Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Location-Based Routing For Wireless 911 Calls	)	PS Docket No. 18-64
	)	
	)	

To: The Commission

COMMENTS OF CTIA

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CTIA[1] submits the following comments in response to the Notice of Inquiry (NOI) seeking comment on location-based routing solutions for 9-1-1 calls.[2]

I. INTRODUCTION AND SUMMARY

Wireless consumers place hundreds of millions of calls to 9-1-1 each year, and they expect that public safety and emergency professionals will respond as quickly as possible. For more than 20 years, wireless carriers have helped public safety professionals in this critical life-saving task through the delivery of 9-1-1 calls. CTIA shares the Commission's commitment to ensure wireless 9-1-1 calls are promptly routed to the appropriate Public Safety Answering Point (PSAP) so that help can be quickly on its way.

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[1] CTIA® (www.ctia.org) represents the U.S. wireless communications industry and the companies throughout the mobile ecosystem that enable Americans to lead a 21st century connected life. The association's members include wireless carriers, device manufacturers, suppliers as well as apps and content companies. CTIA vigorously advocates at all levels of government for policies that foster continued wireless innovation and investment. The association also coordinates the industry's voluntary best practices, hosts educational events that promote the wireless industry and co-produces the industry's leading wireless tradeshow. CTIA was founded in 1984 and is based in Washington, D.C.

[2] *Location-Based Routing for Wireless 911 Calls*, Notice of Inquiry, PS Docket No. 18-64, FCC 18-32 (rel. Mar. 23, 2018) (NOI).

Today, wireless providers route 9-1-1 calls based on the cell site or sector where the call originated, pursuant to a pre-agreed cell-sector-to-PSAP arrangement based on state and local government direction.[3] This approach, among other things, has enabled the rapid and reliable routing of time-sensitive 9-1-1 calls and can help in troubleshooting when call routing issues arise.[4] But 9-1-1 calls at times may be routed to a PSAP that does not have jurisdiction over the call if, for example, a single cell-sector covers two separate counties that each has a separate PSAP.[5] In such circumstances, the PSAP receiving the 9-1-1 call should quickly re-route the call to the jurisdictionally appropriate PSAP to ensure the rapid dispatch of first responders.

As the wireless industry continues to deploy technologies that enhance location information about wireless 9-1-1 calls, the Commission is right to ask whether new technologies can also reduce the number of 9-1-1 calls delivered to PSAPs in neighboring jurisdictions. The Commission should use the record developed here to carefully weigh the costs and benefits of different policy approaches to improvements in wireless 9-1-1 call routing. For example, the Commission should assess the tradeoffs associated with different 9-1-1 call routing mechanisms,

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[3] *See* CSRIC V, Working Group 1, Evolving 911 Services, Final Report – Task 2: 911 Location-Based Routing, at 9 (Sep. 2016), *available at* https://transition.fcc.gov/bureaus/pshs/advisory/csric5/WG1_Task2_FinalReport_092016.docx (CSRIC LBR Report) ("[I]t was agreed in standards documents created with public safety in the early days of E9-1-1 Phase 2, that wireless 9-1-1 calls could be routed using a pre-agreed PSAP to cell sector arrangement. This pre-agreed routing determination allowed a PSAP certainty in call volume and in some cases, funding levels.").

[4] *Id.* ("[T]roubleshooting call routing questions was easier to resolve due to the pre-determination of the routing location.").

[5] While something of a misnomer, for purposes of these comments and consistent with the *NOI*, a "misroute" is a 9-1-1 call delivered to a PSAP based on the pre-agreed cell-sector-to-PSAP arrangement outside the caller's jurisdiction. *See NOI* at n. 1 ("[I]t is important to note that the 'misroutes' that are the subject of this inquiry mostly result from current 911 call routing mechanisms that rely on cell tower location working as designed, not from technical failure of those mechanism.").

such as the potential for a general delay to routing *all* 9-1-1 calls. The Commission also should consider whether location-based routing solutions would be better suited for, and more easily implemented in, the next generation 9-1-1 (NG911) environment. Finally, the Commission should consider alternative methods that can prevent misroutes and/or help to mitigate the impact of misrouted 9-1-1 calls, such as encouraging additional coordination among PSAPs and by PSAPs with wireless providers.

II. THE COMMISSION SHOULD WEIGH THE BENEFITS AND THE COSTS TO ALL WIRELESS 9-1-1 CALLS OF MODIFYING THE CALL ROUTING SYSTEM.

The Commission has found that response times to 9-1-1 calls are critical to saving lives, and has taken a number of actions to minimize those response times.[6] To that end, Commission policy directs wireless providers to route the voice portion of a 9-1-1 call to the proper PSAP, even while their systems separately generate caller location information during the call and convey it to the PSAP. In this way, the existing wireless 9-1-1 routing framework has ensured the rapid delivery of the voice portion of a 9-1-1 call to a PSAP through several steps.

First, wireless carrier's 9-1-1 systems engage in a database lookup to identify the cell site sector from which a 9-1-1 call is placed. This lookup occurs almost instantaneously from when the 9-1-1 caller presses send on their wireless handset. The wireless carrier's system next utilizes a separate database to match the cell site sector to a PSAP using the pre-agreed cell-sector-to-PSAP information. The wireless carrier's system then sends the PSAP information to the Mobile Switching Center (MSC) in order to route the 9-1-1 call to the appropriate PSAP.

[6] *See, e.g., Wireless E911 Location Accuracy Requirements*, Fourth Report and Order, 30 FCC Rcd 1259, 1319 ¶ 162 (2015) ("We conclude that the location accuracy rules we adopt today will improve emergency response times, which, in turn, will improve patient outcomes, and save lives.").

Consistent with the Commission's rules, wireless providers' systems acquire and deliver location information associated with the 9-1-1 call through an entirely separate data stream in order to avoid any call routing delay due the time necessary to acquire the associated location information.

As the Commission moves forward, it should weigh the potential benefits of harnessing location technology to route calls to PSAPs with the potential safety impact if such technologies require additional time to route 9-1-1 calls and, potentially, result in more hang-ups by callers. CTIA urges the Commission to explore the extent to which different 9-1-1 call routing mechanisms involve different tradeoffs, including with respect to response time. While location-based routing technologies may produce faster response times for some 9-1-1 calls, they also could *extend* the response time of 9-1-1 calls that are routed to the jurisdictionally appropriate PSAP using the current 9-1-1 call routing framework. The pros and cons of implementing any new approach should be considered against the fact that the vast majority of wireless 9-1-1 calls today are properly routed to the jurisdictionally appropriate PSAP.

As the Commission's Communications, Security, Reliability and Interoperability Council V (CSRIC) explained in its September 2016 report on location-based routing, "[t]iming of every component within the wireless 9-1-1 call flow is critical to understanding why the existing call routing and data delivery system is in place and the impacts of potential changes to that system."[7] Changes to one component in the 9-1-1 call flow could result in overall delays. CSRIC explained that the voice portion of the 9-1-1 call is routed "no later than 6 seconds" after

[7] CSRIC LBR Report at 8

the caller presses send, and therefore, for location-based routing to be at all viable, location must be available to the MSC in 5 seconds or less.[8]

A location-based routing framework would replace the initial, virtually instantaneous cell site lookup and apply a new location estimate (*e.g.*, latitude/longitude coordinates) for the PSAP database lookup in lieu of (or in addition to) the cell-site-to-PSAP lookup. The Commission should explore whether location technologies used for routing in this manner would be as nearly instantaneous as the cell sector lookup or whether the technologies route 9-1-1 calls closer to the CSRIC-referenced five seconds.[9] If the latter, the Commission should explore whether those technologies would cause delay in routing as compared to the cell-sector framework in use today. Should a location technology-based approach require more time than current cell-sector routing, the Commission should then account for the fact that this additional time would extend to *all* 9-1-1 calls, including the vast majority that are routed to the jurisdictionally appropriate PSAP today under the current call-routing system.[10] In short, the Commission should explore location-based routing and assess whether those technologies represent a genuine improvement to the existing 9-1-1 call routing framework.

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[8] *Id.*

[9] *See id.*

[10] The Commission also should consider whether location-based routing could make coordination and troubleshooting more difficult when routing issues occur. Under the current routing framework, service providers, working with state and local public safety authorities, can make network-level adjustments to mitigate and reduce misroutes; however, location-based routing involves many additional variables and therefore could make adjustments more challenging.

III. THE COMMISSION SHOULD EVALUATE WHETHER TO ADVANCE STANDALONE LOCATION-BASED ROUTING OR PROMOTE ADOPTION OF NG911, WHICH CAN TAKE ADVANTAGE OF LOCATION-BASED ROUTING.

To the extent that location-based solutions can deliver timely routing information, then NG911 functionalities may offer better flexibility for routing 9-1-1 calls than a standalone location-based routing framework. In this regard, the *NOI* observes that "NG911 systems are designed to route calls using caller location information obtained in real time"; in contrast, it asks about the "potential transition costs of implementing location-based routing on current wireless 911 systems"[11] rather than as part of NG911. To that end, the Commission should weigh whether the better course is to devote resources to a standalone location-based solution falling solely on the originating service provider or instead to advance and incentivize NG911.

Commissioners O'Rielly and Carr both raised concerns about pursuing location routing independent from NG911. Commissioner O'Rielly observed:

> Going forward, it would be helpful to know whether any Commission action should be taken now or after NG9-1-1 upgrades. Generally, PSAP and wireless provider attention should be spent on upgrading the 9-1-1 system to the latest technologies that can solve many systemic problems.[12]

Similarly, Commissioner Carr commended the *NOI* for "ask[ing] about implementation of location-based routing as we transition from legacy 911 systems to Next-Generation 911" and suggested that the Commission "need[s] to be mindful that any steps we take in this proceeding are consistent with that transition…."[13]

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[11] *NOI* ¶ 4.

[12] *Id.* at 21 (Statement of Commissioner Michael O'Rielly).

[13] *Id.* at 22 (Statement of Commissioner Brendan Carr).

These are critical questions to ask. In pursuing location-based routing for current 9-1-1 systems, the Commission could be forcing service providers and PSAPs to divert resources to an imperfect, and potentially problematic, solution to misrouted 9-1-1 calls. Instead, the Commission should continue to focus stakeholder resources on the implementation of NG911, which will advance 9-1-1 generally and could provide a useful (and more efficient) framework for incorporating location solutions into 9-1-1 call routing. The Commission also can explore cost-effective alternatives to mitigate 9-1-1 call misroutes in the near term, as described below.

IV. THE COMMISSION SHOULD ALSO DRAW ATTENTION TO WAYS THAT CAN HELP MITIGATE MISROUTED 9-1-1 CALLS TODAY.

As part of this proceeding, the Commission also should consider ways to reduce both the risk of misroutes and the impact of any misrouted calls even under the current cell-sector-based routing framework. In this regard, CTIA believes that certain techniques, which could be rapidly and efficiently implemented today, may help to mitigate 9-1-1 call misroutes and, in turn, reduce response times.

As an initial matter, PSAPs should have the technologies, capabilities, and procedures to respond to any 9-1-1 calls, regardless of whether such calls originate within a given PSAP's jurisdiction. Even when 9-1-1 calls are delivered to a PSAP without jurisdiction over the call, they are delivered to a neighboring PSAP relatively close to both the location of the caller and the PSAP with jurisdiction over the call. After all, the caller must be within range of the cell site subject to the pre-agreed cell-site-to-PSAP arrangement. Accordingly, for such calls, PSAPs should have arrangements in place to identify the PSAP with jurisdiction quickly and then transfer the calls to that nearby PSAP. PSAPs also should have mapping technologies that can harness the location information of the caller available from wireless carriers and relay that information to the PSAP to which they transfer the caller.

In addition, the Commission could encourage further sharing of information by PSAPs with wireless service providers. Specifically, PSAPs should bring concerns about particular call routing issues to the timely attention of wireless carriers that provide service in their jurisdiction. Then, the PSAP and wireless service provider can work collaboratively to troubleshoot the source of the issue and pursue solutions to the extent solutions are available. For example, misroutes may be reduced by adjusting the pre-agreed cell-sector-to-PSAP arrangement to direct a call to one PSAP rather than another. Such adjustments could be particularly useful if, for instance, newly deployed wireless network infrastructure altered the cell sector areas. Accordingly, it is possible that through enhanced coordination, many such misroute occurrences could be eliminated or at least reduced.

Such alternative techniques can be implemented far more efficiently and effectively than wholesale, standalone changes to current routing mechanisms. Therefore, as part of this proceeding, the Commission should examine and draw attention to successful techniques that can reduce misrouted 9-1-1 calls, as well as those that can mitigate the impact of calls that are misrouted.

V. CONCLUSION

CTIA and its member companies share the Commission's commitment to ensure wireless 9-1-1 calls are promptly routed to the appropriate PSAP so that help can be quickly on its way. In moving forward, however, the Commission should consider the costs, benefits, and other tradeoffs of modifying the existing wireless 9-1-1 call routing system, while advancing and incentivizing the transition to NG911 which provides PSAPs with greater flexibility to harness location information, including for routing purposes.

Respectfully submitted,

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