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April 14, 2016

Brent J. Fields
Secretary
United States Securities and Exchange Commission
100 F Street, NE
Washington, DC 20549-1090

Re: Notice of Proposed Commission Interpretation Regarding Automated Quotations Under Regulation NMS (File No. S7-03-16)

Dear Mr. Fields:

Nasdaq, Inc. applauds the Commission's decision to propose this Interpretation Regarding Automated Quotations Under Regulation NMS (the "Interpretation") rather than to engage in *ad hoc* policy making via the IEX Form 1 Application for Exchange Registration. Nasdaq believes that a good rule-making process generally yields good policy results and clear regulatory standards, and that open debate in the marketplace of ideas is the best process for agency rule-making. After careful consideration of the proposal, Nasdaq urges the Commission to adopt a different interpretation than the one proposed; namely, that no artificial delay of any kind be tolerated of Protected Quotations.[1]

The integrity of Protected Quotations is the heart of Regulation NMS, which is itself at the heart of the U.S. equity markets. Protected Quotations are the primary vehicle for price discovery, the ultimate manifestation of intermarket price and time priority, and the *sine qua non* of intermarket order competition. Fair access to Protected Quotations enables all investors and broker-dealers to strive for and to achieve best execution and the optimum trading experience. Protected Quotations from each

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[1] While the proposed Interpretation is styled to address "automated quotations" under Rule 600(b)(3), its primary import is determining whether trading centers with delays up to one millisecond will receive the protection afforded by Rule 611 under Regulation NMS. Therefore, this letter will speak directly to quote protection.

exchange are a main ingredient of the real-time information that investors use to price orders and to evaluate their trading experience and the performance of their broker-dealer agents. The informational value of transaction reports, the other main component of market data, rests on the speed with which the execution of a Protected Quotation is communicated to investors. Weakening the strength and integrity of Protected Quotations would have potentially far-reaching and negative consequences on these critical elements of the equity market ecosystem.

Nasdaq believes the proposed Interpretation does precisely that, threatening to weaken Protected Quotations by re-defining an "immediate and automatic" response to explicitly permit artificial delays of up to one millisecond. Artificial delays inherently contradict and undermine the rationale and effectiveness of "protecting" a quotation. Thus, while artificial delays are tolerated in trading systems of non-displayed venues and are conceivable for venues with unprotected quotes, an artificial delay of a public exchange's Protected Quotation strikes at the very heart of the exchange system because investors rely so heavily on exchanges for price discovery. Of course, investors should remain free to choose venues with artificial delays; venues that voluntarily create artificial delays simply should not be accorded the status and impact attendant to a Protected Quotation.

Prohibiting artificial delays does not imply that exchanges can or must operate uniformly, or that investors can expect or be guaranteed uniform trading experiences. Myriad variables impact aggregate trading times and experiences, including various geographic (location of the matching engine, broker-dealer, and investor) and technological (matching engine speed and functions, order entry speed and functions, telecommunications lines) factors, as well as idiosyncratic investor decisions too numerous to catalogue. The universal constant is that every exchange can – and Nasdaq believes must -- continually strive to strengthen its Protected Quotations by minimizing delays. Therefore, while the Commission cannot mandate or achieve uniformity of communication or processing, it can instill a uniform motivation to eliminate purposeful delays.[2]

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[2] The impact of geographic market dispersal differs from the artificial delays contemplated in the Interpretation. Market operators with Protected Quotations outside the New York area do not impose an artificial delay on New York area market participants. The delay incurred by New York market participants in reaching non-New York area markets is a consequence of physics. Earlier in our history, Nasdaq tried unsuccessfully to re-write geography-based laws of physics with our SEC-approved SDP network. Our Swedish market tried to achieve a similar result with its SAXess trading system. Based on our experience, we cannot endorse viewing delays caused by physical separation in the same manner as artificial delays imposed by a market operator.

The Commission was wise in 2005 in purposefully refraining from establishing any standard for determining an acceptable artificial delay for Protected Quotations.[3] The Commission concluded that any standard for measuring acceptable artificial delay was destined to become obsolete. As the Commission assumed then and noted here, the concept of sub-millisecond increments was considered completely irrelevant just 10 years ago. The global history of public securities markets is a constant march forward, never back. Once introduced to computer technology, with their ever increasing processing speed and use of fiber optics, equity markets could not rely on telegraphs, telephones, or copper lines. Because progress moves forward and not backward (and always will), the Commission's proposed Interpretation is already somewhat outdated and destined to become further obsolete; if recent trends continue, it will become obsolete at faster and faster rates.

Consider, for example, network technology innovation from 2004 to 2016. In 2004, Cisco network switches supported a maximum of 128 1 Gigabyte ports, cost $200,000 (approximately $1500/port), and operated at 35 microseconds. In 2016, Cisco network switches support 48 10 Gigabyte ports, cost about $13,000 (an average of $270/port), and operate at 220 nanoseconds. Thus, in just 12 years, network switches became approximately 80 percent cheaper, 160 times faster, and more commoditized and scalable. This single piece of equipment represents just one of the dozens of conduits that financial transactions will traverse in moving from the mind of an investor, through the national market system, and back into the investor's accounts. As technology makes financial transactions simultaneously faster and less costly, more and more market participants are able to trade more efficiently by reducing transaction times and costs.

In addition to obsolescence risk, any standard for measuring acceptable artificial delay will have inherent ambiguities that create confusion, at best, or manipulation, at worst. The mere act of drawing a line will necessarily and continually require the Commission to police that line. The proposal lacks adequate critical details on critical threshold issues. For example, how is the amount of delay to be measured? Is the artificial delay to be tolerated anywhere within an exchange or only within discrete systems or is it more generalized? Is an artificial delay acceptable pre-trade, at time of trade, and post-trade? Must the artificial delay be symmetrical *vis a vis* all members? How is the artificial delay to be measured -- order-by-order or on average; if average, over what period of time? Will an artificial delay impact the duty of best execution? If a specific form of delay is profitable to market participants, the Commission can expect those participants to attempt to arrange an artificial delay that best suits their needs.

Explicitly permitting artificial delays will open the floodgates to a new wave of complex order types, dramatically elevating the complexity of an already complicated ecosystem. The industry reaction is entirely predictable. First, based on the

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[3] See Securities Exchange Act Release No. 51808 (June 9, 2005) 70 FR 37496, 37504 (June 29, 2005).

Interpretation, each exchange will establish a delay of between one and one thousand microseconds. Each delay will be specially tailored to its specific trading system and its specific business model. Then, each trading venue will respond by introducing new order types, new routing strategies, and new data strategies designed to maximize their members' trading experience with other venues. Finally, as a result, individual members and traders will respond by adopting or at least assimilating all of these new order types, routing strategies, and data from each trading venue. We have experienced this dynamic before; the implementation of Regulation NMS triggered the first wave of complex order types.[4] The difference here is that the expected outcome will be even more complex because the artificial delays can range from 1 to 1,000 microseconds, meaning the delays and the available order types can each have 1000 variations. The number and variety of potential combinations of order types could be staggering.

How much harm the Interpretation will actually cause is difficult to predict, in part because the proposed Interpretation is ambiguous in several respects and because the proposal lacks any empirical data or analytical support for the one millisecond standard proposed (as opposed to any other time increment). The proposal offers no data, analysis or even a theoretical suggestion why one millisecond is an appropriate standard. In our experience, allowing even one millisecond of delay would be quite costly to investors. For example, on an average trading day in March 2016, Nasdaq alone experienced the following average activity: Nasdaq executes 494,115 trades, 63,924,288 shares, and $3,002,848,801 in dollar volume for activity that occurs within one millisecond of receiving a displayed order. All told across U.S. exchanges, the one millisecond standard could prove devastating to investors attempting to achieve the best executions possible, and confounding to regulators attempting to ensure that broker-dealers fulfilled that duty.

Nor does the proposal offer data or analysis of other alternatives, such as microseconds or nanoseconds, and why those are inferior to one millisecond. The securities industry already measures speed in microseconds and nanoseconds, and it is not alone in relying on evolving technology to measure time in increments smaller than milliseconds. For example, whole industries and customers that rely on global positioning systems ("GPS") could not tolerate a millisecond delay; one millisecond delay or error in GPS satellite transmission creates 300 kilometers of geographic drift.[5] The quest to reduce latency and to benefit customers drives numerous industries, such as shipping, telecommunications, the military, and many more. The financial markets are no different.

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[4] A Knight Capital Group report from 2014 estimated that there were over 320 order types across all exchanges. See Demystifying Order Types, Mackintosh (Sept. 1, 2014), available at www.kcg.com.

[5] Data obtained from the National Oceanic and Atmospheric Administration.

Against this potential for ambiguity and harm, the Commission has established no pressing need for an exchange-imposed artificial delay, and no measurable benefit to be gained by accepting an artificial delay. Nasdaq generally agrees that the markets must evolve and that innovation is a critical element of competition. However, as Dr. Holly Bell eloquently summarized:

> While the SEC has stated that competition and innovation within a fair regulatory field should be allowed to shape the evolution of markets, IEX is not offering an innovative or transformative technology in the way that computerized algorithmic trading was or a technology like Blockchain might be in the future. Coiling cable is not disruptive technology; it is simply a human disruption of existing automated systems, a process specifically banned by Reg NMS.[6]

Others claim that an artificial delay protects retail investors, but it is unclear what retail investors are being protected against. According to data from the Tabb Group, retail traders have experienced more than a 50 percent reduction in Effective Spread to Quoted Spread Ratio over the past 15 years, while market makers' profits have declined by over 50 percent.[7] As many have already noted, there is no evidence that the IEX speed bump will benefit investors, nor is there evidence that investors will benefit by extending that precedent of artificial delays to other venues with Protected Quotations. At a minimum, the Commission should make a case-by-case finding that any proposed delay produces benefits that outweigh its costs.

Before making a radical policy shift, an agency should have data demonstrating both the potential benefits and potential costs. Here, the Commission could follow Canadian regulators, effectively running a pilot by treating artificially delayed venues as unprotected quotes. In Canada, TMX Alpha created a randomized speed bump which was described by its owners in similar terms to IEX, as being designed to improve execution quality and offset ostensibly harmful aspects of the trading ecosystem. ITG studied TMX Alpha and found that "[l]arger orders routing to multiple venues are harmed when they include Alpha in their venue selection. ITG also encountered "quote fading" so pronounced that they were able to access "just 44% of the visible liquidity on Alpha. More than half of the Alpha liquidity disappears while our order rests in speed

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6 See Disruption is Not Innovation, John Lothian News (April 9, 2016) at http://www.johnlothiannews.com/2016/04/disruption-not-innovation/#.VwvBok32YY3.

7 See As An Exchange, IEX Wouldn't Be Fair, Simple, or Transparent , Tabb Forum (March 17, 2016) at http://tabbforum.com/opinions/as-an-exchange-iex-wouldnt-be-fair-simple-or-transparent.

bump purgatory. No timing, gimmick, or any other device can prevent this fading."[8] These findings might cause regulators to pause and consider further study before inviting this model into the protected venues of the U.S. equities markets.

In addition to a pilot study, one must also consider that existing measures of time and latency within the markets are generally counted in a small number of microseconds, not milliseconds. For example, Nasdaq's average "throughput" time – the time necessary for an order to traverse Nasdaq's order entry systems, to match in the matching engine, and then to exit Nasdaq's market data distribution system – is 40 microseconds. Also, in the fourth quarter of 2016, Nasdaq expects to transition the technology for the securities information processor to the INET platform, and to reduce median latency from approximately 400 microseconds to 50 microseconds or lower.[9] Finally, when the SEC guided exchanges to install equidistant-cabling within a co-location center to standardize the trading experience within the center, that cabling added approximately 1 to 3 microseconds. Such processing times must call into question whether a one millisecond delay can accurately be characterized as *de minimis*. Given recent rates of technological change, it is reasonable to believe that nanosecond measures already exist or will shortly.

Nonetheless, if the Commission considers itself compelled to accept artificial delays -- which Nasdaq strongly opposes – it should consider a small number of microseconds and not a millisecond. Furthermore, rather than establish a blanket *de minimis* standard, the Commission should in each case of a proposed artificial delay conduct a cost and benefits analysis to determine whether the proposed delay will harm the market. This analysis could include a presumption that any delay below a small number of microseconds is presumptively valid, and that any delay over that small number of microseconds is presumptively invalid, placing the burden on the proposing party to demonstrate the actual effect of its proposed delay. Again, however, Nasdaq urges the Commission to avoid this complication entirely by clarifying its previous guidance to prohibit artificial delays outright.

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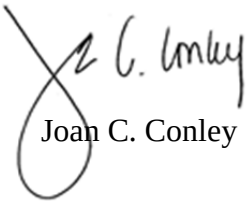
8 See Canada's New Market Model Conundrum, ITG (Sept. 14, 2016), available at http://www.itg.com/thought-leadership-article/canadas-new-market-model-conundrum/.

9 See UTP SIP Migration and Latency Reduction Plan at http://www.nasdaqtrader.com/content/newsalerts/2016/utp/utp2016-01_UTP_SIP_Migration_plan.pdf.

In conclusion, Nasdaq urges the Commission not to expose investors to the potential harm created by exchange-imposed artificially delayed Protected Quotations. Before rushing to make this radical policy shift, the Commission should develop empirical data demonstrating that the level of potential harm (diminished price discovery, lower fill rates, and lower execution quality) is acceptable, and that the potential benefits outweigh the potential harms. What the Commission should avoid is labeling delays as *de minimis*, implying they have no impact when in fact they do. Rather, the Commission should fully understand that impact and affirmatively determine whether that the impact advances, or is at least consistent with, the Commission's important policy objectives.

Respectfully submitted,



Joan C. Conley

cc: The Honorable Mary Jo White, Chair
The Honorable Kara M. Stein, Commissioner
The Honorable Michael S. Piwowar, Commissioner
Stephen Luparello, Director, Division of Trading & Markets