Review and Analysis of Report Prepared by David N. Kinsey, PhD Entitled: "New Jersey Low and Moderate Income Housing Obligations for 1999-2025"

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REPORT SUBMITTED TO:
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EXECUTIVE SUMMARY

The New Jersey State League of Municipalities (NJLM) engaged Econsult Solutions, Inc. (ESI) to analyze Dr. David Kinsey's 2015 calculation of statewide affordable housing obligations for the Fair Share Housing Center (FSHC). ESI's careful reproduction and review of the approach taken by Dr. Kinsey, relative to appropriate analytical and legal precedents, has revealed a number of methodological issues that result in a significant overstatement of calculated affordable housing obligations for New Jersey localities.

Any calculation of the degree of sophistication required to estimate affordable housing need and allocate that need to produce municipal obligations by necessity includes a number of choices on the part of the analyst which influence the final result. The report prepared by Dr. Kinsey appears to contain a series of such decisions that result in a systematic increase in the final calculation of affordable housing obligations. Further, the consequences of these choices create logical and analytical problems that further upwardly bias the final calculation. These issues call into question the appropriateness of the results as a basis for municipal housing obligations.

Table E.S. 1 below summarizes the issues identified by ESI and detailed throughout this report. Where appropriate, we show the approximate increase in calculated statewide housing obligation caused by each issue. Each of these increases reflects the impact of only the issue in question on the final calculation, as the application of multiple methodological changes concurrently would likely result in overlapping effects. These impacts are therefore not necessarily additive, and this report provides no alternative figures for statewide housing obligations to those offered by Dr. Kinsey or Dr. Robert Burchell in his 2014 analysis for the New Jersey Council on Affordable Housing (COAH).

TABLE ES.1 - SUMMARY OF METHODOLOGICAL ISSUES

Report Section	Methodological Issue	Summary	Impact on Statewide Obligation
2.1	Timeframe for Calculation	Inconsistent time periods between Present Need (2010), Prior round obligation (1987-1999) and Prospective Need (1999-2025)	N/A[1]
2.2	LMI[2] Proportion of Population	Different LMI ratios (as a proportion of HH[3]) used for beginning (1999) and end (2025) of prospective need period.	131,000
2.3	Median Income Adjustment to LMI Ratio	Fails to account for impact of aging population on median HH income and thus the LMI threshold.	58,000
2.4	Double Counting Present & Prospective Need	Prospective need calculated 1999-2025 and present need from 2010, leading to potential double counting from 1999-2010	21,000
2.5	Exclusion of Prior Activity	Ignores affordable units added since 1999 (both private market and public subsidized) in the prospective need calculation.	52,000
2.6	Starting Date for Municipal Cap Calculation	Uses 2012 as occupancy base (larger) for cap calculation for prospective need period starting in 1999.	N/A[4]
2.7	Use of Building Permit Data	Residential building permit data erroneously used to represent occupancy leading to upward bias in municipal cap calculation	N/A[5]
2.8	Secondary Adjustments	Makes secondary adjustments at municipal level rather than regional, therefore ignoring new affordable units.	25,000
2.9	Significant Housing Assets	Fails to exclude LMI HH with "significant assets" (own homes with full paid mortgages)	34,000
2.10	Extremely Low Income	Fails to exclude LMI HH that are unable to pay for affordable housing and thus do not represent need from exclusionary zoning standpoint.	76,000

[1] Issues related to inconsistent time periods are reflected in many of the calculations below – the magnitude of this modeling choice on the need calculation cannot be estimated in the abstract
[2] "LMI" refers to "low and moderate income" households, which are one of the base units of the calculation of affordable housing need
[3] "HH" refers to households
[4] The magnitude of impact of this modeling choice on statewide housing need could not be estimated
[5] The magnitude of impact of this modeling choice on statewide housing need could not be estimated

1.0 PURPOSE AND BACKGROUND

1.1 FAIR SHARE HOUSING OBLIGATIONS

In two high profile cases,[6] the New Jersey Supreme Court established the "Mount Laurel Doctrine", affirming the constitutional rights of individuals to choose their housing location and prohibiting discrimination through land use policy. The legal principles underpinning these decisions were incorporated into the 1985 New Jersey Fair Housing Act ("FHA") that created the New Jersey Council on Affordable Housing ("COAH"). Based on these principles, which state that "every municipality in a growth area has a constitutional obligation to provide through its land use regulations a realistic opportunity for a fair share of its region's present and prospective needs for housing for low and moderate income families,"[7] COAH provided operational procedures to determine municipal level obligations.

In Round 1 (1987-1993) and Round 2 (1993-1999), COAH hired Dr. Robert Burchell and his team at Rutgers University to develop forecast models and assign housing obligation targets for each municipality. These calculations are collectively referred to as the "prior round" and their methodology has been accepted by the Court. Since that time, two sets of Round 3 rules adopted by COAH have been struck down by the Court, and the methodology prepared by Dr. Burchell in 2014 remains unadopted by COAH.

The New Jersey Supreme Court's March 10, 2015 decision states that "previous methodologies employed in the First and Second Round Rules should be used to establish present and prospective statewide and regional affordable housing need."[8] This ruling is consistent with the opinion in the 2010 Appellate Court decision on N.J.A.C. 5: 97 in remanding the matter to COAH with a "straightforward" remedy: "determine prospective need by means of a methodology similar to the methodologies used in the prior round rules."[9] That decision further required use of "the most up-to-date available data."[10]

1.2 PURPOSE

On April 16, 2015, the Fair Share Housing Center ("FSHC") released a report entitled "New Jersey Low and Moderate Income Housing Obligations for 1999 – 2025 Calculated Using the NJ COAH Prior Round (1987-1999) Methodology" by David N. Kinsey, PhD, FAICP, PP ("The Kinsey Report").[11] This report was a modification of an earlier report by Dr. Kinsey for FSHC in 2014

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[6] *Mount Laurel I* (1975) and *Mount Laurel II* (1983)
[7] Fair Housing Act of 1985, Section 2.a
[8] 221 N.J. 1 (2015), page 41
[9] 416 N.J. Super. 462 (2010), page 476
[10] *Ibid,* page 476
[11] The report was subsequently revised to correct data errors and re-issued in July 2015.

("2014 Kinsey Report"). The Kinsey Report and accompanying spreadsheets calculate fair share housing obligations for each municipality in New Jersey. The New Jersey State League of Municipalities ("NJLM") engaged Econsult Solutions, Inc. ("ESI") to analyze the Kinsey Report to determine the soundness of the statistical and analytical methodology employed to determine the statewide need. NJLM did not engage ESI to examine need for individual municipalities.

1.3 OVERVIEW OF KINSEY REPORT CALCULATION

The approach taken by Dr. Kinsey to the municipal fair share calculation in his 2015 report for the FSHC is summarized at a broad level below. The methodology is described neutrally in this section, without reference to whether it conforms to the prior round approach or sound statistical principles, which will be reviewed in subsequent sections.

The Kinsey Report defines three components of affordable housing obligations, which are summed together to produce a final calculation of municipal obligations. These components, which are defined below in turn, are:

1) Present Need
2) Prior Round Obligation
3) Prospective Need

1.3.1 PRESENT NEED

"Present Need" describes the estimated number of low and moderate income ("LMI") households ("HH") living in deficient housing. Dr. Kinsey's methodology first identifies the total deficient housing units by municipality using various indicators,[12] and then estimates the degree to which this deficient housing is occupied by LMI households, accounting for overlaps. Dr. Kinsey conducts this calculation as of 2010, using the most recent decennial census data without any extrapolation to the current year, and calculates present need at the municipal level.

1.3.2 PRIOR ROUND OBLIGATION

"Prior Round Obligation" describes housing need identified by COAH in the prior round that remains unmet. Dr. Kinsey's methodology utilizes obligation figures calculated at the municipal level by COAH in 1993-94.[13] These figures reflect the sum of prior round obligation from round

[12] a) Overcrowding in housing built before 1960 (note that this has been updated from 1940 and 1950 in prior rounds); b) housing lacking complete plumbing facilities; and c) housing lacking complete kitchen facilities
[13] As Reported in Appendix C of COAH 3rd Round Rules, June 2008 (N.J.A.C. 5:97).

one (1987-1993) and prospective need from round two (1993-1999), and therefore collectively reflect total prior round obligations from the time period from 1987-1999. No adjustments are made in the calculation with respect to whether those obligations have been met in the interim years, with the Kinsey Report suggesting that this variable "can be evaluated on a case by case basis in individual municipal proceedings."[14]

1.3.3 PROSPECTIVE NEED

"Prospective need" describes estimated housing need for a defined period in the future, based on projected changes in both population (in terms of households) and net housing supply. This calculation is the most complex of the three, and the Kinsey Report devotes approximately 30 of its 40 pages to describing prospective need methodology on a step by step basis. The Kinsey Report breaks this methodology into three phases:

1. Calculating Gross Regional Prospective Need, which entails using population and household projections to estimate LMI household growth over a future time period. Dr. Kinsey does this calculation at the County level, and then aggregates data regionally;

2. Allocating Municipal Prospective Need, which utilizes a variety of factors[15] to assign a calculated share of regional obligations to each municipality within the same region;

3. Adjusting for Secondary Sources of Demand and Supply, which accounts for projections of a variety of market-based factors[16] that impact housing need, and incorporates applicable caps[17] on obligations for individual municipalities.

This methodology covers the time period from 1999 – 2025 (encompassing both retrospective and prospective periods of time), and includes a regional component, which is ultimately converted to a municipal level obligation.

Table 1.1 illustrates the magnitudes of the components of Dr. Kinsey's statewide prospective need obligation calculation, while Table 1.2 illustrates the total statewide obligations calculated by Dr. Kinsey as a sum of present need, prior round obligation and prospective need.

[14] Kinsey Report, July 2015, pg. 8
[15] a) changes in the labor forces, as represented by non-residential tax valuation; b) undeveloped land; and c) differences in household income
[16] a) Filtering of housing stock in and out of the affordable category; b) residential conversions impacting affordable units; and c) demolitions affecting affordable units
[17] Prospective need obligations are capped at 20% of a municipality's occupied housing, or 1,000 units

TABLE 1.1 – COMPONENTS OF PROSPECTIVE NEED CALCULATION (1999 – 2025) CALCULATED BY DR. KINSEY (JULY 2015)

Category	Obligation (units)
Gross Regional Prospective Need	284,974
Secondary Sources Adjustment	7,145
Municipal Obligation Cap Adjustment	(90,476)
TOTAL	**201,643**

TABLE 1.2 – CUMULATIVE STATEWIDE MUNICIPAL HOUSING OBLIGATIONS CALCULATED BY DR. KINSEY (JULY 2015)

Category	Obligation (units)
Present Need (2010)	62,057
Prior Round Obligation (1987 – 1999)	85,875
Prospective Need (1999 – 2025)	201,643
TOTAL	**349,574**

1.4 ESI ANALYSIS

ESI has conducted a thorough review of the Kinsey Report. We have independently re-created several of the critical analysis from Dr. Kinsey's report to confirm our understanding of the methodology employed. We have also analyzed the calculations released by the Council on Affordable Housing ("COAH") in a June 2, 2014 report entitled "Municipal Determination of Rehabilitation Share, Fair Share, and Unanswered Prior Obligation: Overview" by Robert W. Burchell, PhD, William Dolphin, M.A., and Jinwoo Kwon, M.R.P. ("The Burchell Report").

Section 2 below describes the range of methodological issues identified by ESI's analysis. **Any calculation of the degree of sophistication required to estimate affordable housing need and allocate that need to produce municipal obligations by necessity includes a number of choices on the part of the analyst which influence the final result. The report prepared by Dr. Kinsey appears to contain a series of such decisions that result in a systematic increase in the final calculation of affordable housing obligations.** The consequences of these choices create logical and analytical problems that upwardly bias the final calculation. These issues call into question the appropriateness of the results as a basis for municipal housing obligations.

Where appropriate, ESI calculates and presents the numerical impact of choices and errors within Dr. Kinsey's methodology. Each of these values reflects only the impact of that specific choice or error on the final calculation. These values are not necessarily additive, so addressing two or more of the choices or errors will not necessarily change the need by the sum of the individual changes. Further, because of the complexity of the calculation, the spectrum of issues reviewed in this report does not necessarily represent the full universe of issues that can be raised regarding Dr. Kinsey's methodology. The exclusion of any particular aspect of the Kinsey Report from discussion within this analysis does not mean that ESI agrees in full with the methodology employed for that aspect of the calculation. In addition, in this report we have not examined the validity of the estimated obligation for individual municipalities.

2.0 METHODOLOGICAL ISSUES IDENTIFIED

This section reviews Dr. Kinsey's modeling choice that contribute to an elevated estimate of statewide affordable housing need and obligations in New Jersey, and analyzes Dr. Kinsey's justifications for these decisions. Where appropriate, we employ alternative approaches consistent with the Court's standards and the prior round methodology, and calculate the impact these alternative approaches would have on Dr. Kinsey's calculation of statewide affordable housing obligations, had they been applied. As previously noted, each of these changes reflects the impact of only the issue in question on the final calculation, as the application of multiple methodological changes concurrently would likely result in overlapping effects, and are therefore not necessarily additive. Further, this report does not provide an alternative calculation of statewide or municipal level affordable housing obligations.

2.1 TIMEFRAME FOR CALCULATIONS

As described in Section 1.3, affordable housing obligations for a given time period are calculated as the sum of present need, unmet prior round obligations, and prospective need over that period. Given a common starting date, these three categories are mutually exclusive and therefore additive. Unmet obligations and present need combine to quantify existing need that is unmet by current supply of housing of an acceptable quality. Prospective need projects additional need anticipated to arise in the future.[18]

Dr. Burchell's 2014 report for COAH applies this framework to the current round of calculations through his definition of the timeframes for each component. 2014 serves as the common anchor point at which current and past needs are calculated, and the prospective need period begins:

- "Present need" is calculated as of 2014.
- "Prior round obligation" accrued between 1987 and 1999 are updated to 2014, based on the adjustments described below:
    - "Prospective need" that arose due to changes in population between 1999 and 2014 is calculated, and allocated to the prior round obligation. This categorization reflects that fact that this need is temporally retrospective rather than prospective, because it has already accrued.
    - Housing activity between 1999 and 2014 which added to affordable housing supply is allocated to offset a portion of the prior round obligation. This adjustment allows for the prior round calculation to properly reflect only "unmet" obligations.
- "Prospective need" is calculated for the period from 2014 to 2024.

[18] The fact that we are we are currently more than 60% though the "prospective" period means that it is impossible to use prior round methods unaltered. Some recognition of this fact, and adaptation to it, is necessary.

This framework provides for internal consistency, by accounting for all categories of existing need, separate from the forward-looking prospective need calculation. Therefore, the three categories of calculated obligations at the municipal level are additive to represent total obligation, as intended.

Dr. Kinsey's 2015 calculation for FSHC, by contrast, takes a mix and match approach to the time periods covered by each calculation.

- "Present need" is calculated as of 2010.
- "Prior round obligation" accrued between 1987 and 1999 is taken as is, without adjustment for additional need in the interim (which is captured within Kinsey's prospective need period), or for interim housing activity (which is not captured at all).
- "Prospective need" is calculated for the period from 1999 – 2025, despite the fact that this encompasses both retrospective and prospective time periods.
    - The 20 percent municipal obligation cap is assessed from the base of estimated 2012 occupied households.

Table 2.1 illustrates the differences in calculation period for the three components between the Burchell and Kinsey Reports.[19]

TABLE 2.1 – TIME FRAME UTILIZED FOR COMPONENTS OF TOTAL OBLIGATION CALCULATION

Category	Burchell (2014)	Kinsey (2015)
Present Need	As of 2014	As of 2010
Prior Round Obligation (carryover)	1987 - 1999	1987 - 1999
Adjustment for interim prospective need	Yes	None[20]
Adjustment for interim housing activity	Yes	None
Prospective Need	2014 - 2024	1999 - 2025

[19] Note that the one-year difference in the conclusion of the prospective need period (2024 for Burchell vs. 2025 for Kinsey) is a product of the later production date of the Kinsey report, and is considered a material methodological difference in the context of this analysis.
[20] Covered in prospective need period.

Dr. Kinsey's decision to calculate prospective need across a single time period including both retrospective and prospective components creates a number of methodological issues within the calculation, which are reviewed in more detail below.

2.2 LOW AND MODERATE INCOME PROPORTION CALCULATION

Dr. Kinsey's framework of timing for the various elements of affordable housing need also creates a fundamental tension between the Court's directive to adhere to the prior round methodology (which is designed to calculate prospective need from the current date) and the Court's directive to use the most up to date data possible.[21] Kinsey's use of data points from both the beginning (1999) and middle (current) of the period creates an inconsistency with prior round methodology, in which the most up to date data is one and the same with data from the beginning of the prospective need period.

A key step in calculating statewide prospective need is estimating the proportion of total New Jersey households that qualify as low and moderate income ("LMI"). As detailed above, the prior round methodology envisions a prospective need period that is entirely forward-looking. Therefore, the most up to date data available on the proportion of households that are LMI will align with the beginning of the prospective need period, and that proportion has been applied to the estimate of total households at both the beginning and the end of the prospective need period in the prior rounds.

However, as noted above, Dr. Kinsey performs a single calculation for the entire 1999 – 2025 period. To do so, he identifies backdated data from the beginning of the time period (1999) and then uses current data to produce estimates for the conclusion of the prospective need period (2025). This introduces a differential between the proportion of households estimated to be LMI at the beginning and end of the prospective need period. As a result, the incremental growth in LMI households calculated by Dr. Kinsey is not proportionate to overall household growth projected over the time period.

Table 2.2 shows the implications of this methodological choice on the calculation of statewide LMI households. Dr. Kinsey projects incremental population growth of 372,000 households statewide over the period from 1999 – 2025. However, due to the differential LMI ratios used for the starting and end points, calculated incremental growth in LMI households is 284,000, or 77% of that figure. This result is immediately suspicious, because LMI is defined relative to median income, and by definition half of the households have incomes above the median. By contrast, if the LMI ratio from 1999 is applied consistently to 2025, the growth of 372,000 households is estimated to produce an incremental growth of 153,000 LMI households statewide, **131,000** lower than the figure estimated by Dr. Kinsey.

[21] Based on 221 N.J. 1 (2015) and 416 N.J. Super. 462 (2010), as quoted in Section 1.1 of this report.

TABLE 2.2 – ESTIMATION OF STATEWIDE LMI HOUSEHOLDS

	Differential LMI Ratios (Kinsey)			Consistent LMI Ratios		
	1999	2025	Net 1999-2025	1999	2025	Net 1999-2025
Total Households (in 000s)	3,043	3,415	372	3,043	3,415	372
(x) Effective LMI Ratio[22]	41.2%	45.0%	3.8%	41.2%	41.2%	0%
(=) Est. LMI Households (in 000s)	1,253	1,537	**284**	1,253	1,406	**153**
Effective LMI Proportion of Incremental HH Growth			**77%**			**41%**

It is worth noting that the 2014 Kinsey Report[23] for FSHC did not utilize differential LMI ratios for the beginning and end of the time prospective need period, instead applying the 40.3% figure determined by COAH in 2004 using 2000 Census data for the start of the time period to the final year of the time period. This adjustment is by far the largest driver of the vast differential in calculated regional prospective need between the 2014 and 2015 Kinsey Reports for FSHC.[24]

2.3 MEDIAN INCOME ADJUSTMENT TO LMI RATIO

Even if Dr. Kinsey's approach of different LMI ratios in different time periods, described in Section 2.2, were appropriate (we do not say that it is), Dr. Kinsey's projection of the LMI ratio for 2025 fails to account for the impact of forecasted demographic changes on the state's median income. Dr. Kinsey's approach therefore produces an inflated estimate of the LMI ratio in 2025.

The Kinsey Report breaks down households into eight age groups, from 15-24 to 85+. The report calculates the percent of households in each age group that are LMI ("LMI percentages") as of 2013 and applies these LMI percentages to the 2025 projections of the number of households in each age group. Table 2.3 shows the LMI percentages for each age group, as well as that age group's percent of all households.

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[22] Note that Dr. Kinsey's methodology does not directly apply the statewide LMI ratio to the number of households, but rather applies LMI ratios by county by age cohort drawn from the ACS. Therefore the effective ratio estimated for 2025 does not match the statewide average (43.3%) for 2013 because it incorporates anticipated shifts in the age composition of the population between 2013 and 2025. Additional problems introduced by this methodology, independent of the differential rates between starting and end periods, are discussed in section 2.3.

[23] Dr. David Kinsey for Fair Share Housing Center, "New Jersey Low and Moderate Income Housing Prospective Need for 1999-2024 Using the COAH Prior Round (1999-2024) Methodology, July 2014. Step 7, pg. 8

[24] Dr. Kinsey's 2014 calculation of Gross Regional Prospective Need for 1999-2024 in July 2014 was 201,000, 84,000 below the Gross Regional Prospective Need for 1999-2025 of 285,000 calculated in July 2015.

TABLE 2.3: PERCENT OF HOUSEHOLDS IN EACH AGE GROUP AND THE 2013 LMI PERCENTAGE[25]

	Percent of Households		
Age group	2013	2025	Percent LMI in 2013
15-24	1.6%	1.5%	78.4%
25-34	12.9%	12.2%	47.1%
35-44	18.4%	16.1%	39.0%
45-54	23.0%	18.1%	33.2%
55-64	19.9%	20.4%	35.1%
65-74	13.0%	17.7%	48.5%
75-84	7.4%	9.9%	67.9%
85+	3.7%	4.2%	76.8%
TOTAL	100.0%	100.0%	

There are two important items in this table:

1) The 65-74, 75-84 and 85+ groups have significantly higher LMI percentages than other age groups (except the small 15-24 group); and

2) The 2025 population projections show that the older age groups are expected to grow as a percent of the population.

These two items taken together necessarily mean that the median income for the state as a whole will decline.[26] The mathematical principle is straightforward – if the lower income population grows more than the non-lower income population, then the median income will decrease. The decrease in the median income means that the LMI threshold for each age group will decrease, and therefore the percent of LMI in each age category will decrease as well. Therefore the "Percent LMI in 2013" proportion shown cannot be accurately applied to 2025 projections of household proportions by age group.

The Kinsey Report does not take this effect into account, and instead applies LMI percentages based on 2013 data directly to 2025 without first correcting for the lower 2025 statewide median income implied its analysis. However, this effect is a necessary result of the way the Kinsey Report calculates LMI by age groups, and failing to correct for it is a methodological error.

[25] Data in this table is drawn from Dr. Kinsey's analysis. Original source data is the American Community Survey for 2013 information, and the New Jersey Department of Labor and Workforce Development for population projections.
[26] The median income that is needed for calculation purposes, ignores, as the Kinsey Report appropriately does, the impact of inflation.

ESI conducted an analysis that takes this effect into account, which concluded that the demographic assumptions utilized by Dr. Kinsey imply a decrease in median income between 2013 and 2025 of approximately 3 percent.[27] This adjustment in turn reduces the number of LMI households by approximately **58,000**.

2.4 DOUBLE COUNTING IN PRESENT NEED AND PROSPECTIVE NEED

Prospective need within the Kinsey Report is calculated in a single time period from 1999 to 2025, while present need is calculated as of 2010. However, the mechanics of the two calculations suggest that given overlapping time periods, many of the same LMI households may be captured in both categories, and therefore "double counted" when the categories are added together.

- Prospective need is in large part a product of the anticipated increase in LMI households over a given time period (with relevant adjustments and local allocations, as described in Section 1.3.3). Therefore, increases in LMI households that occurred between 1999 and the present are captured within this calculation.

- Present need is a function of the estimated number of LMI households living in deficient housing. Local data on the volume of deficient units is summed (based on proxy indicators described in Section 1.3.1) and a proportion of those households are then estimated to be LMI.

These categories are not mutually exclusive given an overlapping estimation period. Growth in LMI households from 1999 to present will be captured in the prospective need calculation. However, some of these households will have occupied deficient housing between 1999 and 2010, and will therefore also be captured in the present need calculation as of 2010. The categories therefore cannot be summed to produce current obligations, though that addition is what the Kinsey Report does.

To avoid this duplication, it is necessary to align present need with the beginning of the prospective need period. The prospective need period utilized in the Kinsey Report would require calculating present need as of 1999. Unfortunately, this approach may be in tension with the Court's requirement to utilize the most up to date data. This paradox underscores how the choice of timeframes in the Kinsey Report is fundamentally problematic.

Calculating the number of double counted units is difficult. Our estimate is **21,000** units. [28],.

[27] See Appendix A for a detailed explanation of this calculation

[28] For example, the 2010 Present Need in the Kinsey Report is 62,057 and the gross rehabilitation need in 2000 in N.J.A.C. 5:94 is 40,658, implying double counting in that interval of 21,429.

2.5 EXCLUDING PRIOR ACTIVITY

The prospective need calculation in Round 1 and Round 2 methodologies made no provision for incorporating production of affordable housing, because the calculations were performed before the prospective period. The calculations in the Kinsey Report treat 1999-2025 as the prospective period and present a different fact pattern than Round 1 and Round 2 because we are currently more than 60% though the "prospective" period used in the Kinsey Report. Despite this fact, the Kinsey Report chooses to exclude the production of affordable housing from 1999-2015 from its calculation entirely. Instead the Kinsey Report suggests that municipalities can include new units on a "case by case basis" as part of their plans to address total obligations. Therefore, the Kinsey Report's statewide need calculation excludes housing that exists today, and is therefore its need is too large.

In his 2014 analysis for COAH, Dr. Burchell estimated that there were approximately 92,000 affordable units added from 1987 to 2014.[29] This represents approximately 3,300 units per year over the 28 year time period. The annual distribution of those units is unclear based on available data sources, meaning that it is unclear how many units were created between 1999 and 2014. Simply assuming an even distribution of unit production at 3,300 per year, which is conservative given the spike in building activity in the early 2000s, and applying this annual proportion to the 1999-2014 year time period yields an estimate of **52,000** units unaccounted for in Dr. Kinsey's calculation.

2.6 STARTING DATE FOR MUNICIPAL CAP CALCULATION

Dr. Kinsey's choice of timeframe for the prospective need calculation also creates problems within the municipal apportionment process. Obligations for any municipality for a prospective need period are capped at 1,000 units or 20% of occupied housing stock within that community. However, rather than calculating occupied units as of the beginning of the prospective need period in 1999, the Kinsey Report calculates occupied units as of 2012, which are then multiplied by 20% to calculate an obligation cap.[30] For municipalities that increased in size between 1999 and 2012, this approach creates a higher baseline of occupied units, and therefore a higher obligation cap. To use a hypothetical example, a municipality that increased in size by 10% from 2,000 occupied units in 1999 to 2,200 occupied units in 2012 would see its obligation cap increase by the same 10% from 400 (2,000 x 20%) as calculated from the 1999 baseline to 440 (2,200 x 20%). The application of a 2012 cap is not internally consistent if the intent of the rule is to limit obligations over a prospective need period that begins in 1999, and provides another example of how the choice of years covered creates inherent consistency problems.

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[29] *Technical Appendices to Third Round Substantive Rules*, NJ COAH, 2014, page 19.
In addition, COAH released a table showing 75,000 units of affordable housing production as of March 1, 2011 (http://www.state.nj.us/dca/services/lps/hss/transinfo/reports/units.pdf). Given that Dr. Burchell's figure includes three subsequent years of housing production, the figures appear to be broadly in line.

[30] This calculation is applicable if the result is lower than 1,000. If the result is higher than 1,000, the cap is set at 1,000.

This inconsistency results in an increase in the cumulative statewide obligation cap that is approximately **46,000** units higher than if the cap were calculated using 1999 occupancy data. It is unclear the extent to which this overstatement of the cap impacts the calculated cumulative municipal obligation, because its application depends on the extent to which individual municipalities reach their caps and therefore have obligations reduced relative to the uncapped calculation.

2.7 USE OF BUILDING PERMIT DATA FOR HOUSING OCCUPANCY

The Kinsey Report relies on building permit data, rather than certificates of occupancy, to calculate the occupied housing units in a municipality. This approach assumes that all building projects result in completed housing units. However, it is well known that not all building permits result in completed and occupied units.

Table 2.4 shows annual data on housing units authorized by building permits[31] and certificates of occupancy[32] tracked by the New Jersey Department of Community Affairs from 2000 to 2014. Over that fifteen year period, there were 388,298 building permits issued and 317,792 certificates of occupancy, or 81.8% of the building permits.

[31] Available online at: http://www.state.nj.us/dca/divisions/codes/reporter/2014yearly/house_2014.pdf
[32] Available online at: http://www.state.nj.us/dca/divisions/codes/reporter/co.html

TABLE 2.4: HISTORIC RELATIONSHIP BETWEEN RESIDENTIAL BUILDING PERMITS AND RESIDENTIAL CERTIFICATES OF OCCUPANCY IN NEW JERSEY

Year	Residential Building Permits	Residential Certificates of Occupancy	Certificates of Occupancy / Building Permits
2000	38,065	29,705	78.0%
2001	35,680	30,054	84.2%
2002	34,589	29,174	84.3%
2003	35,171	26,932	76.6%
2004	39,254	27,950	71.2%
2005	39,688	31,049	78.2%
2006	32,050	28,564	89.1%
2007	25,590	23,138	90.4%
2008	16,338	18,699	114.5%
2009	11,145	14,460	129.7%
2010	11,885	11,625	97.8%
2011	11,882	10,352	87.1%
2012	15,270	11,118	72.8%
2013	18,795	11,717	62.3%
2014	22,896	13,255	57.9%
2000-2014	**388,298**	**317,792**	**81.8%**

Source: New Jersey Department of Community Affairs

This ratio indicates that municipal level calculations performed by Dr. Kinsey overstate municipal occupancy levels as of 2012.[33] The calculation of municipal obligation caps is therefore inflated. The magnitude of impact of this adjustment on calculated municipal obligations is unclear, since it will vary by the construction activity in each municipality, and by the extent to which calculated municipal obligations exceed calculated caps.

[33] Note that this overstatement is above and beyond the over-estimation caused by calculating occupancy as of 2012, rather than the beginning of the prospective need period in 1999, as reviewed in the previous section.

2.8 SECONDARY ADJUSTMENTS FOR MARKET-BASED FACTORS

Secondary adjustments reflect anticipated changes in the stock of affordable housing available across the prospective need period, which is calculated by Dr. Kinsey from 1999 to 2025 using extrapolations of current and most recently available data. Changes which increase affordable housing supply reduce need, while changes that reduce supply increase need.

The three categories of calculated changes are:

1) The filtering of housing stock into and out of the affordable housing category, which is estimated by Dr. Kinsey to reduce need by adding 67,000 net units to the supply of affordable housing over the prospective need period;

2) Residential conversions to affordable housing stock, which are estimated by Dr. Kinsey to reduce need by adding 6,000 net units to supply over the prospective need period; and

3) Demolitions of affordable housing stock, which are estimated by Dr. Kinsey to increase need by removing 55,000 units of affordable housing supply over the prospective need period.

In sum, these three categories total a net increase of 18,000 units of affordable housing supply, which should yield a commensurate decrease in affordable housing need (67,000 + 6,000 – 55,000 = 18,000).

However, Dr. Kinsey's methodology allocates regional need to municipalities prior to adjusting for the secondary sources detailed above, which produces untenable results for this calculation. The allocation process reduces obligations to zero for certain municipalities. However, these municipalities still contribute to regional demand, and still contribute to the secondary supply factors described above. However, the reduction of the obligations of these municipalities to zero inserts an artificial lower bound beneath which their obligations cannot be reduced. Therefore, if these municipalities are projected to increase affordable housing supply in the course of the prospective need period, that contribution is disregarded in Dr. Kinsey's methodology, rather than appropriately credited as reducing need within the region.

As a result of this approach, the application of the three categories of secondary adjustment ***increases*** affordable housing need in Dr. Kinsey's calculation by 7,000, even though growth in the total housing supply should ***reduce*** affordable housing need by 18,000, according to Dr. Kinsey's own estimates. Applying these adjustments before regional obligations have been calculated, rather than after, reduces the Kinsey Report's calculated adjusted prospective need (1999-2025) by approximately **25,000**.

2.9 SIGNIFICANT HOUSING ASSETS

Another conceptual issue with Dr. Kinsey's methodology is its inclusion of all LMI households as representative of prospective need for affordable housing. This approach is at odds with the intent of the prospective need calculation, which is not to estimate the total volume of LMI households statewide, but rather to define affordable housing need with respect to exclusionary zoning practices. Therefore, deductions for several groups which are represented in the calculation of total LMI households but do not represent affordable housing needs may be warranted, but are not undertaken by Dr. Kinsey.

The first of these categories are LMI households with significant housing assets. Uniform Housing Affordability Controls ("UHAC")[34] under the Fair Housing Act set forth "rules for the establishment and administration of affordability controls"[35] for affordable housing units. These rules specifically cite "equity in real estate"[36] as a form of income considered to determine eligibility. Further, the rules state that that if an applicant household owns their home, has fully paid off their mortgage and spends less than 38% of their income on housing costs, a certificate of eligibility for that applicant "shall be denied by the administrative agent."[37]

FSHC's August 2014 comments on COAH's proposed 3rd Round rules[38] recommend that COAH "delete this factor," arguing that their calculation only concerns the net increase in low income households, which will be unlikely to qualify for deduction under this test because "it is not reasonable to anticipate that a new lower income household will acquire a house and pay off a mortgage within the 2014-2024 projection period used by COAH."[39] Dr. Kinsey's methodology deletes this factor, in keeping with FSHC's stated position.

Two conceptual problems undermine FSHC's argument, which is unsupported by any data provided by FSHC. First, as explored previously, while COAH's round three prospective need projections concern a forward-looking ten year period, Kinsey Report calculations of prospective need cover a 26 year period from 1999 to 2025, during which many mortgages were or will be paid off. More fundamentally, FSHC's characterization of a "new lower income household" misrepresents the nature of net increases in population. Projected net growth in lower income households is driven by far more than migration – it is a complex process including aging, family formation and dissolution, moves in and out of group quarters, and other factors. This net calculation therefore includes many households that are new to the category, without necessarily being "newly formed" or "new to the state." Most relevantly, the anticipated aging of the population would likely produce many households that qualify as LMI in retirement, but would be

[34] N.J.A.C. 5:80-26.1 et. seq.
[35] N.J.A.C. 5:80:26.1
[36] N.J.A.C 5:80-26.16(b)(1)
[37] N.J.A.C 5:80-26.16(b)(3)
[38] Letter from FSHC to COAH re: Proposed Procedural Rules N.J.A.C. 5:98, 46 N.J.R. 912 and Proposed Substantive Rules N.J.A.C. 5:99, N.J.R. 912 (August 1, 2014).
[39] *Ibid*, Paragraph 66

deducted under the asset test based on mortgages paid during their working years. For this group, housing affordability is unlikely to be a concern.

Including the significant housing asset test decreases the Kinsey Report's calculated gross regional prospective need (1999-2025) by approximately **34,000**.

2.10 EXTREMELY LOW INCOME

Prospective need calculations for affordable housing seek to quantify the number of residents seeking housing that is privately owned and operated, and paid for by those residents (albeit at below market rates). However, public policy makers recognize that not all households will realistically be able to afford to pay anything for their housing. For example, the federal Department of Housing and Urban Development (HUD) has a category of "extremely low income" households, which it defines as those with incomes at or below 30% of the area median income. This income category is relevant to participation rules for programs such as the Low-Income Housing Tax Credit (LIHTC). This federal standard is recognized in New Jersey law in the administration of UHAC as of 2008.[40]

Accordingly, COAH utilizes this category to award municipalities "credits" for the provision of affordable housing for this group to reduce their obligations. However, those obligations will realistically be filled by tenants who are between 20 and 30 percent of area median income (AMI). The rent for very low income households is set so that a family earning 30 percent of AMI pays 30 percent of its income for rent. The rent threshold does not decrease as a family's income decreases so that a family earning 20 percent of AMI pays the same as a family at 30 percent of AMI. However, for the 20 percent family, that rent amount is 45 percent of the family's income. Taken to the extreme, for a family earning 9 percent of AMI, rent for a very low income unit is 100 percent of the family's income. Accordingly, families with less than 20 percent of AMI are still not realistically able to access affordable housing because the portion of their income it would require is too great.

FSHC's calculations of prospective need for affordable housing include all households at or below 80% of the median income, without any accounting for extremely low income households. However, as previously noted, the intent of the prospective need calculation is not to identify all affordable housing need, but to identify need with respect to exclusionary zoning practices. It may therefore be appropriate to exclude households with extremely low incomes from the calculation, since they do not represent need that can be fulfilled through private market activity impacted by municipal zoning practices.

[40] N.J.A.C. LD-329.1, Section 5:m

If extremely low income households are conservatively defined as those at 20% of the median income, excluding these households decreases the Kinsey Report's calculated gross regional prospective need (1999-2025) by approximately **76,000**.

CONCLUSION

ESI's careful reproduction and review of the approach taken by Dr. Kinsey in his 2015 report for FSHC has revealed a number of methodological issues, which have been detailed throughout this report.

ESI has successfully reproduced Dr. Kinsey's key calculations, which have been well documented in information released by the FSHC. This process has illuminated the volume of choices that must be made within the modeling approach, and the importance of those choices on the resulting calculations. The choices made by Dr. Kinsey in developing his methodology consistently and systematically result in an increase in calculated affordable housing obligations relative to other reasonable alternatives. Further, these choices create a number of logical and analytical problems within the methodology that undermine its appropriateness as a basis for municipal housing obligations.

These choices and the resulting inconsistencies, both internal and relative to prior round methodologies, have been documented in detail throughout this report. Where appropriate, the consequences of those choices for calculated affordable housing need has been presented to illustrate the magnitude of impact of the various methodological issues. These figures do not represent an alternative calculation of affordable housing obligations on the part of ESI, and should only be interpreted as describing the impact of an isolated revision to the methodology as described within each section. Collectively, they illustrate the significance of questionable modeling choices on the calculations presented within the Kinsey Report.

APPENDIX: CALCULATION OF MEDIAN INCOME ADJUSTMENT

To project the low and moderate income households in 2025, the methodology described below adjusts COAH 2013 income limits by considering projected demographic change from 2013 to 2025.

Table A.1 below summarizes the current and projected age distribution based on head of households in New Jersey from 2013 American Community Survey ("ACS") One Year data and New Jersey Department of Labor and Workforce Development ("NJLWD") projections of population change.[41] The proportion of senior households (those with a head of household age 65 and up) is projected to increase from 24% in 2013 to 31% in 2025.

TABLE A.1: AGE DISTRIBUTION OF NEW JERSEY POPULATION, 2013 & 2025

	2013		2025 (projected)	
Age group	**# of HH**	**%**	**# of HH**	**%**
0-24	49,260	1.6%	49,783	1.5%
25-44	997,221	31.4%	965,746	28.3%
45-64	1,361,575	42.9%	1,312,446	38.4%
65+	768,080	24.2%	1,085,575	31.8%
TOTAL	3,176,136	100%	3,413,550	100%

Projections from NJLWD include only summary tables, rather than full datasets. Therefore, ESI has developed 2013 and 2025 household and median income simulations to demonstrate that the aging of population, given a stable income level within each age cohort, will lead to a lower median income, and thus lower LMI income limits, across regions and statewide in 2025. The steps utilized to conduct this simulation are as follows:

Step 1: Base data from ACS and NJLWD:

A. Calculate the age distribution by age cohort by region in 2013 and 2025

B. Generate median (med), mean (m), variance (v), standard deviation (s.d.) of household income in state and each region

Step 2: 2013 simulation

[41] Note that these are the same original data sources utilized in the Kinsey Report

A. Income distribution is lognormal distribution,[42] but software tool STATA do not have command to generate random numbers of lognormal distribution, only its correspondent normal distribution. Therefore, that distribution is generated.

B. Calculate the two parameters in the normal distribution, the mean (m) and the standard deviation (*s.d.).*

C. The two calculated parameters will simulate a lognormal distribution with almost exact m and *s.d.*as in the original lognormal distribution, but the median can be a bit off. Adjust the parameters using the following equation so it matches med and s.d. in the original lognormal distribution:

$$\text{Med} = e^{\mu}\ ,\ m = e^{\mu+\sigma^2/2}"$$

D. In STATA, apply the adjusted parameters and the number of households to simulate the lognormal distribution for each of the four age cohorts in six regions (24 simulations in total).

E. Aggregate the four simulations in each region, arriving at six simulations in total. Calculate the median and mean of household income by region in 2013, which should match the median and mean of the original lognormal distribution for 2013.

Step 3: 2013 simulation

A. Using 24 sets of parameters in 2013 (as we assume income level as stable in each age cohorts by region), and projected number of households by age cohorts by region, STATA can generate 24 lognormal distributions, and then aggregate six simulations in 2025 as was done for 2013.

Step 4: Calculate Difference Between 2013 and 2025 Simulations

A. According to the comparison of the simulations by region in 2013 and 2025, the median household income is estimated to drop at least 3% in each region, when median and mean of household income remain constant in each age cohorts, and age distribution changes.

B. The impact of this adjustment on the LMI calculation can be estimated by adjusting the 2013 Income limits table by multiplying (1-decreased rate) in each region.

C. Apply the adjusted income limits for 2025 to calculate the number of low and moderate income households in STATA, using 2013 One Year PUMS.

[42] As defined by the University of Alabama-Huntsville Math Department, lognormal distributions are "used to model continuous random quantities when the distribution is believed to be skewed" but whose logarithm is normally distributed. Said mathematically, "Random variable X has a log-normally distribution if ln(x) has the normal distribution." http://www.math.uah.edu/stat/special/LogNormal.html