Texting with Toll-Free Numbers

Old-School Market Failure Plagues a New-Age Market

a QSI Consulting Exploratory Paper

Toll-Free telephone numbers have allowed businesses to pay the long-distance fees of their customers for more than half a century.[1] This simple *reversal-of-charges* concept established Toll-Free numbers as a primary means by which businesses communicate with their customers.

Initially, the 800 area code hosted all Toll-Free numbers and was synonymous in the public lexicon with a Toll-Free call. However, as the popularity of Toll-Free calling accelerated over time, new area codes were required and 888, 866, 877, 855, and others were added to the mix. Today nearly 48 million Toll-Free numbers are available to the market with more than 41 million of those numbers in use.[2]

As technology advances, businesses are using Toll-Free numbers for more than voice conversations. For example, recent advancements have paved the way for text messaging to Toll-Free numbers. Recognizing consumers' strong preference for the ease and convenience of text messaging, the communications industry has been keen to advance text messaging across technologies—text messaging is not just for mobile phones anymore. *With Toll-Free numbers already positioned to facilitate commercial relationships, texting with Toll-Free numbers is the next logical step in texting's cross-technology transition*.

While texting across multiple technologies is an accelerating trend, the vast majority of text messages still originate from or terminate to mobile devices. As such, mobile devices continue to drive the text-messaging marketplace, and the nation's four largest mobile phone companies (who serve nearly 100 percent of mobile subscribers) are the *de facto* gatekeepers.

AT&T, Verizon, Sprint, T-Mobile, and other mobile carriers use third-party *aggregators* to manage traditional text messages exchanged between mobile devices on their wireless networks. A text from an AT&T mobile customer to a Verizon mobile customer is generally forwarded to Syniverse[3] or SAP,[4] who then routes the text message to the intended network for completion. Aggregators provide an efficient and flexible system, bypassing the need for every mobile wireless carrier to be directly connected to every other carrier for text

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[1] *Brief History of Toll-Free Numbers*, available at: http://www.tollfreenumbers.com/blogs/guide-2/brief-history-of-Toll-Free-numbers.html (04/21/2007).

[2] SOMOS (formerly SMS/800, Inc.).

[3] https://www.syniverse.com/

[4] http://go.sap.com/product/technology-platform/sms.html

completion. There are multiple aggregators facilitating mobile-to-mobile text messages, and the market structure (e.g., rates, terms, and conditions for exchanging texts) is relatively mature.

Even for texts to or from regular, traditional wireline telephone numbers (a relatively new but increasingly popular market), the system works generally the same way. Text messages to or from wireline phone numbers enjoy the benefit of multiple aggregators and relatively stable and reasonable rates, terms, and conditions for exchanging text messages. *The same is not true for the Text to Toll-Free (TTF) marketplace.*

TTF is unique in that the nation's largest mobile carriers use a single aggregator, Zipwhip, Inc., to manage practically 100 percent of the TTF traffic to and from their subscribers. In other words, anytime a mobile subscriber in the United States sends a text message to a Toll-Free number or a business uses its Toll-Free number to send a text message to a mobile subscriber, those text messages are routed solely through Zipwhip more than 99 percent of the time. Importantly, Zipwhip also competes with other TTF providers in the retail market.

This unique decision on the part of the mobile carriers appears to have caused major problems in the emerging TTF marketplace, including blocked text messages, substantial price increases, and slowed innovation.

Further, industry guidelines applicable to Toll-Free texts[5] are being ignored, and the Toll-Free industry's neutral-third party registry, specifically designed to ensure security and interoperability, is being bypassed.[6] *Not surprisingly, Zipwhip's unique role as exclusive TTF aggregator as well as retail Toll-Free text provider also leads to anti-competitive behavior*.[7]

The market failures described above are similar to the state of the landline market in the mid-1990s before Congress and the FCC intervened. And the root of the problem is exactly the same—market power. When the five largest mobile wireless carriers, who control more than 99 percent of the mobile subscriber marketplace, choose unanimously (and almost simultaneously) to use a single aggregator for all TTF traffic, they bestow their cumulative market power on that single aggregator (in this case, Zipwhip). History has shown us time and again market power of that magnitude will be abused.

Toll-Free Texting Holds Great Promise

Toll-Free numbers serve as a vital link between businesses and consumers. Not only do most consumers associate Toll-Free numbers with business rather than personal use, but businesses also often spend substantial monies incorporating their Toll-

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[5] CTIA – Everything Wireless®, *SMS Interoperability Guidelines*, Version 3.2.2, effective January 1, 2015.
[6] Id., Section 4.4.
[7] Throughout this whitepaper the term "Toll-Free text provider" is used to describe the non-Commercial

Mobile Radio Service ("CMRS" – the technical description for mobile carriers) providers of Toll-Free text messages, sometimes referred to as over-the-top ("OTT") text providers.

Free numbers directly into their marketing campaigns.

Many people know by heart the catchy jingle for Empire Carpet: "800-588-2300, Em-*pire*!" And most of us who travel regularly pick up the phone and dial Southwest Airlines from memory: 1-800-I FLY SWA.

A recent survey shows that 33 percent of small businesses, 78 percent of medium-sized businesses, and 90 percent of large businesses utilize one or more Toll-Free numbers.[8] Today, those numbers are not used for just voice conversations. Toll-Free numbers are now regularly used to both send and receive text messages.

Texting with Toll-Free numbers is relatively easy. Indeed, for the mobile subscriber, no discernible difference exists between sending a text to a Toll-Free number and texting another mobile subscriber.
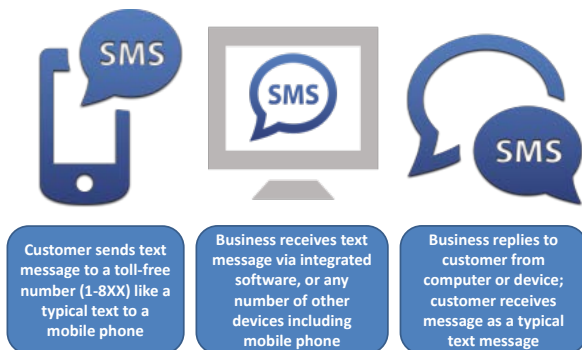
Text messaging, regardless of the telephone number being used, is one of the most prolific forms of electronic communication in the world today. In 2015, more than *two trillion* text messages (SMS/MMS) were exchanged in the U.S. alone.[9]

There is no doubt that the convenience of communicating via text message is a major driver in text messaging popularity:

- The average person responds to a text in 90 seconds (compared to 90 minutes for an email).

- 90 percent of all text messages are read within three minutes of their delivery.

- Text messages are read on average in less than five seconds.[10]

- Overall, 80 percent of US mobile customers prefer texting as a primary means of communication.[11]

- Nearly 92 percent of US adults have mobile phones capable of sending and receiving text messages.

How Toll-Free Texting Works

Customer sends text message to a toll-free number (1-8XX) like a typical text to a mobile phone	Business receives text message via integrated software, or any number of other devices including mobile phone	Business replies to customer from computer or device; customer receives message as a typical text message

[8] *Connecting with text: The shift to landline and Toll-Free business texting,* AT&T Market Survey (January 2016) (hereafter, "AT&T 2016 Market Survey"). Available at: https://www.business.att.com/content/whitepaper/business-texting-market-survey-report.pdf.

[9] Texting volumes taken from CTIA's *Annual Survey Report for Year-End 2015. "*SMS" stands for Short

Message Service and "MMS" stands for Multimedia Messaging Service.

[10] *45 Texting Statistics That Prove Businesses Need to Take SMS Seriously.* Available at: https://onereach.com/blog/45-texting-statistics-that-prove-businesses-need-to-start-taking-sms-seriously/ (09/10/2015) (hereafter "OneReach 2015 Toll-Free Text Statistics").

[11] AT&T 2016 Market Survey.

- 98 percent of US smartphone users utilize text messages on a regular basis.[12]

As text messaging evolves from a predominately personal communications medium to an effective commercial tool, businesses are gearing up to send and receive. This includes text-enabling the same Toll-Free numbers on which they have relied to communicate with customers for decades.

The benefits of text-enabled Toll-Free numbers for consumers and businesses are virtually endless. For example, every air traveler is familiar with the frustration involved in a cancelled flight. You call your airline, wait on hold, and eventually speak with a customer service representative— oftentimes while in a crowded and noisy airport. Hold times are infamous for frustrating consumers and harming a business's reputation.[13] Text-enabled Toll-Free numbers can make this process notably simpler (and less stressful): simply respond to a text message sent from your airline via its trusted 800 number and reschedule via a return text.

Another example involves quick resolutions to time-sensitive activity. Did you just remember that today is your significant other's birthday? Send a text message with all necessary information to 1-800-Flowers to have a bouquet of flowers delivered with minimal time and effort.

It was recently reported that 97 percent of businesses using text-enabled Toll-Free numbers found that communicating with customers was more efficient using text messaging.[14] Yet, only 14 percent of companies regularly communicate with customers via text,[15] and as of mid-2015, roughly 98 percent of Toll-Free numbers in use in the US were *not* text-enabled.[16] The simple conclusion is as follows: *There is substantial room for growth in the TTF marketplace*.

Disruption in the TTF Marketplace

The telecommunications industry involves literally thousands of carriers, cooperating to ensure telephone calls get from one caller to another. These include mobile carriers, traditional wireline carriers, Voice over Internet Protocol ("VoIP") providers, and hundreds of unique and interesting hybrid participants that foster astounding innovation. While each participant pursues its own unique business and technological interests, the market is governed by transparent and enforceable rules and guidelines that ensure reliability in consumer communication.

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[12] AT&T 2016 Market Survey.

[13] See, e.g., *Fortune,* "American Airlines left passenger on hold for 6 hours," March 4, 2015. Available at: http://fortune.com/2015/03/04/american-airlines-hold/

[14] AT&T 2016 Market Survey.

[15] AT&T 2016 Market Survey.

[16] Chatterjee, Koeli. *Get more out of your Toll-Free and landline numbers…Use it for Texting Too!* Available at: http://onehop.co/blog/use-Toll-Free-landline-numbers-for-texting/ (06/06/2016).

The voice market also depends on non-carrier vendors and third-party administrators for signaling, telephone number access, number portability, routing, and numerous other functions critical to providing voice service.

If a wireline carrier refuses to follow the industry's telephone number assignment guidelines when assigning telephone numbers or ignores the Local Exchange Routing Guide (LERG), calls are not likely to be properly routed. Further, Number Portability Administration Center (NPAC) guidelines and the SMS/800 registry ensure calls are securely delivered to the party to whom they are intended. *And FCC rules dictating interconnection and traffic exchange guidelines ensure that calls between carriers can be reliably exchanged at reasonable rates. If carriers ignore these guidelines, calls fail and consumers suffer*.

Though less mature than the voice market, the mobile-to-mobile text message market (i.e., texts between mobile carriers) appears to function well outside federal or state regulation. For example, mobile-to-mobile text messages flow rather seamlessly, even when the sender and receiver are served by two different mobile providers. Yet, these exchanges are fostered by well-established inter-carrier vendors, inter-carrier compensation arrangements between participants of relatively equal bargaining power, and commonly accepted industry-established interoperability guidelines and standards.

When a mobile customer sends a text message to another mobile customer using a different provider, the text is routed through one of a number of neutral, third-party aggregators[17] (*e.g.*, SAP and Syniverse). These aggregators provide the mobile carriers with neutral points of interconnection for purposes of exchanging text messages. The system works well, in part, because (a) market participants can choose their trusted exchange partner from among multiple aggregators, and (b) the economics of the market are well-established, typically requiring the sending party to pay a small fee to the aggregator. As a result, consumers enjoy the benefits of

SMS Text — Neutral 3rd Party Exchange Gateways — SMS Text

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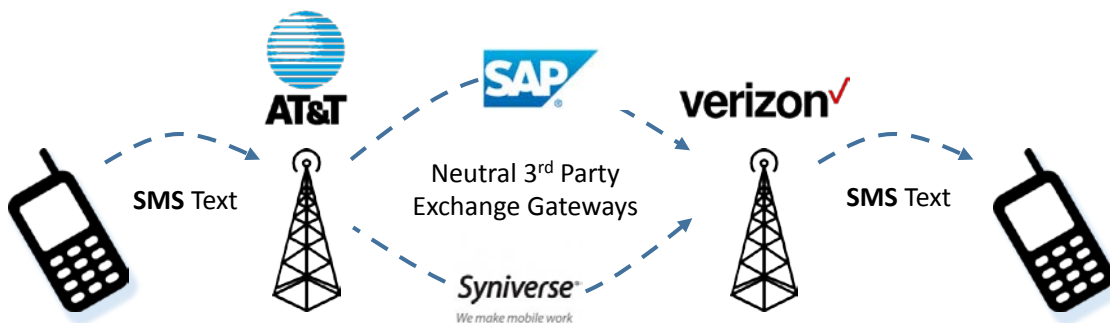
[17] The term *aggregator* in this white paper refers to a company that interconnects with one or more mobile companies and is a middleman between Toll-Free text message providers and mobile companies.

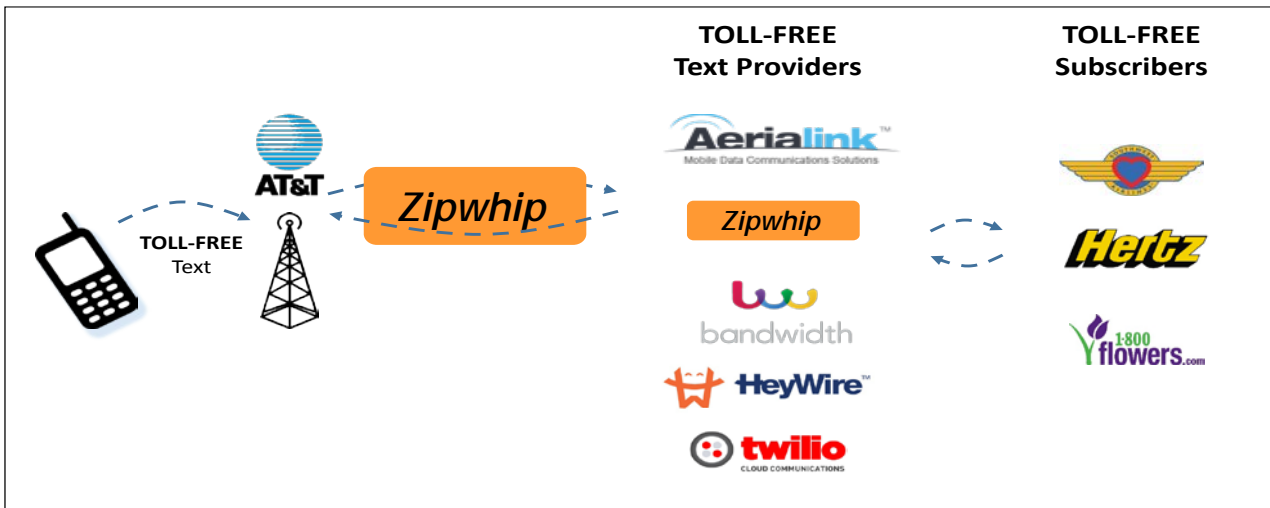|	verizon✓	AT&T	T··Mobile	Sprint	U.S.Cellular	TOTAL
Millions of Connections	136.6	123.9	58.9	57.7	4.8	382.3
Market Share (Connections)	35.7%	32.4%	15.4%	15.0%	1.2%	99.7%
Billions in Revenue	$72.6	$61.0	$22.3	$27.9	$3.3	$187.7
Market Share (Revenue)	38.7%	32.5%	11.9%	14.9%	1.8%	99.8%

Source: FCC Wireless Competition Report, WT Docket No. 15-125, released 12/23/2015; Connections as of 06/30/2015, Table II.B.1; Revenues for YE2014, Tables II.C.1 and II.C.2.

inexpensive texting—even with customers of different mobile carriers (generally at unlimited volumes).

The same cannot be said for the Text-to-Toll-Free market. From 2014 to 2015, the five largest U.S. mobile companies, who collectively serve virtually 100 percent of the wireless market, contracted with a single company—Zipwhip, Inc.—for handling text messages involving Toll-Free numbers.[18] Under this arrangement, the mobile companies have agreed to send all text messages destined for Toll-Free numbers (i.e., mobile-originated texts) through Zipwhip and have also agreed to accept text messages from Toll-Free numbers (i.e., Toll-Free–originated texts) from only Zipwhip.

The arrangements between the mobile providers and Zipwhip created a *de facto* monopoly provider for Toll-Free texts to and from roughly 100 percent of the nation's mobile subscribers. *Not surprisingly, what followed was textbook monopoly behavior—i.e., higher prices, less innovation, and*

TOLL-FREE Text Providers

TOLL-FREE Subscribers

AT&T — TOLL-FREE Text — Zipwhip

Aerialink — Mobile Data Communications Solutions

Zipwhip

bandwidth

HeyWire

twilio — CLOUD COMMUNICATIONS

Hertz

1-800 flowers.com

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[18] See, *e.g.*, SOMOS Notice of Ex Parte, WT Docket No. 08-7 (04/26/2016) ("struck deals with the five largest wireless carriers that requires all texting to Toll-Free numbers to be routed through Zipwhip…") Zipwhip states that it is directly connected with 17 total mobile operators in the United States. See, Zipwhip presentation to the FCC, WT Docket No. 08-7 (04/21/2016).

anticompetitive business practices aimed at leveraging the combined market power of the five largest mobile carriers to the benefit of the mobile companies themselves and Zipwhip.

Importantly, the TTF market appears to have functioned well in its relative infancy prior to the introduction of Zipwhip. However, on April 3, 2014, a problem was encountered in which text messages between Toll-Free text providers and Verizon simply stopped. Reports indicate no prior warning and no error (or "non-deliverable") messages. The Toll-Free text messages between Verizon and the Toll-Free text providers simply disappeared into a virtual black hole.[19]

According to Gene Lew, Chief Technology Officer of Toll-Free text provider Heywire, someone simply "turned the switch off."[20] Apparently, even Verizon's network engineers were unaware of Verizon's shift in Toll-Free texting procedures, initially reaching out to Heywire and others, inquiring about the text message blackout.[21] After scrambling to discover the root cause of the problem, Toll-Free text providers were

ultimately notified by Verizon that all texts to Toll-Free numbers would now be routed via an alternative messaging aggregator— Zipwhip (a company with whom none of the Toll-Free text providers had connectivity or any prior business dealings and with whom they soon discovered was competing with them in the retail TTF market).[22]

Ultimately, all major mobile providers shifted to this strategy and blocked Toll-Free number ranges such that all texts to Toll-Free numbers had to be rerouted through Zipwhip.[23]

Signs of Market Failure

Toll-Free text providers initially approached the mobile carriers directly, asking to interconnect without the need to aggregate through Zipwhip or to establish interconnection similar to that afforded to Zipwhip. The mobile carriers denied those requests.[24] As a result, Toll-Free text providers were forced into commercial agreements with Zipwhip in order to receive or send Toll-Free text messages.[25] According

[19] McMillan, Robert. Wired Online. *A New Net-Neutrality Battle Brews Over…Text Messages.* (12/03/2014). Available at: http://www.wired.com/2014/12/fcc-sms/.

[20] *Id*.

[21] Heywire Letter to FCC, WT Docket No. 08-7 (12/21/2015).

[22] *See, e.g.,* Twilio, Inc. Petition, WT Docket No. 08-7 (08/28/15), p. 8.

[23] *See* Twilio, Inc. *Notice of Ex Parte*, WT Docket No. 08-7 (05/02/2016), indicating that Verizon, AT&T, T-Mobile, and US Cellular blocked Toll-Free number ranges and re-routed SMS texts to a single Toll-Free

aggregator thereby forcing Toll-Free text providers into commercial agreements with Zipwhip.

[24] SOMOS *Notice of Ex Parte,* WT Docket No. 08-7 (04/26/16).

[25] Twilio, Inc. Reply Comments, WT Docket No. 08-7 (12/21/2015), pp. 10-11 ("In other words, Verizon unilaterally and without notice re-routed traffic to its kick-back vendor, knowing Twilio and others would have to connect with this entity if Twilio wanted to restore traffic flows, after it figured out what was happening…Once the ransom was paid, Verizon got its share, and the traffic flowed once more.") Industry stakeholders report that actual contracted terms are

to the text providers, no other option existed; Zipwhip had been established by the mobile companies as the gatekeeper for virtually all Toll-Free texts. They had to make a deal with Zipwhip to survive.

Market power is generally defined as a participant's ability to sustain prices above competitive levels.[26] However, another equally damaging aspect of market power is the ability to increase the costs of competitors, thereby limiting their ability to exert competitive pressure on prices more generally.[27] Where market power exists unilaterally, markets do not operate effectively, and consumers suffer. Highly concentrated markets (i.e., markets where few participants control substantial market share) lend themselves to the exercise of market power.[28]

Acting in unison, the five largest mobile carriers in the US require that all text messages either to or from a Toll-Free number be exchanged through Zipwhip. As a result, Zipwhip controls more than 99 percent of the TTF market. With this information in mind, it is not surprising that competing market participants can identify numerous and systematic failures within the market.

Prices for Exchanging Texts with Mobile Carriers Have Substantially Increased via Zipwhip

For mobile-to-mobile texts between carriers, the carrier whose customer sends a text is generally obligated to pay the carrier delivering the text a small fee. The same arrangement existed for texts to Toll-Free numbers before 2014.

With the introduction of Zipwhip, not only did per-message fees increase by more than three times, but also Toll-Free text providers (who are not mobile carriers) *were, for the first time, required to pay to both send and receive Toll-Free text messages*.[29]

While inter-carrier compensation rates generally vary based on volume, some Toll-Free text providers report price increases between six- and fifteen-fold.

Inter-carrier compensation rates in the non-Toll-Free text message marketplace typically register between $0.0015 and $0.002 per text (or as low as 0.0005 per text for significant volume). Toll-Free text messaging companies report that rates for Toll-Free texts can be as much as $0.006 for both originating and terminating texts, or more

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confidential and protected, at Zipwhip's request, by non-disclosure agreements.

[25] *See* Krattenmaker, Lande and Salop. The United States Department of Justice, "Monopoly Power and Market Power in Antitrust Law*." (1987).

[26] *See* Krattenmaker, Lande and Salop. The United States Department of Justice, "Monopoly Power and Market Power in Antitrust Law*." (1987).

[27] *Id*., Section III, *Toward a More Precise Definition*.

[28] *See*, *e.g.*, Horizontal Merger Guidelines, U.S. Department of Justice and Federal Trade Commission, § 2.1.3 ("The Agencies give weight to the merging parties' market shares in a relevant market…Mergers that cause a significant increase in concentration and result in highly concentrated markets are presumed to be likely to enhance market power…")

[29] SOMOS Notice of Ex Parte, WT Docket No. 08-7 (04/26/16) ("Significantly raised prices for *originating and terminating* messaging traffic…" emphasis added.)

than 10 times more expensive than texts exchanged between two mobile companies.

Although numerous market participants with substantial experience in the industry were consulted, none was found who believed that an aggregator's cost of exchanging a Toll-Free text is more costly than exchanging a non-Toll-Free text. *The clear opinion is that any price differences between exchange rates paid by Toll-Free texting companies and rates for non-Toll-Free texts is solely a result of the market power bestowed upon Zipwhip by the mobile providers*.

This paper further delineates the revenue-sharing motive that likely drives mobile carriers to perpetuate the market failures discussed above. One important aspect of that arrangement is that mobile providers do not generally subscribe to Toll-Free numbers nor do they assign them to their mobile customers. As a result, they are generally insulated from the increased costs imposed by Zipwhip on Toll-Free texts. The market participants most heavily taxed by inflated Toll-Free text exchange rates are third-party providers, such as Twilio, Aerialink, and Heywire, who develop texting applications for business and non-profit organizations.

Texts are Being Blocked

One of the fundamental expectations of a text-messaging customer is that texts he or she sends will be delivered to the intended recipient. Conversely, text-messaging customers expect to receive texts that have been sent to them. When it comes to texts to Toll-Free numbers, however, that expectation is not always met.

Evidence indicates tens, if not hundreds, of millions of text messages are being blocked each year. In most cases, no warning is given that blocking will occur and wireless subscribers typically do not receive notice that their TTF messages have gone undelivered.

> More than
> # 53,000,000
> lawful text messages blocked between January and July 2016.
>
> Source: Twilio, Inc. Notice of Ex Parte, WT Docket No. 08-7, August 11, 2016.

No way exists to independently corroborate the total number of Toll-Free texts blocked. Zipwhip does not provide notification when a text message fails.[30] Further, if someone happens to discover a message was blocked, it can be extremely difficult to determine who actually blocked the message, making resolution of the issue unnecessarily complicated if not impossible. Text messaging provider Twilio explained the difficulty:[31]

> If Twilio asks the wireless carrier why it is blocking the traffic, Twilio is told by the wireless carrier it's not blocking the traffic, the aggregator (it told to) is, so Twilio needs to talk to the aggregator. When

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[30] *See*, *e.g.*, Twilio Petition, WT Docket No. 08-7 (08/28/2015), pp. 2, 8 ("…such blocking of messaging services traffic that uses ten-digit numbers often occurs without any warning to the subscriber and with

no explanation as to how the content is in any way objectionable.")
[31] See, *e.g.*, Twilio, Inc. Petition, WT Docket No. 08-7 (08/28/15), p. 10.

Twilio talks to the aggregator, Twilio is told to talk to the wireless carrier. This is clearly a deliberate circle to nowhere…

No matter who is responsible for blocking Toll-Free text messages, consumers and competitors pay the price. Consumers (including Toll-Free subscribers)[32] are unable to communicate in a manner consistent with their reasonable expectations. Competitors, on the other hand, have difficulty building confidence in their Toll-Free texting products because they have no control over when their customers' texts may simply fail to arrive.

Business Reputations Harmed Due To Blocking

- Thousands of outbound text messages of Dispatch Technologies – workforce management company – blocked without notification. *Source:* Dispatch Technologies Letter to FCC, WT Docket No. 08-7.
- Text messages of FourSquare Labs – a travel application company – blocked without notification; 100% blocking at times. *Source:* FourSquare Labs, Inc., Nov. 16, 2015 Letter to FCC, WT Docket No. 08-7.
- Text messages of Peach Labs, Inc. – a lunch delivery company – blocked. *Source:* Peach Labs, Inc., Oct. 29, 2015 Letter to FCC, WT Docket No. 08-7.
- Text messages of Inbox Health – a healthcare appointment and payment application – blocked without notification; doctor appointments missed and missing payments. *Source:* Inbox Health Aug. 23, 2016 Letter to FCC, WT Docket No. 08-7.
- Text messages of Slade Barbershop blocked; Barber-Q reservation application won't work. *Source:* Slade Barbershop Letter to FCC, WT Docket No. 08-7.

Public safety can also be affected, and the reputations of numerous commercial enterprises have taken a hit. Even education

has been negatively affected by the unilateral blocking of text messages.[33]

Remind 101, Inc., is a popular application that uses text messaging to send homework and assignment reminders, and other messages from teachers to students. According to Remind, more than 150,000 teacher-student interactions per day are being disrupted due to text-message blocking, with a blocking rate of 100 percent for some types of correspondence.[34] Importantly, the text messages being blocked in these examples are those that the customer has explicitly agreed to receive.

Refusal to Follow Their Own Industry Guidelines

In late 2014 and early 2015, CTIA – *Everything Wireless®* (the wireless industry's national trade association) amended its *SMS Interoperability Guidelines*. The new version:

"incorporates [and refines] guidelines for text-enabling toll-free voice telephone numbers, developed in conjunction with SMS/800, the U.S. registrar for toll-free telephone numbers."[35]

These amendments were intended to enhance interoperability in the TTF marketplace by imposing three primary requirements:

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[32] "Toll-Free Subscriber" is defined in 47 C.F.R. 52.101(e) as "The entity that requests a Responsible Organization to reserve a Toll-Free number from the SMS database."

[33] Mobile wireless carriers blocked text messages to a victim of a violent assault about a prisoner release. See, Aerialink Letter to FCC, WT Docket No. 08-7 (05/04/2016). Blocking messages can also slow

response times of first-responders in life-or-death situations. See, Trekmedics Letter to FCC, WT Docket No. 08-7 (11/17/2015). See also, Remind Letter to FCC, WT Docket No. 08-7 (11/19/15).

[34] Remind 101, Inc. Letter to FCC, WT Docket No. 08-7 (11/19/15).

[35] CTIA *SMS Interoperability Guidelines*, Version 3.2.2 (01/01/15), § 1.5

- Only the Responsible Organization (RespOrg)[36] to whom a toll-free number has been assigned should be authorized to text-enable Toll-Free numbers.

- Only working or reserved Toll-Free numbers should be text-enabled.

- A neutral, third-party registry would be developed to maintain active information about the texting capabilities (and requisite authorizing party) for Toll-Free numbers.[37]

The hope was that these amendments would bring order and uniformity to the Toll-Free text marketplace so as to spur innovation and investment. The guidelines were developed and agreed to by a large cross-section of industry stakeholders, including the mobile companies and Zipwhip.

As anticipated by the Toll-Free text amendments, the TSS Registry was built to supplement the SMS/800 registry with new functionality to associate texting RespOrgs[38] with Toll-Free numbers. That new functionality is the Texting and Smart Services (TSS) Registry that was deployed in

July 2015. The TSS Registry was developed in accordance with the CTIA guidelines and with input from CTIA and its members, to serve as the centralized and authoritative provisioning and routing database for all multimedia services associated with Toll-Free numbers.

TSS Registry

- Single, authoritative registry/directory for toll-free smart services
- Administered by a neutral, third-party (SOMOS)
- Accessible to all appropriate organizations
- Compliant with CTIA SMS Interoperability Guidelines
- Integrates with SMS/800 voice registry, SMS/MMS routing databases and messaging directories
- Allows registrars (messaging providers that offer texting on toll-free numbers) to enable and establish routing on behalf of toll-free subscribers
- Confirms active toll-free numbers
- Notifies RespOrg for voice services about a request for toll-free number text-enablement
- Allows RespOrg to review/authorize a text-enablement request
- Performs validations (including ownership) to ensure that the integrity of toll-free numbers are maintained across all communications types
- Broadcasts routing information to routing databases in near real-time

The TSS Registry serves numerous, important functions, not the least of which is to ensure that Toll-Free numbers can be text-enabled only by an authorized RespOrg and that non-working Toll-Free numbers cannot be text-enabled.[39]

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[36] Responsible Organization ("RespOrg") is defined in 47 C.F.R. 52.101(b) as: "The entity chosen by a Toll-Free subscriber to manage and administer the appropriate records in the Toll-Free Service Management System for the Toll-Free subscriber."

[37] CTIA *Interoperability Guidelines*, Version 3.2.2, § 4.4 ("All Toll Free Service Providers that assign Toll Free numbers for use within the North American Numbering Plan (NANP) must use SMS/800 to verify the availability of specific numbers, reserve them, create Customer Records, and download records to Service Control Points (SCPs) to facilitate call processing. SMS/800 administers Functions Tariff F.C.C. No. 1.")

[38] There can be separate RespOrgs for a Toll-Free number – one RespOrg for voice over the Toll-Free number and another RespOrg for texting with the same Toll-Free number.

[39] In comments submitted to the FCC, the ATIS (Alliance for Telecommunications Industry Solutions) SMS/800 Number Administration Committee (SNAC) – speaking on behalf of the Toll-Free RespOrg community – supports the industry's use of the TSS Registry, supports adherence to CTIA guidelines, and expresses concern about unauthorized Toll-Free number text-enablement. See, ATIS Letter to FCC, WT Docket No. 08-7 (08/19/2015).

Despite broad industry agreement, mobile carriers and Zipwhip ignore the amended guidelines and refuse to utilize the assigned third-party neutral TSS Registry. Consequently, numerous problems have arisen of the type the CTIA guidelines were specifically intended to avoid:

- Toll-Free numbers under Zipwhip's control have been text enabled without RespOrg knowledge and authorization.[40]

- Zipwhip has denied controlling RespOrg requests to text-enable a Toll-Free number.[41]

- Zipwhip has refused to recognize an authorized change of Toll-Free service providers.[42]

These problems are a direct result of Zipwhip's refusal to use the TSS Registry. Without accessing authoritative information about who can legitimately authorize a Toll-Free number for sending and receiving texts, Zipwhip appears to make those decisions based upon its own data and business interests, oftentimes without the knowledge or authorization of the RespOrg to whom the number has been assigned. As a result, Toll-Free numbers are susceptible to being *hijacked* by parties who have no right to send or receive texts from that number.

This very scenario was described to the FCC.[43] A Toll-Free number was text-enabled without the Toll-Free subscriber's permission or knowledge, and all incoming texts to that number became accessible by the unauthorized party. Hijacking a telephone number in this way is almost certainly intended to support malfeasance: customers could be sending texts to a Toll-Free number thinking they are communicating with one company (e.g., their credit card company), while in fact they are communicating with another, completely unrelated party.

Obviously, the ability to receive texts intended for someone else and send texts from someone else's Toll-Free number (including the ability to solicit return texts) raises serious concerns, especially in the areas of identity theft and consumer fraud. This concern is especially true considering text-based authorization is one of the primary means by which banks, credit card companies, and even schools (and nearly every other type of commercial institution)

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[40] CSF Corporation, Letter to FCC, WT Docket No. 08-7 (03/08/2016) ("Zipwhip has text enabled a number without the RespOrg's knowledge. . . . Because of this type of activity, we have repeatedly asked Zipwhip to use the TSS registry to verify RespOrg and either confirm or deny a number based on the registry.") See also, SOMOS Letter to FCC, WT Docket No. 08-7 (07/01/2016) ("As recently as May [2016], Somos became aware of two different Resp Orgs that found dozens of their numbers text-enabled without permission from the subscriber or the Resp Org.")

[41] CSF Corporation, Letter to FCC, WT Docket No. 08-7 (03/08/2016) ("Zipwhip has… initially denied the controlling RespOrg's request to text enable the number with CSF as the service provider…)

[42] SOMOS Letter to FCC, WT Docket No. 08-7 (07/01/2016) ("For example, Zipwhip refused to recognize an authorized change of service providers and blocked legitimate messaging traffic. Only after intervention by CTIA and Somos did Zipwhip finally relent and allow the messaging traffic to flow through to the legitimate and authorized customer.")

[43] ATL Communications (RespOrg), Letter to FCC, WT Docket No. 08-7 (12/18/2015).

authorize access to sensitive customer accounts.

Innovation is being Stifled

Zipwhip, like any company, is largely left to choose which text messaging-based technologies or features it will support and market. Indeed, the notion that those decisions should be left to innovators and entrepreneurs is a cornerstone of the American free-market system. However, under the current market construct, because all Toll-Free texts must pass through Zipwhip, its decisions have become the *de facto* industry standard (or more accurately, the industry "limiter"). To the extent Zipwhip chooses not to support a given feature (e.g., MMS messages over a certain size), those messages or features simply are not successfully transmitted.

As a simple economic matter, because the mobile communications industry is so highly concentrated (two carriers serve roughly 70 percent of the market, and the four largest carriers serve nearly 99 percent),[44] mobile carriers are well positioned to exert market power over technological and operational innovation. However, when they all unanimously choose a single vendor that companies must use to exchange Toll-Free texts, the problem is greatly exacerbated. The Telephone Science Corporation (a leader in helping the Federal Trade Commission combat *robocalls*) explained its concerns regarding this type of unchecked authority as follows:[45]

> First, by endowing wireless carriers with unchecked authority to filter messaging for any reason, legitimate traffic can be filtered with impunity. The lack of transparency around the filtering methodology perpetuates a messaging ecosphere where bad actors can devote efforts to exploiting unequally applied messaging filtering strategies. When carrier filtering differs by carrier, it follows that the volume and content of unwanted messages will vary by consumer, depending on the carrier they use. At the same time, good actors, sending legitimate messages, may run afoul of these non-transparent and unequally applied rules."

Zipwhip's competitors have lodged the same complaint against Zipwhip, specific to the Toll-Free marketplace.[46]

One issue is that the security protocols and business practices of Zipwhip currently serve as the lowest common denominator for the Toll-Free texting marketplace. If a texting provider initiates an innovative product that conflicts with Zipwhip's operational procedures, it is likely to have its texts blocked with little recourse.

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[44] *See* table above.
[45] Telephone Science Corp. (TSC) – the winner of the Federal Trade Commission's Robocall Challenge – Letter to FCC, WT Docket No. 08-7 (12/21/2015).

[46] Heywire Letter to the FCC, WT Docket No. 08-7 (11/20/15).

While the risks above are obvious for consumers, Toll-Free subscribers, and Toll-Free text providers, other less obvious distortions may be equally harmful. The largest potential risk to the Toll-Free market may be the fact that large, sophisticated companies are simply avoiding the market until the existing distortions are resolved. This avoidance robs consumers of choice and other benefits of a more robust competitive marketplace.

We spoke with one of the world's most innovative companies that manages millions of landline phone numbers. All landline phone numbers are text-enabled when the company first acquires them—*except for its Toll-Free numbers*. Though this company also manages a large inventory of Toll-Free numbers, it is currently sitting on the sidelines of the growing TTF marketplace until the market is stable enough to support transparency and commercial innovation. This sentiment was stated more concisely by a growing text messaging innovator in recent comments to the FCC:

> "Needless to say, it is difficult for CallFire to plan for and invest in the future of messaging services when CallFire's service can be shut down with no notice, and the only innovations in messaging services are

the ones the wireless carriers expressly allow after a costly vetting process."[47]

When Ma Bell was divested in 1984, roughly three million US Toll-Free numbers were in service.[48] When the system was opened, such that businesses could change providers (predominately AT&T at the time) yet keep their Toll-Free number (via the SMS/800 system being deployed), a mere 18 months later, seven million Toll-Free numbers had been assigned.[49] Today, with mature competition in the Toll-Free voice market, over 40 million Toll-Free numbers are in service in the US. This example is just one industry-relevant example in which market power had stifled innovation and, as a result, limited demand. When steps were taken to address market power, innovation flourished and consumer demand dramatically increased to the benefit of all (except for the prior monopolist).

Anticompetitive Behavior

Zipwhip competes as a Toll-Free text provider as well as the exclusive gateway to the mobile carriers.[50] Hence, each time a Toll-Free text message from a non-Zipwhip messaging provider is blocked or prices to terminate a Toll-Free text are increased,

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[47] Comments of CallFire, WT Docket No. 08-7 (11/20/2015).

[48] *Brief History of Toll-Free Numbers*, available at: http://www.tollfreenumbers.com/blogs/guide-2/brief-history-of-Toll-Free-numbers.html (04/21/2007).

[49] *Brief History of Toll-Free Numbers*, available at: http://www.tollfreenumbers.com/blogs/guide-2/brief-history-of-Toll-Free-numbers.html (04/21/2007).

[50] Section 3.2 of the CTIA *SMS Interoperability Guidelines* recommends against vendors competing in the retail market "to insure impartiality." ("Carrier may offer a direct integration to service provider or may hire a third party to handle the connection with 10-digit Service Provider. To insure impartiality, to be able to serve as a 10-digit aggregator, it is recommended that vendor be restricted from providing 10-digit services.")

Zipwhip benefits vis-à-vis its retail competitors.

Obviously, Zipwhip does not block its own Toll-Free texts, and it does not pay the inflated inter-carrier compensation rates it charges competitors. However, the potential for anticompetitive conduct does not end there. Since Zipwhip serves as the gatekeeper for all Toll-Free texts, it occupies a position in the ecosystem that allows it to collect information about its competitors and their customers. In fact, Zipwhip's competitors are convinced that Zipwhip could, if it wanted, read any Toll-Free text sent to or from its competitors and their customers. Moreover, Zipwhip can use that information to solicit those customers.[51]

In a recent interview, one of Zipwhip's primary messaging competitors relayed an experience whereby it lost a particular customer because the customer's Toll-Free texts continued to get blocked on their way to (and from) the mobile carriers. The provider later found out the customer had transitioned its service to Zipwhip. When this competitor contacted the customer, it was told that all blocking problems were resolved with its move to Zipwhip. It had experienced no further problems.

CSF Corporation, a leading messaging provider, relayed a similar experience to the FCC. CSF had questioned Zipwhip about what it believed to be anticompetitive behavior. Rather than address CSF's concerns, Zipwhip

offered to terminate CSF's agreement, which obviously would mean that CSF could no longer send or receive Toll-Free text messages to mobile subscribers.[52] In essence, Zipwhip's response was an offer to put its competitor out of business. CSF could play along without complaint or be left without the ability to exchange Toll-Free texts.

> **Zipwhip "offer" to Terminate**
> "If you are unsatisfied with our service I'm willing to terminate your agreement immediately with no further financial obligation."
>
> Email response of Zipwhip to CSF Corp. regarding questions about why Zipwhip is not delivering toll-free text messages and how toll-free numbers were activated without RespOrg knowledge/consent. *Source*: CSF Corporation March 8, 2016 Letter to FCC, WT Docket No. 08-7.

In a recent editorial, John Lauer, Zipwhip founder and CEO answers many of Zipwhip's critics. His primary response is that Zipwhip's competitors and naysayers have become irrelevant to the marketplace and are attempting to use public opinion and government regulation to catch up. In essence, Mr. Lauer argues that Zipwhip enjoys its place in the TTF marketplace because of its innovative prowess. He goes so far as to boldly claim that "[t]hree years ago . . . Zipwhip, in partnership with the wireless carriers, invented texting on Toll-Free numbers."[53] His point seems to be that the market anomalies identified in this whitepaper, emanate not from market failure

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[51] SOMOS Notice of Ex Parte, WT Docket No. 08-7 (04/26/16) (Zipwhip "has then used such customer proprietary network information (CPNI) to market their own services.")

[52] CSF Corporation Letter to FCC, WT Docket No. 08-7 (03/08/16).

[53] *Op-Ed; Setting the Record Straight on Toll-Free* Texting by John Lauer, Zipwhip CEO (09/02/16).

but, instead, as a result of Zipwhip's "first mover" or innovator advantage(s).

Our research indicates that Mr. Lauer's claims, regardless of how compelling, are not accurate. We were able to identify numerous examples of Toll-Free text messaging providers successfully offering Toll-Free texting as early as 2009,[54] at least four years prior to Zipwhip's claim to have invented texting on Toll-Free numbers. At that time, Toll-Free message providers used the same message aggregators that serve the mobile-to-mobile text market,[55] and all indications are that the emerging TTF market was working smoothly. The simple fact is that none of the same problems in the marketplace appear to have existed prior to Zipwhip's arrival in 2014.

Revenue Sharing

Admittedly, Zipwhip's ability to garner the unified support of the largest mobile carriers in elevating it to the role of singular Toll-Free text aggregator could be described as innovative. Indeed, many operators who preceded Zipwhip in the market are mystified as to how a company which they had never heard was able to corner the market to such dramatic effect. However, our research indicates that the underlying business case that led to Zipwhip's meteoric rise is hardly new or innovative.

Why would the five largest mobile carriers in the U.S choose a small, relatively unknown company to manage 100% of the TTF traffic to/from their subscribers? Perhaps more importantly, why do the mobile carriers perpetuate this arrangement in the face of growing complaints related to anti-competitive behavior and price gouging? *Not surprisingly, the answer is: "money."*

Zipwhip has substantially increased the prices it charges companies that are working with businesses to "text enable" their Toll-Free numbers. Zipwhip charges those companies up to 10 times more today to exchange a Toll-Free text through Zipwhip, compared to rates those companies paid before Zipwhip was installed as the exclusive aggregator. Zipwhip shares a portion of those increased charges with the mobile carriers. [56] This

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[54] Heywire, Letter to FCC, WT Docket No. 08-7 (12/21/15) ("The Verizon statements while correct, omit the fact that Verizon (and all other CMRS providers) had been processing 8xx Toll-Free number messages with all of its subscribers, with HeyWire **since 2009,** via its interconnection vendors till 3 April 2014 when the SMS traffic was abruptly and without notice to all non-CMRS and interconnection vendors, shut off." Emphasis added). QSI spoke with two other Toll-Free text providers who confirmed that they were providing Toll-Free texting prior to Zipwhip.

[55] Prior to Zipwhip, the Toll-Free text message providers utilized SAP and Syniverse, at their choosing,

as vendors for exchanging Toll-Free texts with the mobile companies.

[56] In filings at the FCC, Twilio discussed these revenue sharing arrangements on numerous occasions. See, Twilio, Inc. Petition, WT Docket No. 08-7 (08/28/15),p. 8 ("When Twilio asked the wireless carriers what was happening, they informed Twilio that they decided to route this traditionally 'called-party-pays' traffic to an alternative messaging aggregator (presumably under revenue-sharing agreements.") *Id.,* pp. 19-20 (The aggregators and wireless carriers have contracts with each other for revenue disbursements.") See also, Reply Comments of Twilio, Inc. WT Docket No. 08-7 (12/21/15) ("The wireless carriers – in concert –

practice is referred to in the industry as "revenue sharing."

Contracts between the mobile carriers and Zipwhip are not publicly-available, but it is clear that a critical aspect of those contracts includes a revenue sharing arrangement.[57] For each Toll-Free text message Zipwhip processes and the mobile carrier sends or receives, Zipwhip collects its higher fees and "kicks" a certain amount of those fees back to the mobile carrier. Because Toll-Free numbers are not generally assigned to mobile companies, their relationship with Zipwhip allows them to monetize Toll-Free texts without increasing their costs by exploiting their dominant market position in the mobile space. The parties that end up paying more (and getting less) are Toll-Free text providers and, ultimately, Toll-Free subscribers.

This type of revenue sharing is not new or innovative. Ironically, the wireline affiliates of wireless companies AT&T, Verizon and Sprint have relentlessly attacked revenue sharing arrangements in the wireline market where they are required to pay rates for exchanging traffic similar to those assessed by Zipwhip. *Indeed, in 2011 they were*

successful in convincing the FCC that where revenue sharing agreements exist, rates for exchanging traffic should be substantially reduced and heavily regulated.

The FCC determined that "revenue sharing" arrangements of this type can lead to market distortion when one or more market participants exercise market power. In its seminal 2011 decision, the FCC determined that revenue sharing agreements in the voice marketplace were causing major market distortions leading to billions of dollars of "over-charges" to long distance companies and inefficient use of the network (a practice the FCC referred to as "arbitrage").[58] As a result, the FCC substantially reduced those fees – in some cases from more than $0.08 per minute, to roughly $0.003 per minute – a reduction of more than 90%.

All indications are that the market-distorting impact of Zipwhip's revenue sharing agreements with the major mobile companies may be even more dramatic than those addressed by the FCC in the voice market.

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deliberately routed their customers traffic to a black hole so that this third-party aggregator could force service providers like Twilio, Heywire and others, to pay a ransom for the traffic's release, and this third-party aggregator in turn kicked a portion of the payment back to the wireless carriers themselves…Once the ransom was paid, Verizon got its share, and the traffic flowed once more.") Neither Zipwhip nor its mobile company partners have attempted to deny these statements about the existence of revenue sharing agreements despite having ample opportunity to do so. A Toll-Free text provider QSI spoke to indicated that revenue sharing between Zipwhip and the mobile companies was

common knowledge in the industry. Furthermore, one party QSI spoke to was approached by Zipwhip to participate in the same type of revenue sharing arrangement described here. That party indicated that it was offered a revenue-share arrangement dependent upon the number of Toll-Free texts its customers sent/received to other market participants.
[57] *Id*.
[58] *In the Matter of Connect America Fund*, Report and Order and Further Notice of Proposed Rulemaking, 26 FCC Rcd. 17663, 17874-90, (11/18/2011). *See* Section XI.

Texting-to-Toll-Free ("TTF") fees dwarf equivalent voice-related fees set by the FCC for revenue sharing arrangements

3,000	the approximate number of text messages that use network capacity equivalent to 1 minute of a voice conversation
$0.005	estimated average fee TTF providers pay to Zipwhip to send and/or receive toll-free text messages to/from one of the 5 largest mobile carriers
$15.00	calculated fee TTF providers pay for the equivalent of 1 minute of voice communication (3,000 x $0.005)
$0.08	approximate fees AT&T, Verizon Sprint and other long distance carriers were charged per minute of voice conversation BEFORE the FCC implemented revenue sharing rules
97%	estimated amount by which FCC revenue sharing rules reduced fees paid by AT&T, Verizon, Sprint and other long distance carriers in revenue sharing situations
$0.003	approximate fees AT&T, Verizon Sprint and other long distance carriers were charged per minute of voice conversation AFTER the FCC implemented revenue sharing rules
5,000 x	the multiple TTF providers currently pay to Zipwhip (who shares those fees with its mobile provider partners) compared to what AT&T, Verizon, and Sprint pay per 1 minute of use AFTER the FCC's revenue sharing rules are implemented

As the analysis above demonstrates, when equated on a network capacity basis, Toll-Free text providers appear to pay Zipwhip roughly *5,000 times more* than AT&T and Verizon pay for the use of other carriers' networks when originating and terminating voice calls. Even before the FCC acted to reduce inter-carrier compensation in the voice market based upon AT&T and Verizon's suggestion that they were being gouged, they still paid roughly *190 times less* than Toll-Free text providers are paying to Zipwhip today on an equivalent capacity basis. Even at those much lower, relative rates, both Verizon and AT&T were adamant that revenue sharing arrangements were to blame for excess profits and unreasonable prices. Both companies argued that revenue sharing agreements should be prohibited. According to Verizon:[59]

"Carriers are not entitled to windfall profits that flow from excessive intercarrier compensation charges. And, there is no better evidence that access rates are excessive than a [competitor's] agreement to share revenues with a business partner…"

Indeed, Verizon was so convinced that revenue-sharing agreements were destructive to the competitive market, that it requested the FCC prohibit them entirely:[60]

"Verizon still favors a declaratory ruling prohibiting carriers from assessing intercarrier compensation charges on traffic subject to a revenue sharing agreement."

AT&T agreed in more direct terms:

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[59] Verizon *Comments*, CC Docket No. CC 01-92 (04/01/11).

[60] *Id*.

"Revenue sharing is unjust and unreasonable."[61]

"Based on public interest harms…it would be appropriate for the Commission to issue a rule declaring that any LEC [local; exchange carrier] access revenue sharing agreement…is prohibited."[62]

Based, in part, on these passionate appeals from AT&T and Verizon, the FCC acted to substantially reduce inter-carrier fees when a revenue sharing agreement existed. And then, less than three years later (2014), both AT&T and Verizon appears to have entered into exactly the same type of revenue sharing agreement with Zipwhip for purposes of enjoying increased fees (and what clearly appear to be windfall profits) from TTF providers.

Ironically, in the voice market, both AT&T and Verizon refused to pay millions of dollars in what they saw as unreasonable intercarrier charges arising from revenue sharing agreements. They were successful in this regard because their competitors were prohibited by FCC rules from blocking their traffic and subsequently disrupting their business. Yet, in this circumstance, no such FCC rules prohibit AT&T and Verizon (or Sprint, T-Mobile, etc.) from blocking text messages from messaging companies who refuse to pay for the same reason. Indeed, as described above, the carriers, in combination with Zipwhip do exactly that.

We Were Able to Intercept Texts Without Proper Authorization

The problems caused by text-message interception and unauthorized text-enablement are too numerous to imagine. *It is for this reason that this particular failure in the TTF marketplace may be of greatest concern to the texting public.* Nonetheless, our literature review indicated that much of the debate in this area is anecdotal. We found a few circumstances where texts had apparently been hijacked, but we found no systematic analysis as to just how that had occurred or who was at fault. So, we devised an experiment.

We conducted a simple test to determine whether we could text-enable Toll-Free numbers to which we had no authorization, and thereafter, intercept texts to those numbers.

Members of our analytic team first leased several Toll-Free numbers from separate telecommunications carriers, using their own names and different corporate identities. In all, we obtained Toll-Free telephone numbers from three different providers.

Each analyst was assigned the responsibility of obtaining several Toll-Free numbers. He/she was then confirmed that voice traffic flowed as expected with each number, and if, not already part of the Toll-Free subscription,

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[61] AT&T *ex parte*, CC Docket No. 01-92 (09/16/10). *See also* AT&T *Comments* (4/01/11) and *Reply Comments* (04/18/11).

[62] *Id*.

text-enabled one or more of those numbers. Test messages were sent to ensure that texts could both be sent and received from each group of Toll-Free numbers.

Once Toll-Free numbers had been legitimately acquired and tested, analysts swapped information about their Toll-Free numbers. They shared only the basic Toll-Free number and name detail, but not underlying account information that would generally be used for authorization. Our thinking was that Toll-Free numbers are regularly advertised and, at least, the Toll-Free number and subscriber (business) name could be known publicly. To the extent one analyst could hijack another analyst's number, simply by knowing the 10-digit number and business name, we would gain insight into how nefarious parties might undertake to do the same.

Each analyst next established accounts with Over-the-Top texting providers. Using these accounts, our analysts attempted to text enable Toll-Free numbers that did not belong to them (i.e., they attempted to "hijack" another analyst's number).

The results of our informal experiment were troubling. Where the numbers were not already text-enabled and therefore not listed

in the TSS registry at the time of request (and the OTT service provider did not use the TSS), 60% of our analysts' attempts to text-enable Toll-Free numbers to which they had no legitimate authorization were granted that same or the next business day.[63] In each "successful" case, the targeted Toll-Free numbers were then used to send texts that appeared to have come from the Toll-Free numbers' authorized subscriber. Perhaps more importantly, we were also able to redirect incoming text messages on each of the "hijacked" Toll-Free numbers away from the authorized subscriber and to the hijacking analyst.

In each circumstance wherein one of our analysts was able to successfully hijack texts to a Toll-Free number, we reviewed information in the TSS registry (and corresponding information from a major data aggregator – Netnumber) to confirm that each Toll-Free number had been recently text-enabled and registered to Zipwhip.[64] [65]

Alternatively, our attempts to hijack Toll-Free numbers that had already been text-enabled and in the TSS registry were unsuccessful without exception. We attempted to activate text-to-Toll-Free services on five separate Toll-Free numbers through five separate text-to-Toll-Free providers - each attempt was denied.[66]

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[63] One hundred percent (100%) of similar attempts to service providers who use the TSS registry were unsuccessful.

[64] Based on registration data, the "successful" hijackings were done through affiliates or agents of Zipwhip.

[65] Presumably, the voice RespOrg was not contacted to provide concurrence with the text-enabling requests. Indeed, neither the voice RespOrg nor the TTF services

provider verified authorization with the Toll-Free numbers' subscriber.

[66] In three instances, our requests were stopped mid-stream when the requesting analysts could not provide a Letter of Authorization ("LOA") verifying ownership of the Toll-Free number. In the other two circumstances, the text-to-Toll-Free service providers simply did not respond to our analysts' requests to text-enable the target Toll-Free numbers.

The Health of the Market

- ✓ Prices 190x to 5,000x more than those found in nearly identical markets

- ✓ A single non-neutral "gatekeeper" through which all TTF traffic must flow

- ✓ Verifiable complaints of anti-competitive behavior

- ✓ Sophisticated suppliers sitting on the sidelines and innovative technologies stifled

- ✓ The integrity of secure communications may be compromised

Individually, each of these characteristics brings into question the health of the TTF marketplace. When combined, they speak clearly to a distorted market. However, when also viewed with the knowledge that the handful of mobile wireless carriers controlling nearly 100% of the country's wireless subscribers profit directly from the distortions – a more troublesome picture develops.

It is our hope that the additional information provided via this paper helps to provide a clearer picture of the market failure that clearly exists within the TTF ecosystem. And, as a result, stimulates meaningful discussions toward further opening the market to competition and transparency such that it can reach its full potential.