Chapter 3

Recommendations

This chapter presents the recommendations that will achieve the two primary goals set forth by this Plan:

1. To improve and expand current pedestrian deficiencies—by preparing a capital improvement process that enables Louisville to increase the pedestrian facility network through retrofitting and expanding current deficient sidewalk and pedestrian crossing locations between 2010 and 2030;
2. To simultaneously reduce the rate of pedestrian crashes between 2010 and 2030.

The recommendations in this chapter are supported by a number of appendices that provide more detailed actions that are needed to strengthen Louisville’s policies and codes, make high priority corridors safer for people on foot, and generally ensure that all streets are designed to accommodate pedestrians.

The recommendations in this chapter are structured in the following way:

Recommendations are broad, but identify specific strategies for accomplishing the dual goals of this Plan. The responsibility for implementing the objectives will fall upon many different agencies and organizations. The objectives are summarized below:

Recommendation 1: Provide accessible, safe and well-maintained pedestrian facilities along and across all streets.

Recommendation 2: Institute policies and practices to ensure that every street in Louisville meets the needs for pedestrians of all abilities

Recommendation 3: Establish education, encouragement, and enforcement programs that support pedestrian travel.

Objectives are provided for each of the recommendations listed above. Objectives are activities that will be undertaken in order to achieve the recommendations. Each objective will have specific strategies which have associated actions. Actions typically have a specific timeframe and are usually assigned to a specific agency or organization. For a full list of actions please refer to the Pedestrian Master Plan Implementation Actions, Appendix B.

Recommendation 1: Provide accessible, safe and well-maintained pedestrian facilities along and across all streets.

The safety and quality of the walking environment were consistently raised as critical issues by local citizens who participated in public meetings and surveys conducted for this Plan. Many deficiencies were identified during the existing conditions analysis as well. This recommendation therefore addresses the need to ensure that pedestrians walking along streets throughout Louisville are provided with adequate facilities that accommodate all types of users.
Objective 1.1
Implement high priority improvements using the prioritization criteria set forth in the Pedestrian Master Plan

a) Provide sidewalks on both sides of all principal arterial roads and at least one side of all other streets in Louisville where feasible.

b) Evaluate projects with a defensible, data-driven prioritization process that incorporates pedestrian demand, socio-economic measures, and land use in order to make the most of limited funds and to ensure that improvements best meet needs.

c) Combine portions of the Pedestrian Master Plan infrastructure list into corridor projects for inclusion in Metro Public Works (MPW's) Capital Improvement Projects list.

Objective 1.2
Establish criteria and set priorities for constructing pedestrian facilities based upon condition, location and proximity, as well as current and future demand

a) Create a single system to inventory, assess and track sidewalks and roadway facilities.

b) Identify goat trails (informal trails and pathways) that could be improved to serve pedestrians.

c) Incorporate connectivity and walkability into school zones by developing minimum standards for pedestrian connectivity and walkability.

d) Coordinate right-of-way improvements adjacent to parks and the Louisville Loop to facilitate pedestrian access to and from parks and to benefit the larger pedestrian network. If the pathway/sidewalk must go on Parks' property, its primary purpose should be to provide access to/from the park.

e) Provide attractive pedestrian access through and across major barriers, including freeways and rail corridors.

f) Accommodate and improve pedestrian access to and across bridges, railroads, state highways and through interchanges.

g) Provide pedestrian access across arterial streets and state routes that divide high demand pedestrian areas. Prioritize projects for improvement using Pedestrian Master Plan criteria. Implement through corridor projects and with other available resources. Seek grant funding as needed.

h) Incorporate shortened pedestrian crossings into roadway designs by providing clear direction on curb bulbs and median islands, as well as other options that reduce the number of lanes a pedestrian must cross at an uncontrolled location (e.g., by eliminating peak hour parking restrictions).

i) Identify and analyze skewed intersections on angled streets, particularly where at least one of the streets is collector level or higher. Modify and adapt for safe pedestrian crossing where feasible.

j) Incorporate findings from performed Walkability Assessments and establish protocol for evaluating and funding prioritized wishes identified by the community.

k) Develop system for identifying and reporting inadequate or missing curb ramps at alleys.

Objective 1.3: Identify a long-term and sustained investment strategy to fund pedestrian improvements

a) Leverage investments across funding programs and with a broad range of partners.

b) Develop a process to leverage funding from Capital Improvement Program (CIP), Operations and Maintenance (O&M), and private development.
Recommendation 2: Institute policies and practices to ensure that every street in Louisville meets the needs of pedestrians of all abilities

A comprehensive policy and code analysis was conducted as a central component of this Plan. Many policy changes and adjustments were identified that will have a profound impact on the walkability of Louisville’s streets. These policy changes will be essential in order for Louisville to provide complete streets that meet the needs of pedestrians of all abilities. Below are the specific recommendations that should be taken to institute policies that support walking.

Objective 2.1: Use existing resources to create more value for fewer dollars

a) Coordinate pedestrian improvements with construction projects such as roadway maintenance, repaving, painting, sewer and water works, and utility corridors.
b) Require routine pedestrian (and bicycle) accommodation with off-site impacts (both new or redevelopment), and a full transportation analysis, with performance based specifications.
c) Create process to use fee-in-lieu funds for sidewalk improvements. Phase out program by requiring that sidewalks must be built unless explicitly impossible. When fee is to be provided in lieu of facility, add a 20% surcharge to act as disincentive to deferring in-kind construction and to assure adequate funds to provide compensatory facility.
d) Systematically use Council Members’ discretionary funds for pedestrian facility repairs and improvements.
e) Coordinate work by the Economic Development Department, such as streetscape improvement programs and walkability improvements.

Objective 2.2: Inspect and enforce right-of-way encroachments

a) Continue LMPD’s inspection and enforcement programs to address removal of private encroachments in the public right-of-way that impact the walkable zone. Clearly identify to the public MPW’s current policy of denying permits for objects in the right-of-way that encroach on the walkable zone and addressing existing encroachments through the following actions: 1) promote voluntary compliance, and 2) if voluntary compliance is not effective, issue a notice of violation as needed so that encroachments that impact the walkable zone are removed.
b) Advance the work of the MPW working group on construction closures and implement recommendations to cover the following topics: 1) improve coordination between proximate construction sites’ use of the right-of-way; 2) provide timely and easily accessible web-based information on current and planned sidewalk construction closures with alternate routes; 3) review sidewalk and street closure fees, permitted closure lengths, and permit renewal requirements; 4) maintain pedestrian access during construction, including keeping the walkable zone free of signage and equipment; and 5) ensure that inspections are timely and frequent.

Objective 2.3: Use Louisville’s Compete Streets policy more fully

a) Give the Complete Streets Manual regulatory force by incorporating relevant portions into the Land Development Code (LDC).
b) Reduce the number of cases in which pedestrian facilities may be eliminated by establishing clear, specific language in the LDC addressing under what circumstances facilities would not be required, taking into account all reasonable alternatives.
c) Implement the Thoroughfare Typology hierarchy system adopted as part of the Complete Streets Manual, which matches bicycle and pedestrian facilities with functional class, design, speed and Form Districts.

d) Use the Walkability Leadership Task Force to oversee and coordinate multi-modal transportation review of development projects, and work with the governmental structure.

e) Encourage the Kentucky Transportation Cabinet (KYTC) to use the Complete Streets Policy for state roads in Louisville Metro.

Objective 2.4: Create an expanded set of design standards for pedestrian paths and sidewalks

a) Prepare an expanded set of sidewalk standards (for pedestrian paths and walks), an updated standard driveway detail, and a curbless pedestrian path design standard for inclusion in Louisville’s Standard Plans. Advance these standards through the MPW review committee and Louisville’s review committee. Publish design details in the Right-of-Way Improvements Manual.

b) Develop specific standards for pedestrian connectors between cul-de-sacs and other subdivision connections to ensure functionality and safety (size, width, fencing limitations, lights, etc.). Require full connectivity in subdivision design standards and retrofits.

c) Revise utility infrastructure (e.g., poles, cabinets, vaults, hand holes) and street furniture placement guidelines so that they do not impact the walkable zone or preempt the ability to install curb ramps at corners. Balance the needs of required utility safety clearances and tree canopy coverage goals.

d) Establish street lighting standards to: 1) discuss pedestrian-oriented lighting in more detail; 2) locate light posts in such a way as to maintain a clear pedestrian zone; 3) include both retrofits and new construction in lighting design standards; and 4) achieve concurrency with International Dark Sky Association “approved dark-sky friendly” standards.

Objective 2.5: Define construction options for property owners to repair sidewalks

a) Ensure all sections of sidewalks are accounted for by the responsible property owner

b) Develop and publish a list of suggested contractors for sidewalk repairs and right-of-way improvements to assist property owners with sidewalk maintenance in support of a clear pedestrian zone.

c) Explore public/private cost-sharing possibilities for sidewalk and streetscape improvements.

Objective 2.6: Update guidelines for crossing treatments

a) Update guidance on crossing treatments to accomplish the following: 1) allow pedestrian crossing islands (or similar crossing aides) where appropriate for controlled and uncontrolled intersections with three lanes or fewer; 2) clarify the set of acceptable crosswalk tools (including alternate marking treatments and in-pavement flashers) and appropriate placement guidelines for each; 3) create flashing beacon guidelines and sign standards; and 4) evaluate existing roadway crossing elements used in proximity to transit stops, based on guidance available from FHWA’s Pedestrian Safety Guide for Transit Agencies.

b) Update guidelines for installing marked crosswalks and stop bars. Update crosswalk marking guidelines to address the following issues: 1) define when to mark crosswalks at all legs of an intersection or at multiple intersections in a corridor; 2) develop criteria for marking crosswalks on non-arterials outside of school zones; 3) routinely install stop bars at all intersections with marked crosswalks at least 4 feet back from the edge of the crosswalk marking and clearly sign the stop bar location to encourage driver compliance; 4) establish guidelines for the placement of stop bars so that new stop bars are coordinated with existing loop detectors; and 5) develop guidance for marking stop bars at locations with unmarked crosswalks.
Objective 2.7: Educate and Enforce "no parking" restrictions at intersection approaches
   a) Remove parking and increase enforcement of no standing or parking restrictions within 20 feet upon the approach to a crosswalk. Explore mechanisms other than signage to designate the restrictions in locations where signage does not currently exist. Update existing codes, as needed, to allow bicycle and scooter parking within this 20 feet zone in certain situations.

Objective 2.8: Develop and maintain short block lengths to maximize pedestrian crossing opportunities
   a) Discourage street and alley vacations that result in long blocks without adequate pedestrian access.
   b) Maintain short block distances wherever possible to improve pedestrian access. Identify locations where mid-block crossings would effectively shorten blocks longer than 600 feet.

Objective 2.9: Evaluate design speed as part of all corridor projects
   b) Revise curb radii standards to create tighter turns to slow traffic in locations that do not have high volumes of truck or bus turning movements and in balance with emergency response needs.
   c) Use a combination of engineering, enforcement, and evaluation tools to reduce speeds along corridors within high priority areas. Prioritize locations near parks, community centers, and neighborhood business districts. Where appropriate, add speed zone limits and signage (including radar speed signs), and expand the use of enforcement efforts (e.g., speed vans, red light cameras) in these areas.

Objective 2.10: Address modal conflicts that result from Complete Streets implementation
   a) Ensure that Pedestrian Master Plan recommendations are coordinated with implementation and update activities for other modal plans (e.g., Thoroughfare Plan, Bicycle Master Plan,) and other metro-wide strategic plans (e.g., Cornerstone 2020).

Objective 2.11: Use land use and zoning tools to encourage and support pedestrian-friendly growth and development
   a) Evaluate and consider revising Land Development Code Form District standards to promote and provide incentives for wider use of pedestrian-oriented development. Prioritize review of dimensional standards for non-residential and mixed-use developments in the suburban form districts of the Land Development Code to assure that the standards address safe pedestrian accessibility and promote walkable environments.
   b) Identify Cornerstone 2020 plans goals and policies that should be revised or created to support implementation of the Pedestrian Master Plan.

Objective 2.12: Integrate public spaces with adjacent businesses
   a) Develop program of renovation assistance for small business owners to improve their frontage, including repair of sidewalks or walkways.
   b) Work with parking garage owners and management companies to eliminate the "caution, vehicles exiting" warning message to focus the message on the drivers instead.
Objective 2.13: Develop guidelines for car-free and shared space streets
   a) Begin to implement shared space streets, with a commitment to developing guidelines and protocols for implementation. Explore possible locations for shared-space streets through examining space allocation in the right-of-way (e.g., narrowing streets, pedestrian-only streets, woonerfs).
   b) Expand program of 2nd Sunday (car-free streets) each year. Focus on locations with strong community interest. Sustain and expand summer street closures in major parks.
   c) Pilot a Car-Free Weekend program, in which Louisvillians are encouraged to live car-free for an entire weekend.

Objective 2.14: Coordinate transit stop and pathway accessibility needs between Louisville and the Transit Authority of River City (TARC)
   a) Develop a program that evaluates transit stops and pathways two blocks in each direction from the stop, including all intersections.
   b) Review current ADA transition plan, consolidating all plans for improving the pedestrian network for persons with disabilities.
   c) Coordinate with TARC on efforts to provide better service as reflected in TARC’s strategic plan.
   d) Coordinate with TARC to improve bus stop amenities such as shelters, lighting and service information.

Objective 2.15: Create a parking strategy to encourage trip-chaining by walking
   a) Broker joint-use parking agreements, supported by site plan review process that rewards joint-use parking elements, i.e., expedited review/permitting.
   b) Joint Use Parking consider when two or more uses on the same or separate properties are located along a transit route and have different peak use times.
   c) Establish a set aside of avoided parking construction costs for pedestrian-friendly facilities.
   d) Use developer set asides (see item “a” above) from reduced parking requirements to pay for pedestrian-friendly facilities.

Objective 3: Establish education, enforcement and encouragement programs that support pedestrian travel.

When asked what would have the GREATEST impact on improving transportation in Louisville. Several respondents to the online survey selected “Drivers not stopping for pedestrians in crosswalks” as the number one factor. Feedback from face-to-face interviews conducted in each of the Louisville’s Pedestrian Summit workshops suggest that motorist behavior such as exceeding posted speed limits, running red lights, and failing to yield to pedestrians at appropriate locations, and pedestrian behavior including crossing multi-lane streets at unmarked mid-block locations, often put pedestrians at risk. In addition to motorist education, residents and visitors to Louisville need to be taught basic pedestrian safety skills as well as laws that pertain to pedestrians in the public right-of-way.

To meet the Louisville’s goal of improving pedestrian safety, physical improvements must be complemented by education, enforcement, and encouragement programs. Efforts must be made to develop a culture of respect between pedestrians and motorists that acknowledges the shared
Objective: 3.1: Identify a long-term and sustained investment strategy to fund pedestrian improvements
a) Develop a strategy to allocate a reasonable and sustainable amount of funding for pedestrian improvements and maintenance, including reallocation of transportation funding to prioritize pedestrians.
b) Develop a framework for resource allocation to guide investment decisions between programmatic and project delivery needs.
c) Continue to work with regional and state agencies to improve funding criteria so that non-motorized projects are competitive for as many fund sources as possible.
d) Explore innovative funding tools for both general pedestrian improvements and specific needs.

Objective: 3.2: Implement a program to communicate to property owners, public and private utilities, city staff, and the general public the importance of keeping this zone clear and in good condition
a) Develop a "Travel Right" guide to communicate to Louisvillians general travel and right-of-way information, both regulatory and encouraging. Information might include: regulations, ranging from speed limits to parking restrictions to laws about white canes and guide dogs to crossing laws; the impact of speed on crash severity, to encourage drivers to slow down; contact information for MPW’s various programs (e.g., Sidewalk Repair Program); great neighborhoods for walking; and hidden staircases.
b) Develop and distribute MPW’s educational brochure (geared toward property owners) about sidewalk and tree maintenance and further develop a communications campaign for property owners that addresses responsibilities in the right-of-way, including: the responsibility to maintain the sidewalk/walkway, planting strip, and vegetation adjacent to their property (including removal of snow and ice); a list of materials that are appropriate for sidewalk repairs and locations where the materials are commonly available; and information about neighborhood design requirements.
c) Encourage pole consolidation, especially in areas where sidewalk space is limited, pedestrian demand is high, and pole replacement is anticipated.
d) Use easements to secure additional space for walking.
e) Promote a clear zone for tree canopy at intersections, via a setback for new trees or a pruning window for existing trees. Balance visibility and lighting needs with tree canopy coverage goals.

Objective: 3.3: Establish and implement a predictable maintenance cycle for crosswalks and stop bars
a) Define a maintenance cycle for crosswalk restriping to ensure that markings are clear and highly visible to drivers and pedestrians. Identify maintenance cycles appropriate to levels of intersection use for City maintenance, as well as guidance for utility or other private development work. Revise internal tracking and communication tools to reflect changes.

Objective: 3.4: Implement and evaluate enhancement and enforcement programs
b) Continue to fund and implement crosswalk emphasis patrols (e.g., crosswalk stings) in balance with jaywalking citations. Identify appropriate locations for focused enforcement efforts, including in the high priority areas identified in the plan. Evaluate the effectiveness of jaywalking citations on improving pedestrian safety.
c) Develop a pilot program to measure the success of existing enforcement and engineering efforts at intersections.
d) Continue to work with Step Up Louisville to encourage using CPTED (Crime Prevention through Environmental Design) analysis for neighborhood improvements.

e) Develop an aggressive Enforcement Program that includes zero tolerance penalties for speeding in a school zone and parking on sidewalks within one mile of school.

f) Advocate for increased enforcement and safety resources at intersection crosswalks and mid-block crossings.

**Objective: 3.5: Encourage transit providers to locate transit stops close to signalized intersections**

a) Encourage transit providers to locate transit stops as close to signalized intersections as possible to facilitate pedestrian crossings while maintaining visibility.

b) In determining the location and spacing of bus stops, work with transit providers to balance the needs of fast and reliable transit service against providing adequate pedestrian access.

**Objective: 3.6: Advance a social marketing campaign to promote walking**

a) Design and implement a pedestrian safety education campaign that targets drivers and pedestrians.

b) Retain a marketing consultant to develop a social marketing program to promote walking. Focus on the role of walking in promoting health (e.g., the health impacts of short trips), walking as a cost-saving approach (e.g., save money on gas), walking as a conservation measure (e.g., improve the environment), and the impact of walking on community building (e.g., meet your neighbors). Evaluate the effectiveness of the campaign.

c) Use public service announcement traffic reports to provide walkability information such as: remind drivers that “pedestrians are everywhere”, announce “good” intersections, advise pedestrian network detours due to construction or special events.

d) Publicize the number of pedestrian-vehicle crashes.

e) Share marketing techniques and approaches to effectively promote services, programs, and facilities that support walking.

f) Develop an effective encouragement program that includes family safety audits, crossing guards at targeted intersections, community policing and neighborhood watch activities during walking to/from school times, and information about SRTS for those involved in designing environments in which children walk or bicycle to school.

g) Explore partnerships with private organizations to fund incentive programs and events that encourage walking.

**Objective: 3.7: Create or expand programs that promote the benefits of walking**

a) Expand programs that promote walking for physical and mental health.

b) Create more Car-free neighborhood guides such as the guide for the Clifton Neighborhood.

c) Expand auto trip reduction programs to encourage more people to travel by means other than the private automobile (including by walking). Increase the number of people participating in a Metro-sponsored commute trip reduction program each year.

d) Explore the possibility of a "Ride Free" day (or other lower cost promotional activities) on all local and regional transit to encourage people to walk and take transit instead of driving.

e) Develop "Walk to Work" day, possibly in collaboration with "Bike to Work" month. Also explore an ongoing program of "Walk to Work Fridays" and "Walk to Work" month.

f) Encourage employer-based programs that offer incentives to walk and use transit with disincentives to drive.

g) Offering employees a choice between bus passes and free parking.

h) Continue to promote Louisville as a pedestrian friendly at the national, regional and local level.
i) Continue neighborhood walkability assessments for neighborhoods, incorporating assessment information into the inventory.

j) Develop criteria and review process for comment based on physical activity and environmental impacts of all new projects. Use existing processes as models for Louisville, such as Decatur, Georgia.

**Objective: 3.8: Increase school-specific pedestrian programs**

a) Create a Safe Routes to School program and team to evaluate engineering needs at all Louisville Metro schools and apply for SRTS funding.

b) Explore partnerships with private schools to expand Safe Routes to School Program to these schools.

c) Develop Safe Routes to Transit and Safe Routes to Parks programs, including infrastructure improvements (e.g., walkways, signs) and safety education for various user groups.

d) Develop a strong safety education program that includes videos for kids, mandatory street-crossing education and bicycle education programs as part of the physical education/practical living curriculum.


**Objective: 3.10: Create materials to communicate general travel and right-of-way information**

a) Add walking routes to My Neighborhood Maps site.

b) Expand pedestrian way finding efforts Metro wide, to include maps, signage in the right-of-way, and web-based tools. Focus way finding at transit stops, to encourage coordination of walking and transit trips.

c) Expand mapping to support pedestrians through the following steps: 1) Develop walking maps for all Louisville neighborhoods; 2) Compile existing neighborhood walking maps to create a "master" walking map for Louisville 3) Develop thematic walking maps/routes for Louisville (e.g., Walks with Kids, Dog Walks, View Walks, Art Walks, Tree Walks, Historic Walks).

d) Collaborate with Metro and TARC to improve pedestrian connections to destinations through on-board destination/way finding guides, stop announcements linked to destinations, flexible routing for events, and better marketing of services and destinations.

**Objective: 3.11: Use social networking to communicate project information in a timely and efficient manner**

a) Communicate project information to those affected in a timely and efficient manner through development of neighborhood listservs and/or partnerships with local blogs.

b) Simplify Louisville’s online resources to improve usability, accessibility, navigability, and coordination.

c) Create a web-based community toolbox to fully engage residents in contributing to an on-going assessment of the pedestrian network.

d) Residents could use the toolbox for information-sharing and reporting, i.e., report repairs, identify “good” walking facilities, etc. Louisville could use the toolbox to communicate with the community on issues such as sidewalk construction or closures. Montgomery County, Maryland’s web-based program allows residents to track development projects can serve as a model. Additionally, the Maryland Department of Transportation is using Google maps in developing a statewide trails network.

**Objective: 3.12: Develop and launch training modules for Louisville Metro staff**
a) Develop and launch training modules for Metro staff, including topics such as: implementation of recommendations from the Pedestrian Master Plan; project conceptualization, design, and construction (as multiple programs build pedestrian facilities); accessibility needs of people with disabilities (training for all MPW employees who participate in the planning, design, and construction of pedestrian facilities); pedestrian-appropriate intersection and crosswalk lighting schema (provided by Lighting Design Lab); and alternative sidewalk standards and maintenance requirements.

b) Improve regional coordination around pedestrian issues through training modules.

Objective: 3.13: Establish better communication and coordination among staff and departments working on related issues

a) Establish active Louisville partnerships to encourage walking, bicycling, and transit use through coordination for these modes (e.g., prioritize pedestrian access to stops and services when planning for transit service/route changes).

Objective: 3.13: Revise and update the plan, its data module, and the project list regularly

a) Revise and update the Pedestrian Master Plan every five years.
b) Update the Plan’s data module and project list annually (with a significant data update anticipated when 2010 Census data is available).
c) Develop and distribute geocoded capital projects list so that all departments have timely information about city projects to facilitate internal coordination and leveraging opportunities.
d) Evaluate data collection and management processes/needs to determine appropriate data for use in tracking success of plan and identifying future improvements.
e) Maintain and update inventories of assets (e.g., the sidewalk inventory), including capture of capital projects and private development.
f) Track and report on plan performance measures.
g) Coordinate stewardship of the Pedestrian Master Plan with Step Up Louisville. Ensure that necessary training is provided to assist SUL in this role.
h) Submission of projects/programs
i) Coordinate the transmission of Pedestrian Master Plan data to a public interface for use by MPW to provide readily available project information during the permitting and inspection processes.

Objective: 3.14: Expand the Mayor’s Miles Program to:

a) Include schools, neighborhoods and commercial areas.
b) Create mechanism for citizens who already incorporate walking into their daily routine to track their mileage; and promote walking by enabling neighborhoods and community groups to track their progress and accurately perceive distance, thus promoting and sustaining active lifestyles.

Objective: 3.15: Increase opportunities for driver education about pedestrians

a) Education/re-education as part of driver’s license renewal. Change process to get license, e.g. on test; include pedestrians or bicyclists as part of driving test. Conduct on-going educational process about changes. For example, show a video on pedestrian safety at DMV offices. Reduce car insurance to reflect this.
b) Advocate for cell phone free areas for drivers and pedestrians.

Objective: 3.16: Evaluate pedestrian crash data as part inventory and assessment.
a) Collect pedestrian crash data.
b) Assess pedestrian crash data.