MEMORANDUM
To: Kentucky Energy Efficiency Stakeholders
Date: August 15, 2016

Following this cover memorandum, you will find the **Kentucky Technical Reference Manual Roadmap (TRM Roadmap)**. This cover memorandum is intended to provide background and context for the TRM Roadmap.

Project Background

The Midwest Energy Efficiency Alliance (MEEA) and the Kentucky Department for Energy Development and Independence (DEDI) initiated this project to explore the possibility of the Commonwealth of Kentucky developing a statewide framework for evaluating, measuring and verifying (EM&V) energy savings achieved through energy efficiency programs. During the first phase of the project, MEEA conducted research and produced a paper describing core issues, concepts and examples from state, regional, federal and private approaches to EM&V. During the second phase of the project, MEEA and DEDI convened a group of energy efficiency stakeholders in Kentucky to work collaboratively in developing a statewide EM&V framework for the Commonwealth. Following a series of stakeholder interviews, a stakeholder workshop held in December 2015 and a follow-up stakeholder survey, DEDI and MEEA determined that although some stakeholders saw value in pursuing a holistic EM&V framework, a majority of stakeholders preferred to learn more about particular components of a framework. Stakeholders identified a Kentucky Technical Reference Manual as a topic that merited additional information and discussion.

Technical Reference Manuals

A Technical Reference Manual (TRM) is a technical resource (in the form of a document, searchable database, spreadsheet, or website) that includes information used in the planning and evaluation of energy efficiency programs. It can include savings values for measures, engineering algorithms to calculate savings, impact factors to be applied to calculated savings, source documentation, specified assumptions and other metrics associated with

energy efficiency measures. The second stakeholder workshop held in March 2016 focused on the potential value of a Kentucky-specific statewide TRM that might be used by the Kentucky Public Service Commission (PSC), utilities and others as a reference document when planning and evaluating rate-payer funded energy efficiency programs. During this workshop, stakeholders offered varied views on the marginal value of a Kentucky TRM, given that utilities currently rely on deemed savings contained in other existing regional and state TRMs, and that to date, utilities regulated by the PSC have satisfactorily submitted DSM plans and evaluations approved by the PSC. Stakeholders indicated that they would be able to better evaluate the value of a Kentucky TRM if they were presented with more details on the scope and applicability of a Kentucky TRM, its potential uses and stakeholder roles and responsibilities.

During the third Kentucky EM&V stakeholder meeting held in June 2016, MEEA presented stakeholders with a draft TRM Policy Document that attempted to answer several of these questions. Stakeholders indicated that the Policy Document presented could provide value to the Commonwealth of Kentucky and suggested several revisions to better align the document with stakeholder needs. The enclosed "**Kentucky TRM Roadmap"** is a revised version of the draft TRM Policy Document and incorporates stakeholder feedback received during the third stakeholder meeting.

Kentucky TRM Roadmap

The TRM Roadmap contains definitions of key terms, trigger conditions for TRM development in Kentucky, a summary of TRM objectives, required elements of measure characterizations, roles and responsibilities for key stakeholders, guidelines for the use of a Kentucky TRM and its relationship to portfolio planning and evaluation, a description of the process and timeline for updating a Kentucky TRM and a structure for a TRM Steering Committee chiefly responsible for leading TRM development and updates.

The TRM Roadmap is not a TRM (see Table 1 for the distinctions between the TRM Roadmap and a TRM). The TRM Roadmap does not commit the Commonwealth of Kentucky or Kentucky energy efficiency stakeholders to the development of a TRM, nor does it presume the future development of a statewide TRM. The TRM Roadmap is intended to reflect and document stakeholder input around the principles that would guide the development, use and maintenance of a statewide TRM and would accompany a statewide TRM

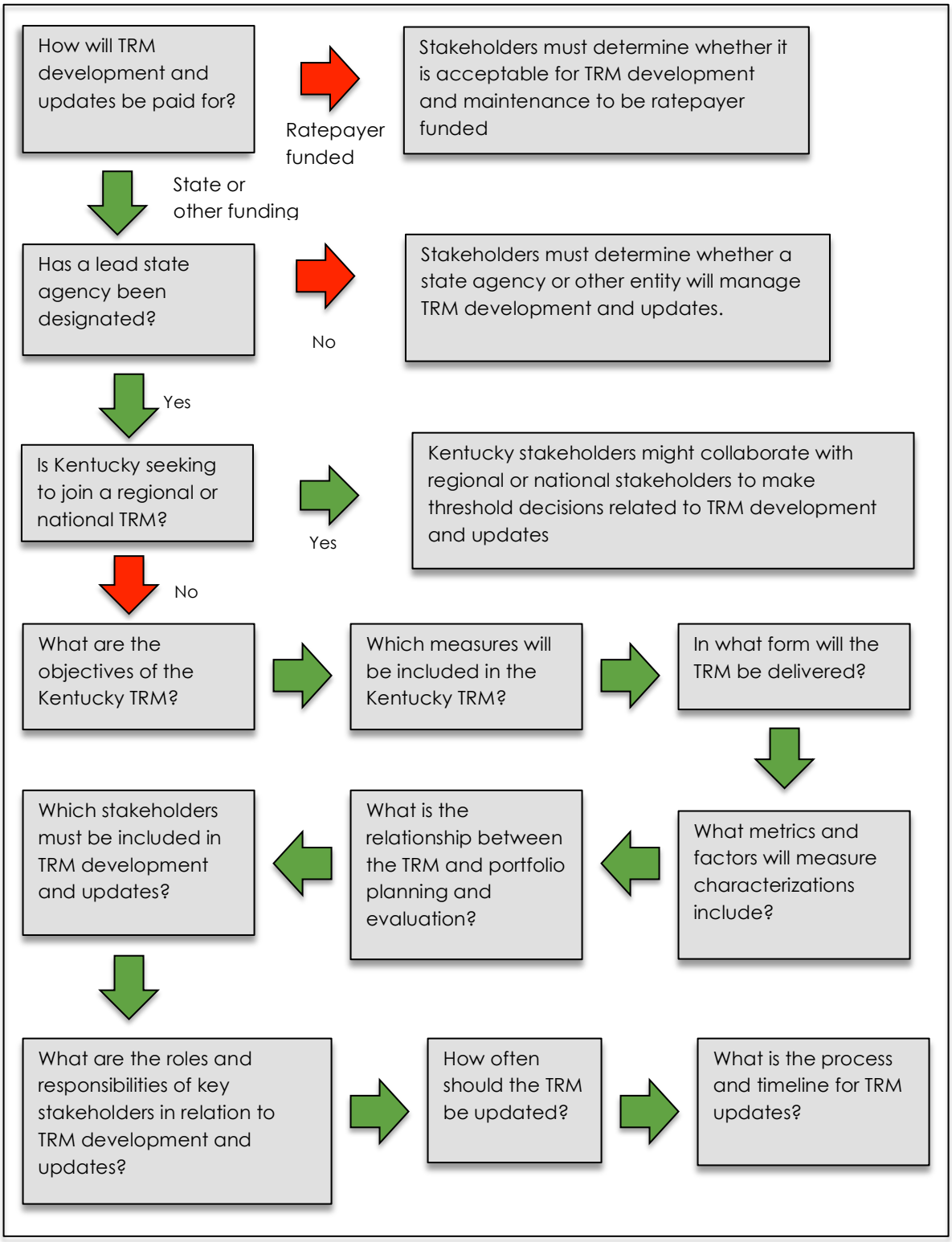
as a standalone document, if stakeholders elect to develop a statewide TRM in the future. As such, MEEA and DEDI seek input from stakeholders on each element of the TRM Roadmap.

Table 1: Elements of TRM Roadmap and TRM

Kentucky TRM Roadmap	**Kentucky TRM (not developed at this time)**
Definitions of Key Terms	Savings Values for Measures
TRM Trigger Conditions	Engineering Algorithms to Calculate Savings
Objectives of the Kentucky TRM	Adjustment Factors to be Applied to Savings Values
Required Elements in Measure Characterizations	Measure-Specific Load Shapes
Guidelines for the Use of the TRM and Relationship to Portfolio Planning and Evaluation	Specified Assumptions
Roles and Responsibilities for Key Stakeholders	Source Documentation
Description of the Process and Timeline for Updating the TRM	

Should Kentucky stakeholders elect to pursue statewide TRM development at some future time, they may decide that the contents of the TRM Roadmap no longer reflect stakeholder consensus. In such a scenario, stakeholders would need to make a series of threshold decisions and revise the TRM Roadmap accordingly. These decision points are illustrated below in Figure 1.

Figure 1: Kentucky TRM Decision Tree



Kentucky TRM Development "Trigger Conditions"

The PSC has indicated that it will not mandate the development or use of a statewide TRM at this time. Kentucky stakeholders have not currently arrived at a consensus regarding whether or not to develop a standardized, statewide TRM.

During the third stakeholder meeting, held in June 2016, stakeholders provided input on the types of conditions that might trigger the development of a Kentucky TRM in the future, and stakeholders suggested that these "trigger conditions" be documented as a part of the TRM Roadmap. Trigger conditions for a Kentucky TRM are described in Figure 2 (below) and are also documented in Section III of the TRM Roadmap. In order for the state of Kentucky to consider initiating TRM development, one or more of these trigger conditions must occur.

Figure 2: Kentucky TRM Trigger Conditions

Trigger Conditions

- PSC order requiring or encouraging the development of standardized, statewide deemed savings values and algorithms for energy efficiency measures;
    - *Note that a utility commission order contributed to the initiation of TRM development in Arkansas and Iowa. See, e.g., Arkansas Public Service Commission, Docket No. 10-100-R Final Order; Iowa Utilities Board, Docket No. EEP-2012-0001 Final Order.*
- State legislation requiring or encouraging the development of standardized, statewide deemed savings values and algorithms for energy efficiency measures;
- State legislation or regulatory order creating mandatory energy efficiency savings targets for Kentucky utilities;
- Federal legislation requiring, encouraging, or incentivizing the development of standardized, statewide deemed savings values and algorithms for energy efficiency measures;
- Lifting of the stay on the U.S. Environmental Protection Agency's Clean Power Plan, and a decision by the state of Kentucky to file a rate-based state plan, or participate in the Clean Energy Incentive Program;
- Regional or national effort to develop a standardized TRM, where stakeholders determine that Kentucky's participation would provide value to the state;
- Availability of funding that can be used for, or specifically dedicated towards, TRM development;
    - *Note that this circumstance contributed to the initiation of TRM development in the state of Missouri. See Missouri Department of Economic Development, Missouri Technical Reference Manual, available at: https://energy.mo.gov/energy/about/trm.*
- Stakeholder consensus in support of the development of a Kentucky TRM.

Kentucky Technical Reference Manual (TRM) Roadmap

Table of Contents

I. Purpose of the Kentucky TRM Roadmap

This Kentucky Technical Reference Manual Roadmap (TRM Roadmap) lays out several principles guiding the development, use and maintenance of the Kentucky Technical Reference Manual (Kentucky TRM). Specifically, this TRM Roadmap:

- Defines common terms
- Reviews trigger conditions for TRM development
- Establishes the objectives of the Kentucky TRM
- Defines the scope and application of the Kentucky TRM
- Defines the roles and responsibilities assigned to stakeholders in relation to the Kentucky TRM
- Establishes a process and timeline for updating the Kentucky TRM.

II. Definitions of Key Terms

The following definitions apply to key terms that will be used in this TRM Roadmap as well as the Kentucky TRM.

***Technical Reference Manual (TRM)*:** A technical resource (in the form of a document, spreadsheet, searchable database, website, or other) that includes energy efficiency measure information used in program planning and evaluation. This information can include savings values for measures, engineering algorithms to calculate savings, measure life information, hourly load shapes of savings, impact factors to be applied to calculated savings (e.g., net-to-gross ratio), source documentation, specified assumptions and other relevant material to support the calculation of measure and program savings and cost-effectiveness.

Program Administrator: Any entity that is regulated by the Kentucky Public Service Commission (PSC) and administers an energy efficiency program.

Energy efficiency measure: an installed piece of equipment or system at an end-use energy consumer facility; a strategy intended to affect consumer energy use behaviors, or modifications of equipment, systems, or operations that reduces the amount of energy that would otherwise have been used to deliver an equivalent or improved level of end-use service.

Prescriptive measure: Prescriptive measures refer to measures offered through a standard offering within energy efficiency programs.

Baseline condition: The baseline condition describes equipment, systems or operations absent the implementation of an energy efficiency measure, against which an energy efficiency measure is compared in order to determine the savings achieved by that measure.

Efficient condition: The efficient condition describes equipment, system or operations that comprise an energy efficiency measure.

Deemed value: An agreed-to average value for a metric associated with an installed energy efficiency measure, usually stated "per unit."

Deemed calculation: An agreed-to engineering algorithm(s) used to calculate the average value for a metric associated with an installed energy efficiency measure.

Net-to-gross ratio: A stipulated ratio applied to the total energy savings resulting directly from program-related actions taken by participants of an energy efficiency program (gross savings) in order to determine the energy savings attributable to the program itself (net savings).

III. Kentucky TRM Trigger Conditions

In order for the Commonwealth of Kentucky to consider initiating TRM development, one or more of the following trigger conditions must be satisfied:

- PSC order requiring or encouraging the development of standardized, statewide deemed savings values and algorithms for energy efficiency measures
- State legislation requiring or encouraging the development of standardized, statewide deemed savings values and algorithms for energy efficiency measures
- State legislation or regulatory order creating mandatory energy efficiency savings targets for Kentucky utilities
- Federal legislation requiring, encouraging, or incentivizing the development of standardized, statewide deemed savings values and algorithms for energy efficiency measures
- Lifting of the stay on the U.S. Environmental Protection Agency's Clean Power Plan, and a decision by the state of Kentucky to file a rate-based state plan, or participate in the Clean Energy Incentive Program

- Regional or national effort to develop a standardized TRM, where stakeholders determine that Kentucky's participation would provide value to the state
- Availability of funding that can be used for, or specifically dedicated towards, TRM development
- Stakeholder consensus in support of the development of a Kentucky TRM.

IV. Kentucky TRM Objectives

The Kentucky TRM is not created by statute and does not create mandatory requirements for utilities or any other entities in Kentucky. The Kentucky TRM is intended to function as a common resource document for use by utilities, program implementers, evaluators, the PSC and any other interested stakeholder. The PSC will not require that any jurisdictional utility use the Kentucky TRM in any filing or proceeding before the PSC, but may use it as a reference guide while reviewing energy efficiency program plans and evaluations.

The Kentucky TRM is intended to fulfill a series of objectives, including the following:

- Provide transparent documentation of energy efficiency measure-specific deemed savings values and algorithms and other parameters and impact factors, vetted by Kentucky stakeholders and based on Kentucky-specific data (where possible)
- Conserve PSC and stakeholder resources by providing an easily accessible source for standardized savings values, thereby reducing the time spent by the PSC in reviewing and approving energy efficiency program plans and evaluations
- Reduce invalidation and evaluation risk faced by regulated utilities by documenting savings values and calculation methods that have been accepted by the TRM Steering Committee[1]
- Promote the development of new energy efficiency programs pursued by utilities and the growth of energy efficiency portfolios by providing an accessible resource documenting the savings available from and the cost-effectiveness of energy efficiency measures

[1] See Section VI, Stakeholder Roles and Responsibilities, for a description of the TRM Steering Committee.

- Provide a common platform for the incorporation of new evaluation studies that refine savings assumptions and estimates.

V. Scope and Application of Kentucky TRM

Version 1 of Kentucky TRM: Version 1.0 of the Kentucky TRM shall be delivered in the form of an Excel-based spreadsheet. Version 1 .0 of the Kentucky TRM shall include all prescriptive measures delivered or installed as a part of energy efficiency programs implemented by Program Administrators in Kentucky.

Measure Characterization: The Kentucky TRM shall provide, for each energy efficiency measure:

1. A brief narrative description of the measure, stating how it saves energy
2. A description of the baseline condition
3. A description of the efficient condition
4. The assumptions used to calculate metrics and factors associated with the energy efficiency measure
5. A deemed value or deemed calculation for the following metrics and factors associated with the energy efficiency measure:
    a. Electric savings (kWh)
    b. Electric demand savings (kW)
    c. Natural gas savings (therms)
    d. Water savings (gallons)
    e. Incremental measure costs ($)
    f. Effective useful lifetime (years)
    g. Annual operating hours (hours)
    h. Operation and maintenance costs ($)
    i. Net-to-gross ratio
    j. Any other adjustment factors to be applied to these metrics
6. The appropriate hourly load shape to apply to electric savings

7. Applicability conditions for the deemed values or calculations associated with the energy efficiency measure (including region, weather, market segment or other conditions)
8. Sources used to characterize the energy efficiency measure.

Adding or Retiring Measures: Program Administrators may add or retire measures to or from their energy efficiency portfolios irrespective of whether these measures are or are not included in the Kentucky TRM. The Kentucky TRM will be updated to reflect new prescriptive measures as per the process described in Section VII of this TRM Roadmap.

Relationships with Portfolio Planning: Program Administrators may use the Kentucky TRM in preparing energy efficiency plan filings. However, Program Administrators reserve the right to submit to the PSC savings and cost values that differ from those contained in the Kentucky TRM for cost recovery, revenue recovery, incentive, or any other purposes.

Relationships with Portfolio Evaluation: Program Administrators and evaluators reserve the right to submit savings and cost values that differ from those contained in the Kentucky TRM.

Retrospective or prospective application: Program Administrators will not be required to apply the values contained in the Kentucky TRM in their energy efficiency plans or evaluations. It is anticipated that the values contained in the Kentucky TRM will be applied prospectively; that is, energy efficiency plans and evaluations will use the most recently-approved version of the Kentucky TRM.

VI. Stakeholder Roles and Responsibilities

Kentucky Energy and Environment Cabinet: The Kentucky Energy and Environment Cabinet shall designate an agency as the lead state agency for TRM development and maintenance. This designated lead state agency shall be responsible for appointing members to the TRM Steering Committee, and a representative from the designated lead state agency shall chair the TRM Steering Committee.

TRM Steering Committee: The TRM Steering Committee shall be responsible for overseeing TRM development, providing a forum to allow interested parties to recommend TRM updates and facilitating consensus for TRM updates. The TRM Steering Committee shall be chaired by a representative from the designated

lead state agency, shall include the Executive Director of the Kentucky Public Service Commission and shall consist of 23 other members. The designated lead state agency shall appoint one representative to the TRM Steering Committee from each of the following groups:

1. Residential consumers
2. Low-income consumers
3. Commercial end-users
4. The manufacturing industry
5. Agricultural consumers
6. Energy service company industry or industry association
7. Organized labor
8. Schools and universities
9. The Kentucky Department of Air Quality
10. The Office of the Kentucky Attorney General
11. Kentucky Housing Corporation
12. Local government, or city or county association
13. Kentucky Association of Electric Cooperatives
14. Kentucky Municipal Utilities Association
15. Environmental advocates

The following groups will each appoint one representative to the TRM Steering Committee:

16. Louisville Gas and Electric Company and Kentucky Utilities Company (LG&E-KU)
17. Duke Energy Corporation
18. Kentucky Power
19. Big Rivers Electric Cooperative
20. East Kentucky Power Cooperative
21. Columbia Gas of Kentucky
22. Atmos Energy
23. Delta Natural Gas Company

The fifteen TRM Steering Committee members appointed by the lead state agency shall each be appointed for five-year terms. The eight Steering Committee members appointed by the groups they represent shall have no term limits. The representative from the lead state agency shall have no term limit.

Rules guiding the duties and powers of TRM Steering Committee members, meeting format and schedule, decision-making, conflict resolution and other items will be specified in the TRM Steering Committee Bylaws. The TRM Steering Committee shall be responsible for developing these Bylaws upon its formation.

TRM Administrator: The TRM Administrator is responsible for managing and executing the process of TRM development and annual updates. The TRM Steering Committee may hire a third-party consultant as a TRM Administrator, or, alternatively, the lead state agency may elect to assume the role of TRM Administrator.

Kentucky Public Service Commission: The Executive Director of the PSC will be a member of the TRM Steering Committee. The PSC may use a Kentucky TRM as a reference resource when reviewing energy efficiency plan and evaluation filings.

Program Administrators: Program Administrators have the primary responsibility of administering energy efficiency programs and submitting filings with the PSC for cost recovery, revenue recovery and incentive purposes. As members of the TRM Steering Committee, Program Administrators will provide feedback during TRM development, leverage existing utility-led DSM collaboratives and propose updates to the TRM when new measures are added to their portfolios.

VII. Kentucky TRM Update Process and Timeline

TRM Update Process:

The process of incorporating new and better information into the Kentucky TRM will occur once every three years. Any party may submit formal recommendations for TRM updates, including modifications to existing measures, new applications of existing measures and the addition of new measures, along with supporting documentation to the TRM Administrator by September 30th of the year prior to the start of the TRM Cycle for which the updated TRM will be in effect (for example, September 30, 2017 for a TRM Cycle running from June 1, 2018 through May 31, 2021).

For proposed new measures, supporting documentation shall include:

a. the identification and description of new measures recommended for inclusion in the TRM,

b. a definition of market specific customer class and any particular segmentation within that class for which the programs are designed,
c. the energy, demand, natural gas and water savings resulting from the measure, and all data, assumptions, calculations and references used in estimating these values,
d. the effective useful life, incremental cost, operating hours, operations and maintenance costs, net-to-gross ratio, any other adjustment factors applicable to the measure, and all data assumptions, calculations and references used in estimating these values,
e. the loadshape and applicability conditions associated with the measure, and the references and data assumptions used in deriving each.

For proposed updates to existing measures, including modifications to existing measures as well as new applications of existing measures, supporting documentation shall include:

a. identification of the relevant existing measure,
b. description of the modification or new application,
c. an explanation of the reason for the modification or new application and
d. applicability conditions for the measure, if a new application.

The TRM Administrator shall bring each recommended update before the TRM Steering Committee. The TRM Steering Committee shall vote on whether to pursue each recommended update according to voting procedures specified in the TRM Steering Committee Bylaws.

Once the TRM Steering Committee settles on a list of existing and new measure updates, the TRM Administrator will prepare proposed TRM updates. The TRM Administrator will bring each proposed update before the TRM Steering Committee and work towards achieving consensus on each update. During the year in which the TRM will be updated (and take effect on June 1), the TRM Administrator must bring proposed updates to existing measures before the TRM Steering Committee by February 28 and must bring proposed new measure updates before the TRM Steering Committee by March 31. The TRM Steering Committee will provide comment and feedback on each update and make a good faith effort to achieve consensus.

Non-consensus updates will be handled according to the conflict resolution processes specified in the TRM Steering Committee Bylaws. The TRM

Administrator will finalize the updated Kentucky TRM with consensus updates and submit this document to the lead stage agency for review. The lead state agency must make any requests for clarifications or revisions and accept the updated TRM by June 1, at which point the updated TRM takes effect.

TRM Implementation Cycles

Year	TRM Version	TRM Updates Recommended to TRM Steering Committee	TRM Administrator Proposes Updates to Existing Measures to TRM Steering Committee	TRM Administrator Proposes New Measure Updates to TRM Steering Committee	TRM Accepted by Lead State Agency	Filings in which TRM may be used
[TRM Development – up to 2 Years]						
1	v1.0				June 1, Year 1 (Y1)	Plans and Evaluations Filed Before Approval of TRM v2.0
4	v2.0	By September 30, Y3	By February 28, Y4	By March 31, Y4	June 1, Y4	Plans and Evaluations Filed Before Approval of TRM v3.0
7	v3.0	By September 30, Y6	By February 28, Y7	By March 31, Y7	June 1, Y7	Plans and Evaluations Filed Before Approval of TRM v4.0
10	v4.0	By September 30, Y9	By February 29, Y10	By March 31, Y10	June 1, Y10	Plans and Evaluations Filed Before Approval of TRM v5.0
13	v5.0	By September 30, Y12	By February 28, Y13	By March 31, Y13	June 1, Y13	Plans and Evaluations Filed Before Approval of TRM v6.0