I. INTRODUCTION

The Wilmington Boulevard Mitigation Program, conducted by Soil Systems, Inc. (SSI) under contract with the Delaware Department of Transportation (DelDOT), centered on seven blocks in downtown Wilmington, Delaware (Figure 1). The program included testing and data retrieval on seven blocks within the Department's Wilmington Boulevard project area (Figure 2). Testing and data retrieval were conducted from July, 1980 to January, 1981. The Department of Transportation's construction project was designed to provide improved access to Wilmington's central business district by providing a direct connection between the city's southside internal street system and Interstate 95, the major northsouth transportation route for the Eastern Seaboard. This project was originally conceived as part of a massive urban renewal effort begun in the late 1960's, and continues to be a major component of the city's effort to revitalize the downtown area. Plans called for construction in two phases. The first phase involved the reconstruction and widening of existing Front Street from Monroe Street, at the terminus of the previously constructed I-95 ramps, to King Street. The second phase consisted of a new roadway curving from King Street to Walnut Street and paralleling Walnut Street from Second Street to Fourth Street.

The mitigation program was conducted to fulfill regulatory obiligations pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, and the National Environmental Policy Act of 1969. The results of the testing and data retrieval program was intended to be incorporated into DelDOT's Environmental Reassessment of the social and environmental impacts of the Wilmington Boulevard Project.

Cultural resource assessment for this project began in 1971, with the submission of a Draft Environmental Impact Statement as required by law (National Historic Preservation Act 1966, as amended, and National Environmental Policy Act 1969). At that time, only the effects on properties already listed on the National Register of Historic Places were considered. Adjustments were then made to the right-of-way under consideration in order to avoid both the Zachariah Ferris House on Second Street, between Washington and West Streets, and the Captain Thomas Mendenhall House at the corner of Front and Walnut Streets. As a result of these design changes, an Environmental Reassessment was conducted in 1976 to assess the additional impacts.

Prior to this reassessment, there had been extensive demolition within the project area, both for urban renewal and in preparation for the construction of Wilmington Boulevard (Table 1). Some structures still remained standing in the project area, but the State Historic Preservation Officer determined that these structures were not eligible for listing on the National Register of Historic Places. These structures might have, at one time, been significant as part of a larger historic group, but demolition had isolated them from their historical context. Their integrity of time and place had been altered. Other structures had been heavily altered and were also determined not to be eligible for listing.

Table 1

Dates of Structure Demolition
by Block

Block	Date
Justison and Washington (Area I)	Late 1960's during urban renewal
Washington and West (Area H)	Late 1960's
West and Tatnall (Area G)	1978 by Delaware Department of Transportation
Tatnall and Orange (Area A)	All structures by 1980, by the Delaware Department of Transportation
Orange and Shipley (Area B)	1980 by Delaware Department of Transportation
Shipley and Market (Area C)	None except for gas station construction before 1936
Market and King (Areas D, E, and F)	Structures on Front during the 1960s. Area turned into parking lot. Remainder of structures demolished during 1979 and 1980

At the time of the 1976 reassessment, the impact on archaeological resources was not considered. By 1979, however, a further design change, from an elevated roadway to an at-grade facility, made a second reassessment necessary. The Delaware State Historic Preservation Officer recommended that an archaeological location/identification study be conducted, and the Department of Transportation agreed.

The location/identification study was undertaken by Mid-Atlantic Archaeological Research in the summer of 1979 (Thomas et al 1980). On the bases of that study, and of a review of certain primary and secondary sources, as well as earlier structural surveys, the Delaware Bureau of Archaeology and Historic Preservation prepared a Determination of Eligibility for the entire purchased right-of-way. This area was designated as the Wilmington Boulevard Historic District. This district was later determined eligible for listing on the National Register of Historic Places.

Using this Determination of Eligibility, a Preliminary Case Report, as specified under 36 CFR Part 800, was prepared by the Delaware Department of Transportation and submitted to the Advisory Council on Historic Preservation.

The Council determined that the construction of Wilmington Boulevard would have an adverse impact on the remaining cultural resources of this district. These resources, as shown by the MAAR study, consisted of the archaeological remains of eighteenth and nineteenth-century occupations along Front Street, a major transporatation route before the construction of the railroad. These archaeological remains included subsurface features (wells, privies, and cellars) as well as intact subsurface deposits, both stratified and unstratified. Expected impacts by the highway project would have included the disturbance or removal of surface deposits and features, the removal of upper levels of deep features such as wells and privies, and the crushing or collapsing of artifacts and features below the construction level. Within the boundaries of the district, both cutting and filling activities would take place during construction. The Delaware Bureau of Archaeology and Historic Preservation prepared a detailed scope-of-work and research design for a program to mitigate these adverse effects.

Soil Systems, Inc. was selected to conduct the mitigation program in July, 1980. The research design included within DelDOT's scope of work and the proposal written by SSI was expanded, upon request of the Advisory Council on Historic Preservation. The new research design became part of the Memorandum of Agreement between the Advisory Council, the Federal Highway Administration, and the Delaware State Historic Preservation Officer. The design identified an overall research domain for the investigation of the effects of urbanization and industrialization on population growth, settlement location, and functional and social characteristics of Wilmington's inner city. The research design reflected the nature and range of variabilility of the archaeological record within the district as perceived from MAAR's investigation.

The design provided a framework for sampling the archaeological remains over the entire project area, since total excavation of the project area was prohibitive. It also provided a focus for research, selecting specific questions out of a complex array of topics that could be studied using data from the project area.

This research design built upon the numerous urban archaeological and social/historical projects that have been conducted in the United States. The number of these urban archaeological projects has increased dramatically in the last ten years. Discussions of various projects have recently been published. Dickens (1982) has edited a volume on several different urban archaeological investigations. A status report on urban archaeology can be found in an article by Staski (1982). Staski's article presents a fairly comprehensive list of urban archaeological projects in the United States, and also discusses the nature of the archaeological record found in urban environments. Published works on specific projects include Rathje and McCarthy's (1977) work in Tucson, Arizona; the Newburyport waterfront project (Faulkner, Peters, Sell, and Dethlefsen 1978); Soil Systems, Inc.'s work in Edenton, North Carolina (Foss, Garrow and Hurry 1979); Bridges and Salwen's (1980) investigations of Weeksville; the Alexandria, Virginia urban archaeological program (Cressey, Stephens, Shephard, and Magid 1982); the MARTA archaeological investigations in Atlanta, Georgia (Dickens and Bower 1980); Schuyler's (1980) work at Sandy Ground in New York City; and others.

There are many other urban projects that are still in progress, are only in manuscript form, or have been presented to the public only at archaeological conferences. These include work in Wilmington, Delaware, (Thomas, Regensburg, and Basalik 1980; Cunningham, Henry, and Coleman 1983); New York City (Rothschild and Rockman 1982, and Rockman personal communication); Washington, D.C. (Anderson, personal communication, and Garrow 1982); Dover, Delaware (Wise 1979); and Savannah, Georgia (Oakley 1980), and many others.

These projects approach their respective urban environments through various field techniques and research orientations. Staski (1982) has divided these projects into four research domains: culture history, ethnicity, urban development, and preservation. In the past, urban archaeological projects were mostly conducted in the context of contract work, without specific research designs (Salwen 1978) or following these four research domains. Currently, the number of contract related urban projects has increased, and those projects still are often conducted without formulated research designs, with some exceptions. Those current urban projects which fall into Staski's ethnicity and urban development categories are usually academically based (cf Schuyler 1976), or are conducted through research organizations not related to contract work (cf Cressey et al 1982). Given the lack of explicit research approaches in contract related urban work, and urban archaeological work in general, Salwen - in a 1978 article - suggested that theoretical models for dealing with American cities be sought in other disciplines, especially current work by urban social anthropologists (Salwen 1978). We should add that urban geography and urban social history are other disciplines from which theroetical approaches can be drawn, as has been done for some current archaeological investigations (Rathje and McCarthy 1977, Cressey et al 1982).

The topic of urban development in the United States had been a major focus of these urban geographical, social, and historical disciplines for many years. Early examples include Park, Burgress and McKenzie's (1925) work in Chicago, which established a base for most future urban work in this country. Later urban studies included research by Ward (1971), Warner (1978), Thernstrom (1964), and Hershberg (1976). These studies provide an excellent pool of research topics that are conducive to the analysis and interpretation of urban material culture.

The research design for the Wilmington Boulevard project integrates some of the current research questions pursued by these other disciplines. It is hoped that this mitigation program will contribute to our understanding of urban environments through the study of material culture.

A major problem encountered during the analysis phase of the Wilmington Boulevard Project was that despite the large numbers of urban projects reported in the literature in published or report form, few of those studies contained detailed artifact analysis discussions that could be used for comparison with the Wilmington Boulevard materials. That problem apparently stems from the fact that urban archaeology is still a new discipline, and many of the published accounts and reports are still preliminary in nature. After careful consideration of the available literature, the decision was made to utilize the Washington Civic Center (Garrow 1980) as the primary comparative example, with secondary dependence on articles published under

the Alexandria, Virginia, archaeological program (cf Cressey et al 1982). Hopefully, the results achieved through the Wilmington Boulevard analysis will stimulate similar efforts on other urban sites so that the body of comparative data of this type will grow in numbers and utility.

This report is divided into seven chapters, each discussing different aspects of the mitigation program. Chapter II presents, in detail, the project research design. This design builds upon the social, historical and geographical urban work, and urban archaeological investigations listed above. The chapter begins with a statement on the research domain of the project, followed by discussions on previous urban investigations upon which this research domain is based. Terminology is defined, and specific hypotheses, test implications, and data requirements derived from the research domain are presented. The project's research domain addresses the effects of industrialization on several types of urban behavior. These include the spatial distribution of land use activities and residences of different socio-economic and ethnic groups, and the nature of consumer behavior, in terms of both food and non-food products. The chapter ends with a discussion of the format of archaeological, historical, and artifactual investigations performed on this project, which are to produce data to test the research questions.

The next chapter presents an historical overview of Wilmington and the project area. The historical overview of the entire city establishes the historical context needed to interpret the project area blocks. It demonstrates when and if the project area can be considered as representative of the historical processes that are occurring in the city at large. The specific block and lot histories of the project area are also briefly discussed in this chapter, with more detailed discussions of the blocks presented in Appendix B. Historical information from the city overview and the block and lot histories are used to examine those aspects of the research domain that can be tested with historical data. These data will be used especially to test those hypotheses addressing the spatial distribution of land use activities and socio-economic group residences during the pre-industrial and industrial periods in Wilmington. A major contribution of this chapter is the definition of what consitutes these two periods in Wilmington's history, and how it is manifested in the archaeological record.

Chapter IV presents the project's field methods and results. The chapter contains an area-by-area description of the excavation methods used and the results achieved. The recorded stratigraphy from each area is discussed, as are the physical descriptions and chronological placements of all features and occupation levels.

Four primary types of information are presented on each area. These include methods employed, results achieved, and analytical contexts and non-analytical contexts explored. The chapter opens with a broad discussion of the areas selected for investigation, the rationale for the selections, and the excavation strategies used. It is necessary, however, to discuss field methods used on an area by area basis as field conditions dictated that each area be approached in a slightly different manner. The results section of this chapter consists of the stratigraphic relationships and the placement of features and occupation levels within each area. Occupation levels and features are examined in terms of the types of refuse they contain. Refuse

types follow the depositional categories developed by Schiffer (1972), and expanded upon by South (1977). These refuse types include displaced refuse, and primary and secondary refuse. Each refuse type found within features and deposits will be discussed and the rationale for including and excluding the different types in further analyses will be presented.

Chapter V., Artifact Analysis, begins with a restatement of the research domain, specific research hypotheses, and a consideration of how these hypotheses are to be addressed through the results of the artifact analysis. This is followed by a detailed discussion on the specific analytical techniques used in the study of artifactual material recovered from the project area.

Two basic organizational schemes are used in this chapter to present the massive artifact analysis data that has been collected. The first is temporal, using the broad periods that have been identified historically and that are the basis for the project's research domain, i.e. pre-industrial and industrial. Within these broad periods, the various archaeological contexts are placed within a temporal continuum. The second organizational scheme is the artifact pattern concept (South 1977). The artifacts recovered from each context are presented following the artifact pattern format, and discussed at the group and class levels. Following this discussion, the primary and secondary refuse contexts that yielded adequate samples, as determined by application of the pattern model, minimum vessel counts, and other quantitative measures, are subjected to the Wise (1976) analyses of ceramically measured socio-economic status, the Miller (1980) ceramic economic scaling method, form and function analysis of ceramic and glass vessels, and ceramic set analysis (Garrow 1982). Each analysis articulates with one or more of the project's research hypotheses. The artifact analysis chapter is organized to present the analytical results from the most general, i.e. artifact patterning, to the most specific, e.g. Miller analysis.

Chapter VI presents the dietary pattern analysis. The results of this analysis are presented separately from the artifact analyses as the faunal and floral analyses provide different, but complimentary data for testing the project's research hypotheses. This chapter discusses the analytical methods used in study of both floral and faunal materials recovered from the project area. Summary discussions of the results of these analyses are also presented. Detailed discussions of the assemblages from each of the analyzed occupation levels, deposits and features are presented in Appendices F and G. Comprehensive tables on the contents of all assemblages are also included.

Within the Synthesis chapter, Chapter VII of this report, the data generated from the historical research, the archaeological investigation, the artifact analysis, and the results of the faunal and ethnobotanical analyses, are correlated. An important portion of this chapter is a point by point discussion of each research hypothesis, and the extent to which each hypothesis is or is not supported by these sets of data. A summary statement is then made, addressing the project's overall research domain.

The final chapter of the report is a summary of the techniques employed in the field and laboratory on this project, and discusses which techniques failed to contribute to the research design, and which should be used on future projects. Further, the concluding chapter delineates the

contributions made by this project to better understanding the history of Wilmington, and discusses current gaps in the historical and archaeological research base on the city.