

TRANSPORTING OVERSIZE WHEELCHAIRS

FINAL REPORT

Prepared for
National Cooperative Highway Research Program (NCHRP)
Transportation Research Board
of
The National Academies

Scott Baker
Vi Truong
Laura Riegel

AECOM
Arlington, Virginia
February, 2012

ACKNOWLEDGMENT OF SPONSORSHIP

This work was sponsored by one or more of the following as noted:

American Association of State Highway and Transportation Officials, in cooperation with the Federal Highway Administration, and was conducted in the **National Cooperative Highway Research Program,**

Federal Transit Administration and was conducted in the **Transit Cooperative Research Program,**

American Association of State Highway and Transportation Officials, in cooperation with the Federal Motor Carriers Safety Administration, and was conducted in the **Commercial Truck and Bus Safety Synthesis Program,**

Federal Aviation Administration and was conducted in the **Airports Cooperative Research Program,**

which is administered by the Transportation Research Board of the National Academies.

DISCLAIMER

This is an uncorrected draft as submitted by the research agency. The opinions and conclusions expressed or implied in the report are those of the research agency. They are not necessarily those of the Transportation Research Board, the National Academies, or the program sponsors.

TRANSPORTING OVERSIZE WHEELCHAIRS

FINAL REPORT

Prepared for
National Cooperative Highway Research Program (NCHRP)
Transportation Research Board
of
The National Academies

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES
PRIVILEGED DOCUMENT

This report, not released for publication, is furnished only for review to members of or participants in the work of the CRP. This report is to be regarded as fully privileged, and dissemination of the information included herein must be approved by the CRP.

Scott Baker
Vi Truong
Laura Riegel

AECOM
Arlington, Virginia
February 2012

CONTENTS

CONTENTS	iv
LIST OF FIGURES AND TABLES	v
AUTHOR ACKNOWLEDGMENTS.....	vi
ABSTRACT	vii
EXECUTIVE SUMMARY	1
CHAPTER 1: Background.....	6
Problem Statement and Research Objective.....	6
Scope of Study	6
CHAPTER 2: Research Approach	8
Task 1	9
Task 2	10
Task 3	11
Task 4	11
Task 5	11
Task 6	12
Task 7	12
CHAPTER 3: Research Findings	13
Survey Results	13
ADA Requirements.....	16
Practices for Handling Oversize and Overweight Mobility Aid and Passenger Requests.....	19
State Survey	19
Transit Operator Survey	20
Vehicle Design and Operation Impacts.....	24
Mobility Aid Builder Design Initiatives.....	25
SECTION 4: Conclusions, Recommendations, and Suggested Research	28
Conclusions.....	28
Recommendations	30
Suggested Research.....	30
REFERENCES	32
APPENDIX A: Transporting Oversize Wheelchairs State Survey	A-1
Questionnaire	A-1
Responses	A-4
APPENDIX B: Transporting Oversize Wheelchairs Transit Agencies Survey.....	B-1
Questionnaire	B-1

Responses	B-5
APPENDIX C: Pertinent ADA Requirements	C-1

LIST OF FIGURES AND TABLES

Table 1: States that Responded to Internet Survey	9
Table 2: Matrix of Transit Operator Responses	10
Table 3: Pertinent ADA Requirements for All Vehicles	16
Table 4: State DOT Representatives Asked to Complete Internet Survey	32
Table 5: Paratransit Vehicle Manufacturers Contacted to Complete Interviews	34
Table 6: Mobility Aid Manufacturers Contacted to Complete Interviews	35

AUTHOR ACKNOWLEDGMENTS

The research reported herein was performed under NCHRP Project 20-65 (Task 31) by AECOM of Arlington, Virginia. Mr. Scott Baker, Senior Consulting Manager at AECOM was the Project Advisor, Ms. Vi Truong, Consultant at AECOM was the Principal Investigator and Ms. Laura Riegel, Analyst at AECOM, served as the technical expert on this task.

The authors wish to thank the states' Department of Transportation (DOT) representatives, transit operator representatives, vehicle and mobility device manufacturers, university experts, and the Disability Rights Education and Defense Fund (DREDF) who contributed to this study.

ABSTRACT

This report documents and presents the problems with transporting oversize wheelchairs as defined by transit agencies, state DOTs, vehicle and mobility device manufacturers, university experts, and advocacy agencies. It also provides information on the pertinent Americans with Disability Act (ADA) requirements for transporting wheelchairs on transit systems, industry practices on how to handle passenger requests that involve oversize and overweight mobility aides and passengers, and a series of recommendations for consideration by the American Association of State Highway and Transportation Officials Multi-State Technical Assistance Program.

This research effort was conducted while the ADA was in the process of revision. However, after the completion of the research the Department of Transportation 49 CFR Parts 37 and 38 which are relevant to this study were amended and revised into final rule effective October 19, 2011. The final rule requires intercity, commuter, and high-speed passenger railroads to ensure, at new and altered station platforms, that passengers with disabilities can get on and off any accessible car of the train. Passenger railroads must provide level entry boarding at the new or altered stations in which no track passing through the station and adjacent to platforms is shared with existing freight rail operations. The level-entry boarding is characterized such that the height of the platform and the door height of the passenger car are aligned so that a passenger using a wheelchair can seamlessly move from one to the other (usually with the assistance of a bridge plate). The final rule does not require passenger railroads to retrofit existing platforms which lead to minimal cost effect to existing systems¹.

The ADA amendment also made modification in the definition of “wheelchair” changing “three or four wheeled devices” to “three or more-wheeled devices.” The change recognized that in recent years, devices that otherwise resemble traditional wheelchairs may have additional wheels (e.g., two guide wheels in addition to the normal four wheels, for a total of six).

The amendment also restricted the definition of common wheelchair to design decisions, rather than operating decisions. While the result of this change is not clear to the authors, it is likely to shift to the transit operating agency some burden for determining that certain wheel-chair user combinations are too large or unsafe.

¹ <http://www.gpo.gov/fdsys/pkg/FR-2011-09-19/pdf/2011-23576.pdf>

EXECUTIVE SUMMARY

Background

The Americans with Disability Act (ADA) requires public and specialized transportation systems to have rolling stock that will accommodate the loading, unloading and in-vehicle securement of a "common wheelchair" and its occupant. Section 37.3 of the DOT's regulations implementing the ADA (49 CFR Parts 27, 37, and 38) defines a "common wheelchair" as a mobility aid belonging to any class of three or more-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds when occupied.² With the development in recent years of more sophisticated and heavier motorized wheelchairs and scooters, passengers with more advanced disabilities (including obesity) are now more mobile and requesting rides on public and specialized transportation systems. Since paratransit vehicles are not necessarily designed to meet these increased size and weight requirements (even though complying with ADA), many providers are considering denying service requests. In addition, many of the new mobility aid devices are not designed to be safely secured in a vehicle causing risk management issues for the passenger and service provider. The objectives of this study were to document and present the problems with transporting oversize wheelchairs as defined by transit agencies, state DOTs, vehicle and mobility device manufacturers, and advocacy agencies.

Work Plan

This study was accomplished by conducting the following seven tasks:

1. Survey states and operators to clearly define the problem as outlined above and its impact on service delivery.
2. Provide clear information on the pertinent ADA requirements current with the research.
3. Provide industry practices on how to effectively handle passenger requests that involve oversize and overweight mobility aides and passengers.
4. Survey paratransit vehicle manufacturers to determine the impact heavier lift loads would have on vehicle design and operation, and what types of vehicle enhancements could be considered when purchasing a paratransit vehicle.
5. Survey mobility aid builders to find out what design initiatives they have or are taking to provide for safely securing their devices in paratransit vehicles.
6. Survey other advocacy organizations (APTA, CTAA, and Project Action) to identify common issues and initiatives being addressed or actions being taken.
7. Provide a series of recommendations for consideration by American Association of State Highway and Transportation Officials Multi-State Technical Assistance Program

ADA Requirements

The surveys for this research were conducted in 2010 and 2011. DOT's regulations were amended in October 2011. The ADA requirements for buses, over-the-road buses, vans, and systems are currently in a process of revision under the provision of the Access Board. The main

² http://www.fta.dot.gov/civilrights/ada/civil_rights_3894.html

changes proposed relate to reducing maximum severity of the ramp slope, circulation paths, and wheelchair space on transit vehicles. These proposed changes have one main implication: they compromise the rider capacity of the transit vehicle. As a result, transit agencies will not be able to transport as many passengers at once and will have to make multiple trips on the same route or acquire larger vehicles which will result in increased cost. The Access Board is also examining specification for lifts and other aspects of vehicles. The Department of transportation is reliant upon the Access Board's guidelines for portions of the regulatory requirement.

State and Operator Perspective

Most states that responded to the survey reported that some agencies within their jurisdiction encounter and have difficulty transporting customers in oversize/un-securable mobility devices. However, most states that responded to the survey reported that few agencies within their jurisdiction have been unable to provide service to those customers.

Most operators that responded to the survey reported that less than one percent of demand response passengers are requesting or using service in oversize/un-securable mobility devices. Most agencies also reported that less than one percent of demand response passengers use a mobility device that has created difficulty because the device was oversized. Some agencies reported having difficulty transporting passengers who use devices that were not designed and tested to be properly secured on a paratransit vehicle. Overall, most agencies that responded to the survey have been able to provide service to passengers who use oversize/un-securable mobility devices.

Most operators had a policy to address oversize/un-securable mobility devices during the ADA eligibility certification process that included citing the ability to refuse transportation based on the "common wheelchair" definition described above. However, at most agencies who responded to the survey, less than one percent of demand response passengers actually applied to use oversize/un-securable mobility devices during the ADA eligibility certification process. Most agencies rarely or never denied the specific use of these devices during the ADA eligibility certification process. A few agencies had scheduling service priorities for oversize/un-securable mobility devices, including scheduling these passengers first, sending two drivers to assist the passenger, or sending a vehicle with a larger lift.

Only a few agencies have encountered workers compensation costs or damage to vehicles due to oversize/un-securable mobility devices. With few exceptions most of the states and/or operators have not experienced significant written or formal allegations of illegality or negative presentation in the media for lack of accommodation for clients with oversize/un-securable mobility devices. With few exceptions, most states and transit operators have not acquired larger size vehicles and lift combinations to accommodate oversize/un-securable mobility devices.

Drivers at most transit agencies that responded to this survey determine whether or not mobility devices exceed their agency's policy standards by trial and error with the lift, however many agencies tried to pre-screen passengers to avoid problems at the time of travel. If a driver does encounter a passenger that he or she cannot accommodate with the lift, most agencies have a policy for the driver to call a supervisor and file an incident report for ADA investigation.

Although few agencies incurred workers' compensation or vehicle damage costs because of oversize/un-securable mobility devices, many agencies had risk management and safety concerns relating to these devices. The agencies' main concerns regarding risk management issues arising

from oversize/un-securable mobility devices were injuries to passengers and operators, and damage to equipment.

Vehicle Manufacturers' Perspective

Paratransit vehicles are currently designed to maximize the interior space; the accommodation of oversize/overweight mobility devices would reduce seating and available payload weight capacity in the majority of vehicles. Vehicle manufacturers would have difficulty increasing the available payload capacity in smaller paratransit vehicles to accommodate heavier wheelchairs because chassis manufacturers are not willing to redesign their chassis considering the small market for paratransit vehicles. (Approximately 23,000 ADA Compliant Demand Response Vehicles operating at NTD agencies in 2008 out of over eight million vehicles manufactured in the US in 2008). Transit agencies that want to increase the available space and payload in their paratransit vehicles will likely have to order a larger vehicle. Adding additional securement in transit vehicles is not a significant issue.

Mobility Aid Manufacturers and University Expert Perspective

The university experts contacted reported that WC19 wheelchairs are the easiest to maneuver and secure in transit vehicles. WC19 is a voluntary industry standard for designing, testing and labeling a wheelchair that is ready to be used as a seat in a motor vehicle. The WC19 standard includes:

- Four permanently attached and labeled securement points that can withstand the forces of a 30 mph, 20 g impact.
- Specific securement point geometry that will accept a securement strap end fitting hook.
- A clear path of travel that allows proper placement of vehicle mounted occupant safety belts next to the skeletal parts of the body,
- Anchor points for an optional wheelchair anchored pelvic safety belt that is designed to withstand a 30 mph, 20 g impact that has a standard interface on it that allows it to connect to a vehicle-anchored shoulder belt.³

Not all manufacturers are comfortable marketing their wheelchairs for use on a moving vehicle, even if they are WC19 compliant. Additionally, health insurance providers do not always cover the additional cost of these wheelchairs (approximately \$250).

The four point strap tie-down system is a universal system that can adapt to a range of wheelchair types, styles and models, and provide for effective securement. This system is used by the majority of transit systems and is WC19 compliant. It is not always easy to use because two of the securement locations are next to the bus wall, requiring the operator to reach under the passenger's body to secure the straps. Wheelchairs that are not WC19 compliant do not always have easily accessible frames to attach the tie-down system. Heavier wheelchairs can be safely secured by using two additional securement straps in the rear of the wheelchair; this does not require any alterations of the vehicle itself.

A major issue in paratransit vehicles is training the operator and passenger to correctly secure the occupant restraint system to prevent passenger injury during an accident.

³ <http://www.rercwts.org/WC19.html>

Recommendations

Currently oversized wheelchairs were not a significant problem, but AASHTO should monitor this issue in the near and long term to keep it from becoming significant. According to the National Health and Examination Survey (NHANES), about one-third of U.S. adults are obese and approximately 17% of children and adolescents aged 2-19 years are obese⁴. The issues of most importance as determined by this study show that there is little coordination between wheelchair manufacturers, vehicle manufacturers, mobility device prescribers, and insurance providers. Vehicle manufacturers challenge the wheelchair manufacturers to design smaller, lighter or more convertible wheelchairs, but the wheelchair manufacturers cannot do this without increasing costs which insurance providers will not likely pay for. Risk management and safety issues, including training, relating to properly securing a mobility device on vehicles are also important.

WC19 wheelchairs are ready to be used as a seat in a motor vehicle and are easy to maneuver and secure in transit vehicles. Every wheelchair manufacturer has some WC19 compliant wheelchairs, but not all advertise their devices this way because they do not want to face the risk of advertising a wheelchair for use in a moving vehicle. Medical practitioners who are prescribing mobility devices to their patients should let their patient know that if they want to ride in a motor vehicle as a passenger they should buy a WC19 wheelchair. However, the extra cost (approximately \$250) is not usually covered by third party providers.

Education about WC19 compliance and coordination between all of these agencies would help shed light on these issues and begin a conversation between interested parties about how to make WC19 compliant wheelchairs more affordable and accessible to people who want or need to use their wheelchair on a transit vehicle.

During the certification process, transit agencies can provide recommendations for attachments to wheelchairs that are not WC19 compliant to make them safe for securement. Since vehicle operators are instrumental in the safety of the passenger through proper securement of the wheelchair to the vehicle, operators should continue to ensure that operator training in this area remains a priority in paratransit services.

Suggested Research

Reviewing this topic from the perspective of the medical practitioners who are prescribing mobility devices and the third party payers would be a worthwhile pursuit. Medical practitioners are often not aware that their patients might want to ride on a transit vehicle in the prescribed wheelchair. If the doctors are aware of the transportation need and are educated about the WC19 then they will more likely prescribe such wheelchairs and advocate to third party payers to at least pay for a portion of the additional cost.

Further analysis of the wheelchair market that evaluates the number of wheelchair clients that are dependent on public transit could extrapolate the level of demand so each party can understand the extent of the need for efficient coordination. Oregon was in the process of initiating a pilot project to specify, purchase, use and test up to two types of vehicles for oversize/weight transportation in an integrated ride environment. Data was to be collected and the state is

⁴ <http://www.cdc.gov/obesity/data/trends.html>

considering providing a state bid for vehicles once the pilot is complete. Analysis of this pilot program and its applicability to other states would be beneficial.

Model training programs for the proper securement of mobility devices in transit vehicles should be explored. The Community Transportation Association of America (CTAA) has a training course “The Passenger Service and Safety (PASS) Driver Certification Program” which trains transportation drivers on the current practices in passenger assistance techniques and sensitivity skills appropriate for serving person with disabilities. The program is designed as a three-day Train-the-Trainer to certify trainers who can then train drivers or as a two-day driver program in which CTAA’s instructors train the drivers. Texas has adopted this training to their systems and it is available to other states.

CHAPTER 1: Background

Problem Statement and Research Objective

The Americans with Disability Act (ADA) requires public and specialized transportation systems to have rolling stock that will accommodate the loading, unloading and in-vehicle securement of a "common wheelchair" and its occupant. Section 37.3 of the DOT's regulations implementing the ADA (49 CFR Parts 27, 37, and 38) defines a "common wheelchair" as a mobility aid belonging to any class of three or more-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds when occupied.⁵ The ADA is a comprehensive Civil Rights law. It covers public as well as private entities to ensure that people with disabilities are not discriminated against unfairly in this country. The transportation provision covers bus, rapid rail, commuter rail, light rail, ferries, paratransit services, sidewalks and pedestrian access and privately operated transportation services. Since passage of the ADA, new technologies (e.g. rail platform gap closure devices and powered bus ramps) have been introduced in the areas of boarding and securement and new designs for wheelchairs have been developed.

With the development in recent years of more sophisticated and heavier motorized wheelchairs and scooters, passengers with more advanced disabilities (including obesity) are now more mobile and requesting rides on public and specialized transportation systems. Since the vehicles are not necessarily designed to meet these increased size and weight requirements (even though complying with ADA), many of these providers were considering denying service requests. In addition, many of the new mobility aid devices are not designed to be safely secured in a vehicle causing risk management issues for the passenger and service provider. The objectives of this study were to document and present the problems with transporting oversize wheelchairs as defined by transit agencies, state DOTs, vehicle and mobility device manufacturers, and advocacy agencies.

Scope of Study

Although the issue of oversized wheelchairs affects all modes, it is uniquely acute and troublesome in paratransit where the issues must be addressed customer-by-customer and trip-by-trip. In fixed route services, the engineering issues are simpler than in paratransit (weight is generally not problematic for rail except where lifts are used), and strict operating procedures clear enough to be administered by vehicle operators and station personnel are accepted. Paratransit is the complementary mode and expectations for accommodation are higher. Furthermore, the engineering issues for paratransit vehicles are more significant than for rail and bus. The issues range from lift structure and mechanics to tire size and capacity. There is virtually no level boarding in paratransit, and ramps are not as prevalent as in buses. Therefore, this effort was focused on how transporting oversize wheelchairs affects paratransit operations.

The research addressed the combined weight of the wheelchair and passenger, the size of the wheelchair, and the ease of securement of the wheelchair and passenger. The first two (weight and size) are covered by regulations and changes are being considered, as described below.

⁵ http://www.fta.dot.gov/civilrights/ada/civil_rights_3894.html

Securement of the wheelchair and passenger may be difficult for devices that meet the size and weight limits, but is often more difficult for wheelchair/passenger combinations that exceed the limit. Weight of the wheelchair and passenger combination is not an eligibility issue, as a passenger may use many different mobility devices, but may be a consideration in deciding to transport a passenger. Difficulty of securement is also not an eligibility issue and passengers are not required to allow securement, but safety of the operator and all passengers including the implications of lack of securement may be a consideration in deciding to transport a passenger.

CHAPTER 2: Research Approach

This research project was conducted in the following seven tasks:

1. Survey states and operators to clearly define their problems with oversize wheelchairs and their impact on service delivery
2. Provide clear information on the pertinent ADA requirements.
3. Provide industry practices on how to effectively handle passenger requests that involve oversize and overweight mobility aides and passengers.
4. Survey paratransit vehicle manufactures to determine the impact heavier lift loads would have on vehicle design and operation, and what types of vehicle enhancements could be considered when purchasing a paratransit vehicle,
5. Survey mobility aid builders to find out what design initiatives they have or are taking to provide for safely securing their devices in paratransit vehicles.
6. Survey other advocacy organizations (APTA, CTAA, and Project Action) to identify common issues and initiatives being addressed or actions being taken.
7. Provide a series of recommendations for consideration by AASHTO and MTAP

The research team initiated Task 6 at the beginning of the project to identify common issues that were included on the survey of states and operators in Task 1. The team communicated with advocacy organizations throughout the project to review progress and recent developments.

The team collaborated with many representatives from states' Department of Transportation (DOT) representatives, transit operator representatives, vehicle and mobility device manufacturers and university experts, and advocacy agencies who are all listed with their contact information in the References Section.

The surveys for this research were conducted in 2010 and 2011. DOT's regulations were amended in October 2011. The ADA requirements for buses, over-the-road buses, vans, and systems are currently in a process of revision under the provision of the Access Board. The main changes proposed relate to reducing maximum severity of the ramp slope, circulation paths, and wheelchair space on transit vehicles. These proposed changes have one main implication: they compromise the rider capacity of the transit vehicle. As a result, transit agencies will not be able to transport as many passengers at once and will have to make multiple trips on the same route or acquire larger vehicles which will result in increased cost. The Access Board is also examining specification for lifts and other aspects of vehicles. The Department of transportation is reliant upon the Access Board's guidelines for portions of the regulatory requirement.

Task 1

Survey states and operators to clearly define their problems with oversize wheelchairs and their impact on service delivery

The research team interviewed advocacy organizations such as APTA, CTAA, and Project Action to identify common issues with the transportation of oversized wheelchairs. Based on these interviews, AECOM developed a separate survey for state DOTs and operators to define their problems with oversize wheelchairs and their impact on service delivery, shown in Appendix A and B respectively. Both surveys were submitted to the NCHRP Panel, as well as the advocacy agencies (APTA, CTAA, and Project Action) for comment and approval.

State Survey

AECOM created a survey using the internet software SurveyMonkey™ and distributed it to the appropriate public transportation personnel at each of the 50 State DOTs and the District of Columbia. The research team used the contact list provided in the *Survey of State Funding for Public Transportation* report. The state public transit department web-site was also a source for the contact list. There were 47 responses in total, 29 of which identified their states. Some states had multiple responses. Responses were collected from the following states:

Table 1: States that Responded to Internet Survey

State	Number of Responses
Alabama	1
Alaska	1
District of Columbia	1
Georgia	1
Illinois	1
Maryland	1
Missouri	6
Montana	1
Nebraska	1
Oregon	1
South Dakota	1
Texas	9
Washington	1
Wisconsin	3

Appendix A shows the survey that was completed by the DOT representatives followed by the detailed responses.

Operator Survey

AECOM created a survey using the internet survey software, SurveyMonkey™, and distributed it to transit operator representatives across the country. Email addresses for appropriate transit representatives were acquired from transit agency contact information on the National Transit Database website. The validity of the survey was ensured by setting a target of at least 50 valid responses. This number ensured that widespread issues would be identified. The research team

sought respondents from at least 12 small urban rural systems, at least 10 systems from urbanized areas 50,000 – 200,000, at least six systems in areas 200,000 – 1,000,000 and at least four systems in the larger urbanized areas. Similarly, the team sought respondents from at least the minimum number of the “Target” column totals from each respective region. There were 75 responses in total, 50 of which identified their transit agency.

The following matrix shows the “Actual” distribution of survey responses by urban area size and region for those responses that identified the agency. As seen in the table, the team did not meet the target number of respondents by four for the Northeast region. The sample was short by one for the Southwest, Pacific, and North Central/Midwest regions. The team made multiple distributions of the survey to meet the targets but the team had to close the survey in order to deliver the report in a timely manner. However the team believes that the sample is representative of the industry for this study.

Table 2: Matrix of Transit Operator Responses

(Note: 25 additional responses did not identify the agency or its characteristics)

Region/ Urban Area Size	Northeast	Southeast	Southwest	Pacific	North Central/ Midwest	Canada	Target	Actual
Rural and <50,000							>12	22
50,000- 200,000							>10	13
200,000- 1,000,000							>6	9
>1,000,00 0							>4	6
Target	>10	>4	>5	>8	>5	N/A	>50	50
Actual	6	27	4	7	4	2	>50	50

Appendix B shows the survey that was completed by the transit operator representatives followed by the detailed responses.

Task 2

Provide clear information on the pertinent ADA requirements

The Americans with Disabilities Act (ADA) prohibits discrimination on the basis of disability in the provision of transportation services by public and private entities. 42 U.S.C. §§12101 et seq. The ADA sets out different responsibilities for the Architectural and Transportation Barriers Compliance Board (Access Board) and the Department of Transportation with respect to implementing the statute.

The ADA requires the Access Board to issue guidelines for transportation vehicles that are readily accessible to and usable by individuals with disabilities. 42 U.S.C. §12204. These guidelines, by themselves, are not legally enforceable and do not require existing transportation vehicles to be retrofitted.⁶

The U.S. Access Board is currently updating guidelines for buses and vans. The updated guidelines were released in draft form for public comment in April 2007. The research team reviewed in detail the pertinent ADA requirements listed on the Access Board website (<http://www.access-board.gov/transit/index.htm>) and has accounted the status of the guidelines and known probable impacts on the explanation of requirements. The detailed requirements are listed in Appendix C.

Task 3

Provide industry practices on how to effectively handle passenger requests that involve oversize and overweight mobility aides and passengers

As part of the state and operators survey, AECOM included questions for survey participants to provide practices on how to effectively handle passenger requests that involve oversize and overweight mobility aides and passengers. The team analyzed these responses and consolidated suggestions. To ensure that the practices are both valid and generally acceptable, and to assist operators in presenting them in the best light, AECOM reviewed the suggestions with APTA, CTAA, and Project Action advocacy groups for persons with disabilities.

Task 4

Survey paratransit vehicle manufactures to determine the impact heavier lift loads would have on vehicle design and operation, and what types of vehicle enhancements could be considered when purchasing a paratransit vehicle.

AECOM contacted vehicle manufacturers to determine the impact heavier lift loads would have on vehicle design and operation, and what types of vehicle enhancements could be considered when purchasing a paratransit vehicle. The team completed detailed phone interviews with Eldorado National, IC Bus, LLC, and The Braun Corporation.

Task 5

Survey mobility aid builders to find out what design initiatives they have or are taking to provide for safely securing their devices in paratransit vehicles.

AECOM contacted mobility aid builders and securement companies to determine what design initiatives they have or are taking to provide for safely securing their devices on paratransit vehicles. The team completed a detailed interview with Quantum/Pride Mobility. During the survey of transit operators, it was discovered that the securement of mobility devices was a significant issue. Therefore, AECOM focused the research effort of this task on securement issues.

Two of the securement contacts, Q'Straint and Sure-Lok, referred the team to wheelchair securement experts Dr. Lawrence Schneider from the University of Michigan and Dr. Mary

⁶ <http://www.access-board.gov/transit/refresh/notice.htm>

Ellen Buning from the University of Louisville. The team completed detailed interviews with these experts.

Task 6

Survey other advocacy organizations (APTA, CTAA, and Project Action) to identify common issues and initiatives being addressed or actions being taken.

To ensure a focus on the research objectives throughout, AECOM initiated Task 6 at the beginning of the project and periodically reviewed its progress. The team surveyed key personnel from APTA, CTAA, and Project Action to identify common issues and initiatives being addressed or actions being taken for individuals with oversized wheelchairs and weight issues that want or need public transit services. These issues were used to develop the survey of states and operators in Task 1.

Task 7

Provide a series of recommendations for consideration by AASHTO and MTAP

This report concludes with a chapter on recommendations for consideration by AASHTO and MTAP, including requirements for additional research.

CHAPTER 3: Research Findings

Survey Results

State Survey

AECOM created a survey using the internet software SurveyMonkey™ and distributed it to the appropriate public transportation personnel at each of the 50 State DOTs and the District of Columbia. There were 47 responses in total. The most important findings are listed in this section. Appendix A shows the detailed state survey results.

The majority of respondents reported that:

- Some of the agencies within their jurisdiction encountered and had difficulty transporting customers in wheelchairs exceeding the maximum weight definition.
- Few or none of the agencies in their jurisdictions had been unable to provide service to customers in wheelchairs exceeding ADA requirements.
- Their states did not have a policy for transit agencies to address oversize/un-securable mobility devices during the ADA certification process. The states that did have a policy only followed the ADA Regulations.
- Their states did not require transit agencies to suggest alternative modes of transport for customers that did not qualify for ADA certification.
- Most agencies in their jurisdictions had not encountered workers compensation costs due to operator injury while maneuvering oversize/un-securable mobility devices. The few states that had had workers compensation costs mostly reported anecdotally about operator back injuries.
- Most agencies in their jurisdiction had not experienced damage to vehicles due to oversize/un-securable mobility devices. The few states that had had damage mostly reported anecdotally about damage to lifts.
- As the state funding administrators they had not experienced written or formal allegations of illegality for lack of accommodation for clients with oversize/un-securable mobility devices.
- Most operators within their jurisdiction had not been negatively presented in the media for not accommodating clients with oversize/un-securable mobility devices.
- They had not acquired larger size vehicles and lift combinations to accommodate oversize/un-securable mobility devices.
- Their states did not have a scheduling priority policy for transit agencies to follow for accommodating oversize/un-securable mobility devices. Oregon, however, was in the process of initiating a pilot project to specify, purchase, use and test up to two types of vehicles for oversize/weight transportation in an integrated ride environment. Data was to be collected and the state was considering providing a state bid for vehicles once the pilot had been completed.

Operator Survey

AECOM created a survey using the internet survey software, SurveyMonkey™, and distributed it to transit operator representatives across the country. There were 75 responses in total. The most important findings are listed in this section. Appendix B shows the detailed transit operator survey results.

The majority of respondents reported that:

- Less than one percent of demand response passengers requested or used service with oversize/un-securable mobility devices. However, about one-fourth of respondents reported that approximately 20% of demand response passengers requested or used service with wheelchairs or devices that were not designed and tested to be properly secured on a paratransit vehicle.
- Their agencies had difficulty transporting less than one percent of demand response passengers because mobility devices did not meet ADA Regulations. However, about 13% of respondents reported that approximately 20% of demand response passengers had been difficult to transport because mobility devices had not been designed and tested to be properly secured on a paratransit vehicle.
- Less than one percent of demand response passengers had been denied service because their device did not meet ADA Regulations.
- Their agencies had policies to address oversize/un-securable mobility devices during the ADA eligibility certification process. Of those respondents who listed the policy, the majority listed the ability to refuse transportation based on the common wheelchair definition.
- Less than one percent of demand response passengers applied for the use of oversize/un-securable mobility devices during the ADA certification eligibility process.
- They rarely or never denied the use of specific oversize/un-securable devices during the ADA certification eligibility process.
- The alternative modes of transportation suggested for passengers with mobility devices that did not meet the ADA Regulations were: emergency services vehicles, private service providers, or asking the passenger to use a different mobility device.
- Drivers determined whether or not a mobility device exceeds their agency's policy standards by trial and error with the lift and calling supervisors. Some agencies also responded that they tried to evaluate all mobility devices during a pre-screening process.
- Their policies for drivers to follow if they encountered a client in a mobility device that they believe may exceed their agency's requirements was to contact dispatch or a supervisor.
- They had not encountered workers compensation costs due to operator injury while maneuvering oversize/un-securable mobility devices. The few agencies that had had workers compensation costs mostly reported anecdotally about operator back injuries.
- They had not experienced damage to vehicles due to oversize/un-securable mobility devices. The few agencies that had had damage mostly reported anecdotally about damage to lifts.
- They had not experienced written or formal allegations of illegality for lack of accommodation for clients with oversize/un-securable mobility devices.

- They had not been negatively presented in the media for not accommodating clients with oversize/un-securable mobility devices.
- They had not acquired larger size vehicles and lift combinations to accommodate oversize/un-securable mobility devices.
- They did not have a scheduling priority policy to follow for accommodating oversize/un-securable mobility devices.
- Their main concerns regarding risk management issues arising from oversize/un-securable mobility devices were injuries to passengers and operators and damage to equipment.

ADA Requirements

The U.S. Access Board is currently updating guidelines for buses and vans. The updated guidelines were released in draft form for public comment in April 2007. The research team reviewed in detail the pertinent ADA requirements listed on the Access Board website (<http://www.access-board.gov/transit/index.htm>) and has accounted the status of the guidelines and known probable impacts on the explanation of requirements.

Requirements for Buses, Over-the-Road Buses, Vans, and Systems are listed in this section. Appendix C shows a detailed matrix of the pertinent ADA requirements for all types of vehicles.

Table 3: Pertinent ADA Requirements for All Vehicles

Category	Current Rule	Proposed Rule
General	New, used or remanufactured buses and vans, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with the applicable provisions of this subpart. If portions of the vehicle are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible vehicles be retrofitted with lifts, ramps or other boarding devices.	N/A
Mobility Aid Accessibility	Provide a level-change mechanism or boarding device (e.g., lift or ramp) and sufficient clearances to permit a wheelchair or other mobility aid user to reach a securement location.	N/A
Ramp Slope	Ramps shall have the least slope practicable and shall not exceed 1:4 when deployed to ground level.	Slope to not exceed 1:6 when deployed to boarding and alighting areas without station platforms and to the roadway
Circulation Paths	Require transit operators to transport wheelchairs and scooters that are up to 30 inches wide and 48 inches long	Requires circulation paths connecting doorways that provide accessible boarding and wheelchair spaces to be at least 34 inches wide. This dimension does not apply to doorways, which are addressed in T503. This dimension applies from the vehicle floor to a height 40 inches minimum above the vehicle floor. The circulation path width can be reduced to 30

		inches at heights 40 inches minimum above the vehicle floor
Wheelchair Space	Require transit operators to transport wheelchairs and scooters that are up to 30 inches wide and 48 inches long	Requires 1 inch minimum maneuvering clearance on the short side of wheelchair spaces entered from the front or rear [the total size of the wheelchair space and maneuvering clearance is 31 inches by 48 inches minimum]; Requires 6 inches minimum maneuvering clearance on the long side of wheelchair spaces entered from the side [the total size of the wheelchair space and maneuvering clearance is 30 inches by 54 inches minimum].
Wheelchair Securement	At least two securement locations and devices shall be provided on vehicles in excess of 22 feet in length; at least one securement location and device, shall be provided on vehicles 22 feet in length or less. The securement system shall be placed as near to the accessible entrance as practicable and shall have a clear floor area of 30 inches by 48 inches. Such space shall adjoin, and may overlap, an access path. When the wheelchair or mobility aid is secured in accordance with manufacturer's instructions, the securement system shall limit the movement of an occupied wheelchair or mobility aid to no more than 2 inches in any direction under normal vehicle operating conditions.	N/A
Vehicle Lift Design Load	The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the	N/A

	material.	
Vehicle Ramp	<p>Ramps 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps shorter than 30 inches shall support a load of 300 pounds.</p> <p>The ramp surface shall be continuous and slip resistant; shall not have protrusions from the surface greater than 1/4 inch high; shall have a clear width of 30 inches; and shall accommodate both four-wheel and three-wheel mobility aids.</p>	N/A

Practices for Handling Oversize and Overweight Mobility Aid and Passenger Requests

As part of the state and operators survey, AECOM included questions for survey participants to provide practices on how to effectively handle passenger requests that involve oversize and overweight mobility aids and passengers. The team analyzed these responses and consolidated suggestions. Appendix A and B show the full state and transit operator survey results, respectively.

To ensure that the practices are both valid and generally acceptable, and to assist operators in presenting them in the best light, AECOM reviewed the suggestions with the Disability Rights Education & Defense Fund (DREDF) and the American Public Transportation Association (APTA).

The most important findings are in this section including relevant comments from the DREDF and APTA.

State Survey

- Most states responded that the transit agencies within their jurisdictions were required to make every effort to reasonably accommodate passengers with special needs in accordance with the Americans with Disabilities Act and “common wheelchair” definition.
 - The DREDF commented that this is a good policy.
- If a customer does not qualify for ADA certification due to the oversize/un-securable characteristics of their mobility device, there are not many other options. Sometimes passengers were referred to non-emergency medical transportation providers or asked to use a smaller chair, or to transfer chair.
 - The DREDF commented that the common wheelchair definition and wheelchair securement rules are separate, independent requirements. Under the ADA, a transit agency may not refuse to provide transportation to a person with a disability because they can’t be secured.
- Most states did not have a scheduling policy for transit agencies to follow for accommodating oversize/un-securable mobility devices. Oregon was in the process of initiating a pilot project to specify, purchase, use, and test up to two types of vehicles for oversize/weight transportation in an integrated ride environment. Data was to be collected and the state was considering providing a state bid for vehicles once the pilot was complete.
 - The DREDF commented that this is a worthwhile research effort.
 - APTA noted that this project is going beyond the ADA requirement in transporting oversize/overweight mobility devices (including wheelchairs). This may set up service providers for litigation if the transit system is providing for some people using oversize/overweight devices but cannot provide for all.
- Some states were suggesting that transit agencies in their jurisdiction order lifts with a capacity of 800 pounds, instead of 600 pounds.
 - The DREDF commented that this is a good policy.
 - APTA noted that ordering lifts with a greater capacity than 600 pounds may be cost-prohibitive for many transit systems and this goes beyond the ADA requirement.

Transit Operator Survey

ADA Eligibility Certification Process

- Some agencies performed pre-screening processes to test whether or not an oversized device would actually fit on the agency paratransit vehicle, while other agencies had no pre-screening process.
 - The DREDF commented that any pre-screening should be separate from eligibility determinations. There is a topic Guide on Eligibility in the ADA Paratransit Section entitled “Don’t: Mix Eligibility with the Common Wheelchair Definition.”⁷ While no agency reported pre-screening for fixed route service, DREDF commented that pre-screening for fixed route service is considered discrimination under the ADA.
 - APTA commented that the topic guide cited is the opinion of one organization and APTA understands that the Federal Transit Administration has not approved the document.
- Most agencies stated that they could refuse to transport passengers who use wheelchairs that do not meet the standard ADA requirements for a common wheelchair. At some agencies, if the wheelchair met all other requirements, but was not securable, the operator might ask the passenger to switch to a regular seat with a seatbelt.
 - The DREDF commented that under the ADA, a transit agency may not require the use of a seatbelt unless seatbelts are provided at all seats, and all passengers are required to use them.
- One agency weighed clients at the time of the certification assessment. The customer must meet the ADA requirement of 600 pounds or less and have a wheelchair that met the definition of a "common wheelchair." However, there were few circumstances where individuals exceeded the limit. The agency was legally advised to transport those individuals with the stipulation that they were able to get themselves to the vehicle either under their own power or by the use of an assistant.
 - The DREDF commented that the assessment for paratransit eligibility should be conducted separately from any weighing of the wheelchair⁸.
- One agency uses Transportation Coordinators (TC) that were part of the Human Services network to conduct in-person functional assessments for transportation. TC's had a variety of services that they offered older adults and persons with disabilities to help problem-solve issues including those related to transportation (For example, home delivered meals).
- One agency would send staff to meet with the rider to determine securement options.

⁷ Disability Rights Education & Defense Fund (DREDF) and TranSystems Corporation. "Topic Guide on Eligibility in ADA Paratransit." Federal Transit Administration, June 2010. Web. 18 Apr. 2011. <<http://www.dredf.org/ADAtg/elig.shtml>>.

⁸ Disability Rights Education & Defense Fund (DREDF) and TranSystems Corporation. "Topic Guide on Eligibility in ADA Paratransit." Federal Transit Administration, June 2010. Web. 18 Apr. 2011. <<http://www.dredf.org/ADAtg/elig.shtml>>.

Alternatives Suggested

- Some agencies referred passengers with oversize/un-securable devices to ambulance services, church buses, taxis, private service providers, etc. that might be able to assist them with their transportation needs. One agency offered to pay mileage for private transportation. This alternative might be more cost effective than using a larger vehicle.
 - The DREDF commented that a transit agency may not, under the ADA, deny transportation because it can't secure an individual's wheelchair. That there is not necessarily a relationship between whether a transit agency can secure a wheelchair, and whether the wheelchair is oversized, because in many cases, a wheelchair that is not oversized may still not be able to be secured by a transit agency, because of lack of training of transit agency staff. A transit agency may not, under the ADA, deny transportation because it can't secure an individual's wheelchair. The DREDF commented that paying mileage is a good approach.
 - APTA commented that the inability to secure a device on board is not sufficient reason to deny a trip except when the device poses a safety problem for other passengers or the operator. The operator must decide. In addition, mileage reimbursement payment would be untenable for most transit systems and beyond the requirements of the ADA.
- Some agencies offered the option of the client boarding out of chair, if able.

En-route Determination

- Many agencies reported that drivers determined en-route whether or not a mobility device exceeded their agency's standards in the process of trying to get the mobility device on and off of a vehicle. Common ways to tell if a device exceeded standards included: (1) If they were unable to safely secure the device and if there was not enough room to safely transport the rider, (2) if the lift would not lift the client in the chair, and (3) if the wheelchair did not fit on the lift
 - The DREDF commented that a transit agency may not, under the ADA, deny transportation because it can't secure an individual's wheelchair because there is not necessarily a relationship between whether a transit agency can secure a wheelchair, and whether the wheelchair is oversized, because in many cases, a wheelchair that is not oversized may still not be able to be secured by a transit agency due to lack of training of staff. A transit agency may not, under the ADA, deny transportation because it can't secure an individual's wheelchair.
 - APTA suggests that there are many reasons that a mobility device may not be secured onboard so it is best not to call out only one reason, the "lack of training of staff."
- At one agency, if the driver suspected that the combined weight was in excess of 600 lbs. then they radioed dispatch for further instructions. They were then asked to take the van and passenger/wheelchair to a weigh station in town. The van was weighed and then the passenger delivered (if possible). The van then returned to the weigh station for a second weighing. The tare was calculated for the weight of the passenger and wheelchair. If a wheelchair is too wide then a tape measure was used to measure the width of the wheelchair.

- The DREDF commented that this is a very problematic practice. There could be a variety of reasons that the first and second weighing vary which are not attributable to the wheelchair weight, such as the amount of gas that has been used, and/or other variables. They also question the accuracy of these types of large scales.
 - APTA commented that (1) weighing the vehicles could result in inconsistent data. The many variables include whether the gas tank is full or empty and many other factors. (2) Measuring whether the mobility device fits within the 30x48 footprint seems an acceptable practice in complying with the ADA and does not appear to be a burden on the transit operator.
- Some agencies required that all approved devices were stickered and the specific information about the make, model, color and sticker number was denoted on the driver's manifest. Some agencies instructed drivers to call radio control before boarding a wheelchair that was not listed on the manifest. In one case, radio control would then research and if the chair was not approved could inform the driver to deny transportation.
 - The DREDF commented that this appears to be an illegal practice under the ADA, which forbids capacity constraints that would reduce the availability of ADA-required service. An individual with a disability may have a new wheelchair, may be using a loaner wheelchair while his or her own wheelchair is being repaired, or may have an un-stickered wheelchair for any number of other legitimate reasons. The individual is still guaranteed the ride by the ADA and may not legally be denied it. There is also considerable risk of illegal denial of service with this policy because the information required by the agency's procedures may not be present on an individual's wheelchair for reasons due to the agency's own error, such as loss of data, incorrect recording of data, and/or other errors.
- Drivers (at agencies that did not pre-screen devices) that encountered an oversize/unsecurable device at the time of transport were advised to contact their supervisor to determine individual solutions, including sending a larger vehicle, or vehicle with a larger lift or ramp.
 - The DREDF commented that sending a larger vehicle is a good policy, though there is not necessarily any connection between oversized wheelchairs (common wheelchair definition) and non-securable wheelchairs under the ADA. Riders of wheelchairs that can't be secured may still not be denied service under the ADA.
 - APTA commented that the inability to secure a device on board is not sufficient reason to deny a trip except when the device poses a safety problem for others, including the operator.
- At some agencies the drivers attempted to assist all mobility aid users. When either the customer could not fit on the lift or the lift could not lift the customer after multiple attempts, the driver contacted dispatch requesting a supervisor's assistance. A supervisor might use the manual function of the lift to board the passenger. If the supervisor was unable to assist the customer to board a vehicle, and if the customer was at home, the trip was cancelled; otherwise alternative vehicle arrangements were made.
- If the initial assessment was questionable, the driver would turn the information into the ADA office for investigation.

- At some agencies, the road supervisor could measure the chair, but it was up to the passenger to tell the combined weight.
- At one agency, if the mobility device was un-securable or not a “common wheelchair,” they read this statement to the passenger: “It is not safe for anyone to use this mobility device for a seat in a moving vehicle, ‘anyone’ could be injured in a quick stop or an accident. ‘Anyone’ would be safer sitting in a stationary seat on a moving vehicle.”
 - The DREDF commented that under the ADA, it is illegal to deny transportation because a transit agency cannot secure a wheelchair.
 - APTA commented that the inability to secure a device on board is not sufficient reason to deny a trip except when the device poses a safety problem for others, including the operator.
- One agency secured all devices that could fit onto the vehicle and used a customer designed "scooter strap" to bridge the foot platform on scooters.
 - The DREDF commented that the use of whatever strapping that enables the transit agency to conduct the ADA-required securement of scooters is a good practice.
 - APTA commented that using the securement strap from the passenger’s mobility device suggests liability for the transit agency.
- One agency would refuse overweight mobility aids. They would accommodate oversized devices if it did not affect any other passengers on the route. If the device could not be properly secured, they advised the passenger that it was not properly secured, advised them of their options, and documented if the passenger chose to be transported on the mobility device not properly secured.
- Some agencies had never had a problem with oversized/un-securable mobility devices.
 - The DREDF commented that these agencies should be studied to show that accommodating a variety of mobility devices is not difficult.

Service Priority

- Most agencies did not have scheduling priorities for oversized wheelchairs.
- One agency scheduled oversize/un-securable mobility devices prior to other mobility aids.
 - The DREDF commented that this is an acceptable policy under the ADA.
- Some agencies denied service to oversize/un-securable mobility devices.
 - The DREDF commented that it is not legal under ADA to deny transportation solely because a wheelchair cannot be secured.
- One agency scheduled two drivers to assist oversize/un-securable mobility devices.
 - The DREDF commented that this is a good practice.
- One agency transported their oversize/un-securable mobility device customer in their oversized lift vehicle.
 - The DREDF commented that this is a good practice.
- At one agency, when a client in a large chair did need a ride it was sometimes necessary to schedule the ride manually and insure that no additional chairs were scheduled on that vehicle.
 - The DREDF commented that this is a good practice.

Vehicle Design and Operation Impacts

AECOM contacted vehicle manufacturers to determine the impact heavier lift loads would have on vehicle design and operation, and what types of vehicle enhancements could be considered when purchasing a paratransit vehicle. The team completed detailed phone interviews with Eldorado National, IC Bus, LLC, and The Braun Corporation. The most important findings are listed in this section.

Vehicle Configuration

- Most paratransit vehicles have essentially the same width and length and are currently maximized for space [Eldorado].
- Minivans (after conversion) have a payload weight of 1,600 pounds. Heavier wheelchairs only affect payload capacity [Braun].
- Configuring a vehicle to accommodate larger/heavier wheelchairs will have a cost implication and most likely cause the vehicle to lose seating capacity, potentially requiring the agency to increase the number of vehicles in their fleet [Eldorado].
- Every ¼” of usable space is a huge advantage over competitors. Every manufacturer has the floor space maximized. If the agency needs more space in a vehicle, they will have to buy a larger vehicle [Braun].
- Manufacturers need to be sure that ADA aisle width requirements are being met in full sized vehicles [Braun].

Chassis Manufacturing

- Approximately 23,000 ADA Compliant Demand Response Vehicles are operated at NTD agencies every year (NTD 2008). This market represents less than two percent of the US vehicle manufacturing market [Eldorado].
- If a vehicle manufacturer asks their chassis supplier for a change in chassis configuration to accommodate larger wheelchairs, the supplier is likely to tell them to use another supplier because the cost of that change is not profitable based on the small market share [Eldorado].
- A typical cutaway chassis for an Eldorado has a 14,500 gross vehicle weight rating and is capable of carrying 16 ambulatory and 2 wheelchairs. To switch to a larger chassis from another manufacturer would increase costs by \$10,000 to \$15,000 [Eldorado].

Securement

- Agencies decide what type of securement system they want to use. The vehicle manufacturer can accommodate most systems [Eldorado].
- The agency would have to pay for any additional securement needed, but the manufacturer would not have to change the track system used resulting in minimal impact to the vehicle manufacturer [IIC, Braun].

Wheelchair Lift

- The wheelchair lift has a safety factor of +20% so additional weight proposed will not be a significant issue [Eldorado].
- Raising the weight limit by 35-50% will cause vehicle lean and force manufactures to change suspension design resulting in a \$1,200 - \$1,800 price increase per vehicle [IIC].

- In ADA compliant double door vehicles, a 42-48” opening allows you to operate the lift without any risk of injuries [IIC].
- Paratransit vehicles can’t deal with 1000 pounds hanging outside of the bus. The suspension would have to be increased [Braun].

Wheelchair Maneuvering Room

- Increasing the wheelchair maneuvering room will displace other seating [EIDorado].
- Every wheelchair takes the space of four seating positions [IIC].
- Increasing the width of the wheelchair past 30” would eliminate minivans as a paratransit option because the minivan door opening (after modifications) is maximized at 30” [Braun].

Mobility Aid Builder Design Initiatives

AECOM contacted mobility aid builders and securement companies to determine what design initiatives they have or are taking to provide for safely securing their devices on paratransit vehicles. The team completed a detailed interview with Quantum/Pride Mobility. During the survey of transit operators, it was discovered that the securement of mobility devices was a significant issue. Therefore, AECOM focused the research effort of this task on securement issues.

Two of the securement contacts, Q’Straint and Sure-Lok, referred the team to wheelchair securement experts Dr. Lawrence Schneider from the University of Michigan and Dr. Mary Ellen Buning from the University of Louisville. The team completed detailed interviews with these experts, who were especially informative. The most important observations are listed in this section.

Interviewee Observations Concerning Wheelchairs

- The university experts contacted reported that WC19 wheelchairs are the easiest to maneuver and secure in transit vehicles. WC19 is a voluntary industry standard for designing, testing and labeling a wheelchair that is ready to be used as a seat in a motor vehicle. The WC19 standard includes:
 - Four permanently attached and labeled securement points that can withstand the forces of a 30 mph, 20 g impact.
 - Specific securement point geometry that will accept a securement strap end fitting hook.
 - A clear path of travel that allows proper placement of vehicle mounted occupant safety belts next to the skeletal parts of the body,
 - Anchor points for an optional wheelchair anchored pelvic safety belt that is designed to withstand a 30 mph, 20 g impact and has a standard interface on it that allows it to connect to a vehicle-anchored shoulder belt.⁹
- WC19 compliant wheelchairs are the easiest to secure in transit vehicles [Schneider, Buning, Quantum]. These are wheelchairs that can withstand a 30 mile per hour

⁹ <http://www.rercwts.org/WC19.html>

change in velocity and have a lap/shoulder belt and 4 securement points. There is a \$250 additional cost for these wheelchairs.

- Quantum transit approved chairs come with cards on the back informing drivers how to secure the chair in a transit system. They also come with a standard pelvic belt. WC19 approved belts cost extra [Quantum].
- Wheelchair manufacturers are trying to design lighter wheelchairs by using lighter materials. This ultimately adds to the cost of the chair, so any improvements in weight come at an increased price [Quantum].
- Quantum transit approved chairs are medium level rehab chairs. These are for people who are unable to get out of their wheelchair. They have medium level chassis, drive faster and climb higher than normal chairs, and have static seating. They come with four point tie down locations and have six wheels to allow for easy turning and moving. They have a maximum 20" seat (26" wide with arms) to fit through transit doors [Quantum].
- The challenge is to get wheelchair manufacturers to be proactive in letting consumers know that if they want to ride in a motor vehicle as a passenger they need a WC19 compliant wheelchair. Many manufacturers have crash tested their wheelchairs and designed them with securement points, but haven't made them WC19 compliant because they don't want to market their wheelchairs for use on a moving vehicle [Schneider].
- If you are in a wheelchair that weighs 500 pounds, the wheelchair will be strong enough to withstand the majority of crashes. At the high end of crashes there is some increased risk of the chair exceeding the forces of the securement system, but using extra tie down straps solves this problem [Schneider].
- Getting third party payers (Medicare, Medicaid) to pay the extra \$250 for WC19 wheelchairs is a challenge [Schneider].
- Medicare only pays for in-home use wheelchairs. Passengers can pay the extra amount for WC19 wheelchairs out of pocket. Medicaid sometimes pays for WC19, but sometimes doesn't. If they don't, the customer cannot pay the additional cost for WC19 chairs because they are trying to protect their beneficiaries from having to pay for extra features [Buning].

Interviewee Observations Concerning Securement Systems

- One of the biggest issues in paratransit is with the occupant restraint system. There is not sufficient driver training on how to position the belts properly on different types of wheelchairs. The lap belt should be 45 degrees to the horizontal in order to resist forward movement. If the belts aren't positioned properly the occupant can submarine under the lap belt or the belt can be too high and catch the person in the neck [Schneider, Buning].
- The four point strap tie-down system anchors at four points in the vehicle and attaches to four points on the wheelchair. It is a universal system that can adapt to a range of wheelchair types, styles and models, and provide for effective securement. A manual effort by the driver and/or attendant is required [Schneider].
- Buses are required to have statically loaded four-point wheelchair strap type securement systems and three point occupant restraint systems [Buning].

- The four point system is not always easy to use because two of the securement straps are next to the bus wall, requiring the operator to get down on his/her hands and knees to reach under the person's body to secure the straps [Buning].
- For larger passengers/wheelchairs doubling up on securement straps on the rear of the wheelchair is suggested [Buning].
- Another problem is that it is hard to find a frame to attach securement straps on some wheelchairs because they have plastic coverings [Schneider].
- If the frame is too large, it is hard to get the right angle or amount of tension on straps to keep the wheelchair in place. ADA requires less than one inch of movement in any direction [Buning].
- The longitudinal distance between the rear and forward anchorages should be from 48 – 52” apart. The current tiedown literature requires 43” or greater. If you only have 44” on the floor, even with a WC19 vehicle, you may not be able to tension the straps correctly in order to resist forward motion in a crash [Schneider].

SECTION 4: Conclusions, Recommendations, and Suggested Research

Conclusions

State DOT Perspective

Most states that responded to the survey reported that some agencies within their jurisdiction encountered and had difficulty transporting customers in oversize/un-securable mobility devices. However, most states that responded to the survey reported that few agencies within their jurisdiction had been unable to provide service to those customers.

Most states did not have a policy for transit agencies within their jurisdiction to address oversize/un-securable mobility devices during the ADA certification process or service planning, and did not require agencies to suggest alternative modes of transport for customers that do not qualify for ADA certification. States that did have a policy only requested that their agencies follow the minimum ADA Regulations.

Only a few operators in the states' jurisdictions had encountered workers compensation costs, damage to vehicles due to oversize/un-securable mobility devices, or written or formal allegations of illegality or negative presentation in the media for lack of accommodation for clients with oversize/un-securable mobility devices. Few operators within the states' jurisdiction had also acquired larger size vehicles and lift combinations to accommodate oversize/un-securable mobility devices.

Transit Operator Perspective

Most operators that responded to the survey reported that less than one percent of demand response passengers were requesting or using service in oversize/un-securable mobility devices. Most agencies also reported that less than one percent of demand response passengers used a mobility device that had created difficulty because the device was oversized. Some agencies reported having difficulty transporting passengers who used devices that were not designed and tested to be properly secured on a paratransit vehicle. Overall, most agencies that responded to the survey had been able to provide service to passengers who used oversize/un-securable mobility devices.

Most operators had a policy to address oversize/un-securable mobility devices during the ADA eligibility certification process that consisted of citing the ability to refuse transportation based on the "common wheelchair" definition described above. However, at most agencies who responded to the survey, less than one percent of demand response passengers actually applied to use oversize/un-securable mobility devices during the ADA eligibility certification process. Most agencies rarely or never denied the specific use of these devices during the ADA eligibility certification process. A few agencies had scheduling service priorities for oversize/un-securable mobility devices, including scheduling these passengers first, sending two drivers to assist the passenger, or sending a vehicle with a larger lift.

Drivers at most transit agencies that responded to this survey determined whether or not mobility devices exceed their agency's policy standards by trial and error with the lift, however many agencies tried to pre-screen passengers to avoid problems at the time of travel. If a driver does encounter a passenger that he or she cannot accommodate with the lift, most agencies had a policy for the driver to call a supervisor and file an incident report for ADA investigation.

Although few agencies incurred workers' compensation or vehicle damage costs because of oversize/un-securable mobility devices, many agencies had risk management and safety concerns relating to these devices. The agencies' main concerns regarding risk management issues arising from oversize/un-securable mobility devices were injuries to passengers and operators, and damage to equipment.

ADA Requirements

The requirements for buses, over-the-road buses, vans, and systems were under review. The main changes proposed related to the ramp slope, circulation paths, and wheelchair space.

- The ramp slope was proposed to decrease from 1:4 to 1:6 when deployed to boarding and alighting areas without station platforms and to the roadway.
- The circulation paths were proposed to increase from 30 inches wide and 48 inches long to 34 inches wide (not including doorways). Based on interviews with vehicle manufacturers, the only implication of this change would be a potential reduction in seating capacity.
- Wheelchair space was proposed to increase from 30 inches wide and 48 inches long to a one inch minimum maneuvering clearance on the short side of wheelchair spaces entered [31 inches wide by 48 inches long], and six inches minimum maneuvering clearance on the long side of wheelchair spaces entered [30 inches wide by 54 inches long].

Vehicle Manufacturer Perspective

Paratransit vehicles were currently designed to maximize the interior space; the accommodation of oversize/overweight mobility devices would reduce seating and available payload weight capacity in the majority of vehicles. Vehicle manufacturers would have difficulty increasing the available payload capacity in smaller paratransit vehicles to accommodate heavier wheelchairs because chassis manufacturers were not willing to redesign their chassis considering the small market for paratransit vehicles. Transit agencies that wanted to increase the available space and payload in their paratransit vehicles would likely have to order a larger vehicle. Adding additional securement in transit vehicles to accommodate the heavier wheelchairs was not a significant issue.

Mobility Aid Manufacturer and University Expert Perspective

WC19 wheelchairs are the easiest to maneuver and secure in transit vehicles, but not all manufacturers are comfortable marketing their wheelchairs for use on a moving vehicle, and health insurance providers do not always cover the additional cost of these wheelchairs.

The four point strap tie-down system is a universal system that can adapt to a range of wheelchair types, styles and models, and provide for effective securement. This system is used by the majority of transit systems and is WC19 compliant. It is not always easy to use because two of the securement locations are next to the bus wall, requiring the operator to reach under the passenger's body to secure the straps. Wheelchairs that are not WC19 compliant do not always have easily accessible frames to attach the tie-down system. Heavier wheelchairs can be safely secured by using two additional securement straps in the rear of the wheelchair; this does not require any alterations of the vehicle itself.

A major issue in paratransit vehicles is training the operator and passenger to correctly secure the occupant restraint system to prevent passenger injury during an accident.

Recommendations

Currently oversized wheelchairs were not a significant problem, but AASHTO should monitor this issue in the near and long term to keep it from becoming significant. The issues of most importance as determined by this study showed that there was little coordination between wheelchair manufacturers, vehicle manufacturers, mobility device prescribers, and insurance providers. Vehicle manufacturers challenged the wheelchair manufacturers to design smaller, lighter or more convertible wheelchairs, but the wheelchair manufacturers could not do this without increasing costs which insurance providers would not likely pay for. Risk management and safety issues relating to properly securing a mobility device on vehicles were also important.

WC19 wheelchairs are ready to be used as a seat in a motor vehicle and are easy to maneuver and secure in transit vehicles. Every wheelchair manufacturer has some WC19 compliant wheelchairs, but not all advertise their devices this way because they do not want to face the risk of advertising a wheelchair for use in a moving vehicle. Medical practitioners who are prescribing mobility devices to their patients should let their patient know that if they want to ride in a motor vehicle as a passenger they should buy a WC19 wheelchair. However, the extra cost (approximately \$250) is not usually covered by third party providers.

Education about WC19 compliance and coordination between all of these agencies would help shed light on these issues and begin a conversation between interested parties about how to make WC19 compliant wheelchairs more affordable and accessible to people who want or need to use their wheelchair on a transit vehicle.

During the certification process, transit agencies could provide recommendations for attachments to wheelchairs that were not WC19 compliant to make them safe for securement. Since vehicle operators are instrumental in the safety of the passenger through proper securement of the wheelchair to the vehicle, operators should continue to ensure that operator training in this area remains a priority in paratransit services.

Suggested Research

Reviewing this topic from the perspective of the medical practitioners who are prescribing mobility devices and the third party payers would be a worthwhile pursuit. Medical practitioners are often not aware that their patients might want to ride on a transit vehicle in the prescribed wheelchair. If the doctors are aware of the transportation need and are educated about the WC19 then they will more likely prescribe such wheelchairs and advocate to third party payers to at least pay for a portion of the additional cost.

The Disability Rights Education & Defense Fund (DREDF) commented that some of the “Practices for Handling Oversize and Overweight Mobility Aid and Passenger Requests,” especially relating to refusal of service to passengers who use mobility devices that cannot be secured, are not legal under the ADA. Further research into these practices and the ADA regulations would be beneficial to provide information to transit agencies to help them ensure that they are following all ADA rules and requirements. The American Public Transportation Association (APTA) also concurs with DREDF but noted that the inability to secure a device on board is not sufficient reason to deny a trip except when the device poses a safety problem for other passengers or the operator. A more standard approach to determining when lack of

securement presents a safety problem for other passengers or the operator would result in wider understanding and would increase acceptance of the approach.

Further analysis of the wheelchair market that evaluates the number of wheelchair clients that are dependent on public transit could extrapolate the level of demand so each party can understand the extent of the need for efficient coordination. Oregon was in the process of initiating a pilot project to specify, purchase, use and tests up to two types of vehicles for oversize/weight transportation in an integrated ride environment. Data will be collected and the state was considering providing a state bid for vehicles once the pilot was completed. Analysis of this pilot program and its applicability to other states would be beneficial.

Model training programs for the proper securement of mobility devices in transit vehicles should be explored. The Community Transportation Association of America (CTAA) has a training course “The Passenger Service and Safety (PASS) Driver Certification Program” which trains transportation drivers on the current practices in passenger assistance techniques and sensitivity skills appropriate for serving person with disabilities. The program is designed as a three-day Train-the-Trainer to certify trainers who can then train drivers or as a two-day Driver program in which CTAA’s instructors train the drivers. Texas has adapted this training to their systems and other states should also adopt the training as well.

REFERENCES

Table 4: State DOT Representatives Asked to Complete Internet Survey

State	Name	Phone	Email
Alabama	Joe Nix	334-353-6421	nixj@dot.state.al.us
Alaska	Debbi Howard	907-465-2883	debbi.howard@alaska.gov
Arizona	Sam Chavez	602-712-7465	Schavez@azdot.gov
Arkansas	James Newcomb	501-569-2475	Mickey.newcomb@arkansashighways.com
California	Kimberly Gayle	916-654-8074	kimberly.gayle@dot.ca.gov
Colorado	Tom Mauser	303-757-9771	Tom.mauser@dot.state.co.us
Connecticut	Michael Sanders		Michael.Sanders@ct.gov
Delaware	Stephanie Burris	302-760-2860	stephanie.burris@state.de.us
District of Columbia	Lezlie Rupert	202-671-1595	lezlie.rupert@dc.gov
Florida	Elizabeth Stutts	850-414-4530	Elizabeth.Stutts@dot.state.fl.us
Georgia	Steven Kish	404-631-1237	skish@dot.ga.gov
Hawaii	Ryan Fujii	808-587-2028	Ryan.fujii@hawaii.gov
Idaho	Rinda Mitchell	208-830-0798	Rinda.mitchell@itd.idaho.gov
Illinois	Charles Kadlec	312-793-2184	charles.kadlec@illinois.gov
Indiana	Larry Buckel	317-232-5292	LBUCKEL@indot.IN.gov
Iowa	Pamella Lee	515-239-1765	pamella.lee@dot.iowa.gov
Kansas	Connie Spencer	785-296-4907	Connies@ksdot.org
Kentucky	Vickie Bourne	502-564-7433	Vickie.Bourne@ky.gov
Louisiana	Donna Lavigne	207-624-3245	Donna.Lavigne@LA.GOV
Maine	Barbara Donovan	207-624-3245	Barbara.donovan@maine.gov
Maryland	Leonard Howard	410-767-0029	LHoward1@mtamaryland.com
Massachusetts	Joanne Champa	617-973-7062	joanne.champa@state.ma.us
Michigan	Andrea Brush	517- 335-2534	BrushA@michigan.gov
Minnesota	Judith Ellison	651 366-4168	ja.ellison@dot.state.mn.us
Mississippi	Charles Carr	601-359-7800	ccarr@mdot.state.ms.us
Missouri	Steven Billings	573-751-2523	Steven.billings@modot.mo.gov
Montana	David Jacobs	406-444-9192	dajacobs@mt.gov

Nebraska	Jerry Wray	402-479-4694	Jerry.wray@nebraska.gov
Nevada	Michelle Gardner-Lilley	775-888-7312	Mgardner-lilley@dot.state.nv.us
New Hampshire	Christopher Morgan	603-271-2468	cmorgan@dot.state.nh.us
New Jersey	Linda Di Giovanni	973-491-8074	ldigiovanni@njtransit.com
New Mexico	David Harris	505-827-5420	DavidC.Harris@state.nm.us
New York	Ron Epstein	518-457-8362	repstein@dot.state.ny.us
North Carolina	Miriam Perry	919-733-4713	mperry@dot.state.nc.us
North Dakota	Bruce Fuchs	701-328-2194	bfuchs@nd.gov
Ohio	Jane Smelser	614- 644-8054	Jane.Smelser@dot.state.oh.us
Oklahoma	Roger Eaton	405- 521-2584	reaton@ODOT.ORG
Oregon	Dinah Van Der Hyde	503-986-3885	Dinah.VANDERHYDE@odot.state.or.us
Pennsylvania	Bob Smeltz	717-787-1219	robsmeltz@state.pa.us
Rhode Island	Robert Shawver	401-222-2694	rshawver@dot.ri.gov
South Carolina	Kayin Jones	803-737-7014	joneskc@scdot.org
South Dakota	Bruce Lindholm	605-773-3574	Bruce.lindholm@state.sd.us
Tennessee	Brenda Wilkins-Porter	615-741-2781	Brenda.wilkins-porter@tn.gov
Texas	Bobby Killebrew	512-374-5232	bkilleb@dot.state.tx.us
Utah	Leone Harwood-Gibson	801-964-4508	lgibson@utah.gov
Vermont	Krista Chadwick	802-828-5750	Krista.chadwick@state.vt.us
Virginia	Terry Brown	804.786.1722	terry.brown@drpt.virginia.gov
Washington	Cathy Silins	360-705-7919	silinsc@wsdot.wa.gov
West Virginia	Toni Boyd	304-558-0428	toni.r.boyd@wv.gov
Wisconsin	John Alley	608-266-0189	john.alley@dot.wi.gov
Wyoming	Taylor Rossetti	307-777-4181	taylor.rossetti@dot.state.wy.us

Table 5: Paratransit Vehicle Manufacturers Contacted to Complete Interviews

Vehicle Manufacturer	Name	Phone	Email
Eldorado National	Sheldon Walle	785-827-1033 x119	sheldonw@enconline.com
Daimler Buses North America, Orion Bus Industries Ltd.	Joe Labonte	905-403-7807	Joseph.labonte@dcbusna.com
Bus Stuf Inc.	James Callagher	610-704-5009	
The Braun Corporation	Mike Pugh Ron Goodrich	574-946-6153 x3067 574-946-6153 ext-3031	Mike.pugh@braunlift.com rong@braunlift.com
Ricon Corporation	Oscar Pardinias	818-267-3085	opardinias@wabtec.com
IC Bus, LLC	Ramses Banda	630-234-3012	Ramses.Banda@Navistar.com
Complete Coach Works	Macy Neshati	951-684-9585	
Midwest Bus Corporation	Daniel Morrill	800-627-6627 x860	
Lift-U	Mark Hogan	209-838-2400	
Champion Bus, Inc. Thor Industries Commercial Bus Division	Kathy Gaffney	810-724-6474	

Table 6: Mobility Aid Manufacturers Contacted to Complete Interviews

Manufacturer/University	Name	Phone	Email
Q'Straint	Jim Reaume		qstraint@qstraint.com
University of Michigan	Lawrence Schneider	734-845-7861	lws@umich.edu
Sure-Lok	Steve Barker	866-787-3565	SBarker@sure-lok.com
University of Louisville	Mary Ellen Buning	502-407-3272	me_buning@mac.com
Permobil	Jeremy Sedlak		jeremy.sedlak@permobilus.com
Invacare	Mark Sullivan		nmsullivan@invacare.com
Sunrise Medical	Dan Critchfield		dan.critchfield@sunmed.com
Quantum	Jill Kolczynski	800-800-8586 x1742	jkolczynski@pridemobility.com

APPENDIX A: Transporting Oversize Wheelchairs State Survey

Questionnaire

We request your participation in the Transportation Research Board (TRB) study titled "Transporting Oversize Wheelchairs" (20-65 (031)).

The Americans with Disabilities Act requires public and specialized transportation systems to have rolling stock that will accommodate the loading, unloading, and "in-vehicle securement" of a "common wheelchair" and its occupant. Section 37.3 of the DOT's regulations implementing the Americans with Disabilities Act of 1990 (ADA) (49 CFR Parts 27, 37, and 38) defines "common wheelchair" as a mobility aid belonging to any class of three or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds when occupied.

We request your participation in this survey in order to clearly define and document the problems that exist in the industry and the impact on service delivery for clients in oversize wheelchairs or weight and wheelchair combinations that exceed minimum ADA requirements. It is our intention that this survey should take less than 20-25 minutes to complete.

Please email laura.riegel@acocom.com with any questions that you may have or call at 703-340-3068. If you would like further information, please feel free to contact Gwen Chisholm Smith at TRB who is in charge of this study. Her contact number is 202-334-3246.

Please fill in the following table:

Common wheelchair definition:

"A mobility aid belonging to any class of three or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds when occupied."

CHOOSE ONE for each box	Customer/wheelchair combination exceeding maximum weight definition	Wheelchair exceeding maximum width definition	Wheelchair exceeding other dimension of common wheelchair definition	Wheelchair or device that has not been designed & tested to be properly secured on a paratransit vehicle
A) How many agencies in your jurisdiction encounter	All Most Some Few None	All Most Some Few None	All Most Some Few None	All Most Some Few None
B) How many agencies in your jurisdiction have difficulty transporting	All Most Some Few None	All Most Some Few None	All Most Some Few None	All Most Some Few None
C) How many agencies in your jurisdiction have been unable to provide service to customers in	All Most Some Few None	All Most Some Few None	All Most Some Few None	All Most Some Few None

2. Does your state have a policy for transit operating agencies to address oversize/un-securable mobility devices during the ADA eligibility certification process? If yes, what is the policy?

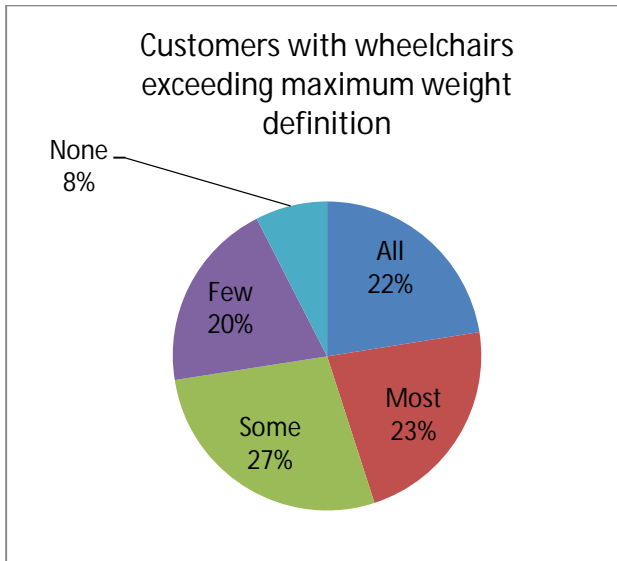
3. If a customer does not qualify for ADA certification due to the oversize/un-securable characteristics of their mobility device, does your state require transit agencies to suggest alternative modes of transport? If yes, what are the options?

4. Have agencies within your jurisdiction encountered workers compensation costs due to operator injury while maneuvering oversize/un-securable mobility devices? If yes, please describe what you know about how many claims were filed and approximately how much in compensation claims was paid.
5. Have agencies within your jurisdiction experienced damage to vehicles due to the oversize/un-securable mobility devices? If yes, please describe what you know about how many vehicles were damaged and approximately how much the damage cost your agency.
6. As the state funding administrator, have you experienced written or formal allegations of illegality for lack of accommodation for clients with oversize/un-securable mobility devices? If yes, please describe the seriousness of the incident(s).
7. Have operators within your jurisdiction been negatively presented in the media for not accommodating clients with oversize/un-securable mobility devices? If yes, how often has this happened?
8. If you acquire or provide funding for wheelchair accessible vehicles for agencies in your state, have you acquired larger size vehicle and lift combinations to accommodate oversize/un-securable mobility devices?
 9. If yes, what was the decision process that led to the acquisition of the larger vehicles?
 10. If yes, what was the increased cost due to the larger size for the following cost categories?
 - a. Capital cost
 - b. Fuel cost
 - c. Maintenance and other operating cost
 - d. Liability cost
 - e. Other costs
11. Does your state have a service priority policy for transit agencies to follow for accommodating oversize/un-securable mobility devices? If yes, what is the policy?
12. Does your state have any other practices or policies to address oversize/un-securable mobility devices?
13. Please tell us about yourself.
 - a. Name
 - b. Position/Job Title
 - c. State
 - d. Phone Number
 - e. Email Address
14. Would you like a copy of the results at the end of our study?

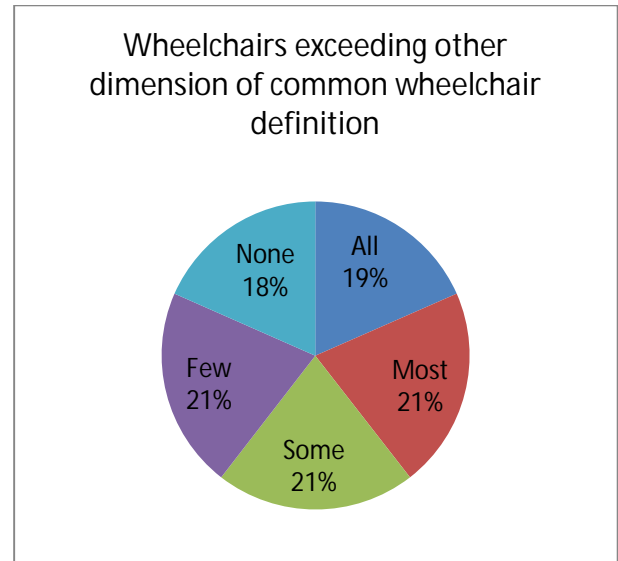
Responses

1A) How many agencies in your jurisdiction encounter:

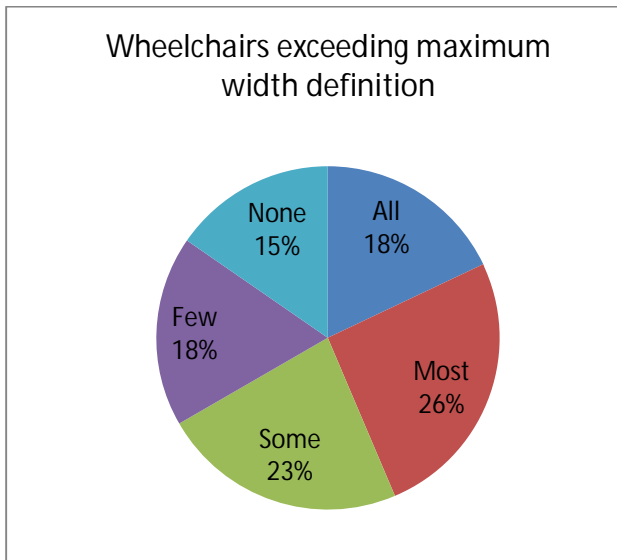
40 out of 47 responded to this question



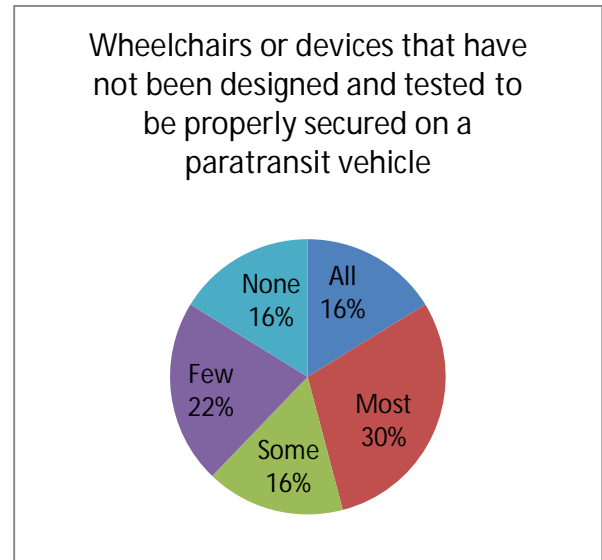
38 out of 47 responded to this question



39 out of 47 responded to this question

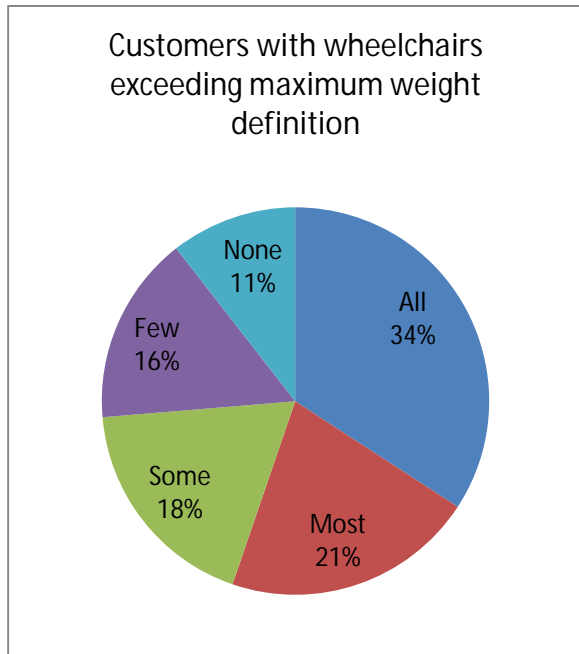


37 out of 47 responded to this question

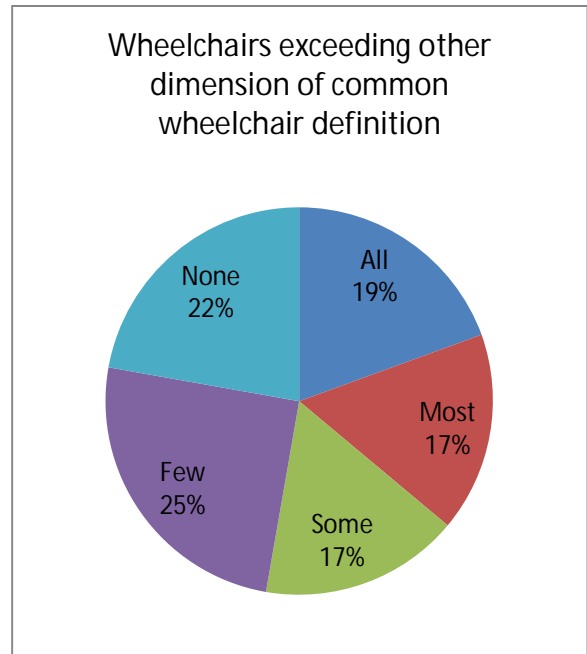


1B) How many agencies in your jurisdiction have difficulty transporting:

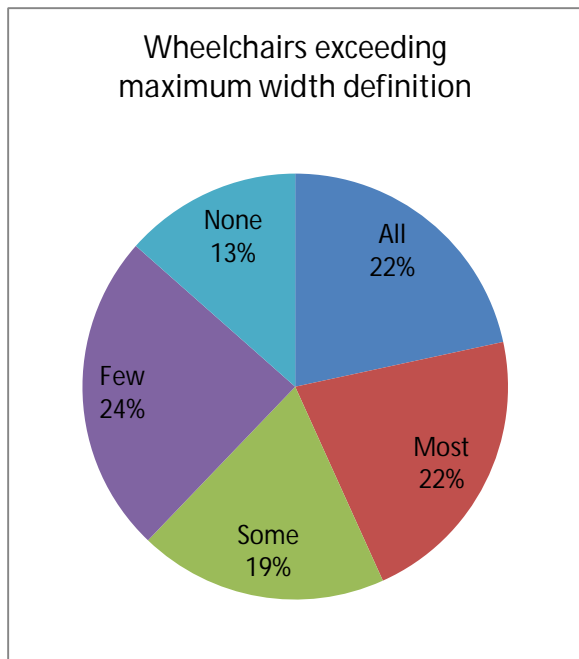
38 out of 47 responded to this question



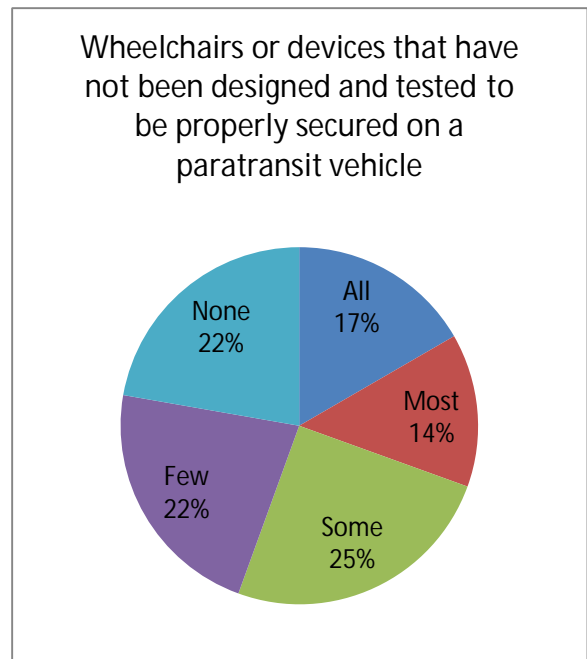
36 out of 47 responded to this question



37 out of 47 responded to this question

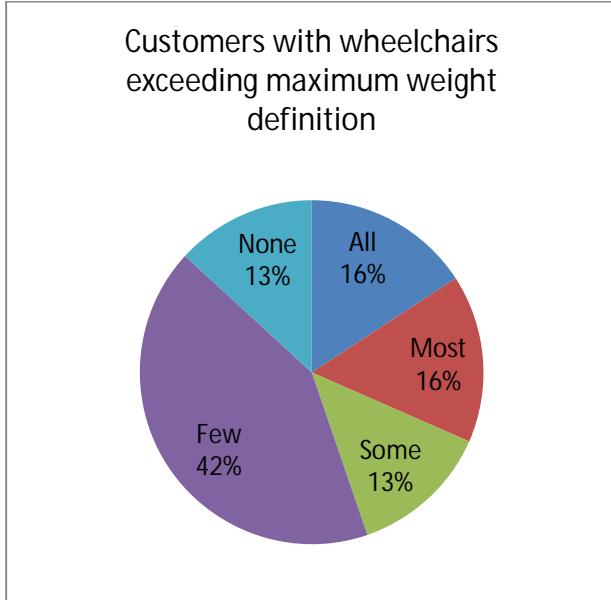


36 out of 47 responded to this question

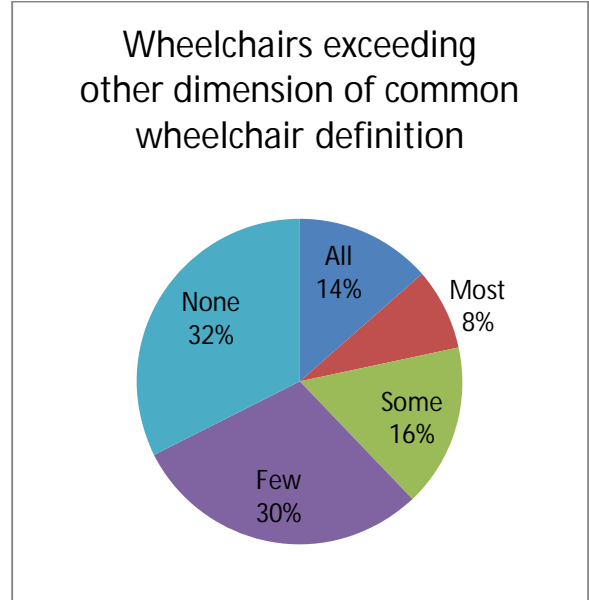


1C) How many agencies in your jurisdiction have been unable to provide service to customers in:

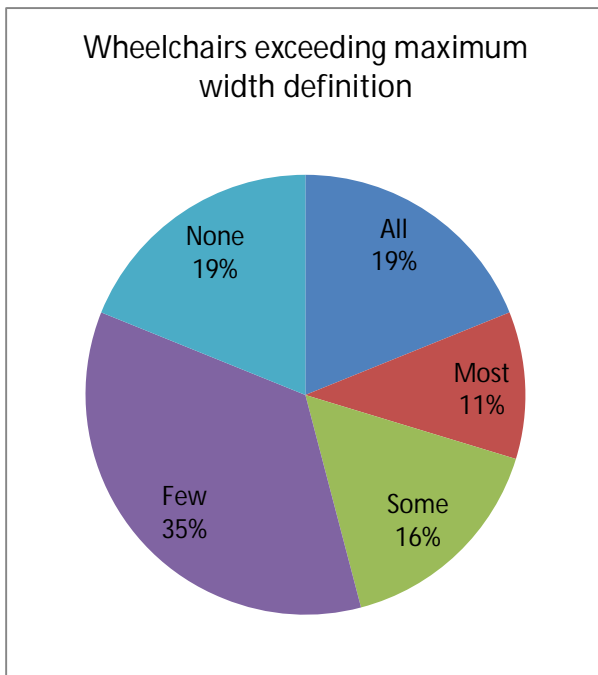
38 out of 47 responded to this question.



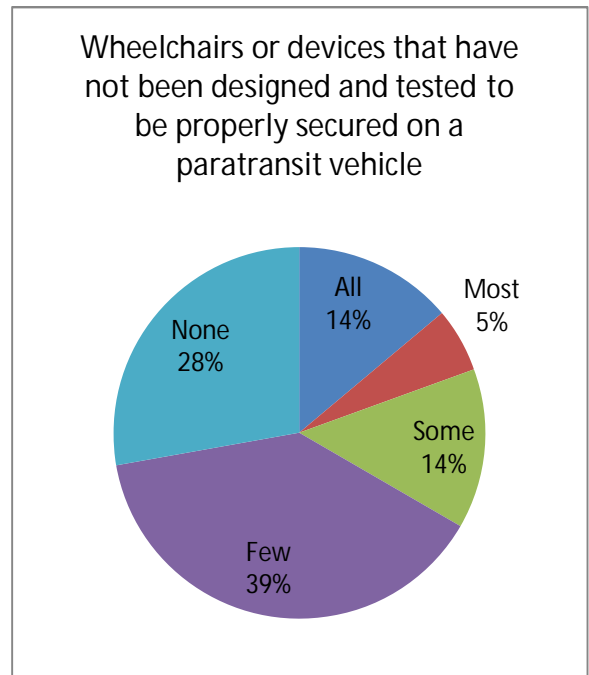
37 out of 47 responded to this question



37 out of 47 responded to this question

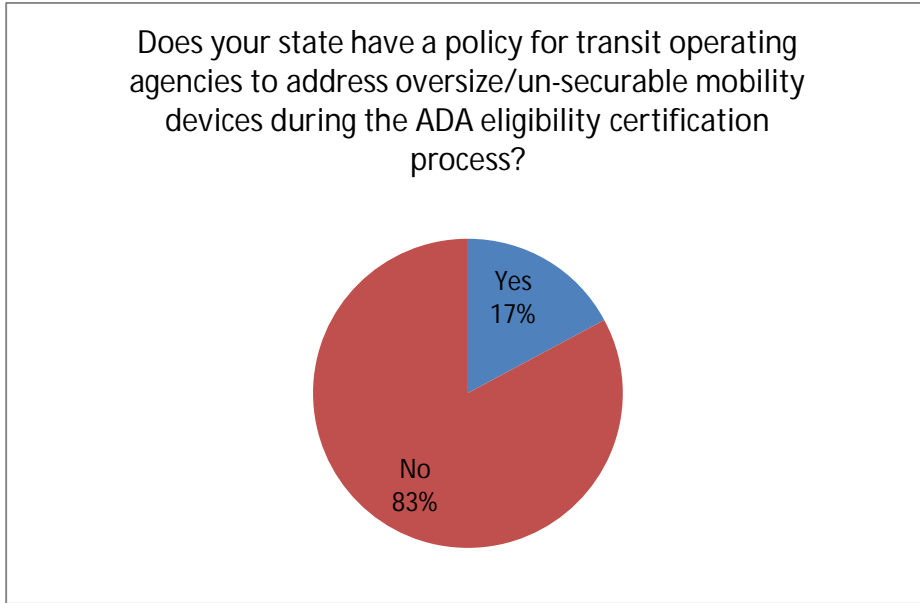


36 out of 47 responded to this question



2.

35 out of 47 responded to this question

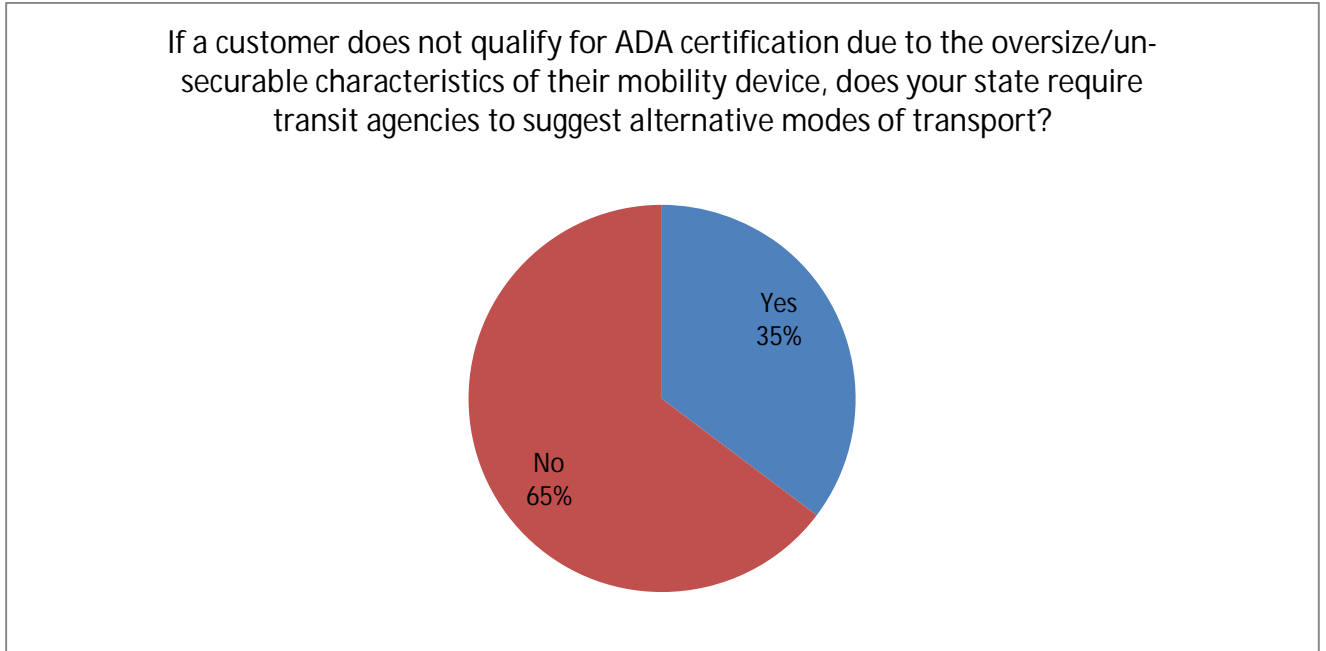


If yes, what is the policy?

Policy	Number of agencies with this policy
Follow ADA Regulations	5

3.

34 out of 47 responded to this question

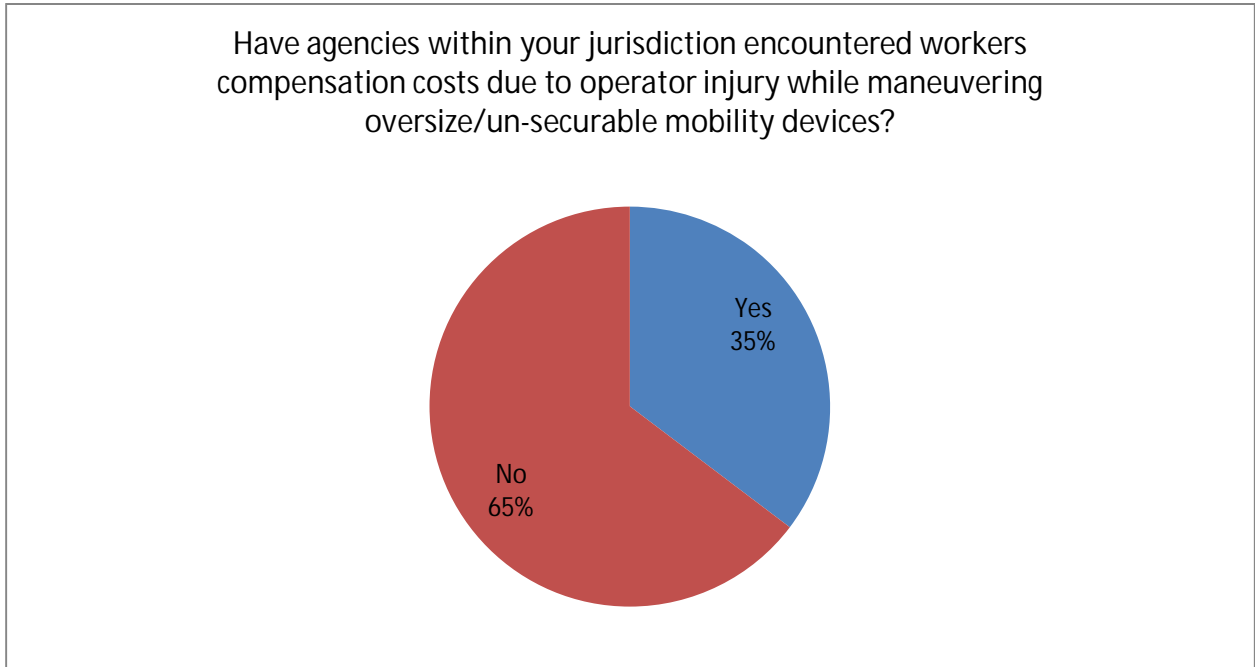


If yes, what are the alternatives?

Alternatives	Number of agencies offering these alternatives
No other alternatives	1
Medicaid Non-emergency transportation	1
Transfer chair	1

4.

34 out of 47 responded to this question

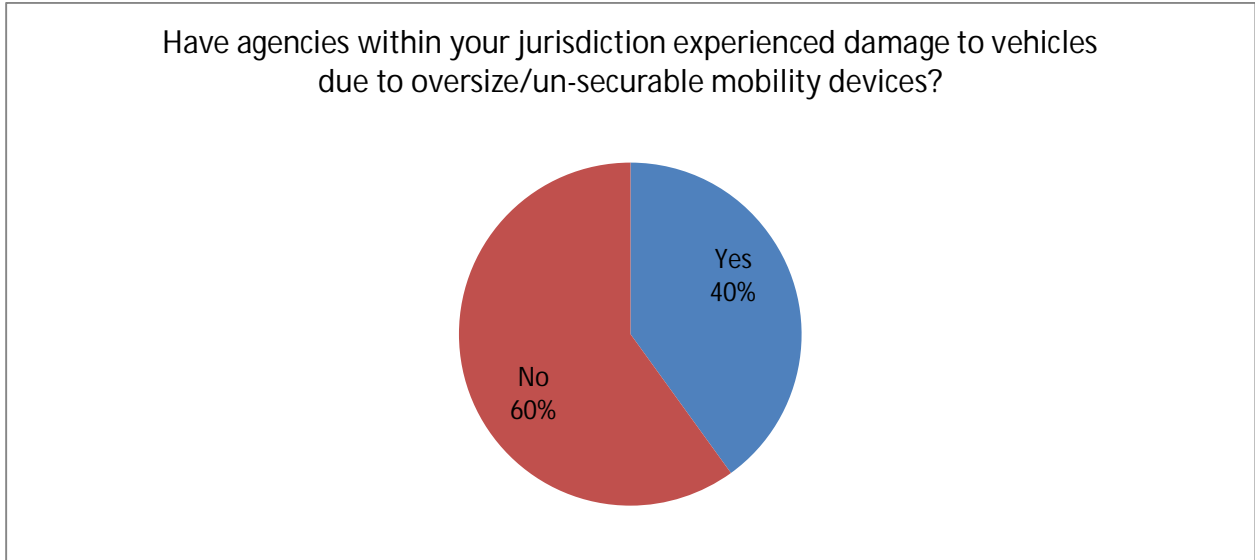


If yes, please describe what you know about how many claims were filed and approximately how much in compensation claims was paid?

Costs	Number of Agencies
Anecdotal only	2
Back injuries	2
2 days of workers compensation	1
Multiple claims worth \$6,000 each	1
6-12 at \$100,000 – 180,000 total	1

5.

35 out of 47 responded to this question

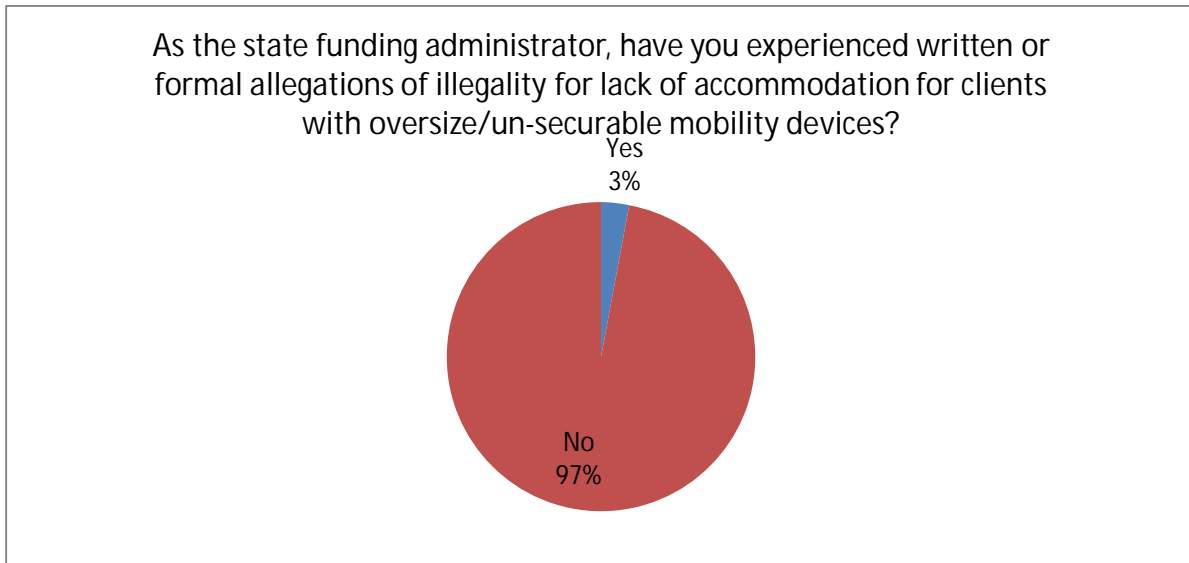


If yes, please describe what you know about how many vehicles were damaged and approximately how much the damage cost your agency.

Damage	Number of agencies
Damage to lift	8
Broken Door window (\$75 – 90 per occurrence)	1
Vans, about 8 per year, lift damage @ \$359 per, buses about 10 per year @ \$350 per.	1
6 vehicles. \$3000.00	

6.

34 out of 47 responded to this question

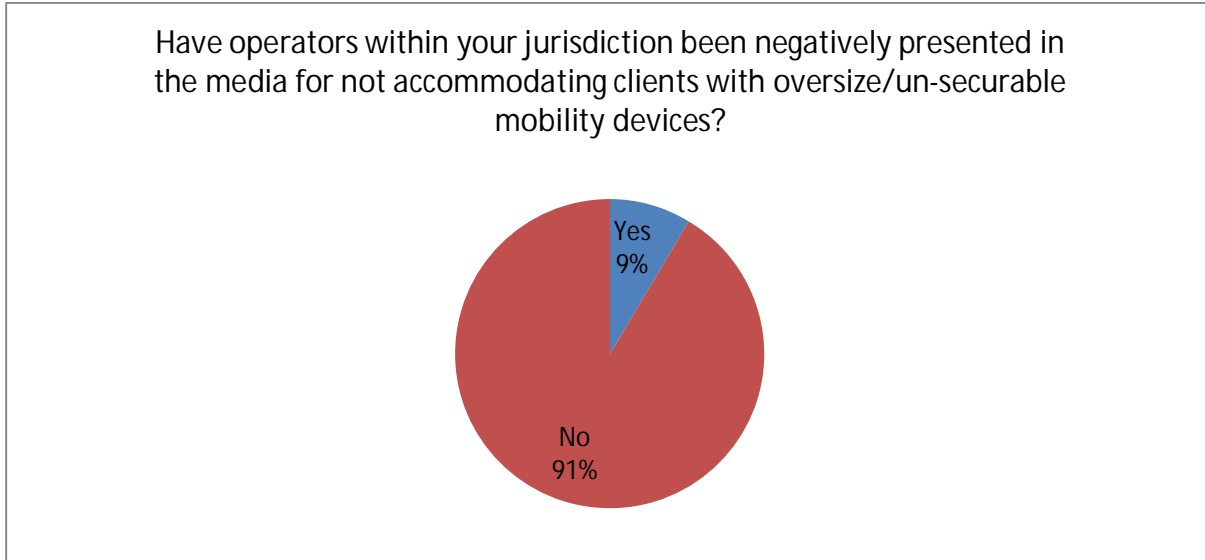


If yes, please describe the seriousness of the incident(s).

As the regulatory agency, have only encountered one written allegation but the situation was resolved by the transit agency supplying an alternative sized vehicle.

7.

35 out of 47 responded to this question



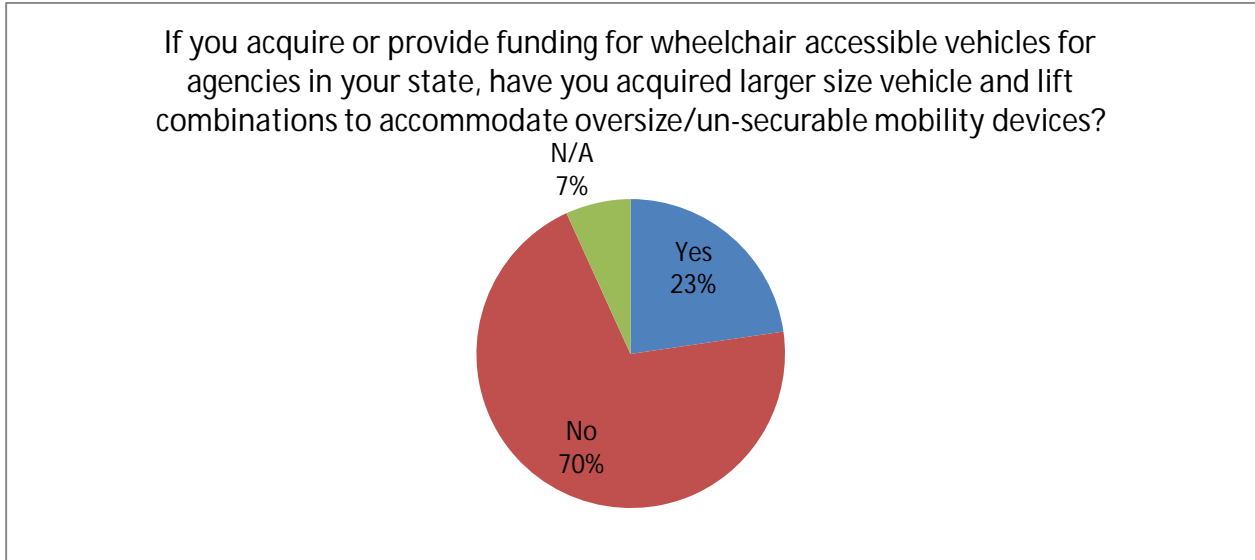
If yes, how often has this happened?

Once that I am aware of, but I am sure there are others. I am just not personally aware.

St. Louis, about once a year.

8.

44 out of 47 responded to this question



9. If you acquire or provide funding for larger vehicles to accommodate oversize/un-securable mobility devices, what was the decision process that led to the acquisition of the larger vehicles?

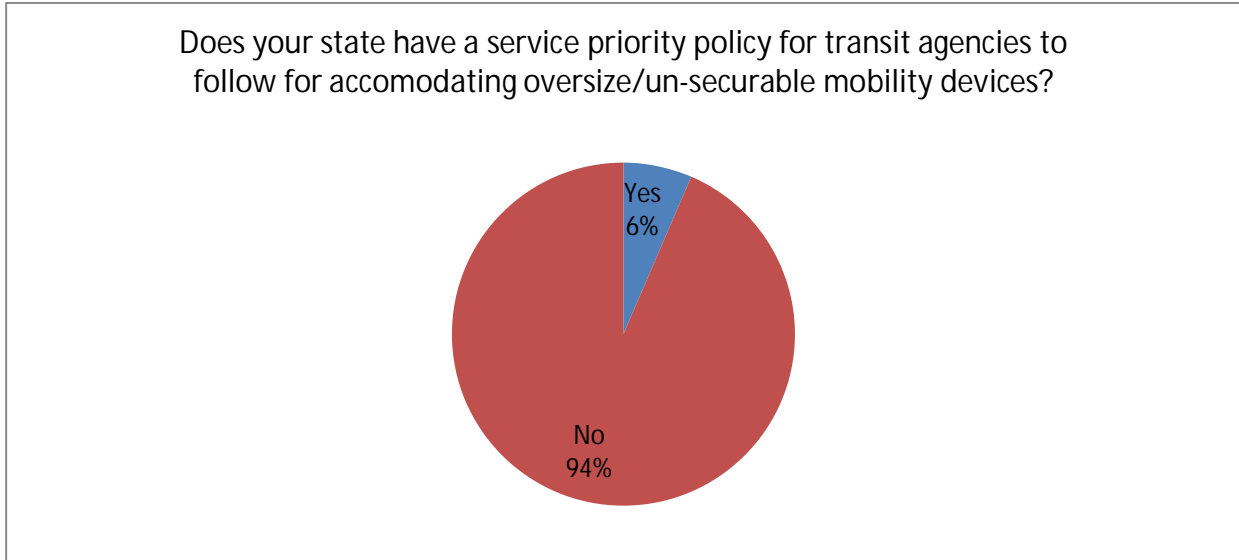
Decision Process	Number of Agencies
Desire to serve the needs of the region	4
Larger lifts needed	3
Comfort and safety	1

10. If you acquire or provide funding for larger vehicles to accommodate oversize/un-securable mobility devices, what was the increased cost due to the larger size for the following cost categories?

Capital Cost	\$2,000
	approximately \$30,000
	approximately \$7,000 on vans and \$10,800 on bus
Fuel cost	approximately \$30,000
Maintenance and other operating cost	\$2,000 annual

11.

31 out of 47 responded to this question



If yes, what is the policy?

We are in the process of initiating a pilot project to specify, purchase, use and test up to two types of vehicles for oversize/weight transportation in an integrated ride environment. Data will be collected and the state is considering providing a state bid for vehicles once the pilot is complete. [Oregon]

12. Does your state have any other practices or policies to address oversize/un-securable mobility devices?

Other Practices and Policies	Number of Agencies
Follow minimum ADA requirements	4
Order larger lifts	2
Ask agencies to secure to the best of their ability	1
Provide training	1

Additional Response

We are in the process of initiating a pilot project to specify, purchase, use and test up to two types of vehicles for oversize/weight transportation in an integrated ride environment. Data will be collected and the state is considering providing a state bid for vehicles once the pilot is complete. A policy may be developed after the pilot for use of specialized vehicles in our state. [Oregon]

There is a standard for a reason. Accommodations are made whenever possible. The Trainers are always looking for information with regards to securing and transporting non-traditional devices.

13. Please tell us about yourself.

Name	Title	State	Phone	Email
Alisha Wickens	Public Transportation Coordinator	TX	214-320-4470	awicken@dot.state.tx.us
Anthony Cochran	Contract Specialist II	TX	409-896-0270	acochra@dot.state.tx.us
Armida Sagaribay	Transportation Funding Specialist	TX	915-790-4234	armida.sagaribay@txdot.gov
Bonnie Payberah	The Whole Person, Inc.	MO		bpayberah@thewholeperson.org
Charles Kadlec	CVP Program Manager	IL	312-793-2184	charles.kadlec@illinois.gov
Cindy Gannaway	Project Manager, DC Circulator	DC	202-962-1128	cgannaway@wmata.com
Dale Lynn	Para-transit Supervisor / City of Columbia	MO	573-817-5072	dalynn@gocolumbiamo.com
Darla Walton	Public Transportation Coordinator	TX	979-778-9668	Darla.Walton@txdot.gov
Dave Kipp	Janesville Transit Operations Supervisor	WI	608-755-3150	kippd@ci.janesville.wi.us
David Jacobs	Lead Transit Planner	MT	406-444-9192	dajacobs@mt.gov
David Merritt	Public Transportation Coordinator	TX	903 737-9372	David.Merritt@TxDot.gov
Dinah Van Der Hyde	Senior Policy Analyst/Policy Manager	OR	503-986-3885	dinah.vanderhyde@odot.state.or.us
James Newcomb	Public Transportation Administrator	AK	501-569-2471	Mickey.Newcomb@ArkansasHighways.com
Jerry Wray	Transit Liaison Manager	NE	402-479-4694	jerry.wray@nebraska.gov
Joe Nix	Transit Program Manager	AL	334-353-6421	nixj@dot.state.al.us
Joe Steier	Transit Manager	WI	262-335-7700	Joseph.Steier@co.washington.wi.us
Lenny Howard	Manager, Office of	M	410-767-	lhoward1@mta.maryland.gov

	Local Transit Support	D	0029	ov
Lynn Castle	PTC	TX	806-748-4480	Lynn.Castle@txdot.gov
Marty Allen	Public Transportation Coordinator	TX	903-510-9114	marty-allen@txdot.org
Melissa Hull	Transportation Specialist	SD	605-773-4870	Melissa.Hull@state.sd.us
Patti Jo Peevy	CALTRAN Program Director	M O		
Richard C. Turner Sr.	Transit Division Director, City of Jefferson City	M O	573-634-6599 ext. 3	rturner@jeffcitymo.org
Ryan Warner	Special Needs Planner	W A	360-705-6918	warnerry@wsdot.wa.gov
Sal La Puma	Assistant General Manager, Valley Transit	WI	920-832-2294	salvatore.lapuma@appleton.org
Shannon Bremer	GITCo Management Team Project Monitor	M O	314-421-0090 ext. 340	sbremer@stldd.org
Stephen Ndima	Public Transportation Coordinator	TX	361-808-2351	stephen.ndima@txdot.gov
Steve Kish	Transit Program Manager	G A	404-631-1237	skish@dot.ga.gov
Susan Stockett	PTC	TX		susan.stockett@txdot.gov
WM OSBORNE	EXECUTIVE DIR.	M O	573-783-5505	bill@ridesmts.org

APPENDIX B: Transporting Oversize Wheelchairs Transit Agencies Survey

Questionnaire

We request your participation in the Transportation Research Board (TRB) study titled "Transporting Oversize Wheelchairs" (20-65 (031)).

The Americans With Disabilities Act requires public and specialized transportation systems to have rolling stock that will accommodate the loading, unloading, and "in-vehicle securement" of a "common wheelchair" and its occupant. Section 37.3 of the DOT's regulations implementing the Americans with Disabilities Act of 1990 (ADA) (49 CFR Parts 27, 37, and 38) defines "common wheelchair" as a mobility aid belonging to any class of three or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds when occupied.

We request your participation in this survey in order to clearly define and document the problems that exist in the industry and the impact on service delivery for clients in oversize wheelchairs or weight and wheelchair combinations that exceed minimum ADA requirements. It is our intention that this survey should take less than 20-25 minutes to complete.

Please email laura.riegel@aecom.com with any questions that you may have or call at 703-340-3068. If you would like further information, please feel free to contact Gwen Chisholm Smith at TRB who is in charge of this study. Her contact number is 202-334-3246.

1. Please fill in the following table:

Common wheelchair definition:

"A mobility aid belonging to any class of three or four-wheeled devices, usable indoors, designed for and used by individuals with mobility impairments, whether operated manually or powered. A "common wheelchair" does not exceed 30 inches in width and 48 inches in length measured two inches above the ground, and does not weigh more than 600 pounds when occupied."

CHOOSE ONE % for each box	Customer/wheelchair combination exceeding maximum weight definition	Wheelchair exceeding maximum width definition	Wheelchair exceeding other dimension of common wheelchair definition	Wheelchair or device that has not been designed & tested to be properly secured on a paratransit vehicle
A) Percentage of demand response passengers requesting or using service with:	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%
B) Percentage of demand response passengers where mobility device has create difficulty transporting because device was	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%
C) Percentage of demand response passenger requests the agency has been unable to fulfill because of mobility device was	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%	0% >0-1% >1-10% >10-20% >20%

2. Does your agency have a policy to effectively address oversized/un-securable mobility devices during the ADA eligibility certification process? If yes, what is the policy?
3. What percentage of demand response passengers apply for the use of oversized/un-securable mobility devices during the ADA certification eligibility process? Choose one.
 - a. 0%
 - b. >0-1%
 - c. >1-10%
 - d. >10-20%
 - e. >20%
4. When you are aware of oversized/un-securable mobility devices, how often do you deny the use of these specific devices during the ADA certification eligibility process? Choose one
 - a. Always
 - b. Often
 - c. Sometimes
 - d. Rarely
 - e. Never
5. If a mobility device does not qualify due to the oversized, overweight, and/or lack of securement combination within your agency's policies and practices, what other alternative options does your agency suggest for your customers to find alternative modes of transport?
6. How do drivers determine whether or not a mobility device exceeds your agency's policy standards en-route?
7. Does your agency have a policy for drivers to follow if they encounter a client in a mobility device that they believe may exceed your agency's requirements? If yes, what is the policy?
8. Has your agency encountered workers compensation costs due to operator injury while maneuvering oversized/un-securable mobility devices? If yes, please describe what you know about how many claims were filed and approximately how much in compensation claims was paid?
9. Has your agency experienced damage to vehicles due to oversized/un-securable mobility devices? If yes, please describe what you know about how many vehicles were damaged and the approximate cost of the damage.
10. Has your agency been sued or received written or formal allegations of illegality for lack of accommodation for clients with oversized/un-securable mobility devices? If yes, please describe the seriousness of the incident.
11. Has your agency been negatively presented in the media for not accommodating clients with oversized/un-securable mobility devices? If yes, how often has this happened?
12. Does your agency use larger size vehicle and lift combinations to accommodate current and future clients with large or heavy mobility device/user combinations?

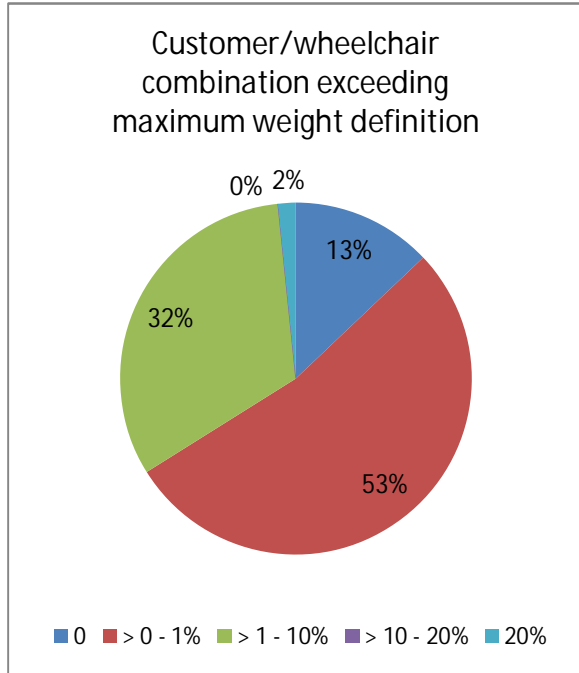
13. If yes, please describe the nature of this practice
14. If yes, what was the increased cost due to the larger size for the following cost categories?
 - a. Capital cost
 - b. Fuel cost
 - c. Maintenance and other operating cost
 - d. Liability cost
 - e. Other costs
15. Does your agency have a service priority policy for accommodating oversize/un-securable mobility device clients? If yes, what is the policy?

What are your agency's concerns regarding risk management issues arising from oversize/un-securable mobility devices for passengers and service providers?
16. What other policies or practices does your agency have to address oversize/un-securable mobility devices?
17. Please tell us about yourself
 - a. Name
 - b. Position/Job Title
 - c. Agency
 - d. City
 - e. State
 - f. Phone Number
 - g. Email Address
18. Would you like a copy of the results at the end of our study?

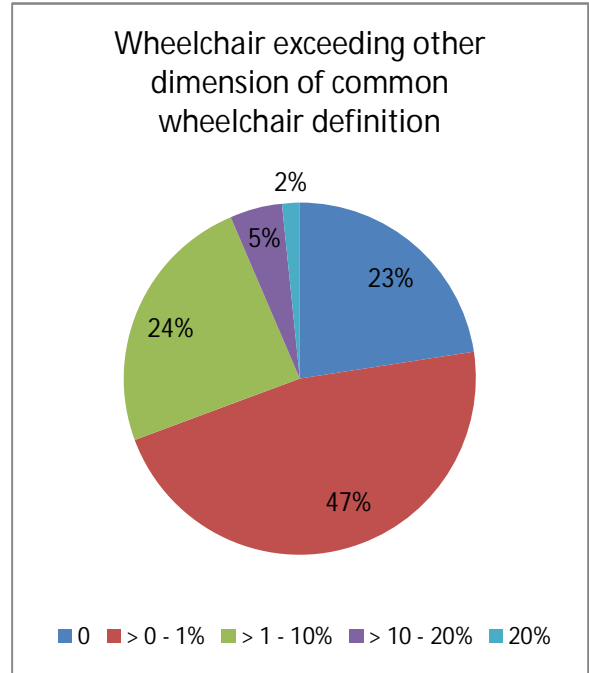
Responses

1A) Percentage of demand response passengers requesting or using service with:

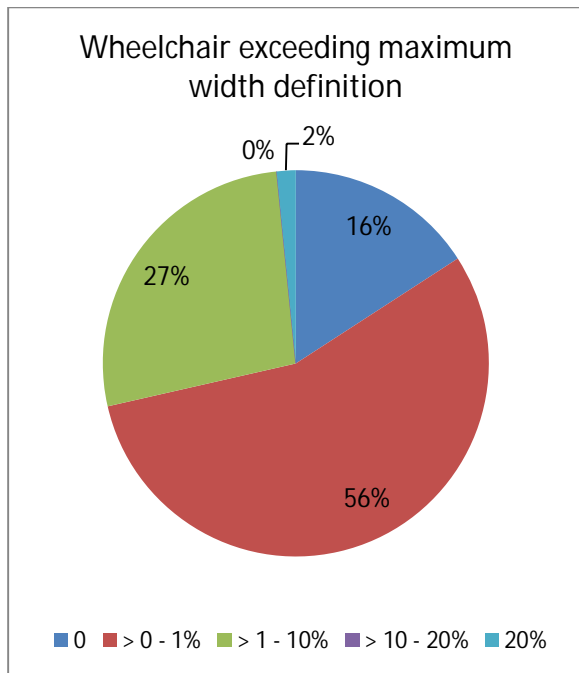
62 out of 75 responded to this question



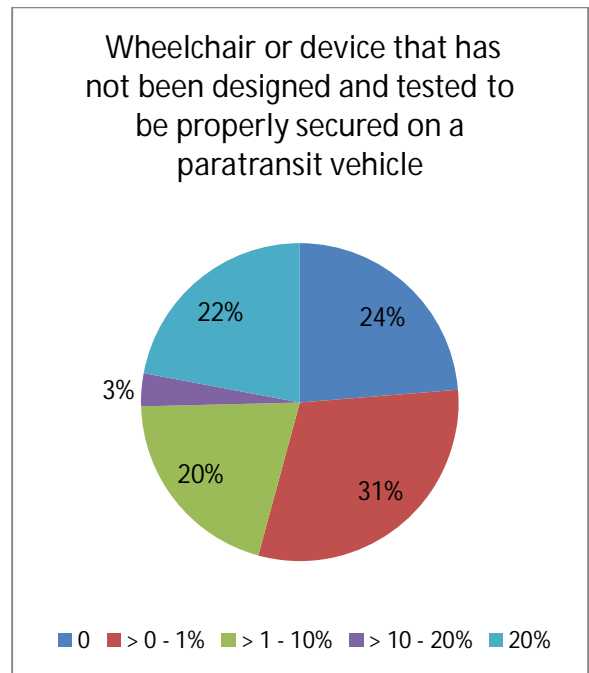
62 out of 75 responded to this question



63 out of 75 responded to this question

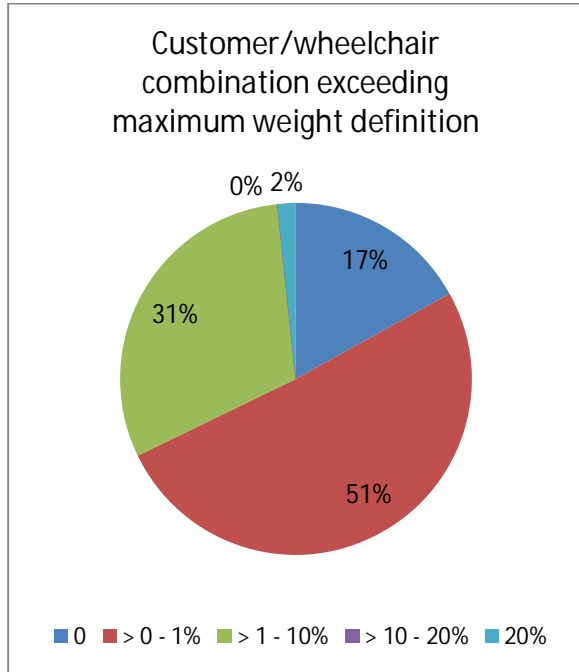


59 out of 75 responded to this question

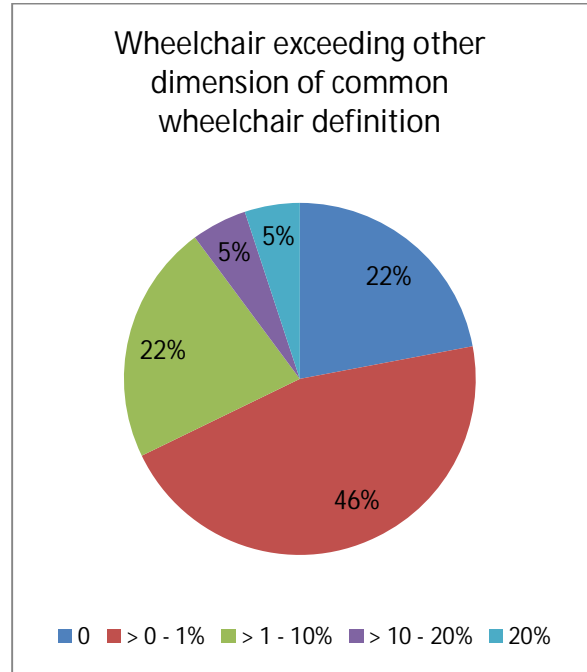


1B) Percentage of demand response passengers where mobility device has created difficulty transporting because device was:

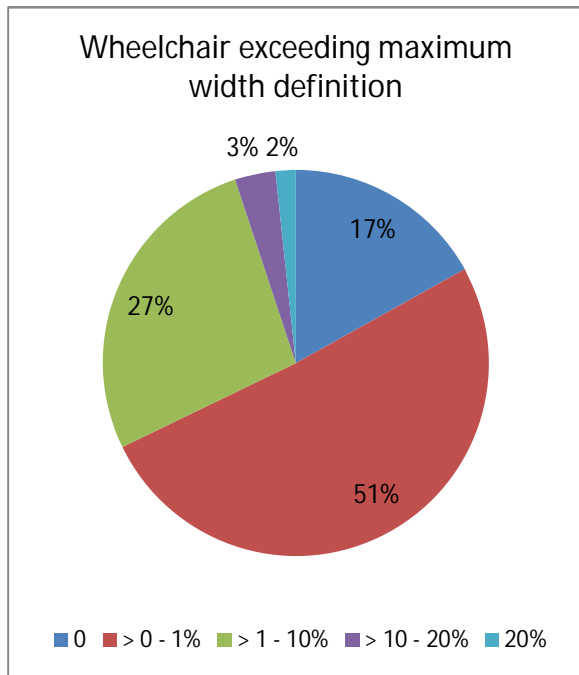
59 out of 75 responded to this question



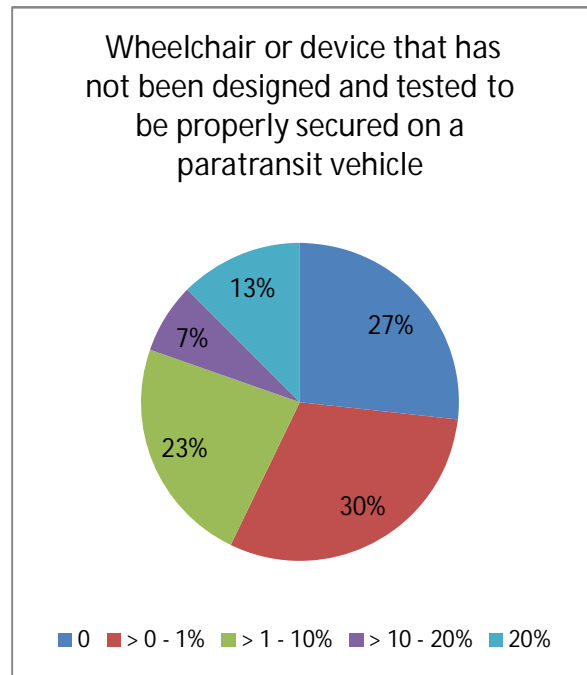
59 out of 75 responded to this question



59 out of 75 responded to this question

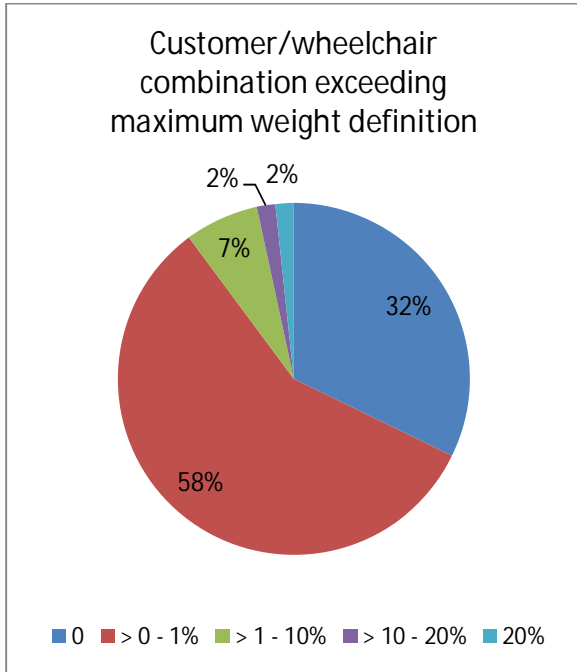


56 out of 75 responded to this question

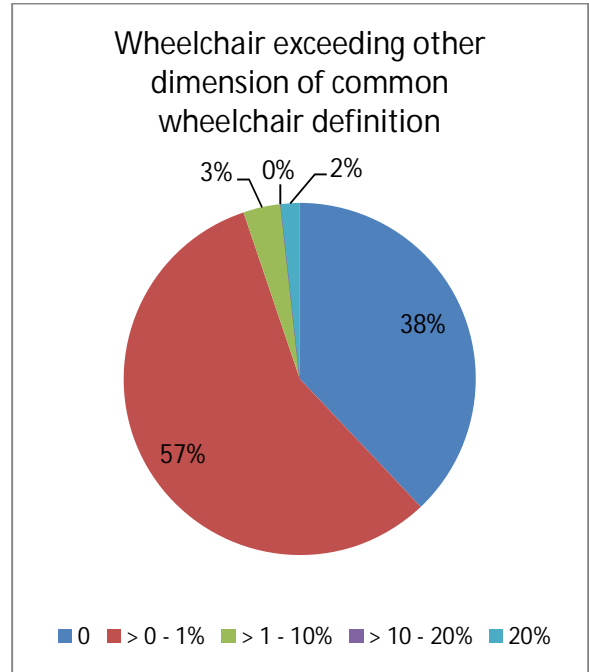


1C) Percentage of demand response passenger requests the agency has been unable to fulfill because of mobility device was:

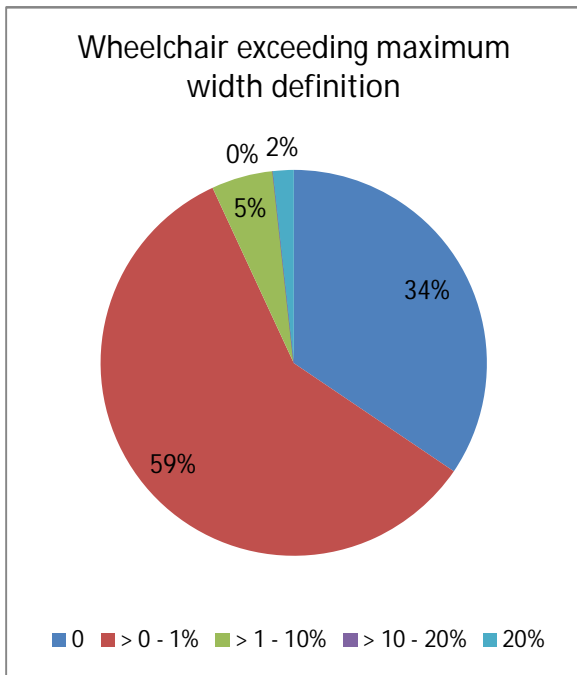
59 out of 75 responded to this question



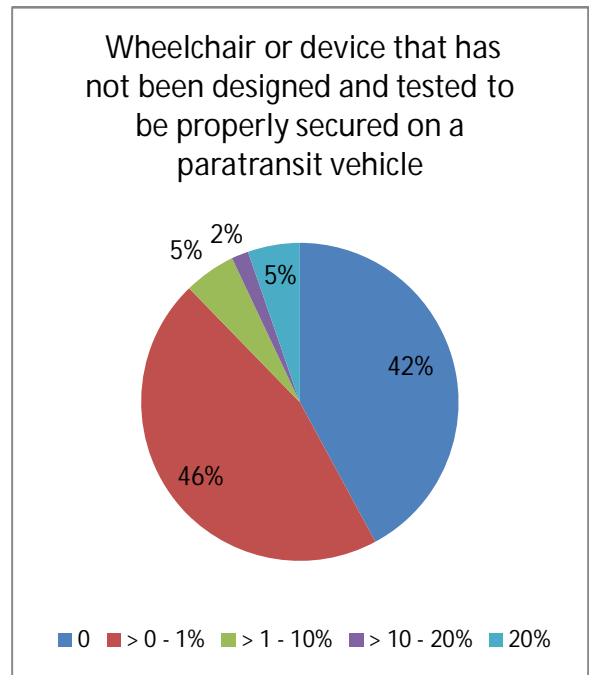
58 out of 75 responded to this question



58 out of 75 responded to this question

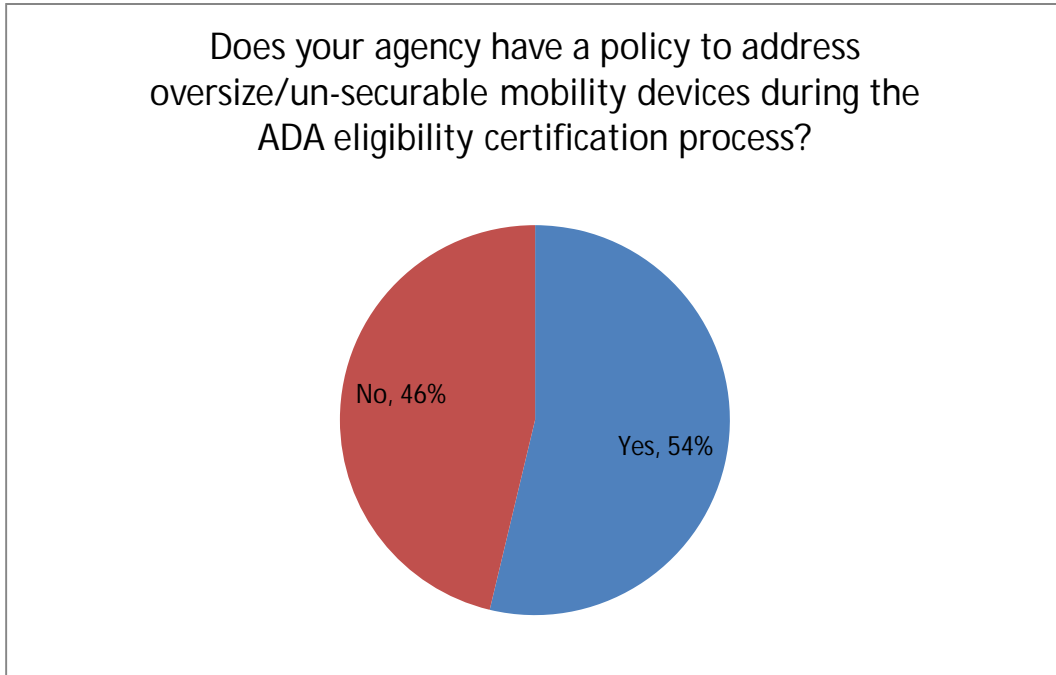


57 out of 75 responded to this question



2.

54 out of 75 responded to this question

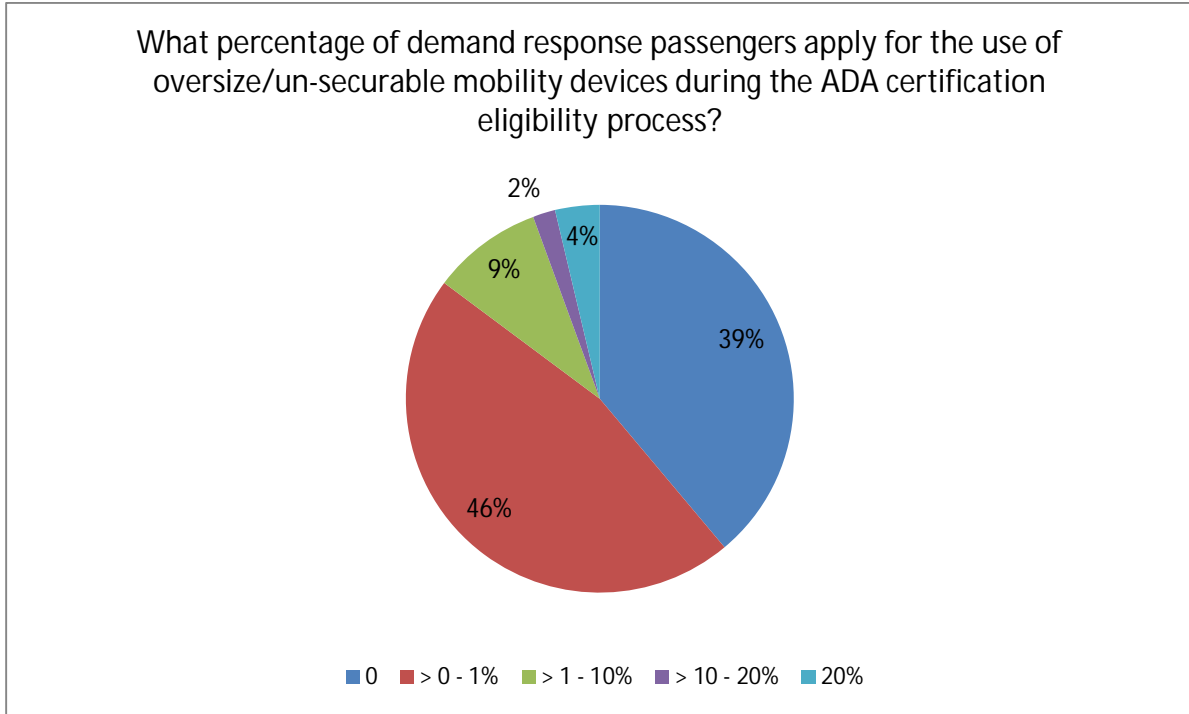


If yes, what is the policy?

Policy	Number of agencies
alternatives provided	2
can refuse to transport in oversize/un-securable mobility device	9
clients are not denied due to their mobility device	1
common wheelchair definition	11
no certification process	2
no pre-screening of mobility devices	1
pre-screen mobility device	6
require transfer out of mobility device	3
transported on buses	1

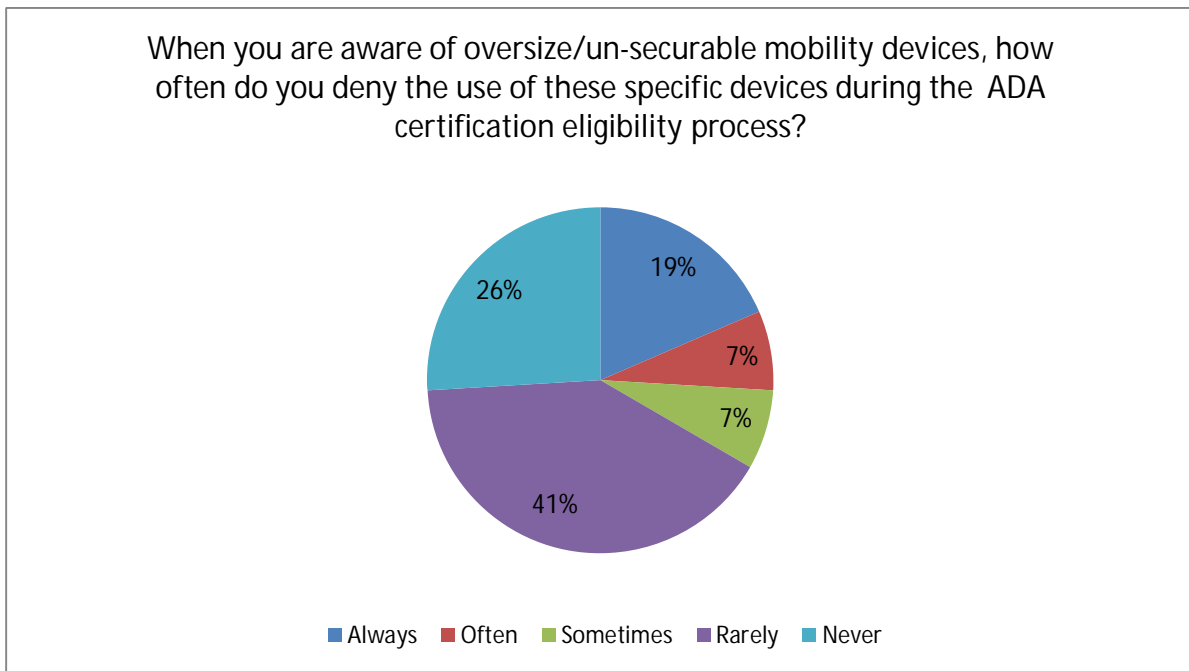
3.

54 out of 75 responded to this question



4.

54 out of 75 responded to this question



5. If a mobility device does not qualify due to the oversized, overweight, and/or lack of securement combination within your agency's policies and practices, what other alternative options does your agency suggest for your customers to find alternative modes of transport?

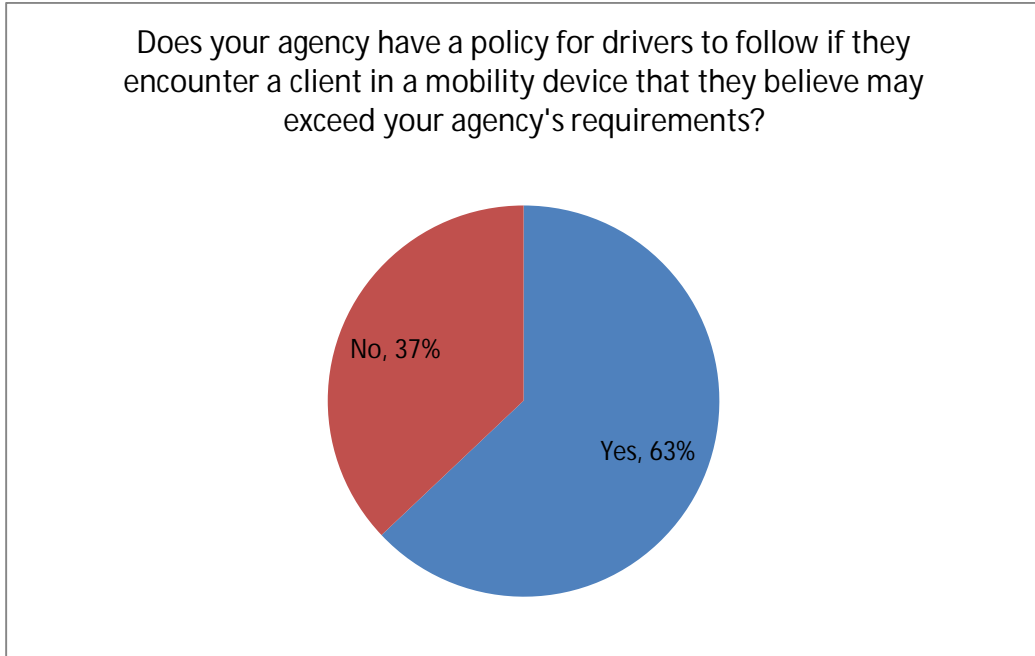
Alternative options	Number of agencies
ask customers to use smaller device	8
find alternative transport and pay mileage	1
in person assessments	1
private service providers	7
refer to other social service agencies	3
rescue squad/EMS/ambulance	16
taxi	2
use lift without device	6
Haven't had this problem	6

6. How do drivers determine whether or not a mobility device exceeds your agency's policy standards en-route?

Determination method	Number of Agencies
ADA office investigation	1
call supervisor/dispatch	22
incident report	2
measure wheelchair	1
pre-screening process	6
training	2
trial and error	29
use oversize lift vehicle	1

7.

54 out of 75 responded to this question

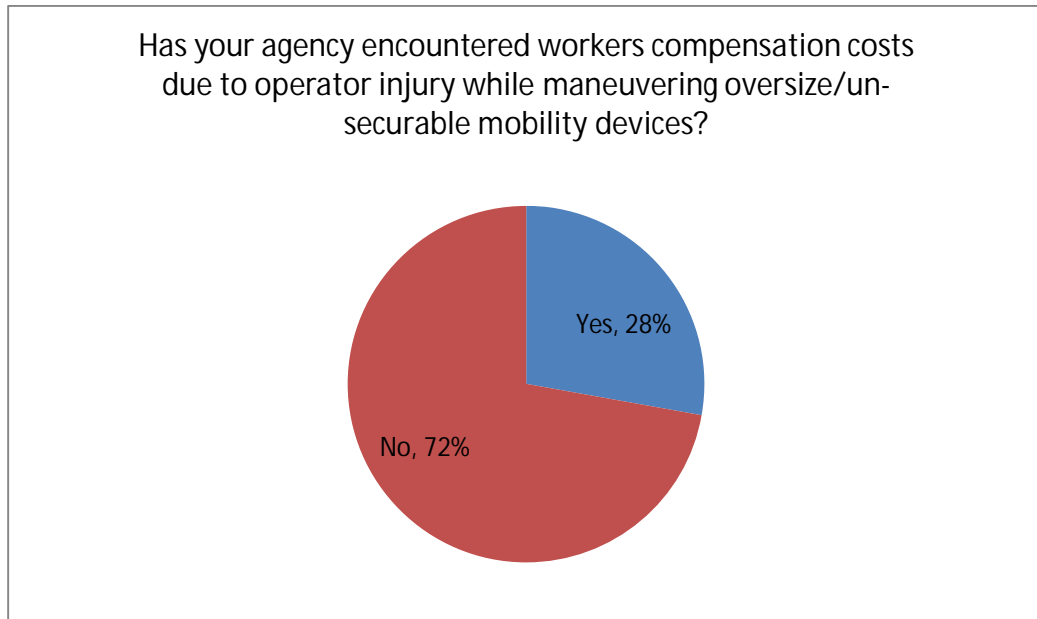


If yes, what is the policy?

Policy	Number of Agencies
can measure chair or discuss with customer	1
contact dispatch/supervisor	33
driver assists	5
fill out incident report	1
go to weigh station	1
transfer out of mobility device	1
travel training	1
vehicle with large lift can be sent	2

8.

54 out of 75 responded to this question

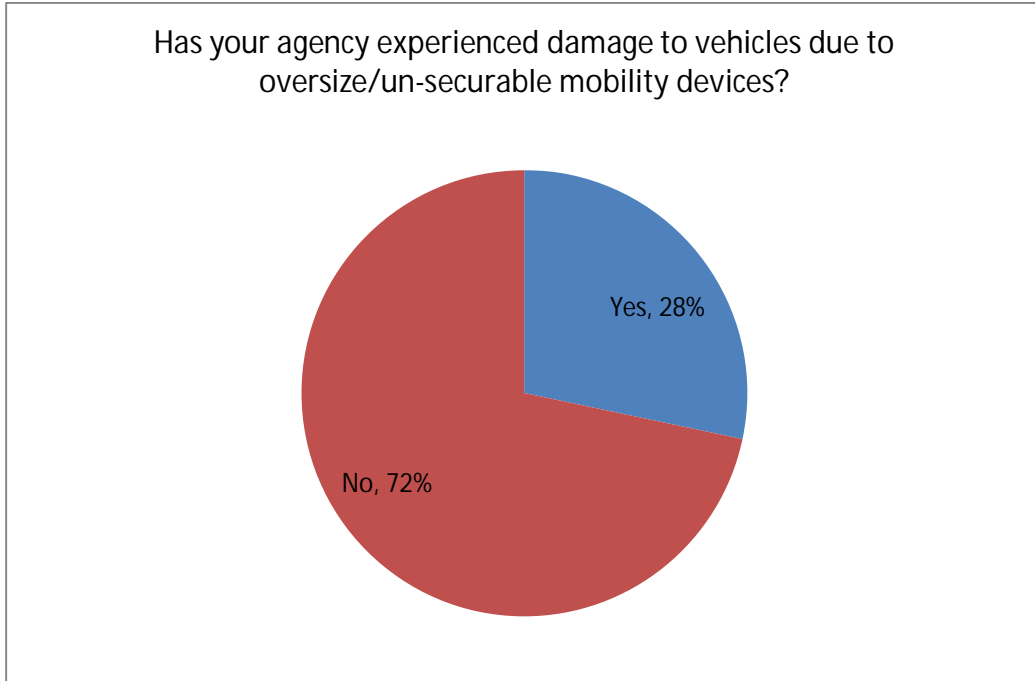


If yes, please describe what you know about how many claims were filed and approximately how much in compensation claims was paid?

Claims information	Number of Agencies
back and neck injuries	1
back and shoulder injuries	1
back injuries	1
lifting heavy wheelchairs	1
permanent partial disability	1
pushing heavy wheelchairs	1
rest time and therapy with pay	1
securing mobility devices	1
5 or 6 claims in 17 years	1
5 claims in 3 years	1
Contractor reports of claims worth 10-15k	1
5-6 back and shoulder strains/year \$500 – 1000 each	

9.

53 out of 75 responded to this question

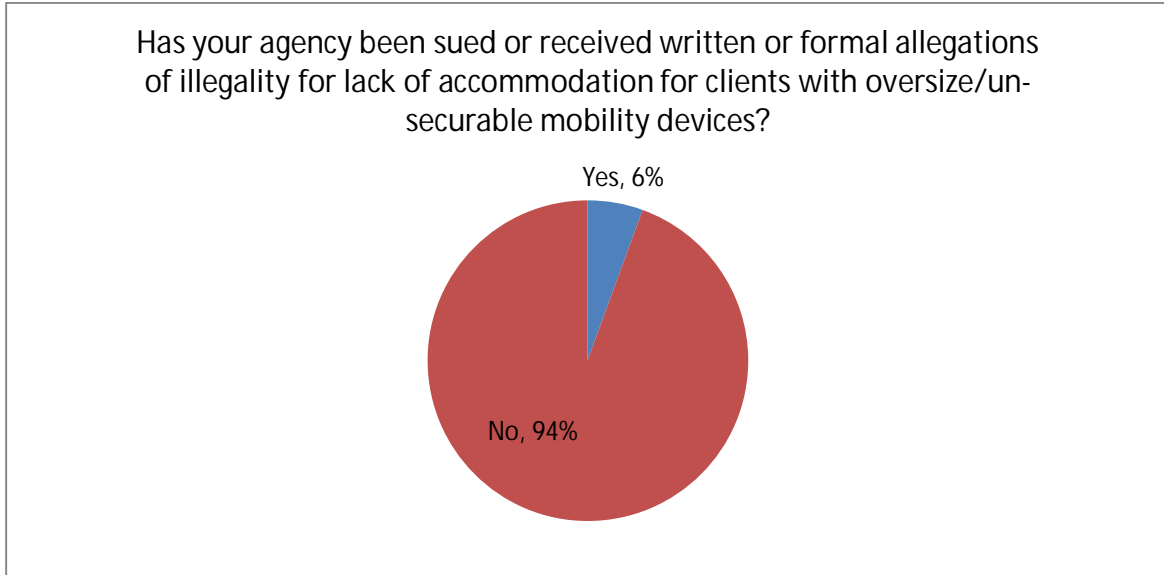


If yes, please describe what you know about how many vehicles were damaged and the approximate cost of the damage.

Type of damage	Number of agencies
damage to hydraulic safety pulley	1
damage to lift	12
damage to ramp	1

10.

54 out of 75 responded to this question



If yes, please describe the seriousness of the incident.

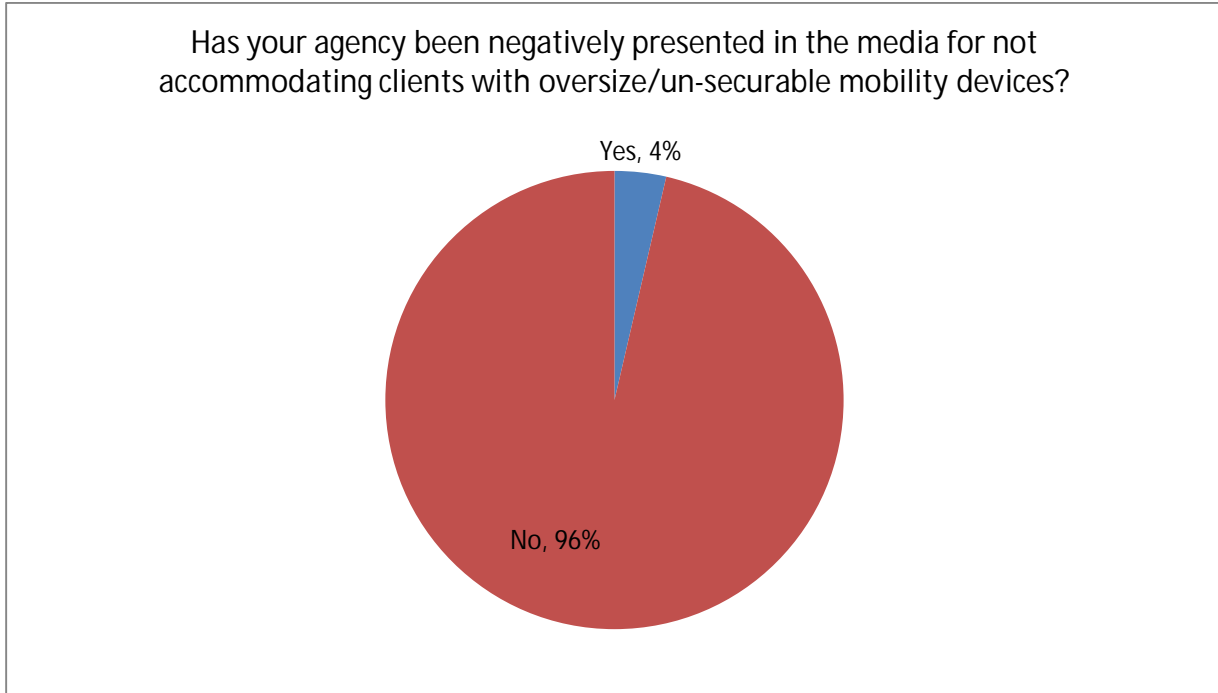
We were legally advised to transport a client who exceeds the weight limit of 600 pounds in their mobility device.

Our local Disability Law Center brought suit against us when we implemented the common wheelchair policy. The suit went before the US Court of Appeals, 10th District who upheld our right to implement the policy as written.

Written allegations only. We were able to solve these issues.

11.

55 out of 75 responded to this question



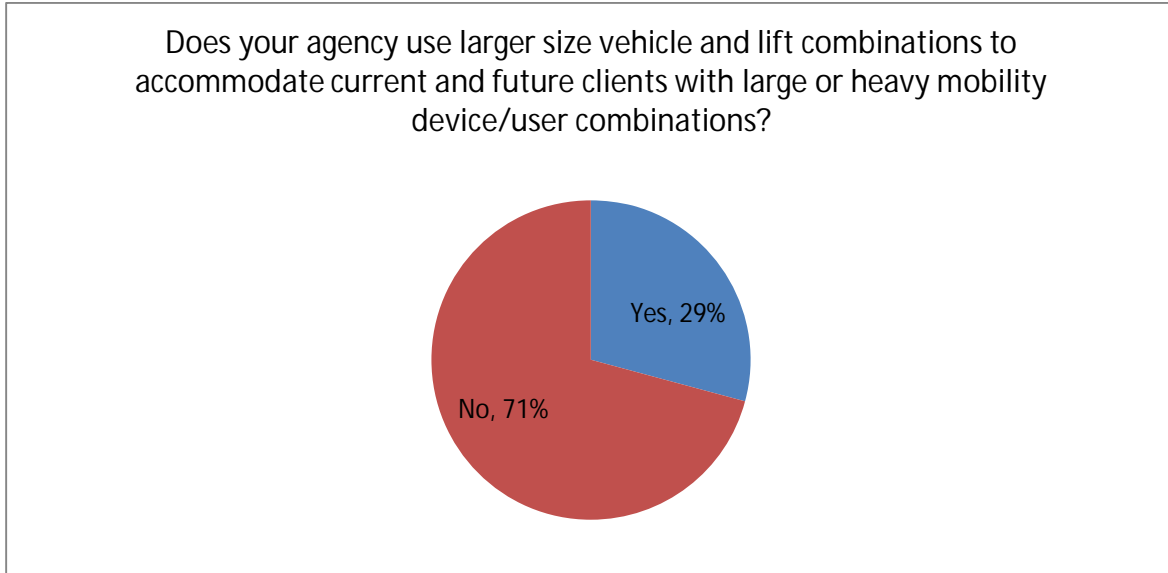
If yes, how often has this happened?

We were negatively portrayed for not transporting an un-occupied wheelchair on a scheduled trip. The occupant had gone to the hospital earlier in the day and the caregivers wanted to make sure the power wheelchair was transported home for convenience.

We did have a large customer we had to occasionally refuse trips to because larger lift not available, threaten to call everyone.

12.

70 out of 75 responded to this question



13. If your agency uses larger size vehicle and lift combinations, please describe the nature of this practice.

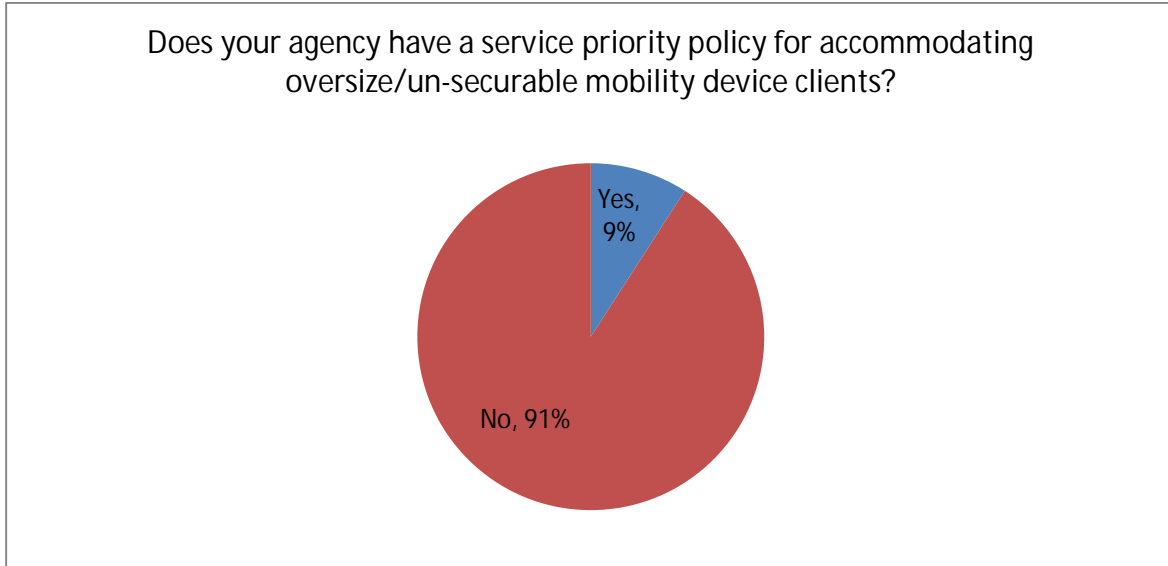
Nature of practice	Number of agencies
All lifts exceed ADA requirements	2
Pre-screen passengers	4
Level boarding/low floors	2
ordered larger vehicles/lifts	7

14. If you use larger vehicles, what was the increased cost due to the larger size for the following cost categories?

Capital cost	Fuel cost	Maintenance and other operating cost	Liability costs
about \$500	increased cost due to using a bus instead of van	added mileage and cost to pick up one person	Although the bus may allow more room, the lift is no different and there is a risk to the driver assisting the passenger and the person in the chair.
Larger/ stronger Lift cost extra \$1150 each			

15.

55 out of 75 responded to this question



If yes, what is the policy?

Policy	Number of agencies
denied service	3
on space available basis	1
scheduled first	1
given same priority	1
schedule two drivers	1
transport in oversized lift vehicle	1

16. What are your agency's concerns regarding risk management issues arising from oversized/un-securable mobility devices for passengers and service providers?

Concerns	Number of agencies
being able to accommodate	1
crowding	2
damage to equipment	6
injuries to passengers and operators	27
legal risks of unsecurable mobility devices	7
safety training	2
stranding passengers	1
vehicle maintenance and repair	1
workers comp	2

17. What other policies or practices does your agency have to address oversize/unsecurable mobility devices?

Policies or Practices	Number of agencies
accommodate oversize if it does not affect other passengers	1
call manager	4
explain common wheelchair policy	1
Implementing a mobility device certification program	1
meet with customer	1
publish ADA limits	1
read liability statement	1
refuse overweight	1
secure as many devices as possible	1
this survey generated policy	1
transfer out of wheelchair	2
use scooter strap	1
use social agencies for assistance	1
use wheelchair accessible buses	1

18. Please tell us about yourself.

Name	Position/Job Title	Agency	City	State	Phone Number	Email Address
Aaron Little	Director	Chilton county Transit	Clanton	AL	205-755-5941	chiltontransit@bellsouth.net
Allison Ledford	Director of Operations	Greater Dayton Regional Transit Authority	Dayton	Ohio	937-425-8510	aledford@greaterdaytonrta.org
Angela Wynes	Assistant Transit Manager	City of High Point	High Point	NC	336-884-3424	angela.wynes@highpointnc.gov
April Hamm	Director	Alleghany In Motion	Sparta	NC	336-372-8747	alletrans@skybest.com
AUSTIN O'DELL	TRANSIT MANAGER	SANTA MARIA AREA TRANSIT	SANTA MARIA	CA	805-925-0951 x225	aodell@ci.santa-maria.ca.us
Barbara Kalosky	General Manager	North East Transportation Co Inc	Waterbury	CT	203-753-2538	bknet6@aol.com
Bonnie Mahoney	Grants Manager	MART	Fitchburg	MA		
Carla Cleveland	Director	Blount County Public Transportation	Oneonta	AL	205-274-4170	transit@otelco.net
Charles Brundza	Superintendent of Operations	TCAT	Ithaca	NY	607-277-9388	cjb59@tcatmail.com
Charles Patton	Public Transportation Director	Columbus County Transportation (a Dept. of County Gov't)	Whiteville	NC	910-641-3929	cpatton@columbusco.org
Cherryl Beveridge	Special Service General Manager	Utah Transit Authority	Salt Lake City	UT	801-287-5350	cbeveridge@rideuta.com
Christy Wilson	Transportation Coordinator	Educational Center for Independence	Chatom	AL	251-847-2970 ext. 22	eci@millry.net
Crystal Martin	Paratransit Program Manager	Madison Metro Transit	Madison	WI	608-267-8654	cmartin@cityofmadison.com
Deanna Crozier	Supervisor of Customer & Client Relations	DATS	Edmonton	Alberta	780-496-4559	deanna.crozier@edmonton.ca
Dion A. Graham Sr.	Operations Training Supervisor	C-TRAN	Vancouver	WA		diong@c-tran.org
Dwayne L Brannan	Driver Supervisor	Baldwin Rural Area Transportation System (BRATS)	Robertsdale	AL	251-972-6817	dbrannan@baldwincoal.gov or cmiddleton@baldwincoal.gov

						ov
Ernestine Cobb	Paratransit Manager	Birmingham-Jefferson County Transit Authority	Birmingham	AL	205-337-1511	ecobb@bjcta.org
Evie Palicz or Matthew Avancena	Manager	Access Services	Los Angeles	CA	213-270-6000	avancena@asila.org; palicz@asila.org
Gary Bretz	Program Coordinator-Paratransit & Alternative Programs	Valley Metro/Regional Public Transportation Authority	Phoenix	AZ	480-287-5985	gbretz@valleymetro.org
Hallie Fonseca	General Manager	Redding Area Bus Authority	Redding	Ca	530-245-7076	hallie.fonseca@veoliatransportation.com
James Parks	Director of Safety, Security, & Risk Mgmt	Cambria County Transit Authority	Johnstown	PA	814-535-5526 ext. 214	jparks@camtranbus.com
Jennifer Ridgway		Pottstown Area Rapid Transit	Pottstown	PA	610-326-5413	jenatcmd@aol.com
Joan DeFee	Director	Autauga County Rural Transportation	Prattville	Al.	334-361-4820	autaugacorural@bellsouth.net
John Sorrell	Manager	Wiregrass Transit Authority	Dothan	AL	334-794-4093 ext. 1431	jsorrell@searpdc.org
June Brewer	Director	DeKalb County Rural Public Transportation	Fort Payne, DeKalb County	AL	256-845-8593	juneb@dekalbcountyal.us
Katrinia Banks-Love	Operations Coordinator	Madison County Commission - TRAM	Huntsville	AL	256/532-3505	tramoc@co.madison.al.us
Kay Eddins	operations supervisor	SCUSA	Albemarle	NC	704-986-3794	keddins@co.stanly.nc.us
Kelly Walker	Transportation Coordinator	Craven Area Rural Transit System (CARTS)	New Bern	NC	252-636-4917	kwalker@cravencountync.gov
Linda Cuthbertson	Director	Avery County Transportation	Newland	NC	828-733-0005	lindacact@bellsouth.net
Mark Weinstein	General Manager	Veolia Transportation for East Bay Paratransit	Oakland	CA	510-446-2007	mark.weinstein@veoliatransportation.com
Meegan Joyce	Special Services Manager	The Rapid	Grand Rapids	MI	616-456-7514	mjoyce@ridetherapid.org
Michael Miller	Accessible Services manager	Sound Transit	Seattle	WA	206-689-4927	michael.miller@soundtransit.org
Mike Kelly	Director of Operations & Maintenance	Santa Fe Rides-City of Santa Fe Transit Division	Santa Fe	NM	505-955-2005	mjkelly@santafenm.gov
Mike Lovett	Director	Greene County	Snow Hill	NC	252-747-8474	mlovett@co.greene.nc.us

		Transportation Department				
Pat Tapley	Director	ARISE	Alexander City	AL	256-329-8444	ariseinc@earthlink.net
Priscilla Rao	Director, Paratransit & Customer Service	TARC	Louisville	KY	502 213-3245	prao@ridetarc.org
Ray Kennedy / Dale Holland	Supervisor / Trainer	Amtran	Altoona	Pa.	814-944-4074	raykennedy@amtran.org / dholland@amtran.org
Samuel Tellis	Transportation Coordinator	Macon - Russell CAA	Tuskegee	AL	334-727-6100 ext 18	mrcaa@bellsouth.net
Sean Sparrow	Inspector	York Region Transit	Richmond Hill	Ontario	905-762-2112	sean.sparrow@york.ca
Shane Christian	Project Administrator	EARPDC	Anniston	AL	256-237-6741	shane.christian@adss.alabama.gov
Sheila B. Grindstaff	Director	Mitchell County Transportation	Bakersville	NC	828-688-4715	sheila.grindstaff@mitchellcounty.org
SHEILA BISHOP	OPERATION MANAGER	LAW. CO. AGING RURAL TRANSIT SYSTEM	MOULTON	AL	256-974-2488	slbishop@bellsouth.net
Susan Anderson	Transit Director	Mountain Projects, Inc,	Waynesville	NC	828-452-1447	sanderson@mountainprojects.org
Terrance Ardrey	LCCII	CATS/STS	Charlotte	NC	704-336-3128	
Terry Parker	Accessible Series Manager	Lane Transit District	Eugene	OR	541-682-3245	terry.parker@ltd.org
Tiffany Pannell	Manager, Mobility Special programs	COTA	Columbus	OH	614-275-5905	pannelltd@cota.com
Tom Greufe	Senior Vice President, Safety and Training	Forsythe Transportation	Cave Creek	AZ	602-758-2303	tgreufe@forsythetransportation.com
Vincent Brown	Assistant General Manager	Charlotte Area Transit System	Charlotte	NC	980-722-7176	vnbrown@ci.charlotte.nc.us
Yvonne Hatcher	Director	Brunswick Transit System, Inc.	Bolivia	NC	910-253-7800	bits@atmc.net
Zaneta Daniels	Manager	Eufaula Barbour Transit Authority	Eufaula	AL	334-687-1242	zdaniels@eufaula.rr.com

APPENDIX C: Pertinent ADA Requirements

	Buses, Over-the-Road Buses, Vans and Systems	Trams and Similar Vehicles Systems	Light Rail Vehicles and Systems	Commuter Rail Vehicles and Systems	Intercity (Amtrak) Rail Cars and Systems	High-Speed Rail Cars, Monorails Systems	Rapid Rail Vehicles and Systems	Automated Guideway Transit Vehicles and Systems
General	<p>New, used or remanufactured buses and vans, to be considered accessible by regulations issued by the Department of Transportation in 49 CFR part 37, shall comply with the applicable provisions of this subpart. If portions of the vehicle are modified in a way that affects or could affect accessibility, each such portion shall comply, to the extent practicable, with the applicable provisions of this subpart. This provision does not require that inaccessible vehicles be retrofitted with lifts, ramps or other boarding devices.</p>							
		<p>New and used trams consisting of a tractor unit, with or without passenger accommodations, and one or more passenger trailer units, including but not limited to vehicles providing shuttle service to remote parking areas, between hotels and other public accommodations, and between and within amusement parks and other recreation areas, shall comply with this section.</p>	<p>Vehicles intended to be operated solely in light rail systems confined entirely to a dedicated right-of-way, and for which all stations or stops are designed and constructed for revenue service after the effective date of standards for design and construction issued pursuant to subpart C of 49 CFR Part 37, shall provide level boarding and shall comply with §§1192.73(d)(1) and 1192.85. Vehicles designed for, and operated on, pedestrian malls, city streets, or other areas where level boarding is not practicable shall provide wayside or car-borne lifts, mini-high platforms, or other means of access in compliance with §1192.83(b) or (c). Existing vehicles retrofitted to comply with the "one-car-per-train rule" at 49 CFR 37.93 shall comply with §§1192.75, 1192.77(c), 1192.79(a) and 1192.83(a) and shall have, in new and key stations, at least one door which complies with §1192.73(a)(1), (b) and (d). Vehicles previously designed and manufactured in accordance with the accessibility requirements of 49 CFR Part 609 or Department of Transportation regulations implementing section 504 of the Rehabilitation Act is coordinated with the platform so that the horizontal gap does not exceed 4 inches and the vehicle floor is within plus or minus 2 inches of the platform height when the vehicle is loaded to 50% of its capacity</p>	<p>Existing vehicles retrofitted to comply with the "one-car-per-train rule" at 49 CFR 37.93 shall comply with §§1192.93(e), 1192.95(a) and 1192.107 and shall have, in new and key stations, at least one door on each side from which passengers board which complies with §1192.93(d). Vehicles previously designed and manufactured in accordance with the program accessibility requirements of section 504 of the Rehabilitation Act of 1973, or implementing regulations issued by the Department of Transportation that were in effect before October 7, 1991 and which can be entered and used from stations in which they are to be operated, may be used to satisfy the requirements of 49 CFR 37.93.</p>	<p>Single-level dining and lounge cars shall have at least one connecting doorway complying with §1192.113(a)(2), connected to a car accessible to persons using wheelchairs or mobility aids, and at least one space complying with §1192.125(d)(2) and (3), to provide table service to a person who wishes to remain in his or her wheelchair, and space to fold and store a wheelchair for a person who wishes to transfer to an existing seat. Restrooms complying with §1192.123 shall be provided in single-level rail passenger coaches and food service cars adjacent to the accessible seating locations required by paragraph (d) of this section. Accessible restrooms are required in dining and lounge cars only if restrooms are provided for other passengers. Sleeper cars shall comply with §§1192.113(b) through (d), 1192.115 through 1192.121, and 1192.125, and have at least one compartment which can be entered and used by a person using a wheelchair or mobility aid and complying</p>	<p>Bi-level lounge cars shall have doors on the lower level, on each side of the car from which passengers board, complying with §1192.113, a restroom complying with §1192.123, and at least one space complying with §1192.125(d)(2) and (3) to provide table service to a person who wishes to remain in his or her wheelchair and space to fold and store a wheelchair for a person who wishes to transfer to an existing seat.</p>	<p>Existing vehicles which are retrofitted to comply with the "one-car-per-train rule" of 49 CFR 37.93 shall comply with §§1192.55, 1192.57(b), 1192.59 and shall have, in new and key stations, at least one door complying with §1192.53(a)(1), (b) and (d).</p>	

					with §1192.127.		
Mobility Aid Accessibility	Provide a level-change mechanism or boarding device (e.g., lift or ramp) and sufficient clearances to permit a wheelchair or other mobility aid user to reach a securement location.	Each tractor unit which accommodates passengers and each trailer unit must comply with the provisions which apply to buses and vans for doors, steps and thresholds (§1192.25) and interior circulation, handrails and stanchions (§1192.29).	All new commuter rail cars, other than level entry cars, covered by this subpart shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate), sufficient clearances to permit a wheelchair or mobility aid user to reach a seating location; and at least two wheelchair or mobility aid seating locations.		At least one doorway, on each side of the car from which passengers board, of each car required to be accessible by §1192.111(a) and where the spaces required by §1192.111(d) are located, and at least one adjacent doorway into coach passenger compartments shall have a minimum clear opening width of 32 inches.	Passenger doorways on vehicle sides shall have clear openings at least 32 inches wide when open. If doorways connecting adjoining cars in a multi-car train are provided, and if such doorway is connected by an aisle with a minimum clear width of 30 inches to one or more spaces where wheelchair or mobility aid users can be accommodated, then such doorway shall have a minimum clear opening of 30 inches to permit wheelchair and mobility aid users to be evacuated to an adjoining vehicle in an emergency.	
					All intercity rail cars, other than level entry cars, required to be accessible by §1192.111 shall provide a level-change mechanism or boarding device (e.g., lift, ramp or bridge plate) and sufficient clearances to permit a wheelchair or other mobility aid user to reach a seating location.		Doorways at ends of cars connecting two adjacent cars, to the maximum extent practicable in accordance with regulations issued under the Federal Railroad Safety Act of 1970 (49 CFR Parts 229 and 231), shall have a clear opening width of 32 inches to permit wheelchair and mobility aid users to enter into a single-level dining car, if available.

Ramp Slope	<p>Current Rule: Ramps shall have the least slope practicable and shall not exceed 1:4 when deployed to ground level.</p> <p>Proposed Rule: Slope to not exceed 1:6 when deployed to boarding and alighting areas without station platforms and to the roadway</p>	<p>The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, measured on level ground, for a maximum rise of 3 inches, and the transition from roadway or sidewalk to ramp may be vertical without edge treatment up to 1/4 inch. Thresholds between 1/4 inch and 1/2 inch high shall be beveled with a slope no greater than 1:2.</p>	<p>Ramps or bridge plates shall have the least slope practicable. If the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 3 inches or less above the station platform a maximum slope of 1:4 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 6 inches or less, but more than 3 inches, above the station platform a maximum slope of 1:6 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is 9 inches or less, but more than 6 inches, above the station platform a maximum slope of 1:8 is permitted; if the height of the vehicle floor, under 50% passenger load, from which the ramp is deployed is greater than 9 inches above the station platform a slope of 1:12 shall be achieved. Folding or telescoping ramps are permitted provided they meet all structural requirements of this section.</p>	<p>The entrance ramp, or loading-edge barrier used as a ramp, shall not exceed a slope of 1:8, when measured on level ground, for a maximum rise of 3 inches, and the transition from station platform to ramp may be vertical without edge treatment up to 1/4 inch. Thresholds between 1/4 inch and 1/2 inch high shall be beveled with a slope no greater than 1:2.</p>	<p>Specifications for boarding devices such as lifts and ramps have not been referenced since level boarding is required.</p>
------------	--	--	---	--	---

Circulation Paths	<p>Current Rule: Require transit operators to transport wheelchairs and scooters that are up to 30 inches wide and 48 inches long</p> <p>Proposed Rule: Requires circulation paths connecting doorways that provide accessible boarding and wheelchair spaces to be at least 34 inches wide. This dimension does not apply to doorways, which are addressed in T503. This dimension applies from the vehicle floor to a height 40 inches minimum above the vehicle floor. The circulation path width can be reduced to 30 inches at heights 40 inches minimum above the vehicle floor</p>	<p>Interior handrails and stanchions shall permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a securement location from the lift or ramp. For vehicles in excess of 22 feet in length, the minimum interior height along the path from the lift to the securement location shall be 68 inches. For vehicles of 22 feet in length or less, the minimum interior height from lift to securement location shall be 56 inches.</p>	<p>At all doors on level-entry vehicles, and at each entrance accessible by lift, ramp, bridge plate or other suitable means, handrails, stanchions, passenger seats, vehicle driver seat platforms, and fare boxes, if applicable, shall be located so as to allow a route at least 32 inches wide so that at least two wheelchair or mobility aid users can enter the vehicle and position the wheelchairs or mobility aids in areas, each having a minimum clear space of 48 inches by 30 inches, which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seat-back rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid circulation and shall be kept to a minimum in the vicinity of accessible doors.</p>	<p>This provision does not require handrails or stanchions but stipulates that where they are provided, they must not obstruct the accessible route connecting accessible seating locations. Handrails or stanchions cannot encroach upon the 32 inches of clear width for accessible routes or the 42 inches of clear width necessary for right-angle turns at vestibule doorways.</p>	<p>Where provided, handrails or stanchions within the passenger compartment shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location from an accessible entrance.</p>	<p>Where provided, handrails or stanchions within the passenger compartment shall be placed to permit sufficient turning and maneuvering space for wheelchairs and other mobility aids to reach a seating location from an accessible entrance.</p>	<p>Handrails and stanchions shall be provided to assist safe boarding, on-board circulation, seating and standing assistance, and alighting by persons with disabilities. Handrails, stanchions, and seats shall allow a route at least 32 inches wide so that at least two wheelchair or mobility aid users can enter the vehicle and position the wheelchairs or mobility aids in areas, each having a minimum clear space of 48 inches by 30 inches, which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seat-back rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid user circulation and shall be kept to a minimum in the vicinity of doors.</p>
-------------------	---	---	---	---	---	---	--

Wheelchair Space	<p>Current Rule: Require transit operators to transport wheelchairs and scooters that are up to 30 inches wide and 48 inches long</p> <p>Proposed Rule: Requires 1 inch minimum maneuvering clearance on the short side of wheelchair spaces entered from the front or rear [the total size of the wheelchair space and maneuvering clearance is 31 inches by 48 inches minimum]; and Requires 6 inches minimum maneuvering clearance on the long side of wheelchair spaces entered from the side [the total size of the wheelchair space and maneuvering clearance is 30 inches by 54 inches minimum].</p>	<p>A space of 48 inches by 30 inches for the clear floor space required to accommodate a single stationary wheelchair and for a platform lift.</p>	<p>An area that can accommodate two wheelchair spaces each 30 by 48 inches in size is provided.</p>	<p>Spaces for persons who wish to remain in their wheelchairs or mobility aids shall have a minimum clear floor space 48 inches by 30 inches. Such spaces shall adjoin, and may overlap, an accessible path. Not more than 6 inches of the required clear floor space may be accommodated for footrests under another seat provided there is a minimum of 9 inches from the floor to the lowest part of the seat overhanging the space. Seating spaces may have fold-down or removable seats to accommodate other passengers when a wheelchair or mobility aid user is not occupying the area, provided the seats, when folded up, do not obstruct the clear floor space required.</p>	<p>All intercity rail cars required to be accessible by §1192.111 shall provide at least one, but not more than two, mobility aid seating location(s); and at least one, but not more than two, seating location(s) which adjoin or overlap an accessible route with a minimum clear width of 32 inches. Spaces for persons who wish to remain in their wheelchairs or mobility aids shall have a minimum clear floor area 48 inches by 30 inches. Such space may have fold-down or removable seats for use when not occupied by a wheelchair or mobility aid user. Sleeping compartments required to be accessible shall be designed so as to allow a person using a wheelchair or mobility aid to enter, maneuver within and approach and use each element within such compartment.</p>	<p>An area that can accommodate two wheelchair spaces each 30 by 48 inches in size is provided</p>	<p>Two areas, each having a minimum clear space of 48 inches by 30 inches, which do not unduly restrict movement of other passengers. Space to accommodate wheelchairs and mobility aids may be provided within the normal area used by standees and designation of specific spaces is not required. Particular attention shall be given to ensuring maximum maneuverability immediately inside doors. Ample vertical stanchions from ceiling to seat-back rails shall be provided. Vertical stanchions from ceiling to floor shall not interfere with wheelchair or mobility aid user circulation and shall be kept to a minimum in the vicinity of doors.</p>
------------------	---	--	---	--	---	--	---

<p>Wheelchair Securement</p>	<p>At least two securement locations and devices shall be provided on vehicles in excess of 22 feet in length; at least one securement location and device, shall be provided on vehicles 22 feet in length or less. The securement system shall be placed as near to the accessible entrance as practicable and shall have a clear floor area of 30 inches by 48 inches. Such space shall adjoin, and may overlap, an access path. When the wheelchair or mobility aid is secured in accordance with manufacturer's instructions, the securement system shall limit the movement of an occupied wheelchair or mobility aid to no more than 2 inches in any direction under normal vehicle operating conditions.</p>	<p>Securement systems on vehicles with GVWRs of 30,000 pounds or above, and their attachments to such vehicles, shall restrain a force in the forward longitudinal direction of up to 2,000 pounds per securement leg or clamping mechanism and a minimum of 4,000 pounds for each mobility aid. Securement systems on vehicles with GVWRs of up to 30,000 pounds, and their attachments to such vehicles, shall restrain a force in the forward longitudinal direction of up to 2,500 pounds per securement leg or clamping mechanism and a minimum of 5,000 pounds for each mobility aid.</p>	<p>There is no requirement for securement systems or tie-down devices.</p>
<p>Vehicle Lift Design Load</p>	<p>The design load of the lift shall be at least 600 pounds. Working parts, such as cables, pulleys, and shafts, which can be expected to wear, and upon which the lift depends for support of the load, shall have a safety factor of at least six, based on the ultimate strength of the material. Nonworking parts, such as platform, frame, and attachment hardware which would not be expected to wear, shall have a safety factor of at least three, based on the ultimate strength of the material.</p>	<p>Specifications for boarding devices such as lifts and ramps have not been referenced since level boarding is required.</p>	

<p>Vehicle Ramp</p>	<p>Ramps 30 inches or longer shall support a load of 600 pounds, placed at the centroid of the ramp distributed over an area of 26 inches by 26 inches, with a safety factor of at least 3 based on the ultimate strength of the material. Ramps shorter than 30 inches shall support a load of 300 pounds.</p> <p>The ramp surface shall be continuous and slip resistant; shall not have protrusions from the surface greater than 1/4 inch high; shall have a clear width of 30 inches; and shall accommodate both four-wheel and three-wheel mobility aids.</p>	<p>Specifications for boarding devices such as lifts and ramps have not been referenced since level boarding is required.</p>
---------------------	---	---