April 4, 2017

VIA E-MAIL

Mr. Brent J. Fields
Secretary
Securities and Exchange Commission
100 F Street, N.E.
Washington, DC 20549-1090

Re: **Proposed Rule Change to Adopt the CHX Liquidity Enhancing Access Delay, Rel. 34-80041 (SR-CHX-2017-04)**

Dear Mr. Fields:

CTC Trading Group, LLC, on behalf of its wholly-owned subsidiary CTC, LLC (collectively, "CTC"), appreciates the opportunity to comment in response to the recent Chicago Stock Exchange, Inc. ("CHX") filing (the "Proposal") proposing to adopt a Liquidity Enhancing Access Delay ("LEAD"),[1] which would introduce a brief delay of 350 microseconds[2] before liquidity-taking orders would execute against CHX market makers meeting substantially—and appropriately—heightened quoting obligations. CTC believes that the Proposal offers an important opportunity to enhance U.S. equities and options market structure to the benefit of investors, and recommends its approval. Below, we emphasize several pertinent points we made in our letter commenting on a prior version of this rule filing,[3] briefly address remarks from other commenters, and provide a few more observations we hope will be useful in the review of the Proposal.

Market Makers Take Unique Risks to Provide Displayed Liquidity

Liquidity providers such as CTC contribute directly to transparency and price discovery by publicly disseminating the prices at which they would buy and sell a wide range of securities on multiple exchanges. The role of market makers in facilitating risk transfer is particularly important in less-liquid instruments (including many ETFs and, especially, options) where the likelihood of natural buyers and sellers posting simultaneous offsetting orders would otherwise be very low.

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[1] *See* Rel. 34-80041 (SR-CHX-2017-04).

[2] 350 microseconds is on the order of magnitude of one-thousandth of the blink of a human eye. *See* http://bionumbers.hms.harvard.edu//bionumber.aspx?id=100706&ver=1 .

[3] *See* our letter dated November 1, 2016, which we incorporate here by reference: https://www.sec.gov/comments/sr-chx-2016-16/chx201616-15.pdf .

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Unlike liquidity takers, liquidity providers stand at continuous risk to the market, and—especially to the extent they post a very large number of bids and offers simultaneously—risk significant losses due to instantaneous adverse selection. Professional trading firms with price feeds that are just a few microseconds faster than a liquidity provider's[4] can be a significant source of such adverse selection. Consequently, market participants who provide liquidity must invest progressively greater sums in direct exchange feeds, ticker plant infrastructure, and related systems in order to avoid being "picked off."[5] These technology expenditures by all parties serve only to protect professional market participants from one another, and do not fill any expressed need for additional speed on the part of investors. Registered market makers fulfilling quoting obligations are particularly impacted by the associated costs, as these obligations may require providing continuous liquidity in a large number of instruments simultaneously.

<u>Continued Investment in Speed Has Diminishing Returns</u>

These costs could be justified if they provided meaningful benefit to investors. On the contrary, however, in order to earn a return commensurate with their level of risk, registered market makers must account for all the costs of running their business when determining the amount of quoted size and the tightest possible bid-ask spread they are able to disseminate to the marketplace. Increased risk of instantaneous adverse selection, and the increased infrastructure costs necessary to mitigate that risk, is therefore a direct driver of market makers quoting wider spreads and/or smaller size in order to generate sufficient risk-adjusted returns—thereby increasing costs for investors. As a result, the endless furtherance of this technology "arms race" acts counter to investor protection and the public interest.[6]

In support of this point, it is interesting that while several commenters have raised concerns that "investors" will be harmed by the Proposal,[7] as of this writing, **<u>zero</u> comment letters from retail brokerage firms have been posted in opposition to this filing**. Indeed, Interactive Brokers Group, the only retail brokerage to comment on either the prior or recent version of the Proposal, recommends its approval.[8] This suggests that the primary objections to this Proposal arise from proprietary trading firms

[4] This includes firms engaging in strategies commonly referred to as "High-Frequency Trading."

[5] "Pickoffs" are trades that impose immediate negative utility on (*i.e.*, are immediately "regretted" by) one party (for example, because a cancellation request had already been transmitted). Trade executions best serve to advance a fair, orderly, and efficient market when, on average, they represent *mutually*-beneficial transfer of risk.

[6] Eric Budish (University of Chicago Booth School of Business), Peter Cramton (University of Maryland), and John Shim (University of Chicago Booth School of Business) have modeled this situation, which they identify as "a never-ending arms race for speed," and characterize the result as "a classic prisoner's dilemma: snipers invest in speed to try to win the race to snipe stale quotes; liquidity providers invest in speed to try to get out of the way of the snipers; and all trading firms would be better off if they could collectively commit not to invest in speed, but it is in each firm's private interest to invest." They conclude, "Our results say that sniping is negative for liquidity and that the speed race is socially wasteful." *See* Eric Budish, Peter Cramton, and John Shim (2015). "The High-Frequency Trading Arms Race: Frequent Batch Auctions as a Market Design Response." *Quarterly Journal of Economics*, 130.4. Retrieved from http://faculty.chicagobooth.edu/ eric.budish/research/HFT-FrequentBatchAuctions.pdf.

[7] *See* letter from Joanna Mallers of the FIA Principal Traders Group, dated March 13, 2017; letter from Ryan Hitch of XR Securities LLC, dated February 24, 2017; and letter from Adam Nunes of Hudson River Trading, dated March 13, 2017.

[8] *See* letter from Boris Ilyevsky of Interactive Brokers Group, dated November 7, 2016.

and exchanges with vested interests in the high-speed-arms-race status quo, which incurs substantial costs on many liquidity providers and, ultimately, on investors. We also respectfully ask the SEC to set aside suggestions that the Proposal be disapproved due to the "need for a holistic market structure review"[9]—a suggestion that, while interesting, is not germane here, as it is fortunately possible for the SEC to both approve this Proposal and *also* review equities market structure holistically.

<u>The LEAD Will Enhance Liquidity Provision and Price Discovery</u>

The Liquidity Enhancing Access Delay proposed by CHX would reduce adverse selection risk for participating CHX market makers in a very thoughtful and deliberate way. By only impacting certain liquidity-taking orders, the Proposal reduces the disadvantage incurred by participating market makers *who are slower by the smallest margin* than the corresponding liquidity takers. By helping to establish a market structure where massive technology expenditures are no longer as critical in preventing trading losses, the Proposal will foster a fairer marketplace with superior liquidity provision and tighter bid-ask spreads as liquidity providers are able to improve their quoted markets. At the same time, the Proposal would continue to afford reasonable benefits to those who choose to invest in higher-performance trading systems (since, under the Proposal, when a trade does occur, the first liquidity taker—even if he or she beats out other would-be takers by only a single microsecond or less—will uniquely be able to execute against the entire posted size, if desired). As rightly noted by Prof. Jim Angel of Georgetown University in his letter recommending approval of an earlier version of this Proposal, "Giving the market makers a few microseconds to update their quotes is a reasonable accommodation that will help to promote the posting of public liquidity in the limit order book. This will incentivize market makers to post more liquidity, leading to deeper quotes and tighter bid-ask spreads."[10]

<u>The Proposed Qualifications for LEAD Market Makers are Substantial and Proportionate</u>

Despite the obvious public-interest benefits of this Proposal in protecting investors and encouraging superior displayed liquidity from qualifying market makers, several commenters who objected to the prior version of this Proposal submitted letters reiterating their prior arguments. In its response (the "Response Letter"),[11] CHX effectively responds to these objections; here, we will address a few observations only.

One commenter describes the LEAD mechanism using loaded phrases such as "extend[ing] a regulatory subsidy [to] privileged market participants"[12] to suggest that the Proposal is somehow unfair. However, we note that the LEAD would not just benefit *any* participants selected at random, but only those qualifying market makers meeting appropriate and substantially heightened, mandatory quoting obligations. In disapproving a proposed rule change by NYSE Amex in 2012, the Commission wrote that "while exchanges may legitimately confer special benefits on market participants willing to accept substantial responsibilities to contribute to market quality, such benefits must not be disproportionate

[9] *See* letter from Joanna Mallers of the FIA Principal Traders Group, dated March 13, 2017.

[10] *See* letter from Prof. James J. Angel of Georgetown University, dated October 16, 2016.

[11] *See* letter from James Ongena of CHX, dated March 24, 2017.

[12] *See* letter from R.T. Leuchtkafer dated March 14, 2017.

to the services provided."[13] Precisely in that vein, strengthened required quoting obligations provide a clear metric for services provided in contributing to market quality. The concept of coupling specific benefits with responsibilities allocated by an exchange to certain qualified market participants is not new, and has existed without controversy for many years in the options markets, where Designated Primary Market Makers, Lead Market Makers, Specialists, etc., continue to be appointed by exchanges on an ongoing basis. As CHX rightly notes in its Response Letter:

> The Minimum Performance Standards are substantial and proportionate to the benefits conferred upon LEAD MMs. In particular, the Exchange notes that the 10% NBBO Requirement is identical to the quoting requirement for NYSE DMMs in securities with an average daily volume of 1,000,000 or more shares and is similar to a requirement for market makers that are Competitive Liquidity Providers ("CLP") on the Bats BZX Exchange, which requires CLPs quote at the NBB or the NBO for 10% to meet its monthly quoting requirement. Above and beyond, LEAD MMs (1) would be subject to tighter Designated Percentage requirements than required of either NYSE DMMs or Bats CLPs and (2) would have to meet the 2% Total Volume Requirement and the 80% Provide Volume Requirement, neither of which are currently required of NYSE DMMs or Bats CLPs. Also, the Minimum Performance Standards will not be applied to non-LEAD MMs. … [T]he Minimum Performance Standards would meaningfully contribute to market quality as the quoting requirements are similar if not identical to the most aggressive quoting requirements for market makers on the NYSE and Bats BZX.

Such a well-established practice as instituting exchange-appointed market makers with special obligations, provided substantial and proportionate quoting requirements are included (as is the case in the Proposal), is well in line with common precedent, and clearly remains consistent with the Act.

<u>The Proposal Would Reduce the Level of Unfair Discrimination in the Marketplace</u>

Commenters also use circuitous logic to suggest that the ability to adjust quotes on CHX in response to, among other things, observed market data on *an entirely different exchange* (CME) somehow constitutes "an exclusive look at the book, ahead of all other participants."[14] This argument seeks to expand the definition of "the book" in an unprecedented way to include information about orders on different exchanges trading different instruments, and is of course invalid. But taking it at face value for a moment, by this logic, market participants today who are able to afford millions of dollars' worth of special-purpose hardware and microwave transmission towers used to shave microseconds off the time required to adjust equity market pricing based on futures exchange order book activity—or activity in other equities—or correlated fixed-income instruments—or news stories scraped from Twitter and analyzed via natural language processing algorithms to extract sentiment information—are *also* getting "an exclusive look at the book, ahead of all other participants" … *if* we may use a similarly expanded definition of the phrase "the book" to include all relevant information that could theoretically be collected anywhere in the world and included in a trading strategy. By the commenter's logic, all this activity should also be prohibited. Instead, CHX is correctly proposing to address the expensive and investor-taxing problem of microsecond-level pickoffs *directly, in the one place it can be addressed in a fair and consistent way*—by allocating proportionate, microsecond-level protections to market makers

[13] *See* Rel. 67437 (SR-NYSEAmex-2011-86).

[14] *See* letter from R.T. Leuchtkafer dated March 14, 2017.

based on quantifiable liquidity-providing obligations they assume to the betterment of the market. As a result, far from introducing new and unfair forms of discrimination, the Proposal would *reduce* unfair discrimination in favor of providing an appropriate trade-off between benefits and responsibilities, in line with past policies rightly promulgated by the SEC. As the Response Letter correctly states, "LEAD is designed to correct the risk/reward dynamic that currently discourages displayed liquidity."

Another commenter repeats his earlier representation that "[t]he more quickly ETFs and futures reflect the fair value of the index, the more efficient the market is,"[15] suggesting that there is limitless benefit to simply re-pricing the market more and more quickly. As we have stated previously, CTC agrees with the general objective of re-pricing assets as quickly as is both (1) reasonable within the constraints of technology generally available to liquidity providers, and (2) beneficial to investors. That said, the SEC does not allow market participants to compete on the basis of ever-smaller price increments (one cannot step in front of other participants by outbidding them by a billionth of a cent) or quote sizes (one cannot step in front of other participants by outbidding them for a billionth of a share); on the contrary, common-sense minimum price and size increments are essential to aggregating liquidity and incentivizing the posting of meaningful quotes at risk to the market. Similarly, while the aggregate reduction in order processing times from several minutes to the sub-second level over the past few decades has certainly benefitted investors, unrestrained competition on the basis of endlessly smaller time increments on the order of a billionth of a second provides no further meaningful benefit.[16] The Proposal seeks to strike an appropriate balance such that markets can still update prices very quickly while providing reasonable protections to qualifying market makers that will result in deeper, tighter quotes.

One commenter[17] repeats an earlier suggestion that because the speed bump will be implemented in software rather than hardware, there will be some degree of indeterminacy in the precise amount of latency introduced, and that this indeterminacy is somehow disqualifying, as if all other exchange systems (or indeed, any technology systems used for any purpose) have 100% deterministic performance at the nanosecond level. This is of course false, so we simply repeat our response: by this logic, the SEC should disallow the use of software to build exchange matching engines altogether, since doing so may also introduce some small degree of indeterminacy. (Indeed, the SEC has also approved mechanisms such as random-length options price improvement auctions, which introduce *intentional* indeterminacy in software, without controversy. It would be illogical to permit intentional indeterminacy, but disallow the small but inevitable indeterminacy that naturally arises in any implementation.)

[15] *See* letter from Adam Nunes of Hudson River Trading LLC, dated March 13, 2017.

[16] The Commission has rightly pointed to the benefits of "*bona fide* arbitrage" in past releases (*see*, *e.g.*, Regulation SHO, Rel. 34-61595, File No. S7-08-09, p. 126, which speaks to the goal of "reduc[ing] pricing disparities between related securities"). Note, however, that LEAD Market Makers who prevent executions by adjusting their quotes during the 350-microsecond delay in no way reduce the efficacy of the arbitrage mechanism, since even absent the execution, the liquidity provider's updated price will still be the "correct" new price (assuming that the order-sending participant was well informed).

[17] *See* letter from R.T. Leuchtkafer dated March 14, 2017.

<u>The Proposal Remains Clearly Consistent with the Quote Rule</u>

Another commenter repeats an earlier suggestion that the Proposal would violate Rule 602(b) (the "Quote Rule") before conceding that CHX's rebuttal of this objection (which echoes our comments in a prior letter) is in fact "technically accurate."[18] CHX's response is indeed technically accurate—in fact, it comports perfectly with the clear and precise language of the Quote Rule. Rule 602(b)(2) states that the broker or dealer's obligation is to execute orders "presented *to it* [i.e., not to the exchange] by another broker or dealer," and 602(b)(3)(ii)(A) explicitly provides for an exception if "*before the order sought to be executed is presented*, such responsible broker or dealer has communicated to its exchange or association … a revised bid or offer" (emphasis added). Because CHX is not proposing to provide any notification of any kind to a LEAD Market Maker indicating that an inbound order has been delayed and may imminently execute, it is clear that no "presentation" to the liquidity provider has occurred, and therefore any revised bid or offer from the liquidity provider that is received before the end of the delay would not represent a violation of the Quote Rule.

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For all of the reasons cited above, we encourage the Commission to approve the Proposal. We note again that the issues referenced here have a much broader impact than just one exchange's rule set. We continue to believe that speedy approval of the Proposal will reduce unfair discrimination on the basis of how much firms are willing to pay for extremely high-performance technology infrastructure, protect investors and the public interest by enhancing price discovery and transparent liquidity provision through improved disseminated quotes from LEAD Market Makers, and continue to remove impediments to the operation of fair and orderly markets that arise from the trading technology arms race—all directly in line with the explicit goals of the Exchange Act. The SEC's approval of this Proposal would open the door for other exchanges to follow suit with innovative proposals that would benefit investors by helping to reduce pickoff risk for liquidity providers meeting appropriately heightened quoting obligations. Conversely, disapproval would further entrench the established technology-driven arms race, to the benefit of several commenting firms, perhaps, but directly contrary to the public interest.

Should you have any questions with respect to this letter, we would welcome the opportunity to discuss it further. We appreciate the opportunity to respond.

Sincerely,

Steve Crutchfield
Head of Market Structure

[18] *See* letter from Elizabeth King of NYSE, dated March 20, 2017.

cc: Ms. Heather Seidel, Acting Director, Division of Trading and Markets
Mr. Gary Goldsholle, Deputy Director, Division of Trading and Markets
Mr. David S. Shillman, Associate Director, Division of Trading and Markets
Mr. John Roeser, Associate Director, Division of Trading and Markets