#### Background

On October 23, 2017, the State Board of Education (Board) directed the Technical Advisory Group (TAC) to review the A-F Accountability Plan, business rules and impact data for problematic issues.

To date, the TAC has met five times to discuss issues relating to the impact data, business rules and the A-F Accountability Plan.

From reviewing the data, the TAC has identified some problematic issues:

#### N-Count:

The FAY N counts for proficiency are aggregated across subject areas (ELA, Math, Science). This makes proficiency points more accessible. In contrast, the FAY N counts for SGT/SGP are broken out by subject area (ELA and Math). By disaggregating the FAY N counts for SGT and SGP, fewer schools have access to these points. One solution to this would be to adjust the SGT and SGP calculation to include both ELA and Math. This would have the added benefit of reducing model complexity by providing consistent treatment for proficiency and growth.

The same problem outlined above applies to subgroup improvement as well – the N counts are separated by subject area. Combining them would give more schools access to these points. However if one combines across subjects for subgroup improvement, there are half as many categories in which to earn two points (20 reduced to 10) and this may not be beneficial to all schools.

For small schools, one option would be to aggregate N counts across school years within the school so that more schools have the potential to reach the N of 20. If this is done, the school's current year averages can be compared to their prior year averages for the measures to determine if they earn credit for improvement or not.

#### Growth:

It is important to understand the differences between SGPs (Student Growth Percentiles) and SGTs (Student Growth Targets). SGPs are normative. All students can benefit or not from the SGP calculation regardless of proficiency level. To obtain an SGP, every student is compared by scale score to their peers around the state. In other words, the highly proficient student (as determined by Scale Score) is compared to other highly proficient students and then ordered from 1 to 99 to determine their SGP. Every student has the potential to earn a 1 SGP up to a 99 SGP within that peer group.

In contrast, SGTs are not normative - every student has the potential to be on target regardless of their peer group. SGT is reported as the growth percentile a student needs to earn to be at the proficient scale score in three years time or by high school graduation. This SGT target was set by state board policy and can be altered as the board sees fit. The confusion comes because SGT is presented in the same format as SGP, on a 1 to 99 scale. It is the SGP needed to be on track to proficiency. A minimally proficient student has a much harder time of obtaining their target than a proficient student whose target will be lower, but all student SGTs are independent of all other students. This is contrasted with SGPs which are inter-dependent – within the peer group one student will get the 1 SGP and another student will earn the 99 SGP. For the SGP, approximately 33% of students will fall into the low growth category (1-33), 33% into the average growth category (34-66), and 33% into the high growth category (67-99).

Here is a hypothetical situation: a student who is proficient in year one AND proficient in year two may have an SGT of 40 for year two. If the student's SGP is 20 in year two, they will be in the low growth category for SGP (p. 14 of business rules) and the below target for SGT (p. 16 business rules) because their trajectory indicates they are no longer on track to be proficient in three years. If the student's SGP is 40 in year two, then they will be in the average growth category for SGP and at/near target for SGT. They are not penalized for maintaining, points are awarded for maintenance per the business rules. If the student's SGP is 67 in year two, they will be in the high growth category for SGP and exceeds target for SGT. Proficient and highly proficient students can and do demonstrate growth – it is a misperception that they do not. However, the opposite is also true: students in all four proficiency categories may NOT demonstrate growth.

A proficient student's SGT should typically fall into the at/near target category as outlined on page 16 of the business rules. One identified issue is that there is, currently, an SGT ceiling effect related to students with an SGT of 89 or higher as presently the business rule indicates that the student can only receive credit for being "At/Near Target" as opposed to "Exceeds Target". A solution for this would be to change the business rule to give all students who meet the 89 or higher SGT credit for "Exceeds Target". This is similar to giving full points for having a 90% or higher graduation rate. This would need to be investigated through future analysis that is beyond the scope of the time constraints present in developing this report.

The weights assigned to SGT and SGP for proficient and highly proficient students have been identified as a point of contention. The argument for adjusting the SGT and SGP weights for proficient and highly proficient students to be higher is that this will allow proficient students access to all the points in the model. From a face validity standpoint, it appears that these weights are unfair to high proficiency schools.

Weighting the SGPs and SGTs higher for the proficient and highly proficient students will lend face validity to the model but increase the number of points earned by only proficient/highly proficient students in the model. These proficient and highly proficient populations already earn 30% of overall model points for proficiency that the minimally and partially proficient students do not. If the SGP and SGT weights for proficient students are increased, the majority of the points in the letter grade model will go to schools with high levels of proficiency. This will skew the letter grades in a way that will be more correlated to poverty. If the cut scores for letter grades are not then adjusted along with these weights, higher poverty schools will have less access to the higher letter grades. To balance these additional points, the weights for minimally and partially proficient SGT and SGP would also need to be adjusted up but this would ultimately result in higher point totals overall. Another consideration would be to have the model assign more points to the non-normative SGT; or to assign greater weight for either SGP or SGT, depending on the schools' higher score.

In the current model using data provided by ADE, of the K-8 schools with high growth (40-50 points earned for growth): 222 received an A, 184 received a B, and 18 received a C. In the 9-12 file for high growth schools (15-20 points earned for growth): 38 received an A, 32 a B, and 10 a C. These demonstrate that high growth alone will not lead to a school receiving an A, that schools must also demonstrate proficiency and earn points for acceleration/CCRI to get an A. During the past year the board appeared to make the policy decision that to be an A school one would have to be excelling across the measures, and the current approach appears to do that. Adjusting the weights is more a policy decision than a psychometric decision.

#### Acceleration Measures (K-8)/CCRI (9-12):

As mentioned under the N count heading, N count concerns in this area could be addressed by aggregating student counts across school years and then comparing the current year averages to the prior year averages to see if improvement was achieved. One problem is that new schools were not eligible for the majority of these points because most of the indicators are evaluated based upon improvement over the prior year. To give new schools access to these points they could be evaluated against the state average until they have two years worth of data. Some schools are only eligible for a limited number of acceleration points due to the homogeneous natures of their populations. The State Board of Education may want to review the business rules to determine if schools should be graded upon the number of acceleration measures a school qualifies for and meets instead of the total number of acceleration points in the entire model. For example, if a school only had 4 possible comparisons worth 2 points each and the school achieved two of those four, then their total would be four out of eight points.

Subgroup improvement is being calculated at the tenth of a point level. In other words, a school only needs to improve proficiency by a tenth of a percentage point over the prior year to earn these points. This is more likely to reflect random variation than true change. More schools might have access to subgroup improvement through higher N counts if subjects are collapsed. In addition, it would help schools to remove the 6 point cap on this measure. It would allow more diverse schools to be rewarded for demonstrating improvement.

Both the Acceleration readiness list and number of CCRI indicators should be increased in subsequent years to allow more schools access to these points in the model. Could parent and student survey data rating schools be incorporated as an additional measure? In the 9-12 model, assigning credit for students taking advanced math, and therefore not testing in the current EOC framework could also be considered.

Grad Rate Point Weights for Years 4 to 7 total to 12% presently (Grad Rate Year 4 is weighted at 5, Grad Rate Year 5 is weighted at 4, Grad Rate Year 6 is weighted at 2.5, and Grad Rate Year 7 is weighted at .5). These weights lead to an artificial inflation of 4-5-6-7 year Graduation Rate points earned by schools. The weights should be corrected to add up to 10% as intended by the business rules.

#### Proficiency

In the current model using data provided by ADE, of K-8 schools demonstrating high proficiency (25-30 points earned for proficiency): 183 received an A, 104 received a B, 9 a C and 9 an NR. Of the 9 C schools, all were evaluated out of 90 points due to not having FAY EL students. 2 of 9 are part of the non-typical configuration schools and all earned less acceleration readiness points than the high proficiency A and B schools. In the 9-12 file for high proficiency schools (25-30 points earned for proficiency): 31 received an A, 1 a B, and 2 an NR. High proficiency alone does not lead to an A – a school must also show improvement in student growth and earn points for acceleration/CCRI to earn an A. This appears to be consistent with the board's direction that an A school be truly excelling.

#### <u>ELL</u>

In analyzing the EL Points, 38% of schools in the K-8 dataset earned the full 10 points while 19% of schools in the 9-12 dataset earned the full 10 points on this measure. Schools that do not meet the N-count in the current year could have their N count combined with that from the prior year in order to reach the minimum N of 20 and have access to the points.

#### **Bonus Points**

**Bonus points were included in setting the cut scores this year.** *It may be better to set the cut scores without including these points.* The addition of a proficiency bonus point for the top 10% most highly proficient schools may address the face validity issue of high proficient schools not receiving As.

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Here is a hypothetical situation: a student who is proficient in year one AND proficient in year two may have an SGT of 40 for year two. If the student's SGP is 20 in year two, they will be in the low growth

category for SGP (p. 14 of business rules) and the below target for SGT (p. 16 business rules) because their trajectory indicates they are no longer on track to be proficient in three years. If the student's SGP is 40 in year two, then they will be in the average growth category for SGP and at/near target for SGT. They are not penalized for maintaining, points are awarded for maintenance per the business rules. If the student's SGP is 67 in year two, they will be in the high growth category for SGP and exceeds target for SGT. Proficient and highly proficient students can and do demonstrate growth – it is a misperception that they do not. However, the opposite is also true: students in all four proficiency categories may NOT demonstrate growth.

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The weights assigned to SGT and SGP for proficient and highly proficient students have been identified as a point of contention. The argument for adjusting the SGT and SGP weights for proficient and highly proficient students to be higher is that this will allow proficient students access to all the points in the model. From a face validity standpoint, it appears that these weights are unfair to high proficiency schools. My comparative example demonstrates that the current weighting is systematically biased against high proficiency schools. In the extreme this means that high proficiency schools meeting the growth target earn a lower grade than proficient schools meeting the target.

Weighting the SGPs and SGTs higher for the proficient and highly proficient students will lend face validity to the model but increase the number of points earned by only proficient/highly proficient students in the model. These proficient and highly proficient populations already earn 30% of overall model points for proficiency that the minimally and partially proficient students do not. If the SGP and SGT weights for proficient students are increased, the majority of the points in the letter grade model will go to schools with high levels of proficiency. This will skew the letter grades in a way that will be more correlated to poverty. If the cut scores for letter grades are not then adjusted along with these weights, higher poverty schools will have less access to the higher letter grades. To balance these additional points, the weights for minimally and partially proficient SGT and SGP would also need to be adjusted up but this would ultimately result in higher point totals overall. Another consideration would be to have the model assign more points to the non-normative SGT; or to assign greater weight for either SGP or SGT, depending on the schools' higher score.

The option of a compensatory model merits some discussion. By definition, a school can compensate for points missed in either proficiency or growth by earning additional points on the alternative. The percentage of compensatory points would need to be capped (e.g., 20% maximum). The idea with a compensatory model is to reward low proficiency schools for meeting or exceeding their growth targets. The model would also compensate for the point loss when a highly proficient student just meets their growth target.

An inherent challenge with the separation of proficiency and growth is that weight adjustments to growth will either favor high **or** low proficiency schools – or no one if growth weights are raised across proficiency levels.

In the current model using data provided by ADE, of the K-8 schools with high growth (40-50 points earned for growth): 222 received an A, 184 received a B, and 18 received a C. In the 9-12 file for high growth schools (15-20 points earned for growth): 38 received an A, 32 a B, and 10 a C. These demonstrate that high growth alone will not lead to a school receiving an A, that schools must also demonstrate proficiency and earn points for acceleration/CCRI to get an A. During the past year the board appeared to make the policy decision that to be an A school one would have to be excelling across the measures, and the current approach appears to do that. Adjusting the weights is more a policy decision than a psychometric decision.

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As mentioned under the N count heading, N count concerns in this area could be addressed by aggregating student counts across school years and then comparing the current year averages to the prior year averages to see if improvement was achieved. One problem is that new schools were not eligible for the majority of these points because most of the indicators are evaluated based upon improvement over the prior year. To give new schools access to these points they could be evaluated against the state average until they have two years worth of data.

Subgroup improvement is being calculated at the tenth of a point level. In other words, a school only needs to improve proficiency by a tenth of a percentage point over the prior year to earn these points. This is more likely to reflect random variation than true change. More schools might have access to subgroup improvement through higher N counts if subjects are collapsed. In addition, it would help schools to remove the 6 point cap on this measure. It would allow more diverse schools to be rewarded for demonstrating improvement.

Both the Acceleration readiness list and number of CCRI indicators should be increased in subsequent years to allow more schools access to these points in the model. Could parent and student survey data rating schools be incorporated as an additional measure? In the 9-12 model, assigning credit for students taking advanced math, and therefore not testing in the current EOC framework could also be considered.

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Haladyna Questions

1. Who is writing this report?

2. How is the report going to be finalized given this rushed schedule?

3. Will there be any comment about the way we are hurrying to answer very complex questions? We simply need more time, work sessions with small groups working on specific issues, and time to craft a well-written comprehensive report to the Board.

I've done some light editing and made comments or suggestions (highlighted).

I appreciate the effort and accuracy in this first draft. However, there is a lot of work ahead completing and polishing this report. I don't know how we can get it done by December 4. Lot of editing needed.

### Background

On October 23, 2017, the State Board of Education (Board) directed the Technical Advisory Group (TAC) to review the Arizona A-F School Accountability Reporting System business rules and impact data for problematic issues.

To date, the TAC has met five times to discuss issues relating to the impact data, business rules and the A-F Accountability Plan. The pace of these meetings has been accelerated to meet deadlines. The TAC thinks there has not been enough time to consider, study, and evaluate all issues thoroughly.

From reviewing the data, the TAC has identified some problematic issues:

# N-Count:

The full academic year (FAY) n-counts for proficiency are aggregated across subject areas (English/language arts (ELA), mathematics, and science). This makes proficiency points more accessible. In contrast, the FAY n-counts for student growth target (SGT)/student growth percentile (SGP) are broken out by subject area (ELA and mathematics). By disaggregating the FAY n-counts for SGT and SGP, fewer schools have access to these points. One solution to this would be to adjust the SGT and SGP calculation to include both ELA and mathematics. This would have the added benefit of reducing model complexity by providing consistent treatment for proficiency and growth.

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The issue with n-counts is the standard error of the mean. It increases, thus categorical consistency is lower. Also, there is a bias issue. By using different n-counts we don't know if the new n-count includes higher or lower achieving students. Haladyna: One solution to the n-count issue is to recognize missing data and re-scale on data that we think is valid. Thus, a total score is imputed recognizing that some schools did not have an opportunity to earn points. In other words, we impute a school score. There are many ways to impute. A condition that must exist is that the sources of data comprising a final point total should be correlated. Without technical reports and documentation, we can't determine if this is so.

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Both the Acceleration readiness list and number of CCRI indicators should be increased in subsequent years to allow more schools access to these points in the model. Could parent and student survey data rating schools be incorporated as an additional measure? In the 9-12 model, assigning credit for students taking advanced math, and therefore not testing in the current EOC framework could also be considered.

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Regarding higher achievers, because of the ceiling effect, student growth should be eliminated or minimized so as to not punish schools with very high achievement.

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