

**BY ELECTRONIC FILING**

June 17, 2019

Marlene H. Dortch  
Secretary  
Federal Communications Commission  
445 12<sup>th</sup> Street, S.W.  
Washington, DC 20554

**Re: NOTICE OF EX PARTE COMMUNICATION OF TRANSACTION NETWORK SERVICES, INC.**

**CG Docket No. 17-59:** *Advanced Methods to Target and Eliminate Unlawful Robocalls*  
**WC Docket No. 17-97:** *Call Authentication Trust Anchor.*

Ms. Dortch:

On June 13, 2019, Lavinia Kennedy, Director, Product Management with Transaction Network Services, Inc. (“TNS”),<sup>1</sup> together with Joe Weeden, VP of Product Development for Metaswitch, met in person with various members of the Consumer & Governmental Affairs Bureau, the Wireline Competition Bureau, and the Office of Economics and Analytics regarding the interest of TNS to participate in stakeholder discussions at the upcoming FCC SHAKEN/STIR Robocall Summit scheduled for July 11, 2019. In attendance from the Consumer & Governmental Affairs Bureau were: Eduard Bartholme, Associate Bureau Chief; and Jerusha Burnett. In attendance from the Wireline Competition Bureau were: Alex Espinoza; Connor Ferraro; Annick Banoun; Jordan Reth; Spencer Reeves; Meg Schumm; Kelsey Fayer; Rebecca Chambers; Pamela Arluk (by phone), Heather Hendrickson (by phone); and Mathew Collins (by phone). In attendance from the Office of Economics and Analytics was Grace Chuan.

At that meeting TNS first provided an overview of its Identity and Protection Services with a focus on how its Call Guardian robocall solution deployed at 4 of the top 6 Wireless providers detects robocalls, how it detects neighbor spoofing, the methodology it uses to identify spoofed or hijacked numbers, and the data sources used by the Call Guardian solution, including crowd sourced feedback. TNS also discussed its Call Authentication Hub for SHAKEN/STIR that enables Tier 2 and Tier 3 carriers to deploy SHAKEN/STIR capabilities, and that provides a pre-SHAKEN/STIR solution for TDM carriers using out-of-band signaling. TNS explained that its partnership with Metaswitch for the Call Guardian Authentication Hub allows it to quickly deploy the capabilities of the Call Guardian Authentication Hub to a wide array of wireline, Tier

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<sup>1</sup> TNS is a leading global provider of data communications and interoperability solutions. TNS offers a broad range of network connectivity and innovative value-added services which enable transactions and the exchange of information in diverse industries such as telecommunications, payment processing, and financial services markets.

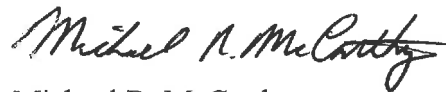
2 and Tier 3 carriers. At the meeting TNS presented the attached slide showing the TNS Analytics Engine that underlies both its Call Guardian robocall solution and its Call Guardian Authentication Hub.

TNS also briefly discussed at the meeting findings from the attached presentation previously given by TNS to the ATIS IP-NNI Task Force on May 1, 2019 on the Impacts of STIR/SHAKEN Telephone Number Validation on User Display based upon a User Study conducted by Cequent, Inc., a wholly owned subsidiary of TNS. Key findings of the study were that: (1) Telephone Number Validation with STIR/SHAKEN does not drastically change consumer's behavior on whether they answer incoming calls; (2) 8 out of 10 people will not answer a call from an unknown number even when the Telephone Number has been validated by STIR/SHAKEN; and (3) consumers are equally likely to block an incoming call that has been validated by STIR/SHAKEN than a call that has not been validated. Key lessons learned from the study were that consumers found that displaying the identity of the caller and the purpose of the call were the key drivers in the consumer's decision whether to answer the call, that consumers did not adjust their call answering behavior when a Telephone Number Validation indicator was displayed, and that consumers are more likely to answer incoming calls when the name of the incoming caller is displayed and for which an analytics provider informs consumers about unwanted calls in addition to spoofed calls.

Finally, TNS expressed its desire to participate in stakeholder discussions at the FCC's upcoming SHAKEN/STIR Robocall Summit on July 11, 2019. TNS explained that at the SHAKEN/STIR Robocall Summit it can present insights on: (1) challenges to SHAKEN/STIR deployments faced by smaller voice service providers whose networks are not yet IP enabled, and lessons learned from helping small to medium size providers deploy SHAKEN/STIR through the TNS Call Guardian Authentication Hub; and (2) the effective use of the Call Guardian Authentication Hub to reduce spoofed robocalls and improve the consumer's calling experience.

This *ex parte* notification is being filed electronically with your office pursuant to Section 1.1206 of the Commission's Rules. Please do not hesitate to contact me with any questions or concerns.

Respectfully submitted,



Michael R. McCarthy  
SVP, Assistant General Counsel  
Transaction Network Services, Inc.

Attachment

cc (via email):

*Consumer & Governmental Affairs  
Bureau:*

Ed Bartholme, Associate Bureau  
Chief; Jerusha Burnett.

*Wireline Competition Bureau:*

Alex Espinoza; Connor Ferraro;  
Annick Banoun; Jordan Reth; Spencer  
Reeves; Meg Schumm; Kelsey Fayer;  
Rebecca Chambers; Pamela Arluk;  
Heather Hendrickson; and Mathew  
Collins.

*Office of Economics and Analytics:*

Grace Chuan

# Analytics Engine :: Big Data Solution, Real-Time Scoring

### TNS Network Data Sources

8XX Call Events CNAM

ENUM/LNP

SS7 Origination

VoLTE Registry

SIP Origination

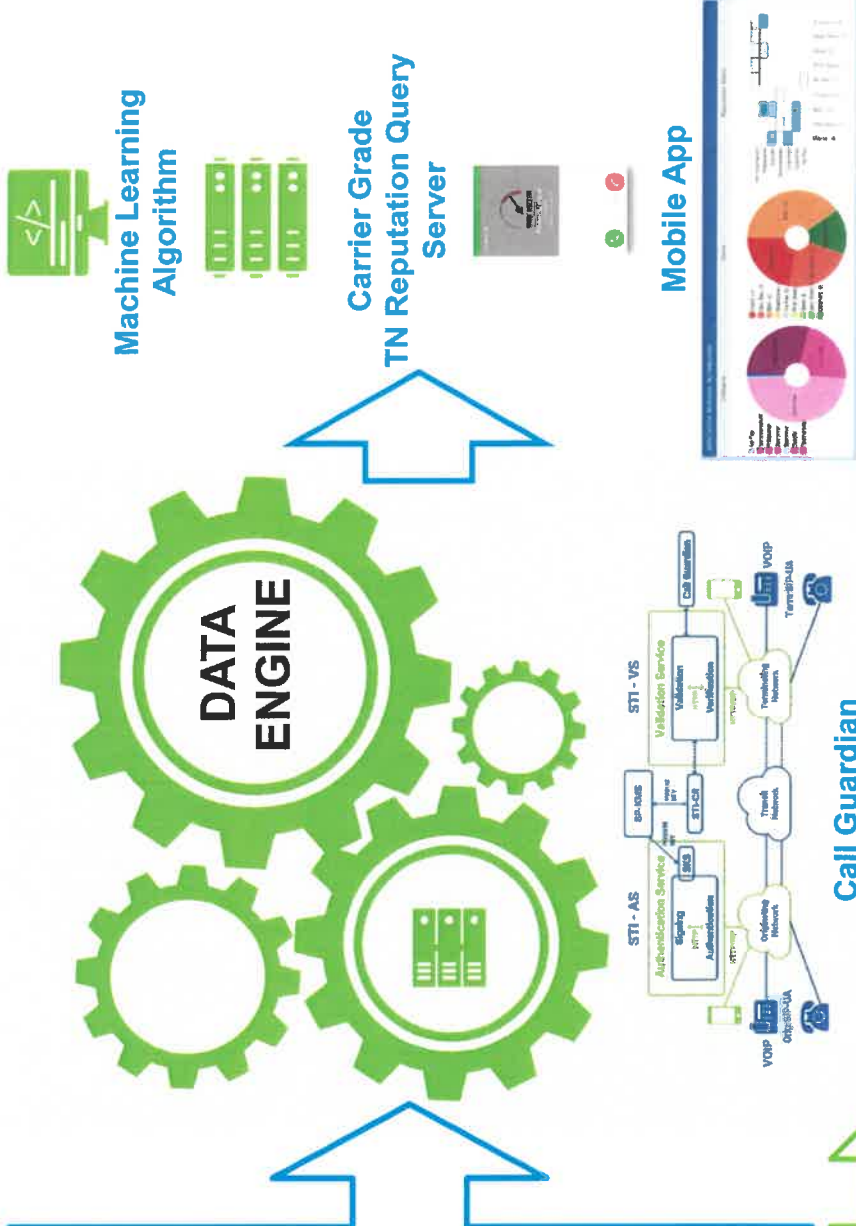
Crowd-Sourced Feedback

Carrier Partner Data

STIR/SHAKEN Inputs

Enterprise Data

**1B Signaling + Database Transactions Per Day from Over 500 Operators**



### Industry Databases

**One Connection - A World of Opportunities**



# Impacts of TN Validation on User Display

## Cequint User Study Findings

Presentation for the ATIS IP-NNI Task Force  
May 1<sup>st</sup>, 2019 – San Diego

Lavinia Kennedy  
[lkennedy@tnsi.com](mailto:lkennedy@tnsi.com)



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# Agenda

- Purpose of Study and Learnings
- Study Demographics
- Study Results
- Findings by Demographics
- Findings by Mobile Behavior
- Conclusion

Cequint has conducted a user study to gather user sentiment and the impact of;

## **Call Authentication on a user's trust and behavior**

for incoming calls and how it applies to various service offering of in-market call identification solutions.

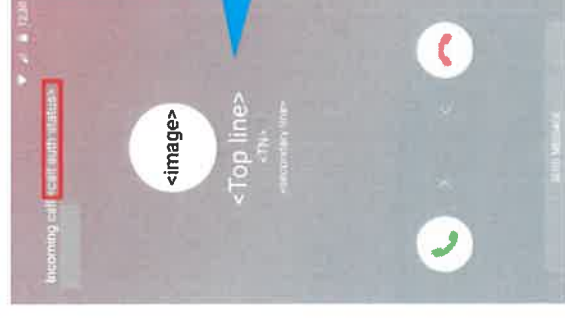
Cequint is a wholly owned subsidiary of TNS:

- Delivering Mobile Caller ID / Protection services since 2007 to all Tier 1 Mobile Operators
- Shipped software on over 550 Makes / Models
- 250M users have experienced our services with “tens of millions” active users per month

As a consumer service, understanding the user impact is imperative to our success

# Learnings

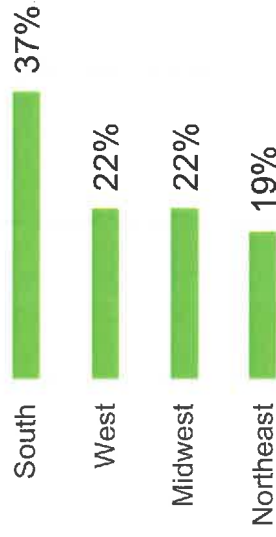
- ❑ Ability to display the identity of the caller and the purpose of the call was a key feature users were looking for
- ❑ Don't show anything related to TN Validation and rely on your analytics to mark calls as "bad"
- ❑ Be as discreet as possible when displaying the TN Validation indicator and be prepared to educate users in order to avoid care calls
- ❑ Users find Accuracy of Analytics important; STIR/SHAKEN puts additional pressure on the Analytics providers to correctly classify/tag the caller



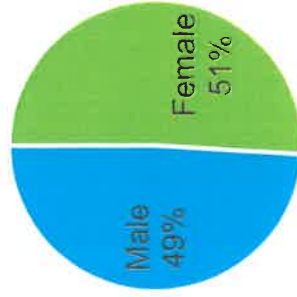
# Study Participant Demographic Profile

1,000 respondents were interviewed online

## US Region

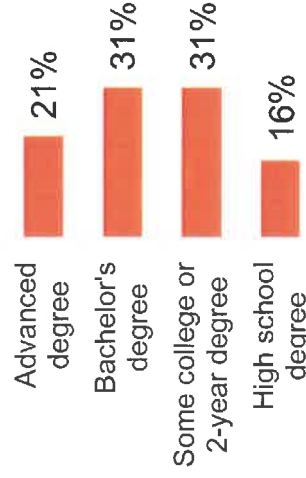


## Gender

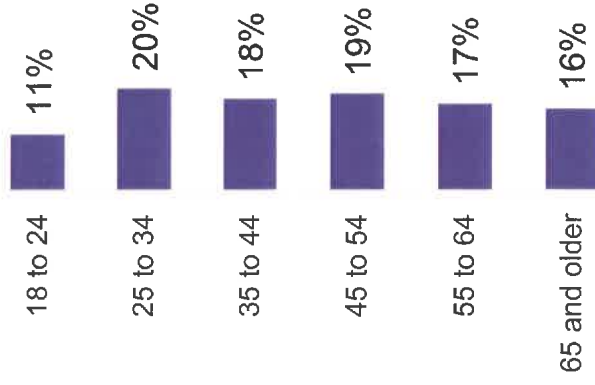


■ Female ■ Male

## Education Level



## Age



The average age of participants is 46 years old.

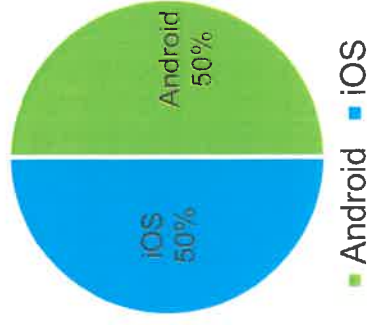
## Household Income



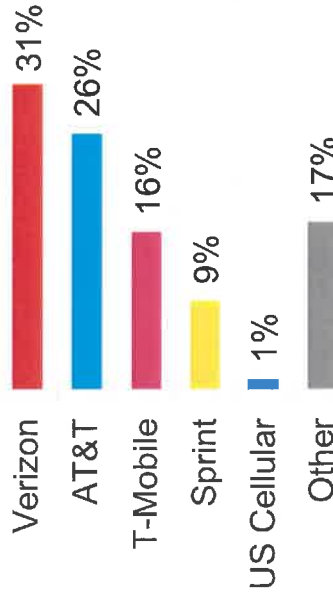
The average income for participants is \$64,000.

# Study Participant Mobile Profile

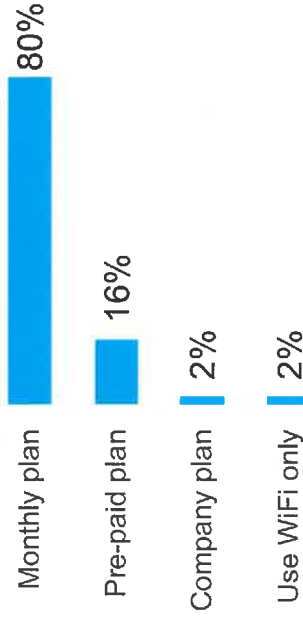
## Operating System



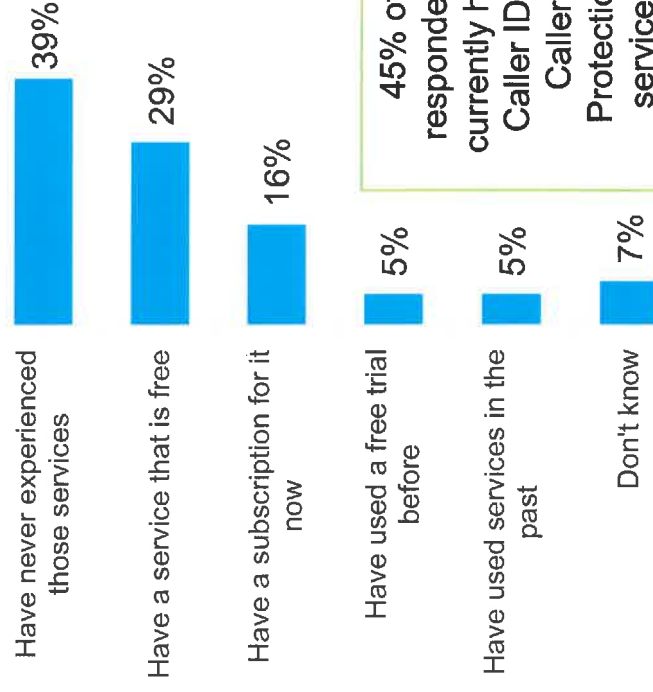
## Mobile Carrier



## Type of Plan



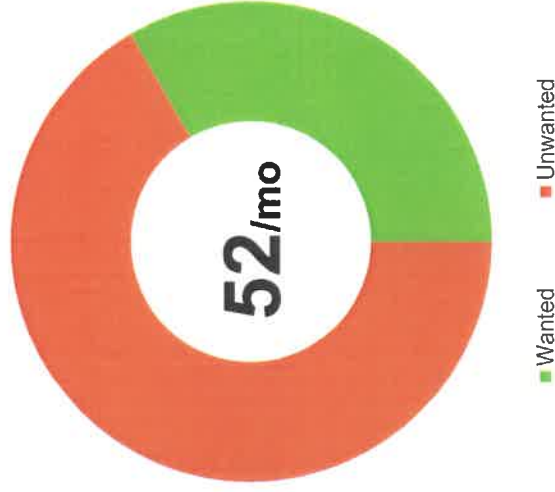
## Experience With Caller ID/Caller Protection Services



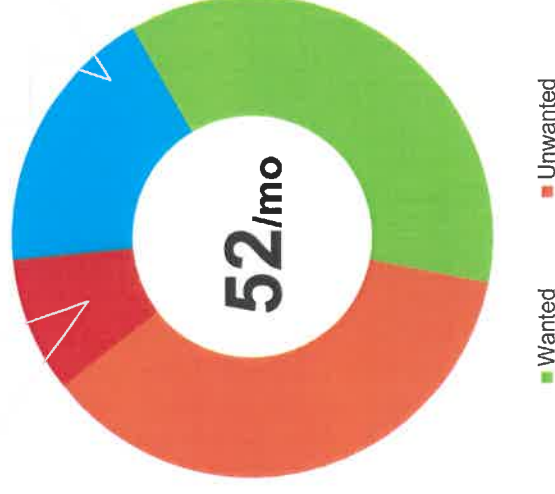
45% of respondents currently have Caller ID or Caller Protection services

# Background Data on Call Patterns

Callers not in contacts (unknown callers)



Unwanted Spoofed  
Calls



Unwanted Legitimate  
Calls

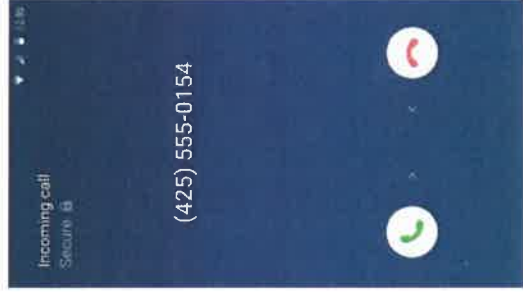
# Overview :: Baseline vs. TN Validation (Passed / Failed)

Baseline



Unknown caller w/  
phone information  
only

TN Validation Pass



Unknown caller w/  
TN Validation Passed  
icon and text

TN Validation Failed



Unknown caller w/  
TN Validation Failed  
icon and text

**Baseline:** Respondents were shown an incoming call screen (representing a call from an unknown number) with phone number only and asked about their sentiment towards the callers (e.g. trust) as well the likely actions they would take. (e.g. answer, block)

**TN Validation:** Respondents were shown an incoming call screen with Passed or Failed TN Validation information and asked the same questions.

**Likelihood to Answer Question:** When seeing this amount of information on the screen during an incoming call, how likely are you to answer the call on a scale from 1 to 5 where 1 means "not at all likely" and 5 means "very likely" to answer? (n=1,000)

**Likelihood to Block Question:** When seeing this amount of information on the screen during an incoming call, how likely are you to block the call on a scale from 1 to 5 where 1 means "not at all likely" and 5 means "very likely" to answer? (n=1,000)

**Trust Question:** What level of trust do you have in the person on the other line being who they say they are when you see this amount of information during an incoming call?

**Clarity Question:** When seeing the information shown above, how clear or confusing do you find this screen when trying to decide whether or not you should answer a call?

# Variations :: TN Validation Passed

Icon only



Text only



Text w/ Icon



Respondents were randomly shown various visual displays for **TN Validation Passed** on the incoming call screen.

Respondents were then gauged on the following:

- Perceived clarity of information shown
- Accuracy in determining what the visual display means

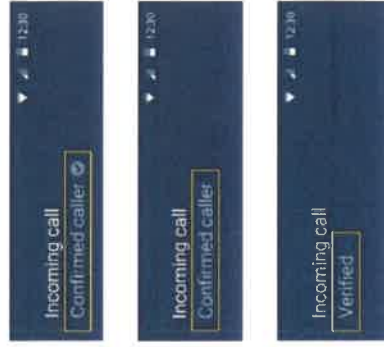
Accuracy Question: Looking at the section highlighted in yellow above, what does this icon mean to you? Please choose one.

Selections (shown in random order): i) Caller is **reputable**, ii) Caller is **safe to talk to**, iii) Caller's identity is **authentic and not falsified**, iv) Call connection is **secure**, v) other

Clarity Question: When seeing the icon highlighted in yellow in the image above, how clear or confusing do you find this specific icon when trying to decide whether or not you should answer a call?

# Observations :: Comparing TN Validation Displays

## Top display options



The combination of text and icon for "Confirmed caller" received the highest clarity and accuracy scores of all TN Validation Passed display options tested.

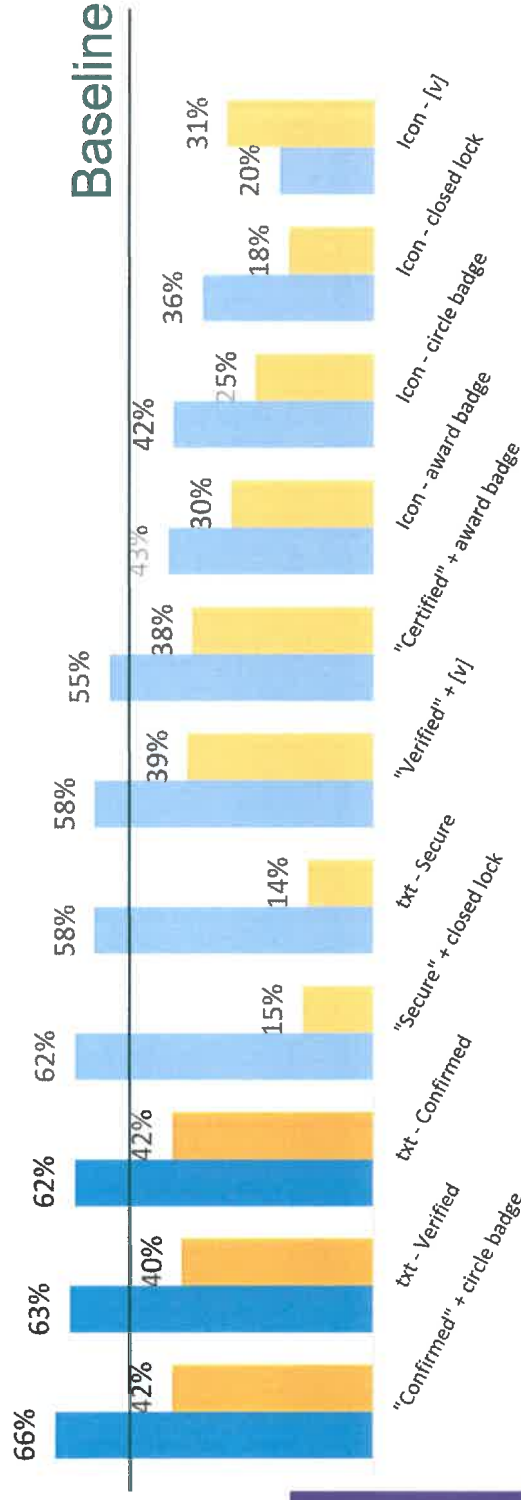
## Key Points

Respondents gave similar ratings on clarity and accuracy for most of the combination text & icon and the text only display options.

Exception is any display w/ the lock icon had the lowest accuracy out of all the options.

Clarity is marginally better than Baseline (no display).

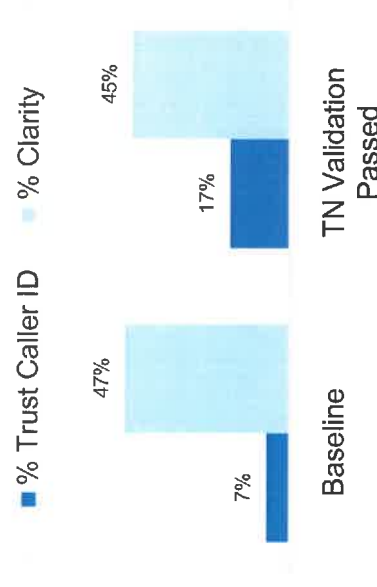
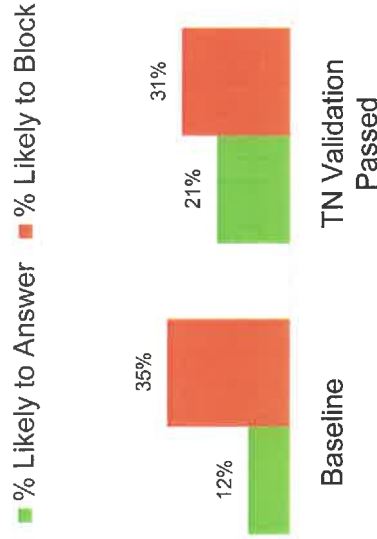
■ % Clarity ■ % Accuracy



# Observations :: Baseline vs. TN Validation Passed



Incoming call  
w/ TN Validation Passed



8 out of 10 people don't answer a call from an unknown number w/ **TN Validation Passed**.

Consumers are equally likely to block when **TN Validation Passed** is shown vs the baseline.

TN Validation Passed does not drastically change consumer's behaviors on incoming calls when compared to the baseline.

8 out of 10 people don't trust the caller even when they are **TN Validation Passed**.

Clarity does not improve with **TN Validation Passed** when compared to the baseline.

Key Points

# User Type: Basic (Free) Services w/ TN Validation

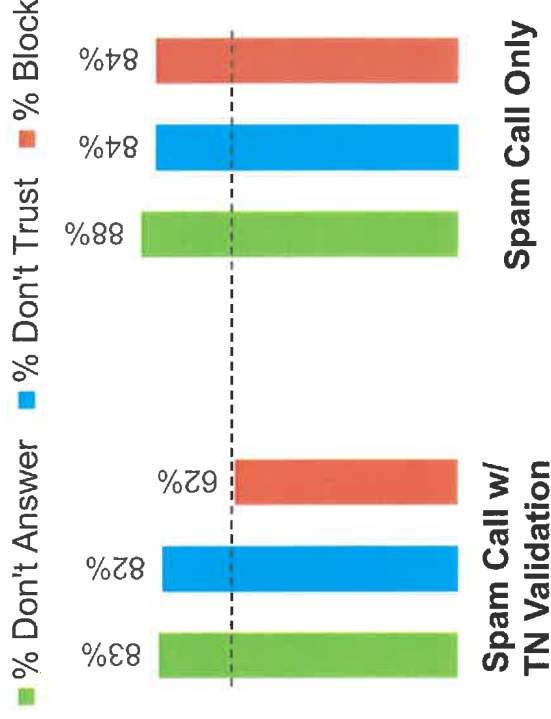
## Key Points



Spam call  
w/ TN Validation Passed

Spam call  
w/ No TN Validation

Analytics does a better job informing consumers about unwanted calls by detecting all types of Spam calls not just Spoofers calls. Consumer sentiments are stronger w/ Spam ID than TN Validation. TN Validation display w/ Spam ID provides no added value to consumers.



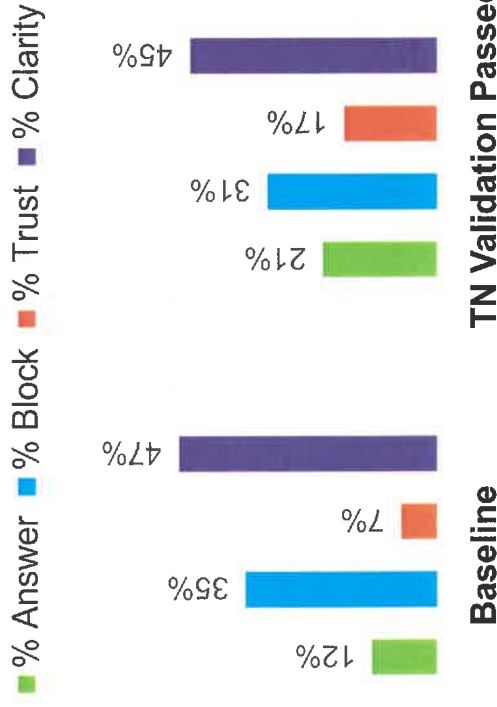
# User Type: Basic (Free) Services w/ TN Validation Passed



Transaction  
Network Services



Incoming call  
w/ TN Validation Passed



4 out of 5 wanted calls are likely to go **unanswered** w/ TN Validation Passed alone.  
3 out of 5 wanted calls are likely to be **blocked** w/ TN Validation Passed alone.  
TN Validation Passed doesn't shift consumer sentiment in any significant way when compared to the baseline. (i.e. no information is shown)

## Key Points

TN Validation Passed without enhanced caller identification does not add any real value to consumers.  
(majority of mobile consumers don't have an enhance caller ID service)

**Even with TN Validation Passed** display present, most consumers **do not trust the caller** nor are they likely to answer the call.

# User Type: Premium (Paid) w/ TN Validation



Incoming call  
w/ TN Validation Passed



Name ID Incoming call  
w/ TN Validation Passed

TN Validation  
Passed



with Name



■ Answer

■ Don't Answer

53% of calls are likely to be answered when name information is provide.

Consumers are 2.5x more likely to answer calls when **name** information is **provide**.

Consumers can better determine if a call is wanted when **name** information is **provided**.

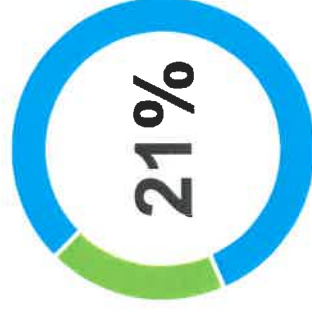
**TN Validation Passed adds little value** to consumers compared to displaying Name because it provides marginal value for the incoming call.

Key Points

# Missed “wanted” calls w/ Enhanced Caller ID



■ Wanted ■ Unwanted



■ Answer ■ Don't Answer

without Enhanced Caller ID



■ Answer ■ Don't Answer

with Enhanced Caller ID

79% of wanted calls are not likely to be answered;

- A child's school,
- A delivery of your wine,
- A hospital or ...



# Variations :: TN Validation Failed Display Variations

Icon only



Text only



Text w/ icon



Respondents were randomly shown various visual displays for **TN Validation Failed** on the incoming call screen.

Respondents were then gauged on the following:

- Perceived clarity of information shown
- Accuracy in determining what the visual display means

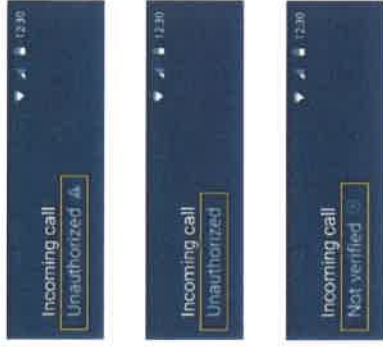
**Accuracy Question:** Looking at the section highlighted in yellow above, what does this icon mean to you? Please choose one.

**Selections (shown in random order):** i) Caller is reputable, ii) Caller is safe to talk to, iii) Caller's identity is authentic and not falsified, iv) Call connection is secure, v) other

**Clarity Question:** When seeing the icon highlighted in yellow in the image above, how clear or confusing do you find this specific icon when trying to decide whether or not you should answer a call?

# Observations :: Comparing TN Validation Failed Displays

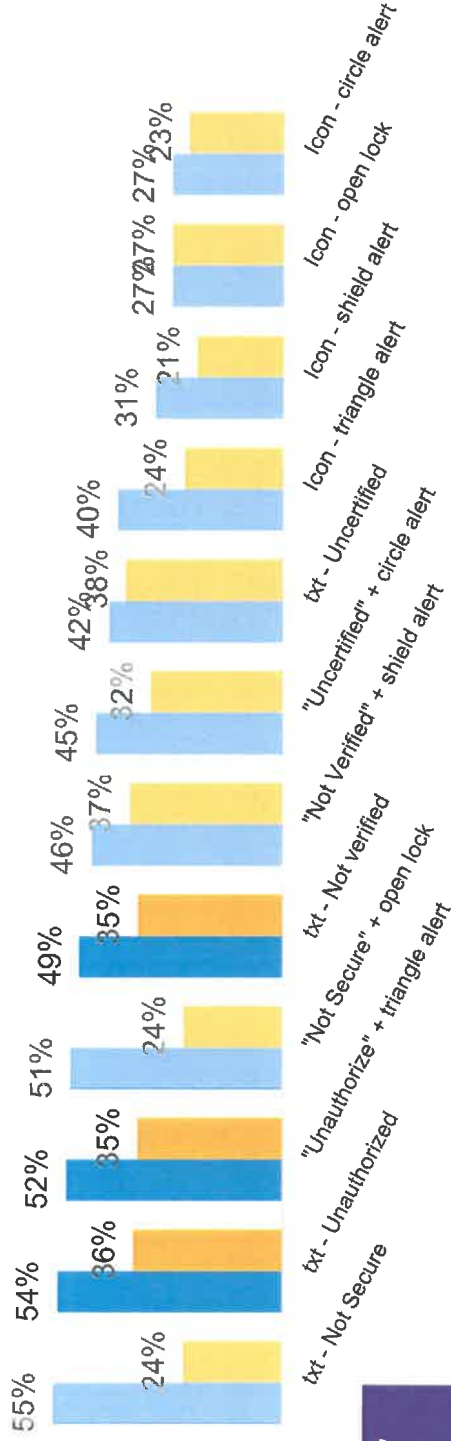
## Top display options



## Key Points

- People find TN Validation Failed display to be less clear than TN Validation Passed.
- Icon only display options had the lowest rating for clarity and accuracy.
- People found the "Not Secure" text display option to be the most clear but had the worst understanding of what it means.

■ % Clarity ■ % Accuracy



Display options w/ "Unauthorized" text received the overall highest ratings on clarity and accuracy.

# Observations :: Baseline vs. TN Validation Failed

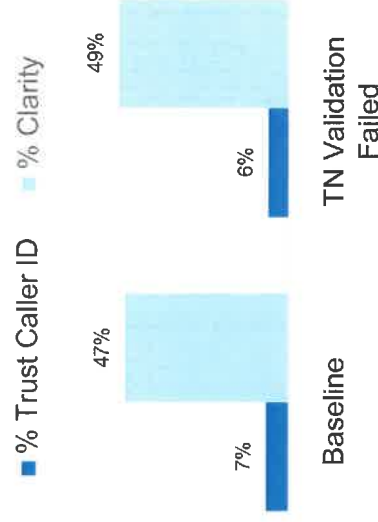
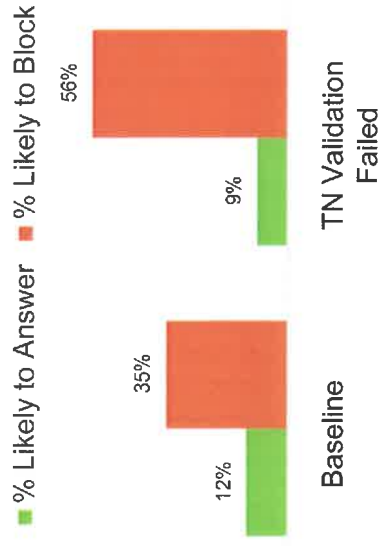


Transaction  
Network Services



Incoming call  
w/ TN Validation Failed

Key Points



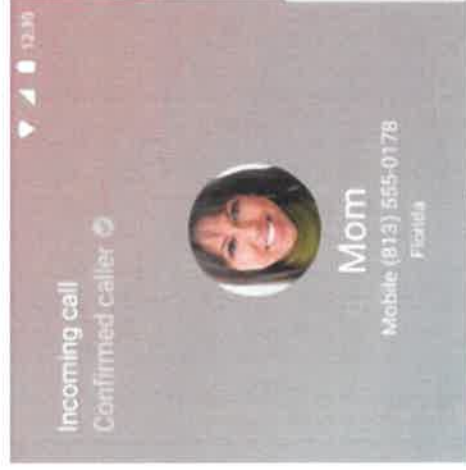
Likelihood to answer doesn't change significantly w/ TN Validation Failed information.

People are more likely to block when TN Validation Failed information is shown.

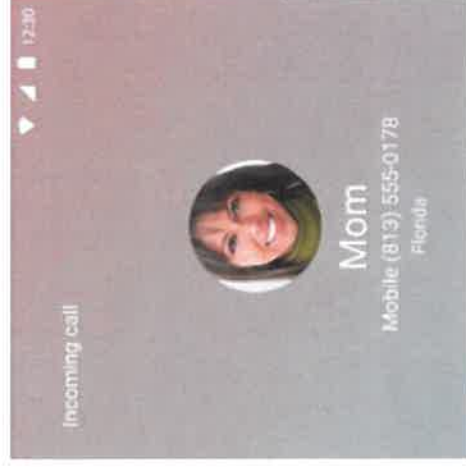
Trust and clarity sentiments remain the same w/ TN Validation Failed information when compared to the baseline.

TN Validation Failed information does not add significant value to the consumer compared to getting no information at all.

# User Type: All Users TN Validation w/ Consumer's Contacts



**Call from contact  
w/ TN Validation Passed**

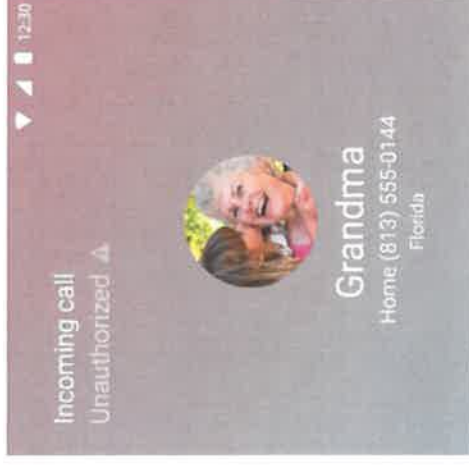


**Call from contact  
w/ TN Validation None**

6 out of 10 calls are likely to have **TN Validation** None information at all.

TN Validation with contact information is confusing. Consumers generally assume they can trust calls from people in their contacts and **TN Validation adds no value**.

*"If I see a call from mom, I'm most likely going to answer it whether or not the Confirmed Caller indicator is shown."*



TN Validation Failed for calls from contacts is very confusing to consumers. It's not clear to the consumer who is actually calling them or if they should answer or not.

# Interesting Findings by Demographics

When looking at the data based on the following groups, there were statistically significantly different behaviors based on demographics:

- Gender:
  - Males are more likely to answer calls and trust callers than females.
- Age:
  - Younger respondents (ages 18 to 35) are more likely to answer calls and trust callers than older respondents (age 55 and older)
  - Older respondents (age 55 and older) are more likely than younger respondents (age 18 to 35) to find enhanced ID information helpful
- Education:
  - Respondents with an advanced degree are more likely than other groups to trust callers are who they say they are.
- Income:
  - Those with a high household income (\$100,000 per year or more) are more likely than those with an income below \$100,000 per year to answer calls from unknown numbers and trust callers from unknown numbers.

# Interesting Findings by Mobile Behavior

When looking at the data based on the following groups, there were statistically significantly different behaviors based on mobile behaviors:

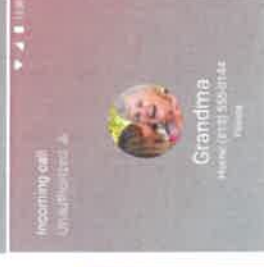
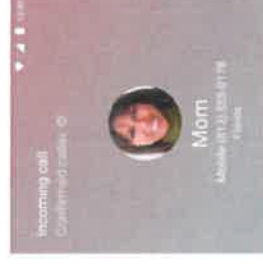
- Experience with Caller ID or Caller Protection Services:
  - Those with experience with Caller ID or Caller Protection services are more likely to answer calls, block calls, and trust callers than those with no Caller ID or Caller protection services experience.
- Receive unknown, but wanted calls:
  - Those receiving 10 or more unknown, but wanted calls per week are more likely to answer calls and trust callers on the other line than those who receive less than 10 unknown, but wanted calls per week.
- Receive unknown, unwanted calls:
  - Those receiving 10 or more unknown, unwanted calls per week are more likely to be interested in blocking calls than those receiving less than 10 unknown, unwanted calls per week.

# Conclusion :: Carrier Specific Display Rules

negative

Reputation of TN

positive

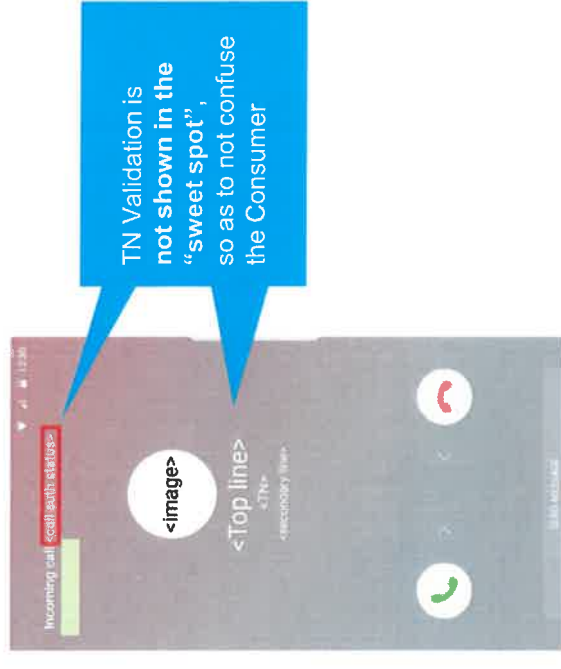


## Key Points of Consideration:

- Users did not adjust behavior w/ or w/o TN Validation displayed
- Users found analytics more important than TN Validation
- Ability to display the identity of the caller and the purpose of the call was a key feature consumers were looking for
- Carriers take on greater cost when consumers are confused (i.e.; calls to care), so education is required for any new display – icon or text
- Each provider has a different Analytics Scoring approach, requiring a unique display strategy per Carrier

## Conclusion :: Learnings

- ❑ Ability to display the identity of the caller and the purpose of the call was a key feature users were looking for
- ❑ Don't show anything related to TN Validation and rely on your analytics to mark calls as "bad"
- ❑ Be as discreet as possible when displaying the TN Validation indicator and be prepared to educate users in order to avoid care calls
- ❑ Users find Accuracy of Analytics important; STIR/SHAKEN puts additional pressure on the Analytics providers to correctly classify/tag the caller



# Thank You!



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