Consumer Action and Matatu Road Safety
USAID: Milestone #1

Chapter 1: Sticker distribution from Direct Line Branches & First 10 Weeks of Lottery draws

I. Sticker Distribution

*Matatu*s typically purchase insurance on a monthly basis in Kenya. Over the course of a month Direct Line, the insurance company, issues about 12,000 new insurance contracts (policies). The project takes advantage of the frequency of interaction between the insurance company and *matatu* owners/drivers to distribute message carrying sticker. In particular, we designed the recruitment strategy so that the insurance company distributes the stickers at the time policies are purchased. During Phase I, March through August 2011, 9,466 vehicles received stickers and 2,096 vehicles were assigned to the control group, reaching a total of 11,740 vehicles. Assignment to any of the 8 sticker arms, the placebo or the control groups was random: every matatu had the same chance of being in any of the 10 study arms. Stickers were distributed from eight Direct Line branches in Embu, Kerugoya, Meru, Nakuru, Nyeri, Thika, and two branches in Nairobi: Hazina Towers,andTom Mboya. Table 1 and Figure 1 show the distribution of stickers across locations.

Table 1. Phase 1 Sticker Distribution by Location

Region	Number of Vehicles that Received Stickers	Percentage
Embu	191	1.98
Nairobi-Hazina Towers	802	8.32
Kerugoya	401	4.16
Meru	307	3.18
Nakuru	858	8.90
Nyeri	327	3.39
Thika	900	9.33
Nairobi-Tom Mboya	5,858	60.74
Total	9,466	100.0

Figure 1. Phase 1 Sticker Distribution by Location

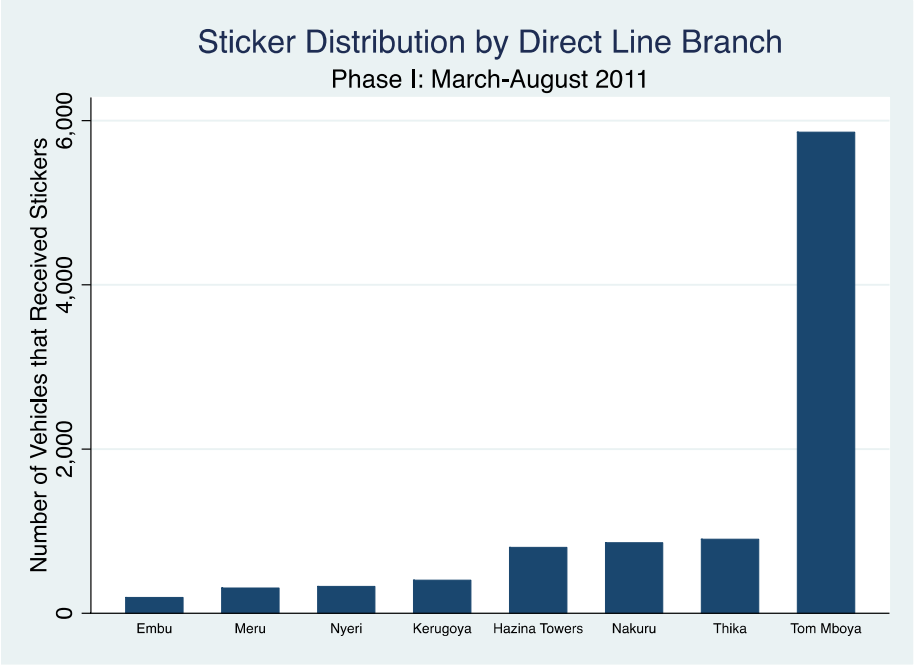

Table 3 shows the distribution of *matatus* assigned to the control group by Direct Line Branch location:

Table 2. Control Group Distribution by Location

Region	Number of Vehicles that Received Stickers	Percentage
Embu	84	4.01
Hazina Towers	85	4.06
Kerugoya	119	5.68
Meru	96	4.58
Nakuru	603	28.77
Nyeri	154	7.35
Thika	301	14.36
Tom Mboya	654	31.20
Total	2,096	100.0

[1]

Stickers were distributed each month during Phase I, with the majority of vehicles receiving stickers in the first two months, March and April. To ensure that the research recruitment process didn't disrupt the company's regular business, we implemented a staggered distribution. We started off in the smaller of the two Nairobi branches and issued stickers for a couple of days. After verifying the efficacy of the recruitment

[1] The distribution of the control vehicles across DL branches deviates from the distribution of stickers mainly because we had to re-balance after discovering and error with the random assignment code.

process, we moved to the larger Nairobi branch on Tom Mboya street. We distributed stickers for about one month before moving out of Nairobi. Proximity to Nairobi determined the order of the roll out. We started recruiting vehicles first in Thika, then Nakuru and then finally in the Mount Kenya region: Nyeri, Kerugoya, Embu and Meru. Table 3 and Figure 2 show the distribution of stickers across months.

Since the Nairobi branches account for nearly 60% of the firm's business, it is not surprising that nearly half of the recruitment process was completed in the first month in March. Late recruitment, in June to August, is concentrated in the Mount Kenya region.

Table 3. Phase 1 Sticker Distribution by Month

Month	Number of Vehicles that Received Stickers	Percentage
March	4,624	47.95
April	2,380	24.68
May	1,602	16.61
June	518	5.37
July	461	4.78
August	59	0.61
Total	9,644	100.0

Figure 2. Phase 1 Sticker Distribution by Month

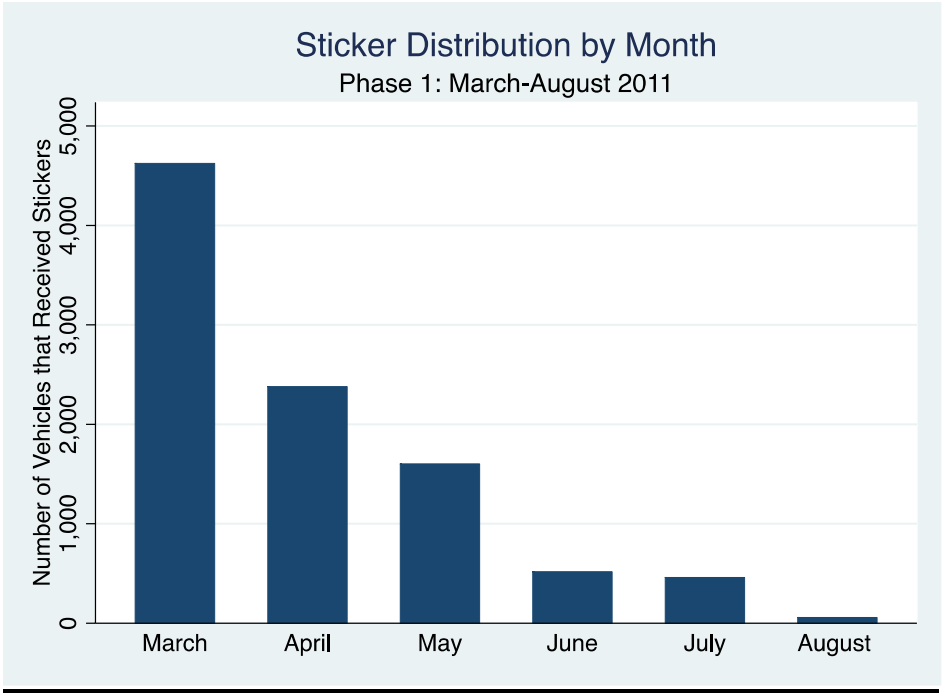

Table 4 shows the distribution of *matatus* assigned to the control group by month:

Table 4. Control Group Distribution by Month

Region	Number of Vehicles that Received Stickers	Percentage
March	109	5.20
April	593	28.29
May	858	40.94
June	200	9.54
July	304	14.5
August	32	1.53
Total	2,096	100.0

The assignment of stickers or designation to the control group was randomized in real time via a random number generation procedure. The digital certificate issuing software was programmed so that sales agents could not issue insurance coverage without having complied with the sticker assignment protocol. The sales agents scanned each of the four stickers (each sticker has an individualized serial number and associated bar code) and delivered them, with the insurance certificate, to the agent/driver purchasing cover. Table 5 below shows the distribution of stickers across treatment groups, including the number of vehicles assigned to the control group.

Table 5. Phase 1 Sticker Distribution by Treatment Group

Treatment	Number of Vehicles Receiving Stickers	Percentage
(0) Control	2,096	17.85
(1) Placebo	1,759	14.98
(2) Accident- Individual	992	8.45
(3) Accident- Group	991	8.44
(4) Text- Individual	971	8.27
(5) Text- Group	979	8.34
(6) Injury- Individual	974	8.29
(7) Injury- Group	980	8.35
(8) Protest- Individual	1,000	8.52
(9) Protest- Group	998	8.50
Total	11,740	100.0

See Appendix Figure 1 for sticker designs.

II. Lottery

A lottery was included to provide incentives for the three players—the agent, the owner, and the driver—to ensure the placement of the Zusha road safety stickers in the vehicles. Field staff employed by ASIRT-Kenya (the NGO with which we work) roamed the bus stops throughout Nairobi and in regional centers across the country to register vehicles for the lottery. If a vehicle was observed to have all four road safety stickers in place, it

was entered into the weekly lottery draw. Once entered, the vehicle is eligible to win for all remaining weeks that the lottery is in operation.[2]

During the first 11-week phase of the lottery, ten registered *matatus* were drawn each week and inspected. If inspections revealed that a matatu retained all four *assigned* stickers, three prizes of KShs. 5,000 each were awarded, one to the driver, one to the owner, and one to the insurance agent.

To promote awareness of the Zusha campaign and to lend credibility to the lottery, during this phase, radio advertisements were aired on local stations. Support for this component was provided on a pro-bono basis by Royal Media Services. The ads did not promote road safety directly, but instead were targeted at drivers, owners and agents encouraging them to insert (and maintain) the stickers and thereby become eligible for the lottery. . Two 60-second spots and two presenter mentions were aired each afternoon for a period of two months starting from April 2011. No commercial print or television advertising was undertaken. Promotional posters were placed inside Direct Line offices.

Overall, during this period, 71.8% of the matatus that were drawn had all four assigned stickers still in place. Table 6 shows the results from each of the 11 lottery draws in Phase I.

Table 6. Lottery Draws- First 11 Weeks (March-June 2011)

Week	No. of Draws	No. of Winners	Share of Winners from Draws
1	10	7	70%
2	10	9	90%
3	10	8	80%
4	10	7	70%
5	10	9	90%
6	10	7	70%
7	10	5	50%
8	10	6	60%
9	10	8	80%
10	10	5	50%
11	10	8	80%
Total	110	79	71.8%

[2] The sticker inspection exercise was abandoned after two and a half months after an evaluation of the data revealed that the number of eligible matatus was not growing: finding matatus proved to be more difficult than we had anticipated.

Broadcast media represents a low cost alternative channel to scale up consumer-enforcement campaigns across the entire country. The objective of this component of the study is to assess the effectiveness of such a campaign, and its complementarity, if any, with the more readily available messages carried by the stickers. To this end, we are collaborating with Royal Media Services (RMS) to broadcast a road safety advertising campaign.

While we anticipated launching the radio campaign in August 2011, six months after the first stickers were issued, funding-related delays pushed back our launch date to January 2012. Coincident with the radio campaign, we issued a fresh round of stickers to vehicles, maintaining Phase I assignments. This strategy allows us to reliably measure the interaction between these two forms of passenger empowerment strategies.

The radio spots have been aired on two radio stations: Inooro and Muuga FM. The campaign includes both spot ads and presenter mentions that shall run through-out the campaign period as follows:

- Muuga (January 2-March 31 2012): Four times a day: Two spots in the morning and two in the evening
- Inooro (January 2-March 31 2012): Twice a day: One spot in the morning and one in the evening

The ads will be airing in two local languages Kikuyu and Meru. The radio ads are specifically targeted to passengers encouraging them to speak up before it is too late. The reasons for choosing these two stations are twofold. Firstly since we are in an election year, RMS were reluctant to air the spots on their two nationally broadcast stations. Secondly, matatu utilization for intra- and inter-city travel is heavily concentrated in areas where Kikuyu and Meru are widely spoken.

Appendix figure 2 shows the geographic focus of the intervention. The dashed regions represent other media markets in Kenya that are not directly exposed to the Zusha media campaign. While the reach of the radio spots is smaller than we had originally planned for, the geographic concentration of the current set of radio spots, furnishes us with another dimension of variation to exploit in measuring the effects of broadcast media. We can thus use road safety outcomes in media markets that were not exposed to the radio campaign as a control (with adequate adjustments).

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Chapter 3: Direct Observation Protocol and Preliminary results

Enumerators received training on how to use a GPS device to collect data on their trips. For this activity we used Garmin's eTrex GPS device. We took great care to explain that this data collection exercise would be different from the typical protocol. We explained to the enumerators that unlike a conventional survey in which you walk up to a subject and interview them, this data collection exercise is implemented by direct observation. Essentially the enumerator observes what is happening and reports as objectively as possible what they have observed. This also has to be done without directly influencing the behavior of those being observed. Enumerators were told not to explain their presence in the vehicles as research assistants, but rather that they were passengers.

The direct observation takes place inside a matatu: the enumerator takes a trip in a matatu enrolled in the study and collects observations about what happens inside the vehicle **during** the trip. In order to establish if a vehicle was eligible, enumerators looked for a Direct Line sticker in the windscreen of the vehicle. [3]

There were four key pieces of information that this direct observation will collect.

1) Sticker inspections – at the outset, the information to be collected included indicating the number of stickers still remaining in the vehicle. As reported above, this activity was abandoned shortly into phase I.
2) Trip information – using the GPS device we record distance travelled and maximum, moving and overall average speeds.
3) The number of incidents considered dangerous (by the enumerator); these include driving at very high speeds, overtaking in blind corners, swerving to avoid potholes, etc.
4) The reactions and response of passengers to these incidents? Do the passengers say anything in response to these events? What do they say? How many passengers speak up? What types of passengers speak up and finally how does the driver respond?

All of this information is collected and saved on the GPS device. The device allows us to primarily locate where we are on earth using triangulation with a number of geo-stationary satellites. However, because this device can locate one's position at any one point, it means that we can trace out the movement of an enumerator with this device and can measure a variety of attributes such as their speed, direction, elevation, etc.

We attempt to have as many enumerators start and finish their day in Nairobi. With the exception of Nairobi which will have 8 enumerators assigned to routes, 2 enumerators will be assigned to each route. Non-Nairobi routes include: Nyeri, Nakuru, Meru, Thika and Embu.

Enumerators receive a daily flat rate (500 Khs); a per diem for those outside of Nairobi (400Khs for hotel, 300 Khs for food, and transport costs according to location); and payment per sticker recorded.

During the period from April to September 2011 we conducted nearly 3700 trips. The data for each of these trips is summarized in the tables and figures below. The least sensitive data to enumerator coding error is the maximum speed posted throughout the trip. Figure 3 below shows the distribution of maximum speeds by month of the trip.

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[3] Given the high degree of churning across insurance providers, in a number of cases, vehicles still carrying the directline sticker were chosen for trips, even when Directline was no longer the third-party insurer for that vehicle. Many times this was not a problem, since the vehicle had been recruited to be part of the study.

Median maximum speeds range between 90 and 110 km/hr. Trips in August and September were mostly constrained to cover trips within Nairobi and explain the lower maximum speeds observed.

Figure 3. Direct Observations Data: Average Maximum Speeds Recorded by Month

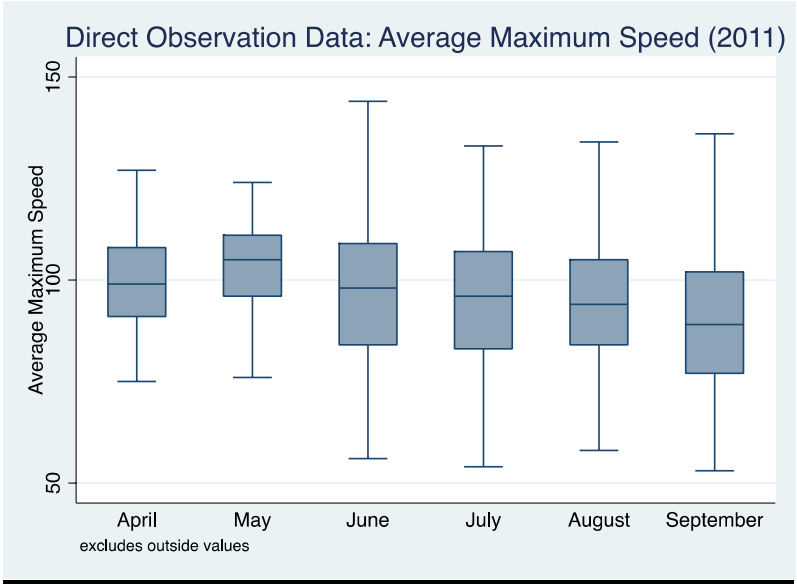


Table 7 below uses the same data to calculate the average maximum speed attained by month.

Table 7. Direct Observations Data: Average Maximum Speeds by Month

Month	Average Speed, km/hr	Standard Deviation	Frequency
April	98.75	13.63	57
May	103.93	10.98	138
June	96.40	16.72	821
July	95.65	36.74	967
August	93.99	14.97	860
September	90.30	16.26	834
Total	94.57	23.36	3,677

The trip meter function on the GPS units also records the average distance covered on that trip. As figure 4 below shows, the median trip ranges between 30 and 80 km. Trips in April and September were predominantly intra-city trips within Greater Nairobi.

Figure 4. Direct Observations Data: Average Distance Traveled Per Trip by Month

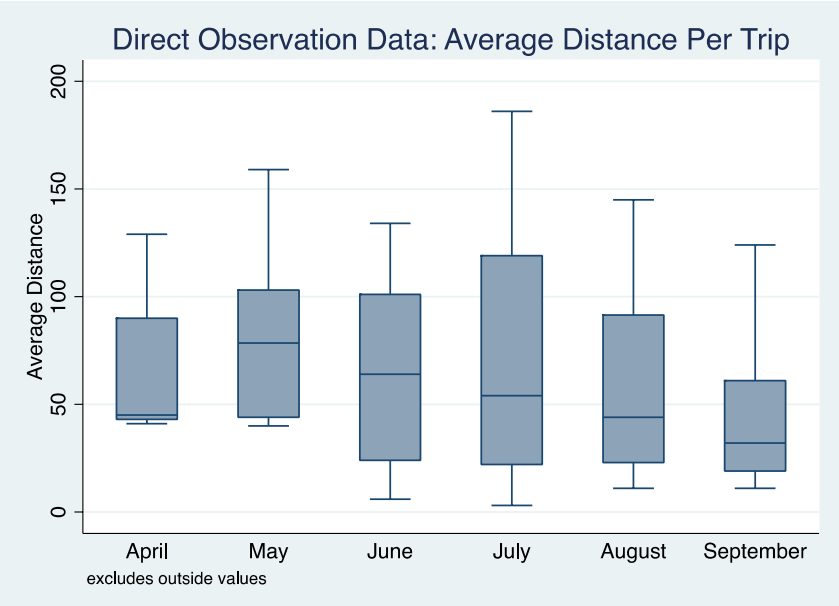


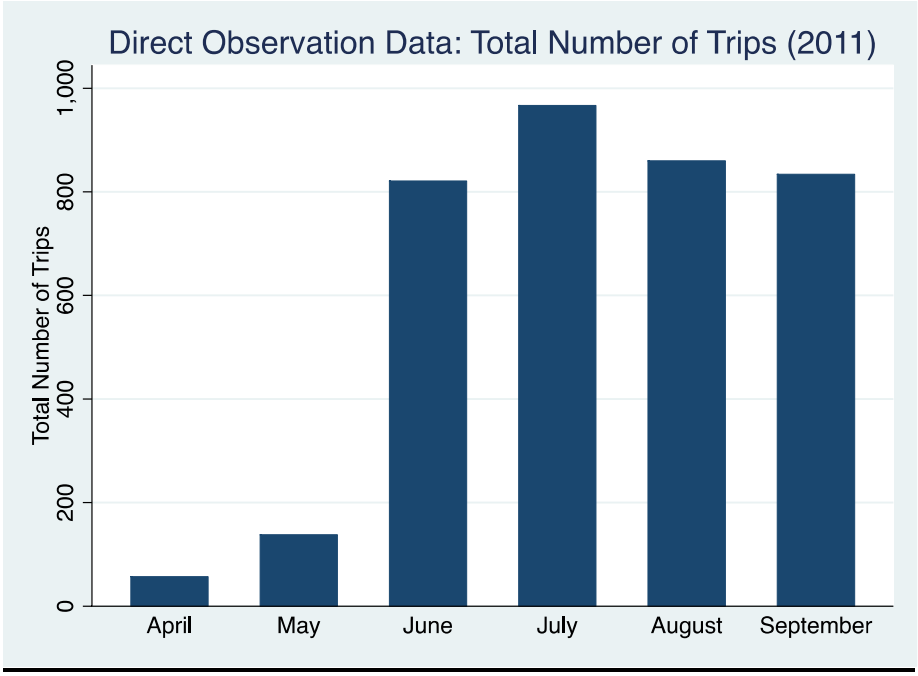
Table 8 shows the average distance traveled by month. The average distance travelled varies between 50 and 80km, with standard deviations of about 35km.

Table 8. Direct Observations Data: Average Distance Traveled per Trip by Month

Month	Average Distance	Standard Deviation
April	70.68	31.38
May	79.58	33.17
June	62.89	39.58
July	71.56	58.35
August	57.76	43.33
September	51.60	45.96
Total	62.16	47.78

Finally, figure 5 below shows the total number of trips taken during Phase I. As the figure shows, the bulk of these trips were taken between June and September of 2011. Fewer trips are taken in April and May as a result of the sticker inspection exercise, which was abandoned at the end of May.

Figure 5. Direct Observations Data: Sum of Trips Traveled by Month



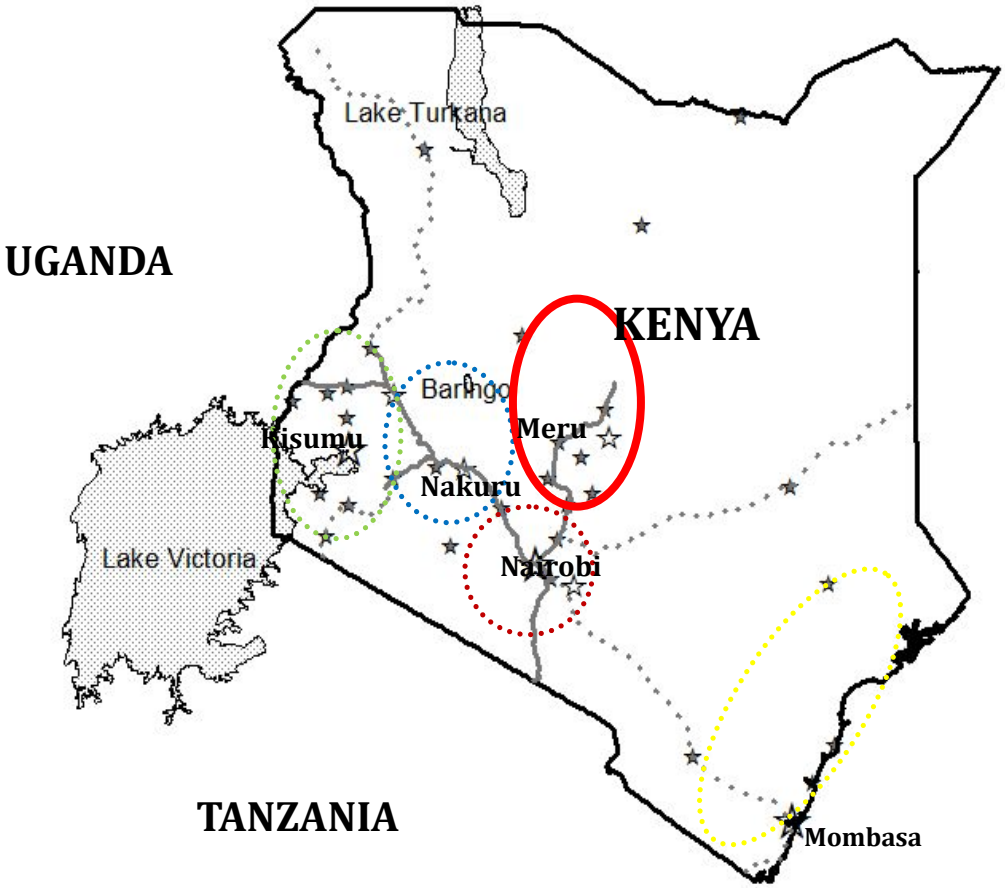
Chapter 4: Recruitment Efforts: Project Coordinator, Accountant and Administrative Assistant

We hired a project coordinator in October 2011 to manage the project while based in Kenya till December 2012. The project coordinator's main responsibility is to coordinate and supervise the implementation of the impact evaluation activities in the field, working closely with the project implementation partners and the field based coordinator to manage various aspects of the field experiment.

We have also hired an accountant to manage the finances of the project. The main responsibility of the accountant is to generate bi-monthly accounting reports according to the reporting guidelines and format set out by Georgetown University working closely with the project coordinator. We are currently discussing some issues regarding the terms of reference, but should start work immediately.

As for the administrative assistant position we are currently interviewing different candidates for the position. However, we were unable to find suitable candidate. We decided to offer the half position to an exisiting part-time employee of ASIRTThe administrative assistant will assist with all aspects of administrative management, directory maintenance, logistics, equipment inventory, filing of documents and providing multifaceted general office support.

Appendix Figure 1:Geographic focus of the media campaign



Notes: Dashed oval regions represent other media markets that are not served by our campaign**.** The Nairobi market would however, be exposed to our campaign given the large share of the population that is Kikuyu or Meru speaking.

Group Name	Group Number	Sticker Number	Sticker Images 1	Sticker Images 2
Placebo	1	1	Travel Well	Travel Well
		2	Safiri Salama	Safiri Salama
Accident - Individual	2	3	SPEAK UP NOW Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		4		
		5	SPEAK UP NOW Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		6		
Accident - Group	3	7	SPEAK UP NOW Umoja ni Nguvu Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Umoja ni Nguvu Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		8		
		9	SPEAK UP NOW Umoja ni Nguvu Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Umoja ni Nguvu Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		10		
Text - Individual	4	11	SPEAK UP NOW You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Jikinge dhidi ya uendeshaji mbaya wa gari ZUSHA
		12		
		13	SPEAK UP NOW You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Jikinge dhidi ya uendeshaji mbaya wa gari ZUSHA
		14		
Text - Group	5	15	SPEAK UP NOW Umoja ni Nguvu You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Umoja ni Nguvu Jikinge dhidi ya uendeshaji mbaya wa gari ZUSHA
		16		
		17	SPEAK UP NOW Umoja ni Nguvu You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Umoja ni Nguvu Jikinge dhidi ya uendeshaji mbaya wa gari ZUSHA
		18		
Injury - Individual	6	19	SPEAK UP NOW Don't end up a victim of dangerous driving ZUSHA	SEMA USIKIKE Jichunge usiwe ukawa muathiriwa wa uendeshaji mbaya wa gari ZUSHA
		20		
		21	SPEAK UP NOW Don't end up a victim of dangerous driving ZUSHA	SEMA USIKIKE Usiwache dreva asiyejali afanye mtoto wako kuwa yatima ZUSHA
		22		
Injury - Group	7	23	SPEAK UP NOW Umoja ni Nguvu Don't end up a victim of dangerous driving ZUSHA	SPEAK UP NOW Umoja ni Nguvu Don't end up a victim of dangerous driving ZUSHA
		24		
		25	SPEAK UP NOW Umoja ni Nguvu Don't end up a victim of dangerous driving ZUSHA	SPEAK UP NOW Umoja ni Nguvu Don't end up a victim of dangerous driving ZUSHA
		26		
Protest - Individual	8	27	SPEAK UP NOW You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Usimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		28		
		29	SPEAK UP NOW Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		30		
Protest - Group	9	31	SPEAK UP NOW Umoja ni Nguvu You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Umoja ni Nguvu Usimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		32		
		33	SPEAK UP NOW Umoja ni Nguvu Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Umoja ni Nguvu Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		34		

INDEPENDENT CONSULTANT CONTRACT
NO. RX2450-807-WA
BETWEEN
GEORGETOWN UNIVERSITY
AND
WOUBEDLE ALEMAYEHU

Georgetown University ("Client") hereby contracts with Woubedle Alemayehu (Independent Consultant- IC) for the performance of certain tasks or services.

IC's principal place of business is located at:
403 South Van Dorn Street, Apt. 203
Alexandria, VA 22304

Client's principal place of business is located at:
Georgetown University
37th & O Streets, NW
Washington, D.C. 20057

THEREFORE, in consideration of the premises and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound hereby, the parties expressly agree to the following terms and conditions (Contract):

1. SERVICES TO BE PERFORMED.

A. Client engages IC to perform, and IC shall timely provide the tasks or services detailed in the **STATEMENT OF WORK** appended as **ATTACHMENT A,** attached hereto and incorporated herein by reference. All tasks and services shall be performed in a manner consistent with industry standards.

B. To the extent that IC subcontracts or otherwise engages other individuals ("subcontractors") to perform the services outlined in **ATTACHMENT A**, IC will be responsible for those subcontractors' performance of services and will ensure that such subcontractors comply with the terms of this Contract.

C. The term of this Contract shall begin on November 1, 2011, and shall end on January 31, 2013.

2. PRIME AGREEMENT. IC acknowledges and agrees that Client has received Grant No. AID-OAAG-11-00053-00, CFDA No. 00.000 (Prime Agreement) from the US Agency for International Development (Sponsor). In order to perform its obligations thereunder, Client desires to enter into a contract with IC to provide services as set forth in this Contract. The terms and conditions of the Prime Agreement, where applicable, are incorporated in this Contract and have full force and effect as if detailed here in their entirety.

3. TERMS OF PAYMENT. Client shall pay IC according to the following terms and conditions:

A. Client shall pay IC an amount not to exceed **USD $33,000** for the services described in **ARTICLE 1**.

B. IC shall submit monthly itemized original invoices not greater than USD $2,200 monthly to Client for the payments called for in this paragraph. Original Invoices must show the Contract No. **RX2450-807-WA** and the Department/Person receiving goods or services thereunder. Improper invoices will be returned to IC. Billing is "Net 30" unless otherwise specified.

C. Invoices shall be submitted to Prof. William Jack at the following address:

Georgetown University
Department of Economics
577 ICC Building
37th and O Streets, NW
Washington, DC 20057-1045

4. INSTRUMENTALITIES. IC shall supply all equipment, tools, materials, and supplies to accomplish the designated tasks. IC is responsible for all repairs to all equipment and tools provided by and to IC and used to accomplish the designated tasks.

5. CONTROL. Nothing in this Contract is intended nor shall be construed, to create any employer/employee relationship, a joint venture relationship, or to allow the Client to exercise control or direction over the manner or methods by which IC, its employees or agents perform the services that are the subject of this Contract. The sole interest of the Client is to ensure that the services of IC shall be rendered and performed in a competent, efficient and satisfactory manner.

6. PAYROLL OR EMPLOYMENT TAXES. All payroll or employment taxes of any kind are the sole responsibility of the IC and accordingly, no such payroll or employment taxes shall be withheld or paid with respect to any payments due to IC. The

payroll or employment taxes that are subject of this paragraph include but are not limited to FICA, FUTA, federal personal income tax, state personal income tax, state disability insurance tax, and state unemployment insurance tax.

7. WORKER'S COMPENSATION. All workers compensation insurance for IC or IC's employees is the sole responsibility of the IC and not of the Client. IC shall comply with the workers compensation laws with respect to IC and IC's employees. In the event IC is a nonresident alien, payments to IC may be subject to withholding of up to 30% depending on the individual's residency and tax situation.

8. COMPLIANCE WITH IMMIGRATION LAWS. IC shall be solely responsible for completing an I-9 form for all of its employees and otherwise comply with the employer sanction provisions of Section 274A of the Immigration and Nationality Act.

9. COMPLIANCE WITH PRIVACY LAWS. In performing its work under the terms of this Contract, IC shall abide by all applicable laws regarding privacy of information including, but not limited to, the Family Educational Rights and Privacy Act and the Health Insurance Portability and Accountability Act, as well Client's applicable policies concerning such laws.

10. WORK FOR HIRE/WARRANTY.

A. Any and all work and/or intellectual property including, without limitation, the work itself in whatever medium displayed, and any derivative works in whatever medium displayed, that may be developed for Client pursuant to terms of this Contract is a "work for hire" and as such becomes the sole and exclusive property of Client. In the event that any such work is not deemed a "work for hire," IC hereby irrevocably assigns any and all of its right, title and interest to and in such work and/or intellectual property to Client.

B. IC represents, warrants and covenants that the services to be provided hereunder do not and will not contain any matter that is in violation of any copyright, trademark, proprietary right, or personal right of any third party, or otherwise violates any law or regulation. IC will indemnify and hold Client and its assigns, harmless from any and all claims, liabilities, costs and expenses, including reasonable attorney's fees, arising as a result of the breach or alleged breach of these representations, warranties and covenants.

11. CONFIDENTIALITY. IC acknowledges and agrees that it shall not at any time during the term of this Contract or later, except without prior written permission of the Client, publicize its relationship with the Client; disclose information relating to the Client's operations to persons other than duly constituted governmental agencies or

pursuant to subpoena, or furnish to any person other than the officers, directors or employees of the parties hereto, with any such disclosure subject to the confidentiality obligations contained herein, any information developed or obtained in performance of IC's services hereunder, including, without limitation, business plans, financial data, alumni and donor lists of Client and technical program information and results. In each instance, IC shall receive prior written approval from Client in advance of making any such disclosure. It is understood that in the event of any violation of the restrictions set forth in this Section, Client shall be entitled to preliminary and permanent injunctive relief from any Court which may have jurisdiction, in addition to any other remedies available under this Contract or at law or in equity. This clause shall survive the expiration and termination of this Contract.

12. PUBLICATION, ADVERTISEMENT, AND TRADEMARKS. IC agrees that he or she will not use the names, logos, trademarks or make any other reference to Georgetown University and any of its components in any advertising of any kind, including, but not limited to, brochures, letterhead, business cards, office plaques, client lists, press releases and promotional materials.

13. AUTHORITY. IC acknowledges and agrees that IC has no authority to enter into any contract or agreement to bind Client and further acknowledges and agrees that IC, its employees, or its agents has not and shall not represent to anyone that IC has any such authority. IC represents and warrants to Client that in the performance of its obligations hereunder, it is not in breach of and will not breach any other agreement with a third party.

14. INDEMNIFICATION. IC agrees to indemnify Client, its Board of Directors, officers, employees, agents, and students from and against any and all costs, losses, damages, liabilities, expenses, demands, and judgments, including court costs and reasonable attorney's fees, which may arise out of IC's or any subcontractor's performance of services under this Contract, IC's or any subcontractor's breach of this Contract, or IC's or any subcontractor's violation of any applicable law, except to the extent such are caused solely by the fault or negligence of Client.

15. LIABILITY & INSURANCE.

A. Reserved.

B. Reserved.

C. In no event shall Client, IC or their respective officers, agents or employees be liable for loss of profits or for indirect, special, incidental or consequential damages, arising out of or related to the performance of this Contract.

16. GOVERNING LAW. This Contract shall be construed in accordance with, and its performance governed by, the relevant Sponsor policies and regulations, and the laws of the State of New York.

17. TERMINATION

A. Either party may terminate or suspend this Contract in whole or part upon twenty (20) days written notice to the other party.

B. In all instances of termination or suspension by the Client, the IC shall be given written notice of the termination or suspension, including a written explanation of the reason(s) for such action. Where appropriate, the IC shall be given reasonable time to cure any deficiency in its performance. If the deficiency is not corrected within a reasonable time, as defined by the Client in consultation with the IC, the parties agree to negotiate in good faith an equitable downward adjustment in price.

C. All provisions related to indemnification, rights in intellectual property and financial and reporting obligations after termination shall survive the termination of this Contract.

18. RECORDS AND AUDITS. Records associated with this Contract shall be retained by IC for at least three (3) years after final payment under this Contract. IC agrees to give Client and its designees or their authorized representatives access to these records or any other pertinent books, documents, papers or other records, in order to make audits, examinations, excerpts and transcripts. Access shall be available during normal working hours and upon reasonable notice. This right of access shall be retained for three (3) years after final payment under this Contract, and shall continue for as long as the records are retained by IC and as long as required by the applicable provisions of the Prime Agreement.

19. FORCE MAJEURE. Neither Client nor IC shall be responsible for any failure or delay in the performance of any obligations hereunder to the extent that failure is caused by Force Majeure including, without limitation, acts of God, flood, fire, labor disputes, riots or civil commotions, litigation, acts of terrorism, war, or act of any foreign nation, power of government, or governmental agency or authority; or acts or omissions of the other party; or non-delivery or delays in delivery by any other supplier of goods or services deliverable under this Contract.

20. REPRESENTATIONS AND CERTIFICATIONS.

A. INDEPENDENT BUSINESS. IC represents, warrants and certifies that IC is engaged in an independent business and has complied with all federal, state, and local

laws regarding business permits and licenses of any kind that may be required to carry out the said business and the tasks to be performed under this Contract.

B. BUSINESS CUSTOMERS. IC represents, warrants and certifies that IC is engaged in the same or similar activities for other clients and that Client is not IC's sole and only client or customer.

C. FEDERAL ANTI-TERRORISM COMPLIANCE. IC agrees to comply with all U.S. anti-terrorism laws and regulations. IC's signature below shall serve as certification that, to the best of IC's knowledge, IC and any subcontractor personnel assigned to this project (a) is/are not, (b) has/have not been designated as, (c) is/are not owned, affiliated, or controlled by, and (D) does/do not support, assist or aid a suspected terrorist organization or individual as defined by Federal law including, but not limited to, Executive Order 13224 available at http://www.ustreas.gov/offices/enforcement/ofac/legal/eo/13224.pdf . If IC hires, contracts or transfers project work to any individuals or organizations that are not named in the original proposal, IC shall verify that such individual or organization is not included on the United States Treasury Department, Office of Foreign Assets, Specially Designated National list (PDF form) available at http://www.treas.gov/offices/enforcement/ofac/sdn/index.shtml. IC shall provide a written verification of such verification with the submission of its next invoice.

D. FEDERAL GOVERNMENTAL COMPLIANCE. IC certifies that it will comply with all applicable assurances set forth in **CERTIFICATIONS** attached hereto and incorporated herein as **ATTACHMENT B.**

21. CONDITION PRECEDENT: TRAINING IN THE PROTECTION OF HUMAN SUBJECTS.

A. IC acknowledges that training in the protection of human subjects is a condition precedent to this Contract. IC acknowledges that by signing this Contract, IC certifies that, if applicable, IC and any other project personnel responsible for the design, conduct or reporting of the research have completed human subject training offered by the Collaborative IRB Training Initiative ("CITI") website: http://www.citiprogram.org/.

B. CERTIFICATION OF THE COMPLETION OF THE CITI TRAINING SHALL BE SUBMITTED WITH THE SIGNED CONTRACT.

22. ATTACHMENTS. The following attachments are an integral part of this Contract:

ATTACHMENT A	Statement of Work
ATTACHMENT B	Certifications
ATTACHMENT C	Incorporated Terms of the Prime Agreement

23. RESERVED.

24. RESERVED.

25. SEVERABILITY. The terms of this Contract are severable such that if any term or provision is declared to a court of competent jurisdiction to be illegal, void, or unenforceable, the remainder of the provisions shall continue to be valid and enforceable.

26. ASSIGNMENT. IC shall not assign this Contract or any right or obligation hereunder without the prior written consent of Client.

27. WAIVER, AMENDMENT AND ENTIRE UNDERSTANDING. This Contract constitutes the entire understanding between the parties with respect to the subject matter hereof and may not be amended except by a written agreement of the parties. No waiver of any term, provision, or condition of this Contract, whether by conduct or otherwise, in any one or more instances, shall be deemed to be or construed as a further and continuing waiver of any such term, provision or condition hereunder.

28. COUNTERPARTS. This Contract may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

29. INCORPORATED TERMS OF THE PRIME AGREEMENT.

A. Some terms of the Prime Agreement between the Client and The United States Agency for International Development are appended as **ATTACHMENT C** and are an integral part of this Contract where applicable. They are in full force and effect as if written in this Article in their entirety. Where the terms read or imply "The Government or the United States Agency for International Development they shall be considered to read or imply "The Client." Where they read or imply "The Grantee" they shall be considered to read or imply "The IC." Where they read or imply a Sponsor official, they shall be considered to read or imply the relevant Client official. This Contract establishes a relationship only between the Client and the IC.

B. The terms of **ATTACHMENT C** supplement the articles of this Contract. They do not replace or supersede nor are they replaced or superseded by the Articles of this Contract. In the event of a conflict between the articles of this Contract and the applicable provisions of **ATTACHMENT C**, a resolution shall be determined by the Director, Office of Sponsored Programs or her designee.

30. ACCEPTANCE. This Contract shall be effective upon its execution by the duly authorized representatives of the Client and the IC. By signing below, each individual represents and warrants that he or she is authorized to enter into and legally bind their respective parties to this Contract.

FOR GEORGETOWN UNIVERSITY:

_____
(Signature)
Mary E. Schmiedel, CPCM, JD
Associate Dean for Research Administration and Director
Office of Sponsored Programs

Date:_____

FOR WOUBEDLE ALEMAYEHU:

_____
(Signature)

_____
(Print Name and Title)

Date:_____

ATTACHMENT A

STATEMENT OF WORK

1. Summary

The independent contractor (IC) will manage the evaluation of an experimental road safety intervention in Kenya.

The IC's main responsibility is to coordinate and supervise the evaluation activities in the field, working closely with the project's implementing partners (from here on ZUSHA partners), service providers and the data collection team. The IC will also be involved in analytical aspects of the evaluation, ensuring the integrity and security of the data collected. The IC will be based in Kenya and will prepare and supervise data collection associated with the recruitment of vehicles and data arising from the implementation of a number of protocols that are part of the field experiment.

The IC, working with the research team at Georgetown University, the ZUSHA partners, and other field staff will implement the design of the CAMS impact evaluation.
IC will provide constructive comments on the final agreements on the impact evaluation questions, and design will be made in a consultative process with the Impact Evaluation Team, which is composed of:

- ASIRT Kenya
- Direct Line Insurance Company
- Royal Media Company
- Georgetown University Faculty members (the Principal Investigators) and the
- Data collection team

2. Tasks

The IC will work under the overall supervision of the principal investigators of the CAMS study, Professors William Jack (Economics) and James Habyarimana (Public Policy Institute).

The IC will prepare regular progress reports, communicate on an ongoing basis and provide day-to-day support on the tasks of the impact evaluation teams that are listed below.

The main tasks of the IC are:

(i) Act as a liaison between the PIs, and ZUSHA partners and the data collection team.
(ii) Act on behalf of the PIs in overseeing the activities of the sub-contractors, ASIRT, and the media survey team to ensure that they execute according to the terms laid out in the research proposal.
(iii) Ensure that service providers contracted to deliver goods and services for the

research project meet the requisite standards and terms.

(iv) Support the identification of key questions to be addressed, outcome indicators, data sources and media sample sizes (including sampling framework and field procedures) and timeline.

(v) Prepare field work protocols and survey instruments.

(vi) Follow up with program operations to ensure that roll out of the intervention proceeds according to the agreed impact evaluation design and timing.

(vii) Supervise the implementation of data collection associated with the broadcast media component

(viii) Supervise data entry and the collation of all the data required for the evaluation

(ix) Carry out analysis of data including a report of basic statistics and provide feedback to project implementation agencies. Help undertake the analysis of data to validate sample selection and provide a report of basic statistics. Provide program specific diagnostics as needed.

3. Deliverables

The IC will provide monthly email reports to the PIs outlining progress made and challenges encountered during the preceding month. More frequent communications are expected as circumstances require.

CERTIFICATIONS

By signing this Contract, IC represents, warrants and certifies that:

Certification Regarding Financial Conflicts of Interest

IC has adequate policies and procedures in place to identify, manage, reduce and eliminate potential Financial Conflicts of Interest, as that term is defined in Title 42 of the Code of Federal Regulations, Part 50, for Investigators performing activities pursuant to this Contract. As defined in Title 42 of the Code of Federal Regulations, Part 50, an "Investigator" is anyone with responsibility for the design, conduct, or reporting of research, as well as the Investigator's spouse and dependent children. Before expending any funds under this Contract, IC agrees to report to Client any identified Financial Conflicts of Interest for her Investigators and the actions it has taken to manage, reduce, or eliminate the identified Financial Conflicts of Interest.

Certification Regarding Debarment and Suspension

Neither it nor its principals nor employees are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal or local governmental department or agency.

Certification Regarding Lobbying

1) No funds associated with this Contract have been paid or will be paid, by or on behalf of IC, to support activities that constitute lobbying as defined in Internal Revenue Code Section 4945(d)(1) and the regulations thereunder.

2) IC shall require that the language of this certification be included in the contract documents for all agreements at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipient shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into.

Certification Regarding Drug-Free Workplace

(a) The IC certifies that, as a condition of the Contract, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with this Contract; and

(b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of this Contract, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the University's signatory of this Contract.

USAID Drug-Free Workplace

(1) The recipient agrees that it will publish a drug-free workplace statement and provide a copy to each employee who will be engaged in the performance of any Federal award. The statement must

(a) Tell the employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in its workplace;
(b) Specify the actions the recipient will take against employees for violating that prohibition; and
(c) Let each employee know that, as a condition of employment under any award, he or she

(i) Must abide by the terms of the statement, and
(ii) Must notify you in writing if he or she is convicted for a violation of a criminal drug statute occurring in the workplace, and must do so no more than five calendar days after the conviction.

(2) The recipient agrees that it will establish an ongoing drug-free awareness program to inform employees about

(a) The dangers of drug abuse in the workplace;
(b) Your policy of maintaining a drug-free workplace;
(c) Any available drug counseling, rehabilitation and employee assistance programs; and
(d) The penalties that you may impose upon them for drug abuse violations occurring in the workplace.

(3) Without the Agreement Officer's expressed written approval the policy statement and program must be in place as soon as possible, no later than the 30 days after the effective date of this award, or the completion date of this award, whichever occurs first.

(4) The recipient agrees to immediately notify the Agreement Officer if an employee is convicted of a drug violation in the workplace. The notification must be in writing, identify the employee's position title, the number of each award on which the employee worked. The notification must be sent to the Agreement Officer within ten calendar days after the recipient learns of the conviction.

(5) Within 30 calendar days of learning about an employee's conviction, the recipient must either

(a) Take appropriate personnel action against the employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973 (29 USC 794), as amended, or
(b) Require the employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for these purposes by a Federal, State or local health, law enforcement, or other appropriate agency.

(6) The policies and procedures applicable to violations of these requirements are set forth in 22 CFR Part 210.

INCORPORATED TERMS OF THE PRIME AGREEMENT

A. All international travel in connection with this subgrant shall be accomplished by U.S. Flag air carriers or U.S. code sharing to the extent that service by those carriers is available as provided for in Title 41 CFR 301.10, "Public Contracts and Property Management, Transportation Expenses".

B. Pursuant to Section 106(g) of the Trafficking Victims Protection Reauthorization Act of 2003, IC shall not engage in severe forms of trafficking in persons or procure a commercial sex act during the term of this Contract; or use forced labor in the performance of the Contract. Any violation of this prohibition in this paragraph F by IC or any employee of IC through conduct that is either associated with the performance of this Contract or imputed to IC pursuant to 2 CFR part 180, "OMB Guidelines to Agencies on Government-wide Debarment and Suspension (non-procurement") shall result in the unilateral termination of this subgrant, without penalty. IC shall inform the Sponsor immediately of any information it receives from any source alleging a violation of a prohibition of this paragraph.

C. IC acknowledges that English is the official language of all award documents.

Consumer Action and Matatu Road Safety
USAID: Milestone #2- Second Round of Sticker Distribution Report

Report 1: Outline of the Design, Production, and Implementation of the Replacement Stickers

Phase II of sticker distribution started in mid-December 2012 to coincide with the launch of a road safety radio campaign which started in January 2012. Providing fresh stickers ensured that the message remain clear, in the case that the Phase I stickers were damaged or faded. Distributing the fresh stickers around the launch of the radio campaign was intended to allow us to assess the effectiveness of such a campaign, and its complementarity, if any, with the more readily available messages carried by the stickers.

Direct Line insurance agents distributed the fresh stickers at the time monthly policies are purchased. In order to keep the analysis of the impact of the stickers simple, we maintained Phase I assignments. This means that a vehicle that was assigned to the control, placebo or any of the eight sticker groups in phase I, stayed in that group for phase II. During Phase II, December 12 through March 22, 2012, 7822 vehicles received stickers and 1622 vehicles were designated to the control group, reaching a total of 9444 vehicles.[1] Stickers were distributed from eight Direct Line branches in Embu, Hazina Towers, Kerugoya, Meru, Nakuru, Nyeri, Thika, and Tom Mboya. Table 1 and Figure 1 show the distribution of stickers across locations.

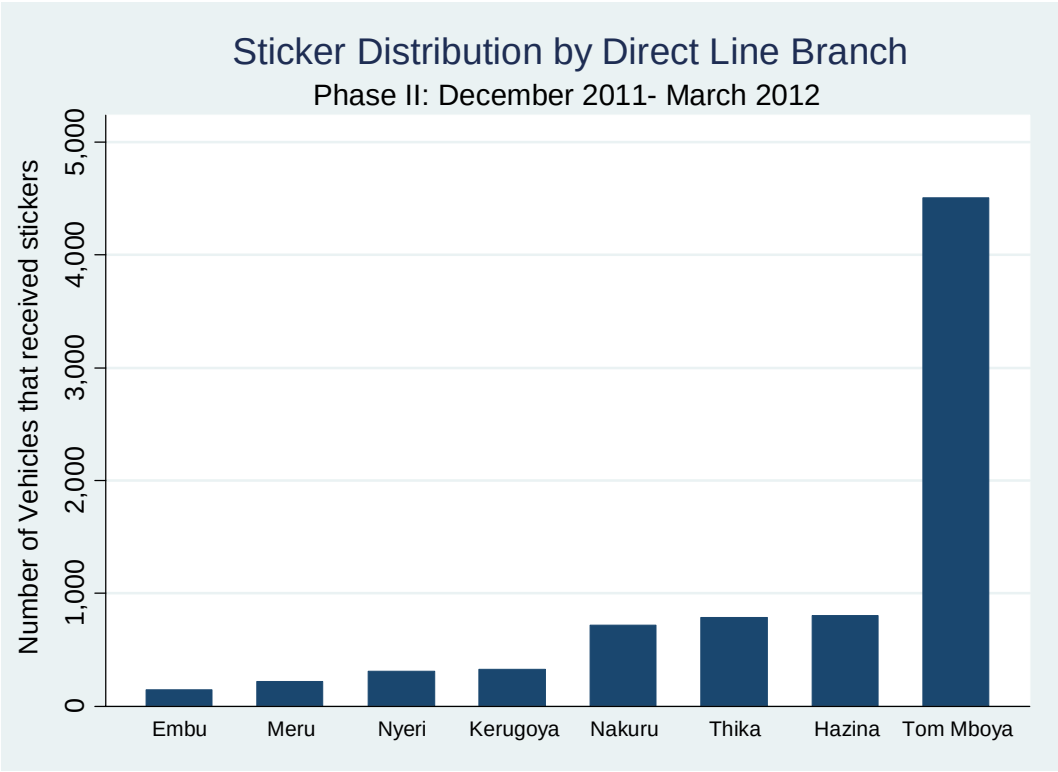
Table 1. Phase II Sticker Distribution by Location

Region	Number of Vehicles that Received Stickers	Percentage
Embu	146	1.9
Nairobi - Hazina Towers	806	10.3
Kerugoya	328	4.2
Meru	221	2.8
Nakuru	717	9.2
Nyeri	310	4.0
Thika	788	10.1
Nairobi - Tom Mboya	4506	57.6
Total	7822	100.0

[1] About 20% of vehicles recruited in Phase I have since switched insurance cover providers. This attrition is consistent with the level of churning observed in this industry, where there is no price differentiation in the cost of third party cover.

More than two out of every three returning phase I vehicles obtained their cover from Nairobi during the recruitment period. Nearly 60% of returning vehicles bought their cover in the main Nairobi branch of Tom-Mboya. This distribution of vehicles across Direct Line's branches is consistent with the distribution in Phase I and suggests uniform attrition due to switching cover provider .

Figure 1. Phase II Sticker Distribution by Location



The distribution of control vehicles across branches is also consistent with the cross-branch composition for Phase I. As Table 2 below shows, a large share of control vehicles were recruited from Nairobi and Nakuru, two of the largest Direct Line markets (excluding Mombasa). As we reported in milestone 1 report, the disproportionately large share of control vehicles recruited in Nakuru, reflects faulty software discovered after the Nairobi recruitment had been completed.

Table 2. Phase II Control Group Distribution by Location

Region	Number of Vehicles that Received Stickers	Percentage
Embu	72	4.4
Nairobi - Hazina Towers	68	4.2
Kerugoya	106	6.5
Meru	72	4.4
Nakuru	478	29.4
Nyeri	133	8.2
Thika	241	14.8
Nairobi - Tom Mboya	452	27.8
Total	1622	100.0

Stickers were distributed each month during Phase II, with the majority of vehicles receiving stickers in the first two months, December 2011 and January 2012. Figure 2 show the distribution of stickers across months. Unlike in Phase I, where recruitment was carefully staggered to minimize disruption to regular commercial operations, recruitment in Phase II was rolled out to all branches a few days after opening in Nairobi. As such, the overall recruitment process of all returning Phase I vehicles was completed much faster than during Phase I.

Figure 2. Phase II Sticker Distribution by Month

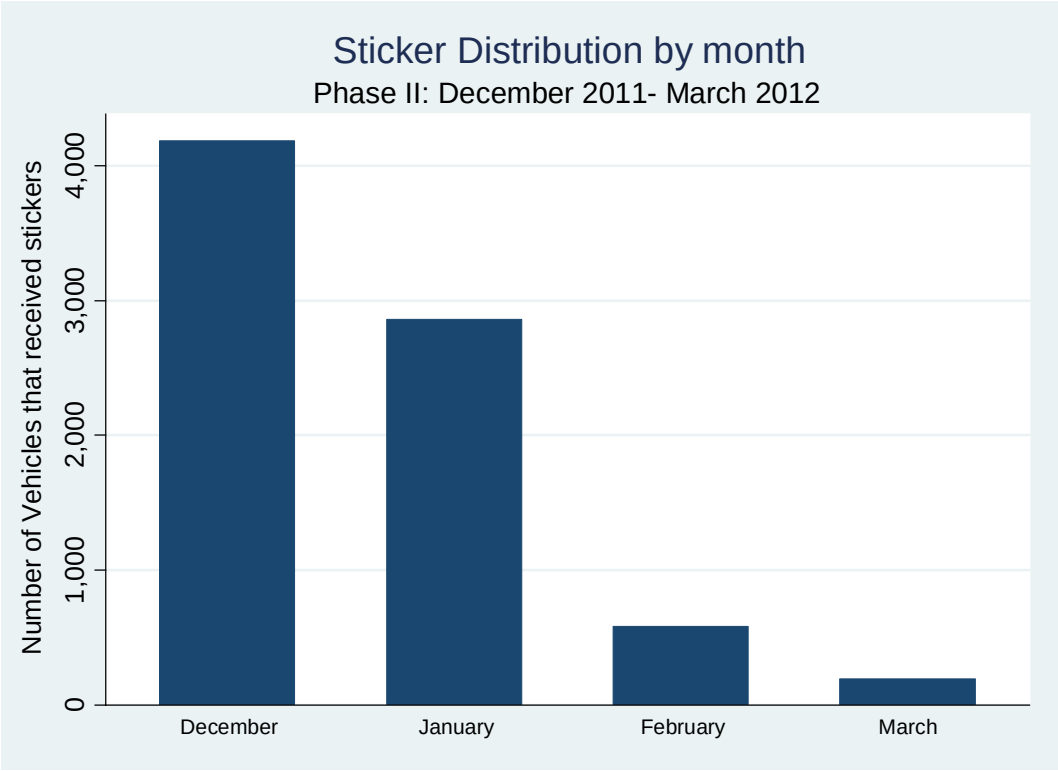


Table 4 shows the distribution of *matatus* assigned to the control group by month: this is about 80% of the number of vehicles that were recruited in Phase I and consistent with uniform attrition across all study arms.

Table 4. Phase II Control Group Distribution by Month

Month	Number of Vehicles that Received Stickers	Percentage
December	1017	62.7
January	545	33.6
February	36	2.2
March	24	1.5
Total	1622	100.0

Direct Line's management information systems and training of insurance sales agents.
Vehicles that received a treatment in the first round received the same treatment in the second round and those designated to the control group in the first round were designated to the control group in the second round. The new code for sticker issuing was programmed into the Direct Line management information system for the second round. Similar to the first round, the digital certificate issuing software was programmed so that sales agents could not issue insurance coverage without having complied with the sticker assignment protocol. The sales agents scanned stickers (each sticker has an individualized serial number and associated bar code) and delivered them, with the insurance certificate, to the purchase. All sales agents, at each of the Direct Line branches were informed of the new sticker issuing strategy for the second round.

Table 5. Phase II Sticker Distribution by Treatment Group

Treatment	Number of Vehicles Receiving Stickers	Percentage
(0) Control	1622	17.17
(1) Placebo	1444	15.29
(2) Accident- Individual	820	8.68
(3) Accident- Group	815	8.63
(4) Text- Individual	779	8.25
(5) Text- Group	763	8.08
(6) Injury- Individual	818	8.66
(7) Injury- Group	779	8.25
(8) Protest- Individual	809	8.57
(9) Protest- Group	795	8.42
Total	9444	100.0

Lottery:

As with Phase I, during Phase II a lottery was run to provide incentives for the three players—the agent, the owner, and the driver—to ensure the placement of the road safety stickers in the vehicles. Only vehicles that were receiving stickers in Phase II were considered in the draws.

During this phase of the lottery, December to March 2012, ten registered *matatus* that received stickers in Phase II were drawn each week and inspected. If inspections revealed that a matatu retained all four assigned stickers, three prizes of Kshs. 5,000 each were awarded, one to the driver, one to the owner, and one to the insurance agent. Overall, during this period, 30% of the matatus that were drawn passed the inspection and the players received the reward. Table 6 shows the results from the lottery from Phase II.

Table 6. Lottery Draws- Phase II (December to March 2012)

Week	No. of Draws	No. of Winners	Share of Winners from Draws
1	10	6	60
2	10	4	40
3	10	4	40
4	10	1	10
5	10	4	40
6	10	1	10
7	10	2	20
8	10	4	40
9	10	1	10
10	10	5	50
11	10	1	10
Total	110	33	30

Report 2: Radio Survey Draft and Sampling Survey

A survey was conducted to assess the media campaign that ran January through March 2012. During this period, the radio spots aired on two radio stations: Inooro and Muuga FM. The campaign includes both spot ads and presenter mentions ran through-out the campaign period as follows:

- Muuga (January 2-March 31, 2012): Four times a day: Two spots in the morning between 5:00-10:00 am and 10:00 am -1:00pm and two in the evening between 4:00- 8:00pm and after 8:00pm.
- Inooro (January 2-March 31, 2012): Twice a day: One spot in the morning between 5:00-10:00 am and one in the evening between 4:00-8:00pm.

The duration of each ad campaign is one week and the campaigns occur every two weeks in order to generate variation over time to enable estimation of the impact of the broadcasts. The ads were aired in two local languages Kikuyu and Meru. The choice of these two stations primary reflects constraints from the broadcaster. However, the two stations covers communities that predominantly use matatus for both inter- and intra-city travel. The radio ads were specifically targeted to passengers encouraging them to speak up before it is too late.

The enumerators that were trained in Phase I continued to collect direct observation data in Phase II. They each received additional training on the direct observation data in order to update the data collection protocol. Additionally, they received training on the media survey in February 2012. This included the purpose of the survey, survey instrument and how to conduct the surveys both using the survey software (Mobenzi Software see Appendix B) and how to operate the mobile phone used to conduct the survey. Enumerators were given instructions on how to ask questions and were instructed not to prompt answers on questions relating to the radio spots. We made a decision ot target the surveys to passengers or potential passengers as opposed to households, to measure more directly the salience of the broadcasts for matatu users. In addition, our sampling of potential passengers was concentrated in areas where Kikuyu and Meru are the predominant languages spoken. Enumerators were instructed only to survey potential passengers that were not boarded on a matatu but where around the matatu stage at their respective destinations. Each enumerator surveyed a total of 8 potential passengers per day- 4 when they reached their destination and 4 when they returned to their starting point.

The enumerators where divided into groups of 7 or 8. One group was based in Nairobi and the other group in the Mount Kenya region specifically in the town of Meru. Each group spent a week in each location travelling to different destinations using those two destinations as their starting point. At the end of the week the groups would switch base locations and continue the trips. These two locations were selected as starting points for surveys to capture information about across the two languages in which the ads were aired. Nairobi because of the Kikuyu speaking population and Meru in Mount Kenya region to capture the Meru speaking population.

The Zusha media campaign survey is primarily intended to collect information on passengers' perception of the radio spots. It was designed to gauge the message strength and clarity, and passengers' awareness and recall of the spots. Passengers were asked questions regarding their favorite radio stations, listening times and specific questions relating to the Zusha radio campaign spots and their interpretations of the spots. Additional background information on passengers was collected, including frequency of riding, occupation, and primary language, gender and ages, thus allowing us to better understand the audience. Additional questions were asked of *matatu* drivers, including frequency of trips, length of trips and start date of driving. Appendix C provides a complete draft of the media campaign questionnaire, and Appendix D provides the Terms of Reference with the survey company.

Report 3: First Six Months Direct Observation

In addition to conducting media surveys on the Zusha campaign, enumerators continued to collect direct observation data. Entering Phase II the enumerators were already trained on the

purpose of the study and how to use a GPS device to collect data on their trips. The Program Coordinator worked with enumerators to resolve any problems or questions from Phase I. The enumerators understood that unlike a conventional survey in which you walk up to a subject and interview them, this data collection exercise is implemented by direct observation. As before the enumerator observed what was happening on their trips and reports as objectively as possible what they have observed.

Also like Phase 1, the direct observation takes place inside a matatu: the enumerator takes a trip in a matatu enrolled in the study and collects observations about what happens inside the vehicle **during** the trip. In order to ensure the integrity of the data collected it is **very important** that the enumerator conceals the purpose of this trip. In other words, the enumerator should be seen to be just another passenger on that trip.

In addition to the survey data, there are key pieces of information that this direct observation will collect.

1) Trip information – using the GPS device we record distance travelled and maximum, moving and overall average speeds.
2) The number of incidents considered dangerous these include driving at very high speeds, overtaking in blind corners, swerving to avoid potholes, etc.
3) The reactions and response of passengers to these incidents? Do the passengers say anything in response to these events? What do they say? How many passengers speak up? What types of passengers speak up and finally how does the driver respond?

All of this information is collected and saved on the GPS device. The device allows us to primarily locate where we are on earth using triangulation with a number of geo-stationary satellites. However, because this device can locate one's position at any one point, it means that we can trace out the movement of someone with this device and can measure a variety of attributes such as their speed, direction, elevation, etc.

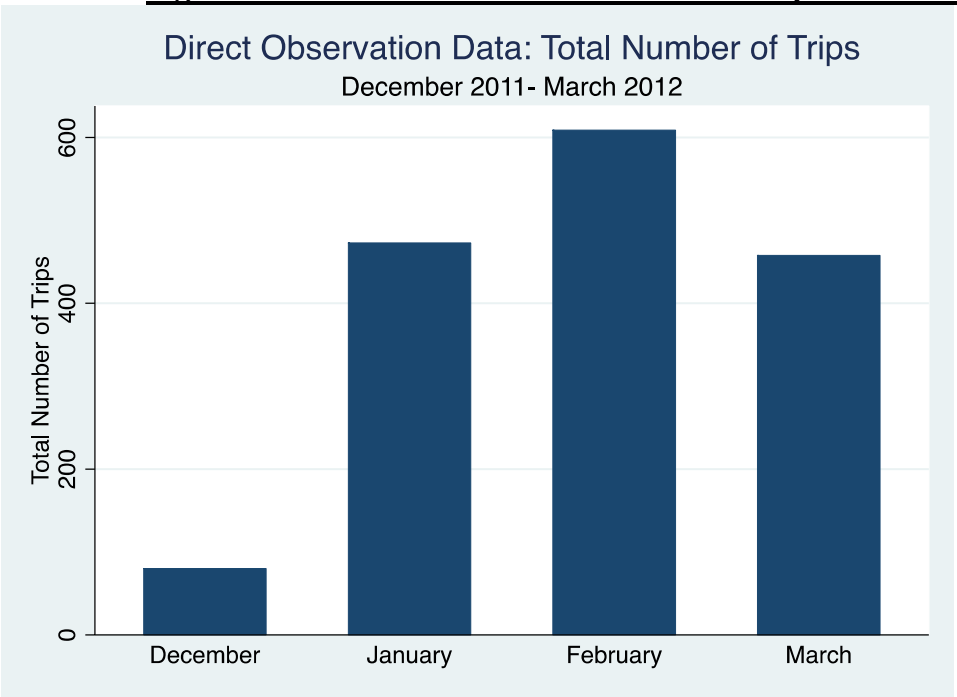
Enumerators switch location every week. This is done through random assignment of all 15 enumerators to a location. Enumerators are ineligible to return to the same location for two weeks in a row.

Enumerators' reimbursement was raised to reflect increases in the cost of living since Phase I, and the additional responsibility of conducting survey. receive a daily flat rate 700Khs; a per diem for those outside of Nairobi (600Khs for accommodations, and 400 Khs for food). The lead field coordinator received a daily flat rate of 1350Khs per day, and the field coordinator in Meru received an additional 150Khs.

During the period from January to March 2012 we received the following data from the enumerators regarding maximum speeds, distance traveled and number of trips.

Figure 3 below shows the number of trips taken starting in late December 2011 to March 2012. As the figure shows, an average of about 510 trips were conducted in the first three months of 2012, with a range of 458 in March to 609 in February.

Figure 3. Direct Observations Data: Sum of Trips Traveled by Month



Enumerators collected three different types of information during these trips: maximum and average speed achieved during the trip and the total distance covered. Figure 4 below shows the distribution of maximum speeds achieved by month. Median maximum speeds range from about 90 km/hr in December and January to just over 100 km/hr in February and March.

Figure 4. Direct Observations Data: Average Maximum Speeds Recorded by Month

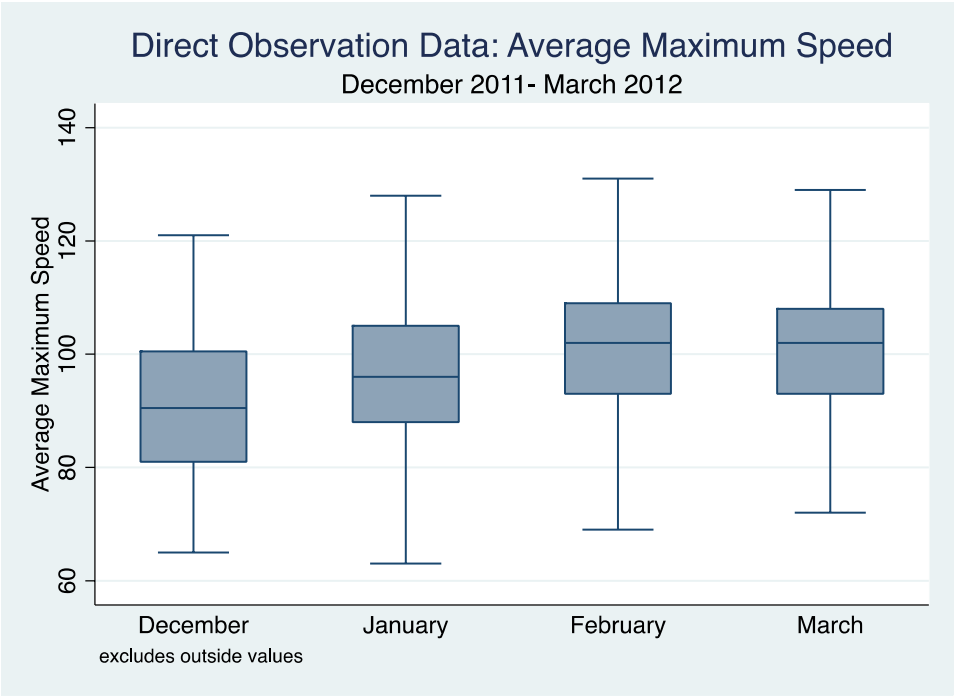


Table 7 below shows summary statistics for the distance covered by enumerators for Phase II trips. The average distance covered in one trip is about 80 km. As the table shows, there was considerable variation across trips with some trips being less than 5km and others being more than 120 km. There is very little variation across the months of January, February and March.

Table 7. Direct Observations Data: Average Distance Per Trip by Month

Month	Average Distance	Standard Deviation	Frequency
December	41.05	28.87	80
January	79.32	57.87	609
February	82.14	55.48	473
March	82.47	56.96	458
Total	79.38	56.28	1620

Group Name	Group Number	Sticker Number	Sticker Images 1	Sticker Images 2
Placebo	1	1	Travel Well	Travel Well
		2	Safiri Salama	Safiri Salama
Accident - Individual	2	3	SPEAK UP NOW Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		4		
		5	SPEAK UP NOW Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		6		
Accident - Group	3	7	SPEAK UP NOW Umoja ni Nguvu Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Umoja ni Nguvu Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		8		
		9	SPEAK UP NOW Umoja ni Nguvu Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Umoja ni Nguvu Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		10		
Text - Individual	4	11	SPEAK UP NOW You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Jikinge dhidi ya uendeshaji mbaya wa gari ZUSHA
		12		
		13	SPEAK UP NOW You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Jikinge dhidi ya uendeshaji mbaya wa gari ZUSHA
		14		
Text - Group	5	15	SPEAK UP NOW Umoja ni Nguvu You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Umoja ni Nguvu Jikinge dhidi ya uendeshaji mbaya wa gari ZUSHA
		16		
		17	SPEAK UP NOW Umoja ni Nguvu You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Umoja ni Nguvu Jikinge dhidi ya uendeshaji mbaya wa gari ZUSHA
		18		
Injury - Individual	6	19	SPEAK UP NOW Don't end up a victim of dangerous driving ZUSHA	SEMA USIKIKE Jichunge usiwe ukawa muathiriwa wa uendeshaji mbaya wa gari ZUSHA
		20		
		21	SPEAK UP NOW Don't end up a victim of dangerous driving ZUSHA	SEMA USIKIKE Usiwache dreva asiyejali afanye mtoto wako kuwa yatima ZUSHA
		22		
Injury - Group	7	23	SPEAK UP NOW Umoja ni Nguvu Don't end up a victim of dangerous driving ZUSHA	SPEAK UP NOW Umoja ni Nguvu Don't end up a victim of dangerous driving ZUSHA
		24		
		25	SPEAK UP NOW Umoja ni Nguvu Don't end up a victim of dangerous driving ZUSHA	SPEAK UP NOW Umoja ni Nguvu Don't end up a victim of dangerous driving ZUSHA
		26		
Protest - Individual	8	27	SPEAK UP NOW You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Usimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		28		
		29	SPEAK UP NOW Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		30		
Protest - Group	9	31	SPEAK UP NOW Umoja ni Nguvu You have the power to slow down a reckless driver ZUSHA	SEMA USIKIKE Umoja ni Nguvu Usimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		32		
		33	SPEAK UP NOW Umoja ni Nguvu Don't let a reckless driver get away with murder ZUSHA	SEMA USIKIKE Umoja ni Nguvu Msimwache dereva aendeshaye bila kujali aepuke kosa la kuua ZUSHA
		34		

Appendix B. Mobenzi Survey[2]

The Mobenzi mobile application is available for Java, BlackBerry, Windows Mobile and Android – offering an enormous selection of handset options, ranging from entry-level feature phones to sophisticated handsets. For the purpose of this study we decided to use the Nokia 2710 Navigation handset that had GPS capabilities.

Mobenzi Researcher is used extensively for the collection of baseline data, commonly through the implementation of household surveys, patient interviews and healthcare facility audits. In longitudinal studies, Mobenzi Researcher underpins many of the research activities involved in randomized control trials.

Regardless of the complexity of the form or survey, fieldworkers simply respond to each instruction one-by-one (or section-by-section on devices with larger screens). Mobenzi Researcher handles skip logic, validation, and even complex repeat rules automatically in the background. And because the application runs on standard mobile phones – it leverages an interface familiar to more than 3 billion people.

Surveys can be created in any language, even multi-byte languages such as Telugu, French and Arabic. Where available, fieldworkers can select the language they are most comfortable with. Mobenzi Researcher streamlines the logistics involved in generating and maintaining multi-lingual forms.

The ability to capture photographs and location information on supported handsets enhances the validity of data collection and, in some cases, opens up a completely new range of possibilities.

On handsets supporting GPS, Mobenzi Researcher includes the geographic position at which each response was captured providing the basis for spatial analysis and input into a GIS.

Design and deploy mobile surveys from the web

Whether you need to configure a simple operations form of just a few fields or deploy a research survey containing extensive branching logic, the intuitive designer includes all the tools you'll need.

Maintaining language variations is effortless with changes to survey logic and structure synchronized automatically.

Access & manage data in real time

[2] This section is drawn from www.mobileresearcher.com

Integrated reports allow submissions to be shared and monitored as they arrive from the field. When more complex analysis is required, data can be exported in standard formats or accessed programmatically via theAPI.

Slice & dice your data, then share the results

Filtering capabilities allow you to segment data based on standard fields such as when a submission was received, which fieldworker captured it, what language it was captured in and many more. You can also create your own filters based on questions taken from the survey itself to generate custom datasets in seconds which can be browsed online, exported or charted.

Want to save your filter to reuse later or share it with a colleague? No problem. You can even configure a report and share it on the web (with optional password protection) to provide access to collected data, whilst maintaining full control of what data are included.

Integrated mapping

Submissions captured using GPS-enabled handsets are automatically geocoded and plotted on an interactive map. Information overlays can be configured to display when a submission's marker is clicked, presenting contextual information sourced from the corresponding data.

Combining filters with the interactive map enables spatial insights to be gained without the need for complex and expensive third-party GIS products.

Monitor & communicate with fieldworkers

Integrated SMS keeps you in constant contact with your team. Monitor fieldworker activity and perform location lookups on-demand with ourSIM monitoring service.

A central dashboard

Support for any number of users and granular permission settings means all stakeholders can be involved. Create as many studies, projects or departments as you need and configure roles and access rights appropriately. Build on previous experience and reduce setup time by reusing previous questions or entire form templates with just a few clicks.

Appendix C. Media Survey

Section 1. Background Information

1.1 Interview City

In which city/town is this interview occurring?

Expects a single option response (**required**)

Nairobi [01]
Thika [02]
Kitui [03]
Meru [04]
Embu [05]
Naivasha [06]
Nanyuki [07]
Nakuru [08]
Nyeri [09]
Narok [10]
Nyahururu [11]
Eldoret [12]
Kisumu [13]
Kakamega [14]
Namanga [15]
Other [16]

1.2 Interview City Other

Prerequisites

Skip when ***Interview City (1.1)*** **Not Equal *'Other [16]'***

Please Specify:

Expects a single line text response (**required**)

1.3 Name of Respondent: [Fieldworker: Enter the first name and last initial. E.g. James H)

Expects a single line text response (**required**)

2.14 Respondent Sex

Sex of respondent:

Expects a single option response (**required**)

Male [1]
Female [2]

2.14 Respondent Age

Age of respondent:

Expects a numeric response (**required**)

1.6 Home Language

What is the MAIN language that you speak at home?

Expects a single option response (**required**)

Kikuyu [1]

Swahili [2]

English [3]

Meru [4]

Luo [5]

Other [6]

1.7 Home Language Other

Prerequisites

Skip when ***Home Language (1.6)*** **Not Equal** ***'Other [6]'***

Please Specify:

Expects a single line text response (**required**)

1.8 Respondent Occupation

Respondent's MAIN occupation

Expects a single option response (**required**)

Government, civil servant [1]

Private sector, employee [2]

Private sector, entrepreneur [3]

Casual Laborer [4]

Student [5]

Other [6]

1.9 Respondent Occupation Other

Prerequisites

Skip when ***Respondent Occupation (1.8)*** **Not Equal** ***'Other [6]'***

Please Specify:

Expects a single line text response (**required**)

1.10 Last Used Inter-city Transportation

Before today, when was the last time you used a matatu for inter-city transportation?

Expects a single option response (**required**)

Yesterday [1]

This week [2]

This month [3]

More than 1 month ago [4]

More than 3 months ago [5]

1.11 Radio Station

Which radio station do you listen to the MOST?

Expects a multiple selected options (**required)**

Citizen [01]

KBC Kiswahili [02]

Inooro[03]

Easy/Nation [04]

KISS [05]

Q FM [06]

Musyi [07]

Ramogi [08]

Coro [09]

Kass [10]

Muuga [11]

Kameme [12]

Capital [13]

Venus FM [14]

Other [15]

1.12 Hours Listening to Radio

How many hours a day do you listen to the radio?

Expects a numeric response (**required)**

Constraints

*Response must be **Greater Than or Equal '0'***

Section 2. Demographics and Matatu Utilization

2.1 Times Listening to Radio

What times of the day do you listen to the radio?

Expects a multiple selected options (**required)**

6-10am [1]

10am-2pm [2]

2-6pm [3]

6-10pm [4]

After 10pm [5]

2.2 Heard Zusha Campaign Radio Spot

Did you hear the Zusha campaign radio spot today/yesterday?

Expects a sing option response (**required)**

Yes [1]
No [2]
Don’t know/Cannot say [3]

2.3 Reminder Play Radio Clip
[Fieldworker: PLEASE PLAY THE RADIO CLIP TO THE RESPONDENT]

2.4 Heard Radio Ad
Did you hear this radio ad today/yesterday?
Expects a sing option response (**required**)
Yes [1]
No [2]
Don’t know/Cannot say [3]

2.5 Ever Heard Ad
Have you ever heard this on the radio?
Expects a sing option response (**required**)
Yes [1]
No [2]

2.6 Radio Spot About
What do you think this radio ad is about? [Fieldworker: DO NOT PROMPT]
Expects a sing option response (**required**)
Road Safety [1]
Other subject [2]
Branches
If response **Equals ‘Other Subject [2]’** then skip to ***Lets take care of ourselves (2.8)***

2.7 Think Ad is Effective
Do you think this ad is effective?
Expects a sing option response (**required**)
Very Effective [1]
Effective [2]
Cannot Say [3]
Not Effective [4]
Very Ineffective [5]

2.8 Lets take care of ourselves
Have you ever heard a road safety program on the radio called Lets take care of ourselves?
Expects a sing option response (**required**)
Yes [1]
No [2]

2.9 Twimenyere Twingwa

Have you ever heard the program Twimenyere Twingwa on the radio?

Expects a sing option response (**required**)

Yes [1]

No [2]

2.10 Respondent Matatu Driver

Is the respondent a driver of a matatu?

Expects a sing option response (**required**)

Yes [1]

No [2]

Branches

If response **Equals 'Yes [1]'** then skip to ***Length of Driving (2.11)***

If response **Equals 'No [2]'** then skip to ***End (3.1)***

2.11 Length of Driving

Over the past 7 working days, how many days have you been the driver of this vehicle?

Expects numeric response (**required**)

2.12 Start Date for Driving

When did you start driving this vehicle?

Expects a date response (**required**), Default: 01-03-2012

_____

2.13 Average Trips

Average number of trips per week?

Expects numeric response (**required**)

2.14 KM traveled

Average distance (in kilometers) traveled in a normal working day?

Expects numeric response (**required**)

2.14 Matatu Number Plate

Number plate of Matatu:

Expects a single line text 16esponse (**required**)

Appendix D

GEORGETOWN UNIVERSITY
SUBGRANT NO. RX2450-807-DDD
UNDER
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
GRANT NO. AID-OAAG-11-00053-00

SUBGRANTEE:	Digital Divide Data
ADDRESS:	115 West 30th Street Suite 400 New York, New York 10001
SUBGRANT PERIOD:	August 25, 2011 through August 31, 2012
PRICE:	$30,000
CDFA No.	98.001

PREAMBLE

This fixed price Agreement (Agreement) is between Georgetown University, a Congressionally chartered institution of higher education organized under the laws of the District of Columbia, located at 37th & O Streets, NW, Washington, DC 20057 (University) and Digital Divide Data, a California non-profit corporation (Subgrantee). It constitutes a subgrant for the transfer of work under Grant Number AID-OAAG-11-00053-00 (Prime Agreement) issued to Georgetown University by The United States Agency for International Development (Sponsor).

In consideration of the premises and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, and intending to be legally bound, the parties expressly agree to the terms and conditions contained in this Agreement.

ARTICLE I. STATEMENT OF WORK

The Subgrantee agrees to undertake activities in accordance with the Statement of Work appended as **ATTACHMENT A**.

ARTICLE II. KEY PERSONNEL

The activities to be performed under this Agreement are under the direction of **Amolo Ng'weno**. Should she be unable to continue during the period of performance of this Agreement, Georgetown University reserves the right to approve or disapprove any successor recommended by the Subgrantee.

ARTICLE III. PERIOD OF PERFORMANCE

The effective period of performance of this Agreement shall begin on August 25, 2011, and shall terminate on August 31, 2012.

ARTICLE IV. PRICE

In consideration of the Subgrantee's performance of the work required by **ARTICLE I** and by the terms contained in this Subgrant, the University promises to pay Subgrantee the amount of $30,000. The Subgrantee agrees not to invoice for an amount in excess of $30,000. Costs shall be incurred in accordance with the **BUDGET**, which is appended as **ATTACHMENT B**.

ARTICLE V. PAYMENT

A. Payments for performance under this Agreement shall be issued by the University to the Subgrantee within 30 days of receipt of ***proper***, ***approved*** invoice(s) in the Georgetown University Sponsored Accounting Office. Invoices should be submitted to the University according to the following schedule:

DATE	AMOUNT	DELIVERABLES
February 1, 2012	$15,000	Survey Instrument – Should be ready for use on Mobenzi survey system.
May 31, 2012	$10,000	Data Collected – Should have undergone an initial cleaning.
August 31, 2012	$5,000	Final Report – Should include cross tabulations and a complete data set.

B. To be considered ***proper***, an invoice must contain the Agreement identification number, **Subgrant No. RX2450-807-DDD**, sufficiently itemize expenses for which the Subgrantee is invoicing, and contain an original dated approval signature of an authorized representative of the Subgrantee. This signature shall certify that the expenses recited in the invoice reflect actual expenditures consistent with the terms of this Agreement.

C. To be considered ***approved***, an invoice must also bear the dated approval initials or signature of **Dr. William Jack**.

D. Final invoices shall be submitted to the University within sixty (60) days of the termination date of this Agreement. Final invoices received later than sixty (60) days following the termination date of this Agreement shall be honored for payment at the discretion of the University unless another date for submission is agreed upon in advance by the University.

E. Final payment under this Agreement shall be predicated upon receipt and acceptance of Georgetown University of all services and reports called for under this Agreement.

F. Invoices shall be sent to:

Director, Cost & Sponsored Accounting Office
Georgetown University
Box 571164
Washington, DC 20057-1164
Phone: (202) 687-2313
Facsimile: (202) 687-2054

Payment shall be made to: **Digital Divide Data**

and shall be sent to: **115 West 30th Street**
Suite 400
New York, New York 10001

Subgrantee's Tax ID number of record is: **20-1148452**

G. Invoices that exceed either the period of performance of this Agreement or the obligated amount of this Agreement may be considered invalid invoices, and may be returned to the Subgrantee unpaid. Acceptance and payment by the University of any invalid invoices shall not be construed as a waiver of the University's right to return future improper invoices.

ARTICLE VI. RECORDS AND AUDIT

A. Records for this Agreement are to be retained by the Subgrantee for at least three years after final payment under this Agreement and all pending matters are closed. If an audit, litigation, or other action involving the records is started before the end of the three year period, the records must be retained until all issues arising out of the action are resolved or until the end of the three year period, whichever is later. The Subgrantee agrees to give the University, USAID, the Comptroller General of the United States, or any of their authorized representatives access during regular business hours to these

records and any other pertinent books, documents, papers or other records, in order to make audits, examinations, excerpts and transcripts.

B. The Subgrantee agrees to comply with the requirements of OMB Circular A-133 or Circular A-128 as appropriate and the Single Audit Act of 1984, 31 U.S.C. 7501-7507. The Subgrantee further agrees to provide the University with copies of any independent auditors' reports within 30 days of their receipt by the Subgrantee. Where the report includes instances of non-compliance with federal laws and regulations, the Subgrantee shall provide copies of responses to the report and a plan for corrective action.

ARTICLE VII. PUBLICATIONS

The Subgrantee agrees that when issuing statements, press releases, requests for proposals, bid solicitations, and other documents describing programs funded in whole or in part with Federal money, the Subgrantee shall clearly state (1) the percentage of total cost of the program or project that will be financed with Federal money, and (2) the dollar amount of Federal funds for the project or program.

ARTICLE VIII. PATENTS, INVENTIONS AND INTELLECTUAL PROPERTY

A. Pursuant to the Bayh-Dole Act and Executive Order 12591 (April 10, 1987), all recipients of federal research funding, i.e., all federal grantees, contractors and consortium participants and other organizations receiving funds under federal grants and contracts, whether small businesses, large businesses, or non-profit organizations, are subject to the invention reporting requirements in 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements."

B. The Subgrantee certifies that it has established and implemented an employee invention reporting policy to identify the parties who perform work under this Subgrant and who may be reasonably expected to make inventions.

C. The Federal Government reserves a paid-up, nonexclusive and irrevocable license to reproduce, publish or otherwise use, and to authorize others to use for federal purposes: i) the copyright in all products developed under this subgrant; and ii) any rights of copyright to which the subgrantee purchases ownership under an award (including but not limited to curricula, training models, technical assistance products, and any related materials). Such uses include, but are not limited to, the right to modify and distribute such products worldwide by any means, electronically or otherwise. Federal funds may not be used to pay any royalty or licensing fee associated with such copyrighted material, although they may be used to pay costs for obtaining a copy

which are limited to the developer/seller costs of copying and shipping. If revenues are generated through selling products developed with grant funds, including intellectual property, these revenues are program income. Program income is added to the grant and must be expended for allowable grant activities.

D. The University reserves a paid-up, nonexclusive and irrevocable license to reproduce, publish or otherwise use, for the purposes of fulfilling its obligation to the prime sponsor: i) the copyright in all products developed under this subgrant; and ii) any rights of copyright to which the subgrantee purchases ownership under an award (including but not limited to curricula, training models, technical assistance products, and any related materials). Such uses include, but are not limited to, if necessary, the right to modify and distribute such products worldwide by any means, electronically or otherwise.

ARTICLE IX. INDEMNIFICATION

The Subgrantee shall indemnify and hold harmless the University, its directors, officers, employees, and agents from any and all claims that may arise out of or on account of the Subgrantee's breach of any term of this Agreement or from the negligence or intentional misconduct of the Subgrantee.

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ARTICLE X. LIABILITY INSURANCE

The Subgrantee shall maintain, unless otherwise specified, comprehensive general liability insurance in the amount of at least $1,000,000 combined single limit per occurrence/$2,000,000 aggregate, Worker's Compensation coverage including Employer's Liability, in accordance with appropriate federal and state laws, and automobile liability insurance with a combined single limit for bodily injury and property damage of not less than $1,000,000 per accident throughout the performance of this Agreement.

ARTICLE XI. TERMINATION

A. Either party may terminate or suspend this Agreement in whole or part upon thirty (30) days written notice to the other party.

B. In all instances of termination or suspension by the University, the Sub-grantee shall be given written notice of the termination or suspension, including a written explanation of the reason(s) for such action. Where appropriate, the Sub-grantee shall be given reasonable time to cure any deficiency in its performance. If the deficiency is not

corrected within a reasonable time, as defined by the University in consultation with the Subgrantee, the Agreement may then be immediately terminated or suspended.

C. In the event of any termination or suspension of this Agreement, other than for breach by Subgrantee, the University and Subgrantee will negotiate an equitable downward adjustment in price upon receipt of which payment Subgrantee shall immediately deliver to the University all deliverables as found in the state and format(s) they are in at the date of termination.

ARTICLE XII. NAMES OR MARKS

University and Subgrantee each agree not to use the other party's names, logos or marks without specific prior written authorization.

ARTICLE XIII. TRAINING IN THE PROTECTION OF HUMAN SUBJECTS

Subgrantee acknowledges that training in the protection of human subjects is a condition precedent to this contract. Subgrantee acknowledges that by signing this Agreement, Subgrantee certifies that, if applicable, Subgrantee and any of its or any lower tier contractor's project personnel responsible for the design, conduct or reporting of the research have completed human subject training offered by the Collaborative IRB Training Initiative ("CITI") website: http://www.citiprogram.org/.

ARTICLE XIV. INCORPORATED TERMS OF THE PRIME AGREEMENT

A. The following terms of the Prime Agreement are incorporated by reference and are in effect where applicable:

The following OMB Circulars are incorporated by reference into this Agreement and, are in effect where applicable:
A-110 "Uniform Requirements for Grants and Agreements with Institutions of Higher Education, Hospitals, and Other Nonprofit Organizations"
A-21 "Cost Principles for Educational Institutions"
A-122 "Cost Principles for Nonprofit Organizations
A-133 "Audits of States, Local Governments and Non-Profit Institutions"

B. Some terms of the Prime Agreement between the University and The United States Agency for International Development are appended as **ATTACHMENT C** and are an integral part of this Agreement where applicable. They are in full force and effect as if written in this Article in their entirety. Where the terms read or imply "The Government

or the United States Agency for International Development, they shall be considered to read or imply "The University." Where they read or imply "The Grantee" they shall be considered to read or imply "The Subgrantee." Where they read or imply a Sponsor official, they shall be considered to read or imply the relevant University official. This Agreement establishes a relationship only between the University and the Subgrantee.

C. All international travel in connection with this subgrant shall be accomplished by U.S. Flag air carriers or U.S. code sharing to the extent that service by those carriers is available as provided for in Title 41 CFR 301.10, “Public Contracts and Property Management, Transportation Expenses”.

D. Pursuant to Section 106(g) of the Trafficking Victims Protection Reauthorization Act of 2003, Subgrantee shall not engage in severe forms of trafficking in persons or procure a commercial sex act during the term of this subgrant; or use forced labor in the performance of the this subgrant. Any violation of this prohibition in this paragraph F by Subgrantee or any employee of Subgrantee through conduct that is either associated with the performance of this subgrant or imputed to Subgrantee pursuant to 2 CFR part 180, “OMB Guidelines to Agencies on Government-wide Debarment and Suspension (non-procurement”) shall result in the unilateral termination of this subgrant, without penalty. Subgrantee shall inform the Sponsor immediately of any information it receives from any source alleging a violation of a prohibition of this paragraph F.

E. Confidential Information. Confidential information, as used in this provision, means: 1) information or data of a personal nature about an individual or 2) information or data submitted by or pertaining to an institution or organization or 3) information which might require special consideration with regard to the timing of its disclosure may derive from studies or research, during which public disclosure of preliminary invalidated findings could create erroneous conclusions which might threaten public health or safety if acted upon.

The University and Sponsor may identify elsewhere in this subgrant specific information and/or categories of information which the Sponsor will furnish to the University or the Subgrantee or that the University or Subgrantee is expected to generate which is confidential. The University and the Sponsor may identify confidential information from time to time during the performance of this subgrant.

Subgrantee shall follow the rules and procedures of disclosure set forth in the Privacy Act of 1974 and the implementing regulations and policies, with respect to systems of records determined to be subject to the Privacy Act.

Confidential information shall not be disclosed without prior written consent of the University and the Sponsor.

F. Subgrantee shall provide written advance notice of at least 45 days to the University and and the Sponsor of the Subgrantee's intent to release findings of studies or research, which may have the possibility of adverse effects on the public or the Sponsor. In the event the University and the Sponsor does not object in writing within 45 days, the Subgrantee may proceed with disclosure.

G. Subgrantee acknowledges that English is the official language of all documents and correspondence related to this Agreement.

H. Debarment, Suspension, Ineligibility, and Voluntary Exclusion (December 2003)
The policies and procedures applicable to debarment, suspension, and ineligibility under USAID-financed transactions are set forth in 22 CFR Part 208, as found at:
http://www.access.gpo.gov/nara/cfr/waisidx_10/22cfr208_10.html

I. Branding and Marking Requirements for Assistance Awards (ADS 320.3.3)
As found at: http://www.usaid.gov/policy/ads/300/320.pdf
Effective Date: 01/08/2007
USAID's policy is that programs, projects, activities, public communications, or commodities implemented or delivered under co-funded instruments – such as grants, cooperative agreements, or other assistance awards that usually require a cost share – generally are "co-branded and co-marked." In accordance with 22 CFR 226.91, this policy applies to these assistance awards even when the award does not require any cost sharing (see **ADS 303.3.10**).

J. Co-Branding and Co-Marking (ADS 320.3.3.1)
As found at: http://www.usaid.gov/policy/ads/300/320.pdf
Effective Date: 01/08/2007
Co-branding and co-marking mean that the program name represents both USAID and the implementing partner, and the USAID Identity and implementer's logo must both be visible with equal size and prominence on program materials produced for program purposes. Such program materials include the assistance set forth at **22 CFR 226.91 (b) – (e)**. Program materials do not include commodities the recipient or sub-recipient procures for their own use in administering the USAID-funded program (in accordance with the definition of "commodities" in **22 CFR 226.2**). In short, co-funding means co-branding and co-marking.

K. The terms of **ATTACHMENT C** supplement the articles of this Agreement. They do not replace or supersede nor are they replaced or superseded by the Articles of this Agreement. In the event of a conflict between the articles of this Agreement and the applicable provisions of **ATTACHMENT C**, a resolution shall be achieved in accordance with **ARTICLE XIV**.

ARTICLE XIV. DISPUTES

A. There is no formal procedure established for resolving disputes between the University and the Subgrantee. It is University policy to make every reasonable effort to resolve all issues fairly by negotiation without litigation. Any disputes arising under this Agreement shall be brought to the attention of the Georgetown University Office of Sponsored Programs. Authority for resolving such disputes on behalf of the University shall reside with the Associate Dean for Research Administration and Director, Office of Sponsored Programs or her designee.

B. This Article shall not be construed to limit the administrative or legal rights otherwise available to the parties in the event of violations of the terms or conditions of this Agreement.

ARTICLE XV. NOTICES

Any official notices required under the terms of this Agreement shall be hand delivered or sent by Certified Mail, postage prepaid, return receipt requested, to the appropriate individual and address listed below.

For the University:
Jean Fallow
Georgetown University
Office of Sponsored Programs, Box 571168
37th & O Streets, NW
Washington, DC 20057
(202) 687-7345 (o)
(202) 687-4555 (f)
fallowj@georgetown.edu

For the Subgrantee:
Amolo Ng'weno
Digital Divide Data
115 West 30th Street
Suite 400
New York, New York 10001
212-461-3700 (o)
_____ (f)
amolo@digitaldividedata.org

ARTICLE XVI. ATTACHMENTS

The following attachments are an integral part of this Agreement:

ATTACHMENT A	Statement of Work
ATTACHMENT B	Budget
ATTACHMENT C	Certifications

ARTICLE XVII. INDEPENDENT CONTRACTOR

Subgrantee is an independent contractor of the University, not a partner, agent or joint venturer of the University. No further business relationship is inferred beyond the terms of this Agreement and neither party shall hold itself out contrary to these terms by advertising or otherwise, nor shall either party be bound by any representation, act or omission whatsoever of the other.

ARTICLE XVIII. REPORTING REQUIREMENTS

The Subgrantee's Principal Investigator will provide to William Jack (University PI), an annual progress report on work performed under this Agreement as required to fulfill the reporting requirements of the Prime Award and to enable the filing of the continuation application, if applicable. Reports shall be sent to the University's PI by email to wgj@georgetown.edu.

ARTICLE XIX. CIVIL RIGHTS

The Subgrantee shall comply with the provisions of the Civil Rights Act of 1964, as amended and implementing regulations, and the Assurance of Compliance, which the Subgrantee must have on file prior to award of this Agreement. The aforementioned Act, as amended, and its implementing regulations are incorporated into this Agreement by reference.

ARTICLE XX. EQUAL EMPLOYMENT OPPORTUNITY

The Subgrantee shall comply with Executive Order 11246, entitled "Equal Employment Opportunity," as amended by Executive Order 11375, and as supplemented in 41 CFR Part 60.

ARTICLE XXI. CLEAN AIR AND WATER

The Subgrantee shall comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act of 1970 (42 U.S.C. 1857 et seq.); the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) as amended; Executive Order No. 11738; and the related regulations of the EPA (40 CFR, Part 15 et seq.). Violations shall be reported to the University. The aforementioned regulations are incorporated into this Subgrant by reference.

ARTICLE XXII. ANTI-TERRORISM

Executive Orders No. 13224 and U.S. Law prohibit transactions with, and the provision of resources and support, to individuals and organizations associated with terrorism. It is the legal responsibility of the Subgrantee compliance with these Executive Orders and Laws. The Subgrantee's signature below shall serve as certification that, to the best of Subgrantee's knowledge, Subgrantee and any personnel or lower tier contractors assigned to this project (a) are not; (b) have not been designated as; (c) are not owned, affiliated or controlled by; and (d) do not support, assist or aid a suspected terrorist organization or individual as defined by Federal anti-terrorism law including, but not limited to, Executive Order 13324 or included in any lists published by the U.S. Department of Treasury's Office of Foreign Asset Controls. This provision must be included in all lower tier agreements issued under this agreement.

ARTICLE XXIII. GOVERNING LAW

Unless otherwise provided by a specific term of this Agreement, this Agreement shall be governed by and interpreted in accordance with the relevant United States Agency for International Development's policies and regulations and the laws of the District of Columbia.

ARTICLE XXIV. WAIVER

No waiver of any term, provision or condition of this Agreement whether by conduct or otherwise in any one or more instances shall be deemed to be or construed as a further or continuing waiver of any such term, provision or condition, or of any other term, provision, or condition of this Agreement.

ARTICLE XXV. MODIFICATION OR AMENDMENT

No modification or amendment to this Agreement shall be valid unless in writing, signed by an authorized representative of the University and an authorized representative of the Subgrantee. Only designated individuals within the Georgetown University Office of Sponsored Programs are authorized to modify this Agreement for Georgetown University.

ARTICLE XXVI. ENTIRE AGREEMENT

This writing contains the entire agreement of the parties and there are no promises, understandings, or agreements of any kind pertaining to this Agreement other than those written in this Agreement.

ARTICLE XXVII. SEVERABILITY

In the event that any provision of this Agreement is deemed illegal, unenforceable, or void, the parties agree that another provision that is legal and enforceable and achieves the same objective will be substituted. If that is not possible, then both parties shall be relieved of all obligations arising under the provision. If the remainder of this Agreement is not affected by such declaration or finding and is capable of substantial performance, then the remainder shall be enforced to the extent permitted by law.

ARTICLE XXVII. CAPTIONS OR HEADINGS

Captions or headings contained in this Agreement are inserted only as a matter of convenience and do not in any way define, limit, or extend the scope or intent of this Agreement or any term or provision of this Agreement.

ARTICLE XXVIII. COUNTERPARTS

This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

ARTICLE XXIX. ACCEPTANCE

This Agreement shall not be considered accepted or effective until signed below by authorized representatives of both of the parties. By signing below, each individual warrants that he or she is authorized to bind his or her organization to this Agreement.

FOR GEORGETOWN UNIVERSITY:

(Signature)
Mary E. Schmiedel, CPCM
Associate Dean for Research Administration and Director
Office of Sponsored Programs

Date:

FOR DIGITAL DIVIDE DATA:

(Signature)

_____

(Name)

_____

(Title)

Date:_____

ATTACHMENT A

STATEMENT OF WORK

Consumer Action and Matatu Safety (CAMS)

Subgrantee shall administer a media exposure survey of passengers and drivers as part of the CAMS study. The primary survey locations will be selected so as to capture a large share of the listening audience of the two radio stations airing the road safety ads.

Tasks to be performed by Subgrantee under the direction of Amolo Ng'weno:

Subgrantee shall perform the tasks associated with this Agreement as instructed by the principal investigators of the CAMS study, Professors William Jack (PI) and James Habyarimana (PI), and as requested by the Independent Consultant, Woubedle Alemayehu (IC), on behalf of the PIs.

Specifically, Subgrantee shall:

1. Arrange and finance data collection via mobile phone using Mobenzi Researcher. Expenditures include setting up a mobile data collection platform, purchasing the phones that will be used by enumerators, wages, per diems and transport.

2. Train enumerators and field test data collection application.

3. Administer a media survey to approximately 7,000 potential matatu passengers in Nairobi, and Central and Rift Valley Provinces.

4. Provide secure storage space for project materials and equipment.

5. Provide administrative and financial services to the IC and PIs as required.

Subgrantee shall submit the following deliverables:

1. A survey instrument to be used on Mobenzi Researcher
2. A clean and validated database of responses to survey questionnaires.
3. A short report of the survey activities and in particular, incidents that could confound the analysis or interpretation of the data.

By signing the Subgrant, the Subgrantee's authorized official certifies, to the best of his or her knowledge and belief that:

Certification Regarding Financial Conflicts of Interest

The Subgrantee assures the University that Subgrantee has adequate policies and procedures in place to identify, manage, reduce and eliminate potential Financial Conflicts of Interest, as that term is defined in the Title 42 of the Code of Federal Regulations, Part 50, for Investigators performing activities pursuant to this Subgrant. As defined in Title 42 of the Code of Federal Regulations, Part 50, an "Investigator" is anyone with responsibility for the design, conduct, or reporting of research, as well as the Investigator's spouse and dependent children. Before expending any funds under this Subgrant, Subgrantee agrees to report to the University any identified Financial Conflicts of Interest for its Investigators and the actions it has taken to manage, reduce, or eliminate the identified Financial Conflicts of Interest.

Certification Regarding Lobbying

1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Subgrantee, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan or cooperative agreement.

2) If any funds, other than Federal appropriated funds have been paid or will be paid to any person for influencing or intending to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan or cooperative agreement, the Collaborator shall complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying" to the University.

3) The Subgrantee shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for such failure.

Debarment, Suspension, and Other Responsibility Matters

The Subgrantee certifies by signing this Subgrant that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any federal department or agency.

OMB Circular A-133 Assurance

The Subgrantee assures the University that it complied with A-133 and that it will notify the University of completion of all required audits and of any adverse findings which impact this Subgrant.

Certification Regarding Drug-Free Workplace

(a) The IC certifies that, as a condition of the Agreement Subgrantee will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity within the scope of this Agreement; and

(b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of this Agreement it will report the conviction, in writing, within 10 calendar days of the conviction, to the University's signatory of this Agreement and shall otherwise adhere to policies and procedures applicable to violations as set forth in 22CFR Part 210.

The Drug-Free Workplace Act

Requires Subgrantee to publish a statement about your drug-free workplace program. Subgrantee must give a copy of this statement to each employee (including consultants and temporary personnel) who will be involved in award-supported activities at any site where these activities will be carried out.

Consumer Action and Matatu Road Safety
USAID: Milestone #3- Interim Report on Research Activities

This milestone report covers activities implemented during the period April through June 2012. Phase II of sticker distribution started in mid-December 2012 to coincide with the launch of a road safety radio campaign which started in January 2012. This report is structured as follows. Part 1 describes the sticker distribution and the accompanying lottery to encourage rention. Part II describes the sample of respondents interviewed to measure the salience of the media component of this intervention. Finally Part III describes the measurement activities collecting information about drivers and passenger behavior.

PART I: STICKER DISTRIBUTION AND LOTTERY

While we are close to issuing the last set of stickers, phase II of this study is not yet complete. The main reason that sticker distribution has been slower than anticipated is that there is considerable churning in the insurance client base. While the pattern of churning is not fully clear, we have observed about one quarter of vehicles recruited in phase I moving to a different insurance company within a year. The total number of vehicles purchasing insurance has not changed much, suggesting that an equal number of new clients have started purchasing insurance from our partner.

As we reported in milestone #2, Direct Line insurance agents distribute a new set of stickers at the time monthly policies are purchased. In order to keep the analysis of the impact of the stickers simple, we maintained Phase I assignments. This means that a vehicle that was assigned to the control, placebo or any of the eight sticker groups in phase I, stayed in that group for phase II. During Phase II, December 12 through June 30, 2012, 9,224 vehicles received stickers and 1,545 vehicles were designated to the control group, reaching a total of 10,769 vehicles.[1] Stickers were distributed from eight Direct Line branches in Embu, Hazina Towers, Kerugoya, Meru, Nakuru, Nyeri, Thika, and Tom Mboya. Table 1 and Figure 1 show the distribution of stickers across locations. Due to the fact that we reported numbers for December 2011 through March 2012 in the milestone 2 report we have created a separate column for the period from April through June 2012, and a column for the entire duration.

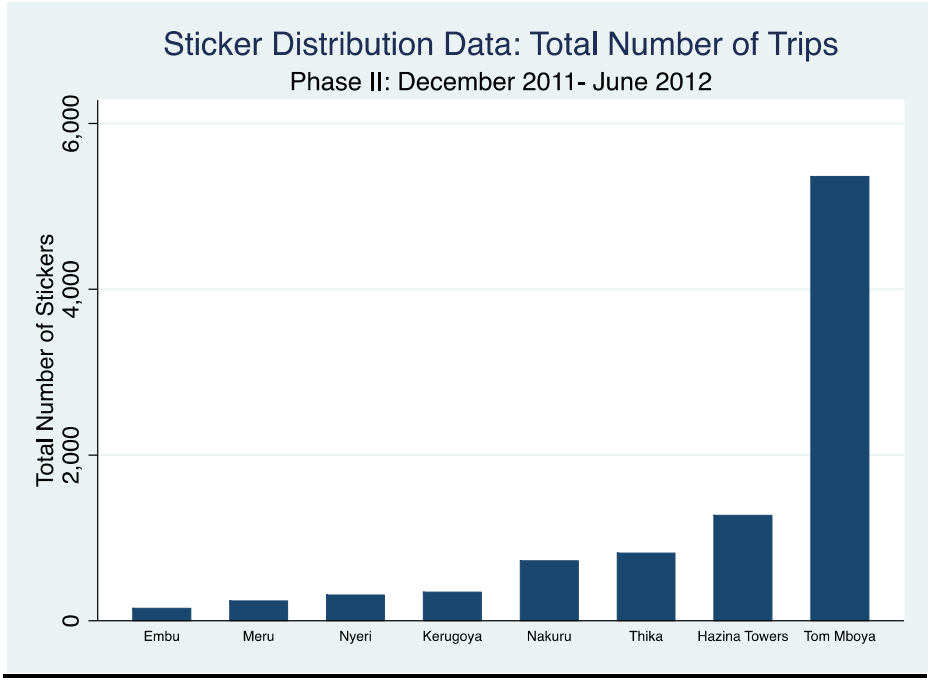
[1] About 20% of vehicles recruited in Phase I have since switched insurance cover providers. This attrition is consistent with the level of churning observed in this industry, where there is no price differentiation in the cost of third party cover.

Table 1. Phase II Sticker Distribution by Location

Region	No. of Vehicles that Received Stickers (Dec-March 2012)	No. of Vehicles that Received Stickers (April-June 2012)	Total No. of Vehicles that Received Stickers (Dec-June 2012)	Percentage
Embu	146	6	152	1.65
Nairobi - Hazina Towers	806	467	1273	13.80
Kerugoya	328	18	346	3.75
Meru	221	18	239	2.59
Nakuru	717	6	723	7.84
Nyeri	310	1	311	3.37
Thika	788	29	817	8.86
Nairobi - Tom Mboya	4506	857	5363	58.14
Total	7822	1402	9224	100.0

More than two out of every three returning phase I vehicles obtained their cover from Nairobi during the recruitment period, from the Tom-Mboya and Hazina Towers Direct Line branches. Nearly 60% of returning vehicles bought their cover in the main Nairobi branch of Tom-Mboya. This distribution of vehicles across Direct Line's branches is consistent with the distribution in Phase I and suggests uniform attrition due to switching insurance cover provider.

Figure 1. Phase II Sticker Distribution by Location



The distribution of control vehicles across branches is also consistent with the cross-branch composition for Phase I. As Table 2 below shows, a large share of control vehicles were recruited from Nairobi and Nakuru, two of the largest Direct Line markets that are participating in this study. As we reported in milestone 1 & 2 reports, the disproportionately large share of control vehicles recruited in Nakuru, reflects faulty software discovered after the Nairobi recruitment had been completed.

Table 2. Phase II Control Group Distribution by Location[2]

Region	Control Group Vehicles (Dec-March)	Control Group Vehicles (April-June)	Total Control Group Vehicles	Percentage
Embu	70	7	77	2.83
Nairobi - Hazina Towers	70	106	176	6.47
Kerugoya	102	2	104	3.82
Meru	71	3	74	2.72
Nakuru	477	15	492	18.08
Nyeri	135	6	141	5.18
Thika	241	11	252	9.26
Nairobi - Tom Mboya	455	950	1,405	51.64
Total	1,621	1,100	2,721	100.0

Stickers were distributed each month during Phase II, with the majority of vehicles receiving stickers in the first two months, December 2011 and January 2012. Figure 2 shows the distribution of stickers across months. The blue-grey color for December through March indicates the total monthly sticker distribution numbers. The darker bars show a considerably lower total distribution for April through June. Unlike in Phase I, where recruitment was carefully staggered to minimize disruption to regular commercial operations, recruitment in Phase II was rolled out to all branches a few days after opening in Nairobi. As such, the overall recruitment process of all returning Phase I vehicles is being completed much faster than during Phase I.

[2] Numbers have been adjusted since the Milestone 2 report to more accurately reflect the timing of sticker distribution. Previously some vehicles were erroneously omitted.

Figure 2. Phase II Sticker Distribution by Month

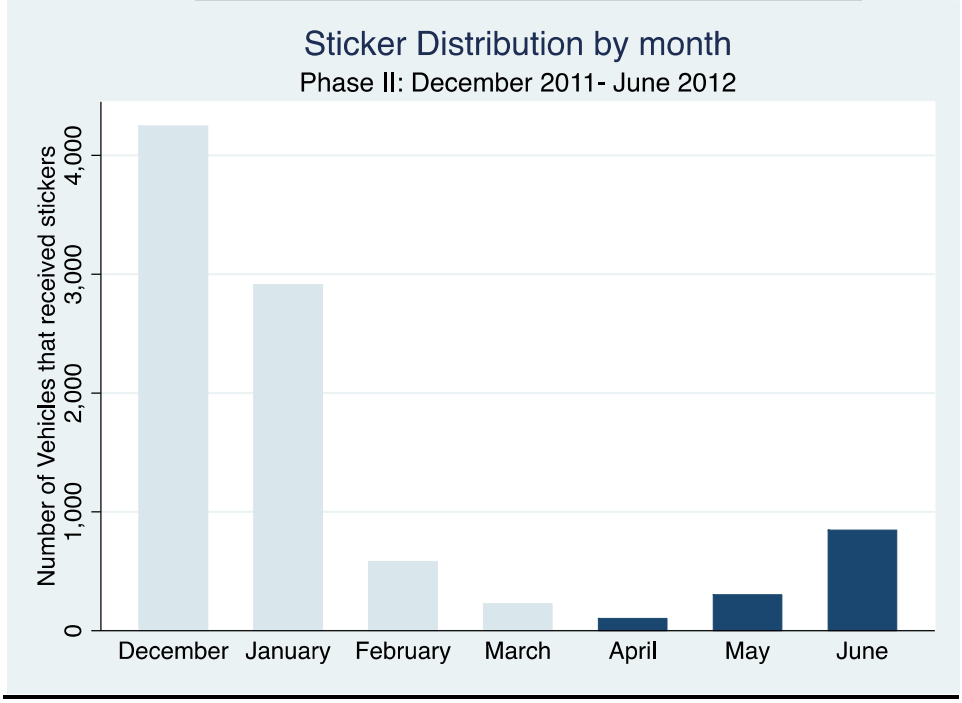


Table 4 shows the distribution of *matatus* assigned to the control group by month: the total number of control vehicles observed during this phase is about 80% of the number of vehicles recruited in Phase I. We expect that the bulk of the 'attrition' is due to switching of insurance provider and is further confirmation of the uniform attrition across all study arms between phase I and II.

Table 4. Phase II Control Group Distribution by Month[3]

Month	No. of Control Group Vehicles	Percentage
December	896	32.93
January	663	24.37
February	37	1.36
March	36	1.32
April	34	1.25
May	316	11.61
June	739	27.16
Total	2,721	100.0

Direct Line's management information systems and training of insurance sales agents. As we reported in milestone report 2, vehicles that received a treatment in the Phase I received the same treatment in Phase II. Similarly vehicles designated to the control

[3] Numbers have been adjusted since the Milestone 2 report to reflect accurate distribution. Previously there had been a data error.

group in Phase I were designated to the control group in the second phase. All sales agents, at each of the Direct Line branches were informed of the new sticker issuing strategy for the second round.

Table 5. Phase II Sticker Distribution by Treatment Group

Treatment	No. of Vehicles Receiving Stickers (Dec-March 2012)	No. of Vehicles Receiving Stickers (April-June 2012)	Total No. of Vehicles Receiving Stickers (Dec-June 2012)	Percentage
(0) Control	1621	1100	2721	22.78
(1) Placebo	1444	417	1861	15.58
(2) Accident-Individual	820	74	894	7.48
(3) Accident-Group	815	96	911	7.63
(4) Text-Individual	779	168	947	7.93
(5) Text- Group	763	130	893	7.48
(6) Injury-Individual	818	102	920	7.70
(7) Injury- Group	779	189	968	8.10
(8) Protest-Individual	809	51	860	7.20
(9) Protest- Group	795	175	970	8.12
Total	9,443	2,502	11,945	100.0

Lottery:

As with Phase I, during Phase II a lottery was run to provide incentives for the three players—the agent, the owner, and the driver—to ensure the placement and retention of the road safety stickers in the vehicles. Only vehicles receiving stickers in Phase II were eligible for the draws.

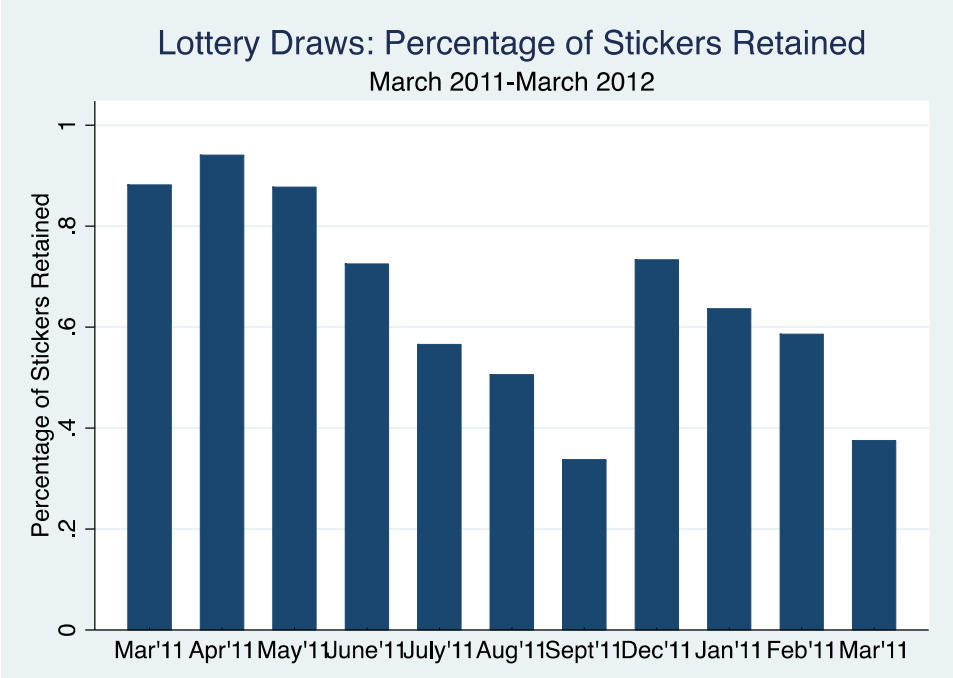
During this phase of the lottery, December through June 2012, ten registered *matatus* that received stickers in Phase II were drawn each week and inspected. If inspections revealed that a matatu retained all four assigned stickers, three prizes of Kshs. 5,000 each were awarded, one to the driver, one to the owner, and one to the insurance agent. Overall, during this period, 30% of the matatus that were drawn fulfilled the draw requirements and the corresponding individuals received the Kshs 5000 reward. Table 6 shows the results from the lottery from Phase II.

Table 6. Lottery Draws- Phase II (April to June 2012)

Week	No. of Draws	No. of Winners	No. of Inspected Vehicles	Share of Winners from Draws
1	10	6	8	60
2	10	4	7	40
3	10	4	9	40
4	10	1	7	10
5	10	4	6	40
6	10	1	3	10
7	10	2	10	20
8	10	4	7	40
9	10	1	4	10
10	10	5	8	50
11	10	1	6	10
Total	110	33	75	30

Table 6 above provides only a coarse picture of the rate of sticker retention. In Figure 3 below we show the percentage of stickers retained in the matatus that were inspected each month of the lottery. Rather than simply count how many vehicles have all four stickers, this analysis counts stickers even in vehicles that have lost one or more stickers. Predictably, the percentage of stickers retained was higher earlier in the sticker distribution periods, and decreased over time, indicating a need for sticker replacement.

Figure 3. Lottery Draws- Phase II (December to June 2012)



PART II: MEDIA SURVEY

A survey was conducted to assess the reach and salience of an accompanying media campaign that ran January through March 2012. The radio spots aired on two radio stations: Inooro and Muuga FM. Appendix A provides schedule of the *Zusha* radio spots for both radio stations.

The duration of each ad campaign is one week and the campaigns occur every two weeks in order to generate variation over time to enable estimation of the impact of the broadcasts. The ads were aired in two local languages Kikuyu and Meru. The choice of these two stations primary reflects constraints from the broadcaster. However, the two stations cover communities that predominantly use matatus for both inter- and intra-city travel. Like the stickers, the radio ads were specifically targeted to passengers encouraging them to speak up before it is too late.

We elected to carry out a mobile-based survey in order to maximize coverage without reducing the effectiveness of enumerator supervision. Our enumerator team received training on the media survey in February 2012. This included the purpose of the survey, survey instrument and how to conduct the surveys both using the mobile-basedsurvey and how to operate the mobile phone used to conduct the survey. Enumerators were given instructions on how to ask questions and were instructed not to prompt answers on questions relating to the radio spots. We made a decision to target the surveys to passengers or potential passengers as opposed to households, to measure more directly the salience of the broadcasts for matatu users. In addition, our sampling of potential passengers was concentrated in areas where Kikuyu and Meru are the predominant languages spoken. Enumerators were instructed only to survey potential passengers that were not boarded on a matatu but where around the matatu stage at their respective destinations. Each enumerator surveyed a total of 8 potential passengers per day- 4 when they reached their destination and 4 when they returned to their starting point.

The enumerators where divided into groups of 7 or 8. One group was based in Nairobi and the other group in the Mount Kenya region specifically in the town of Meru. Each group spent a week in each location travelling to different destinations using those two destinations as their home base. At the end of the week the groups would switch base locations and continue the trips. These two locations were selected as starting points for surveys to reliably measure message reach across the two communities targeted by the ads: Nairobi because of the Kikuyu speaking population and Meru in Mount Kenya region to capture the Meru speaking population.

The Zusha media campaign survey collected information from 9,807 respondents. It was designed to gauge the message strength and clarity, and passengers' awareness and recall of the spots. Passengers were asked questions regarding their favorite radio stations, listening times and specific questions relating to the Zusha radio campaign spots and their interpretations of the spots. Additional background information on passengers was collected, including frequency of matatu use, occupation, and primary language spoken at home, gender and age, providing a rich description of the target population.

Approximately 60% of respondents speak Kikuyu or Meru as their primary language and almost 70% were male. This disproportionate share of males in the sample is consistent with other passenger populations that we have worked with. Nearly 80% of the respondents were between the ages of 21 and 40, with 43% between the ages 21 and 30, and 37% 31 to 40. Three quarters of the respondents were passengers and the rest were drivers. Additional questions were asked of *matatu* drivers, including frequency andlength of trips and start date of driving. Table 7 through Table 11 present key summary statistics for the sample of survey respondents.

Table 7. Media Survey Interviews: Share speaking particular language at home

Primary Language	Frequency	Percent
English	63	0.64
Kikuyu	3,460	35.28
Luo	352	3.59
Meru	2,451	24.99
Other	1,633	16.65
Swahili	1,848	18.84
Total	9,807	100.0

Table 8. Media Survey Interviews: Gender

Gender	Frequency	Percent
Female	3,100	31.61
Male	6,707	68.39
Total	9,807	100.0

Table 9. Media Interviews: Age

Age Range (years)	Frequency	Percent
13-20	429	4.37
21-30	4,173	42.55
31-40	3,644	37.16
41-50	1,278	13.03
51 or above	283	2.89
Total	9,807	100.0

Table 10. Media Survey Interviews: Driver vs. Passenger

Driver/Passenger	Frequency	Percent
Passenger	7,613	77.63
Driver	2,194	22.37
Total	9,807	100.0

Table 10. Media Survey Interviews: Town/City where survey was conducted

City	Frequency	Percent
Embu	192	1.96
Kakamega	3	0.03
Kitui	25	0.25
Meru	2,135	21.77
Nairobi	3,351	34.17
Naivasha	113	1.15
Nakuru	110	1.12
Nanyuki	156	1.59
Narok	75	0.76
Nyahururu	35	0.36
Nyeri	292	2.98
Thika	3,109	31.7
Other	211	2.15
Total	9,807	100.0

PART III: Direct Observations of Driver and Passenger Behavior

In addition to conducting media surveys on the Zusha campaign, enumerators continued to collect direct observation data. Entering Phase II the enumerators were already trained on the purpose of the study and how to use a GPS device to collect data on their trips. The Program Coordinator worked with enumerators to resolve any problems or questions from Phase I. The enumerators understood that unlike a conventional survey in which you walk up to a subject and interview them, this data collection exercise is implemented by direct observation. As before the enumerator observed what was happening on their trips and reports as objectively as possible what they have observed.

Also like Phase 1, the direct observation takes place inside a matatu: the enumerator takes a trip in a matatu enrolled in the study and collects observations about what happens inside the vehicle **during** the trip. In order to ensure the integrity of the data collected it is **very important** that the enumerator conceals the purpose of this trip. In other words, the enumerator should be seen to be just another passenger on that trip.

In addition to the survey data, there are key pieces of information that this direct observation will collect.

1) Trip information – using the GPS device we record distance travelled and maximum, moving and overall average speeds.
2) The number of incidents considered dangerous these include driving at very high speeds, overtaking in blind corners, swerving to avoid potholes, etc.
3) The reactions and response of passengers to these incidents? Do the passengers say anything in response to these events? What do they say? How many

passengers speak up? What types of passengers speak up and finally how does the driver respond?

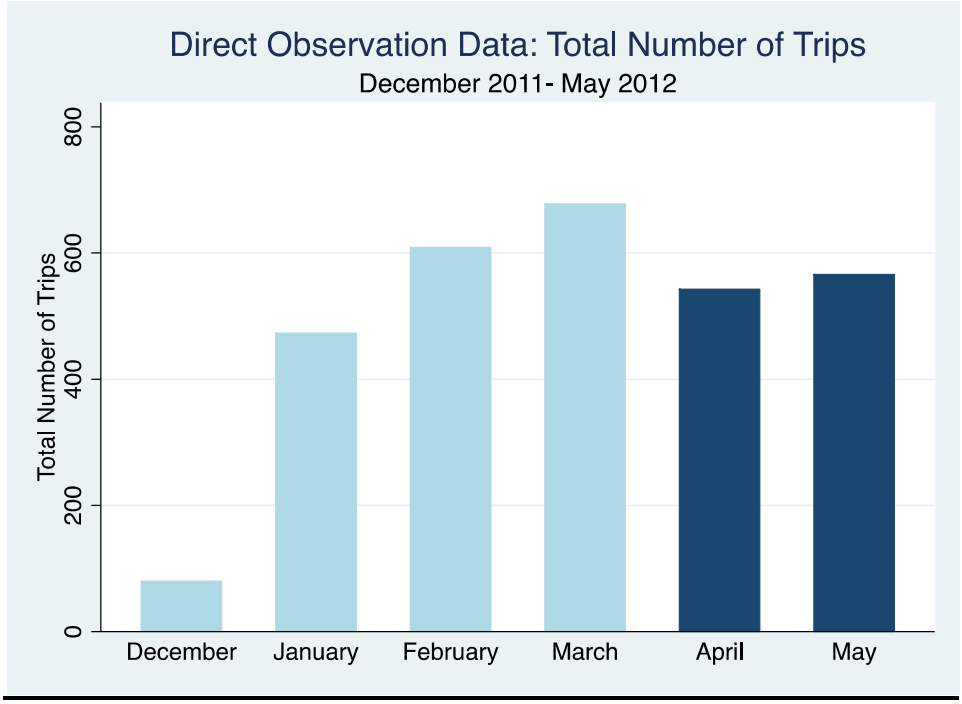
All of this information is collected and saved on the GPS device. The device allows us to primarily locate where we are on earth using triangulation with a number of geo-stationary satellites. However, because this device can locate one's position at any one point, it means that we can trace out the movement of someone with this device and can measure a variety of attributes such as their speed, direction, elevation, etc.

Enumerators' reimbursement was raised to reflect increases in the cost of living since Phase I, and the additional responsibility of conducting survey and receive a daily flat rate 700Khs; a per diem for those outside of Nairobi (600Khs for accommodations, and 400 Khs for food). The lead field coordinator received a daily flat rate of 1350Khs per day, and the field coordinator in Meru received an additional 150Khs.

During the period from January to May 2012 we received the following data from the enumerators regarding maximum speeds, distance traveled and number of trips.

Figure 4 below shows the number of trips taken starting in late December 2011 to end of May 2012. As the figure shows, an average of about 574 trips were conducted in the six months of phase II, with a range of 473 in January to 678 in March.

Figure 4. Direct Observations Data: Sum of Trips Traveled by Month



Enumerators collected three different types of information during these trips: maximum and average speed achieved during the trip and the total distance covered. Figure 5 below shows the distribution of maximum speeds achieved by month. Median maximum speeds range from about 90 km/hr in December and January to just over 100 km/hr in February and March.

Figure 5. Direct Observations Data: Average Maximum Speeds Recorded by Month

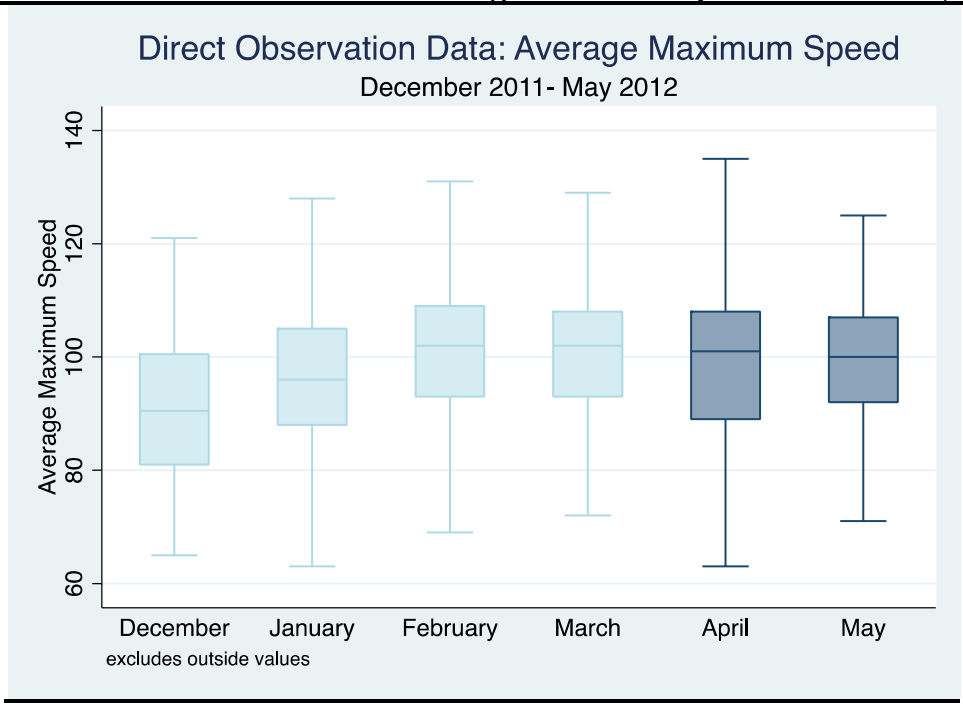


Table 7 below shows summary statistics for the distance covered by enumerators for Phase II trips. The average distance covered in one trip is about 83.35 km. As the table shows, there was considerable variation across trips with some trips being less than 10 km and others being more than 200 km. There is very little variation across the months of January through May.

Table 7. Direct Observations Data: Average Distance Per Trip by Month

Month	Average Distance	Standard Deviation	Frequency
December	41.05	28.87	80
January	79.32	57.87	609
February	82.14	55.48	473
March	82.47	56.96	458
April	90.60	61.11	543
May	84.05	58.23	566
Total	83.35	57.81	2949

APPENDIX A
MEDIA SPOTS SCHEDULE 2012:

MUUGA FM		
Date	**Time**	
	Morning	**Afternoon/Evening**
01-January	06:46, 11:22	16:23, 20:13
02-January	07:42, 12:24	17:21, 21:33
03-January	06:32, 11:21	16:56, 22:13
04-January	08:32, 10:34	18:28, 22:45
05-January	06:49, 12:27	16:26, 20:18
06-January	07:41, 12:26	17:22, 21:37
07-January	08:41, 10:22	18:24, 20:14
08-January	07:42	17:21
23-January	06:56, 11:33	16:33, 20:09
24-January	07:42, 12:36	19:12, 22:07
25-January	06:35, 11:31	17:16, 21:43
26-January	08:32, 10:14	18:38, 22:25
27-January	09:33, 12:21	16:44, 20:13
28-January	07:47, 12:37	17:11, 21:53
29-January	07:47	19:51
13-February	07:43, 12:09	17:33, 21:23
14-February	06:22, 11:14	16:43, 20:34
15-February	07:34, 10:31	18:41, 23:13
16-February	08:38, 12:31	16:28, 20:15
17-February	06:51, 12:47	17:35, 21:38
18-February	09:41, 10:36	18:12, 23:37
19-February	08:18	16:11
05-March	06:46, 11:22	16:23, 20:13
06-March	07:42, 12:24	17:21, 21:33
07-March	06:32, 11:21	16:56, 22:13
08-March	08:32, 10:34	18:28, 22:45
09-March	06:49, 12:26	16:26, 20:18
10-March	07:41, 12:26	17:22, 21:37
11-March	07:42	19:21
26-March	06:56, 11:33	16:33, 20:09
27-March	07:42, 12:36	19:12, 22:07
28-March	06:35, 11:31	17:16, 21:43
30-March	09:33, 12:21	16:44, 20:13
31-March	07:47, 12:37	17:11, 21:53
01-April	07:47	17:51

INOORO FM		
Date	**Time**	
	Morning	**Afternoon/Evening**
01-January	07:22	16:23
02-January	07:21	18:25
03-January	07:25	17:44
04-January	07:29	18:19
05-January	07:28	--
06-January	07:11	17:10
07-January	07:09	18:42
08-January	08:29	16:41
23-January	06:46	16:23
24-January	08:16	17:46
25-January	09:37	16:48
27-January	07:27	18:38
28-January	09:16	19:09
29-January	06:18	19:46
13-February	08:28	16:24
15-February	07:21	18:15
17-February	09:25	17:42
18-February	07:29	18:19
19-February	06:41	19:13
01-March	09:16	19:09
05-March	07:22	16:23
07-March	07:21	18:25
09-March	07:25	17:44
10-March	07:29	18:19
11-March	07:09	18:42
26-March	06:46	16:23
28-March	08:16	17:46
30-March	09:37	16:48
31-March	07:27	18:38

Consumer Action and Matatu Road Safety
USAID: Milestone #4- Interim Report on Research Activities

This milestone report covers preliminary results from the media surveys conducted during the period February through May 2012, the completion of sticker distribution, lottery outcomes and administrative data collected through September 2012. Part I describes the survey results on the reach, recall and salience of the radio messages. Part II examines key attributes of the driver and passengers surveyed associated with awareness of the media campaign. Part III describes the data collection activities conducted to obtain all claims from the insurance companies during (and before) the study period. Finally, Part IV provides the results of the last set of Zusha lotteries.

PART I: MEDIA SURVEY: REACH, RECALL, AND SALIENCE

The road safety radio campaign started in January 2012 and continued in intervals through March 2012. In order to assess the reach, recall and salience of the broadcast radio campaign that ran between January and March 2012, a survey was fielded at the beginning of February 2012. As we described in Milestone 3, the radio spots aired on two Royal Media stations: Inooro and Muuga FM. The schedule of these *Zusha* radio spots for both radio stations is also detailed in the Milestone 3 report.

The duration of each radio ad campaign is one week and the campaigns occur every two weeks in order to generate variation over time to enable estimation of the impact of the broadcasts. The ads were aired in two local languages Kikuyu and Meru. While limited in national coverage, the two stations cover communities that intensively use matatus both for inter- and intra-city travel. Like the stickers, the radio ads were specifically targeted to passengers encouraging them to speak up before it is too late.

To maximize the informativeness of the survey, we restricted the sample of respondents to passengers or potential passengers. The benefit of this sampling strategy over a random sample of households is that we minimize the share of non-matatu users in the sample, enabling a more precise evaluation of the radio campaign. In addition, our sampling of potential passengers was concentrated in areas where Kikuyu and Meru are the predominant languages spoken. Enumerators were instructed only to survey potential passengers that had not boarded a matatu but were around the matatu stage at designated sampling points. Sampling points were chosen as the start and end-points of a common set of inter-city trips between Nairobi and the Mount Kenya area. Each enumerator surveyed a total of 8 potential passengers per day—4 when they reached their destination and 4 when they returned to their starting point.

The Zusha media campaign survey collected information from 9,859 respondents.[1] It was designed to measure message penetration and comprehension by those exposed to the messages. Passengers were asked questions regarding their favorite radio stations, listening times and specific questions relating to the Zusha radio campaign spots and their interpretations of the spots. Additional background information on passengers was collected, including frequency of matatu use, occupation, and primary language spoken at home, gender and age, providing a rich description of the target population.

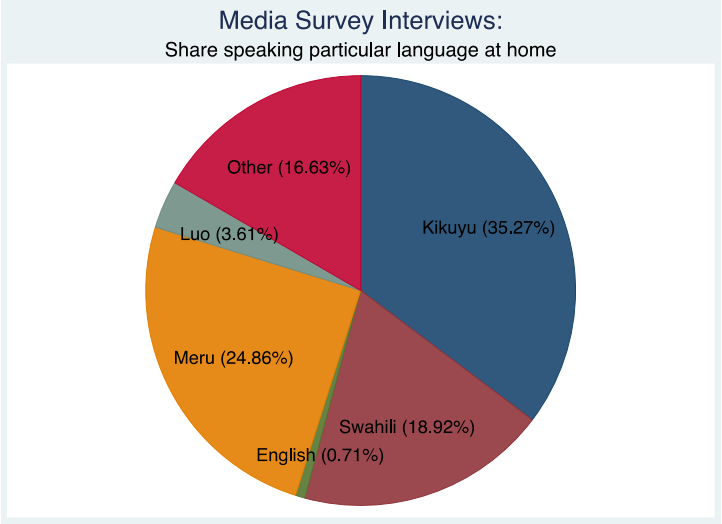
Almost 70% of respondents are male. This disproportionate share of males in the sample is consistent with other passenger populations that we have observed in previous work (see Habyarimana and Jack 2011). Nearly 80% of the respondents were between the ages of 21 and 40, with 43% between the ages of 21 and 30, and 37% 31 to 40. Tables 1, and Figures 1 and 2 below, provide summary statistics for the sample of survey respondents.

Table 1. Media Survey Interviews: Gender and Age

Gender	**Frequency**	**Percent**
Male	6,731	68.4
Female	3,115	31.6
Age Group		
20 and below	438	4.4
21-30	4,200	42.7
31-40	3,642	37.0
41-50	1,279	13.0
51 and above	287	2.9
Age Group		
Young (<= 32)	5,389	54.7
Old (>32)	4,457	45.3
Total	9,486	100.0

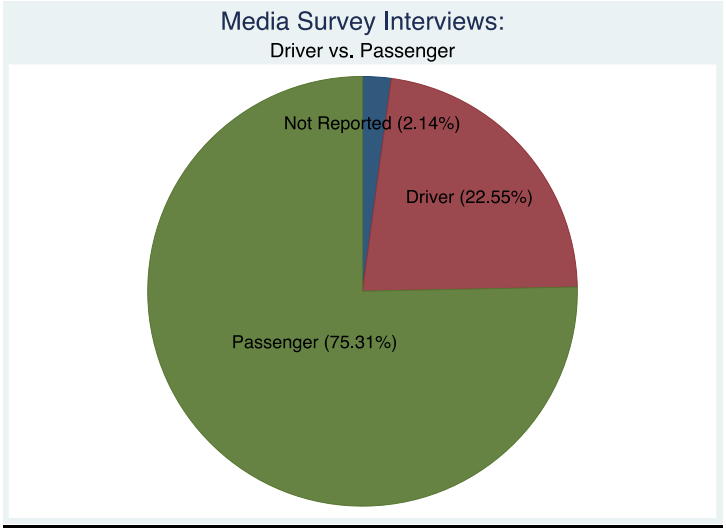
[1] This is a correction from Milestone 3 Report where we reported 9,807respondents.

Figure 1. Media Survey Interviews: Share speaking particular language at home



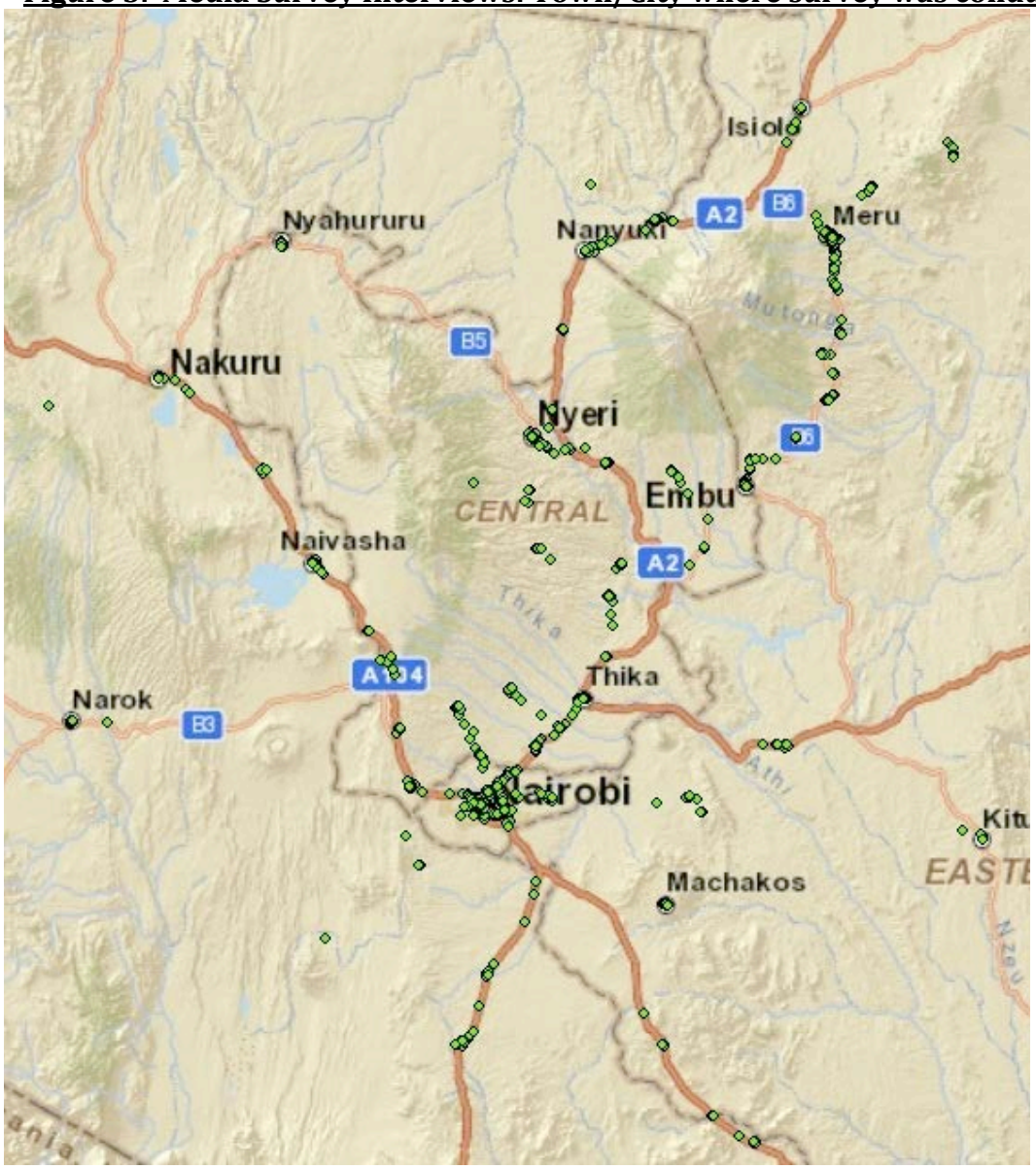
A majority of our respondents are under the age of 32 with the nearly 80% of respondents clustered in the 21-30 and 31-40 age groups. As figure 1 above shows, approximately 60% of respondents speak Kikuyu or Meru as their primary language. A further 19% list Swahili as their primary language. In order to evaluate the potential impact of the media survey on drivers of vehicles, we included drivers in the sample of respondents. As figure 2 below shows, nearly one out of every four respondents was a driver.

Figure 2. Media Survey Interviews: Driver vs. Passenger



Sampling points were chosen both to maximize the number of matatu users as well exposure to the radio campaign. Figure 3 below portrays the distribution of interviews by location. Approximately one-third of the interviews were conducted in Nairobi, and one-fifth were conducted in Meru. Appendix B provides detailed a detailed breakdown across all interview cities.

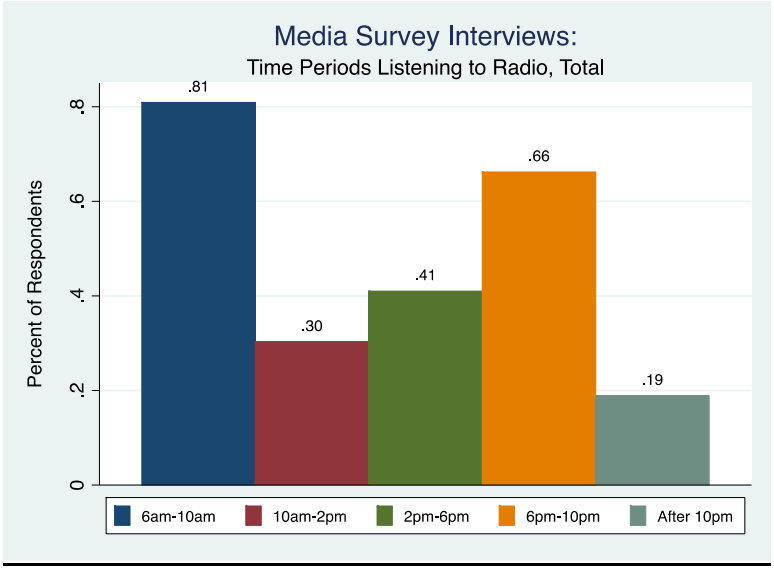
Figure 3. Media Survey Interviews: Town/City where survey was conducted



We asked respondents to indicate what times of the day they listened to the radio. Figure 4 below shows the fraction of respondents indicating the time of day during which they listened to a radio. The peak hours of radio listening are between 6am and 10am, with 81% of respondents reporting listening during this period. This was followed by the period 6pm to 10pm, when 66% of respondents reported listening.

This suggests that primary listening periods occur during respondents' morning and evening commutes.

Figure 4. Media Survey Interviews: Time Periods Listening to the Radio, Total

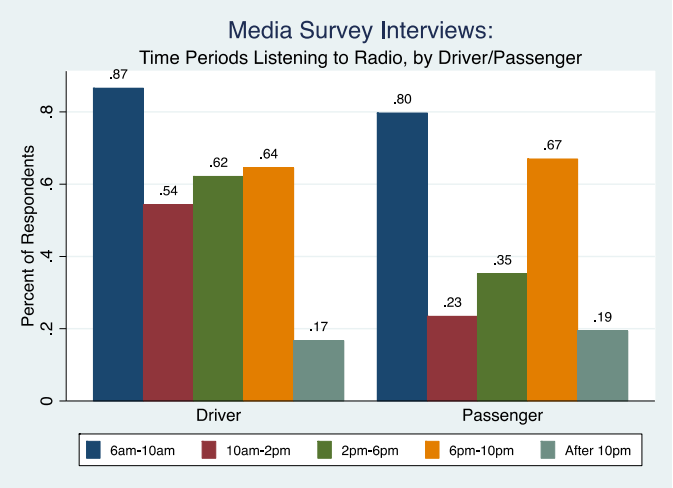


As Table 2 below shows, we don't find any significant differences in listening patterns across two key demographic characteristics: age and gender. While older listeners prefer the early morning shift and males prefer the day-time slots, the differences in listenership are small.

Table 2. Media Survey Interviews: Time Periods Listening to the Radio, by Gender and Age Group

Time Period	Percent of Males	Percent of Females	Percent of Young (<=32)	Percent of Old (>32
6am-10am	80.8	81.3	78.2	84.2
10am-2pm	32.7	25.1	26.7	34.6
2pm-6pm	43.5	35.7	38.0	44.7
6pm- 10pm	67.7	62.8	64.0	68.8
After 10pm	18.9	19.0	21.3	16.1

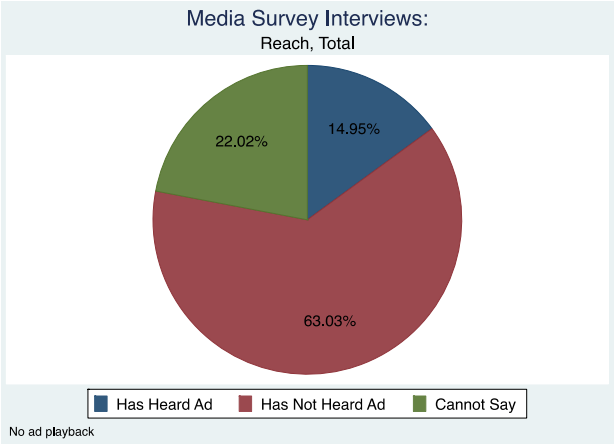
Figure 5. Media Survey Interviews: Time PeriodsListening to the Radio, by Driver/Passenger



We observe a significant difference in the time of day when comparing matatu drivers and passengers. From 10am to 2pm and 2pm to 6pm 54% and 62% of drivers, respectively, reported listening to the radio. Respectively, during these same periods, 23% and 35% of passengers reported listening to the radio. This difference is not surprising since drivers spend the midday hours in their matatus.

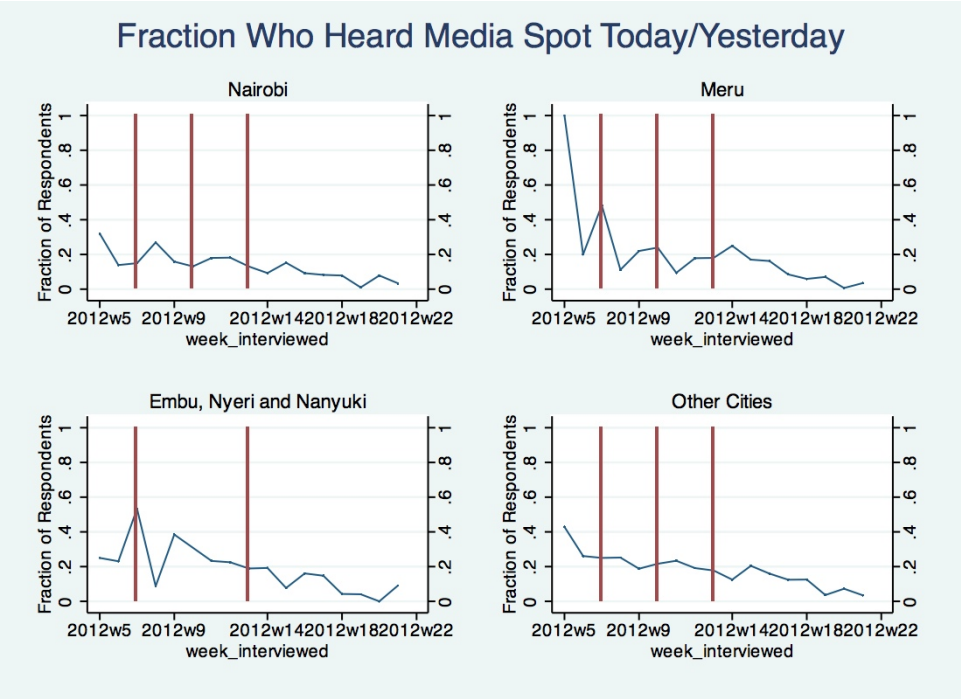
We now turn to an examination of awareness of the radio spots aimed at encouraging passengers to monitor and sanction matatu drivers. Respondents were asked whether or not they had heard the radio ad in two different ways. First, respondents were asked whether they had ever heard the radio ad by name, without hearing the radio ad played back. Approximately 15% of respondents said "yes," 63% said "no," and 22% said they "did not know." Figure 6 portrays the distribution of responses for the entire sample. We do not observe any notable differences in radio reach across age, gender, and drive-status.

Figure 6. Media Survey Interviews: Reach, Total



Over the period of the media survey interview, there was a downward trend in the fraction of respondents who recalled hearing the radio ad. This is consistent with the fact that the radio campaign aired during the early part of the media survey, but not in the latter half. Specifically, the radio spots were aired in weeks 1, 4, 7, 10, and 13 of the 2012. Figure 7 below shows the fraction of respondents who affirmatively responded to the question of whether or not they had heard the radio ad, across four main geographical areas.

Figure 7. Media Survey Interviews: Fraction of Respondents that heard Zusha Radio Ad, by week aired



The figure above above shows the penetration of the radio campaign over 18 weeks starting in the first week of February in four distinct media survey locations. We divide the sample into Nairobi, where the media market is very dense, Meru and Embu/Nyeri/Nanyuki where our two radio stations have a relatively higher share of the listening audience and other cities enroute to the Mount Kenya loop. As the figure shows, there is considerable heterogeneity in the penetration of the message across space and time. Consistent with message fatigue, all the four geographic areas show a downward trend in penetration over time. Encouragingly, in the areas where these two radio stations had the largest market share, message awareness is very high in the first month of the media campaign, averaging about 60% in Meru at the beginning of the survey in week 6 of 2012. The figure also shows the extent to which message awareness is a function of whether the message is currently playing: the two spikes in the Meru and Nyeri/Embu/Nanyuki areas following the

resumption of the radio campaign in week 7 is suggestive that the optimal intensity of these kinds of campaigns is of higher frequency than this radio campaign.

Figure 8. Media Survey Interviews: Reach, by Radio Station

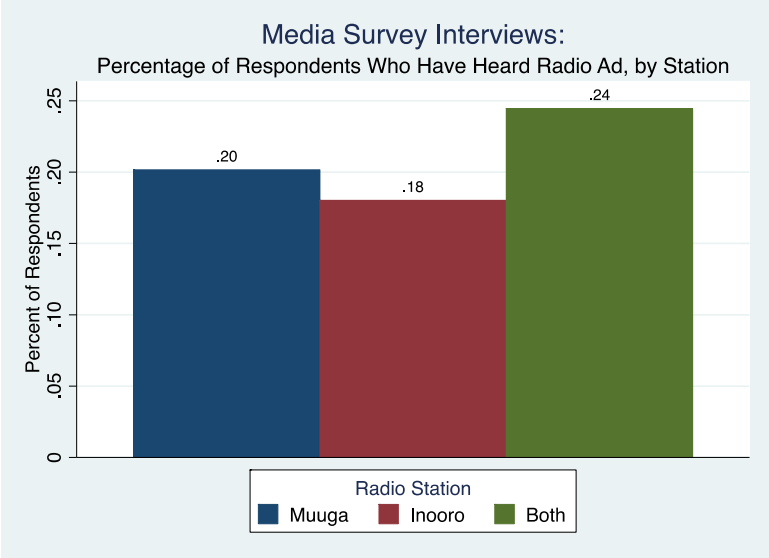
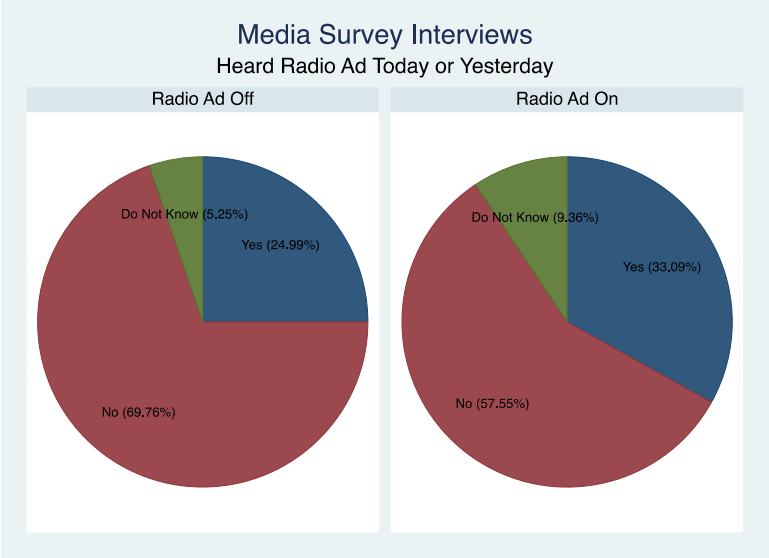


Figure 8 above shows a very similar degree of message awareness across respondents who reported listening to either radio station. Respondents who listened to both radio stations are about 5 percentage points more likely to report awareness of the radio ads.

After answering the question without radio ad playback, enumerators then replayed the ad for respondents using the playback function on the cell phones that they were carrying. Since there were two ads airing on two different stations, we randomly assigned which radio spot would be heard by enumerator and alternated the ad carried by a particular enumerator from week to week. Respondents were then asked whether or not they had heard the ad today or yesterday. A higher share of respondents recall hearing the ad on playback. Approximately 27% of the respondents answered "yes," compared to 67% who answered "no," and 6% who were still uncertain as to whether they had heard the ad. Responses varied depending on whether or not the radio ad was being aired during the week of the media survey interview. On weeks when the radio campaign was airing, a greater percentage of respondents said they had heard the ad, 33% versus 25% in "off" weeks. Figure 9 shows the distribution of responses to this question.

Figure 9. Media Survey Interviews: Reach Today/Yesterday, by Radio On/Off



Finally, respondents were then asked whether they had ever heard the particular radio ad that had just been played back to them. Approximately 65% of respondents reported "yes" and 35% reported no. As in Figure 9 above, responses varied based on whether or not the interview occurred during a week when the radio campaign was airing. When it was airing, approximately 69% of respondents said "yes," versus 65% in off weeks. Responses to this question varied across age, gender and driver-status. Approximately 67% of males responded "yes" to ever hearing the radio ad, versus 60% of females. Nearly 73% of old respondents (those over the median age of 32) responded "yes", versus 58% of young passengers. Between drivers and passengers, 82% of drivers responded "yes," versus 61% of passengers. Figure 10 and Tables 3 and 4, show the distribution of responses to whether or not passengers had ever heard the radio ad.

Table 3. Media Survey Interviews: Reach, Total

	Radio Ad On		Radio Ad Off	
Response	**Number of Respondents**	**Percent of Respondents**	**Number of Respondents**	**Percent of Respondents**
Ever Heard Ad	1,290	68.62	5,097	63.88
Never Heard Ad	590	31.38	2,882	36.12

Figure 10. Media Survey Interviews: Reach, Total by Radio Ad On/Off

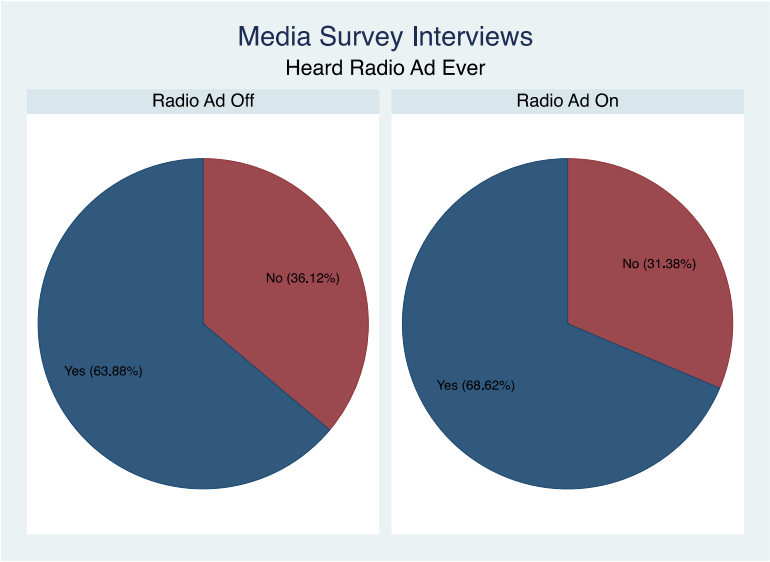


Table 4. Media Survey Interviews: Reach, by Gender

Demographic Category	Percent Ever Had the Radio Spot
Males	67.8
Females	59.5
Young	57.7
Old	73.5
Drivers	81.8
Passengers	61.6

Respondents were then asked to recall the subject of the Zusha radio ads. Approximately 84% of all respondents answered that the radio ad was about road safety, and 16% reported a different subject. There was little if any difference across gender. Approximately 89% of old respondents said that the radio ad was about road safety, versus 79% of young respondents. Of drivers, 94% said the radio ad was about road safety, versus 83% of passengers. Figure 11 and Table 5, show the distribution of responses regarding message recall.

Respondents were then asked if they thought that the radio spot they had just heard is effective. Nearly 70% responded that the ad was "effective" or "very effective." Across our demographic categories, nearly 74% of males said that the ad was "effective" or "very effective," versus 65% of women. Among old respondents, nearly 79% said that the ad was "effective" or "very effective," versus 64% of young respondents. Among drivers, 90% said that the ad was "effective" or "very effective,"

versus 67% of passengers. Figure 11 portrays the distribution of responses for the entire sample. Table 5 shows responses by respondents' characteristic.

Figure 11. Media Survey Interviews: Effectiveness of Radio Spot

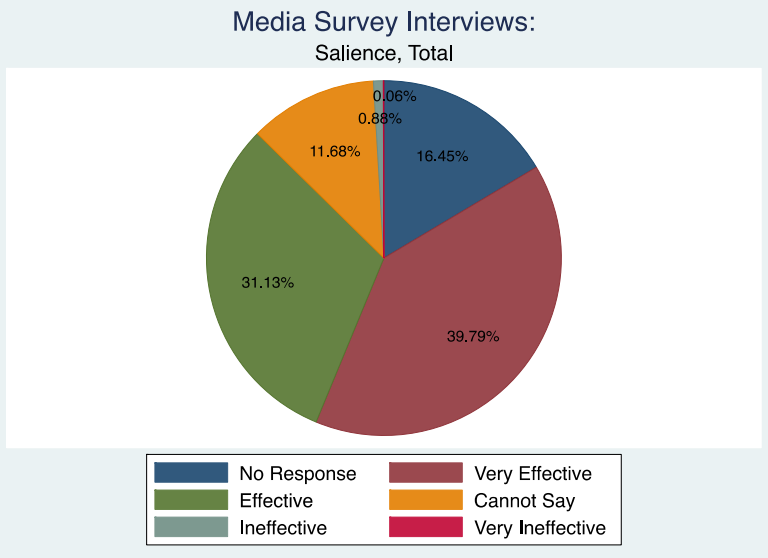


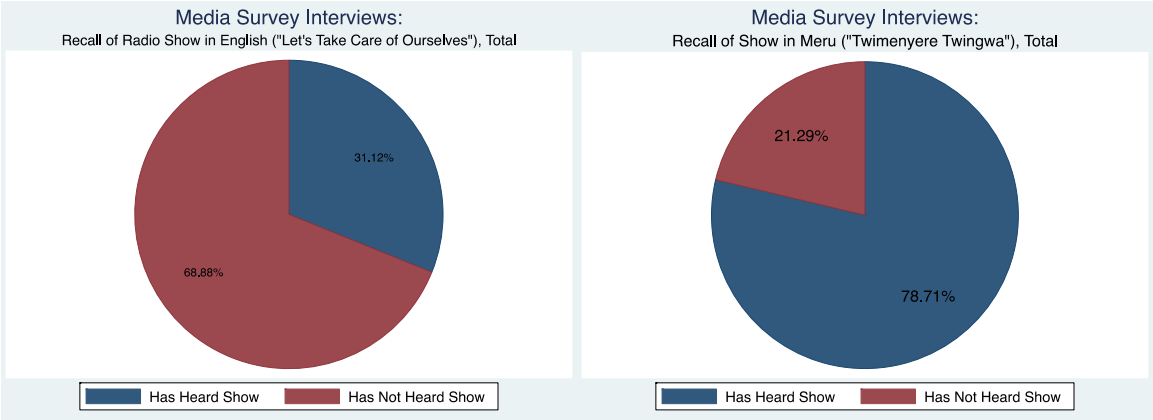
Table 5. Media Survey Interviews: Salience

	Percent Indicating Level of Effectiveness of Radio Ad					
Percent of Group	**Very Effective**	**Effective**	**Cannot Say**	**Ineffective**	**Very Ineffective**	**No Response**
Male	43.75	29.98	9.51	0.92	0.09	15.75
Female	31.24	33.61	16.44	0.80	0	17.91
Young	31.62	32.79	13.66	1.11	0.06	20.76
Old	49.67	29.12	9.33	0.61	0.07	11.20
Driver	60.55	29.28	3.60	0.81	0.04	5.71
Passenger	34.71	32.57	14.44	0.93	0.07	17.29

In April 2012, we were made aware of a road-safety radio program airing on Muuga radio station. This was an initiative independently established by our media partner, Royal Media, to discuss road safety issues in a talk-show format suited to the audience. In order to account for this impact this radio show may have on road safety outcomes, starting in week 15 (the week of April 10, 2012), enumerators began asking respondents questions about this particular radio program. Respondents were asked whether or not they had heard the program both using its English title ("Let's Take Care of Ourselves") and in Kimeru ("Twimenyere Twinga"). When the title was presented in English, approximately 31% of respondents reported hearing the program, versus nearly 69% in Meru. Figure 12 portrays this

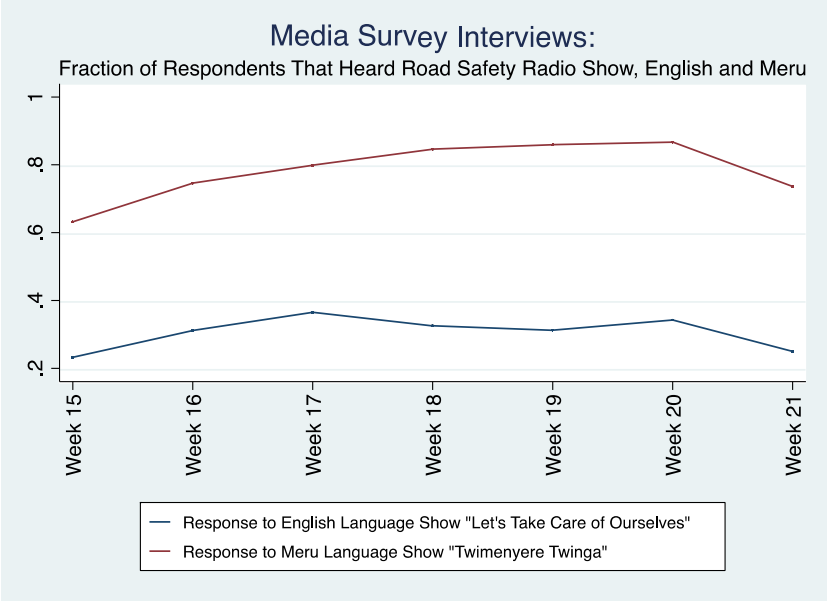
distribution. The figure shows the fraction of respondents who reported hearing the program starting in week 15 through the end of the program.

Figure 12. Media Survey Interviews: Recall of Radio Program (English), Total



Over time, the fraction of respondents aware of this program increased and remained high throughout the survey period through the end of May. We are still collecting details about the specific road safety strategies discussed in this program. However, since this program was only aired on one station, we are in a position to determine whether it had any complementary effects on accident claims.

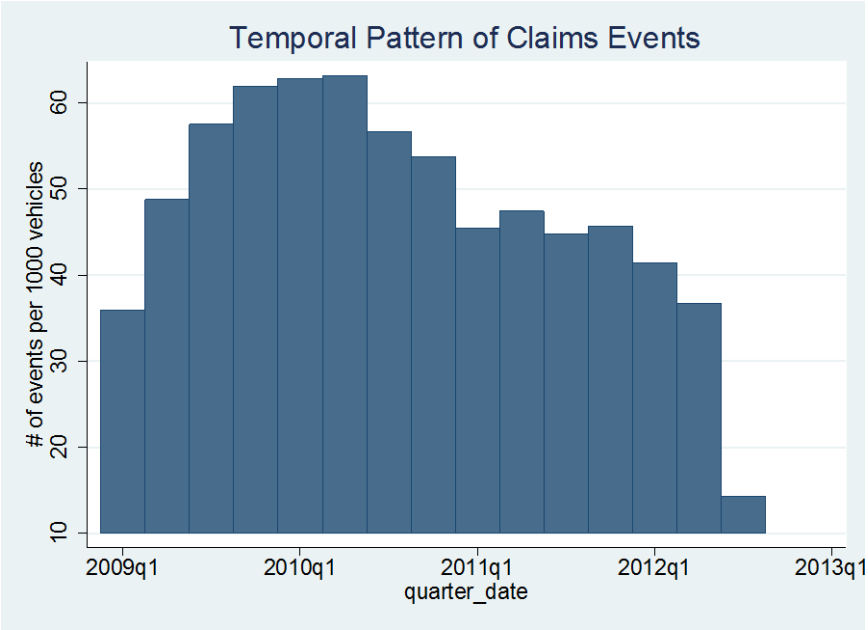
Figure 13. Media Survey Interviews: Fraction of Respondents that heard Radio Show



PART II: INSURANCE CLAIMS

Our primary outcome data for this evaluation comes from the administrative data collected by Directline Assurance. When an insured vehicle submits a claim, the date of the incident, the identity of the vehicle involved, the number of fatalities/injuries and approximate claim costs are recorded. Below we present a summary of the data collected between January 2009 and September 2012. In particular we show the number of incidents per 1000 vehicles by calendar quarter.

Figure 14: Administrative Data on Insurance Claims



As Figure 14 above shows, claims per 1000 vehicles range from a low of just over 35 to a high of 63. The figure also shows that claims rates have fallen from an average level of 51 and 59 in 2010 and 2011 respectively to just over 45 in 2011. Data for 2012 is incomplete, since administrative data goes up to the beginning of September and claims reporting has a lag of up to six months.[2]

PART III: DIRECT OBSERVATION

DIRECT OBSERVATION DATA:

Direct Observation data for Phase II was collected between December 2011 and May 2012. No new direct observation data has been collected since the submission of the

[2] In the next report, we hope to present a more complete picture using claims data running through the first couple of months of 2013.

previous report (Milestone 3). The following summarizes what we previously reported:

- An average of 574 trips were conducted per month in Phase II, with a range of 473 in January to 678 in March.
- Maximum speeds ranged from about 90 km/hr in December and January to just over 100km/her in February and March.
- The average distance covered in one trip was about 83.35 km, with considerable variation across trips with some trips being less than 10 km and others being more than 200km.

PART IV: ZUSHA LOTTERY

The lottery continued to provide incentives for three key participants in this study —the insurance agent, the matatu owner, and the driver—to ensure the placement and retention of the road safety stickers in the vehicles. Only vehicles receiving stickers in phase II were eligible for the draws.

During this phase of the lottery, May through August 2012, ten registered *matatus* that received stickers in phase II were drawn each week and inspected. As before, if inspections revealed that a *matatu* retained all four stickers, three prizes of Kshs. 5,000 each were awarded; one to the driver, one to the owner, and one to the insurance agent. Overall, during this period only 10.77% of the *matatus* that were drawn fulfilled the draw requirements. Table 6 shows the results from the lottery during this period.

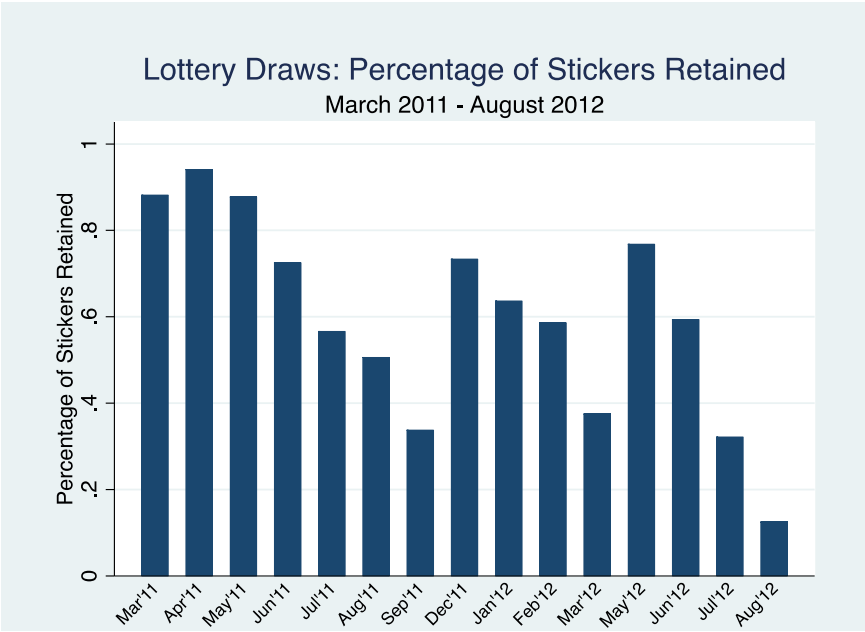
Table 6. Lottery Draws- Phase II (May to August 2012)[3]

Week	No. of Draws	No. of Winners	No. of Inspected Vehicles	Share of Winners from Draws
1	10	3	4	30
2	10	2	5	20
3	10	1	5	10
4	10	1	2	10
5	10	1	3	10
6	10	2	7	20
7	10	2	4	20
8	10	1	3	10
9	10	1	1	10
10	10	0	2	0
11	10	0	1	0
12	10	0	0	0
13	10	0	4	0
Total	130	14	41	10.77

[3] Note: Table 6 in Milestone 3 was incorrectly labeled as April to June 2012, it should have been labeled as December 2011 to March 2012.

A closer examination shows that the low winning rates were driven by very low 'find' rates. Of the 10 drawn winners, the number of vehicles inspected ranged from 0 to 7, with a median of 4 vehicles inspected. Even then, using the median number of vehicles with all four stickers as a share of the median number of inspected vehicles, only one in four vehicles have all four stickers.

Figure 15. Lottery Draws- Phase II (December to August 2012)



A more accurate measure of sticker retention is to report the share of all stickers found in vehicles inspected as a fraction of all stickers (assuming perfect retention). This is shown in figure 15 above. The figure shows three periods starting from March – September 2011, December 2011- March 2012 and May 2012 – August 2012. In each of these periods, sticker retention is falling at a fairly uniform rate. Sticker retention is higher in phase I of the study, starting from a high of about 90% in April 2011 to a low of about 34% in September 2011. In phase II, sticker retention starts off a little above 70% in December 2011 and May 2012 and falls to a low of just over 10% in August 2012. However, as Table 6 above shows, this lower rate of retention could be driven by less effort exerted in inspected all winning vehicles. That verification effort is lower is plausible given that assessors were doing this on top of their regular jobs.

APPENDIX A:

STICKER DISTRIBUTION

Sticker distribution was not complete as of the submission of the previous report. Sticker distribution finished on August 6, 2012. As discussed in the milestone 3 report, the primary reason that sticker distribution was slower than anticipated was that there was considerable churning in the client base. While the pattern of churning is not fully clear, about one quarter of vehicles recruited in phase I obtained their cover from a different insurance company. The total number of vehicles purchasing insurance from Directline has remained the same across the two phases, suggesting that an equal number of new clients have started purchasing insurance from our partner.

As we reported in milestones #2 and #3, Direct Line insurance agents distribute a new set of stickers at the time monthly policies are purchased. In order to keep the analysis of the impact of the stickers simple, we maintained Phase I assignments. This means that a vehicle that was assigned to the control, placebo or any of the eight sticker groups in phase I, stayed in that group for phase II. During phase II, December 2011 through August 2012 9,944 vehicles received stickers and 3,384 vehicles were designated to the control group, reaching a total of 13,328 vehicles.[4] Stickers were distributed from eight Direct Line branches in Embu, Hazine Towers, Kerugoya, Meru, Nakuru, Nyeri, Thika, and Tom Mboya. Table 7 and Figure 16 show the distribution of stickers across locations.

Table 7. Phase II Sticker Distribution by Location

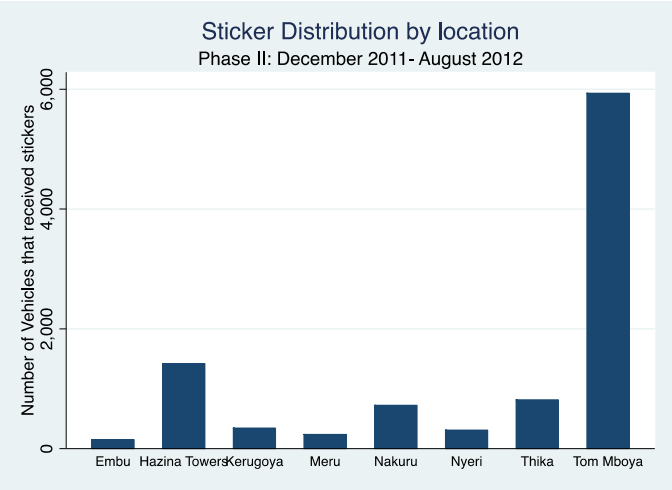
Region	Number of Vehicles that Received Stickers	Percentage
Embu	152	1.53
Nairobi- Hazina Towers	1,419	14.27
Kerugoya	346	3.48
Meru	239	2.40
Nakuru	725	7.29
Nyeri	310	3.12
Thika	818	8.23
Nairobi- Tom Mboya	5,935	59.69
Total	9,944	100.00

Nearly three out of every four returning phase I vehicles obtained their cover from Nairobi during the recruitment period, from the Tom-Mboya and Hazina Towers Direct Line branches. Nearly 60% of vehicles bought their cover in the main Nairobi branch of Tom-Mboya. This distribution of vehicles across Direct Line's branches is

[4] About 20% of vehicles recruited in phase I have since switched cover providers. This attrition is consistent with the level of churning observed in the industry, where there is no price differentiation in the cost of third party cover.

consistent with the distribution in Phase I and suggests uniform attrition due to switching insurance cover provider.

Figure 16. Phase II Sticker Distribution by Location



The distribution of control vehicles across branches is also consistent with the cross-branch composition for phase I. As previously reported in Milestone 3, a large share of control vehicles were recruited from Nairobi and Nakuru, two of the largest Direct Line markets that are participating in this study. As we reported in milestone 1, 2 & 3 reports, the disproportionately large share of control vehicles recruited in Nakuru, reflects faulty software discovered after the Nairobi recruitment had been complete.

Stickers were distributed each month during Phase II, with the majority of vehicles receiving stickers in the first two months. Table 8 and Figure 17 shows the distribution of stickers across months. Unlike phase I, where recruitment was carefully staggered to minimize disruption to regular commercial operations, recruitment in phase II was rolled out to all branches a few days after opening in Nairobi. As such, the overall recruitment process of all returning phase I vehicles was completed much faster in phase II than in phase I.

Table 8. Phase II Sticker Distribution by Month, December 2011- August 2012

Month	Number of Vehicles that Received Stickers	Percentage
December	4,248	42.72
January	2,912	29.28
February	582	5.85
March	227	2.28
April	105	1.06
May	305	3.07
June	846	8.23
July	709	7.13
August	10	0.10
Total	9,944	100.00

Figure 17. Phase II Sticker Distribution by Month, December 2011- August 2012

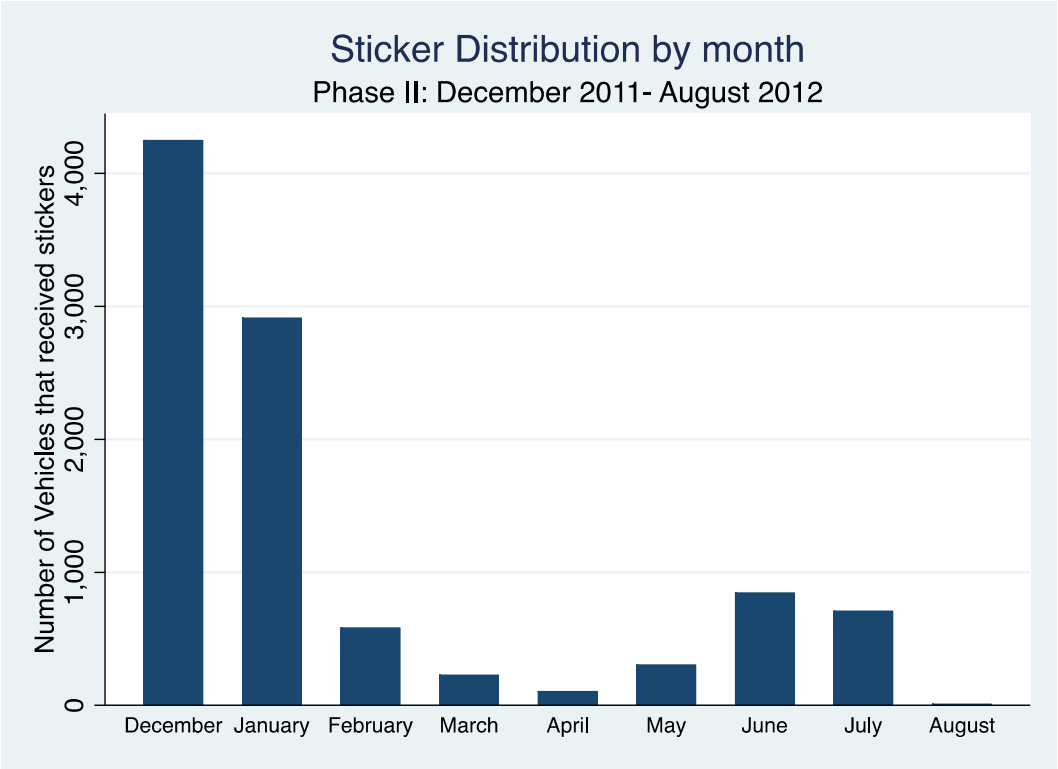


Table 9. Phase II Control Group Distribution by Month[5]

Month	No. of Control Group Vehicles	Percentage
December	896	26.48
January	663	19.59
February	37	1.09
March	36	1.06
April	34	1.00
May	316	316
June	739	21.84
July	663	19.59
Total	3,384	100.0

Table 10. Phase II Sticker Distribution by Treatment Group

Treatment	No. of Stickers Receiving Stickers	Percentage
(0) Control	3,384	25.39
(1) Placebo	2,058	15.44
(2) Accident- Individual	945	7.09
(3) Accident- Group	963	7.23
(4) Text- Individual	1,040	7.80
(5) Text- Group	965	7.24
(6) Injury-Individual	974	7.31
(7) Injury-Group	1,053	7.90
(8) Protest- Individual	888	6.66
(9) Protest-Group	1,058	7.94
Total	13,328	100.00

[5] Numbers for the month of July have been added since Milestone 3.

APPENDIX B:

Table 20. Media Survey Interviews: Town/City where survey was conducted

Interview City	Frequency	Percent
Chuka	163	1.65
Embu	193	1.96
Gatundu	139	1.41
Githunguri	151	1.53
Isiolo	111	1.13
Kajiado	137	1.39
Kerugoya	140	1.42
Kiambu	150	1.52
Kikuyu	193	1.96
Matuu	103	1.04
Maua	129	1.31
Meru	2,153	21.84
Nairobi	3,375	34.23
Naivasha	115	1.17
Nakuru	110	1.12
Nanyuki	158	1.60
Nyeri	293	2.97
Thika	216	2.19
Timau	145	1.47
Other	1,685	17.09
Total	9,859	100.00

Consumer Action and Matatu Road Safety
Milestone #5- Report on Research Activities

This milestone report details the conclusion of all implementation and data collection activities. It summarizes all research activities conducted during Phase I and Phase II, running from March 2011 to August 2013. Part I describes the vehicle recruitment. Part II describes the data collection activities conducted to obtain all claims from the insurance companies during (and before) the study period. Part III summarizes passenger survey activities. Part IV provides information on the lottery drawings and outcomes. Part V describes data collection activities for direct observation trips.

PART I: VEHICLE RECRUITMENT

As outlined in the previous milestone reports, vehicle recruitment was done through the Direct Line insurance agency. Direct Line agents distributed stickers at the time that drivers purchased monthly policies. Sticker distribution occurred over two phases: phase I and phase II. During phase I, which ran from March 2011 through August 2011, a total of 9,644 treatment vehicles and 2,096 control vehicles were recruited, for a total of 11,740 vehicles. During phase II, which ran December 2011 through August 2012, 9,944 treatment vehicles and 2,030 control vehicles were recruited, reaching a total of 11,974. In all, a total of over 78,000 stickers were issued over the two phases.

As reported in previous milestones, in order to keep the analysis of the impact of the stickers simple, we maintained phase I assignments in phase II. This means that a vehicle that was assigned to the control, placebo or any of the eight treatment groups in phase I, stayed in that group for Phase II. As discussed in milestones #3 and #4, the sticker distribution was slower than anticipated during phase II, due primarily to considerable churning in the client base. Following a pattern that is common in this industry, about one quarter of vehicles recruited in phase I obtained coverage from a different insurance company over the recruitment period in phase II. The total number of vehicles purchasing insurance from Direct Line has remained the same across the two phases, suggesting that an equal number of new clients have started purchasing from our insurance partner.

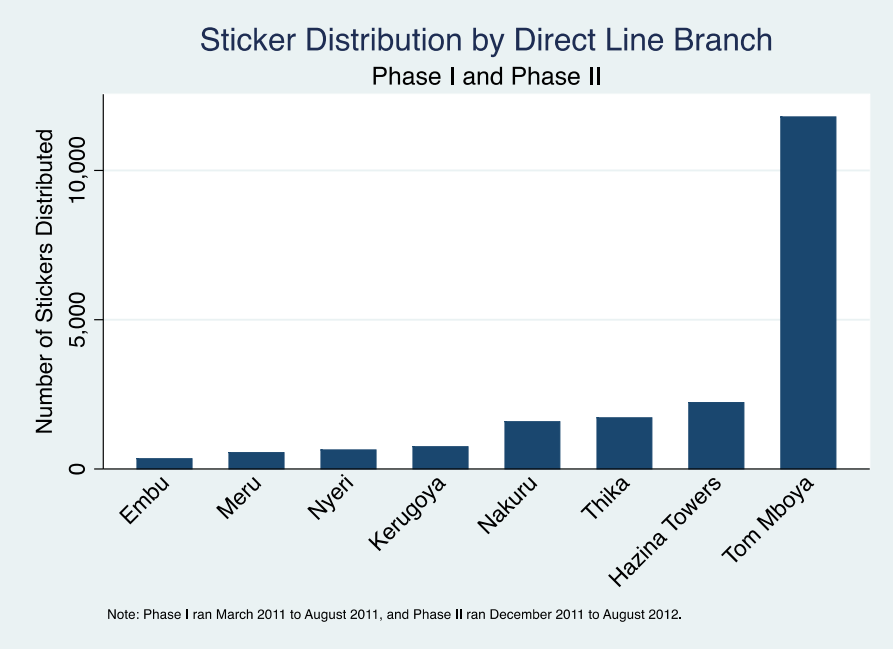
Stickers were distributed from eight Direct Line branches in Nairobi and Central Kenya. Specifically stickers were distributed from two Nairobi branches of Tom Mboya and Hazina towers and then from Embu, Kerugoya, Meru, Nakuru, Nyeri andThika. Table 1 and figure 1 show the distribution of stickers across locations. We have created a separate column for each phase, and a column for the entire duration.

Table 1. Sticker Distribution by Location

Region	Phase I: Number of Vehicles that Received Stickers	Phase II: Number of Vehicles that Received Stickers	Total: Number of Stickers Issued	Percentage
Embu	191	152	1,372	1.75
Hazina Towers	802	1,419	8,884	11.34
Kerugoya	401	346	2,988	3.81
Meru	307	239	2,184	2.79
Nakuru	858	725	6,332	8.08
Nyeri	327	311	2,552	3.26
Thika	900	817	6,868	8.77
Tom-Mboya	5,858	5,935	47,172	60.21
Total	9,644	9,944	78,352	100.0

More than two out of every three vehicles obtained their cover from Nairobi during the recruitment period, from the Hazina Towers and Tom-Mboya Direct Line Branches. Approximately 60% of vehicles bought their cover in the main Nairobi branch of Tom-Mboya. The distribution of vehicles across Direct Line's branches was consistent across phase I and phase II, suggesting uniform attrition due to switching insurance cover provider.

Figure 1. Sticker Distribution by Location



The distribution of control vehicles across branches was also consistent across phase I and phase II. As previously reported in milestones #3 an #4, a large share of control vehicles were recruited from Nairobi and Nakuru, two of the largest Direct

Line markets that are participating in this study. Table 2 shows the distribution of control vehicles across Direct Line branch. As reported in previous milestone reports, the disproportionately large share of control vehicles recruited in Nakuru reflects faulty software discovered after the Nairobi recruitment had been complete.

Table 2. Control Group Distribution by Location

Region	Phase I: Number of Vehicles that Received Stickers	Phase II: Number of Vehicles that Received Stickers	Total: Number of Vehicles that Received Stickers	Percentage
Embu	84	80	164	2.99
Hazina Towers	85	205	290	5.29
Kerugoya	119	105	224	4.09
Meru	96	74	170	3.10
Nakuru	603	496	1,099	20.05
Nyeri	154	141	295	5.38
Thika	301	253	554	10.11
Tom-Mboya	654	2,030	2,684	48.98
Total	2,096	3,384	5,480	100.0

Stickers were distributed each month during phases I and II, with the majority of vehicles receiving stickers in the first two months of each phase. Table 3 and Figure 2 show the distribution of stickers across months for both phases. As reported in milestone #4, unlike phase I, where recruitment was staggered to minimize disruption to regular commercial operations, recruitment in phase II was rolled out in all branches a few days after opening in Nairobi. As such, there are no timing differences in access to phase II stickers across branches. However, the overall recruitment process proceeded at about the same pace as in phase I.

Table 3. Sticker Distribution by Month

Month & Year	Number of Vehicles that Received Stickers	Percentage
Phase I		
March 2011	4,624	23.61
April 2011	2,380	12.15
May 2011	1,602	8.18
June 2011	518	2.64
July 2011	461	2.35
August 2011	59	0.30
Total Phase I	9,644	49.23
Phase II		
December 2011	4,248	21.69
January 2012	2,912	14.87
February 2012	582	2.97

March 2012	227	1.16
April 2012	105	0.54
May 2012	305	1.56
June 2012	846	4.32
July 2012	709	3.62
August 2012	10	0.05
Total Phase II	9,944	50.77
Total All Phases	19,588	100.00

Figure 2. Sticker Distribution by Month

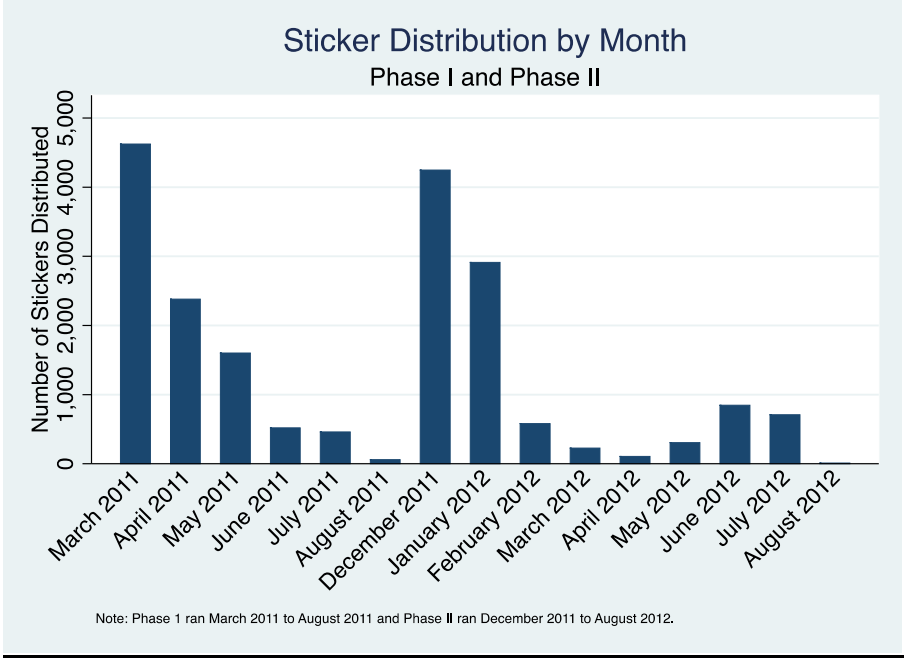


Table 4. Control Group Distribution by Month

Month & Year	Number of Vehicles that Received Stickers	Percentage
Phase I		
March 2011	109	1.99
April 2011	593	10.82
May 2011	858	15.66
June 2011	200	3.65
July 2011	304	5.55
August 2011	32	0.58
Total Phase I	2,096	38.25
Phase II		
December 2011	896	16.35
January 2012	663	12.10
February 2012	37	0.68
March 2012	36	0.66

April 2012	34	0.62
May 2012	316	5.77
June 2012	739	13.49
July 2012	663	12.10
Total Phase II	3,384	61.75
Total All Phases	5,480	100.0

The distribution of vehicles across treatment groups was consistent across phase I and phase II. Table 5 shows the distribution of vehicles across treatment type. Approximately 20% of vehicles were assigned to the control group, and 15% to the placebo. The remaining vehicles were evenly assigned to the various treatment groups.

Table 5. Phase I & II Sticker Distribution by Treatment Group

Treatment	Phase I	Phase II	Total	Percent
(0) Control	2,096	3,384	5,480	21.86
(1) Placebo	1,759	2,058	3,817	15.23
(2) Accident- Individual	992	945	1,937	7.73
(3) Accident- Group	991	963	1,954	7.79
(4) Text- Individual	971	1,040	2,011	8.02
(5) Text- Group	979	965	1,944	7.75
(6) Injury- Individual	974	974	1,948	7.77
(7) Injury- Group	980	1,053	2,033	8.11
(8) Protest- Individual	1,000	888	1,888	7.53
(9) Protest- Group	998	1,058	2,056	8.20
Total	11,740	13,328	25,068	100.0

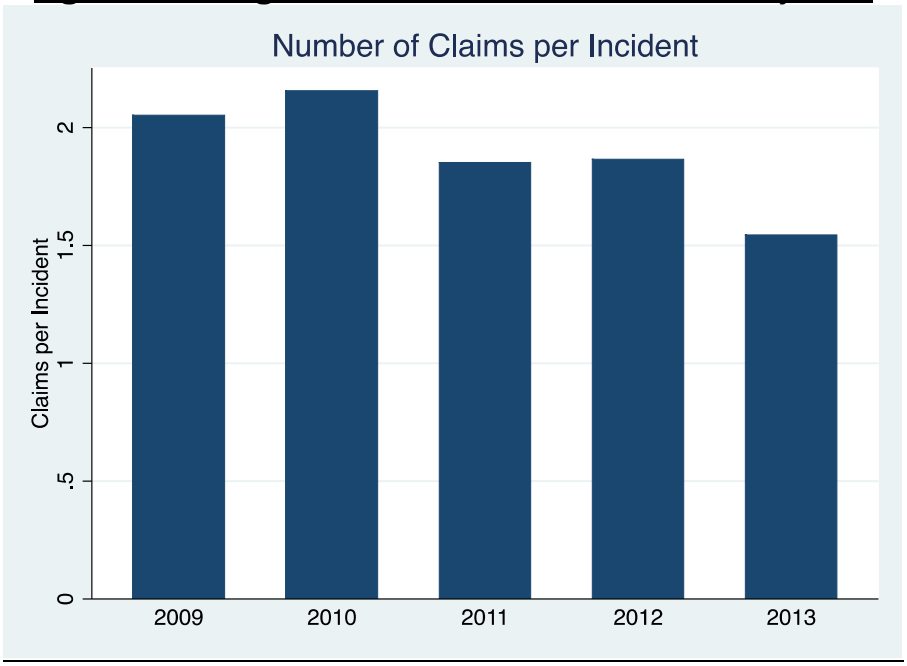
PART II: INSURANCE CLAIMS

As outlined in milestone #4, our primary outcome data for this evaluation comes from the administrative data collected by Directline Assurance. When an insured vehicle submits a claim, the date of the incident, the identity of the vehicle involved, the number of fatalities/injuries and approximate claim costs are recorded. Below we present a summary of the data collected between January 2009 and March 2013.

First we show the average number of claims filed per incident across the five years and then the number of incidents per 1000 vehicles by calendar quarter. As figure 3 shows below, the number of claims per incident has fallen slightly over the 5 years from a high of just over 2 claims per incident in 2009 and 2010 to about 1.6 claims per incident in 2013.

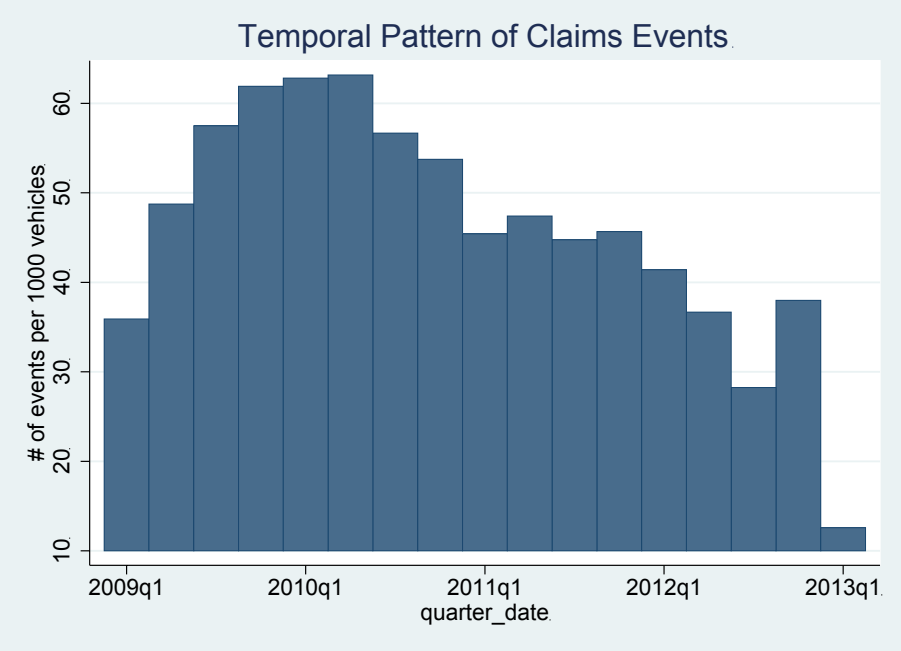
While the claims data do not always indicate the nature of the claim, just over half of the claims are soft tissue injuries, about 8% of claims involve bone fractures and 5% of claims are fatalities.

Figure 3. Average Number of Claims Per Incident, by Year



In addition to the decline in the number of claims per incidents, the number of claims per 1000 vehicles has been falling over time as shown in Figure YY below. In particular, Figure YY shows the number of incidents per 1000 vehicles by calendar quarter. The number of claims per 1000 vehicles fell from a high of just over 60 in 2010 to an average of just under 40 in 2012.

Figure 4. Average Number of Incident per 1000 Vehicles, by Calendar quarter



PART III: PASSENGER SURVEYS

As explained in milestone #4, the road safety radio campaign started in January 2012 and continued in intervals through March 2012. In order to assess the reach, recall and salience of the broadcast radio campaign that ran between January and March 2012, a survey was fielded at the beginning of February 2012. As we described in milestones #3 and 4, the radio spots aired on two Royal Media stations: Inooro and Muuga FM. The schedule of these *Zusha* radio spots for both radio stations is also detailed in the Milestone 3 report.

A description of the radio ad campaign and our survey procedures were discussed at length in milestone #4. In summary, he Zusha media campaign survey collected information from 9,859 respondents. It was designed to measure message penetration and comprehension by those exposed to the messages. Passengers were asked questions about their radio habits and interpretations of the spots, and basic background and demographic information was collected, including frequency of *matatu* use, occupation, and primary language spoken at home, gender and age, providing a rich description of the target population.

Passengers were asked questions regarding their favorite radio stations, listening times and specific questions relating to the Zusha radio campaign spots and their interpretations of the spots. Additional background information on passengers was collected, including frequency of matatu use, occupation, and primary language spoken at home, gender and age, providing a rich description of the target population.

The following provides a summary of what we previously reported:

Demographics and listening habits:

- Nearly 70% of the respondents were male, and nearly 80% of the respondents were between 21 and 40 years of age (43% were between 21 and 30, and 37% between 31 and 40).
- Approximately 60% of respondents speak Kikuyu or Meru as their primary language, and 19% list Swahili as their primary language.
- Nearly one out of every four respondents was a driver.
- Approximately one-third of the interviews were conducted in Nairobi, and one-fifth were conducted in Meru.
- The peak hours of radio listening are during morning and evening commutes. 81% of respondents report listening to the radio between 6am and 10am, and 66% report listening between 6pm and 10pm. Drivers report higher listening rates than passengers during the midday hours.

Awareness of Radio Spots

- When asked if they had ever heard of the radio ad by name, without hearing it played back, 15% said yes, 63% said no, and 22% said they did not know.

- After hearing the radio ad played back, when asked if they had heard the ad today or yesterday, 15% said yes, 63% said no, and 22% said they did not know.
- After hearing the radio ad played back, when asked if they had *ever* heard the ad, 65% of the respondents said yes.
- Over the period of he media survey interview, there was a downward trend in the fraction of respondents who recalled hearing the radio ad. This is consistent with the fact that the radio campaign aired during the early part of the media survey, but not the latter half.
- There was a very similar degree of message awareness across respondents who reported listening to either radio station.
- 84% of all respondents answered that the radio ad was about road safety. Nearly 70% responded that the ad was "effective" or "very effective."

PART IV: LOTTERY DRAWINGS AND OUTCOMES

During both recruitment periods, phase I and phase II, a lottery was run to provide incentives for three players—the agent, the owner, and the driver—to ensure the placement of the road safety stickers in the vehicles. Vehicles were considered in the draws if they received stickers during the current phase. For example, a vehicle that received stickers only in phase I would be considered for the lottery during phase I, but not phase II.

Table 6 shows the break down of lottery draws across the two periods. Rounds 1 and 2 occurred during phase I of this study, and Rounds 3 and 4 occurred during phase II. Each week of the lottery, ten registered *matatus* that received stickers were drawn and inspected. As reported in the previous milestones, if inspections retained all four assigned stickers, three prizes of Kshs. 5,000 each were awarded, one to the agent, one to the owner, and one to the driver. During round 1 of the lottery, March to May 2011, 72% of the *matatus* that were drawn passed the inspection and the players received the reward. During round 2 of the lotter, June to September 2011, 32% of the *matatus* that were drawn passed inspection and the players received the reward. In rounds 3 and 4, 30% and 11% of the *matatus,* respectively, passed the inspection and the players received the reward. Overall, during phases I and II, 35% of the *matatus* that were drawn and I passed inspection.

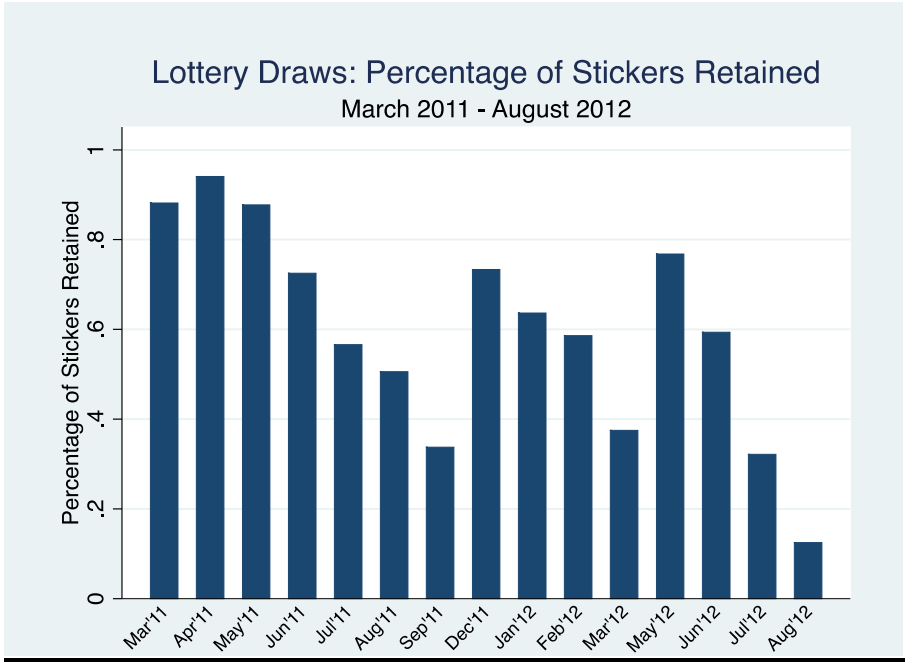
Table 6. Lottery Draws- Phase I & II

Week	No. of Draws	No. of Winners	No. of Inspected Vehicles	Share of Winners from Draws
Round 1: March 2011-May2011				
21-Mar-2011	10	7	9	70%
28-Mar-2011	10	9	10	90%
4-April-2011	10	8	10	80%
11-April-2011	10	7	10	70%
18-April-2011	10	9	9	90%
26-April-2011	10	7	9	70%
3-May-2011	10	5	10	50%
9-May-2011	10	6	10	60%
16-May-2011	10	8	9	80%
25-May-2011	10	5	10	50%
30-May-2011	10	8	10	80%
Total	110	79	106	71.8%
Round 2: June 2011- September 2011				
28-June-2011	10	7	10	70%
5-July-2011	10	4	9	40%
11-July-2011	10	5	10	50%
18-July-2011	10	4	9	40%
25-July-2011	10	4	10	40%
5-Aug-2011	10	3	9	30%
8-Aug-2011	10	1	10	10%
16-Aug-2011	10	2	9	20%
23-Aug-2011	10	5	9	50%
29-Aug-2011	10	3	7	30%
6-Sept-2011	10	2	8	20%
13-Sept-2011	10	2	9	20%
19-Sept-2011	10	0	3	0%
Total	130	112	112	32.3%
Round 3: December 2011-March 2012				
22-Dec-2011	10	6	8	60%
28-Dec-2011	10	4	7	40%
3-Jan-2012	10	4	9	40%
9-Jan-2012	10	1	7	10%
24-Jan-2012	10	4	6	40%
1-Feb-2012	10	1	3	10%
1-Feb-2012	10	2	10	20%
10-Feb-2012	10	4	7	40%
28-Feb-2012	10	1	4	10%
2-Mar-2012	10	5	8	50%
12-Mar-2012	10	1	6	10%
Total	110	33	75	30%
Round 4: May-August 2012				
16-May-2012	10	3	4	30
23-May-2012	10	2	5	20
30-May-2012	10	1	5	10
6-June-2012	10	1	2	10
13-June-2012	10	1	3	10
20-June-2012	10	2	7	20
27-June-2012	10	2	4	20

4-July-2012	10	1	3	10
11-July-2012	10	1	1	10
18-July-2012	10	0	2	0
25-July-2012	10	0	1	0
1-August-2012	10	0	0	0
8-August-2012	10	0	4	0
Period Total	130	14	41	10.77
TOTAL	**480**	**238**	**334**	**35%**

Figure 3 shows the sticker retention rate, reflecting the share of all stickers found in vehicles inspected as a fraction of all stickers (assuming perfect retention). Figure 3 shows three periods starting from March-September 2011, December 2011-March 2012, and May 2012- August 2012. As reported in milestone #4, in each of these periods, sticker retention is falling at a fairly uniform rate. Sticker retention is higher in phase I of the study, starting from a high of about 90% in April 2011 to a low of about 34% in September 2011. In phase II, sticker retention starts off a little about 70% in December 2011 and May 2012, and falls to a low of just over 10% in August 2012. However, as Table 6 above shows, this lower rate of retention could be driven by less effort exerted in inspecting all winning vehicles in phase II as compared with phase I. As mentioned in milestone #4, the lower verification effort is plausible given that assessors were doing this on top of their regular job.

Figure 3. Lottery Draws- Phase I & II (March 2011 to August 2012)



PART V: DIRECT OBSERVATION DATA COLLECTION

Direct observation data was collected in Phase I and Phase II, for a total of 15 months. Phase I ran between March 2011 and September 2012, and Phase II ran between December 2011 and August 2012. A total of 6,626 observation trips were conducted. As previously reported, enumerators were trained on the purpose of the study and how to use a GPS device to collect data on their trips. The Coordinator worked with the enumerators to resolve any problems or questions. The enumerators understood that unlike a conventional survey in which you walk up to a subject and interview them, this data collection exercise is implemented by direct observation.

During phase I and phase II, the direct observation took place inside a *matatu*: the enumerator took a trip in a *matatu* enrolled in the study and collected observations about what happened inside the vehicle during the trip. The enumerator was instructed to report as objectively as possible what they observed on their trips. In order to ensure the integrity of the data collected, it was very important that the enumerator conceal the purpose of the trip.

As reported in previous milestones, in addition to the survey data, there are key pieces of information that the direct observation collected:

1) Trip information—using the GPS device enumerators recorded distance travelled and maximum moving and overall average speeds
2) The number of incidents considered dangerous; these include driving at very high speeds, overtaking in blind corners, swerving to avoid potholes, etc.
3) The reactions and responses of passengers to these incidents? Do the passengers say anything in response to these events? What do they say? How many passengers speak up? What types of passengers speak up? How does the driver respond?

Enumerators' reimbursement reflected the cost of living—so it was increased between phase I and phase II to reflect the cost in living. Additionally, enumerators received higher compensation in phase II due to the additional responsibility of conducting the passenger survey. In phase I enumerators received a daily flat rate of 500 Khs.; a per diem for those outside of Nairobi (400 Khs. for accommodations, and 300 Khs. for food). In phase II enumerators received a daily flat rate of 700 Khs.; a per diem for those outside of Nairobi (600 Khs. for accommodations, and 400 Khs. for food). The field coordinator received a daily flat rate of 1,350 Khs. per day, and the field coordinator in Meru received an additional 150 Khs.

The following summarizes what we previously reported:

Phase I:

- An average of 487 trips were conducted per month in phase I, with a range of 57 in April 2011 to 967 in July 2011.
- Maximum speeds range between about 90 km./hr. in September 2011 and 110 km./hr. in May 2011.
- The average distance covered in one trip was about 62 km., with considerable variation across trips with some trips being less than 5 km. and others being more than 200 km.

Phase II:

- An average of 574 trips were conducted per month in phase II, with a range of 473 in January 2012 to 678 in March 2012.
- Maximum speeds ranged from about 90 km./hr. in December 2011 and January 2012 to just over 100 km./hr. in February and March 2012.
- The average distance covered in one trip was about 83.35 km., with considerable variation across trips with some trips being less than 10 km. and others being more than 200 km.

Figures 4 below shows the total number of trips taken during both phases of this study. As the figure shows, the bulk of the trips taken during phase I were taken between June and September 2011. As reported in milestone #1, fewer trips were taken in April and May 2011 as a result of the sticker inspection exercise, which was abandoned at the end of May 2011. The bulk of the trips taken during phase II occurred between January and May 2012.

Figure 4. Direct Observations Data: Sum of Trips Traveled By Month

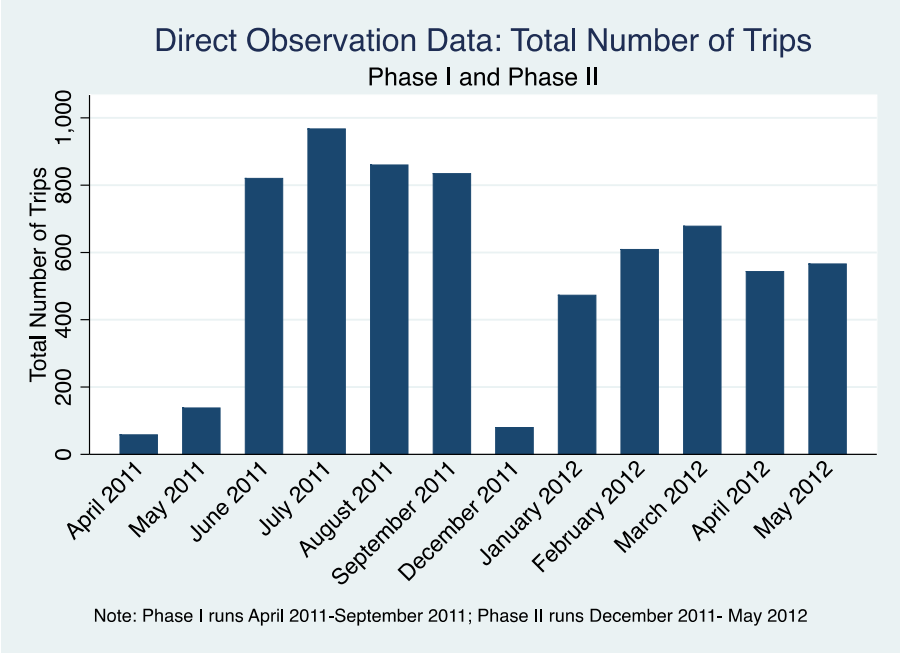


Figure 5. Direct Observation Data: Average Maximum Speeds Recorded by Month

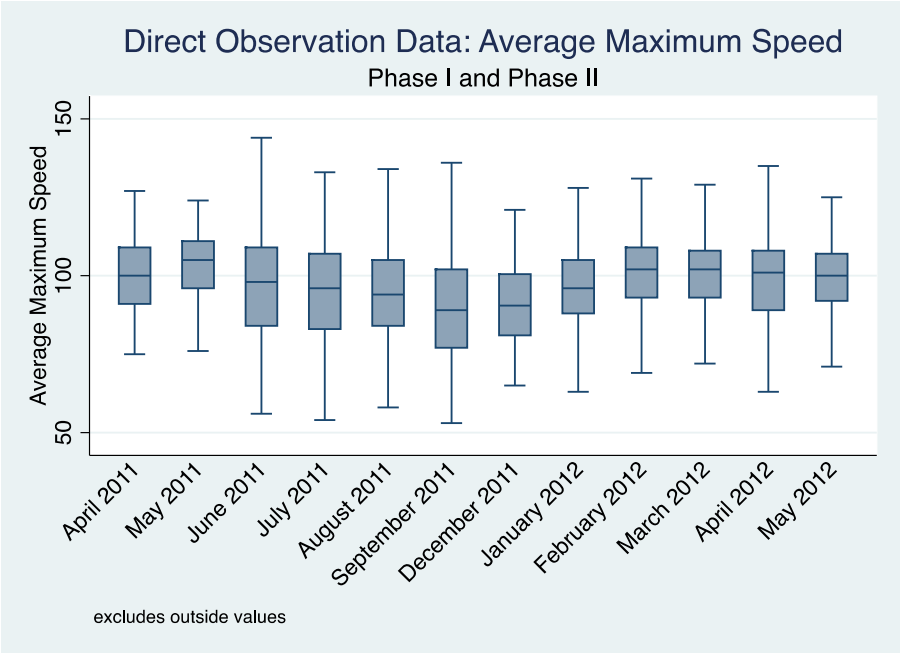


Figure 5 above shows the average maximum speeds recorded by month for both phase I and phase II. The lowest average maximum speed, 90 km./hr. was recorded at the end of phase I, in September 2011. The highest maximum average speed, 104 km/hr., was recorded near the beginning of phase I, in May 2011.

Table 7. Direct Observtaions: Average Distance by Month (Km.)

Month & Year	Average Distance (km)	Standard Deviation	Frequency
Phase I			
April 2011	70.68	31.38	57
May 2011	79.58	33.17	138
June 2011	62.89	39.58	821
July 2011	71.56	58.35	967
August 2011	57.76	43.33	860
September 2011	51.60	45.96	834
Phase II			
December 2011	41.05	28.87	80
January 2012	79.32	57.87	609
February 2012	82.14	55.48	473
March 2012	82.47	56.96	458
April 2012	90.60	61.11	543
May 2012	84.05	58.23	566
Total	71.61	53.55	6,626

PART VI: TIMELINE FOR ANALYSIS AND REPORT WRITING

We are close to obtaining all the different datasets that we need for the analysis for the report and manuscript preparation. The only piece of data that is yet to be obtained is claims rate data from the other large insurance company for public service vehicles (PSV). We have given ourselves a deadline of December 15th 2013 to obtain this data.

In the interim, we have commenced analysis of the other data from Directline Assurance (claims and policies), the direct observations data as well as the survey of exposure to the radio spots.

We anticipate completing this analysis by the end of January 2014.
Thereafter final report preparation will be carried in February and March 2014 with an expected delivery date of March 31, 2014. The preparation of any accompanying manuscripts and presentations will be carried out during that time.

During this first quarter of 2014, we will carry out dissemination activities such as seminars and the preparation of policy briefs targeting audiences both here in the US as well as in Kenya.

Consumer Action and Matatu Road Safety
USAID: Milestone #6- Report on Cost Effectiveness of Intervention

This milestone report details the cost effectiveness of the ZUSHA intervention. We begin with a brief summary of the activities conducted during Phase I and Phase II, running from March 2011 to August 2013 in Part I & II. Part III documents the costing exercise for these activities. Part IV summarizes passenger survey activities that provide important inputs into the DALY calculations. Part V lays out the information we use to generate the DALYs saved by the intervention. We conclude with our estimates of cost per DALYS saved as a result of the intervention.

PART I: VEHICLE RECRUITMENT

As outlined in previous milestone reports, vehicle recruitment was done through the Direct Line Assurance Company. Direct Line agents distributed stickers at the time that drivers purchased predominantly monthly policies.[1] Sticker distribution occurred over two phases. For the purposes of this report we will refer to these as phase I and phase II. During phase I, which ran from March 2011 through August 2011, a total of 9,644 treatment vehicles and 2,096 control vehicles were recruited, for a total of 11,740 vehicles. During phase II, which ran from December 2011 through August 2012, 9,944 treatment vehicles and 2,030 control vehicles were recruited, reaching a total of 11,974. In all, a total of over 78,000 stickers were issued over the two phases.

As reported in previous milestones, in order to keep the analysis of the impact of the stickers consistent, we maintained phase I study assignments in phase II. This means that a vehicle that was assigned to the control, placebo or any of the eight treatment groups in phase I, received the same stickers corresponding to the phase I assignment in Phase II.

Stickers were distributed from eight Direct Line branches in Nairobi and Central Kenya. Specifically stickers were distributed from two Nairobi branches of Tom Mboya and Hazina towers and then from Embu, Kerugoya, Meru, Nakuru, Nyeri andThika. Table 1 and figure 1 show the distribution of stickers across locations. We have created a separate column for each phase, and a column for the entire duration.

[1] Less than 10% of policies purchased during the study period covered a duration of more than 1 month.

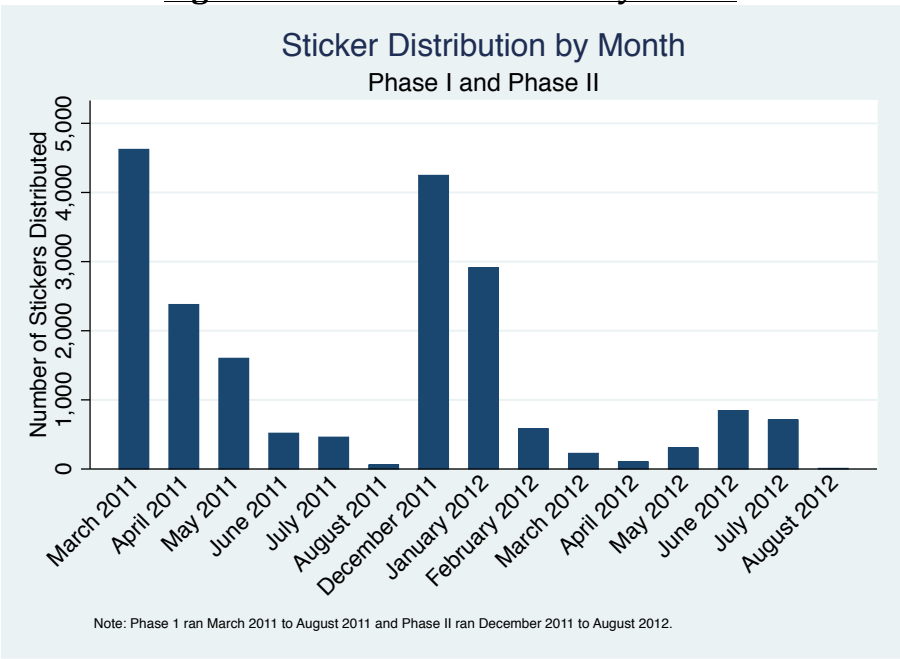
Table 1. Sticker Distribution by Location

Region	Phase I: Number of Vehicles that Received Stickers	Phase II: Number of Vehicles that Received Stickers	Total: Number of Stickers Issued	Percentage
Embu	191	152	1,372	1.75
Hazina Towers	802	1,419	8,884	11.34
Kerugoya	401	346	2,988	3.81
Meru	307	239	2,184	2.79
Nakuru	858	725	6,332	8.08
Nyeri	327	311	2,552	3.26
Thika	900	817	6,868	8.77
Tom-Mboya	5,858	5,935	47,172	60.21
Total	9,644	9,944	78,352	100.0

More than two out of every three vehicles obtained their cover from Nairobi during the recruitment period, Approximately 60% of vehicles bought their cover in the main Nairobi branch of Tom-Mboya. The distribution of vehicles across Direct Line's branches was consistent across phase I and phase II, suggesting uniform attrition and entry across branches.

Stickers were distributed each month during phases I and II, with the majority of vehicles receiving stickers in the first two months of each phase. Figure 1 show the distribution of stickers across months for both phases. As reported in milestone #4, unlike phase I, where recruitment was staggered to minimize disruption to regular commercial operations, recruitment in phase II was rolled out in all branches a few days after opening in Nairobi. As such, there are no timing differences in access to phase II stickers across branches. However, the overall recruitment process proceeded at about the same pace as in phase I. One reason that recruitment remained open longer during Phase II was an expectation that vehicles that had switched to other insurance providers would switch back. The blip in recruitment in June and July 2012 corresponds to assigning non-phase I study vehicles to treatment groups, instead of the default control group.

Figure 1. Sticker Distribution by Month



The distribution of vehicles across treatment groups was consistent across phase I and phase II. Table 2 shows the distribution of vehicles across treatment type. Approximately 20% of vehicles were assigned to the control group, and 15% to the placebo. The remaining vehicles were evenly assigned to the various treatment groups.

Table 2. Phase I & II Sticker Distribution by Treatment Group

Treatment	Phase I	Phase II	Total	Percent
(0) Control	2,096	3,384	5,480	21.86
(1) Placebo	1,759	2,058	3,817	15.23
(2) Accident- Individual	992	945	1,937	7.73
(3) Accident- Group	991	963	1,954	7.79
(4) Text- Individual	971	1,040	2,011	8.02
(5) Text- Group	979	965	1,944	7.75
(6) Injury- Individual	974	974	1,948	7.77
(7) Injury- Group	980	1,053	2,033	8.11
(8) Protest- Individual	1,000	888	1,888	7.53
(9) Protest- Group	998	1,058	2,056	8.20
Total	11,740	13,328	25,068	100.0

PART II: LOTTERY DRAWINGS AND OUTCOMES

During both recruitment periods, a lottery was run to provide incentives for three stakeholders —the agent, the owner, and the driver—to ensure the placement of the road safety stickers in the vehicles. Vehicles that received stickers during the current phase were eligible for the draw. This means, for example, that a vehicle that received stickers only in phase I would be considered for the lottery during phase I, but not phase II.

Table 3 shows the break down of lottery draws across the two periods. Rounds 1 and 2 occurred during phase I of this study, and Rounds 3 and 4 occurred during phase II. As reported in the previous milestones, if inspections revealed that a randomly selected vehicle retained all four assigned stickers, three prizes of Kshs. 5,000 each were awarded, one to the agent, one to the owner, and one to the driver. Overall, during phases I and II, 35% of the *matatus* that were drawn and I passed inspection.

Table 3. Lottery Draws- Phase I & II

Week	No. of Draws	No. of Winners	No. of Inspected Vehicles	Share of Winners from Draws
Round 1: March 2011-May2011				
21-Mar-2011	10	7	9	70%
28-Mar-2011	10	9	10	90%
4-April-2011	10	8	10	80%
11-April-2011	10	7	10	70%
18-April-2011	10	9	9	90%
26-April-2011	10	7	9	70%
3-May-2011	10	5	10	50%
9-May-2011	10	6	10	60%
16-May-2011	10	8	9	80%
25-May-2011	10	5	10	50%
30-May-2011	10	8	10	80%
Total	110	79	106	71.8%
Round 2: June 2011- September 2011				
28-June-2011	10	7	10	70%
5-July-2011	10	4	9	40%
11-July-2011	10	5	10	50%
18-July-2011	10	4	9	40%
25-July-2011	10	4	10	40%
5-Aug-2011	10	3	9	30%
8-Aug-2011	10	1	10	10%
16-Aug-2011	10	2	9	20%
23-Aug-2011	10	5	9	50%
29-Aug-2011	10	3	7	30%
6-Sept-2011	10	2	8	20%
13-Sept-2011	10	2	9	20%
19-Sept-2011	10	0	3	0%
Total	130	112	112	32.3%

Round 3: December 2011-March 2012				
22-Dec-2011	10	6	8	60%
28-Dec-2011	10	4	7	40%
3-Jan-2012	10	4	9	40%
9-Jan-2012	10	1	7	10%
24-Jan-2012	10	4	6	40%
1-Feb-2012	10	1	3	10%
1-Feb-2012	10	2	10	20%
10-Feb-2012	10	4	7	40%
28-Feb-2012	10	1	4	10%
2-Mar-2012	10	5	8	50%
12-Mar-2012	10	1	6	10%
Total	110	33	75	30%
Round 4: May-August 2012				
16-May-2012	10	3	4	30
23-May-2012	10	2	5	20
30-May-2012	10	1	5	10
6-June-2012	10	1	2	10
13-June-2012	10	1	3	10
20-June-2012	10	2	7	20
27-June-2012	10	2	4	20
4-July-2012	10	1	3	10
11-July-2012	10	1	1	10
18-July-2012	10	0	2	0
25-July-2012	10	0	1	0
1-August-2012	10	0	0	0
8-August-2012	10	0	4	0
Period Total	130	14	41	10.77
TOTAL	**480**	**238**	**334**	**35%**

PART III: COSTING OF THE PROGRAM

In this section we illustrate the costs of delivering the program from the perspective of an insurance company, bus service provider, industry group or non-governmental organization. We follow the guidelines laid out in Dhaliwal, Duflo, Glennerster and Tulloch (2012) in detailing the costs of the entire exercise.

As Table 4 below shows, there are 5 main categories of costs associated with this program. Below we document the key constituents of the reported costs and any assumptions used to generate those costs.

Program Administration:

We hired a project manager who spent the greater part of her time managing the research activities associated with the evaluation of this intervention. A very conservative estimate of the fraction of time that she spent on program administration issues is about one day a week. We assume an upper bound for the program administration window of two years.

Program Materials and Preparation
This line item includes the cost of printing and packing all the stickers required for the intervention. To ease calculation, we include the cost of printing and packing the placebo stickers that are included purely for research purposes. This assumption likely overstates this component by about 10%. For each phase, 8 employees took two weeks to sort and pack the stickers.

Staff Training
For each Directline Assurance branch office, we trained the office manager and the sales agent(s). In total, 7 office managers and 12 sales agents were trained. For each phase of the project, training lasted about half a day. We assume a daily rate of $60 for office managers and $30 for sales agents to arrive at the cost of this activity. Training was delivered by the study project manager and didn't entail the production of any additional materials.

Implementation Costs
Implementation costs consist of the following items:

i) Lottery – 480 draws were completed over the course of the two phases. Each eligible winning vehicle cost Directline $176.47.
ii) In addition, there is a 10% license fee for all draws paid to the Betting Control and Licensing Board (BCLB).

Monitoring costs
Monitoring sticker distribution was integrated into an existing information management system. The programing required to incorporate monitoring functions required a total of three days of a senior programmers time at a unit cost of $500 per day.

Table 4: Summary of Intervention Costs

Section	Description	Total Costs
Program Administration	Costs of one program administrator who worked **throughout all phases of the intervention and implementation**.	$9,120.00
Preparation of Intervention Materials	Costs that were incurred to **print stickers and envelopes as well as sort and pack stickers for each phase.**	$20,888.00
Staff Training	Costs that were incurred to **train *staff* involved in the intervention**. Training was delivered by program administrator.	$780.00
Implementation Costs	Costs of **implementing the intervention**. This includes the cost of the 480 lottery draws that were carried out across both phases of the study. Includes the cost of the BCLB license fee..	$93,176.47

Section	Description	Total Costs
Monitoring Costs	Costs incurred to integrate sticker distribution monitoring and tracking software into the existing Directline Information Management System.	$1,500.00
	Total:	$125,464.47

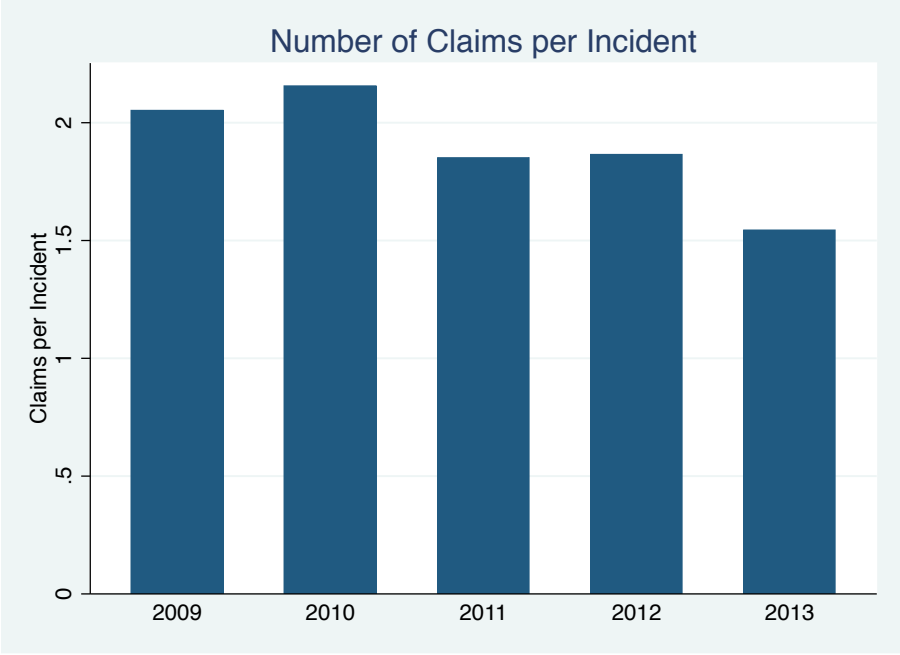
As the table above shows, we obtain a total cost of implementing the program of just over $125,000.

Next we turn to the calculations of the benefits of this program.

PART IV: DALY CALCULATION

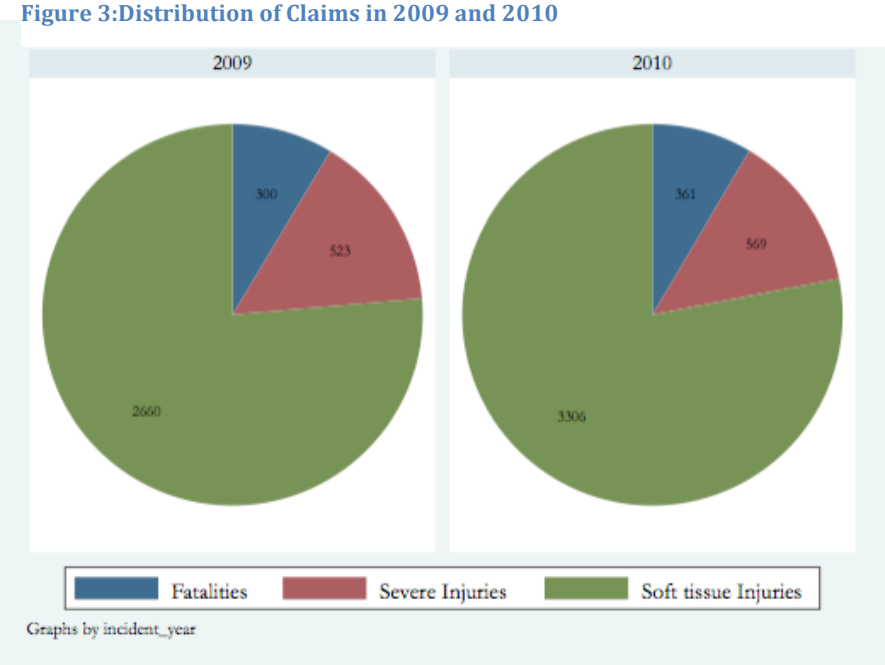
Preventing road traffic incidents leads to DALYs saved as a result of both deaths and injuries avoided. Assuming that incidents avoided are representative of those we observe in our control group, we leverage rich administrative records indicating the occurrence of an injury or death. Figure 2 below shows the duration of the records we use starting in January 2009 and ending in December 2013. While the claims data do not always indicate the detailed nature of the claim (such as the age and gender of the victim), just over half of the claims are soft tissue injuries, about 8% of claims involve bone fractures and 5% of claims are fatalities.

Figure 2. Average Number of Claims Per Incident, by Year



Perhaps the most relevant window for the calculation of DALYs saved comes from Figure 3 below which shows the distribution of claim types in the two years before the Zusha intervention took place.

Figure 3:Distribution of Claims in 2009 and 2010



As the figure above shows, the ratio of fatalities to other road traffic injuries is about 10:1 in 2009 and a little higher in 2010. We use this ratio to estimate DALYs due to disability saved. An important input into any DALY calculation is the age of the potential victim. Since the claims data don't include specific demographic attributes of victims, we use passenger surveys to estimate the demographic characteristics of potential victims of road traffic injuries.

As we report in milestones #3 and #4, a survey of nearly 10,000 *matatu* users was completed to measure the penetration and awareness of a radio campaign. The average age of a passenger in that survey is 32.7. Nearly 70% of the respondents are males. We consult life tables to calculate the life expectancy of the typical *matatu* passenger.[2] Since the life expectancy differs considerably for the typical male and female *matatu* user (39.3 vs 41.6), we use a weighted average, using the share of males in the radio campaign survey as the weight. This gives us a life expectancy of the typical passenger of just under 40 years.

Using the WHO global burden of disease discount rate of 3%, this implies that the years of life lost (YLL) by the typical passenger who dies in a traffic accident is about 24 years. The claims data don't provide an easy way to calculate years-lived-with-disability due to road traffic incidents. Below we lay out a series of assumptions varying both the ratio of DALYs between years of life lost (YLL) and years lived with disability (YLD).

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[2] Life tables for Kenya obtained from the WHO Global Health Observatory - http://apps.who.int/gho/data/view.main.60850?lang=en

First, we turn to the results of our intervention. As the final report (attached) documents, the Zusha intervention prevents about 140 accidents per year and saves a total of about 55 lives. We use the lives saved estimate together with life expectancy of the typical *matatu* passenger as a starting point for calculating the YLL component of the DALYs. Since the disability associated with a traffic accident ranges from soft tissue injuries which are temporary to paraplegia which is irreversible, we make assumptions about both the number of such injuries as well as their duration to calculate total DALYs. Table 5 below shows the assumptions.

Table 5: Total DALYS and Assumptions

Total DALYs	Ratio of Injury:Death	
Discounted Years Lived with Disability	2	10
5	**1859**	**4059**
10	**2409**	**6809**
15	**2959**	**9559**

We assume three different estimates of discounted years lived with a disability ranging from a lower bound of 5 to an upper bound of 15. We also assume two levels of the ratio of injuries to fatalities. In particular we assume that there are twice as many such injuries as produce the associated range of YLDs or 10 times as many. Note that the WHO assumes a ratio ranging between 20 and 50.

These assumptions produce a range of DALYS saved from a low point of just under 1,900 to just under 10,000 when YLD for injuries is 15 and the number of injuries per fatality is 10.

PART V: Cost Effectiveness

Our cost effectiveness estimates is a straight forward quotient of the costs of the program illustrated in section III and the DALYs saved estimates above. We use Table 5 above to generate the cost per DALY saved, using our program cost of $125,464.47 and the DALYs saved shown in that table.

Table 6: Cost Effectiveness Estimates

Cost Effectiveness	Ratio of Injury:Death	
Discounted Years Lived with Disability	2	10
5	**$67.49**	**$30.91**
10	**$52.08**	**$18.43**
15	**$42.40**	**$13.13**

Our costs effectiveness estimates range from about $13 when the composition of injuries is dominated by very severe and long-lasting conditions and there are ten times as many injuries per fatality to $68 when injuries are dominated by soft tissue injuries and there

are only twice as many injuries per fatality. Our preferred estimate of just under $31 per DALY saved uses a ratio of injuries to fatalities of 10 and the lower bound of YLDs.[3]

[3] Please note that the difference in the Cost effectiveness estimates reported in the paper and here reflect some refinements in the calculation that take into account the discount rate as well as a downward revision to program costs of just under 5%.

PNAS PLUS

Results of a large-scale randomized behavior change intervention on road safety in Kenya

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Road accidents kill 1.3 million people each year, most in the developing world. We test the efficacy of evocative messages, delivered on stickers placed inside Kenyan matatus, or minibuses, in reducing road accidents. We randomize the intervention, which nudges passengers to complain to their drivers directly, across 12,000 vehicles and find that on average it reduces insurance claims rates of matatus by between one-quarter and one-third and is associated with 140 fewer road accidents per year than predicted. Messages promoting collective action are especially effective, and evocative images are an important motivator. Average maximum speeds and average moving speeds are 1–2 km/h lower in vehicles assigned to treatment. We cannot reject the null hypothesis of no placebo effect. We were unable to discern any impact of a complementary radio campaign on insurance claims. Finally, the sticker intervention is inexpensive: we estimate the cost-effectiveness of the most impactful stickers to be between $10 and $45 per disability-adjusted life-year saved.

road safety | governance | accountability | consumer empowerment

Road accidents represent a large and growing cause of death in the developing world (1). About 1.3 million people are estimated to die each year on the road, and between 20 and 50 million are injured. By 2030, road accidents will be the fifth leading cause of death worldwide, killing more people than HIV/AIDS, tuberculosis, and malaria combined. Among 15–29 y olds, road accidents are already the single largest cause of death. In light of these figures, the World Health Organization (WHO) has called for urgent action to address the epidemic of road injuries and deaths.

In this paper, we report results of a scaled-up road safety experiment in Kenya between 2011 and 2013, called Zusha! (Swahili for "Protest!"), which was aimed at reducing accidents involving the country's 14-seater minibuses, or matatus. Our intervention was aimed at promoting agency among matatu passengers, empowering them to challenge the driver to slow down and drive less recklessly if they felt their safety was compromised. To this end, we posted stickers with evocative messages inside the vehicles, exhorting the passengers to act, with phrases like "Don't let a reckless driver get away with murder," and others. We tested the efficacy of different kinds of messages, including the role of images in general in eliciting a response, and the relative merits of using fear vs. reason to motivate behavior change. We also present evidence that messages promoting collective action were more effective than those aimed simply at alleviating individual-level constraints. That is, inaction appears to be associated more with coordination failure than with a lack of information as such.

Overall, the stickers reduce insurance claims of matatus assigned to treatment groups by between one-quarter and one-third on an intent-to-treat (ITT) basis. Among the roughly 8,000 vehicles in the treatment groups, the reduction was 25%, and we estimate that about 140 accidents were avoided per year, and about 55 lives were saved annually. Using data on the age distribution of likely passengers derived from a survey we conducted, we conservatively estimate the cost-effectiveness of the intervention as being between $13 and $60 per disability-adjusted life-year (DALY) saved. The cost-effectiveness of the more impactful stickers, which reduced claims by 34%, was between $10 and $45 per DALY saved.

In addition to the sticker intervention, a radio campaign was aired on two local radio stations that cover certain areas around Mt. Kenya in the central highlands and in the capital city Nairobi. The campaign was activated on a weekly basis on five occasions over the course of the first 6 mo of 2012. We examine insurance claims for events that took place over this period in areas with radio coverage and without, but in contrast to the large effects of the stickers, find no significant impacts.

In Habyarimana and Jack (2), we documented the results of a small pilot study of a similar intervention with a single treatment group and a control. The treatment included a bundle of five stickers, three with text only and two with grisly images of injuries, as well as a weekly lottery that drivers of treated vehicles could win if they were found to be in compliance. Although compliance with the treatment was not perfect, it was sufficiently high to allow us to estimate significant impacts. Vehicles assigned to the treatment group were 50% less likely to file an insurance claim over the following 12-mo period and were 60% less likely to file a claim for an accident involving an injury or death. Using treatment assignment as an instrumental variable, we estimated a local average treatment effect on those who complied with the treatment assignment equivalent to an 80% reduction in accident rates.

The experiment reported in this article was more comprehensive, with a sample five times the size of the pilot, allowing us to incorporate fully eight treatment arms as described in detail below and a placebo. The placebo allowed us to address a potential shortcoming of the pilot: that the lottery itself could have induced better driving. Although eligibility to win the lottery was based only on the retention of the stickers and not on remaining accident free, there was a concern that the prospect of winning the lottery might itself also have induced drivers to be more

Significance

Road accidents kill 1.3 million people each year, most in the developing world. Evocative messages inside Kenyan matatus, or mini-buses, that promote passenger agency and legitimize complaints against dangerous driving are found to reduce average maximum speeds and average moving speeds by 1–2 km/h and insurance claims by between one-quarter and one-third. The cost-effectiveness of the most impactful stickers is between $10 and $45 per disability-adjusted life-year saved.

Author contributions: J.H. and W.J. designed research, performed research, analyzed data, and wrote the paper.

The authors declare no conflict of interest.

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Table 1. Phase 1 treatment assignments and retention in phase 2

Sticker type	Phase 1 recruitment	Phase 2 retention
Pure control	2,093	82%
Placebo	1,759	77%
Treatment stickers	7,885	73%
Total	11,737	75%

	Individual action		Collective action	
Treatment groups	Phase 1 recruitment	Phase 2 retention	Phase 1 recruitment	Phase 2 retention
Text only	971	73%	979	70%
Supportive (voice)	1,000	71%	998	72%
Consequence aversion (injuries)	974	75%	980	76%
Event aversion (crashes)	992	70%	991	72%
Total	3,937	72%	3,948	73%

careful: either because the prize made life more worth living or because they misinterpreted the eligibility rules and thought they could win the prize if they had a safe driving record. The placebo arm in our expanded study thus included a relatively neutral sticker,* retention of which gave drivers the same chance of winning the lottery as those of vehicles in the treatment arms. However, we find no evidence of a placebo effect, suggesting the treatment stickers themselves lead to a reduction in accidents.

Most other interventions aimed at inducing changes in driving behavior have been directed at the driver, and some have used shock therapy to that end. Guria and Leung (3), for example, found effects of an advertising campaign in New Zealand against speeding and drunk driving. Other studies have reported impacts of seat belt rules, speed humps, and speed cameras (1, 3–8), but few randomized evaluations, if any (apart from our pilot), have been conducted.

Theory of Change

The factors that lead to road crashes and that are within the control of individual decision makers include speed, use of attention-impairing substances, seat belt use, vehicle maintenance, and general effort or care. If all stakeholders make well-informed and well-coordinated decisions, then the incidence of road accidents will be in some sense efficient. However, at least three sources of market failure could prevail on the road. One is the obvious externality imposed by a reckless matatu driver on other road users external to his vehicle, including other drivers, passengers, and pedestrians. This source of inefficiency is not directly addressed by our intervention. A second reflects a simple lack of information on the part of passengers: the social norm may dictate that passengers do not question the driver and that complaining is simply not an option. That is, even when gains from trade between the driver on the one hand and the passengers on the other exist, bargaining might not take place. Finally, a free-rider problem could exist among passengers inside a matatu, whereby the collective preferences of passengers outweigh those of the driver but are not expressed. If there is a psychic or social cost to complaining (perhaps no one wants to be perceived as weak), but the benefits of doing so accrue to all riders, then complaining has the attributes of a public good, and social pressure will likely be undersupplied.†

The interventions we evaluate are aimed at correcting the second and third market failures identified above and could act either to directly inform individuals of the feasibility of complaining or to lower the cost of doing so. More indirectly, the messages—conveyed visually to matatu passengers on stickers inside the vehicle, as well as through radio announcements—could legitimize complaint, allowing riders to confidently challenge the heretofore-unquestioned authority of the driver.

As well as motivating complaints, some of the stickers include a small nudge that encourages collective action (see below). Any evidence that stickers with this component have differential (positive) effects will suggest that coordination failures within minibuses are important determinants of road accidents.

The stickers could of course influence driver behavior even in the absence of passenger responses, either directly if the driver himself takes note of the messages or indirectly if he anticipates the complaints of passengers and preemptively adjusts his driving accordingly. Indeed we do not observe statistically meaningful differences between treatment and control groups in terms of observed passenger behavior, as captured by field staff who recorded passenger behavior and driver responses on nearly 1,500 trips, although the highly qualitative nature of these data limits our ability to do so in any case. Nonetheless, such inconclusive evidence is not inconsistent with the large reduced form impacts on insurance claims that we observe.

The trips taken by our field staff do, on the other hand, yield informative data on speed. Using hand-held global positioning system (GPS) devices, we find that vehicles assigned to treatment groups exhibited lower recorded maximum and average moving speeds than those in the control or placebo arms.

Finally, our treatment is at the vehicle level. Whereas most drivers drive the same vehicle on a regular basis, there is some driver rotation both within the day and across days, so drivers who have been exposed to the treatment can end up driving untreated vehicles. More importantly, passengers nearly certainly will ride on both treated and untreated vehicles. These patterns of exposure suggest there could be large spillovers across vehicles, which would hamper our ability to observe differences in outcomes. Only if there was no driver effect, and only if the passenger impact depreciated immediately after exposure, would observed differences reflect the true underlying treatment effect of the interventions. Our measured effects are thus nearly certainly underestimates of the true impacts of the intervention.

The Interventions

The experiment consisted of a total of 10 different arms as documented in Table 1. Vehicles assigned to a control group received no stickers and were ineligible for the lottery. Vehicles

*A true placebo arm would have had no sticker whatsoever and simply the lottery. The placebo stickers we used can be interpreted as a low-, but not zero-, dose intervention.

†Note that not all riders will derive the same, or even positive, benefit from one person's complaints. Nonetheless, lowering the costs of voicing their preferences should improve the ability of passengers to coordinate their actions.

in the other nine groups were offered four stickers each, two with English text and two with Kiswahili. Vehicles in a placebo group were assigned stickers that read simply "Travel Well" and the Kiswahili translation "Safiri Salama."

All other vehicles were assigned across four primary treatment arms, each with two subarms. In all these treatment groups, passengers were emphatically encouraged to speak up against bad driving. One primary treatment arm contained stickers with text only and no images, whereas the other three primary treatment arms included images along with the same text. Among these three arms, the "supportive" theme included images of riders shouting at the driver, the "consequence aversion" theme included images of injured passengers, and the "event aversion" theme included images of wrecked vehicles. Fig. 1 shows one of the stickers issued under each theme.

Finally, each of the four primary treatments was crossed with a collective action intervention. In the four "individual action" subarms, no changes were made to the stickers; but in the four "collective action" subarms, a small additional piece of text was added to each sticker, reading "Umoja ni nguvu." Literally this translates as "Unity is power," but the meaning might be closer to "Together we can." The consequence aversion sticker in Fig. 1 includes this motif.

From 2011 to 2013, we worked with a Kenyan insurance company that sold coverage to about 12,000 matatus through seven sales offices throughout the country.[‡] Third party insurance is mandatory for public service vehicles in Kenya, and most vehicles purchase policies on a monthly basis. Typically, an insurance agent visits a sales office, pays for the coverage, and collects a certificate that is then posted on the inside of the windscreen as evidence of insurance. The decisions to accept, insert, and retain the four stickers were effectively taken by three parties, respectively, the vehicle owner, the insurance agent (an intermediary who purchases insurance on behalf of owners), and the driver. To encourage compliance with the intervention, all three parties were enrolled in a lottery. After recruitment, each week, 10 noncontrol group vehicles were chosen at random (from a population of roughly 10,000) and inspected. If all four stickers were observed to be in the appropriate position, the agent, owner, and driver each received 5,000 Kenyan Shillings, or about $60 (roughly a week's wage for the driver). Vehicles in the placebo group were eligible for the lottery. To boost the credibility of the lottery, during the first 2 mo of the intervention (March and April 2011), advertisements were broadcast on two radio stations encouraging the agents, owners, and drivers to accept the stickers and keep them in place and included interviews with winners.

Finally, although treatment assignment was recorded and used for the purposes of implementing the lottery, it played no role in the claims review, adjustment, or settlement process, and individual claims staff were unaware of the status of any given vehicle.

Recruitment, Data, and Empirical Strategy

Recruitment and Randomization. We recruited vehicles at the point of insurance purchase in two phases, first from March to May 2011 and then from December 2011 to April 2012. At the point of recruitment, vehicles were randomized across treatment, placebo, and control arms using a random number generated as part of the computerized sales process. The 8,797 vehicles that purchased coverage in both phase 1 and phase 2 were assigned to the same groups throughout the experiment. Phase 2 was never intended to be a new experiment but rather an attempt to replenish stickers from phase 1 due to wear and tear, so in our analysis, we use only those vehicles recruited in phase 1. Table 1 reports the numbers first recruited in each treatment arm in phase 1 and the share of each group that was retained in phase 2.

Fig. 1. Examples of stickers in the placebo arm and in each treatment group.

Data. We use three sources of data in our analysis. First, we have access to complete administrative data on insurance claims from January 2009 to December 2013 from the company with which we worked. Among the sample of vehicles we recruit, we have basic identifying information (such as the license plate), as well as the identity of vehicles drawn in the lottery each week and the number of winners.

Second, we conducted a short interview with 9,807 passengers at the termination of bus rides, in which we inquired about their experiences on the trip and their exposure to the radio campaign.

Third, we collected data from a total of 4,405 matatu trips on vehicles recruited in phase 1 taken by our field staff over the course of 1 y following recruitment. The enumerators were equipped with a GPS device that automatically measured the maximum trip speed and average moving speed and could be used to manually record the location and nature of any dangerous incidents, any associated behavior of passengers, and the response of drivers. The enumerators were instructed to ride any matatu that was currently covered by our partner insurance company (something that could be inferred easily by visual inspection), without regard to the presence or absence of any stickers. They did, however, record the number plate so we could determine treatment assignment.

The total number of vehicles in our experimental sample increased from 11,737 in phase 1 to 12,512 in phase 2, due in part to the growth in the insurer's business over the period. However,

[‡]The company sold insurance to matatus that operated on both intracity and long distance routes, although these data were not collected at the point of sale. In the pilot study (2), we recruited only long distance vehicles.

Table 2. Summary statistics

Indicator	Mean	SD	Minimum	Maximum
Claims data (n = 9,358 incidents)*				
No. of claims per incident	1.993	3.516	1	83
No. of fatalities per incident	0.105	0.49	0	21
Share of incidents with at least one fatality	0.078	0.269	0	1
No. of claims with broken bones per incident	0.155	0.517	0	11
Share of incidents with at least one injury	0.444	0.497	0	1
No. of claims with soft tissue injury per incident	1.051	3.114	0	77
Share of incidents with nonvehicle claimants	0.188	0.39	0	1
Share of incidents with vehicle damage claimant	0.256	0.436	0	1
Passenger survey (n = 9,807)†				
Share male	0.68	0.46	0	1
Age	32.69	8.38	13	83
Share speak Kikuyu	0.35	0.48	0	1
Share speak Meru	0.25	0.43	0	1
Share had at least two bus trips in past week	0.58	0.49	0	1
Share ever exposed to radio spot	0.65	0.48	0	1
Trips data‡				
Speed (n = 4,405)				
Distance covered on trip, km	69.07	50.97	3	229
Maximum speed reached, km/h	95.95	15.51	25	155
Moving average speed, km/h	45.88	17.04	3	105
Events (n = 1,471)				
Share of events reported as reckless	0.15	0.36	0	1
Share of events passengers speak to driver	0.18	0.38	0	1

*Claims data for January 1, 2009–December 13, 2013, during which period there were 9,538 incidents. An incident is a crash or other event that results in at least one insurance claim. There can be multiple claims (e.g., by different injured individuals) associated with a single incident. Data reflect all claims, not just claims by vehicles in our experimental sample.

†Kikuyu and Meru are dominant languages spoken in Central Kenya, where the two radio stations that aired the safety messages have the largest audiences.

‡Enumerators collected speed data automatically on GPS units; 4,405 valid records were submitted. However, events such as excessive speed, reckless driving, and passenger complaints to drivers were recorded manually. Of these, 1,471 events could be properly matched to vehicles.

this net increase reflected exit of 2,943 vehicles (25%) and entry of 3,718 new vehicles (30% of the phase 2 sample), a rate of churn that is common in the industry. Table 2 reports summary statistics for vehicles recruited in phase 1 from the three data sources described above.

Balance and Attrition. We collect limited information on the vehicles at recruitment, but use license plate attributes (the letters of which provide an indicator of the time since registration, but not necessarily vehicle age) and prerecruitment claims data to present a balance test in Table 3.[§] The table reports comparisons of vehicles in the control and placebo group, and any treatment group.[¶]

There is no imbalance on license plate attributes at baseline (Table 3), and if anything, as reported, the treatment group was more likely to have had a previous claim than the control and placebo groups and had higher annualized accident rates in previous years (although the number of previous claims per accident was lower in the treatment group). To the extent that these differences reflect a divergence in underlying group characteristics, a simple comparison of treatment with control and placebo vehicles would underestimate the treatment effect of the stickers. On the other hand, if the observed preintervention accidents and claims follow nonparallel trends such as a mean reversion process, then the difference in differences estimate would overstate the treatment effect. To assess this possibility we conduct a falsification test using data from earlier periods. The results, available in Table S3, show that preintervention trends were actually higher in the treatment group, suggesting an even larger treatment effect than we estimate with the simple double difference. Indeed, under the assumption that the preintervention trends (as opposed to levels) in each group would have been maintained, the estimated treatment effect of the stickers is roughly twice as large.

Finally, attrition at phase 2 differed across groups, being highest among treatment vehicles, and lowest among control vehicles (Table 3). Table S4 provides a test for balance of the nonattrited sample on preintervention characteristics. The direction and extent of imbalance is consistent with that reported in Table 3. In addition, using data from 2009 onward, we find no evidence that attrition is systematically related to insurance claims history, nor, by inference, to the potential impact of the stickers on driver behavior.[#] Nonetheless, we propose that any nonrandom attrition would be biased toward more risky drivers and would attenuate measured effects.

Fig. 2 shows the number of weekly lottery winners over the course of the two phases of the project. Compliance with assignment to sticker groups, as measured by the number of winners out of 10 drawn, was initially very high, but fell over the first 6 mo of the intervention. During the second phase, the

[§]We do not have comprehensive data on the insurance coverage status of the recruited vehicles over the full history of claims data to which we have access. Instead, we only see if and when those vehicles experienced an event that led to a claim.

[¶]Table S1 reports these balance tests for the individual action and collective action groups separately, and Table S2 reports the results for the four message types separately. Similar patterns are observed.

[#]In a regression of attrition from phase 1, the coefficient on annualized prerecruitment claims rates is −0.012, with a robust SE of 0.016 and R^2 of 0.00 (n = 11,737).

Table 3. Balance test

Indicator	Control	Placebo	Treatment	Control vs. placebo	Control vs. treatment	Placebo vs. treatment
Vehicle attributes						
Share with license KA...[†]	0.583	0.567	0.566	0.017	0.017	0.000
	(0.011)	(0.012)	(0.006)	(0.016)	(0.012)	(0.013)
Share with license KB...	0.416	0.433	0.433	−0.016	−0.016	0.000
	(0.011)	(0.012)	(0.006)	(0.016)	(0.012)	(0.013)
Share with license KBK-N	0.113	0.122	0.117	−0.009	−0.005	0.004
	(0.007)	(0.008)	(0.004)	(0.010)	(0.008)	(0.009)
Share with license KBP-S	0.006	0.009	0.009	−0.002	−0.003	−0.001
	(0.002)	(0.002)	(0.001)	(0.003)	(0.002)	(0.003)
Phase 1 attrition rate	0.175	0.229	0.276	−0.054***	−0.100***	−0.046***
	(0.008)	(0.010)	(0.005)	(0.013)	(0.011)	(0.012)
N	2,093	1,759	7,885	3,852	9,978	9,644
Claims data						
Any previous claim[‡]	0.152	0.170	0.181	−0.018	−0.029***	−0.011
	(0.008)	(0.009)	(0.004)	(0.012)	(0.009)	(0.010)
Any previous injury claim	0.078	0.077	0.084	0.001	−0.005	−0.007
	(0.006)	(0.006)	(0.003)	(0.009)	(0.007)	(0.007)
Any previous fatality claim	0.015	0.016	0.016	−0.001	−0.001	0.001
	(0.003)	(0.003)	(0.001)	(0.004)	(0.003)	(0.003)
Number previous claims	2.563	1.938	1.775	0.626**	0.789***	0.163
	(0.211)	(0.141)	(0.062)	(0.256)	(0.167)	(0.151)
Annualized accident rate	0.079	0.097	0.104	−0.018**	−0.025***	−0.007
	(0.005)	(0.006)	(0.003)	(0.007)	(0.006)	(0.007)
N	2,093	1,759	7,885	3,852	9,978	9,644

Table covers only phase 1 vehicles, including both those that were found in phase 2 and those that were not. SEs in parentheses. Significant differences at **5% and ***1% levels.

[†]Vehicle license plates are of the form KXX NNNX, where X represents a letter and N a number. KA... license plates were issued before KB... plates, and among KB... plates, KBK-N were issued before KBP-S.

[‡]Previous claims refer to claims recorded before recruitment.

same pattern emerged, but starting from a lower base. This lower base may have been because the radio advertisements promoting the lottery were not aired in phase 2 or because the stakeholders had updated their beliefs about the probability of being drawn.

Empirical Specifications. In our analysis of sticker impacts below, when using pre- and postintervention claims data, we calculate intent to treat estimates of a difference in difference specification of the form

$$y_{igt} = \alpha + \beta_g D_{ig} + \gamma Post_{it} + \delta_g D_{ig} \times Post_{it} + \varepsilon_{igt}, \quad [1]$$

where D_{ig} is a dummy variable equal to 1 if vehicle i is in treatment group g, and $Post_{it}$ is a dummy equal to 1 if the observation for vehicle i is after the adoption of the intervention. The coefficient of interest, δ_g, measures the extent to which the outcome y_{igt} for vehicle i in the post period differs from the expected level, given its baseline level. The primary outcome variable we use is insurance claims, but we also model accident severity and maximum and average recorded speeds.[||] Because of the large number of experimental groups, we present results for a variety of treatment aggregations. Similarly, after confirming the absence of a placebo effect, we combine the placebo and control groups. SEs are clustered at the vehicle level.

We use our passenger survey data to assess exposure to the radio campaign, which was deployed in three regions of Kenya—Nairobi, Nakuru, and Mt. Kenya—and was orthogonal to the sticker assignment. In addition, we model weekly claims rates with the following regression:

$$y_{ijt} = \sum_{j=1}^{3} \mu_j + \sum_{w=1}^{52} \omega_w + \psi_{2012} + \sum_{j=0}^{3} \sum_{t=-52}^{51} \delta_{jt} \mu_j D_t + \varepsilon_{it}. \quad [2]$$

Based on the sales office at which it purchased insurance coverage on the date of recruitment, each vehicle is assigned to one of four regions: j = 0, 1, 2, 3. Region 0 is Mombasa: a location far from the other three regions that were exposed to the radio campaign. y_{ijt} is an indicator variable equal to 1 if vehicle i in region j experienced a claim in week t. We estimate this equation using data from January 2011 to December 2012.**

We include week-of-the-year fixed effects (ω_w) and a fixed effect for 2012 (ψ_{2012}). The coefficients of interest are the δ_{jt}, which multiply a dummy variable D_t equal to 1 in week t of the 2-y period. A negative and significant value of δ_{jt} for weeks coinciding with or just after the weeks in which the radio spots aired would indicate a corresponding reduction in claims associated with the campaign.

Results

In this section, we report results of the sticker intervention and the radio campaign.

[||]As we only have speed data for the period after recruitment, our intent to treat estimates of sticker impacts are based on a simple (single-difference) ordinary least squares specification on assignment.

**The sample of vehicles we use includes 26,213 that were observed between March 2011 and July 2012. We assume a balanced panel of these vehicles over the full 2-y observation period. This assumption implies that all of these vehicles' accident records are observed for the entire period. However, in the context of significant turnover, any accidents covered by other insurance companies are not captured in our data. Because we don't expect such churning to be correlated with the timing of the radio campaign, measurement error is differenced out. (We show below that the analysis remains unchanged if we restrict the sample to vehicles that are observed in at least 8 of the 16 mo.)

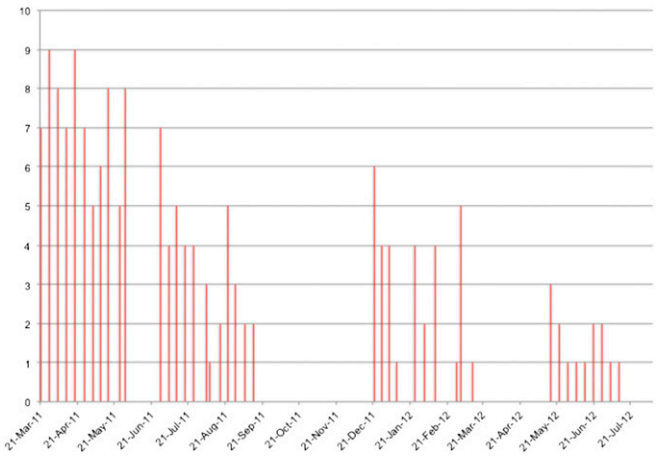

Fig. 2. Weekly lottery winners.

Sticker Intervention Results. Table 4 reports our main results of the effects of the sticker interventions, using the difference in difference specification in Eq. **1** for claims (first column), and a single difference specification for the other outcomes (second through fifth columns). For the claims regression, we exploit data spanning a period of 28 mo before the beginning of the intervention to 30 mo after. In the trips regressions, we control for the trip distance and include enumerator fixed effects. All results measure intent to treat effects. We use data on all vehicles recruited in phase 1, but disregard those that were recruited for the first time in phase 2.

Each horizontal panel presents the coefficients of regressions with treatment assignment aggregated into different groups. Section A compares outcomes for vehicles assigned placebo stickers and any treatment sticker with those for the control group (the constant is not included in the table). The point estimate of the placebo effect on annual claims is negative, whereas the effect on maximum speed is positive, but neither effect is significantly different from zero. However, vehicles with any nonplacebo sticker had statistically significantly fewer claims. Although we do not detect a placebo effect directly, we cannot reject equality of the treatment and placebo effects. Although we believe our evidence (on which we elaborate below) supports the claim that explicit calls for action are important motivators of behavior change, even the low dosage of the placebo may have been partially effective.

Under the parallel trends assumption, the counterfactual annualized rate of claims expected in the post period for vehicles assigned to any nonplacebo treatment was 6.86%, so the coefficient of −0.017 represents a reduction in claims of 25%.

Using GPS devices, we automatically recorded information on speeds on 4,405 separate trips undertaken by our field staff. Maximum speeds in nonplacebo treatment vehicles were on average about 1 km/h less than those of the control group in the post period, although this difference is not statistically significant. A broader measure of vehicle speeds is the average moving speed shown in the third column. Here we estimate a significant difference: vehicles with stickers are about 1 km/h slower than control vehicles.

Section B also estimates the impact of stickers motivating individual vs. collective action by comparing outcomes for vehicles in these subgroups with those in the placebo and control groups combined. The effects on claims are both negative, although statistically significant only for the collective action subgroup, for which the point estimate is about twice as large. The coefficient of −0.22 represents a 32% reduction in claims against the estimated counterfactual. We argue that the difference in focus, between individual and collective action, is unlikely to affect drivers directly, so that the differences in outcomes between the two groups suggests differences in, and indeed the presence of, actual passenger responses or the threat thereof. On the other hand, maximum speeds exhibit similar responses to the two treatments, being lower in both subgroups than in the control/placebo comparison group, although the effect is significant at the 10% level for the individual action subgroup. Average

Table 4. Impacts of sticker assignments

Experimental arms	Claims†	Maximum speed (km/h)	Average speed (km/h)	Reckless event	Passenger voice
A. Main effects					
Placebo	−0.014	0.908	0.146	0.027	0.049
	(0.010)	(0.745)	(0.792)	(0.033)	(0.035)
Any treatment sticker	−0.017**	−0.979	−1.019**	0.020	0.005
	(0.008*	(0.606)	(0.506)	(0.024)	(0.027)
Treatment = placebo, *P* value	0.29	0.00	0.13	0.80	0.11
B. Individual vs. collective action					
Individual	−0.012	−1.257*	−0.853	0.024	−0.003
	(0.008)	(0.649)	(0.629)	(0.026)	(0.029)
Collective action	−0.022***	−0.687	−1.194**	0.017	0.013
	(0.008)	(0.637)	(0.484)	(0.027)	(0.030)
C. Message types					
Text message only	0.001	−0.692	−1.404***	0.022	−0.012
	(0.010)	(0.707)	(0.532)	(0.032)	(0.033)
Supportive: Voice	−0.024**	−0.039	−0.984*	0.036	0.018
	(0.010)	(0.685)	(0.509)	(0.030)	(0.033)
Event aversion: Crash	−0.028***	−2.039***	−0.966	0.012	0.001
	(0.010)	(0.717)	(0.811)	(0.030)	(0.034)
Consequence aversion: Injury	−0.016*	−1.210*	−0.755	0.010	0.010
	(0.010)	(0.734)	(0.824)	(0.031)	(0.034)
Observations	23,474	4,405	4,405	1,471	1,471

Clustered SEs in parentheses. Significance at *10%, **5%, and ***1% levels.

†In the claims regression, entries are coefficients on the reported independent variable interacted with postrecruitment in a difference in difference specification. In the speed and survey regressions, entries reflect simple differences.

moving speeds are also both lower than the control group, but this time the difference is significant for the collective action subgroup.

Finally, section C reports estimated effects for each message type (combining both individual and collective action subgroups within each arm) compared with the control and placebo groups. Text-only stickers appear to have no impact whatsoever on claims, although they are associated with a reduction in average moving speed of 1.4 km/h. All other message types reduce claims by statistically significant margins and are associated with lower maximum and average moving speeds. Effect sizes range from a 26% reduction in claims (for the consequence aversion treatment) to a fall of 34% for each of the other two treatments (supportive and event aversion). Across these groups, maximum speeds are 0–2 km/h lower, and average moving speeds are 0.8–1.0 km/h lower.

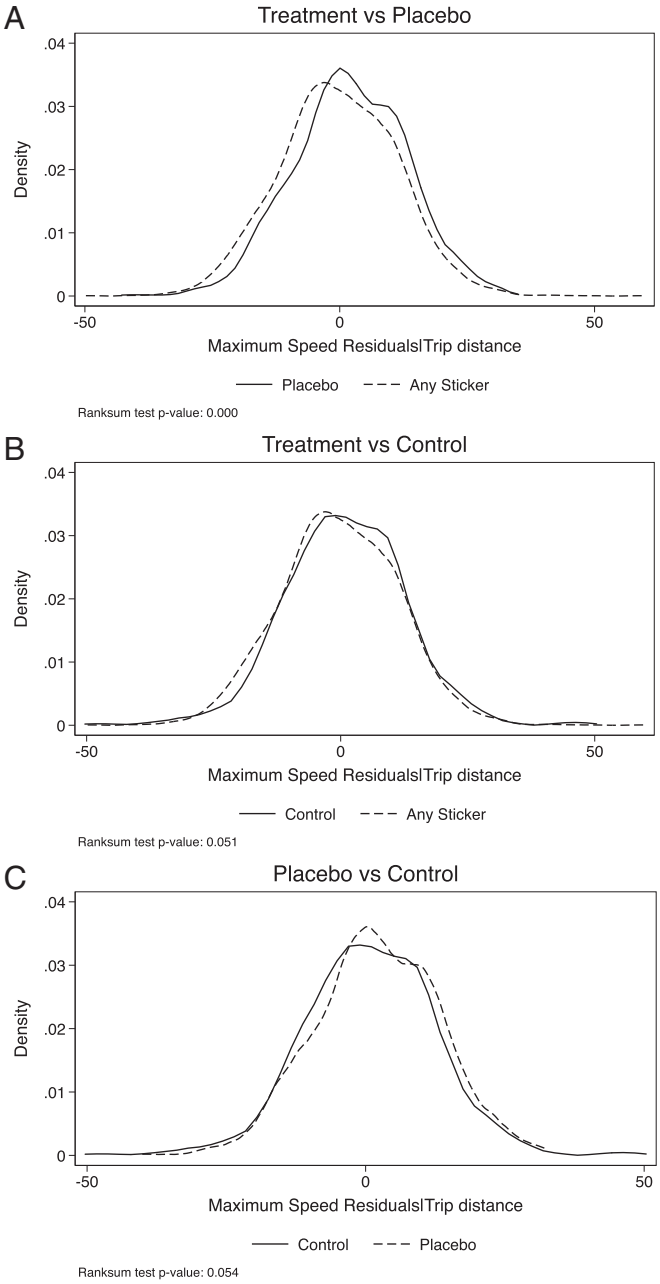

Fig. 3. (*A*) Kernel estimators of conditional maximum speed densities: treatment vs. placebo. (*B*) Kernel estimators of conditional maximum speed densities: treatment vs. control. (*C*) Kernel estimators of conditional maximum speed densities: placebo vs. control.

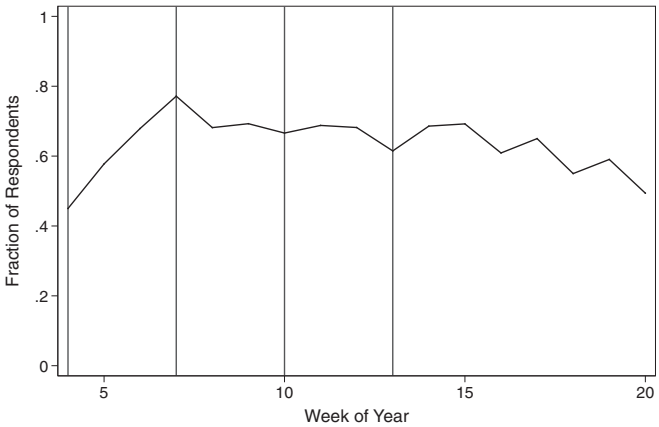

Fig. 4. Exposure to the radio campaign.

In Table 4, we are unable to detect differences in reports of reckless driving (fourth column) or passenger complaints (fifth column) across treatment groups. This lack of directly observed changes in behavior could reflect the more subjective nature of the data collection process, as well as the nature of the impacts of the stickers, on which we comment further below. We were only able to match valid qualitative data in 1,471 of the trips taken by our enumerators, who manually recorded information on the types of driving events as well as associated passenger and driver reactions.

From Table 2, on 15% of trips some kind of reckless driving was reported, whereas on 17% passengers were observed to speak to the driver. Across all groups, a little over half of all passenger complaints were due to trip interruptions such as breakdowns, but 30% reflected reckless driving. Of the latter, in two-fifths the driver was speeding, in two-fifths he was overtaking dangerously or swerving, and in one-fifth he was driving distractedly. Women and men were equally likely to speak up, and in two thirds of the events, both did so. Nine percent of those who voiced complaints were considered by our enumerators to be young, nearly half were middle aged, and the rest were elderly.[††] Overall, speaking up against bad driving does not appear to be unusual.

Our regressions reflect average impacts across all vehicles by assignment. Although claims are sufficiently rare (statistically) and necessarily discrete, making it difficult to discern distributional impacts, such impacts are more easily observed in our maximum speed data. Fig. 3 *A–C* plots pairwise comparisons of the distributions of maximum vehicle speeds for all recruited vehicles in our sample, by assignment to control, placebo, and any treatment.

Comparing the treatment and placebo distributions (Fig. 3*A*), treatment group vehicles exhibit a speed distribution that is displaced to the left, and we reject equality of these distributions at the 1% level ($P = 0.000$). This difference appears to be due to two effects: first, the distribution of treatment group vehicle speeds is shifted to the left of that of the control group—we can reject equality of these distributions (Fig. 3*B*) at the 10% level ($P = 0.051$); and second, the distribution of placebo vehicle speeds is shifted to the right of the control group—we reject equality of these distributions (Fig. 3*C*) again at the 10% level ($P = 0.054$).

[††]We did not ask the passengers their ages, but instead our enumerators were instructed to record the passengers as being young, middle-aged, or elderly.

The fact that maximum speeds in the placebo group appear to be higher than those of the control warrants some discussion. One potential explanation is that the "Travel Well" stickers might have induced slightly more aggressive driving behavior on dimensions that did not necessarily increase accidents, such as driving a little faster on the open road. Such behavior would be consistent with the higher speeds shown in Fig. 3*C*, whereas not having a demonstrable effect on accidents.

Results of the Radio Campaign. From January to April 2012, a series of five 1-wk campaigns were aired on two regional radio stations with coverage in the country's Mt. Kenya region and Nairobi. Thirty-second radio spots promoting the Zusha! message were aired in the morning and evening peak hours from Monday to Saturday and were then withdrawn for a period of 4 wk. This timing ensured we avoided any monthly seasonality effects.

We surveyed passengers of vehicles over the 4-mo period during which the radio campaign operated, in a range of cities and towns, to ascertain exposure levels to the treatment. Fig. 4 suggests high levels of awareness on the part of passengers early on in the campaign but that the salience of the ads might have fallen over time.[‡‡]

Fig. 5 shows the approximate geographic coverage of the radio stations that carried the road safety messages. The most relevant aspect of the figure is that Mombasa (on the coast) is far removed from the circled areas reached by the radio campaign.

Fig. 6 includes four panels. In each of the first three panels, we illustrate the difference between the weekly coefficients δ_{jt} of Eq. **2** in a given exposed region (Nairobi, Nakuru, and Mt. Kenya) and those estimated for Mombasa, along with the 95% confidence interval (CI). The fourth panel, for comparison, reports the point estimates of the three region weekly differentials (relative to Mombasa) in one graph and no confidence intervals. The vertical lines in each graph are placed at the weeks during which the radio campaign was aired.

There is no evidence that accident rates in any of the exposed areas consistently exhibit reductions in comparison with those in Mombasa in or soon after weeks during which the radio spots played.[§§]

What Can We Say About Mechanisms? Although we detect reduced accidents and slower speeds among vehicles assigned to treatment, we do not observe more passenger complaints in them. Of course, this does not necessarily imply that the stickers do not encourage passengers to voice concerns about dangerous driving, because both complaints and bad driving are likely to be determined simultaneously. Such a conclusion could only be drawn if we were able to exogenously randomize reckless driving itself across vehicles, orthogonal to sticker treatment assignment. However, we argue that our data are more consistent with an increase in passenger empowerment than with a direct effect on the driver.

First, the data do indicate a certain level of passenger complaints among the control group. These complaints could conceivably be random, unrelated to driver behavior, but this seems unlikely. Under this reasonable assumption, if the stickers work through a direct effect on the driver, then we should observe lower levels of complaints in the treatment groups. On the other hand, if the stickers work by inducing passengers to complain more, conditional on reckless driving, then the effect on equilibrium complaints is ambiguous: they should increase holding reckless driving constant, but fall as such recklessness is reduced (which it appears to be, from the claims and speed data). Power and data quality issues aside, our results favor a mechanism consistent with passenger empowerment ahead of a direct driver effect, although we are unable to draw definitive conclusions.

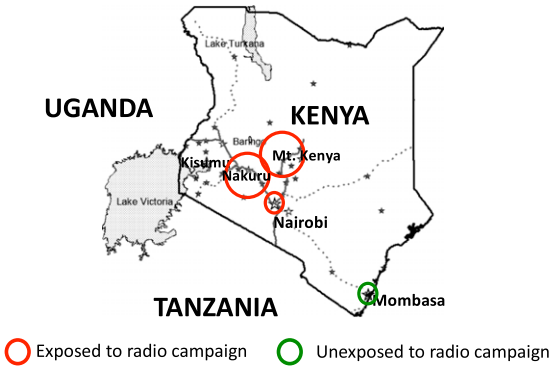

Fig. 5. Approximate areas of coverage of radio stations that carried the road safety campaign.

Financial and Social Returns to the Intervention

Among the roughly 8,000 vehicles in the treatment groups, about 140 accidents were avoided over the course of a year. Using information on the cost of each claim, we are able to calculate the implied financial rate of return to the insurance company from the intervention. The primary (nonresearch) costs of administering the intervention included the costs of printing and distributing the stickers and the costs of the lottery. On the basis of these data, we estimate a financial rate of return between 57% and 255%.[¶¶,##]

Associated with the accidents that were avoided, we estimate 55 lives were saved. From our survey, we have some information on the age distribution of matatu passengers, although we lack such information on others who might have been injured or killed in accidents, such as pedestrians. However, we conservatively estimate the cost-effectiveness of our intervention as being between $13 and $60 per DALY saved. This value is derived from our passenger surveys, which indicate an average age of about 30 y, and an assumption that life expectancy at 30 in this population is about 60 y. We further assume that disability adjustments mean that each injury avoided saves the equivalent of between 5 and 15 y of healthy life and that the ratio of injuries to deaths is between 2 and 10–1.***

[‡‡]The high levels were reported in response to questions about ever having heard the radio spot. When asked if they had heard it "yesterday," respondents reported lower rates of exposure, consistent with the interrupted deployment of the radio campaign.

[§§]Restricting this analysis to those vehicles that were observed to be insured with our partner insurance company in at least 8 of the 16 mo between March 2011 and July 2012 yields similar results.

[¶¶]The median claim cost was about 90,000 Kenyan shillings, or about $1,125 at the prevailing exchange rate at the time, whereas the mean cost was 202,000 shillings, or $2,525. The costs of printing the stickers and running the lottery amounted to about $100,000. The financial rate of return using the median cost was 57%, and using the mean cost was 255%.

[##]To the extent that both the intervention and its effect depreciated over time, this figure would also represent the return to a sustained intervention in which stickers were redesigned and replenished, although of course it is difficult to predict the behavioral response of passengers over the longer term. Either they could become immune to the intervention, in which case it would lose its effect, or the behavior it motivates could constitute a new social norm, in which case there would be no need for continued exposure and the return (both financial and social) to the initial investment would be enormous.

***Even these numbers are conservative. The WHO considers the ratio of injuries to deaths to be between 20 and 50 to 1.3 (see above). Our data suggest a ratio of 10 to 1, although a large fraction of injuries are relatively minor soft tissue injuries.

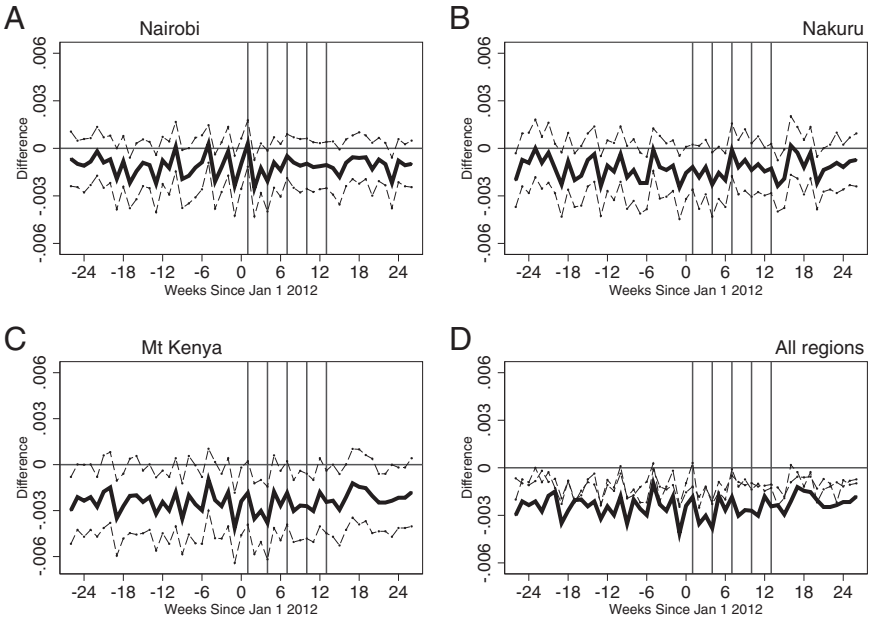

Fig. 6. Radio campaign analysis. (*A*) Differential weekly claims rates in Nairobi vs. Mombasa (with 95% CI). (*B*) Differential weekly claims rates in Nakuru vs. Mombasa (with 95% CI). (*C*) Differential weekly claims rates in Mt. Kenya vs. Mombasa (with 95% CI). (*D*) Point estimates of differential weekly claims rates in Nairobi, Nakuru, and Mt. Kenya vs. Mombasa.

Although these estimates depend on a number of underlying assumptions, they suggest the intervention is highly cost-effective in saving lives and comparable to some of the "best buys" in public health. The more impactful stickers, which were associated with reductions in accident rates of 34%, were correspondingly more cost-effective: for these stickers, the cost per DALY saved was between $10 and $45.[†††]

Conclusions

Our results suggest that salient and actionable information delivered in a timely manner can be effective in improving the safety of public bus travel in Kenya and by extension in other contexts. Overall, reported accidents fell by a quarter in vehicles assigned to the treatment groups, and messages that promoted collective action against bad driving reduced claims by one-third, as did messages with particularly evocative images. Text-only messages were particularly ineffective, possibly due to limited literacy, but we expect more for psychological and emotional reasons, especially considering the adult literacy rate in Kenya is 72%[‡‡‡] and likely higher in the areas in which the study vehicles operated. Although strikingly large, the effect sizes were somewhat smaller than the even larger 50% reduction observed in our 2011 study. That study, however, was conducted with long distance vehicles only, whereas the current evaluation included both long distance and intracity buses. We hypothesize that city accidents could be less responsive to the sticker intervention, because speeds are often much lower, as are the costs of accidents perceived by passengers, and hence their proclivity to speak up even when nudged to do so.

More ubiquitous information, as delivered over a radio campaign, had no discernible effect in reducing claims, although the impacts of a longer-term and more intense campaign could be larger.

Although we cannot detect differences in actual passenger behavior between treatment and control groups, the striking effectiveness of the collective action intervention, which we hypothesize is unlikely to differentially affect the driver's perceptions or actions, suggests that consumer empowerment lies at the heart of the intervention's impact. Also, we argue that the lack of correlation between treatment assignment and observed passenger behavior is inconsistent with a direct driver mechanism. Buses assigned to all treatment groups are observed to reach maximum speeds that are on average about 1–2 km/h slower.

The impacts of our intervention on both maximum and average moving speeds and claims allow us to robustly calibrate the causal relationship between speed reduction and accidents, because the variation is exogenously driven by treatment assignment. The results support and provide perhaps the first, to our knowledge, rigorous confirmation in a sub-Saharan African context of, the WHO's (1) claim that lowering speeds by 5 km/h can reduce accidents by 25%. Indeed, our results suggest either that smaller reductions in speed are sufficient to attain such safety outcomes and that lowering speeds by 5 km/h could have even larger impacts than anticipated or that our intervention both lowered speed and reduced other forms of recklessness, such as dangerous overtaking or distracted driving, which both combined to reduce the rate of accidents substantially.

[†††]An alternative measure of the efficacy of the intervention measured the lives saved against the time lost due to lower speeds. Based on the average trip length (about 60 km) and a reduction in average speed of 1 km/h, each person loses 1 min per trip. Assuming there are 3 trips per day and 14 passengers (the legal limit), this amounts to 42 min per vehicle per day. Over 365 d, the equivalent of 10.6 d is thus lost per vehicle in a year. For the 8,000 vehicles in our treatment groups, a total of 233 y of time lost. If a death is equivalent to the loss of 30 y, lost time per year amounts to the same as 7.8 lives: i.e., slowing down costs 7.8 lives of time, but in return 55 lives are saved.

[‡‡‡]Unicef, www.unicef.org/infobycountry/kenya_statistics.html.

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