NEW YORK CITY TEACHERS' RETIREMENT SYSTEM BOARD MEETING Held on Thursday, November 15, 2018, at 55 Water Street, New York, New York ATTENDEES: JOHN ADLER, Chairman, Trustee DAVID KAZANSKY, Trustee THOMAS BROWN, Trustee DEBRA PENNY, Trustee SUSANNAH VICKERS, Trustee LINDSEY OATES, Trustee PATRICIA REILLY, Teachers' Retirement System THAD McTIGUE, Teachers' Retirement System SUSAN STANG, Teachers' Retirement System VALERIE BUDZIK, Teachers' Retirement System REPORTED BY: YAFFA KAPLAN JOB NO. 2467227 ATTENDEES (Continued): KAVITA KANWAR, Teachers' Retirement System LIZ SANCHEZ, Teachers' Retirement System ANNETTE HANHARAN, Teachers' Retirement System CARMELA CRIVELLI, Teachers' Retirement System ROBERT BETHELMY, Teachers' Retirement System PAUL RAUCCI, Teachers' Retirement System RENEE PEARCE, Teachers' Retirement System AMY CASSIDY, ESQ., Law Department SAM RUMLEY, Office of the Actuary DOLORES CAPONE, Office of the Actuary ANDREW BRADFORD, Teachers' Retirement System MELVYN AARONSON, Teachers' Retirement Sytem PAUL MARTINIELLO, CEM

0003 1 Proceedings MR. ADLER: All right, good afternoon. 2 3 Welcome. 4 MR. KAZANSKY: And one lovely afternoon 5 it is. 6 MR. ADLER: Welcome to this snowy day at 7 the Teachers' Retirement System regular board meeting for November 15, 2018. 8 9 Patricia, will you please call the roll? 10 MS. REILLY: John Adler? 11 MR. ADLER: I am here. MS. REILLY: Thomas Brown? 12 13 MR. BROWN: Here. 14 MS. REILLY: David Kazansky? 15 MR. KAZANSKY: Present. MS. REILLY: Lindsey Oates? 16 17 MS. OATES: Here. 18 MS. REILLY: Debra Penny? 19 MS. PENNY: Here. 20 MS. REILLY: John Dorsa -- I mean, I'm sorry. 21 22 MS. VICKERS: I am here for John Dorsa. 23 Susannah Vickers. 24 MS. REILLY: Okay. 25 MR. ADLER: We have a quorum? 0004 1 Proceedings 2 MS. REILLY: We do. 3 MR. ADLER: Before we move into our 4 agenda, I would just like to ask Sam Rumley 5 from the Office of the Actuary to make an 6 introduction. 7 MR. RUMLEY: Okay. Thank you. I would like to introduce to the board a colleague 8 that works -- she is a manager in the 9 10 actuarial services division at the Office of 11 the Actuary. This is Dolores Capone. And she 12 is part of the chief actuary's succession 13 planning scenario along with her idea of 14 having professional staff development, and 15 finally just to give the board some continuity 16 with the familiar face, so if you need to 17 contact someone, Dolores is your individual. 18 So thank you. 19 MR. ADLER: With that, we will move 20 ahead with the agenda. 21 MS. REILLY: Next is an update on TRS 22 operations. Kavita is going to give us that. 23 Ms. KANWAR: Members have been notified 24 that their account statements for the third 25 quarter of 2018 are now available. Οn

1 Proceedings November 5th, quarterly account statements 2 3 were posted on a website for approximately 4 125,000 members who are currently in service or on leave. Mailing of these statements will 5 6 occur between November 16th and November 19th. 7 On August 30, TDA quarterly statements 8 were posted online for approximately 56,000 members who have TDA-deferral status. Mailing 9 10 occurred on November 5th. And finally, the 11 TDA quarterly statements for TDA beneficiary 12 participants were mailed to a population of 13 approximately 1,000 members on October 24th. Earlier this fall we informed our members that 14 15 the third-quarter account statements would be 16 the last one they receive by mail. Future 17 account statements will be available on our 18 secure website. This is the latest step in 19 our strategic effort to more paperless 20 operations. 21 The fall 2018 issues of our member newletters have been published and posted on 22 23 our website. In-Service News will be mailed 24 to retired members over the next weeks and the 25 Benefit Reports will be mailed to our 0006 1 Proceedings 2 retirees. 3 MS. REILLY: Thank you. 4 MR. ADLER: Thank you. 5 MS. REILLY: So next is the executive 6 director's report and the first item there --7 oh, before I get to that, I did want to let 8 everybody know that we have gotten a new 9 investment and board meeting schedule as a 10 There has been a change which is handout. 11 highlighted in yellow. 12 MR. ADLER: That's a change that's been 13 previously sent out to us? 14 MS. REILLY: Right but we are just 15 making sure everybody has it. 16 MR. ADLER: Okay, great. Thank you. 17 MS. REILLY: So the executive director's 18 report, and the next item is the matter of the 19 minutes and it's been suggested -- I'm sorry. 20 The next meeting and it's been suggested that 21 the next regular meeting of the Teachers' 22 Retirement Board be held on the third Thursday 23 of the month, December 20, 2018. 24 Next is adoption of the revised proxy 25 voting guidelines.

0007 1 Proceedings MR. KAZANSKY: Please skip to the 2 3 resolved. 4 MS. REILLY: "Resolved that the 5 Retirement Board hereby ratifies adoption of the revised proxy voting guidelines for the 6 7 Teachers' Retirement System". MR. ADLER: Okay. So this is a 8 ratification really of a vote that the 9 10 committee -- it's the committee's 11 recommendation, proxy committee recommendation 12 to the full board. 13 So can we have a motion to adopt this 14 resolution? 15 MR. BROWN: So moved. MR. ADLER: Is there a second? 16 17 MS. VICKERS: Second. 18 MR. ADLER: We will take Ms. Vickers. I 19 think she was in under the wire. Any 20 discussion? Okay. All in favor of the motion 21 to ratify adoption of the revised proxy voting 22 guidelines, please say aye. Aye. 23 MS. OATES: Aye. 24 MS. PENNY: Aye. 25 MS. VICKERS: Aye. 8000 1 Proceedings MR. BROWN: Aye. 2 3 MR. KAZANSKY: Aye. 4 MR. ADLER: All opposed, please say nay. 5 Any abstentions? Motion carries. 6 MS. REILLY: Next item on the agenda is 7 attendance at a conference, and the following 8 resolution is presented for consideration and 9 possible adoption. 10 "Resolved that the Trustees of the Teachers' Retirement Board hereby approve the 11 12 attendance and participation of the Executive Director and/or her designees and any 13 14 interested Trustee at the National Conference 15 on Public Employee Retirement System's 16 Legislative Conference from January 27th 17 through January 29, 2019. 18 MR. ADLER: Okay. Is there a motion? 19 MR. KAZANSKY: So moved. 20 MR. ADLER: Thank you, Mr. Kazansky. Is 21 there a second? 22 MR. BROWN: Second. 23 MR. ADLER: Thank you, Mr. Brown. Any 24 discussion? All in favor of the motion to 25 approve attendance at the NCPERS Legislative

0009 1 Proceedings 2 Conference in January, please say aye. Aye. 3 MS. OATES: Aye. MS. PENNY: Aye. 4 5 MS. VICKERS: Aye. 6 MR. BROWN: Aye. 7 MR. KAZANSKY: Aye. MR. ADLER: All opposed, please say nay. 8 Any abstentions? Motion carries. 9 10 MS. REILLY: Next on the agenda is the 11 matter of the calendar. And first item is the approval of all of the CIM minutes from 12 13 10/17/2018, the investment meeting minutes 14 from 10/4/2018, the board meetings from 15 10/18/2018. 16 MR. ADLER: So first, let me see if 17 anyone has any comments or changes for any of 18 those meeting minutes. Seeing none, can we 19 get a motion to approve all the minutes that 20 Patricia just read off? 21 MS. VICKERS: So moved. 22 MR. ADLER: Thank you, Ms. Vickers. Is 23 there a second? 24 MS. PENNY: Second. 25 MR. ADLER: Thank you, Ms. Penny. Any 0010 1 Proceedings 2 discussion? All in favor of approval of the 3 motion approving the minutes, please say aye. 4 Aye. 5 MS. OATES: Aye. 6 MS. PENNY: Aye. 7 MS. VICKERS: Aye. 8 MR. BROWN: Aye. 9 MR. KAZANSKY: Aye. 10 MR. ADLER: All opposed, please say nay. Any abstentions? Motion carries. 11 12 MS. REILLY: Next is the calendar and 13 you have all received an electronic version of 14 the calendar. 15 MR. KAZANSKY: Please waive the reading 16 of the calendar. 17 MR. ADLER: So we have the calendar in 18 front of us. Is there a motion to approve 19 adoption of the calendar? 20 MR. KAZANSKY: So moved. 21 MR. ADLER: Thank you, Mr. Kazansky. Is 22 there a second? 23 MR. BROWN: Second. 24 MR. ADLER: Thank you, Mr. Brown. Any discussion? All in favor of the motion to 25

0011 1 Proceedings 2 approve the calendar, please say aye. Aye. 3 MS. OATES: Aye. 4 MS. PENNY: Aye. 5 MS. VICKERS: Aye. 6 MR. BROWN: Aye. 7 MR. KAZANSKY: Aye. MR. ADLER: All opposed, please say nay. 8 Any abstentions? Motion carries. 9 10 MS. REILLY: Next, other business. We 11 have a presentation by CEM. 12 MR. MARTINIELLO: Good afternoon, 13 pleasure to be here. I come from less snowy 14 Canada to very snowy New York. My name is 15 Paul Martiniello. I am a director with CEM Benchmarking which I understand most people in 16 17 the room know who we are and what we do. I 18 recognize a couple of faces. 19 With that said, I did want to spend a 20 couple of minutes giving a bit of context as 21 to the service that we provide under the 22 pension administration benchmarking and the 23 results that I am going to review with you 24 this afternoon. 25 So our pension benchmarking 0012 1 Proceedings 2 administration service looks at both your 3 costs and service within -- we basically do an analysis and comparison among the peer group 4 5 that essentially addresses whether or not your system is adding value based on what you are 6 7 spending. So value for money. And those two 8 elements of our report is what I am going to 9 review in the next few minutes. 10 That said, there is also a best global 11 practices piece which I wanted to just 12 highlight, and that has to do with the fact 13 that, as you can appreciate, we work with 14 pension plans all over the world and we have 15 the luxury, if you will, and benefit of 16 dealing with experts in the pension field like 17 those in TRS NYC among the others in our 18 database. And as a result, there is a lot of 19 sharing of best practices and experiences that 20 everybody values, and it's done either 21 virtually online through a platform we have as 22 well as conferences that we run once a year. 23 Also we conduct some research, so I want to 24 mention that and also give kudos to the team 25 here at TRS in New York. I have known Kavita

0013 1 Proceedings 2 and a few others like Joan and Matt for 3 several years and they have been great 4 contributors to that effort, so I look forward 5 to that as we move forward. And the last bit of context I want to 6 7 add is CEM is an acronym for cost-effective measurement and that's -- I think that's 8 9 important to bring out because essentially 10 cost-effectiveness is really about the 11 cost-benefit dynamics, so it's not just 12 reducing cost, being obsessed with reducing 13 cost. Obviously that's always a good thing. 14 I think what's most important is understanding 15 the value that your system is providing to the 16 members given what you are spending at the 17 same time as managing costs, so that's just a 18 point I wanted to bring out. 19 We have seen trends that speak to our 20 global best practices that really support 21 this. There is three main ones that I can 22 highlight. Primarily number one is -- and 23 they are all interrelated. I hope these all 24 resonate with you, cost-effectiveness and all 25 the various initiatives that go into making a 0014 1 Proceedings 2 system more cost-effective. There is focus on 3 member communication, all things member 4 communication, engagement which are obviously 5 important to your member base, and something 6 that we have seen become increasingly more 7 important in the last few years. And the last 8 thing is system modernization. This is a 9 trend we have seen throughout our database, 10 and there is various reasons why systems are 11 modernizing, starting with strategic reasons. 12 So your drive to maybe go more member-centric, 13 for example. Obsolence of your systems 14 because they are just at the stage where they 15 need to be updated, and the last one is 16 complexity or dealing with increased 17 complexity in your system of which, as you can 18 appreciate, these are all interrelated. Ιf 19 your system is obsolete, then you are not 20 going to be able to implement those. So those 21 are trends we see throughout our database and 22 I want to bring those up front because they do 23 add some color to the results that we are 24 going to see.

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With regards to our global database, I

0015 1 Proceedings 2 am not going to spend time here going through 3 the details but will remind everyone it is a 4 global database. We do work with pension 5 plans all over the world except for a few that 6 we are still trying to make some progress on 7 in some European countries where we are not 8 present, even some African, Asian countries as 9 well as Latin America we have got some focus, 10 and hopefully in the next year or so we will 11 see more of those systems added to the global 12 peer group. But what's more important for the 13 purposes of our analysis and the results I am 14 going to show is the custom peer group that we 15 have established for your system, Teachers of 16 New York. We have put together a peer group 17 which we bound peers around you by size, 18 especially including size of active number of 19 members and annuitants, and the reason we 20 focus on active members and annuitants and 21 remove the inactives is because we know from 22 experience that active members and annuitants 23 are what primarily drives administration 24 costs. 25 So as you can see, your system is very 0016 1 Proceedings close to the median. Couple of things I want 2 3 to highlight from this peer group are two 4 things. One is the fact that this is 5 consistent year over year so the same peer 6 group as we compared to you last year, so that 7 provides some consistency in our comparison 8 especially when we look at trends. 9 Second thing is take a look at member 10 mix in terms of your percentage of active and 11 annuitants compared to your peer average and 12 you are very close. As a matter of fact, your 13 system has about 4 percent more active and 14 annuitants than the peer average but very well 15 aligned, so there is not a lot of noise, if 16 you will, than having annuitants more active 17 in your peer group. 18 So let's look at some numbers. Your 19 total pension administration costs of 52 20 million -- by the way, those are numbers for 21 2017. Maybe I didn't make that clear up 22 front. Fifty-two million dollars which 23 translates to a cost of 235 dollars per active 24 members and annuitants, which when we compare 25 you to the peer group, the peer average of

0017 1 Proceedings 115, it puts you at 120 dollars more than the 2 3 peer average. 4 So what we ask at CEM is why. Why is 5 your cost higher than the peer average, and we 6 have got a model that breaks down the reasons 7 which I am going to go into. Before I go into 8 the details of that particular model though, I just wanted to highlight the complexity factor 9 10 of your particular system which I don't think 11 I need to tell anybody in this room you are a 12 fairly complex system. We measure that 13 relative to other systems, not only in your 14 peer group but also the universe. So this 15 chart you are looking at, the dark blue is you 16 and the middle blue is your peers and the 17 remainder are the universe, and you can see 18 that basically when we look at your 19 complexity, you are the third-highest not only 20 in the peer group but the universe, and it 21 reflects your policy and things that are 22 typically out of control from a management's 23 perspective, but I would like to bring that to 24 your attention here because it does add some 25 context around the fact that complexity does 0018 1 Proceedings 2 have an impact on administration costs and in 3 the case of a system like yours which is going 4 through a system modernization project, it can 5 also have increased costs because of the 6 things that you have to contend with when you 7 are putting that system in place. 8 So back to the model and why your costs 9 are 120 dollars above the peer averages. So 10 we at CEM have a model whereby we have six key 11 drivers that we go through. The first one is 12 economies of scale, which is a nonissue in the 13 case of your system. The second two, number 14 two and three have to do with transactions. 15 The first one is the number of transactions 16 that your system processes per member so it 17 really reflects workloads. And the other element of that is productivity side which is 18 19 how many transactions your FTE process and how 20 effectively do they do that. So you can see 21 the higher transactions per member in your 22 case increased your costs per member above the 23 peer average by 60 dollars, and there is a bit 24 of an offset there of about 20 dollars in 25 terms of the productivity and we are going to

1 Proceedings go into some of this in a bit more detail. 2 3 The fourth element has what to do with costs 4 that vary by FTEs, so when you add an FTE to 5 your system, you obviously have salaries and 6 benefits, but there is also things like 7 building utilities and HR, IT Desktop that could be impacted. Here we have a slight 8 9 impact of \$3.52 that we will look at a little 10 bit closer. We also look at third-party costs that relate to just front office activities. 11 By "front office", I am referring to the way 12 13 we define it at CEM are activities that come 14 into contact with members and/or employers. 15 Okay. So and there is -- you basically have 16 lower third-party costs with respect to those 17 types of transactions, and then the last key 18 driver has to do with basically paying more or 19 less for back office activity, and by "back 20 office" we are talking about basically support 21 activities such as governance, the major 22 project which in this case will be your system 23 administration, IT strategy, actuary, legal, 24 et cetera. 25 I just want to point one thing out which 0020 1 Proceedings 2 is -- this is an exception. An additional 3 calculation we made for your system that you see there to the right has an asterisk on it 4 5 specifically next to major projects, and 6 that's due to the fact that there was some 7 questions around okay, well, here at TRS NYC 8 we expense our major projects on an annual 9 basis versus other systems may amortize it 10 over longer periods. So what's the impact? 11 Well, you can see we did a calculation with an 12 assumption of eight-year amortization, which 13 is as far as the data for yourselves that we 14 can actually do this calculation. You can see 15 the difference. There is a bit of a 16 difference. It's not really material. Your 17 costs would have been 62 dollars more than the 18 peer average versus the 71. 19 And just as a side note, I will say 20 within your peer group there is only three 21 that are not conducting system administration 22 projects, and within those three, the majority 23

23 actually are -- they do both. Some amoritize, 24 capitalize the costs, and others expense it, 25 so they capitalize some and expense other

0021 1 Proceedings parts of that. So and then like yourselves, 2 3 there is just three that just expense it 4 fully, so I want to make sure that everybody 5 is clear that you are in a very comparable 6 group with regards to that so I wouldn't be 7 too concerned. 8 Now let's go into a bit more detail as 9 to some of the more material drivers behind 10 the costs. The transactions per volume. So 11 this one is interesting. First of all, 12 transaction volumes we knew through our 13 experience are key driver of cost, so it's 14 something to take a look at. As you can see 15 in the case of your system, it was 16 substantially higher than the peer average by 17 193 percent which led to an increase of total 18 cost per member by \$60.18. And we are going 19 to see in a few minutes -- actually not in a 20 few minutes, in a few seconds because I am 21 going to flip to the slide in a little bit more detail and I apologize it's a little bit 22 23 hard to read, but I just want to drive down 24 what those transactions look like. 25 So we are not going to go into this but 0022 1 Proceedings this is what I referred to earlier as the 2 3 front office transaction so everything that comes into contact with members in terms of 4 5 things like putting pensions into pay and 6 accepting new members, withdrawals, 7 everything, everything to do with member 8 communication. And the third block is your data collection and data maintenance with 9 10 respect to the work you do with employers. So 11 specifically the difference here and the 12 driver for TRS NYC has to do with what I have 13 come to learn about your system is the deficit 14 and credit of service that you have with your 15 teachers and the collection of that on a 16 retroactive basis and I understand there is 17 two elements. There is just the normal course 18 of business that happens with teachers on an 19 ongoing basis and there is a more exceptional 20 situation where you have got this five-year 21 contract with the union that there is a whole 22 bunch of these being processed and inhabited 23 for a couple of years and this will drop off 24 in about three years' time in 2020. And that 25 second element is what really has driven the

0023 1 Proceedings 2 transactions up in particular with what we are 3 labelling here 1-D, the purchases and 4 transferring, and that's one of the more 5 expensive type of transactions. So that's 6 really what's driving the cost relative to 7 your peer average for your system, and when that drops off, you did a quick calculation, 8 if it drops off to numbers, the management 9 10 team told me it would have 75 percent drop-off 11 which would have a substantial impact on that. 12 The two other activities I want to point 13 out is first one listed as calls and e-mails 14 but really talking about call volume. As you 15 can see, they are substantially higher than 16 the peer average. That I also understand is 17 driven a lot by the same issue with deficit 18 and credit of service where letters are sent 19 to the members and there is a definitive spike 20 in call volumes that are seen. A lot of 21 members are calling for status updates on the 22 situation, which I am also told will be online 23 shortly and that will ideally have an impact 24 on less calls as well. And then the third one 25 is the member counseling, one on one. We have 0024 1 Proceedings 2 seen an increase on that activity in the past 3 year, which has an administrative cost to it. However, I will tell you, jumping ahead to the 4 5 service side, we have also seen an increase in 6 your service scores as a result of one-on-one 7 counseling which members love, right? That's 8 a very valued service albeit kind of an 9 expensive one too. 10 In terms of the productivity, I am not 11 going to really say much more about this. 12 Like I said, there is an offset in the case of TRS NYC. Your staff -- if you look at 13 14 transactions per FTE and what's processed, you 15 process more transactions per FTE than peers 16 in a few average areas, but not surprisingly 17 it's what we just saw with respect to the 18 purchases transferred in as well as the 19 handling of those calls. Okay? So that has 20 the effect of dropping the cost by -- in this 21 case \$20.27 relative to the peer average. In 22 terms of actual costs per FTE, these are -- as 23 I mentioned earlier, the costs varied at FTE. 24 You can see that if we look at the total, your 25 total cost per FTE increased by \$3.52 relative

1 Proceedings 2 to the peer average. 3 Two components to highlight here. The 4 first is the fact that major project staff 5 costs are higher. I think that's potentially 6 to be expected given where you are at with 7 your project, and I just want to clarify that 8 this does include -- so this includes all 9 staff under the management of TRS of which 10 some are consultants that are part of that. 11 So that's the definition. The other component 12 to this is the fact that buildings and 13 utilities are quite a bit higher and that has 14 to do with your environment in which you work 15 in. 16 Just as a note on the major project cost 17 and staff, I just want to add some color again 18 on a global perspective I have seen. We took 19 a look at numbers in our universe database 20 that for 2000 to 2016 -- I don't have the '17 21 numbers but we saw an increase in costs in 22 major projects and IT of 17 percent per annum 23 every year for those seven years. We would 24 like to say we have seen a reduction in costs 25 in other activities like member-facing 0026 1 Proceedings 2 activities. I think the jury is still out on 3 that. It's a little bit early because we don't have enough data but I think we will. 4 5 That's the expectation but what we have seen 6 is absolutely an increase in the amount of 7 online activity. Members are going online 8 into the secure portion of websites for their 9 systems to the tune of 9 percent increase 10 annually over that same time period. So we 11 hope that as we move forward that the benefits 12 of the work that's being done on the system 13 will show some efficiencies. They are 14 certainly starting to show some division to 15 the member utility and what they can do. 16 MR. ADLER: Can I just ask a question? 17 MR. MARTINIELLO: Sure. 18 MR. ADLER: So the building utilities, 19 that's a huge disparity there. So is that 20 just based on the cost of our rent and the 21 associated cost? 22 MR. MARTINIELLO: Correct. That's what 23 I suspect. Exactly. 24 MR. ADLER: And the salary stuff, that 25 includes fringes, that includes pension and

0027 1 Proceedings 2 health-care costs; is that correct; is that 3 right or not because pension costs are not 4 included in our budget I don't believe so --5 MR. MARTINIELLO: It does include 6 salaries and benefits. So if benefits -- if 7 the health care for your or the pensions for 8 your staff are in there --9 MR. ADLER: You may not know whether 10 because remember, our budget doesn't --11 MR. McTIGUE: It does not include that. 12 I don't know how they calculate this. 13 MR. ADLER: Just curious. That's fine. 14 MS. REILLY: But you can look, our staff 15 are paid less than our peer average. 16 MR. ADLER: Although that may be because 17 they are not including the pension costs 18 whereas others are. It may not be an 19 apples-to-apples comparison. 20 MS. REILLY: Well, we are all supposed 21 to be all doing the same thing. MR. ADLER: I know but because our 22 23 budget doesn't include our pension cost, our 24 most recent budget, we just did an asterisk, 25 but previously it wasn't in there at all. 0028 1 Proceedings 2 Anyway --3 MR. MARTINIELLO: I am not going to 4 spend some time on this next slide because it 5 does speak more to the cost environment. This 6 is in comparison to your -- to the other peers 7 that we are comparing you to, and you can see 8 that in the case of yourselves, based on where 9 you are located, you do have the highest cost 10 environment. In terms of back office 11 activities, now looking at what you are 12 actually paying for these back office 13 activities relative to the peers, you can see 14 that there is really two components that are 15 higher and the first is governance and 16 financial control. So this is governance that includes financial administration, control, 17 18 board strategy policy, as well as government 19 public relations. That's all bucketed into 20 that, so you spend more than your peers on 21 that which leads to 12.41 increase. 22 And the next one is the major one which 23 I am sure everybody is aware of is the major 24 projects which like I said, there is a trend

25 out there and we are hoping that at some point

0029 1 Proceedings 2 in time benefits will be seen with regards to 3 that kind of investment. I am very curious to 4 see how that unfolds. 5 Now I am going to switch gears. So we 6 have gone through costs. I am going to go to 7 the other side and that's service. So we have a very in-depth survey of 120 questions on 8 9 service-related items and these are items that 10 are deemed value add to your members and that 11 allows us to basically score your system on a 12 scale of 1 to 100 as to where you are in 13 service and compare that to the peers and you 14 can see that your total service score of 76 15 was below the peer median of 84, but I will 16 say it has increased significantly since last 17 year and I am going to go into that in a 18 couple of slides. 19 What I do want to highlight here are a 20 couple of things. First of all, the goal is 21 not to be 100. That's just not cost 22 effective. It really -- this part of the 23 report really is useful for the management 24 team to assess where they are different from 25 their peer groups and basically look at where 0030 1 Proceedings 2 they may be able to add certain services or 3 quite frankly even reduce. You can go the other way around. At the end of the day, it 4 has to be services valued by your member base 5 6 and that's what is most important. So to look 7 at some of the key service metrics that we 8 include in the score, these five in particular 9 are ones that we measure right across the 10 board and highlight in the executive summary 11 because they are important to members at the 12 end of the day. The first one is member 13 contacts, and within that specifically the 14 percentage of calls resulting in undesired 15 call outcomes as well as average total wait 16 time including time negotiating auto 17 attendances, and you can see that for TRS NYC 18 it's been since 2014 an improvement and a 19 tremendous one at that. So kudos to the team 20 here for that. Especially I would say the 21 first one, percentage of calls, undesired call 22 outcomes, both of these things are going to 23 help and have helped improve the service 24 score, and more importantly, I am sure your 25 members are quite pleased with that.

0031 1 Proceedings 2 In terms of the website, you have gone 3 from nine online tools to 12 in the past year 4 and that's also fantastic. A little bit less than the peer average of 14. But I also 5 6 understand that will continue to improve with 7 the implementation of your new pension system. 8 In terms of one-on-one counseling, here 9 is what we are showing is really the 10 percentage of your active membership that 11 attend one-on-one counseling as well as a 12 second bullet speaks to the average of your 13 active membership that attends presentations, 14 and in both cases they are substantially 15 higher than the peer average which reflects 16 engagement by your member base. The fourth 17 one, pension inceptions has to do with how 18 quick you can turn a pension or put a pension 19 into pay and make sure there is no gap between 20 their paycheck and now pension pay. You guys 21 are at the top of the game there so I have 22 nothing really to add. That's been consistent 23 year over year. 24 In terms of member statements as well, I 25 don't have anything to add. You have current 0032 1 Proceedings 2 material in terms of the data for member 3 statements as well as you provide estimates on 4 the member statement as to what they can 5 expect in the future with their pension, which 6 is also something that's highly valued and 7 been proven to increase engagement by members. 8 So looking at your specific score and 9 why has it gone up from 70 to 76 in the last 10 year and you can see here the trend from 2014 11 and up to 2017 -- I have already talked about 12 the call center so I am not going to review 13 that -- as well as the website. I mentioned 14 the reasons behind that. On the one-on-one 15 counseling it's -- the one improvement there 16 that had an impact this past year is you now 17 provide realtime written benefit estimates and 18 service credit cost estimates, and in terms of 19 satisfaction surveying, your surveying on the 20 one-on-one-counseling focused primarily on 21 that activity which is excellent. Now, can 22 this be improved? It always can be improved. 23 Like I said, the goal is not to get to 100 but 24 there is always room for improvement and our 25 report actually goes into quite a bit of

1 Proceedings details as to the areas which you can improve 2 3 and based on our model, how many points you 4 would gain. 5 I just highlighted three material ones 6 here, which the first one has to do with 7 satisfaction surveying. So essentially the more satisfaction surveying that you do of 8 9 your members on matters deemed important to 10 them like putting pensions into pay, like 11 telephone calls, written estimates, purchase 12 transfers in, et cetera, the better service 13 score will you have. In terms of menu layers on your phone 14 15 call tree, the fewer the better, so there is 16 room for improvement there, and lastly, with 17 regards to reaching a knowledgable person, as 18 the numbers are already showing, there is a 19 tremendous improvement to get to 137 seconds 20 there. There is still room to improve based 21 again on our model. Whether that's something 22 that makes sense for your system is something 23 only you can decide. That's something that 24 can be looked at. 25 Now, I have heard from management all 0034 1 Proceedings 2 three of these things are being worked on, and there will be improvement to the score the way 3 4 we calculate it if not in 2018, by 2019. So 5 now to put it back together and in terms of 6 cost and service, I am not going to repeat 7 everything you just heard. The costs as you 8 know are above your peer average and we know 9 why. The primary reasons why being your major 10 project, system administration modernization 11 work, as well as the somewhat unique spike in 12 processing of transactions, and on the flip 13 side your service score is improved so it 14 really is going in the direction you want to 15 see. Your costs are being maintained and your 16 service score is going up, which leads back to 17 my earlier comment about looking at more of 18 the dynamic between costs and benefit and 19 making sure you are ideally providing quality 20 service to your members while maintaining your 21 soft costs. 22 So that's my presentation. I hope I 23 stayed within the time. I did want to give

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23 stayed within the time. I did want to giv 24 thanks to Kavita and Michael and all the 25 others on the team that spend the time to

0035 1 Proceedings provide us with the data because without that, 2 3 none of this could be possible. And we will 4 open the floor to any questions. 5 MR. ADLER: Questions for Paul? Can we 6 get a copy of the presentation? 7 MR. MARTINIELLO: Sure. 8 MR. ADLER: Great. Okay. Thank you. 9 MR. MARTINIELLO: Thanks for your time. 10 MR. ADLER: Let me just say 11 congratulations to the team on service 12 improvement, really very substantial 13 improvement over the past year. So that's 14 great work. 15 MR. KAZANSKY: Teachers are always happy 16 to see the grades go up. 17 MR. ADLER: Okay. Questions, comments 18 from the public? 19 MR. AARONSON: The public is very 20 pleased to see improvement that we made at TRS 21 this year. 22 MR. ADLER: Thank you, Mel Public. Okay 23 anything else for our public agenda? So I 24 think we have a matter we need to take up in 25 executive session. So can we have a motion to 0036 1 Proceedings 2 exit public and go into executive session? MS. PENNY: Sure. I move pursuant to 3 4 Public Officers Law Section 105 to go into executive session for discussions regarding 5 6 specific contract matters. 7 MR. ADLER: Thank you. Is there a 8 second? MS. VICKERS: Second. 9 10 MR. ADLER: Thank you. Any discussion? All in favor of the motion to exit public 11 12 session and go into executive session, please 13 say aye. Aye. 14 MS. OATES: Aye. 15 MS. PENNY: Aye. 16 MS. VICKERS: Aye. 17 MR. BROWN: Aye. 18 MR. KAZANSKY: Aye. 19 MR. ADLER: All opposed, please say nay. 20 Any abstentions? Motion carries. 21 (Whereupon, the meeting went into Executive Session.) 22 MR. ADLER: Okay. Very good. So a 23 motion to return to public session would be in 24 order. Is there such a motion? 25 MS. VICKERS: So moved.

0037 1 Proceedings 2 MR. ADLER: Thank you, Ms. Vickers. Is 3 there a second? 4 MR. BROWN: Second. 5 MR. ADLER: Thank you, Mr. Brown. Any 6 discussion? All in favor of the motion to 7 exit executive session and return to public 8 session, please say aye. Aye. 9 MS. OATES: Aye. 10 MS. PENNY: Aye. MS. VICKERS: Aye. 11 12 MR. BROWN: Aye. 13 MR. KAZANSKY: Aye. 14 MR. ADLER: All opposed, please say nay. 15 Any abstensions? Motion carries. 16 Okay. We are back in public session. 17 Susan, will you please report out of executive 18 session. 19 MS. STANG: In executive session, 20 certain investment contract matters were 21 discussed. Consensus was reached, which will 22 be announced at the appropriate time. 23 MR. ADLER: Thank you very much. 24 Anything further for today? Seeing nothing, a 25 0038 1 Proceedings 2 motion to adjourn would be in order. 3 MR. BROWN: So moved. 4 MR. ADLER: Thank you, Mr. Brown. Is 5 there a second? 6 MS. VICKERS: Second. 7 MR. ADLER: Thank you, Ms. Vickers. Any 8 discussion? All in favor of the motion to 9 adjourn, please say aye. Aye. 10 MS. OATES: Aye. 11 MS. PENNY: Aye. 12 MS. VICKERS: Aye. 13 MR. BROWN: Aye. 14 MR. KAZANSKY: Aye. 15 MR. ADLER: I think it's unanimous. The 16 meeting is adjourned. 17 (Time noted: 4:22 p.m.) 18 19 20 21 22 23 24 25

Proceedings CERTIFICATE STATE OF NEW YORK) : ss. COUNTY OF QUEENS) I, YAFFA KAPLAN, a Notary Public within and for the State of New York, do hereby certify that the foregoing record of proceedings is a full and correct transcript of the stenographic notes taken by me therein. IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of November, 2018. YAFFA KAPLAN