Executive Summary

In February 2022, Utah DEM and FEMA published the *Utah K-12 Public Schools Unreinforced Masonry Inventory* (Inventory). It lists 119 school campuses in Utah that have unreinforced masonry (URM) construction, which has a high risk of major damage or collapse from earthquakes. It also lists more than 200 other school campuses that have buildings with other types of construction that may be at high risk from earthquakes. However, at the public release of the Inventory, there was not yet guidance on a defined minimum standard for voluntary seismic retrofits of K-12 public schools in the state. There was also no guidance on how meeting that standard would affect the status of a school campus in the Inventory. This report provides this guidance by recommending answers to these five questions:

- How can a school campus be removed from the Inventory and/or have its status in the Inventory changed?
- What seismic performance objectives and engineering retrofit criteria (i.e., defined minimum standard), if any, should a school meet to have its status change?
- What steps should be taken, if any, to confirm that a retrofit meets the defined minimum standard?
- Should previously retrofitted school buildings be treated differently, and if so, how?
- Who should manage the Inventory and make decisions about changes to the status of school campuses?

The main focus of the report is to provide recommendations for school buildings that are made with URM. However, much of this information also applies to other types of buildings identified in the Inventory. The Utah State Board of Education and local education agencies are the main audiences for the report. Other audiences, such as elected officials and parent-teacher associations, should also benefit from it.

This report provides background information to give context for the answers it recommends. This includes details on the factors that affect decisions about school facility upgrades. Factors include common funding mechanisms for school projects; reasons for and barriers to seismic retrofits; issues related to funding fairness; and replacement and retrofit costs. The report also describes building codes and regulatory enforcement for URM and other seismically vulnerable school buildings in Utah. This includes a discussion of the building-code basis for seismic retrofits; retrofit procedures for voluntary seismic retrofits; current Utah practices and requirements for school construction; and the value of strong enforcement of standards in the context of URM buildings.

The discussion about building codes highlights that Utah (as with other states) does not require a minimum seismic performance (i.e., expected seismic safety in future earthquakes) for voluntary retrofits as long as the work does not make a building less safe. This means that Utah schools have used a wide range of procedures with different seismic performance objectives. This leads to varied seismic safety even among schools that have been retrofitted, not to mention those that have not. A few examples of retrofitted schools in Utah show this point.

This report recommends using a Minimum Earthquake Safety Level (MESL) to design seismic retrofits for Utah school buildings. It defines this MESL through reference to the currently adopted building code in Utah. It provides a rationale as well. The report recommends use of the Inventory to inspire action and monitor progress toward the MESL. To meet this goal, update the statuses of URM buildings as they are retrofitted or replaced; do not remove them from the Inventory. Due to its relevant mandate and authority, the report notes that the Utah State Board of Education is the best state agency for assuming ownership and control of the Inventory. However, the board would need more personnel and financial resources to take on this responsibility.

The report proposes types of information to collect about school buildings in the Inventory that are retrofitted, replaced, closed, or repurposed. The state can use this information to communicate statewide progress on school earthquake safety. The report also describes how previously retrofitted schools should be treated in the Inventory and provides a pathway for showing that they have met the MESL.

Seismic retrofit feasibility studies are vital tools as they help local education agencies make informed decisions about future actions that relate to the school buildings in the Inventory. Seismic safety evaluations are one component of seismic retrofit feasibility studies. But facility condition assessments of K-12 schools, which the state requires, do not always include seismic safety evaluations. The report recommends types of information to include in seismic retrofit feasibility studies.

The report also provides recommendations for future study. This includes the need for guidance on addressing liability surrounding school earthquake safety, addressing other vulnerable school construction types besides URM, and evaluating the seismic safety of private, charter, and Indigenous K-12 schools in Utah. The report recommends evaluating current school facility design and construction practices in Utah, developing a seismic risk reduction education campaign, and setting a target date for all URM schools in Utah to be retrofitted, replaced, closed, or repurposed.