A	N/A	N/A	N/A	N/A	N/A	0.52%
ND	✗	✗	✗	✗	N/A	N/A	Only if need to move the MB system	Maybe necessary crash data analysis before changing MB system	✗	0.16%
PA	✓	✗	✗	✗	✗	N/A	N/A	N/A	Maybe some municipalities have some authority	0.53%
TX	✗	✗	✓	N/A	✓	N/A	✓	✓	✓ County and City govmt might have control of some roads	0.59%

Table 5.4. Guidance and Mailbox Related Crashes for State DOTs that provided with Crash Data for this Project (Continued).

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	Frequency MB Crashes (FHE)
VA	✓	✗	Only for material & geometry	N/A	✓	N/A	N/A	N/A	✗	0.11%
WS	Other	✗	N/A	✗	✓	N/A	N/A	N/A	✗	0.45%
WY	✓	✓	✓	✓	✓	N/A	✓	✓	✗	0.11%

Table 5.5. Guidance and Mailbox Related Fatalities for State DOTs that provided with Crash Data for this Project.

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	MB Fatality Severity w respect to total MB-crashes (%)
AK	✓	✗	✓	✗	N/A	✗	✓	✓	✗	N/A
CO	✓	✗	✓	✗	N/A	✗	✓	✓ Owner can re-replace the new with the old mailbox system	✗	0.000%
DE	✓	✗	Only for material & geometry	✗	N/A	✗	✓	✓	✗	0.138%
KS	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.142%
KY	✓	✗	✓	✗	✓	N/A	N/A	N/A	✗	N/A
LA	Other	✗ For State roads, permit needed, but no checking	✓	✗	✓	N/A	✓	✓	✗	0.103%
ME	✓	✗	Must be breakaway or guidance on material/ geometry	✗	✓	✓	N/A	N/A	✗	N/A

Severity for MB fatality is calculated w/ respect to total # of MB Crashes
*DOT crash database contains only FHE
**Maine DOT suggested not to label the data as FHE and/or MHE

Table 5.5. Guidance and Mailbox Related Fatalities for State DOTs that provided with Crash Data for this Project (Continued).

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	MB Fatality Severity w respect to total MB-crashes (%)
MN	✗	✗	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	N/A	✓	✓	0.000%
MS	Other	✓ Specifications are part of driveway permit	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ND	✗	✗	✗	✗	N/A	N/A	Only if need to move the MB system	Maybe necessary crash data analysis before changing MB system	✗	0.000%
PA	✓	✗	✗	✗	✗	N/A	N/A	N/A	Maybe some municipalities have some authority	0.203%
TX	✗	✗	✓	N/A	✓	N/A	✓	✓	✓ County and City govmt might have control of some roads	N/A

Severity for MB fatality is calculated w/ respect to total # of MB Crashes
*DOT crash database contains only FHE

Table 5.5. Guidance and Mailbox Related Fatalities for State DOTs that provided with Crash Data for this Project (Continued).

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	MB Fatality Severity w respect to total MB-crashes (%)
VA	✓	✗	Only for material & geometry	N/A	✓	N/A	N/A	N/A	✗	N/A
WS	Other	✗	N/A	✗	✓	N/A	N/A	N/A	✗	N/A
WY	✓	✓	✓	✓	✓	N/A	✓	✓	✗	0.000%

Severity for MB fatality is calculated w/ respect to total # of MB Crashes
*DOT crash database contains only FHE

Table 5.6. Guidance and Mailbox Related Injuries for State DOTs that provided with Crash Data for this Project.

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	MB Injury Severity w respect to total MB-crashes (%)
AK	✓	✗	✓	✗	N/A	✗	✓	✓	✗	N/A
CO	✓	✗	✓	✗	N/A	✗	✓	✓ Owner can re-replace the new with the old mailbox system	✗	2.57%
DE	✓	✗	Only for material & geometry	✗	N/A	✗	✓	✓	✗	5.25%
KS	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.49%
KY	✓	✗	✓	✗	✓	N/A	N/A	N/A	✗	N/A
LA	Other	✗ For State roads, permit needed, but no checking	✓	✗	✓	N/A	✓	✓	✗	8.56%
ME	✓	✗	Must be breakaway or guidance on material/ geometry	✗	✓	✓	N/A	N/A	✗	N/A

Severity for MB injury is calculated w/ respect to total # of MB Crashes
*DOT crash database contains only FHE
**Maine DOT suggested not to label the data as FHE and/or MHE

Table 5.6. Guidance and Mailbox Related Injuries for State DOTs that provided with Crash Data for this Project (Continued).

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	MB Injury Severity w respect to total MB-crashes (%)
MN	✗	✗	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	N/A	✓	✓	10.22%
MS	Other	✓ Specifications are part of driveway permit	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ND	✗	✗	✗	✗	N/A	N/A	Only if need to move the MB system	Maybe necessary crash data analysis before changing MB system	✗	4.19%
PA	✓	✗	✗	✗	✗	N/A	N/A	N/A	Maybe some municipalities have some authority	7.51%
TX	✗	✗	✓	N/A	✓	N/A	✓	✓	✓ County and City govmt might have control of some roads	N/A

Severity for MB injury is calculated w/ respect to total # of MB Crashes
*DOT crash database contains only FHE

Table 5.6. Guidance and Mailbox Related Injuries for State DOTs that provided with Crash Data for this Project (Continued).

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute	Severity MB Injuries (MHE and FHE) (w/ respect to total MB crashes – FHE and MHE)
VA	✓	✗	Only for material & geometry	N/A	✓	N/A	N/A	N/A	✗	N/A
WS	Other	✗	N/A	✗	✓	N/A	N/A	N/A	✗	N/A
WY	✓	✓	✓	✓	✓	N/A	✓	✓	✗	5.26%

Severity for MB injury is calculated w/ respect to total # of MB Crashes
*DOT crash database contains only FHE

Mailbox crash frequency and severity was summarized in Table 5.7 for all those State DOTs that gave crash data availability. Not all States, however, provided with FHE and MHE for evaluation of frequency and severity, respectively. The researchers decided to consider only those States that gave availability of both FHE and MHE data (Tables 5.8). These were: CO, DE, KS, LA, MN, ND, PA and WY.

The researchers divided the States in 3 groups according to the knowledge previously acquired in terms of State availability of a policy for choice and installation of crashworthy mailboxes (Tables 5.9). The first group included MN and WY, which were the DOTs that resulted having a policy for mailbox support choice and for which the DOTs seems to be very pro-active in checking mailbox installations and, when necessary, replacing them with a crashworthy structure. The second group included ND and PA, which were the DOTs that resulted not having a policy regarding crashworthy mailbox support choice. The third group included CO, DE, and LA, which were the DOTs that resulted having a guidance for crashworthy mailbox support, but that, however, did not seem to have authority on the single owner about selection and installation of the suggested crashworthy mailbox support. Researchers were not able to find sufficient data for the State of Kansas in terms of permit requirements, guidance for crashworthy mailbox support choice and law enforcement about crashworthy mailbox support selection and placement. For this reason, researchers decided not to include the State of Kansas in any specific group.

Comparisons for the three groups are reported in Tables 5.10 (Yes policy DOTs), Table 5.11 (No Policy DOTs), and Table 5.12 (only guidance, but not authority DOTs). In order to consider a State DOT having a policy or not regarding crashworthy mailbox support selection and placement, the authors reviewed all the information collected either by web, phone conversation and/or email exchange with DOT personnel (for more details, see Appendix F).

As a result, Minnesota and Wyoming were considered "Yes Policy" States, based on the fact that:

- "… Minnesota can enforce the law on private citizen to replace a mailbox support when it is declared to be a public nuisance, a road hazard, and a danger to the health and safety of the traveling public if located along a street or highway having a speed limit of 40 miles per hour or greater. The mailbox installations that are documented to have passed an accredited crash test are acceptable. An accredited crash test is considered to be a test conducted in accordance with procedures described in the most recent National Cooperative Highway Research Program report."
- "In Wyoming the single owner is required to have a permit for installation of mailbox support when that is in the right-of-way of the land. WYDOT has policies and checks whether the support is crashworthy. If it is not, WYDOT will take it away and require that is replaced with a crashworthy one."

North Dakota and Pennsylvania were considered a "No Policy States", based on the fact that:

- "The owner of the mailbox system can choose the system; there is not a need to go through selection. North Dakota DOT does not have a policy and the authority to do anything. Only with major projects, the DOT might need to move the mailbox system already installed and re-install a different type of mailbox support. It might be necessary to analyze crash data before making any decision about changing the mailbox support system.
- "The owner of the mailbox system can chose the system; there is not a need to go through selection. Pennsylvania DOT does not have the authority to do anything. It might be that only some municipalities have some authority, but that's not a general rule."

Colorado, Delaware and Louisiana were considered a "Having Some Guidance" States, based on the fact that:

- "Colorado DOT has not authority to enforce any law in the choice of a crashworthy mailbox support system. The DOT collaborates with USPS to inform the private owner of the importance and of the types of crashworthy systems available. The owner, however, can choose the mailbox support system he/she prefers, even if not crashworthy. When the DOT replaces the mailbox support system during major highway projects, it choses crashworthy support systems. The owner, however, could still re-replace the system installed by the DOT with the old one which was not crashworthy."
- "Delaware DOT requires from the citizen to choose a mailbox system in a certain material and geometry range only. If the DOT is working on a highway project and needs to replace a mailbox support, then it is requested that the contractor chooses a mailbox support system with a FHWA letter of acceptance. However, when the private citizen choses and install the mailbox system, no FHWA letter is required."
- "There is no permit required for selection and installation of new mailboxes and there is no checking. As for state road, there is a permit, however still there is no checking. LADOT issues guidance for choice of crashworthy mailbox support, but no law can be enforced. If an issue is raised for a particular mailbox selection and placement, then LADOT request that the mailbox would be changed, but again cannot enforce law. Last, if LADOT need to replace a mailbox support system, it will replace it with a choice of a crashworthy one."

Table 5.7. State Frequency and Severity for MB Related Crashes.

State DOT	All FHE MB-Crashes	All MHE MB-Crashes	Frequency FHE MB-Crashes w respect to total crashes	Fatal MB-Crashes (#)	MB Fatality Severity w respect to total MB-crashes (%)	Injury MB-Crashes (#)	MB Injury Severity w respect to total MB-crashes (%)
AK ('05-'09)*	204	N/A	0.34%	N/A	N/A	N/A	N/A
CO ('08-'10)	338	257	0.11%	0	0.000%	9	2.57%
DE ('05-'10)	656	305	0.56%	1	0.138%	38	5.25%
KS ('07-'11)	1,351	299	0.42%	2	0.142%	35	2.49%
KY ('06-'10)*	4955	N/A	0.66%	N/A	N/A	N/A	N/A
LA ('06-'10)	1,496	2,271	0.19%	3	0.103%	250	8.56%
ME ('06-'10)**	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MN ('06-'10)	611	844	0.16%	0	0.000%	114	10.22%
MS ('06-'11)*	565	N/A	0.52%	N/A	N/A	N/A	N/A
ND ('07-'11)	136	137	0.16%	0	0.000%	8	4.19%
PA ('07-'10)	3,308	809	0.55%	7	0.203%	259	7.51%
TX ('07-'11)*	12,727	N/A	0.59%	N/A	N/A	N/A	N/A
VA ('09-'11)*	253	N/A	0.11%	N/A	N/A	N/A	N/A
WS ('06-'10)*	2,521	N/A	0.45%	N/A	N/A	N/A	N/A
WY ('08-'10)	93	78	0.11%	0	0.000%	5	5.26%

*DOT crash database contains only FHE
**Maine DOT suggested not to label the data as FHE and/or MHE since for the time frame the data were collected there was not report of it (there are circumstances where it could be something else, besides FHE or MHE)

Table 5.8. State Frequency and Severity for MB Related Crashes for Crash Databases Including both FHE and MHE.

State DOT	All FHE MB-Crashes	All MHE MB-Crashes	Frequency FHE MB-Crashes w respect to total crashes	Fatal MB-Crashes (#)	MB Fatality Severity w respect to total MB-crashes (%)	Injury MB-Crashes (#)	MB Injury Severity w respect to total MB-crashes (%)
CO ('08-'10)	338	257	0.11%	0	0.000%	9	2.57%
DE ('05-'10)	656	305	0.56%	1	0.138%	38	5.25%
KS ('07-'11)	1,351	299	0.42%	2	0.142%	35	2.49%
LA ('06-'10)	1,496	2,271	0.19%	3	0.103%	250	8.56%
MN ('06-'10)	611	844	0.16%	0	0.000%	114	10.22%
ND ('07-'11)	136	137	0.16%	0	0.000%	8	4.19%
PA ('07-'10)	3,308	809	0.55%	7	0.203%	259	7.51%
WY ('08-'10)	93	78	0.11%	0	0.000%	5	5.26%

Table 5.9. Guidance and Policies for the States of CO, DE, KS, LA, MN, ND, PA, and WY.

State DOT	Owner Responsible	Permit	DOT Guidance/ Information	Checking of Existing MB Supports	Request to Change MB Support	Owner Pays for Replacement	Replacement w/ Hwy Projects	Replacement w/ FHWA Approved MB Support	Law Enforcement /Statute
CO	✓	✗	✓	✗	N/A	✗	✓	✓ Owner can re-replace the new with the old mailbox system	✗
DE	✓	✗	Only for material & geometry	✗	N/A	✗	✓	✓	✗
KS	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LA	Other	✗ For State roads, permit needed, but no checking	✓	✗	✓	N/A	✓	✓	✗
MN	✗	✗	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	✓ For Hwy w/ limit ≥ 40 mph w/ MnDOT Projects	N/A	N/A	✓	✓
ND	✗	✗	✗	✗	N/A	N/A	Only if need to move the MB system	Maybe necessary crash data analysis before changing MB system	✗
PA	✓	✗	✗	✗	✗	N/A	N/A	N/A	Maybe some municipalities have some authority
WY	✓	✓	✓	✓	✓	N/A	✓	✓	✗

Table 5.10. State MB Related Policy, Frequency and Severity for States with Both FHE and MHE Data.

State DOT	Policy	All FHE MB-Crashes	All MHE MB-Crashes	Frequency FHE MB-Crashes w respect to total crashes	Fatal MB-Crashes (#)	MB Fatality Severity w respect to total MB-crashes (%)	Injury MB-Crashes (#)	MB Injury Severity w respect to total MB-crashes (%)
CO ('08-'10)	~	338	257	0.11%	0	0.000%	9	2.57%
DE ('05-'10)	~	656	305	0.56%	1	0.138%	38	5.25%
LA ('06-'10)	~	1,496	2,271	0.19%	3	0.103%	250	8.56%
MN ('06-'10)	✓	611	844	0.16%	0	0.000%	114	10.22%
ND ('07-'11)	✗	136	137	0.16%	0	0.000%	8	4.19%
PA ('07-'10)	✗	3,308	809	0.55%	7	0.203%	259	7.51%
WY ('08-'10)	✓	93	78	0.11%	0	0.000%	5	5.26%

Table 5.11. Summary for the States of MN, and WY (Considered YES Policy).

State DOT (Year)	Policy	All FHE MB-Crashes	All MHE MB-Crashes	Frequency FHE MB-Crashes w respect to total crashes	Fatal MB-Crashes (#)	MB Fatality Severity w respect to total MB-crashes (%)	Injury MB-Crashes (#)	MB Injury Severity w respect to total MB-crashes (%)
MN ('06-'10)	✓	611	844	0.16%	0	0.00%	114	10.22%
WY ('08-'10)	✓	93	78	0.11%	0	0.00%	5	5.26%

Table 5.12. Summary for the States of ND, and PA (Considered NO Policy).

State DOT (Year)	Policy	All FHE MB-Crashes	All MHE MB-Crashes	Frequency FHE MB-Crashes w respect to total crashes	Fatal MB-Crashes (#)	MB Fatality Severity w respect to total MB-crashes (%)	Injury MB-Crashes (#)	MB Injury Severity w respect to total MB-crashes (%)
ND ('07-'11)	✗	136	137	0.16%	0	0.000%	8	4.19%
PA ('07-'10)	✗	3,308	48	0.55%	7	0.203%	259	7.51%

Table 5.13. Summary for the States of CO, DE, and LA (Considered Having Guidance).

State DOT (Year)	Policy	All FHE MB-Crashes	All MHE MB-Crashes	Frequency FHE MB-Crashes w respect to total crashes	Fatal MB-Crashes (#)	MB Fatality Severity w respect to total MB-crashes (%)	Injury MB-Crashes (#)	MB Injury Severity w respect to total MB-crashes (%)
CO ('08-'10)	~	338	257	0.11%	0	0.000%	9	2.57%
DE ('05-'10)	~	656	305	0.56%	1	0.138%	38	5.25%
LA ('06-'10)	~	1,496	2,271	0.19%	3	0.103%	250	8.56%

Table 5.14. Frequency and Severity for the States of MN, and WY (Considered YES Policy).

State DOT (Year)	Policy	Frequency FHE MB-Crashes w respect to total crashes	MB Fatality Severity w respect to total MB-crashes (%)	MB Fatality Severity Group (%)	MB Injury Severity w respect to total MB-crashes (%)	MB Injury Severity Group (%)
MN ('06-'10)	✓	0.16%	0.00%	0.00%	10.22%	9.85%
WY ('08-'10)	✓	0.11%	0.00%		5.26%	

Table 5.15. Frequency and Severity for the States of ND, and PA (Considered NO Policy).

State DOT (Year)	Policy	Frequency FHE MB-Crashes w respect to total crashes	MB Fatality Severity w respect to total MB-crashes (%)	MB Fatality Severity Group (%)	MB Injury Severity w respect to total MB-crashes (%)	MB Injury Severity Group (%)
ND ('07-'11)	✗	0.16%	0.000%	0.19%	4.19%	7.34%
PA ('07-'10)	✗	0.55%	0.203%		7.51%	

Table 5.16. Frequency and Severity for the States of CO, DE, and LA (Considered Having Guidance).

State DOT (Year)	Policy	Frequency FHE MB-Crashes w respect to total crashes	MB Fatality Severity w respect to total MB-crashes (%)	MB Fatality Severity Group (%)	MB Injury Severity w respect to total MB-crashes (%)	MB Injury Severity Group (%)
CO ('08-'10)	~	0.11%	0.000%	0.10%	2.57%	7.43%
DE ('05-'10)	~	0.56%	0.138%		5.25%	
LA ('06-'10)	~	0.19%	0.103%		8.56%	

The researchers used the concept of ANOVA to statistically evaluate the results given in Tables 5.11 through 5.16. In statistics, ANOVA (ANalysis Of VAriance) provides a statistical test of whether or not the means of several groups are all equal, and therefore generalizes t-test to more than two groups.

ANOVA can be used to compare multiple groups, but can also be used to evaluate only two groups at a time. Here, researchers decided to apply ANOVA analysis to all three groups at the same time, but also to pair of different groups.

ANOVA evaluates and returns different variables, and one of them if the p-value. The p-value is defined as the probability of obtaining a test statistic at least as extreme as the one that was actually observed. When the p-value is less than a predetermined significance value n, usually chosen as 0.05, one often rejects the null hypothesis, indicating that the observed result would be highly unlikely under the null hypothesis. In other words, for the application on this particular study, if the calculated p-value results < 0.05, than the groups that were formed can be considered significantly statistically different in terms of fatality or injury rate.

Here, ANOVA analysis was applied on fatality percentages and injury percentages distinctly. This way, the analysis served to provide whether there is or there is not similarity between the mailbox injury severity and fatality severity means of each group.

Below is a list of the different ANOVA evaluations computed:

- Fatality for all groups (Table 5.17(a));
- Fatality between Yes- and No- Policy groups (Table 5.17(b));
- Fatality between Yes- and Maybe-Policy groups (Table 5.17(c));
- Fatality between No- and Maybe-Policy groups (Table 5.17(d));
- Injury for all groups (Table 5.18(a));
- Injury between Yes- and No- Policy groups (Table 5.18(b));
- Injury between Yes- and Maybe-Policy groups (Table 5.18(c));
- Injury between No- and Maybe-Policy groups (Table 5.18(d)).

If we limited ourselves comparing the fatality percentages for the States that have and have not a policy and also for those which have a sort of guidance, we could argue that not having a policy seems to cause more fatalities than having one. Also, it seems that having a sort of guidance (without necessarily a policy) helps in reducing the fatality rate for mailbox related crashes. However, in order to have a more objective comparison, we can introduce statistical analysis (ANOVA). ANOVA compares the group means to evaluate if they are statistically significantly different between each other.

With the ANOVA, according to the results reported in Table 5.17, it appears not to be a significant statistical difference between the groups chosen in terms of fatality rate. In other words, if we repeated the all analysis on mailbox related crashes once again, we could easily find that the fatality rate resulted from a State belonging to one group could be similar to the fatality rate resulted from another state belonging to another group. ANOVA was also performed on pair of groups to evaluate fatality rate, to compare groups directly one with another. In all these analysis, still ANOVA showed that it appears not to be a significant statistical difference between the two chosen groups, in terms of fatality rate.

Similarly, with the application of the ANOVA analysis on injury rates, it appears not to be a significant statistical difference between the groups chosen (Table 5.18). In other words, if we repeated the all analysis on mailbox related crashes once again, we could easily find that the injury rate resulted from a State belonging to one group could be similar to the injury rate resulted from another state belonging to another group. Again, ANOVA was also performed on pair of groups to evaluate injury rate, to compare groups directly one with another. In all these analysis, still ANOVA showed that it appears not to be a significant statistical difference between the two chosen groups, in terms of injury rate.

Table 5.17. ANOVA Analysis for Fatality Data.

(a) ANOVA Analysis for Fatality for all Groups

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	0	0	0
Column 2	2	0.203	0.1015	0.020605
Column 3	3	0.241	0.080333	0.005146

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.011803	2	0.005901	0.763989	0.523585	6.944272
Within Groups	0.030897	4	0.007724			
Total	0.0427	6				

(b) ANOVA Analysis for Fatality Between Only Yes-Policy and No-Policy Groups

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	0	0	0
Column 2	2	0.203	0.1015	0.020605

ANOVA

ce of Varic	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between (	0.010302	1	0.010302	1	0.42265	18.51282
Within Gr	0.020605	2	0.010302			
Total	0.030907	3				

Table 5.17. ANOVA Analysis for Fatality Data (Continued).

(c) ANOVA Analysis for Fatality Between Only Yes-Policy and Maybe-Policy Groups

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	0	0	0
Column 2	3	0.241	0.080333	0.005146

ANOVA

ce of Varic	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between (	0.007744	1	0.007744	2.25718	0.230011	10.12796
Within Gr	0.010293	3	0.003431			
Total	0.018037	4				

(d) ANOVA Analysis for Fatality Between Only No-Policy and Maybe-Policy Groups

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	0.203	0.1015	0.020605
Column 2	3	0.241	0.080333	0.005146

ANOVA

ce of Varic	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between (	0.000538	1	0.000538	0.052202	0.833963	10.12796
Within Gr	0.030897	3	0.010299			
Total	0.031435	4				

Table 5.18. ANOVA Analysis for Injury Data.

(a) ANOVA Analysis for Injury for all Groups

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	15.48	7.74	12.3008
Column 2	2	11.7	5.85	5.5112
Column 3	3	16.38	5.46	9.0031

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	6.627343	2	3.313671	0.370054	0.712104	6.944272
Within Groups	35.8182	4	8.95455			
Total	42.44554	6				

(b) ANOVA Analysis for Injury Between Only Yes-Policy and No-Policy Groups

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	15.48	7.74	12.3008
Column 2	2	11.7	5.85	5.5112

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	3.5721	1	3.5721	0.401089	0.591289	18.51282
Within Groups	17.812	2	8.906			
Total	21.3841	3				

Table 5.18. ANOVA Analysis for Injury Data (Continued).

(c) ANOVA Analysis for Injury Between Only Yes-Policy and Maybe-Policy Groups

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	15.48	7.74	12.3008
Column 2	3	16.38	5.46	9.0031

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	6.23808	1	6.23808	0.617489	0.489331	10.12796
Within Groups	30.307	3	10.10233			
Total	36.54508	4				

(d) ANOVA Analysis for Injury Between Only No-Policy and Maybe-Policy Groups

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Column 1	2	11.7	5.85	5.5112
Column 2	3	16.38	5.46	9.0031

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.18252	1	0.18252	0.023283	0.888408	10.12796
Within Groups	23.5174	3	7.839133			
Total	23.69992	4				

The researchers believe that having a bigger sample size of State DOTs crash database would have helped the research in terms of having more data for comparison between State DOTs with and without crashworthy mailbox support policy.

Also, researchers believe that more accurate data could be obtained and analyzed if all crash databases obtained from the different DOTs could have been more easily comparable. Some DOTs crash databases do not incorporate MHE and/or all collisions and their sequence from the same crash event. Because of this, some DOTs crash data could not be included in the final comparison, because did not allow for an exact evaluation of fatalities due to mailbox related crashes. Also, a deeper analysis could have been developed by considering a comparison among DOTs of the injury levels recorder from mailbox related crashes. With the data collected from the current DOTs databases, this could not be accomplished in this research. In fact, different DOTs had different injury severity codes which could not always be comparable.

Also, more detail analysis on road classification, posted speed limit, type of road, weather conditions (which might considerable vary between the northern and the southern States) might be a starting point for a deeper analysis of this data and for a more effective comparison.

With the very limited data that were available for the purpose of this research study, it appears that implementation of current policies for crashworthy mailbox supports selection and placement does not statistically contribute to the outcome of a lower fatality and injury rate for mailbox related crashes.

REFERENCES

1. AKDOT Design & Construction Standards. Last retrieved 02 October, 2012, from http://www.dot.state.ak.us/stwddes/dcstraffic/assets/pdf/metal_mailbox_support_design.pdf.

2. AASHTO (1985). Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. American Association of State Highway and Transportation
Officials, Washington, D.C.

3. AASHTO (1994). A Guide for Erecting Mailboxes on Highways. American Association of State Highway and Transportation Officials, Washington, D.C.

4. Bligh, P. R., D. L. Bullard, et al. (2000). Impact Performance Evaluation of Work Zone Traffic Control Devices. Report No. FHWA/TX-01/1792-2. Texas Transportation Institute, College Station, TX.

5. Bligh, P. R., W. L. Menges, et al. (2001). Testing and Evaluation of Molded Plastic Mailboxes. Report No. FHWA/TX-01/1792-6. Texas Transportation Institute, College Station, TX.

6. Washington Transportation Bulletin (1993). "Mailbox Safety." Retrieved 15 December, 2010, from
http://epdfiles.engr.wisc.edu/pdf_web_files/tic/bulletins/Bltn_014_Mailbox_Safety.pdf.

7. Campise, W. L. and E. R. Hayes (1984). Test and Evaluation of Neighborhood Mailbox. Report No. FHWA/TX-84/52 +343-2. Texas Transportation Institute, College Station, TX.

8. Fitzpatrick, J. F. (1974). The Law and Roadside Hazards. Charlottesville, VA, Michie Co.

9. Mak, K. K. and W. L. Menges (1996). Testing of State Roadside Safety Systems volume VII:
appendix F - Crash Testing and Evaluation of the Minnesota Swing-a-Way Mailbox Support.
Report No. FHWA-RD-98-042. Texas Transportation Institute, College Station, TX.

10. Michie, J. D. (1981). Recommended Procedures for the Safety. Performance Evaluation of
Highway Safety Appurtenances. NCHRP Report 230. Washington D.C.

11. Mn/DOT Road Design Manual. Last retrieved 02 October, 2012, from http://dotapp7.dot.state.mn.us/edms/download?docId=1062364.

12. Ross, H. E., K. C. Walker, et al. (1980). "The Rural Mailbox: A Little-Known Roadside Hazard." Transportation Research Record(769): 4-12.

13. Ross, H. E., D. L. Bullard, et al. (1993a). Mailbox Bracket Crash Tests. Report No. TX-94/1945 2F. Texas Transportation Institute, College Station, TX.

14. Ross, H. E., D. L. Sicking, et al. (1993b). Recommended Procedures for the Safety Performance Evaluation of Highway Features. NCHRP Report 350. Washington D.C.

15. Sheikh, N. M., Bligh, R. P., and W. L. Menges (2006). Crash Testing and Evaluation of the Shur-Tite Multiple-Mailbox Mount. Report No. FHWA/TX-06/0-5210-2. Texas Transportation Institute, College Station, TX.

16. Tahan, F., et al. (2004). Safety Performance Evaluation of Secure Mailboxes Using Finite Element Simulation & Crash Testing. NCAC 2004-W-001. National Crash Anlaysis Center, The George Washington University, Ashburn, VA.

17. USPS (2012). "Mailbox Guidelines" Retrieved 26 September, 2012, from https://www.usps.com/manage/know-mailbox-guidelines.htm.

18. WADOT Design Manual. Last retrieved 02 October, 2012, from http://www.wsdot.wa.gov/Publications/Manuals/M22-01.htm#Individualchapters.

APPENDIX A. MAILBOX GUIDELINES - USPS

Mailbox Guidelines

So what makes a good mailbox?

From the wear and tear of daily use to constant assault from the elements, these guidelines will help you set up a mailbox that stands up to it all.

If you're buying a new mailbox, look for the Postmaster General's seal of approval; every new mailbox design should be reviewed and approved before it goes to market.

If you opt to construct your own mailbox, you should run your plans by your local postmaster. Overall, the mailbox you build will need to meet the same size, strength, and quality standards as manufactured boxes.

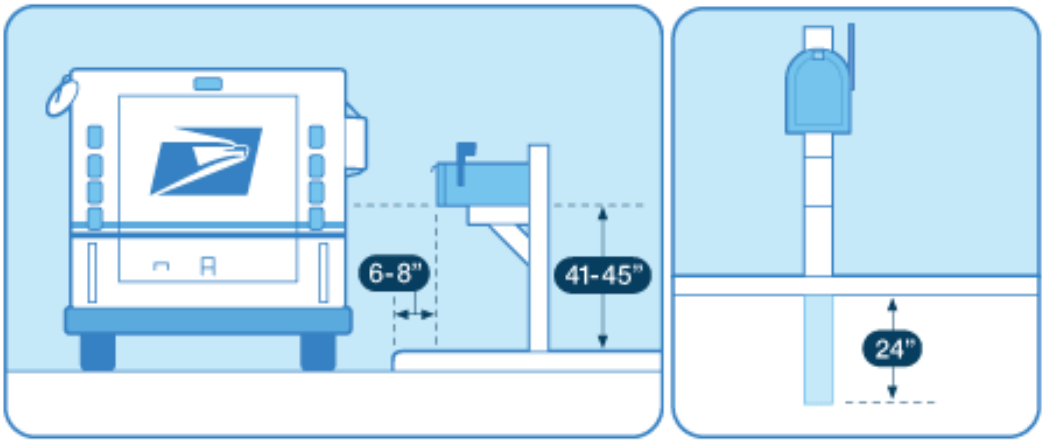
The house or apartment number should be clearly displayed on your mailbox. And, if your mailbox is on a different street than your house, the street name should appear on it, too.

Placement | The Post | Maintenance | Door Slots

Your local postmaster must approve the location of your mailbox.

Put a roadside mailbox where a carrier can reach inside without leaving the truck. That means positioning it about 41" to 45" off the ground and back about 6" to 8" from the curb.

If you live in the city and are attaching the box to your house, just make sure it can be accessed easily from your sidewalk, steps, or porch. Because city carriers often shoulder heavy bags, put your mailbox about 4' from the ground. That way, your carrier won't have to stretch or bend to reach it. And remember to keep the path to your mailbox clear in inclement weather.



Mailbox Guidelines

So what makes a good mailbox?

From the wear and tear of daily use to constant assault from the elements, these guidelines will help you set up a mailbox that stands up to it all.

If you're buying a new mailbox, look for the Postmaster General's seal of approval; every new mailbox design should be reviewed and approved before it goes to market.

If you opt to construct your own mailbox, you should run your plans by your local postmaster. Overall, the mailbox you build will need to meet the same size, strength, and quality standards as manufactured boxes.

The house or apartment number should be clearly displayed on your mailbox. And, if your mailbox is on a different street than your house, the street name should appear on it, too.

Placement | The Post | Maintenance | Door Slots

If you're mounting a curbside mailbox on a post near the street, the support should be secure and safe. The best supports are designed to bend or fall away if a car hits them.

The Federal Highway Administration recommends...

- a wooden mailbox support no bigger than 4" x 4".
- a 2"-diameter standard steel or aluminum pipe.

Bury your post no more than 24" deep, so it can give way in an accident.

Don't use potentially dangerous supports, such as...

- heavy metal pipes.
- concrete posts.
- farm equipment, such as milk cans filled with concrete.

In areas with lots of snow, we suggest a semi-arch or extended arm-type support. That way, snowplows will be able to sweep under without knocking it down.

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Placement | The Post | **Maintenance** | Door Slots

Your mailbox takes a serious beating from the weather, especially in the winter. We suggest a routine mailbox check-up every spring.

You might just need to…

- Replace loose hinges on the door.
- Repaint rusty or peeling parts.
- Remount the post, if it's loose.
- Replace missing or faded house numbers.

And year-round keep obstructions away from your mailbox. Your carrier may not deliver your mail if there's a car, shrub, snowdrift, or unfriendly dog in front of it.

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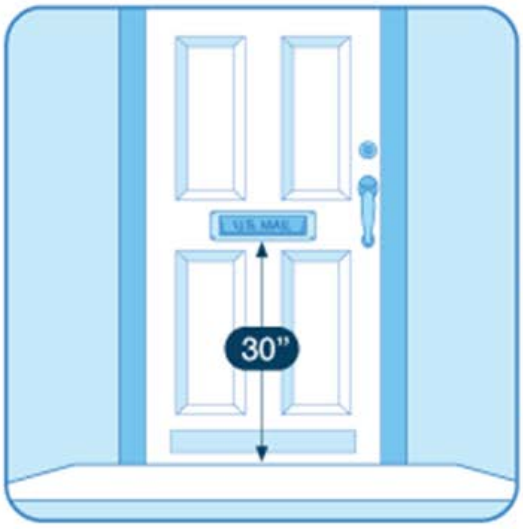
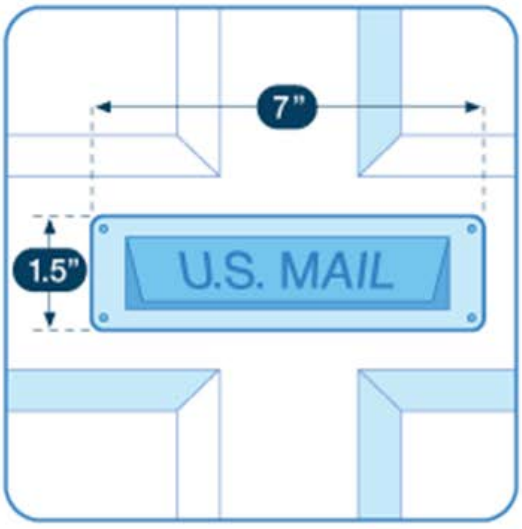
Placement | The Post | Maintenance | Door Slots

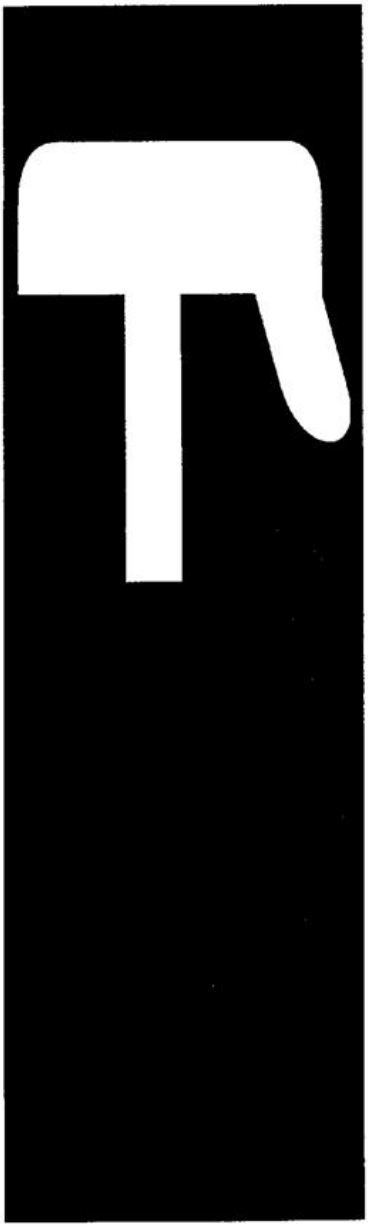
Some homes and apartments have a slot in the door for receiving mail. It should meet the following standards.

- The opening must be at least 1 1/2" x 7".
- Horizontal slots must have a flap hinged at the top. Vertical slots should be hinged on the opposite side from the door's hinges.
- If you have an inside hood for more privacy, the hooded portion shouldn't be below the bottom of the outside plate on a horizontal slot. On a vertical slot, the hood shouldn't extend beyond the side of the outside plate on same side as the door's hinges.
- The hood should not project more than 2 1/16" beyond the inside of the door.
- The bottom of the slot must be at least 30" above floor.





APPENDIX B. AASHTO – A GUIDE FOR ERECTING MAILBOXES ON HIGHWAYS



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Prepared by the Task Force for Roadside Safety
of the Standing Committee on Highways
Subcommittee on Design

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ISBN: 1-56051-028-5

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Table of Contents

List of Figures and Tables

A GUIDE FOR ERECTING MAILBOXES ON HIGHWAYS

INTRODUCTION

There are tens of millions of mailboxes on rural and suburban roads and streets. The design and management problems these mailboxes create for highway agencies are the same or similar to those they have in handling control of access, accommodation of utilities, and the design of bus stops and intersections. Furthermore, there is the added human problem that comes from a mailbox being a link with, if not an extension of, the home or business served by it. The postal patrons may view the mailbox as a part of their domain and resent, even resist, directions concerning their mailbox. Thus, an extra measure of diplomacy and public relations may be needed to effect changes in the design and location of mailbox installations.

Highway safety is the primary reason for a highway agency's becoming involved with mailboxes, which, in some areas, are often the only fixed objects close to the road. Of course, there are also highway maintenance and traffic service considerations, but they are relatively minor in comparison with safety. Because most accident record systems do not isolate accidents associated with mailboxes, there is limited data on these accidents. However, what data there is suggests that possibly 70 to 100 people die annually in the United States in vehicles striking mailboxes where the design of the mailbox or, especially, its support can be shown to have contributed to the severity of the accident. While this number is low, it is significant because it is associated with obviously and unnecessarily hazardous mailbox installations.

The typical single mailbox installation (Figure 1), consisting of a light sheet metal box mounted on a 100 mm x 100 mm wooden post or a 38 mm diameter light gauge pipe, is not a serious threat to motorists, although improvements in typical post-to-box mounting details would further reduce its threat. (See discussion in the "Mailbox Support and Attachment Design" section.) It is the massive structures, such as the masonry columns, railroad rails and ties, tractor wheels, plow blades, concrete filled barrels, etc. (Figure 2), sometimes used to support mailboxes that turn a single mailbox installation into a lethal roadside obstacle that should be eliminated.

The typical grouped or multiple mailbox installation (Figure 3) is also a serious hazard to the motorist who strikes it. This installation consists of two or more posts supporting a horizontal member, usually a timber plank, which supports the group of mailboxes. The horizontal members in these installations are poised at windshield height and when struck, have impaled or decapitated motorists. For safe alternative designs for grouped mailbox installations, see section titled "Mailbox Support and Attachment Design."

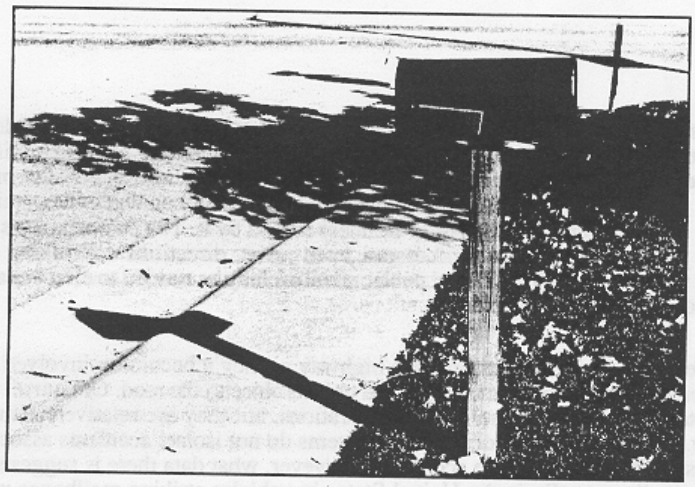
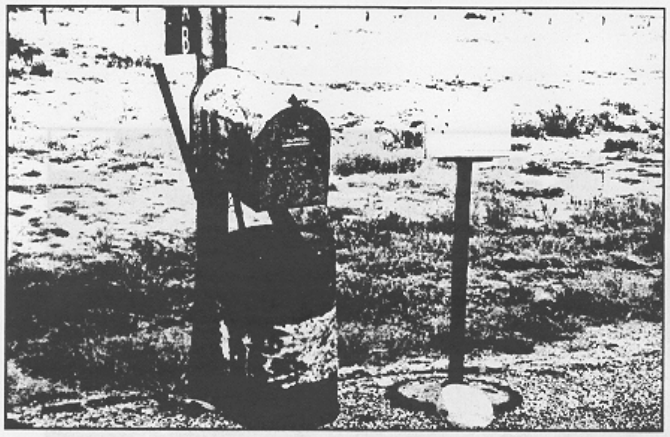
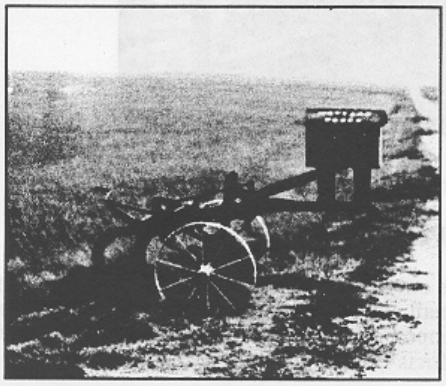


Figure 1A. Mailbox with Wooden Post Support

Figure 1B. Mailbox with Steel Post Support

TYPICAL SINGLE MAILBOX INSTALLATIONS





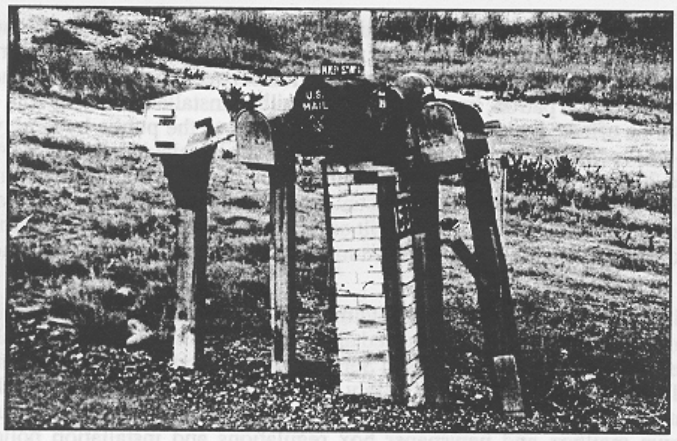


Figure 2

EXAMPLES OF HAZARDOUS SINGLE MAILBOX INSTALLATIONS

Figure 3

EXAMPLE OF HAZARDOUS MULTIPLE MAILBOX INSTALLATION

Injury from striking a mailbox is not the only risk associated with mailboxes. The mail carrier's maneuvers in collecting and delivering mail and the patron's activities, as pedestrian or motorist, in depositing and collecting mail, create opportunities for traffic conflict and human error. Reducing the number and/or severity of these conflicts is an important objective of this guide.

It is only by banishing mailboxes from our highways that mailbox-related traffic accidents could be eliminated. This is impractical, but to the extent there are identifiable and correctable problems, there is room for improvement. Through cooperation between the highway agencies, the U.S. Postal Service, and the postal patron, improvements in mailbox installation details and, in many instances, locations can be effected with little or no increased cost to the public by simply seeing that good state-of-the-art practices are followed when mailboxes are installed or replaced. (A typical mailbox lasts from 5 to 20 years, depending on service conditions, with the average life being about 10 years. Traditionally, the postal service has had an annual mailbox improvement week. See Appendix C.) Furthermore, when highways are rebuilt or undergo significant upgrading, there may be opportunities to incorporate relatively inexpensive mailbox accommodation improvements.

The general principles and guidelines contained in this publication are also applicable to newspaper delivery boxes and similar devices located along public highways. These guidelines are compatible with the requirements of the U.S. Postal Service (see Appendix D) and are presented in the interest of providing the highest degree of safety practicable for the motoring public, mail carriers, and postal patrons. Highway agencies and localities are encouraged to use these guidelines in developing their own mailbox and newspaper box regulations and installation policies and standards. It should be understood that these are general guidelines and that local conditions, such as legal institutions and practices, population densities, topography, highway characteristics, snowfall, prevailing vehicle characteristics, etc., are factors to consider in developing regulations and standards.

GENERAL PRINCIPLES AND GUIDELINES

A. Control Regulations

It is recommended that each highway agency adopt control regulations for the placement of mailboxes and newspaper boxes within rights-of-way of public highways. Correlation of these regulations with those for the granting of driveway entrance permits might be considered. Mailbox and newspaper box control regulations should follow the principles and guidance contained in this document and include the following:

- a reference to pertinent statutes
- a statement that all mailbox installations must meet the requirements of the U.S. Postal Service
- a requirement that all mailbox and newspaper box installations conform to the current policies and standards of the highway agency regarding location, geometry, and structure of such installations
- information on where one can obtain copies of the current policies and standards
- a statement on permits, if required
- a statement on how approval of exceptions may be obtained
- a description of the highway agency's and the postal patron's responsibilities regarding new installations and regarding replacement installations
- a description of the distribution of responsibilities and the procedures to be followed in removing unsafe or nonconforming installations

Appendix A contains a model control regulation.

Appendix B is an example of an informative pamphlet on mailbox supports.

B. Mail Stop and Mailbox Location

Mailboxes should be placed for maximum convenience to the patron, consistent with safety considerations for highway traffic, the carrier, and the patron. Consideration should be given to (1) minimum walking distance within the roadway for the patron, (2) available stopping sight distance in advance of the mailbox site (especially troublesome on older roads), and (3) possible restriction to corner sight distance at intersections and driveway entrances. New installations should, where feasible, be located on the far right side of an intersection with a road or driveway entrance.

Boxes should be placed only on the right-hand side of the highway in the direction of travel of the carrier, except on one-way streets where they may be placed on the left-hand side. It is undesirable to require pedestrian travel along the shoulder. However, this may be the preferred solution for distances up to 60 m when compared to alternatives, such as constructing a turnout in a deep cut, placing a mailbox just beyond a sharp crest vertical curve (poor sight distance), or constructing two or more closely spaced turnouts.

The placing of mailboxes along high-speed, high-volume highways should be avoided if other practical locations are available. Mailboxes should not be located where access is from the lanes of an expressway or where access, stopping, or parking is otherwise prohibited by law or regulation. Where there are frontage roads, the abutting property owners may be served by boxes located along the frontage roads. No mailbox should be at a location that would require a patron to cross the lanes of an expressway to deposit or retrieve mail. Where the U.S. Postal Service deems that service is not warranted on both frontage roads, or where there is a frontage road only on one side, patrons not served directly should be accommodated by mailboxes at a suitable and safe location in the vicinity of the crossroad nearest the patron's property.

Placing a mail stop near an intersection will have an effect on the operation of the intersection. The nature and magnitude of this effect depend on traffic speeds and volumes on each of the intersecting roadways, the number of mailboxes at the stop, extent of traffic control, how the stop is located relative to the traffic control, and the distance the stop is from the intersection.

At intersections where one roadway is given the right-of-way and the other is stop controlled, a vehicle at a mail stop on a through roadway approach to the intersection may restrict the view between a vehicle entering the intersection from the right and the through traffic behind the mail stop. A mail stop on the through road on the far side of the crossroad increases the chance the crossroad driver will pull into the path of the vehicle on the through road that is headed for the mail stop. A mail stop in advance of a stop sign creates the potential for a vehicle at the mail stop blocking the view of the stop sign. The least troublesome location for a mail stop at these intersections is adjacent to a crossroad lane leaving the intersection. Nevertheless, there is still a chance that a driver reentering traffic from the mail stop will not see or be seen from a vehicle turning onto the crossroad. Figure 4 shows possible locations of mail stops at a typical rural intersection. Using the mail stop location dimensions in the figure will minimize the effect a stop will have on an intersection's operation and minimize the hazard to persons using the mail stop.

Mailbox heights are usually set to accommodate the mail carrier. Typically, the bottom of the mailbox is located 1 m to 1.2 m above the mail stop surface.

Mailboxes should be located so that a vehicle stopped at a mailbox is clear of the adjacent traveled way. An exception to this principle may be reasonable on low-volume, low-speed streets and roads. But basically, a vehicle stopped at a mailbox should be clear of the traveled ways and the higher the traffic volume or speed, the greater the clearance should be.

Most vehicles stopped at a mailbox will be clear of the traveled way when the mailbox is placed outside a 2.4 m wide usable shoulder or turnout. This position is recommended for most rural highways. For high-volume, high-speed highways, it is recommended that 3 m wide turnouts should be provided where the shoulder is not 3 m wide. Where conditions justify, 3.6 m wide turnouts should be provided. However, it may not be reasonable to require even a 2.4 m shoulder or turnout on very low-volume, low-speed roads or streets. To provide space outside the all-weather surface for opening the mailbox door, it is recommended that the roadside face of a mailbox be set 200 mm

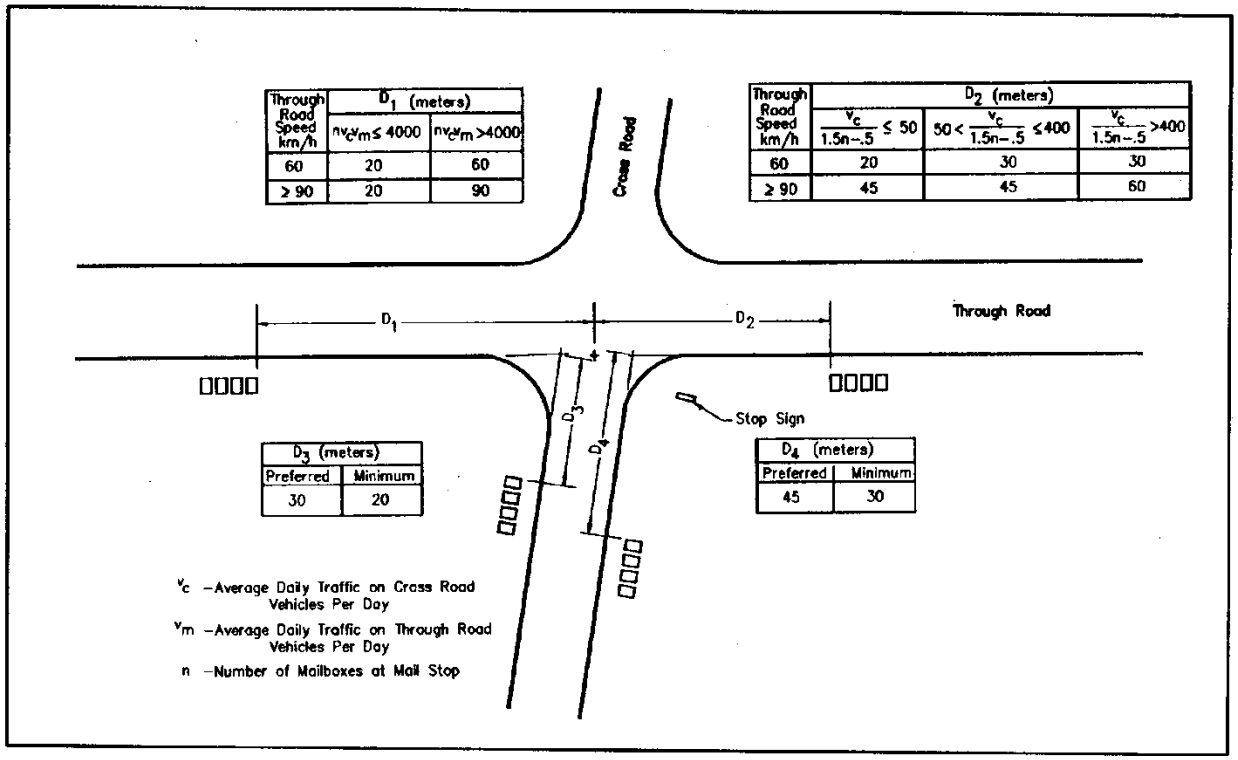


Figure 4

SUGGESTED MINIMUM CLEARANCE DISTANCES TO NEAREST MAILBOX IN MAIL STOPS AT INTERSECTIONS

SUGGESTED GUIDELINES FOR LATERAL PLACEMENT OF MAILBOXES

Table 1

Highway Type and Traffic Conditions	Width of All-Weather Surface of Turnout or Available Shoulder at Mailbox - Meters		Distance Roadside Face of Mailbox is to be Offset Behind Edge of Turnout or Usable Shoulder - Millimeters	
	Preferred	Minimum	Preferred	Minimum
Rural highway ADT over 10,000 vpd	> 3.6	3.0	200 to 300	0
Rural highway ADT = 1,500 to 10,000 vpd	3.6	2.4		
Rural highway ADT = 100 to 1,500 vpd	3.0	2.4		
Rural road ADT under 100 vpd	2.4	1.8		200*
Residential street without curb or all-weather shoulder	1.8	0		
Curbed residential street	Not applicable		200 to 300 Behind Traffic Face of Curb	150 Behind Traffic Face of Curb

ADT = Average Daily Traffic vpd = Vehicles Per Day

* If a turnout is provided, this may be reduced to zero.

to 300 mm outside the all-weather surface of the shoulder or turnout. Suggested guidelines for the placement of mailboxes are shown in Table 1. These are based on experience and engineering judgment.

When a mailbox is installed in the vicinity of an existing guardrail, it should, wherever practical, be placed behind the guardrail.

C. Mailbox Turnout Design

Shoulder or turnout widths suitable to safely accommodate vehicles stopped at mailboxes are discussed in the "Mail Stop and Mailbox Location" section and are shown in Table 1.

The surface over which a vehicle is maneuvered to and from a mailbox must be sufficiently stable to support passenger cars stopping regularly during all weather conditions. Where the available shoulder surface strength or width are not sufficient for the purpose, they should be modified to provide a suitable all-weather mailbox turnout. In most instances, adequate surface stabilization can be obtained by the addition of select materials to the in-place soils. A mailbox turnout for grouped mailboxes may require greater stabilization or possibly a surface treatment course to accommodate multiple patron use. Special measures may also be needed where highway traffic conditions encourage hard braking or high acceleration of vehicles in a mailbox turnout.

Slowing a vehicle in traffic, as drivers are usually required to do when entering a mailbox turnout, increases the risk of an accident. The ideal way to minimize this risk is to provide a speed change lane. A wide, surface-treated shoulder can be used for this purpose. Unfortunately, at most mailbox turnout locations, suitable shoulders are not available and it would be far too expensive to provide shoulders or turnouts that would allow all speed change to be accomplished outside the traveled ways. Figure 5 shows a mailbox turnout layout considered appropriate for different traffic conditions.

Figure 5 shows the minimum space needed for maneuvering to a parallel position out of traffic and for returning to traffic. The typical driver would probably slow to about 15 km/h before starting into the low-speed turnout, making it unsuitable for high-speed highways where driver expectancy does not include such slow moving traffic.

Before entering a 2.4 m wide turnout with a 20:1 taper for high-speed traffic similar to that shown in Figure 5, a driver would probably slow to about 50 km/h and would slow considerably more, possibly to as slow as 10 km/h, before clearing the traveled way. While this is not an ideal exit maneuver, for the few stops generated by a single mailbox, it probably would not create an unacceptable hazard on most rural highways.

Increasing the width of the turnout to 3.6 m and maintaining the 20:1 taper rate suggested in Figure 5 might induce a driver using the turnout to enter it at about 70 km/h and to clear the traveled way at about 40 km/h. While this is still not ideal, it should be quite acceptable for all but very few sites. These very few sites might be found on highways operating at high speeds and carrying over 3,000 to 4,000 vehicles per day with a high percentage of vehicles on long trips. For these conditions, consideration should be given to providing shoulders or turnouts at unavoidable mail stops that will provide for greater speed change opportunity outside the traffic stream.

The tapers shown in Figure 5 represent theoretical layouts. It may be more practical to square the ends of the turnout or to provide a stepped layout with the full width of the shoulder strengthened, if required, for the length of the turnout and the shoulder widened to the full width of the turnout for the entire length of the portion of the turnout outside the shoulder width. It may also be simpler to construct a continuous turnout-width shoulder rather than individual turnouts where mailbox turnouts are closely spaced.

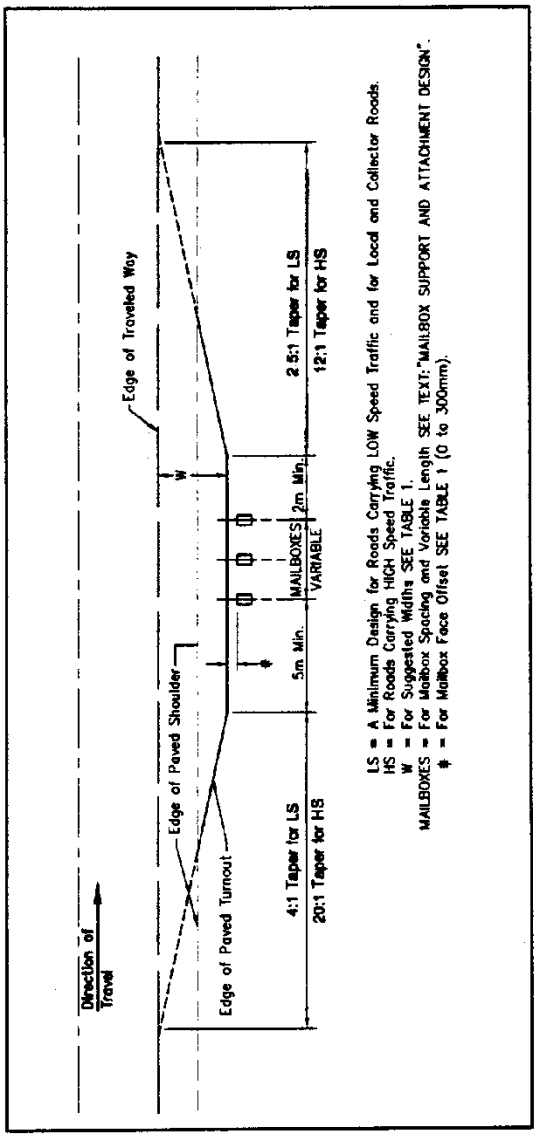


Figure 5

MAILBOX TURNOUT

D. Mailbox Support and Attachment Design

All exposed mailboxes should be firmly attached to supports that yield or break away safely if struck by a vehicle. National Cooperative Highway Research Program Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features," contained performance criteria for mailbox supports when subjected to crash testing with an automobile. These criteria can be summarized as follows:

- Mailbox supports should, with a minor qualification, be no more substantial than required to resist service loads and reasonably minimize vandalism. Nominal 100 mm x 100 mm square or 100 mm diameter wood posts or 38 mm to 50 mm diameter standard steel or aluminum pipe posts, embedded no more than 600 mm into the ground, are the maximum strength supports that should be considered. Lower strength supports, such as lightweight flanged channel steel posts, have given satisfactory service in most environments. A metal post should not be fitted with an anchor plate. However, an anti-twist device that extends no more than 250 mm below the ground surface is acceptable. The qualification to this criterion minimizing post strength is that for supports such as those made of wood that breaks rather than bends under impact, the support needs sufficient strength to accelerate the box to a speed approaching that of the impacting vehicle so that the chances of the box penetrating the vehicle's windshield are minimized. Test results indicate that the 100 mm x 100 mm square or 100 mm diameter dimensions for wood supports should be both minimum and maximum post dimensions.

- Mailbox to post attachments should prevent mailboxes from separating from their supports under vehicle impacts. The lighter the mailbox, the easier it will be to meet this criterion or, conversely, given sufficient post attachment strength, the less sensitive the safety of an installation will be to the mass of the mailbox. Figures 6 through 10 show acceptable attachment and support details. The exact support hardware dimensions and design may vary, such as having a two-piece platform bracket, or alternative slot and hole locations. The product must result in a satisfactory attachment of the mailbox to the post, and all components must fit together properly.

- Multiple mailbox installations must meet the same criteria as do single mailbox installations. This requirement precludes the use of a heavy horizontal support member such as the one shown in Figure 3. Figures 7, 9, and 10 show acceptable multiple mailbox support systems. The use of a series of such installations or of individually supported boxes is acceptable. However, vehicle rollover occurred when a row of eight closely spaced mailboxes individually supported with 3 kg/m channel post supports was crash tested with a small car, impacting off center at high speed. Film from this test and results from other tests suggest that the reason for this performance was a ramping caused by the closely spaced mailboxes piling up. To avoid this problem, it is recommended that mailbox supports be separated a distance at least equal to three-fourths of their heights and preferably their full heights above ground. It is also preferred that multiple mailbox installations be located outside the highway clear zone, if feasible, such as on a service road or minor intersecting road.

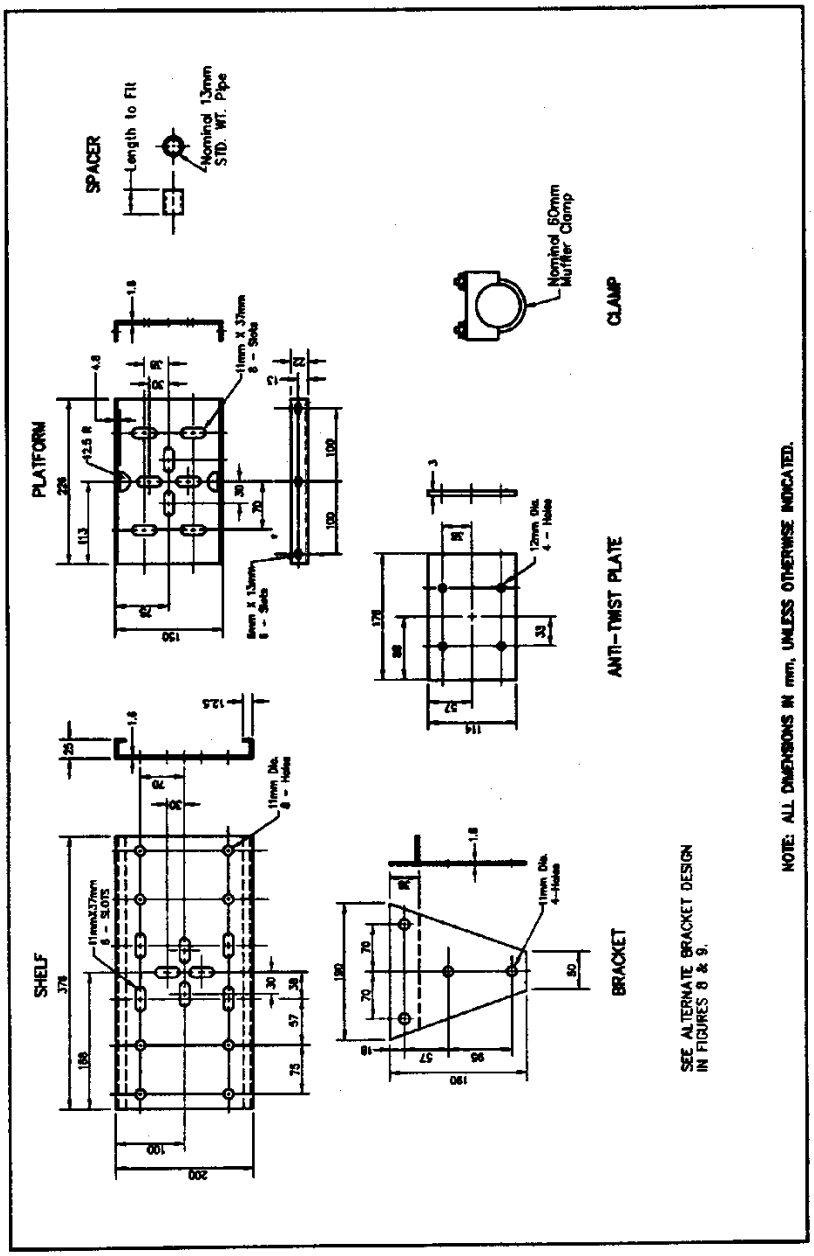


Figure 6

MAILBOX SUPPORT HARDWARE SERIES A

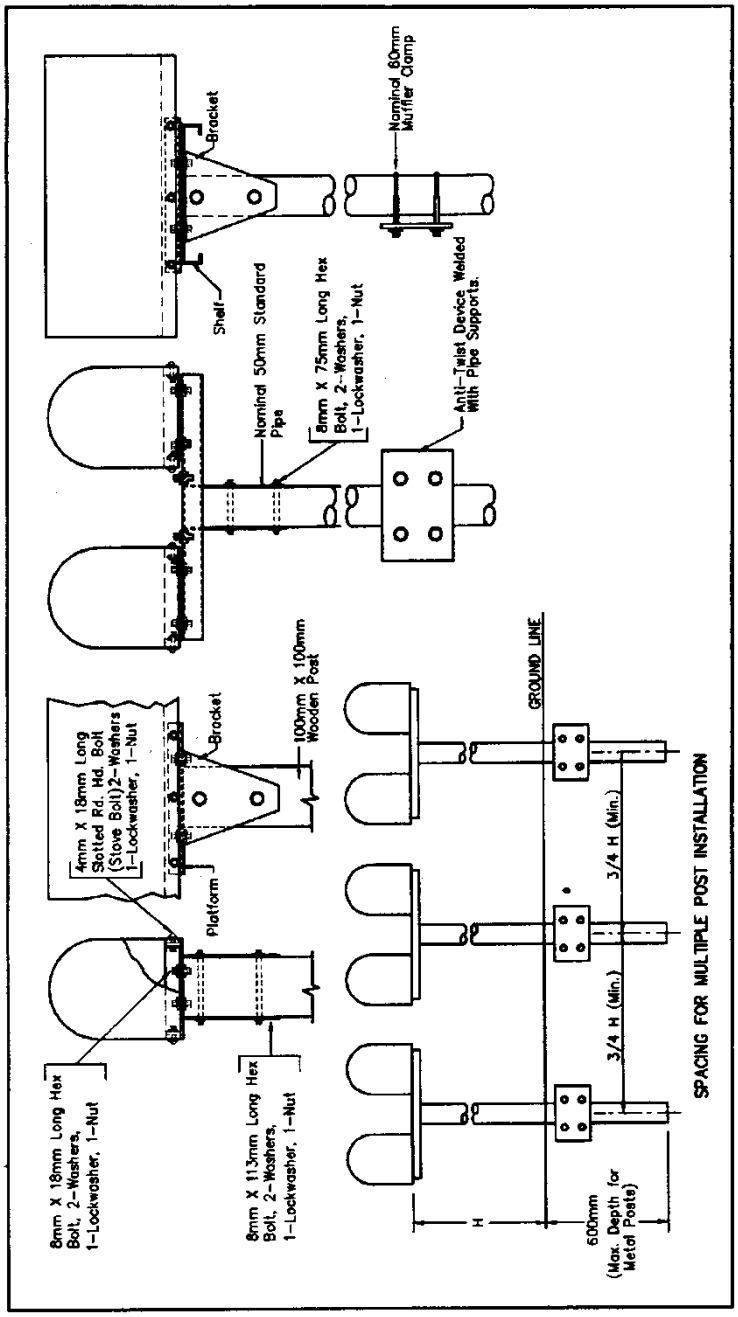


Figure 7

SINGLE AND DOUBLE MAILBOX ASSEMBLIES SERIES A

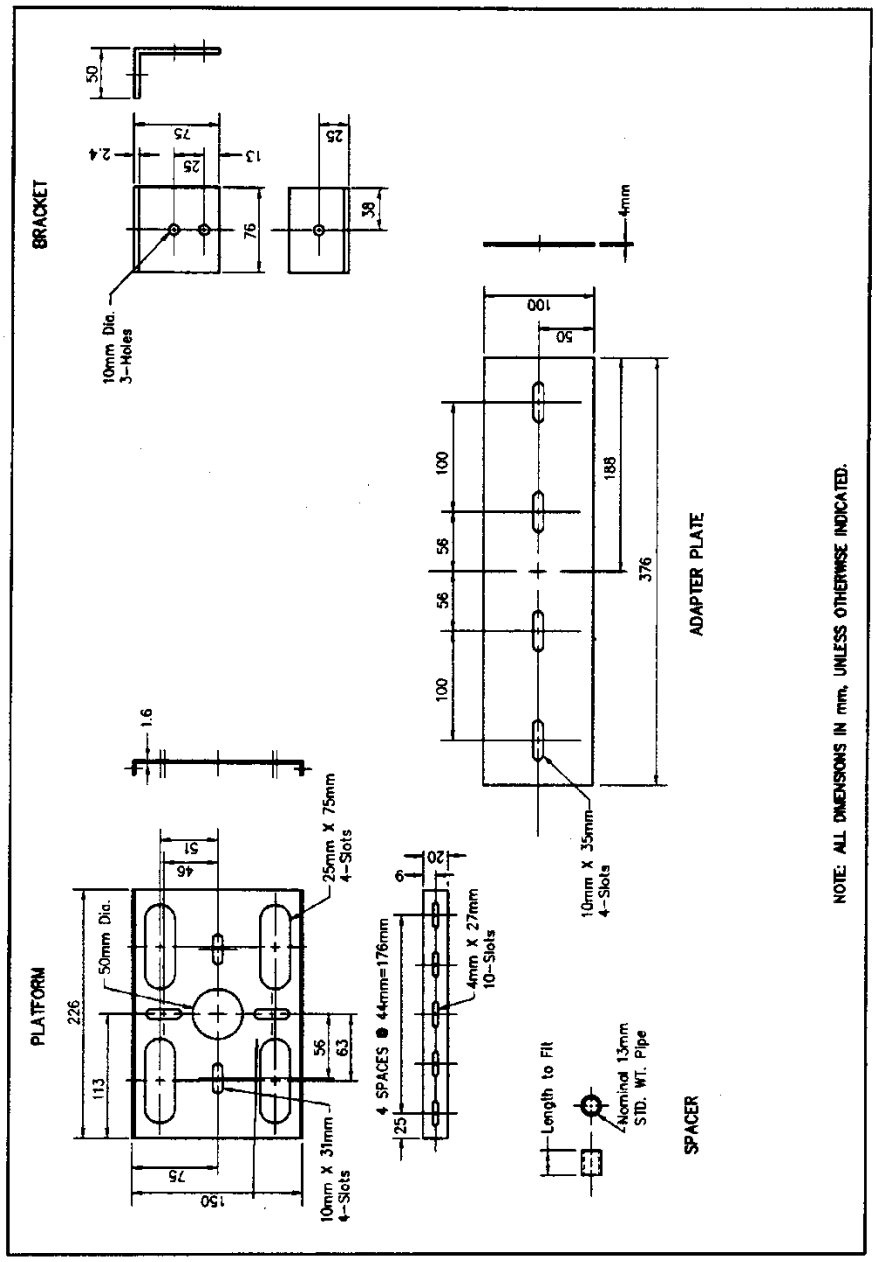


Figure 8

MAILBOX SUPPORT HARDWARE SERIES B

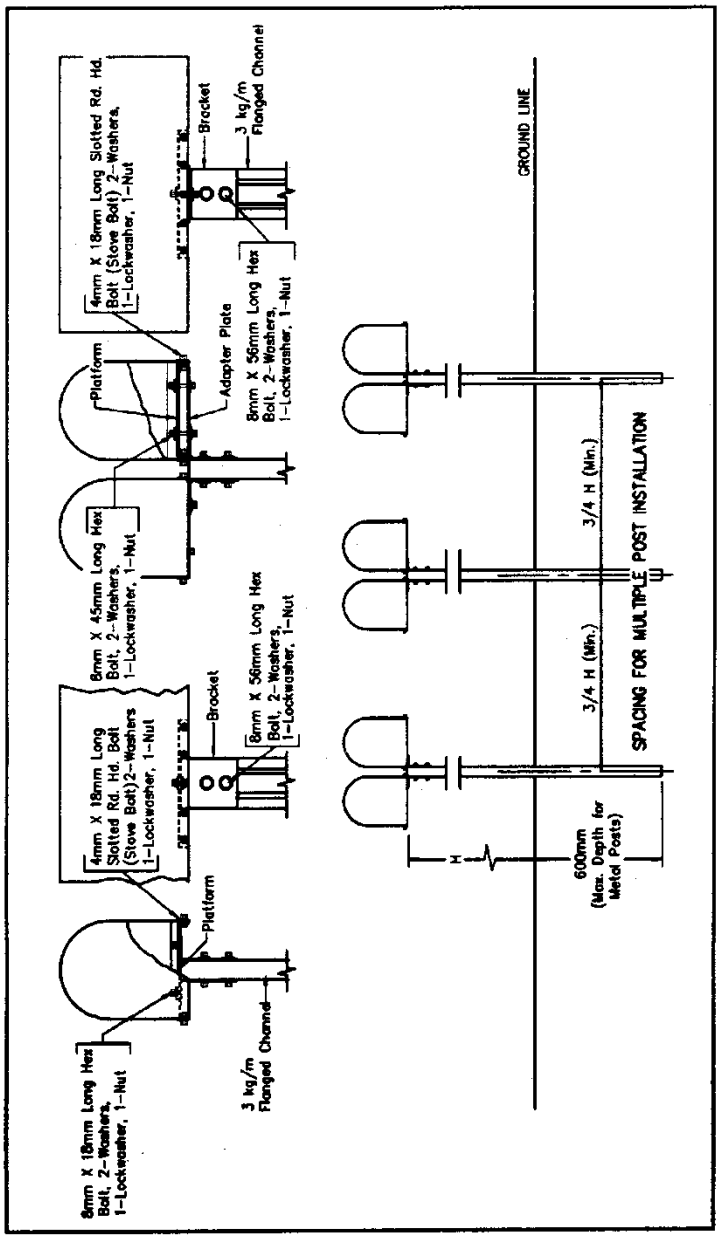


Figure 9

SINGLE AND DOUBLE MAILBOX ASSEMBLIES SERIES B

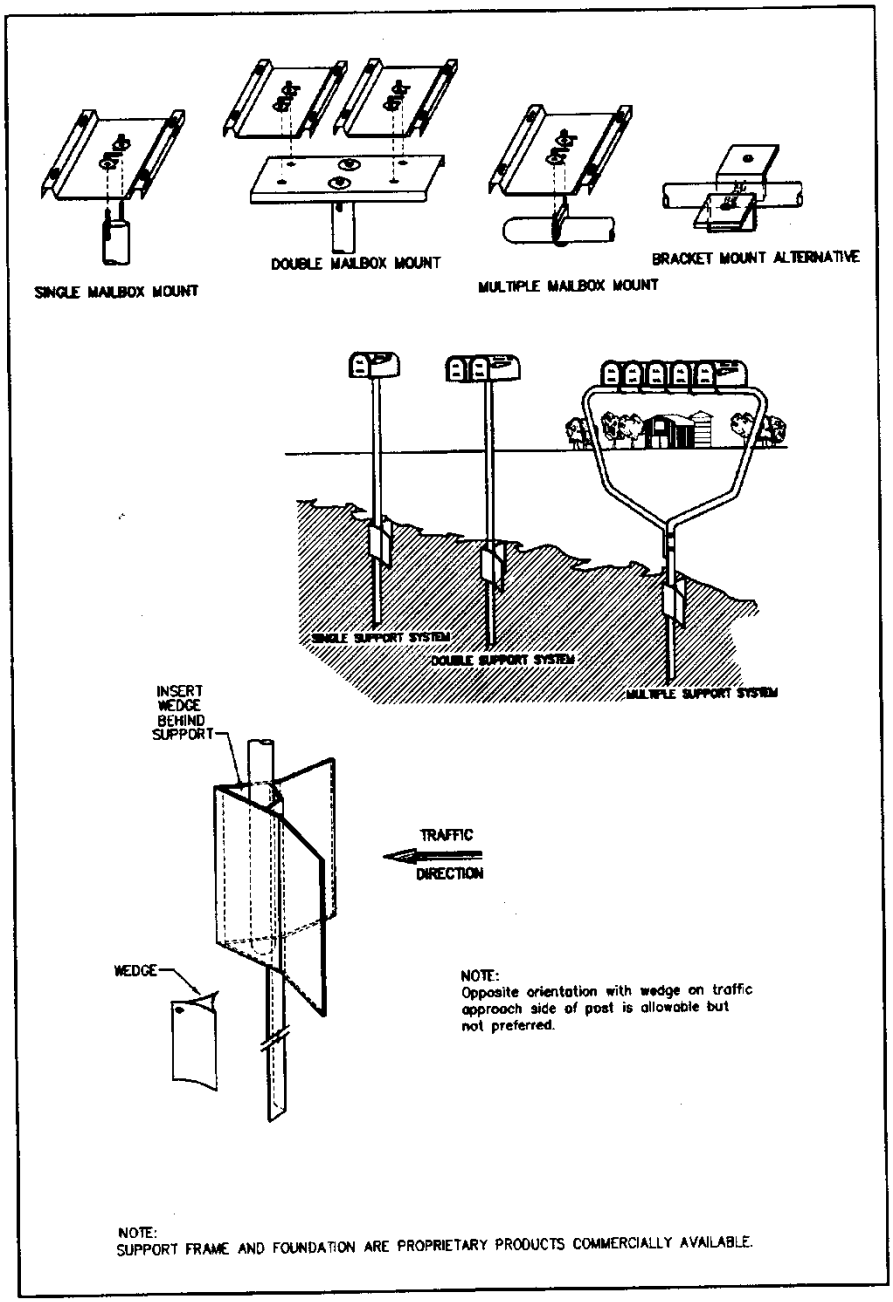
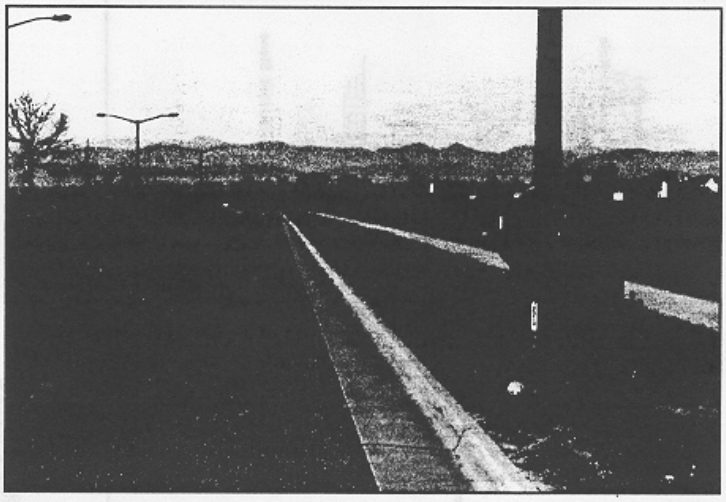
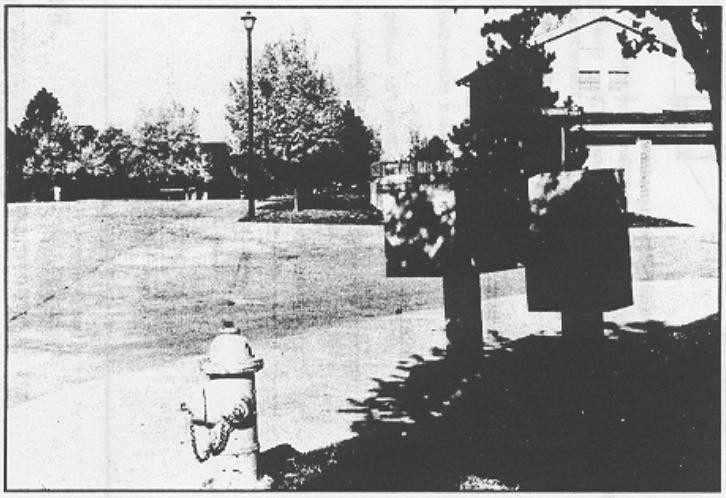


Figure 10

SINGLE AND MULTIPLE MAILBOX ASSEMBLIES
SERIES C



COLLECTION UNIT ADJACENT TO AUXILIARY LANE



NEIGHBORHOOD DELIVERY AND COLLECTION BOX UNITS

Figure 11

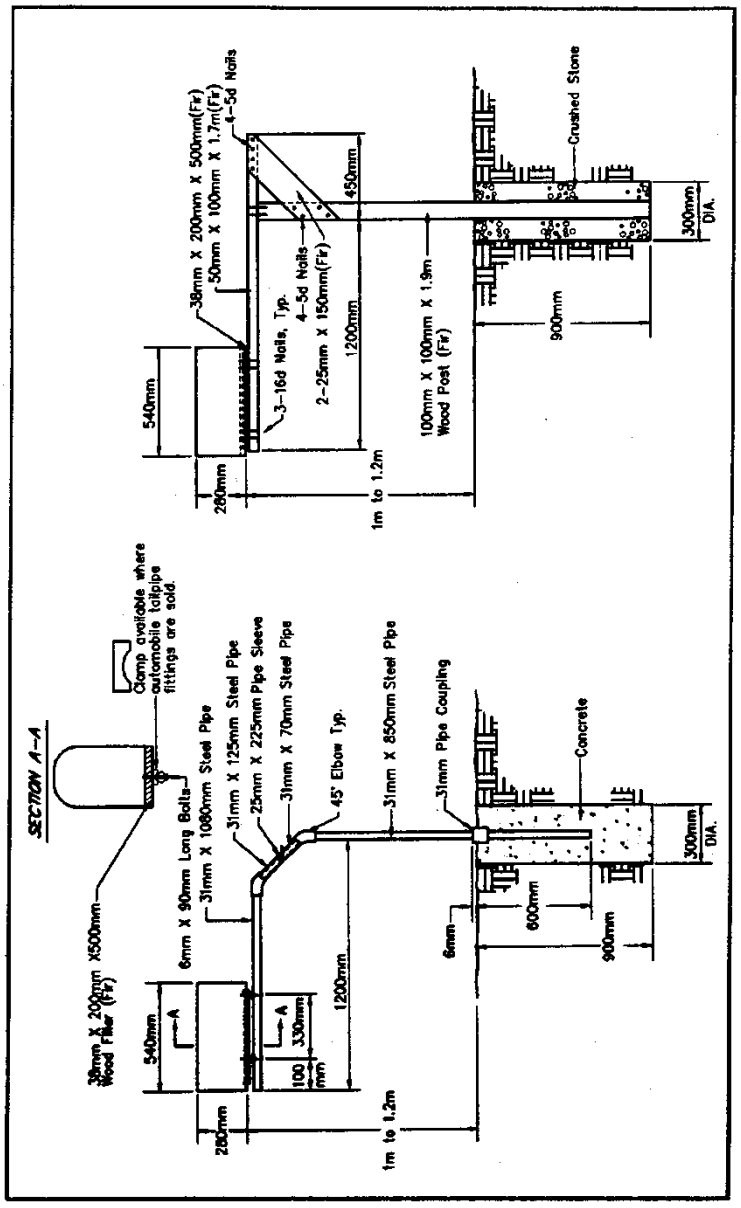


Figure 12

CANTILEVER MAILBOX SUPPORTS

- The Neighborhood Delivery and Collection Box Units (NDCBU) are a specialized type of multiple mailbox installations (Figure 11) that should be located at sites that provide adequate safety to errant motorists and safe access by postal patrons and carriers. The NDCBU is a cluster of 8 to 16 locked boxes mounted on a pedestal or within a framework, the combination of which generally has a mass between 45 and 90 kg. While NDCBUs usually serve a limited number of single family residences in urban areas, their use has been observed in rural areas. A crash test of one of these units at 100 km/h showed that it failed to meet safety requirements. Therefore, NDCBUs must be located outside the clear area needed for the safe recovery of errant vehicles. Postmasters and their designers responsible for the location of NDCBUs should be instructed to contact local government authorities, including the appropriate highway officials (state, county, township, municipal, etc.) prior to installation to ensure safe location of NDCBUs.

In areas of high snowfall, some highway agencies have found cantilever mailbox supports advantageous. While such designs do permit windshield contact with the box without the vehicle first contacting the support, tests of the designs shown in Figure 12 did not reveal serious consequences. The operational advantage of these supports is that snow can be plowed close to the mailbox without the windrow from the plow pushing the support over.

Lightweight newspaper boxes may be mounted below the mailbox on the mailbox support.

Recently, mailboxes of heavy gauge steel or other substantial materials have been designed and sold as deterrents to vandalism. These massive boxes (over 5 kg) meet Postal Service requirements for minimum size, material durability, ease of access, etc. and are quite resistant to deformation. However, these boxes are potentially hazardous to occupants of errant vehicles regardless of the support used. They should be restricted to use only along low-speed, low-volume streets in residential areas.

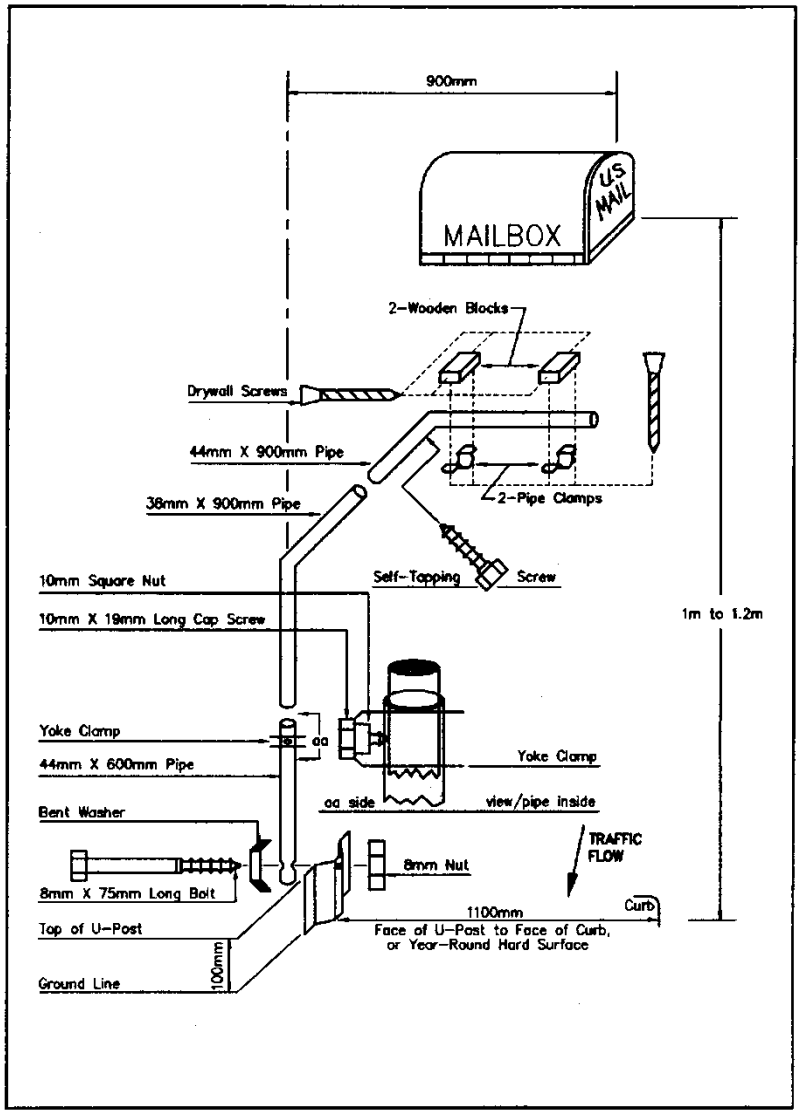


Figure 13

BREAKAWAY CANTILEVER MAILBOX SUPPORT

APPENDIX C. MAILBOX SUPPORT SYSTEMS – FHWA LETTERS OF ACCEPTANCE

U.S. Department of Transportation
Federal Highway Administration

1200 New Jersey Ave., S.E.
Washington, DC 20590

July 25, 2007

In Reply Refer To: HSSD/SS-151

Mr. Darrell Heald
Vice President
SHUR-TITE Products
P.O. Box 2283
Round Rock, TX 78680

Dear Mr. Heald:

In your letter of December 14, 2006, you requested the Federal Highway Administration's (FHWA) acceptance of SHUR-TITE® multiple mailbox mount at the National Cooperative Highway Research Program (NCHRP) Report 350 test level 3 (TL-3). In support of your request, you provided a copy of the Texas Transportation Institute report dated November 2006, entitled "Crash Testing and Evaluation of the SHUR-TITE® Multiple Mailbox Mount" and digital video of the crash test conducted on the device.

Requirements
Mailbox supports should meet the guidelines contained in the NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features." FHWA Memorandum "ACTION: Identifying Acceptable Highway Safety Features" of July 25, 1997, provides further guidance on crash testing requirements of support structures.

Product description
The SHUR-TITE® multiple mailbox mount is designed to support as many as 4 or 5 mailboxes (depending on their size and total weight) on a support frame that is fabricated from 2-3/8 inch (60.3 mm) diameter and 0.065 inch (1.7 mm) thick steel tubing. The top portion of the support frame consists of a horizontal tube, which is welded at both ends to a 25 inch (63.5 cm) radius, semi-circular shaped tube. The bottom of the semi-circular tube is welded to a 22.5 inch (57.2 cm) long vertical tube. Two detailed drawings of the multiple mailbox support are enclosed for reference.

Test article installation
The test installation had four mailboxes mounted on its top. Two of these mailboxes were smaller, measuring approximately 9 inches by 7 inches by 19 inches (229 mm x 178 mm x 483 mm) and weighing 7 lb (3.2 kg). The remaining two mailboxes were a larger size, measuring approximately 15 inches by 11.5 inches by 23.5 inches (381 mm x 292 mm x

597 mm) and weighing 13 lb 10 oz (6.2 kg). The small mailboxes were directly attached to the standard Texas Department of Transportation bracket mount with four 1/4 inch (6.4 mm) diameter bolts.

The mailbox frame was placed into a 12 inch (305 mm) diameter by 30 inch (762 mm) deep concrete footing. At the center of this concrete footing, a 3 inch (76.2 mm) diameter by 17 inch (43.2 cm) long plastic tube socket was used for mounting the mailbox support frame. Once the mailbox support frame was inserted into the footing, it was secured in place with a plastic wedge placed between the vertical support frame tube and the plastic socket in the concrete footing.

Testing
The criteria in the NCHRP Report 350 for mailbox supports specifies that to meet TL-3 they must successfully pass tests 3-60 and 3-61. These tests involve the standard 820 kg passenger car impacting the support head-on and at the critical impact angle at a speed of 35 km/h (test 3-60) and 100 km/h (test 3-61).

Both tests were conduced on your mailbox support. In test 3-60, the test vehicle impacted the device at an impact angle of 0 degrees and with the left quarter point of the vehicle aligned with the centerline of the mount. Upon impact, the support pulled out of the ground socket as designed. Contact with the windshield was made but no damage resulted. In test 3-61, the test vehicle contacted the device at an impact angle of 0 degrees and with the right quarter point of the vehicle aligned with the centerline of the support. Upon impact, the support pulled out of the ground base as designed and the mailboxes contacted the windshield. The windshield shattered an area of 5 square feet and depressed 3.2 inches (81 mm) inward without any holes or penetration into the occupant compartment. A summary of the test results is enclosed.

Based on the crash testing results, I agree that the SHUR-TITE® multiple mailbox mount meets the evaluation criteria for NCHRP 350 TL-3 for mailbox supports and may be used at all appropriate locations on the National Highway System (NHS) when selected by the contracting authority. The SHUR-TITE® multiple mailbox mount was tested in a configuration that included two small mailboxes weighing 7 pounds (3.2 kg) each and two large mailboxes weighing 13.6 pounds (6.18 kg) each. The total weight of the mailboxes is approximately 41 pounds (18.6 kg). Alternate mailbox arrangements are considered acceptable, provided that the total weight of the mailboxes does not exceed the total tested weight of 41 lb (18.6 kg).

Standard provisions
Please note the following standard provisions that apply to FHWA letters of acceptance:

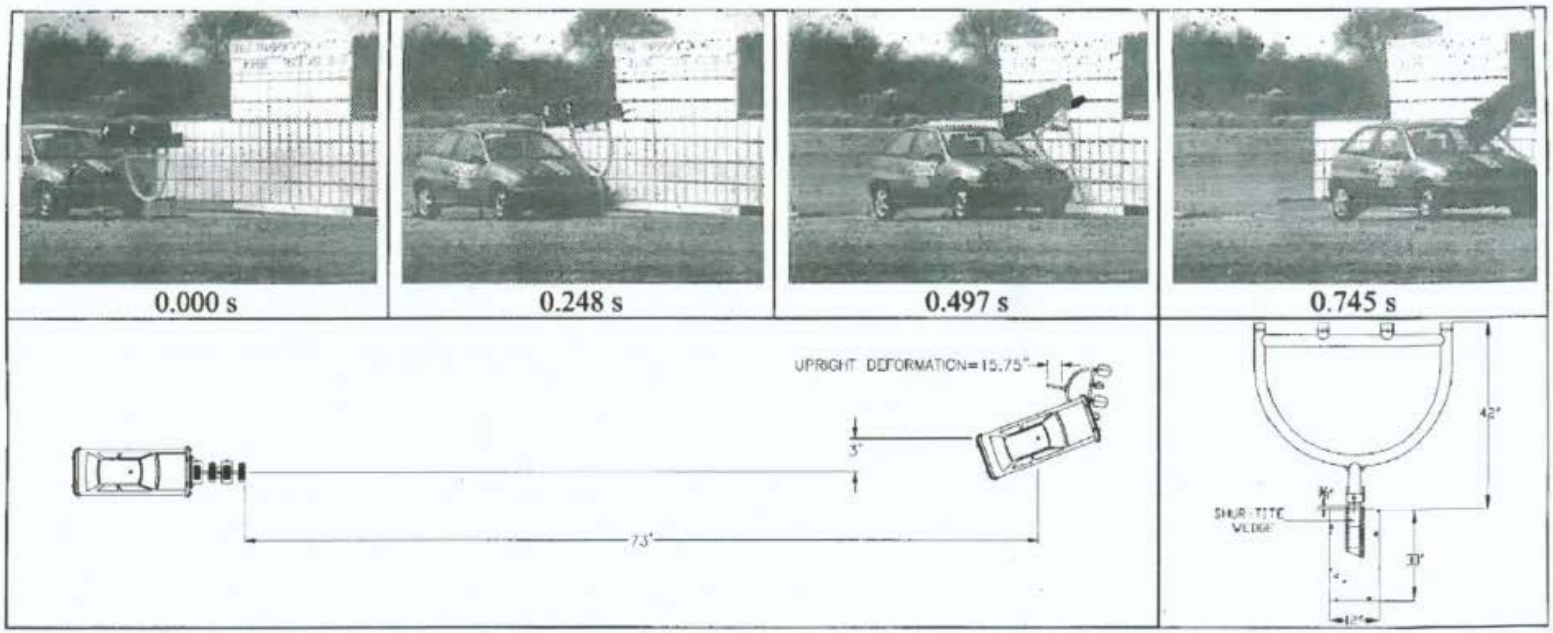
- This acceptance is limited to the crashworthiness characteristics of the devices and does not include their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.

- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance designated as number SS-151 shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- The SHUR-TITE® multiple mailbox mount is a patented product and considered proprietary. If proprietary devices are specified by a highway agency for use on Federal-aid projects, except exempt, non-NHS projects, they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

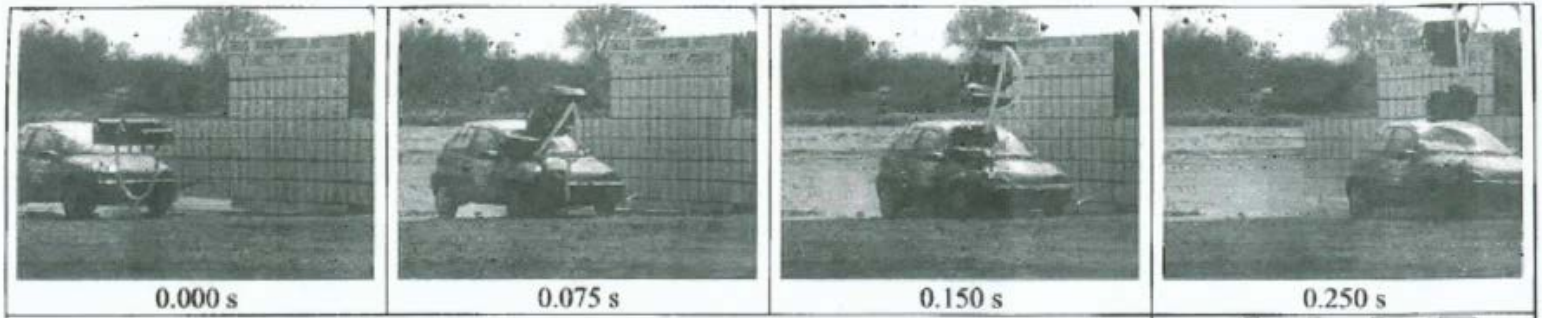
George E. Rice, Jr.
Acting Director, Office of Safety Design
Office of Safety

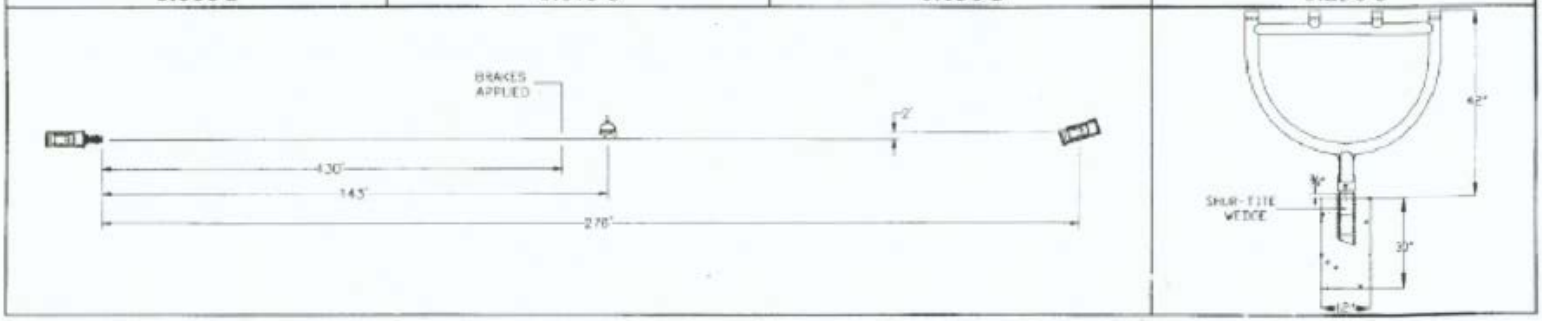
Enclosures



General Information		**Impact Conditions**		**Test Article Debris Pattern (ft)**	
Test Agency	Texas Transportation Institute	Speed (mi/h)	22.1	Longitudinal	73.0
Test No.	452106-1	Angle (deg)	0	Lateral	3.0
Date	03-03-2006	**Exit Conditions**		**Vehicle Damage**	
Test Article		Speed (mi/h)	N/A	Exterior	
Type	Mailbox Support	Angle (deg)	0	VDS	12FD1
Name	Shur-Tite® Multiple-Mailbox Mount	**Occupant Risk Values**		CDC	12FDEW1
Installation Height (inches)	42.0 to Bottom of Mailboxes	Impact Velocity (ft/s)		Maximum Exterior	
Material or Key Elements	Four Mailboxes Mounted using Standard TxDOT Hardware	Longitudinal	3.9	Vehicle Crush (inches)	nil
		Lateral	1.0	Interior	
Soil Type and Condition	Standard Soil, Dry	THIV (km/h)	4.4	OCDI	FS0000000
Test Vehicle		Ridedown Accelerations (g's)		Maximum Occupant	
Type	Production	Longitudinal	-0.2	Cmpt. Deformation (inches)	0
Designation	820C	Lateral	-0.2	**Post-Impact Behavior**	
Model	1995 Geo Metro	PHD (g's)	0.3	(during 1.0 sec after impact)	
Mass (lb)		ASI	0.09	Max. Yaw Angle (deg)	-1
Curb	1755	Max. 0.050-s Average (g's)		Max. Pitch Angle (deg)	1
Test Inertial	1808	Longitudinal	-1.1	Max. Roll Angle (deg)	-1
Dummy	170	Lateral	-0.4		
Gross Static	1978	Vertical	-0.7		

1 ımmary of Results for *NCHRP Report 350* Test 3-60 on the Shur-Tite® Multiple-mailbox Mount.





General Information

Test Agency	Texas Transportation Institute
Test No.	452106-2
Date	03-03-2006

Test Article

Type	Mailbox Suport
Name	Shur-Tite® Multiple-mailbox Mount
Installation Height (inches)	42.0 to Bottom of Mailboxes
Material or Key Elements	Four Mailboxes Mounted using Standard TxDOT Hardware
Soil Type and Condition	Standard Soil, Dry

Test Vehicle

Type	Production
Designation	820C
Model	1995 Geo Metro
Mass (lb (kg))	
Curb	1755
Test Inertial	1808
Dummy	170
Gross Static	1978

Impact Conditions

Speed (mi/h)	62.6
Angle (deg)	0

Exit Conditions

Speed (mi/h)	57.7
Angle (deg)	0

Occupant Risk Values

Impact Velocity (ft/s)	
Longitudinal	4.9
Lateral	2.3
THIV (km/h))	5.8
Ridedown Accelerations (g's)	
Longitudinal	-0.3
Lateral	-0.4
PHD (g's)	0.5
ASI	0.18
Max. 0.050-s Average (g's)	
Longitudinal	-2.1
Lateral	0.3
Vertical	0.9

Test Article Debris Pattern (ft)

Dynamic	276.0
Permanent	2.0

Vehicle Damage

Exterior	
VDS	12FD2
CDC	12FDEW2
Maximum Exterior Vehicle Crush (inches)	nil
Interior	
OCDI	RF0000000
Maximum Occupant Cmpt. Deformation (inches)	3.2 (windshield)

Post-Impact Behavior

(during 1.0 sec after impact)

Max. Yaw Angle (deg)	3
Max. Pitch Angle (deg)	-2
Max. Roll Angle (deg)	2

Summary of Results for *NCHRP Report 350* Test 3-61 on the Shur-Tite® Multiple-mailbox Mount.

Refer to: HSA-10/SS-119

Mr. Stuart Cole
Northwest Pipe Company
Traffic Systems
P.O. Box 2002
Houston, Texas 77252-2002

Dear Mr. Cole:

On February 27 an acceptance letter was sent to you, numbered SS-115, which found the following systems acceptable for use on the National Highway System:

1) Northwest Pipe POZ LOC S-Q Post ™ Sign Support System
2) PozLoc Sign Support System with extended anchor for use in weak soils.
3) PozLoc Breakaway Mailbox Support System for snow regions.

Please note that we have found it necessary to revise the designation of that letter to "SS-119."

I apologize for any inconvenience, and I appreciate your understanding.

Sincerely yours,

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

FHWA:HSA-10:NArtimovich:tb:x61331:8/12/03
File: SS119NWpipeFIN.wpd
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N. Artimovich, HSA-10)

Refer to HSA-10/SS-115

Mr. Stuart Cole
Northwest Pipe Company
Traffic Systems
PO Box 2002
Houston, TX 77252-2002

Dear Mr. Cole:

Thank you for your letters of December 27, 2002, January 15, 2003, and February 10, 2003, requesting Federal Highway Administration (FHWA) acceptance of variations to your company's breakaway support systems for use on the National Highway System (NHS). Accompanying your letters were: 1) a report from the Texas Transportation Institute (TTI) on the square slipbase system, and videos of the crash tests; 2) a 1996 TTI report on weak soil testing of the PozLoc system; and 3) drawings of the PozLoc Breakaway Mailbox Support. You requested that we find the following acceptable for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

1) Northwest Pipe POZ LOC S-Q Post ™ Sign Support System
2) PozLoc Sign Support System with extended anchor for use in weak soils.
3) PozLoc Breakaway Mailbox Support System for snow regions.

Introduction
Testing of the Square Slipbase Sign Support System and prior testing of the PozLoc systems was in compliance with the guidelines contained in the NCHRP Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. Requirements for breakaway supports are those in the American Association of State Highway and Transportation Officials' (AASHTO) Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

1) The Northwest Pipe POZ LOC S-Q Post ™ Slipbase Sign Support System consists of a 2.5 x 2.5 inch x 10 ga and 12 ga perforated square steel tube signpost mounted in a triangular slip base system. This system uses a 0.02 inch thick triangular keeper plate separated from the base plate by circular cardboard washers. A 3 ¾ inch long horizontal 0.5 inch diameter pin through the holes in the signpost prevent the end of the post from dropping below the slip joint.

In test NWP-P1, the lower portion of the slip base was rigidly anchored to the steel anchor plate in the pendulum facility. In test NWP-P2, the lower portion of the slip base was mounted in a standard TxDOT concrete footing placed in NCHRP Report 350 standard soil at the pendulum Facility. Details of the triangular slip base system are detailed in the diagrams that are enclosed

for reference. A 48 x 48 inch x 5/8-inch thick plywood sign panel was mounted at a height of 7 feet in test P1, and at a height of 7 feet, 2 inches in test P2. The slip base bolts were torqued to 40 foot-pounds in test P1 and to 60 foot-pounds in test P2

Testing

Pendulum testing was conducted on the slip base system. The mass of the test bogie was 820 kg in all tests. The test bogie was equipped with a crushable honeycomb nose simulating the front end of a Volkswagen Rabbit. (Although no longer produced, this configuration is considered a "worst case" design.) The complete devices as tested are shown in the Enclosures.

Test Number	NWP-P1	NWP-P2
Foundation Type	Rigid test foundation	Concrete footer in Std soil
Pendulum Test Mass		
Slip Base Bolt Torque	40 foot pounds	60 foot pounds
Impact Angle	Zero degrees	Zero degrees
Test Impact Velocity	21.1 mph (34 kmh)	21.2 mph (34.2 kmh)
Occupant Impact Speed	None	None
Bogie Delta V	1.32 fps (0.43 m/s)	1.47 fps (0.47 m/s)
Extrapolated high speed Delta V	1.84 fps (0.56 m/s)	1.73 fps (0.53 m/s)
Stub Height	4 inches	3-1/2 inches

Occup. Speed: Occupant Impact Speed: Speed at which a theoretical front seat occupant will contact the windshield. Delta V: Speed change of the test vehicle / bogie.

Findings

Velocity changes were all within acceptable limits. Because stub heights were at the 4-inch maximum we recommend that installation instructions stress the need to keep the height of the lower slip plate below the 4 inch maximum as required by the AASHTO Specification. The results of testing met the FHWA requirements and, therefore, the Northwest Pipe Square Slipbase Sign Support System described above and shown in the enclosed drawings for reference are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed by a State.

2) PozLoc Sign Support System with extended anchor for use in weak soils. The PozLoc sign support system was crash tested in weak soils in February of 1997. In both the low and high speed tests the post pulled the socket / anchor out of the ground (in strong soil, the post pulls out of the socket.) FHWA Acceptance Letter SS-65A, dated 6-20-97, covered the PozLoc system in all soil types. The PozLoc anchor used in the testing was 33 inches (383 mm) long. Your current request is to find this system acceptable if anchors 48 inches (1220 mm) or 60 inches (1525 mm) long are used. Because of the increased embedment length it can be assumed that there will be greater resistance to pullout. After reviewing the prior crash testing we have concluded that the greater resistance will not be a disadvantage. If the anchor does not pull out then the system's

performance will be more like that seen in the strong soil testing. In those tests, the subject of FHWA Acceptance Letter SS-1 dated 5-13-86, the vehicle velocity changes were also below the "desirable" limits. Therefore, we concur that 48-inch and 60-inch long PozLoc anchors are acceptable for use.

3) PozLoc Breakaway Mailbox Support System for snow regions. The Northwest Pipe Co. 90 Degree Poz-Loc Socket Assembly for use with mailboxes is similar to the POZ-LOC Socket System with a minor difference. The single box cantilevered support system currently being used is 1-1/4 inch Schedule 40 pipe fabricated with pipe fittings (drawings enclosed for reference) in a concrete base. You proposed that the post be a 2-3/8 inch OD 14 ga pipe using a swaged elbow. The post is to be mounted in a POZ-LOC Socket and wedge mounted in concrete. You also requested a different single and double box support, which is a simple vertical 2-3/8 inch OD 14 ga pipe, mounted on a POZ-LOC post and socket. Because the Poz-Loc anchor performance has been found acceptable for sign supports, and the thin 14 gage steel is specified for the pipe supporting the mailbox, these systems can be expected to perform in an acceptable manner.

Findings:
In addition to the square slipbase system discussed as item 1) above, the Poz-Loc supports covered as items 2) and 3), as shown in the enclosed drawings for reference, are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, or under the range that similar systems were tested, when proposed by a state.

Please note the following standard provisions that apply to FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, or conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number SS-115 shall not be reproduced except in full. As this letter and the supporting documentation that support it become public information, it will be available for inspection at our office by interested parties.
- Northwest Pipe Company's Poz-Loc S-Q Post ™ slipbase system is a patented product and is considered "proprietary." The use of proprietary devices specified on Federal-aid

projects, except exempt, non-NHS projects (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

Sincerely yours,

Michael S. Griffith
Acting Director, Office of Safety Design
Office of Safety

2 Enclosures

FHWA:HSA-10:Nartimovich:db:x61331:2/26/03
cc: Reader – HSA-1, HAS-10(Chron File, NArtimovich)
h:directoryfolder/nartimovich/ss15nwpipeFIN

U.S. Department
of Transportation
Federal Highway
Administration

January 23, 2007

400 Seventh St., S.W.
Washington, D.C. 20590

In Reply Refer To:
HSSD/SS-144

Mr. Bryan Reeves
ARC Technologies, LLC
966 Liledoun Road
Taylorsville, NC 28681

Dear Mr. Reeves:

Thank you for your mail correspondence of August 18, 2006, requesting the Federal Highway Administration (FHWA) acceptance of your company's simulated stone mailbox columns for use on the National Highway System (NHS). Accompanying your letter was a report on testing of this roadside hardware conducted by the Texas Transportation Institute, test videos and digital photographs. You requested that we find it acceptable for use on the NHS under the provisions of the National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Requirements
Mailbox supports should meet the guidelines contained in the NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features". The FHWA memorandum "ACTION: Identifying Acceptable Highway Safety Features" of July 25, 1997, provides further guidance on crash testing of breakaway supports.

Product description
The ARC simulated stone mailbox column for use on the NHS is fabricated as a hollow, one-piece rotational casting. The hardened shell or wall of the column has a thickness that ranges from 0.19 in. (4.8 mm) to 0.38 in. (9.7 mm) and is comprised of two layers or coats. The first coat or face mix, which has a thickness ranging from 0.09 in. (2.3 mm) to 0.19 in. (4.8 mm), consists of gypsum, sand, liquid and dry resin, hardener, accelerator, and pigment. The second coat or back-up mix is comprised of a two-component polyurethane and has a thickness ranging from 0.09 in. (2.3 mm) to 0.19 in. (4.8 mm). The exterior surface of the column is molded to resemble stone masonry construction.

The column measures 20 in. x 20 in. x 62 in. tall (508 mm x 508 mm x 1575 mm). The upper cap of the mailbox column measures 24 in. x 24 in. (610 mm x 610 mm). A U.S. Postmaster approved T2 mailbox measuring 21 in. long x 8 in. wide x 10.5 in. high (533 mm x 203 mm x 267 mm) is cast into the column at a height of 40 in. (1016 mm) to the bottom of the mailbox. A 6 in. (152 mm) diameter x 16.5 in. (419 mm) long plastic newspaper tube is also cast into the

mailbox column at a height of 30 in. (762 mm) to the bottom of the tube. The upper two thirds of the hollow simulated stone column is backfilled with two-part Instapak FlowRite™ foam that has a molded density of 1.0-1.4 lb/ft^3 (16.0-22.4 kg/m^3).

Test article installation
In tests, the ARC simulated stone mailbox column was installed on precast concrete foundation pad measuring 24 in. x 24 in. x 2.5 in. thick (610 mm x 610 mm x 64 mm) and weighing 64 lb (29 kg) placed level to and flush with the surrounding ground. The pad was secured in place by driving two 0.38 in. (9.7 mm) diameter x 18 in. (457 mm) long anchoring spikes into the ground through precast holes. The bottom shell of the mailbox column was secured to the top surface of the concrete foundation pad through liberal application of Liquid Nail™ adhesive. The pattern use for the adhesive included a line around the perimeter of the mailbox column and several lines extending radially outward from the center to the outer edges of the column.

Testing
Full-scale automobile testing which included the NCHRP report 350 Test 3-60 (low-speed test) and the NCHRP Report 350 Test 3-61 (high speed test) was conducted on your company's mailbox column. The complete device as tested is shown in the enclosed drawing. The NCHRP Report 350 test 3-60 involved an 820 kg passenger car (820C) impacting the mailbox column head-on with the left quarter point of the vehicle aligned with the centerline of the mailbox column at a nominal impact speed and angle of 35 km/h and 0 degrees, respectively. The NCHRP Report 350 test 3-61 involved an 820 kg passenger car (820C) impacting the mailbox column head-on with the right quarter point of the vehicle aligned with the centerline of the mailbox column at a nominal impact speed and angle of 100 km/h and 0 degrees, respectively.

Findings
In the low-speed test, the simulated stone mailbox column yielded to the vehicle by breaking apart at the base. The largest fragment, which weighed 75 lb (34.0 kg), rode up the windshield (which shattered) and over the top of the vehicle. The fragment did not penetrate or show potential for penetrating the occupant compartment, nor to present hazard to others in the area. No occupant compartment deformation occurred. The vehicle remained upright during and after the impact. Occupant risk factors were within the preferred limits. The vehicle did not intrude into adjacent traffic lanes, as it traveled through the test site and came to rest 103 ft (31.4 m) behind the point of impact. The summary of test results is enclosed.

In the high-speed test, the simulated stone mailbox column yielded to the vehicle by breaking apart at the base. The largest piece weighed 53 lb (24.0 kg), rode up the windshield (which shattered) and over the top of the vehicle. The fragment did not penetrate or show potential for penetrating the occupant compartment, nor to present hazard to others in the area. Occupant compartment deformation was 3.5 in. (91 mm) in the roof area over the right front seat, which is less than the maximum acceptable roof crush criterion for breakaway support structures of 5 in. (127 mm) as established by the FHWA. The vehicle remained upright during and after the collision event. Occupant risk factors were within the preferred limits. The vehicle did not intrude into adjacent traffic lanes, as it traveled through the test site and came to rest 370 ft (113 m) behind the point of impact and 11.8 ft (3.6 m) to the left of centerline. The summary of test results is enclosed.

The results of testing met the FHWA requirements and, therefore, the ARC simulated stone mailbox column described above and shown in the enclosed drawings for reference is acceptable for use as the NCHRP Report 350 Test Level 3 device on the NHS, when selected by the contracting authority, subject to the provisions of Title 23, Code of Federal Regulations, Section 635.411 as they pertain to proprietary products.

Standard provisions
Please note the following standard provisions that apply to the FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the MUTCD.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number SS-144 shall not be reproduced except in full. As this letter and the documentation which support it become public information, it will be available for inspection at our office by interested parties.
- The "ARC Simulated Stone Mailbox Column" is a patented product and is considered "proprietary". The use of proprietary devices specified on Federal-aid projects, except exempt, non-NHS projects: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

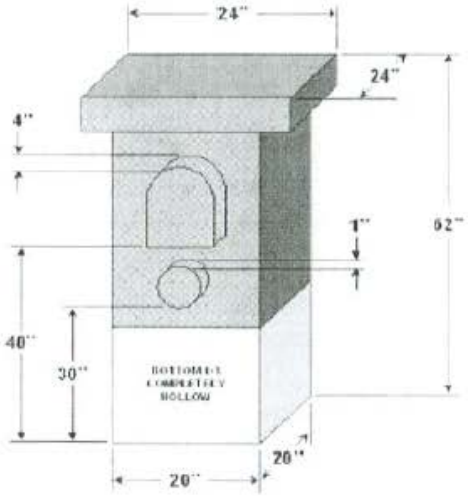
Sincerely yours,

/original signed by/

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

Enclosure

FHWA:HSSD:NArtimovich:tb:x61331:1/18/07
File: s://directory folder/nartimovich/SS144-ARCSimStoneMailboxFIN.doc
cc: HSSD (Reader, HSA; Chron File, HSSD; NArtimovich, HSSD;
MMcDonough, HSSD)



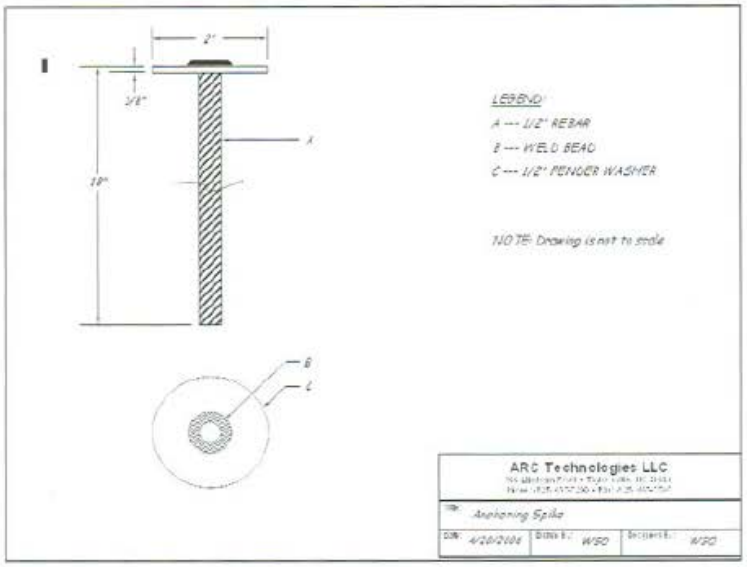
Wall Thickness
1st Coat (Portion Wall) - 3/32" - 3/16"
2nd Coat (Pourerviane) - 3/32 - 3/16"
Overall - 3/16 - 3/8"

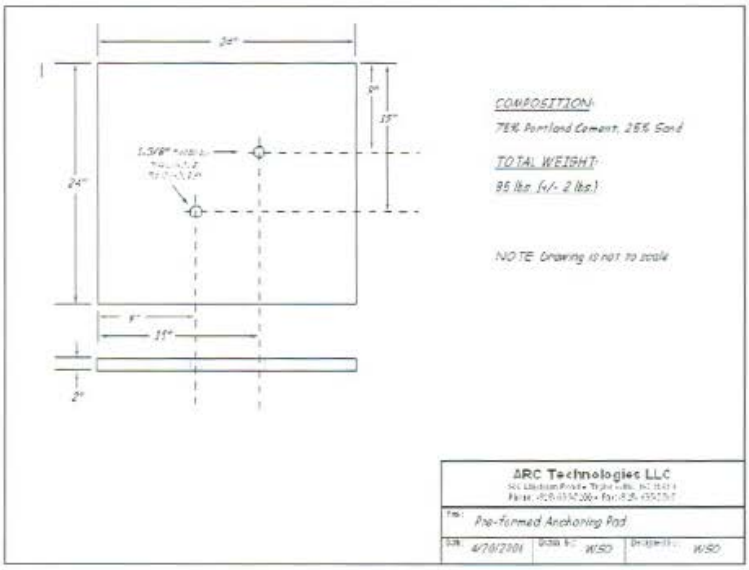
Foam Backfill Upper 2/3 of Column
(Indicated by crossed area in drawing)

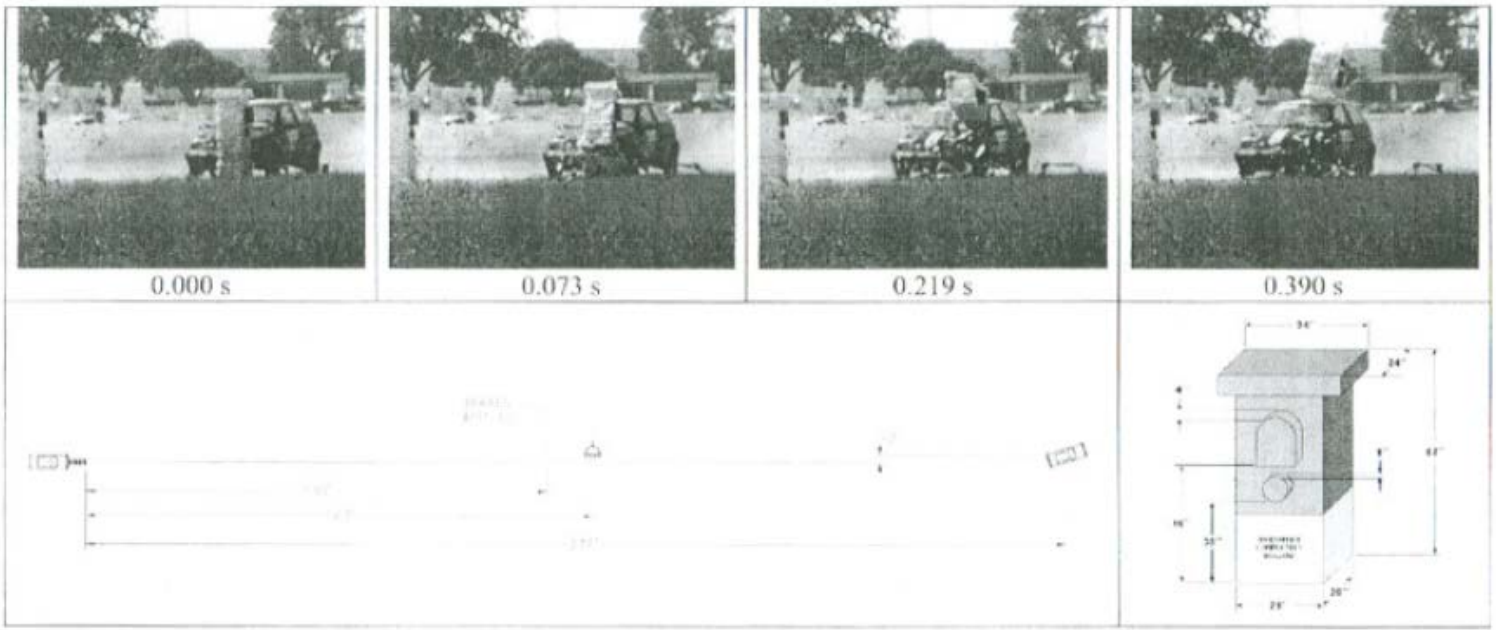
Total Column Weight 95 - 100 lbs

ARC Technologies LLC
556 Liledoun Road • Taylorsville, NC 28681
Phone: (828) 635-7200 • Fax: (828) 635-7535

Title: Finished Stone Mailbox Column		
Date: 7/ /08	Drawn By: NSO	Designed By: NSO

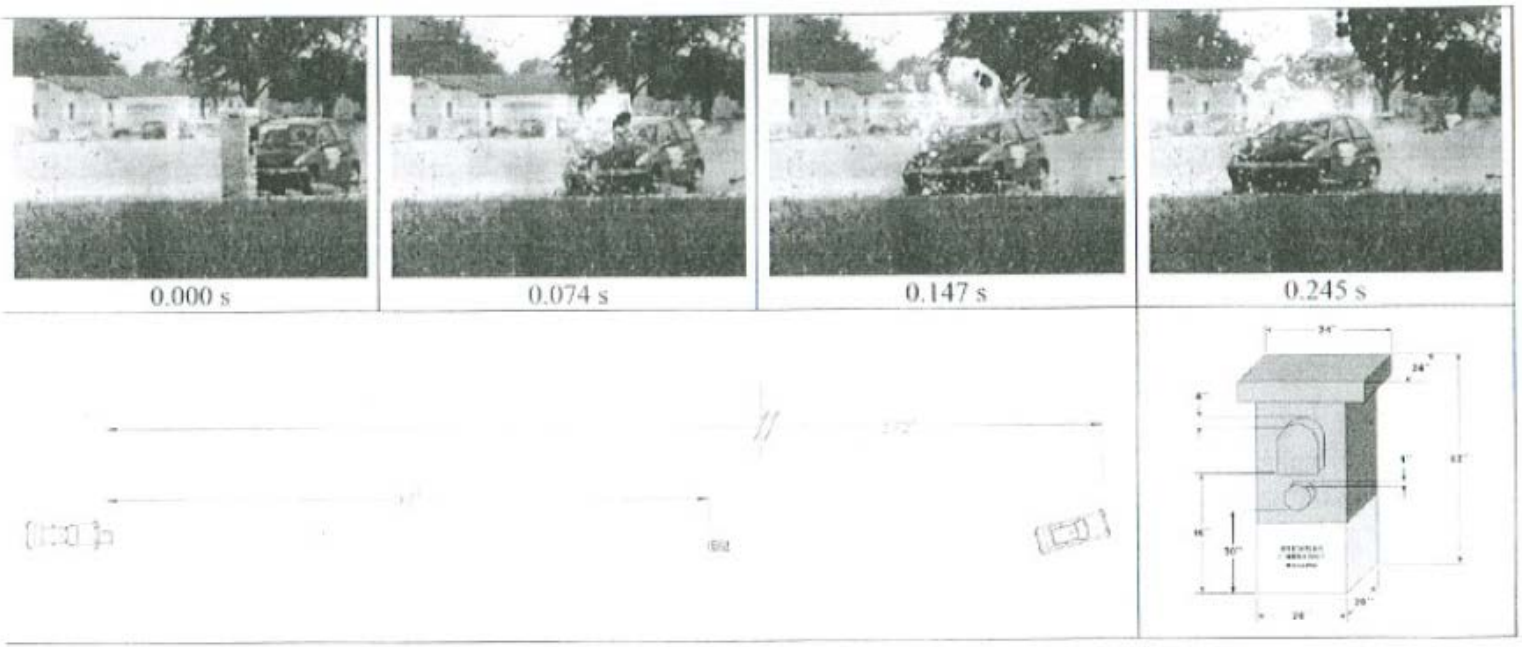

2"
1/8"
18"
A
B
C
LEGEND:
A --- 1/2" REBAR
B --- WELD BEAD
C --- 1/2" FENDER WASHER
NOTE: Drawing is not to scale
ARC Technologies LLC
Title: Anchoring Spike
Date: 4/20/2004
Drawn By: WSD
Designed By: WSD


24"
24"
8"
15"
1.5/8" HOLE
8"
15"
2"
COMPOSITION:
75% Portland Cement, 25% Sand
TOTAL WEIGHT:
95 lbs. (+/- 2 lbs.)
NOTE: Drawing is not to scale
ARC Technologies LLC
Title: Pre-formed Anchoring Pad
Date: 4/20/2004
Drawn By: WSD
Designed By: WSD



General Information		**Impact Conditions**		**Test Article Debris Scatter (m)**	
Test Agency	Texas Transportation Institute	Speed (km/h)	34.5	Longitudinal	7.6
Test No.	400001-ARC1	Angle (deg)	0	Lateral	3.2
Date	06-08-2006	**Exit Conditions**			
Test Article		Speed (km/h)	32.1	**Vehicle Damage**	
Type	Mailbox	Angle (deg)	0	Exterior	
Name	Simulated Stone Mailbox Column	**Occupant Risk Values**		VDS	12FL1
Installation Height (m)	1.57	Impact Velocity (m/s)		CDC	12FLAN1
Material or Key Elements	Composite Shell; Lower Portion Hollow; Foam Backfill in Upper Two Thirds	Longitudinal	1.2	Max. Exterior	
		Lateral	0.1	Vehicle Crush (mm)	0
Soil Type and Condition	Standard Soil, Dry	THIV (km/h)	4.5	Interior	
Test Vehicle		Ridedown Accelerations (g's)		OCDI	FS0000000
Type	Production	Longitudinal	-0.3	Max. Occupant Compartment	
Designation	820C	Lateral	0.3	Deformation (mm)	0
Model	1996 Geo Metro	PHD (g's)	0.4		
Mass (kg)		ASI	0.06	**Post-Impact Behavior**	
Curb	805	Max. 0.050-s Average (g's)		(during 1.0 sec after impact)	
Test Inertial	820	Longitudinal	0.7	Max. Yaw Angle (deg)	-1
Dummy	77	Lateral	0.2	Max. Pitch Angle (deg)	1
Gross Static	897	Vertical	0.4	Max. Roll Angle (deg)	-1

Summary of results for *NCHRP Report 350* test 3-60 on the simulated stone mailbox column.



General Information		**Impact Conditions**		**Test Article Debris Scatter (m)**	
Test Agency	Texas Transportation Institute	Speed (km/h)	99.6	Longitudinal	28.3
Test No.	400001-ARC2	Angle (deg)	0	Lateral	7.62
Date	06-08-2006	**Exit Conditions**			
Test Article		Speed (km/h)	96.0	**Vehicle Damage**	
Type	Mailbox	Angle (deg)	0	Exterior	
Name	Simulated Stone Mailbox Column	**Occupant Risk Values**		VDS	12FR2
Installation Length (m)	1.57	Impact Velocity (m/s)		CDC	12FRAN2
Material or Key Elements	Composite Shell; Lower Portion Hollow; Foam Backfill in Upper Two Thirds	Longitudinal	1.4	Max. Exterior Vehicle Crush (mm)	60
Soil Type and Condition	Standard Soil, Dry	Lateral	1.2	Interior	
Test Vehicle		THIV (km/h)	6.7	OCDI	RF0200000
Type	Production	Ridedown Accelerations (g's)		Max. Occupant Compartment Deformation (mm)	91
Designation	820C	Longitudinal	-0.4		
Model	1995 Geo Metro	Lateral	0.6	**Post-Impact Behavior**	
Mass (kg)		PHD (g's)	0.6	(during 1.0 sec after impact)	
Curb	796	ASI	0.13	Max. Yaw Angle (deg)	6
Test Inertial	820	Max. 0.050-s Average (g's)		Max. Pitch Angle (deg)	2
Dummy	77	Longitudinal	-1.5	Max. Roll Angle (deg)	-2
Gross Static	897	Lateral	0.6		
		Vertical	-1.1		

. Summary of results for *NCHRP Report 350* test 3-61 on the simulated stone mailbox column.

Sec. 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.

August 17, 2004

Refer to: HSA-10/SS-125

Mr. Tom Friend Friend
Innovations
P.O. Box 636 Hibbing, Minnesota 55746

Dear Mr. Friend:

Thank you for your email correspondence of July 7, 2004, requesting Federal Highway Administration (FHWA) acceptance of modifications to your company's breakaway mailbox supports for use on National Highway System (NHS). Accompanying your letter were drawings of the new Model #037 mailbox support. You requested that we find it acceptable for use on the National Highway System under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

Sign supports and mailbox installations should meet the guidelines contained in the NCHRP Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features". Requirements for breakaway supports are those in the American Association of State Highway and Transportation Officials' (AASHTO), "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals".

The original Friend Town and Country Mailbox Support was found acceptable by the FHWA acceptance letter B-24 dated June 16, 1993. The acceptance was based on a comparison to the mailbox support designed and crash-tested by the Minnesota Department of Transportation. You also had an informal, live-driver test conducted at an impact speed of 62 mph.

The modifications to the Town and Country Mailbox are summarized below:

1) A single muffler clamp replaces the yoke clamps, used for height adjustments.
2) The extension U-post has been deleted.
3) Revised U-post driver, which is discarded upon installation.

We agree with your assertion that these modifications will have no significant affect on the breakaway performance of your company's mailbox support. Therefore, the modifications to your mailbox support described above and shown in the enclosed drawings for reference are acceptable for use as a Test Level 3 device on the NHS under the range of conditions as the similar mailbox support was tested, when proposed by a State.

Please note the following standard provisions that apply to FHWA letters of acceptance:

Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.

Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.

Should the FHWA discover that the qualification testing was flawed, that in-service performance

reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.

You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.

You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.

To prevent misunderstanding by others, this letter of acceptance, designated as number SS-125 shall not be reproduced except in full. As this letter and the supporting documentation which support it become public information, it will be available for inspection at our office by interested parties.

The Friend Town and Country Mailbox Support is a patented device and is considered "proprietary." When proprietary devices are *specified by a highway agency* for use on Federal-aid projects they: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. These provisions do not apply to exempt non-NHS projects. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

Sincerely yours,

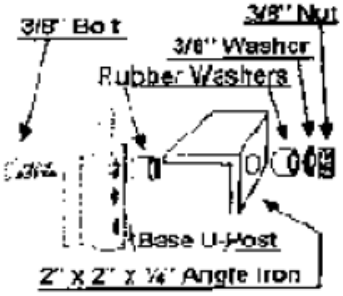
/Original Signed by/

John R. Baxter, P.E. Director, Office of Safety Design
Office of Safety
Enclosures

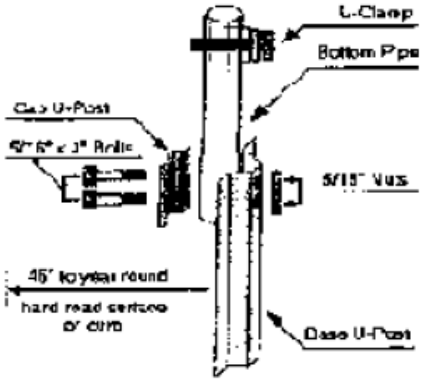
INSTALLATION INSTRUCTIONS

1. Attach 2 - Foot Barrier to 3" Base U-Post as shown below. Use 8 lbs. sledge hammer with half swings, make sure Base U-Posts going in plumb (straight up and down), leaving 4" of the Base U-Post out of the ground. Now remove U-Post Driver.

Note: Do not over tighten U-Post Driver. Finger tighten and then ¼ turn more with a wrench.

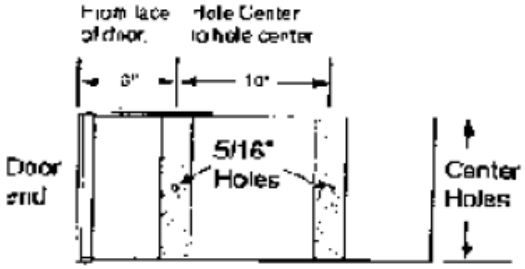


2. Attach 24" Bottom Pipe (elongated end) and the Cap U-Post to the Base U Post.



3. Center U Clamp assembly over slots in Bottom Pipe, finger tighten. Then insert Middle Pipe (notch up).

4. Cut 2 Wooden Blocks 1/8" narrower than the bottom inside of the mailbox, then insert Wooden Blocks as shown in the drawing. Insert 4 Drywall Screws thru mailbox lip into Wooden Blocks and tighten. Now mark hole centers as shown. Using 5/16" drill bit, drill thru Wooden Blocks and the bottom of the mailbox. Be certain to cautiously remove any sharp burs from inside of the mailbox.



5. With the mailbox on its side, insert 2 – ¼" x 4" Carriage Bolts thru the holes from inside of the mailbox. Next, holding the Carriage Bolt that is farthest back with your left hand and using your forearm to hold the Carriage Bolt closest to the door, with your right hand and hold the Top Pipe between the two holes, line up the two holes with the Carriage Bolts and push both Carriage Bolts thru the Top Pipe. Slide 1 - No. 10 Washer over each Carriage Bolt and tighten ¼" Nut until the Top Pipe is set in Wooden Blocks. Note: Wood blocks will show slight indent.

6. If you have no paper tubes, go to instruction 7. To install up to 2 paper tubes, use 2 Drywall Screws and 2 - #10 Washers per paper tube. Hold tube under mailbox and Wooden Blocks, yet tight to the Top Pipe (as shown). Note: Paper tubes ends should go beyond end of Top Pipe. Fasten securely to Wooden Blocks (use 6" Phillips screw driver) via existing holes in bottom of paper tube.

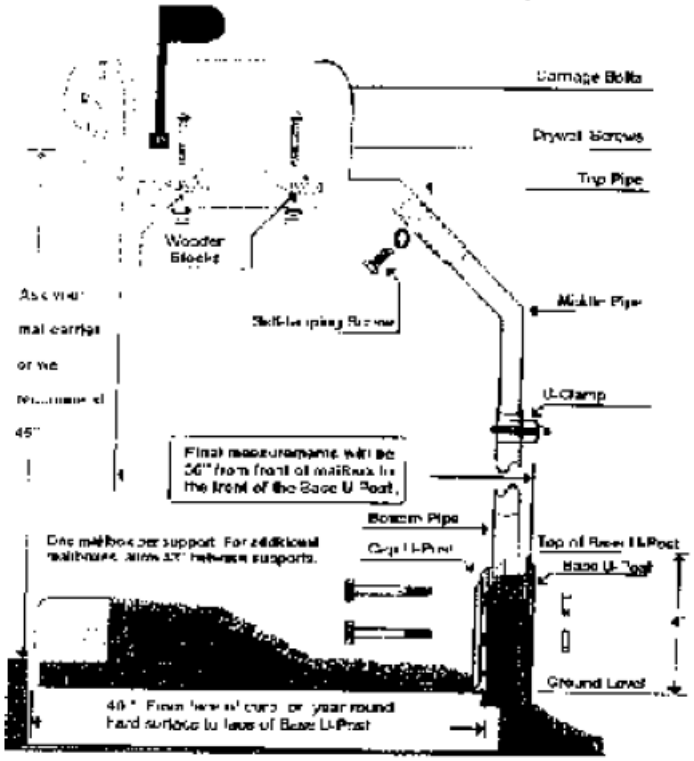
7. Slide Top Pipe over Middle Pipe (slotted pipe), and insert the ¼" x ¾" Self-tapping Screw (with #10 washer) into the hole on the underside of the Top Pipe. Make certain the screw is set into the slot of the Middle Pipe.

8. Adjust height, point straight towards the road. If everything looks good, tighten the U-Clamp Assembly Bolts and Flange Nuts securely. Tightening will cause the Bottom Pipe to compress around the Middle Pipe and lock it into position.

FRIEND INNOVATIONS

Installation Instructions

We are pleased to offer you our # 037 Mailbox Support!



Model 037 PARTS LIST:

1 Top Pipe – 1 ¾" O.D. x 36"
1 **Middle Pipe** – 1 ⅜" O.D. x 36"
1 **Bottom Pipe** – 1 ¾" O.D. x 24"
1 **Cap U-Post** 1.12 lbs./ft.
1 **Base U-Post** – 31" 2 lbs. Per ft.
1 – **Self-tapping Screw** – ¼" x ¾" w/ No. 10 Washer
2 – **Bolt w/Nut** 5/16" x 3"
1 – **Bolt w/Nut & Washer** 3/8" x 1½"
1 – **U-Clamp Assembly w/Saddle** and 2 – 3/8" **Flanged Nuts**
8 – **Drywall Screws**
5 – **Washers No. 10**
2 – **Carriage Bolt** ⅜" x 4" **w/Nut** and **Washer No. 10**
2 – **Wooden Blocks**

Used for installation only:

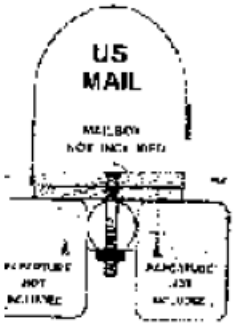
1 – **U-Post Driver** – 2" x 2" x ¼" Angle Iron, w/ 1 3/8" x1½" **Bolt, w/ Nut & Washer.** Also includes 2 **Rubber Washers**

For special Needs:

friend@rrslink.net

Phone/Fax/Message 218.263.4457

Friend Innovations
P.O. Box 536
Hibbing, MN 55746



WARNING:

1 Buried electrical Lines, gas, steam, T.V., telephone, etc. MAY BE HAZARDOUS OR FATAL TO YOUR HEALTH check with your local utilities before installing the Base U-Post (in Minnesota call 1.800.252.1166)

2. Metal edges maybe sharp, wear gloves and keep children away. Also wear eye protection, safety glasses, proper clothing, and keep others away in case metal fragments come flying about from hammering on the U-Post Driver.

Patented (over)

Sec. 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items, or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists, or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.

Refer to: HSA-10/SS-114

Mr. Darren Hesse
National Sales Manager
S-Square Tube Products
5495 East 69th Avenue
Commerce City, Colorado 80022

Dear Mr. Hesse:

Thank you for your July 12, 2002, letter to Mr. Nicholas Artimovich requesting Federal Highway Administration (FHWA) acceptance of your company's NEX Tube as a breakaway component of a crashworthy mailbox support for use on the National Highway System (NHS). Accompanying your letter were photographs of your proposed mailbox mounting systems. You requested that we find the NEX Tube Mailbox Support System acceptable for use on the National Highway System under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features." On October 12, 2002, you provided additional information on a redesigned support for accommodating multiple mailboxes.

Introduction
Pendulum and full-scale automobile testing of NEX Tube sign supports was completed in 1998, and was in compliance with the guidelines contained in the NCHRP Report 350, Recommended Procedures for the Safety Performance Evaluation of Highway Features. Requirements for breakaway supports are those in the American Association of State Highway and Transportation Officials' Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals. Our Acceptance Letter, SS-81, found the NEX Tube sign supports acceptable for use on the NHS.

The NEX Tube mailboxes use the same deformed cross-section 14 gage steel pipe, formed into what might be called a "question mark" shape. The base of the support is inserted into a ground socket and secured with a wedge. Drawings of the supports are enclosed for reference.

Findings
The testing of the NEX Tube sign supports showed that the socket and wedge arrangement was a successful breakaway design, with vehicle velocity changes well below the desirable limit of 3 m/sec for single supports and approximately 3 m/s for a

dual post support. You asked that we compare your socket design to the V-Loc system, which has already been tested as a mailbox support. We concur with your assertion that the same technology will be effective as a single/double mailbox support. Therefore, the NEX Tube sign support will be acceptable for use as a single/double mailbox support using the socket and wedge design as shown in the enclosed drawings.

You also asked that we accept the NEX tube for use with multiple mailboxes using the "inverted coat hanger" arrangement. When the V-Loc system was tested with a multiple mailbox support (using 14 gage steel pipe in an "inverted coat hanger" arrangement) the occupant impact speeds were almost at the limit of acceptability. Because your design did not replicate the basic "closed loop" shape of the V-loc system, we were not as certain that five-box support using the NEX tube would meet the occupant impact velocity requirements. You have since redesigned your multiple mailbox support to replicate the "inverted coat hanger" arrangement, which we expect will perform in an acceptable manner.

The single/double mailbox support and the "inverted coat hanger" multiple mailbox support described above and shown in the enclosed drawings for reference are acceptable for use as Test Level 3 devices on the NHS under the range of conditions tested, when proposed by a State. The single box supports are considered crashworthy for conventional rural mailboxes weighing up to 5 pounds. The multiple box supports are considered crashworthy when boxes weighing up to 3.5 pounds each, are used.

Please note the following standard provisions that apply to FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices and does not cover their structural features, nor conformity with the Manual on Uniform Traffic Control Devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of FHWA and NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number SS-114 shall not be reproduced except in full. As this letter and the supporting documentation which support it become public information, it will be available for inspection at our office by interested parties.
- The Nex Tube is a patented product and is considered "proprietary." The use of proprietary devices specified on Federal-aid projects, except exempt, non-NHS projects: (a) must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for

synchronization with existing highway facilities or that no equally suitable alternative exists or; (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411, a copy of which is enclosed.

Sincerely yours,

Carol H. Jacoby, P.E.
Director, Office of Safety Design

Enclosure

Sec. 635.411 Material or product selection.

(a) Federal funds shall not participate, directly or indirectly, in payment for any premium or royalty on any patented or proprietary material, specification, or process specifically set forth in the plans and specifications for a project, unless:

(1) Such patented or proprietary item is purchased or obtained through competitive bidding with equally suitable unpatented items; or

(2) The State highway agency certifies either that such patented or proprietary item is essential for synchronization with existing highway facilities, or that no equally suitable alternate exists; or

(3) Such patented or proprietary item is used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes.

(b) When there is available for purchase more than one nonpatented, nonproprietary material, semifinished or finished article or product that will fulfill the requirements for an item of work of a project and these available materials or products are judged to be of satisfactory quality and equally acceptable on the basis of engineering analysis and the anticipated prices for the related item(s) of work are estimated to be approximately the same, the PS&E for the project shall either contain or include by reference the specifications for each such material or product that is considered acceptable for incorporation in the work. If the State highway agency wishes to substitute some other acceptable material or product for the material or product designated by the successful bidder or bid as the lowest alternate, and such substitution results in an increase in costs, there will not be Federal-aid participation in any increase in costs.

(c) A State highway agency may require a specific material or product when there are other acceptable materials and products, when such specific choice is approved by the Division Administrator as being in the public interest. When the Division Administrator's approval is not obtained, the item will be nonparticipating unless bidding procedures are used that establish the unit price of each acceptable alternative. In this case Federal-aid participation will be based on the lowest price so established.

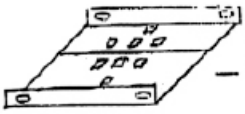
(d) Appendix A sets forth the FHWA requirements regarding (1) the specification of alternative types of culvert pipes, and (2) the number and types of such alternatives which must be set forth in the specifications for various types of drainage installations.

(e) Reference in specifications and on plans to single trade name materials will not be approved on Federal-aid contracts.

ENCLOSURE 2

— 5/16" Hex nut

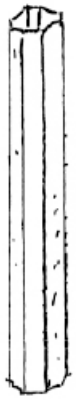
— 5/16" Flat washer



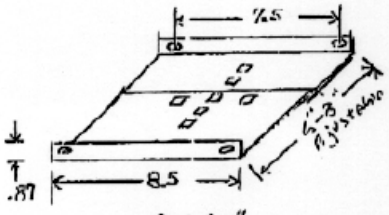
— UA Universal Mailbox brkt. Det. "B"

— "U" Lock wedge Det. "A"

— 5/16" x 2½" Carriage bolt

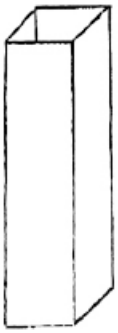


— Post
2" x 14 Ga Nex tube
115" Long

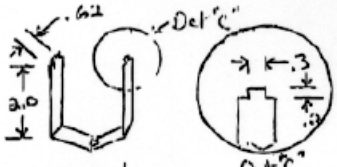


Det "B"
Mail Box Brkt
2 Reqd.
16 Ga Galv. Steel

— Nex
Wedge



— Anchor
2¼" SQ x 12 G Tube
30" Long

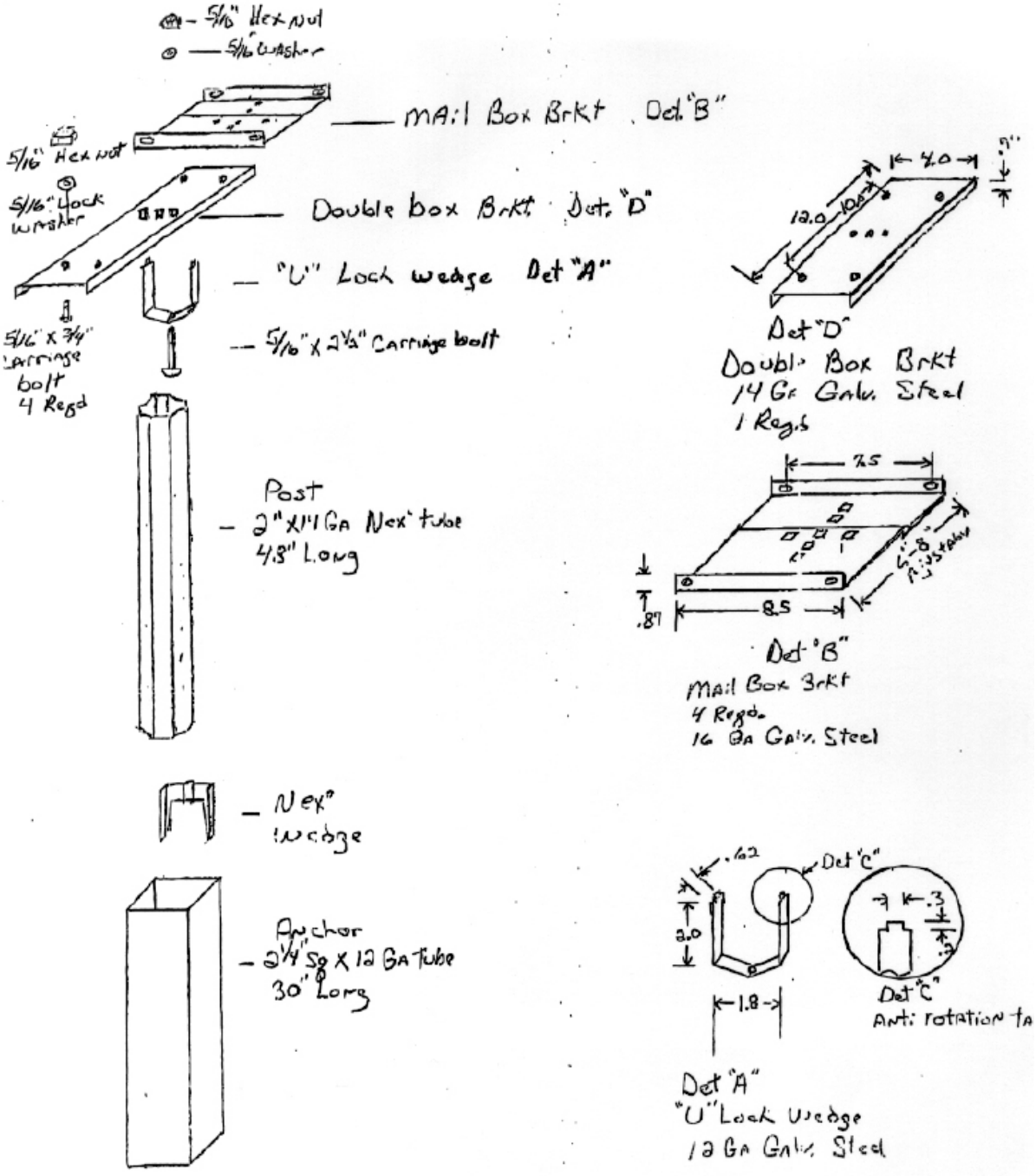


Det "A"
"U" Lock Wedge
12 GA Galv. Steel

P.P. " 5,846,502
P.A" 115,847
(other pat. pending)

Single Mail Box Support System

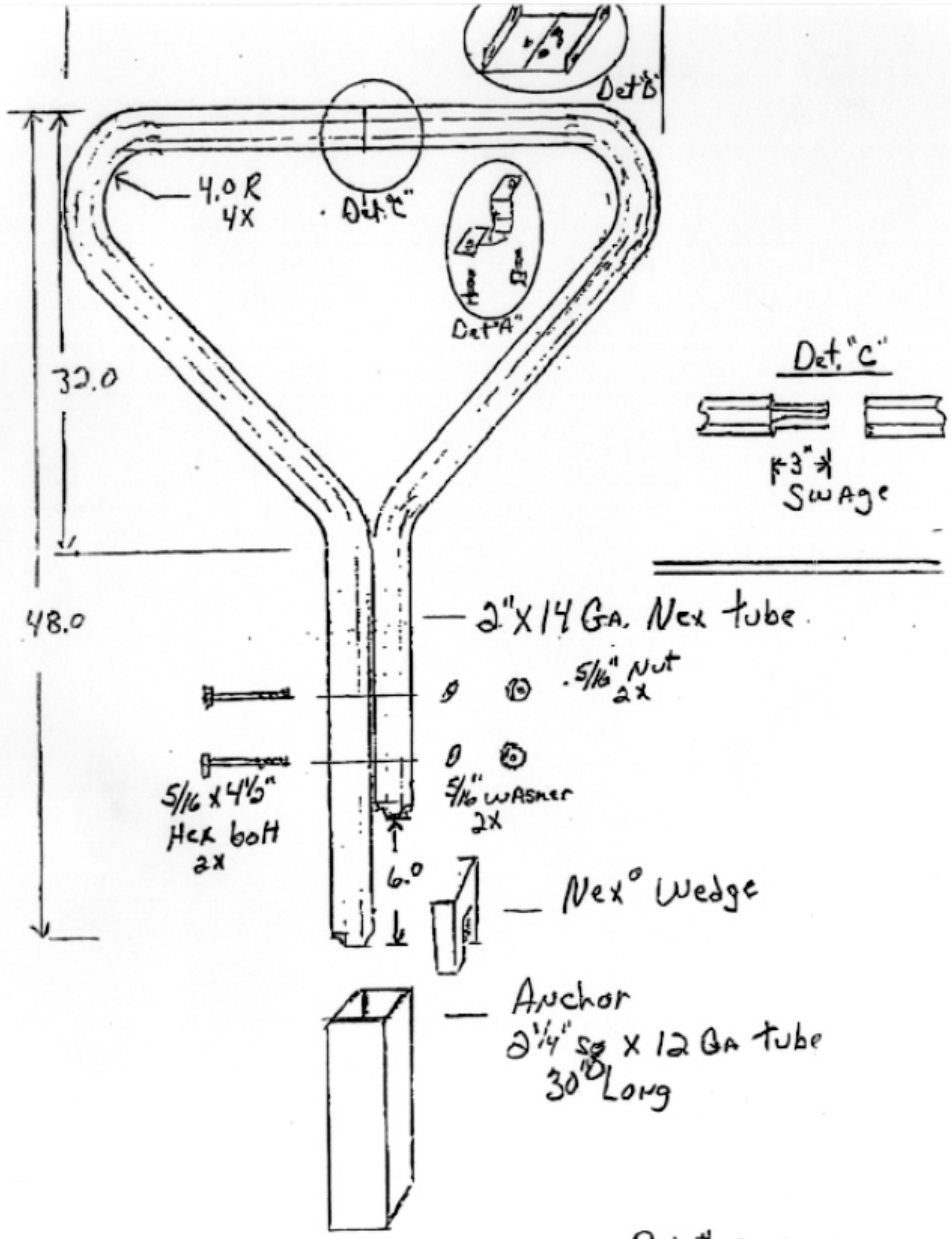
10-03-02



Pat. # 5,848,502
Pat # 415,847
other pat. Pending

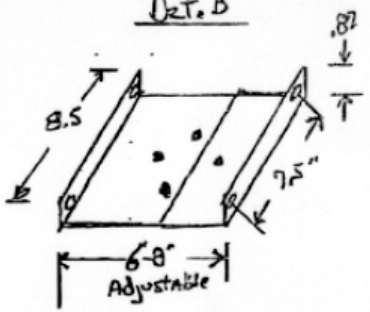
Double MAil Box Supp
System

10-03-02



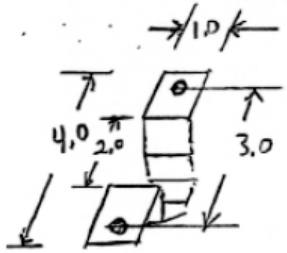
Det. "C"

Det. "B"



MAil Box BrKt.
16 GA Galv. Steel
5 Sets Reqd.

Det "A"



AtHachment BrKt.
14 GA Galv. Steel
5 Reqd.
10 - 5/16" X 3/4" CArriage bolt
10 - 5/16" Hex nuts
10 - 5/16" washers

PAT. # 5,848,502
PAT. # 415,847

Mult. MAil Box Support

APPENDIX D. SURVEY - MAILBOX HAZARD AND RISK ASSESSMENT

Mailbox Hazard and Risk Assessment

Scope of the survey

This survey is intended for State Departments of Transportation and aims at gaining information regarding state permitting requirements and enforcement policies as they relate to mailbox supports.

The survey will address data concerning:

- type of mailbox supports (single and multiple) currently in use;
- placement of mailbox supports with respect to the roadway;
- standards for permanent mailbox supports;
- crashworthiness of mailbox supports;
- crash data involving mailbox supports.

Contact Information

***1. Please enter your contact information.**

Name:

Title:

Agency:

Address:

City/Town:

State:

ZIP:

Email Address:

Mailbox Supports Policy

In this first part of the survey, you are asked to respond to a few questions regarding your State's mailbox support policy (if any).

***2. Does your State have standards for mailbox support installation?**

- Yes
- No
- Other

If "Other", please specify

Mailbox Hazard and Risk Assessment

***3. Do you follow the United States Postal Service (USPS) Regulations?**

- Yes
- No
- Other

If "Other", please specify

***4. Please provide your own State standards and policies (you may provide the URL address where your policies can be accessed and/or appropriate contacts for further follow up)**

***5. Is the owner of the mailbox responsible for installation?**

- Yes
- No
- Other

If "Other", please specify

Single Mailbox Supports

The scope of next part of the survey is to collect data regarding single mailbox supports (and foundations) available and acceptable for use in your State.

Available crashworthy single mailbox supports are grouped according to their material (wood, polyurethane and steel). A list of single mailbox supports is presented and the user is asked to choose ALL the single mailbox support types currently in use in his/her State.

Please note you can click on the link to visualize the listed mailbox support type.

Mailbox Hazard and Risk Assessment

Single Mailbox Supports - WOOD

6. Which type of single wood mailbox supports are allowed in your State? Please check all that apply.
Please note that, for each option, you can click on the hyperlink to view a picture of the particular mailbox support model.

- ☐ Step 2 Company, MailMaster Deluxe, 4" x 4"
- ☐ Other

If 'Other', please describe (you can include description, pictures, drawings, links, etc... any information that you think it might be relevant to understand the type of mailbox support))

Single Mailbox Supports - POLYURETHANE

7. Which type of single polyurethane mailbox supports are allowed in your State? Please check all that apply.
Please note that, for each option, you can click on the hyperlink to view a picture of the particular mailbox support model.

- ☐ Arc Technologies LLC, Simulated Stone Column, 20" x 20" x 62"
- ☐ Other

If 'Other', please describe (you can include description, pictures, drawings, links, etc... any information that you think it might be relevant to understand the type of mailbox support))

Single Mailbox Supports - STEEL

Mailbox Hazard and Risk Assessment

8. Which type of single steel mailbox supports are allowed in your State? Please check all that apply.

Please note that, for each option, you can click on the hyperlink to view a picture of the particular mailbox support model.

- ☐ Step 2 Company, MailMaster Deluxe, 2 lb/ft U-channel
- ☐ Non-proprietary, 2 lb/ft winged channel
- ☐ Non-proprietary, Two 2 lb/ft winged channel
- ☐ Minnesota DOT, Swing Away, 3 lb/ft U-channel
- ☐ Rubbermaid, Rubbermaid Deluxe, 3-in diameter, Sch-40 pipe
- ☐ Northwest Pipe Co, PozLoc cantilever support with swaged elbow, 2-3/8" O.D., 14 ga steel pipe
- ☐ Northwest Pipe Co, PozLoc vertical support, 2-3/8" O.D., 14 ga steel pipe
- ☐ Non-proprietary, 2-3/8" O.D., 13 ga steel pipe
- ☐ Hyphenate S-Square Tube Products, NEX Tube, 2-3/8" O.D., 14 ga steel NEX pipe
- ☐ Friend Innovation, Friend Town and Country, Top Pipe: 1-3/4" O.D. x 36"; Middle Pipe: 1-1/2" O.D. x 36"
- ☐ Shur-Tite, Shur-Tite Steel Mailbox Post, 2-3/8" O.D., 16 ga steel pipe
- ☐ Other

If 'Other', please describe (you can include description, pictures, drawings, links, etc... any information that you think it might be relevant to understand the type of mailbox support))

Single Mailbox Supports - OTHER

9. Which other types of single mailbox supports (recycled plastic, rubber, composite, ...) are allowed in your State? Please check all that apply.

Please note that, for each option, you can click on the hyperlink to view a picture of the particular mailbox support model.

- ☐ Shur-Tite, Shur-Tite Flex Mailbox Post, 2-3/8" O.D.
- ☐ Other

If 'Other', please describe (you can include description, pictures, drawings, links, etc... any information that you think it might be relevant to understand the type of mailbox support))

Mailbox Hazard and Risk Assessment

Single Mailbox Supports - FOUNDATIONS

10. Which types of foundation are allowed in your State for single mailbox supports? Please check all that apply.
Please note that, for each option, you can click on the hyperlink to view a picture of the particular mailbox support foundation.

- ☐ Frangible Base, (example)
- ☐ Wedge and Socket System, (example)
- ☐ Direct Embedded Support, (example)
- ☐ Frangible Steel Nested Support, (example)
- ☐ Slip Base Support, (example)
- ☐ Other

If 'Other', please describe (you can include description, pictures, drawings, links, etc... any information that you think it might be relevant to understand the type of mailbox support))

Placement Regulation for Single Mailbox Supports

The scope of next part of the survey is to collect data regarding placement regulation for single mailbox supports in your State.

***11. What is the minimum allowable vertical height from the road surface to the bottom of the box, for single mailbox installation?**

- ○ No specific vertical height required
- ○ Between 41 and 45 inches (USPS Regulation)
- ○ Other

If "Other", please specify

Mailbox Hazard and Risk Assessment

***12. Do your standards for single mailbox support selection or placement vary with design AADT of roadway?**

- Yes
- No
- Other

If "Other", please specify

***13. Please provide explanation on how the AADT affects the standards for single mailbox support selection or placement (you may provide the URL address and/or appropriate contacts for further follow up)**

***14. Do your standards for single mailbox support selection or placement vary with design speed of roadway?**

- Yes
- No
- Other

If "Other", please specify

***15. Please provide explanation on how the design speed affects the standards for single mailbox support selection or placement (you may provide the URL address and/or appropriate contacts for further follow up)**

Mailbox Hazard and Risk Assessment

***16. What is the minimum distance a single mailbox should be set from the front face of the curb?**

- ○ No specific distance required
- ○ Between 6 to 8 inches
- ○ Other

If "Other", please specify

***17. What is the minimum distance a single mailbox should be set from the front face of the road edge?**

- ○ No specific distance required
- ○ Between 6 to 8 inches
- ○ Other

If "Other", please specify

***18. Is your single mailbox support system NCHRP Report 350 crashworthy?**

- ○ Yes
- ○ No
- ○ Don't know, has not been tested

Multiple Mailbox Supports

The scope of next part of the survey is to collect data regarding multiple mailbox supports (and foundations) available and acceptable for use in your State.

Available crashworthy multiple mailbox supports are grouped according to their material (wood and steel). A list of multiple mailbox supports is presented and the user is asked to choose ALL the multiple mailbox support types currently in use in his/her State.

Please note you can click on the link to visualize the listed mailbox support type.

Multiple Mailbox Supports - WOOD

Mailbox Hazard and Risk Assessment

19. Which type of multiple wood mailbox supports are allowed in your State? Please check all that apply.
Please note that, for each option, you can click on the hyperlink to view a picture of the particular mailbox support model.

- ☐ Prairie Proto Products - Montana -, Swing-A-Way, 4" x 4" (72" long)
- ☐ Other

If 'Other', please describe (you can include description, pictures, drawings, links, etc... any information that you think it might be relevant to understand the type of mailbox support))

Multiple Mailbox Supports - STEEL

20. Which type of multiple mailbox supports are allowed in your State? Please check all that apply.
Please note that, for each option, you can click on the hyperlink to view a picture of the particular mailbox support model.

- ☐ Dual, Hyphenate S-Square Tube Products, S-Square Mailbox, 2-3/8" O.D. NEX steel post
- ☐ Dual, PozLoc vertical support, 2-3/8" O.D., 14 ga. steel pipe
- ☐ Dual, Non-Proprietary, 2 lb/ft winged channel
- ☐ Dual, Foresight Industries (V-Loc), 1.66" O.D., 16 ga steel pipe
- ☐ Dual, Foresight Industries (V-Loc), 2-7/8" O.D., 11 ga steel pipe
- ☐ Dual, Shur-Tite, Shur-Tite Mailbox Double Adapter, 2-3/8" O.D., 16 ga steel pipe
- ☐ Multiple (5), Hyphenate S-Square Tube products, S-Square Mailbox, NEX Post 2-3/8" O.D., 14 ga steel pipe
- ☐ Multiple (4), Non-proprietary, Foresight Tubular Support Multiple Mailbox Post, 2-3/8" O.D.
- ☐ Multiple (4), Shur-Tite, Shur-Tite Multiple Mailbox Post, 2-3/8" O.D., 16 ga steel pipe
- ☐ Other

If 'Other', please describe (you can include description, pictures, drawings, links, etc... any information that you think it might be relevant to understand the type of mailbox support))

Multiple Mailbox Supports - FOUNDATIONS

Mailbox Hazard and Risk Assessment

21. Which types of foundation are allowed in your State for multiple mailbox supports? Please check all that apply.
Please note that, for each option, you can click on the hyperlink to view a picture of the particular mailbox support foundation.

- ☐ Frangible Base, (example)
- ☐ Wedge and Socket System, (example)
- ☐ Direct Embedded Support, (example)
- ☐ Frangible Steel Nested Support, (example)
- ☐ Slip Base Support, (example)
- ☐ Other

If 'Other', please describe (you can include description, pictures, drawings, links, etc... any information that you think it might be relevant to understand the type of mailbox support))

Placement Regulation for Multiple Mailbox Supports

The scope of next part of the survey is to collect data regarding placement regulation for multiple mailbox supports in your State.

***22. What is the minimum allowable vertical height from the road surface to the bottom of the box, for multiple mailbox installation?**

- ○ No specific vertical height required
- ○ Between 41 and 45 inches (USPS Regulation)
- ○ Other

If "Other", please specify

Mailbox Hazard and Risk Assessment

***23. Do your standards for multiple mailbox support selection or placement vary with design AADT of roadway?**

- Yes
- No
- Other

If "Other", please specify

***24. Please provide explanation on how the AADT affects the standards for multiple mailbox support selection or placement (you may provide the URL address and/or appropriate contacts for further follow up)**

***25. Do your standards for multiple mailbox support selection or placement vary with design speed of roadway?**

- Yes
- No
- Other

If "Other", please specify

***26. Please provide explanation on how the design speed affects the standards for multiple mailbox support selection or placement (you may provide the URL address and/or appropriate contacts for further follow up)**

Mailbox Hazard and Risk Assessment

***27. What is the minimum distance a multiple mailbox should be set from the front face of the curb?**

- No specific distance required
- Between 6 to 8 inches
- Other

If "Other", please specify

***28. What is the minimum distance a multiple mailbox should be set from the front face of the road edge?**

- No specific distance required
- Between 6 to 8 inches
- Other

If "Other", please specify

***29. Is your multiple mailbox support system NCHRP Report 350 crashworthy?**

- Yes
- No
- Don't know, has not been tested

Crash Data

The scope of this part of the survey is to collect crash data information related to vehicle impacts against mailbox supports.

Mailbox Hazard and Risk Assessment

***30. In your State crash database, is "mailbox" coded as an object struck?**

- Yes
- No
- Other

If "Other", please specify

***31. Do you have electronic crash data that can be accessed for the scope of this project?**

- Yes
- No
- Other

If 'Other', please specify

***32. Please provide contact information or link to crash data source.**

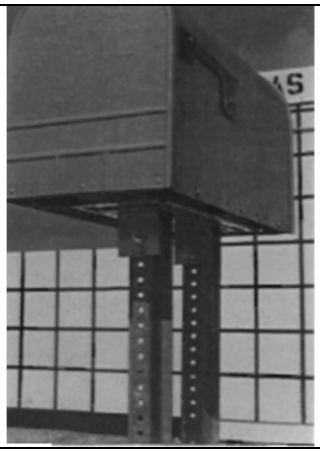
Table D1. Single Mailbox Support Models Included in the Survey.


WOOD - MailMaster Deluxe, 4" x 4"

POLYURETHANE - Arc Technologies LLC, Simulated Stone Column, 20" x 20" x 62"

STEEL - Step 2 Company, MailMaster Deluxe, 2 lb/ft U-channel

Table D1. Single Mailbox Support Models Included in the Survey (Continued).

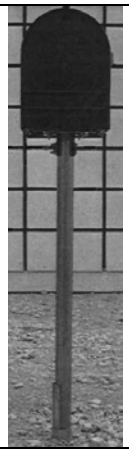
 
STEEL - Non-proprietary, 2 lb/ft winged channel
 
STEEL - Non-proprietary, Two 2 lb/ft winged channel

STEEL - Minnesota DOT, Swing Away, 3 lb/ft U-channel

Table D1. Single Mailbox Support Models Included in the Survey (Continued).


STEEL - Rubbermaid, Rubbermaid Deluxe, 3-in diameter, Sch-40 pipe
N/A
STEEL - Northwest Pipe Co., PozLoc cantilever support with swaged elbow, 2-3/8" O.D., 14 ga steel pipe
N/A
STEEL - Northwest Pipe Co., PozLoc vertical support, 2-3/8" O.D., 14 ga steel pipe

Table D1. Single Mailbox Support Models Included in the Survey (Continued).


STEEL - Non-proprietary, 2-3/8" O.D., 13 ga steel pipe

STEEL - Hyphenate S-Square Tube Products, NEX Tube, 2-3/8" O.D., 14 ga steel NEX pipe

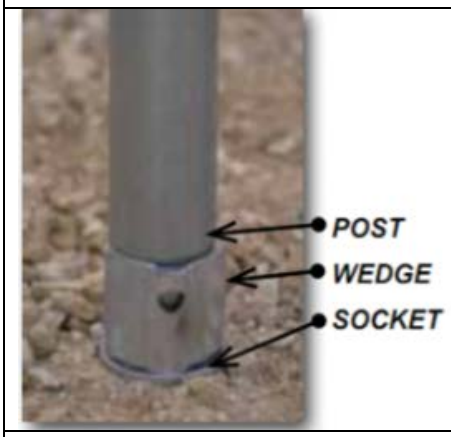
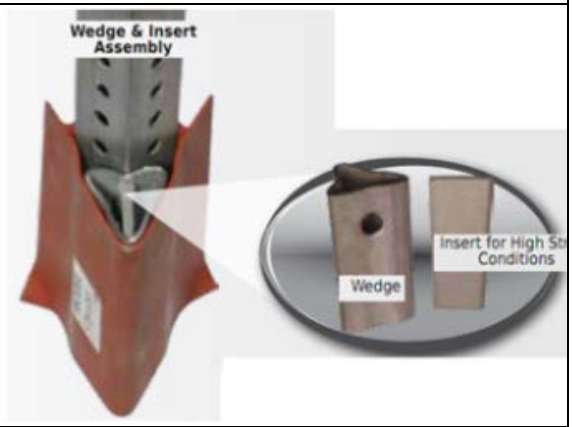
STEEL - Friend innovation, Friend Town and Country, Top Pipe: 1-3/4" O.D. x 36"; Middle Pipe: 1-1/2" O.D. x 36"

Table D1. Single Mailbox Support Models Included in the Survey (Continued).


STEEL - Shur-Tite, Shur-Tite Steel Mailbox Post, 2-3/8" O.D., 16 ga steel pipe

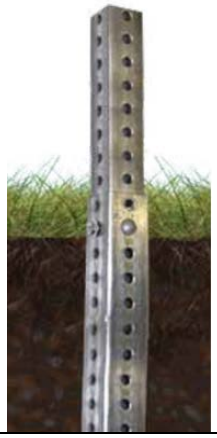
OTHER - Shur-Tite, Shur-Tite Flex Mailbox Post, 2-3/8" O.D.

Table D2. Mailbox Support Foundation Types Included in the Survey.


Frangible Base (example)
 
Wedge and Socket System (example)

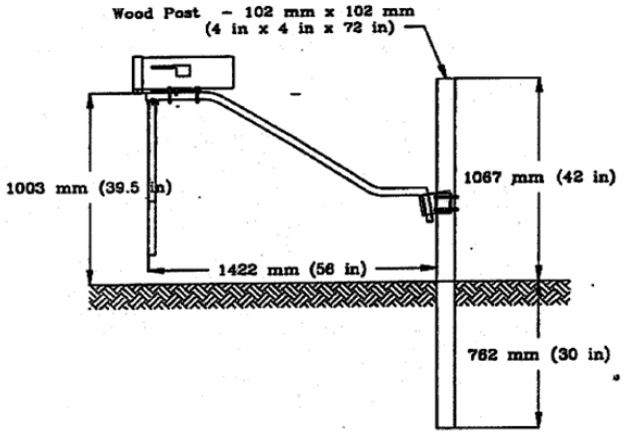
Direct Embedded Support (example)

Table D2. Mailbox Support Foundation Types Included in the Survey (Continued).


Frangible Steel Nested Support (example)

Slip Base Support (example)

Table D3. Multiple Mailbox Support Models Included in the Survey.


WOOD - Prairie Proto Products -Montana, Swing-A-Way, 4" x 4" (72" long)

STEEL - Dual, Hyphenate S-Square Tube Products, S-Square Mailbox, 2-3/8" O.D. NEX steel post
N/A
STEEL - Dual, PozLoc vertical support, 2-3/8" O.D., 14 ga steel pipe

Table D3. Multiple Mailbox Support Models Included in the Survey (Continued).

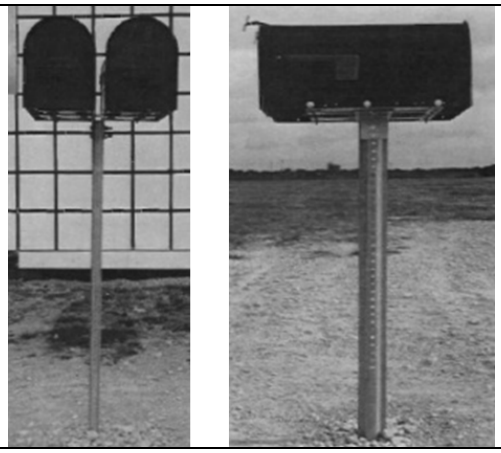
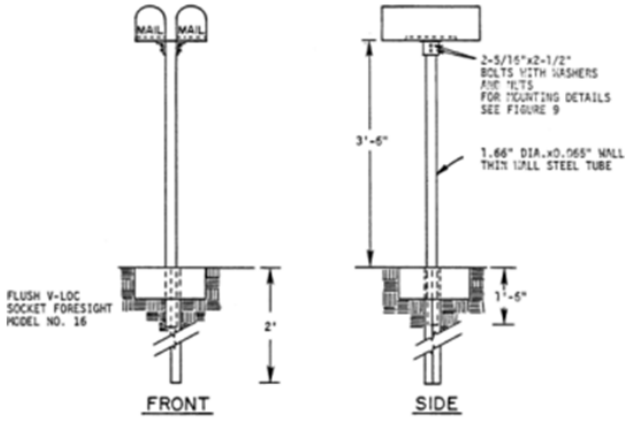

STEEL - Dual, Non-Proprietary, 2 lb/ft winged channel

STEEL - Dual, Foresight Industries (V-Loc), 1.66" O.D., 16 ga steel pipe
N/A
STEEL - Dual, Foresight Industries (V-Loc), 2-7/8" O.D., 11 ga steel pipe

Table D3. Multiple Mailbox Support Models Included in the Survey (Continued).

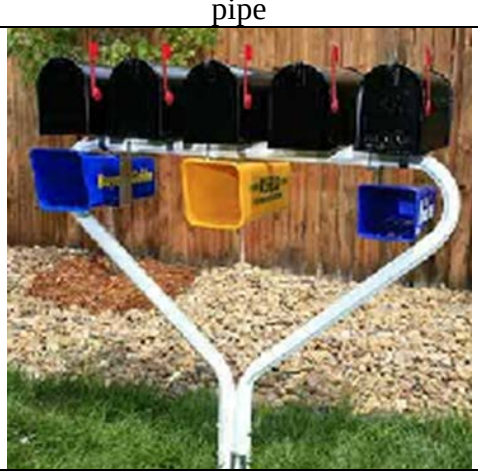
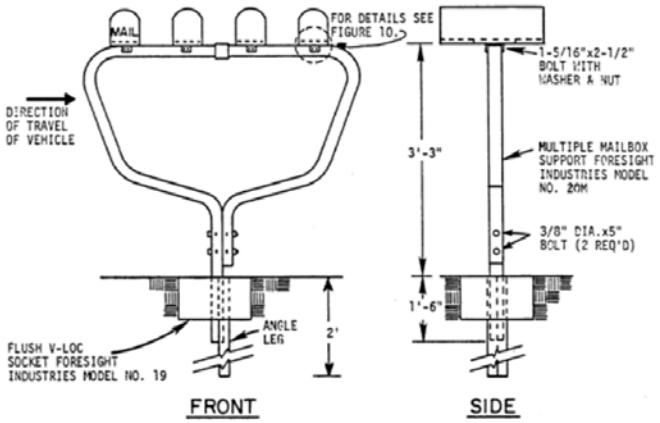

STEEL - Dual, Shur-Tite, Shur-Tite Mailbox Double Adapter, 2-3/8" O.D., 16 ga steel pipe

STEEL - Multiple (5), Hyphenate S-Square Tube Products, S-Square Mailbox, NEX Post 2-3/8" O.D., 14 ga steel pipe

STEEL - Multiple (4), Non-Proprietary, Foresight Tubular Support Multiple Mailbox Post, 2-3/8" O.D.

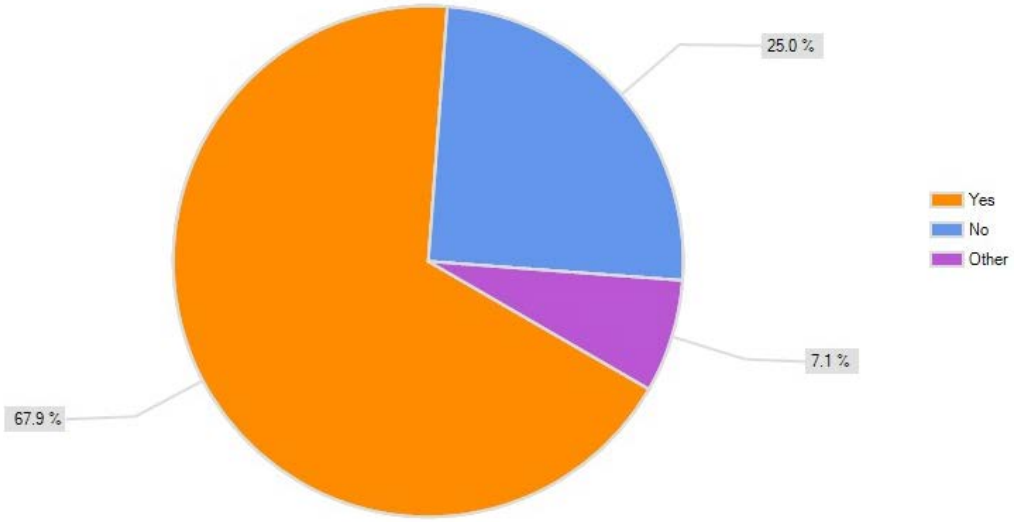
Table D3. Multiple Mailbox Support Models Included in the Survey (Continued).

	
STEEL - Multiple (4), Shur-Tite, Shur-Tite Multiple Mailbox Post, 2-3/8" O.D., 16 ga steel pipe	

APPENDIX E. SURVEY RESULTS - MAILBOX HAZARD AND RISK ASSESSMENT

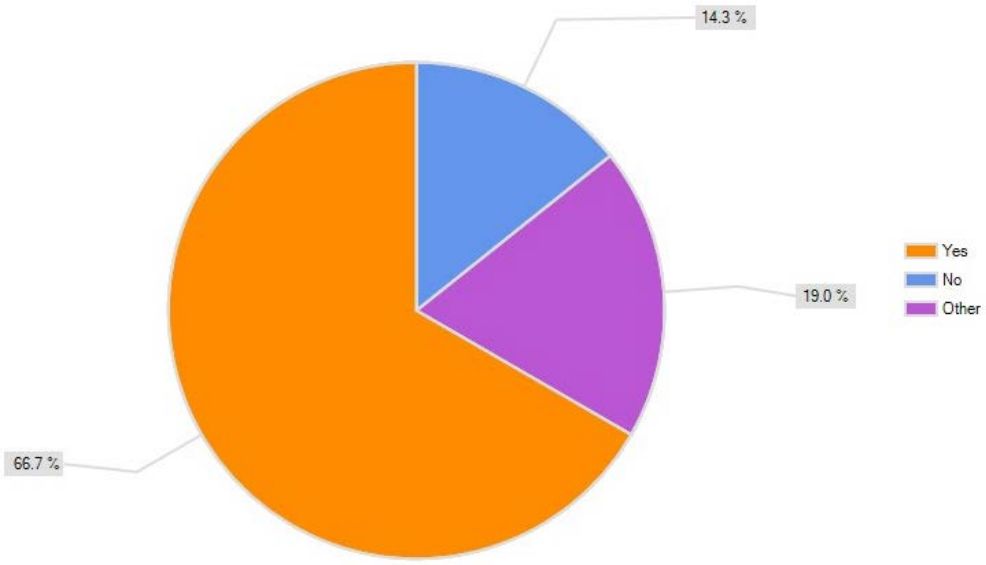
1) Question: Does your State have standards for mailbox support installation?

Answer:



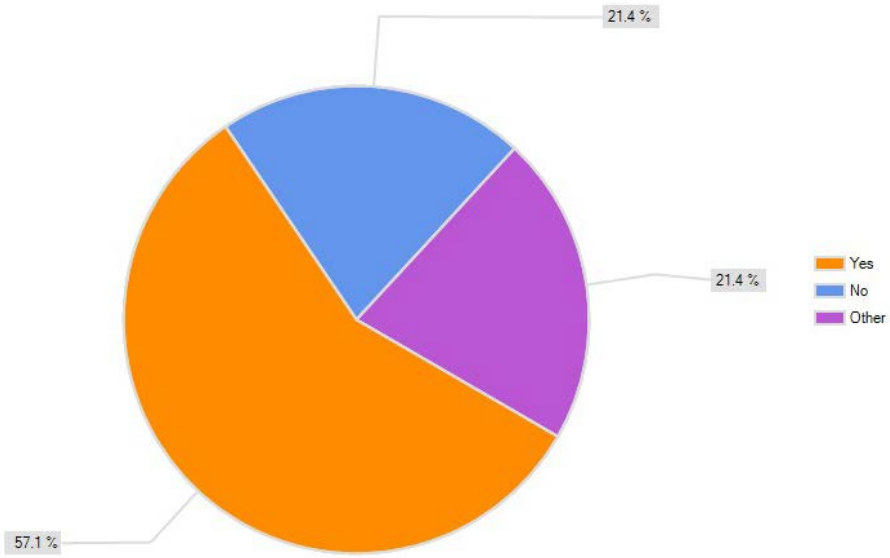
2) Question: Do you follow the united States Postal Service (USPS) regulations?

Answer:



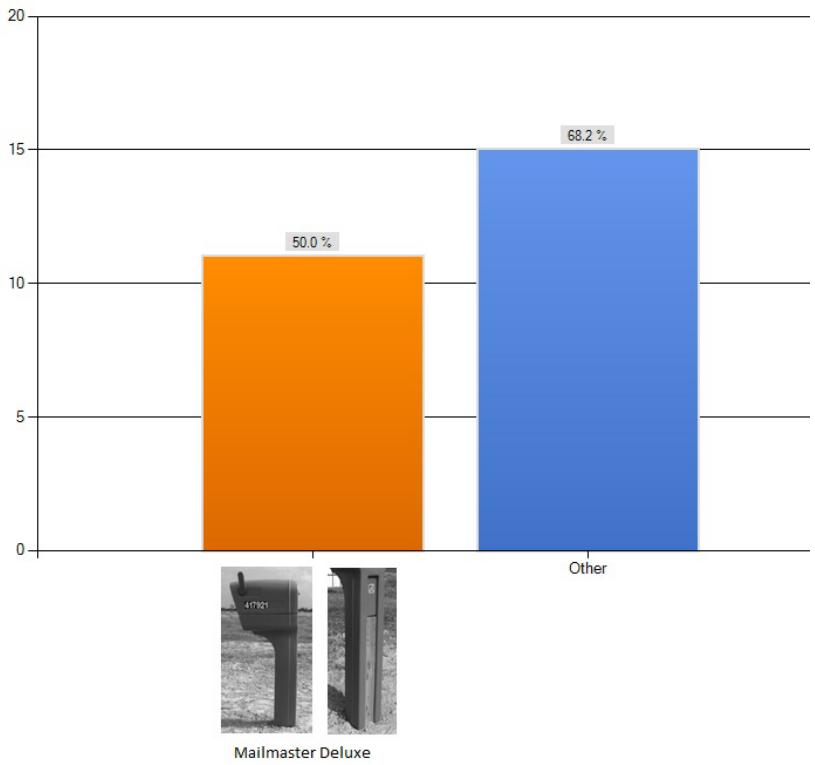
3) Question: Is the owner of the mailbox responsible for installation?

Answer:



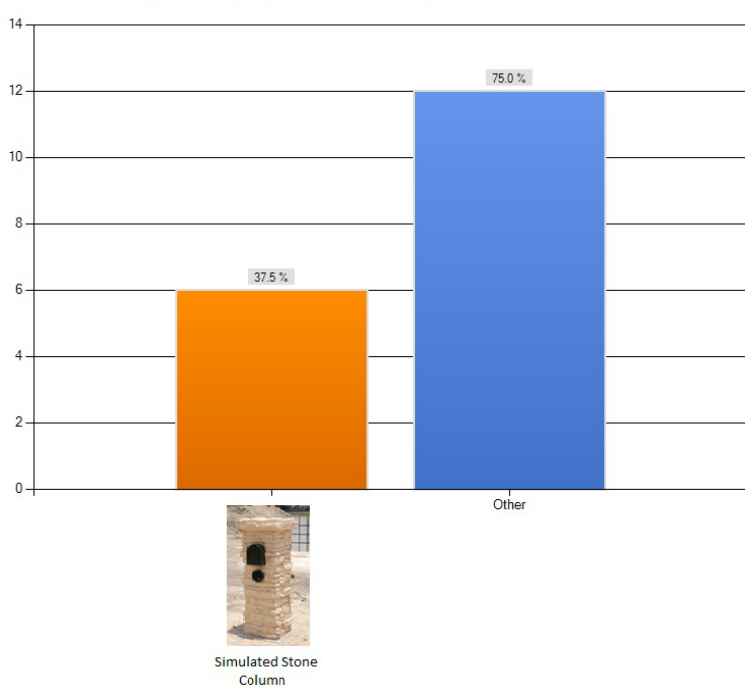
4) Question: Which type of single wood mailbox supports are allowed in your State?

Answer:



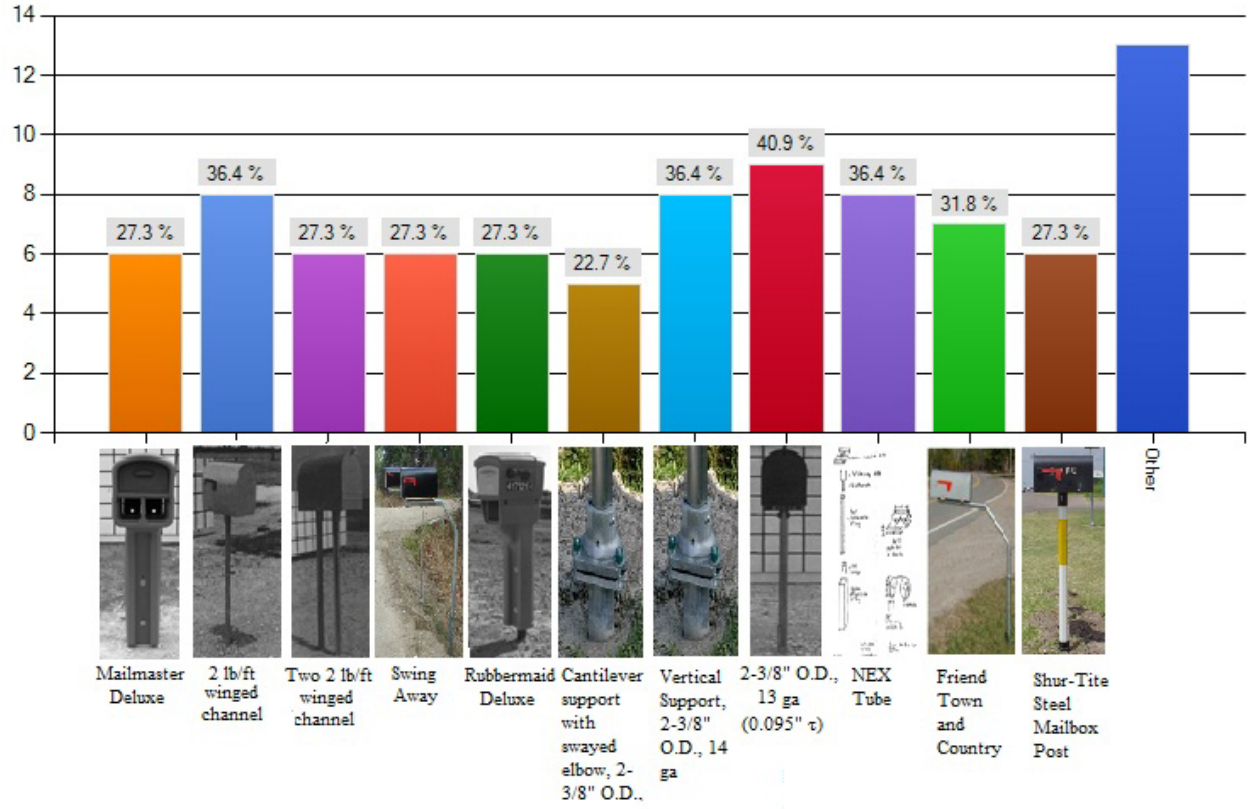
5) Question: Which type of single polyurethane mailbox supports are allowed in your State?

Answer:



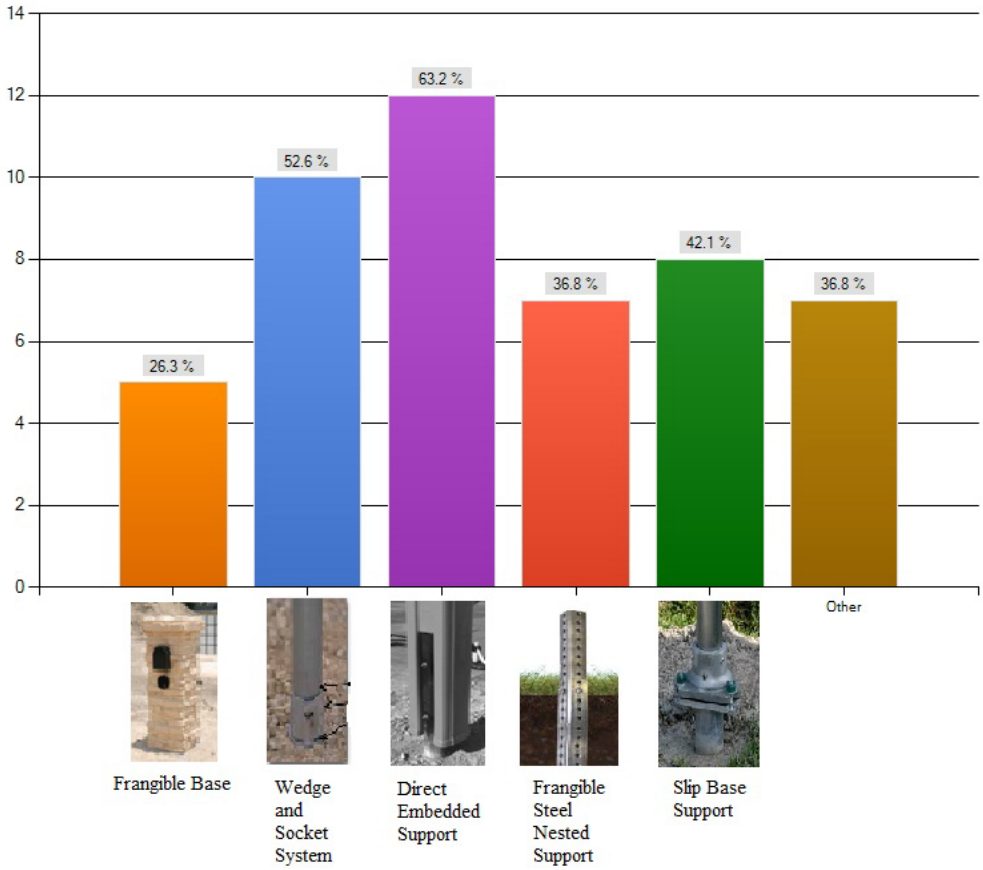
6) Question: Which type of single steel mailbox supports are allowed in your State?

Answer:



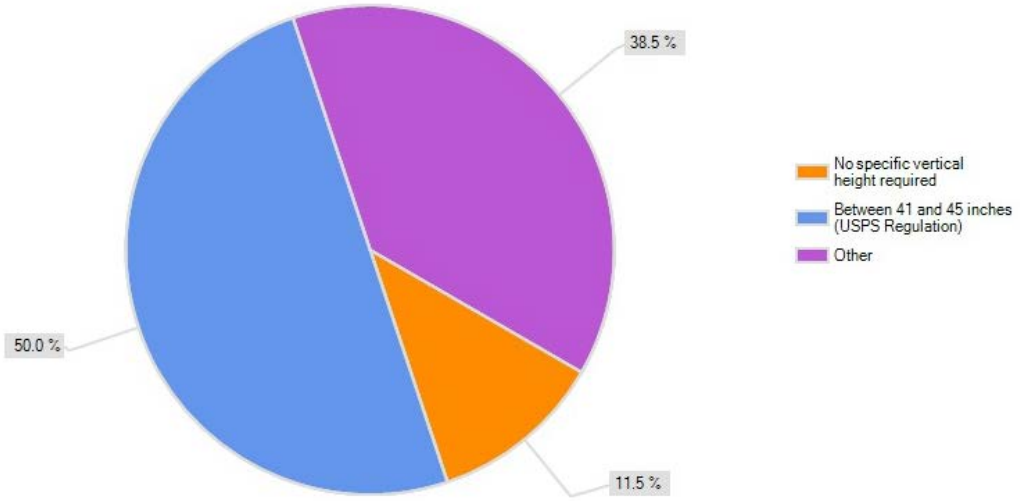
7) Question: Which types of foundation are allowed in your State for single mailbox supports?

Answer:



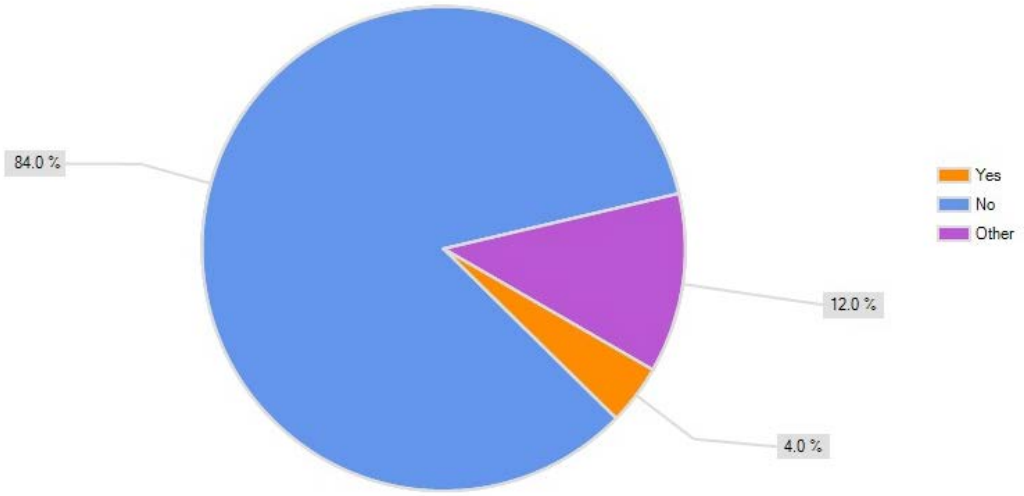
8) Question: What is the minimum allowable vertical height from the road surface to the bottom of the box, for single mailbox installation?

Answer:



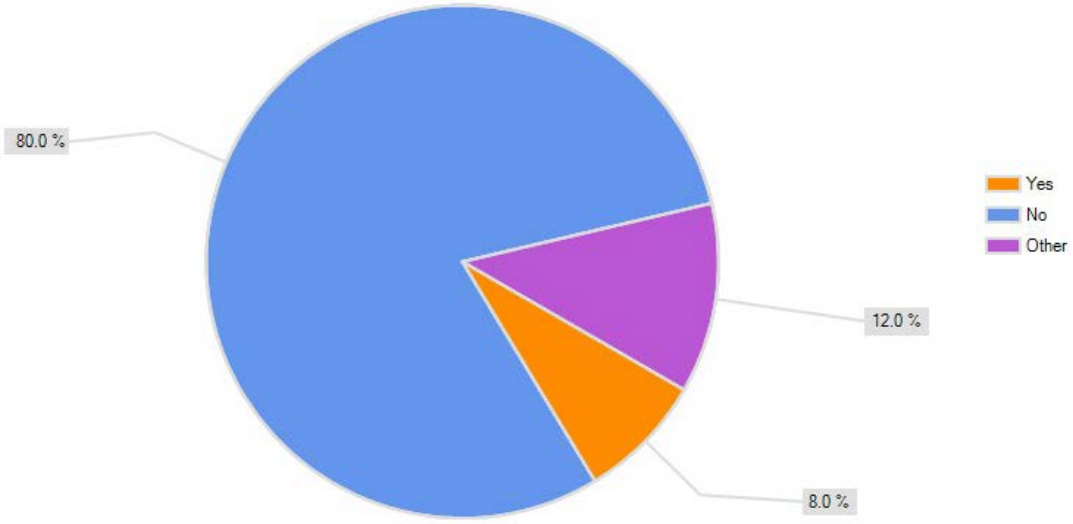
9) **Question**: Do your standards for single mailbox support selection or placement vary with design AADT of roadway?

Answer:



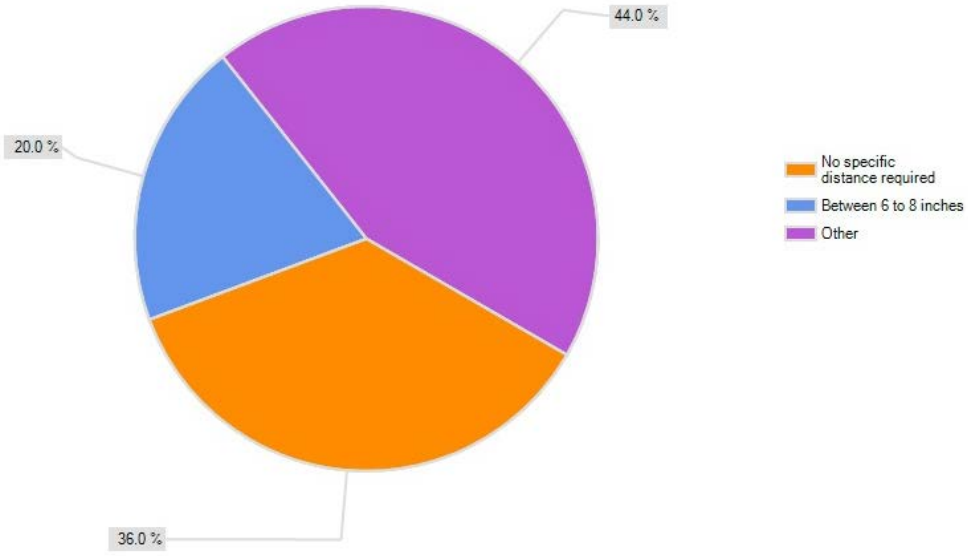
10) **Question**: Do your standards for single mailbox support selection or placement vary with design speed of roadway?

Answer:



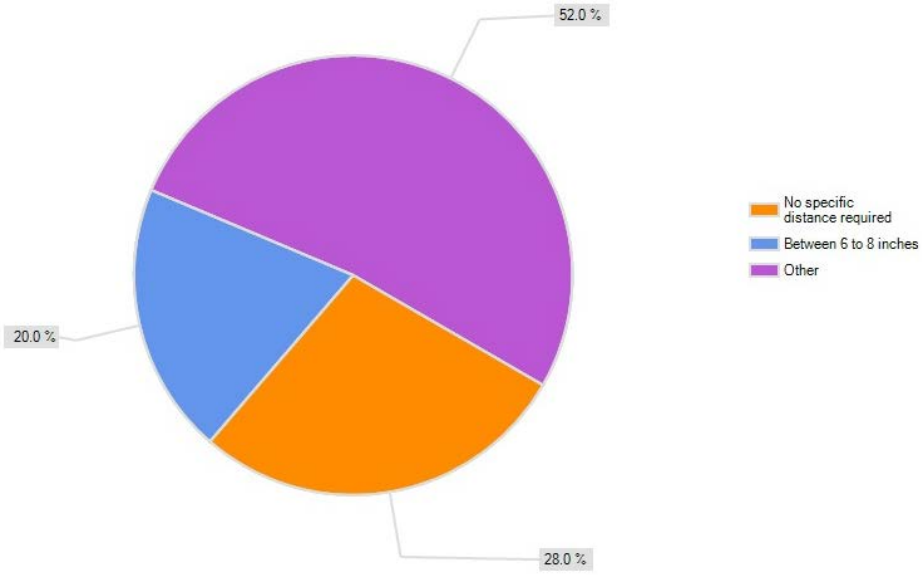
11) Question: What is the minimum distance a single mailbox should be set from the front face of the curb?

Answer:



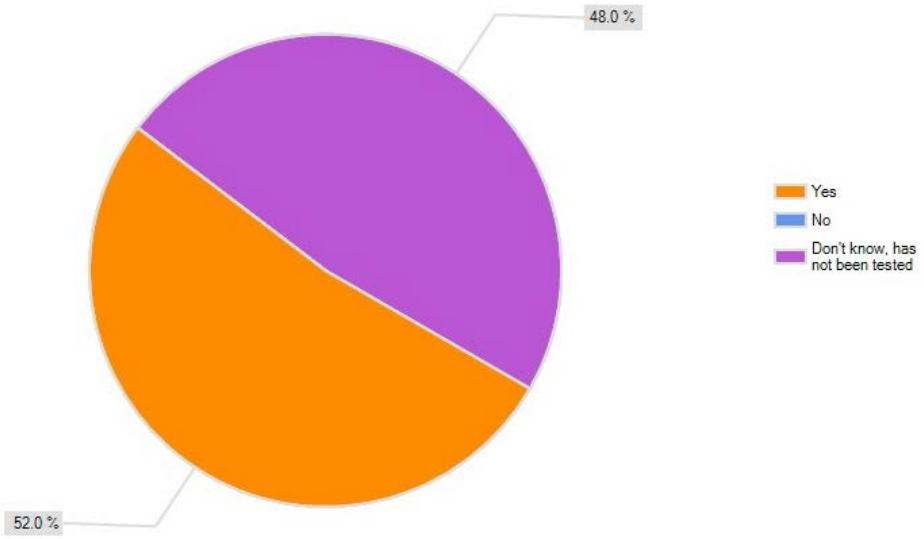
12) Question: What is the minimum distance a single mailbox should be set from the front face of the road edge?

Answer:



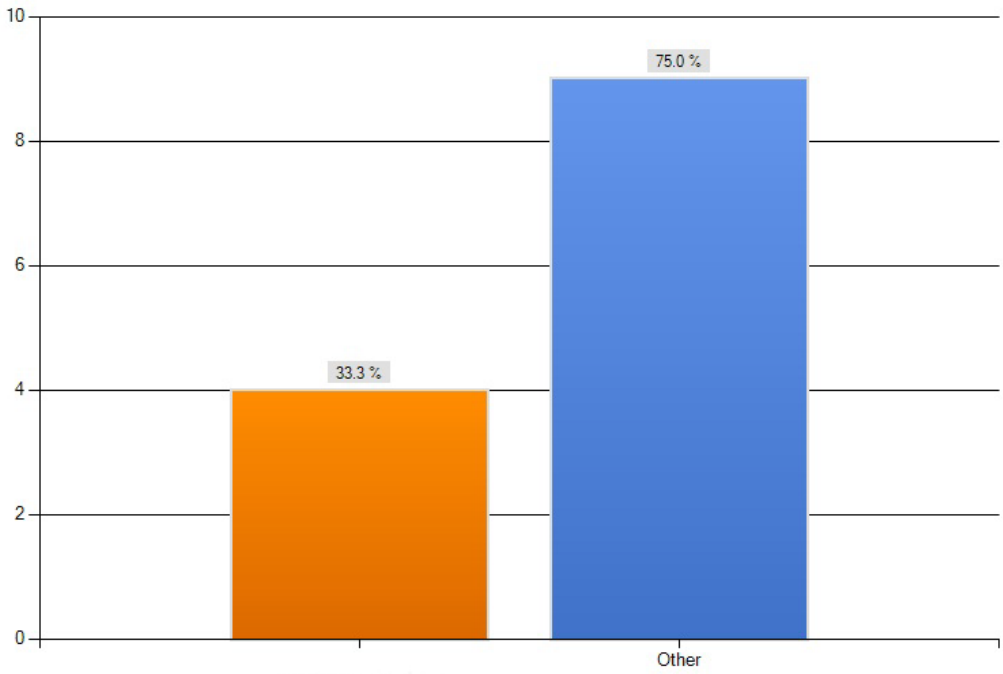
13) Question: Is your single mailbox support system NCHRP Report 350 crashworthy?

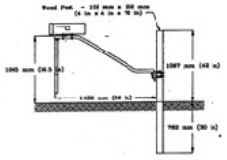
Answer:



14) Question: Which type of multiple wood mailbox supports are allowed in your State?

Answer:

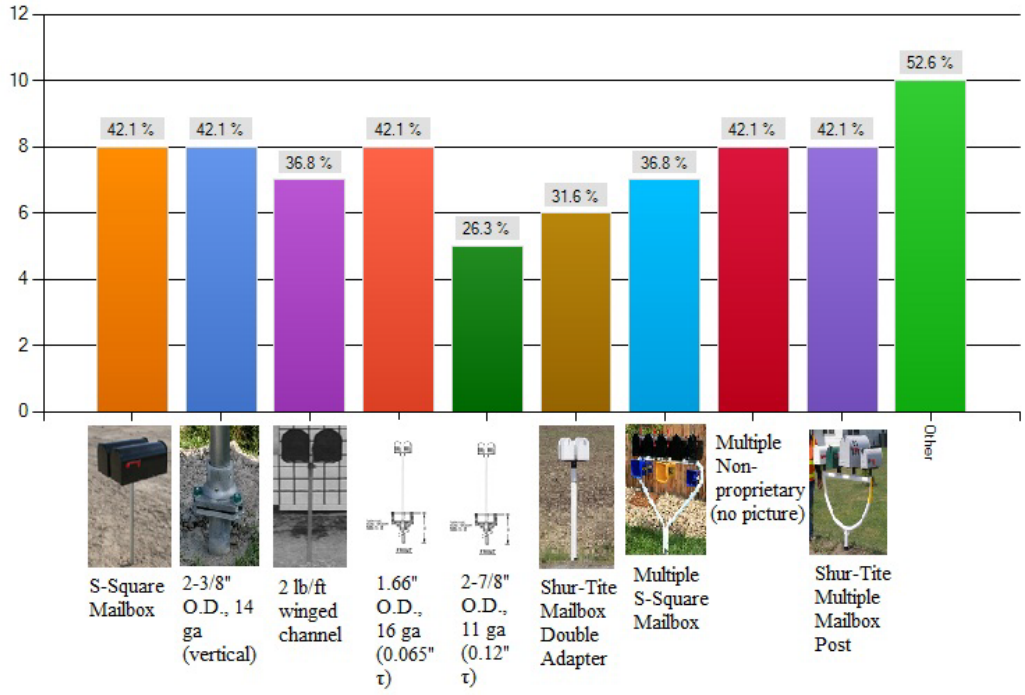




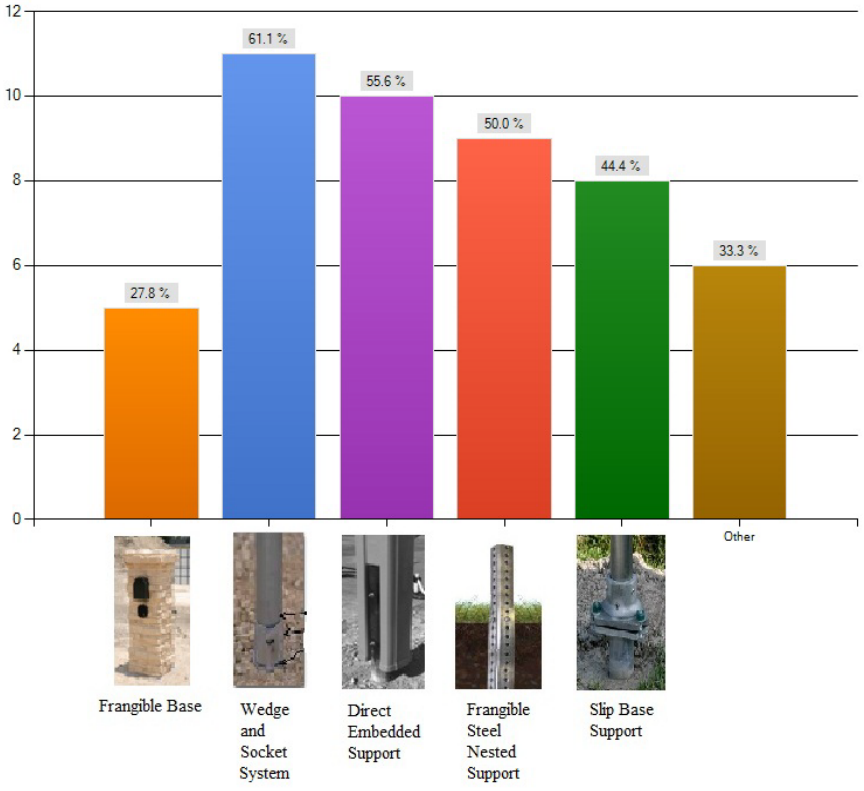
Swing-A-Way

15) Question: Which type of multiple mailbox supports are allowed in your State?

Answer:



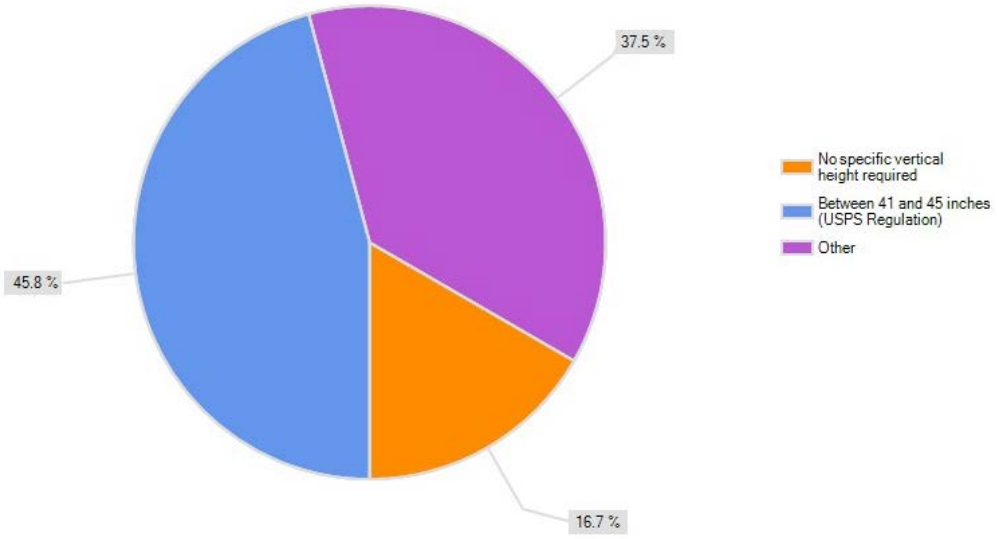
16) Question: Which types of foundation are allowed in your State for multiple mailbox supports?



Answer:

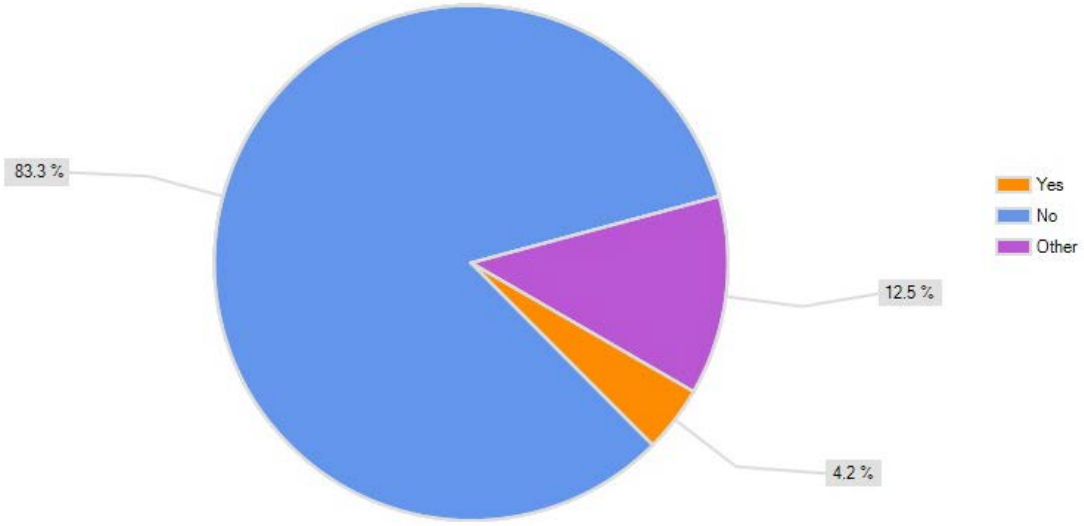
17) Question: What is the minimum allowable vertical height from the road surface to the bottom of the box, for multiple mailbox installation?

Answer:



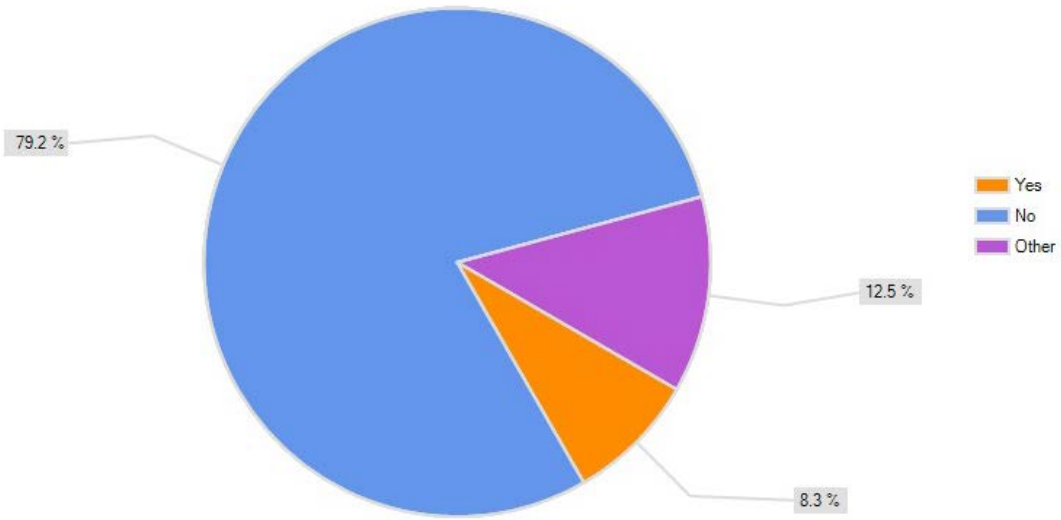
18) Question: Do your standards for multiple mailbox support selection or placement vary with design AADT of roadway?

Answer:



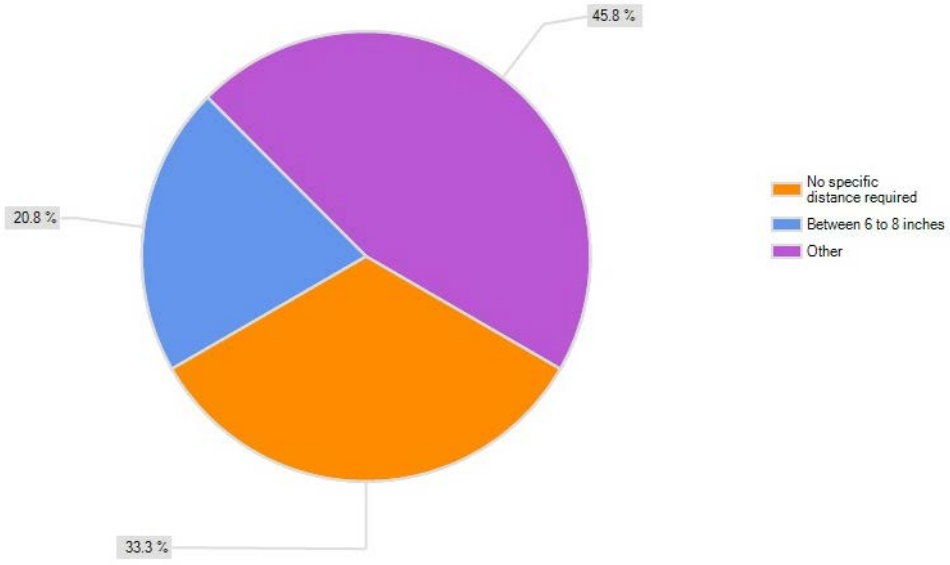
19) Question: Do your standard for multiple mailbox support selection or placement vary with design speed of roadway?

Answer:



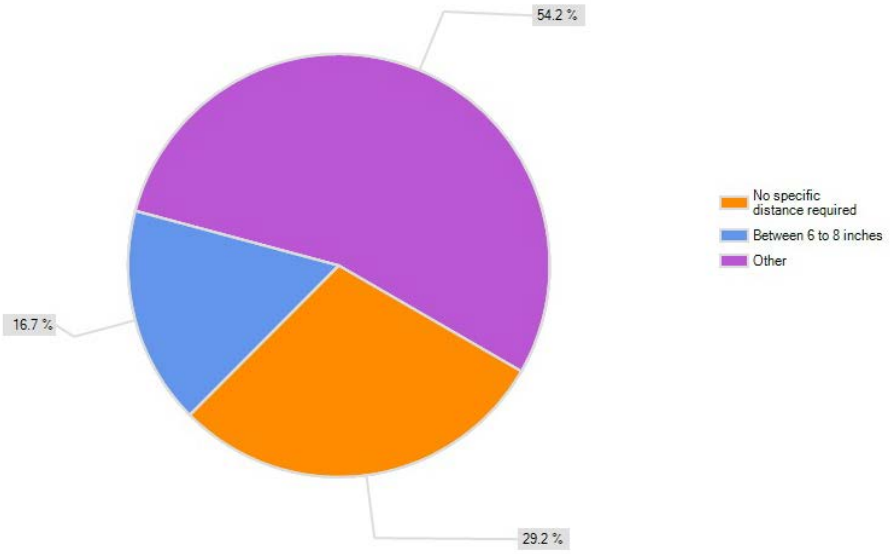
20) Question: What is the minimum distance a multiple mailbox should be set from the front face of the curb?

Answer:



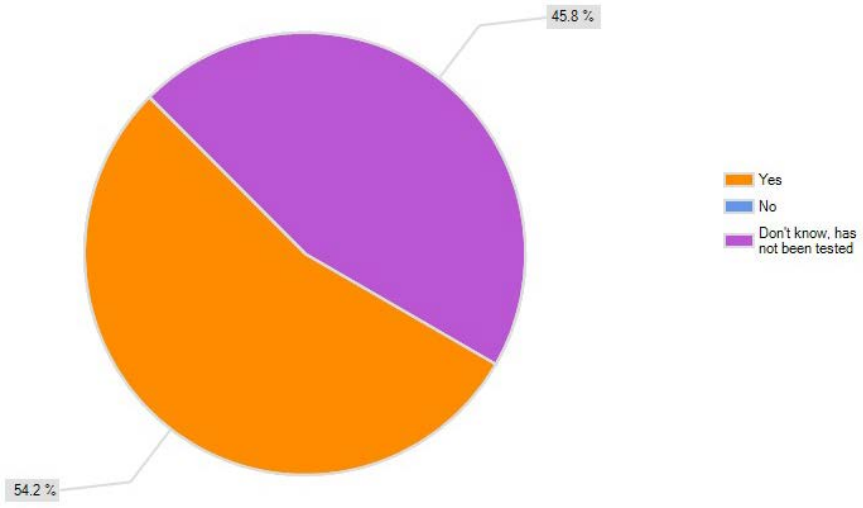
21) Question: What is the minimum distance a multiple mailbox should be set from the front face of the road edge?

Answer:



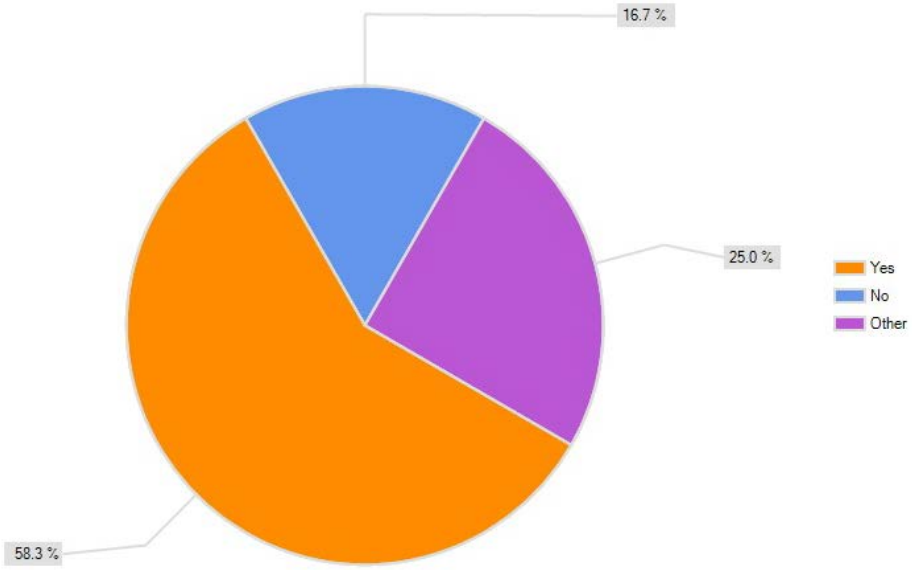
22) Question: Is your multiple mailbox support system NCHRP Report 350 crashworthy?

Answer:



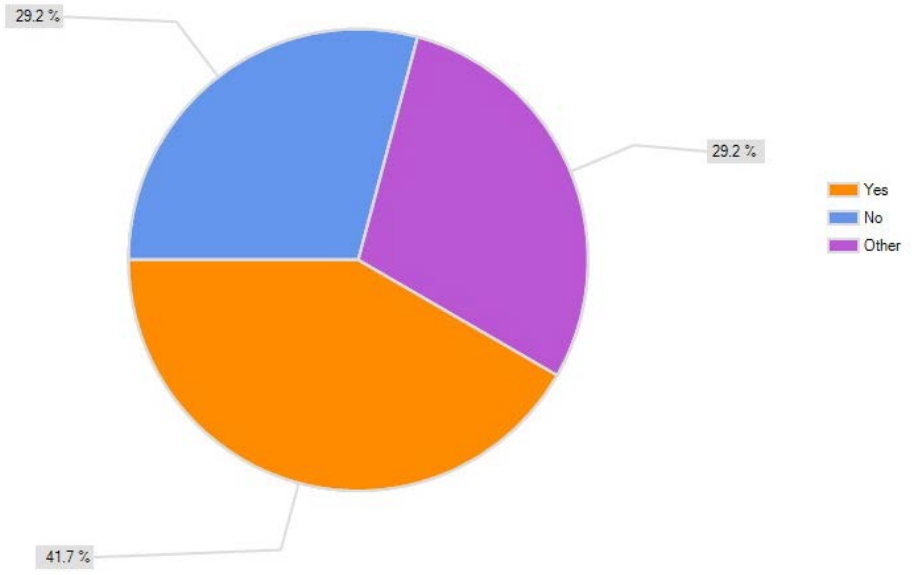
23) Question: In your state crash database, is "mailbox" coded as an object struck?

Answer:



24) Question: Do you have electronic crash data that can be accessed for the scope of this project?

Answer:



APPENDIX F. STATUTES RELATING TO MAILBOX INSTALLATION

ALASKA

From: Phone conversation with Jeff C. Jeffers, P.E. Statewide Traffic & Safety Engineering, Alaska Department of Transportation and Public Facilities, Phone: 907.465.8962, Email: jeff.jeffers@alaska.gov

Alaska DOT has standard drawings that are FHWA approved for mailbox supports. On AKDOT mailbox page users are redirected to the USPS page for some details, however there is not guidance in the Alaska Traffic Manual (state supplement to the MUTCD), nor in the Preconstruction Manual or a departmental policy and procedure.

This is interpreted by the department to mean AKDOT does not have rights to request or require property owners to apply for an encroachment permit when it comes to mailboxes. The only opportunity AKDOT has to control mailboxes is during a project where AKDOT removes existing mailboxes and replaces them with AKDOT design at project expense.

It can be said that AKDOT does not have any policy on mailbox selection and placement from the crashworthiness point of view.

From: "The Alaska State Legislature"
Web address:
http://www.legis.state.ak.us/basis/folioproxy.asp?url=http://wwwjnu01.legis.state.ak.us/cgi-bin/folioisa.dll/stattx11/query=*/doc/%7bt9551%7d?

Sec. 19.25.200. Encroachment permits; liability.

(a) An encroachment may be constructed, placed, changed, or maintained across or along a highway, but only in accordance with regulations adopted by the department. An encroachment may not be constructed, placed, maintained, or changed until it is authorized by a written permit issued by the department, unless the department provides otherwise by regulation. The department may charge a fee for a permit issued under this section.

(b) The provisions under (a) of this section do not apply to a mailbox or a newspaper box attached to a mailbox.

(c) Upon receipt of an application, the department shall issue an encroachment permit to a private person, a government agency acting in a business capacity, or an owner or lessee of land contiguous to the right-of-way for an encroachment that, on January 1, 2005, was present within the right-of-way of an interstate, primary, or secondary highway and is not authorized by a written encroachment permit if the department finds that

(1) the encroachment does not pose a risk to the traveling public, and the integrity and safety of the highway is not compromised;

(2) the applicant has demonstrated the encroachment was erected with the good faith belief it was lawful to erect and maintain the encroachment in its location;

(3) the denial of the encroachment permit would pose a hardship on the person, agency, owner, or lessee who applies for the permit;

(4) the issuance of an encroachment permit will not cause a break in access control for the highway;

(5) the land will not be necessary for a highway construction project during the initial term of the permit; and

(6) issuance of a permit is consistent with federal requirements regarding encroachments on federal-aid highways.

(d) The department may not remove an encroachment present within the right-of-way of an interstate, primary, or secondary highway on January 1, 2005, unless the owner, occupant, or person in possession of the encroachment or any other person causing or permitting the encroachment to exist receives the notice provided under AS 19.25.230 and is informed of the application process for an encroachment permit under (c) of this section. The department may charge a fee, not to exceed $100, for an encroachment permit issued under (c) of this section. An encroachment permit issued under (c) of this section may contain reasonable conditions to protect the traveling public, the safety and integrity of a highway's design, and the public interest.

(e) The land area described in an encroachment permit may not be used to meet minimum requirements for a contiguous land use under applicable municipal land use standards or under applicable regulations adopted by the Department of Environmental Conservation. The use of land contiguous to the land area described in the permit must satisfy the applicable municipal land use standards and applicable regulations adopted by the Department of Environmental Conservation without regard to the land area described in the permit.

(f) The issuance of an encroachment permit under AS 19.25.200 - 19.25.250 does not entitle the owner, occupant, or person in possession of the encroachment or any other person to a payment of compensation or of relocation benefits under AS 34.60 if the encroachment permit is revoked or not renewed or if the encroachment must be changed, relocated, or removed under AS 19.25.200 - 19.25.250.

(g) The state is not liable for damage to, or damage or injury resulting from the presence of, an encroachment in the right-of-way of a state highway.

Sec. 19.25.210. Relocation or removal of encroachment.

If, incidental to the construction or maintenance of a state highway, the department determines and orders that an encroachment previously authorized by written permit must be changed, relocated, or removed, the owner of the encroachment shall change, relocate, or remove it at no expense to the state, except as provided in AS 19.25.020, within a reasonable time set by the department. If the owner does not change, relocate, or remove an encroachment within the time set by the department, the encroachment shall be considered an unauthorized encroachment and subject to the provisions of AS 19.25.220 - 19.25.250.

COLORADO

From: Phone conversation with David Wieder, Manager, CDOT Maintenance and Operations, Colorado Department of Transportation, Phone: 303.512.5502, email: david.wieder@dot.state.co.us

Colorado DOT has not authority to enforce any law in the choice of a crashworthy mailbox support system. The DOT collaborates with USPS to inform the private owner of the importance and of the types of crashworthy systems available. The owner, however, can choose the mailbox support system he/she prefers, even if not crashworthy. When the DOT replaces the mailbox support system during major highway projects, it choses crashworthy support systems. The owner, however, could still re-replace the system installed by the DOT with the old one which was not crashworthy.

DELAWARE

From: “Delaware County Secondary Road Department Policy and Procedure Memorandum”
Web address:
http://www.co.delaware.ia.us/offices/engineer/forms/PPM%2017%20Mailbox%20Supports.pdf

SUBJECT: Mailbox Installation in County Rights of Way

Problem: Highway and roadside safety is the primary reason for Delaware County regulating the placement and type of mailboxes located within county rights of way. National crash data studies show that between 70and 100 people die each year in crashes with improperly designed mailboxes and their supports (AASHTO statistics, 2002 Roadside Design Guide, 3rd Edition). Mailbox and newspaper delivery boxes like utility poles, telephone pedestals, and other appurtenances in the right of way are a necessary part of providing services and access to rural residences. Mailboxes however, much like traffic control devices and signs, are located very close to the traveled portion of the roadway, usually right on the shoulder of the road. Unlike traffic control devices and signs however, mailboxes and similar items are placed on the roadway at random by many different people and guidelines for their placement are often not known by those who install them. Also, unlike traffic signs and other traffic control devices, mailbox supports are installed with little regard to their potential for causing a roadside hazard if they are struck by an errant vehicle.

The large, unyielding mailbox supports placed by some rural residents, while intended to be attractive decorations or to provide vandal proof mounting for mailboxes or newspaper delivery boxes, can create a severe crash hazard by their very nature and location in the roadway. To achieve their purpose of allowing ready access to rural letter carriers, they are mounted at windshield height and placed on the edge of the road where they are vulnerable to being struck by an errant vehicle. Mailboxes create a hazard to vehicles and the occupants of those vehicles because of this windshield level mounting height since the windshield is the weakest part of the protective cage provided to vehicle occupants by the automobile frame and body panels.

Discussion: All mailbox installations must meet U. S. Postal Service Regulations, which are part of this installation policy, but those installations must also meet county requirements for safety so that the mailbox and its support are not a hazard to traffic. This mailbox installation policy is based on a sample policy provided within the AASHTO Roadside Design Guide, 3rd Edition, which was published in 2002 by the American Association of State Highway and Transportation Officials (AASHTO). This policy is also developed to keep the county in compliance with its legal duty to remove obstructions within the right of way as required by Chapter 319 of the Code of Iowa.

Policy: Mailbox and Newspaper Delivery Box Installation on County Roads

SECTION 1: SCOPE

No mailbox or newspaper delivery box, hereinafter both referred to as a mailbox, will be allowed to exist on Delaware County Secondary Road rights of way if it interferes with the safety of the traveling public or the function, maintenance, or operation of the highway system. A mailbox installation not conforming to the provisions of this regulation is an unauthorized encroachment within the right of way and may be declared as an obstruction under chapter 319 of the Code of Iowa.

The location and construction of mailboxes shall conform to the rules and regulation of the U.S. Postal Service as well as to standards established by the Delaware County Secondary Road Department. Delaware County standards for the location and construction of mailboxes are available from:

Delaware County Engineers Office
P.O. Box 68 – 2139 Highway 38
Delaware, Iowa 52036
Phone: 563-927-3505

A permit for the installation of a mailbox is required by Section 319.14 of the Code of Iowa. That permit is available at the address listed above. A mailbox installation that conforms to the following criteria will be considered acceptable unless, in the judgment of the County Engineer, the installation interferes with the safety of the traveling public or the function, maintenance, or operation of the highway system.

SECTION 2: LOCATION

No mailbox will be permitted where access is obtained from a freeway or where access is otherwise prohibited by law or regulation.

Mailboxes shall be located on the right hand side of the roadway in the carrier's direction of travel route except on one-way streets where they may be placed on the left hand side of the road. The bottom of the box shall be set at an elevation established by the U.S. Postal Service, usually between 39 inches and 48 inches above the roadway surface as measured from the shoulder of the road. The optimum installation height is 42 inches. The roadside face of the box shall be offset from the edge of the traveled way by a distance of no less than the greater of the following:

- 8 feet (where no paved shoulder exists and the shoulder cross slope is 13% or flatter);
- the width of the all weather (rock or turf) shoulder present plus 8"-12" to face of box;
- the width of an all weather turnout specified by the Secondary Road Department plus 8"-12" to the face of the box.

Exceptions to the placement criteria above will exist on subdivision streets and certain designated rural roads where the County Engineer deems it in the public interest to permit lesser clearances or to require greater clearances. On curbed streets, the roadside face of the mailbox shall be set back from the face of the curb a distance of 6" – 12". On residential or subdivision streets and rural roads without all weather shoulders that carry low traffic volumes operating at low speeds, the roadside face of the mailbox shall be offset between 8" and 12" beyond the edge of the pavement or edge of the road. On very low volume rural roads with low operating speeds, the Secondary Road Department may find it acceptable to offset mailboxes a minimum of 6 feet from the traveled way and under some low-volume, low-speed applications may accept clearance as low as 32 inches.

Where a mailbox is located at a driveway entrance, it shall be placed on the far side of the driveway in the carrier's direction of travel. This location better accommodates county snow removal operations.

Where a mailbox is located near an intersecting road, it shall be located a minimum of 100 feet beyond the centerline of the intersecting road in the carrier's direction of travel. This distance shall be increased to 200 feet when the average daily traffic on the intersecting road exceeds 400 vehicles per day.

Where the mailbox is installed in the vicinity of an existing guardrail, it should, wherever practical, be placed behind the guardrail.

3.0 STRUCTURE

Mailboxes shall be of light sheet metal or plastic construction conforming to the requirements of the U. S. Postal Service. Newspaper delivery boxes shall be of light metal or plastic construction and of the minimum dimensions suitable for holding a newspaper. Some mailboxes approved by USPS may not meet county crash requirements. Manufacturers and models approved by USPS do not necessarily signify any endorsement by AASHTO or the Delaware County Secondary Road Department. Questions on compliance with USPS or Delaware County regulations should be directed your local postmaster and /or the County Engineer.

No more than two mailboxes may be mounted on a support structure unless crash tests have shown the support structure and mailbox arrangement to be safe. However, lightweight newspaper boxes may be mounted below the mailbox on the side of the mailbox support.

Mailbox supports shall not be set in concrete unless crash tests have shown the support design to be safe.

A single 4" by 4" square or 4" diameter wooden post; or metal post, Schedule 40 2" diameter (nominal size IPS; external diameter 2 3/8"; maximum wall thickness 0.154 inches) or smaller, embedded no more than 24 inches into the ground, shall be acceptable as a mailbox support. A metal post shall not be fitted with an anchor plat, but may have an anti-twist device that extends no more than 10 inches below the ground surface.

The post to box attachment details should be of sufficient strength to prevent the box from separating from the post top if the installation is struck by a vehicle. The exact support hardware dimensions and design may vary, such as having a two-piece platform bracket or alternative slot and holed locations. The product must result in a satisfactory attachment of the mailbox to the post, and all components must fit together properly.

The minimum spacing between centers of support posts shall be three fourths of the height of the posts above the ground line. Mailbox support designs not described in this section are acceptable if approved by the Delaware County Engineer. Illustrations of approved mailbox supports and attachments are included with this policy as appendix A.

SECTION 4: SHOULDER AND PARKING AREA CONSTRUCTION

It shall be the responsibility of the postal patron to inform the Delaware County Secondary Road Department of any new or existing mailbox installations where shoulder construction is inadequate to provide all weather access to the mailbox.

SECTION 5: REMOVAL OF NONCONFORMING OR UNSAFE MAILBOXES

Any mailbox or mailbox support that is found to violate the intent of this regulation shall be removed by the postal patron upon notification by the Delaware County Secondary Road Department under procedures described in Section 319.13 which states:

If the following constitute an immediate and dangerous hazard, …placed or erected upon the right of way of any public highway shall without notice or liability in damages be removable and the costs thereof assessed against … (t)he owner or person responsible for placement of all other obstructions.
Any such obstruction not constituting an immediate and dangerous hazard shall be removed without liability after forty-eight hour notice served in the same manner in which an original notice is served, or in writing by certified mail, or in any other manner reasonably calculated to apprise the person responsible for the obstruction that the obstruction will be removed at the expense of such person after the notice is given.
Such removal and assessment of cost in the case of primary roads shall be by the department and in the case of secondary roads by the board of supervisors.
Upon removal of the obstruction, the highway authority may immediately send a statement of the cost of removal to the person responsible for the obstruction. If within ten days after sending the statement the cost is not paid, the highway authority may institute proceeding in the district court system to collect the cost of removal.

At the discretion of the County Engineer, based on an assessment of hazard to the public, the patron shall be granted not less than 24 hours and not more than twenty days to remove an unacceptable mailbox and its support. After the specified period has expired, the unacceptable mailbox will be removed by the Secondary Rod Department at the postal patron’s expense.

SECTION 6: MAILBOXES AND SNOW REMOVAL

Delaware County conducts winter snow removal operations under the terms of Delaware County Ordinance number 3 which establishes the policy and level of service in respect to the clearance of snow and ice during winter months. Section 3 of the ordinance addresses mailboxes and states the following:

"The County will assume no liability for mailboxes and fences damaged because of snow removal unless such action can be determined to be malicious or by direct contact with a plow or wing blade. The County will not replace mailboxes damaged or knocked down by the force of snow thrown from the plow."

The county further does not remove accumulated snow from in front of, underneath, or near the location of the mailbox to accommodate the delivery of mail. It shall be the responsibility of the postal patron to remove snow which accumulates around the mailbox to accommodate mail delivery.

SECTION 7: PERMITS

As required by Section 319.14 of the Code of Iowa, rural residents planning to install a mailbox should obtain a permit to perform the work from the County Engineer. Permits are available at the address shown in Section 1 of this policy.

From: Phone conversation with Robert King, Community Relations Officer, Phone: 302.760.2080, Email: bob.king@state.de.us

Delaware DOT requires from the citizen to choose a mailbox system in a certain material and geometry range only. If the DOT is working on a highway project and needs to replace a mailbox support, then it is requested that the contractor chooses a mailbox support system with a FHWA letter of acceptance. However, when the private citizen choses and install the mailbox system, no FHWA letter is required.

KANSAS

The researchers were not able to identify a guidance for Kansas DOT with respect to the selection and use of crashworthy mailbox supports and any authority the DOT might have on it.

KENTUCKY

From: “Kentucky Transportation Cabinet Department of Highways District 9 Permits Branch”
Web address:
http://transportation.ky.gov/Permits/Pages/default.aspx
http://transportation.ky.gov/district-9/documents/encroachpermitd9.pdf
Notice: It does NOT address mailboxes!

From: Phone conversation with Nancy Albright, P.E., Director of the Kentucky Transportation Cabinet – Maintenance Section, Kentucky Transportation Cabinet, Phone: 502.564.4556, Email: nancy.albright@ky.gov

Kentucky DOT does not have a policy for the selection and the installation of mailbox supports.
KYDOT requires breakaway posts.
There is no requirement for pre-approved mailbox support selection and installation.
If DOT finds an “illegal” mailbox placement, in their ROW, a letter is sent to the owner of the mailbox asking for changing the mailbox. However, the law cannot be enforced on this matter.

LOUISIANA

From: “Louisiana Department of Transportation and Development – Right-of-Way Permits”
Web address:
http://www.dotd.la.gov/highways/maintenance/maintmgt/home.aspx

Right-of-Way Permits

The DOTD Right-of Way Permit Unit is responsible for regulating the location, design, methods for installing, adjusting, accommodating, and maintenance of non-DOTD facilities such as driveways and utilities on highway right-of-way. The types of permits issued include: Project, Residential and Commercial Driveway, Vegetation Enhancement, Vegetation Maintenance, Traffic Signal, Traffic Control Device, Geophysical, Movable Property, Mailbox, Wireless, and Fiber-Optic. Additionally, the Right-of-Way Permit Unit is responsible for negotiating joint use agreements for use of DOTD right-of-way.

All completed permit applications must be submitted to the District Right-of-Way Permit Specialist responsible for the Parish in which the work will take place. If the permit application includes more than one District, a separate permit must be prepared for each affected District. Be sure to attach to the permit application all additional documentation such as drawings. Any questions regarding the requirements for completing the forms listed on this web page should be directed to the appropriate District Right-of-Way Permit Specialist.

Applicant must submit entire permit application form including rules and regulations in order to be processed.

Notice of Disclaimer: I hereby certify that this permit is in its initial form and has not been altered, changed, or modified in any manner whatsoever without the express written consent of the Right-of-Way Permits Unit of the Louisiana Department of Transportation and Development (DOTD). I hereby agree that any alteration, change, or modification made to the initial form of this permit without the express written consent of the DOTD's Right-of-Way Permits Unit may result in the entire permit or any portion thereof, at the sole discretion of the DOTD, being deemed null and void.

From: Phone conversation with Chad Winchester, Road Design Administrator, Louisiana Department of Transportation and Development, Phone: 225.379.1048, Email: Chad.Winchester@la.gov

There is no permit required for selection and installation of new mailboxes and there is no checking. As for state road, there is a permit, however still there is no checking. LADOT issues guidance for choice of crashworthy mailbox support, but no law can be enforced.
If an issue is raised for a particular mailbox selection and placement, then LADOT request that the mailbox would be changed, but again cannot enforce law.
Last, if LADOT need to replace a mailbox support system, it will replace it with a choice of a crashworthy one.

Also, from drawing "Mailbox Installation Details" (Figure F1):

"… No more than two mailboxes may be mounted on a support structure unless the support structure and mailbox arrangement have been shown to be safe by crash testing in accordance with NCHRP Report 350. However, lightweight newspaper boxes may be mounted below the mailbox on the side of the mailbox support. … Mailbox support designs not detailed will be acceptable if crash tested in accordance with NCHRP Report 350 and if approved by the engineer."

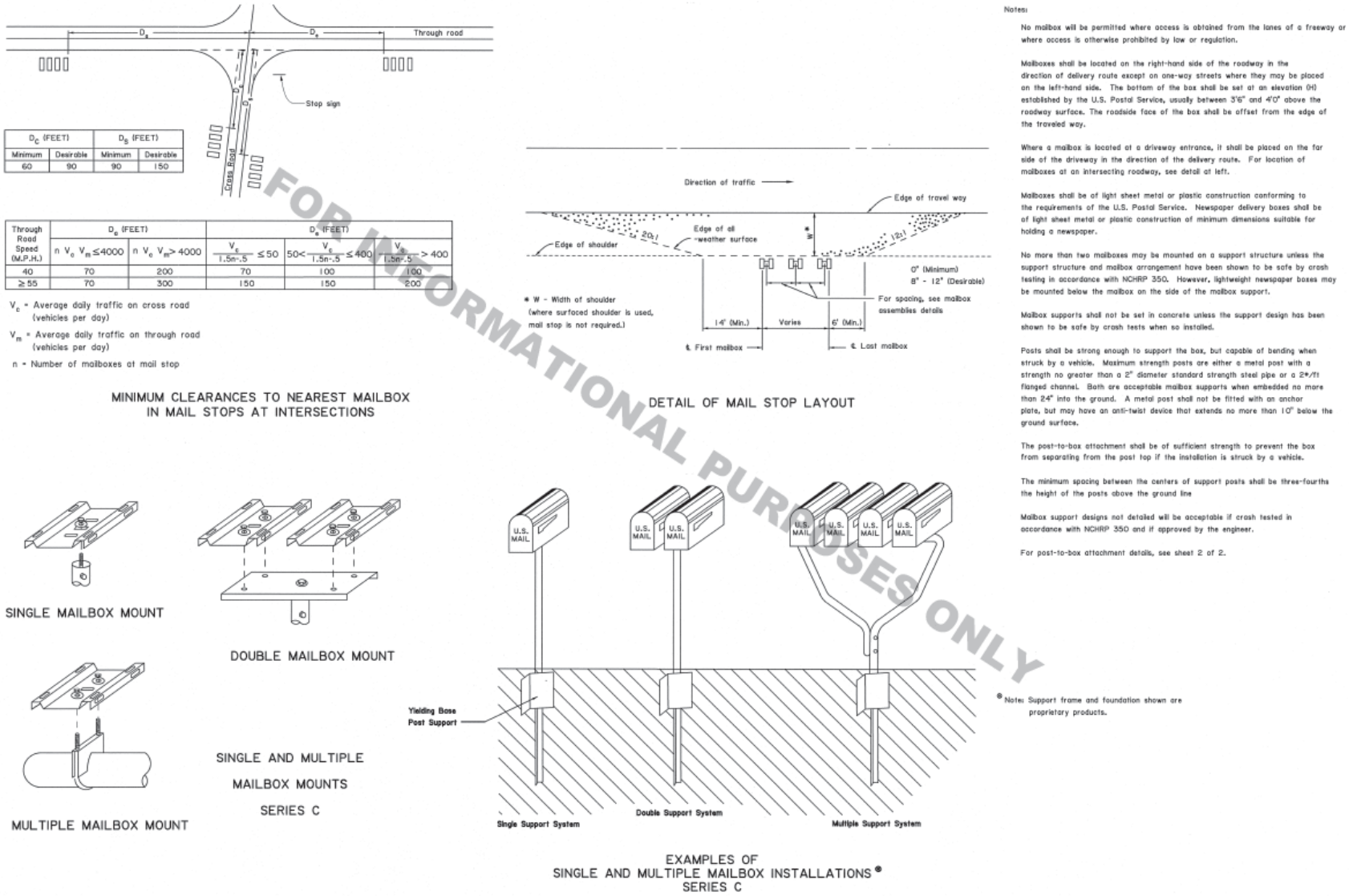


Figure F1. Mailbox Installation Details – Louisiana Department of Transportation and Development.

MAINE

From: "MaineDOT. Mailbox Policy for Maine's State and State-aid Highways"
Web address:
http://www.maine.gov/mdot/winterdriving/mailbox.htm
http://www.maine.gov/mdot/winterdriving/documents/pdf/Mailbox_Policy_2012-07.pdf

For convenience and practicality, mailbox installations have been allowed within the right-of-way of Maine's state and state-aid highways; however it is important to recognize that such installations have two very important conditions:

1) The mailbox must be installed in accordance with applicable standards to ensure that mail can be delivered and that the mailbox does not create an obstacle or safety hazard to those that use or maintain the highway, and

2) The mailbox is installed entirely at the owner's risk. In other words, if the mailbox incurs damage during any sort of highway operations or maintenance, the property owner is not entitled to replacement or compensation. In fact, if the mailbox was not installed in accordance with the applicable standards as stated above, the owner may even be held liable for injuries or damages that may have been incurred as a result.

Mailbox design and installation standards are available from several sources, and mailbox owners are expected to consult this information prior to undertaking any mailbox installation or replacement. The following standards have nationwide relevance and were developed in cooperation with one another:

The United States Postal Service (USPS) Mailbox Guidelines. The USPS defines the standards for mailbox construction, as well as the placement tolerance that must be met to accommodate postal operations. Specifics may be obtained from your local post office or online at:
https://www.usps.com/manage/know-mailbox-guidelines.htm?

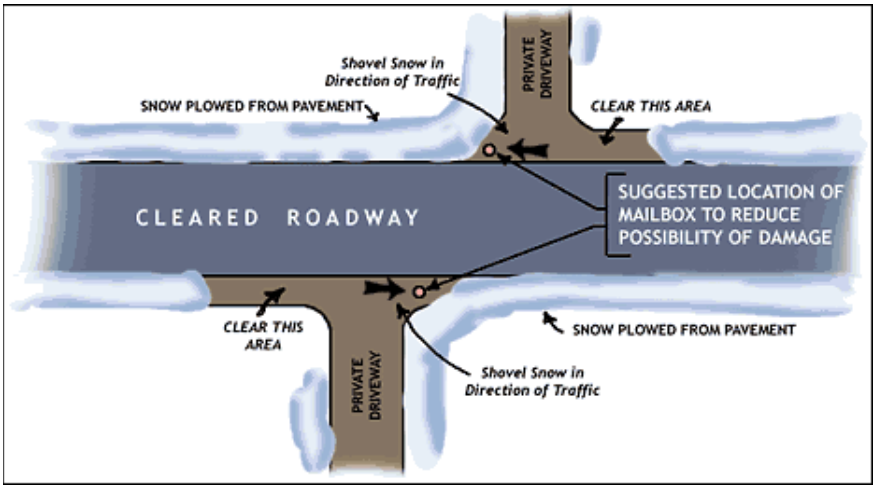
American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide. The AASHTO Roadside Design Guide, Chapter 11: *Erecting Mailboxes on Streets and Highways* deals with the safety and construction of privately owned mailboxes, mailbox supports, and mailbox turnout designs and is less focused on postal operations. This publication may be obtained online through the AASHTO Bookstore at:
https://bookstore.transportation.org/Item_details.aspx?id=1807

MaineDOT has developed this policy to promote compliance with these national standards and to help further clarify the expectations and responsibilities of Maine mailbox owners to improve the safety of our highways. The following pages further specify the details associated with the mailbox height, location, offset, and post type to minimize the potential hazards associated with mailbox installations and to reduce the opportunities for damage to mailboxes.

Mailbox Installation Standards

General Location:

Whenever possible, your mailbox should be located after your driveway opening. This location placement improves visibility, minimizes the amount of snow that comes off of the snow plow, and improves the approach for your mail carrier. The diagram below further clarifies this preferred placement:



Mailbox Support Design:

It is best to use an extended arm type of post with a free-swinging suspended mailbox. This allows snowplows to sweep near or under boxes without damage to supports and provides easy access to the boxes by carrier and customers. The following picture shows a free-swinging suspended mailbox:

Offset:

Mailboxes should be set back from the edge of the shoulder – regardless of whether the shoulder is gravel or paved. In other words, the face of the mailbox should be at least one foot (1') back from the edge of the normally plowed surface of the highway or the face of curb. Greater offset distances are encouraged whenever possible to allow the mail carrier to get further out of traffic and to further minimize potential damage to your mailbox. The following picture shows a mailbox with a reasonable offset:

Height:

According to USPS standards, a mailbox must be installed with the bottom of the mailbox located between 41" and 45" high above the surface of the highway shoulder. MaineDOT recommends that this height be closer to the 45" measurement to minimize conflict with the height of the plow truck wing when snow is being pushed back during, or between, winter storms. The following picture further clarifies the height considerations:

Post Size, Type and Embedment:

Mailbox posts must be sturdy enough to hold up the mailbox in all types of weather conditions, however they cannot be so rugged that they present a hazard to vehicles that inadvertently leave the road. If a mailbox support is struck by a vehicle, it must easily break away. Therefore, the following types of posts are deemed acceptable:

4" x 4" wooden posts embedded 2 feet into the ground. Larger wooden posts may be used only if the post is drilled through with an appropriate spade bit to create a shear plane that is no higher than 6" above the surface of the surrounding ground. The number and size of the drilled holes depends upon what is necessary to bring the cross-section of the larger post down to the equivalent cross-sectional area of a standard 4" x 4" post. (MaineDOT Standard Specification 606.06);
1" to 2" round diameter steel or aluminum pipe or standard U-channel post embedded 2 feet into the ground;
Unacceptable mailbox supports include: anything that is filled with concrete, masonry and stone structures, heavy steel structures, and most objects that were intended for other uses (e.g. antique plows, I-beams, and various other household tools and objects).

NOTICE: Mailboxes, attachments or support systems not consistent with this policy are considered "Deadly Fixed Objects" (aka. "DFOs") and are in violation of 23 MRSA §1401-A. As such, when these installations are recognized by MaineDOT, the owner will be informed of the hazard and immediate removal will be requested. If the property owner does not comply with this request, MaineDOT may elect to remove the installation and seek reimbursement from the property owner for all costs incurred.

From: Phone conversation with Dale Peabody, Director of Transportation Research, Maine Department of Transportation, Phone: 207.624.3305, Email: dale.peabody@maine.gov

MaineDOT can inform the resident of a hazard and ask them to comply. We do not enforce the law but could remove the existing hazard and charge the resident for the work.
Fines would be applied by law enforcement.

MINNESOTA

From: Email exchange with Alex Chernyaev, Assistant Design Standards Engineer, Minnesota Department of Transportation, Email: alex.chernyaev@state.mn.us

The selection and permissible locations of mailbox installations and supports on streets or highways in Minnesota are regulated by Minnesota Rules 8818.0100 to 8818.0300 .

MnDOT Road Design Manual Chapter 11-11
http://dotapp7.dot.state.mn.us/edms/download?docId=1062364
provides guidance for mailbox support selection and installation on highways with speed limit 40 mph or greater under MnDOT projects. As per these guidance, the mailbox support shall be accepted by FHWA as meeting the NCHRP Report 350 crashworthiness criteria.

As per my understanding, Minnesota can enforce the law on private citizen to replace a mailbox support when it is declared to be a public nuisance, a road hazard, and a danger to the health and safety of the traveling public if located along a street or highway having a speed limit of 40 miles per hour or greater. The mailbox installations that are documented to have passed an accredited crash test are acceptable. An accredited crash test is considered to be a test conducted in accordance with procedures described in the most recent National Cooperative Highway Research Program report.
I am not aware if the single citizen need to have a permit to install the mailbox.

From: "Minnesota Administrative Rules"
Web address:
https://www.revisor.mn.gov/rules/?id=8818.0300

8818.0300 PROHIBITED MAILBOX STRUCTURES; EXCEPTIONS.
Subpart 1. Unlawful installations and supports. The following mailbox installations and supports are declared to be a public nuisance, a road hazard, and a danger to the health and safety of the traveling public if located along a street or highway having a speed limit of 40 miles per hour or greater:
A. an installation that contains more than one vertical support;
B. a single support containing more than two mailboxes;
C. a wooden support with a cross-sectional area greater than 16 square inches at any above-ground point along the support (for example, the maximum allowable square and round support dimensions are four inches by four inches and 4.5 inches in diameter, respectively), except that larger wooden supports are acceptable if, at a height four inches above the ground, the support cross-sectional area is altered in some fashion so as to reduce the cross-sectional area at that point to 16 square inches or less;
D. a metal support of a weight of four pounds per foot or more for any one foot of vertical measurement above ground (for example, a standard steel pipe of up to two inches inner

diameter would be acceptable), except that larger metal supports are acceptable if, within the first three inches above ground the metal support is less than four pounds per foot (less than one pound for the three-inch length);

E. a mailbox that is not acceptable for delivery of mail by the United States Postal Service;

F. adjacent mailbox installations whose respective supports are spaced closer than 30 inches, as measured from center of support to center of support;

G. neighborhood delivery and collection box units, whether or not United States Postal Service approved;

H. a support comprised of material other than solely wood or metal that either exceeds 16 square inches in total cross-sectional area at a height four inches above ground or is of a weight of four pounds per foot or more for any one foot of vertical measurement above ground, unless within the first three inches above ground the support is less than four pounds per foot (less than one pound over the three-inch distance). Examples of such nonconforming supports could include supports such as filled milk cans, brick structures, plows, and concrete-filled pipe; and

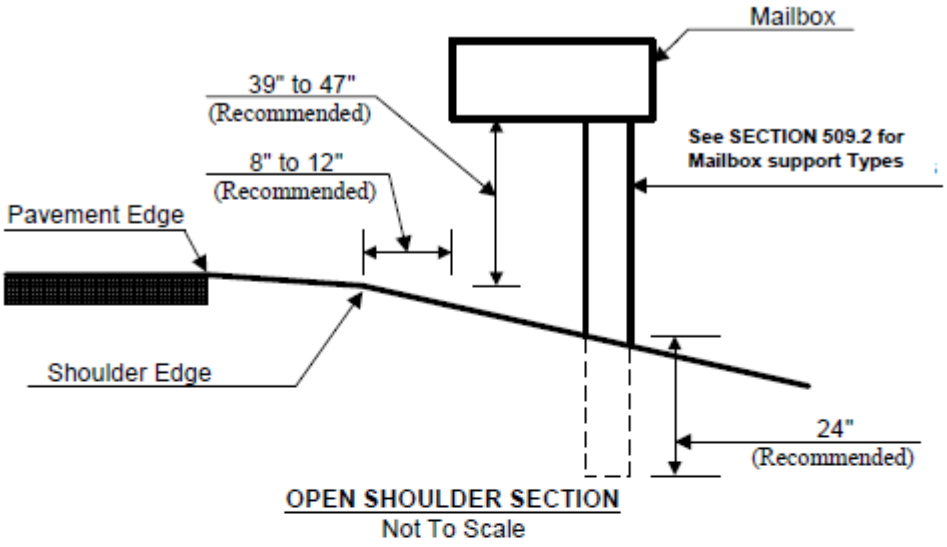
I. an installation, whether a support or closed mailbox, that encroaches the usable roadway or its airspace.

Subp. 2. Exceptions. Notwithstanding subpart 1, mailbox installations that are documented to have passed an accredited crash test are acceptable. An accredited crash test is considered to be a test conducted in accordance with procedures described in the most recent National Cooperative Highway Research Program report, "Recommended Procedures for the Safety Performance Evaluation of Highway Appurtenances," published by the Transportation Research Board, National Academy of Sciences, 2101 Constitution Avenue N.W., Washington, D.C. 20418. This report and future revisions of this report are incorporated by reference. The report is not subject to frequent change and is available to the public at the State Law Library, Judicial Center, 25 Rev. Dr. Martin Luther King Jr. Blvd., St. Paul, Minnesota 55155, and through the Minitex interlibrary loan system.

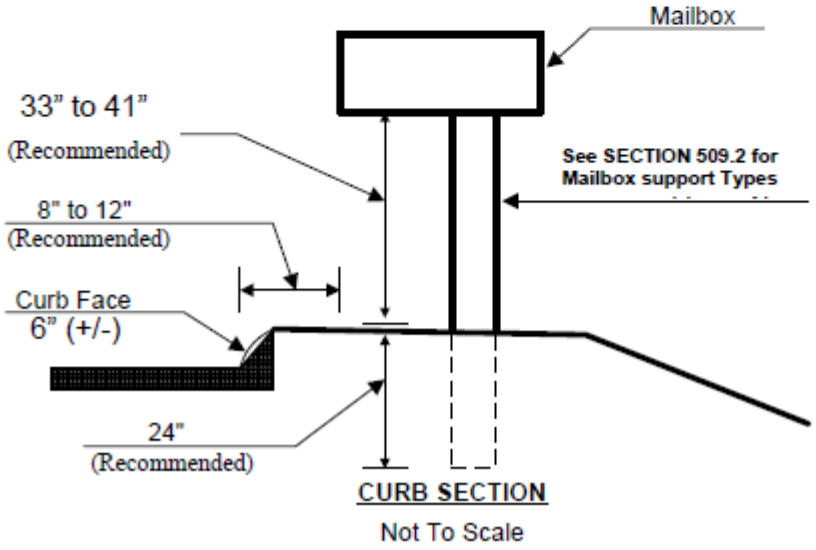
MISSISSIPPI

From: "Sub-Part 7501 – Maintenance. Chapter 04013 Driveway and Street Connections, Median Openings, Frontage Roads"
Web address:
http://mdot.ms.gov/apa_data/apa_rules/PDF_Record/Maintenance/37.I.7501.04013/37.I.7501.04013.pdf

509 Mail Boxes to be placed on highway right of way must meet the following specifications which are to be made a part of driveway permit applications:
Mailbox materials and size shall conform to the requirements of the United States Postal Service. Mailbox supports may be 4" x 4" square or 4" diameter round wood posts, 6" diameter PVC pipe, or any other mailbox supports listed in the current edition of the AASHTO Roadside Design Guide, Chapter 11 (The Roadway Design Division has a copy), or any mailbox found acceptable and certified under the NCHRP 350 testing program.
Mailbox front is recommended to be 8" to 12" from the edge of the shoulder or the curb face, with the post/support to be 39" to 47" above the shoulder edge or at a height specified by the local United States Postal carrier.
A cross-section view of the roadway at the mailbox location is shown below:



OPEN SHOULDER SECTION
Not To Scale



CURB SECTION
Not To Scale

5. Any deviation from the above specifications must be approved by the District Engineer.

NORTH DAKOTA

From: Phone conversation with Shawn Kuntz, Traffic Operations Engineer, North Dakota Department of Transportation, Phone: 701.328.2673, Email: skuntz@nd.gov

The owner of the mailbox system can chose the system; there is not a need to go through selection. North Dakota DOT does not have a policy and the authority to do anything. Only with major projects, the DOT might need to move the mailbox system already installed and re-install a different type of mailbox support. It might be necessary to analyze crash data before making any decision about changing the mailbox support system.

PENNSYLVANIA

From: Phone conversation with Mark Burkhead, P.E., Pennsylvania Department of Transportation, Phone: 717.783.5110, Email: mburkhead@state.pa.us

The owner of the mailbox system can chose the system; there is not a need to go through selection. Pennsylvania DOT does not have the authority to do anything. It might be that only some municipalities have some authority, but that's not a general rule.

TEXAS

From: Email exchange with Justin Obinna, Transportation Engineer, Texas Department of Transportation, Email: Justin.Obinna@TxDOT.Gov
Web address:
http://www.txdot.gov/inside-txdot/division/maintenance/mailbox-safety.html
http://www.txdot.gov/inside-txdot/division/maintenance/mailboxes.html

TxDOT furnishes the mailbox supports. Click on Mailboxes on State Highways and Mailbox Safety and FAQ's and TxDOT Mailbox Standards for more information.
The owner does not need a permit for the selection and placement of the mailbox support.
TxDOT use only FHWA crashworthy approved mailbox support systems. Click on Mailboxes on State Highways and Mailbox Safety and FAQ's
TxDOT has the authority to regulate the selection and installation of mailbox support also from a crashworthiness point of view:

Transportation Code Sec. 224.031. DUTY OF DEPARTMENT. (a) It states: The department has exclusive and direct control of all improvement of the state highway system.
This exclusive and direct control authority also includes the roadside and associated roadside safety appurtenances of which mailboxes are a subset.
Crashworthiness is addressed in Mailboxes on State Highways and Mailbox Safety and FAQ's

TxDOT is responsible for making sure that mailboxes are FHWA crashworthy approved and only when their installation is being requested within TxDOT's right of way.

Some roads in Texas are not under the control of TxDOT. Examples of such roads are county roads and city streets. County and City governments stipulate their rules for such roads working with their city or county engineer who, of course, are naturally bound by the Texas Engineering Practice Act. There may be other government body interests on roads such as improvement districts, like the Aldine Improvement District. This district played a leading role in a hazard elimination program project involving sidewalk improvements on the Aldine Mail Route road in the Houston Area.

VIRGINIA

From: Email exchange with Robert Prezioso, Acting State Maintenance Engineer, Virginia Department of Transportation, phone: 804.786.0816, email: Robert.Prezioso@vdot.virginia.gov

Although the owner is responsible for installation of the mailbox, he/she does not need a permit for the selection and placement of the mailbox support.
VDOT does not choose the mailbox support system. Guidance on this can be found in the Virginia administrative code (24VAC30-151-560. Mailboxes and newspaper boxes).
VDOT does not have the authority to regulate the selection and installation of mailbox support also from a crashworthiness point of view.
When VDOT discovers a mailbox installation which creates a safety hazard for roadway traffic, the homeowner will be notified and requested to change the mailbox installation.

From: "24VAC30-151-560. Mailboxes and newspaper boxes"
Website:
http://leg1.state.va.us/cgi-bin/legp504.exe?000+reg+24VAC30-151-30
http://leg1.state.va.us/cgi-bin/legp504.exe?000+reg+24VAC30-151-560

24VAC30-151-560. Mailboxes and newspaper boxes

Mailboxes and newspaper boxes may be placed within VDOT right-of-way without a permit; however, placement should not interfere with safety, maintenance and use of the roadway. Lightweight newspaper boxes may be mounted on the side of the support structure. Breakaway structures will be acceptable as a mailbox post. Breakaway structures are defined as a single four-inch by four-inch square or four-inch diameter wooden post or a standard strength, metal pipe post with no greater than a two-inch diameter.

WASHINGTON

From: Phone conversation with Dave Olson, Design Policy, Standards, & Research Manager Washington State Department of Transportation, Phone: 360.705.7952, Email: Olsonda@wsdot.wa.gov

Washington DOT can oblige the single private to modify the mailbox support if they see it is not safe (not crashworthy). However, the DOT does not check every single mailbox system. The DOT does not have any control on the selection of the mailbox support system and cannot enforce the law on the single private to change the system previously selected.

From: Web page
http://www.wsdot.wa.gov/publications/manuals/fulltext/M41-10/SS2010.pdf
http://www.wsdot.wa.gov/publications/manuals/fulltext/M22-01/1600.pdf

Mailboxes
For mailboxes located within the Design Clear Zone, provide supports and connections as shown in the Standard Plans. The height from the ground to the bottom of the mailbox is 3 feet 3 inches. This height may vary from 3 feet 3 inches to 4 feet if requested by the mail carrier. If the desired height is to be different from 3 feet 3 inches, provide the specified height in the contract plans. (See Exhibit 1600-6 for installation guidelines.) Coordinate with homeowners when upgrading mailboxes. In urban areas where sidewalks are prevalent, contact the postal service to determine the most appropriate mailbox location. Locate mailboxes on limited access highways in accordance with Chapter 530, Limited Access. A turnout, as shown in Exhibit1600-6, is not needed on limited access highways with shoulders of 6 feet or more where only one mailbox is to be installed. On managed access highways, mailboxes are to be on the right-hand side of the road in the postal carrier's direction of travel. Avoid placing mailboxes along high-speed, high-volume highways. Locate Neighborhood Delivery and Collection Box Units (NDCBUs) outside the Design Clear Zone.

WYOMING

From: Phone conversation with William Wilson, P.E., Standards Engineer, Wyoming Department of Transportation, Phone: 307.777.4216, Email: bill.wilson@dot.state.wy.us

In Wyoming the single owner is required to have a permit for installation of mailbox support when that is in the right-of-way of the land. WYDOT has policies and checks whether the support is crashworthy. If it is not, WYDOT will take it away and require that is replaced with a crashworthy one.

From: Email exchange with William Wilson, P.E., Standards Engineer, Wyoming Department of Transportation, Phone: 307.777.4216, Email: bill.wilson@dot.state.wy.us

To the best of my knowledge, there are no Statutes in Wyoming in regard to mailboxes. I think that comes from our authority to regulate what is in the state highway right-of-way.

APPENDIX G. CRASH DATA ANALYSIS - CRASH SEVERITY FOR CRASHES INVOLVING MAILBOXES

Table G1. Crash Severity for Crashes Involving Mailboxes - Colorado.

	Most Harmful Event	
Year	Fatalities	Injuries
2008	0	6
2009	0	1
2010	0	2
Total	0	9

Table G2. Crash Severity for Crashes Involving Mailboxes - Delaware.

	Most Harmful Event	
Year	Fatalities	Injuries
'05-'10 Total	1	38

Table G3. Crash Severity for Crashes Involving Mailboxes - Kansas.

	Most Harmful Event	
Year	Fatalities	Injuries
2006	N/A	N/A
2007	N/A	N/A
2008	N/A	N/A
2009	1	6
2010	1	29
Total	2	35

Table G4. Crash Severity for Crashes Involving Mailboxes - Louisiana.

	Most Harmful Event	
Year	Fatalities	Injuries
2006	2	46
2007	1	50
2008	0	70
2009	0	69
2010	0	54
Total	3	289

Table G5. Crash Severity for Crashes Involving Mailboxes - Minnesota.

	Most Harmful Event	
Year	Fatalities	Injuries
2006	0	22
2007	0	27
2008	0	16
2009	0	26
2010	0	28
Total	0	118

Table G6. Crash Severity for Crashes Involving Mailboxes – North Dakota

	Most Harmful Event	
Year	Fatalities	Injuries
2007	0	3
2008	0	0
2009	0	1
2010	0	2
2011	0	2
Total	0	8

Table G7. Crash Severity for Crashes Involving Mailboxes - Pennsylvania.

	Most Harmful Event*		First and Most Harmful Event*	
Year	Fatalities	Injuries	Fatalities	Injuries
2006				
2007	0	8	1	60
2008	2	10	1	60
2009	1	14	1	44
2010	1	9	0	43
Total	4	33	2	147

Table G8. Crash Severity for Crashes Involving Mailboxes - Wyoming.

	Most Harmful Event	
Year	Fatalities	Injuries
2008	0	2
2009	0	5
2010	0	2
Total	0	9

APPENDIX H. CRASH DATA ANALYSIS - FIXED OBJECTS RELATED CRASHES

Table H1. Fixed Objects Related Crashes - Alaska.

Fixed Object Type Hit	# Total Crashes (2005-2009)
Bridge Rail	94
Bridge/Overpass	55
Curb/Wall	396
Fence	361
Guardrail End	204
Guardrail Face	844
Light Support	331
Sign	604
Traffic Signal Pole	91
Tree	362
Utility Pole	302
Other Fixed Objects	567

Table H2. Fixed Objects Related Crashes - Colorado.

Fixed Object	Total Object Crashes (2008-2010)
Barricade	99
Bridge Structure	257
Cable Rail	650
Concrete Highway Barrier	4051
Crash Cushion/Traffic Barrel	200
Culvert Headwall	357
Curb	2534
Delineator Post	1454
Embankment	3397
Fence	2677
Front to Front	1
Front to Rear	4
Front to Side	3
Guardrail	3963
Involving Other Object	1277
Large Rocks/Boulder	947
Light/Utility Pole	2095
Other Fixed Object	1103
Pedestrian	1
Railroad Crossing Equipment	82
Side to Side	2
Sign	2233
Traffic Signal Pole	348
Tree	1598
Vehicle Debris or Cargo	1194
Wall/Building	443
Wild Animal	2
Overturning	7
Other Non-Collision	229
Mailboxes	338

Table H3. Fixed Objects Related Crashes - Delaware.

Fixed Objects	Total Object Crashes (2005-2010)
Impact Attenuator/Crash Cushion	32
Bridge Overhead Structure	11
Bridge Pier Support	305
Bridge Rail	22
Cable Barrier	29
Culvert	44
Curb	291
Ditch	439
Embankment	3867
Guardrail Face	3380
Guardrail End	80
Concrete Traffic Barrier	169
Other Traffic Barrier	25
Tree	2254
Utility Pole	2565
Light Support	60
Traffic Sign Support	99
Overhead Sign Support	4
Traffic Signal Support	12
Fence	97
Other Post	301
Other Fixed Object	2711
Mailboxes	656

Table H4. Fixed Objects Related Crashes - Kansas.

Fixed Objects	Total Object Crashes (2006-2010)
Barricade	226
Bridge Rail	2062
Bridge Structure	961
Building	673
Crash Cushion	134
Culvert	2116
Curb	5042
Ditch	8823
Divider/Median Barrier	5823
Embankment	1889
Fence/Gate	3824
Guardrail	4065
Hydrant	626
Other	890
Other Post or Pole	1904
Overhead Sign Support	82
Railroad Crossing Fixtures	241
Sign Post	4272
Tree	4452
Unknown/Blank	425
Utility Devices	6626
Wall	700

Table H5. Fixed Objects Related Crashes - Kentucky.

Fixed Object	Total Object Crashes (2006-2010)
Bridge Pier Abutment	478
Bridge rail	1635
Building wall	4193
Cable Barrier	459
Concrete Barrier	1825
Crash Cushion	461
Culvert/Head wall	3450
Curb	4201
Embankment/Ditch	39606
Fence	9866
Fire Hydrant	1090
Guardrail	13178
Other	8302
Sign Post	3518
Tree	14138
Utility Pole	8602

Table H6. Fixed Objects Related Crashes - Louisiana.

Fixed Objects	Total Object Crashes (2006-2010)
Impact Attenuator	271
Bridge Overhead Structure	654
Bridge Pier/Support	179
Bridge Rail	2324
Culvert	806
Curb	3046
Ditch	7644
Embankment	502
Guardrail Face	1377
Guardrail End	288
Concrete Traffic Barrier	1419
Other Traffic Barrier	409
Tree	2013
Utility Pole	3040
Traffic Sign Support	1290
Traffic Signal Support	254
Other Post/Pole	960
Fence	1001
Mailbox	1496
Other Fixed Object	1928

Table H7. Fixed Objects Related Crashes - Maine.

Fixed Objects	Total Object Crashes (2006-2010)
Bridge Piers	149
Building/Wall	807
Construction, Barricades, Equipment	96
Crash Cushion	26
Culvert Headwall	385
Embankment, Ditch, Curb	7880
Fencing	543
Fire Hydrant/ Parking Meter	326
Gate or Cable	10
Light Pole	408
Median Safety Barrier	562
Other Guardrails	4088
Other Poles, Posts, or Supports	495
R.R. Crossing Device	41
Rock Outcrops or Ledge	1292
Sign Structure Post	1244
Traffic Signal	83
Tree or Shrubbery	8576
Utility Pole	5940

Table H8. Fixed Objects Related Crashes - Mississippi.

Object Struck	Total Object Crashes (2006-2011)
Animal	2120
Attenuator/Cushion	92
Bridge Structure	1737
Crossover	1018
Culvert	431
Curb	1954
Ditch	4343
Embankment	1712
Other Fixed Object	2820
Fence	607
Guardrail	1693
Mailbox	565
Maintenance Equipment	114
Median Barrier	1621
Post/Pole/Support	3218
Tree	3815

Table H9. Fixed Objects Related Crashes – North Dakota

Fixed Objects	Total Object Crashes (2007-2011)
Bridge/Pier/Abutment	113
Bridge Overhead Structure	25
Bridge Parapet End	9
Bridge Rail	283
Concrete Traffic Barrier	243
Culvert	115
Curb	654
Ditch	1755
Embankment	274
Fence	205
Guardrail End	47
Guardrail Face	334
Highway Traffic Sign Post	430
Impact Attenuator	24
Luminaire/Light Support	377
Mailbox	136
Other Fixed Object	548
Other Post/Pole/Support	413
Other Traffic Barrier	30
Overhead Sign Support	33
Traffic Signal Support	35
Tree	351
Utility Post	205

Table H11. Fixed Objects Related Crashes - Virginia.

Fixed Objects	Total Object Crashes (2009-2011)
Bank or Ledge	6913
Tress	6352
Utility Pole	2694
Fence or Post	1876
Guardrail	4751
Parked Vehicle	111
Tunnel, Bridge, Underpass, Culvert, etc.	907
Sign, Traffic signal	1574
Impact Cushioning Device	82
Other	3980
Jersey Wall	1481
Building/Structure	433

Table H12. Fixed Objects Related Crashes - Washington.

Fixed Objects	Total Object Crashes (2006-2010)
Roadway Ditch	12,566
Tree or Stump (stationary)	10,684
Fence	9,136
Utility Pole	8,426
Concrete Barrier/Jersey Barrier - Face	8,258
Guardrail - Face	6,979
Earth Bank or Ledge	5,608
Wood Sign Post	4,821
Over Embankment - No Guardrail Present	4,094
Bridge Rail - Face	3,767
Street Light Pole or Base	3,583
Curb, Raised Traffic Island or Raised Median Curb	3,490
Mailbox	*2,521*
Retaining Wall (concrete, rock, brick, etc.)	2,153
Other Objects	1,967
Building	1,649
Cable Barrier	1,643
Boulder (stationary)	1,185
Fire Hydrant	1,131
Utility Box	992
Guardrail - Leading End	967
Snow Bank	783
Metal Sign Post	774
Culvert and/or other Appurtenance in Ditch	756
Rock Bank or Ledge	686
Guardrail - Through, Over or Under	529
Crash Cushions - Impact Attenuators	498
Into River, Lake, Swamp, etc.	415
Signal Pole	413
Traffic Signal Pole or Box	404
Underside of Bridge	314

Table H12. Fixed Objects Related Crashes - Washington (Continued).

Fixed Objects	Total Object Crashes (2006-2010)
Temporary Traffic Sign or Barricade	274
Not Stated	233
Guide Post	193
Concrete Barrier/Jersey Barrier - Through, Over or Under	127
Bridge Column, Pier or Pillar	120
Construction Materials	109
Railway Crossing Gate	101
Concrete Barrier/Jersey Barrier - Leading End	97
Manhole Cover	85
Bridge Rail - Leading End	82
Bridge Abutment	47
Bridge Rail - Through, Over or Under	38
Railway Signal Pole	37
Parking Meter	30
Overhead Sign Support	21
Reversible Lane Control Gate	19
Toll Booth Island	6
Drawbridge Crossing Gate Arm	5
Miscellaneous Object or Debris on Road	4
Toll Booth	4
Closed Toll Gate	4
Mud or Landslide	2