prehistoric adaptations appear to be not radically contradicted by the data collected from the 1984 and 1985 Route 13 surveys. At the same time, some alterations of the models may be necessitated by the data, while many new avenues of research have been opened. It is expected that the Phase I and II Route 13 archaeological survey will provide much new data to these ends.

HISTORIC ARCHAEOLOGICAL RESOURCES

The following discussion of historic archaeological resources consists of two parts: a brief summary of the local history and a discussion of regional research issues and the classes of historic archaeological sites which are most likely to contribute data pertinent to these research questions.

REGIONAL HISTORY

This overview is abstracted from Munroe (1978, 1984), Hoffecker (1973, 1977), Weslager (1961, 1967), Lemon (1972), Hancock (1932, 1947, 1976), Hudson (1969), Scharf (1888), and Bausman (1940, 1941).

The earliest colonial settlement in Delaware known as Swanendael ("valley of swans") was made at present Lewes in 1631 under the sponsorship of patroons of the Dutch West India Company for the purpose of whaling and raising grain and tobacco. This venture was privately financed, but it ended in tragedy because the all-male population was wiped out by the local Indians in a massacre in 1632. Farther north a group of Swedes in the employ of the New Sweden Company built Fort Christina in 1638 in what is now part of the present city of Wilmington establishing the first permanent European settlement in Delaware. The Swedish government supported the venture, and Fort Christina became the nucleus of a scattered settlement of Swedish and Finnish farmers known as New Sweden. Within a few years this Swedish settlement included a fort, church and small farming community.

The Dutch claimed the identical land -- from the Schuylkill River south -- by right of prior discovery, and in 1651 the West India Company retaliated by building Fort Casimir at New Castle in an attempt to block Swedish efforts to control commerce in the Delaware River. The Swedes captured this fort in 1654 and renamed it Fort Trinity. Rivalry between Swedes and Dutch continued, and the Dutch recaptured Fort Trinity in 1655, and also seized Fort Christina. As a result New Sweden went out of existence as a political entity due to lack of support from the homeland although the Swedish families continued to observe their own customs and religion.

In 1657 as a result of peaceful negotiations the City of Amsterdam acquired Fort Casimir from the West India Company, and founded a town in the environs of the fort called New Amstel. This was a unique situation in American colonial history -- a European city became responsible for the governance of an

American colony. A small fort was also erected at Lewes in 1659 for the purpose of Blocking English intrusion, and a few settlers built homes there including 41 Dutch Mennonites who established a semi-socialistic community in July of 1663. They, too, were under the supervision of local officials appointed by the burgomasters of Amsterdam.

English hegemony of the region began in 1664 when Sir Robert Carr attacked the Dutch settlement at New Amstel on behalf of James Stuart, Duke of York, brother to Charles II. This was an important move on England's part to secure her economic position in the New World. New Amstel, renamed New Castle, was besieged and sacked by English soldiers and sailors resulting in the deaths of three Dutch soldiers and the wounding of ten others. English troops plundered the town, and English officers confiscated property, livestock, and supplies belonging to the City of Amsterdam, as well as the personal property and real estate owned by the local Dutch officials. The homes of the Mennonites and other settlers at Lewes were also pillaged.

A transfer of political authority from Dutch to English then followed, and the Dutch settlers who swore allegiance to the English were allowed to retain their lands and personal properties with all the rights of Englishmen. Former Dutch magistrates continued in office under English authority, and Swedes, Finns, and Dutch alike peacefully accepted the rule of the Duke of York through his appointed governors.

In 1671 the Duke of York made the first land grants in the area of present Kent County. By 1679, 53 grants had been made. With water transportation the major mode of travel and commerce in the late seventeenth century, most of the lands granted in Delaware had frontage on a navigable stream or waterway. This was especially true for present day Kent County. Twenty-one of the 53 grants made by 1679 in Kent County were along the St. Jones River.

Overland travel was extremely difficult in the region throughout the seventeenth and eighteenth centuries with heavily wooded and marshy areas constituting major obstacles. The sparseness of the population and corresponding lack of accommodations for travelers added to the discomfort and dangers of overland transportation. In 1680 people living in the upper part of Kent County, then part of Whorekill County, petitioned Governor Andros to create a new, smaller county and thus relieve them of traveling to Lewes. Sixty-five settlers living between Blackbird and Cedar Creeks signed the petition, but believed that 100 "tithabel" persons would be affected. Governor Andros granted the petition in 1680 and established the northern boundry of the new county, St. Jones County, at Duck Creek and the southern boundary at Cedar Creek.

In 1682, William Penn was granted proprietary rights over Pennsylvania and the Lower Three Counties which included all of modern Delaware. Relations with Pennsylvania deteriorated and

relative autonomy for the Three Lower Counties, including a separate assembly, was established by 1701. Economic ties, however, continued to link Penn's factionalized colony.

Boundary conflicts soon developed in St. Jones County, renamed Kent by 1683. The border with New Castle County was Duck (Smyrna) Creek, but as the creek did not extend very far to the west, the western part of the boundary was left undefined. Even more significant were rival claims by the Calverts in Maryland. The Delaware-Maryland border, particularly along northern Kent County, was hotly disputed until it was permanently fixed in 1765. Specific efforts by both Penn and Calvert to establish settlements along the disputed boundary provides an excellent example of the influence of proprietary decisions and endemic boundary disputes in determining historic settlement patterns.

Waterways were important to transportation and commerce as early roads were limited in number and of poor condition. The few existing roads led to landings on rivers and the Delaware Bay where produce and goods were shipped by cheaper, and more efficient, water transport. The Delaware River - Delaware Bay served as a major focus of water transportation because the majority of Delaware's streams flow eastward to these bodies. For this reason the large port city of Philadelphia, and to a lesser extent Wilmington and New Castle, exerted major commercial influence on the Delaware counties throughout the eighteenth century and later. Wilmington, New Castle, and Lewes were also ports for ocean-going vessels involved in export trade. Overland transport was limited to a few major roads, such as the eighteenth century post road connecting Philadelphia-Wilmington-New Castle-Odessa-Middletown-Dover-Lewes with a western branch at Milford linking it to the Chesapeake Bay. Small secondary roads and paths interconnected numerous villages and hamlets and were relatively common within the study area.

One reason for the relatively slow growth of Kent County beyond the St. Jones River drainage was a lack of any extensive network of navigable streams or good roads in the western part of the study area. Land north and west of the navigable portions of Duck, St. Jones, Little and Murderkill Creeks, were more sparsely populated than other areas in Kent County because of the importance of water transportation in the cheap movement of bulky agricultural products. In an attempt to improve the roads in the Lower Counties, the General Assembly in 1752 and again in 1761 called for the construction of a "King's Road" between the New Castle-Kent County border and Lewes. This road was to be 40 feet wide with all but ten feet cleared. Secondary roads of 30 feet in width and all but ten feet cleared were also to be constructed. From Salisbury along the New Castle-Kent County border, the post road continued south through Dover, Camden, Milford and Frederica, eventually to reach Lewes and the Maryland border (Laws of the State of Delaware 1797:320, 390-394).

By the middle of the eighteenth century population increases and commercial expansion stimulated the growth of towns and the development of transportation and industry. Dover and Smyrna quietly emerged as the two largest towns in Kent County, with markets, landings and central locations attracting new settlers. Lebanon, Camden, Milford and Frederica were also established communities by this time. The population of Kent County in the study area grew through both natural increase and the continued movement of new peoples into the area from Maryland, Pennsylvania, the other two counties of Delaware, and from Europe, particularly Great Britain. A census taken privately in 1760 gave the population of Kent County as 7,000 individuals (Conrad 1908:580).

The median size of land warrants granted in 1735 in Kent and New Castle counties was between 200 and 300 acres, with the typical grant close to 200 acres (Penna. Archives 1891: 193-202). Larger grants, however, were not uncommon. This trend towards smaller average holdings as compared to seventeenth century grants was due to a tendency for large grants and tracts to be divided and subdivided by sale and inheritance. If New Castle County and southeastern Pennsylavania can be used as a rough comparison, the density of rural settlement in northern Kent County was approximately 5 households per square mile (Ball 1976:628). For more poorly drained parts of the study area, particularly those along upland swamps, this density is expected to have been lower.

The general rise in land prices in Delaware in the late eighteenth century reflected the development of larger regional and extra-regional markets for Delaware agricultural products, particularly wheat. The development of larger markets in turn spurred the growth of established urban areas, most notably Wilmington, and the establishment of smaller cities and towns throughout the agriculturally productive areas of the state. In the study area, Middletown, Salisbury (Duck Creek Crossroads), Noxontown, and Dover were established trade and service centers along the Dover-Lewes post road by the mid-eighteenth century. The profitability of wheat accelerated a trend towards large-scale, market-oriented small grain agriculture already well established in Kent and New Castle counties.

Throughout the late eighteenth and nineteenth centuries, the agrarian Delmarva peninsula was considered an area of production and transshipment between the Chesapeake Bay markets (Annapolis and Baltimore) and the Delaware River and Bay markets (Philadelphia and New York). As local markets prospered, so too did the hamlets and other unplanned towns that had sprung up at crossroads and around taverns, mills and landings. One such crossroad community in the study area was Seven Hickories, a stop along the Kenton to Dover road. Important landings included the Brick Store, Hay Point and Short landings along the Smyrna River; Dona, Naudain and White Hall landings along the Leipsic River; and Lebanon, Forest, and White House landings along the St. Jones. Landings, as well as towns and hamlets in the study area,

formed, grew and sometimes declined according local and regional economic conditions.

Mills were an important part of the economy and an extensive network of mills throughout the state were established during the eighteenth and nineteenth centuries. Millworks in the agrarian areas were frequently multi-functional with water-powered grist, saw, and cloth fulling operations being performed at different seasons at the same location. The mills primarily produced goods for local markets. A number of such mills are located in the study area. The Blackbird, Leipsic, and Wyoming areas in particular contain a number of significant mill sites.

Throughout Delaware's agricultural history farm labor has been a valued commodity. In the colonial period blacks in slavery and white indentured servants were the primary farm laborers. By the mid-eighteenth century, white indentured servants were as numerous as black slaves. Slightly less than one-half of the blacks in the state in 1790 were free; however, by 1810, less than one-quarter of blacks were slaves according to federal censuses. Free black labor played an increasing role in farm production in Delaware as ethical and economic factors reduced the profitability of slavery prior to the Civil War. After Emancipation, black labor continued be a significant factor in farm production.

According to the 1810 national census, the population of Kent County was 20,495 persons. Marginal farm lands were being increasingly settled as good, well-drained lands with access to markets were becoming more scarce. The move inland from navigable waterways apparent by the late eighteenth century began with the influx of new populations, particularly from England. This period of growth from the late eighteenth to early nineteenth centuries, however, was short lived with the population of Kent County actually decreasing in the late 1810s to the 1830s. By 1840 the population of Kent County, according to the national census, had declined to 19,872 persons. Given the natural increase of the people that remained in Kent County during this period, the number of people leaving and "passing through" the County is even greater.

The movement of large numbers of Delawareans in the early nineteenth century was caused in part by the sharp decrease in demand for Delaware agricultural products following the end of the War of 1812 and the Napoleonic Wars. Both conflicts had created an inflated market for American agricultural products, particularly wheat and other cereal crops. Other areas of the country were equally hard hit, with the nation faced with serious economic difficulties by 1819.

The rapid population growth of the first decades of the nineteenth century in Delaware also forced many farmers off the land. Competition for prime land forced many new farmers to clear and till land of poor or marginal quality. Many of these farmers were then hard pressed to turn a profit from their

farmsteads and thus became part of the outward migration from Delaware.

Corresponding to the decline in wheat prices and increased competition for good land was a significant decrease in the fertility of agricultural lands throughout the state. Poor farming methods, erosion, and simply exhausted land contributed to the economic woes of Delaware farmers. Increased opportunities in urban areas and the West also served to draw people from Delaware, and Kent County in particular. As more and more people left Delaware, the resulting labor shortage made the cultivation of marginal and exhausted lands even less profitable. This in turn influenced the movement of even more people away from Kent County. Poorly drained areas in the study area west of Dover were particularly affected.

The economic crises of the first decades of the nineteenth century helped to spur the beginning of an agricultural revolution throughout Delaware. The first agricultural improvement society in Kent County was formed in 1835. In 1836 the General Assembly authorized the first state geological survey under James C. Booth to analyze soils, locate sources of fertilizers, and advise farmers throughout the state. A number of factors worked in conjunction to establish Kent County, and Delaware as a whole, as an important agricultural producer. The discovery of marl, a natural fertilizer, during the construction of the Chesapeake and Delaware Canal in the 1820s enhanced the productivity of Delaware agriculture.

The opening of the canal in 1829 further encouraged the production of market-oriented crops by providing for the more efficient transportation of perishable goods. The opening of the Philadelphia, Wilmington and Baltimore Railroad in 1839 complemented existing water-based transportation systems and provided transportation of northern Delaware produce to the growing eastern markets. The extensive production of market-bound crops developed later in Kent and Sussex Counties due to a lack of interior transportation facilities, although produce did move by water from seaport towns. When the Delaware Line extended rail service to Dover and later Seaford in the 1850s, a vast agricultural hinterland was opened and agricultural production for markets increased significantly.

Prior to 1832 Delaware's agricultural products were primarily grains, with fruit and vegetable crops of lesser importance. Farming in the northern counties of Delaware was on a mixed system with cereal crops, fodder, livestock, fruits and vegetables produced for immediate consumption with surpluses sold in both local and regional markets. In this system, a portion of the farm was kept in permanent pasture while the remainder was cropped in a rotation of corn, oats, barley, wheat and clover. Livestock included cattle, swine, and draft animals with dairy products and livestock continuing to be a major farm occupation well into the nineteenth century. Lumber, flaxseed, hemp, and tobacco were also produced. Extensive rather than intensive use

of the land prevailed, presumably as a consequence of the emphasis on wheat exports and the general prosperity of most farms.

From the 1830s to the 1870s Delaware was the center for peach production in the eastern United States. Rich soil, favorable climate and rainfall, excellent transportation facilities, and strategic location near large markets made peach production a lucrative enterprise. Delaware City with its canal location led Delaware and New Castle County in production until the 1850s. The peach industry was hindered in Kent and Sussex counties until the 1850s due to transportation limitations. Early attempts there failed because producers could not move fruit to market economically. Rail service into the area and the absence of the peach blight in the southern counties made peaches profitable into the 1870s.

By the end of the "peach boom," massive harvests were being shipped by rail and steamship lines to New York where much was readied for resale to the northern states. The spread of a disease known as the "Yellows" devastated orchards throughout the state and brought an end to the boom. However, until the peach blight curtailed production, the peach industry proved profitable for a large number of peach growers, as well as a variety of support industries. Basket factories, canneries, and peach tree nurseries all aided in and reaped the financial rewards of the peach industry. Two components of the Smyrna study area, Smyrna Landing and the Brick Store (N-135) were heavily involved in the peach trade and included landing, cannery, evaporator, warehouse, and light manufacturing activities.

After the peach boom, other orchard and truck crops, particularly tomatoes, were important in the Smyrna area. The railroad and steamship lines integral to peach distribution, depended on peach shipment for a large portion of their annual revenue. One especially well preserved "peach house" is located within the proposed Route 13 Corridor. This standing structure, N-133, is in the Smyrna study area and represents one aspect of a larger trend in Delaware history towards the large-scale production of perishable crops for nearby urban markets.

Throughout the nineteenth century, and into the twentieth, agriculture in Delaware continued to focus on perishable products with a decrease in staples. More diverse crops, including tomatoes, apples, potatoes, and truck produce became more common in response to the demands of markets in New York, Philadelphia, Baltimore, and other cities. The number of acres cultivated in Kent County rose from approximately 283,000 acres in 1850 to 338,000 acres by 1900. Poultry and dairy production also increased significantly in this period in Delaware, particularly in Kent and Sussex counties.

Concurrent with the rise in importance of truck crops and dairy products in the late nineteenth century was the improvement of transportation throughout the state. The completion of the

Delaware Railroad trunkline through to Seaford in 1856 encouraged the production of such goods by providing quick and cheap access to regional markets. Prior to the Delaware Railroad, steamboats and other water craft provided areas of Kent County with cheap and efficient transportation. One of the study areas, Smyrna Landing, was an important landing and warehouse district well into the twentieth century.

The Delaware Railroad spurred the growth of numerous towns along its route. Kenton, Cheswold [Moorton], Camden, and Wyoming prospered as the railroad expanded the mercantile and service functions these areas had previously performed. By 1900 Camden was the largest of these towns with a population of 536 people.

Tenant farming, which had been common in the eighteenth century, became even more prevalent in the nineteenth century. Large land owners, having acquired much of their holdings during the hard times of the 1820s and 1830s, leased their land to tenants. Most of the land owners and tenants were white, although a number of tenants and farm laborers, particluarly in Kent and Sussex counties were black. By 1900 over 50% of all farmers in Delaware were tenants or share croppers. Sites associated with agricultural tenancy comprise a significant number of the historic archaeological and standing structure resources identified along the southern Route 13 Corridor. Tenancy remained a dominant farming practice into the twentieth century, with almost 50% of the farmers in Kent County tenants in 1925.

The agricultural trends identified in the late nineteenth century continued relatively unchanged well into the twentieth century. Corn and wheat declined in importance due to competition from the western states. By 1880 alfalfa, legumes, and truck crops were increasing in importance and by the mid-twentieth century, had become more profitable than wheat. Dover was still the largest city in Kent County, although smaller than Wilmington and Newark. Smyrna, Leipsic, Little Creek and other towns in the eastern part of Kent County also expanded slightly during this period.

The late nineteenth and early twentieth centuries also saw the increasing commercialization of southern New Castle and Kent counties. Light manufacturing, including carriage making and cabinet making, and foodstuff processing, including canning and juice/syrup production, became an important part of the Delaware economy. Smyrna and Dover were the sites of most of this commercial and manufacturing activity, although other areas including Camden-Wyoming and Frederica were involved. The International Latex Corporation, established near Dover in 1939, was the first large manufacturer not utilizing local raw materials to locate in Kent County. Since World War II, other manufacturers, including General Foods and Scott Paper, have located in the county and together represent a significant addition to the economy of the study area.

The late nineteenth century also saw the continued growth of different ethnic communities in Kent County, particularly of Amish and Mennonites in the area west of Dover and of "Moors" in the Cheswold area. A number of prosperous Amish and Mennonite farms still exist in the study area near Fork Branch. The "Moors" of Delaware are a group of people who claim a common descent from a number of Black, Indian, and European ancestors. Until the early twentieth century, the Moors maintained their own schools and in World War I and II insisted on being listed as a separate race. As with the Amish and Mennonites, the Moor community exists today.

The patterning and density of settlement in Delaware, and the study area specifically, have been strongly influenced by several factors throughout its history: 1) an agrarain economy; 2) the commodity demands of large markets, first Europe and the West Indies, and later domestic commercial-industrial centers, and 3) transportation facilities. The completion of the Dupont Highway in 1923 linked the northern and southern sections of the state and helped to complete the shift in agricultural production towards non-local markets and open new areas to productive agriculture. Improved transportation in the twentieth century also brought a decline in the importance of the many small crossroad and "corner" communities that had sprung up in the late eighteenth and nineteenth centuries.

RESEARCH QUESTIONS AND SITE SIGNIFICANCE

With regard to historic research, the large size of the Route 13 Relief Route Planning Corridor allows for the development and testing of a number of research questions within historical archaeology and geography, American history and material culture studies. The geographical and archaeological data generated by further work in the Route 13 Corridor would also provide useful information for the study of more traditional paradigms in the historical analysis of Delaware and the Chesapeake region (Tate and Ammerman 1979:43-45; Earle 1975:7; Wesler 1982:65).

The following research questions and topics are designed to integrate the interdisciplinary use of all archival, historic, architectural, and archaeological resources within a general research design that can be coordinated with all the different phases of an eventual data recovery program. These questions are not theoretical or explanatory in themselves, but rather encompass numerous issues of anthropological and historical significance and are broad enough in scope to be applicable to many kinds of sites. In addition, as all of these research questions have been either directly or indirectly addressed by previous historical and archaeological research, these research directions are designed to complement, rather than replace, these existing data bases.

Included with each research question is a list of specific archaeological sites from within the Corridor that could yield

relevant data. These sites are identified and located in other studies of the Route 13 Corridor (Custer, Jehle, Klatka and Eveleigh 1984; Custer and Bachman 1986; Custer, Bachman, and Grettler 1986) and further information on each site can be found in these studies. Table 8 gives the total number of sites in the Corridor by function and time period and also notes the sites within the final alignment by these categories. The relationship between potential research questions and types of historic sites is given in Tables 9-26. Tables 9-26 indicate what types of historic sites are likely to yield data relevant to specific research questions. The relative "quality" or applicability of data likely to be recovered at different levels of investigation is expressed according to a scale of high (H), medium-high (M-H), medium-low (M-L) and low (L). It can be noted that most of the known sites in the final alignment are agriculturally related dwelling complexes.

For the purposes of this research design, "significant" sites are those likely to produce data relevant to current historical, geographical, archaeological, and architectural research questions and goals. This definition of significance is in keeping with guidelines established by the National Register of Historic Places (King, Hickman, and Berg 1977) and accepted professional standards (Raab and Klinger 1977; Miller 1980). In addition, Tables 9-26 are subjective models of significance and attempt to include as many historic sites within the Corridor as possible within specific classes of research questions.

Two general levels of investigation, Phase I/II and Phase III, are used in Tables 9-26. These levels were created to differentiate between primarily locational and background data versus more extensive, site-specific data recovery operations. The first general level, Phase I/II, assumes primarily locational and background data about a site and a limited amount of subsurface testing. Such testing would be primarily to determine preservation and eligibility for National Register listing. The second general level, Phase III, assumes more intensive data about a site and more extensive archaeological testing, including complete data recovery. These levels are organizational rather than explanatory and should be interpreted as such.

Site function is a grouping by function of the 49 historic site types identified by previous studies (Custer, Jehle, Klatka, and Eveleigh 1984; Custer and Bachman 1986; Custer, Bachman, and Grettler 1986) and is consistent with guidelines established by the Delaware Bureau of Archaeology and Historic Preservation (Del Sordo and Guerrant 1985). Table 8 includes a breakdown of each major site function group. The time periods used in Table 8 and Tables 9-26 are based upon suggestions from the BAHP and reflect general trends within the political, social, and economic history of Delaware (Del Sordo and Guerrant 1985). Again, these temporal units are organizational rather than explanatory and should be interpreted accordingly.

TABLE 8

NUMBER OF HISTORIC SITES BY SITE FUNCTION AND TEMPORAL UNIT FOR THE ENTIRE ROUTE 13 CORRIDOR

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
1910-x	30(3)	10(3)	109(38)	4(0)	9(7)	3(0)	5(2)	5(1)
1820-1910	720(111)	388(43)	265(63)	20(2)	68(26)	22(4)	48(28)	18(4)
1760-1820	40(7)	2(2)	27(17)	17(2)	16(1)	1(1)	11(1)	2(0)
1720-1760	20(4)	0(0)	9(3)	1(0)	0(0)	0(0)	0(0)	0(0)
1680-1720	2(2)	0(0)	1(0)	0(0)	0(0)	0(0)	3(1)	0(0)
1630-1680	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
Unknown	19(6)	1(1)	44(18)	1(1)	2(0)	0(0)	6(5)	4(4)

AGCX: AGCX, AGBLG, PLANT, ESTATE, PEACH, PEAORC

AGTEN: AGTEN, TENANT, SLAVQ, MWHSE

DWCX: DWCX, DW

MLLCX: SMCX, SOMCX, GMCX, AGMCX, MMCX, SOMCX

COMM: COMM, MANUFY, WARE, LANDOP, RT, BANK, LMKILN, WKSH, STO, TAV, HOT, PHYS, BSSH

INDTEN: INDTEN, WKDW

CUHR/SCH: CHUR, SCH, CEM, GOVBLG, PO

TRNSP: SCOSTA, SERVST, RR, RRR, RRSTA, BRID, CAUWY, CCBLG, LTHSE, VESSEL

( ): SITE COUNTS FOR FINAL ALIGNMENT

TABLE 9

DATA QUALITY BY SITE FUNCTION FOR SETTLEMENT PATTERN AND LOCATIONAL STUDIES FOR 1630-1680

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Settlement Patterns								
I/II:	H	H	H	H	H	H	H	H
III:	M-H	M-H	M-H	M-H	M-H	M-H	M-H	M-H
Frontier Development								
I/II:	H	H	H	H	H	H	H	H
III:	H	H	H	H	H	H	H	H
Farmstead & Houselot Design								
I/II:	H	H	H	M-H	M	H	M-L	M-H
III:	H	H	H	H	M	H	M-L	M-H

TABLE 10

DATA QUALITY BY SITE FUNCTION FOR SETTLEMENT PATTERN AND LOCATIONAL STUDIES FOR 1680-1720

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Settlement Patterns								
I/II:	H	H	H	H	H	H	H	H
III:	M-H	M-H	M-H	M-H	M-H	M-H	M-H	M-H
Frontier Development								
I/II:	H	H	H	H	H	H	H	H
III:	H	H	H	H	H	H	H	H
Farmstead & Houselot Design								
I/II:	H	H	H	M-H	M-H	H	M-L	M-H
III:	H	H	H	H	M-H	H	M-L	M-H

TABLE 11

DATA QUALITY BY SITE FUNCTION FOR SETTLEMENT PATTERN AND LOCATIONAL STUDIES FOR 1720-1760

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Settlement Patterns								
I/II:	H	H	H	H	H	H	H	H
III:	M-H	M-H	M-H	M-H	M-H	M-H	M-H	M-H
Frontier Development								
I/II:	H	H	H	H	H	H	H	H
III:	H	H	H	H	H	H	H	H
Farmstead & Houselot Design								
I/II:	H	H	H	M-H	M	H	L	M
III:	H	H	H	H	M	H	L	M

TABLE 12

DATA QUALITY BY SITE FUNCTION FOR SETTLEMENT PATTERN AND LOCATIONAL STUDIES FOR 1760-1820

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Settlement Patterns								
I/II:	H	H	H	H	H	H	H	H
III:	M-H	M-H	M-H	M-H	M-H	M-H	M-H	M-H
Frontier Development								
I/II:	M-H	M-H	M-H	M-H	M-H	M-H	M-H	M-H
III:	M	M	M	M	M	M	M	M-H
Farmstead & Houselot Design								
I/II:	H	H	H	M-H	M	H	L	M-L
III:	H	H	H	M-H	M-L	H	L	M-L

TABLE 13

DATA QUALITY BY SITE FUNCTION FOR SETTLEMENT PATTERN AND LOCATIONAL STUDIES FOR 1820-1910

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Settlement Patterns								
I/II:	H	H	H	H	H	H	H	H
III:	M	M	M	M	M	M	M	M
Frontier Development								
I/II:	L	L	L	L	L	L	L	L
III:	L	L	L	L	L	L	L	L
Farmstead & Houselot Design								
I/II:	H	H	H	M-H	M-L	H	L	M-L
III:	H	H	H	M-H	M-L	H	L	M-L

TABLE 14

DATA QUALITY BY SITE FUNCTION FOR SETTLEMENT PATTERN AND LOCATIONAL STUDIES FOR 1910-PRESENT

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Settlement Patterns								
I/II:	H	H	H	H	H	H	H	H
III:	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L
Frontier Development								
I/II:	L	L	L	L	L	L	L	L
III:	L	L	L	L	L	L	L	L
Farmstead & Houselot Design								
I/II:	H	M-H	H	M-H	M-H	H	L	L
III:	H	M-H	H	H	H	H	L	L

TABLE 15

DATA QUALITY BY SITE FUNCTION FOR ECONOMIC, COMMUNITY, AND TRANSPORTATION STUDIES FOR 1630-1680

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Agricultural History								
I/II:	H	H	M-H	H	M-H	M-L	M-L	H
III:	H	H	M-H	H	M-H	M-L	M-L	H
Commercial & Industrial History								
I/II:	H	H	M	H	H	H	M	H
III:	H	H	M-H	H	H	H	M-L	H
Tenancy								
I/II:	H	H	M	M-H	M-H	H	M	M-H
III:	H	H	M-H	M-H	M-H	H	M-L	M-H
Subsistence & Foodways								
I/II:	H	H	H	M-H	H	H	M-L	M-H
III:	H	H	H	M-H	H	H	M-L	M-L
Community Studies								
I/II:	H	H	H	H	H	H	H	H
III:	H	H	H	H	H	H	H	H
Transportation History								
I/II:	M-H	M-H	M-H	H	H	M-H	M-H	H
III:	M	M	M	H	H	M	M-H	H

TABLE 16

DATA QUALITY BY SITE FUNCTION FOR ECONOMIC, COMMUNITY, AND TRANSPORTATION STUDIES FOR 1680-1720

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Agricultural History								
I/II:	H	H	M-H	H	M-H	M-L	M-L	H
III:	H	H	M-H	H	M-H	M-L	M-L	H
Commercial & Industrial History								
I/II:	H	H	M	H	H	H	M	H
III:	H	H	M-H	H	H	H	M	H
Tenancy								
I/II:	H	H	M	M-H	M	H	M-L	M-H
III:	H	H	M-H	M-H	M	H	M-L	M-H
Subsistence & Foodways								
I/II:	H	H	H	M-H	H	H	M-L	M-H
III:	H	H	H	M-H	H	H	M-L	M-H
Community Studies								
I/II:	H	H	H	H	H	H	H	H
III:	M	M	H	H	H	H	H	H
Transportation History								
I/II:	M-H	M-H	M-H	H	H	M-H	M-H	H
III:	M-H	M-H	M-H	H	H	M	M-H	H

TABLE 17

DATA QUALITY BY SITE FUNCTION FOR ECONOMIC, COMMUNITY, AND TRANSPORTATION STUDIES FOR 1720-1760

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Agricultural History								
I/II:	H	H	M-H	H	M-H	M-L	M-L	H
III:	H	H	M-H	H	M-H	M-L	M-L	H
Commercial & Industrial History								
I/II:	H	H	M	H	H	H	M-L	H
III:	H	H	M	H	H	H	M-L	H
Tenancy								
I/II:	H	H	M	M-H	M	H	M-L	M-H
III:	H	H	M-H	M-H	M	H	M-L	M-H
Subsistence & Foodways								
I/II:	H	H	H	M-H	H	H	M-L	M-H
III:	H	H	H	M-H	H	H	M-L	M-H
Community Studies								
I/II:	H	H	H	H	H	H	H	H
III:	M-H	M-H	M-H	M-H	M-H	M-H	M-H	H
Transportation History								
I/II:	M-H	M-H	M-H	H	H	M-H	M-H	H
III:	M	M	M	H	H	M	M-H	H

TABLE 18

DATA QUALITY BY SITE FUNCTION FOR ECONOMIC, COMMUNITY, AND TRANSPORTATION STUDIES FOR 1760-1820

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Agricultural History								
I/II:	H	H	M-H	H	M-H	M-L	M-L	H
III:	H	H	M-H	H	M-H	M-L	M-L	H
Commercial & Industrial History								
I/II:	H	H	M	H	H	H	M-L	H
III:	H	H	M-H	H	H	H	M-L	H
Tenancy								
I/II:	H	H	M	M-H	M	H	M-L	M-H
III:	H	H	M-H	M-H	M	H	M-L	M-H
Subsistence & Foodways								
I/II:	M-H	M-H	M-H	M-H	M-H	M-H	M-L	M-H
III:	H	H	H	M-H	M-H	H	M-L	M-H
Community Studies								
I/II:	H	H	H	H	H	H	H	H
III:	M-H	M-H	M-H	M-H	M-H	M-H	M-H	H
Transportation History								
I/II:	M-H	M-H	M-H	H	H	M-H	M-H	H
III:	M	M	M	H	H	M	M-H	H

TABLE 19

DATA QUALITY BY SITE FUNCTION FOR ECONOMIC, COMMUNITY, AND TRANSPORTATION STUDIES FOR 1820-1910

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Agricultural History								
I/II:	H	H	M-L	H	M	M-L	M-L	H
III:	H	H	M-L	H	M	M-L	L	H
Commercial & Industrial History								
I/II:	H	H	M-L	H	H	H	M-L	H
III:	H	H	M-L	H	H	H	L	H
Tenancy								
I/II:	H	H	M	M-H	M-L	H	M-L	H
III:	H	H	M	M-H	M-L	H	L	M-H
Subsistence & Foodways								
I/II:	M-H	M-H	M-H	M	M	M-H	L	M
III:	H	H	H	M-H	M-H	H	L	M-L
Community Studies								
I/II:	H	H	H	H	H	H	H	H
III:	M-H	M-H	M-H	M-H	M-H	M-H	M-H	H
Transportation History								
I/II:	M-H	M-H	M-H	H	H	M-H	M	H
III:	M	M	M	H	H	M	M	H

TABLE 20

DATA QUALITY BY SITE FUNCTION FOR ECONOMIC, COMMUNITY, AND TRANSPORTATION STUDIES FOR 1910-PRESENT

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Agricultural History								
I/II:	H	H	M-L	H	M-H	M-L	M-L	H
III:	H	H	L	H	M-H	L	L	H
Commercial & Industrial History								
I/II:	H	H	M	H	H	H	M-L	H
III:	H	H	M	H	H	H	L	H
Tenancy								
I/II:	H	H	M	M-H	H	H	M-L	H
III:	H	H	M	M-H	H	H	L	M-H
Subsistence & Foodways								
I/II:	M-H	M-H	M-H	M	M	M-H	L	M
III:	H	H	H	M-H	M-H	H	L	M-L
Community Studies								
I/II:	H	H	H	H	H	H	H	H
III:	M	M	M	M	M	M	M	H
Transportation History								
I/II:	M-H	M-H	M-H	H	H	M-H	M	H
III:	M	M	M	H	H	M	M	H

TABLE 21

DATA QUALITY BY SITE FUNCTION FOR METHODOLOGICAL AND MATERIAL CULTURE STUDIES FOR 1630-1680

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Status & Wealth								
I/II:	H	H	H	M-H	M-H	H	M	M
III:	H	H	H	H	H	H	M	M
Ethnicity								
I/II:	H	H	H	M-H	M-H	H	M-H	M
III:	H	H	H	H	M-H	H	M-H	M
Material Culture Studies								
I/II:	H	H	H	M-H	M-H	H	M	M
III:	H	H	H	H	H	H	M-H	M-H

TABLE 22

DATA QUALITY BY SITE FUNCTION FOR METHODOLOGICAL AND MATERIAL CULTURE STUDIES FOR 1680-1720

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Status & Wealth								
I/II:	H	H	H	M-H	M-H	H	M	M
III:	H	H	H	H	H	H	M	M
Ethnicity								
I/II:	H	H	H	M-H	M-H	H	M-H	M
III:	H	H	H	H	M-H	H	M-H	M
Material Culture Studies								
I/II:	H	H	H	M-H	M-H	H	M	M
III:	H	H	H	H	H	H	M-H	M-H

TABLE 23

DATA QUALITY BY SITE FUNCTION FOR METHODOLOGICAL AND MATERIAL CULTURE STUDIES FOR 1720-1760

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Status & Wealth								
I/II:	H	H	H	M-H	M-H	H	M	M-L
III:	H	H	H	H	H	H	M	M-L
Ethnicity								
I/II:	H	H	H	M-H	M-H	H	M-H	M-L
III:	H	H	H	H	M-H	H	M-H	M-L
Material Culture Studies								
I/II:	H	H	H	M-H	M-H	H	M	M
III:	H	H	H	H	H	H	M-H	M-H

TABLE 24

DATA QUALITY BY SITE FUNCTION FOR METHODOLOGICAL AND MATERIAL CULTURE STUDIES FOR 1760-1820

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Status & Wealth								
I/II:	H	H	H	M-H	M-H	H	M	M-L
III:	H	H	H	H	H	H	M	M-L
Ethnicity								
I/II:	H	H	H	M-H	M-H	H	M	M-L
III:	H	H	H	H	M-H	H	M	M-L
Material Culture Studies								
I/II:	H	H	H	M-H	M-H	H	M	M
III:	H	H	H	H	H	H	M-H	M-H

TABLE 25

DATA QUALITY BY SITE FUNCTION FOR METHODOLOGICAL AND MATERIAL CULTURE STUDIES FOR 1820-1910

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Status & Wealth								
I/II:	H	H	H	M-H	M-H	H	M-L	L
III:	H	H	H	H	H	H	M-L	L
Ethnicity								
I/II:	H	H	H	M-H	M-H	H	M-L	L
III:	H	H	H	H	M-H	H	M-L	L
Material Culture Studies								
I/II:	H	H	H	M-H	M-H	H	M	M
III:	H	H	H	H	H	H	M	M

TABLE 26

DATA QUALITY BY SITE FUNCTION FOR METHODOLOGICAL AND MATERIAL CULTURE STUDIES FOR 1910-PRESENT

	AGCX	AGTEN	DWCX	MLLCX	COMM	INDTEN	CHR/SCH	TRNSP
Status & Wealth								
I/II:	H	H	H	M-H	M	H	L	L
III:	H	H	H	M-H	M-H	H	L	L
Ethnicity								
I/II:	H	H	H	M	M	H	L	L
III:	H	H	H	M	M	H	L	L
Material Culture Studies								
I/II:	H	H	H	M-H	M-H	H	M-L	M-L
III:	H	H	H	H	H	H	M-L	M-L

The present historic archaeological data base existing prior to any data recovery survey program consists of a number of urban and rural sites in Delaware and the Middle Atlantic region. The urban environment of Wilmington has been intensively explored by Thomas (1980), Wise (1980), Klein and Garrow (1984), Cunningham (1980), Beidelman et al. (1986) and Cultural Resource Group (1985). The excavation of several rural sites in northern Delaware under contract with the Department of Transportation has provided a significant data base for comparisons with site types in southern Delaware. The data recovery survey programs of these northern Delaware sites included questions on topics like settlement patterns, agricultural and industrial development, transportation networks, and other aspects of the region (Coleman et al. 1983, 1984, 1985; Coleman and Custer 1986; Catts et al. 1986; Custer et al. 1985; O'Conner et al. 1985; Heite and Heite 1985; Thompson and Gardner 1986).

A primary goal of this research design is to include work done in Delaware within as large a regional framework as possible. A substantial historical archaeological data base has been established for the Middle Atlantic region covering of a range of site types and locations, and data gathered from Delaware sites would be an important addition to our understanding of the history of the region. To facilitate discussion and apply the sites within the Corridor into as broad and diachronic data base as possible, the following research questions have been grouped into three major topical associations (1) settlement pattern and locational studies, (2) social, economic, and transportation studies, and (3) material culture studies. These major topics correspond to those of Tables 9-26. Specific sites within the Corridor that have the potential for particularly relevant data are included with each specific research question. A general discussion of related research questions and other possible sources of data based upon Tables 9-26 is included at the end of each major topical group. In the discussions of research questions, sample sites from both the entire Route 13 Corridor and the specific final alignment are noted. Sites from the entire corridor are noted because they serve as examples of classes of sites which may be identified during the Phase I study of the final alignment. However, it should be understood that only those eligible sites located in the impact zone of the final alignment will be subjected to Phase III excavations.

Settlement Pattern and Locational Studies

By studying the way in which people settled in Delaware it is possible to address a number of important issues in the history of Delaware and the region. Settlement pattern and locational studies are based upon how people perceived an area and how they consciously or unconsciously located their dwellings in response to the natural and man-made environments. In addition, the study of environment and cultural adaptation has long been a primary focus in prehistoric archaeology, particularly cultural ecology, and many of the same theoretical

perspectives and research strategies can be applied to historic sites (Miller 1980:4).

A number of significant research questions concerning historic settlement patterns in Delaware can be applied to the 1,973 historic sites identified thus far in the Route 13 Relief Route Corridor. What principles governed site location in Delaware during the historic period? Are historic sites in the state patterned similarly to those in other areas of the Middle Atlantic? What is the relationship between the physical environment and settlement patterns in Delaware and the region? Similarly, how does site location vary through time in response to changes in markets, transportation, and agricultural developments and between different areas within Delaware, specifically New Castle versus Kent counties? Current research on the Route 13 Corridor (Custer and Grettler 1986) has identified a number of significant patterns for historic site location and further work appears promising. The factors influencing changes in settlement patterns are complex and the synthesis of the geographical and archaeological data generated by further research at all mitigation levels (Tables 9-14) would be an important addition to the available data base (Wise 1978, 1979a, 1979b, 1980; Gardner 1979; Henry 1981).

As shown in Tables 9-14, every type of historic site, over the entire historic period, could be significant for settlement pattern research questions. Detailed information about specific sites as recovered during Phase III excavations, however, is not always necessary. Rather, settlement pattern studies are most efficiently pursued through large-scale, non-random comparisons of the primarly locational data recovered by Phase I and often Phase II operations.

One particular strength of the existing Route 13 historic data base in settlement pattern studies is the wide range of site types exhibited in the period from 1820 to 1910. Nearly 78% (Table 6) of the historic sites identified thus far in the Corridor date to this period and include such diverse types as "peach houses" (N-1493, N-117, N-110), industrial tenant dwellings (160, 165, 431, 432), and railroad stations (56, 383). As has been noted, ongoing settlement pattern analysis of the Route 13 Corridor (Custer and Grettler 1986) of the 1820-1910 period has begun to outline a rather extensive picture of life in central Delaware during this time. This extensive picture of life is possible because of the number and range of commercial, industrial, agricultural, and dwelling sites found in the Corridor and the ability of settlement pattern studies to integrate such diversity into a valid historical context.

Settlement pattern studies not only reconstruct the historic built and natural environment at any single time, but also assess the stability through time of different settlement and land use patterns. By studying the boundaries of different parcels through time, and by comparing different land use systems, it is possible to test specific hypotheses about the history of

Delaware and the region. Thus, one facet of settlement pattern studies is to utilize land use and inheritance patterns as an "artifact" (Carter 1983:xiv; Heite and Heite 1981:1) of the historic occupation of Delaware. One specific hypothesis within settlement pattern studies that could be tested is Carville Earle's observation that along the western shore of the Chesapeake, a prevalence of short-term farm tenancy in an area tended to perpetuate and increase chaotic land holdings as farm boundaries and acreages were continually being shifted and disputed (Earle 1975:182).

The survey of deed, court of common pleas, chancery court, and other archival records completed by Phase I/II research could be used to test Earle's hypothesis and add significant data to our understanding of historic site location and farm tenancy in Delaware. This particular hypothesis is also supported by the large number (399) of agricultural tenant sites in the Corridor (Table 8). Examples of particularly well preserved tenant sites within the corridor, with a high probability of intact subsurface features and/or standing structures include K-2742, K-3582, K-4009, K-1613, 660, N-5856, 1031-1033, and K-2066.

Such a survey of archival resources, supported by archaeological and material culture data from controlled surface collections, test excavations, and architectural investigations found in Phase I/II research could also be used to address related questions. For example, how permanent were farm and lot boundaries in the study area? How does the Corridor compare to other areas in Delaware and the Middle Atlantic? Again such specific questions could be used to address larger paradigms in American history. One such area of interest is the use of known trends in land ownership and inheritance patterns to mark larger changes in regional economic and social conditions (Mitchell 1978:70; Earle 1975:104-105, 131, 165). As with the other research questions posed here, this paradigm encompasses a number of major research topics, including agricultural and economic history, material culture studies, and social history. This interdisciplinary nature of such research questions is reflected in Tables 9-14.

Related to settlement pattern studies is the question of "frontier" development in the Middle Atlantic region. The term "frontier" is used here to refer to the earliest periods of settlement within the region and with the understanding that "frontier" in the classic sense applies to only a very short period in Delaware history. Although only six sites from the 1630-1720 time period are in the Corridor, relatively little is known about the earliest settlements in Delaware and any data gathered would be an important addition to the current data base. Two of the six sites identified in the Corridor from this period are K-955 and N-3920. Both of these sites are agricultural complexes and have been identified as significant in previous studies (Custer et al. 1984; Custer, Bachman, and Grettler 1986) and have a high potential for undisturbed archaeological features. Further work at types of sites within the final

alignment at both the Phase I/II and Phase III levels could yield significant data (Tables 9 and 10). Due to the scarcity of seventeenth and early eighteenth century sites in the region, any such sites would be significant resources for research questions concerning Delaware's early history (Tables 9, 10, 15, 16, 21, 22).

A number of specific questions concerning both settlement patterns and frontier development can be raised concerning this period. How was early Delaware settled, in particular southern New Castle and Kent counties? How was the area and its environment perceived by those who settled in the region? How did these settlers consciously or unconsciously locate their dwellings in response to the environment? Was the "long lot" system of land use identified for Maryland, New Jersey, and parts of Delaware (Wise 1979b, 1980; Wacker 1975: Chapter 4) used in the study area? Questions such as these show the close relationship between different classes of current research interests, particularly for this earliest period in Delaware's history. Again, a substantial amount of work on this subject has been completed in the region and these questions are designed to suggest ways in which further work on the Route 13 Corridor can support this existing data base.

Research questions involving both settlement pattern and frontier development can be addressed in a number of ways. First of all, synchronic and diachronic comparisons of known site types and locations identified in Phase I and II surveys can be used to establish settlement patterns and to mark changes over time. Since a variety of site types are represented in the Corridor, the potential overall quality of Phase I and Phase II is high (Tables 9-14). Historic sites from the earliest periods of Delaware history, those most useful for frontier studies, are particularly significant (Tables 9-14).

A second major way to pursue settlement pattern and frontier development studies is through the testing of specific archaeological hypotheses. For example, current frontier development models (Green and Perlman 1985; Pogue 1986; Foss 1984) assume that as European settlers met new environmental conditions, they developed new, different ways of living. After this period of initial variability, a trend towards standardization is hypothesized as environmental conditions selected for the most useful adaptations. Archaeologically, then, early sites in Delaware should show an initial period of variability in such attributes as layout, use, and material culture assemblage with a gradual increase in standardization between sites over time. Current research in northern Delaware (Shaffer 1986) supports this general model and data gathered from sites in southern New Castle and Kent counties would be an important addition to the existing data base.

Research questions such as these, in part answerable by an intensive historic geographical and archaeological survey, in turn generate data applicable to other questions in American

history and historical archaeology (Miller 1980:3-4; Wesler 1982:18-19; Wacker 1975:xvii). For example, how significant is the timing of interior settlement patterns, particularly in the areas north and west of the St. Jones River, as postulated for other areas by Lemon (1972:42) and Mitchell (1978:80)?

Although only six pre-1720 sites have been identified thus far, it is likely that more such sites, particularly components of later sites, exist in the Route 13 Corridor. The area south and east of Dover along Puncheon Run and the St. Jones River and the Blackbird and Appoquinimink areas are particularly likely to contain further significant early historic sites.

Related to both Delaware's early history and settlement patterns is the question of farmstead design. Farmstead design in Delaware and the Middle Atlantic has been the focus of a number of studies in a variety of disciplines, particularly architectural history (Herman 1982; Del Sordo 1984; Eberlein and Hubbard 1962; Carson et al. 1981; Wells 1982) and folklore (Glassie 1968, 1972). How were agricultural complexes laid out? What was the arrangement and function of dwellings, outbuildings, and yard areas and how was each used? In a more general sense, where were early farmsteads placed within each land parcel? The relative importance of transportation, soils, markets, and other factors should be studied further on both a site-specific and community basis to determine how they influence farmstead design and placement through time. For the earliest periods of Delaware history, farmstead design is hypothesized to be one of the main variables in the suggested trend towards standardization of adaptive strategies.

A number of sites in the Route 13 Corridor could yield significant data on farmstead and houselot design. Most of the sites in the Corridor are either agricultural (64%) or dwelling complexes (23%, Table 8) and both Phase I/II and more intensive Phase III studies are expected to yield significant data (Tables 9-14).

In conclusion, research questions concerning settlement patterns, frontier dynamics, and farmstead/houselot design can be applied to a range of historic sites. These questions reflect the strengths of the existing Route 13 data base and include both synchronic and diachronic components. These components in turn address other issues in the history of Delaware and the region. Historic sites that are likely to generate useful data are found throughout the 58 mile corridor as both standing structures with associated archaeological remains and as distinct historic archaeological sites. Comparative data from a large variety of sites, particularly at the Phase I/II level, is well suited to discussions of settlement patterns, changes in land use and inheritance, and Delaware's early history. More intensive and site-specific data, such as that commonly recovered in Phase III programs, provides valuable information for research questions dealing with frontier dynamics and farmstead/houselot design.

Economic and Transportation Studies

The second major group of research questions that can be applied to the Route 13 Corridor concern the social and economic history of southern New Castle and Kent counties, and by implication, of Delaware and the Middle Atlantic region. As the Corridor is and has been primarily an agricultural region, changes in transportation and agriculture have played a key role in the social and economic history of the region and will be given special emphasis. Also, as most of the sites in the Corridor date from 1820-1910 and current research (Custer and Grettler n.d.) has identified a number of statistically significant trends, special emphasis will also be given to this period. For every period, the growth of communities, particularly as a barometer of economic conditions will be considered. Historic sites that can be expected to yield significant data to particular aspects of these research questions are summarized in Tables 15-20.

The general shift through time from subsistence to market-oriented agriculture is one possible focus for study within the agricultural history of Delaware (Mitchell 1978:4). Research on such a shift would involve a detailed understanding of a variety of issues including 1) the primarily subsistence-oriented agriculture of the seventeenth and early eighteenth centuries, 2) the growth of wheat and other small grain agriculture in the eighteenth and nineteenth centuries, 3) the partial collapse of this wheat-based economy in the 1810s and 4) the revival and renaissance of agriculture in the nineteenth and early twentieth centuries with the advent of new techniques, crops, and markets.

As can be seen, this shift towards marketable foodstuffs is extremely complex and encompasses numerous issues within the agricultural history of Delaware. As noted by Barbara Clark Smith, Delawareans throughout the historic period balanced farm and family needs with subsistence and cash crop opportunities and that this shift is more a matter of a change in emphasis than a complete economic reorientation (Smith 1985).

A number of specific questions concerning this overall trend towards marketable crops in the agricultural history of the region. What kinds of agricultural goods were sold in Delaware through time? What kinds of technological demands did different crops impose and how did farmers meet them? How "flexible" were farmers historically and how was Delaware affected by fluctuations in local, regional, and international markets? Agricultural sites within the Corridor that could yield significant data include N-3965, N-5038, N-5042, K-1366, and K-4011.

Both Phase I/II locational and Phase III data recovery survey programs of a variety of agricultural and commercial sites would be needed to detail the agricultural history of southern New Castle and Kent counties (Table 15-20). A careful exploration of archival resources such as agricultural censuses, court

records, and land advertisements would be a good first step in determining local agricultural preferences and understanding the overall pattern of agricultural land use through time in Delaware.

Apart from a need to study changes in Delaware's agricultural and economic history, specific questions concerning farm life need to be addressed (Wesler 1982:18; Henretta 1978:3). Did farmers grow most of the food their families consumed? How much income was earned and how was it spent? What proportion went to food, rent, clothing, tools, taxes, and household goods? How were these goods exchanged between neighbors and within the community? Questions such as these point to a larger paradigm in American history--to what degree were farmers self-sufficient and how did this change over time? Much has been written about the traditional self-sufficiency of American farmers (Loehr 1952; Henretta 1978:13-16, 20; Merrill 1977; Bidwell and Falconer 1941; Hofstadter 1957) and the study of the wide range of farm sizes represented in the Route 13 Corridor could yield valuable data.

Specifically, it would be necessary to intensively test a range of farm, particularly agricultural complexes and tenant sites, and farm-related sites, particularly mills and stores, to determine self-sufficiency and the domestic economies of specific sites. Data recovered from intensive Phase II and III excavations of farmsteads of different socio-economic levels, including agricultural tenant sites, could form a significant data base of inter-farm and community comparisons (Tables 15-20).

Research questions concerning farm life and self-sufficiency point towards the need for a more complete understanding of the lower class of non-landed tenant farmers (Bausman 1933). Agricultural tenancies are well represented in the Corridor with 399 such sites located thus far (Table 8). Few of their dwellings, however, survive and the historical record makes little reference to the role played by this group in the rural society. Only one agricultural tenant dwelling (K-2742) is extant. Most known agricultural tenant dwellings are of less substantial construction and appear to be situated near the roadsides of each farmstead, while the landowner's more imposing dwelling is located back from the road. How this is related to the agricultural community and the general social structure of the region has not yet been fully addressed.

The geographic and archaeological data generated by all subsequent data recovery survey programs for the Route 13 Corridor would greatly increase our present understanding of the agricultural history of Delaware (Tables 15-20). Particularly exciting is the possibility of substantial data from farms of different size and socio-economic levels and from a variety of agricultural and commercial settings. Catts et al. (1986), Coleman et al. (1984, 1985), and Lothrop (1986) have tested and partially excavated a number of agricultural tenant sites in northern Delaware. Further work in the Route 13 Corridor could add to this data base and would allow more complete

generalizations to be made about all classes of farms in New Castle and Kent counties. This is especially true for the 1850-1880 time period in which the greatest number of agricultural tenant sites with a high potential for archaeological features in good context are found. Example sites include K-266, N-5087, K-3840, K-257, and K-3844.

Transportation has always been a key factor in the agricultural and economic history of Delaware and further research questions could target additional areas of study (Heite and Heite 1982; Henry 1981:45). Various modes of transportation have been utilized in the study area through time and with these shifts in emphasis have come subtle changes in town development and size (Lemon 1967:503), rural settlement pattern, population density, and manufacturing opportunities such as carriage making, tanning, and foodstuff processing. The impact of railroad transportation on Middletown, Clayton, Kenton, and a number of other towns in Delaware is one example of the effects of changes in transportation. The effects of such changes in the Middle Atlantic region are extremely complex (Taylor 1951) and future research could seek to identify and assess these changes through site and locale-specific data.

Approximately 25 transportation related historic sites have been identified in the Route 13 Corridor (Table 8). Transportation sites include bridges (N-1309, K-5644), canal company buildings (59), landing operations (K-202, N-3918, 66), and railroad (338, 553) and stagecoach (N-6303) related sites. Transportation sites are probably under-represented in the Corridor, particularly for the earlier time periods. Landing operations in particular are under-represented as most farms with access to navigable water possessed landings as part of their regular operations. And as water transportation was of primary importance prior to the wide-spread development of consistently good roads in the early nineteenth century, landings were an important part of many early Delaware farms.

As mentioned, the earliest forms of travel in the Route 13 Corridor were probably by boat and on foot, as the few early roads were frequently unsuitable for cart travel. Landings and the heads of navigable streams became transshipment centers and thus foci for settlement. During the early nineteenth century, the establishment of adequate roads and then railroads altered the commercial pattern and emphasized the junctions of these later modes of travel. Hamlets grew up around road/railroad intersections and places like Seven Hickories, Dinah's Corner and Pearsons Corner were eclipsed by Hartly, Kenton, and Cheswold and other towns through which the railroad passed. Research within the proposed Route 13 Corridor could try to reveal the mechanisms of this change and document its ramifications for village life, commercial patterns, and population change.

As previously mentioned, landing sites along the navigable portions of streams in the study area, particularly along the Near West/Near East alignment, could provide another focus for

research. Landings were an integral part of regional transportation and economic systems throughout the historic period, yet virtually no documentation exists as to their actual location, location in relationship to other sites, size, use, or construction.

In addition to the seven landing sites identified thus far in the Corridor, 60 major commercial landings have been located near the study area. The four other landing sites in the Corridor are historical archaeological sites 430, 433, 429, and 841. Eighteenth and nineteenth century land advertisements frequently detail small private landings as part of the improvements made on a property and a detailed survey of available archival resources conducted as part of Phase I and II programs could yield significant data on these important links in the agricultural and commercial economies of the region (Tables 15-20).

One of the features of the early road network was taverns or inns placed at intervals along the major thoroughfares (Ward 1968). If the establishment could be situated at a crossroads, so much the better. Research into the Buck Tavern, at Summit Bridge, Delaware (Wilkins and Quick 1976), the Mermaid Tavern and Tweed's Tavern on Limestone Road (Catts et al. 1986), and the William H. Anthony Hotel in Stanton (Thompson and Gardner 1986) suggests that rural inns and taverns in Delaware were licensed, but often ephemeral businesses which were often contained in farmhouses or dwellings only slightly modified for the purpose. Tavern and inn sites within the Corridor that could yield significant data include N-1503, K-3271, 64,823 and 824. Further Phase I, II, and Phase III research on such sites, especially when integrated with specific data on the economic and transportation history of the region, could be a significant contribution to the existing data base (Tables 15-20. Taverns and inns are included in the "commercial" site type.)

Significantly, further research on the Route 13 Corridor offers the opportunity to study on a large scale community development and, in some instances, decline in rural Delaware. One of the most prominent features of Delaware history is the waxing and waning of hamlets and other "crossroad" communities as local service and transportation centers according to local and regional economic conditions. Thus far, over 100 such communities have been identified in the Route 13 Corridor. As barometers of larger social and economic changes, the study of crossroad communities such as Boyd's Corner, Pine Tree Corners, and Big Oak Corners (all of which are in the final alignment) and "mill towns" such as Noxontown could be used to study urbanism in a largely rural, pre-industrial context. The data produced by such a study would augment existing local studies (Heite and Heite 1985, 1986) and could become an important part of a diachronic study of regional community development in Delaware and the Middle Atlantic.

Both Phase I/II and Phase III survey programs could yield significant data for community studies. Phase I/II programs would be best suited for primarily locational studies. Dwelling, commercial, and industrial sites are most likely to yield significant data for community studies as agricultural sites are less likely to be located in urban areas. Agricultural sites, however, would be an important part of the economic history of the area and would be significant for community studies in that respect. For site and community specific studies, Phase III programs are likely to yield significant data. Transportation related sites could yield significant data for community studies at all levels of study (Tables 15-20).

Detailed information on landings, transporation, and "crossroad" communities could be used to address additional research questions. For example, how did Philadelphia, Baltimore, and New York influence the concentration of storing, loading, and other commercial facilities in Smyrna, Smyrna Landing, Dover and other commercial centers in southern New Castle and Kent Counties? What is the relationship between these changes in transportation and markets and the diachronic trend in Delaware agriculture towards more diversified and market-oriented crops? On a more specific level, what is the relationship between the tremendous growth of the Smyrna Landing area in the mid-nineteenth century and the large-scale production of perishable truck and orchard crops, particularly peaches and tomatoes, in that area? The Smyrna area contains over 60 agricultural and commercial sites including agricultural complexes (925, K4250, K-4002), tenant residences (786, K-4009, K-3939), warehouses (N-135, 433-440), manufactories (K-4026, 925, 427), and landing operations (429, K-202).

Three of these sites in the Smyrna area are particularly significant. The first archaeological site, 433, is associated with the site of a pre-1868 commercial structure that has served as a manufactory, landing operation, and warehouse. Further work at this site, even though the orignial structure has been removed and some evidence of machine disturbance exists, could yield significant data on the commercial development of the Smyrna area. A similar range of functions has been attributed to historic archaeological site 925. This site is a pre-1868 agricultural complex and manufactory and has been associated with one archaeological feature, a foundation (Custer, Bachman and Grettler 1986). In addition, the potential for other subsurface features is high. The third site, 786, is a industrial tenant house from the period 1868-1893. This standing structure has one related outbuilding and also has a high potential for archaeological features in an undisturbed context. Historic sites such as these could be expected to yield significant data at all levels of any eventual mitigation programs (Tables 15-20).

As can be seen from the examples given, historic sites from the mid-nineteenth century to the early twentieth century are particularly well represented in the Smyrna area (Table 8). Within this period, 29 sites, including warehouses, industrial

tenant dwellings, and commercial sites have been identified. This range of commercial and industrial sites could offer significant information at all levels of investigation about the growth and subsequent decline of the Smyrna area.

Data gathered from the Smyrna area and compared to similar data from the Blackbird, Appoquinimink, and Leipsic areas could form the basis of a larger study of the commercial, industrial, and agricultural economies of southern New Castle and Kent counties.

Approximately 99 historic sites have been located in the Blackbird area, including a number of mills (294, 295), tenant dwellings (325, N-3921, N-5879), and commercial sites (N-5849, N-5851, 288). Three of these sites could prove particularly significant. Historic archaeological site 295 is a pre-1849 sawmill complex along Blackbird Creek and has associated archaeological features. Representative of tenant dwellings in the area is K-5879. This archaeological site has been associated with an agricultural tenant dwelling from the period 1849-1868. Although the structure has been removed, K-5879 is relatively undisturbed and the potential for intact subsurface features is high. Representative of commercial sites is N-5851. This standing structure is a pre-1868 railroad station and store and has been associated with two extant outbuildings and a high potential for intact archaeological features. Further work, at all levels, at sites such as these could yield significant information on the social, economic and transportation history of Delaware and the Middle Atlantic region (Tables 15-20).

In the Appoquinimink area, 68 historic sites have been identified (Custer, Jehle, Klatka and Eveliegh 1984). As with the Smyrna and Blackbird areas, the Appoquinimink area had been occupied since the early eighteenth century and further research at all levels could offer a diachronic as well as synchronic perspective to current research questions (Tables 15-20). Approximately 37% of these Appoquinimink sites offer a high potential for the recovery of significant archaeological data from undisturbed contexts. Sites in the Appoquinimink area include a variety of commercial and agricultural types. Agricultural types with a high potential for undisturbed archaeological remains include agricultural complexes (N-5902, N-5898, 179), peach estates (N-432, N-110) and tenant houses (255, 264). Commercial sites with a high archaeological potential include mills (161, 229) and manufactories (255, N-417). Industrial tenant dwellings are also represented (164, 165). Further work, at all levels, on sites such as these could yield significant data, especially if compared to similar sites in the Blackbird, Smyrna, and Leipsic areas.

The Leipsic area also contains a number of significant resources for the study of the commercial, industrial, and agricultural economies of central Delaware. This area contains seven mill sites, both as standing structures with associated archaeological sites (K-833, K-1395, K-238) and archaeological

sites (556, 557, 552, 476). Each of these mill sites are relatively undisturbed and offer a high potential for archaeological features in good context. Industrially related sites include four industrial tenant archaeological sites (55, 559, 583, 584). While generally less well-preserved than the mills, each of these tenant dwellings offer at least a moderate potential for intact archaeological features.

Agricultural sites compose the bulk of the sites in the Leipsic area with agricultural complexes and tenant dwellings particularly well-represented. Twenty-four agricultural sites, including three eighteenth century estates and complexes. Two of these eighteenth century agricultural complexes (K-1395, K-238) have also been associated with milling activities. Further work at both these sites, in conjunction with other agricultural and milling sites in the area could yield significant data at all levels of study (Tables 15-20).

Not to be overlooked is the impact of the construction of the present Route 13 on the lifeways of the people of the Upper Delmarva Peninsula. This road, which essentially replaced an older Philadelphia to Lewes Post Road, drastically altered the traffic pattern on the Delmarva when it was opened in the early 1920s. Many historic sites in the Corridor date to this period, particularly as standing structures. The Camden and Star Hill areas along the present Route 13 contain 29 dwellings and dwelling complexes dating from the 1920s to 1945. Further research, at both the Phase I/II and Phase III levels, could expand our present knowledge of the tremendous social, political, and economic changes initiated by the DuPont Highway (Tables 15-20).

In conclusion, research questions concerning the agricultural, economic, and transportation history of southern New Castle and Kent counties can be applied to a range of historic sites. These research questions reflect the strongly agricultural nature of the Route 13 Corridor and place this heritage within a regional social, economic, and technological context. Historic sites that are likely to produce useful data are found throughout the Corridor and include a wide range of site types. Data generated from specific sites could be productively compared with sites in other areas, especially among and between the Smyrna, Blackbird, Appoquinimink, and Leipsic areas. Such a wealth of data could form the nucleus of a larger study of the economic history of central Delaware and the Middle Atlantic region. These research questions are generally well suited for the efficient use of both Phase I/II and Phase III surveys. Transportation studies, in particular, offer the opportunity to trace developments in the agricultural, commercial, and industrial history of central Delaware from the earliest periods to the present.

Material Culture Studies

The last major group of research questions that can be applied to the Route 13 Corridor concern specific methodological questions within historical archaeology and material culture studies. Methodological research questions seek to refine the way in which we gather, analyze, and interpret archaeological and historical data. Very often, research aimed at methodological concerns involve gathering data relevant to specific topical research questions, particularly those within social history and economic studies. Thus, these material culture methodological questions have bearing on almost every aspect of historic archaeology, with the possible exception of strictly locational studies (Tables 21-26).

One current methodological question within historical archaeology involves the use of material remains to determine social and economic status. Determinations of status and wealth through material remains is based on the seemingly common sense premise that wealthy or higher status households should contain different, i.e. more expensive, artifacts than poorer ones. Material culture assemblages from different ethnic groups are expected to vary according to different cultural precepts and traditions. Artifacts that supposedly show these differences in wealth and status best are ceramic assemblages and types, particularly expensive imported or luxury wares and other household items (Miller and Stone 1970; South 1972). Recent studies, however, have found this model to be too simplistic. In an effort to refine this model, various limitations have been introduced. Stanley South has stated that status differences are reflected better in seventeenth rather than eighteenth or nineteenth century material culture assemblages and that analysis of ceramics by shape (function) is more sensitive than by type (South 1972). More recent studies have made further attempts to refine this model for status, wealth, and ethnic differences through extensive intra-site comparisons (Otto 1977) and various improved economic and social scales for determining high status ceramics (Miller 1980) and accounting for differential archaeological preservation, salvaging and recycling, and disposal patterns (Rodeffer 1984). Despite these efforts, the equation of artifact, particularly ceramic, assemblages with wealth and status is much more complex than simply "the rich buy expensive and the poor buy cheap" (Foss 1985:2).

In addition to artifact assemblages, archaeologists and material culturalists have looked to other social and economic factors, particularly subsistence patterns and foodways, to determine status, wealth, and especially ethnicity from the material record (Schuyler 1980). Foodways, or how food is prepared, served, and stored has proven to be a particularly significant factor in the interpretation of historic sites and further work appears promising. Food preparation, butchering practices, and seasonality seem to be particularly sensitive factors in the material culture record (Bowen n.d.). In addition, foodways and subsistence have been extensively studied

from a variety of disciplines (Anderson 1971; Champ 1979) and further work on the Route 13 Corridor, particularly at the Phase III level, could be an important addition to the extant data base (Tables 21-26).

With regard to research on food ways and subsistance patterns, artifact assemblages from different sites of known socio-economic levels and similar functions could be compared to determine the extent to which archaeologically derived data can be used to make reliable inference about social and economic conditions. The large number of dwelling sites, including agricultural complex and tenant sites, in the Corridor could constitute a particularly fertile resource for the recovery of significant material culture data (Tables 21-26). Commercial, transportation, municipal, and other sites with minimal occupation are expected to be less likely to yield significant comparative data (Tables 21-26).

A second major methodological concern within historical archaeology and material culture studies is the integration of archaeological and material culture data with more traditional historic resources such as inventories, orphan's court and probate records? How best can archaeological and material culture data and archival resources be used together? What can such data explain about the past? If the material record and archival sources disagree, how best can discrepancies be resolved? How best can oral histories be used within the archaeological record (Duranceau 1983)? Are physical remains inherently more objective and less biased than written records? How do artifacts and archaeological data depict change and what kind of data tells us the most about past human behavior?

Questions such as these point to the need for a tighter definition of the role of material culture and archaeological evidence in historical research. A number of attempts have been made (Deetz 1977; Issac 1982; Glassie 1968; South 1972; Schlereth 1985) and the most promising approach appears to be a rough equality between both data bases, with historic and archival research providing the major hypotheses. According to this view, material culture is seen as one type of historical evidence with its own set of inherent strengths and weaknesses (South 1977; Schlereth 1985). Further work on the Route 13 Corridor, at all levels and site types, could help to identify these variables and begin to formulate corresponding hypotheses (Tables 21-26).

In conclusion, research question concerning methodological and material culture studies can be applied to nearly every site within the Corridor. Even sites of limited preservation or integrity can pose situations which foster the development of new and different methodologies. These research questions reflect many of the theoretical frameworks and historical models currently being applied to historic archaeological sites and add to our understanding of past lifeways in two ways. First of all, methodological and material culture research questions serve to refine the accuracy and precision with which we gather and

interpret historical data. Secondly, in refining the way in which archaeologists reconstruct past lifeways, they often gather data relevant to larger historical issues. For example, methodological research questions dealing with determinations of wealth and status not only expand the way in which archaeologists interpret archaeological and material culture data, but also adds substantially to our understanding of specific social and economic conditions. Detailed data from Phase III and sometimes Phase I/II survey programs are best suited to answer methodological and material culture questions (Tables 21-26).

Historic sites that are likely to yield significant data are found throughout the Corridor, with short occupation dwelling sites expected to yield the most information (Beidleman 1986). Wealth, status, and ethnicity research questions in particular are best answered by such sites (Tables 21-26). The primary limitations on sites likely to yield significant data are preservation and overall site integrity. Data from disturbed areas are less useful, but may pose situations which encourage new and imaginative solutions.

In conclusion, the varied prehistoric and historic archaeological sites located within the Route 13 alignment have the potential to yield significant data relevant to a wide variety of research questions. Careful collection of the data from these sites will help to guide studies of these research issues in the future.