

TITLE

East Breckinridge: A case study of one vs. two-way streets

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ABSTRACT

The livability of an inner-city neighborhood is greatly impacted by the design of the street in terms of whether it accommodates the needs of one-class of users (cars and trucks) while ignoring the needs of pedestrians and bike riders. While recent moves toward ‘complete streets’ policy throughout the country have allowed for more dollars to flow toward bicycle and pedestrian oriented projects, many streets are still plagued by unsafe conditions. This is especially the case for multi-lane one-way streets, which some studies show as creating unsafe crossing conditions for pedestrians and cyclists. This study evaluates the changes of street dynamics over 13 blocks of a single street Louisville, Kentucky. Our methods are the following for this case study: photographs of the street current and historic, traffic accident data, crime data, counts of trees, housing valuation data, foreclosure and vacant and abandoned structures and lots. We find that conversion of East Breckinridge to a multi-lane, one way street increased crime, accidents, abandonment, and decreased property values. We found the multi-lane one ways, although not contributed solely to degradation, is a significant cause to the erosion of community. This provides support for expanded thinking about how two-way street conversions may increase livability.

INTRODUCTION

Streets are the life-blood of cities, simply put it is where life occurs. It is where citizens interact with each other and the policies of the locality every day. The streets of a city are a significant determinate of whether the neighborhood is hostile towards pedestrians or is a home for multiple modes of transportation. Currently, there is a shift in American society where people are starting to move back to urban areas in search of walkable neighborhoods (Cortright 2009; Speck 2012; Ehrenhalt 2012). Cities are renovating areas and competing with each other in order to take advantage of the new influx of residents. A number of these inner-city neighborhoods have suffered from years of neglect and development that has been focused on suburban interest (Duany, Plater-Zyberk, and Speck 2001).

One of these areas that is of particular interest is the conversion of inner-city residential streets and commercial corridors into multi-lane one way in order to move traffic faster. These conversion have been an associated with the loss of business and intensity of blight in neighborhoods (Cervero and Kockelman 1997; Leinberger and Alfonzo 2012). Yet beyond theory, we are unaware of any studies that ever done a detailed empirical examination of what happens when multi-lane one-way streets are converted to more livable calmer streets.

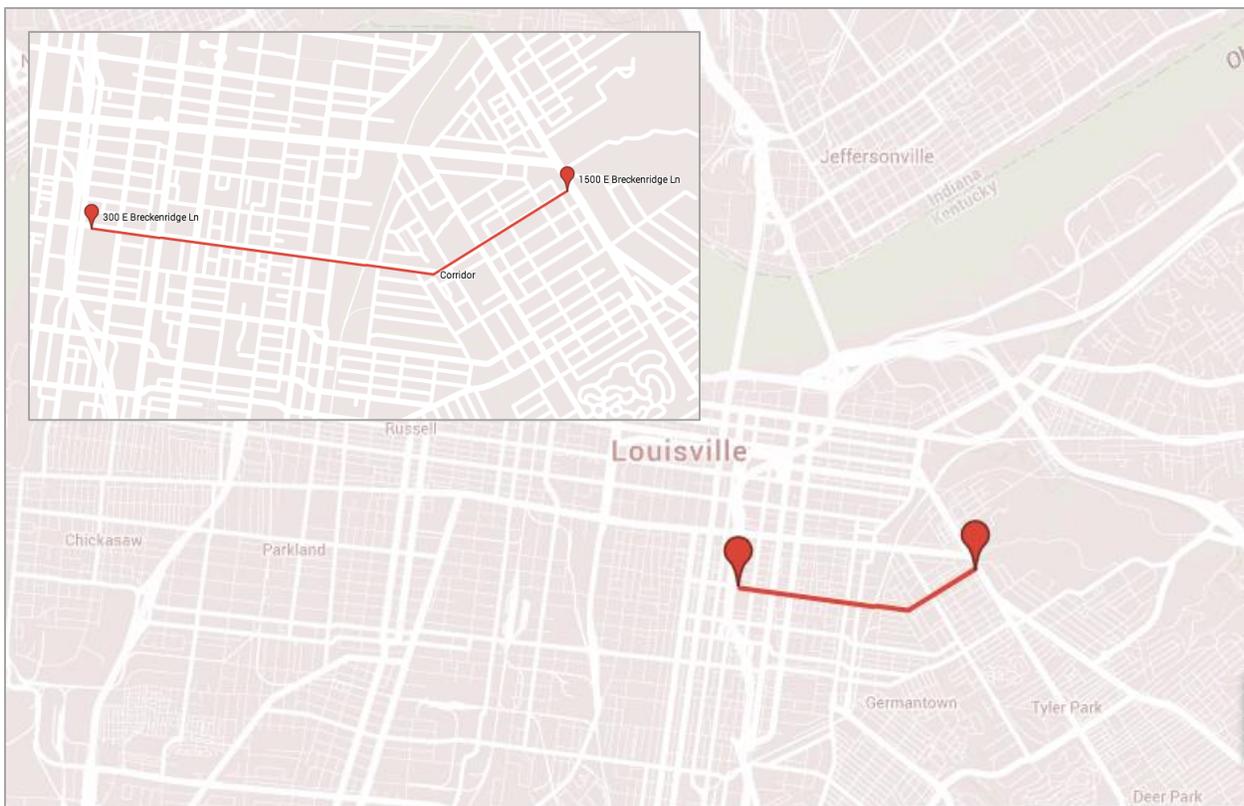


FIGURE 1: Site Location

In this paper we examine 13 blocks on a single street, Breckenridge, in Louisville, Kentucky in order to understand if the distinction of one-way and two-way have an influence in terms of traffic counts, traffic accident data, crime data and property valuation. We find there is a

stark difference between the two types of street design, suggesting that two-way streets are beneficial to the long-term sustainability of communities.

BACKGROUND

Prior to the 1950's, two-way streets were the predominant street design in American urban areas. Slowly, traffic and congestion problems led to the conversion to today's version of the multi-lane, one-way street design (Appleyard 1981; Handy, Paterson, and Butler 2003). Before automobile use became a primary mode of transportation, two-way streets and a greater intensity of pedestrian traffic in urban areas was typical of a city's streetscape. Today's typical streetscape is characterized by one-way streets dominated by high speed automobiles making these streets unsafe and unfriendly to pedestrians and bicyclists (Edwards 2002). However, two-way streets seem to be making a resurgence due in part to moves toward 'complete street' and 'multi-modal' service models (Appleyard 1981; A. Jacobs and Appleyard 1987; A. B. Jacobs 1993). These efforts have been echoed in work that extolls the benefits of well-designed, narrow streets that promote alternative transportation (Cervero and Kockelman 1997; R. Ewing et al. 2006; Southworth 2005).

Despite accounting for the virtues of street design few studies specifically looked at the benefits of multi-lane, one-way streets and detriment of their one-way counterparts. Literature shows that multi-lane, one-way streets may be less safe than their two-way counterparts (Reid Ewing and Dumbaugh 2009). One-way streets allow higher speeds in downtown areas, generating negative safety implications for the overall community (Papaioannou 2007; Stemley 1998). Additionally, while multi-lane, one-way streets may benefit auto-mobility some research shows that the young, the elderly and those with reduced capacity are most vulnerable (J. A. Oxley et al. 2005; J. Oxley, Fildes, and Dewar 2004; Wazana et al. 2000).

Within this context, we posit that one-way streets are harmful to downtown communities, and that two-way streets are positively beneficial to downtown communities – not only from a safety perspective, but from an economic and sociological views. Some evaluation already suggests multi-lane one-way streets hurt housing values and businesses because they are less appealing, less eye catching for motorists traveling at higher speeds, and more conducive to illegal activities and crime Hanka and Gilderbloom, 2007; Riggs et. al; forthcoming)

Multi-lane one-ways also discourage bike riding and in some cases make it illegal to ride a bike. Bike riders if given a choice will choose routes where automobiles drive slower (two-way) than on faster multi-lane one-way streets. Bike and car crashes are also more deadly with higher speeds with a 50% chance of dying if hit by a car going 45 mph compared to being hit by a car going 25 mph where there is a 25% chance of surviving. At the same time traffic rules prohibit bikes if they choose to go against one-way traffic (Gilderbloom, 2010). The June 21, death of a 52 year old biker on Louisville's multi-lane one-way 15th Street was blamed on him and not the van that killed him instantly for "illegally" riding his bike by going against traffic (Mallory, 2014: A-1). In other words, one-way streets make biking more inconvenient and dangerous.

Moreover, the conventional wisdom that multi-lane one ways reduce car pollution is also questionable. The claim made that cars going faster means less pollution than slower cars is true

when you test cars at the race track of the Indianapolis 500. But residential streets are not the same as a race track. First, a one way street often causes the trip to another destination to take longer as you have to “circle around the block not once but several times” which is a common experience for residents on one-way streets trying to find a home or a business. Moreover, a common complaint of residents is that they don’t like going downtown because it is confusing and scary with an array of multi-lane one-way streets along with several two-ways. “I don’t like going downtown” is a common complaint or experiencing just once drivers accidentally turned into a one-way street going the wrong and some actually ending up in major accidents some being deadly. Two-way streets simplify commuting by providing alternative routes and less confusion. Moreover, the one-way streets also discourages bikes which have zero carbon emissions and encourages greater car usage which contribute to more pollution.

While these are complex, multivariate issues we posit that two-way streets can positively impact urban communities in a variety of ways including increased pedestrian safety, decreased traffic and traffic accidents, reduced crime rates and increased property values. This paper further details and explores these potential impacts.

METHODOLOGY

Study Area

We select to carry out a neighborhood-level analysis in Louisville, Kentucky, a mid-sized Midwestern city, which is far more representative than a mega cities such as New York, Chicago and Los Angeles. Louisville is one of approximately 160 American cities with a population of 50,000 or more which is not located within 20 miles of another neighboring city of more than 50,000 (Appelbaum et al. 1976; Ambrosius, Gilderbloom, and Hanka 2010; Gilderbloom et al. 2011). Louisville’s relatively monocentric urban landscape, with surrounding suburban rings of decentralized development, is characteristic of older industrial cities grappling with the effects of deindustrialization and suburbanization.

Like many U.S. cities, Louisville is segregated by race and socio-economic status. These minority populations, mostly African-American, constitute about one-third of the inner core and about one-fifth of Louisville Metro. The medium size, geographic isolation, and urban structure of Louisville produces a better estimate of the impact of conversion of multi-lane one-way streets than would a case study of a megacity like New York or Los Angeles (Appelbaum 1978).

This study provides exploration of a street with a 10-block segment of one-way traffic followed by 3-block segment of two-way traffic and the effects of traffic directionality can have. It does so by measuring the difference in valuation and abandonment data for the two way vs. the one way segment. This is followed up by qualitative broken-window analysis of the neighborhoods.

Data and Variables

This study will examine the housing valuation, foreclosures, abandoned buildings and and lots on the 12 block of Breckinridge in order to better understand the implications of street traffic flow on neighborhood dynamics. Housing valuation is calculated by block and is provided by the Jefferson County Property Valuation Administration (JCPVA). There is a number of

reasons housing valuation is used instead of sales price. First, local assessment data was collected by the Jefferson County Property Valuation Administration and is readily available for analysis. Second, assessments closely approximate actual market values, despite their reputation as undervaluing properties (Ambrosius et al., 2009; Gilderbloom et al., 2009).

Proponents of using assessed values in analysis argue that gross assessment error is corrected by the appeals process and audits by state governments and that assessed value “acts as a proxy for the true market value” (Clapp and Giaccotto 1992: 301). Kentucky Revised Statute 134.385 requires that local property assessments be at least 80 % of the fair market value. Therefore, it is assumed that assessed value is a proxy for true market value. Additionally, the JCPVA also provided data on the number of buildings that were on each block. From this we were able to calculate an average value per building. This data will allow insight into the value placed upon these different block and the relative close distance will allow for an accurate assessment of the designation of street traffic flow.

The number of foreclosures was also provided by the JCPVA. This is a raw count of current foreclosures in each block. Examining current foreclosure will allow a preview into the investment risk of each area, although a longitudinal examination would be preferable. The next variable abandoned properties and lots was collected from the VAPSTAT (Vacant and Abandoned Property Statistics) system. This system is used to identify vacant and abandoned properties in Louisville.

RESULTS

Valuation, Abandonment and Foreclosure

Table 1 contains the table for valuation of buildings by block on Breckinridge. It should be noted that the 900 block only contains industrial land use. The building density on the one way segment of the street is considerable less than on the two way segment, an average of 15 building per block for one way section versus 22 buildings per block for two way segment. One way blocks building density ranges between 2 and 29, while two way blocks range between 17 and 21. Property values on two way blocks seem to be generally higher when compared to their one way counterparts, average value per building is \$97,178 for one way blocks versus an average value per building of \$146,994 for two way blocks. The average value per building on the one way blocks range from \$47,879-\$412,370 and the average value for two way blocks range from \$99,635-\$173,600.

TABLE 1. Valuation by Block Breckinridge

Bloc k	One Way or Two Way	Number of Buildings	Total Value of Buildings	Average Value per Building
200	One	6	\$ 632,050	\$ 105,341.67
300	One	15	\$ 1,231,940	\$ 82,129.33
400	One	4	\$ 824,180	\$ 206,045.00
500	One	12	\$ 912,120	\$ 76,010.00
600	One	14	\$ 836,520	\$ 59,751.43

700	One	28	\$ 1,340,620	\$ 47,879.29
900	One	2*	\$ 824,740	\$ 412,370.00
1000	One	29	\$ 2,768,890	\$ 95,478.97
1100	One	20	\$ 1,976,780	\$ 98,839.00
1200	One	11	\$ 2,159,930	\$ 196,357.27
1300	Two	17	\$ 1,693,810	\$ 99,635.88
1400	Two	28	\$ 4,860,800	\$ 173,600.00
1500	Two	21	\$ 3,147,050	\$ 149,859.52

Notes: * Indicates only industrial buildings on the block

When it came to vacant lots there were none present on the 1300, 1400 or 1500 block. There was only one foreclosure and one vacant structure listed on the two way segment of Breckinridge. However, there were eight vacant housing units, two vacancy lots and two foreclosures on the one way section of Breckinridge.

Trees

The presence of trees along the street and sidewalk serve important purposes. First, they reduce the heat island effects of the area. This is particularly important in Louisville since it is rated as one of the worst heat island cities in the US. Second, they increase the attractiveness of the area and encourage walking and alternative transportation. Third, hedonic price studies have found that trees add value to nearby properties. Fourth, the presence of trees serve as traffic calming measures. Fifth, they reduce sun glare during sunrise and sunset, making the streets safer. Considering these three reasons, it would be an important preliminary step to understand if tree presence is different between one way and two way segments of Breckinridge. In order to collect this data we surveyed the total number of trees present along the street and sidewalk of the blocks in this study.

Data concerning the presence of trees is listed in Table 2. The number of trees present on one way segments ranges from 0-24 with an average of 8.7 trees per block, while the number of trees present on two-way sections range from 16-31 with an average of 21 trees per block. Furthermore, when examining the maturity of the trees it seems that two way segments tend to have more mature trees when compared to their one-way counter parts. From this it is clear there are less trees on the one-way sections of Breckinridge, which could prove to have negative externalities in terms of air quality, attractiveness and traffic conditions.

TABLE 2. Presence of Street Trees

Block	One or Two Way	Number of Trees
200	One	0
300	One	4
400	One	5
500	One	7
600	One	7
700	One	7
900	One	19
1000	One	10
1100	One	4
1200	One	24
1300	Two	16
1400	Two	18
1500	Two	31

Broken Window Assessment

While on its own tree canopy may not have an impact the visible implications of their impact are clear in our broken window assessment. Homes on the one way segments show significantly more signs of neighborhood distress than homes on two way segments – where homes are well maintained and streets amenities appear more plentiful. In general as our assessment shows sidewalks in front of these one-way streets are very poorly maintained and unusable for anything with smaller wheels. The condition of them, along with the fast-moving traffic on the one-way street, suggests a desire to invest only in non-local traffic movement over local access and infrastructure.



Photo by Brad Cronin

FIGURE 2: Homes on the 500 and 600 blocks of Breckinridge. The homes for the majority of the one-way portion of Breckinridge St. are in poor to uninhabitable condition. While some examples of homes in fair condition exist, they do not exist in any significant number or concentration.



Photo by Brad Cronin

FIGURE 3: A pair of homes is pictured here on the 600-700s blocks of Breckinridge St, open to one-way traffic. On-street parking is allowed on both sides of the street with the exception of morning rush hour when no car (resident-owned or otherwise) may be parked in the right lane. Traffic is controlled by signals.

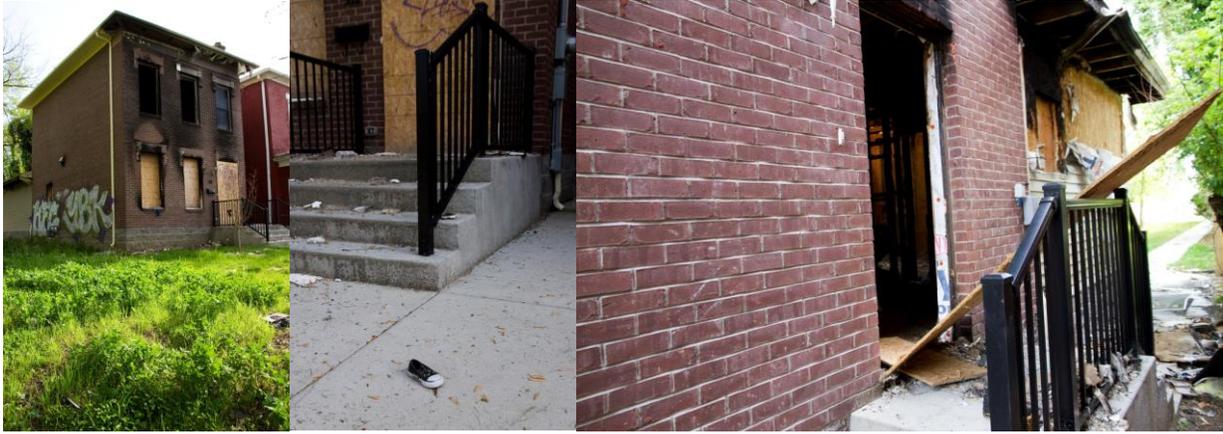


Photo by Brad Cronin

FIGURE 4: A home destroyed by fire on the 500 block of Breckinridge is pictured first. The doorstep of the same home is pictured second. The side entrance of the home is pictured below.



Photo by Brad Cronin

FIGURE 5: An abandoned vehicle is pictured inside of a fenced, empty lot on the 800 block of Breckinridge Street. In the background is a much larger empty lot on the 900 block, west of the railroad overpass.



Photo by Brad Cronin

FIGURE 6: Homes on the 1300-1400 blocks of Breckenridge. Most homes are very well maintained and exhibit significant investments including recent paint application, elaborate landscaping, and new roof shingles, siding, and or windows. The sidewalks on this portion are well-maintained and provide useful infrastructure for pedestrians, children on bicycles and skates, people using wheelchairs or mobility scooters, and for stroller usage. For the most part, tree cover is good on this portion of Breckinridge St. Pedestrians would not need to travel far between tree canopies. A sidewalk on the 1300 block of Breckinridge is pictured below.

DISCUSSION

In a recent press release, Mayor Fischer of Louisville announced the following:

Breckinridge (and Kentucky Streets) will be reconfigured from three driving lanes during peak hours and two driving lanes during off-peak hours to two driving lanes during peak hours, a single driving lane during off-peak hours, and a bicycle lane.

These roadway reconfigurations are a proven way to increase safety for drivers, pedestrians and cyclists. Traffic tends to move at reduced speed but with greater efficiency because of not having to stop behind drivers waiting to make left turns. Drivers face fewer blind spots because they face only one lane of opposing traffic at a time, reducing crashes up to 34 percent.

Pedestrians also benefit from fewer blind spots along with having to cross only three lanes of traffic instead of four. Bike lanes provide cyclists with the same benefits as pedestrians and allow them to move more safely in parallel with automobile traffic. There is also a benefit to local businesses as drivers are more likely to notice them under the reconfigured conditions.

The Mayor claims this is a "road diet" but it's a speedway with cars going as fast as 50 to 60 miles an hour. The Mayor's proposal is opposed by most wise green urban thinkers including Jeff Speck, Andres Duany and Marilyn Melkonian (2.5 billion dollars in new housing construction including \$35 million in West Louisville) who has seen this. Our metrics provide the best evidence yet against the continuation of multi-lane one way streets hurts and destroys neighborhoods. City planners also noted that these arguments "made sense" and should be acted upon.

We show that calm, two way streets with trees make neighborhoods grow. In a recent study we showed that the conversion to two way streets has significant reduction in accidents, foreclosures and abandonment along with an increase in property values. In this analysis we show comparable results with a more human touch – including photographs and representative samples from neighborhoods using our broken window analysis.

Despite this work, the consultants who carried out this transportation design plan claimed that two way conversion, "...is not part of the discussion." The Mayor's bike planner claimed we had no data to back up these claims and wanted to see the full report. He then suggested that our sources were questionable. We told him that they came from government sources like Property Value Administration data, Census data, police reports and photographs, however there was no rapid move to do anything but promote a future of auto-mobility.

Put simply, there is no urban science that shows that maintaining multi-lane one way streets will increase the livability of neighborhoods, however our data shows that if urban policy makers consider two-way streets it has the potential to shape change. Perhaps abandoned homes would be fixed up, crime would fall, accidents would be reduced and reinvestment would occur. Struggling restaurants would also see increased patronage and general economic condition could be improved. We show that this type of livability gain may be achievable if communities are willing to reinvest in their streets as multi-modal corridors that support bikes and pedestrians in addition to cars.

Yet the reality from our experience in Louisville is that policy makers need additional justification. While it may be obvious to planners that maintain a street such as Breckinridge as

a multi-lane, one-way street is not a good plan and will further erode urban quality of life. Fixing the bombed out homes along the corridor by solving the streets is not as obvious to policy makers and politicians. After making promises to convert downtown streets from multi-lane, one-way streets to two-way, not much has happened in Louisville. More research is needed to create win-win scenarios for business, homeowners, children, urban pioneers, bikers, and walkers, including:

Illustrating tax benefits: How much more in tax revenue has been collected by the city on properties on the converted streets? How much more would it be if the three one way streets in question were converted if that factor were applied to all properties on those streets? What would it be if all one way streets were converted and the increase factor applied to the properties on them?

Quantifying safety: How many fewer crashers have occurred on the converted streets? Can that reduction be quantified into lives saved and \$\$ saved through fewer injuries, less lost work, less calls to ambulances, etc.? Are crashes higher in multi-lane one way streets because the visibility of the driver adjacent to a sidewalks reduced with cars moving behind the parked car?

Comparing business creation: Compare number of business opened vs. closed on converted streets vs. a control group of three unconverted streets?

Calculating neighborhood reinvestment: Compare number of renovation permits pulled vs. demolition permits pulled (and calculate the loss of property tax that comes with vacant lots)?

Compare population changes and reduction in crime: Do safer streets bring more people to live and reduce crime? How many people are walking about on converted vs. unconverted streets?)

IMPLICATIONS & CONCLUSION

This study reinforces our earlier work discussed above by looking at one street which has parts multi-lane one-way and other parts calm two ways. This research adds to our understanding of how important traffic calming is for the livability of a city. We also show how multi-lane one way streets decrease the amount of trees which creates a heat island effect, a reduction in neighborhood housing valuation and increased abandonment.

Louisville's multi-lane one way streets are a disaster for neighborhoods resulting in greater crime, traffic accidents, and abandonment. If Louisville really wants to improve the safety and quality of neighborhoods, it should start immediately by converting its multi-lane one-way streets back to two-way traffic that result in slower car speeds and encourage greater use by pedestrians and bikes. Neighborhoods become more livable, safer and prosperous when residential streets are calmer.

While cities have rushed to convert multi-lane one way streets few rigorous studies have been done to look at traffic calming impacts. Our study clearly shows that they matter. Two-way streets can improve the livability of a neighborhood with a significant increase in property values and neighborhood well-being.

And in our case the neighborhood is being reborn. Property improvements on the two-way streets have nearly doubled, thanks to neighbors complaining and Dr. Jim Mims responding with aggressive code enforcement mandating property upgrades. The sight of dumpsters, scaffolding, and home improvement trucks have replaced prostitution, drug dealers and fencing operations. The streets are being reclaimed by babies in carriages, joggers, bikers, retirees, same sex couples, and hipsters.

Neighborhoods with multi-lane one ways have needlessly suffered for too long. Cities now need bold leadership that enacts proven policies that work and responds to neighborhood demands. Traffic calming works. It's a win-win for the city, neighborhoods, children, developers, and homeowners.

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