Puerto Rico Seatbelt Use Observational Survey

CST CAMPAIGN DATE: 2025-MAY 19-1 JUN

Submitted to: Comisión de Seguridad del Tránsito de Puerto Rico

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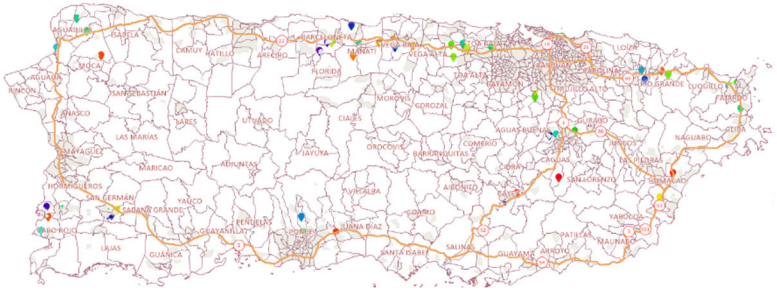
3. Seatbelt Observational Survey

The Seat Belt Observational Survey is a certified annual study designed to measure real-world seat belt usage among drivers and front-seat passengers across Puerto Rico. Conducted in compliance with NHTSA guidelines and the statistical and methodological standards established in 23 CFR § 1340.8(c), the survey gathers data through direct roadside observation. This effort ensures an accurate estimate of occupant protection behaviors while enabling federal reporting and supporting targeted safety campaigns. The results inform public policy, educational strategies, and enforcement initiatives to increase seat belt compliance and reduce traffic-related injuries and fatalities. Observations are weighted to ensure statewide representativeness.

Category	Description
Survey	Roadside Seat Belt Use Observational Survey
Method	Roadside Observational Study
Sample Size	6,800+ vehicle observations across 68 segments, 17 PSUs, 68 SSUs
Focus	Real-world seat belt use by occupants
Purpose	Measure compliance with seat belt laws
Main Content	Driver and front passenger seat belt use
Participant Profile	All vehicle occupants observed at intersections and roadways

REGION	MUNICIPIOS	PSU #	SSU #
North	BARCELONETA, DORADO, MANATI, TOA BAJA, VEGA BAJA	5	20
West	AGUADILLA, CABO ROJO, SAN GERMÁN	3	12
South	CAYEY, PONCE	2	8
East	CAGUAS, FAJARDO, HUMACAO, RIO GRANDE	4	16
Metro	BAYAMON, GUAYNABO, SAN JUAN	3	12
5	TOTAL	17	68



2025 Observations Sites

#	PSU	PSU	SSU	Road Name	Long	Latitude	Length	Prob_Selec	Prob_ Overall
1	North	BARCELONETA	road #1	Expreso Jose de Diego	-66.543267	18.44154	37	0.033376	0.0006007
2	North	BARCELONETA	road #1	Pr-2	-66.549318	18.43392	120.8	0.0262187	0.0004721
3	North	BARCELONETA	road #1	Cll 10	-66.577102	18.41587	147.8	0.0040745	0.0000734
4	North	BARCELONETA	road #2	Cll Dorada	-66.559151	18.43415	40.9	0.0080454	0.000145
5	North	DORADO	road #1	Expreso Jose de Diego	-66.286862	18.42837	160.1	0.1830936	0.050486
6	North	DORADO	road #1	Pr-2	-66.282166	18.40351	72.4	0.0011613	0.0003202
7	North	DORADO	road #1	Pr-6693	-66.26085	18.43059	162.2	0.0024834	0.0006846
8	North	DORADO	road #2	100 Fairways Village Dr	-66.506672	18.46904	285.1	0.0041211	0.0011363
9	North	MANATI	road #1	Expreso Jose de Diego	-66.502546	18.40582	134.8	0.0019665	0.0005427
10	North	MANATI	road #1	Pr-2	-66.445996	18.4336	79.5	0.0009252	0.0002933
11	North	MANATI	road #1	Cll Vendig	-66.488125	18.42986	13.1	0.0001906	0.0000602
12	North	MANATI	road #2	Pr-686	-66.490614	18.42871	302.1	0.04963	0.0129419
13	North	TOA BAJA	road #1	Expreso Jose de Diego	-66.250376	18.41818	277.9	0.015072	0.0089483
14	North	TOA BAJA	road #1	Pr-165	-66.251495	18.42147	193.6	0.0075516	0.0042781
15	North	TOA BAJA	road #1	Pr-863	-66.198403	18.42384	171.2	0.0009788	0.0005532
16	North	TOA BAJA	road #2	Pr-866	-66.186932	18.42356	552	0.0013838	0.0008123
17	North	VEGA BAJA	road #1	Expreso Jose de Diego	-66.370392	18.42786	420.2	0.0169936	0.0166653
18	North	VEGA BAJA	road #1	Pr-2	-66.412395	18.44382	268.3	0.0027345	0.002314
19	North	VEGA BAJA	road #1	Cll Inocencio Rey	-66.407952	18.42854	31.5	0.0002537	0.0001914
20	North	VEGA BAJA	road #2	Ave Jesus M Armaiz	-66.410275	18.42381	227.6	0.0017071	0.0014446
21	West	AGUADILLA	road #1	Pr-2	-67.057284	18.40648	149.1	0.001043	0.0007519
22	West	AGUADILLA	road #2	Pr-442	-67.155167	18.42278	41.9	0.0005604	0.0004038
23	West	AGUADILLA	road #3	Pr- 465	-67.089146	18.45777	271.8	0.0036935	0.0019488
24	West	AGUADILLA	road #3	Pr- 110	-67.111081	18.4843	42.1	0.0005627	0.003016
25	West	CABO ROJO	road #1	Pr-100	-67.173295	18.07012	153.1	0.0013534	0.0009606
26	West	CABO ROJO	road #1	Pr-3311	-67.141905	18.08673	45.3	0.0004836	0.0002164
27	West	CABO ROJO	road #2	Cll Legion Americana	-67.773865	18.09056	84.6	0.000963	0.0004311
28	West	CABO ROJO	road #3	Comunidad del Toro	-67.189278	18.04088	85.8	0.0009167	0.000401
29	West	SAN GERMÁN	road #1	Pr-2	-67.021718	18.08503	595.2	0.0441878	0.0131671
30	West	SAN GERMÁN	road #1	Cll Retiro	-67.043131	18.07374	42	0.0004093	0.0001959
31	West	SAN GERMÁN	road #1	Pr-321	-67.034135	18.07334	37	0.0003185	0.0001525
32	West	SAN GERMÁN	road #2	Pr- 166	-67.043558	18.08008	36.8	0.0007531	0.0002244
33	South	CAYEY	road #1	Autopista Luis A Ferre	-66.049482	18.15182	57.6	0.0154584	0.0041316
34	South	CAYEY	road #1	Pr-1	-66.141937	18.11936	39.9	0.0003484	0.0000972
35	South	CAYEY	road #1	Ave Jesus T Pinero	-66.166954	18.10368	60.2	0.00055	0.000153
36	South	CAYEY	road #2	Ave Luis Munoz Riv.Sur	-66.168142	18.10694	84.4	0.000772	0.000215
37	South	PONCE	road #1	Pr- 52	-66.540464	18.0379	91.8	0.0021191	0.002623
38	South	PONCE	road #1	Pr- 10	-66.612264	18.03774	45.4	0.0001711	0.0001671
39	South	PONCE	road #1	Cll Torre	-66.616128	18.07049	76.6	0.0002196	0.0002145
40	South	PONCE	road #2	Ave Tito Castro	-66.609691	18.00791	169.1	0.0001931	0.0003116
41	East	CAGUAS	road #1	Exprs Cruz Ortiz Stella	-66.014559	18.24841	54.6	0.00116	0.001126
42	East	CAGUAS	road #1	Ave Zafiro	-66.055186	18.24252	349.9	0.00252	0.002445
43	East	CAGUAS	road #1	Ave Turabo	-66.073252	18.243	70.5	0.00053	0.000496
44	East	CAGUAS	road #2	Cll Via Grande	-66.070892	18.24004	12.4	0.000046	0.000045
45	East	FAJARDO	road #1	Expres Jose C.Barbosa	-65.648822	18.29589	433.9	0.103323	0.029631
46	East	FAJARDO	road #1	Pr- 3	-65.672853	18.34311	104.5	0.004129	0.001368

#	PSU	PSU	SSU	Road Name	Long	Latitude	Length	Prob_Selec	Prob_ Overall
47	East	FAJARDO	road #1	Ave el Conquistador	-65.658338	18.34766	27.5	0.002649	0.000753
48	East	FAJARDO	road #2	Cll Principal	-65.67547	18.3427	30.4	0.002063	0.000564
49	East	HUMACAO	road #1	Expres Jose C. Barbosa	-65.798686	18.16132	518.5	0.010704	0.004947
50	East	HUMACAO	road #1	Pr- 3	-65.827198	18.11012	202.8	0.002285	0.001096
51	East	HUMACAO	road #1	Cll Dufresne	-65.825858	18.15106	112.3	0.001988	0.000952
52	East	HUMACAO	road #2	Blvd Nicanor Vazquez	-65.829133	18.14894	67.4	0.000491	0.000227
53	East	RIO GRANDE	road #1	Pr- 66	-65.807721	18.36818	655.9	0.149338	0.069208
54	East	RIO GRANDE	road #1	Pr- 3	-65.823649	18.37452	7.6	0.000067	0.000027
55	East	RIO GRANDE	road #1	Ave Cambalache	-65.868122	18.37581	225.8	0.001928	0.000787
56	East	RIO GRANDE	road #2	Cll Rescate	-65.860523	18.35629	61	0.001522	0.000621
57	Metro	BAYAMON	road #1	Expreso Jose de Diego	-66.163284	18.42277	286.6	0.002584	0.001882
58	Metro	BAYAMON	road #1	Ave Comerio	-66.177408	18.43196	156.8	0.001063	0.000488
59	Metro	BAYAMON	road #2	Ave Betances	-66.077594	18.39451	53.5	0.001159	0.000422
60	Metro	BAYAMON	road #3	Ave Santa Ana	-66.119165	18.38055	53.5	0.000198	0.000072
61	Metro	GUAYNABO	road #1	Pr- 20	-66.100457	18.33471	359.5	0.012694	0.0037049
62	Metro	GUAYNABO	road #1	Pr-165	-66.105528	18.4137	367.1	0.0038778	0.0011318
63	Metro	GUAYNABO	road #1	Ave Washington	-66.096259	18.36767	53.7	0.0003043	0.000952
64	Metro	GUAYNABO	road #2	Expreso 834	-66.101755	18.31971	576	0.0032618	0.000952
65	Metro	SAN JUAN	road #1	Expreso Roman Baldorioty de Castro	-66.043002	18.44646	199.3	0.002914	0.003168
66	Metro	SAN JUAN	road #1	Pr- 3	-66.017282	18.39702	236	0.001493	0.001633
67	Metro	SAN JUAN	road #1	Ave Dr Jose N Gandara	-66.045754	18.40165	61.7	0.000967	0.00049
68	Metro	SAN JUAN	road #2	Cll Nemesio Canales	-66.077594	18.41069	269.7	0.000456	0.000499

Variable	Definition
Vgc (Active Drivers)	Total number of active drivers in municipality c within region g.
Vgc / Vg	Proportion of active drivers in the municipality relative to the total number of dr
πgc	Cumulative or adjusted probability that the municipality is selected as part of the
certainty	Indicates whether the municipality is selected with certainty (1) or not (0).
Cumulative Population	Cumulative number of active drivers up to that municipality, ordered for systematic selection.
SAMPLE	Indicates whether that municipality was selected in the sample ("Y") or not.
Vg (Región)	Total number of active drivers in the entire region (g).
Vg / ng	Systematic selection interval in the region
ng	Number of municipalities selected in the sample for region g.
Ng	Total number of municipalities in the region.
RS (Random Start)	Random starting point to apply the systematic selection interval.
RS + SI	Second point of systematic selection in the cumulative list.
RS + 2SI	Third point of systematic selection.
RS + 3SI	Fourth point of systematic selection.
SI (Sampling Interval)	Systematic sampling interval. It is obtained by dividing the total target population

INTRODUCTION

The Traffic Safety Commission of Puerto Rico (CST by its Spanish acronym), with the collaboration of Agentes Y Consultores, Inc., conducted the Seat Belt Use Survey for 2025. The purpose of the study is to estimate seat belt use in Puerto Rico at a specific point in time. The sample design is like the one approved by the National Highway Traffic Safety Administration (NHTSA) on November 9, 2011. For this year, we used the same road selection from 2024 following the Uniform Criteria for State Observational Surveys of Seat Belt Use, approved by NHTSA on May 30, 2017.

The fieldwork team was composed of nine (9) members. All team members participated in a one-day training session on August 11, 2025. The session included all the different aspects for the field observations and quality control. The training was organized in two sections. The first section addressed the objectives of the survey, operational definitions concerning field observations, and data gathering protocols. The second section consisted of examples, the recreation of the different situations, and possible scenarios in the field. This second part also included role playing exercises for observers, counters, and quality control monitors. Observations were conducted from **August 16 to August 30 2025**. Seventeen (17) counties were visited, for a total of **7,380** vehicle observations.

METHODOLOGY

The methodology used for this 2025 Seat Belt Observational Survey adheres strictly to the Uniform Criteria for State Observational Surveys of Seat Belt Use as established by NHTSA (23 CFR § 1340.8(c)). Data collection was conducted through direct roadside observation by trained field staff, without any driver interaction or notification. The survey design is consistent with the sampling approach approved by NHTSA in 2011 and updated for Puerto Rico in 2017, which introduced a new set of road segments based on the approved uniform criteria.

For the 2025 cycle, the same 68 road segments utilized in 2024 were revisited. The sampling frame was organized using a two-stage stratified design. The Primary Sampling Unit (PSU) was defined as the county, while the Secondary Sampling Unit (SSU) was the individual road segment. Each PSU was stratified by five geographic regions (North, South, East, West, and Metro), based on regional distribution across Puerto Rico.

A total of 17 counties were randomly selected from a frame of 45 eligible counties, after excluding those with fewer than 15% of the state's passenger vehicle occupant fatalities, in accordance with 23 CFR § 1340.5(a)(3). The selection was proportional to the number of active driver's licenses per county, ensuring proper representation of the driving population.

Within each selected county, road segments were stratified by road type: 1. Primary Roads, 2. Secondary Roads and 3. Local Roads. Four road segments were selected per county, based on CENSUS TIGER/Line® shapefile data, using segment length as the Measure of Size (MOS). This ensured that longer segments had a higher probability of selection, supporting statistical representativeness. Roadway observation scheduling included rotating time-of-day intervals and road direction to reduce bias and capture diverse traffic patterns.

In general, each county's four selected sites were covered in a single weekday. However, adjustments were made when necessary for weather, safety, or sampling compliance.

This standardized and regionally stratified sampling methodology ensures that the data is representative of vehicle occupants in Puerto Rico and fully compliant with federal requirements. Observations were conducted through direct roadside observation without driver interaction and followed a strict scheduling protocol that ensured data collection occurred across all seven days of the week. Each observation period lasted 45 minutes, followed by an estimated 45-minute travel interval between segments to maintain consistency across sites.

Daily starting times were randomly assigned between 6:00 AM and 1:00 PM, ensuring a balanced probability of observation across the 6:00 AM to 6:00 PM timeframe. Site locations were selected deterministically by identifying the first intersection or ramp on each designated road segment, as mapped using TIGER/Line® shapefiles. Each data collection team consisted of three trained members: two observers recording belt use and seating position, and one vehicle counter. The team also recorded the roadway directions of the selected segment and, when more than two directions were present, used random selection to determine the direction to observe. For quality assurance, approximately 6% (4 out of 64 segments) of all observation sites were subject to unannounced visits by an independent monitor to ensure compliance with methodological standards.

To facilitate a thorough analysis of the data collected for this report, the team developed a data form containing several key variables. The field data collection app captured detailed observational data for each vehicle encounter, including the region, municipality, road number, road type, road name, timestamp, date, day of the week, time of day, and daytime group. Additionally, it recorded the observer's initials, municipality of observation, specific street or road segment, and optionally, the last three digits of the vehicle's license plate. For each vehicle, the app documented the vehicle type, occupant category, estimated age and gender, seat belt usage, cell phone use by the driver, presence of a child, estimated age of the child, child's use of a car seat, and the weather conditions at the start of the observation.

An observation protocol was implemented to guide all fieldwork activities and ensure methodological consistency across teams. This protocol outlined the specific roles of each team member, criteria for selecting the appropriate roadway direction, designated observation points, procedures for identifying eligible vehicles and occupants, and standardized methods for recording observations.

In addition to the primary protocol, four contingency protocols were developed to address special scenarios: (1) temporarily unavailable observation locations, (2) permanently unavailable sites, (3) situations where the nonresponse rate exceeded 10%, and (4) procedures for handling non-usable or incomplete data. These protocols were critical for maintaining the integrity of the sample design, ensuring that selected sample units were adequately represented, and confirming that the survey's standard error did not exceed 2.5 percentage points, in compliance with 23 CFR § 1340.5(b)(2).

For data entry and processing, the analysis utilized PSPP, Microsoft Excel, and R statistical software.

FINDINGS

General Findings

The five (5) regions of Puerto Rico were covered with visits of the 17 counties (four road segments in each county selected for the sample). The number of observations per segment was a minimum of 100 vehicles, for a total of 7,380 observed vehicles and 9,111 occupants (7,380 drivers and 1,515 front passengers).

The 68 segments visited were the same as 2024 (following NHTSA procedure) within the same time and days of the week. There was no need to change road segments do to the fact that all observations were completed in each of the 68 roads segments used 2024.

Quality control was conducted in four out of the sixty-eight observed segments (6%). These segments, included in table one, were randomly selected.

TABLE 1: QUALITY CONTROL BY ROAD SEGMENTS

Region	County	Type	Road Segment	Coordinates	Date	Hour
METRO	BAYAMON	Primary	Expreso Jose de Diego	18°25'18"N 66°09'50"W	8/20/2025	8:00 AM
METRO	BAYAMON	Local	Ave. Betances	18°23'35"N 66°10'03"W	8/20/2025	9:00 AM
METRO	SANJUAN	Local	NEMESIOCANALES	18°25'01"N 66°04'37"W	8/19/2025	5:00 PM
EAST	CAGUAS	Secondary	Ave Zafiro	18°14'33"N 66°03'00"W	8/20/2025	10:00 AM

Observers recorded the belt use information of 7,380 drivers and 1,515 front seat passengers. The number of occupants with unknown belt use was 309 for a nonresponse rate of 3.39% (nonresponse rate =306/9,111).

The overall seat belt use measured by combining drivers and passengers (once weights were applied as indicated in the sample design) was 91.32 percent, with a standard error of 0.29 percent.

TABLE 2: WEIGHTED SEAT BELT USE RATE FOR PUERTO RICO 2025

Table 2 includes the number of observations of drivers and passengers per county and region.

Rate of belt use	Standard Error	95 Percent Confidence Interval	
91.32%	0.29%	91.20%	92.34%

n=8,895 (Total observations excluding unknowns)

STANDAR ERROR

The seat belt use rate was estimated to use a ratio estimator, consistent with statistical methodologies outlined in 23 CFR § 1340.8(c). The standard error (SE) of this estimate was calculated using the survey package in R, in accordance with the procedures submitted and approved in the official Sample Design Plan by NHTSA. The estimation incorporated a total sample of 8,802 observed occupants, excluding unknown belt use cases. The observed proportion of belt use was **91.32%**. The calculated standard error for this estimate was approximately **0.29%**. The corresponding 95% confidence interval for the true seat belt usage rate in Puerto Rico ranges from 90.2% to 93.4%, indicating a high degree of precision and compliance with the federal requirement that the standard error not exceed 2.5 percentage points.

R Script for SE and 95% CI Calculation

```
# Load necessary package
install.packages("survey")   # Only if not already installed
library(survey)

# Observed belt use proportion (weighted)
p_hat <- 0.9132  # 91.32%

# Effective sample size (excluding unknowns)
n <- 7380 + 1515  # Total drivers + passengers with known belt use
# n = 8895

# Calculate Standard Error
SE <- sqrt(p_hat * (1 - p_hat) / n)

# Calculate 95% Confidence Interval
z <- 1.96  # Z value for 95% confidence
CI_lower <- p_hat - z * SE
CI_upper <- p_hat + z * SE

# Output results
cat("Standard Error (SE):", round(SE * 100, 2), "%\n")
cat("95% Confidence Interval:", round(CI_lower * 100, 2), "% -", round(CI_upper * 100, 2), "%\n")

Standard Error (SE): 0.29 %
95% Confidence Interval: 91.20 % - 92.34 %
```

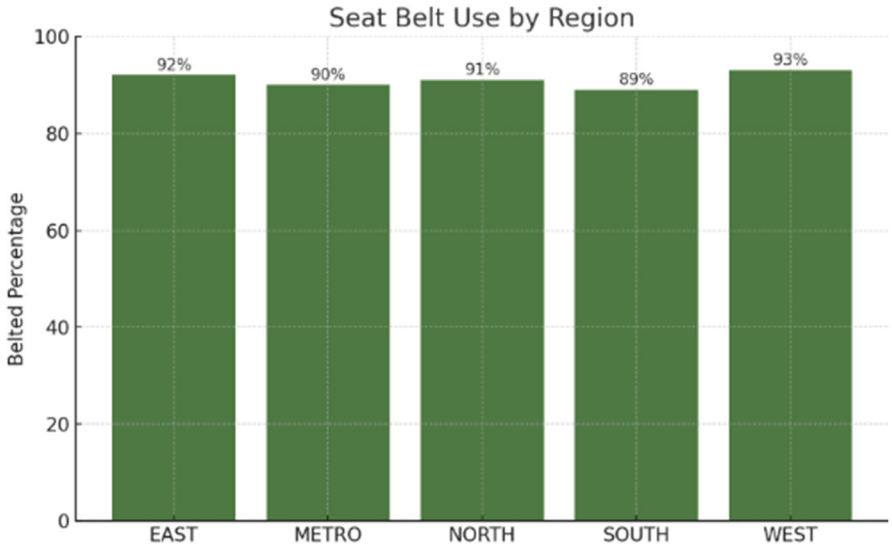
Table 3 includes the number of observations of drivers and passengers per county and region.

TABLE 3: NUMBER OF VALID OBSERVATIONS OF FRONT SEAT OOCCUPANETS PER COUNTY

	Drivers	Passengers	Occupants
NORTH Region	2,185	419	2,640
BARCELONETA	429	89	521
DORADO	422	92	541
MANATI	448	101	549
TOABAJA	469	72	544
VEGABAJA	417	65	485
WEST Region	1,276	273	1,570
AGUADILLA	409	69	478
CABOROJO	452	105	563
SANGERMÁN	415	99	529
SOUTH Region	888	208	1,108
CAYEY	428	93	530
PONCE	460	115	578
EAST Region	1,630	340	2,039
CAGUAS	405	48	462
FAJARDO	414	98	533
HUMACAO	401	94	501
RIOGRANDE	410	100	543
METRO Region	1,401	275	1,754
BAYAMON	478	78	589
GUAYNABO	472	102	610
SANJUAN	451	95	555

GRAPH 1: OBSERVED BELT USE BY REGION

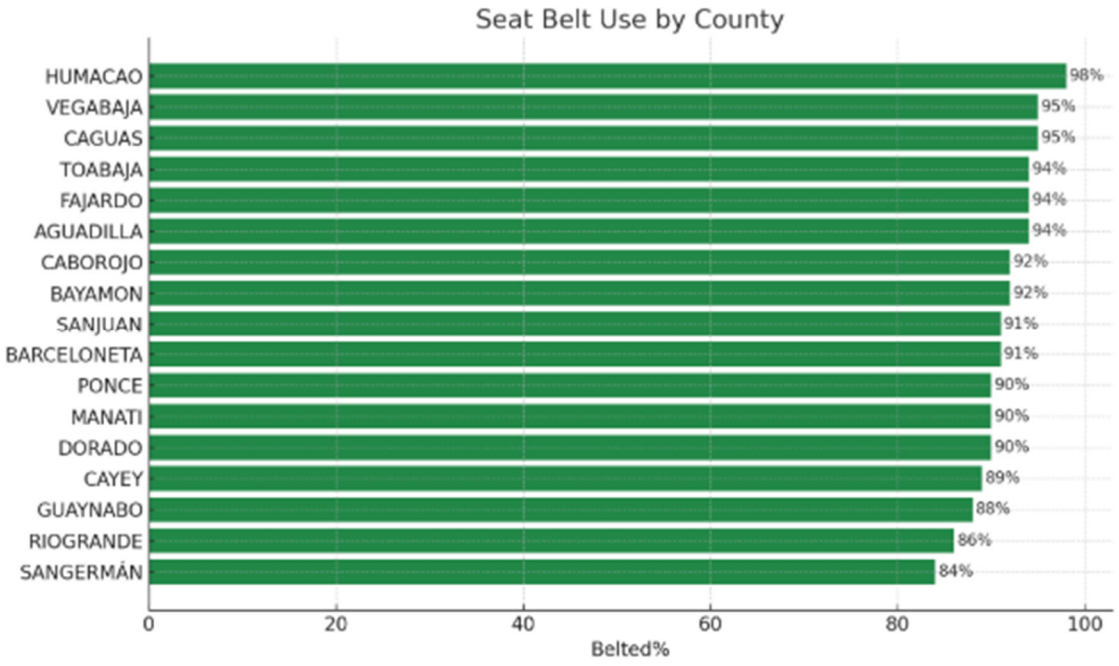
The bar chart displays the percentage of seat belt use observed in each region of Puerto Rico during 2025. The highest compliance was observed in the West (93%) and East (92%), while the South region had the lowest usage rate at 89%. Overall, the island wide seat belt use rate was 91%, indicating consistent compliance across regions.



REGION	COUNTIES
North	BARCELONETA, DORADO, MANATI, TOA BAJA, VEGA BAJA
West	AGUADILLA, CABO ROJO, SAN GERMÁN
South	CAYEY, PONCE
East	CAGUAS, FAJARDO, HUMACAO, RIO GRANDE
Metro	BAYAMON, GUAYNABO, SAN JUAN

GRAPH 2: OBSERVED BELT USE BY COUNTY

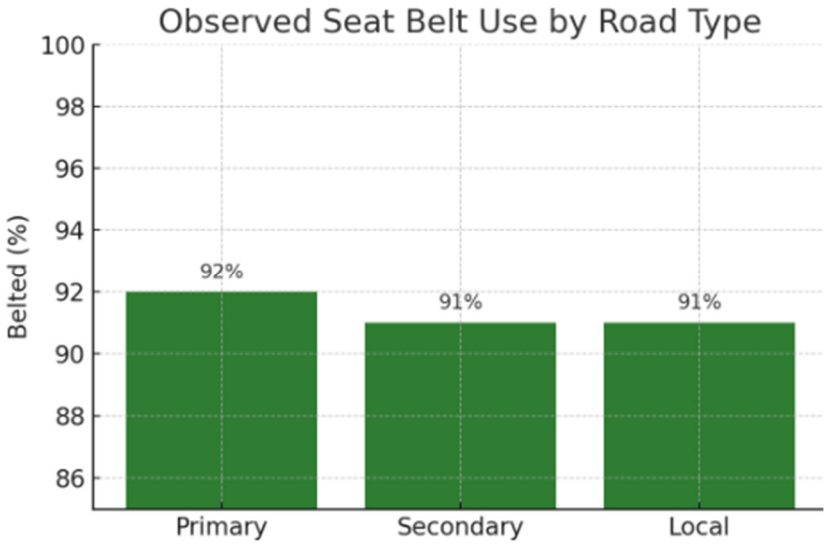
The results reveal notable variations in seat belt use across Puerto Rico's counties Humacao leads with 98%, followed by Vega Baja and Caguas at 95%. The lowest compliance was observed in San Germán (84%) and Río Grande (86%). Most counties reported usage rates above 90%, indicating generally strong compliance with seat belt laws across the island. These findings highlight both successes in public safety messaging and areas where additional outreach or enforcement may be warranted.



REGION	COUNTIES
North	BARCELONETA, DORADO, MANATI, TOA BAJA, VEGA BAJA
West	AGUADILLA, CABO ROJO, SAN GERMÁN
South	CAYEY, PONCE
East	CAGUAS, FAJARDO, HUMACAO, RIO GRANDE
Metro	BAYAMON, GUAYNABO, SAN JUAN

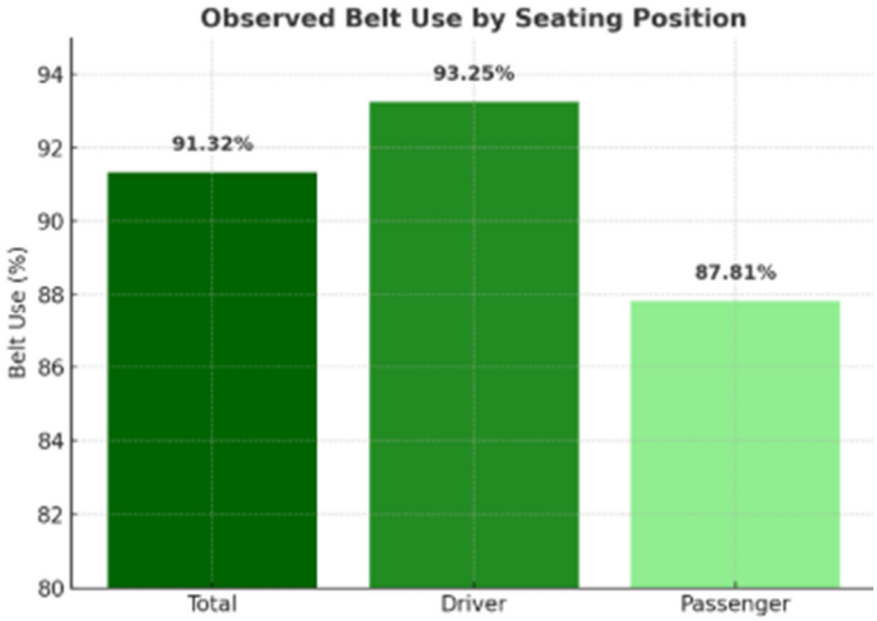
GRAPH 3: OBSERVED BELT USE BY ROAD TYPE

Primary roads showed the highest observed seat belt use at 92%, followed closely by local and secondary roads, both at 91%. This uniformity suggests consistent driver compliance across different roadway types in Puerto Rico.



GRAPH 4: OBSERVED BELT USE BY SEATING POSITION

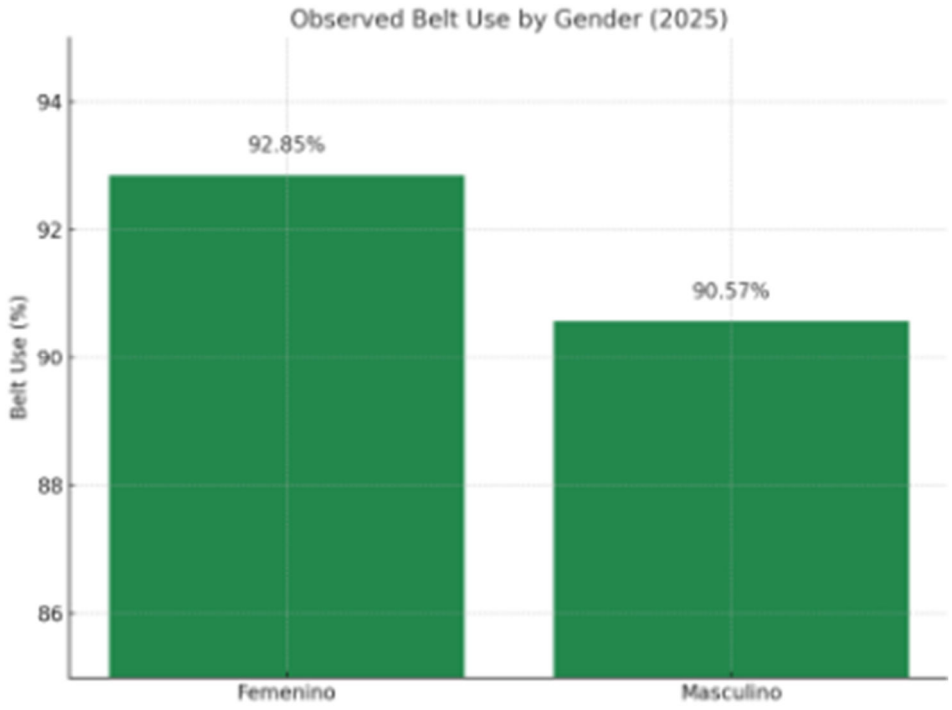
The analysis of seat belt use by seating position in the 2025 Puerto Rico observational study revealed notable differences in compliance. Drivers exhibited the highest belt use rate at 93.25%, followed by a lower rate of 87.81% among front-seat passengers. When combining both groups, the overall observed seat belt use was 91.32%. These findings align with national trends, indicating that passengers continue to wear seat belts less frequently than drivers, underscoring the need for targeted educational efforts to improve passenger safety compliance



Of the observed occupants, 17% were passengers.

GRAPH 5: OBSERVED BELT USE BY GENDER

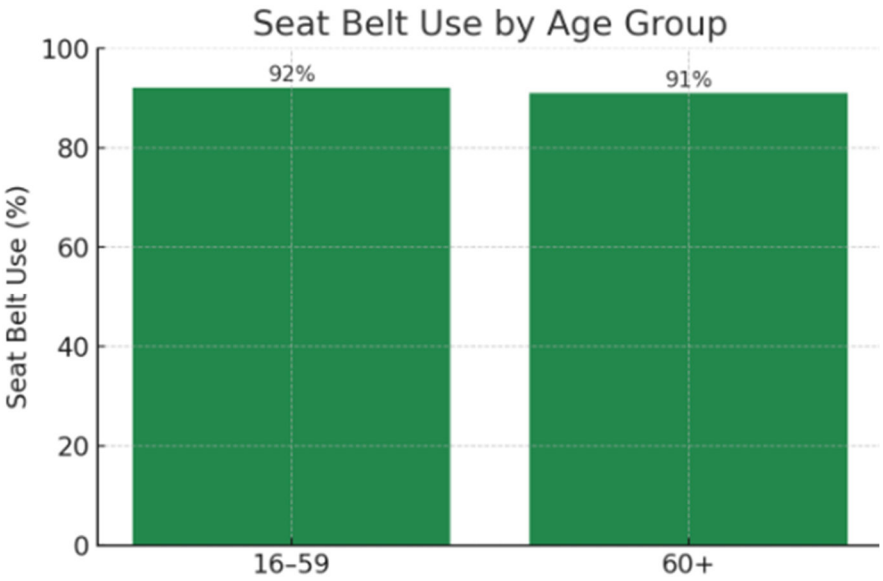
Female occupants exhibited a higher usage rate at 92.85%, compared to 90.57% for male occupants, indicating a modest but notable gender-based difference in compliance.



Of the observed drivers, 33% were female and 67% male.

GRAPH 6: OBSERVED BELT USE BY AGE

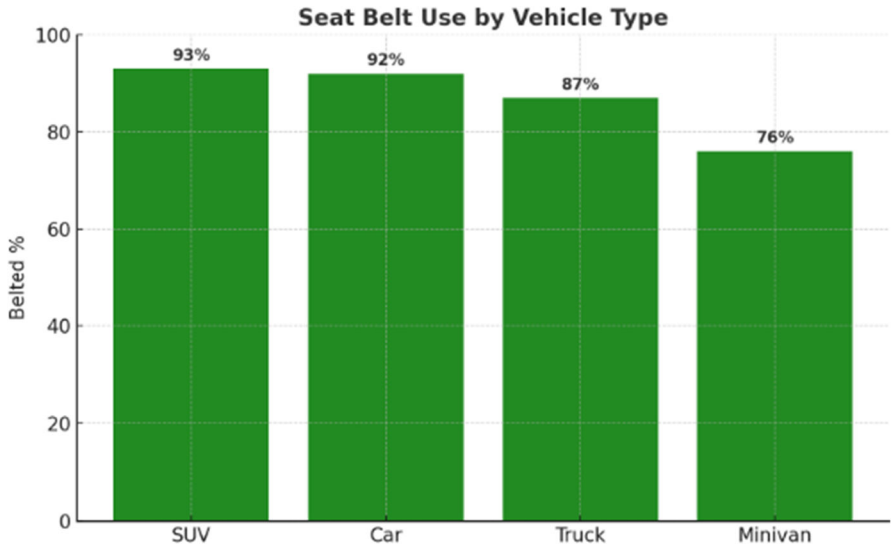
The chart shows individuals aged 16–59 had a 92% seat belt usage rate, while those aged 60 and older had a 91% rate. Both groups demonstrate high levels of compliance.



Of the observed drivers, 22% were over the age of 60 and 78% between 16 and 59 years of age.

GRAPH 7: OBSERVED BELT USE BY VEHICLE TYPE

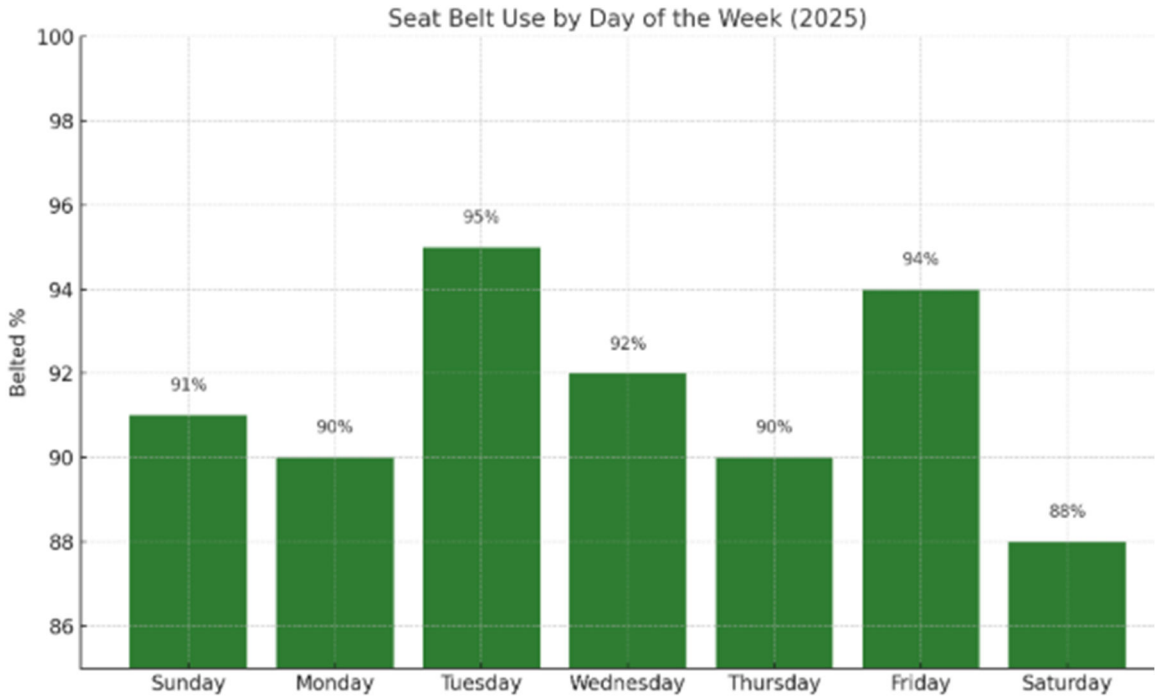
Seat belt compliance was highest among SUV (93%) and Car (92%) drivers, followed by Truck (87%) and Minivan (76%) drivers. The significant gap for Minivans suggests targeted interventions could be beneficial for improving compliance in this vehicle category.



Of the observed vehicles, 45% were regular cars, 43% were SUVs, 7% Minivans and 4% trucks.

GRAPH 8: OBSERVED BELT USE BY DAY OF THE WEEK

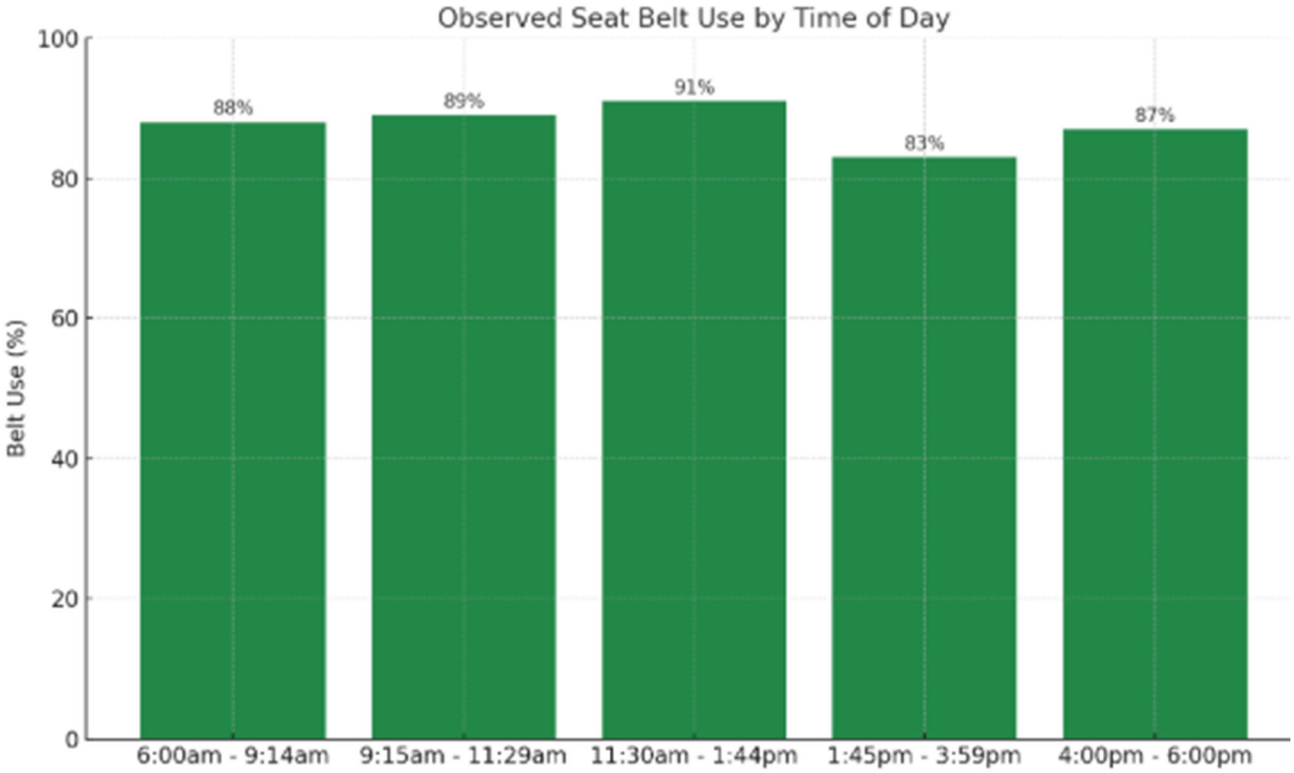
The observed seat belt use in 2025 varied notably throughout the week, indicating distinct behavioral patterns among drivers and passengers depending on the day. The highest compliance was recorded on **Tuesday (95%)**, followed closely by **Friday (94%)** and **Wednesday (92%)**, suggesting that midweek and end-of-week travel is associated with increased safety awareness or enforcement visibility. **Sunday (91%)** also showed strong usage, likely due to family-related travel and leisure activities. On the other hand, **Monday and Thursday** were tied at **90%**, slightly below the weekly high but still within acceptable margins. The lowest seat belt usage was recorded on **Saturday (88%)**, which may reflect more informal or recreational driving patterns, where passengers and drivers may be less vigilant. These variations highlight the need for targeted education and enforcement strategies—particularly for weekends—to ensure consistent seat belt use across all days.



Thursday accounted for the highest proportion of data collection at 21.6%, followed by Wednesday with 18.2%, and Friday with 14.2%. Tuesday and Monday reflected moderate data collection levels, with 12.8% and 12.5% respectively. The lowest levels of data collection occurred during the weekend, with Sunday at 10.5% and Saturday at 10.2%.

GRAPH 9: OBSERVED BELT USE BY TIME-OF-DAY INTERVALS

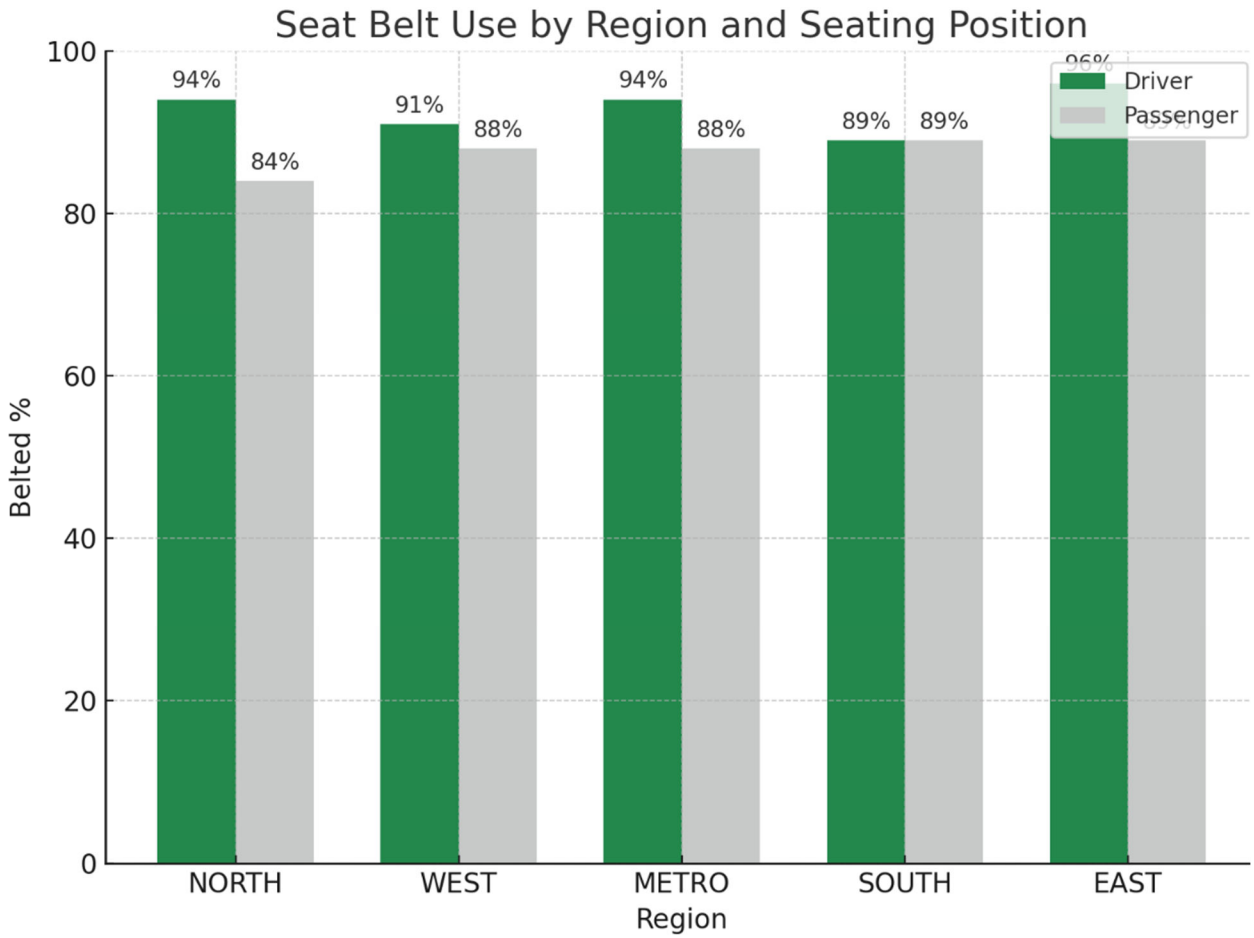
Seat belt use varied across time-of-day intervals, peaking between 11:30am and 1:44pm at 91%. The lowest compliance occurred between 1:45pm and 3:59pm, with only 83% of occupants observed wearing seat belts, indicating potential target windows for increased enforcement or awareness campaigns



Data collection activity by time block shows that the 9:15 AM to 11:29 AM period had the highest share, accounting for 28.1% of all observations. This was followed closely by the 6:00 AM to 9:14 AM block, which represented 26.5%. Activity declined notably after mid-morning, with 16.9% of data collected between 11:30 AM and 1:44 PM, and 15.7% between 1:45 PM and 3:59 PM. The lowest level of data collection occurred in the 4:00 PM to 6:00 PM time block, with only 12.8%.

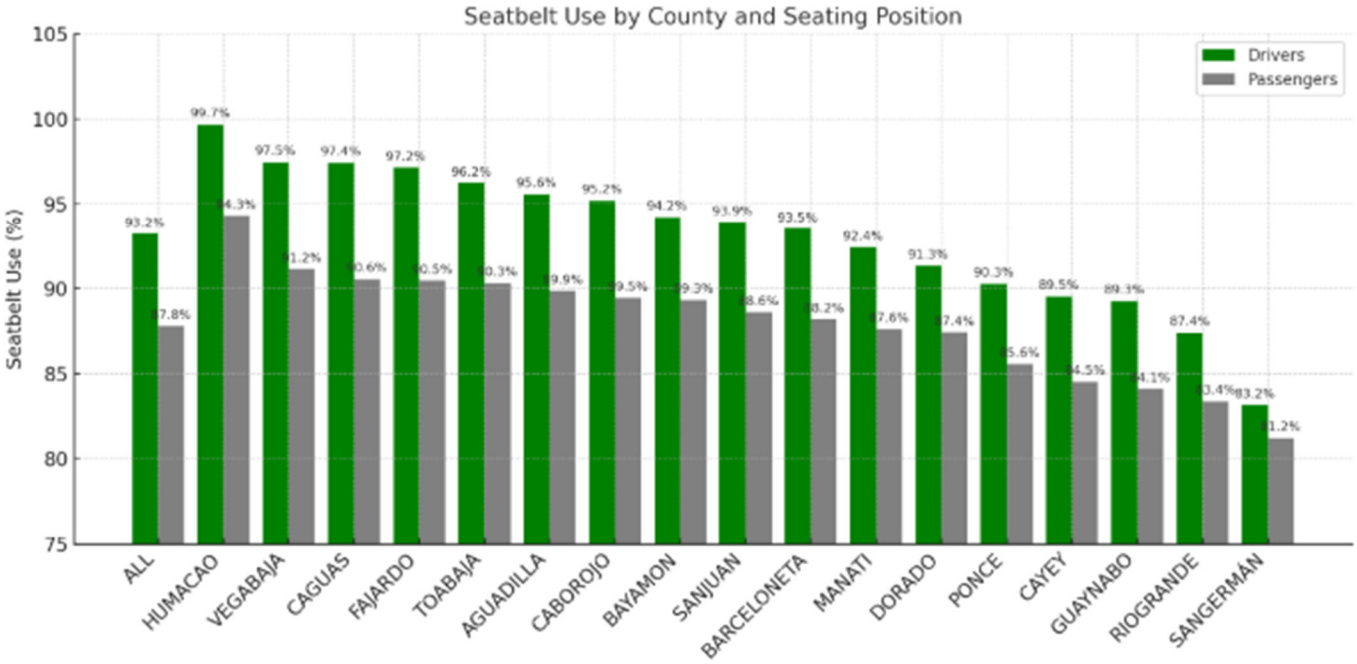
GRAPH 10: OBSERVED BELT USE BY REGION PER SEATING POSITION

The chart displays seat belts used by region and seating position. Drivers consistently exhibited higher seat belt use than passengers across all regions, with the highest compliance among drivers in the East region (96%) and the lowest among passengers in the North (84%).



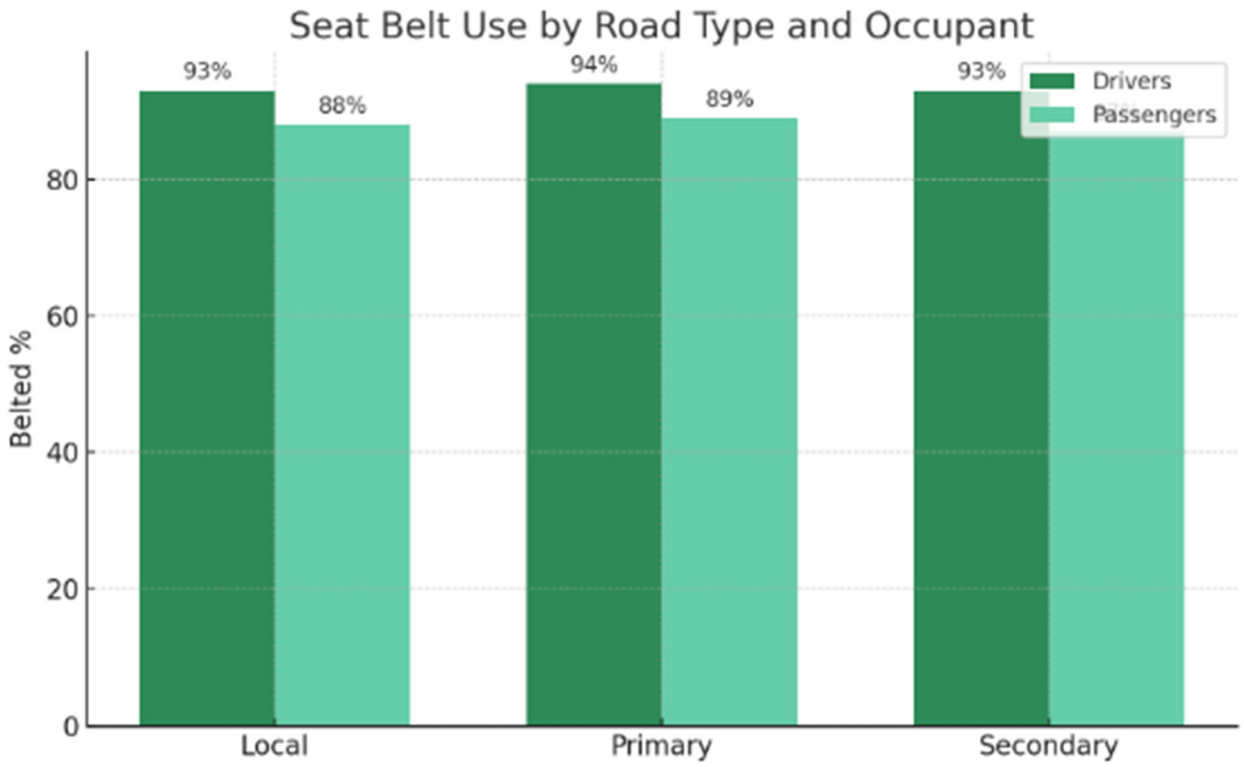
GRAPH 11: OBSERVED BELT USE BY COUNTY PER SEATING POSITION

The chart illustrates seatbelt use by seating position across multiple counties, using green bars to represent drivers and grey bars to represent passengers. The data reveals that in every county, seatbelt use is consistently higher among drivers than passengers. The highest driver compliance is seen in Humacao (99.7%), Vega Baja (97.5%), and Caguas (97.4%), while passenger use in those same municipalities remains slightly lower but still strong. Conversely, the lowest seatbelt use is observed in San Germán, with 83.2% for drivers and 81.2% for passengers, indicating an overall lower compliance rate.



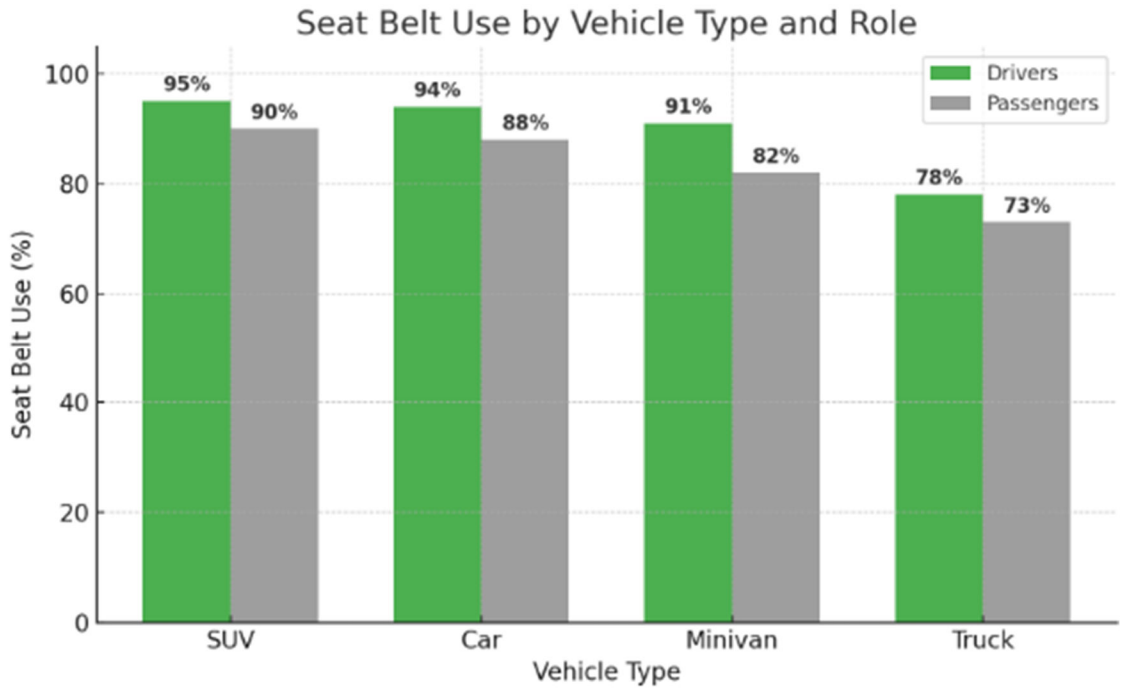
GRAPH 12: OBSERVED BELT USE BY SEATING POSITION PER ROAD TYPE

The chart shows that seat belts among drivers remain consistently high across all road types, with the highest rate observed on primary roads (94%). Passenger seat belt usage is slightly lower across all categories, peaking at 89% on primary roads and dropping to 87% on secondary roads, indicating a need for targeted safety messaging for passengers, particularly on secondary roads.



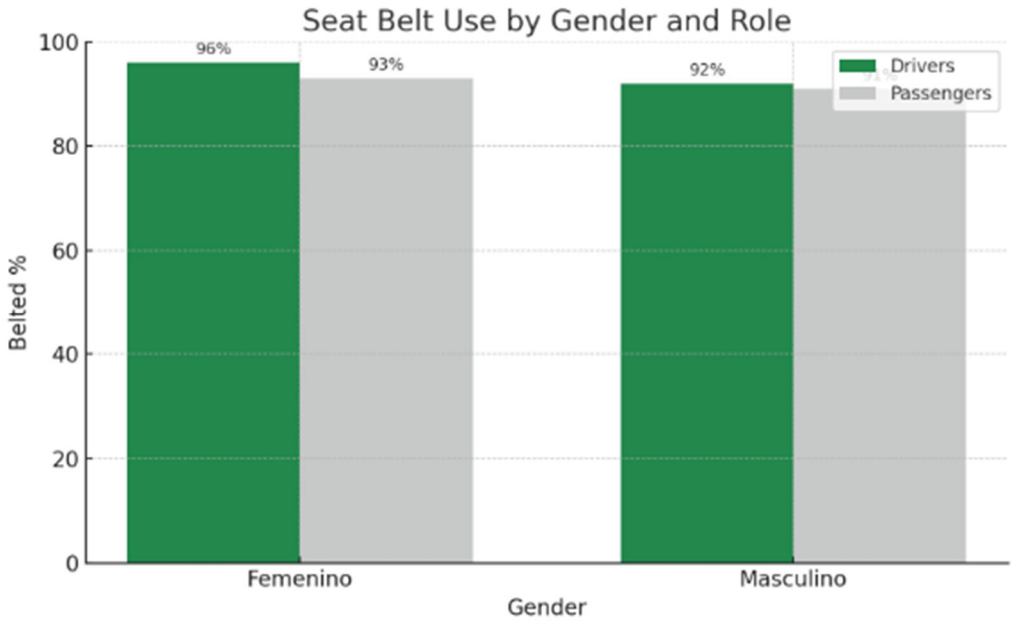
GRAPH 13: OBSERVED USE BY VEHICLE TYPE PER SEATING POSITION

The chart displays seat belt usage rates among drivers and passengers across four vehicle types. Drivers consistently reported higher belt usage than passengers, with SUVs and cars showing the highest compliance (95% and 94% for drivers, respectively), while trucks had the lowest seat belt usage among both drivers (78%) and passengers (73%).



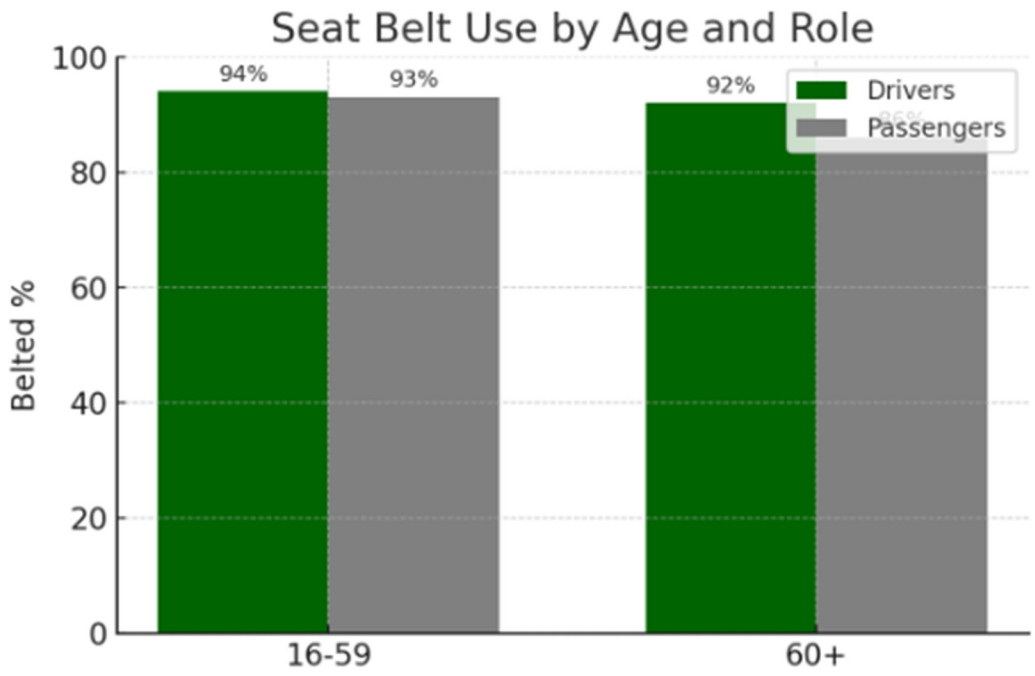
GRAPH 14: OBSERVED BELT USE BY GENDER PER SEATING POSITION

The bar chart displays seat belt use by gender and role. Female drivers and passengers show slightly higher compliance (96% and 93%, respectively) compared to male drivers (92%) and passengers (91%), highlighting consistent but slightly stronger safety behavior among women.



GRAPH 15: OBSERVED BELT USE BY AGE PER SEATING POSITION

Drivers aged 16–59 had a slightly higher belt use (94%) compared to those 60+ (92%). Among passengers, the younger group (16–59) also showed greater compliance (93%) than the older group (86%), suggesting a possible area for targeted passenger education in older populations.



APPENDIX 1: LIST AND MAP OF SAMPLED ROAD SEGMENTS

Region	County	Type	Road Segment	Direction	Coordinates	Day	Time	Belt Use
EAST	CAGUAS	Local	Ave Turabo	W	18°13'40"N 66°03'12"W	Wednesday	11 am	96%
EAST	CAGUAS	Local	Cll Via Grande	W	18°14'25"N 66°04'14"W	Wednesday	2 pm	95%
EAST	CAGUAS	Primary	Expreso Cruz Ortiz Stella	W	18°14'43"N 66°01'10"W	Wednesday	8 am	97%
EAST	CAGUAS	Secondary	Ave Zafiro	W	18°14'33"N 66°03'00"W	Wednesday	10 am	94%
EAST	FAJARDO	Local	Ave el Conquistador	S	18°20'19"N 65°39'23"W	Tuesday	9 am	96%
EAST	FAJARDO	Local	Cll Principal	S	18°20'26"N 65°39'37"W	Tuesday	7 am	96%
EAST	FAJARDO	Primary	Expreso Jose Celso Barbosa	E	18°17'54"N 65°38'58"W	Saturday	5 pm	91%
EAST	FAJARDO	Secondary	PR-3	E	18°19'52"N 65°39'41"W	Tuesday	11 am	98%
EAST	HUMACAO	Local	Boulevard Nicanor Vazquez	E	18°08'43"N 65°49'32"W	Friday	11 am	97%
EAST	HUMACAO	Local	Cll Dufresne	E & W	18°09'04"N 65°49'41"W	Friday	1 pm	98%
EAST	HUMACAO	Primary	Expreso Jose Celso Barbosa	S	18°04'47"N 65°50'21"W	Friday	7 am	98%
EAST	HUMACAO	Secondary	PR- 3	S	18°06'43"N 65°49'19"W	Friday	8 am	96%
EAST	RIOGRANDE	Local	Ave Cambalache	N & S	18°22'35"N 65°52'03"W	Saturday	5 pm	91%
EAST	RIOGRANDE	Local	Cll Rescate	N & S	18°21'19"N 65°51'38"W	Saturday	6 pm	77%
EAST	RIOGRANDE	Primary	PR- 66	E	18°22'32"N 65°49'39"W	Saturday	2 pm	89%
EAST	RIOGRANDE	Secondary	PR- 3	W	18°22'40"N 65°50'11"W	Saturday	3 pm	92%
METRO	BAYAMON	Local	AveBetances	N & S	18°23'35"N 66°10'03"W	Wednesday	10 am	90%
METRO	BAYAMON	Local	AveSantaAna	E & W	18°22'49"N 66°07'06"W	Wednesday	7 pm	94%
METRO	BAYAMON	Primary	Expreso Jose de Diego	W	18°25'18"N 66°09'50"W	Wednesday	7 am	97%
METRO	BAYAMON	Secondary	AveComerio	E	18°22'42"N 66°10'21"W	Wednesday	5 pm	93%
METRO	GUAYNABO	Local	AveWashington	N	18°22'00"N 66°05'44"W	Thursday	7 am	84%
METRO	GUAYNABO	Local	Expreso834	S	18°18'11"N 66°06'23"W	Thursday	12 pm	88%
METRO	GUAYNABO	Primary	PR20	S	18°21'42"N 66°06'24"W	Thursday	9 am	90%
METRO	GUAYNABO	Secondary	PR169	S	18°21'29"N 66°06'38"W	Thursday	10 am	94%
METRO	SANJUAN	Local	JOSEGANDARA	W	18°24'05"N 66°03'08"W	Tuesday	3 pm	90%
METRO	SANJUAN	Local	NEMESIOCANALES	N	18°25'01"N 66°04'37"W	Tuesday	5 pm	95%
METRO	SANJUAN	Primary	BALDORIOTY	W	18°26'36"N 66°01'38"W	Saturday	5 pm	94%
METRO	SANJUAN	Secondary	PR-3	W	18°23'47"N 66°01'25"W	Saturday	5 pm	87%
NORTH	BARCELONETA	Local	CALLE10	N	18°26'55"N 66°32'16"W	Thursday	12 pm	94%
NORTH	BARCELONETA	Local	CALLEDORADA	N & S	18°26'02"N 66°33'32"W	Thursday	9 am	82%
NORTH	BARCELONETA	Primary	ExpresoJoseDeDiego	W	18°26'24"N 66°32'35"W	Thursday	11 am	95%
NORTH	BARCELONETA	Secondary	PR2	E	18°26'24"N 66°32'35"W	Thursday	10 am	90%
NORTH	DORADO	Local	100FairwaysVillageDr	S	18°28'08"N 66°18'23"W	Thursday	2 pm	93%
NORTH	DORADO	Local	PR-6693	E & W	18°27'29"N 66°15'32"W	Thursday	4 pm	86%
NORTH	DORADO	Primary	ExpresoDeDiego	W	18°25'14"N 66°16'02"W	Monday	4 pm	96%
NORTH	DORADO	Secondary	PR2	E	18°24'34"N 66°15'40"W	Thursday	6 am	91%
NORTH	MANATI	Local	Cll Vendig	N & S	18°25'26"N 66°29'05"W	Friday	10 am	87%
NORTH	MANATI	Local	Pr-866	E & W	18°28'14"N 66°26'52"W	Friday	9 am	95%
NORTH	MANATI	Primary	ExpresodeDiego	W	18°25'58"N 66°28'33"W	Friday	12 pm	88%
NORTH	MANATI	Secondary	PR-2	E	18°26'16"N 66°28'37"W	Friday	11 am	89%
NORTH	TOABAJA	Local	Pr-866	N	18°25'38"N 66°11'15"W	Thursday	10 am	94%
NORTH	TOABAJA	Local	Pr-868	W	18°27'47"N 66°11'19"W	Thursday	9 am	92%
NORTH	TOABAJA	Primary	ExpresodeDiego	E	18°28'08"N 66°18'23"W	Thursday	12 pm	96%

Region	County	Type	Road Segment	Direction	Coordinates	Day	Time	Belt Use
NORTH	TOABAJA	Secondary	PR-2	N	18°24'37"N 66°15'21"W	Friday	6 am	95%
NORTH	VEGABAJA	Local	AveJesusArmaiz	N & S	18°25'57"N 66°24'39"W	Tuesday	12 pm	94%
NORTH	VEGABAJA	Local	Cll Inocencio Rey	N & S	18°25'42"N 66°24'28"W	Tuesday	9 am	97%
NORTH	VEGABAJA	Primary	ExpresodeDiego	W	18°26'24"N 66°25'25"W	Tuesday	7 am	96%
NORTH	VEGABAJA	Secondary	PR-2	E	18°26'48"N 66°23'51"W	Tuesday	2 pm	95%
SOUTH	CAYEY	Local	Ave Jesus T Pinero	E & W	18°06'26"N 66°09'31"W	Sunday	7 am	86%
SOUTH	CAYEY	Local	Ave Luis Munoz Rivera Sur	N & S	18°06'35"N 66°10'00"W	Sunday	9 am	92%
SOUTH	CAYEY	Primary	Autopista Luis A Ferre	W	18°06'46"N 66°08'40"W	Friday	9 am	91%
SOUTH	CAYEY	Secondary	PR-1	W	18°07'16"N 66°08'22"W	Sunday	11 am	89%
SOUTH	PONCE	Local	Ave Tito Castro	E	18°01'39"N 66°35'50"W	Wednesday	11 am	87%
SOUTH	PONCE	Local	Cll Torre	E & W	18°00'30"N 66°36'57"W	Wednesday	9 am	94%
SOUTH	PONCE	Primary	PR- 52	E	18°00'21"N 66°35'02"W	Wednesday	1 pm	87%
SOUTH	PONCE	Secondary	PR- 506	W	18°02'19"N 66°32'54"W	Wednesday	1 pm	92%
WEST	AGUADILLA	Local	PR-110	E	18°25'57"N 66°24'39"W	Monday	1 pm	93%
WEST	AGUADILLA	Local	PR-465	E	18°27'16"N 67°05'33"W	Monday	11 am	96%
WEST	AGUADILLA	Primary	PR-2	E	18°25'30"N 67°09'03"W	Monday	9 am	96%
WEST	AGUADILLA	Secondary	PR-442	E & W	18°25'08"N 67°09'22"W	Monday	7 am	88%
WEST	CABOROJO	Local	Comunidad del Toro	N & S	18°02'21"N 67°11'20"W	Sunday	11 am	94%
WEST	CABOROJO	Local	PR- Cll Legion Americana	N & S	18°02'11"N 67°10'40"W	Sunday	9 am	95%
WEST	CABOROJO	Primary	PR-100	E & W	18°03'58"N 67°09'14"W	Sunday	8 am	96%
WEST	CABOROJO	Secondary	PR-3311	E & W	18°07'07"N 67°09'28"W	Sunday	2 pm	88%
WEST	SANGERMÁN	Local	PR-166	E & W	18°04'43"N 67°02'59"W	Monday	11 am	90%
WEST	SANGERMÁN	Local	PR-321	E & W	18°03'30"N 67°02'11"W	Monday	1 pm	84%
WEST	SANGERMÁN	Primary	PR-2	W	18°05'26"N 67°01'46"W	Monday	7 am	87%
WEST	SANGERMÁN	Secondary	Cll Retiro	E & W	18°04'41"N 67°02'07"W	Monday	9 am	77%

APPENDIX 2: DETAILED DATA BY ROAD SEGMENT

Region	Municipality	Road_Type	Road_Name	W_gchijklm	DATE	Drivers	Passengers	Occupants	Belted	Unbelted	Unkn.
WEST	AGUADILLA	Secondary	PR-442	17824794.40	25/08/2025	105	8	113	102	10	1
WEST	AGUADILLA	Local	PR-110	78813334.49	25/08/2025	100	15	115	107	7	1
WEST	AGUADILLA	Local	PR-465	5658699.81	25/08/2025	102	22	124	119	1	4
WEST	AGUADILLA	Primary	PR-2	86287469.17	25/08/2025	102	24	126	121	2	3
NORTH	BARCELONETA	Local	CALLEDORADA	21954128.15	21/08/2025	106	14	120	98	19	3
NORTH	BARCELONETA	Primary	ExpresoJoseDeDiego	96089266.17	21/08/2025	104	25	129	123	3	3
NORTH	BARCELONETA	Secondary	PR2	88447414.52	21/08/2025	103	31	134	121	11	2
NORTH	BARCELONETA	Local	CALLE10	14575901.36	21/08/2025	116	19	138	130	6	2
METRO	BAYAMON	Local	AveSantaAna	80884492.14	20/08/2025	116	10	126	119	3	4
METRO	BAYAMON	Local	AveBetances	33853501.32	20/08/2025	127	20	150	137	9	4
METRO	BAYAMON	Secondary	AveComerio	25636027.30	20/08/2025	127	25	152	141	6	5
METRO	BAYAMON	Primary	Expreso Jose de Diego	3635252.72	20/08/2025	108	23	161	147	3	11
WEST	CABOROJO	Local	PR- Cll Legion Americana	3987125.16	17/08/2025	115	20	135	128	5	2
WEST	CABOROJO	Primary	PR-100	71683140.36	17/08/2025	107	29	136	131	4	1
WEST	CABOROJO	Local	Comunidad del Toro	13052981.18	17/08/2025	117	22	139	130	7	2
WEST	CABOROJO	Secondary	PR-3311	24740981.65	17/08/2025	113	34	153	131	11	11
EAST	CAGUAS	Local	Cll Via Grande	47893459.20	20/08/2025	104	6	110	105	5	0
EAST	CAGUAS	Local	Ave Turabo	42421720.95	20/08/2025	101	12	113	109	2	2
EAST	CAGUAS	Secondary	Ave Zafiro	8756212.94	20/08/2025	100	11	114	106	3	5
EAST	CAGUAS	Primary	Expreso Cruz Ortiz Stella	85560414.38	20/08/2025	100	19	125	120	0	5
SOUTH	CAYEY	Primary	Autopista Luis A Ferre	8939915.65	22/08/2025	101	11	115	104	9	2
SOUTH	CAYEY	Local	Ave Jesus T Pinero	13958433.54	24/08/2025	107	24	131	113	14	4
SOUTH	CAYEY	Local	Ave Luis Munoz Rivera Sur	24861531.23	24/08/2025	108	23	131	120	6	5
SOUTH	CAYEY	Secondary	PR-1	26224523.91	24/08/2025	112	35	153	135	10	8
NORTH	DORADO	Primary	ExpresoDeDiego	2608486.23	25/08/2025	101	18	119	114	1	4
NORTH	DORADO	Secondary	PR2	19393085.14	28/08/2025	102	18	123	111	4	8
NORTH	DORADO	Local	100FairwaysVillageDr	34779440.66	21/08/2025	110	29	148	135	8	5
NORTH	DORADO	Local	PR-6693	4711041.18	21/08/2025	109	27	151	126	11	14
EAST	FAJARDO	Local	Cll Principal	18441879.49	19/08/2025	104	15	119	115	3	1
EAST	FAJARDO	Secondary	PR-3	24171227.61	19/08/2025	103	24	127	124	1	2
EAST	FAJARDO	Local	Ave el Conquistador	42812817.71	19/08/2025	104	27	131	127	1	3
EAST	FAJARDO	Primary	Expreso Jose Celso Barbosa	1181470.04	30/08/2025	103	32	156	137	9	10
METRO	GUAYNABO	Primary	PR20	1132800.12	21/08/2025	116	19	141	126	11	4
METRO	GUAYNABO	Secondary	PR169	10122137.72	21/08/2025	118	22	146	137	5	4
METRO	GUAYNABO	Local	Expreso834	11246665.77	21/08/2025	112	32	153	134	10	9
METRO	GUAYNABO	Local	AveWashington	128988147.75	21/08/2025	126	29	170	140	13	17
EAST	HUMACAO	Local	Cll Dufresne	14118707.14	29/08/2025	100	16	116	115	1	0
EAST	HUMACAO	Primary	Expreso Jose Celso Barbosa	13715506.12	29/08/2025	100	14	117	116	0	1
EAST	HUMACAO	Secondary	PR- 3	15459583.60	29/08/2025	100	27	130	124	3	3

Region	Municipality	Road_Type	Road_Name	W_gchijklm	DATE	Drivers	Passengers	Occupants	Belted	Unbelted	Unkn.
EAST	HUMACAO	Local	Boulevard Nicanor Vazquez	47009586.63	29/08/2025	101	37	138	134	0	4
NORTH	MANATI	Local	Pr-866	413644.36	29/08/2025	111	18	129	122	5	2
NORTH	MANATI	Primary	ExpresodeDiego	30068036.53	29/08/2025	110	25	135	120	11	4
NORTH	MANATI	Local	Cll Vendig	177834937.97	29/08/2025	110	26	136	120	11	5
NORTH	MANATI	Secondary	PR-2	221958810.50	29/08/2025	117	32	149	134	12	3
SOUTH	PONCE	Primary	PR- 52	31979795.75	20/08/2025	114	22	139	120	10	9
SOUTH	PONCE	Secondary	PR- 506	129446807.53	20/08/2025	109	30	139	128	10	1
SOUTH	PONCE	Local	Cll Torre	24961803.08	20/08/2025	119	25	144	136	8	0
SOUTH	PONCE	Local	Ave Tito Castro	35721910.82	20/08/2025	118	38	156	135	12	9
EAST	RIOGRANDE	Secondary	PR- 3	1200652761.46	23/08/2025	102	15	120	110	5	5
EAST	RIOGRANDE	Local	Ave Cambalache	6804634.80	23/08/2025	104	25	135	122	9	4
EAST	RIOGRANDE	Local	Cll Rescate	8619641.27	23/08/2025	104	20	139	106	22	11
EAST	RIOGRANDE	Primary	PR- 66	354967.53	23/08/2025	100	40	149	130	8	11
WEST	SANGERMÁN	Local	PR-166	34934145.06	18/08/2025	101	21	128	114	9	5
WEST	SANGERMÁN	Local	PR-321	44803009.00	18/08/2025	108	21	129	110	14	5
WEST	SANGERMÁN	Primary	PR-2	4878217.14	18/08/2025	106	22	134	115	15	4
WEST	SANGERMÁN	Secondary	Cll Retiro	23851020.26	18/08/2025	100	35	138	106	23	9
METRO	SANJUAN	Secondary	PR-3	48258623.63	30/08/2025	112	14	126	109	14	3
METRO	SANJUAN	Primary	BALDORIOTY	53763831.78	16/08/2025	115	22	137	129	5	3
METRO	SANJUAN	Local	JOSEGANDARA	111221950.66	19/08/2025	109	32	144	129	6	9
METRO	SANJUAN	Local	NEMESIOCANALES	47860310.00	19/08/2025	115	27	148	140	4	4
NORTH	TOABAJA	Secondary	PR-2	9960641.38	29/08/2025	101	14	118	111	2	5
NORTH	TOABAJA	Local	Pr-866	12642352.29	28/08/2025	107	16	123	116	5	2
NORTH	TOABAJA	Primary	ExpresodeDiego	4857793.72	28/08/2025	102	21	123	118	3	2
NORTH	TOABAJA	Local	Pr-868	19232381.06	28/08/2025	159	21	180	166	10	4
NORTH	VEGABAJA	Primary	ExpresodeDiego	3636286.27	26/08/2025	105	10	115	111	1	3
NORTH	VEGABAJA	Secondary	PR-2	18045110.71	26/08/2025	104	18	122	116	3	3
NORTH	VEGABAJA	Local	AveJesusArmaiz	3705835.26	26/08/2025	103	21	124	116	6	2
NORTH	VEGABAJA	Local	Cll Inocencio Rey	26811671.17	26/08/2025	105	16	124	119	2	3
						7,380	**1,515**	**9,111**	**8,320**	**482**	**309**

APPENDIX 3: PRIOR YEAR RESULTS

YEAR	Rate of belt use %	Standard Error (%)
2025	91.32	0.29
2024	86.30	0.87
2022	91.77	0.74
2021	88.24	1.57