

**MEMORANDUM**

**To:** Programming Committee

**From:** CMAP Staff

**Date:** October 4, 2017

**Re:** Options for setting 2018 regional safety performance targets

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Established under MAP-21 and continued in the FAST Act, state departments of transportation (DOTs) and metropolitan planning organizations (MPOs) are given separate responsibility for establishing performance targets and using a set of performance measures to track progress toward meeting those targets for a variety of transportation areas including safety, bridge and pavement condition, air quality, freight movement, and system reliability. A [memo](#) outlining these requirements was provided to the Transportation Committee at the March 3, 2017 meeting. The safety performance measure (Safety PM) requirements are set out in the Federal Highway Administration's [National Performance Management Measures: Highway Safety Improvement Program](#) final rule.

This memo provides an overview of the Safety Performance Management (PM) rule, provides background on the Illinois Department of Transportation's (IDOT) statewide Safety PM targets, and describes several options CMAP has to fulfill the requirements of the Safety PM rule. The memo concludes with a discussion of possible steps to achieving the safety goals.

**Safety Performance Management Rule (Safety PM)**

The Safety PM requires state DOTs and MPOs to establish safety targets as five-year rolling averages on all public roads for: (1) the number of fatalities, (2) the rate of fatalities per 100 million vehicle miles traveled (VMT), (3) the number of serious injuries, (4) the rate of serious injuries per 100 million VMT, and (5) the number of non-motorized fatalities and non-motorized serious injuries. Thus, the form of the 2018 target is the desired value of the 2014-2018 average for each of the measures. Injuries and fatalities from traffic crashes vary considerably from year to year due to numerous factors, and the five-year average is meant to smooth large changes.

State DOTs and MPOs must adopt annual targets for each safety measure, with state DOTs required to establish quantitative targets. The actual target should be set to what the state

believes it can achieve;<sup>1</sup> the rule does not specify or provide guidance for how ambitious the targets are to be. Each year the FHWA is to evaluate whether states have met, or made significant progress toward meeting, their targets. FHWA will consider states to be in compliance if they have met or improved from the baseline at least four of the five required performance targets.

By contrast, MPOs can either choose to set quantitative targets or commit to help implement the state's target by planning for and programming safety projects. The MPO has the option to support any or all of the state's safety targets or develop its own safety targets for any or all individual measures. State DOTs are to establish their targets by the time the annual Highway Safety Improvement Program report is due to FHWA at the end of August 2017. MPOs have until the end of February 2018 to establish their targets. After that, MPOs are to update their safety targets each year in a report to the state DOT. The MPO will also need to integrate the Safety PM into its planning process by including it in the Metropolitan Transportation Plan (MTP), that is, ON TO 2050. In addition, the MPO is required to show how investments in the Transportation Improvement Program (TIP) help achieve the Safety PM targets.

## **IDOT Statewide Safety Targets**

IDOT set its [statewide targets](#) in August (Table 1). IDOT considered two methods to set targets and chose the method with the greatest decrease for each measure. The first is to extrapolate values for the years 2017 and 2018 from a least-squares trend line based on five data points – the five-year rolling average for each year 2012-2016<sup>2</sup> -- and set those values as the targets. The second method is a two-percent annual reduction from the 2012-2016 average (the baseline). IDOT established the targets for fatalities, fatality rates, and the number of non-motorized serious injuries and fatalities as a two-percent annual reduction. By contrast, the least squares method projected an increase in these categories. IDOT used the least squares method for setting the targets for the serious injuries and the rate of serious injuries. The serious injury and rate of serious injuries targets result in a decrease greater than the two percent annual reduction.<sup>3</sup>

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<sup>1</sup> According to [FHWA guidance](#), state DOTs and MPOs are strongly discouraged from using aspirational goals, such as Towards Zero Deaths (TZD), when setting safety targets. While the FHWA agrees with a zero-fatality goal, and even supports the Towards Zero Deaths initiative, the annual safety targets are to be reasonable so agencies can track progress towards their long-term goals. Setting reasonable targets is expected to allow agencies to see how changes in policy or funding have an effect on traffic safety, and if agencies are not meeting goals, allow them to alter how they approach safety. The annual safety targets are designed to be interim targets that agencies should use to track their performance toward meeting long-term goals.

<sup>2</sup> In IDOT's analysis for fatalities, the data covering the years 2012-2016 was used for the baseline. Because serious injury data from 2016 is not available, IDOT used data covering the years 2011-2015 to estimate the value for 2016 and then made a five-year average based on 2012-2016 information.

<sup>3</sup> It is worth noting that the IDOT targets result in fairly aggressive year-to-year fatality and serious injury reductions. In order to achieve a specific value for the new five-year rolling average, the oldest years are removed from the calculation and the newest years are added on to it. Considering the fatalities from

**Table 1. 2018 safety performance measure targets for the state of Illinois**

| <b>Measure</b>                                | <b>Baseline (2012-16 average)</b> | <b>2018 Target (2014-18 average)</b> |
|---|-----------------------------------|--------------------------------------|
| Total fatalities                              | 990.2                             | 951.0                                |
| Fatality rate                                 | 0.94                              | 0.90                                 |
| Total serious injuries                        | 11,774.4                          | 11,231.1                             |
| Total serious injury rate                     | 11.29                             | 10.83                                |
| Non-motorized fatalities and serious injuries | 1,570.8                           | 1,508.6                              |

Note also that state DOTs can maintain compliance with the safety PM rule by preventing safety from worsening relative to the baseline. If the target will be met by matching the 2012-2016 base average of 990 fatalities, there will need to be an average of 973 fatalities for 2017 and 2018.

### **Regional Safety Performance Target Alternatives**

As described above, MPOs have the option to establish targets specific to the MPO planning area or commit to supporting the state DOTs targets. Below CMAP staff has listed a number of potential options the MPO can pursue for setting the Safety PM targets for the CMAP region. Charts comparing options for the five safety performance measures are included at the end of the memo.

1. **Agree to support IDOT's targets.** Although committing to the state targets does not require that CMAP commit to any specific share of reductions, it is helpful nonetheless to compute CMAP's share based on the fraction of crashes occurring in the CMAP area.
2. **Set targets based on regional annual trends.** Similar in concept to IDOT's trends-based targets, this option would set the Safety PM targets as straight-line trends using annual regional crash and VMT data from the previous five years (2012-2016 for fatalities and 2011-2015 for serious injuries).<sup>4</sup>
3. **Achieve a 5-percent annual reduction.** This option assumes an annual five percent reduction for all five safety performance measures as a year-over-year reduction starting from the most recent data (2015 or 2016), rather than a reduction in the five-year rolling average.

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2012-2016, in order to achieve the IDOT goal of a 5-year average of 951 fatalities (2014-2018) there will need to be an average of 876 fatalities for 2017 and 2018, which is actually 11.5 percent lower than the baseline and a 19 percent reduction from fatalities in 2016. In the discussion of targets for five-year averages, it is important to understand that the decreases in averages are made through real reductions in annual crashes. These annual reductions may be much larger than the nominal change in rolling 5-year averages.

<sup>4</sup> IDOT's approach for estimating future fatalities and serious injuries was based on extrapolating the five-year rolling averages, not the annual values.

4. **Seek to achieve Vision Zero targets in City of Chicago, and base remainder of region's targets on IDOT reduction.** The Chicago Department of Transportation (CDOT) recently released a 2017 – 2019 action plan that aims to reduce fatalities and serious injuries from traffic crashes by 20 percent and 35 percent, respectively, by 2020 and eliminate both by 2026. This option supports the City's Vision Zero Initiative by setting the targets based on the City achieving its stated goals and basing the remainder of the region's targets on IDOT's goals.

## Discussion

The Safety PM represents a major change in the way priorities are set and how progress is tracked in the federal transportation program. For CMAP and the state, the key value of the safety target-setting process is in demonstrating the appropriate commitment to improved safety for all road users. The region has made significant progress in decreasing the number of traffic related fatalities in the region from 687 in 2000 to 470 in 2016. Yet the upward trend of both fatalities and serious injuries is worrisome.

Options 1 and 4 involve the MPO modeling its goals after two major stakeholders, IDOT and the City of Chicago. While it is not completely straightforward to compare the two approaches arithmetically, analysis suggest that regional targets based on either approach would be similar. The exception is that the target for non-motorized serious injuries and fatalities would be less aggressive if CMAP committed to the statewide target. Note that the MPO does not have to agree to all statewide targets. For instance, CMAP could support IDOT's targets for the motorized performance measures and set a more aggressive target for the non-motorized serious injuries and fatalities on the logic that the CMAP region has experienced growth in the number of cyclists and there are large numbers of pedestrians in downtown Chicago.

Overall, options 1 and 4 are both aggressive in the face of trends. By contrast, option 2, the trend-based target, would have the five-year average for both fatalities and serious injuries increase significantly. Moreover, the annual number of serious injuries increases and the number of fatalities stays at the current (2016) level. Given the importance of improving safety, it is not recommended that the region simply seek to maintain trends. There is some question about how achievable the reductions in options 1 and 4 are region-wide. As a result, the 5-percent annual reduction option charts a middle path. It is worth noting that reducing annual fatalities and serious injuries by 5 percent per year would eliminate them by the year 2036.

In summary, Table 2 shows the five-year average targets for 2014-2018 that result from each of the options discussed above. Again, the performance targets are required to be in the form of five-year rolling averages. The estimated number of serious injuries or fatalities that would need to be achieved during 2018 are included in the table to indicate the annual values that would have to occur to attain the five-year targets.

**Table 2. 2018 safety performance measure target options for the CMAP region**

| Measure                                       | Baseline            |                       | CMAP share of IDOT target |                  | CMAP annual trend target |                  | CMAP 5% annual reduction |                  | Vision Zero with CMAP share of IDOT target |                  |
|---|---------------------|-----------------------|---------------------------|------------------|--------------------------|------------------|--------------------------|------------------|--|------------------|
|   | Base 5-year average | Most recent year data | Target average (2014-18)  | Single year 2018 | Target average (2014-18) | Single year 2018 | Target average (2014-18) | Single year 2018 | Target average (2014-18)                   | Single year 2018 |
| Total fatalities                              | 426                 | 470                   | 409                       | 343              | 445                      | 462              | 424                      | 394              | 410  | 346              |
| Fatality rate                                 | 0.71                | 0.79                  | 0.68                      | 0.57             | 0.74                     | 0.77             | 0.71                     | 0.66             | 0.68                                       | 0.58             |
| Total serious injuries                        | 6643                | 7158                  | 6134                      | 4384             | 7017                     | 7327             | 6755                     | 6454             | 6079                                       | 4201             |
| Total serious injury rate                     | 11.10               | 11.96                 | 10.25                     | 7.33             | 11.72                    | 12.24            | 11.29                    | 10.78            | 10.16                                      | 7.02             |
| Non-motorized fatalities and serious injuries | 1159                | 1377                  | 1152                      | 1001             | 1251                     | 1331             | 1224                     | 1242             | 1038                                       | 622              |

In order for the region to reverse the upward trend in fatalities and serious injuries, it will need to take a holistic approach to traffic safety. CMAP is preparing a safety strategy paper that makes recommendations for reducing fatalities and serious injuries through policy, infrastructure improvements, enforcement, and technology. The safety strategy paper explores many infrastructure improvements that would improve the safety of our roads as well as policy recommendations such as increasing the importance of traffic safety in programming decisions. In general, however, the paper concludes that behavioral change is by far the most important factor in safety improvement.

### Next steps

Following discussion by the committee in October, CMAP staff will return with a recommendation for the 2018 safety targets and request approval from the Transportation Committee in November. The recommended safety targets will be brought to the MPO Policy Committee and CMAP Board in January.

Whichever option the MPO selects, the region will need to demonstrate how it is achieving targets through the TIP and long-range plan. This requirement of the Safety PM rule will allow CMAP to track roadway safety improvements to estimate their effects on fatalities and serious injuries. Preliminary analysis of TIP projects reveals that the region is spending \$188 million on projects that will be completed during 2017-2018 which include safety enhancements. However, given the information in the TIP, assessing how much the region spends on transportation projects that improve safety and their individual effects on crashes is challenging. In the future, more information on project characteristics will probably be needed to meet the requirements of the Safety PM rule.

### Discussion questions

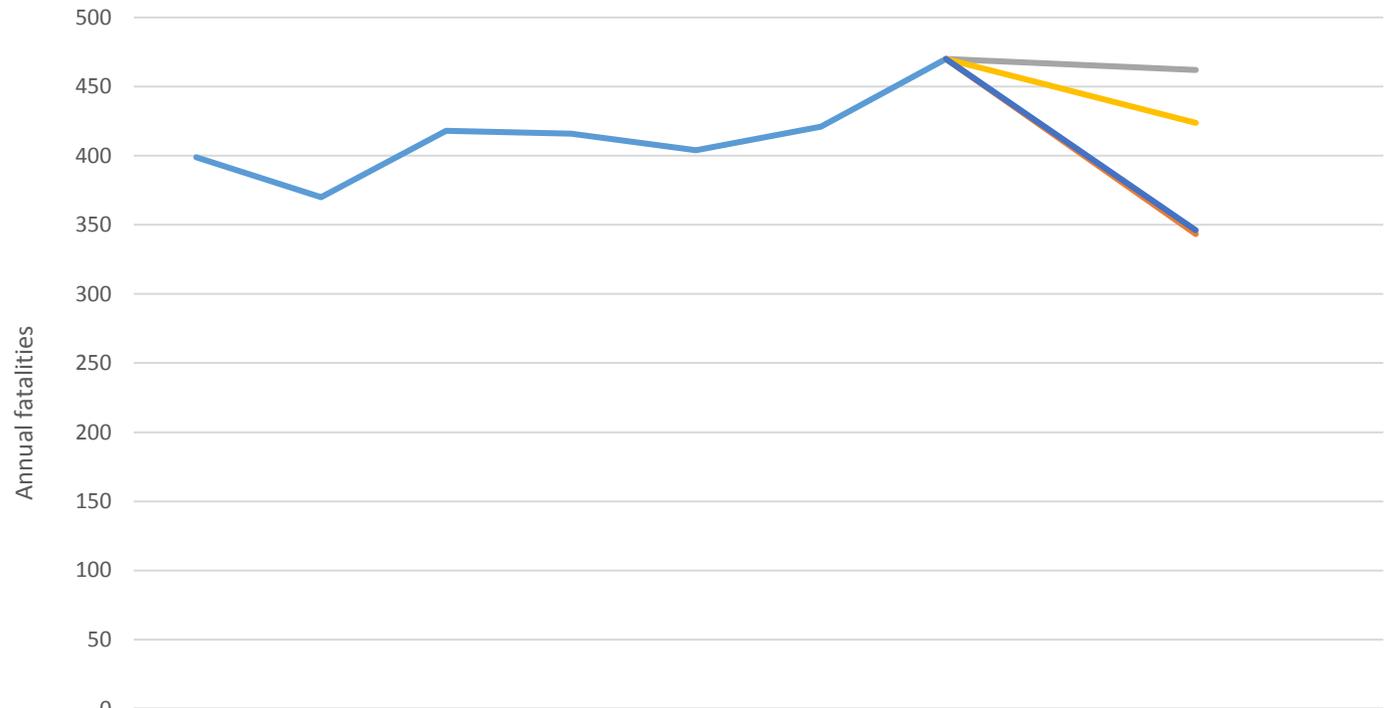
- Which additional options should be considered for setting the region’s safety targets?
- Is there a preferred option from the list you would like CMAP to pursue?
- Would it be acceptable to have increasing targets for a few years?

ACTION REQUESTED: Discussion

## **Target options charts**

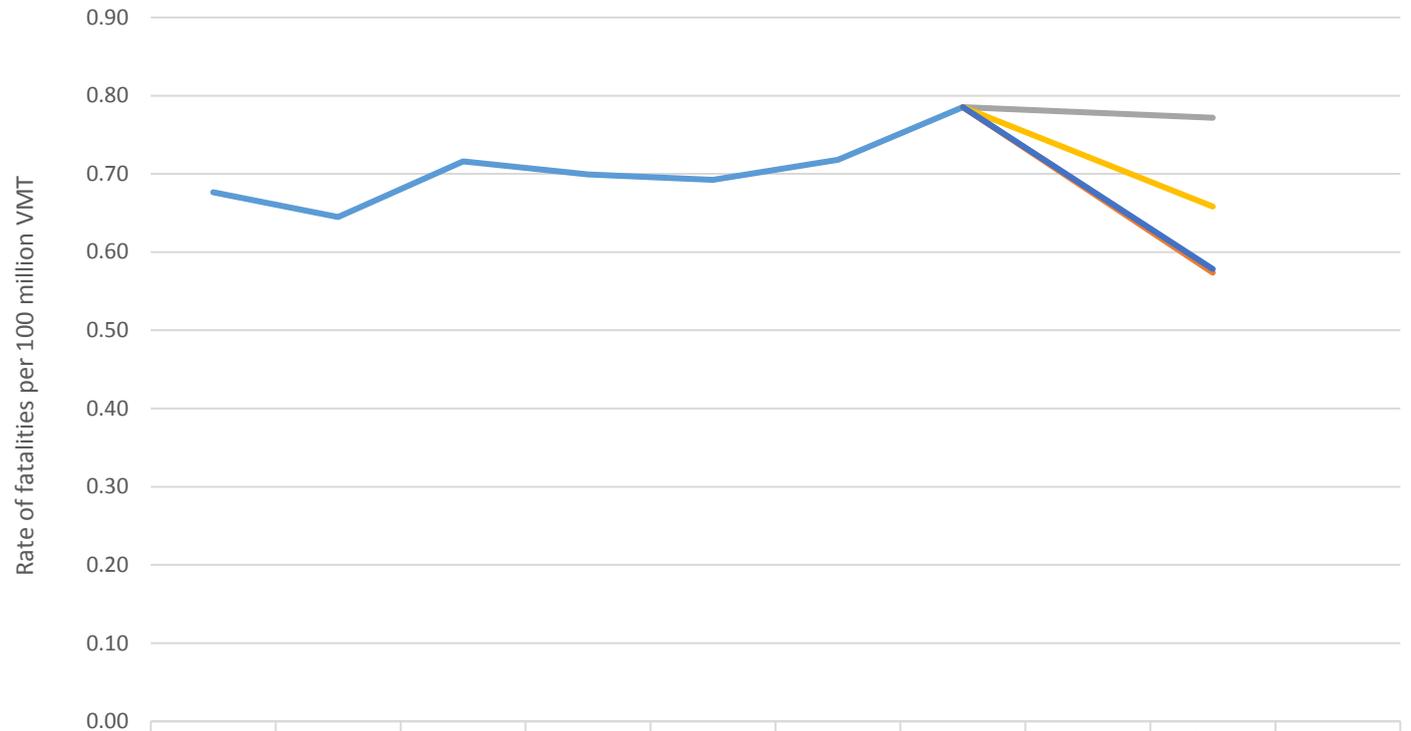
The following charts show the annual trend along with the projected number of fatalities and serious injuries that would have to occur during 2018 to achieve any of the target options expressed as five-year rolling averages. The estimated fatalities and serious injuries are based on the same percentage of annual reduction for both 2017 and 2018 (e.g., a 5 percent reduction from 2016 to 2017 and a 5 reduction from 2017 to 2018). The reductions are subtracted from the single most recent year of fatalities (2016) and serious injuries (2015), as opposed to the value of the 5-year average (2012-2016 or 2011-2015).

Traffic fatalities target options



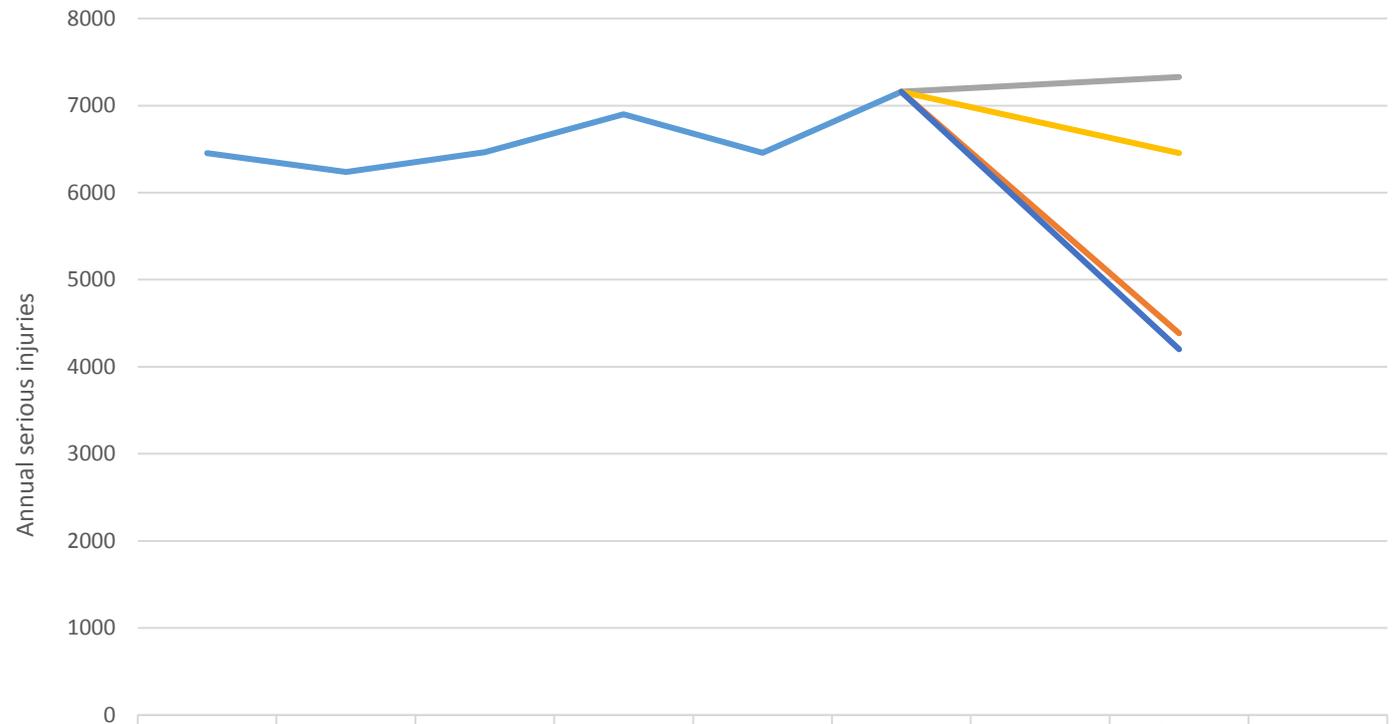
|   | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |  | 2018-One year value to meet 5 year average target | 2018 Target (2014-18 average) |
|---|------|------|------|------|------|------|------|--|---|-------------------------------|
| Annual fatalities                             | 399  | 370  | 418  | 416  | 404  | 421  | 470  |  |   |                               |
| 1. CMAP share of IDOT target                  |      |      |      |      |      |      | 470  |  | 343   | 409.0                         |
| 2. CMAP annual trend target                   |      |      |      |      |      |      | 470  |  | 462   | 444.6                         |
| 3. CMAP 5% annual reduction                   |      |      |      |      |      |      | 470  |  | 424   | 433.1                         |
| 4. Vision Zero with CMAP share of IDOT target |      |      |      |      |      |      | 470  |  | 346   | 409.8                         |

Traffic fatalities per VMT rates target options



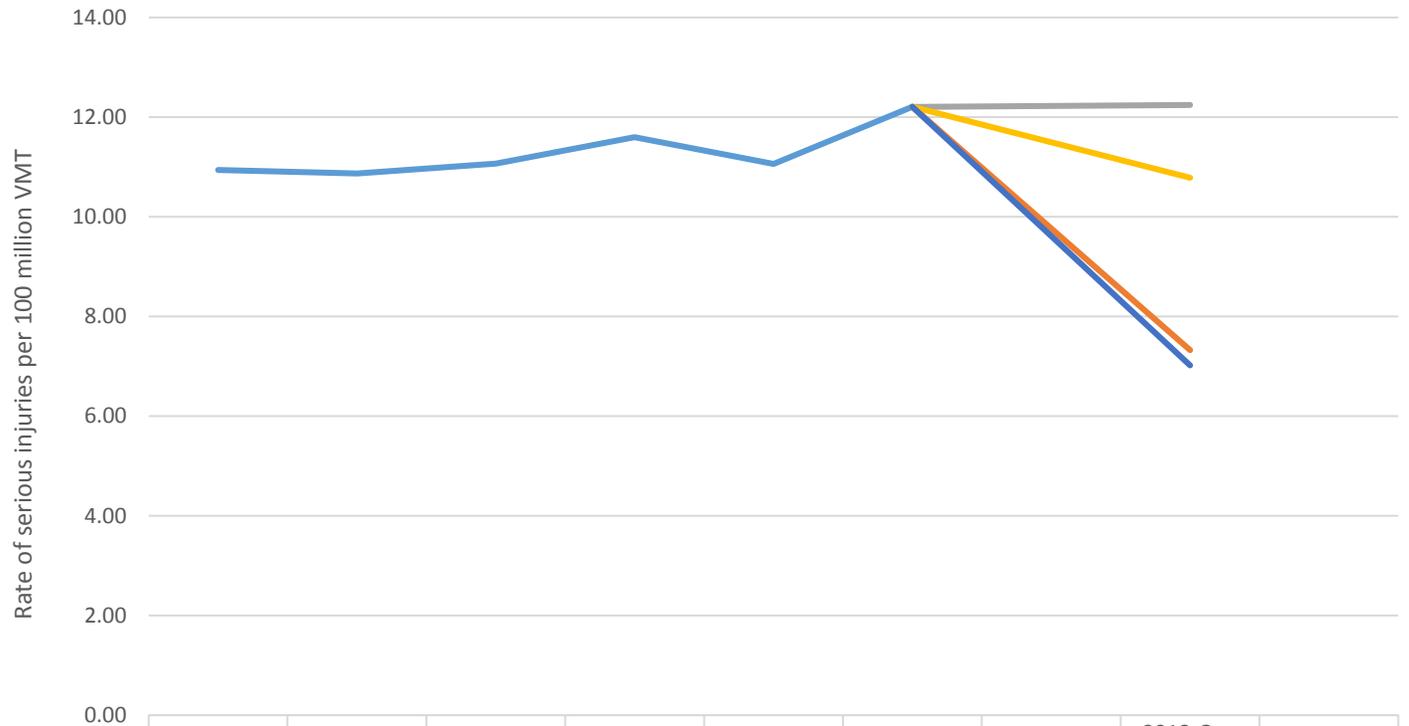
|   | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 |  | 2018-One year value to meet 5 year average target | 2018 Target (2014-18 average) |
|---|------|------|------|------|------|------|------|--|---|-------------------------------|
| Annual fatalities per VMT rate                | 0.68 | 0.64 | 0.72 | 0.70 | 0.69 | 0.72 | 0.79 |  |   |                               |
| 1. CMAP share of IDOT target                  |      |      |      |      |      |      | 0.79 |  | 0.57  | 0.68                          |
| 2. CMAP annual trend target                   |      |      |      |      |      |      | 0.79 |  | 0.77  | 0.74                          |
| 3. CMAP 5% annual reduction                   |      |      |      |      |      |      | 0.79 |  | 0.66  | 0.72                          |
| 4. Vision Zero with CMAP share of IDOT target |      |      |      |      |      |      | 0.79 |  | 0.58  | 0.68                          |

Traffic serious injuries rates target options



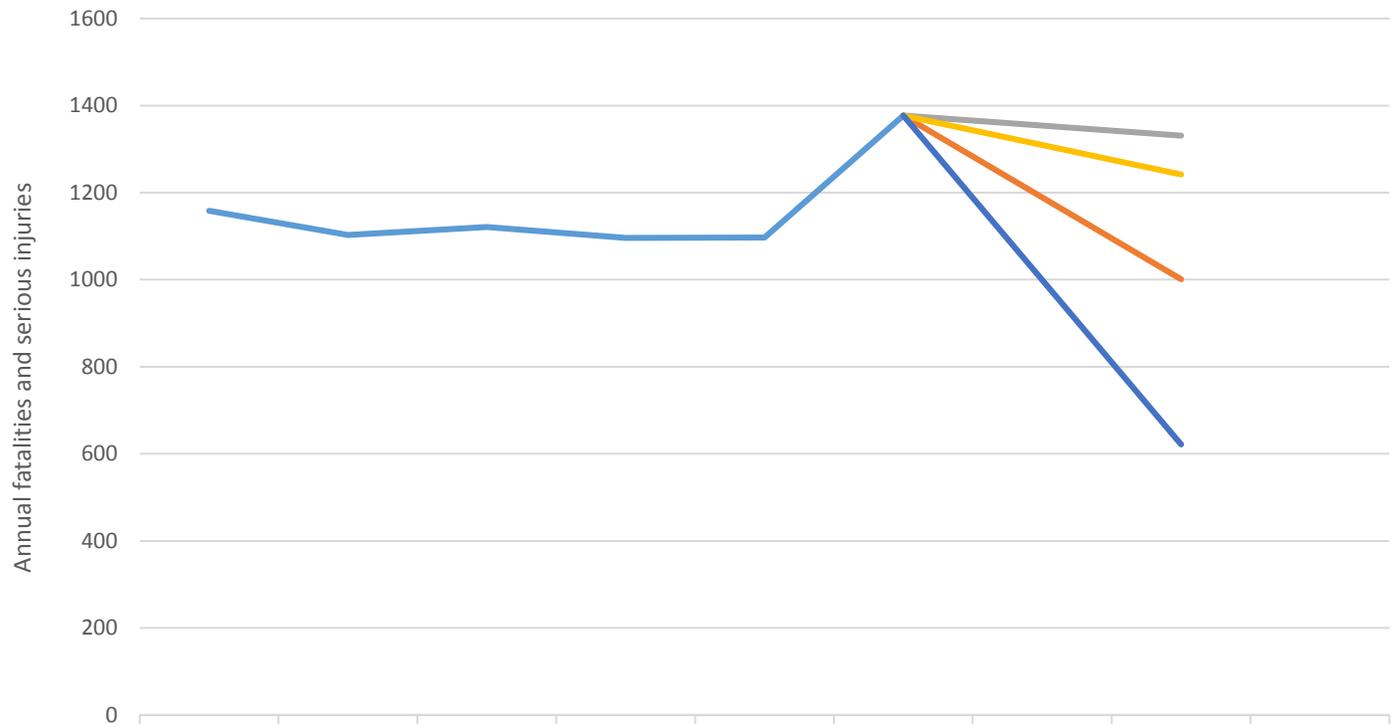
|   | 2010 | 2011 | 2012  | 2013  | 2014  | 2015  |  | 2018-One year value to meet 5 year average target | 2018 Target (2014-18 average) |
|---|------|------|-------|-------|-------|-------|--|---|-------------------------------|
| Annual serious injuries                       | 6455 | 6237 | 6,463 | 6,900 | 6,456 | 7,158 |  |   |                               |
| 1. CMAP share of IDOT target                  |      |      |       |       |       | 7,158 |  | 4384  | 6133.8                        |
| 2. CMAP annual trend target                   |      |      |       |       |       | 7,158 |  | 7327  | 7016.8                        |
| 3. CMAP 5% annual reduction                   |      |      |       |       |       | 7,158 |  | 6454  | 6754.8                        |
| 4. Vision Zero with CMAP share of IDOT target |      |      |       |       |       | 7,158 |  | 4201  | 6078.9                        |

Traffic serious injuries per VMT rates target options



|   | 2010  | 2011  | 2012  | 2013  | 2014  | 2015  |  | 2018-One year value to meet 5 year average target | 2018 Target (2014-18 average) |
|---|-------|-------|-------|-------|-------|-------|--|---|-------------------------------|
| Annual serious injuries per VMT rate          | 10.94 | 10.87 | 11.07 | 11.60 | 11.06 | 12.21 |  |   |                               |
| 1. CMAP share of IDOT target                  |       |       |       |       |       | 12.21 |  | 7.33  | 10.25                         |
| 2. CMAP annual trend target                   |       |       |       |       |       | 12.21 |  | 12.24   | 11.72                         |
| 3. CMAP 5% annual reduction                   |       |       |       |       |       | 12.21 |  | 10.78   | 11.29                         |
| 4. Vision Zero with CMAP share of IDOT target |       |       |       |       |       | 12.21 |  | 7.02  | 10.16                         |

### Non-motorized fatalities and serious injuries target options



|   | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |  | 2018-One year value to meet 5 year average target | 2018 Target (2014-18 average) |
|---|------|------|------|------|------|------|--|---|-------------------------------|
| Annual fatalities and serious injuries        | 1158 | 1103 | 1121 | 1096 | 1097 | 1377 |  |   |                               |
| 1. CMAP share of IDOT target                  |      |      |      |      |      | 1377 |  | 1001  | 1152                          |
| 2. CMAP annual trend target                   |      |      |      |      |      | 1377 |  | 1331  | 1251                          |
| 3. CMAP 5% annual reduction                   |      |      |      |      |      | 1377 |  | 1242  | 1224                          |
| 4. Vision Zero with CMAP share of IDOT target |      |      |      |      |      | 1377 |  | 622   | 1038                          |

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