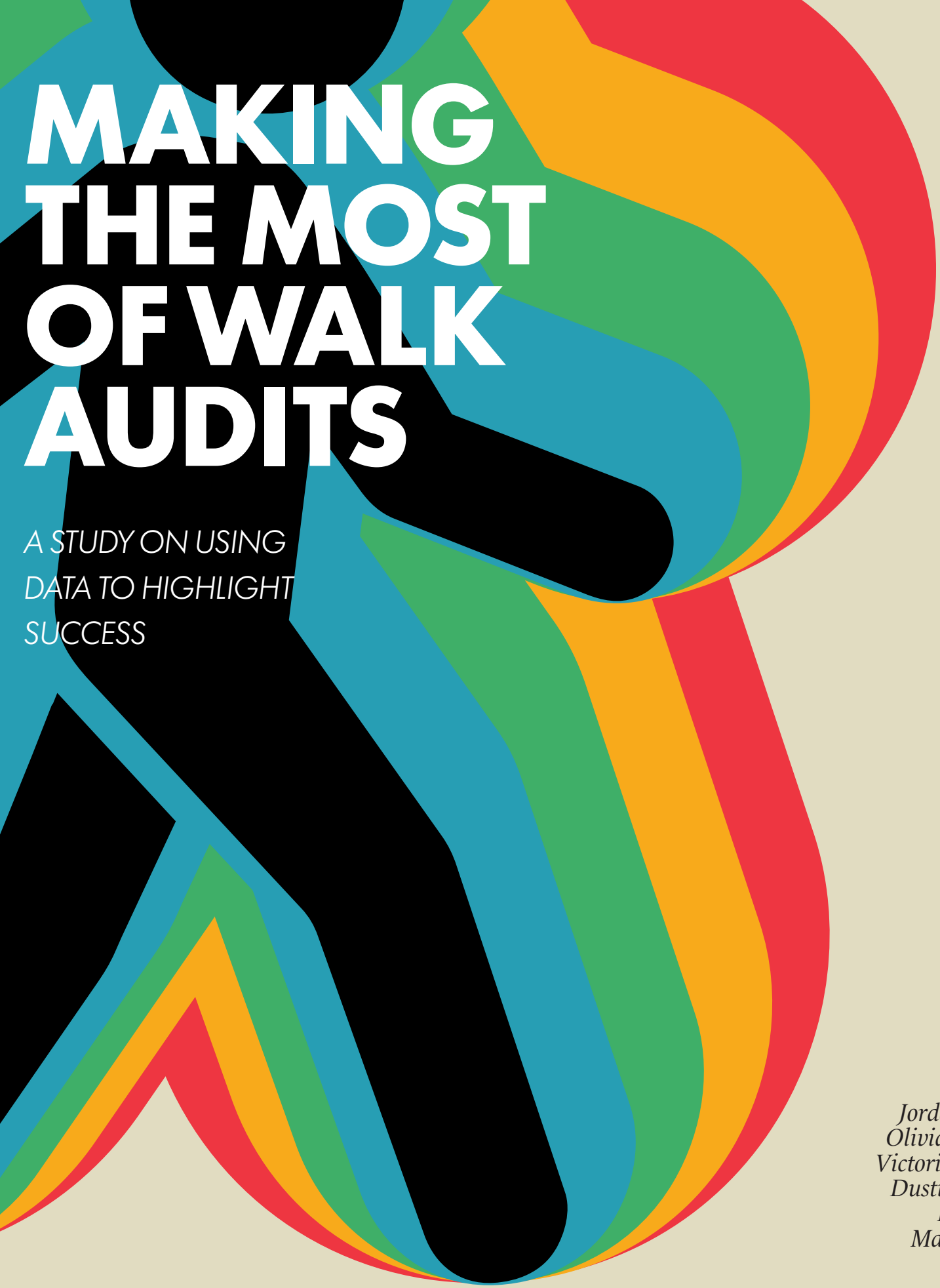

MAKING THE MOST OF WALK AUDITS

A STUDY ON USING DATA TO HIGHLIGHT SUCCESS

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UEP 255: FIELD PROJECTS
SPRING 2026

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SPECIAL THANKS

Special thanks to Sumeeta Srinivasan, Jonny Gomez-Pereira, and all of the wonderful Tisch Data Lab assistants for your help with the project. Thanks to Erin Leahy, Bruja, Emmie Sanatar, and Bridget Grew for emotional support. To Derek the IT guy for technical assistance. To Vengaboys and the Police for creative inspiration. To Pini's Pizzeria for the slices. To our dear rivals The Crabs for being such good sports. And or course, to all of our interviewees. We couldn't have done this without your help.

EXECUTIVE SUMMARY

For non-profit organizations like WalkMassachusetts, which must perpetually compete for limited resources, the skillful use of data is increasingly important. Good data helps non-profits tell compelling stories about how they turn every dollar or volunteer hour they get into positive change. And those stories, in turn, help attract more volunteers, secure more donations, and win more contracts and grants. To that end, our team of graduate students at Tufts University's Department of Urban and Environmental Policy and Planning (UEP) worked for fourteen weeks alongside our partners at WalkMassachusetts (Brendan Kearney and Iolando Spinola) to identify powerful new ways the organization could *display*, *analyze*, and *augment* their data, specifically their structured repository of walk audit reports.

The mission of WalkMassachusetts is to ensure pedestrians feel connected and valued on the streets of the Commonwealth. Walk audits are one of the key tools they use. A walk audit is a community-driven process which entails an intentionally planned walk, usually in a group, to document current conditions, including discomforts and hazards. The auditors then prepare a report, including photos and recommendations for change.

At the start of our project, WalkMassachusetts had already compiled a spreadsheet summarizing key details from 114 walk audits, including metadata, recommendations, and themes (like "accessibility" or "youth"). WalkMassachusetts asked our UEP Field Projects team to develop a more user-friendly way to present this information, centered around a map, that would make it easy for a user to browse the data, look-up specific audits, or discover relevant audits by themes. To accomplish this, we created an interactive web-based dashboard.

As the dashboard took shape, we also became aware of its limitations, generating the need for additional deliverables. First, the dashboard clearly highlighted places where walk audits are *missing*, but that is not the same as locations where audits are *needed*. To address this discrepancy, we conducted a supplementary spatial analysis comparing pedestrian crashes with audits and the population of municipalities to identify truly under-audited communities.

Second, the dashboard illuminated places where audits were *completed*, but it did not tell us anything about the *quality* of those audits. We wanted to know: Have the recommendations been acted upon? Can we see the before/after photos? Such data could help WalkMassachusetts quickly highlight their triumphs, and help activists identify exemplary audits to emulate; but this information is not currently captured. To address these gaps, we researched a number of past audits to understand what success means in this context, and what kind of data could reasonably be captured in the future. Our findings also illuminated some key insights for making the walk audit process more effective which we compiled for WalkMassachusetts.

We ultimately delivered an interactive data dashboard coupled with a set of recommendations for making the most of the walk audit process, and enabling more powerful dashboards and reporting in the future. Based on our research findings, we encourage WalkMassachusetts to: (1) expand existing toolkits, (2) streamline communication, (3) implement an iterative follow-up process, (4) prioritize underserved municipalities using GIS analysis, and (5) increase the scope of data collected.

Image credit: WalkMass

INTRODUCTION

Walkable communities play a critical role in advancing public safety, residents' well-being, accessibility, and equitable access to economic opportunity. Across Massachusetts, local governments, advocacy organizations, and residents increasingly recognize the importance of improving pedestrian infrastructure to support safer and more inclusive mobility. One widely used method for identifying pedestrian safety concerns and infrastructure gaps is the walk audit– a structured, community-based assessment in which participants evaluate sidewalks, crossings, lighting, traffic behavior, accessibility, and other elements of the built environment. Walk audits generate valuable, place-based insights that can inform infrastructure improvements, strengthen community advocacy, and guide public investment in safer streets.

For more than a decade, the nonprofit organization WalkMassachusetts has supported communities across the state in conducting walk audits to assess pedestrian conditions and promote safer, more walkable environments. While these audits have contributed to many positive transformations, the potential for this data to inform policy discussions, support grant applications, or guide targeted infrastructure investments has not been fully realized. The data collected through walk audits over the past ten years exists primarily in static reports and documentation that is difficult to synthesize, visualize, or communicate effectively to policymakers, community groups, and the broader public.

Recognizing this challenge, WalkMassachusetts has partnered with our Tufts Urban and Environmental Policy and Planning Field Projects team to make their audit collection more accessible and impactful. The primary objective is to transform existing information into interactive geospatial tools that allow users to visualize and interact with audits across the state. By presenting walk audit findings in a visually compelling and easily navigable format, the tools can serve as both an educational platform and an advocacy resource. Municipalities, community organizations, and advocacy groups can use these visualizations to better understand pedestrian safety challenges, learn from past walk audit efforts, and identify opportunities to pursue funding or grant programs that support walkability improvements across Massachusetts.

Ultimately, this project seeks to help WalkMassachusetts transform a decade of valuable community-generated data into a strategic resource that informs policy, supports advocacy, and strengthens efforts to build safer, more equitable walking environments throughout the Commonwealth.

BACKGROUND

WHAT IS A WALK AUDIT?

A walk audit is the first step toward creating safer, more comfortable streets (WalkMassachusetts 2026). It is a community-driven process that documents and reports current street conditions, such as dangerous intersections and sidewalks, as well as protected bike lanes and benches (ibid, 2026). Additionally, audits can be more specific, addressing urban heat islands, transit connections, Americans with Disabilities Act (ADA)-compliant streets, economic viability and more (ibid, 2026). Walk audits are an opportunity for residents to participate in envisioning a better future for their communities (Moening and Zimmerman, 2018). They can be informal or involve town representatives; they can be done solo or with a group, using checklists and forms to record and report findings (Moening and Zimmerman, 2018). Regardless of how a walk audit is conducted, it acts as a tool to engage community members and gather information for schools, community planning, safety projects, and more (ibid, 2018).

A walk audit being conducted in Belchertown – Image credit: WalkMass

PARTNER ORGANIZATION

WalkMassachusetts uses walk audits as a tool to make walking safer and easier in Massachusetts, encouraging better health, a cleaner environment, and more vibrant communities (WalkMassachusetts 2026). Founded in 1990, the nonprofit organization, originally named WalkBoston, strives toward a Commonwealth where all pedestrians feel connected and valued on their streets (ibid. 2026). The change to "WalkMassachusetts" occurred in 2023 to better reflect all walk audits, legislation, design manuals, and community engagement implemented outside Boston and throughout Massachusetts (ibid. 2026). The work WalkMassachusetts conducts centers on valuing community, equity, and partnership, while addressing key issues in walkability (ibid. 2026). These issues include pedestrian safety, walkable communities, aging-friendly walking focused on elderly community needs, transit connections, and walking policy and design (ibid. 2026). Currently, the organization maintains a large spreadsheet with all 114 walk audits (and counting) it has completed to date. As the number of audits continues to grow, WalkMassachusetts wants to present this data in a simpler form for communities to access.

RESEARCH QUESTION

Our Field Project team set out to compile walk audit data collected by WalkMassachusetts into a database where users can learn about previously conducted audits, their effectiveness, and their outcomes, encouraging residents to organize walk audits in their own communities. Additionally, we wanted to use spatial analysis tools to conceptualize where new audits should take place, based on an examination of various GIS layers such as pedestrian crashes, heat island data, environmental justice criteria, and other city/town issues. Improving the process of finding areas where cities

can implement new audits raised another question: how can we improve the current walk audit process that WalkMassachusetts uses, in order to enhance the outcomes of future audits? This question includes multiple facets: researching communities before the walk audit, conducting the audit itself, and following up to track changes and hold communities accountable for turning the recommendations into reality.

Our project seeks to address three questions:

1. How can we better present all of the collected walk audit data through a more powerful and visually appealing public interface?

2. Where should new walk audits be prioritized?

3. How can we create a more effective walk audit process by identifying audit successes (e.g., infrastructure change, policy creation, educational moments), and amending the walk audit follow-up process to create more actionable recommendations?

These three research questions correspond to three interrelated deliverables that captures the lifecycle of a walk audit:

1. A **data dashboard** showcasing where walk audits have occurred *[In the form of a Website]*

2. A **spatial analysis** of high-risk walking areas in Massachusetts to be prioritized for future walk audits *[Included in our Recommendation Document]*

3. A **qualitative analysis** of the walk audit process *[Included in our Recommendation Document]*

This report will begin with a literature review, which provides an academic underpinning for the project. We then explain each of our deliverables in turn: the interactive dashboard, the geospatial analysis of under-audited communities, and the qualitative investigation into the audit process. Next, we explain how the deliverables inform a set of unifying recommendations for WalkMassachusetts. Finally, we will discuss some limitations to our project as a whole, and wrap up with a conclusion.

Image credit: Boston MPO

LITERATURE REVIEW

To develop foundational knowledge about bridging walkability gaps, the WalkMassachusetts Field Projects team reviewed relevant literature collected from the Tufts Library online database, Google Scholar, and the WalkMassachusetts website. Given the breadth of our study, we sought articles, websites, and webinars covering a wide range of topics. This included seeking information on grants and other funding opportunities for municipalities and non-profit organizations, conventions on walk audit practices, factors that enhance and detract from walkability, tools for data visualization, and the efficacy of walk audits in influencing local government policy to enhance walkability. With these search parameters in mind, we needed to consider the geographic context of our project when selecting literature to review, and therefore focused our searches on Massachusetts and the United States. We also primarily reviewed materials from the last 10-15 years.

PROBLEMS WALK AUDITS SEEK TO ADDRESS

Walk audits and similar tools are used to address a lack of, and issues related to, walkability, such as health issues related to increasingly sedentary lifestyles, traffic congestion, and environmental threats like heat islands and carbon emissions (Grant et al., 2011). These problems stem from a variety of sources regarding social injustices, available economic resources, and ecological constraints from varied land uses and a changing climate. This review focuses on a lack of active mobility in cities and towns and how this relates to issues of walkability. In the past, U.S. cities have based their infrastructure on the mobility of cars and not people. This is now creating barriers on how people move around their communities in a safe and timely manner. During our literature search, we identified two main infrastructure-related problems that walk audits seek to address: safety and development.

Safety

Pedestrian safety encompasses a range of factors like pedestrian crashes and fatalities, routes to school, policy-compliant streets, crime, and perceptions of safety. One of the most frequently discussed components of pedestrian safety is addressing crashes involving bicyclists and pedestrians that result from inadequate pedestrian infrastructure. During 2021 in the U.S., 7,388 pedestrians were killed and 60,577 were injured in traffic crashes (National Highway Traffic Safety Administration, 2023). These crashes tend to be highly concentrated around intersections, public transit stations, and major destination facilities (Sung et

al., 2022). Numerous studies of compact, mixed-use urban environments in the U.S. have identified these locations as increasingly dangerous, whether in highly car-centric or pedestrian-dense settings (Sung et al., 2022). These studies led to urgent recommendations to secure pedestrian safety in high-concentration areas and mixed-use urban environments (Sung et al., 2022). Pedestrian crashes cannot be generalized due to mixed pedestrian interactions and varied environments (Sung et al., 2022). As a result, it is essential that communities tailor their implementation of pedestrian safety policies to their specific environments and interactions to address these crashes (Sung et al., 2022). The dangers posed by vehicular traffic in these particular, high-risk locations can be mitigated through infrastructure changes such as curb buffers, traffic-calming measures, crosswalks, and lighting (Bereitschaft, 2024). One of the primary goals of a walk audit is to identify existing gaps in pedestrian safety infrastructure where such solutions can be implemented.

Pedestrian safety for children is especially important in areas near schools. It is imperative that pedestrian crashes in and around school zones are eliminated and that the routes children take to school have infrastructure that creates a safe environment. Initiatives such as the Safe Routes to School Partnership, a nationwide nonprofit organization dedicated to improving the walkability of communities, provides communities with resources to create safer routes, encouraging walking and biking to school to help reach national health goals (McDonald, 2008). Looking at current crash reports near school zones, it appears that mitigation efforts, such as speed reductions, positively impact pedestrian safety and reduce fatal crashes (Sung et al., 2022).

Similarly, when designing walkability safety measures, consideration should be extended to residents with disabilities. The goal of transportation facilities is to provide mobility to residents and society (O'Hanlon et al., 2016). In providing this mobility, transportation should not only be safe and efficient but also usable for persons with limited mobility (O'Hanlon et al., 2016). Active and public transportation infrastructure that is inaccessible to the elderly and disabled community can leave transit-dependent residents stranded (Jenkins et al., 2020). Adults with disabilities are twice as likely to experience barriers to transportation and mobility as adults without disabilities (Jenkins et al., 2020). This leaves over half a million people with disabilities to rarely leave their homes because of a lack of pedestrian resources to support their needs (Jenkins et al., 2020). By conducting walking and transportation analyses using tools such as walk audits, municipalities' ADA compliance inadequacies can be fully assessed and documented, informing local government and council members on where improvements can be made to address these issues.

Finally, the issue of infrastructure safety can also be addressed through perceptions of crime and feelings of safety when walking and biking through communities. Many microscale elements of a community's built environment impact walking behavior and residents' sense of safety and comfort (Bereitschaft, 2024). Pedestrians feel safer in areas with active street life, storefronts, and proper lighting (Bereitschaft, 2024). Areas that provide a 'natural surveillance' or 'eyes on the street' concept enhance pedestrians' sense of safety, especially in the dark (Bereitschaft, 2024). When streetscapes appear unkempt or sensorially dull, they reduce feelings of safety and discourage walking in these areas (Bereitschaft, 2024). Simple changes in lighting and streetscape can alter perceptions of streets in municipalities. Walk audits can document these feelings, enabling local governments to implement changes.

Inequity in Urban Form

The suburban style of separated land uses and winding, fused grid road networks can create disjointed neighborhoods where it is hard for residents to get from one dense area to another. Within these disconnected communities, over 90% of trips are by car, yet 27% are less than a mile, and an additional 13% are less than 2 miles (Moudon and Lee, 2003). This is a direct result of local zoning policies that encourage this type of urban design and restrict walkable, mixed-use development

(Hooper et al., 2015). This design is linked to health-related behaviors, such as active transportation and walkability (Hooper et al., 2015). Residents living in compact, connected communities were twice as likely to walk recreationally for 60 minutes or more compared to those living in disconnected developments (Hooper et al., 2015). The absence of pedestrian infrastructure, such as footpaths or sidewalks, can determine whether residents walk locally or use other modes of transportation to reach places that could otherwise be accessible on foot (Hooper et al., 2015). When suburban subdivisions are developed without regard to a comprehensive city or regional plan that prioritizes walkability, it becomes difficult to provide equitable distribution of amenities within walking distance (Hooper et al., 2015). This results in widespread, disjointed residential developments that are not interconnected, leaving neighborhoods disconnected from one another with few destinations within walking distance and little to no pedestrian infrastructure (Hooper et al., 2015). These disconnections can negatively affect a municipality's character and mobility.

Walkable, transit-oriented environments are especially crucial for disadvantaged groups such as low-wage workers, immigrants, and ethno-racial minorities, who have lower car ownership rates and are thus more likely to rely on alternative modes of transportation (Bereitschaft, 2024). Additionally, research suggests that walkability factors are not equally distributed or accessible to these disadvantaged groups that would benefit the most (Bereitschaft, 2024). In many cities, white, highly educated, and high-income residents benefit from greater access to public transportation, while wealth differences enable them to purchase cars and use additional modes of transportation (Jenkins et al., 2020). Past research has shown that 90% of high-income communities have sidewalks, while only 49% of low-income communities do (Safe Routes to School, 2018). By conducting a walk audit, communities can identify, log, and report street inequities that can lead to safer, fairer street environments (Safe Routes to School, 2018).

SOLUTIONS

In light of the safety, health, environmental, and economic concerns identified as factors that limit walkability, it is clear that a means to develop lasting solutions to repair mobility is necessary. This section will analyze the effectiveness of walk audits as a tool in addressing these issues by looking at their potential benefits and their role in generating funding. Furthermore, this section will explore the benefits of making the data collected by walk audits publicly accessible, and the best practices for doing so. Ultimately, this section serves to explore the feasibility and effectiveness of using walk audits as a tool in addressing these prevailing issues regarding walkability.

Walk Audits as a Solution

The walk audit process involves community members walking along predetermined routes, noting any positive or negative aspects of the built and natural environments, as well as of the overall experience (WalkMassachusetts, 2026). This process not only provides an on-the-ground perspective of how existing pedestrian infrastructure impacts users, it also provides an understanding of the barriers faced by community members, as well as the way in which policy has tangible impacts, strengthening connections among residents and between interest groups (John, 2025). Following the walk, an official write-up is drafted and eventually published by the sponsoring organization. This includes a summary of the experience, any observed infrastructural shortcomings in regards to crossings, lighting, land use, and more, and specific short- and long-term policy recommendations (WalkMassachusetts 2026; AARP 2022). Through this process, issues that impede walkability and perpetuate the aforementioned community concerns are formally documented by a diverse group of participants, highlighting the audit's role as both a data-gathering instrument as well as a tool for community mobilization. Most walk audits tend to follow a standard protocol:

1. Complete a 'Walkability Assessment Questionnaire' to identify objectives of the audit.

2. Determine day-of specifics, including the route of interest, major areas of concern, and coordination with participants and relevant stakeholders.

3. Walk the length of the specified route, and complete a post-walk report highlighting any findings (O'Hanlon et al., 2016; Safe Routes Partnership, 2018).

In doing so, walk audits serve as tools to assist communities in designing and bringing awareness towards more comfortable, safe, aesthetically pleasing, and useful walking routes (O'Hanlon et al., 2016).

"Planning efforts are a very good tactic to enact policy change and increase the likelihood that better design choices are made as funding becomes available.

Walk Audits as a Means for Obtaining Funding

Deeher and Shumann not only assess the strength of walk audits as a tool for raising awareness about issues in their analysis of Seattle communities, but also assess the strength of walk audits as an effective medium to apply for grants and additional government funding (2009). Grants, a form of financial assistance, are essential in the funding and completion of community-involvement projects, effectively bridging the gap between the monetary capabilities of a program or project and its overall needs (Education and Local Government Grants 101, 2026). Grants are offered at both the federal and state levels; the United States has 23 authorized federal block grant programs that fund a wide range of improvement projects (Jaroscak, 2021). Despite the availability of these grants, specific guidelines, requirements, and deadlines impede many local agencies from taking full advantage of them (Education and Local Government Grants 101, 2026 2-4). In fact, one of the most common reasons for a denial of a grant application is the lack of a compelling narrative which illustrates the way in which a given community can serve to benefit from a grant, as well as an assessment of the ways in which the community will suffer if the improvement project is not completed due to inadequate funding (Education and Local Government Grants 101 2026). Walk audits, which serve as a means of qualitative data collection conducted by concerned community members and invested stakeholders, can be a useful tool to both provide data that supports claims for necessary community improvement projects, and to build this overall narrative, which is essential for the grant application process.

Outcomes of Walk Audits

Walk audits have been used in achieving lasting change in municipalities, specifically with regards to concerns of safety and comfort, economic viability, health, and social cohesion, which are all key factors in creating a sense of belonging and community in a locale (City of Cincinnati, n.d.).

A major goal of walk audits is to increase the safety and comfort of pedestrians and active transportation users alike. To address these issues and create changes it is important that the audit process is effective in finding improvement areas, and the recommendations are properly communicated. Walk audits focus on completing pedestrian networks, from improving crosswalk conditions to adding pedestrian signals to installing nighttime lighting for increased safety and visibility (Daigle, 2025). As infrastructural issues like these are some of the easiest to spot, due to their connection to pedestrian and bicyclist accidents and fatalities, the Federal Government has created programs for improvement projects related to infrastructure through grants administered by the Safe Streets For All Program, among others (Daigle, 2025).

Therefore, due to funding opportunities, walk audits naturally tend to prioritize infrastructural change in their projected outcomes rather than changes in policies or programs.

The formal documentation of walk audits allows them to serve as a means of raising awareness about policy points of concern. Community members are often encouraged to cite walk audits and their findings when they advocate for addressing certain issues (O'Hanlon et al., 2016). In her assessment of the effectiveness of walk audits in bringing about community change in Delaware, Policy Scientist Julia O'Hanlon explains the way in which audit findings can be utilized to the highest degree. "After the audit," O'Hanlon begins, "work with the stakeholder group to prioritize recommendations, prepare a written summary, present

Image credit: Boston MPO

findings, gain support, and develop an action plan that considers the need for plans, policies, design changes, funding support, maintenance plans/agreements, technical assistance, and outreach/education" (O'Hanlon et al. 2016, 9). Believing the strength of the walk audit process lies in the participation and buy-in of community members, O'Hanlon emphasizes that lasting change, specifically within the policy sector, is possible only when audit objectives are clear and participants are inspired (O'Hanlon et al., 2016). This viewpoint is shared by many in the field of policy and community action, including Rebecca Deehr and Amy Shumann, who assessed the successes of walk audits as a tool in communities across Seattle, WA. Through their analysis, they found walk audits to be most effective at bringing about significant changes when they were used as tools to bring about policy change at the highest level of decision making, emphasizing, "planning efforts are a very good tactic to enact policy change and increase the likelihood that better design choices are made as funding becomes available" (Deehr and Shumann, 2009, S409).

Increased levels of walkability that occur from walk audits also have the potential to improve town development and economic strength. Using a 'Walk Score', a metric developed and used by real estate companies that considers factors like nearby amenities, green space, and walking biking modes makes it possible to determine how pedestrian friendly a community is. An analysis of property values in Delaware reveals prospective homeowners value walkability; "a higher Walk Score can increase a property's value anywhere from $4,000 to $34,000 for a residential property or from 9% to 54% per square foot for a commercial property, depending on the level of change in walkability," policy scientist Julia O'Hanlon found (O'Hanlon et al., 2016, 5). In addition to the economic impact higher Walk Scores can have, research suggests cities that prioritize alternative forms of transportation, such as public transit, are more likely to reduce costs associated with automobiles and necessary related infrastructure (Bereitschaft, 2024). Thus, using walk audits as a means of changing and improving a community's culture of transportation to transition away from a complete reliance on cars has the potential to result in significant savings (Bereitschaft, 2024). The positive impact that increasing walkability through walk audits would have on local development and economic strength is clear (Grant et al., 2011).

The improved sidewalks, parks, and pedestrian-friendly areas that can result from walk audits are known to have significant positive impacts on the overall health of a community and its environment. Activity-friendly environments are reported to improve various measures of residents' health, from a decrease in chronic illnesses to an increase in reported mental health (O'Hanlon et al., 2016).

Furthermore, as walk audits serve to improve walkability and access to alternative transportation methods, a common outcome of the policy and infrastructural change following an effective walk audit is improved environmental health of a community. Towns with higher rates of walkability as well as active transportation experience decreased rates of driving, in turn reporting lower levels of air pollution, water pollution, carbon dioxide emission, and tire-related microplastics (Bereitschaft, 2024; O'Hanlon et al., 2016).

In addition to social and environmental health improvements, a benefit of increased walkability is an increase in general town cohesion and sense of community. An analysis of walkable communities in Ottawa, Canada, concluded that residents in areas with a greater amount of walkability reported higher levels of social interactions and sense of belonging (Grant et al., 2011). This can be understood using the concept of a third space, or a place where socialization occurs outside of home or work (Oldenburg, 1999). In walkable communities, sidewalks, parks, and pedestrian-friendly areas serve as these "third spaces", which in turn increases the overall cohesion of a town and sense of community felt by its members (Bereitschaft, 2024). This byproduct of the walk audit process, an increased feeling of cohesion, is not only felt among community members. The relationships that form between residents and local authorities as a result of this process are equally as important as the sense of community that can grow among residents themselves, as well as the infrastructural changes that can come about (Brandén and Samburg, 2021).

Walk audits clearly have the potential to have significant positive impacts on the communities in which they are conducted. The Safe Routes to School National Partnership emphasizes this in their general walk audit toolkit. "When our streets are walkable, our communities benefit in all kinds of ways," Kate Moening and Sara Zimmerman, researchers for the Safe Routes to School National Partnership, explain (Moening and Zimmerman 2018, 1). The changes to a town's environment, economic strength and development, health, and overall cohesion that can occur following the completion of a successful walk audit help this goal of walkability become realized.

Walk Audits as a Tool for Relationship Building

Walk audits inspire conversations between community members, planners, engineers, and elected officials, strengthening relationships in an attempt to develop a street system desired by all (ACEEE, 2025). Thus, effectively conducted walk audits have been found to be essential in the comprehensive analysis of a town center as a form of civilian monitoring of pedestrian infrastructure (Grant et al. 2011). As a tool, walk audits assist individuals in communities and smaller organizations in working together and advocating for a change they would like to see, especially when these relationships are oftentimes overlooked due to financial or time constraints (Grant et al., 2011). As previously stated, meaningful relationships are one of the most important outcomes of effective walk audits. Research suggests that in order to develop these relationships, a strong sense of trust in others is needed, with social cohesion being essential in achieving shared goals and well-being (City of Cincinnati, n.d.). Specifically, those conducting and participating in a walk audit need to rely on the assistance of community members, stakeholders, policy makers, and government actors when planning, completing, and referencing an audit (Grant et al., 2011). Without the trust that these groups and individuals will fulfill their responsibilities, these relationships will not develop, and the overall audit process will be less effective. Furthermore, relationships are essential in the execution of changes. Experts in community action and policy argue that successful walk audits often depend on partnerships with similar organizations, as these alliances help expand access to resources and generate the political traction needed to advance related programs and projects within a broader process of change (Grant et al., 2011).. Thus, the success and effectiveness of walk audits depend on the presence of strong relationships among partnering stakeholders. Barriers to the success of walk audits include limited funding, limited department bandwidth, reluctance to

change, suspicion of their purpose, and lags in the bureaucratic system (Grant et al., 2011). Although these challenges act as a potential barrier to bringing about substantive change, strong relationships can act as as tool to further change making after an audit is conducted (Grant et al., 2011).

Benefits of Publicly Accessible Data

As with any meaningful set of data, the way in which findings from walk audits are presented, as well as who can access these findings, undoubtedly impacts their potential reach. Proponents of publicly accessible data suggest that when data is accessible by all, citizens are able to engage more actively in democratic practices, and the potential for advocacy increases (Haroon, 2024; Rabinowitz, n.d.). For walk audits, a tool which hinges on the concepts of participatory planning and policy, an increase in advocacy is indispensable (Brandén and Samburg, 2021). In addition to increased rates of advocacy, publicly available data increases transparency and accountability in decision-making, enhancing overall policy formation (Haroon, 2024).

A caveat to the benefits of publicly accessible data is that it must be readable and easily understood by the public. Therefore, it is advised to follow existing best practices regarding data visualization, especially in regards to geospatial data. Such best practices include recognizing your intended audience and using clear symbols, colors, and other identifying features (Moore, 2025). Although technical data can lead to substantive policy change, it has the potential to be difficult for the average reader to digest. Publicly accessible data should be visualized and compiled in a way that is reader-friendly and audience-appropriate (Moore, 2025). Furthermore, users should not be deterred from accessing data due to challenges in understanding its legibility, especially when this data is visualized in map, table, or graph form. Using best practices for walk audits allows for thoughtfully visualized data to serve as a key component for community-based participatory processes (Esri, 2020).

Image credit: Boston MPO

THE WALK AUDIT DASHBOARD

One of our core deliverables is a data dashboard that presents existing audits in a map view and allows for search and filtering.

Prior to the start of our project, WalkMassachusetts had already compiled a spreadsheet with structured data of over 100 walk audits they or other organizations conducted across the state. It includes key metadata about the audits, summaries of the recommendations, key themes (like "accessibility," "youth," or "climate - heat") and a link to the actual report. The organization publishes this document as a "searchable database" in the form of a public Google Sheet. The collection is perpetually growing (WalkMassachusetts, n.d.). They also publish a Google Form that allows the general public to submit walk audits for inclusion. The form has the same structure as the sheet, but a member of the WalkMassachusetts team manually reviews new submissions before moving them over to the public sheet.

WalkMassachusetts asked us to turn this into a "geospatial database" and project it onto a map for easier viewing. They envisioned a tool for visualizing all the audits, with which a user could search for specific audits, or discover relevant audits based on themes.

Figure 1: The walk audit data submission form

METHODS

We created a prototype data dashboard to visualize and interact with walk audit summary data, which we iterated on throughout the semester. The prototype made it clear that the existing spreadsheet can already act as a "geospatial database" with minimal data cleaning of city/town names. It also provided a demonstration of the type of visualization that was possible with existing data, which allowed us to discuss together with our partner what other types of visualization were desired, and what additional data were needed to create them.

The dashboard drew inspiration from other interactive, public data dashboards with map components. These include Residensity (Figure 3), a web tool for exploring residential density and land use

	A	B	C	D	E	F	G
1	WalkMassachusetts Walk Audit Database						
2	CITY/TOWN	YEAR	SUMMARY	LONG TERM RECOMMENDATIONS	SHORT TERM RECOMMENDATIONS	STREETS, INNTERSECTIONS + AREA COVERED	THEMES
3	Barnstable (Hyannis)	2018	WalkMass conducted a walk audit along Route 132 (Iyannough Road) in Hyannis on August 9, 2018, as part of the EOPSS Pedestrian Safety	- Redesign Route 132 using a complete streets approach (narrower 10-foot lanes where	- Implement quick-build and non-structural safety measures: trim vegetation, clear debris and obstacles from sidewalks, adjust	Route 132 / Route 28 (Iyannough Road) between Independence Drive and	Connectivity Traffic Calming, Spe Economic Developm
4	Belchertown	2015	Healthy Hampshire organized a walk audit of Route 202 in Belchertown, covering the area from the town common to the Eastern Hampshire	- Implement traffic calming techniques to slow traffic down. - Increase safety and visibility of	- Increase safety and visibility of crosswalks by repainting. - Install push-button pedestrian activated	Route 202 (State St & Maple St)	Comfort & Safety Traffic Calming, Spe Bike or Bus Conne
5	Blandford	2021	The Hilltowns CDC, Healthy Hampshire, and WalkMass are leading a 5-year grant project to improve walkability in Hilltowns Village Centers,	- Improve safety and visibility of existing pedestrian crossings within the village center.	- Reduce traffic speeds on Route 23 through the Blandford village center. - Consider pedestrian wayfinding signage	Russel Stage Rd., Main St., North St., & South Part of Watson Park Walking Trail	Comfort Traffic Calming, Spe Connectivity Acce
6	Boston	2015	WalkBoston aided students from Codman Academy Charter School with identifying the safety benefits of closing Epping St after a	- Epping St should be closed, and the campus should be extended across Epping St to improve	- Implement measures to stop drivers from turning abruptly onto Epping St to avoid the red traffic light at the Norfolk/Talbot intersection.	Epping St, Norfolk St, Talbot St	Schools Traffic Calming, Spe Comfort & Safety
7	Boston	2016	On September 14, 2016, Urban Edge and WalkBoston conducted a walk assessment in	- Consider eliminating right-turn lanes (potentially in conjunction	- Add crosswalks across streets and intersections (e.g. Washington St, Columbus	Columbus Ave, Dixwell St, School St, Washington St,	Accessibility Age F Comfort & Safety F

Figure 2: The original walk audit spreadsheet

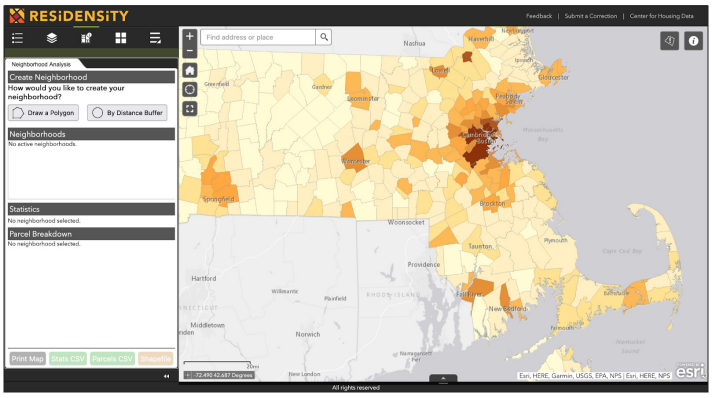


Figure 3: Example dashboard from Vision Zero View website (City of New York, n.d).

patterns in Massachusetts, and VisionZeroView (Figure 4), a tool for examining traffic crashes in NYC (City of New York, n.d.; Massachusetts Housing Partnership, n.d.) One common feature of these dashboards is having a large map view on the right and an interactive tools section to the left.

Through the iterative, collaborative design process requirements for the dashboard solidified. We determined that the dashboard must:

1. *Highlight* the activity of WalkMassachusetts with a map that shows all audits.

2. Make it easy to *find* specific audits with search and filter abilities (Eg. "Somerville 2014")

3. Make it easy to *discover* relevant audits based on themes. For instance, if an activist wants to conduct an audit that pertains to schools, it may be useful to see all audits that relate to schools.

Later on, a new requirement emerged. Our partner liked the idea of creating shareable pages for specific audits. They explained they are trying to become a "clearinghouse" for any audits that take place in the state of Massachusetts. They want to host and publicize all audits, not just the ones they conduct. By creating rich, standardized, shareable pages, they can provide value to other organizations that submit audits to WalkMassachusets, and make it easier for anyone to view and discover audits of interest.

Finally, the dashboard development process also involved reviewing the data fields that are captured. We experimented with using Google AppSheet to capture more types of data than a single spreadsheet allows. We ultimately made some minor changes to data fields in the existing spreadsheet with our partner, detailed below, but reserved major changes (like migrating to AppSheet) for our recommendations section.

Code

The interactive map was developed using custom HTML, CSS, and JavaScript code, stitched together with the Vue JavaScript framework. For the map component, the open-source library MapLibre was used. To prepare data for MapLibre, a Shapefile containing the geometries of all the cities and towns in Massachusetts was downloaded from MassGIS and converted into the GeoJSON format (MassGIS 2024). Similarly, the spreadsheet of walk audits was converted into JSON. Municipalities are matched with geometries by name (eg, "Cambridge") and counts are generated on the fly in JavaScript. The web app is deployed using Netlify, and pointed to the WalkMassachusets subdomain: audits.walkmass.org.

Additionally, there is a snippet of code that keeps data current by fetching the current data spreadsheet and converting it into JSON each time the

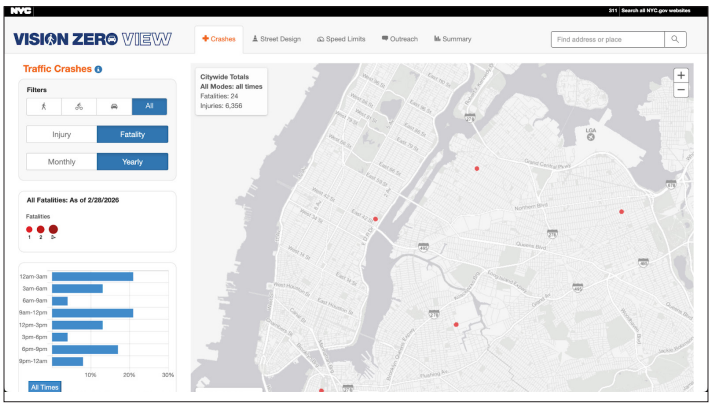


Figure 4: Example of the Residensity dashboard (Massachusetts Housing Partnership, n.d.).

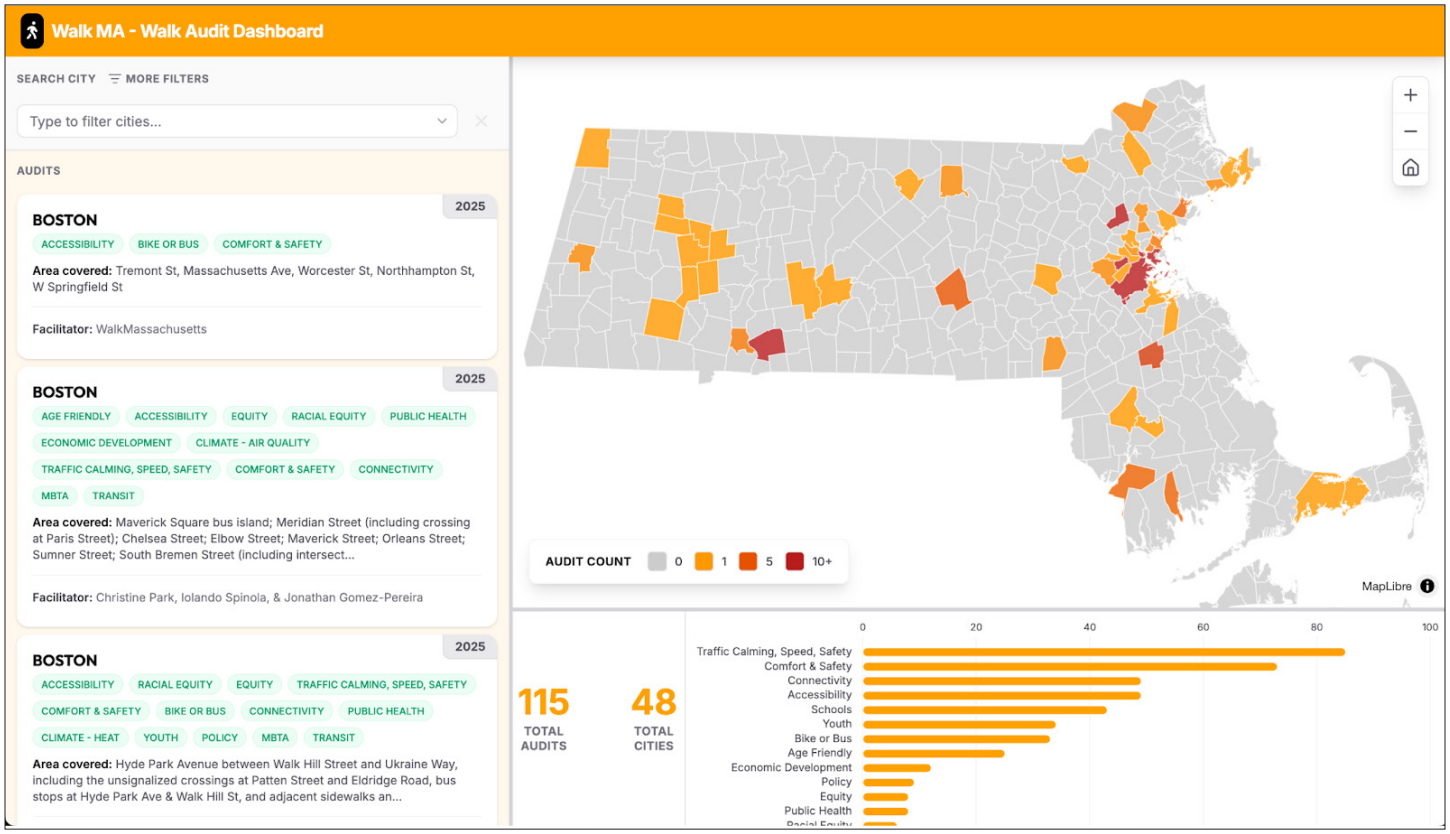


Figure 5: The Walk Audit Dashboard – Live at: https://audits.walkmass.org/

app loads. This code is written in Go and deployed as a Netlify Serverless Function.

Source code is available on GitHub (Michels [2026] 2026).

RESULTS

We completed a working dashboard, which has been successfully deployed to the partners website.

The dashboard showcases where audits have occurred in the form of an interactive choropleth map, and also presents a list of clickable audit cards. A particular city can be searched or selected, and the cards and map can be filtered down by city, year, or selected themes. When a card is clicked, a popup shows details about the audit, pulled from the Google Sheet.

Additionally, the popup can be expanded to a unique, shareable page for each audit, making it easier to publicize, and generating credibility for WalkMass as the "clearinghouse" for all audits that occur in the state.

Two key points to emphasize about the dashboard are (1) it is hosted for free (on the Netlify free tier) and (2) data updates automatically when the underlying spreadsheet is updated. Thus, the organization does not need to pay for hosting and does touch any code to keep the dashboard up to date.

Contingencies: If live data cannot be fetched, the dashboard will revert to a saved data file, so at least the audits available at this time of this report will be viewable. Additionally, if the website receives a massive amount of traffic it may no longer qualify for the free tier, but our partner determined that they could most likely justify paying for hosting in that event.

Data Changes

A few minor changes were made to the data structure of the spreadsheet. At the start of the project,

these were the fields being captured in the Google Sheet:

- **CITY/TOWN** `[text]` | "Boston (East Boston)"
- **YEAR** `[number]` | 2016
- **SUMMARY** `[text]` | "East Boston seniors, WalkMass, the City of…"
- **LONG TERM RECOMMENDATIONS** `[list of text]` | " - Create safer crossings…"
- **SHORT TERM RECOMMENDATIONS** `[list of text]` | "- Enhance the public…"
- **STREETS, INTERSECTIONS + AREA COVERED** `[list of text]` | "Maverick Sq, Meridian St, Saratoga St, Border St…"
- **THEMES** `[list of tags]` | "Accessibility, Comfort & Safety, Connectivity"
- **VIEW** `[hyperlinked text]` | PDF
- **FACILITATOR/AUTHOR** `[text]` | "Dorothea Hass & Adi Nochur"

One suggestion that was implemented was separating the neighborhood, eg, "East Boston" in "Boston (East Boston)" from the city/town name, and applying data validation to the city/town column to ensure all entries could easily be matched to a city/town on the map.

A second minor change that was implemented was adding an "Organization" column to differentiate between audits that WalkMass completed vs. audits done by outside organizations.

We experimented with capturing other types of data, but ultimately left this to our recommendations.

Image credit: WalkMass

SPATIAL DATA ANALYSIS

As the dashboard took shape, it raised new questions which were addressed through a supplementary spatial analysis. In particular, we found that when viewers interacted with the dashboard their eyes were often drawn to the large swaths of grey, which represent communities with no audits. That 'empty space' seems to be calling out for audits. This is positive in the sense that it can serve as a call to action, but it is also somewhat misleading. In reality, "missing" is not equivalent to "needed." Need depends on the size of the population and the magnitude of the safety or comfort concerns. A community with several audits could still need another one more than a community with zero audits. This led to a new research question: *Which communities should be prioritized for future audits, based on need?*

METHODS

We used ArcGIS Pro to conduct a statewide geospatial analysis using crash data from the Massachusetts Department of Transportation (MassDOT), population and municipal geometry from the Massachusetts Bureau of Geographic Information (MassGIS), and audit count data from the WalkMassachusetts audit repository.

We also experimented with using data from the Boston Metropolitan Planning Organization (Boston MPO), and the Environmental Protection Agency (EPA) such as temperature, heat index, and air quality index data, and environmental justice data to highlight areas of potential concern for pedestrian advocates. Maps were developed based on these data but a complete geospatial analysis highlighting specific areas to prioritize was not completed due to time constraints.

The maps created relate to common themes for audits which also frequently align with grant opportunities related to common grants (eg. safety, air quality, and vulnerable communities). We decided to focus on one key question: which areas are under-audited by WalkMassachusetts relative to the number of pedestrian crashes they experience. Other data sets provide important lenses and should be analyzed in the future, but this simplified question provides a clear, meaningful, and actionable result.

Model One: Crash-Audit Ratio

Crashes are often clustered in major cities and densely populated areas, as confirmed by our initial findings using the kernel density function. However, a city with several crashes but a very large population may not exhibit as much pedestrian risk as a community as 1-2 crashes but a small population, which is why counts are divided

by population. Hence, the crash-audit ratio model compares crashes divided by audits for each municipality, while also scaling both counts to 'per capita' to account for population differences.

Our calculation uses the data from the most recent U.S. Census population estimates and audit counts from the WalkMass Database. Zonal Statistics were processed in ArcGIS to obtain an accurate count of audits each town received, and were then joined to the Census Data Shapefile with a share field in the attribute table. Data on crashes involving pedestrians documented by MassDOT between 2023-2025 were also added to the shapefile using a spatial join.

The model also includes a small constant of 0.0001 in the denominator to avoid divisio by zero. The following equation was employed:

$$Score = \frac{crashes\ per\ capita}{audits\ per\ capita + 0.0001}$$

A lower score indicates that a town may experience pedestrian crashes but has received limited or no audits. A walk audit in those areas is appropriate and may reduce the likelihood of a recurrent crash.

However, a limitation of this methodology is the potential for data overrepresentation of smaller towns; a single crash in a low-population area can disproportionately inflate the per capita rate, causing towns with smaller populations to receive higher scores. To address this, we propose a second model.

Model Two: Location Quotient

Rather than considering population, the location quotient model asks: what share of all the crashes in the state happened here, and what share of all the audits in the state happened here? If a municipality received 50% of the crashes in Massachusetts, but also 50% of the audits, then that feels intuitively balanced. However, if a particular municipality suffered 50% of the crashes but only received 2% of the audits, that would suggest it is being under-audited.

The data used was the same as in the previous model: pedestrian-involved crashes (both injury and fatal) recorded by MassDOT from 2023-2025 and audit counts derived from the WalkMassachusetts audit database.

The equation is as follows:

$$LQ = \frac{\%\ of\ state\ crashes\ in\ Town\ X}{\%\ of\ state\ audits\ in\ Town\ X}$$

The interpretation of the score is:

- LQ > 1.0: The town is Under-Audited. Its share of crashes is higher than its share of audits.
- LQ = 1.0: The town's audit activity is perfectly "in sync" with its crash volume relative to the state average.
- LQ < 1.0: The town is Proactive. It has a higher share of audits than its share of crashes would suggest.

To handle the towns with 0 audits, we used the +1 Smoothing (Laplace Smoothing) in the denominator. Laplace smoothing (also known as "additive smoothing") is very common and widely respected in data science and statistics. So the more detailed formula is as follows:

$$LQ = \frac{\left(\frac{count\ of\ crashes\ in\ Town\ X}{total\ crashes\ in\ MA}\right)}{\left(\frac{count\ of\ audits\ in\ Town\ X\ +\ 1}{total\ audits\ in\ MA\ +\ 1}\right)}$$

We ultimately believe this second model gives more meaningful results than the first one.

FINDINGS

We identified potentially under-audited communities using two different models, and highlighted additional areas of concern based on additional data.

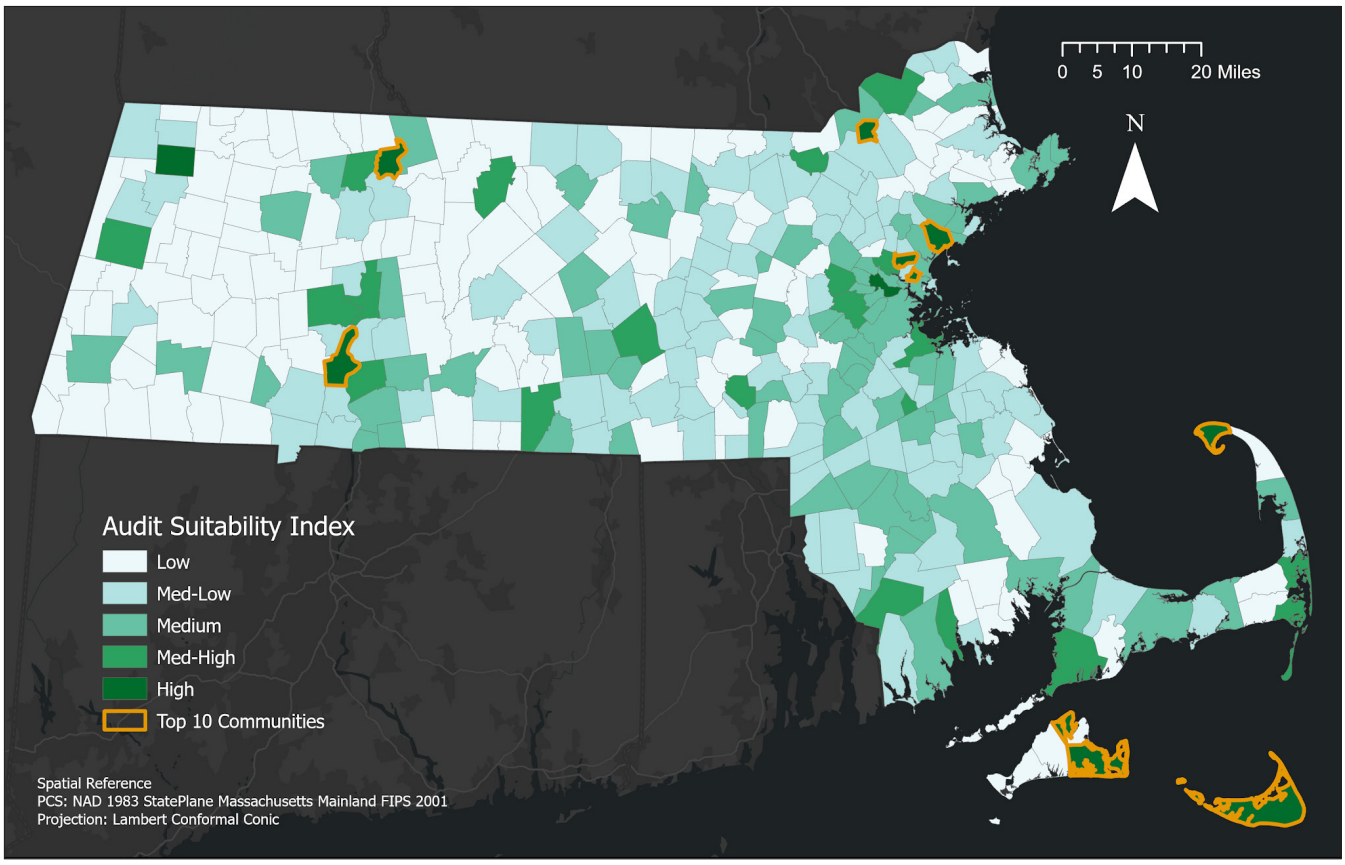


Figure 6: Cities and towns with audits-per-capita vs crashes-per-capita. – Data Source: MassDOT

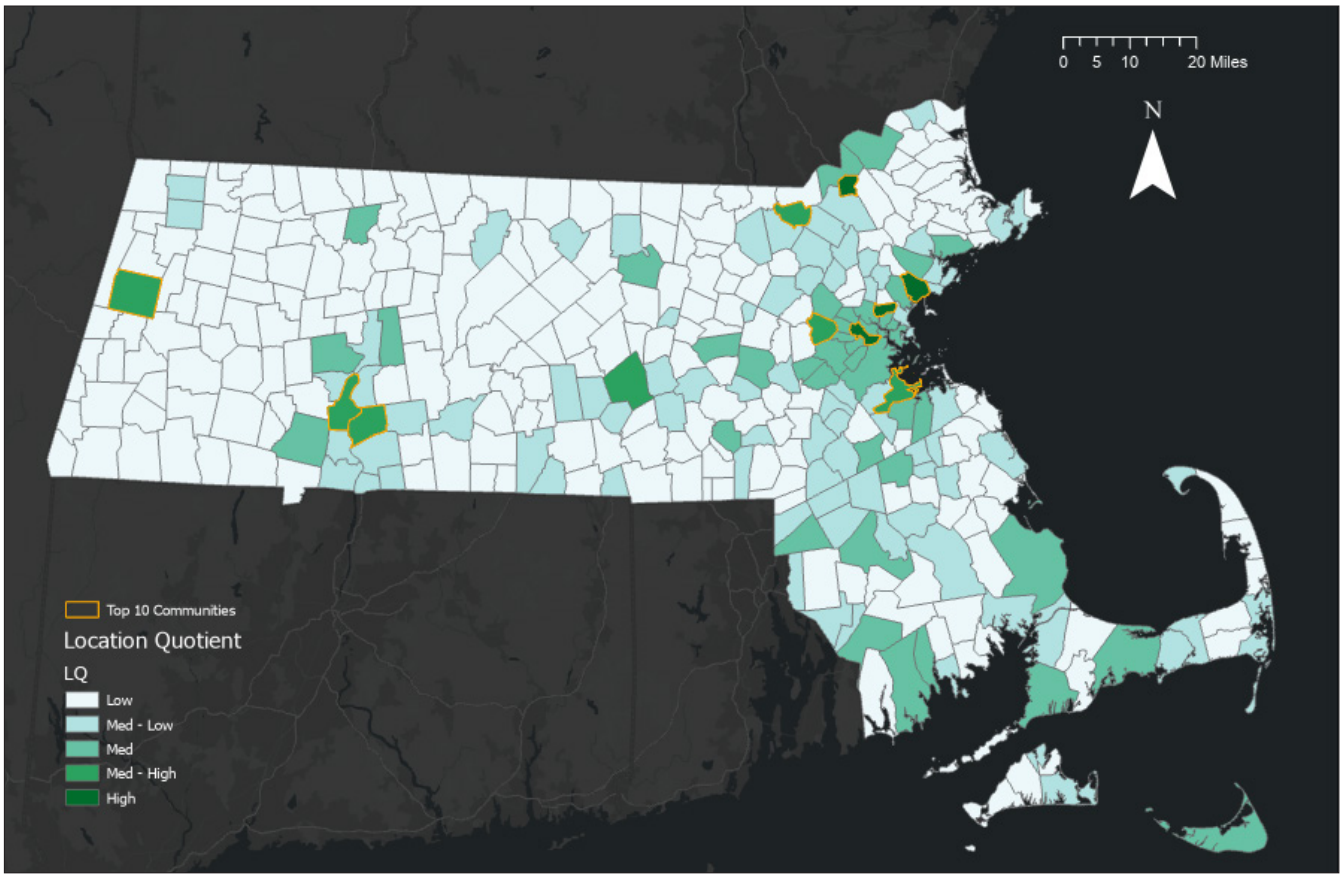


Figure 7: Cities and towns of interest based on "location quotient," the percent of the state's crashes that took place here vs. the percentage of the state's audits. – Data Source: MassDOT

Model One (Crash-Audit Ratio) Results

Figure 6 shows the map produced by model one, the crash-audit ratio.

The top ten under-audited communities identified by this model are as follows:

1. Malden
2. Edgartown
3. Holyoke
4. Lynn
5. Chelsea
6. Nantucket
7. Provincetown
8. Gill
9. Lawrence
10. Tisbury

As discussed previously, this model may over-emphasize small towns, which led us to employ a second model.

Model Two (Location Quotient) Results

Figure 7 shows the map produced by model two, the location quotient.

The top ten under-audited communities identified by this model are as follows:

1. Malden
2. Cambridge
3. Pittsfield
4. Chicopee
5. Holyoke
6. Quincy
7. Lawrence
8. Lynn
9. Waltham
10. Lowell

It is notable that some communities show up in both models: Malden, Lynn, and Lawrence. Malden is ranked first in both calculations, so it is likely an area of high concern. The second model replaces some very small towns with larger communities, which is why it may be a better assessment. It makes sense intuitively that Cambridge ranks highly, since the city had 157 pedestrian crashes in the dataset but has only received one audit.

Additional Maps

Though they are not connected to a complete geospatial analysis, we also present some additional maps that highlight areas of concern throughout Massachusetts: pedestrian traffic fatalities, air quality, and environmental justice (EJ) communities. The maps provide visual clues as to which parts of the state face especially high audit risks, but without conducting a more rigorous analysis we do not wish to make specific claims. The recommendations section details our suggestions for utilizing these data sets in the future to conduct more targeted analysis. For example, it could be asked: where are EJ communities with bad air quality that have not received an air-quality related audit?

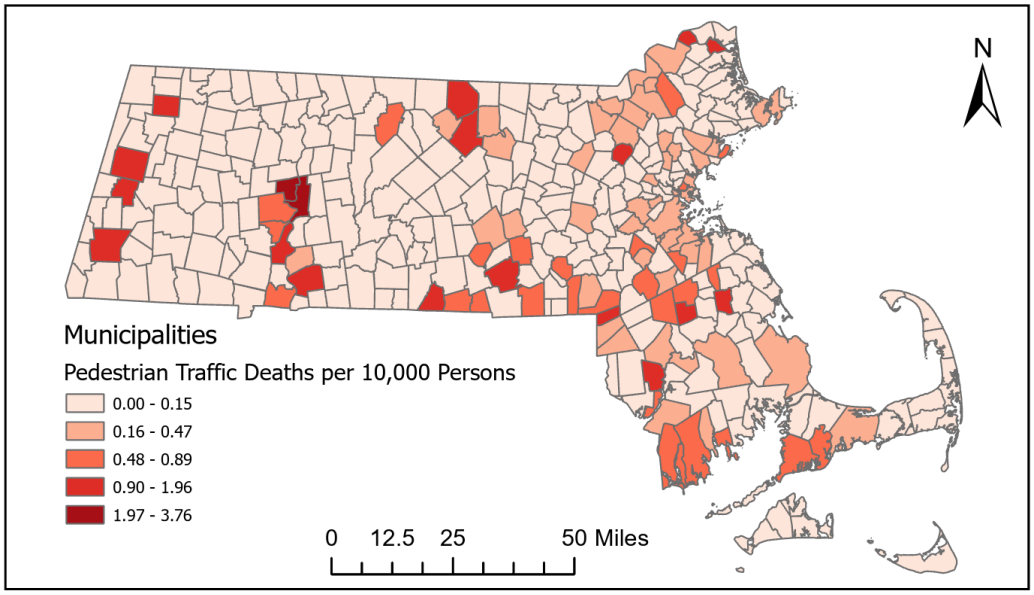


Figure 8: Pedestrian traffic fatalities, 2023-2025 – Data Source: MassDOT

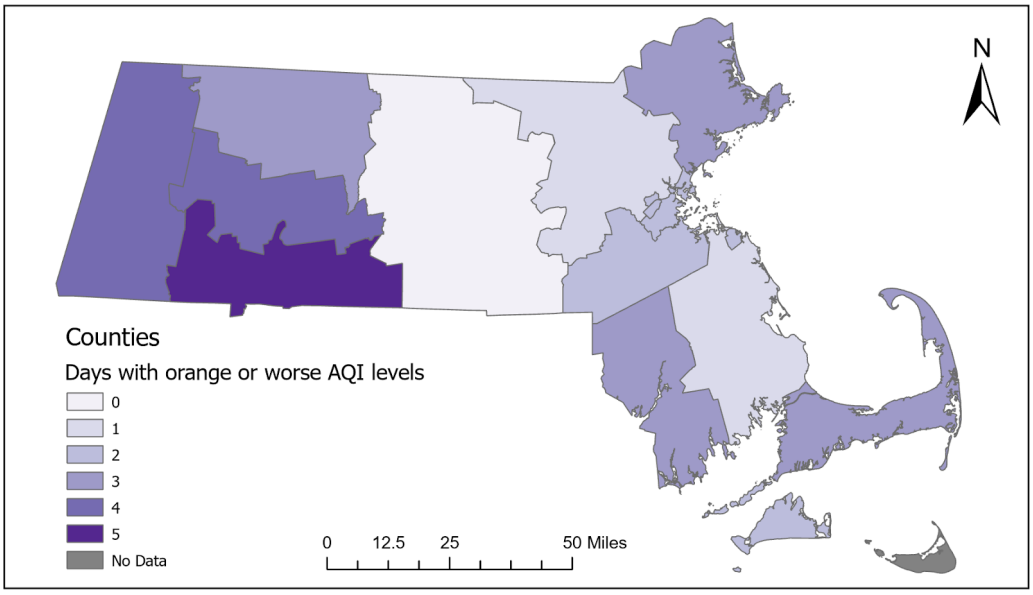


Figure 9: Days with air quality rated as "unhealthy for sensitive groups" or worse. – Data Source: EPA

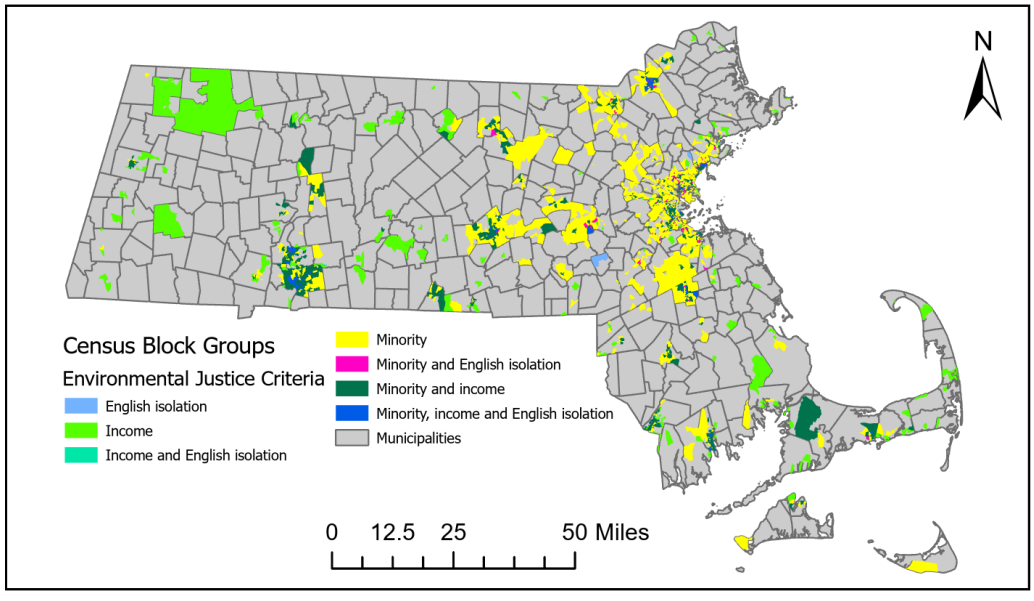


Figure 10: Environmental justice groups (english isolation, income, minority.) – Data Source: MassGIS

QUALITATIVE DATA ANALYSIS

The data dashboard and spatial analysis deal with the walk data that already exists; in this section we turn to data that doesn't. As mentioned in the above se To answer this question, we decided to look into the 'success' of walk audits to quantify areas where the recommendations made in the report were followed through, or where major educational moments, relationship building, community cohesion, or policy had been implemented. In addition, we wanted to address areas where any recommendations for improvement in the audit process, as well as a follow-up process to gather this 'success' data, were possible. This led us to a research based qualitative analysis of walk audits and WalkMassachusetts's process in creating these opportunities.

METHODS

Case Study Research

A part of our larger goal was to examine the effectiveness of walk audits. The success of walk audits is a piece of data that is not currently captured by the existing audit process. To examine this more closely, we chose five municipalities across Massachusetts to research in depth as a form of an audit case study analysis. Through conversations with our partner organization, our group decided on a set of criteria by which we selected our municipalities of interest. This criteria includes:

- Number of audits completed per municipality
- Recency of audits conducted per municipality
- Timeline of upcoming active transportation related policies, plans, or designs
- Proximity of municipality to Tufts University
- Nature of municipality (urban, rural, suburban, etc.)

We used these criteria to conduct research that would allow for representation of all municipalities in Massachusetts while factoring in our project timeline and the availability of walk audit data. Using this set of criteria, we decided on Springfield, Worcester, Somerville, Watertown, and Boston as our case study locations. Once agreed upon, we divided all audits conducted in these municipalities for further analysis. This analysis process included an in-depth reading of each audit, as well as a compilation of notes highlighting repeated pieces of information, such as audit participants, grants or funding sources, policy suggestions, long term and short term recommendations, and a review of the municipality's current or planned design changes regarding pedestrian infrastructure. This was done with the intent of furthering our understanding of similarities and differences between audits conducted in different municipalities and to inform our interview process.

Interview Process

Using this research, we were better informed about whom to interview to gather a wide variety of opinions and stories that would yield a range of recommendations for WalkMassachusetts. We focused on selecting a range of interviewees from our selected towns who were either repeat auditors, worked in organizations or planning departments that collaborated closely with WalkMassachusetts, or maintained an ongoing relationship with WalkMassachusetts. Once we selected these potential interviewees, we sent emails informing them of our project and the goal of improving the WalkMassachusetts walk audit process. We then scheduled fourteen interviews total over the span of three weeks, March 9th - March 25th, via Zoom (see Table 1 for details).

Table 1: Interview participant details		
Name	**Municipality**	**Organization**
Brendan Kearney	All	WalkMass
Jay Minkarah	Springfield	DevelopSpringfield
Dorothea Hass	All	WalkMass
Lisa Schletzbaum	Watertown & Worcester	MassDOT
Jeff McCollough	Springfield	Pioneer Valley Planning Commission
Alessandra Seiter	Somerville	Pedestrian and Transit Advisory Committee
Karin Valentine Goins	Worcester	Mass in Motion; Walk Bike Worcester
Bonnie Polin	All	MassDOT
Sandy Amoakohene	Worcester	Central Massachusetts Regional Planning Commission
Brad Rawson	Somerville	City of Somerville Director of Mobility
Stacey Beuttell	All	WalkMass
Tony Lechuga	Boston	WalkMass; LivableStreets
Matt Skopo	Springfield	City of Springfield Department of Public Works
Zeke Mermell	Watertown	City of Watertown Senior Planner

We chose to focus on a few themes to extract information that would be best translated into the dashboard and to provide WalkMassachusetts with recommendations to improve their audit process. We created general questions that we then tailored to each interviewee, depending on whether they were part of walk audits, worked for WalkMassachusetts, or were part of an organization that worked closely with WalkMassachusetts. These questions focused on how the walk audit started, the interviewee's relationship to WalkMassachusetts and how it began, what went well and what were some barriers to the audit process, outcomes from the audit, and recommendations for a follow-up process to capture successes/failures. The full list of our general questions can be found in Appendix A.

Afterwards, we transcribed all fourteen interviews so we would have direct quotes readily available to pursue qualitative coding concepts on. These interviews were all transcribed using Zoom's transcribe tool, and were edited and checked individually through audio recordings to fix any mistakes from the software tool.

Coding and Themes

During the interview process, we developed codebook themes as we asked questions and received answers that led to areas of interest that we wanted to focus on in our qualitative research. We then used these themes based on our interview questions to condense responses into specific categories. These categories turned into a codebook (see Appendix B) that allowed us to place quotes related to these themes into groups for easy access. These codes included:

- How the audit started
- The audit process: what worked well, areas for improvement, what did not work well
- Relationship to WalkMassachusetts
- Outcomes from the audit
- Follow-up process recommendations
- Community cohesion and buy-in
- Dashboard suggestions
- Other themes that reveal themselves

"Success is different to different people. It doesn't make one better or worse than the other.

Once placed in these groups, we created a summary report combining important and repeated comments into one condensed form that led us to more digestible qualitative findings. This report emphasized various parts of the audit process that WalkMassachusetts can take with them for future recommendations, highlighting areas that work well, as well as areas that can be built upon.

FINDINGS

The most significant findings are described in Table 2; for a full list of our findings and the supporting quotes, reference Appendix C. Our main findings directly tie into the recommendations we have created that incorporate the GIS spatial analysis, dashboard and database collection, and the qualitative analysis into our recommendations. Finding 1 is important in understanding the overarching theme that all municipalities are different and cannot be audited through one model. Based on many responses, almost all interviewees had recommended looking at 'success of walk audits' through a diverse lens. Specifically looking at success through "different perspectives," and how "success is different to different people." By understanding the view that there is not one way to quantify success, it allows for greater cohesion and understanding in the audit process. This allows WalkMassachusetts to understand that the outcomes of walk audits, whether big or small, have an impact on the communities audited. This can look like bigger infrastructure change, or just increased awareness of current pedestrian issues. Although some municipalities may seem to have 'greater success' compared to others, it is all based

Table 2: Interview findings	
Finding	**Supporting Quote**
1. There is not one metric of success for walk audits; success is different for each municipality.	"I would hesitate to, like, try to find one metric of success, or two metrics of success. I think it's…important, maybe to count it as, you know, different perspectives. There's… success is different to different people. Um, it doesn't make one better or worse than the other." "But there's a lot of ways that we can all measure success, especially advocates, we need to do this that don't… they have to do with more people being aware of something, or temporary tries, or events that happen that highlight things. So, um… I hope to plant that seed, because I think that in all of my work that that's turning out to be really important." "Yeah. I I hope part of the conversation, though, is, you know, what is success? Because we can't, you know, what the American Society of Civil Engineers gives our whole infrastructure system a D. You know, and we're all going to be tightening belts going forward. I don't have to tell you that. And so, the question becomes, what is, how to frame success."
2. WalkMassachuetts creates strong relationships, areas for engagement, and respect in audited communities.	"An audit is a way of deliberately noticing and recording what's there, and they do an amazing job with the way they get people engaged, the information they come up with, putting it into actionable terms." "I don't even know if they're aware that they do this, but they have profound respect for the people who actually are living in a community."
3. There are many barriers in conducting walk audits to consider throughout the process (e.g., time, consensus, money, resources).	"That's part of the, kind of, I don't know, frustration for people in our roles. It takes 10-15 years to see anything happen. Um, and we're the ones kind of kicking the rock uphill, but the community doesn't know that. . . So all they know is that there was a walk audit that happened, there was a lot of hype around it for maybe 3 months or so, and then silence. And we're the ones keeping that thing moving forward, but to the community, nothing happened." "This is like one, one of the reasons that I gave up on transportation planning. It's extremely hard. It's extremely slow. Nobody's happy at the end of the day. Everybody feels like they're losing out for some reason. But it's also, it's also just expensive infrastructure changes are really expensive." "I would say consensus sometimes is also a stumbling block, because you have…in the case of walk audits, they might want to have pedestrian crossings at all approaches, but you can't… well, I shouldn't say you can't have that. You could have that, but the trade-off is then you'd have to stop all the vehicles, and so that there's a…disconnect with what people want to be able to accommodate pedestrians crossing, and to accommodate vehicles. So, Um, it brings out those, um, potential conflicting goals." "Springfield might have a much smaller staff than Somerville, even though they have a much bigger population, right? So, you know, we can't take that stuff for granted. Everybody's fighting a hard fight with limited resources."

on the level of resources, time, money, and stage of pedestrian advocacy and planning that community is in.

Our second finding looks specifically at areas where WalkMassachusetts excels in their audit process. We decided to highlight Finding 2 in our report to not only allow WalkMassachusetts to give themselves a 'pat on the back' regarding what has gone well, but to also highlight these areas and lift them up more through our recommendations. We found that WalkMassachusetts excelled in engaging, respecting, and allowing for participants on the walk audit to feel heard and to advocate for their community. During our interviews there were many times where respondents had mentioned other auditing methods in comparison to WalkMassachusetts audits. In these comparisons, other audits seemed to focus on deliberate data collection, involvement of engineers, and a lack of resident perspectives in these processes. With WalkMassachusetts audits, interviewees emphasized how these audits focused on resident experiences and how audit leaders created a space where residents could advocate for their safety and be a part of the process in creating solutions in their communities. Focusing on the feelings of a corridor, the information gathered was deemed as more informational and specific in what kinds of changes needed to be made in comparison to the data driven audits. Highlighting these relationships with WalkMassachusetts and within communities, we are able to tailor our recommendations around their strengths in community engagement, story-based data collection, and building trust as an important area to continue to hone in on in this process.

This leads directly into Finding 3, which emphasized the main barriers to the audit process and implementation of recommendations after the audit occurs. Some of the main issues that walk audits face regard finding consensus on the recommendations made in reports, the money and resources available in communities that hold these walk audits, and issues regarding how long infrastructure change takes and the expectations surrounding these changes among municipalities These barriers, specifically expectations with the timeline of infrastructure change are important to communicate to residents and municipalities so they are aware of how long these projects can take. By not communicating the time frame of recommendations and any plans in place, this can create resident frustration. Reducing this frustration is important in making sure that residents continue to feel heard in advocating for their pedestrian needs. Incorporating these lessons into the areas where WalkMassachusetts is already excelling through community engagement and respect can create a better walk audit process, follow up, and greater actionable change in these municipalities.

> **"Everybody's fighting a hard fight with limited resources.**

Highlighting these three findings gave us insight into stories and hidden issues that led to recommendations for WalkMassachusetts to implement and consider in their current audit process. Additionally, tying them into GIS spatial analysis recommendations to improve the 'before the audit' process is imperative to assist the municipalities that need help the most. They also are crucial to identifying new types of data for our partner organization to collect in order to create a more robust dashboard. This links them directly back to the GIS and dashboard analysis, which in turn impacted the recommendations we provided for WalkMassachusetts.

RECOMMENDATIONS

Expanding on the initial task from WalkMassachusetts to create a geospatial database, we have generated a set of recommendations which assists in increasing the legibility and usability of walk audit data, as well as in improving the overall walk audit process.

1) EXPAND EXISTING TOOLKIT

Currently, WalkMassachusetts has a toolkit which includes their "Walk Audit Academy" as well as their "Ped101" video series. These resources introduce the concept of a walk audit, issues related to walkability and built environments, and a general approach to administering a walk audit. Although useful, we believe this toolkit can be improved through the inclusion of materials regarding post-audit procedures. The final video in the "Walk Audit Academy" series titled "Moving to Action" includes general information on formatting audit findings and contacting key actors. However, interview responses highlighted that for groups or individuals without a background in advocacy, this may not be enough information to help transform findings into tools to drive action. Therefore, we suggest including the titles of key actors who audit findings can be sent to, timeline estimates on hearing back from these contacts as well as the implementation of changes, and how to upload audit data to WalkMassachusetts' database. Our conversations with previous audit participants highlighted how the general public has limited knowledge on how long public-sector changes take, and this oftentimes leads to burnout, loss of interest, and a feeling of discontentment with the advocacy field. Therefore, increasing transparency through the development and expansion of the existing toolkit can not only incentivize more people to conduct their own audits, but can help mitigate these feelings and expectations, ultimately improving the process as a whole.

2) STREAMLINE COMMUNICATION

Our interviews revealed to us that there are several reasons why an audit may start. Whether it be due to a grant received by WalkMassachusetts or a municipality, a precipitating event, or something else, walk audits do not have one central impetus. As a result, it was the consensus among our interviewees that it is unclear how exactly audits were initiated. Therefore, we suggest streamlining communication between WalkMassachusetts and municipalities, advocacy groups, or individuals interested in hosting an audit. This could be done through the development of a form using a platform such as Qualtrics, which automatically filters out spam and irrelevant responses. Currently, those interested in having a walk audit can email WalkMassachusetts with a request. Although this provides a way in which groups can reach out, these emails can be lengthy and may not include all necessary information, leading to a back and forth that will delay the process. A form improves upon this method as the questions can be designed to collect all relevant and necessary information in one go. Furthermore, the uniform nature of a form allows for the responses to be stored such that WalkMassachusetts will have all of the necessary information if an opportunity to select a municipality for an audit arises in the future.

In addition to developing an intake form for those interested in developing a relationship with WalkMassachusetts and hosting an audit, we recommend WalkMassachusetts develop an update form. Using a similar process as described above, WalkMassachusetts can launch and push a form where individuals can provide updates to audits that have been completed. This method of crowd-sourcing is useful in capturing the post-audit outcomes that WalkMassachusetts may not have the capacity to capture themselves. Furthermore, as with the intake process, using a form for this collection of

information will help keep the responses relatively uniform and concise, easing the eventual analysis process.

3) IMPLEMENT AN ITERATIVE FOLLOW-UP PROCESS

One of WalkMassachusetts' priorities going into this project was to develop a follow-up process that allowed them to not only capture the outcome of audits, but to maintain relationships built through the process. Our interviews revealed this is not only a desire of WalkMassachusetts', but a desire across the board. Therefore, we recommend designing and implementing an iterative, three staged follow-up process. In developing the time estimates for each stage, we used responses from all of our interviews, in an attempt to simultaneously provide specific timeframes and allow for this process to be used across different municipalities with different needs.

Stage 1 (~1 week post audit) : Email all audit participants

The goal of this short email is to simply maintain presence immediately following the audit. We recommend this email includes a thank you to all audit participants for their involvement as well as a summary of the next steps. We believe this will not only increase participants' trust in WalkMassachusetts, but will help temper expectations.

Stage 2 (~6-18 months post audit) : Face-to-face with key actors

The goal of this second stage is to gauge the status of audit recommendations. In speaking with past participants during our interview process, we heard that projects and changes related to audit findings can take a long time to materialize. It is for this reason we suggested waiting 6-18 months to begin this stage. Furthermore, we continuously heard that an update like this would be more beneficial to all parties involved if it were done in the form of a conversation rather than an exchange of emails. This includes in person chats as well as via Zoom.

Stage 3 (≥ 2 years) : Site revisit

This final stage of our proposed process is intended to capture the outcomes of the audit once it has reached its mature stage. In speaking with various stakeholders, we believe an in-person revisiting of the site would be the best way to document audit outcomes, capture after photos, and maintain relationships with local groups and individuals. However, we recognize this may be infeasible. In that case, we recommend the site gets "revisited" through a thorough face-to-face conversation with key actors specifically aimed at discussing the "after" of the site.

Image credit: Boston MPO

4) PRIORITIZE MUNICIPALITIES USING SPATIAL ANALYSIS

Occasionally, WalkMassachusetts has the ability to choose the location of an audit. We have conducted a spatial analysis of the State of Massachusetts assessing pedestrian traffic fatalities in an attempt to analyze the relationship between this data and existing audit data. This data was used to create a ratio of the number of audits conducted in a municipality to the number of pedestrian traffic

fatalities. Visualizing this across the State highlighted 10 municipalities that have been "under-audited", meaning they have the highest number of pedestrian traffic fatalities relative to the number of audits they have had. These municipalities are: Malden, Edgartown, Holyoke, Lynn, Chelsea, Nantucket, Provincetown, Gill, Lawrence, and Tisbury. Therefore, we recommend more audits be conducted in these towns and cities. Furthermore, we recommend this spatial analysis using the methodology of comparing data to the number of audits conducted in a municipality be used with different pieces of data, such as air quality or environmental justice census blocks, to determine the suitability of prospective municipalities during the selection portion of the audit process.

5) IMPLEMENT A MORE ROBUST DATA CAPTURE

The previous recommendations outline a process for capturing additional walk audit data, including follow-up data. This data must be stored thoughtfully in order to be useful. Currently, WalkMassachusetts uses a single Google Sheet as its database, which is user-friendly and adequate for the current types of data. Some additional data we would like to see collected are: exact addresses of walk audits (which would enable more fine-grained geospatial analysis); contact information for audit leaders (to facilitate the follow-up process), and timestamped updates on the area as well as photos with captions from before, during, and after the audit (to clearly highlight successes.) Capturing such data will require going beyond a single spreadsheet, perhaps adopting a "relational" database system, like PostgreSQL. However, this comes with additional complexity. We believe Google AppSheet offers a good middle ground between the power of a relational database and the familiar user interface of a Google Sheet. Some of this additional data could, in the future, be represented in the walk audit dashboard. It will also enable new types of data analysis and visualization that are not possible today.

We believe these recommendations, as a whole, will not only help WalkMassachusetts improve their display and use of current walk audits, but improve the implementation and process of walk audits in the future.

Image credit: Boston MPO

LIMITATIONS

We would like to acknowledge the limitations with our research and deliverables. Firstly, the literature review: although relatively comprehensive, the literature we explored is not exhaustive. The scope of this study is narrowed by geography: since WalkMassachusetts is a state-level organization, the supporting literature centers on U.S. walk audits. This means our analysis of community-based planning remains restricted to the American and Massachusetts landscapes. An additional limitation of this literature review is the timeframe covered by the sources used. As the popularity of walk audits and participatory planning and policy in general has increased in recent years, much of the literature surrounding its use, success, and areas for improvement is also limited to recent years. As a result, the long-term impacts of the tools covered by this review are yet to be seen. Finally, if there were more time available, our team could have added more specific sections regarding the projects we were focused on throughout the report into this review, rather than conducting a general overview of what walk audits seek to address.

Secondly, our spatial analysis section focused primarily on a straightforward comparison between pedestrian-involved crashes and walk audits. A more comprehensive analysis would make greater use of the additional data sources we briefly touched on: environmental justice criteria, environmental data like heat island effects, and air quality conditions. This could be especially helpful when looking at specific themes to target for municipalities. Another limitation with our crash vs. audit analysis is that some communities, like Cambridge, may show up on high pedestrian crash rates simply because they do a better job of reporting minor crashes than other communities. Discerning the difference between more crashes and better reporting would require a careful analysis.

Similarly to the spatial analysis research, our qualitative analysis focused only on five cities and the key actors participating in the audits in these areas. For a more robust dataset that includes more input and recommendations from other cities that held walk audits, we would have been able to capture a more diverse set of findings that would lead directly into our findings from there.

The dashboard is limited by existing data, which does not tell the full story. The findings of our two analyses led us to insight on capturing more data and showcasing this on our dashboard, but the actual implementation was out of scope and left to the recommendations section.

We understand that not everything we suggest can or will be implemented once we turn this report over due to matters of time, resources, and money within the organization. If we were able to extend our capacity as a team past the time constraints given, we would have been able to get a jump start on some of these recommendations like creating these audit request and update forms, applying changes to create more robust toolkits, and even creating a full procedural form for a follow-up process. Still, we hope the recommendations will help illuminate the path, and perhaps a future Field Projects team may be able to advance next steps.

Image credit: WalkMass

CONCLUSION

Walk audits have the ability to result in meaningful change in regards to a community's infrastructure, environment, economy and development, health, general level of cohesion, and policy provision (Moening and Zimmerman 2018). When formatted adhering to best practices, the data gathered during this civilian-run process has the potential to help the public, stakeholders, and policymakers understand the need for change, ultimately resulting in an effective use of time and resources for local planning departments (Moore 2025). Our Field Project sought to understand and improve the walk audit lifecycle by completing qualitative and spatial analysis accompanied by data visualization tools to quantify areas of success and areas to improve upon. This extensive research led us to understand the evolving and complex nature behind walk audits to find that quantifying 'success' looks different for every community. Through focused recommendations based on real responses and spatial analysis accompanied by the dashboard to provide insight on what has been done, allows WalkMassachusetts to extend their resources. In doing so, this allows WalkMassachusetts to become an audit powerhouse to bring together mobility advocates in creating actionable change throughout the state.

By delivering these findings, recommendations, and the database dashboard, we hope to assist WalkMassachusetts in advocating for and improving mobility in communities that need it most.

Image credit: WalkMass

BIBLIOGRAPHY

America Walks. "How to Conduct a Walk Audit." America Walks, March 2, 2023. https://americawalks.org/all-about-walk-audits/.

Bereitschaft, Bradley. 2024. "Chapter 3 Equity in Neighborhood Walkability: Challenges and Opportunities." In Equity in the Urban Built Environment, 1st ed. Routledge.

Brandén, Jennie, and Linda Sandberg. 2021. "Governing Safety Through the Politics of Community? A Governmentality Analysis of the Practice of 'Safety Walks' in Three Swedish Cities." Space and Polity 25 (1): 1–19. https://doi.org/10.1080/13562576.2021.1894916.

City of New York. n.d. "Vision Zero View." NYC.gov. Accessed April 2, 2026. https://vzv.nyc/.

Conway, K. S., and A. K. Menclova. 2025. "Walkability and Mental Health Resiliency During the COVID-19 Pandemic." Health Economics: 1921–1942. https://doi.org/10.1002/hec.70013.

"Countermeasures That Work: Pedestrian Safety." National Highway Traffic Safety Administration. Accessed February 27, 2026. https://www.nhtsa.gov/book/countermeasures-that-work/pedestrian-safety.

Creatore, Maria I., Richard H. Glazier, Rahim Moineddin, Ghazal S. Fazli, J. Charles Victor, Herbert C. Link, and Gillian L. Booth. "Association of Neighborhood Walkability With Change in Overweight, Obesity, and Diabetes." JAMA 315, no. 20 (2016): 2211–2220. https://doi.org/10.1001/jama.2016.5898.

Daigle, Caroline. "Local Residents Can Guide Safer Street Design with Walk Audits." ACEEE Blog. June 20, 2025. https://www.aceee.org/blog-post/2025/06/local-residents-can-guide-safer-street-design-walk-audits.

Deehr, Rebecca C., and Amy Shumann. 2009. "Active Seattle: Achieving Walkability in Diverse Neighborhoods." American Journal of Preventive Medicine 37 (6): 403–11. https://doi.org/10.1016/j.amepre.2009.09.026.

"Get to Know Your Neighborhood With a Walk Audit." 2018. Safe Routes to School National Partnership. https://www.saferoutespartnership.org/sites/default/files/get_to_know_your_neighborhood_with_a_walk_audit.pdf.

Grant, Theresa, Caroline Andrew, Nancy Edwards, Heidi Sveistrup, and Mary Egan. 2011. "Creating Walkable Places: Neighbourhood and Municipal Level Perspectives on the Socio-political Process in Ottawa, Canada." Journal of Urbanism: International Research on Placemaking and Urban Sustainability 4 (1): 81–104. https://doi.org/10.1080/17549175.2011.563958.

Haroon, Talha. "Key Benefits of Making Government Data Accessible to the Public and Fostering Innovation Through Data-Driven Decision-Making." LinkedIn, March 25, 2024. https://www.linkedin.com/pulse/key-benefits-making-government-data-accessible-public-talha-haroon-upikf/.

Hooper, Paula, Matthew Knuiman, Fiona Bull, Evan Jones, and Billie Giles-Corti. 2015. "Are We Developing Walkable Suburbs through Urban Planning Policy? Identifying the Mix of Design Requirements to Optimise Walking Outcomes from the 'Liveable Neighbourhoods' Planning Policy in Perth, Western Australia." International Journal of Behavioral Nutrition and Physical Activity 12 (1): 63. https://doi.org/10.1186/s12966-015-0225-1.

Jaroscak, Joseph V. "Community Development Block Grants: Funding and Allocation Processes." Library of Congress, March 24, 2021. https://www.congress.gov/crs-product/R46733.

Jenkins, Wesley, Christina Stacy, Alena Stern, et al. 2020. "The Unequal Commute: Examining Inequities in Four Metro Areas' Transportation Systems." The Urban Institute, October 6. https://www.urban.org/features/unequal-commute.

John, Raveena. "How Walk Audits Help Create a Safer Built Environment." Smart Growth America, September 23, 2025. https://www.smartgrowthamerica.org/knowledge-hub/news/how-walk-audits-help-create-a-safer-built-environment/.

Massachusetts Housing Partnership. n.d. "Residensity." Residensity. Accessed April 2, 2026. https://residensity.mhp.net/.

Massachusetts Bureau of Geographic Information. 2021. "Environmental Justice Populations in Massachusetts." Version November 2022. October. https://www.mass.gov/info-details/massgis-data-2020-environmental-justice-populations.

Massachusetts Bureau of Geographic Information. 2024. "MassGIS Data: Municipalities." Mass.Gov, May. https://www.mass.gov/info-details/massgis-data-municipalities.

Massachusetts Department of Transportation. n.d.-a. "2023 Crashes." Accessed March 12, 2026. https://massdot-impact-crashes-vhb.opendata.arcgis.com/datasets/MassDOT::2023-crashes/about.

Massachusetts Department of Transportation. n.d.-b. "2024 Crashes." Accessed March 12, 2026. https://massdot-impact-crashes-vhb.opendata.arcgis.com/datasets/MassDOT::2024-crashes/about.

Massachusetts Department of Transportation. n.d.-c. "2025 Crashes." Accessed March 12, 2026. https://massdot-impact-crashes-vhb.opendata.arcgis.com/datasets/MassDOT::2025-crashes/about.

McDonald, Noreen C. 2008. "Critical Factors for Active Transportation to School Among Low-Income and Minority Students." American Journal of Preventive Medicine 34 (4): 341–44.

Michels, Dustin. (2026) 2026. Dustinmichels/Walkma-Map. Vue. January 21, released April 30. https://github.com/dustinmichels/walkma-map.

Moening, Kate, and Sara Zimmerman. 2018. "Let's Go For A Walk: A Toolkit for Planning and Conducting a Walk Audit." Safe Routes to School National Partnership.

Moore, T. "Geospatial Data Visualization Techniques: A Guide for Beginners." Duncan-Parnell, September 16, 2025. https://www.duncan-parnell.com/blog/341/geospatial-data-visualization-techniques-duncan-parnell?srsltid=AfmBOoo6nvLUFj-RgPRgRlQjbRXrNHMvlO3QcSrRNuBv_eFuQZEI6Fdy.

Moudon, Anne Vernez, and Chanam Lee. 2003. "Walking and Bicycling: An Evaluation of Environmental Audit Instruments." American Journal of Health Promotion 18 (1): 21–37. https://doi.org/10.4278/0890-1171-18.1.21.

O'Hanlon, Julia, Marcia S. Scott, and Lexi West. 2016. "Healthy and Complete Communities in Delaware: The Walkability Assessment Tool." University of Delaware. https://udspace.udel.edu/server/api/core/bitstreams/2befd567-e1d1-4cf9-9589-eaa5e7e84e44/content.

Oldenburg, Ray. The Great Good Place: Cafés, Coffee Shops, Bookstores, Bars, Hair Salons, and Other Hangouts at the Heart of a Community. New York: Marlowe & Company, 1999. https://doi.org/10.2307/jj.9561417.

Rabinowitz, Phil. "Using Internet-Based Tools to Promote Community Health and Development." The Community Tool Box. Accessed February 25, 2026. https://ctb.ku.edu/en/table-of-contents/overview/model-for-community-change-and-improvement/internet-tools/main.

Sung, Hyungun, Sugie Lee, SangHyun Cheon, and Junho Yoon. 2022. "Pedestrian Safety in Compact and Mixed-Use Urban Environments: Evaluation of 5D Measures on Pedestrian Crashes." Sustainability 14 (2): 646. https://doi.org/10.3390/su14020646.

United States Environmental Protection Agency. 2025. "AirData Annual Summary AQI by County." Data & Tools. November 24. https://aqs.epa.gov/aqsweb/airdata/download_files.html.

"Visualization Best Practices." Esri, February 22, 2020. https://www.esri.com/about/newsroom/arcuser/visualization-best-practices.

WalkMassachusetts. n.d. "Walk Audits." Accessed April 30, 2026. https://walkmass.org/walk-audits/.

APPENDICES

APPENDIX A: INTERVIEW QUESTIONS

1. **What is your relationship with walk audits/WalkMass**
    a. Why were you involved in the process?
2. **How did the walk audit start?**
    a. Was there a grant available that made this happen? Was there an issue or event being addressed? Did the audit occur because of a program? Because of some incoming development?
        i. Essentially, trying to find what the main goal(s) were being addressed in the audit, or for the town the interviewee was working for
    b. Were there any barriers or difficulties to getting the audit started?
3. **How was this process effective/ineffective?**
    a. What was helpful?
        i. Any tools? People on the audit that were knowledgeable or in important city/town positions?
    b. Did any outcomes come out of the audit?
        i. If so, how long did it take? How did the outcomes happen? Were there outcomes outside of infrastructure change that occurred (relationships, policy change, etc.)?
        ii. If not, why do you think there were no outcomes?
            1. Are there ways to improve the process to achieve positive outcomes?
            2. What would you have done differently if you were to repeat the process over again? Either as a participating member or as a member of WalkMass?

4. **What is the follow-up process you used/you received after the audit occurred?**

    a. Was this effective in gathering information? Would you be inclined to let WalkMassachusetts know about any changes/outcomes that resulted from the audit recommendations?

    b. If you were to recommend any changes to the follow-up process you used/received, what would you add/change?

        i. Would a survey be beneficial? How long would you suggest before it is sent? Should there be incremental check-ups?

APPENDIX B: INTERVIEW CODEBOOK

Code	Subfields	Definition
How it started	None	Looking at WHY the walk audit was put together
Audit Process	What worked well; What didn't work well/areas for improvement	This is specifically looking at the process of the walk audit itself; This could include talk of how they enjoyed the process, what didn't go well during the process, etc.
Relationships	None	Relationships specific to Walk-Massachusetts - what the interviewee's relationship is to the organization, if it is ongoing, things like that
Outcomes	Infrastructure; Policy; Relationships Made; Education/ Aha Moment; Community Cohesion	Any outcome from the process, can be good or bad, big or small, seen or unseen
Follow-Up Process	None	Looking at ways that WalkMassachusetts can improve their current follow-up process
Community Buy-In	Buy-In; No Buy-in	How the community perceives walkability and the audit process; if they find this process important to their community or not, etc.
Dashboard Suggestions	None	Things that were recommended that could be applicable to the dashboard, or direct recommendations for the dashboard
Other	None	Whatever does not fit into other codes but is found important to include.

APPENDIX C: FULL LIST OF FINDINGS AND SUPPORTING QUOTES

Finding	Supporting Quote(s)
1. There is not one metric of success for walk audits; success is different for each municipality.	"I would hesitate to, like, try to find one metric of success, or two metrics of success. I think it's…important, maybe to count it as, you know, different perspectives. There's… success is different to different people. Um, it doesn't make one better or worse than the other." "But there's a lot of ways that we can all measure success, especially advocates, we need to do this that don't… they have to do with more people being aware of something, or temporary tries, or events that happen that highlight things. So, um… I hope to plant that seed, because I think that in all of my work that that's turning out to be really important." "Yeah. I I hope part of the conversation, though, is, you know, what is success? Because we can't, you know, what is the American Society of Civil Engineers gives our whole infrastructure system a D. You know, and we're all going to be tightening belts going forward. I don't have to tell you that. And so, the question becomes, what is, how to frame success."
2. WalkMassachusetts creates strong relationships, areas for engagement, and respect in audited communities.	"An audit is a way of deliberately noticing and recording what's there, and they do an amazing job with the way they get people engaged, the information they come up with, putting it into actionable terms." "I don't even know if they're aware that they do this, but they have profound respect for the people who actually are living in a community."

Finding	Supporting Quote(s)
3. There are many barriers in conducting walk audits to consider throughout the process (time, consensus, money, resources).	"That's part of the, kind of, I don't know, frustration for people in our roles. It takes 10-15 years to see anything happen. Um, and we're the ones kind of kicking the rock uphill, but the community doesn't know that. . . So all they know is that there was a walk audit that happened, there was a lot of hype around it for maybe 3 months or so, and then silence. And we're the ones keeping that thing moving forward, but to the community, nothing happened." "This is like one, one of the reasons that I gave up on transportation planning. It's extremely hard. It's extremely slow. Nobody's happy at the end of the day. Everybody feels like they're losing out for some reason. But it's also, it's also just expensive infrastructure changes are really expensive." "I would say consensus sometimes is also a stumbling block, because you have…in the case of walk audits, they might want to have pedestrian crossings at all approaches, but you can't… well, I shouldn't say you can't have that. You could have that, but the trade-off is then you'd have to stop all the vehicles, and so that there's a…disconnect with what people want to be able to accommodate pedestrians crossing, and to accommodate vehicles. So, Um, it brings out those, um, potential conflicting goals." "So much pushback from people that were like, I need to drive my car. And so we worked really hard on putting together some presentations and statistical materials, visuals to demonstrate, like if you get one person out of their car and into the bike lane, it makes it easier for you to drive your car and like really trying to frame it as like a win-win instead of like a lose-lose for people." "Springfield might have a much smaller staff than Somerville, even though they have a much bigger population, right? So, you know, we can't take that stuff for granted. Everybody's fighting a hard fight with limited resources."

Finding	Supporting Quote(s)
4. Personalization during audits is more effective and respected by municipalities than gathering technical data.	"The biggest issue that we ran into often was, like, engineers aren't people's, people. And so they were just so bad at trying to, especially in Boston, some real diehard old-timing engineer people who just wanted to be able to, like, make a decision and say, we're done here. So we've really gone at the public education targets, and so we felt like it was really important for us to bridge that gap, be like the people people. Like, we can take a complex idea, can try to share it in a way that your everyday person understands and can appreciate." "There's the ones (walk audits) all the way at the other end, you have researchers doing extremely detailed ones, collecting all this information, most of which never gets analyzed or used. And so that's, you know, what's the point of all that precision? And then there's the work that WalkMass does, and others that is really in the middle. It's intended to be action-oriented." "And it was really helpful to hear like other staff at Walk Boston to say, like - Here are the regulations in like the, you know, standards, you know, like this crosswalk can't be, like, within this distance of an intersection. So, like, we can't get a crosswalk here, but we can get one farther down over here, learning all those different overlapping, like, design standards that come from like, towns have design standards, but the state has design standards, and then our federal design standards and regulations, and. So I think it's really helpful on walk audits for just, like, the general community to understand all those different layers that affect, like, how your street looks, the way it does."
5. There is a wide range of how audits start; it is necessary to understand the why and how to assist the municipality in the best way possible.	"Uh, so it really depends on…What… I think what's happened is issues coming up. On the local level, and then deciding, I think, a walk audit makes sense here." ". . .but much of them were connected to either sort of contracts, grants, and precipitating events. I think those are the main three that you would talk about." Question: "what is the most common, um… reason to walk audit is prompted? What, like… Do you find that it was through, like, funding and grants, or because of a, like, precipitating event, or relationships existing with members in a community? Um, or a combination of all of them?" Answer "I think it's a combination of all of them"

Finding	Supporting Quote(s)
6. Including more specific and robust toolkits and reports from audits would result in communities creating more change from audit recommendations.	"There were a few barriers that we were able to overcome based on some of the resources that we had, that I think if there were more, like, Um, like, specific guidance and like templates and things like that, I think it would make it a lot easier for communities that don't have the kind of infrastructure we have available to us to be able to pursue walk audits on their own." "I don't know if they have in there approximate costs, who's responsible? Um, how it could be done. That piece of it, which helps to actually implement some of the recommendations. And it could be in there, honestly, I don't know. But, um, it could be in there. But I would highly recommend, because the whole purpose of doing the audit is to make sure it's implementable, you know, practical, usable, implementable. So, I think they need to have that piece in there." "I think what I would find most helpful is, like, if there were, um. Just strategies, right? I mean, even really basic ones, right? Like, here's the best way to follow up via email, or like, or if you already have a really good relationship with your, you know, city. Um, you know, here are mechanisms that you could take to, like, hold them accountable in some way."
7. The relationships that WalkMassachuetts makes with communities and actors within these audits are valuable, and it is important to keep a line of communication open for future collaboration.	"You can't shortchange the relationship-building. You can't manufacture trust. You have to earn it. Sometimes you have to just, like, take the lumps and take the criticism and keep trying to do the work the right way slowly but surely over time. People will continue to just be like, oh, you know what? There they go again. But. But we know that they're one of us, right?" "So it is definitely an evolving. And I would say the research work that they do, which is not really why we're talking today, but it matters, because in my opinion, the more ways that you interact, the, you know, that that enhances a relationship and makes it more valuable to both sides."
8. Infrastructure change from audits is harder to find due to the time it takes. Audits will typically result in quick builds or minor changes (e.g. crosswalks, traffic signal changes).	"I would say we were most effective at getting traffic signal changes timing. Um… then I would say we were… Especially in the slow streets areas, and there was another street in… And one of the Codman neighborhoods, where they put in, um. Speed bumps, neckdowns. And in general, there was a lot of emphasis upon slowing traffic. Both in terms of going through and also turning radii." "Without the walk audits, and those reports that went to the city, the city wouldn't have maybe been able to get as much Complete Streets funding as they did to make all these crosswalk changes… I mean, most of the things that I remember in that report were, like, mostly crosswalk changes around schools, which is where a lot of the walk audits were done in Springfield, and that was great to know that that happened."

Finding	Supporting Quote(s)
9. Policy change from audits typically comes from involvement in pedestrian programs (e.g., Complete Streets, Vision Zero), zoning/land use changes, or increased pedestrian advocacy.	"The city, you know, has implemented various policies. We got Complete Streets policy. So the new roadway construction projects are to be designed to include street, complete streets components, which sort of relates to walk Massachusetts goals as well. So I guess it sort of further highlighted that need for that change in our approach to road construction." "They formed a walk, they formed Walk Ocean, like, after we were there, and that was really meaningful, because then they pushed forward to, like, get complete streets funding and change some of the things that they were working on, so that…was cool too, right? Because you're… you're seeing that there's spin-offs of advocacy that's gonna continue once you've left, which is, of course, the only way to get policy systems and environmental change, is to kind of make it sustainable."
10. Walk audits allow for greater community cohesion, relationship building, transparency, and knowledge sharing between important actors (e.g., non-profits, city councilors, planners, etc.).	"So I think… I think there was a lot of good that came out of knowledge sharing with both community and with politicians, decision makers. We have really good relationships. We have several organizations with like transportation and planning versus officials in Boston and in other small towns." "It's like, this is a huge example of community building, huge example of coalition building. And it really helps us to move the needle. Focus community and public sector energy on moving these transportation policies and projects forward. Yeah, I love it. I'm so excited."

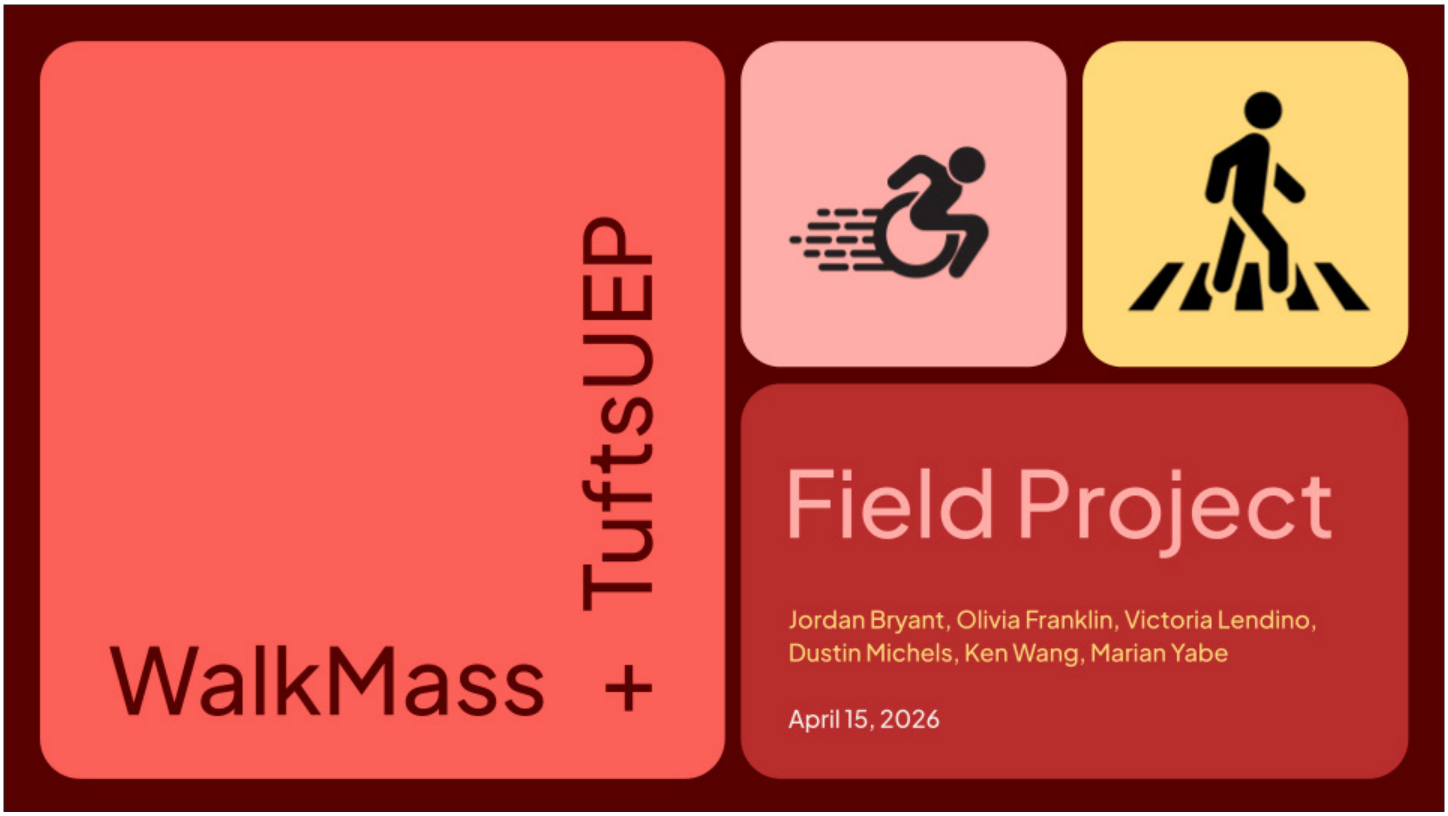
Finding	Supporting Quote(s)
11. Educational and 'aha' moments were the most talked about outcome from walk audits and allowed participants to view pedestrian safety through a different perspective.	"Some of the most important and meaningful, um… experiences were just those aha moments of people actually walking on the walk on it. Um, particularly municipal staff and engineers who are incredibly good at, um, reading plans and knowing what the standards are, but maybe, in some cases, less aware of what it actually feels like to be on the road. Um, and so those are really meaningful when you see an engineer go, whoa, I didn't really realize, you know, that that particular curb radius made you feel… that… uncomfortable even because it's totally… hold on, now my phone's ringing in my ears. Um, so that… that was meaningful." "My favorite piece is the aha moments. You go out there and you look and you say, wait, those pavement markers don't match the sign, and it's really confusing, and that's a $300 fix, and…Boom, we've saved all these… we've prevented all these crashes. So I love when that happens, and it does happen, you know, occasionally the aha moments that people are like, wait, what… what's going on? This is an obvious fix." "Um, but also participants afterwards had, you know, given us feedback that they, um, they now had tools and, like, criteria to evaluate other areas of the city with from, you know, our processes that we implemented on the walk audit. Um, so they, you know, I got emails afterwards being like, now I'm walking in Davis Square, or in Assembly Square, and I'm, like, still thinking about these things."
12. Walk audits allow for underrepresented communities within municipalities to be seen and advocated for.	"And then we also had a lot of collaboration from the Somerville Commission for Persons with Disabilities, who helped us to co-host the walk audit, and they… they're a committee that I think has felt like very excluded from public processes in the past, and Um, having their collaboration, I think, was a way to… I think it was successful in kind of rebuilding some trust with them, where they actually felt included and listened to and heard." "Um… But just something more concrete. I think just the disability community feeling like they're they're included. They, they, you know, it's an ongoing challenge to really make sure that they're there at the get go and that they feel included. Because I've heard, you know, halfway through the design of a project, they understandably really don't like how they're brought in, and maybe it might be too late to."

Finding	Supporting Quote(s)
13. A follow-up process is highly desired so communities can continue to communicate with WalkMassachuetts and move from observation to change. This process should be personal.	"How do we move it beyond the observation to the, um, to the action. . . how do you go from the observations and the really great recommendations to actually making some change. And that's processed out of… auditing into well, into the true advocacy." "Collecting a variety of qualitative and quantitative data at some point after a project is kind of good manners, is a humble way to acknowledge that you might not have solved all the problems that you wanted to. Or you might have created some additional new problems, and hopefully you solved more than you created. But it also helps reflect organizational learning.Because evaluation work needs to be treated as a project with a timeline and a budget and staff hours communication strategy. And so, yeah, maybe that's another piece of the puzzle, is, like, looking back, that walk audits past. And saying, oh, that's right. Somerville finished this cool project. Did they collect data? Do we know if those buses are running more frequently or reliably than they had been? Do we know if crashes are down or speeding is down? Do we know if pedestrian and bicycle counts are up? et cetera, et cetera, et cetera. And that could be a nice little thing." "I think it would be nothing but valuable to kind of put in a process around Um, follow-up and…just for the organization, for the people involved, and then particularly for the organization to kind of continue to show and get more grants and get more…more work."
14. Greater data collection can assist the database and inform the dashboard to allow municipalities to understand and navigate walk audits better.	"Well, they could maybe just have a map showing the locations where there was improvements made." "It might be interesting to have somewhere in this database of formats, or whatever it is that you're creating, to sort of have categories of types of changes that have happened like, is it paint? Was it a whole road reconstruction? Was it…just signage, like, whatever it happened to be." "A picture is worth a thousand words. And I think it could really help. We could even, you know, export that and use it in reports." "I don't know if Massachusetts, walk Massachusetts. has any kind of portal or anything like that, where you could request an audit. But that might be something of use, and then that would be used as, like, leverage to highlight why a particular area might need to be prioritized, and then funding could be found to move that project forward faster. If it had more buy-in or more… justification."

Finding	Supporting Quote(s)
15. The amount of community buy-in varies per community, but the more engaged the more change can occur.	"I think if we were there, the community had, you know, those that showed, up if they didn't know before the walk audit started, they understood afterwards why it was a valuable experience." "I would definitely say yes, and that it depends, right, on the priorities of the…area at the time like, I think…I don't think there's anything wrong with doing an audit where there hasn't been public buy-in yet, or…A call to action yet, because that audit may be a way to raise awareness, and if that's the case, then that's great to do an audit there, if it makes sense to kind of raise this as an issue." "So my point is that it varies hugely, and the needs for advocacy vary hugely in a community. And of course, then there's the resource part of it. You know, Worcester is a gateway city. It's very different from Lexington or something."
16. Rural communities care about pedestrian safety as much as any other municipality, but may be less trusting of an outside organization starting up a relationship.	"What's the big deal? You know, do they even have any issues? You know, the issues in Springfield are serious, right? But that's not the case. In fact, those rural communities, it's really dangerous to walk on those roads, you know, proportionally wise, you are at greater risk. You know, walking along the rural road shoulder in the evening, the wrong side, without any bright colors, then you are walking any street in Springfield. So the risk is there. It's real. The impacts are real for a small community just as much, if not as you know, as anywhere else."
17. No municipality is the same; the process must be conducted differently in each place.	"It's not a one-size-fits-all. . .If going forward, walk Massachusetts thought we got this model, it works really great in Arlington, we're going to use that here. You got to have different… you've got to have things differently, because the structure for the decision making and the enabling and the implementation are all different."

APPENDIX D: APRIL 2026 WALKMASSACHUSETTS NETWORK MEETING

WalkMassachusetts holds a monthly webinar series in which they discuss topics related to improving walkability throughout the state with elected officials, local organizers, community groups, and residents. Our team had the wonderful opportunity to present our project and preliminary findings, receive feedback, and answer questions. A few key slides are included below within this appendix, and the recording of the full meeting and presentation can be found here on WalkMassachusetts's YouTube channel: https://www.youtube.com/watch?v=fIGJJwf54gI



Our Tasks

01	Priorities	Identify **under-audited** communities that should be **prioritized**
02	Process	What does **success** look like and how can we create a more **effective** audit process?
03	Data	How can we better **present** walk audit data through a powerful and **visually appealing** public interface?

Preliminary Findings

Community Engagement

"walk audits are...**community building at their core**, and they're a way for us to honor the fact that **residents and community members have legitimate lived experience and authentic expertise in urban design**..."

Aha Moments

"And... the...It's certainly eye-opening, to have people in a meeting and talk about you know, a certain location... and they see that there's a lot of people walking or biking... **It changes somebody's opinion on things when they're actually seeing it and hearing from people about what their experiences are**, what the safety issues are... they start to become aware of... of these things, and...**It starts to matter to them**"

Follow-Up Needed

"Really, it's the question, **what happens after?** What is the potential outcome, right? Is it...keeping people engaged in this information? **Is there a way to take the input and actually put it towards something solid?**"

"I think **it would be nothing but valuable to kind of put in a process around follow-up** and...just for the organization, for the people involved, and then particularly for the organization to kind of continue to show and get more grants and get more...more work."

Goal

Unlocking a Decade of Walk Audit Data

The Challenge

- 100+ walk audits conducted over 10+ years
- Organized and detailed but hard to browse
- Difficult to synthesize, visualize, and communicate insights

The Solution

Develop an interactive, accessible, and decision-making ready tool for

- Policy makers,
- Community advocates, and
- WalkMA donors & board

Features

- Map-based (visual)
- Interactive
- Shareable
- Discover audits using themes

Next Steps

Complete Analyses

- Complete qualitative coding
- include additional variables in spatial analyses

Solidify Recommendations

- Compile a list of recommendations across our three categories

Handoff Dashboard

- Web code to host the spatial database
- Documentation for its use and maintenance

Final Report & Presentation

- 100% draft report: April 24
- Final presentation: April 28