PUTTING PEOPLE FIRST

An Alternative Perspective with an Evaluation of the NCE Cities "Trillion Dollar" Report

by

Wendell Cox

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AUTHOR:

Wendell Cox a senior fellow with Center for Opportunity Urbanism. He is also Chair, Housing Affordability and Municipal Policy for the Frontier Centre in Canada and serves a member of the Board of Advisors of the Center for Demographics and Policy at Chapman University. Wendell Cox is also principal of Demographia, an international public policy and demographics firm.

He is co-author of the "Demographia International Housing Affordability Survey, which annually rates housing affordability in more than 350 metropolitan areas in nine nations. He is also author of "Demographia World Urban Areas, an annual resource that estimates the land area, population and density of urban areas with at least 500,000 population. Wendell Cox was appointed to three terms on the Los Angeles County Transportation Commission, which was the top mass transit and road policy body in the largest U.S. county. H also served as a visiting professor at the Conservatoire National des Arts et Metiers in Paris.

He has a bachelor's degree in Government from California State University, Los Angeles and a Masters in Business Administration from Pepperdine University in Los Angeles.

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ABSTRACT

A fundamental function of domestic policy is to facilitate better standards of living and minimize poverty. Yet favored urban planning policies, called "urban containment" or "smart growth," have been shown to drive the price of housing up, significantly reducing discretionary incomes, which necessarily reduces the standard of living and increases poverty. This makes the alleviation of poverty, the opportunity for better living standards and aspirations for upward mobility secondary to contemporary urban planning prescriptions. Despite this, calls to intensify land use regulations are becoming stronger and more insistent.

A New Climate Economy report (NCE Cities report), by Todd Litman, "Analysis of Public Policies that Unintentionally Encourage and Subsidize Urban Sprawl," contends that the failure to implement urban containment policy (smart growth) costs more than $1.1 trillion annually in the United States. The urban containment policies favored by the NCE Cities report seek to substantially increase urban population densities and transfer urban travel from cars to transit, walking and cycling.

There are serious consequences to such policies, which lead to lower standards of living and greater poverty. This report evaluates the NCE Cities report which places urban containment policy as its most important priority. This Evaluation report offers an alternate vision, focused on improving living standards for all, while seeking to eradicate poverty.

The NCE Cities report relies heavily on social costing and externality analysis of lower density development. While these are useful tools, they are ultimately subjective and should be used with great caution.

This Evaluation identifies a number of issues with respect to the NCE Cities report cost analysis.

1. Nearly 90% of the cost is attributable to personal vehicle use, and is based on a fixed cost per mile differential between the Most Compact (densest) quintile of US urban areas and the four quintiles that are less dense. This Evaluation finds a range of differences in per capita mileage among the quintiles that is far smaller than the NCE Cities report estimates. Adjustment for this and other issues would reduce the NCE Cities report cost estimate by more than 80 percent, to a maximum of approximately $200 billion.

    Other, unquantified issues are identified that could reduce estimate even further.

2. The NCE Cities report largely dismisses the housing affordability consequences of urban containment policy. By rationing land, urban containment policy drives up the price of housing and has been associated with an unprecedented loss of housing affordability in a number of metropolitan areas in the United States and elsewhere. Urban containment policy has also been associated with greater housing market volatility. This is a particular concern given the role of the 2000s US housing bubble and bust in precipitating the Great Financial Crisis that resulted in a reduction of international economic output.

3. Urban containment policy has significant negative externalities. A recent economic analysis associates an annual loss of nearly $2 trillion in gross domestic product in the United States with more stringent housing regulation. This estimate would

nullify the NCE Cities report cost of dispersion estimate by more than 1.5 times. More significantly, it would dwarf the NCES Report cost estimate as adjusted in this Evaluation .

The purpose of public policy in cities is not to focus a particular urban form, planning philosophy, type of housing, population density, or mode of transport. The purpose is rather to seek better lives for people. The most appropriate form of urban planning policy is that which facilitates better living standards and less poverty. There is increasing evidence that urban containment policy is not only irreconcilable with housing affordability and price stability but also with better standards of living and reduced poverty.

> *"The purpose of public policy in cities is … to seek better lives for people"*

1. INTRODUCTION

Around the world there is considerable and deserved concern about standards of living and poverty. This was illustrated in the communiqué from the G-20 Summit in Brisbane in November. Governments from countries as diverse as China, Russia, France, Japan, Canada, Australia, the United States and 14 others adopted a communiqué declaring "better living standards" as the highest priority and a commitment to poverty eradication.[1]

Short of maintaining the rule of law and preserving order, governments probably have no higher domestic priority than facilitating higher living standards and eradicating poverty. Obviously this requires economic growth. But it also requires that public policies not reduce discretionary incomes by unnecessarily driving up household expenditures Indeed, discretionary income --- the financial resources left after paying taxes and paying for necessities such as housing, food, clothing and transportation --- must be maximized, because it determines both the standard of living and the extent of poverty. Moreover, higher living standards and less poverty enable greater opportunities by encouraging aspiration.

A recent NCE Cities report Analysis of Public Policies that Unintentionally Encourage and Subsidize Urban Sprawl, (the "NCE Cities" report) reflects a general preoccupation with urban form that is all but universal in planning circles. The NCE Cities report was authored by Todd Litman, of the Victoria Transport Policy Institute.[2] The NCE Cities report advocates "smart growth" policies ("urban containment").It concludes that the social costs of urban dispersion ("urban sprawl") in the United States exceed $1 trillion annually. One purpose of the NCE Cities report is to provide advice to top public officials in the developing world on urban policy. The perspective of the report is that urban containment is preferable to more dispersed development patterns.

The urban containment policies advocated by the NCE Cities report call for substantial increases in urban population densities and discouragement of automobile use. The consequences of such policy options are the subject of this report.

For decades, urban policy in some nations has been based on a philosophy that seeks to stop the physical expansion of cities (urban areas). This expansion is commonly referred to as "urban sprawl." Urban containment policy also seeks to minimize the use of automobiles and sport utility vehicles, while encouraging travel by mass transit, walking

and cycling.

When implemented, the principal policy instrument has been stronger land-use regulations on urban peripheries, often including urban containment boundaries beyond which development is either severely restricted or even prohibited. These policies are referred to as "urban containment" and by other labels, such as smart growth, compact city policy, urban consolidation, livability and growth management.

Urban containment policy can conceivably reduce the physical expansion of cities, however, as The Economist put it,the consequences are "severe."[3] The problem is basic economics. Restricting the supply of a demanded good, such as land for new residential development, leads to higher prices, all other things equal. Urban containment restricts the supply of available land, which makes housing and other development more expensive for all households.

The result is higher housing prices relative to middle class incomes. High housing price-to-income ratios are generally evident over time where urban containment has been implemented, in contrast to urban areas that have retained more liberal land-use policies. More recent research has indicated significant economy wide consequences (Section 3).

In a sense, urban policy has been sidetracked to a secondary objective of developing an urban model that fits the predilections of planners. It also appeals to some private developers, who might benefit from such restrictions. The focus of policy should be principally on improving living standards and reducing poverty. The nature of the urbanization that produces such results is secondary. This Evaluation shares the G20 perspective, viewing better living standards and the eradication of poverty as primary purposes of domestic policy.

This Evaluation does not favor any particular urban form, planning philosophy, type of housing, population density or mode of transport. These are means – that may or may not further the objective of a better standard of living and eradicating poverty. Land use regulations should be adopted based on the extent to which they are consistent with improving the standard of living and reducing poverty. This Evaluation reviews the NCE Cities, report from this perspective.

2. COST ANALYSIS

The heart of the NCE Cities report is a $1 trillion estimate of the social costs of urban dispersion in the United States. This section provides an overview of relevant social costing issues and evaluates the specific costs calculations from the NCE Cities report.

2.1
SOCIAL COSTS: CONTEXT

Social costs are the combined direct costs borne by users plus any uncompensated external costs or externalities (costs imposed on to others without their consent). Noise and air pollution costs effects are examples of externalities.

The standard view among economists is the following: "When all voluntary transactions have been entered into by market transactors, there still remain some interactions that ought to be internalized but which the market forces left to themselves cannot cope with."[4] Externality analysis attempts to estimate (replicate) the prices that would exist if they were established in the market.

But the textbook discussion ignores critical problems. First, what is the magnitude of these unpriced interactions? Can they be objectively estimated? What is the cost of rectifying the problem? If there is a cost, can it be reduced without incurring even greater costs? (Is the cure

worse than the disease?) Who will do the fixing? Economists also point to inevitable problems of politics ("government failure") that must be addressed before politics is invoked to correct a "market failure."There is often anything but full agreement on externalities, their costs and possible corrective pricing: [5]

> "... Externalities, for example, are in the eye of the beholder."

Social costing expert Mark DeLucci[6] of the University of California, Davis indicated that best estimates of externalities can vary by an order of magnitude (10 times).Taking this range, for example, the lowest estimate for a non-market cost might be $1,000, while the highest estimate might be $10,000.DeLucci continues: "although further research and analysis can in principle reduce this uncertainty, they might not reduce it enough for us to pick the "right" price with confidence, especially for environmental externalities."

> DeLucci continued:
> *Even if we could estimate the right prices precisely, it would be difficult to install efficient pricing. Ideally, prices would not be fixed for a vehicle mile of travel or gallon of fuel rather they would vary with the factors that determine the external cost being priced: ambient conditions, road attributes, traffic characteristics, exposed population, and so on. But it would be difficult to measure these in real time.*

DeLucci highlights the variances that occur in external cost estimates, using his own extensive work for the United States Federal Highway Administration. DeLucci's estimated non-market costs of the automobile and other forms of transport show that from low to high, there was a difference of 450%. The range was even higher in air pollution costs, at more than 1500%. Parking had a low estimate of

zero, which means its variation cannot be measured, since dividing by zero yields an undefined result.

It is no surprise then that there can be large differences between externality estimates prepared by different sources. For example, based on his analysis, DeLucci indicated a range from $0.09 to $0.45 per mile for the automobile, with a best estimate of $0.12.[7] The NCE Cities report placed the external costs of the automobile at $0.48 per passenger mile. This is four times the DeLucci best estimate (all data adjusted to 2014$).[8]

Further, not all analysts include the same social costs. For example, DeLucci includes full costs of mass transit (including subsidies). The NCE Cities report does not consider the social costs of mass transit (Section 2.21e).

Externalities, which must be estimated, rather than directly observable in the market, are subject to inevitably large uncertainties both in space and time. The market then, other things being equal, objectively determines prices, even though they may swing substantially over time (like prices in stock markets). In contrast, non- market prices are based on best estimates, a necessary reality given their theoretical origin, whether academic, political or by other non-market processes.

DeLucci suggests that: "One might reasonably be skeptical of building policy on such compounded uncertainty." DeLucci cautions against using such analysis to determine public policy, suggesting instead its optimal role should be in informing political debate.

One such example is the substantial progress in reducing road fatalities through product advances and regulatory action (Box 1).

ROAD FATALITIES

The United States has experienced a massive decline in road fatalities per mile traveled. This is illustrated by comparing the number of fatalities and driving in 1946 torecent data. In 1946, there were 0.2 cars per capita in the United States. Driving was 340 million miles per year. There were 31,900 traffic fatalities.

By contrast, data from the most recent year (2013) that there were nearly 0.75 light vehicles (cars, personal trucks and sport utility vehicles) per capita, an increase of 275 percent from 1946. Driving was approximately 3 trillion miles, approximately ten times as much as in 1946. Yet, in 2013, there were only 32,700 traffic fatalities, little above 1946. In the interim fatalities rose to a peak of nearly 55,000 in 1972, when driving volumes were 60 percent below 2013. The National Highway Traffic Safety Administration noted that the 2013 results represented a 25 percent decline in fatalities in only 9 years and that the fatality rate is at an historic low. [9]

Further progress seems likely to be made, especially with the greater penetration of crash avoidance systems and, in the longer term, automated vehicles.

2.2
THE NCE CITIES REPORT COST ANALYSIS

Beyond the inevitable uncertainties over the magnitudes of external costs, there are problems with the specific cost analysis developed in the NCE Cities report, the most important of which are described below.

THE NCE CITIES REPORT QUINTILES

The NCE Cities report estimates the incremental social costs of urban dispersion on a scale of compactness to dispersion. It differentiates estimated costs between the most compact and the most dispersed cities, with the cities divided into quintiles (fifths). The social cost estimate of $1.1 trillion is the sum of the cost differences between the Most Compact quintile (which has the lowest estimated cost according to the NCE Cities report). The criteria for assignment to these "NCE Cities" quintiles is not clear, nor are the urban areas assigned to each quintile indicated.

The NCE Cities report calls Quintile 1 the "smartest growth" quintile (hereinafter referred to as the "Most Compact" quintile) and Quintile 5 is called the "most sprawling" quintile (hereinafter referred to as the "Most Dispersed" quintile). [10] NCE Cities report Table 11 indicates that the quintiles are based on the "Sprawl Index," [11] which rates metropolitan areas in the United States using compactness/ dispersion index.

However, footnote #5 on page 44 (which apparently refers to note #2 in NCE Cities report Table 11), gives an indication that the quintiles are defined by urban population density: "Based on the range of densities reported in large U.S. urban areas reported in FHWA 2012, Table HM-72." [12] The lack of clarity arises from the fact that the two measures, the "Sprawl Index" and the "range of densities

of large urban areas" differ, though are likely to be similar, because density is a component of the index. No selection criteria for selecting the "large US urban areas" is indicated. FHWA Table HM-72 includes data for more than 400 urban areas, ranging in size from populations from 50,000 to nearly 18 million.

The pivotal element in the NCE Cities report cost element is range in the vehicle miles per capita estimated by quintile. Approximately 90% of the costs are determined by the differences vehicle mileage per capita between the NCE Cities report quintiles (Section 2.21a).

Because of these factors, it was not possible to directly replicate the NCE Cities report Quintiles. This made it necessary to develop an alternative quintile analysis (the Replication Quintile) necessary for evaluation of the NCE Cities report cost analysis.

THE REPLICATION QUINTILE ANALYSIS

This Evaluation constructs an alternative compactness/dispersion quintile analysis (the Replication Quintile analysis), based on the most recent data. According to the NCE Cities report, "large urban areas" were used to define the quintile ranges in the NCE Cities report.

For the purposes of compact/dispersed quintile analysis, it was assumed that a larger urban area would be at the core of a metropolitan area of more than 500,000 population. These criteria are used for the Replication Quintile analysis, which yields 102 areas.

The quintiles are determined based on the urban area [13] population densities within each metropolitan area (Appendix A). The quintiles are population weighted, so that each quintile includes approximately the same population. The Replication Quintiles include a 2012 urban area population of 173 million, 68 percent of the nation's urban population (253 million [14]). The definitional difference between metropolitan areas and urban areas is indicated in Figure 1.

In the Most Compact quintile, all of the metropolitan areas have overly restrictive land use policy, especially urban containment policy. A number of the metropolitan areas in the More Compact quintile also have such policies. The Most Dispersed quintile is dominated by metropolitan areas that have more liberal land use policies. The relationship between restrictive land use policy (especially urban containment policy) and higher house prices is described in Section 3.

Physical & Functional Forms of the City
Urban Areas & Metropolitan Areas

Figure **1**

GENERIC CITY FORM with description	Includes		
	Urban Core	**Suburbs** Inside the Built-Up Area	**Exurbs** Outside the Built-Up Area
URBAN AREA - Physical City with Built-Up Area	YES	YES	NO
METROPOLITAN AREA - Functional City (Economic City) Labor Market	YES	YES	YES

2.21
EVALUATION OF COST FACTORS

The NCE Cities report Quintile analysis indicates a "stair step relationship "in which incremental costs per capita rise from the lowest in the Most Compact quintile, and rising through each of other quintiles to the highest costs in the Most Dispersed Quintile (Figure 2). [16] There are consistent "compactness/dispersion" factors, which the text indicates represent "the change in an impact for each one-quintile" shift. [17]

### 2.21 a
PER CAPITA MILEAGE COSTS BY QUINTILE

The largest purported compactness/dispersion cost difference is related to vehicle usage. The NCE Cities report multiplies the estimated vehicle miles in each quintile by a fixed cost per mile (Section 2.21b). The difference in these costs in Quintiles 2 through 5 relative to the Quintile 1 costs represents $1.00 trillion of the $1.14 trillion estimated cost (nearly 90%). According to the NCE Cities report, the Most Dispersed quintile (Q5) had average annual per capita mileage 120 percent higher than that of the Most Compact quintile (Q1) in 2012. [18]

A Replication Quintile analysis was used for comparison to evaluate the per capita miles traveled estimates in the NCE Cities report. The steps in developing these alternative estimates are described below.

(1) "Total Miles Traveled:" Total vehicle miles traveled by urban area were for 2012 were from FHWA Table HM-72 (2012). [19]

(2) "Commercial Truck Factor:" A downward adjustment of 8.0 percent [20] was made to estimate light vehicle travel (cars, light trucks and sport utility vehicles). [21] This required removal of other vehicle travel, such as "2-axle, 6-tire or more and combination trucks (semis), many of which are commercial. The NCE Cities report includes other vehicle travel(Figure 3). [22]

## NCE Cities Report Quintile Milage
PER CAPITA ESTIMATED 2012
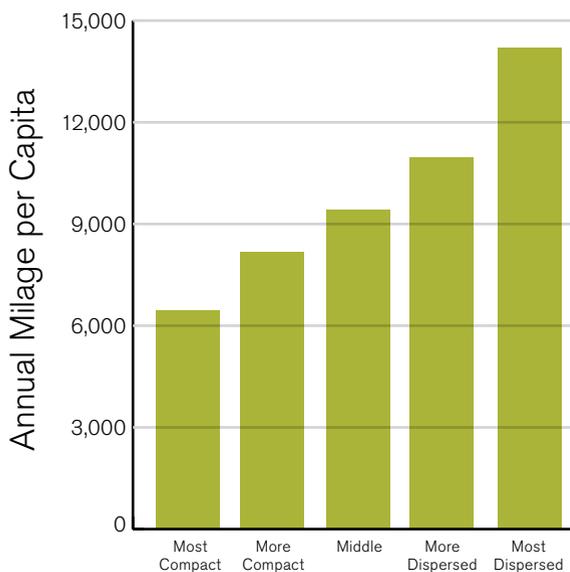
From "NCE Cities" Report Table 11 Converted from kilometers

Figure 2

Annual Vehicle Mileage Per Capita
UNITED STATES: 2012
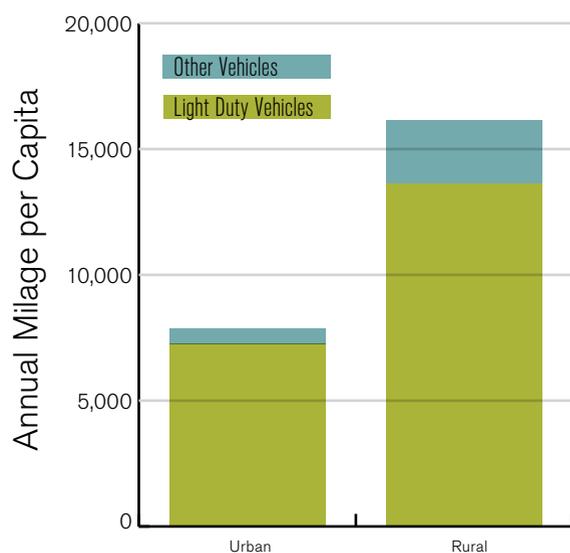
Derived from FHWA 2012 Table VM-1

Figure 3

(3) "Census Urban Area Factor:" Another downward adjustment was required to account for the excess vehicle travel in FHWA urban areas that is not attributable to the Census urban area population. The vehicle miles in FHWA Table HM-72 relate to the FHWA urban areas, which cover more land area than the Census urban areas (the source of the population data). More often than not, the land area of FHWA urban areas, as indicated in FHWA Table HM-72 are larger than the Census bureau urban areas. [23] FHWA urban areas tend to be enlarged for planning purposes. [24] However populations are typically not adjusted upward to account for the additional population living in these larger areas. The travel data by urban area is based on these larger land areas, which contain more people than the Census Bureau urban areas. The exclusion of this additional population leads to an overstatement of per capita vehicle travel. To account for this discrepancy, it was assumed that the average resident in FHWA urban areas travels the same distance annually as all urban residents. [25] This required a 3.8 percent downward adjustment from the overall light vehicle mileage estimate.

(4) The total light vehicle travel in Census urban areas was divided by the 2012 estimated urban area population from the American Community Survey, to obtain an estimate of 2012 vehicle miles per capita in the urban areas. [26]

Because there are no readily available data by urban area for the commercial truck and urban area adjustments, the same downward adjustment factors were applied to all of the Replication Quintile urban areas.

The Replication Quintile analysis resulted in a far smaller range in per capita mileage between the Most Compact and Most Dispersed Quintiles than the NCE Cities report Quintile analysis (42 percent versus 120 percent).

A "benchmark" analysis was also performed, using 2010 data and all urban areas to test the NCE Cities report Quintile analysis and the Replication Quintile analysis for 2012. The results of the Replication Quintile analysis were closer to the Benchmark test than the NCE Cities report Quintile analysis (Appendix B).

Quintile Analyses: Average Mileage per Capita

Table 1

Quintile	NCE Cities Quintile Analysis (2012)	This Evaluation Replication Quintile (2012)	This Evaluation Benchmark Test (2010)
Most Compact (Q1)	6,452	6,024	6,235
More Compact (Q2)	8,186	6,630	6,660
Middle (Q3)	9,423	7,063	7,370
More Dispersed (Q4)	10,982	7,409	7,719
Most Dispersed (Q5)	14,218	8,536	8,548
Average Urban	9,482	7,129	7,304
RANGE (Q5/Q1)	**120%**	**42%**	**37%**

NCE Cities & Evaluation Mileage

PER CAPITA QUINTILE ESTIMATES: 2012

Figure **4**
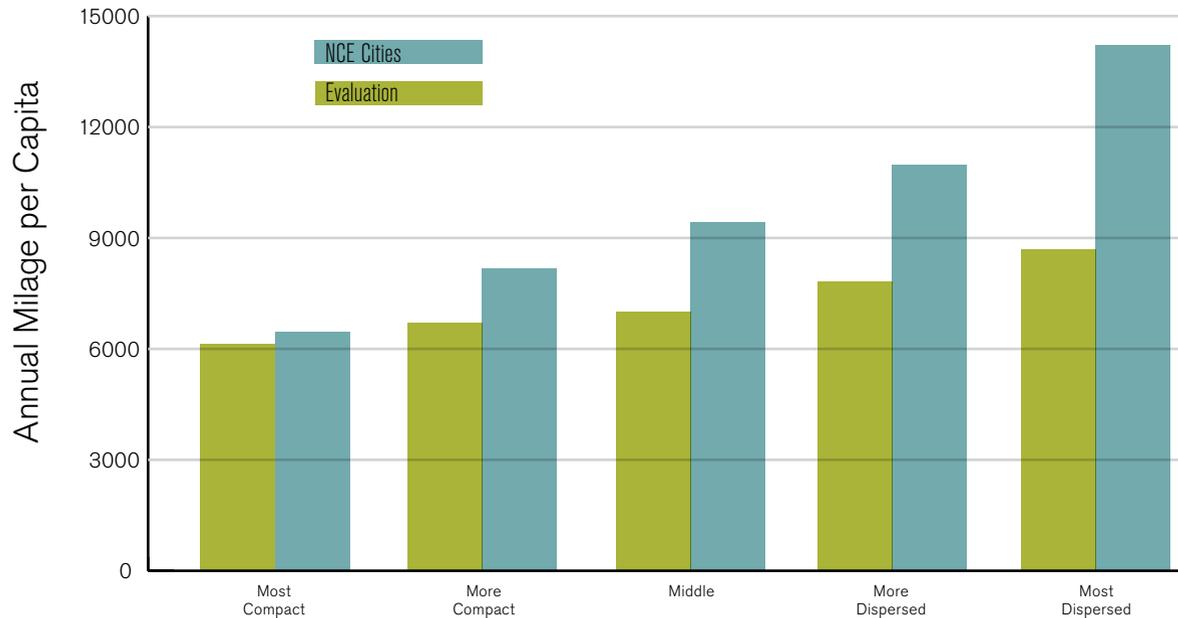
Calculated from American Community Survey: 2012

The estimates from the NCE Cities report, this Evaluation's Replication Quintiles and the Benchmark test are shown in Table 1 and Figure 4.

Source of the Higher NCE Cities Report Mileage Estimates: The NCE Cities range of vehicle travel per capita appears to be based on FHWA Table HM-72, [27] which reports 2000 population and 2012 travel data. Between 2000 and 2012, there were substantial population increases, which were heavily weighted toward the more dispersed quintiles.

The lower mileage estimates in the Replication Quintile analysis are the result of excluding trucks (except for light vehicles), using light vehicle per capita travel, rather than all vehicle travel

per capita travel (including trucks) and calculating per capita urban travel using population data for the same year as the vehicle travel data (2012).

Cost Adjustment: The NCE Cities report estimates vehicle costs using a fixed cost per mile. Use of the range from the Replication Quintile would substantially reduce vehicle costs (as would also be the case if the range in the Benchmark test were used). Applying this mileage range to the NCE Cities report estimates would reduce the NCE Cities report costs by approximately two-thirds or approximately $680 billion.

Congestion Cost per Capita: 2011

Figure **5**

REPLICATION QUINTILE ANALYSIS
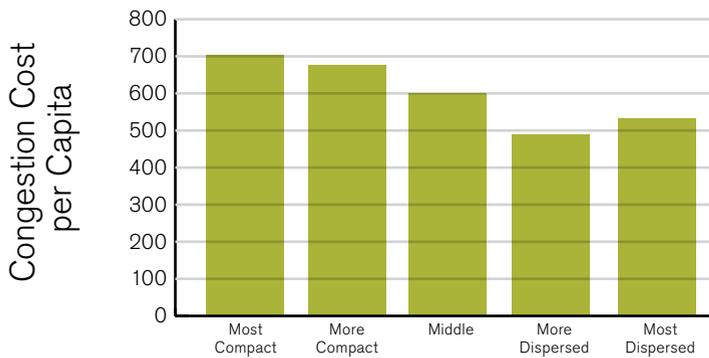
Calculated from Texas A&M Transportation Institutie data

2.21 b
CONSUMER EXPENDITURES ON VEHICLE TRAVEL

In addition to the apparent over-estimate of vehicle travel, the NCE Cities report uses vehicle internal costs per capita that are more than 50 percent above the consumer expenditures reported by the US Department of Labor Bureau of Labor Statistics (BLS). [28]

The NCE Cities report assumes $0.71 cents per mile for internal costs (direct consumer costs). [29] This compares to the actual consumer expenditures, as reported by the Bureau of Labor Statistics on light duty vehicles [30] of $0.41 in 2014 dollars, including all expenditures for purchases, gasoline, maintenance, repairs, insurance and parking. [31]

Part of the difference is likely to be an overstatement of vehicle purchase costs per mile (depreciation), which is often calculated using a vehicle life that is considerably shorter than seen in actual practice (average vehicle life has increased substantially in recent decades). [32]

An additional adjustment to account for this difference would further reduce the costs outlined in the NCE Cities report. Reconciliation of the internal costs to the consumer expenditure mileage rate would reduce the NCE Cities report costs another $80 million.

2.21 c
COST FACTORS NOT WHOLLY RELATED TO MILEAGE

The NCE Cities report estimates the cost of vehicle travel between quintiles using a standard cost per mile for each factor. Thus, each additional mile of travel increases the cost estimate by the same amount. However, the actual relationships appear to be reversed from the NCE Cities report assumption, while in other cases there is a less than "one-to-one" relationship between the factor and mileage. For example:

Some costs the NCE Cities report considers to be mileage related appear to be negatively related to mileage. For example:

- Texas A&M Transportation Institute data indicates that congestion costs per capita are highest in the Most Compact quintile and lower in the more dispersed quintiles (Figure 5). The excess time spent in traffic congestion (relative to free flowing traffic) during peak hours is 90% greater in the Most Compact Quintile then in the Most Dispersed Quintile. [33] Further, international traffic reporting organizations generally report greater congestion in more compact cities. [34]

- Insurance costs may be higher in more dense urban areas. According to "carsdirect.com," higher population densities are associated with higher insurance rates. [35]

Other factors appear to be less than directly related to mileage, contrary to the treatment in the NCE Cities report. For example:

- Fuel consumption per mile is significantly increased in traffic congestion (fuel economy is retarded), because traffic flows become more erratic (there is more starting and stopping)

and more idling. [36] A flat mileage rate, such as used in the NCE Cites report will tend to understate costs in more congested, generally higher density areas and overstate costs in less congested, less dense areas. [37] For example, Texas A&M Transportation Institute data indicates that wasted fuel per capita in the highest density quintile cities is approximately 35% higher than in the lowest density cities. [38]

- As noted above, traffic congestion tends to be greater in more dense urban areas. This can result in higher maintenance and repair costs per mile, such as from greater engine wear, shorter tire life and more frequent brake replacement.

There is not sufficient information to adjust the NCE Cities report cost estimate to account for reductions from factors not wholly related to vehicle mileage.

2.21 d
PROPERTY TAXES

The NCE Cities report estimates local public service costs, in part using property tax per capita.[39] The NCE Cities report assumes that property taxes per capita rise 10% between each quintile from the Most Compact to the Most Dispersed. In fact the Replication Quintile indicates an opposite relationship.

The Replication Quintiles uses actual US Census Bureau American Community Survey data to estimate property taxes per capita. This produces an estimate substantially different than the NCE Cities quintile analysis. Property taxes per capita in the Most Compact quintile are the highest and approximately 35% higher than in the Most Dispersed quintile. The Most Dispersed quintile has the lowest property taxes per capita.

Adjustment for this factor would substantially change the public service cost relationship between the quintiles. Costs would increase in the Most Compact and lower costs would result in the Most Dispersed quintile. Adjusting the NCE Cities report estimate to the actual data from the American Community Survey property tax estimates would reduce costs approximately $80 billion annually, in addition to the cost reductions noted above (Figure 6). This downward adjustment would be in addition to the downward adjustment in Section 2.21a and the unspecified downward adjustments in Sections 2.21b and 2.21c.

2.21 e
INFRASTRUCTURE AND MASS TRANSIT COSTS

The NCE Cities report indicates steadily rising infrastructure costs

Property Tax by Quintile

Figure **6**

REPLICATION QUINTILE ANALYSIS: 2012
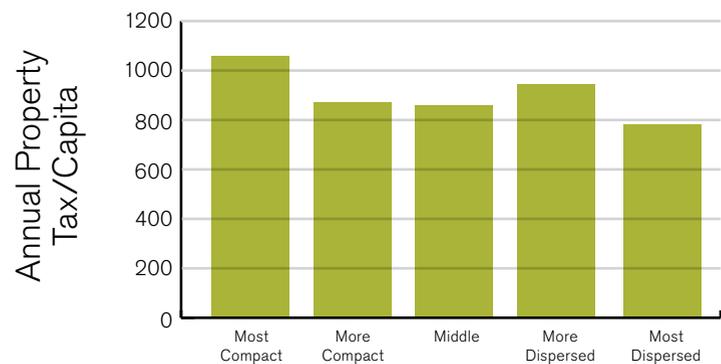
Calculated from American Community Survey: 2012

Figure **7**

## Quintile Infrastructure & Transit Costs
2012: NCE CITIES REPORT & THIS EVALUATION

the additional costs paid by taxpayers and road users to subsidize mass transit services. In the United States, these subsidies are, in the aggregate, more than 75% of mass transit capital and operations spending in 2012. [43]

The highest mass transit expenditures per capita, are in the Most Compact quintile ($646) and are more than seven times that of the Most Dispersed quintile (Figure 7). [44] The mass transit expenditure per capita difference between the Most Compact and Most Dispersed quintiles ($555) is more than double the NCE Cities report estimated difference in infrastructure costs between the same two quintiles ($248). [45]

Delucci (Section 2.1) generally finds that the external costs of mass transit are higher than those of the automobile. A parallel analysis of mass transit, including its externalities might have produced an even more substantial advantage for the more dispersed quintiles relative to the more compact quintiles.

Adjusting the NCE Cities report cost estimate to include mass transit would reduce costs approximately $90 billion annually, in addition to the cost reductions above. This downward adjustment would be in addition to the downward adjustments described in Sections 2.21a through 2.21d.

(roads, schools and utilities) between the Most Compact and the Most Dispersed quintiles. [40] The evidence cited in the NCE Cities report is from a single study performed by the Philadelphia regional planning agency covering its region. [41] However, the costs of "greenfield" development may not exceed those of "infill" development. For example, Gruen notes that: "... replacing obsolete and worn infrastructure is likely to be more expensive in older cities than building new infrastructure on vacant land in the suburbs..." [42]

As noted above, the NCE Cities report excludes the substantial infrastructure related expenditures on mass transit (Section 2.1). The Replication Quintile analysis estimates mass transit expenditures, using data from the US Department of Transportation Federal Transit Administration National Transit Database. These expenditures include not only those paid by consumers (fares), but

2.21 f
POTENTIALLY HIGH EXTERNALITY ESTIMATE

As was noted above (Section 2.1), non-market (externality) price estimates are subject to wide variation. The NCE Cities report estimates the externalities of the automobile at $0.48 per mile. By contrast, DeLucci's estimate is $0.12 (above) adjusted for inflation. The NCE Cities report estimate is four times that of DeLucci.

Further, there is an association between urban containment policies, favored by the NCE Cities report and higher housing prices relative to incomes. These impacts appear to spill over into higher costs in other sectors, including higher rates of poverty, lower standards of living and the economy in general. (Section 3). These costs could dwarf the NCE Cities report estimate.

2.22
SUMMARY OF ADJUSTMENTS

In contrast to the findings indicated in the NCE Cities report, the above re-evaluation would reduce the $1.1 trillion cost 82 percent, or by approximately $930 billion annually.

This would leave an NCE Cities report cost estimate of approximately $210 billion (Table 2).[46] The combined internal and external costs of urban containment policy arising from the associated higher house prices dwarf this figure, as we will explain below. (Section 3)

An estimate of externality costs covering all issues, together with addition of social costs not included in the NCE Cities reduce would reduce the figure even more, perhaps even offsetting the cost estimate altogether (Section 3.1). For example, as will be indicated in Section 3, the higher housing costs associated with urban containment policy could dwarf any reasonable estimate of the costs of dispersion.

Adjustments to the NCE Cities Report Cost Estimate
Table **2**
(Excludes some items, such as the costs of urban containment. See note)

FACTOR	AMOUNT
NCE Cities Report Cost Estimate	$1,140
Most Current Mileage (2.21a)	-$680
Property Taxes (2.21d)	-$80
Infrastructure & Mass Transit (2.21e)	-$90
Consumer Espenditure Adjustment (2.21b)	-$80
Total Adjustments	-$930
Adjusted NCE Cities Cost Estimate	$210
Minimum Downward	**82%**

Adjustment in Billions (rounded to the nearest $10 billion)

Note: Additional Downward Cost Adjustments. 1, Adjustments (Cost Reductions) Not Quantified: Costs not wholly related to mileage Factors (2.21c), and External Costs (2.21f). 2. Housing cost increases associated with urban containment policy are likely to more than offset any costs (Section 3).

3. MIDDLE-INCOME HOUSING AFFORDABILITY

The greatest difficulty with the NCE Cities report's cost analysis is its dismissal of the economic consequences from declining housing affordability that is associated with urban containment policy.

As noted above, the NCE Cities report indicates a perspective that favors urban containment policy ("smart growth"). There is considerable evidence of a significant link between the implementation of urban containment policy and higher house prices. Housing costs are the largest element of household budgets, [47] increases in housing costs can seriously lower the standard of living by reducing household discretionary incomes. Moreover, high house prices have a dampening effect on economic growth, resulting in less efficient allocation of economic resources, reduced consumer expenditures for other goods and services, and reduced employment levels from reduced consumption.

This section outlines the connection between urban containment policy and higher house prices.

3.1
THE ASSOCIATION BETWEEN URBAN CONTAINMENT AND HIGHER HOUSE PRICES

For decades, urban planning has focused to a large extent on combating "urban sprawl," the spatial expansion of cities. Urban planners have sought to limit or even prohibit building new housing outside the existing urban footprint. These policies are generally called "urban containment," and often include "urban growth boundaries" policies that restrict new greenfield urban development. Recently, The Economist magazine assessed the experience with such policy noting that:

"Suburbs rarely cease growing of their own accord. The only reliable way to stop them, it turns out, is to stop them forcefully. But the consequences of doing that are severe." [48]

The consequences, according to The Economist are that London has "almost no modern suburban houses and very high property prices." The housing affordability crisis is not limited to the London area, but extends to every urban center within the United Kingdom.[49] The housing affordability crisis also extends to virtually all markets in Australia and New Zealand and into markets with urban containment policy in Canada and the United States.

Because the NCE Cities report focuses on the United States, much of the housing analysis in this Evaluation will also focus on the United States.

MEASURING MIDDLE-INCOME HOUSING AFFORDABILITY

Metrics are required to measure middle income housing affordability. Price to income ratios may be the most widely used.[50] Price to income ratios have been used by many organizations, including the World Bank, the Organization for Economic Cooperation and Development (OECD), the International Monetary Fund (IMF), the Bank for International Settlements (BIS), national government ministries and others.

MIDDLE-INCOME HOUSING AFFORDABILITY IN THE UNITED STATES

Housing affordability is indicated by price-to-income ratios. A typical such measure is median house price divided by median household income (the "median multiple") or median house value divided by median household income. These ratios express house prices in terms of annual incomes, and thus an accurate

way of defining relative prices between metropolitan areas.

Between World War II and 1970, virtually all major US metropolitan areas [51] had price-to-income ratios [52] of 3.5 or less, based on data reported in the decennial censuses of 1950, 1960 and 1970. The one exception was Hartford, which had a price-to-income ratio of 3.6 in 1950. Over this period, nearly all markets had price-to-income ratios of under 3.0 and above 2.0. This range was sufficient to accommodate a wide range of local factors, such as differing amenities and demand levels. Generally, supply was responsive to demand in all markets.

This was to change substantially in the 1980 Census, which showed 8 major metropolitan areas with price-to-income ratios above 3.5. Six of these were in California, where significant land use regulation had begun around the early 1970s[53] The six California metropolitan areas had the highest price-to-income ratios, and they were the highest ever recorded to that time. The highest price-to-income ratio reached 5.3, nearly 50 percent above the Hartford ratio in 1950.

Even so, from 1980 to 2000, the average price-to-income ratio was 3.0 or less among the major metropolitan areas, except in briefly (in1980 and 1981).[54] Generally the price-to-income ratios rose during the housing bubble, led by the highly regulated markets, which reached price-to-income ratios of near 10.0 in the coastal California markets of San Francisco, San Jose, San Diego and Los Angeles.[55] These and other highly regulated markets accounted for a disproportionate concentration of the excess housing value during the bubble and losses during the housing bust. [56]

SUMMARY OF ECONOMIC RESEARCH

The association between higher house prices and urban containment policy is a matter of basic economics. Other things equal, the price of a demanded good or service will increase where supply is limited. Highlights of economic research are described below.

House prices have increased strongly in many metropolitan markets that have adopted urban containment policy. The economic effects are documented in reports by Paul Cheshire[57] at the London School of Economics, Arthur Grimes,[58] the former Chairman of the Reserve Bank of New Zealand, and others. In the United States, the largest middle-income housing affordability losses have been in California. The California Legislative An-

"House prices have increased strongly in many metropolitan markets that have adopted urban containment policy."

alyst's Office[59] reaches conclusions similar to that of earlier work by Dartmouth University economist Fischel (1994),who documented the association between California's tightening land use restrictions and higher house prices.

Former Governor of the Reserve Bank of New Zealand Donald Brash [60] attributes the housing affordability losses to "the extent to which governments place artificial restrictions on the supply of residential land." The restrictions can take various forms, from the most extreme, such as urban containment boundaries that can be used to severely limit green-

field development or to virtually outlaw it. There are less obvious restrictions, such as the euphemistic designation of "growth areas," which can prohibit development elsewhere, having virtually the same effect as urban growth boundaries.

Higher land costs flow through to the cost of housing, which is the largest expenditure in household budgets. [61] These effects can be seen in some of the stronger metropolitan economies, such as London, San Francisco and Sydney. Where urban containment policy has been adopted in virtually all markets, as in Australia and the United Kingdom, house prices have skyrocketed relative to incomes even in smaller markets and the weakest major markets, such as Liverpool, Glasgow and Adelaide.

> *"The higher land prices associated with urban containment policy can lead to higher rents, which disproportionately impact low income people."*

Kate Barker, a former member of the Monetary Policy Committee of the Bank of England was commissioned by the Blair government to prepare reports on housing affordability and land supply in the United Kingdom, She attributed the much higher prices to that nation's urban containment policies in *The Barker Review.* [62]

Legendary urbanist Sir Peter Hall expressed concern about the social inequity produced by urban containment policy in Great Britain. His extensive review led him to indicate that less affluent homeowners and poorer renters had paid the greatest price for Great Britain's urban containment policy. Hall laments the impact of these policies on the "ideal of a property owning democracy." [63]

Princeton University and New York University Professor Shlomo Angel found that:

> *...heavy-handed regulations and infrastructure shortages can constrain supply. The overall result can be a shortage of housing, accompanied by high prices and low affordability for all.* [64]

The higher land prices associated with urban containment policy can lead to higher rents, which disproportionately impact low income people. This is evident in California, which now has the highest poverty rate in the United States after adjusting for the cost of housing. California's poverty rate is much higher than that of states renowned for their high poverty rates, at 50% above Mississippi and nearly double that of West Virginia.[65] Housing cost adjusted poverty rates are not reported below the state level.

THE LAND GRADIENT DISCONNECT

Portland State University professor Gerald Mildner further shows that the imposition of an urban growth boundary breaks the historic relationship between the cost of land closest to the core, and that further out by substantially increasing the price of land relative inside an urban containment boundary relative to land on the other side. [66]

"Land prices tend to decline from a peak at the center of a metropolitan area, until they meet the underlying value of agricultural land. At the margin, urban and agricultural land prices will equalize as farmers and developers compete for land."

URBAN CONTAINMENT POLICIES DISRUPT THIS RELATIONSHIP.

The Barker Review of Land Use Planning provides two charts that illustrate the land values from the center of the city to agricultural land on the outside, under differing regulatory environments. These two charts:

> *"... the land value gradient (a) where the land market functions efficiently, with a smooth progression of uses, and (b) where restrictions on the ability of land to be transferred between uses leads to discontinuities in the gradient."*

Thus, Figure 8 (Barker Review Chart 8.1) portrays the change in land values akin to the more liberal regulatory environments that preceded urban containment policy. Figure 9 (Barker Review Chart 8.2) is a representation of land values under a highly regulated environment, such as in urban containment policy (which applies to virtually all of the United Kingdom). [67]

The interruption in the continuity of declining land prices is so stark that Mildner (2009) cites a 10-fold differential across the urban containment boundary in Portland. Grimes (2007) finds an 11 times differential in Auckland. These differentials elevate land prices throughout the metropolitan area.

Finally, even proponents of urban containment policy note its potential for increasing house prices. Nelson, et al [68] confirm the fundamental economic principle that restricting supply tends to be associated with higher prices, other things being equal. They indicate that: **"... the housing price effects of growth management policies [69] depend heavily on how they are designed and implemented.** If the policies serve to restrict land supplies, then housing price increases are expected" (emphasis in original). Nelson, et al. further point out that growth management

Figure **8** and **9**

Normal Land Value Gradient
FROM THE BARKER REVIEW
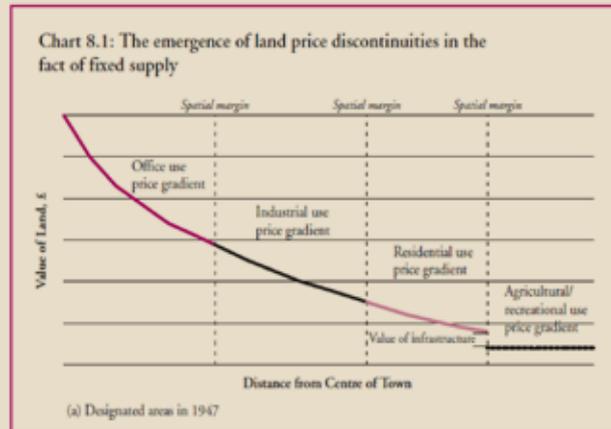
Chart 8.1: The emergence of land price discontinuities in the fact of fixed supply

(a) Designated areas in 1947

The chart in this figure reproduced from the *Barker Review of Land Use Planning: Interim Report*, reproduced under Crown copyright

Discontinuous Land Value Gradient
FROM THE BARKER REVIEW
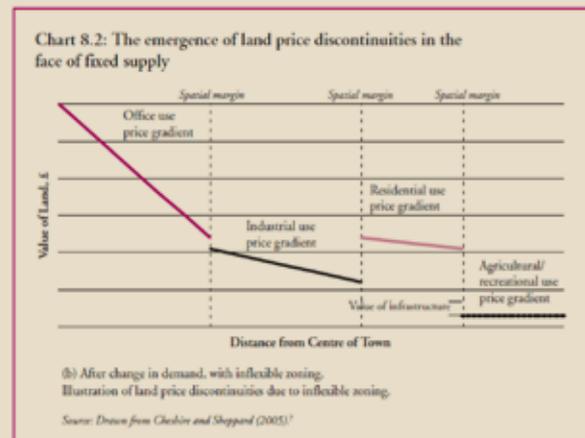
Chart 8.2: The emergence of land price discontinuities in the face of fixed supply

(b) After change in demand, with inflexible zoning.
Illustration of land price discontinuities due to inflexible zoning.

Source: Drawn from Cheshire and Sheppard (2005).

The chart in this figure reproduced from the *Barker Review of Land Use Planning: Interim Report*, reproduced under Crown copyright

policies have been associated with higher house prices in California.

Justin Phillips (U.S. Department of Justice and Evan Goodstein (Lewis and Clark College) noted that *"Increasing density should substitute for higher land prices"* [70] in an examination of urban containment policy in Portland, Oregon.[71] This frequently cited research, however, does not indicate that there was

"… restrictive land use regulation has been associated with greater housing market price volatility."

any actual mitigation of affordability impacts, it simply theorizes that impacts should occur. Phillips and Goodstein found that the urban containment boundary had added less than $10,000 to housing prices, based on data from 1996 and before. [72] Much greater house price escalation followed later. In 1996, Portland's median house price was 3.3 times the median household income (median multiple), which added $90,000 to the price of a house, adjusted for incomes. By 2014, the median multiple was nearly 50 percent higher, at 4.8,[73] as the shortage of land for new houses became more acute. Further, Portland house cost escalation may have been moderated by the availability of larger, generally less costly housing across the Columbia River in Clark County, Washington, which has less stringent land regulation.

SPECULATION AND THE VALUE OF PLANNING PERMISSION

In addition to skewing the relationship between demand and supply in the favor of a restricted number of sellers, the value of planning permission (authorization) becomes capitalized into land prices. [74]

As would be expected in a market in which demand overwhelms constrained supply, urban containment policy tends to encourage speculative activity, with its land price increasing impacts. [75] The effect was described by Hall, et al.: [76]

> *… even if the planning authority scrupulously provides just the right amount of land for the expected increase,* [77] *by definition it will not be enough. The Development Plan, in the words of an Australian report, will act as a speculator's guide. Land was planning permission or likely planning permission, becomes a desirable item which will be traded and increasing prices, or hoarded. In order to prevent this, the planning authorities would have had to have provided very much more land than they knew would be needed. This, for obvious reasons, they were not willing to do.*

PRICE VOLATILITY

Finally, restrictive land use regulation has been associated with greater housing market price volatility. [78] As was noted above, this was indicated in the United States, as much of the excess value of housing during the run-up to the housing bust, and much of the housing value losses were concentrated in highly regulated markets. [79] The US housing bust is generally acknowledged to be a critical factor in precipitating world-wide Great Recession. [80]

THE NEED FOR ECONOMIC REALISM

Peter Hall faulted an insufficient understanding of economics as a principal cause of the house price escalation and noted the need for a greater attention to market economics. [81]

The crucial weakness of the post-war planning system then, has been the failure to control the price of land. This failure is partly attributable to the lack of understanding of the way in which the property market works (which in turn is associated with the lack of statistical data on property transactions). Non-economists generally seem to believe that the price of land and property is the inevitable result of uncontrollable forces of demand and supply. In fact under a planning system, the supply of land on the open market depends upon conditions which are almost entirely created by government action. Unfortunately economists, who might appreciate this fact, do not often seem interested in town planning."

HOUSING COSTS RELATIVE TO INCOMES: THE REPLICATION QUINTILES

As noted above (Section 2.22), the Most Compact quintile is composed of metropolitan areas with overly restrictive land use regulation and the Most Dispersed quintile is dominated by metropolitan areas with more liberal land use policies. Middle-Income housing affordability--- as evidenced by the median multiple --- is strongest in the Most Dispersed quintile. The More Dispersed and Middle quintiles, also with a large representation by metropolitan areas with liberal land use regulation, have middle-income housing affordability that is near to equal that of the Most Dispersed quintile. Middle-income housing affordability is most problematic in the Most Compact quintile and associated with the overly restrictive land use policies. Middle-income housing affordability is better in the More Compact quintile, but remains significantly worse than in the three more dispersed quintiles (Figure 10).

External Costs (2.21f). 2. Housing cost increases associated with urban containment policy are likely to more than offset any costs (Section 3).

Housing Affordability by Quintile
REPLICATION QUINTILE ANALYSIS: 2012

Figure **10**
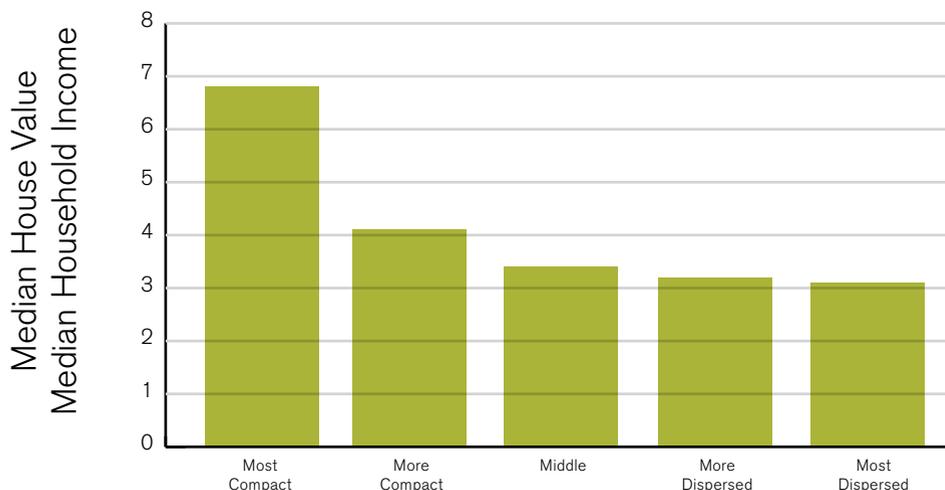
Calculated from American Community Survey: 2012

LOWER INCOME HOUSING AFFORDABILITY

Lower income housing affordability is also the worst in the Most Compact quintile. This is indicated by data on "working families" in Housing Landscape 2014, published by the National Housing Conference. [82] The percentage of working households that have a severe housing burden (expenditures on housing exceeding 50 percent) is two-thirds higher in the Most Compact quintile (Q1) than in the three most dispersed quintiles (Figure 11). [83]

The percentage of working families with severe housing burdens (spend more than 50% of their gross income on housing) is greatest in the Most Compact quintile and the least in the Most Dispersed quintile. Metropolitan areas in the Most Dispersed quintile (Q5), such as Oklahoma City, Pittsburgh, Indianapolis and Birmingham (Alabama) have severe housing burden rates approximately one-half that of the Most Compact quintile (Q1). The four metropolitan areas with the highest percentage of households with a severe housing burden are in the Most Compact and More Compact quintiles, Miami, Los Angeles, New York and San Diego (ranging from 31.8% to 38.5%).

OVERCROWDING

Overcrowded housing is an important indicator of the standard of living. Overcrowding is much more substantial in the Most Compact Quintile. One measure is the number of residents per room, with more than one indicating overcrowding. The Most Compact quintile has approximately four times the extent of overcrowding as in the two most dispersed quintiles (Figure 12).

3.2
THE EXTERNALITIES OF
URBAN CONTAINMENT POLICY

In fact, the issue is much larger than middle income housing affordability. The distortion of housing markets associated with urban containment policy also has consequences (negative externalities) for the entire economy.

This is to be expected. As noted above, housing is the largest expenditure item in household budgets. In the United States, housing is the only major expenditure item with large differences relative to incomes between metropolitan areas. [84] Where households must spend a greater share of their incomes on such an import-

Households – Severe Housing Burden
MAJOR METROPOLITAN AREAS 2012

Figure 11
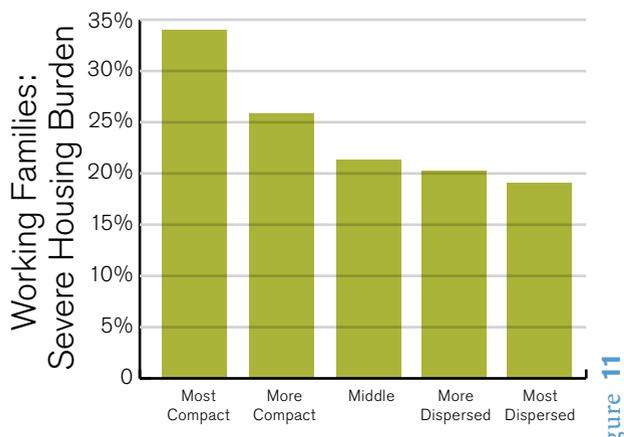
Housing - Overcrowding
REPLICATION QUINTILE ANALYSIS: 2012

Figure 12
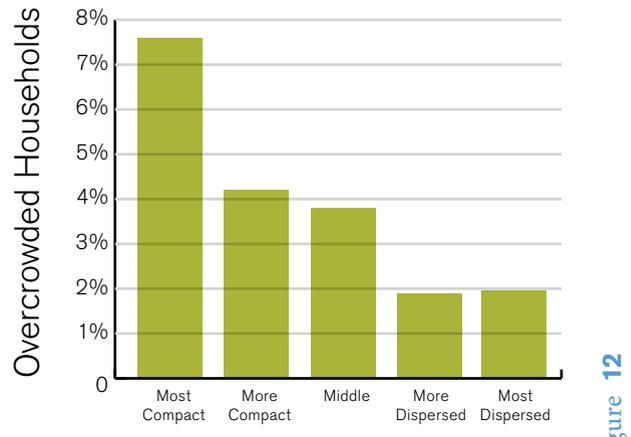
ant component, they have less discretionary income. This can be expected to lead to lower economic production of goods and services that they cannot afford because of the high housing prices.

Federal Reserve Board economist Raven Saks found, in an econometric analysis that where housing supply is more constrained by regulations, employment growth is likely to be less than expected. [85]

Thomas Piketty [86] has published economic research indicating that recent decades have seen a massive expansion in inequality. This is in contrast to the more egalitarian distribution patterns of the 20th century, which replaced much less equal distribution of prior centuries. MIT's Matthew Rognlie [87] examined Piketty's data and concluded that much of the observed inequality is from housing wealth. [88] According to Rognlie:

> "the literature studying markets with high housing costs finds that these costs are driven in large part by artificial scarcity through land use regulation .... A natural first step to combat the increasing role of housing wealth would be to reexamine these regulations and expand the housing supply."

The substantial long-term damage that can be inflicted on economy is illustrated in research by Chang-Tai Hsieh of the University of Chicago and Enrico Moretti of the University of California, Berkeley. [89] They attribute a US GDP loss of $1.95 trillion in 2009 (13.5% of the GDP) as "almost entirely driven" by regulatory constraints on housing.

"We conclude that the aggregate gains in output and in welfare from spatial reallocation of labor are likely to be substantial in the U.S., and that a major impediment to a more efficient spatial allocation of labor is the growing constraints to housing supply in high wage cities."

Hsieh and Moretti further conclude that the housing constraints lower the:

> "... income and welfare of **all** US workers and amount to a large **negative externality** imposed by a minority of cities on the entire country (emphasis in original)."

This nearly $2 trillion estimate would more than nullify the NCE Cities report unadjusted cost of dispersion estimate by more than 1.5 times.

The studies cited above indicate that the negative externalities of restrictive housing regulations burden the entire economy, not just the housing sector.

Additional Costs to Society: There are further potential costs. As noted below, home ownership can be an important path to a higher standard of living for middle income households. Lack of access to owned housing by lower income households can prevent upward movement to middle income status. These are important consequences not included in the NCE Cities report analysis above (Section 2.2). The costs to society of a continued decline in middle income standards of living and intractable poverty rates are substantial. Yet, as is the case with non-market costs (Section 2.1), the costs of greater poverty and a smaller number of middle income households is not readily or easily quantified. They are not considered in the NCE Cities report.

Further, there is less equality of income distribution in the Most Compact quintile urban areas. The highest Gini coefficient, which indicates the least equal income distribution, is recorded in the Most Compact quintile. The other four quintiles, all more dispersed, are below that of the Most Compact quintile, indicating more equal income distribution (Table 3).

Table **3**

Gini Co-effecient
(Income Equality)

Quintile	Gini Index
Most Compact (Q1)	0.497
More Compact (Q2)	0.464
Middle (Q3)	0.462
More Dispersed (Q4)	0.462
Most Dispersed (Q5)	0.464

Data from American Community Survey, 2012
Population weighted. Higher is less equal.

Figure **13**

Bottom Quintile Households Upper Limit
REPLICATION QUINTILE ANALYSIS: 2012
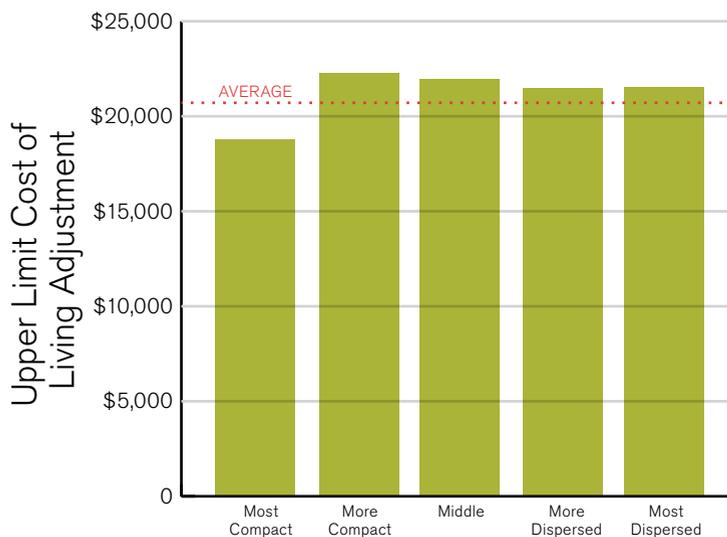
Cost of Living Adjusted American Community Survey & Bureau of Economic Analysis data

3.3
DISMISSAL OF HOUSING COSTS INCREASES IN THE NCE CITIES REPORT

The NCE Cities report acknowledges that "probably the most legitimate criticism is that it can reduce single-family housing affordability..." However, the report goes on to say that " but smart growth policies that allow more compact, infill development increase housing and transport affordability, and so are particularly beneficial to low-income households." In fact, however, this Evaluation shows that income inequality is more severe in and that low income housing affordability is worse in the Most Compact quintile, where urban containment policies abound (Section 3.1).Moreover the lowest income household quintile incomes in the Most Compact quintile are well below average, when adjusted for the cost of living (Figure 13). This is in addition to the fact that middle-income housing affordability is the worst in the Most Compact quintile, regardless of transportation costs (below).

Further, the NCE Cities report also contends that house price increases are the result of both urban containment and restrictions on infill development in the existing urban area. [90]

> "...it is the combination of urban containment and restrictions on compact infill development that drive up housing prices."

It is true that US zoning rules have often limited infill development, both in markets with urban containment policy and those with liberal regulation. Yet it is only in markets where urban containment policies have been imposed that housing has become seriously unaffordable for middle-income households. For example, the core city Houston has no zoning and has thriving multi-family development throughout, both high-rise

and mid-rise. At the same time, the liberal zoning policy of Houston's suburbs[91] retained middle-income housing affordability in the suburbs. The opposite is true as well. In most major US metropolitan areas (a few examples are Dallas-Fort Worth, Cincinnati, Atlanta, Indianapolis, and Raleigh), core and infill development regulations are considerably tougher than in the city of Houston. Yet, even with these restrictions, overall liberal regulation with respect to suburban development has retained middle-income housing affordability.

Moreover, if, as some analysts indicate,[92] substantial relaxation of zoning was required for housing affordability to be maintained with an urban containment boundary, then there was an imperative prerequisite for concurrent adoption. The subsequent housing affordability losses could indicate either that urban containment boundaries were prematurely adopted without the necessary zoning relaxation or that the expectation of improved housing affordability may have been implausible from the start. In contrast, experience indicates that without urban containment policy, middle-income housing affordability can more easily be retained.

Nearly all of the US core cities (municipalities) for which data is readily available have experienced declining population since 1950.[93] The limited infill demand is also indicated by the continuing dispersion of US metropolitan in a Census Bureau radius analysis,[94] which indicates that all net growth occurred outside a five mile radius from the core city center between 2000 and 2010. Most of the growth was outside a 10 mile radius (Figure 14). Our "City Sector Model" small area[95] analysis shows that virtually all population growth between 2000 and 2011 occurred in functionally suburban and exurban areas (Figure 15).[96]

Population Growth by Distance from Core
51 US MAJOR METROPOLITAN AREAS: 2000–2010
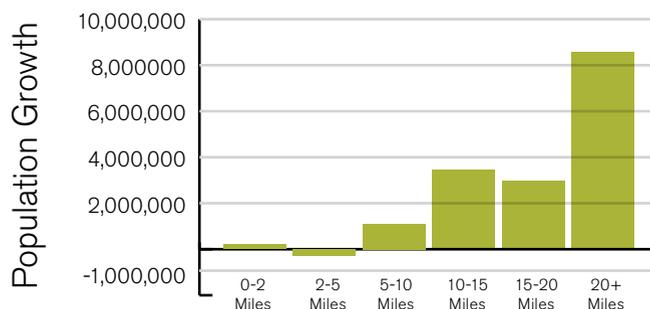
Data from Census Bureau

Population: Type of Urban Sector
MAJOR METROPOLITAN AREAS: 2000–2011
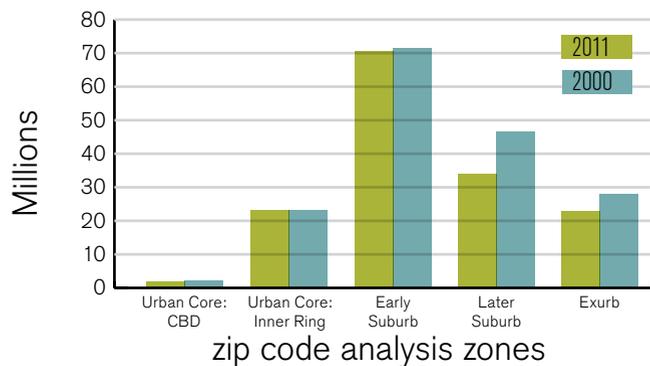
City Sector Model Calculated from Census Bureau data

This is consistent with the continuing dispersal of US metropolitan areas. The core counties of the 50 metropolitan areas with more than 1 million population experienced a net domestic outmigration of approximately 5.3 million between 2000 and 2013.[97] At the same time, there was a net in-migration of approximately 3.3 million to the suburban and exurban counties. This indicates that households generally choose to live in lower density areas (more dispersed areas), rather than higher density areas (more compact areas), other things being equal.

Net migration from the core counties and to the suburban counties was greatest in the Most Compact and More Compact

Figure **16**

Domestic Migration within Major Metro Areas
CORE COUNTIES V. SUBURBAN COUNTIES (2000–2013)
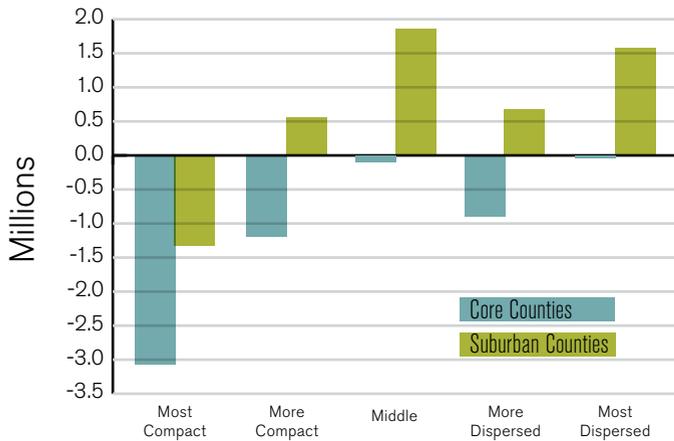
quintiles (Figure 16). These rates of migration slowed during the Great Recession, but core to suburban and exurban migration continues, with a net loss of 275,000 in the core counties between 2010 and 2013, and a net gain of 485,000 in the suburban and exurban counties, [98] indicating that for every one net domestic migrant leaving the core counties, nearly two moved to the suburban counties (because suburban counties gain net domestic migration from both the core counties and from counties outside major metropolitan areas). The largest domestic migration losses continued in core counties of the Most Compact quintile.

Many of these core counties have continued to increase their populations, as international immigrants have replaced residents who have moved elsewhere. However, recently arrived foreign born residents usually have lower incomes. In 2013, the average recent foreign-born male earned 36% less than the average native born male. The average recent foreign-born female earned 30% less than the average native born female. [99] The urban cores have long been the first residential location of new immigrants. Their lower incomes are not well matched to the higher housing costs in core areas, and particularly the higher cost of infill development. Foreign born residents increasingly move to the suburbs themselves. [100]

MIDDLE-INCOME HOUSING AND TRANSPORTATION COSTS

The NCE Cities report also dismisses the high costs of urban containment policy by suggesting that lower costs in other sectors more than compensate for the increases according to the NCE Cities report, as is indicated below: [101]

> *"...but many smart growth [102] policies increase overall affordability by allowing more compact housing types and reducing infrastructure and transport costs."*

However, urban containment policies that severely ration land for greenfield development, such as urban containment boundaries and other policies are associated with overall higher house prices and lower discretionary incomes (Section 3.1).

Most households are home owners in the United States, and even after the Great Recession, the aspiration for home ownership remains strong. Polling by the Demand Institute (operated by The Conference Board and Nielson) found that 77% of respondents considered home ownership "an excellent investment." [103] One of the most important reasons for this is the potential for increasing wealth through increasing home equity.

Yet, the cost of middle-income houses is far higher in urban containment markets than in markets without urban containment policy, even when accounting for transportation costs. A median household analysis [104] indicates that the transportation costs in more restrictively regulated metropolitan areas fall far short of compensating for the much higher

housing costs. [105] The annual housing costs vary by $31,000. The maximum difference in vehicle costs is less than $3,000 (Figure 17). A historical analysis, comparing real urban containment market housing and transportation costs today with costs before implementation of urban containment would indicate similar differences.

HIGHER HOUSING COSTS CAN LEAD TO MORE DISPERSION AND LONGER COMMUTES

Ironically, higher house prices due in part by urban containment, (designed in part to reduce "sprawl"), may also drive greater dispersion within metropolitan regions, as people drive farther to obtain housing they can afford (referred to as "driving to qualify"). This is illustrated by expansion of major metropolitan region [106] geographies after the 2010 census.

These include examples such as adding Stockton metropolitan area to the San Francisco Bay [107] combined statistical area, the Allentown metropolitan area to the New York combined statistical area and Corvallis to the Portland combined statistical area. [108] These additions to metropolitan regions indicate an expansion of the commuter sheds to more than

80 miles (130 kilometers) to Stockton, 90 miles Allentown (145 kilometers) and to 85 miles (140 kilometers) to Corvallis from urban cores. This reflects the reality that job dispersion is continuing apace, even in the most regulated areas. [109]

HOUSING ADJUSTED POVERTY RATES

Housing costs differ much more between markets than any other component of the household budget, including transportation. This is illustrated by the fact that the United States Census Bureau publishes a supplemental poverty rate, adjusted for housing cost differentials. This is the only element of household expenditure for which such an alternative set of data is published. [110]

4. CITIES AND PEOPLE

The strong rate of world urbanization has occurred as households have moved to cities, aspiring toward better standards

Figure **17**

Housing & Transport: 2014
HOUSEHOLD EXPENDITURES BY METROPOLITAN AREA
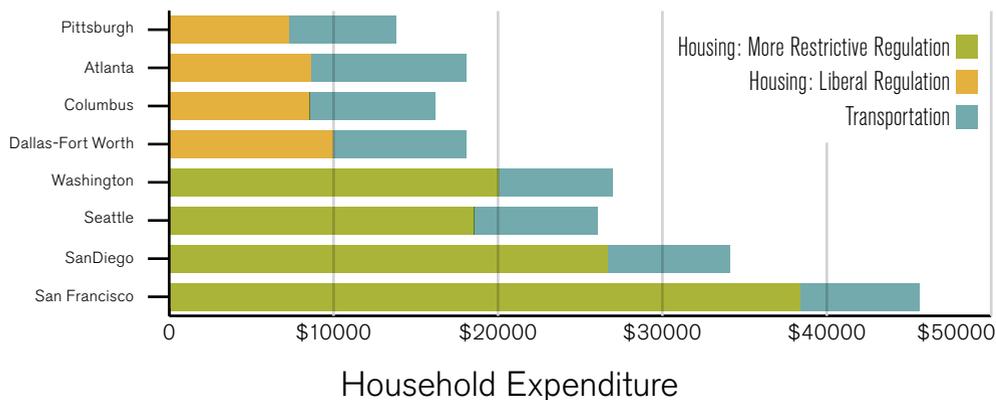
Calculated from BLS, FHWA & Census Bureau data

of living. In the most successful large economies, such as the United States, Canada and Australia, home ownership has been an important part of that aspiration and has been associated with the development of a large affluent middle-income population.

Home ownership is important to household wealth creation, a higher standard of living and neighborhood social stability. Even after the Great Recession, home equity remains more than 60 percent of average household wealth.[111] Homeownership is the source of most middle income wealth in the United States. Federal Reserve Board data indicates that the average homeowner has a net worth of $174,500 compared to $5,000 for the average renter.[112]

This is at a time when low income households are suffering an ever wider gap with the wealthier. This is particularly the case for African-Americans and Hispanics.

Research at Brandeis University showed that the wealth gap between Whites and Blacks in the United States had quadrupled between 1984 and 2007.[113] A later Brandeis study attributed this gap, in large measure, to ethnic differences in housing asset. The study indicated that greater access to home-ownership for Blacks would contribute the most toward reducing this gap.[114] Yet land use regulation has been strengthened to an unprecedented degree and middle income housing affordability has generally declined in metropolitan areas with urban containment policy. These policies work against any effort to reduce the wealth gap between Blacks and Hispanics relative to White-non-Hispanics.

As is shown in Section 4, both middle-income and lower-income housing affordability is associated with the three more dispersed density quintiles in the United States.

REVEALED CONSUMER PREFERENCES

The NCE Cities report cites consumer preference research as suggesting that "more optimal planning and pricing would cause many households to choose more compact communities..."[115]

In fact, US households for some time have been revealing the opposite preference, moving from generally denser urban areas to less dense areas. This mirrors the migration away from more compact areas within metropolitan areas and toward more dispersed areas within metropolitan areas (Section 3.2).

Net Domestic Migration
MAJOR METROPOLITAN AREAS: 2000–9 & 2010–2014

Figure **18**
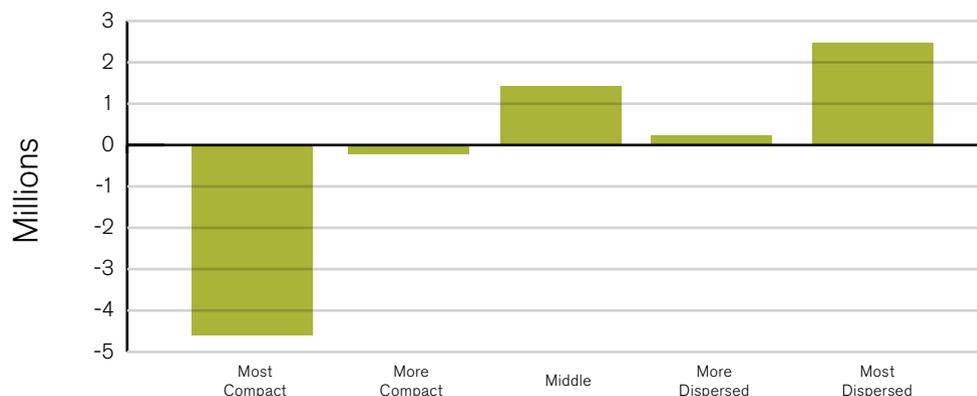
Calculated from US Census Bureau data (no data for 2010)

US Census Bureau domestic migration data indicates that a net 4.6 million people moved away from the Most Compact quintile (Q1) between 2000 and 2014. The largest net domestic migration gain was in the Most Dispersed quintile (Q5), at 2.5 million (Figure 18).

This migration pattern was concentrated in the period of rising house prices. Since the housing bust, the difference has moderated, but still remains substantial. Between 2010 and 2014, the Most Compact quintile lost a net 700,000 domestic migrants. The Most Dispersed quintile gained a net 500,000 domestic migrants.

None of this should be surprising. Just as people have flocked to cities for better lives for decades, their aspirations have led them to seek the upward mobility available in cities with lower costs of living. Indeed, the higher incomes associated with some denser cities can be more than offset by even higher housing costs.[116]

Not only are prices lower, but the chances of being able to afford a single-family house are greater in the more dispersed urban areas because of lower house prices relative to incomes (Section 3.1). The single-family house remains the overwhelming preference of most US households,[117] but now can be well beyond the ability of middle-income households to afford in urban containment markets. The "commodity" view that one house is as good as another, whether a single family house with a large yard or a flat in a high rise ignores demonstrated consumer preferences.

THE CITY, MASS TRANSIT AND THE STANDARD OF LIVING

Cities (metropolitan areas) are labor markets (Bertaud 2014). As they become larger, then tend to become more productive.[118] Their economic productivity tends to be enhanced by access that permits more jobs to be reached by the average worker in a fixed amount of time, such as 30 minutes.[119]

Accessing Urban Opportunities: The NCE Cities report promotes walking and mass transit as a means of travel in cities. Yet, these modes of travel are incapable of unlocking the employment opportunities that exist throughout the modern metropolitan area.

Mass transit access is limited in the modern metropolitan area. This can be illustrated by comparing access in New York metropolitan area, [120] with its comparatively high density, by far the largest employment center in the US (Manhattan) and the most extensive mass transit system to that of Atlanta, by some accounts the most dispersed large urban area in the world. [121] According to research by the University of Minnesota Accessibility Observatory, the average worker in New York can reach only 210,000 jobs in 30 minutes by mass transit.[122]

In contrast, the average automobile commuter in Atlanta, can reach more than three times as many jobs in 30 minutes, [123] despite Atlanta's far smaller job market (approximately one-quarter that of New York).[124] Thus, a resident in Atlanta, with an urban form disdained in the NCE Cities report has access to a larger range of employment opportunities by car than in the apparently favored urban form of New York using transit, also preferred by the NCE Cities report.

Further, walking access is even more limited. The University of Minnesota Accessibility Observatory Lab indicates

that the average resident in the New York metropolitan area can reach fewer than 50,000 jobs, far below the 210,000 accessible by mass transit in New York and the more than 600,000 jobs accessible to the average employee by car in Atlanta. [125]

The dispersed US urban form is associated with more modest levels of traffic congestion and generally shorter work trip travel times. [126] This is facilitated by decentralized travel patterns that permit co-location of jobs and residences throughout the metropolitan area. Lee and Gordon, [127] showed that most employment in major US metropolitan areas was outside the central business districts and sub-centers (sometimes called "edge cities"). In other research, Gordon and Lee [128] found that there were generally faster work trip travel times to the more dispersed employment locations, such as the sub-centers and dispersed areas, rather than to the central business districts.

The shorter US one-way work trip travel times are illustrated by the following:

- Hong Kong, the high-income world's most dense urban area (by far), has an average one-way work trip travel time of 47 minutes. [129] Hong Kong's transit work trip market share may be the highest in the high-income world.
- By comparison, far less dense US urban areas have overwhelming automobile work trip market shares and much shorter travel work trip travel times. Dallas-Fort Worth, with a similar population to Hong Kong, has an average work trip travel time of 27 minutes. Los Angeles, nearly twice as large, has a work trip travel time of 29 minutes. Much smaller and far less dense Kansas City (2 million population) has a work trip travel time of 23 minutes. [130]

Further, today's large metropolitan areas, whether in the high income, middle income or low income world, are far too large in spatial terms for walking and cycling to provide access to all but a small percentage of employment opportunities.

A resident for whom walking is forced by poverty necessarily finds employment opportunities exceedingly limited. The same is true of residents whose limited financial resources force them to travel by mass transit or cycling.

Economic aspiration can be best served by access options that make the best opportunities available to people throughout the entire labor market (metropolitan area). This requires personal access capable of reaching large parts, if not all of the metropolitan area.

The need for worker access to job opportunities throughout the metropolitan area is not limited to the United States or the high income world. Basic access can even be achieved throughout developing world cities with informal small vehicle transit systems, [131] in African cities like Addis Ababa or in Manila that deliver travelers from within walking distance of their origin to locations close enough to complete the trip by walking. However, metropolitan mobility based on walking, cycling and conventional mass transit, when necessitated by low income, severely restricts access to employment and can consign people to a lifetime of poverty.

URBAN CONTAINMENT AND ASPIRATION

The story of urban containment as it has been implemented in some cities of the United States and Canada, as well as in other high-income nations (such as Australia, Canada, New Zealand, the United Kingdom) [132] has been to substantially increase the cost of housing. Even before the house price increases, housing

had been the largest expenditure item in the household budget.

This effect has been consistent with basic economics. London School of Economics Professor Paul Cheshire shows that urban containment policy and housing affordability are irreconcilable (Cheshire 2009). Cheshire also indicates that, without liberalizing reform there could be a future of "inevitably long term deteriorating housing affordability and price volatility." This is a sobering conclusion, given the role played by the most volatile US metropolitan housing markets,--- and their high degree of regulation --- in precipitating the Great Recession.[133]

The cost of owned housing has tripled, and doubled in urban areas since the implementation of urban containment policy, such as in Vancouver, Sydney, London, San Francisco and Auckland. The continued spread of urban containment policy is likely to seriously retard middle income housing affordability if adopted in other urban areas. Moreover, the continuing imbalance between supply and demand in such cities seems likely to make housing even less affordable in the years to come.

RIGHTING PRIORITIES AND EXPANDING OPPORTUNITY

As the G-20 leaders have agreed, there is an imperative to broadly improve opportunities for higher incomes of people and to eradicate poverty. This requires reforming policies that produce the opposite results.

Although well meant by proponents, urban containment policies can be an even greater problem for developing world nations where smaller percentages of households are middle income and there is greater poverty.

Urban planning policies should be adopted based on their impact on the standard of living and poverty eradication. In a world striving to improve people's lives and lift people out of poverty, there is no place for policies that reduce the standard of living, expand poverty and discourage upward mobility.

Maintaining and improving the standard of living and eradicating poverty requires liberalization of land use regulations where housing affordability has been lost. It also requires ensuring that new regulations that impair the standard of living or increase poverty rates be avoided.

5 SUMMARY OF OPINION

The following opinions are offered with respect to the NCE Cities report

- The externality cost estimates appear to be much too high. At the same time, any estimate of such non-market costs are fraught with difficulty. Extreme caution should be used in applying these, or any externality cost estimates in the development of public policy.
- The per capita mileage estimates between the urban areas quintiles, on which the cost analysis is based appear to be high.
- The overall vehicle consumer expenditure estimate per mile appears to be well above BLS consumer expenditure estimates.
- The assumption of fixed costs per mile does not appear to reflect the relationship with costs for some factors, especially the congestion induced loss of fuel economy in more compact cities.
- Appropriate, quantified adjustments would reduce the NCE Cities report cost estimates by approximately 85% (Table 2).

- Other, unquantified adjustments could reduce the NCE Cities cost estimate further, even to the point of nullification or reversal.
- By far the most important problem is the failure of the NCE Cities report to acknowledge the association of house price increases with the urban containment policy. Recent research indicates that the impact on the economy (gross domestic product) and actual household wealth could be far greater than any reasonably estimated cost of dispersion.

There is growing evidence that urban containment policy is not only irreconcilable with housing affordability and price stability, as indicated by Cheshire (2009) , but also undermines improved standards of living and reduced poverty.

This evaluation does not recommend particular policies to developing world nations, whose citizens aspire for the better lives that are enjoyed in the West. Identifying and implementing policies that address the most pressing domestic challenge of improving living standards and reducing poverty will not be simple. However, a genuine intention to solve the problem requires putting the needs of people first. Urban policy should be an outgrowth of that effort, not the other way around.

6. IMPLICATIONS FOR POLICY

Throughout history, cities have attracted large populations by facilitating better lives for people and providing opportunities to escape the poverty that was rampant in many rural areas. This is the very purpose of and justification for cities. [134]

The fundamental issues are not urban form, planning philosophy, type of housing, population density or mode of transport. Each of these are, in relative terms, peripheral issues. The well-being of people, as evidenced by an improving standard of living and progress toward eradicating poverty should be paramount. This cannot be achieved without raising discretionary incomes.

The fundamental domestic policy question facing political leaders around the world is how to facilitate better living standards and to eradicate poverty. A minimum requirement for any such effort is that government itself not materially contribute to higher than necessary consumer expenditures.

This Evaluation has examined a number of issues in the NCE Cities report. Governments, whether in the developing world, the United States or other parts of the developed world need to recognize how urban containment policies erect impediments to higher standards of living, depress opportunities and increase poverty rates. Such policies that create such havoc on millions of lives need to be seriously reconsidered and challenged by those who recognize that the primary purpose of cities is to improve the lives of their residents.

The Replication Quintiles are determined based on the urban area population densities within each metropolitan area. The quintiles are population weighted, so that each quintile includes approximately the same population (Table A).

Replication Quintile Metropolitan Area Assignment

Table **A**

Akron, OH	5	Greensburo, NC	5	Palm Bay, FL	5
Albany, NY	5	Greenville, SC	5	Philadelphia, PA-NJ-DE-MD	3
Albuquerque, NM	4	Harrisburg, PA	5	Phoenix, AZ	3
Allentown, PA-NJ	5	Hartford, CT	5	Pittsburg, PA	5
Atlanta, GA	5	Honolulu, HI	5	Portland, ME	5
Augusta, GA-SC	5	Houston, TX	3	Portland, OR-WA	2
Austin, TX	4	Indianapolis, IN	5	Poughkeepsie, NY	5
Bakersfield, CA	2	Jackson, MS	5	Providence, RI-MA	4
Baltimore, MD	3	Jacksonville, FL	5	Provo, UT	3
Baton Rouge, LA	5	Kansas City, MO-KS	4	Raleigh, NC	5
Birmingham, AL	5	Knoxville, TN	5	Richmond, VA	5
Boise City, ID	4	Lakeland, FL	5	Riverside, CA	3
Boston, MA-NH	4	Lancaster, PA	5	Rochester, NY	4
Bridgeport, CT	5	Las Vegas, NV	2	Sacramento, CA	2
Buffalo, NY	4	Little Rock, AR	5	Salt Lake City, UT	2
Cape Coral, FL	5	Los Angeles, CA	1	San Antonio, TX	3
Charleston, SC	5	Louisville, KY-IN	5	San Diego, CA	2
Charlotte, NC-SC	5	Madison, WI	4	San Francisco, CA	1
Chattanooga, TN-GA	5	McAllen, TX	5	San Jose, CA	1
Chicago, IL-IN-WI	2	Memphis, TN-MS-AR	5	Scranton, PA	4
Cincinnati, OH-KY-IN	5	Miami, FL	2	Seattle, WA	3
Cleveland, OH	4	Milwaukee, WI	4	Springfield, MA	5
Colorado Springs, CO	3	Minneapolis-ST. Paul, MN-WI	4	St. Louis, MO-IL	4
Columbia, SC	5	Modesto, CA	2	Stockton, CA	2
Columbus, OH	4	Nashville, TN	5	Syracuse, NY	4
Dallas-Fort Worth, TX	3	New Haven, CT	5	Tampa-St. Petersburg, FL	4
Dayton, OH	4	New Orleans, LA	3	Toledo, OH	4
Denver, CO	2	New York, NY-NJ-PA	1	Tucson, AZ	4
Des Moines, IA	4	North Port, FL	5	Tulsa, OK	5
Detroit, MI	4	Ogden, UT	4	Virginia Beach, VA-NC	3
Durham, NC	5	Oklahoma City, OK	5	Washington, DC-VA-MD-WV	2
El Paso, TX	2	Omaha, NE-IA	3	Wichita, KS	4
Fresno, CA	2	Orlando, FL	4	Worchester, MA	5
Grand Rapids, MI	5	Oxnard, CA	2	Youngstown, OH-PA	5

Quintiles population weighted, based on gross urban density in metropolitan areas

Appendix B:
BENCHMARK ANALYSIS

A benchmark analysis was developed for 2010, to test the NCE Cities report and Replication Analysis quintile analyses to test the reasonableness of the per capita mileage range estimates of the NCE Cities report and the Replication quintiles developed for this evaluation.

The year 2010 was selected because, as a census year, population, land area and density data is available for all of the urban areas that are listed in FHWA Table HM-72 for 2010. This complete census data can be used to estimate urban light vehicle mileage per capita starting with the vehicle travel data in the same table.

As with the Replication Quintile analysis, the mileage estimates are reduced to reflect light vehicle travel only and the differences between Census Bureau urban area populations and the unspecified additional population living in the larger FHWA urban areas.

A range of 37 percent was found between the per capita mileage in the Most Compact Quintile and the Most Dispersed Quintile. This is relatively close to the 42 percent range identified in the Replication Quintile analysis. [136]

The NCES Cities report Most Dispersed quintile has an average miles traveled per capita 120 percent more than that of the Most Compact quintile. This is more than three times the difference of 37 percent between the two quintiles in the Benchmark test.

The mileage estimates are indicated in Table 1, above.

Appendix C:
REPLICATION QUINTILES MILEAGE ESTIMATES METHODOLOGY

The Replication Quintile mileage estimates are based on the 2012 light vehicle mileage per capita in urban areas, as indicated in Table C, below.

Calculation Average Travel Per Capita: US Urban: 2012

Factor	Value Source
A. Total Urban Vehicle Miles: 2012	**1,838,177,000,000** from FHWA Table VM-1, 2012
B. Total Urban Population: 2012	**252,700,000** Estimated at 2010 Urban Share of US Pop.
C. Miles Per Capita: 2012 (A/B)	**7,274**

Table C

1. Calculate average per capita urban light vehicle travel for 2012.
2. Obtain 2012 vehicles miles for each urban area (from FHWA Table HM-72, 2012)
3. Reduce 7.7 percent to include only light vehicles (from FHWA Table VM-1, 2012):
4. Reduce by the census urban area factor: 3.8 percent (estimated population difference between Census Bureau urban areas and FHWA urban areas (Section 2.21a).
5. This results in an annual light vehicle miles traveled by urban area for 2012.
6. Annual vehicle miles are divided by the estimated 2012 urban area population from the 2012 American Community Survey, to obtain miles per capita.

The well-being of people, as evidenced by an improving standard of living and progress toward eradicating poverty should be paramount.

1. "G20 Leaders' Communiqué", Brisbane G20 Leaders' Summit, November 15-16, https://g20.org/wp-content/up-loads/2014/12/brisbane_g20_leaders_summit_communique.pdf.

2. Todd Litman, , "Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl", *The New Climate Economy*, March 2015 http://static.newclimateeconomy.report/wp-content/uploads/2015/03/public-policies-encour-age-sprawl-nce-report.pdf.

3. "Places Apart; Essay: A Planet of Suburbs",*The Economist*, December 6, 2014, http://www.economist.com/node/21634591/sites/all/modules/custom/ec_essay

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5. Daniel Halberstam, "Federalism Theory in a Nutshell," in *The Oxford Handbook of Law and Politics*, ed. Gregory A. Caldeira et al.(Oxford: Oxford University Press, 2008).

6. Mark DeLucci, "Should We Try To Get The Prices Right?",*Institute of Transportation Studies*, Spring 2000, Access Number 16,http://pubs.its.ucdavis.edu/download_pdf.php?id=436.

7. Adjusted to 2014$ from 1991.

8. Calculated from data in NCE Cities report Tables 11 and 12

9. Troy Green, "U.S. Department of Transportation Announces Decline in Traffic Fatalities in 2013", *National Highway Traffic Safety Administration*, December 19, 2014, http://www.nhtsa.gov/About+NHTSA/Press+Releases/2014/traffic-deaths-decline-in-2013.

10. These neutral terms are substituted for the pejorative "sprawl."

11. The Sprawl Index uses population density, land use mix, activity centering and street accessibility in its calculations. Reid Ewing and Shima Hamidi, "Measuring Sprawl 2014", *Smart Growth America*, April 2014, 2,http://www.smartgrowthamerica.org/documents/measuring-sprawl-2014.pdf.

12. "Analysis of Public Policies That Unintentionally Encourage and Subsidize Urban Sprawl", 44.

13. A principal urban area is the largest urban area in a metropolitan area.

14. Estimated assuming the same urban population percentage of the national population as was reported in the 2010 census.

15. Urban areas are the extent of the built environment, or the continuously built-up areas. Metropolitan areas include the urban areas, but also economically connected territory to the outside, generally defined by commuting criteria.

16. The Most Compact quintile is more likely to have strong land use policy, while the more dispersed quintiles (Middle, More Dispersed and Most Dispersed) are more likely to have liberal land use policy.

17. NCE Cities report, Table 11.

18. Calculated from data in NCE Cities report Table 11. The Most Dispersed Quintile kilometers per capita (22,896), is 120 percent higher than the Most Compact Quintile kilometers per capita (10,389).

19. The intercensal urban area estimates are for the land area included in the urban areas in the 2010 census. This results in an under-estimate of urban area populations, because the population in areas of expansion from 2010 to 2012 is not included. This method is less than idea1, but preferable to any other method for estimating 2012 urban area population.

20. Calculated for urban areas from FHWA Table VM-1 (2012).

21. There is no readily available source for these figures by urban area.

22. The NCE Cities report calculates a national average vehicle miles traveled from FHWA Table VM-202. This table includes all vehicle travel, light vehicle and other travel. The table also includes both rural and urban vehicle miles. Because urban vehicle miles per capita are lower than in rural areas, this results in an overstatement of the urban miles per capita that are used in the NCE Cities report analysis.

23. The land area of the FHWA urban areas in *Highway Statistics* Table HM-72 for 2010 exceed the land area of the corresponding Census Bureau urban areas by nearly 60 percent (Calculated from Census Bureau and FHWA data). Among the FHWA urban areas listed in the 2010 Table HM-72, only one had a population different than that reported in the census.

24. In *Highway Statistics* Table HM-72.

25. Calculated from FHWA Table VM-1 (2012).

26. The American Community Survey 2012 urban area population estimates are based on the 2010 geographical definitions.

27. NCE Cities report footnote 9, page 44, which appears to correspond to footnote 5 in the text.

28. US Department of Labor, Bureau of Labor Statistics, *Consumer Expenditures Reports.*

29. Calculated from data in NCE Cities report Table 11, indicating an internal cost per kilometer of $0.44, which is converted to a cost per mile of $0.71.

30. Excluding other vehicles, especially commercial trucks.

31. In 2012, the average consumer unit (household) expenditures on transportation were $8,998. On a per capita basis, this becomes $3,382 (2.5 persons per consumer unit, as reported by BLS) Public transportation is deducted, resulting in $8,456. The average miles traveled per capita is estimated at 8,448, which is derived from the NCE Cities report estimate of 9,482, minus other vehicle mileage, as reported in *Highway Statistics* Table VM-1. The result is $0.40 per mile, adjusted to $0.41 in 2014$ (http://www.bls.gov/opub/reports/cex/consumer_expenditures2012.pdf).

32. For example, the widely quoted AAA *Cost of Driving* vehicle purchase figures are based on new car depreciation assumptions over a five year period. By contrast, the US Department of Energy Transportation Energy Data Book 33 Tables 3-12 and 3-13 indicate that 1990 cars have a median life of 16.9 years and light trucks 15.5 years (http://cta.ornl.gov/data/index.shtml) The BLS consumer expenditures data is an estimate of actual expenditures. See: "Your Driving Costs", *AAA Association Communication*, 2014, http://publicaffairsresources.aaa.biz/wp-content/uploads/2014/05/Your-Driving-Costs-2014.pdf

33. Calculated from Texas A&M Transportation Institute data for 2011 (latest available at this writing). Data is available for 85 of the 102 metropolitan areas in the Replication Quintile analysis.

34. Wendell Cox, "Urban Travel and Urban Population Density", *Journeys*, Land Transport Authority of Singapore, November 2012, http://ltaacademy.gov.sg/doc/J12 per cent20Nov-p19Cox_Urban per cent20Travel per cent20and per cent20Urban per cent20Population per cent20Density.pdf.

35. "Car Insurance Premiums: Why do Zip Codes Affect Costs" , *CarsDirect*, January 27, 2012, http://www.carsdirect.com/car-insurance/car-insurance-premiums-why-do-zip-codes-affect-costs

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37. The Lewis Center for Regional Policy Studies Program on Local Government Climate Action Policies, "Measuring Greenhouse Gas Emissions for SB 375 Implementation", *UCLA School of Public Affairs*, http://www.arb.ca.gov/cc/sb375/rtac/meetings/070709/commentaddendum.pdf, Delcan, iTRANS and ADEC consultant teams, "The Cost of Urban Congestion in Canada", *Transport Canada*, April 2006, http://www.adec-inc.ca/pdf/02-rapport/cong-canada-ang.pdf

38. From Texas A&M Transportation Institute data for the Replication quintile analysis urban areas. Population weighted.

39. Property taxes are not a predictor of the differences between local government public service costs, because their

relationship to local government expenditures varies substantially. This Evaluation uses the NCE Cities report assumption of a relationship only to evaluate the consistency of its estimates with respect to property taxation.

40. The referenced source in the NCE Cities report does not include mass transit.

41. "Regional Analysis of What-If Transportation Scenarios", *Delaware Valley Regional Planning Commission*, July 2003, http://www.dvrpc.org/reports/03020.pdf

42. Claude Gruen, *New Urban Development Looking Back to See Forward* (New Brunswick, NJ: Rutgers University Press, 2010), 163.

43. Calculated from data in Jeffrey L. Barnett et al., "2012 Census of Governments: Finance – State and Local Government Summary Report", *United States Census Bureau*, December 17, 2014, http://www2.census.gov/govs/local/summary_report.pdf

44. Analysis of operating and capital costs by urban area from 2010 Federal Transit Administration National Transit Database.

45. NCE Cities report, Table 11.

46. This analysis does not constitute an endorsement of the NCE Cities report methodology. Its purpose is to indicate the magnitude of the adjustment necessary to account for the factors described in Sections 2.21a through 2.21f.

47. US Department of Labor Consumer Expenditure Reports. In 2013, approximately one-third of expenditures by households were for housing.

48. "Places Apart; Essay: A Planet of Suburbs".

49. The term "middle-income housing affordability" is used to distinguish the broader subject from the more narrow lower-income housing affordability, which often requires government funding. While lower-income housing affordability has been an issue in the United States for decades, it is only in the last two to three decades that middle-income housing affordability has become a serious concern in some metropolitan markets.

50. Price-to-income multiples have the advantage of understandability. They describe house prices in terms of years of household income or earnings.

51. The 52 metropolitan areas with more than 1,000,000 population in 2013 (there is no data for Las Vegas in 1950, which had not achieved metropolitan area status).

52. Median house value to median household income ratio.

53. William Fischel, Regulatory Takings, Law, Economics and Politics(Cambridge, MA: Harvard University Press.

54. Median house price to median household income ratio (median multiple) from 1980.Data from Census Bureau, National Association of Realtors and Harvard University Joint Center for Housing Studies.

55. Wendell Cox and Hugh Pavletich (annual). Demographia International Housing Affordability Survey, http://www.demographia.com/dhi.pdF

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61. See, for example, the *11th Annual Demographia International Housing Affordability Survey:* 2015, http://www.demographia. com/dhi.pdf

62. Kate Barker, *Review of Housing Supply: Delivering Stability: Securing Our Future Housing Needs: Final Report–Recommendations* (Norwich, England: Her Majesty's Stationery Office, 2004), www.hmtreasury. gov.uk/consultations_and_legislation/barker/consult_barker_index.cfm and .Kate Barker, *Barker Review of Land Use Planning* (Norwich, England: Her Majesty's Stationary Office, 2006), http://www.hm-treasury.gov.uk/media/4EB/AF/barker_finalreport051206.pdf

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64. Shlomo Angel, *Housing Policy Matters: A Global Analysis* (New York: Oxford University Press, 2000)

65. Kathleen Short, "The Supplement Policy Measure: 2013", *United States Census Bureau*, October 2014, http://www.census. gov/content/dam/Census/library/publications/2014/demo/p60-251.pdf

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67. The charts in Figures 8 and 9 are reproduced from the *Barker Review of Land Use Planning: Interim Report*, reproduced under Crown copyright.

68. Arthur C., Nelson, Rolf Pendall, Casey J. Dawkins and Gerrit J. Knaap, "The Link Between Growth Management and Housing Affordability: The Academic Evidence", February 2002, http://www.brookings.edu/es/urban/publications/growth-mang.pdf

69. Urban containment policies.

70. Justin Phillips and Eban Goodstein. 2000. "Growth Management and Housing Prices: The Case of Portland, Oregon." *Contemporary Economic Policy* 18, no. 3 (2000):334–344.

71. Further, land use regulations that liberalize allowable densities cannot be assumed to satisfy the demand of consumers for larger houses on more land. Housing units "fungible;" consumers do not equally favor all types of housing. On the contrary, consumers have substantially varying tastes. For example, a city center high-rise condominium is not likely to be attractive to households preferring larger detached homes in the suburbs, and vice versa.

72. As Anthony Downs has indicated, the mere imposition of an urban growth boundary is not necessarily associated with increase in house prices. The key issue is, as noted above, the maintenance of a competitive land supply. Portland's land supply remained competitive until the early 1990s.

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76. Hall, *The Containment of Urban England*, 396.

77. Increase in demand.

78. Edward Glaeser .and Joseph Gyourko, *Rethinking Federal Housing Policy: How to Make Housing Plentiful and Affordable* (Washington, D.C., American Enterprise Institute, 2008).

79. Wendell Cox, "The Housing Crash and Smart Growth," National Center for Policy Analysis, June 2011,http://www.ncpa.org/pdfs/st335.pdf

80. Additional research is summarized at http://www.demographia.com/db-dhi-econ.pdf

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83. Quintile analysis limited to the 50 metropolitan areas in *Housing Landscape* 2014.

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105. Combined Statistical Areas.

106. Officially called the San Jose-San Francisco combined statistical area. San Jose is listed first by the Census Bureau because it has become the largest municipality in the San Francisco Bay area.

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center for
opportunity urbanism

To us, cities emerge because they provide opportunity to people, and are sustainable only so long as they continue to do so.

For a city to sustain itself, it must provide a wide range of opportunities – not just for the affluent. And the city, better seen as a metropolitan area, needs to address the diverse interests and preferences of its residents. And given that those interests and preferences are constantly evolving, the "over planning" mindset is untenable, even dangerous, to the future of cities that embrace it.

Another paradigm is needed; one that concentrates more on human capital than physical capital. Such a paradigm would stress issues of upward mobility, human capital development, small business expansion, governance, and middle-wage job growth. It would not ignore the physical environment, but acknowledge that physical assets should adapt to serve human beings, not the other way around. It would also change the way we think about physical assets, giving higher priority to those that actually boost opportunity, particularly for working and middle-class residents.

It will be the primary task of the Center to spell out how cities can drive opportunity for the bulk of their citizens. Initially, at least, this will be primarily a virtual, media-centered effort. This is necessary given the very weak profile of key opportunity cities, including Houston, particularly in comparison with the key media centers located either in the Northeast or coastal California. A major reason why the current planning mindset so dominates policy discussion, in part, reflects that there is no coherent alternative vision. Our intention is through conferences, articles and studies to provide an alternative "pole" in the now very stilted and predictable trajectory of urban studies. It will help rediscover the essence of great cities, what Descartes called "an inventory of the possible."

PRINCIPLES OF OPPORTUNITY URBANISM

- The primary organizing principle of cities should be the creation of opportunity and social mobility.

- People should have a range of neighborhood choices (including suburban), rather than being socially engineered into high-density, transit-oriented developments beloved by overly prescriptive planners.

- Restricting housing supply unreasonably through regulation drives up costs and harms the middle class.

- Education impacts housing choices, forcing parents to overpay in the few good school districts or move further out of the core city. Making educational alternatives available for working and middle class families is essential to upward mobility and long-term urban growth.

- Supporting the needs of middle-class families should be just as important, if not more, than the needs of the childless creative class. Children, afterall, represent the future of society.

- Successful economies need a broad spectrum of industries. Solid middle-class and blue-collar jobs are just as important as the much celebrated high-tech industries aimed at white-collar professionals. Educational choices should be made to address these varied needs.

- Concentrations of power – whether through political or economic structures – undermine social mobility and the creation and pursuit of new opportunities. Decision-making power, therefore, should be as widely dispersed as practical.

- Transit investments should be based in large part on serving cost-effectively those who most need it, to provide a reasonable alternative for those (the disabled, elderly, students) for whom auto transit is difficult. It should not be primarily a vehicle for real estate speculation or indirect land use control. The use of bus transport, including rapid bus lanes, as well as new technologies, including firms like Uber and driverless cars, need to be considered as potential answers to the issue of urban mobility.

- In general, cities are better off with more market-oriented land-use policies than prescriptive central planning.

Design Notes

Best Cities for Minorities and the graphics utilize the following:

To achieve visual harmony a modified version of the grid Jan Tschichold conceived for his book Typographie was employed.

MINION PRO Chapman's serif family, is a digital typeface designed by Robert Slimbach in 1990 for Adobe Systems. The name comes from the traditional naming system for type sizes, in which minion is between nonpareil and brevier. It is inspired by late Renaissance-era type.

BERTHOLD AKIZEDENZ GROTESK is Chapman's san serif family. It is a grotesque typeface originally released by the Berthold Type Foundry in 1896 under the name Accidenz-Grotesk. It was the first sans serif typeface to be widely used and influenced many later neo-grotesque typefaces after 1950.

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Professor Chimenti is also the founder and head of Chapman's **Ideation Lab** that supports undergraduate and faculty research by providing creative visualization and presentation support from appropriately qualified Chapman University undergraduate students. Services include creative writing, video, photography, data visualization, and all aspects of design. The students specialize in the design and presentation of complex communication problems.