Brick Streets- Response to Council Questions/FAQs

How long can a brick street last?
How long a brick street lasts depends upon a variety of aspects- weather, traffic loads, disruption due to utility work, etc. Columbia's existing brick streets downtown have lasted 100 years with little to no maintenance. New construction materials have pushed the life of brick streets estimate, by the construction industry, to over 150 years. The cobblestones laid down on Rome's Appian Way are about 2,000 years old and counting, and have withstood everything from sandals, horses, and tour busses.

Where brick streets are in poor condition, the cause is typically the condition of the base the bricks are laid upon. The bricks themselves do not warp or buckle, but rather the sand and gravel base underneath them has reacted adversely to weather and traffic/load conditions. Thus, this proposed policy does not recommend any maintenance or repairs without replacing the present bases with smooth, long-lasting concrete bases topped with an appropriate intermediary, cushioning material. If individual bricks break, they can be replaced individually without tearing up large segments of the street.

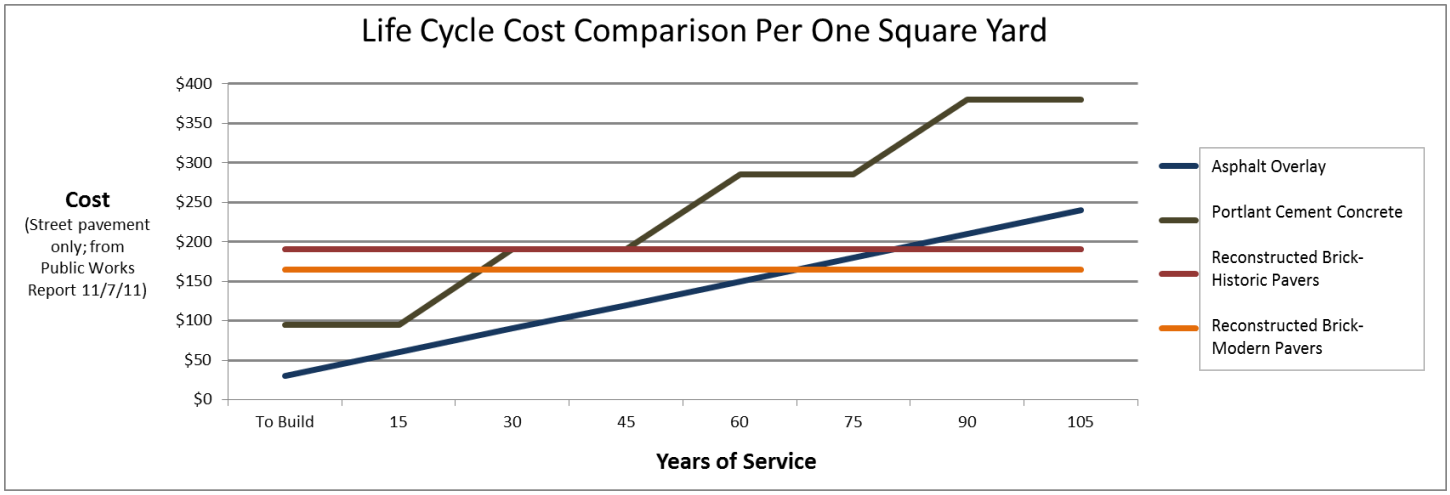
Are brick streets more, or less, expensive than asphalt streets?
There is some debate on this topic. On a per square foot basis, over a large area, new or salvaged historic brick is more expensive than asphalt. However, because asphalt must be replaced every 15 years (+/-) and bricks will last more than 100 years, the bricks are less expensive over the life-cycle of the street. If the life of asphalt pavement downtown is only 15 years, the streets would need to be repaved more than 6 times in 100 years. History tells us that bricks last far longer than 15 years.

At the March 21, 2011 City Council meeting, Council requested a staff report indicating the cost of rehabilitating an existing brick street versus the installation and maintenance of a concrete street. The subsequent report for CM #3295 prepared by the Public Works Department, Brick Street Renovation (11/07/11), has been attached for Council consideration, and the following is an excerpt summarizing the cost differential between street materials:

> ***Comparative Costs***
> *This portion of the report presents comparative costs per square yard of street pavement for three options available for future maintenance or renovation of downtown streets. The costs are for the street pavement only and do not include any additional associated projects that could include sidewalk replacement or utility replacement. The costs have been estimated using recent bid prices for city projects in Columbia and other communities in the Midwest that are working on similar issues.*
>
> > *Cost to mill and overlay an existing asphalt overlay on an historic brick paved street…….$30 per Square Yard*
> > *Cost to remove a brick paved street (with or without asphalt overlay) and reconstruct a brick paved street to the correct elevation and grade on an improved base:*
> >
> > > *Two options are available for reconstructing a brick paved street. One option is to use historic pavers; the other is to use modern pavers. There are pros and cons to each option. The cost is slightly higher for using historic pavers, due mostly to the availability of the historic pavers and the need to place all pavers by hand. Additional pavers are needed since many of the existing pavers are broken. With modern pavers the*

option exists to place pavers mechanically which can save labor costs. Both types of pavers need to be placed on a suitable base which in the downtown area is a concrete base pavement due to the vehicle loads and the proximity of underground utility and service connections.
Using historic pavers….. $190 per Square Yard
Using modern Pavers…..$165 per Square Yard
Cost to remove a street (any material) and replace with a Portland Cement Concrete street…. $95 per Square Yard

This information has been plotted to show the potential life-cycle cost of the street pavement over time:



What kind of maintenance has been done on Columbia's bricks streets?
The City Public Works department does not have a brick street maintenance policy, so maintenance has generally been deferred or piecemeal. Many brick areas have been slowly replaced or paved over in the course of utility or other street work, leaving areas of miss-matched materials. These areas where different materials meet are often more negatively affected by weather conditions, traffic, snow removal, etc., then areas of a single pavement material.

South Glenwood Avenue's historic brick street (from Broadway south to Stewart) was rehabilitated in the 1990s, and is in excellent condition.

According to Public Works' Brick Street Renovation report: "Brick pavements in the downtown area are generally in fair condition with various amounts of rutting and uneven surface conditions due mostly to the poor strength of the base under the pavement. This uneven surface condition is also evident on some of the brick paved streets that have been overlaid with asphalt. The vehicle loads in the downtown area are considerably heavier than in the early 1900's when the brick pavements were originally placed."

Due to heavier loads in modern time, the Brick Streets policy follows the industry best practice recommendation to replace sand and gravel bases with concrete bases to extend the longevity of the brick streets life-cycle beyond 100 years and to maintain a smooth surface.

Will historic brick pavers break down if placed on concrete bases?
As with all paving materials, appropriate construction methods and materials are the key factors behind the longevity of brick paved streets re-laid over a concrete base. The benefit of brick pavers is that if a brick cracks or breaks, that brick can be removed and replaced. Asphalt and concrete roads have a very different process for repairing cracks and potholes. All paving materials are not immune to repair needs, which is why this proposed policy has been prepared.

Historic pavers were traditionally laid upon a gravel and sand base. In previous generations, brick streets often carried less and lighter traffic. The use of concrete bases will extend the life of historic brick pavers, but to prevent material breakdown, an intermediary cushion material, such as a level sand asphalt setting bed, will need to be placed between the concrete base and the brick pavers. Additionally, historic bricks re-laid over concrete bases will need to be in good condition (lacking fractures and cracks) to provide the longest life-span.

What about ADA requirements and crosswalks?
It is very important that all crosswalks over brick streets, curb ramps, and adjacent sidewalks are ADA accessible. While modern bricks have often been used in recent times in Columbia to visually distinguish downtown crosswalks while providing ADA accessibility, crosswalks over brick streets do not have to be brick.

The Americans with Disabilities Act of 1990 does not require any street material (asphalt, brick or concrete) to meet the same ADA standards as sidewalks, ramps and crosswalks; however, with proper restoration techniques, brick streets can follow sidewalk, ramp and crosswalk design standards for slopes, cross slopes, and surface impediments such as vertical surface discontinuities. Two important design factors are recommended: repaired brick streets need to be uniformly placed over a level concrete base to prevent vertical obstructions and tight, sand-swept joints are needed to create a smooth surface to limit traveling vibrations.

The ability of brick pavers to be ADA accessible can be seen in the numerous new sidewalks Columbia has built with decorative brick-paved sections (examples include Eight Street, Seventh Street and Broadway). The repaving of Short Street is also an example of accessible modern brick pavers; South Glenwood Avenue provides a good example of accessible historic brick pavement.

Do brick streets calm traffic?
Brick streets are commonly cited to be an excellent traffic calmer because they look and feel different than other streets. A case study of Winter Park, Florida showed a drop in average speed from 29 mph from 41 mph after a brick restoration project was undertaken in 1996.

Is there a cost estimate available for the scope of the proposed brick streets policy?
No, not at this time. City Public Works has indicated that cost estimates may be based upon the bid to use modern brick pavers on the newly reconstructed Short Street. A cost estimate for historic brick pavers may be based upon estimates in Public Works' Brick Street Renovation report.

How would this policy be implemented over time?
The HPC has identified repairing downtown brick streets as the highest priority. These brick streets are the most used, the most visible, and are generally in the worst condition. That is why the policy sets a goal of 20 years to repair the brick streets in the core zone. 20 years was the suggested timeline for the complete repair of these streets to balance budget concerns versus repair needs. Which core zone streets are fixed first within this timeline should be determined by

the Council, staff and the public *in the same way other street projects are prioritized, designed and funded- through interested parties and public hearing meetings held by the City Council*.

There is already a brick streets repair fund in the budget, though little funding has been put in it in recent years (Annual Historic Brick Street Renovation, account # C00234). The HPC also suggests that during every annual budget process, the Council allocate funds into the brick streets account to eventually fund uncovering or "daylighting" brick streets in the core zone. A suggested prioritized list is provided in the policy resolution. There is no timeline on when these streets would be daylighted, nor is there an explicit requirement to do so within a certain time period. Any brick street uncovering projects would follow the *same process by which other street projects are prioritized, designed and funded- through interested parties and public hearing meetings held by the City Council*.

The sections of this policy resolution describing how brick streets should be treated when disturbed by utility or other street work should begin following adoption of the policy resolution.

The Council may also direct the preparation of an "ordinance to allow a majority (percentage to be established) of the property owners living on a portion of at least one block of a street with historic brick pavement to request that their street be restored using either historic or modern brick pavers dependent upon availability and subject to a special assessment of property tax to pay for the expense of such work", as called for in section 4, following policy resolution adoption. Such an ordinance would be subject to a public hearing.

Additional Resources:

ADA and Sidewalks, Delaware T2 Center, June 2011
http://www.ipa.udel.edu/healthyDEtoolkit/docs/ADAsummaryPlanning209.pdf

Brick Streets, Blair Historic Preservation Alliance, Blair Nebraska,
http://www.blairhistory.com/bricks/faq_new.htm

Flexible Vehicular Brick Paving: Brick Paving A Heavy Duty Applications Guide, Brick Industry Association
http://www.pinehallbrick.com/userfiles/BIAheavypaving.pdf

Life Cycle Performance, Boyer, Dr. Bob, Asphalt Institutute Senior District Engineer and Jay Hensley Asphalt Enginner Chief Engineer
http://www.asphaltmagazine.com/archives/1999/Summer/Life_Cycle_Performance.pdf

PHB TechBullet #12 Case Study: Winter Park Streetscapes: A new concept in traffic calming, Pinehall BRick
http://www.pinehallbrick.com/userfiles/TechBullet12_001.pdf