

AD - Bernards

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Economic, financial + market research

"A review of a "Employment Growth  
Projection for 6 counties surrounding Bernards  
Twp, NJ"

pgs 15

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MEMORANDUM

**To:** Benjamin Cittadino, Esquire  
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201 Nassau Street  
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**From:** Richard Reading and Associates

**Date:** December 27, 1976

**Subject:** A Review of a Document Entitled "Employment Growth Projections for Six Counties Surrounding Bernards Township, New Jersey", prepared by James C. Ohls and Peter Bearce of Mathematica Policy Research.

In accordance with your request, we have reviewed the above-referenced document and are enclosing herewith our preliminary comments in this regard. The purpose of our review was to evaluate the logic and foundation of the MPR employment projections, analyze the statistical and data base employed in the projection procedure, to assess the mathematical manipulations involved and to comment upon the actual projections of employment in the six-county region derived by the MPR report. Overall, there are a great many areas of question or concern regarding the contents of the MPR report; however, it is the question of relevancy which is probably of the utmost importance in the subsequent review. The highlights and principal findings of Richard Reading and Associates resulting from this review are presented in the following pages.

**A. MAJOR FINDINGS AND AREAS OF EXCEPTION**

1. Authorization and Objective. Initially, it is somewhat curious to note that the MPR report was commissioned by the Defendant's counsel,

McCarter and English, rather than the governing body of the Township of Bernards. In this regard, one cannot help but wonder whether or not this MPR research effort was, in fact, authorized by the Township. In addition to the question of authority of the subject report, it also appears that there is a question as to the true purpose of the MPR report. Although the introduction of the MPR report indicates that its objective was to "make estimates of future employment growth in Essex, Hunterdon, Middlesex, Morris, Somerset and Union Counties", there is no indication as to why the employment projection for these six counties was, in fact, undertaken. 1 2

Presumptively, as well as by reference within the report itself, it appears that the purpose of the MPR research was to derive employment projections for these six total counties that would support the previously promulgated employment projections of Township Committeeman William W. Allen. If such support were, in fact, the true objective of the report, questions must certainly arise as to the propriety of the analysis undertaken by Mathematica Policy Research. 3 1

2. Purpose of Report. Insofar as the MPR report purports to present "employment projections for the six counties surrounding Bernards Township", it appears that some discussion should have been provided as to how or why these six total counties (rather than portions of these six counties) relate to the Township of Bernards. Similarly, although the MPR report concludes with a housing requirement circuitously derived through a population projection for Bernards Township, such conclusions are offered without any explanation as to their relationship to the employment projections in the six-county area or the Township of Bernards. 4

3. Area of Analysis. For these reasons, as well as those subsequently discussed, the MPR survey at best appears unrelated to the housing

needs in Bernards Township. Specifically, the housing allocation analysis prepared by Bernards Township by both the Plaintiff and the Defendant Township, itself, appear to be in agreement on at least one item--that the housing need for a municipality is predicated upon the employment region for that municipality. The Plaintiffs have determined the housing need for Bernards Township to consist of the area within a thirty-minute driving time from the center of the Township; whereas the Township's own report establishes its housing region as a ten-mile radius from the population center of the Township. In either case, the housing region designated is a geographic area that is not co-extensive with county boundaries. In the larger thirty-minute driving time region, only Somerset County is included in its entirety; while in the ten-mile radius proffered as a region by Committeeman Allen, only a portion of Somerset County and lesser portions of contiguous counties are encompassed within the Bernards Township housing region. Thus, the development of employment projections for this six-total-county area developed by MPR appears to be more than somewhat unrelated to the housing needs of Bernards Township.

4. Form of Projections. In addition to housing region delineation problems arising from the MPR research effort that projects employment on a countywide basis only, and which does not and cannot provide employment projections for less than county units such as municipalities, is the ironic fact that the Township's own Fair Share Analysis requires municipal, not county, data. The Housing Allocation Analysis developed for Bernards Township by Committeeman Allen employs his "J. O. R. D." formula to compute housing needs on a municipal employment/distance basis. Thus considered, the projection of total employment for the six total counties surrounding Bernards Township would not appear to be related to any significant degree to the particular situation existing in Bernards Township, nor

would it be consistent with the data base information and statistics required by Mr. Allen for the J. O. R. D. formula. To be comparable and of any use in the allocation analysis for Bernards Township, MPR should have projected employment on a municipal rather than county basis from which aggregations for the housing region could be prepared.

5. Bias and Relevancy. The effect of the inclusion of the six total counties rather than the related portions thereof is that the employment growth in virtually every county would be depressed by the inclusion of either older urban areas to the east or by the extremely rural agricultural areas to the west. The inclusion of cities such as Newark in Essex County, Perth Amboy and Carteret in Middlesex County and the City of Elizabeth in Union County all tend to dampen or reduce the overall rates of growth in the total counties. The relevant portions of these counties of concern to Bernards Township which are the western Essex, Union and Middlesex Counties are, in fact, the more rapidly growing sections of these encompassed counties. By dealing with total counties rather than the appropriate portions of counties, it becomes quite apparent that MPR has effectively reduced the growth rate attributable to the Bernards Township housing region.

6. Time Frame Utilized. Another problem with the MPR research is the time frame selected by the report of 1976 to 1982. In the first place, the time frame analyzed is rather brief (only six years), while secondly, the years reported by MPR (1976 and 1982) are not comparable with any other published forecast. Whether by accident or intent, these years so selected avoid comparison to all published employment projections.

7. Projection Uncertainty. Another difficulty with the MPR employment projections is that they do not provide a single employment projection

for the six counties of their concern, but rather provide a range or perhaps parameters of employment growth. Whether their inability to settle upon a single employment projection reflects their own uncertainty, or whether it is merely intended to keep their option open, it certainly would create problems in planning for future housing.

8. Circumvential Approach. The employment projections derived by MPR do not, of themselves, result in the computation of housing needs, but rather they approach housing requirements through a circumvential method that involves population estimates in order to derive housing needs. This technique introduces another element of subjectivity (choice) into the ultimate housing need projections which is not necessary, as housing needs should be directly correlated with projected employment growth.

9. Inconclusiveness. Finally, there is an additional exception to the MPR report to the extent that it is not conclusionary. The subject report does not establish housing needs for Bernards Township, but rather as a conclusion indicates only the results of a projection under an explicit application to the Allen J. O. R. D. theory. MPR makes no statement one way or the other as to the reasonableness of this application, commenting only to the similarity of the results achieved by the application of the J. O. R. D. formula to their similar county employment projections.

## B. DETAILS OF THE ANALYSIS

While the foregoing has enumerated some of the major areas of exception to, and what appear to be logical flaws in the MPR research effort, there are also a number of details and factors contained therein which should be commented upon, as they provide a foundation upon which the conclusions of the MPR report are based.

As a background to their employment projections, MPR indicates that there are three powerful forces in New Jersey which will influence employment in the future years. These powerful forces are identified as: (1) an overall slowdown in the rate of employment growth in the United States; (2) recent dislocations of employment away from the northeastern portion of the United States wherein New Jersey is located; and (3) the statewide trend in the movement of employment and population from New Jersey's older urban areas into suburban and rural areas of the State. While we do not take specific exception to these three forces as basic premises, the method of application and magnitude of the effect as utilized by MPR must be investigated.

By establishing these three major forces, MPR has created three interdependent variables upon which their particular "choices" of relationships could drastically effect the employment projections in the various counties under consideration. Thus, while MPR identifies the "forces", it avoids indicating what the relative effects of these forces might be.

On pages 5 and 6 of the MPR report, its authors indicate that there will be wide differences in the effect of these "forces" upon the employment growth among the six counties subject of their study. The study, however, neither quantifies the effects on the individual counties, nor has this premise been taken the necessary step forward to indicate that there are also distinct differences within the counties themselves, i. e. Newark vs. Livingston in Essex County. This failure to recognize the importance of the municipal components of the counties' growth is one of the continuing flaws of the MPR survey which eventually invalidates its relevance to the Bernards housing region, as well as its application to the J. O. R. D. formula employed by Allen which is precipitated upon municipal employment locations.

After identifying these three major factors on page 6, the MPR report proceeds on pages 6 and 7 to reject the published methodologies for projecting job growth. In this regard, the report dismisses two published projections of employment: (1) a study entitled "New Jersey's Manpower Challenge of the 80's" by the New Jersey Department of Labor and Industry; and (2) the book entitled "Modeling State Growth: New Jersey 1980" prepared by the Center for Urban Policy Study at Rutgers. The basis for the MPR rejection is that: (1) both projections rely upon historical data as a basis for their estimates; (2) both forecasts provide estimates for the year 1980, rather than for the year 1982, selected by the MPR report; and (3) both of the aforementioned studies were based upon data which MPR considers to be relatively dated because they both were based upon data which did not go beyond 1972, whereas the MPR survey will utilize data through 1975. With respect to these exceptions, it must be noted that: (1) all forecasts are based upon some historical data, even those prepared by MPR; (2) the projection of employment for the year 1980 is not a disability of these studies and could readily be extrapolated to the desired year 1982; and (3) it would appear that MPR could have updated the forecast of these surveys by the inclusion of data now available through 1975 rather than creating a new projecting technique.

Nevertheless, the authors of the MPR report indicate that they have elected to create two new projecting techniques, rather than relying upon the techniques and statistics developed by these agencies. The first technique identified for use by the MPR report is essentially an extrapolation of past county trends in jobs by industry, while the second methodology used by the MPR report is based upon a projection of the proportional trend of the State's total employment held in various counties in New Jersey.

In selecting a data base or source for their projections, MPR has chosen County Business Patterns, which is an annual publication of the

United States Department of Commerce that presents county estimates of employment based upon reports of employers. There are two major problems with this selection of a data base: (1) these Department of Commerce reports are, in themselves, only estimates; and (2) the data which is furnished therein is for total counties only and does not provide any information on less than a county level. The inavailability of municipal data is a disadvantage of this source, not only for regional purposes, but also by virtue of the fact that correlations to Bernards Township are precluded because compatible employment estimates for the Township itself are not provided. Consequently, any comparison between employment estimates based upon County Business Patterns for the six total counties, and the published covered employment statistics for Bernards Township would represent a comparison of data which is obviously not comparable. It is interesting to note that the selection of County Business Patterns as a data base, while not impliedly self-serving, has admittedly resulted in lower projections of employment than those reported by the New Jersey Department of Labor and Industry.

NO AGRICULTURAL  
NO RAILROAD  
MUN GOVT  
FED GOVT

With respect to the period analyzed for projections, MPR reports that it utilized the years 1966 through 1975. There is nothing inherently incorrect with the selection of these years for their projection basis, as the combination of the years of the late sixties (which contained higher employment growth) with those of the early to mid-seventies (which included a recessionary period) should result in an overall normative and reasonable projection. However, the actual technique of such projections is obviously important. For example, if one were to project only the trend, the more recent recessionary effects upon employment in New Jersey would naturally indicate ever-increasing declines in employment growth, an effect which is

not the most realistic. Economists recognize that a recession is a temporary situation, and consequently, recovery is impliedly indicated. Therefore, the recessionary trends observed for the years 1973 to 1975 should have been treated as an anomaly, not a criteria for future projections. Unfortunately, MPR does not present any details as to the specific manner in which its projections were accomplished.

On page 12, which is entitled "Table 3, Employment Growth Rates as Estimated by Methodology 1", MPR presents employment projections for each of the six total counties for the years 1976 and 1982. With respect to the 1976 employment estimates derived by MPR, it is interesting to note that these projections not only appear conservative, but are actually below the 1975 employment estimates by every County Planning Board, as well as by the Port Authority of New York. With respect to the estimated employment for 1982 set forth by MPR on Table 3, their estimates for 1982, with the exception of Hunterdon and Middlesex Counties, are lower than all published employment projections, including those of "Modeling State Growth", the Port Authority and County Planning Boards for 1980. The conservatism apparent in these employment projections undoubtedly reflects the MPR choices of the factors that were applied as the three major interdependent variables previously discussed. An example of the limited growth projected by MPR for 1982 is apparent in the Somerset County projection. The MPR estimate of 87,925 employees in Somerset County during 1982 is significantly below the 95,322 employees estimated by "Modeling State Growth", the 100,000 employees estimated by the Port Authority and the 98,000 employees estimated by the County Planning Board for the year 1980. Moreover, it should be recognized that these other published employment projections did not encompass substantial increases in employment in Somerset County resulting from the location of two major AT&T facilities within the County's

boundaries. While the MPR report indicates a growth of only 13,338 employees in all of Somerset County between their 1976 and 1982 projections (Methodology 1), it is interesting to note that 4,341 of these employees would be included in just two projects in Bernards Township. Even if we discount normal employment growth in Bernards Township and discount the economic multiplier which would be attributable to the 3,400 new AT&T employees and 941 new employees of Mount Airy Associates in Bernards Township, these 4,341 new jobs would account for 32.5 percent of the total growth of employment in Somerset County during the next six years. This employment projection by MPR for Somerset County cannot realistically include the employment prospects arising from major employment generators such as the AT&T facilities in Bernards and Bedminster Townships and Mount Airy Associates in Bernards Township. The MPR employment projections for Somerset County appear to be strictly a conservative extrapolation of past employment growth with no consideration whatsoever afforded to the present situation within the County.

The second form of employment projection prepared by MPR was discussed on pages 13 and 14 of their report as being derived as a fraction of the national employment, by industry category, that is located in New Jersey. This New Jersey percentage of national employment was then broken into smaller percentages to represent the county components of New Jersey's employment. The application of a national model to New Jersey and subsequently to the various counties in New Jersey has several potential flaws in its construction. Due to the scope of national employment, a factor such as rounding or even a minor change in the fractional component which represents New Jersey employment would result in substantial changes in the State's employment base. Merely because certain other portions of the United States may be growing at a faster rate than New Jersey, the lower

percentage of growth thusly attributable to New Jersey does not necessarily indicate a decline in employment, but rather only a decrease in its rate of growth relative to the other portions of the United States. Once again, it is unfortunate that the MPR report does not provide the numbers, percentages or equations that were utilized in developing this forecast. Consequently, it is difficult to determine the reasonableness of these projections without the presentation of the numerical employment projections.

In any event, the unreasonableness of this second methodology employed by MPR is evident in Table 4 (page 16) entitled "Employment Growth Rates as Estimated by Methodology 2". These projections are even lower than those set forth by Methodology 1, and possibly reflect judgemental or rounding factors in their computation. Again, with the exception of Hunterdon and Middlesex Counties, the employment estimates of MPR are lower in 1976 and 1982 than published estimates for 1975 and 1980. Under Methodology 2, Somerset County is projected to have a total employment of 88,201 persons by 1982, an increase of 11,234 persons over the 1976 MPR projection of 76,967 employees. Not only is this 1982 projection of 88,201 persons for Somerset County low in both absolute and relative terms, but it is only slightly higher than the 86,000 employees estimated for Somerset County in 1975 by the Port Authority! In relative terms, the growth of 11,234 new jobs during this six-year period could not possibly reflect the impact of the substantial employment generators previously discussed in Bernards and Bedminster Townships. To illustrate the very minor level of employment growth projected for Somerset County by MPR, one need only to recognize that of the total 11,234 persons projected for the County during the six-year period, 38.7 percent (4,341) of these employees would be located in just two projects in Bernards Township alone. On the other hand, were these employment projections, in fact, intended to represent employment growth

including the AT&T facilities, Bernards Township could appear to have the responsibility for housing 38.7 percent of all new employment in Somerset County.

On page 17 of the MPR report, it is notable that its authors qualify their projections as "projections" only, and certainly far from certain. The report continues to state that "many different steps in the estimation process are subject to judgement, including choice of data bases, choice of functional forms of equations, choice of the time period over which to run the regressions and choice of the variables to include within the equations." (emphasis added) Hence, there is finally an admission that choice of the various factors does play a significant role in the equations and the projections ultimately derived. One cannot help but wonder what would have been the result if MPR had made other choices.

As a final note regarding techniques, the MPR reports that refinements of the methodologies utilized would be possible if more time and resources were available for the research. Unfortunately, the form of refinements that the authors indicate they would like to undertake, such as experimenting with additional functional forms and working with data to include a greater level of industry desegregation, are not the type of refinements which are necessary. The truly required refinements, those which would provide the projections on a municipal basis which could then be related through aggregations to a region pertinent to Bernards Township, are not identified by the MPR report, nor are such refinements possible with the data base that the report has selected.

On pages 19 through 23 of the MPR report, discussion and information is presented which must be presumed to be the conclusions. This section of the report is mysteriously entitled "Implications of the Analysis with

Regard to Bernards Township Population Predictions". Up to this point there has been no discussion as to population predictions or even how the six total counties relate to Bernards Township. Ironically, neither is such information reported in these remaining four pages. Rather than presenting a conclusion based upon employment projections contained in the MPR report, the authors have elected to compute the population predictions derived by the J. O. R. D. formula devised by Mr. Allen with peripheral reference to employment projections. This section ends with the sentence, "The development and formal assessment of alternative methodologies for estimating future increases in the population of Bernards Township was beyond the scope of the present research, and no such work has been undertaken." With such a heading, one would believe that the MPR report would not prepare population predictions for Bernards Township. Surprisingly, we discover that they have prepared such projections. These projections, however, are not based upon their own methodology, research or any information derived in the course of the preceding report, but rather through a comparison and application of Mr. Allen's J. O. R. D. formula, attempts to conclude something which is, at this point, not totally clear.

Without even a mention of tacit acceptance or agreement with the Allen J. O. R. D. formula, the MPR report proceeds to provide the population forecast for Bernards Township via a relationship of some J. O. R. D. results relative to MPR's employment projections. Not only is this application incomparable, it is also irrelevant, not to mention being impossible. Although the MPR report has never established any relationship between the total-six-county area and the Township Bernards, it proceeds to calculate the population forecast and housing requirements for Bernards Township from their unrelated employment projections for six central New Jersey counties.

Notwithstanding these irrelevancies, the calculations derived by MPR are actually in error and premised upon an illogical assumption. The population allocation undertaken by MPR for Bernards Township is based upon percentage allocations of the places of employment of Bernards Township residents. No information whatsoever or correlation was made to the place of residence of Bernards Township employees, which is the critical factor in housing need determinations (the question is not where people work who live in Bernards, but rather where people live who work in Bernards). While the place of employment of Bernards Township residents may be of some value in defining a region, the attempt to predict the place of residence of Bernards Township's employees as the mathematical opposite ignores many pertinent social, economic and employment factors. The fallacy of the logic and application in this regard can best be illustrated as a hypothetical situation. . . The theory indicates that if the residents of Bernards Township comprised 3.0 percent of the work force in municipality "A", that somehow there is a logical presumption that 3.0 percent of the work force in Bernards Township would conversely be thus expected to reside in municipality "A".

This hypothetical situation more or less describes the logic and structure of the J. O. R. D. theory which is now utilized by MPR. A basic fallacy in this approach is that there is not a direct and bilateral correlation between the place of work of Bernards Township residents and the place of residence of Bernards Township employees.

In this regard, one must remember that Bernards Township is one of the wealthiest communities in New Jersey, and as such, its affluent residents have had the opportunity to select their place of residence from a vast number of municipalities. Such is not necessarily the case with the

persons employed within Bernards Township. Because Bernards Township residents could afford to reside in virtually any municipality in New Jersey, actual place of residence in Bernards Township is not as directly correlated to their employment as it would be in the normal situation not influenced by extreme wealth. Obviously, the laborers, clerical employees and others employed in Bernards Township do not have the same latitude in selecting a housing location. This consideration is particularly important when one considers the very substantial increases in employment being experienced in Bernards Township.

Another major fallacy in the population distribution theory advanced by MPR through their acceptance of the Allen J. O. R. D. technique is that whatever influences and restraints which past zoning practices have caused in Bernards Township, as well as other municipalities in the area, are, in fact, appropriate, fair and reasonable. The MPR study's failure to recognize that zoning in some areas of the State, at least in the past, has been exclusionary, is yet another major and debilitating flaw in this form of analysis. For example, the large lot, exclusive zoning in Bernards Township has, undoubtedly, kept many Bernards Township employees from securing housing therein. The MPR report accepts the results of such place of work/ place of residence restraints as a fair, or otherwise reasonable, situation. Obviously, this is not the case, and unquestionably, many employees who would have desired to secure housing closer to their place of employment in Bernards Township have been unable to do so due to the inordinately high cost of housing in the Township. These locational constraints do not occur in the reciprocal situation for the reasons previously cited. It is apparent from the income levels reported in Bernards Township that the Township's residents could select housing virtually anywhere in the State of New Jersey, and consequently, it is highly unlikely that Bernards's residents would be

financially impeded in securing housing closer to their places of employment if they desired to do so. Thus, the MPR report's use of such a theory for the allocation of population and, ultimately, the housing need for Bernards has a remarkable flaw in its basic logic and foundation.

It is common knowledge that longer commutes and greater geographic separations between place of residence and place of work increase with income. In other words, the correlation between place of residence and place of employment decreases with wealth and increases at the lower range of income levels. Common sense and logic would dictate that the lowest paid employees could least afford the long commutes to their place of work; whereas in the upper income executive levels, the inverse is the case. In the upper ranges, employment opportunities are not present in every community, and often are clustered in urban centers; whereas, in the lower income categories, manual and other unskilled labor type situations are available in virtually every community. As a result, higher income employees commute to employment locations in which they would not want to reside, while unskilled laborers must reside as close as possible to their places of employment. For these reasons, there is a presumptive inequity between the reasons for in- and out-commutation in Bernards Township, and MPR's failure to recognize the influence of income, in combination with their acceptance of zoning-influenced housing opportunities as being appropriate, tends to further invalidate the MPR population/housing predictions.

### C. CONCLUSIONS

Based upon our review of all of the foregoing, little relationship can be found between the employment projections prepared by MPR and the housing needs in Bernards Township. The employment projections by MPR appear