# Town of Knox

# Comprehensive Plan

# 1994

# TOWN OF KNOX COMPREHENSIVE PLAN

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## SECTION 1

## OVERVIEW

The Town of Knox, which contains the hamlets of Knox and Township, is located in the northwestern corner of Albany County and encompasses approximately 26,000 acres. It is situated on a weathered, glaciated plateau which stretches south and west beyond the Helderberg Escarpment. In 1785, the western boundary was established to be 24 miles west of and parallel to the west bank of the Hudson River. The township overlooks the Mohawk and Hudson River Valleys, and on clear days the Adirondack Mountains to the north, and the Berkshire and Green Mountains to the east, are visible.

The Town of Knox Comprehensive Plan reviews, in Section 2, where we have been, our roots, our heritage. Early settlers leased land in Knox under the Dutch patroon system. Eventually, however, the people revolted against this coercive aristocracy in a series of Anti-Rent Wars and gained control of their land. Although Knox has always been a rural town, with farming as its main occupation, it also has supported a thriving pill box manufacturing industry, sawmills, gristmills and tanneries, as well as fine schools and several tea houses and hotels. The Town planning process began in 1967 with the appointment of a natural resource inventory committee. The ongoing planning process resulted in the development of a zoning ordinance and subdivision regulations, and has provided a good foundation for the Town's current planning efforts. Section 3 defines the comprehensive plan in terms of and within the framework of the planning process. The plan is the blueprint for the current and future protection, enhancement, growth and development of the Town. Prime sources of information for the plan are the Town residents and non-resident land owners. Information was obtained from questionnaire surveys and public meetings. Other important sources of information are the background studies which are in Section 4. The background studies relate to the Town's vital, social and physical statistics, infrastructure, and environmental resources and constraints. Together, all of this information is used to derive the Town's goals, which are discussed in Section 5. The goals shape a vision of what the Town can and should be in the future, and embrace the preservation of the Town's rural character, the continued existence of open spaces, development consistent with the Town's rural character and implementation of those actions that will optimally promote the attainment of Town goals. The plan concludes with a listing and discussion in Section 6 of recommendations relating to the zoning ordinance, subdivision regulation and other actions that the Town should take in the implementation phase of planning.

## SECTION 2

## HISTORY

Prior to 1790, the Town was known only as a wild, mountainous part of the West Manor of Rensselaerwyck. In those times, Watervliet, the "mother" of the towns of Albany County, was a vast area with indefinite boundaries. As population increased, however, it became necessary to reduce this area into administrative units of manageable size. Therefore, in 1790, Rensselaerville, which included the present townships of Berne, Westerlo and Knox, was separated from Watervliet; Berne, which included the township of Knox, was apportioned from Rensselaerville in 1795; finally, the township of Knox was established, separate from Berne, on February 28, 1822.

Legend gives the Hamlet of Knox the early name of Fechtburg, or Fighting Hill. This name arose from a bitter dispute over leadership among a party of pioneers encamped at the site of the Hamlet. Later, the Hamlet became known as "Pucker Street", a reference to the inhabitants' aloof attitudes (or alternately, to a plethora of old maids in residence there) or, owing to the nearly 100-foot width of the road running through it, as simply "The Street". The origin of the name of Knox is uncertain, but probably came from Colonel Knox, Revolutionary War hero, or possibly, in honor of John Knox, the Reformer.

A map prepared by William Cockburn for Stephen Van Rensselaer in 1787 shows the Town divided into plots of approximately 120 acres. There were many settlers already on the land when the map was prepared; historians conclude that these were probably lease-holders, although this can not be conclusively documented since the original leases were a part of the Van Rensselaer papers destroyed in the Capital fire.

In 1845, the Town of Knox reported a population of 2,145 and Knoxville, as it was then known, contained about 30 dwellings. Following the Revolutionary War, many more settlers came into the area from the vicinity of Stonington, Connecticut.

The Patroon system, which was exported to the New World from Holland long after it had been abandoned there, encumbered a section of the Hudson River valley and the adjacent lands on either side with a coercive aristocracy that led to long, bitter years of hardship and suffering and eventually, to armed revolt.

In 1629, Kiliaen Van Rensselaer, a pearl and diamond merchant of Amsterdam and a director of the Dutch West India Company, was given a charter for a grant of land in America in return for his agreement to establish a colony of fifty persons on the grant within four years. Kiliaen's grant rapidly became the Manor of Rensselaerwyck, which stretched along both sides of the Hudson River for 24 miles

and encompassed an area of about 700 thousand acres.

The first patroon of Rensselaerwyck never saw or visited his estate, but his agents served him well and the vast tract was handed down to his descendants intact. It became a hereditary seat of enormous economic and political power, as well as a source of ever-increasing wealth. The manor survived both the British conquest of the colonies in 1664 and the American Revolution more than a century later, with the powers of the patroon only superficially diminished.

Henry Christman's *Tin Horns and Calico*, a stirring and authoritative account of the struggle of the reluctant tenant farmers against entrenched injustice, describes their situation in the 1830's:

"Under the patroon system, flourishing as vigorously as it had in the days of the early seventeenth century, a few families, intricately intermarried, controlled the destinies of three hundred thousand people and ruled in almost kingly splendor over nearly two million acres of land."

Stephen Van Rensselaer III, sixth lord of the manor, and his son, Stephen IV, were the descendants of old Kiliaen most intimately bound up with the history of Knox. In *Tin Horns and Calico*, Henry Christman portrays the state of the manor as it was when Stephen III came of age in l785:

"Only scattered settlers had gone beyond the fertile valley lands to clear the heights of the Helderbergs, where thousands of untouched acres still awaited the ax and the plow. Stephen now announced a `liberal' program to people the rest of his seven hundred thousand acres. He would give the patriots of the Revolution homesteads without cost; only after the farms became productive would he ask any compensation.

"Surveyors were sent over the hills; farms of one hundred and twenty acres each were blocked out; exaggerated reports were issued about the fertility of the soil... Men began to come and to each the patroon said: `Go and find you a situation. You may occupy it for seven years free, then come in at the office, and I will give you a durable lease with a moderate wheat rent."

Several thousand farms were taken up on the basis of the patroon's vague offer, and for most of the prospective lease-holders, especially for those who found their "situations" in the rocky uplands of the Helderbergs, the seven years spent in clearing a homestead in the wilderness, were years of cruel privation and rugged toil. As Henry Christman wrote:

"Here the farmers spent their energy wresting a living from the grudging land, and talked with patient humor of the stones that pushed up perennially as the only dependable crop. Some even fancied that the Helderbergs were the last place made by God, and the dumping-ground for all the rock left over from Creation."

Many settlers had to "hire out" in order to support their families while they cleared their farms. Some traveled many miles to work for a half-bushel of corn a day, trudged home with the corn on their backs, and then picked up their axes to work at their own homesteads.

When the seven years of unremitting labor had ended and the settlers went back to the patroon for their "durable leases", they were handed contracts of "incomplete sale", which had been drafted for the patroon by his brother-in-law, Alexander Hamilton. With these "leases", or "incomplete sale" contracts, the patroon evaded the intent of laws enacted in 1792, and "sold" to the settlers the lands which they had cleared, subject to certain conditions, as set forth in *Tin Horns and Calico*:

"As 'purchase' price for the title to and the use of the soil, the tenant was to pay ten to fourteen bushels of winter wheat annually, and four fat fowls; and he was to give one day's service each year with team and wagon. He was to pay all taxes, and was to use the land for agricultural purposes only. The patroon specifically reserved to himself all wood, mineral and water rights, and the right of re-entry to exploit these resources. The tenant could not sell the property, but only his contract of incomplete sale, with its terms unaltered. A 'quarter-sale' clause restricted him still further: if he wished to sell, the landlord had the option of collecting one-fourth of the sale price or recovering full title to the property at three-quarters of the market price. Thus the landlord kept for himself all the advantages of land ownership, while saddling the 'tenant' with all the obligations, such as taxes and road-building."

Rent was due on the first of January. All through the Helderbergs teams were hitched to wagons or sleighs for the long pull over frozen roads to the office of the distant patroon. Some farmers traveled for more than a day. Once they had reached the office of the patroon's agent, they waited outside in the cold yard until their names were called. When summoned, they went up to a small, circular window and handed their "rates" to the agent inside. In turn, each tenant who had met his obligation came away from the window clutching his receipt for wheat and "four fat fowls" which had been delivered previously to one of the patroon's collection points. But whether a tenant could pay or not, or whether he was sick or injured, he was required to be represented at the patroon's office on Rent Day. No tenant was allowed inside the office, or permitted to examine the books in which his rents were recorded. The tenant had only his receipt and the agent's assurance that the entries were correct.

## Anti-Rent Wars

Stephen Van Rensselaer III, who died in 1839, let nearly half a million dollars in rent go uncollected, and thus, was called the "Good Patroon". Upon his death, the West Manor (mainly Albany County) was inherited by his son, Stephen IV, who ordered that all delinquent rents be collected forthwith and threatened actions to recover the farms of those who did not pay up at once.

The young patroon's ultimatum weighed heavily on many tenants; the farms which they, and their fathers before them, had hacked and grubbed out of the harsh wilderness were now threatened with abrupt seizure. Resentment against the patroon system had long smouldered among the tenants of the manor, especially among the farmers of the hill townships of Berne, Westerlo, Rensselaerville, and Knox. The old patroon had been mindful of the latent hostility, and it is said that he never ventured into the Helderbergs without an escort of armed outriders. He was careful, too, to take no action that would unite the tenants against him. Now, however, the young heir's ultimatum achieved that unity of opposition, and the resentment in the hill townships flared.

Men gathered in angry groups to discuss the ultimatum and to renew the old, rankling discontents: the perpetual rents, their status as tenants from which there was no possibility of escape and the "incomplete sale" contracts which would never culminate in ownership of the lands they worked. Farmers for whom the rents were no hardship joined with those for whom payment was impossible, and together they confronted the patroon with a united opposition - a common defiance.

Stephen's agents fanned out through the hill townships to collect the rents, but they returned, for the most part, empty-handed. Stephen then ordered the farmers to form a committee and to meet with him. The tenants complied, but when the committee went to the manor, Van Rensselaer refused to speak with them. Rather, he had his agent demand that the tenants submit their grievances in writing in the form of a petition. The farmer-delegates were working farmers, not petition writers, and they had hoped to discuss their problems with the patroon on a personal basis, just as they threshed out their individual problems over stone walls, in church yards, and over the wheels of wagons. But, once again, they complied.

A week later, through his agents, Stephen acknowledged that he was prepared to modify the policies of the manor in some respects, but insisted that the basic issue - back rents - must be resolved by full payment before other matters were discussed. The back rents, he said, were the concern solely of the individual debtor and the estate. The writs of ejectment followed, and the Anti-Rent War began.

The hill farmers responded with a document addressed to the "pretended proprietors" of their soil. This new Declaration of Independence included the vow, "We will take up the ball of the Revolution where our fathers stopped it and roll it to the final consummation of freedom and independence. . ."

Stephen's agents, the sheriff and deputies rode through the hills with their writs. But wherever they went, tin horns and conch shells signaled their arrival. They found the roads blocked by the calico "Indians", silent farmers, armed and mounted, who galloped out of the woods whenever the horns sounded in the hills.

Finally, in 1852, after years of violence, Stephen IV abandoned his attempt to subdue the rebellious tenants of the hill townships, and offered the West Manor to land speculators. The leases in the Helderbergs were bought up by Walter S. Church, who was determined to crush the hill town rebels in order to reap the anticipated profits of his investment. Church placed a high priority on the subjection of the Town of Knox. Arthur B. Gregg, author of *Old Hellebergh*, describes the reason for Church's concern: "Many bitter anti-renters of that township, descendants of pioneer Connecticut yankees, had ignored every demand for delinquent rents and vigorously opposed attempts to dispossess."

With the sheriff and the military courts as the instruments of his policy, Church moved against Knox. In 1866, a military force moved to Altamont by train and then marched up the hill to encamp at the intersection of the roads leading to Warner Lake and Thompsons Lake, now Routes 157 and 157A, remaining there from July until October.

In *Old Hellebergh*, a pertinent report by Senator Colvin to the Landholders Convention is cited:

"The military have held possession of the Helderberg towns. Dwelling houses have been broken into, furniture cast out upon the public highway, the military have occupied the roads. People have been stopped while peaceably traveling on business, their vehicles searched and then ordered to move on. Men looking on at a distance were fired on, chased and had to fly to save their lives. Sheep were killed, hen roosts broken into and robbed, grain taken, fed and destroyed, potato fields dug, corn gathered, eaten and wasted, garden vegetables, flowers rooted up wantonly. Firewood, carefully collected for the winter was burned and fences and buildings afterward. While men made days and nights hideous with drunken revelry."

Colonel Church's counsel, Judge Rosendale, gives this version of the incident:

"...In July 1866 a military expedition was sent to the town of Knox to serve process which was met by a body of resisters who fled, however, on approach of the

soldiers. Nine persons were arrested and sent to Albany Police Court. As late as September, l866, two companies of local militia were sent to the anti-rent district, where tenants had committed excesses upon persons holding property of tenants ejected for non-payment of rent: the militia brought fourteen prisoners accused of resisting the Sheriff's officers."

In 1866, according to the report of the Landholders Convention, as cited in *Old Hellebergh*:

> "...the sheriff, Col. Church and an armed gang went to the premises of Amos and Mathias Warner (1)* without a process and broke into his house and began to throw property out upon the public road. An Irishman, a blacksmith, living in the neighborhood came in, witnessed the devastation and objected to the removal, closing and holding the door. This was claimed as resistance. Col. Church returned to the city, called out the military and marched them to the house of the Warners, took the possession of the farm, encamped there picketing the highways. The property was seized and appropriated and never did the Sheriff let go his hold until the Warners agreed to pay the extortionate sum of $4,000."
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> (*See the 1866 Map of Knox in Appendix A for numbered locations as well as locations of early school districts.)
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> "The property of the Rev. Mr. Daniels, pastor of the Lutheran Church in the neighborhood (this church was located next to the present-day Highland Farms Restaurant)(2) and who had rented from the Warners a part of the dwelling house, shared the same fate as the Warners property. It, with his library of fine and handsomely bound books was also cast upon the public highway in the very midst of a pelting rain storm."
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> "Similar scenes were enacted in the same neighborhood against the mother of Palmer Gallup who was never sued, and against Conrad Batcher and Son (north of the barn on property located at the junction of Routes 157 and 157A (3). Complaints were also made against Hanes, Gallup and others, they were arrested and treated in the most ruffianly and brutal manner. Their dwelling houses were broken into, in the night by armed men and they were handcuffed and refused either food or drink for the term of a whole day. One of the farmers, a most quiet man, Mr. Hiriam Hane assures me, was dragged from his dwelling house in the night time, only himself and old mother being home, handcuffed and kept in that condition without food or drink for ten hours and although he begged piteously for a glass of water it was refused him and it was not until he was lodged in police office that his burning thirst was relieved by a member of the police department."

Today a historical marker on Warner Lake Road, Route 157A(1), proclaims the fact that this was the scene of the anti-rent eviction described in the report of the Landholders Convention. Old Hellebergh records Elias Warner's first-hand description of the troubled period. "There were stirring times," said Mr. Warner. "The nights were made hideous by the Anti-renters riding by on horseback and blowing horns. Anyone who paid his rent was hated and they would cut the tails off the horses belonging to such people." This recalls Henry Christman's account, in the Acknowledgements section of *Tin Horns and Calico*, of an interview with William Quay, described as "the last of the Anti-Renters." Quay, who had been arrested in 1865 during Church's last foray into the Helderbergs, told Mr. Christman of "the Hell we raised on the mountain."

The summer of 1866 was the last time that troops were ordered out into the Helderbergs; the "heart of the anti-renters was broken." All opposition did not end, however, for a violent incident occurred as late as the early 1880's.

Old Hellebergh cites a report of the Albany County Supervisors for 1866, showing a bill for $1,295.52 for supplies for Col. Church and others to "subdue the late Unholy Anti-Rent War."

Mr. Gregg further states, "The days of the Calico Indian, tar and feathers, night riders and counch shells are gone. No more are court calendars crowded with land cases but if you buy property or accept a mortgage in the territory of old Rensselaerwyck, it is well to have a complete and thorough search."

## Churches

The early churches, which followed our pioneer forefathers into the wilderness, were powerful forces in the lives of those early settlers. The familiar, comforting rituals of religious services assumed an even greater importance for the men and women from the isolated farms and dwellings scattered among the hills.

The early churches also provided meeting places for secular, social gatherings. And out of those gatherings, whether held for worship, social pleasure, or the discussion of common problems, grew the associations and ties that bound the people of the upland wilderness into communities.

The Lutheran Church was the first to be organized in Knox. The first church (and schoolhouse), a building of approximately 20 feet square, was erected about 1750. It was moved to a new location and remodeled around 1810, and then, replaced by a new church in 1828-29. In 1839, the Reformed members withdrew and built a

separate church at Secor's farm, which they called the Second Berne Reformed Church. The Lutheran Church was more fully reorganized as Zion's Lutheran Church at Knox by the Rev. Adam Crounse. In 1850, a Lutheran Church building was erected at a cost of $1,200, and during 1868 and 1869 the parsonage was completed(2). From 1884 through the 1900s, the Lutheran Church was vigorous and active. The church burned in 1930 and was not rebuilt.

There were three Methodist Churches in Knox. Reverend William Brown, said to have been the first Methodist preacher, was a circuit rider who for many years rode the wilderness trails to Knox, Berne, Reidsville, Middleburgh and Schoharie, with his bible in his saddlebags. He was known throughout the hills by the affectionate nickname, "Old Saddlebags, the Circuit Rider."

Arthur Gregg, in *Old Hellebergh*, relates that Reverend Brown was summoned to the manor of the patroon, Stephen Van Rensselaer, to account for his failure to meet the payments of his rent. "Old Saddlebags" appeared before the expensively-dressed patroon clad in his homespun coat, leather breeches and high boots, and asserted that his delinquency was a consequence of his calling, which was to preach God's word to scattered groups of Christians who were themselves so poor that their contributions were insufficient for his rent.

The wealthy patroon could not believe that the uncouth bumpkin standing before him was in truth a preacher, and he seized upon the occasion to expose this rough-hewn tenant, and to also provide comic entertainment for his friends. Accordingly, he invited Reverend Brown to preach a sermon in the big two-steepled Dutch Church at Albany. But the man who had ridden the long miles of his circuit, carrying the Word to small congregations, was not so easily discomfited, and "Old Saddlebags" rose to the occasion. For the text of his sermon to the elegant congregation he chose Matthew 19:24: "It is easier for a camel to go through the needle's eye than for a rich man to enter into the kingdom of heaven." The patroon was deeply impressed and when the service had ended, approached the horseback preacher and said: "Tomorrow, we shall fix the deed - a valid deed - free from rent forever." The Reverend William Brown and his wife and child were buried in a tiny plot on a farm on Knox Cave Road(4).

The first Methodist Church, which stood about a mile east of the Hamlet of Knox, was torn down and replaced in 1851 by a new church in the Hamlet that stood until 1932(5). Another Methodist Church was built in Township(6); it was used by an Apostelic Church congregation from 1960-1963. During the years after 1850, the Methodist Church was a vital force in the affairs of the community. On November 20, 1884, the Knowersville Enterprise (the present Altamont Enterprise) reported a centennial meeting at the Methodist Episcopal Church.

For a period of time, beginning in 1917, the Methodist congregation formed a federation with the Dutch Reformed Church. In the absence of written records it is assumed that the community was unable to provide funds for the support of two congregations; however, each congregation is said to have maintained separate records and accounts. It has been reported that "insurmountable problems" beset the unusual federation, and that it survived at all was due in large measure to the resourcefulness and character of the first pastor, Alfred V. Patton.

Some of the older members never fully accepted the federation and when, on the night of January 5, 1932, the Methodist Church burned to the ground, "many members felt that this was an Act of God." The Methodist Church was never rebuilt and the Dutch Reformed Church, which is now the only church in the Hamlet of Knox, absorbed the remaining members. The old Methodist Church was located on the lot east of the Knox Museum(5).

According to Parker's *Landmarks of Albany County*, the Reformed Church of Knox had its origin in the Presbyterian Church which was organized in 1825. The New England settlers who came to Knox from Connecticut agitated for a Presbyterian Church and sporadic services were held until the first regular pastor, Rev. J. Judson Buck, was installed in 1825. The church was described as an unadorned wooden building which stood approximately 195 feet northeast of the present church.(7) Tenney and Howell state: "It was a plain wooden building of the uninviting kind, called God's barn." However, the membership dwindled, funds grew scarce, and the Dutch Reformed settlers in the village increased in number and influence. Reorganization under the Dutch Reformed persuasion was much discussed and finally, the 31 members of the original Presbyterian congregation were dismissed and the church was reorganized to form a new Dutch Reformed congregation. Incomplete records suggest that a "new" Reformed Church at Knox was built around 1850.

An 1890 issue of the Enterprise yields the following description from a letter of Emmet Willard. "The high pulpit looked down into square pews that were as high as an ordinary mans head, a veritable box or as they were called 'Sheep pens'." Probably the high "pens" were designed to block the icy drafts that swept through the church and to retain the meager warmth of portable heaters, either the pierced metal boxes which held hot coals, brought by affluent members, or the heated soapstones used by those of lesser means.

The Knox Reformed Church was moved to its present location(8) in 1902 by local people under the supervision of Edward Evans, an Albany contractor; hay jacks, rollers, and one team of horses were used. During the same year, contributions of money and lumber made it possible to raise the church hall.

## Schools

Specific knowledge concerning the early schools in the Town, and the teachers and pupils who went to them, is fragmentary. It seems probable that the children who could be spared from necessary chores were assembled in one of the homes of an area, where they were taught by transient teachers. When a schoolmaster left, doubtless the lessons were suspended until another arrived. Many of those early teachers were clergymen or farmers; some had only a little more education than their older students.

In 1789, the New York State legislature authorized that two lots in each township of the public state land be set apart for gospel and school purposes. The Common School Act of 1812 authorized the establishment of common, or public schools. In Amasa Parker's *Landmarks of Albany County*, it is reported that the Town of Berne (of which Knox was then a part) passed a resolution to raise $500 for the support of the common schools. Tenney and Howell's *History of the County of Albany*, cites a report that one of those pioneer schools was located in Knoxville (the present Hamlet of Knox), and another stood in the vicinity of Township.

The first buildings specifically erected for schools were crude structures of unpeeled logs, topped with a lean-to roof that was sealed against the weather with sheets of bark laid over pole rafters. The floor was packed dirt and the hard benches upon which the children sat were split 1ogs. A fieldstone fireplace stood at one end for warmth. Later, when the press of other work permitted, the dirt floor was covered with puncheons of white pine, and the bark roof was replaced with shakes.

The children in those schools ranged from six to sixteen years; they recited their lessons aloud and consequently the schools became known as "Blab Schools". Schoolmasters were paid by the parents according to the number of children they sent and the periods for which they sent them; payment consisted of whatever commodity the parents had on hand, such as deerskins, grain, or vegetables.

As the Town of Knox grew, so did the schools, and the log "Blab Schools" gave way to small frame buildings. In 1886, Knox had thirteen school districts, each of which elected its own trustee, clerk, and tax collector. The trustee was charged with the hiring of the teacher, supervision of the school, and providing for the supply and maintenance of the building and its equipment. By that time, the schools were supported by a local tax that varied according to the value of an individual's taxable property.

Teachers were then paid thirty dollars per month and for that sum they were required not only to teach a wide variety of subjects to pupils of various ages and abilities within a single room, but also to clean the room, and to build and maintain fires in the wood-burning stove.

Many senior citizens of Knox recall those one-room schools in rich detail: the drinking water supply, carried in a pail from the well of a neighboring house, and the common dipper that hung above the pail; the immovable desks with the attached seats, especially if those seats were anchored too close to the stove; the heat of the room in the late spring and the incessant droning of innumerable flies, which came in freely through the open, unscreened windows; when winter winds rocked the building and drove the snow against the windows, how cold it was for all except the envied few who sat within the narrow radius of the stove. Those who did sit by the stove remember how their flesh slowly roasted on the side nearest the stove, while on the opposite side they froze.

District No. 1 was located on what is now Rock Road. In 1932, the children were transferred to the Berne-Knox Central School and the schoolhouse was sold; it was subsequently converted to a dwelling.

The schoolhouse of District No. 2, located at the intersection of Route 146 and Witter Road, is presently owned by the Knox Volunteer Fire Company and used as the Township firehouse. An old, handwritten ledger, containing 100 years of school records (1849-1949), states that no funds were voted for the school in 1850, and in October 1851, it was voted to change the site of the school to its present location. According to the ledger, District No. 9 was consolidated with District No. 2 in 1866-67, and the combined district was designated as No. 2.

Among the interesting items in the ledger is the first mention, in 1913, of a teacher's retirement fund and an entry of $3.58 for that fund. The first individual drinking cups were furnished in 1925, and during that year it is noted that older children of the district were sent to Altamont High School. Electric lights were installed in 1935. The minutes of 1946 record a decision to petition the Commissioner of Education to dissolve District No. 2, and to transfer the district to the Berne-Knox Central School System. The schoolhouse remained empty until it was purchased by the Knox Fire Company.

District No. 3 was located at what is now the corner of Pleasant Valley Road and Taber Road. The district was annexed to the Berne-Knox Central School system in 1932; the schoolhouse was moved to Township and was converted to a private dwelling.

District No. 4 was located on Rt. 156. The district became a part of the Guilderland Central School system and the schoolhouse was used as a farm tenant house.

District No. 5, at Ketcham Lane and Boys Club Lane, in the Thompsons Lake area, became part of the Berne-Knox Central School system in 1951; for ten years, 1940-50, the children of the district were driven to the Altamont School. The schoolhouse was kept in its original state until 1971, when it was converted into a dwelling.

The schoolhouse of District No. 6 was located in the center of the Hamlet of Knox. It was owned by the Knox Volunteer Fire Company and used as their firehouse from 1950 until 1988, when the building was replaced. The district was centralized into the Berne-Knox School system in 1931, although the actual transfer was not accomplished until 1933.

The District No. 7 schoolhouse was located on the Knox-Gallupville Road; it is now used as a farm building.

The schoolhouse of District No. 8, located at the intersection of Beebee and Middle Roads, was torn down and rebuilt in 1910. It was subsequently converted into a dwelling.

District No. 9 was combined with District No. 2 in 1866 since, as reported by Tenney and Howell, "District No. 9 is a joint district most of which lies within the town of Wright, Schoharie County, only 2 children of school age living in the portion lying in Knox and the schoolhouse being located in Wright."

The schoolhouse of District No. 10 is located on the Bozenkill Road on a site probably donated to the district by the Snyder family. The Snyder School, as it was known, remains in its original condition except for the addition of double doors.

District No. 11 was located on the Knox-Delanson Road, near the intersection of West Wind Road. In 1930, high school students of the district were sent to Delanson Union Free School, now part of the Duanesburg Central School System. The school was bought and converted into a dwelling.

The school of District No. 12 was known as the Van Benschoten School because the site, located on Quay Road near the junction with Bell Road, was donated by John Van Benschoten. After the district was incorporated into the Berne-Knox School system, the schoolhouse was moved to the Altamont Fairgrounds as an example of the one-room school.

The building of District No. 13 was originally located on the old Zimmer farm but was moved to the Bradt farm to provide a more central location, where it still stands. In 1949 the school could no longer meet the expenses of a teacher's salary and bus transportation and the district was consolidated with the Berne-Knox system.

District No. 14 was taken into the Town of Wright school system and was known as the Shingle Town School. School No. 15 was located at West Berne.

The Berne-Knox School system was established in 1932, and had a junior high school; in 1933 it was expanded to include grades 9 through 12. It included all of the districts of Knox excepting 4, 10 and 14.

## Knoxville Academy

Knoxville Academy was organized under the general laws of the State of New York for the establishment of academies around 1820-30. It was incorporated by the New York State Legislature in 1837, and admitted by the Regents in 1842. It was one of the finest educational facilities in Albany County. Tenney and Howell report that it "once stood high among similar educational establishments." The Academy prepared its students for entrance to college, and also qualified them to enter teaching or to go into business. Students came to the Academy not only from Albany, Schenectady, and the surrounding areas, but also from abroad.

Ray Mowers, in the Albany Evening News of October 15, 1936, reported that " . . . in 1826 the Masonic brethren of the Helderbergs erected a temple in Knox hamlet which later became the celebrated Knox Academy." He also mentions that Knox had the oldest Masonic Chapter, and that after the temple became the Knoxville Academy, the chapter went to East Berne and then to Berne.

Eventually, following the establishment of the State Normal Schools, the Knoxville Academy went into a decline. For a time, an attempt was made to continue the Academy as a private school, but this did not succeed. The Academy was in session during the years 1840 through 1869. The building served as a public school for a number of years after the Academy closed down. Later it was converted into three separate apartments and today it is a one-family home(9).

## Early Industries

Farming was the earliest industry in the Helderbergs. Prospective settlers were given glowing reports of rich soils and optimum growing conditions; however, they often found rocky land with thin topsoil and a short growing season. Nonetheless, many farms were successful. In 1820, Malachi Whipple's farm was cited as the model farm in Albany County.

*The History of Albany County* by Tenney and Howell cite that sawmills were in operation before 1825 at various points along the small streams. On the Bozenkill, the Duane sawmill is said to have been in operation since 1795. Part of the foundation is clearly visible today(10).

Amos Crary, Hiriam Gage, Egbert Schoonmaker and Nathanial Swan were listed as operating mills before 1825. Swart and Saddlemire, Frederick Bassler and Bemsley Williamson were operating sawmills in the 1880s. Bassler's sawmill was located on the present Hillendale farm and its foundation can still be seen(11). Earl Sturgess, former Knox town historian, affirms that a sawmill built by Swan and Sturgess in the 1830s at Sturgess' Hollow(12) sawed pine lumber night and day when the water was high enough. Another sawmill, probably operated by Chesebro or Keenholts, sawed hardwood. Both of these foundations are still in evidence today.

According to Tenney and Howell, Alexander Crounse "erected a tannery on the main road through Knoxville(13) and for many years did a large business in the manufacture of harness and leather goods." Eugene G. A. Crounse, son of Alex Crounse, established improved machinery for the manufacture of horse feed and ran both the tannery and a grist mill. Emmett Willard, reminiscing in a letter to the editor in an 1898 issue of the Enterprise, states that "Alex Crounses' tannery located in the hollow brings both the smell of the tannery and all the wonders of the old mill." Tenney and Howell record that the changes in the hide and leather trade made tanning a less profitable business; town historian Sturgess states that when Johnstown began the manufacture of leather, it could be done much more cheaply, and subsequently Knox's tanning operation dwindled. The old tannery evidently was then turned into a grist mill. It is reported that the grist mill burned down in 1896 and again Knox farmers had to take their hand-flailed grain to the surrounding towns.

Gideon Taber was another tanner and harness manufacturer who also made shoes. He went to Canada during the American Revolution because of his Quaker beliefs, and upon his return, became an itinerant shoemaker. He prospered so well that he established a small tannery to make leather and manufacture shoes, saddles, and harnesses; he employed quite a number of men. This work was done on the Taber homestead(14).

The blacksmiths were located right in the Hamlet, one at the present site of the Stevens Gas Station(15), and the other next to the Knox Museum(16). Prentice Williams was a cabinet maker, and also did the undertaking business in the Hamlet of Knox in the early 1800's.

Knox had no waterpower of importance; consequently, agriculture was the biggest industry. One of the early products was hops. Earl Sturgess states that in "back of Charles Beebe's place there was once the largest hop farm in Albany County"(17). Another was the "old Lendrum Place" in the Bozenkill Hollow, now the Altamont Rod and Gun Club(18). The 1866 Map 0f the Town 0f Knox shows a hop house near West Road(19).

Hop growing required planning and work. Hop yards were laid out seven feet apart each way and carefully cultivated with special plows, cultivators and harrows. Men grubbed the hops in spring and women tied them to poles early in the summer. New plants were started from the runners of roots. The hop-picking day began at 7 a.m. and ended at dusk. Harvesting was begun in August and continued until the frost; only the flower was picked. Hop kilns, or hop houses, had steep roofs and a ventilator which turned with the wind to keep the hops dry.

Hops were picked, dried and baled here and presumably brought by wagon loads to breweries in Albany. The Altamont Enterprise cites in 1887 that the major yards belonging to George and Joseph Haverly yielded over 900 boxes of hops. Boxes were 3 feet by 9 feet and 24 inches deep and were partitioned to make four boxes. Pickers were given one of these large boxes, then filled the interior four, for which they were paid $.50 per box.

Hop picking bees are recalled by many older Knox residents. The Enterprise published these new items from Knox, September 5, 1885: "We will undoubtedly be well represented at the social hop jigs as many of our citizens excel in tripping the light fantastic toe". In 1886: "Villagers who have been away hop picking are returning laden with shekels and a determination never to go hop picking again." The hop industry declined with the advent of prohibition and never recovered.

Another early industry was the manufacture of butter and cheese. Tenney and Howell state that a cheese factory was built about 1/4 mile from Berne in 1878;

later, an 1886 issue of the Enterprise states that, "The Berne and Knox cheese factory have incorporated their organizations and are prepared to do business in a legal manner. The building was said to be 72 by 26 feet and had two floors; the lower floor contained a five horsepower boiler that heated the milk vats. Four hundred and ninety-five pounds of cheese were made in a day." Nearly every homestead in the early 1800s made their own butter and cheese. Many times it was used to buy other staples at the stores.

The pioneers raised wool and flax for the spinning and weaving of cloth; they raised grain to make flour and meal, again using these products to buy other items.

## Pill Box Manufacturing

The most important industry for Knox was the manufacture of wooden pill boxes. In 1806 Nathan Crary invented and organized this industry and for almost 100 years Knox and pill boxes were synonymous. Tenney and Howell state that "Many of the citizens of Knoxville and vicinity find employment in the industry."

Landmarks of Albany County declares "Nathan Crary began the manufacture of wooden pill boxes and supplied some of the largest pill makers in the country. At the present time John M. Quay and Sanford Quay are conducting the business". The late Millard Quay was a nephew of Sanford Quay and his wife, Loretta, reports that "Millard cut down numerous basswood trees, cut them up to make winding and stamp shavings for the many ladies to make into pill boxes. Sanford stamped the bottom and tops of the boxes by the keg-full and Millard cut winding shavings and got them ready to be made into boxes."

There were at least six factories in the Town, with many homes carrying on phases of pill box making. One factory, thought to be the first, is located in the back of the Little League baseball field in the Crary dwelling, which remains in its original state(20). Another factory was located at the old Chesebro place(21), and another on the Crary property(22). Several other homes were pillbox manufacturing sites(23, 24, 25).

Arthur Quay stated in an paper written for the Albany Institute of History and Art (and later featured in the Knox Sesquicentennial Booklet) that the "invention of machinery to turn out glass vials and tin boxes and the scarcity of basswood trees were the chief causes for the end of the industry".

## Cassidy's Castle

Cassidy's Castle was located in the Town of Knox on Old Stage Road(26) and was built, inhabited and deserted in the short span of 50 years. Edward A. Cassidy, an Albany architect, studied in France during the 1890s and there conceived the idea of building a castle on the highest part of his estate. He selected George Weaver as contractor, and bought an entire square mile of land to insure a plentiful supply of the Oriskany stone they planned to use. Once completed, Cassidy Castle with its Norman arch, glass-enclosed turret and ancient stone architecture became widely known.

A tourist hotel was erected on the side of the mountain to house the guests who came to see it and Saturday night game-cock matches. The estate also contained a quarter-mile enclosed racetrack which Cassidy used to break and train his colts.

Cassidy sold his estate to Harriet Christie of Camp Pinnacle, who in the 1940s transferred the castle and several acres to the Salvation Army of Albany to be converted into a Fresh Air Camp. The castle was eventually torn down.

## Caves in the Town of Knox

Tenney and Howell report that "a mile and a quarter north of Knoxville are two caves, supposed to be of considerable extent, which are objects of interest to many and about which cluster several picturesque but scarcely probable legends which have been handed down to present generations of residents through their ancestors, from the early settlers."

The Cockburn Map of 1787 designates a cave in the vicinity of Lot #47. David C. Palmer in Report #10 of the Northeast Regional Organization of the Speleologic Society states that Knox Cave has reputedly been known to explorers for over 200 years. A 1935 issue of the Schenectady Union Star asserts that the cave was known to white settlers and to Indian tribes before them. It states that remains of pine torches, covered by a thin coating of deposit, as well as arrowheads and fireholes, have been found; these were probably used by Indian explorers. *The Underground Empire* by Clay Perry, reports that in early Colonial times Dutch soldiers pursuing Indian marauders from Fort Orange (now Albany) 18 miles to the east discovered that the disappearing Americans were vanishing into this cave.

The rocks of Knox Cave were once part of the floor of the inland sea; crinoids, brachiopods, coral and fossils have been found in abundance. The cave was uncovered on the Burdell Truax property(27) in 1933 and was leased to D. C. Robinson of Esperance. After blasting cleared the entrance of debris, lights were

installed and stairs put in. Knox Cave was opened to the public for the first time and the Big Room, Dungeon, Indian passage, the first two fissure passages east of the entrance passage and the route leading to the Gun Barrel were exhibited. In the early 1930s the cave is reported to have gained such popularity that on some weekends up to 1000 people were reported to have been given the guided tour.

In 1935 Robinson began the construction of the Knox Roller Rink next to the cave, and in 1937, the rink opened for business, under the direction of Charles Zwetsch. For many years people came from a wide area to enjoy the huge roller skating rink and to dance on Saturday nights.

*The Underground Empire* states the experienced spelunkers found the interior of Knox Cave disappointing because they had been led to expect too much by the "somewhat imaginative descriptions" of the owner. However, "this cave has been left in a far more natural state and although well lighted and paved in rough places there has been no shifting of formations or buildings of rooms by man. The visitors enter on the second and third levels; there are six levels that have been traveled and more than nine parallel sets of passages."

After World War II, Mr. Robinson leased the cave to the Weber Brothers who replaced the deteriorating stairs and added handrails and other safety devices. The principal attraction at this time was the Rotunda Room, said to be "110 feet from floor to ceiling with calcite crystals and cave onyx, fossils and other interesting wonders".

In 1953 and 1954, Cliff Forman, Robert Kronsberg, and Warren Enck operated the cave and did an extensive clearing operation. Prior to this time all that was known was the section which extended to the "Broken Room"; in 1954 a large new area was discovered. The last attempt to commercialize the cave was in 1957-58, when guided tours were given. A wedding was held in the Big Room of Knox Cave in 1958, with 160 guests attending.

The cavern is still used by spelunkers; it is presently owned by the Northeastern Cave Conservancy. The Knox Volunteer Fire Co. has several times had to rescue unfortunate spelunkers who were trapped deep within the cave.

Another cave of interest is called the Wynd Cave, located past High Point Cemetery(28). Mr. Warner, former historian for Altamont, provides the information that the Wynd family originally lived by a crossroads tavern, known as Brumaghim Corners, near the Hamlet of Knox, but then moved to Thompsons Lake. Lewis Wynd stumbled onto the cave while hunting. He is said to have spent many weeks removing loose rocks and debris from the cave entrance, then building a cover with a slanting, hatchway door and padlocking it. His purpose was to attract the summer

boarders and "city folks" vacationing at Thompsons Lake, charging admission and thereby availing himself of much needed cash.

Wynd did not own this land nor did he receive permission for its use. His well-laid plans met with disaster when he expected on the Fourth of July to guide his patrons through the cave but instead found that the entrance shed had been smashed and the cave's mouth filled with loose rocks. He never rebuilt; legend relates that he then began to "dig for gold or else bury his treasure".

Lewis Wynd died at the age of forty-six but legendary exploits of the younger Wynds persisted. Their apparent lack of steady employment led to the belief that they were thieving. "It seems," states Mr. Warner, "that at intervals they were even reported to the sheriff who would muster a posse and chase them, but they always eluded capture and were supposed to hide and live in this cave atop of the plateau." The legend of the Wynd brothers and buried stolen goods remains a memento of the Wynd Cave. It is still a spot for spelunkers.

There are several other Town of Knox caves in the spelunkers' repertoire which should be included, even though they do not boast the sagas of either the Knox or Wynd Caves. There is the Knox Fossil Cave, or Becker Cave, off Becker Road, the Reservoir Cave, the World's End Sinkhole Cave, Pryzsiecki's Pit, Tenant Farm Cave, Tunnel Cave of Pleasant Valley Lane and Devil's Hole behind the Knox Cemetery.

## Tea Houses, Inns, Hotels

The earliest tea room or teahouse in the Town of Knox was "The Crossways". It was housed in "Ed" Barkley's store(29) and was operated by Helen and Margaret Ogden. It apparently did not operate for too many years. The earliest hotel seems to have been in existence before 1850 and is still in operation at the same site in Township(30); it is known as the Township Hotel and is presently operated by Barney and Harry Palumbo.

The present Foxenkill Lodge(31) was said to have been Allen's Tea Room in the years 1900 -1925. The Highland Farm Restaurant has only been in operation for about twenty years and was converted from an old farm house(32). The Wayside Tavern, located on Route 157, was also once a tea house(33); it is currently operated by Arthur Martin.

Merryman's Tea House(34), owned and operated by Lesley Brower, was opened in 1927 and closed on Labor Day, 1941; it was in a 175-year old home that once belonged to Merriman Nasholds. Merriman had fixed wagon wheels so a big wheel

was hung in a tree outside of the tea house. The Tea House was operated for five years without running water or electricity but still was well patronized. Albany, Schenectady and neighboring towns frequented this fine eating place.

World War II brought about a general shortage of gasoline, distant motoring became difficult, and Merryman's Tea House closed. The building has since burned and only the chimney remains standing.

## Knox at War

Many in Knox fought in the early wars. Capt. Benjamin Fowler, Lt. Henry Dennison, Capt. Elisha Williams, and James Dyer, orderly to General George Washington, served in the Revolutionary War and their graves are found at High Point Cemetery. Col. Asa Abbot whose grave is in a small plot located off the Knox-Gallupville Road(35) and Amos Torrey, Silas Blodgett, and John Saddlemire, all buried in the Knox Cemetery, also fought in this war. Landmarks of Albany County list six men from the Town of Knox as serving in the War of 1812. The Civil War found 77 volunteers from the Town of Knox; their names are recorded in Tenney and Howell's *History of Albany County*. World War I sent more of the Town's young men to fight, and in 1945 young men and women again went, as many also did in the wars that followed.

## Travel

Before plank roads and railroads, farmers were obliged to carry all their marketable produce to Albany in lumber wagons, traveling through deep sands for about half way. A letter to the editor in 1884 states that previous to the building of the plank road about 1850 he witnessed "long processions of wagons passing along the 'old Schoharie Road'. Many times not returning until two days afterward besides the time previously consumed and yet to be consumed."

An issue of the Enterprise in 1898 reminisced about the stage coach:

> "The mail coach toiled up and was whirled down the "Old Stage Road" each day. A bumping, rumbling old coach on leather springs with a huge boot behind full of trunks and drawn by four flying horses.
>
> "Delivered letters on foolscap carefully folded in together and sealed with a gob of sealing wax or many gay colored wafers and was carefully left unpaid.

"It was the only rapid transit to and over the Helderbergs.

"In winter when the countryside was rich in snow banks that filled the lanes from the top rail to the top rail of the staked fences."

In the 1920's, transportation to the city was provided by the Jitney bus, a gasoline-powered vehicle with open sides. Later, in the 1940's, Wade's bus service brought workers from Middleburg to Schenectady.

## Library

Tenney and Howell state that in 1824 Knox had a library of 400 volumes. "There long existed a library in this town that was modeled after the New England town libraries. It was helpful in forming the character of the people to habits of intellectual culture and good morals." Records of this library, which apparently was outstanding for those times, are missing; they may have been destroyed in a fire which burned the Knox Town Clerk's home in 1850.

In 1901, the Altamont Enterprise stated that a new club was formed in Knox to organize another library. It started with over 100 volumes and was located over the blacksmith shop(15); the library services have since been discontinued.

## Fires and Fire Protection

Fire protection was a long-standing problem in Knox. Early inhabitants of the Town were concerned with providing aid and helping fire victims to reestablish themselves; to this end, they organized the Knox Mutual Insurance Company in 1858 (the final dissolution of the Company occurred in the late 1930s due to dwindling membership and Westerlo took the remaining few members).

An 1893 issue of the Altamont Enterprise states that at 4 o'clock during the afternoon of August 25, the Academy bell tolled its warning and all the neighbors turned out to help as E.P. Barckley's farm, located in the Hamlet, was on fire. It was apparently caused by two small boys playing in the barn. Over 70 tons of hay, a quantity of rye, and 500 bushels of oats were destroyed. The article also states "had there been a high wind, the whole village would have been burned out".

In 1932, a fire that simultaneously destroyed the Methodist Episcopal Church and the barns of Mr. Austin Saddlemire Sr., clearly demonstrated the need for local fire protection. The fire started shortly after evening chores began on January 4, 1932, and spread rapidly. Residents who responded found the milkhouse and barn fully

involved; when the Berne Fire Company arrived, the water supply was found to be short, and additional fire companies were called from the surrounding areas. The headlines in the next day's afternoon edition of the Albany Times Union read, "$35,000 Fire Sweeps Village of Knox".

On July 28, 1936, the Town Boards of Berne and Knox met at the Schoolhouse located in the Hamlet to consider the annexation of certain properties of the Town of Knox to the Berne Fire District. At the meetings' end, the petitioners of the territories of School District Nos. 1 and 3 were granted their request to receive fire protection from the Berne Fire District. The area comprising School District No. 6 was struck from the petition.

Approximately two months later the residents of Knox initiated a movement to have a fire company of their own. They started with an amateur show, which realized a profit of $20 to be saved toward the purchase of a fire truck.

During the early 1940s, a committee was formed to discuss the possibilities of establishment of local fire protection. In 1945, a document was formulated to petition the taxpayers of the Town to form a fire district. Many residents signed immediately but some objected to the plans. After two years of canvassing the Town, the committee members finally persuaded a majority that the Town needed its own fire protection. Fifty-one percent of the assessed evaluation of the Town signed the agreement to establish a fire district. The petition was presented to the Knox Town Board for review in October, 1948.

On February 23, 1949, the Town Board held a public meeting to consider and take action on the proposed fire districting, but the meeting was adjourned without the Board reaching a decision.

The fire district as proposed would have the following boundaries: All that property in the Town of Knox, County of Albany, State of New York described as follows: Bounded on the North by the Town of Duanesburg, County of Schenectady; on the East by the Town of Guilder land County of Albany; on the South by the Berne Fire District as enlarged in 1936 and on the West by the Town of Wright, County of Schoharie.

The Town Board met again on April 23, 1949. They resolved and approved acceptance of the fire districting petition with the boundaries as stated above and allowed an estimated amount of $1500 to be spent for fire apparatus and fire hose. The volunteer firemen held their organizational meeting on November 1, 1948 and founded the Knox Volunteer Fire Company. There were forty men present. A Ladies Auxiliary to the newly organized Company was formed in 1949. On February 1, 1950, the Comptroller of the State of New York established the Knox Fire District

and in December, the first Board of Fire Commissioners was elected.

On May 5, 1950, the Fire Company purchased the one-room school building in the Hamlet of Knox from School District No. 6 for the said sum of one dollar. The interior was completely remodeled, with work being done by the firemen. Remodeling money was borrowed from various citizens of the Town who waived interest charges and set date of repayment. The remodeled fire house was dedicated on December 1, 1950 with a capacity crowd in attendance.

In the summer of 1951, the Fire Commissioners purchased the first piece of fire apparatus from the Scotia Fire Department for the sum of $595. The Fire Company incorporated and became known as the Knox Volunteer Fire Company, Inc. on August 19, 1953.

The Knox Volunteer Fire Company membership has provided not only fire protection for the residents of the Town but also vital services in emergencies, such as searches for lost persons, cave rescues, and recovery from floods, sleet and ice storms. The fire company even pumped water into the Altamont Reservoir from Thompsons Lake during a prolonged drought in 1956.

A large second addition to the firehouse was constructed by the membership in 1959. A telephone warning system for reporting fires was installed in 1964 by the Board of Fire Commissioners. In 1966, the School District No. 2 property at Township was repaired and converted into a firehouse; once again, the majority of the work was done by the firemen. A house numbering system was established in 1968, with the assistance of Niagara Mohawk Power Company.

In 1988, the old firehouse/schoolhouse was replaced with a larger building which had more facilities for community events.

## Town Government

The New England forefathers brought their traditional form of government to the Town of Knox. The town was the unit responsible for collecting taxes, holding elections, establishing and supervising schools, and maintaining highways. Early records of the Town of Knox, starting with its formation in 1850, were destroyed by fire; the first recorded bylaws appear in Tenney and Howell's *History of Albany County*. The first meeting was held at the home of Henry Barkley, located at the corner of Route 156 and Knox Cave Road(36). At that time Knox was divided into three assessment districts. Overseers of the poor were appointed and directed to report to the Town meetings thereafter the number of the poor to be maintained, the cost of their maintenance, and to estimate the cost for the ensuing year. Men could

pay their highway tax by working on the roads; this work is now done by men employed by Town and County.

Article 6 of the bylaws stated that "no horses shall go at large; no cattle, sheep or swine shall go at large and the penalty on them shall be, when found going at large and secured in any pen or yard or any premises, the owner or owners therof shall pay to the person or persons taking them up the following sum - For every stallion two years old, four dollars; for every cow, ox, steer, bull or calf, fifty cents; for every sheep, two cents per head; for every swine, six cents per head and for every boar two months old or older, two dollars." Half the money collected went to the person who "captured" the loose animals and the other half went to the poor. Stock could not be impounded for more than 48 hours, and owners of impounded animals had to be notified within 24 hours of the trespass.

Fence viewers were appointed by the Town to supervise the building and repair of the fences which enclosed the Town's "common property" fields. It was the duty of the fence viewer to see that every man worked for an equal length of time each year on these "pales", as the fences were called, or paid his share for the work of others. Fence viewers were also required to examine fences on private lands, noting breaks and ordering repairs where necessary. If cattle broke through a defective fence, causing damage, the fence owner had to stand the loss, but if cattle broke through a sound fence, the cattle owner would be required to pay. The bylaws stipulated that partition fences for lands, gardens, orchards, and meadows should be five feet high. Fence viewers were allotted seventy-five cents for each day of service.

Town offices, which were elective, consisted of Supervisor, Town Clerk, Justice of Peace, Collector, Assessor, Commissioners of Highways, Election Inspectors and Overseers of the Poor. Tenney and Howell's *History of Albany County* contains the civil list for 1851-1854.

The names of Knox's town officials are contained in the proceedings of the Board of Supervisors of Albany County for each year since its inception. A town hall was built in 1976 on a site directly behind the Knox Historical Society, on the former Saddlemire farm.

Planning efforts began in 1967 when the Town of Knox Natural Resource Inventory Committee, appointed by the Town Supervisor, published two reports: "Land Use Guide and Map for the Town of Knox", and "Water Resources Guide for the Town of Knox". In 1972, the Town Board appointed a Zoning Commission charged with the responsibility of developing a zoning ordinance. The first zoning ordinance was adopted by the Town Board on December 10, 1974. With the adoption of the zoning ordinance, the Town also created the Knox Zoning and Planning Boards. The Planning Board adopted subdivision regulations on July 2, 1979.

# SECTION 3

# PLANNING PROCESS

## 3.1 Definition

The comprehensive plan is the heart of the planning process. It identifies the goals, objectives, principles, guidelines, policies, standards, devices and instruments for the immediate and long range protection, enhancement, growth and development of the Town. It serves as the basis for land use regulation, infrastructure development, public and private investment and any future plans which may detail any of the topics herein.

The plan is general, comprehensive and long range. It is general in that it is broad in scope and deals with large land areas. It is comprehensive in that it takes into consideration the land use demands of present and future Town residents. It is long range in that it provides a framework for the protection, enhancement, growth and development of the Town for many years into the future.

## 3.2 Information Sources

The plan incorporates information from questionnaire surveys of Town residents and non-resident land owners, comments and recommendations from public meetings and background studies relating to the Town's vital and social statistics, geology, infrastructure, and natural resources. The draft Helderberg Escarpment Planning Guide prepared by the Helderberg Escarpment Planning Committee was a useful source of information. Also, and to the extent they were available, plans were reviewed for adjoining towns and, in particular, the hilltowns. Other information sources are listed in the Bibliography.

A questionnaire was distributed to residents in April 1974 to secure public comment prior to the preparation of the original Knox Zoning Ordinance. There were 221 responses to that survey; it is not known how many survey forms were distributed. In the 1974 survey, respondents were about equally divided on the questions of whether a comprehensive zoning ordinance was desirable (as opposed to one regulating basically the size of building lots), and whether or not all businesses should be located in one business district. Residents opposed by a factor of 2 to 1 the idea of permitting businesses to develop on a town wide basis without establishing business zones. When asked whether building lots should be 1, 2, 3, 4 or 5 acres, the largest number of respondents preferred 2 acres, while the average response was 3 acres. The average response coincided with area requirements for

water supply and sewage disposal imposed by geological environmental constraints. A zoning ordinance was adopted in December 1974 that specified 3 acre building lots. Although the zoning ordinance contained provisions for a business district, should one be needed in the future, it did not actually create a business district, but prohibited most businesses anywhere else.

During October 1990, a more comprehensive questionnaire was mailed to 900 Knox residents and non-resident land owners. The bulk of the mailing was to postal patrons by postal route and post office box; additional mailings were made to non-resident land owners based on tax records. According to Capital District Regional Planning Commission (CDRPC) data, there were 980 housing units in Knox in 1990, of which 47 were vacant and 42 were for occasional use (see Section 4.1.2) If that number accurately represents the number of households in the Town, the method of distribution used for the survey missed only a few households. About 40% (363) of the survey forms were completed and returned. The excellent response rate undoubtedly reflects the residents' interest in their community, but it was also enhanced by providing postage paid return envelopes, and by giving a free dinner for two (donated by Highland Farms Restaurant) to a resident selected at random from those who returned the survey. The survey was distributed with a tear-off raffle ticket so that the survey responses themselves remained anonymous.

The 1990 survey was divided into two major parts: the first part gathered data on the respondent's home, property and family; the second part asked for the respondent's opinion on a variety of planning and zoning issues. A portion of the survey was open-ended, asking what the respondent liked or disliked about Knox. Some of the data in the summary is useful in helping to judge whether the residents who responded (40% of the 900 surveys distributed) are representative of the total population of Knox. Knox has a total land area of about 27,000 acres, of which about 26,000 acres are privately owned; roads and public parks occupy about 1000 acres. The land owned by the respondents should therefore total about 10,400 acres (40% of 26,000). According to the survey, the respondents actually have a total of 10,011 acres (about 4% less than expected). So the sample seems representative with respect to land owned. Further, according to the 1990 census, the population of Knox was 2661; the 18+ population was 1892. The respondents should therefore represent 1064 people (40% of 2661), and 757 of age 18 or older. The survey shows that the total household population represented was 1058 (about 1% less than expected), 753 being over 18 (note, the 753 figure does not include 18 year olds). Again, the sample seems representative.

For the purpose of the survey, the Town was divided into nine sections: Northwest, North, Northeast, West, Central, East, Southwest, South and Southeast. The largest population is in the central section of Knox (29%), followed by the east (13%) and west (12%) sections. The central, east and west sections combined contain 54% of

the Town's population. Part of that trend is probably due to the greater land areas in those sections (combined, those sections contain about 46% of the total land area in the Town), but part is due to the fact that Routes 146 and 156, the primary east-west roads in Town, are predominantly in those sections. Respondents in the three southern sections have the greatest amount of land (41%), and the greatest average amount of land per person (SW - 48 acres/person; S - 38 acres/person; SE - 47 acres/person). In the east section the respondents have the least amount of land per person (average 10 acres/person), and a surprisingly small total amount of land (5% of the total land area reported), considering the fact that the acreage of the east section is about 16% of the total acreage in the Town. It appears that about 2/3 of the land in the east section is owned by individuals who are not represented in the survey. In other sections, the percent of the land area reported is roughly comparable to the percent of the acreage in the section. This anomaly deserves attention since it may mean that much of the land in the east section is likely to be developed. The west and southwest sections together contain over half of the income producing land in the Town (about 53%). Next is the southeast section with 15% and the north section with 11%. On average, 34% of the privately owned land in Knox is used to produce income. Another 10% is used for homes (assuming a 3 acre lot for each home). The remaining 56% of the private land may be at risk of being sold, unless it produces benefits for the landowner commensurate with the property tax.

The survey revealed interesting information relating to existing lot sizes. Only 28% of the homes in Knox are on lots of less than 3 acres; 18% are on lots of less than 1 acre. However, two-thirds of the mobile homes in the Town are on lots of less than 3 acres. Only 16% of the respondents have 50 acres or more.

The only strong trend noted in the well data is a tendency for newer wells to be deeper. It is not clear whether this trend represents a greater difficulty in obtaining water as more water is drawn from the aquifer, or a tendency for modern well-drillers using modern equipment to drill deeper wells. There seems to be a slight statistical trend for deeper wells to have poorer yields. The northeast section has the greatest average well depth and the lowest average yield. With the exception of the northwest section, where the average well flow rate is above the Town-wide average, there appears to be a tendency for well yields to be greater the closer the well is to the southeast corner of the Town. About l2% of the respondents have well yields greater than 10 gallons per minute. On the other hand, 12% of respondents had to drill a second well to get acceptable yields.

The average number of people per household in Knox was 2.9; in the nine sections the average varied from 2.6 to 3.3 with no obvious pattern. According to CDRPC publications, the 1990 population for Knox was 2661, and number of housing units in use year round was 891; based on that data, Knox should have had 3 people per

household (2661/891). Based on 1990 census data (see Section 4.1.2), there were 2.95 persons per household.

The average number of preschool children (under 6 years) per household is 0.25; the average number of people over 55 years is 0.48 persons. Except for the east and southwest sections, most sections of the Town did not vary greatly from these averages for preschool children and people over 55; the east section had the highest number of preschool (0.38) and the lowest number of over 55 persons (0.38), while the southwest section had the fewest preschool (0.14) and the largest number of people over 55 (0.75).

Of the working adults in the Town, 84% work in Albany County; another 10% work in Schenectady county. They commute an average of 19 miles each way to work. Only about 3% use mass transit, but about a third of commuters would use mass transit if it were more available. About 14% of the working population car pool.

The survey identified several differences between the current zoning ordinance and resident preferences. Current zoning prohibits bars, slaughter houses and used car sales anywhere in the Town; a strong majority of the respondents would permit such businesses with restrictions. On the other hand research labs with more than 50 employees and mining are currently allowed in most parts of the Town with a special use permit; most respondents would not allow either activity. Survey respondents strongly endorsed the zoning ordinance's prohibition of junk yards and motorcycle race tracks. A substantial majority of residents objected to row houses and condominiums, two forms of housing not mentioned in the zoning ordinance. However, senior citizen housing and affordable housing were acceptable to a large majority. In response to the question on minimum lot size for single family homes, respondents were permitted to choose any number they preferred. For the Residential Zone the answers ranged from less than one up to 20 acres; most answers were 5 acres or less; the average was 3 acres. For the Agricultural Zone the answers ranged from less than one up to 50 acres; most answers were 10 acres or less; the average was 5 acres. There was no apparent trend in either response based on the amount of land owned by the respondent. The average responses for the nine sections of Knox ranged from 3 to 4 acres for the Residential Zone, and from 4 to 7 acres for the Agricultural Zone (the south section had the 7 acre average). There appeared to be a very slight trend for residents of the Agricultural Zone to prefer larger lot sizes for both Agricultural Zone and Residential Zone building lots.

The survey gave a sense of resident priorities concerning preservation issues. The Town's water resource is the highest priority; 91% of respondents believe that groundwater preservation should be addressed in comprehensive planning; 90% believe that historic sites should be protected. The survey is consistent in showing that the protection of agriculture (87%) and farmland preservation (86%) are high

priorities; 85% believe that woodlands should be protected; 85% believe that scenic views should be protected; and 83% believe that wetlands should be protected. All are clearly high priorities for the respondents.

Concerning commercial development in Knox, fully two-thirds of respondents believe there should be a business district; slightly less than half are in favor of an industrial development district. However, when asked to select the best section of the Town for commercial development, 48% said that no place is suitable. When asked whether existing groups of businesses should be designated as business districts to permit their improvement, 82% of respondents approved of doing so for the area which includes the gas station, post office and general store; 66% were in favor of the area which includes the town garage and the Township Tavern, and 57% were in favor of the area which includes Highland Farms Restaurant and the Mountain Woodshop. There were no apparent trends by section of the Town except, respondents in the central section (where two of three suggested business districts are located) and residents of the east section (where the third suggested district is located) seemed to favor the idea of a business district less than most other sections of the Town. This suggests that the idea should be explored with the residents who would be most directly affected by the creation of the suggested business districts.

Since the formation of the initial Master Plan Committee in 1989, there have been numerous public meetings to discuss Town planning issues. One such public meeting was held on January 24, 1991 to discuss the results of the resident survey. There was some comment questioning the validity of the well yield data; for example, if the survey had been conducted during a drought, the results may have been different. It was suggested that the water supply was poorest in the Knox Hamlet area. Discussion at this and other public meetings and analysis of the resident survey suggests that a supplemental resident survey would be desirable. The purpose of the supplemental survey would be to poll residents of the Hamlet area, Township and the area around Highland Farms Restaurant about creating business districts around existing groups of businesses. The most overwhelming resident priority is the preservation of the natural beauty, resources and rural character of the Town. It is noteworthy that the survey revealed that 69% of the respondents intend to spend the rest of their lives in the Town.

Another important source of information in the planning process are the background studies on the Town's population, housing, economics, schools, budget, groundwater, surface waters, soil, farmland, geology, utilities, transportation, parks, historical buildings, vegetation, wildlife and scenic vistas. These are discussed in Section 4.

# SECTION 4

# BACKGROUND STUDIES

## 4.1 Vital and Social Statistics

To know where we come from is important in determining where we are going. This statement is true for every area of concern in the Knox comprehensive plan. Nowhere, however, is it more important than where we address the history and future of the people of Knox. It is after all, the sociological impact that is the focused concern of all of the comprehensive plan studies.

The statistics contained in the subsequent portions of this section contain information from a variety of research methods by agencies outside the Town. As it is appreciated that these statistics offer us an excellent understanding of our current standing in all of the subsequent topics of this report, we have come to understand, through our research, that future predictions are not an exact science.

### 4.1.1 Population

A good understanding of population trends is evident after first taking a look at the broad picture. Graph 4.1-1 charts the population change in New York State since 1940. After a steady growth in the periods between 1940-1950, 1950-1960 and 1960-1970, a population decline of 4% took place between 1970 and 1980. Since 1980 the population increase has been less than 1%.

Graph 4.1-2 indicates a similar trend with the population of Albany County. A period of no-growth, between 1970-1980, and a declination of 1% between 1980-1990 are in close relationship to changes in state population.

It is when we look at the local level that we witness a contrary movement. Graph 4.1-3 charts the population changes in the Town of Knox. Looking as far back as the period between 1940-1950 indicates a much greater increase than the State or County trend. Graph 4.1-4 further displays this difference by superimposing the percentage changes of all three surveys. This information enlightens us to population growth change comparisons. Regardless of the reasons for the local population increases, the trend is obvious and the facts are clear. Graph 4.1-5 compares the population growth of Knox with the adjacent towns of Berne and Westerlo. A near parallel percentage advancement (Graph 4.1-6) defines a rapid population increase in these three rural towns in Albany County.

Graph 4.1-1

Graph 4.1-2

Graph 4.1-3

Graph 4.1-4

Graph 4.1-5

Graph 4.1-6

This information was obtained from reports of the New York State Department of Economic Development Data Center, Albany County Planning Board, and the U.S. Census.

### 4.1.2 Housing

According to the 1990 Census, there are 980 housing units in the Town of Knox. Table 4.1-1 is a breakdown of these units into unit types. Table 4.1-2 indicates the breakdown of these same units into occupancy status.

Table 4.1-1
Housing Unit Types

| Unit Type | Number of Units | Percentage of Total |
|---|---|---|
| Single Units | 809 | 82.7% |
| Single Unit Attached | 5 | .5 |
| Double Units | 26 | 2.6 |
| 3-4 Unit Dwellings | 10 | 1.0 |
| Mobile Homes | 122 | 12.4 |
| Other | 8 | .8 |
| Total | 980 | 100.0% |

Table 4.1-2
Occupancy Status

| Status | Number of Units | Percentage of Total |
|---|---|---|
| Owner Occupied | 808 | 82.4% |
| Renter Occupied | 83 | 8.5 |
| Occasional Use | 42 | 4.3 |
| *Vacant | 47 | 4.8 |
| Total | 980 | 100.0% |

- Units for rent, sale, rented or sold but unoccupied, and others at the time of the census.

Housing in the Town of Knox is greatly affected by the change in the average number of persons per housing unit as well as household trends.

The average number of persons per housing unit has gradually decreased from 3.78 in 1960 to 2.95 in 1990. Pointing out the population statistics from Section 4.1.1, an increase in population together with a decrease in the number of persons per unit obviously leads to an increase in housing units.

Table 4.1-3 indicates the household types within the Town.

Table 4.1-3
Household Types

| Household Type | Number of Households | |
|---|---|---|
| Family Households | | |
| Married Couples | 615 | 69.0% |
| Male- no Wife | 32 | 3.6 |
| Female- no Husband | 73 | 8.2 |
| Non Family Households (Singles) | | |
| Male | 106 | 11.9 |
| Female | 65 | 7.3 |
| Total Surveyed | 891 | 100.0% |

The total number of single-parent households has increased since the 1970 Census and represents 11.8% of the households within the Town. This type of household trend can be seen as impacting the average persons-per-housing unit by providing a general decrease and division of married-couple families into smaller family units.

Housing development within the Town, in general, has occurred through individual single-unit construction. Building and zoning regulations provide for development based on a three-acre minimum lot size. The availability of an adequate water supply, sewage disposal and infrastructure has a major impact on housing development . (Please refer to Section 4.3, Geology.)

Multi-lot subdivision development to date has been minimal. The most recent development of this type can be seen in the Kendal Estates subdivision off Knox Cave Road South. This subdivision provides for eight single-family houses to be built on a cul-de-sac soon to be adopted by the Town as a Town road.

### 4.1.3 Economics

The agricultural job opportunities, that at one time were the base of the main local employment scene, for the most part are history. Today, of the working labor force of 1365 in Knox, 1293 individuals or 94.7% work outside of the Town. According to the 1990 Census, only 72 residents work within the Town, 54 of them within their homes. Table 4.1-4 indicates the occupational areas of the Knox labor force.

Table 4.1-4
Labor Occupations Town of Knox (1990 Census)

| | |
|---|---|
| Agriculture, Forestry, and Fisheries | 41 |
| Construction | 160 |
| Manufacturing | 119 |
| Transportation | 29 |
| Communication and Other Utilities | 42 |
| Wholesale Trade | 118 |
| Retail Trade | 146 |
| Finance, Insurance and Real Estate | 86 |
| Services- Repair, Entertainment, Health, Educational, etc. | 461 |
| Public Administration | 179 |

The median income for all households in the Town is $36,736. This has increased by 116% over the past 10 years and represents the greatest increase in Albany County. While this factor might give an immediate feeling of general economic improvement, it is important to understand the income category shifting that has taken place. For example; according to the 1980 Census, only 0.5% of families in the Town had an income of $75,000 or more. In 1990, 7.5% of families have an annual income between $75,000 to $125,000. This category alone, based on a relatively low-base population, has a significant impact on median statistics.

Graph 4.1.-7 plots the number of households in various income groups for the calendar year 1989.

Poverty -- According to the 1990 Census, of the total population of 2661, Knox has 265 residents below the poverty level. This represents approximately 10% of the population.

### 4.1.4 Schools

Primary and secondary age students in the Town of Knox attend schools in five different districts and several private schools. These districts are shown on the Infrastructure Map in Appendix B. Small groups of students near the perimeter of the Town attend schools in the Duanesburg, Guilderland, Schoharie and Voorheesville Central School Districts. It is important to note that the geographic boundaries of the Town do not correspond with school district boundaries. This not only affects the placement of students into various districts, but is also a delineation of school district funding from real property taxes within the Town. This is noteworthy in regard to zoning applications.

The majority of students in Knox attend the Berne-Knox-Westerlo School District. BKW, as with many rural schools, is in a position of increasing enrollment, increasing state mandates and diminishing state funding. Because of this, it is more difficult to provide a quality primary and secondary education program and facility for the Hilltown community. In April, 1994, voters passed a bond referendum in support of an addition to the Berne-based school facility. Construction on the new wing will begin in the summer of 1995 and will work to alleviate overcrowded classroom conditions.

The interaction of development in a town with public education is a challenge for most communities. As schools attempt to keep up with enrollment growth, a communications component in the municipal planning process that addresses education would be advantageous to this degree. Table 4.1-5 indicates the enrollment history and projections for the Berne-Knox-Westerlo School District.

Graph 4.1-7

Table 4.1-5

BERNE KNOX WESTERLO SCHOOL DISTRICT

ENROLLMENT HISTORY AND PROJECTION

| Year | TOTAL K-6 | TOTAL 7-12 | TOTAL K-12 |
|---|---|---|---|
| 87-88 | 629 | 510 | 1139 |
| 88-89 | 658 | 478 | 1136 |
| 89-90 | 685 | 466 | 1151 |
| 90-91 | 720 | 472 | 1192 |
| 91-92 | 726 | 510 | 1236 |
| 92-93 | 767 | 512 | 1279 |
| 93-94 | 745 | 521 | 1266 |
| 94-95 | 758 | 535 | 1293 |
| 95-96 | 754 | 564 | 1318 |
| 96-97 | 744 | 595 | 1339 |
| 97-98 | 739 | 614 | 1353 |
| 98-99 | 731 | 644 | 1375 |
| 99-00 | 733 | 660 | 1393 |
| 00-01 | 751 | 650 | 1401 |
| 01-02 | 751 | 644 | 1395 |
| 02-03 | 751 | 633 | 1384 |
| 03-04 | 751 | 630 | 1381 |

One of the more interesting statistics pointed out in Section 4.1.3 addresses the increase in the mean income level in Knox. The transformation of Knox from a rural agricultural community to a predominately bedroom and self-employed community is most likely the reason for this shift. These changes are also reflected in the public education sector. Table 4.1-6 shows the post graduation trends as they are evolving at the Berne-Knox-Westerlo School District.

Table 4.1-6

27 YEAR STUDY OF GRADUATING CLASS

| | POST HIGH SCHOOL EDUCATION | AVE. SAT SCORES | 2 YEAR COLLEGE | 4 YEAR COLLEGE |
|---|---|---|---|---|
| 1993 | 72.0% | 944 | 46.0% | 21.0% |
| 1992 | 66.0 | 926 | 30.0 | 30.0 |
| 1991 | 75.0 | 850 | 65.0 | 10.0 |
| 1990 | 61.0 | 917 | 43.0 | 13.0 |
| 1989 | 61.0 | 996 | 34.0 | 27.0 |
| 1988 | 65.0 | 969 | 44.0 | 21.0 |
| 1987 | 71.0 | 990 | 45.0 | 26.0 |
| 1986 | 53.6 | 945 | 33.3 | 20.0 |
| 1985 | 43.9 | 883 | 32.9 | 11.0 |
| 1984 | 36.0 | 914 | 20.3 | 15.1 |
| 1983 | 47.4 | 917 | 25.6 | 19.2 |
| 1982 | 48.75 | 876 | 35.0 | 12.5 |
| 1981 | 43.28 | 864 | 26.92 | 13.46 |
| 1980 | 39.79 | 939 | 25.51 | 12.24 |
| 1979 | 36.17 | NA | 18.8 | 12.77 |
| 1978 | 46.7 | NA | 25.0 | 17.39 |
| 1977 | 38.6 | NA | 20.46 | 14.77 |
| 1976 | 35.3 | NA | 15.7 | 16.7 |
| 1975 | 40.0 | NA | 24.0 | 12.0 |
| 1974 | 39.3 | NA | 23.8 | 14.3 |
| 1973 | 36.6 | NA | 24.4 | 8.9 |
| 1972 | 35.0 | NA | 22.9 | 8.1 |
| 1971 | 55.6 | NA | 30.6 | 18.4 |
| 1970 | 53.1 | NA | 31.0 | 17.1 |
| 1969 | 52.3 | NA | 22.6 | 20.7 |
| 1968 | 37.6 | NA | 11.0 | 22.6 |
| 1967 | 46.4 | NA | 14.5 | 29.1 |

This chart shows that since 1967 there has been a significant increase in students choosing to further their education. It is also interesting to note that the percentage of students attending a 2-year college has gone up while the percentage for 4-year college has gone down since 1967.

### 4.1.5 Budget

Comparisons of the Knox Town expenditures and revenues provide some very interesting information as they pertain to the ever changing fiscal responsibilities and shifting revenue sources. This information is of particular interest when applied to the population and economic information provided earlier. Table 4.1-7 breaks down the 1980, 1985, 1990 and 1994 municipal budget expenditures into various categories.

Table 4.1-7
TOWN OF KNOX EXPENDITURE SUMMARIES FOR 1980-1994

| CATEGORY | 1980 | 1985 | 1990 | 1994 |
|---|---|---|---|---|
| General Government | $49,100 | $77,170 | $199,688 | $141,417 |
| Public Safety | 2,620 | 3,165 | 3,020 | 3,960 |
| Culture & Recreation | 5,075 | 14,845 | 17,365 | 18,110 |
| Home & Community Service | 9,050 | 62,730 | 12,600 | 12,318 |
| Transportation | 15,400 | 31,975 | 61,185 | 80,578 |
| Undistributed | 20,850 | 26,200 | 15,500 | 21,200 |
| Sanitation | - | - | 49,000 | 92,700 |
| | | | | |
| Highway | | | | |
| Repair and Improvements | 61,000 | 100,000 | 125,000 | 144,000 |
| Bridges | 2,000 | 3,000 | 3,000 | 3,000 |
| Machinery & Debt | 42,200 | 80,000 | 60,000 | 74,000 |
| Improvements | 16,000 | 30,000 | 35,000 | 160,000 |
| Employee Benefits | 15,900 | 80,702 | 61,800 | 70,800 |
| Snow Removal | 63,000 | 116,500 | 142,000 | 142,000 |
| | | | | |
| Total | $302,195 | $626,277 | $785,158 | $964,083 |

It is evident by examining the items under both General and Highway that the greatest responsibility on the Town budget is the Highway Fund. The general Town budget expenditures have increased by approximately $268,188 between 1980 and 1994. The Highway Fund has increased by $291,605 within that same time period. The most recent significant burden to the budget is the sanitation category, which pays for our transfer station/recycle center operation.

Table 4.1-8 represents a summary of revenues for the same years as above. Because of the constant fluctuation in revenue categories, the last column summarizes the overall funding change as a percentage comparing the 1980 and 1994 budgets.

Table 4.1-8
TOWN OF KNOX REVENUE SUMMARIES FOR 1980-1994

| CATEGORY | 1980 | 1985 | 1990 | 1994 | 14 YR. CHANGE |
|---|---|---|---|---|---|
| Federal Revenue Sharing | $15,000 | $ 22,223 | $ - | $ - | 100.0% |
| State Aid | 22,407 | 50,001 | 58,175 | 28,175 | 25.7 |
| Mortgage Tax | 4,000 | 15,000 | 10,000 | 15,000 | 375.0 |
| Sales Tax | 70,000 | 152,000 | 308,000 | 466,000 | 665.7 |
| Local Revenues | 6,000 | 16,265 | 20,055 | 14,070 | - |
| Revenue Totals | 117,407 | 241,989 | 368,230 | 523,245 | 445.7 |
| Property Tax | 91,718 | 67,900 | 102,794 | 138,098 | 50.5 |
| Combined Revenues | 209,125 | 309,889 | 499,024 | 661,343 | 316.2 |

We can surmise that the main revenue component to the Town budget is sales tax. This revenue has been constantly increasing while funding from other sources has been less predictable. In 1992, the Albany County Legislature adopted an additional 1% Albany County Sales Tax; in part, this was to aid in offsetting the decline in State and Federal funding to local municipalities. Federal Revenue Sharing funds peaked around 1985 for the Town and, as is evident, disappeared completely in the 1990 budget. State Aid, although increases are noted from 1980 through 1990, is also on the decline with funding in the 1994 budget not significantly higher than in 1980.

The combined revenue totals have increased significantly since 1980. The average annual property tax increase from 1980 to 1994 is 3.6%. This compares favorably to the non-property tax revenue increase averaging approximately 31.8% annually in that same time period. This is a good representation of the Town's reliance on revenue sources other than local property taxes.

The average annual property tax increase figure is even more interesting when viewed in a per-capita perspective. Based on the population totals in Graph 4.1-3, the population grew from 2471 in 1980 to 2661 in 1990. The property tax revenues were $91,718 and $102,794 respectively. The per-capita breakdown is $37.11 per person in 1980 and $38.62 in 1990 in terms of taxation responsibility. This is representative of a 4% increase over the ten year period, or .4% annually.

## 4.2 Infrastructure

### 4.2.1 Utilities

#### Domestic Water Supply

There are currently no public water systems in the Town of Knox. Water is supplied by a variety of systems on an individual basis including: deep wells, shallow or dug wells, well points, springs and ponds. Water supply systems for new structures and new systems being installed for existing buildings must comply with State and County Health Department standards. A new residence in the County of Albany must have a deep well, no closer than 100 feet from any part of a septic system, with a minimum yield of five gallons per minute, and must be tested for purity prior to acceptance by the County Health Department. Refer to Section 4.3.4 of this Plan for discussion of water resources in the Town of Knox.

#### Sewage Disposal

There are currently no public sewer systems in the Town of Knox. Sewage is disposed of by a variety of different systems but generally include a septic tank for primary treatment with effluent draining to either a leaching pit or tile field. All new buildings are required to comply with State design standards and must be inspected during installation by the County Health Department. Many older systems were installed prior to the establishment of standards and were inadequately designed and/or installed. Existing systems are not generally inspected for adequate operation, although the County Health Department will make on-site inspections if requested or if complaints are received.

#### Solid Waste Disposal

The Town of Knox currently operates a state of the art waste transfer station, located on Street Road in Township. At an Association of Towns meeting, the New York State Department of Environmental Conservation referred to this transfer station as a model facility for rural towns. The station consists of a series of collection bins into which residents deposit separated recyclable and non-recyclable material. The State of New York has established a formula for the success of recycling within municipalities called the "diversion rate". The diversion rate is equal to the amount of material recycled divided by the total material collected. In 1992, the diversion rate for Knox was 23.5 percent and in 1993, it was 24.14

percent. The State's objective is 50 percent. The Town's percentage appears disproportionately low because composting is not included in the computation of its diversion rate; composting comprises a large proportion of the State's diversion rate.

The transfer station is currently open 15 hours per week including, Tuesday and Thursday 4-7 pm and Saturday 8 am to 5 pm. The Town employs two people to attend and operate the transfer station. Additionally, time is spent by highway department workers loading and delivering glass and plastic during the week.

Components of the transfer station include:

Solid Waste Disposal: Non-recycled material, other than construction debris, is deposited through a hopper to a compaction chamber and into a transfer trailer. Bulky waste such as mattresses and furniture are deposed into an open container. There are currently no provisions for the disposal of construction debris. The volume of solid waste collected per week is 20 to 25 tons. The solid waste collected in the transfer containers are delivered to the Rapp Road Landfill where it is shredded and landfilled. The landfill is owned by the City of Albany and operated by Energy Answers. Until recently, much of the shredded material was used as fuel for the Sheridan Avenue incinerator, the energy from which was used to heat the Empire State Plaza. Plans are underway to construct an incinerator in Green Island, which may be the future destination of the Knox waste.

Burn Bin: This wire cage enclosure is sixteen feet by twenty feet and is used to burn brush and clean wood. Material is generally burned twice per week, weather permitting.

Hazardous Waste: The Town currently participates in a countywide household hazardous waste collection program which occurs twice each year; one Saturday in June and one in September.

Recycling: Recyclable items are voluntarily presorted and deposed in various designated bins at the transfer station. These materials are then sold or given to different recycling companies. These materials include:

Glass; *Brown - 2.4 tons per year.
*Green - 4.1 tons per year.
Clear - 22.92 tons per year.
Glass is delivered to Carco.
Tin; 13.6 tons per year, taken by Kruger Recycling.
Aluminum; 1,120 pounds per year, taken by Freedman.

Plastic; 4.4 tons per year.
Newspaper; 67.85 tons per year, taken by Kruger Recycling.
*Batteries; 580 pounds per year, taken by Mercury Refining.
*Tires; 500 per year, taken by Mohawk Tire Recycling.
*Cardboard; 16.39 tons per year, taken by Kruger Recycling.
*Indicates items which the Town currently has to pay to have removed and recycled.

### Electrical Service

The entire Town is located in the electric service territory of the Niagara Mohawk Power Corporation. There are no significant constraints to delivery of electric service to any areas of the town. A lighting district does exist in the Hamlet.

### Natural Gas Service

There is currently no natural gas distribution service within the Town. The nearest areas with natural gas service are the Villages of Altamont and Voorheesville. There are, however, two separate major natural gas transmission lines traversing the Town of Knox and are owned by Iroquois Gas Transmission System and Tennessee Gas Pipeline Company. Future service may be considered from one of these sources. The routes of these pipelines are shown on the Town Infrastructure Map in Appendix B.

### Other Utilities

Cable services, wireless cable, local regional telephone services (NYNEX) and all major long distance telephone services are available within the Town.

## 4.2.2 Transportation

### Highways

There are 90.61 centerline miles of public roads in the Town of Knox including: 19.13 miles of State roads, 35.26 miles of County roads and 36.22 miles of Town roads.

Major transportation routes within the Town of Knox include State routes 146, 156, 157, 157A and 443. The two most traveled routes are 146 and 156. Both routes

extend to the east and north for commuters to Albany and Schenectady through Altamont. Route 146 extends westwardly across the western border of the Town into Schoharie County. Route 156 extends southwestwardly across the Town to the Hamlet of Berne. The primary north-south route through the Town is County Route 252 (Knox Cave Road), extending from Warner Lake northwardly to Schenectady County.

While the Town of Knox remains distinctively rural in character, it is also conveniently located within commuting distance of the Cities of Albany (approximately 40 minutes to downtown) and Schenectady (approximately 30 minutes to downtown). The northwest corner of Town is near Interstate I-88 which connects to the New York State Thruway to the east and extends southwest to Oneonta, Binghamton, and the State's southern tier. The eastward routes through Altamont also connect to the major intersection of the New York State Thruway and the Northway in Albany with direct connections to large urban centers via these interstates, including Buffalo, Montreal, Boston and New York. State Route 443, a small section of which extends through the Town of Knox at its southwest corner, provides access through Berne to south Albany and additional entrances to the New York State Thruway.

A network of secondary local roads provide access to the majority of land within the Town. These roads are owned and maintained by both the Town and the County. All County roads are paved while the Town roads consist of a combination of paved and unpaved roads.

## Town Highway Department

The Town of Knox Highway Department is located on Route 146 in Township. The Highway Department employs a staff of eight highway and maintenance personnel, including one superintendent, two equipment operators, four truck driver/laborers and one laborer. Equipment owned by the Town is maintained in-house including such major work as engine and transmission overhauls.

The function of the Highway Department is to improve and maintain the system of Town roads. This includes improvement of road base, increasing sight distances, removal of obstructions and hazards from rights of way, maintaining drainage, snow removal and salting.

### Public Transportation

There is no passenger railroad nor commuter rail service within the Town, but there is a major Amtrak station in both Schenectady and Rensselaer with connections to all major American cities. A portion of the Delaware and Hudson railroad bed, which is in the process of being abandoned, extends across the northeast corner of the Town. The right-of-way is potential access to Land Conservation District 1.

There are several alternatives for the residents of Knox to utilize bus service provided by the Capitol District Transit Authority (CDTA) including:

the #95 Berne-Knox, a weekly Wednesday route providing service with several stops in Berne, Knox and Altamont with destinations including 20-Mall, Crossgates Mall, Stuyvesant Plaza, Colonie Center and downtown Albany. Service includes one route to Albany in the morning and one returning in the afternoon.

the #21X, a daily commuter route originating in Altamont and terminating in Downtown Albany. There is one morning bus and two afternoon returns.
the #13, a daily commuter route originating in Voorheesville and terminating in downtown Albany. There are two morning buses and two afternoon returns.

### Airports

There are no public airports in the Town of Knox. Personal and private airports are a permitted use contingent upon securing a special use permit from the Town Zoning Board of Appeals.

Major regional airports include the Schenectady County Airport in Glenville and the Albany Airport in Colonie. The Albany Airport is the largest regional facility, hosting several major commercial airlines.

## 4.2.3 Parks

Within the Town of Knox there is an abundance of both publicly and privately owned open land as well as designated park areas for active recreation and field sports. Public lands and parks include State and Town but not County.

## State Lands and Parks

The Knox State Wildlife Management Area is located near the center of the Town and consists of two parcels of land totaling approximately 260 acres. The larger parcel (149 acres) is located between State Route 156 and Pleasant Valley Road. The other parcel is located east of Pleasant Valley Road. These lands are open to the public for a variety of activities including hiking, cross-country skiing and hunting.

There are portions of two State parks in the Town of Knox including most of Thompson's Lake Campground State Park (125 acres) and a small portion of the north end of John Boyd Thacher State Park.

Thompson's Lake Campground State Park provides public access to a lake 60 feet deep, covering 128 acres. There are 140 campsites open from May 1 through Columbus Day. Recreational activities available include boating (carry in only), fishing, a bathing beach, volleyball courts, horseshoe pits, a play area for children and an interpreted nature trail. There are also evening programs in the summer. Winter activities include ice fishing and cross-country skiing.

John Boyd Thacher State Park encompasses 1,900 acres of land along the Helderberg escarpment, of which 38 acres are located in the southeast corner of the Town of Knox. Summer activities include: a large swimming pool; outdoor courts for paddle tennis, handball, basketball and volleyball; baseball diamonds; two play areas for young children; numerous hiking trails; refreshment stands; and dozens of picnic areas, many with pavilions. Cross-country skiing trails are also available in the winter.

### Town Park

The Town of Knox owns a park consisting of 70 acres located behind Town Hall in the Hamlet of Knox. The property has been acquired in three separate purchases beginning in 1963. The latest purchase extended the park on the northern edge along Street Road.

The park offers various recreational opportunities including: a children's playground, a large pavilion, tennis courts (2), basketball court (2), baseball diamond (Little League), and a one mile nature walk.

### Other Protected Areas

Limestone Rise Preserve is located in the northwest portion of the Town in an area along Route 146, at the intersection of Nash Road. It is owned and managed by the Nature Conservancy, a private organization. The preserve consists of approximately sixty acres of open field and mature and young wooded areas. It is located at the west end of the Helderberg escarpment. The preserve contains unique geological, botanical and ecological features. Some of these features include: wetlands, sink holes, surface cracks, fossils and rare plants such as Ginseng (Panax Quinquefolius, on the Federal list of endangered species), Hooker's orchid, and walking fern. The purpose of the Preserve is to protect the Ginseng and other features from human intervention. It is intended to be used for education, scientific study and passive recreation. Trails have been established for the purpose of public access to the site.

Other protected areas include the Altamont Reservoir and the Northeast Cave Conservancy program at Knox Cave (9 acres).

## 4.2.4 Cultural and Scenic Resources

### 4.2.4.1 Historic Buildings

There is a great wealth of historic buildings within the Town of Knox, dating from as far back as the late 18th century. Most of the extant structures within the Town, however, date from the 19th century. The greatest period of prosperity and development within the Town, as evidenced in the architecture, was the first half of the 19th century. The predominant styles of American architecture from this period include the earlier Federal Style and the later Greek Revival Style. Most of the early buildings in the Town contain elements of these styles. Very few Victorian buildings from the late 19th century exist within the Town. This lack of late 19th

century development is due in large part to the westward expansion of the continent, with farmers seeking more fertile farmland than could be found in the Helderbergs.

Knox has always been a relatively poor rural farming community because of its inaccessibility to markets and poor soil. Consequently, few "high style" buildings were constructed at any period. There are, however, numerous extant historic buildings of sound construction built by skilled craftsmen in the established styles of the period (generally ensuring good proportioning). These buildings include farmhouses, barns and other out buildings, churches, factories and shops. They tend to be simple in form with little ornamentation yet were highly functional and well sited.

Thirteen buildings in Knox have been recognized as historically important due to the roles they played in the cultural development of the Town. There are, however many other structures which have not been recognized that are also significant both for their architectural quality and for their association to historical personages or events. Furthermore, there is historical significance to the collective association of historic buildings, widely dispersed over the landscape, regardless of their individual architectural character. These buildings contribute to the character of the nineteenth century rural landscape, not unlike the importance of historic districts in urban settings where the overall context is more important than individual buildings. This is especially important in Knox because of the heretofore minimal development having occurred since the mid 19th century, leaving the historic rural character largely undisturbed.

Buildings that have been recognized as important historic buildings include:

H1. Methodist Church, 1851 - Frame building located in East Township, the second Methodist Church in Knox. Presently not in use.

H2. Township Hotel, c. 1850 - Two story frame building located in East Township. Still in operation as a bar.

H3. House, c. 1840 - Two story frame house located in West Township.

H4. Lee's Church, c. 1860 - Two and a half story frame building, located on Rt. 252 near West Wind Road. Used as a single family home since the 1920's.

H5. West Wind Farm, c. 1860 - Large house built and still owned by the Gage family, and located on West Wind Road. Part of the Underground Railway during the Civil War.

H6. Stone House, late 1700's - Located on the Bozenkill Road, two story single family home, constructed with stones from the nearby creek by a Mr. Lewis.

H7. Store and Post Office, c. 1840 - Located in the Hamlet of Knox, two story frame building, still used for post office.

H8. Blacksmith Shop, 1830 - Two story frame building with an outside stairway, located in the Hamlet of Knox. Presently used as a gas station.

H9. Dutch Reformed Church, early 1800's - Frame building with later additions, located on Rt. 156 in the Hamlet of Knox. Formerly a federation of Methodist and Dutch Reform Churches. Contains a chandelier given by Queen Anne of England to the First Reformed Church of Albany, which in turn gave it to the Knox Church.

H10. Knox Historical Museum, late 1800's - Two story frame farm house, later used for Museum. Located in the Hamlet, Rt. 156.

H11. Pill Box Factory, early 1800's - One of approximately six identified, a one story frame building off Rt. 156 in the Hamlet of Knox. Originally owned by Nathan Crary, who organized the pill box industry in 1806. The pill boxes were formed from basswood shavings; this was a thriving business which operated for almost 100 years. The introduction of glass vials, tin boxes and the scarcity of basswood trees were the primary causes of the industry's decline.

H12. Knoxville Academy, 1826 - A two story frame building built by the Masonic Order, located on Rt. 156 in the Hamlet of Knox. It served as a preparatory school for college entrance from 1840 through 1860, and later as a public school. It was remodeled in the 1960's and is now used as a one-family home.

H13. Christian Zandt House, c. 1790 - A two story brick house still owned by a descendant, this house features a beehive oven. It is located on Rt. 156, about two miles south of the Hamlet.

Please refer to the Cultural and Scenic Resources Map and Appendix C for specific locations of historic buildings and cemeteries.

The locations of the cemeteries are as follows:

A. Knox Cemetery - East of Knox on Route 156.

B. Old Knox Cemetery - Route 156 across from Knox Firehouse.

C. High Point Cemetery - Corner of Route 156 and Old Stage Road.

D. Lee's Church Cemetery - Knox Cave Road, two miles north of Route 146.

The locations of family cemeteries are:

1. Saddlemire Road, first hedge-row on left side.

2. North side of Middle Road., .2 mile east of Beebe Road.

3. Nash Road, .2 mile north of Route 146, on west side of the road beside Nature Conservancy.

4. Van Auken burial site, on east side of Knox Cave Road.

5. Stan William's Farm, on east side of Knox Cave Road.

6. White Road, behind White farm house.

7. Bozenkill Road, on the north bank between Pulliam's home and the Van Buren farm.

8. Quay Road, southeast of the Helderberg Rod & Gun Club.

9. Corner of Quay and Bell Roads, across from the pond.

10. Knox Cave Road, on the Feldman property, west of West Wind Road.

11. Route 156, across from Witter Road.

12. Pleasant Valley Road, on State Property (Old Bardkley Farm) off Route 156.

13. Route 156, west of the Altamont Reservoir (across from the dam bridge).

14. Zimmer Road, Schoonmaker burial site, southeast of Crounse Road.

15. At the end of Gibb's Road, off Knox Cave Road.

16. Church Road, near the Town line.

17. Quay Road, on right side one mile north of Route 146.

18. Ketcham Road, near Ketcham's farm on old Brunk farm (site destroyed).

19. Church Road, on the Lewis farm, on the north knoll near junction of Beebe Road.

20. Colliton Road, one mile off Bozenkill Road on Ostrander farm.

21. South side of Bozenkill Road, on Peterson farm (old Snyder farm).

22. Bozenkill Road, .5 mile west of West Wind Road (old Williamson farm).

23. Craven Road, on Price property (old Quackenbush farm).

24. Knox-Gallupville Road, 1.5 miles from village on Whipple property (site destroyed).

25. Knox Cave Road, .7 mile north of Lee's Church (old Burman's farm).

26. Lewis Road, Strand property (old Keenholts and Lewis farms).

27. North side of Bozenkill Road, 300 ft. east of D & H Railroad.

28. South side of Route 146, Dees' property (old Lawyer farm).

29. North side of Middle Road, 400 ft. east of Knox Cave Road.

### 4.2.4.2 Scenic Resources

Scenic areas, scenic vistas and scenic corridors are defined on the basis of guidelines set up by the Adirondack Park Agency and other towns. One need not travel far to see the beauty in Knox. It is hoped that through the efforts of conservation and comprehensive planning these natural surroundings will remain to be shared by many. The beauty of the scenery in this area is too exhaustive to reduce to a listing; however, several particularly noteworthy examples are described below under the categories of scenic areas, scenic vistas and scenic corridors.

A scenic area is an area that is generally undeveloped and provides a natural habitat for wildlife and plants. These areas are enjoyed by walking along or driving on a road. Scenic vistas are seen generally from a point and afford the onlooker with a panoramic view of an expansive area. Scenic corridors are areas of unspoiled and undeveloped nature. Most corridors are channel-like views and are exemplified in country roads. The serenity felt and the pure beauty seen offer the onlooker a chance to view nature close at hand.

## An Overview of Scenic Resources in Knox

ROUTE 156 FROM WITTER ROAD TO THE EASTERN TOWN LINE - This entire drive is along the face of the escarpment, but in an area where the escarpment is divided into two or three separate lifts. It includes views of the highest point on the Helderberg escarpment, referred to locally as High Point, the feature which is prominent in the view of the escarpment from the City of Albany. Route 156 is one of the main routes taken by visitors to Thacher Park. On the way up the hill, the dominant experience is viewing sections of the escarpment up-close, and viewing the escarpment "on edge," including distant views of the steep slopes above Witter Road (Knox Land Conservation District #2, and other land). On the way down the hill, there are still impressive views of the escarpment, but the dominant experience is the panoramic views of the Capital District and the mountains beyond. The view from the area around the junction of Witter Road and Route 156 is most impressive.

HIGH POINT OVERLOOKS - There are several overlook points above Altamont that are just as enjoyable as the Thacher Park overlooks, but they lie on private land. Nonetheless, the overlooks are used by the public, but not with the frequency of the overlooks at Thacher Park.

BOZENKILL VALLEY - The Bozenkill has some breath-taking scenery including steep slopes, sheer rock faces and high water falls. This area is designated as the Knox Conservation District #1.

ROUTE 146 FROM QUAY TO BELL ROADS - This section of road gives a view of Knox Conservation District #2 from below. This is one of the last views of a steep section of the escarpment as one travels west: just a few miles to the west is Limestone Rise, owned by the Nature Conservancy, where the relief is gentle enough to permit roads directly up the hill.

WEST WIND ROAD - Here the road goes directly down a gentle section of the escarpment. To the east of the road is a steep ravine; to the west is an interesting old ornate farm.

THOMPSON'S LAKE CAMPSITE AREA - This is a beautiful bowl-shaped area perched on top of the Helderberg Escarpment to the west of Thacher Park.

ROADS IN THE TOWN - The hilly terrain in Knox provides a series of interesting panoramic views of farmland and hamlets as one drives around the Town. Witter Road is a particularly good example.

## Scenic Vistas

V1. View from Route 156, from Witter Road to John Kolanchick home overlooking Albany, Schenectady and Northern areas.

V2. View from Route 156 from crest of hill to Town line overlooking northeastern areas including Albany, Schenectady and Saratoga.

V3. View from Beebe Road looking south overlooking the hills of Knox and the Town of Berne to the Catskills.

V4. View from Middle Road, near Town line looking west toward Schoharie County.

V5. View from Wukits Lane is actually 360 degrees, however, it overlooks the Hamlet of Knox to the south.

V6. View from Knox Cave Road looking southwest towards the Town of Berne.

V7. View from Middle Road at the hilltop above the Knox Cave Road intersection looking east toward Altamont and beyond.

V8. View from Pleasant Valley Road looking west toward Schoharie County.

V9. View from Ketcham Road looking south toward the Town of Berne.

V10. View from Ryan Road overlooking the City of Albany and regions to the east.

V11. View from Becker Road overlooking the Town of Berne.

V12. View from Line Road looking west over Schoharie County and beyond, a quarter-mile from Knox-Gallupville Road.

V13. View from Line Road one-fifth of a mile above Seabury Road looking west.

V14. View overseeing Village of Berne.

V15. View overlooking Village of Berne and hills to the west.

V16. View from Knox Cave Road, looking north toward Schenectady County.

V17. View from southern end of Seabury Road, overlooking valley to the south.

## Scenic Areas

A1. Bozenkill Falls, west on Bozenkill Road past Bell Road on the right side of bridge.

A2. When descending the hill on Old Stage Road, the view of the rocky cliffs on the right or east.

## Scenic Corridors

C1. Street Road from Knox-Gallupville Road starting at the bottom of hill to Saddlemire Road.

C2. Turner Road starting at Tabor Road extending to Town line.

C3. Old Stage Road one mile from Route 156 starting at the bottom of a very twisting uphill course and ending at the top of the hill.

C4. Love Joy Road through to private property.

C5. View between the hills looking toward the Town of Berne.

C6. View overlooking Pleasant Valley and Town of Berne.

C7. A very charming rustic area - Line Road.

C8. Bozie Hollow Road - starting at the top of the hill and joining the Bozenkill Ravine at the bottom.

Please refer to the Cultural and Scenic Resources Map in Appendix C for specific locations of scenic vistas, areas and corridors.

## 4.3 Geology

### 4.3.1 Background

The Town of Knox is situated in the northwest corner of Albany County on the Helderberg Plateau, overlooking the Hudson River Valley. The majority of the Town lies between 900 and 1400 feet above mean sea level, although a low of 500 feet is found in the Bozenkill Valley along the northeastern border of the Town and a high of over 1500 feet is found on the hills to either side of Route 157A.

The hills and valleys found within Knox have been sculpted through the action of both streams and glaciers. The streams within Knox have carved their way down through the Helderberg Plateau. They have been influenced by the underlying bedrock and glacial landforms. The Bozenkill is an example of a stream which has been influenced by the bedrock, because it follows a bed of easily erodable shale rather than cutting across more resistant layers. Glacial landforms, such as drumlins, which are low, smoothly rounded, elongate hills composed of glacial till, help determine the path of the smaller tributaries of the Town's major streams. Glacial till is simply rock particles of greatly varying size which are deposited directly from the melting ice of glaciers.

As the branch of the glacier which covered Albany County advanced across the Helderberg Plateau during the Wisconsin glaciation, it travelled through the Town of Knox roughly along an axis running from Dunnsville to West Berne. Ice to the right and left of the axis flowed away in broad sweeping arcs such that it spread from east to west in the northwestern region of the Town and north to south in the southeastern region. Because drumlins are oriented in the direction of ice flow, many tributaries are also oriented in these directions. As the glacial margins were receding northward, roughly 14,700 years ago, large quantities of glacial till were deposited across the Town of Knox. Since the glacier rarely transported material more than five miles, much of the Town's soils were formed in till derived from local shales, sandstones, and limestones.

### 4.3.2 Soils

The Soil Conservation Service of the United States Department of Agriculture in cooperation with the Cornell University Agricultural Experiment Station conducted a soil survey of Albany County in 1983, revising the initial survey published in 1942.

A general soil map for the Town of Knox in Appendix F shows the areal extent of the Town's major soils. More detailed, larger scale maps showing the locations of all soils within the Town are given in Appendix G. Table 4.3-1 gives the relative abundances of all soil types found within the Town. This was compiled by examining the large scale soil maps and noting the number of each soil type, not taking into account areal extent.

A detailed description of the Town's minor soils can be found on pages 17-107 of the Soil Survey of Albany County. A general description of the Town's major soils (the Nunda-Burdett and Farmington-Wassaic soil complexes) is given below.

The Nunda-Burdett soils are very deep, generally found in areas where the bedrock is at depths greater than 5 feet. The Nunda soils typically occur along the sides and tops of ridges. They are moderately well drained, and have permeabilities which are moderate in the surface and subsurface layers and slow or very slow in the subsoil and substratum. The seasonal high water table is at a depth of 18 to 24 inches for very brief periods in the spring. In contrast, the Burdett soils are typically found on the flat and lower parts of hillsides and ridges. They are somewhat poorly drained, and have permeabilities which are moderate in the surface and subsurface layers and slow in the subsoil and substratum. The seasonal high water table is at a depth of 6 to 18 inches from November to May. In general, these soils are suited for crops, hay, and pasture on dairy farms, and are considered good soils for use as wildlife habitat and woodlands. The seasonal high water table and the permeability of these soils limit the use of these soils for community development.

The Farmington-Wassaic soils are derived mainly from limestones, and are found on broad, undulating landscapes. The Farmington soils are shallow, with a depth to bedrock of 10 to 20 inches. They are well drained to moderately well drained, and have moderate permeability. The Wassaic soils are moderately deep, with a depth to bedrock of 20 to 40 inches. They are moderately well drained, and have permeabilities which are moderate in the surface layer and slow or very slow in the subsoil. These soils are suited for crops, hay, and pasture land in most areas, but their potential for use as recreation areas and wildlife habitat is good only in some areas. The shallow and moderate depth bedrock, rock outcrops, and creviced limestone limit their use for community development.

Appendix H rates the suitability of all soils found within the Town as prime farmland, for constructing dwellings with basements, and for installing septic tank absorption fields. It also lists the depth to bedrock, the hardness of bedrock, and the depth of the high water table. Each of these uses and soil parameters are explained below.

Table 4.3-1

Prime farmland is defined by the U.S. Department of Agriculture as land which is best suited for food, feed, forage, fiber, and oilseed crops. It produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment. The suitability of soils for constructing dwellings with basements or installing septic tank absorption fields are considered: *slight,* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate,* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; or *severe,* if the soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance costs are required. Dwellings refer to structures which are built on shallow foundations over undisturbed soil, and have a load limit which is not greater than that of a three story single family house. A septic tank absorption field is an area where effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only soil between the depths of 24 to 72 inches was evaluated. Depth to bedrock was measured up to a depth of 60 inches. If the bedrock was less than 60 inches deep it was rated as either soft or hard. Soft bedrock may be excavated using trenching machines, backhoes, or small rippers, while hard bedrock may require blasting or special equipment. The high water table is the highest level a zone saturated with water reaches during the course of most years.

### 4.3.3 Surface Water

The Town of Knox lies along the drainage divide of two major rivers: the Hudson River and the Mohawk River. Water in the northern and eastern sections of Town flows to the Hudson River, while water in the southern and western regions flows into the Mohawk River. The Lower Hudson River Drainage Basin comprises a total area of about 1,860 square miles, of which 22.5 square miles are within the Town of Knox. Similarly, 18.1 square miles of the Mohawk River Drainage Basin's approximate 3,456 square miles lie within the Town of Knox.

The individual streams and lakes within the Town of Knox have been numbered in accordance with a system devised by the New York State Department of Environmental Conservation, which is used in its biological survey reports on the State's watersheds. In this system each stream is numbered consecutively, proceeding upstream from the mouth of the primary river. All reservoirs, ponds, and lakes are designated by the letter "P" followed by a separate consecutive number as encountered within the tributary systems. For example, the Bozenkill is labeled H-221-4-P270-1. The "H" stands for the primary stream (the Hudson River), the "221" stands for the 221st tributary from the mouth of the Hudson River (Island Creek), the "4" stands for the fourth tributary of Island Creek (Normanskill), "P270" is the 270th pond or other surface water body found along the

Normanskill (the Watervliet Reservoir), and the "1" represents the first tributary of the Watervliet Reservoir, the Bozenkill.

Surface waters are an important resource. Depending upon the quality of the water, rural surface waters are a source of drinking water and can be used for recreational uses such as swimming and fishing. Surface waters are classified in accordance with their best usage, which relates to the highest level of quality.

Surface waters are assigned the classification of AA, A, B, C, or D. The best usage of Class AA and A surface waters is as a source of water supply for drinking, culinary or food processing purposes. Class AA surface waters may require disinfection; whereas Class A may require even more extensive treatment such as coagulation, sedimentation, and filtration. The best usage of Class B surface waters is primary contact recreation such as swimming, diving, or water-skiing. Class C waters are suitable for fishing, and Class C(T) will support trout. Class D waters are suitable for secondary contact recreation such as boating. Quality standards for each class of surface water are set forth in New York State regulations (6NYCRR Part 701). The classification of Town surface waters are given in Table 4.3-2.

Shallow shale waters are waters that exist in shales 150 feet or less beneath the ground. The most influential surface feature on shallow shale waters in the Hamlet would be the tributary known as Mill Pond Creek and the adjacent low area in the middle of Knox Cemetery. These surface water features remain saturated year round. Wells to the south and west of the cemetery may be somewhat affected by these features. Downstream from Knox Cave Road, this tributary may influence wells on the southern side of Route 156. Currently, however, it is considered a poor source and would only influence those wells where the main feed is known to come from a depth of less than 25 feet. The tributary that flows between Route 156 and Street Road fills a large wetland area northwest of the Hamlet. This wetland is a recharge zone for the New Scotland shaly limestone (a shale) and therefore should be valued as a major contributor to shallow shale waters. The upstream section of this creek provides some additional saturation.

Table 4.3-2

The remaining surface waters are perched water holdings. Perched holdings are small wetlands or ponds situated atop a rock layer, and many examples can be found in the numerous small ponds scattered throughout the Town. Wetlands are discussed further in Section 4.4.3. A good example of a perched water holding can be seen on the short plateau area about a quarter of a mile south of the Hamlet. This short plateau, roughly half a mile wide and running northeast to southwest, provides an excellent shale insurgence area due to its topographic position. The dipping rock strata keeps water nestled against the rising Onondaga limestone to the south. This surface water feature, which is perched above the Hamlet, influences wells along the southern ridge. It's influence on the Hamlet's water supply is hampered by the distance and change in geologic strata between it and the Hamlet.

### 4.3.4 Groundwater

The Town of Knox is underlain with bedrock consisting of layers of limestone, sandstone, and shale, all of which slope slightly to the southwest. Although they are solid, water is generally able to seep or flow (as the case may be with limestone) into the rock layer. If the rock layer yields water when tapped by a well, it is termed an aquifer. Each type of bedrock transmits and handles water differently.

The water yields described in this section represent averages. Topographic features vary from area to area and significantly influence individual well yields. There are five types of bedrock in the Town: Schenectady Formation, Helderberg Group, Tristates Group, Onondaga Limestone and Lower Marine Facies. These are shown on the Agricultural and Geological Resource Map in Appendix E.

The Schenectady Formation comprises virtually all of the bedrock in the northern hall of the Town. It is medium to dark gray, brown, weathering thin to thick bedded sandstones and subgraywackes interbedded with gray-black, silty shales. It is a very poor aquifer, with reported yields of less than three gallons per minute. Dry wells are common; water quality is generally poor; and hydrogen sulfide is often present.

The Helderberg Group is an east-west band of bedrock that comprises approximately one third of the bedrock in the southern hall of the Town. Within this group is found Becroft Limestone (light to medium gray to pinkish, coarsely crystalline massively bedded fossiliferous limestone), New Scotland Formation (medium to dark gray, fine grained, shaley, fossiliferous limestones and interbedded dark-gray, calcerous mudstones), Kalkberg Formation (bluish-gray, fine grained, argillaceous, thin to medium bedded siliceous, fossiliferous limestones, with seams of shale and beds/lenses of chert in lower portions), Coeymans Formation (light, coarsely crystalline, massively bedded, fossiliferous limestone), Manilius Limestone (dark-gray, fine-grained, interbedded

ribbon-thin to medium-bedded limestones and massive, bistromal limestones), and Roundout Formation (olive-gray, fine-grained dolostone, with occasional interbedded shales, rarely exposed). The reported yields in the Helderberg Group averages three to four gallons per minute and the water is hard.

The Tristates Group is an east-west band of bedrock that comprises approximately one third of the bedrock in the southern hall of the Town. Within this group is found Schoharie Formation (dark bluish-gray, laminated calcerous mudstones and siltstones and agrillaceous limestone), Esopus Shale (dark gray to black, sandy shales, which weather readily to a dark brown gravel), and Oriskany Sandstone (calcareous to quartzose sandstone). The Esopus Shale can be a good aquifer having yields averaging twenty gallons per minute. The water from this aquifer is very soft.

The Onondaga Limestone is an east-west band of bedrock that comprises approximately one third of the bedrock in the southern hall of the Town. It is light to dark bluish gray, massively bedded limestone containing beds and lenses of chert. It is a moderate to poor aquifer with an average yield of three gallons per minute. Water is restricted to joints and open solution cavities and, therefore, yields can be expected to vary widely. Water from this aquifer is hard.

The Lower Marine Facies is a relatively small pocket of bedrock adjacent to the southern Town boundary. It is part of the Hamilton Group and consists of gray, thin to thick bedded quartzose siltstones with interbedded dark gray to green shales. It is a moderate aquifer with average yields of eight gallons per minute. The water quality in this aquifer ranges from good to poor and may contain hydrogen sulfide.

Limestone can be dissolved by acids from decaying plant matter or rainwater to form passages through which water can travel. Caves are limestone passages that can literally pipe water from one place to another. There are several caves in the Town which can be entered, such as Knox Cave or Skull Cave. However, there also undoubtedly exist many more caves which cannot be entered, yet are large enough to transport water. Caves, or karst water systems, can be broken down into three general zones: insurgences, conduits, and resurgences.

Insurgences are the areas where surface water enters the ground, recharging the aquifer. Recharge in limestone occurs in surface features such as sinkholes or pits and below ground in joints or fractures. When the aquifer is recharged from surface features it is funneled directly into the karst water system, undergoing little or no treatment by soil layers.

The conduit portion is the network of passages which make up the cave itself. The water table in a karst system exists solely within these dissolved cracks and passages, making it very uneven and irregular. Although it is often assumed that the water passes through

a single passage, this is not always the case. For example, in backed-up areas (where water cannot flow out of the ground freely) thousands of small cracks in the limestone are dissolved, expanding the cave outward. These highly saturated areas can provide a high-yield well source, if your well happens to pass through it. One well may hit the saturated zone and provide 20 gallons of water per minute, where a well drilled two feet away may be completely dry because it didn't make contact with any water-bearing fractures or passages. Another, more important problem is that these limestone aquifers are very susceptible to what goes on at the insurgence areas. For instance, if water stops flowing into the ground the water table may drop several feet or more. Wells tapping these aquifers may go completely dry during seasons of little or no surface water flow. In addition, water quality in such wells is very susceptible to changes that occur on the surface. Muddy water entering through an insurgence will very likely cause the water drawn from a well in the saturated zone to be murky. The fact that what occurs above ground can so easily and rapidly affect the water below ground, is what makes wells drawing water from a limestone aquifer so vulnerable and unpredictable.

The resurgence zone is where the water comes back out of the ground, usually as a spring. In some cases springs can be quite obvious, providing a resurgence of hundreds of gallons of water per minute. In others, it may simply be a constantly saturated area of ground.

Between the layers of limestone that lie under the town are layers of shale. Shale is generally darker in color and softer than limestone. A surface exposure of shale will provide sharp and sometimes jagged edges. This is because shale cannot be dissolved in the same manner as limestone. Although shale can be eroded by physical elements, such as water and frost, it will not provide curved, smooth edges and a buffed appearance as does limestone.

Because shale cannot dissolve, it will not form water passing conduits in the same way as limestone. Although these shales are fractured and have cracks in them, the cracks are so small that they have little influence on ground waters. In general, shale conducts water very slowly. Under conditions of constant saturation, water will enter shale bedding much in the same way as it would a piece of submerged wood. Through the smaller than hairline "bedding planes" of the rock, water will enter at an almost undetectable rate.

The insurgence areas of shale bedding are not very obvious. They take the form of standing surface water areas. Wetlands, bogs and some ponds are to be considered as inputs if they are located over shale. It takes a large wetland area to recharge a water table in shale. The entering of this water into the bedding is, in fact, often slower than the rate of evaporation from that same surface water feature.

Wells drilled into saturated shale beds recharge slowly. The flow from the rock into the well opening is often so slow that it is advisable to drill to the base of the entire shale unit in order to increase surface area for recharge. Usually only by drilling through the entire shale unit can enough water be extracted to supply a household. Unlike the direct link to a handful of surface features as in the limestone systems, shale water tables are often unaffected by surface flow fluctuations. The purity of the water from shales is also more consistent. Turbid water created by a rain storm will not affect the quality of water supplied to a shale well.

The resurgence of shale waters is usually as subtle as its insurgence. Sometimes dribbling springs can be found coming out of a shale cliff. More than likely a shale resurgence will take the form of a damp area of rock which evaporates water faster than it is supplied. In many cases there will be no detectable resurgence.

The best topographic feature for ground water insurgence is a plain or valley of substantial size perched higher than the extraction zone. Ideally this surface feature would be in contact with a rock capable of uniformly introducing it, such as the shale beds in our area. Most wells can trace their source from a surface feature higher than or equal in elevation to them. Using the Hamlet of Knox as an example, the best insurgence area topographically is the high plateau region northeast of the Hamlet, between Route 156 and Street Road east of Knox Cave Road. It is the only flat area updip from the Hamlet capable of a substantial influence on ground water. Because the geologic strata are dipping southwest, this area could have had a more positive affect on ground water. Water will flow easiest downdip, and in this case, it would head for the Hamlet. Geologically speaking, however, the rock that is present in this insurgence area is limestone; and instead of providing a uniform downdip insurgence into a shale bed, the waters are drained away in limestone conduits. The lands further north and east of this area are on the other side of the surface water divide. Sloping towards the plateau above Altamont, runoff in this area feeds a ground water system unassociated with the relatively shallow wells (250 feet or less) of the Hamlet. The topography also dictates where surface waters flow, and hence, determines how much water runs towards a certain area.

The plateau area above Altamont, and north and east of the Hamlet, provides several good insurgence areas for shale waters of the Normanskill and Schenectady shales. To the residents of that area, these insurgences provide water to a shallow shale water system from which they extract ground water. Because these shales are dipping southwest, these waters also form a ground water table beneath the Hamlet area. This water table lies several hundred feet beneath the Hamlet (300 feet and deeper). Because of the great distance from these insurgences and the slow conductive properties of the shale beds, it takes a great deal of time for waters to reach the Hamlet area. Water extracted from this type of system could have been in the ground for hundreds of years. This is why they are termed "ancient shale waters." The very deep wells in our area are extracting from this type of water supply. As with shallow shale systems, ancient shale water systems are more reliable, but are very slow to recharge. It is advisable to drill well below the water contacted level in order to provide adequate surface area in the casement for recharge, as well as reservoir. The water quality from these deep wells is also unpredictable. Because of the distance it covers and the amount of time it spends in the ground, ancient shale waters are prone to mineral absorption from the shale. What is commonly referred to as "sulfur water" often comes out of ancient shale water wells. Such wells can also produce small amounts of natural gas.

The waters entering the northeastern watershed area predominately bypass the Hamlet through karst conduits. The valley due north of the Hamlet is a resurgence area because of its lower elevation. Here the water resurges from the ground in the form of several springs. The bottom of this valley shows no sign of bedrock. This is because the original topographic features have been smoothed off by glaciation. When the glaciers moved south over North America during the ice age, they scraped off high grounds and soils and deposited them in low areas. In the case of the Beaverdam Valley, glacial debris was deposited over the springs, which in turn prevented surface water flow. This action caused further infiltration of the karst waters into the limestone beds (Manlius and Coeymans limestones) in which they flow. Essentially, the backed-up waters expanded the limestone ground water table zone.

The northeast watershed karst drainage system influences some of the wells in the Hamlet's northeast section. Let us now consider the area on both sides of Route 156, between Knox Cave Road and Knox Gallupville Road. Once again, the water supply in this area is limited by a lack of watershed input. The topography of this area places the watershed on a plateau underlain with limestone. To the north, the Beaverdam Valley is a surface water flow and wetland of significant ground water influence. Because of the size of this wetland and its elevation, it may be considered the most significant contributor to the more stable 100 to 200 foot wells in the western section of the Hamlet. To the south, a small creek is perched at the base of a hill. The creek flows parallel to Route 156. Because of the southern hill, a watershed exists which routes the surface water flow downhill to the creek and then away from the Hamlet. The watershed is not a tremendous influence on ground waters. This watershed is, however, a source of water

to the limestone water table that underlies the Hamlet. This water table exists in a 27 foot bed of limestone containing a karst system and, as in the previous case, is an undependable source of water. Wells that are 25 feet or less obtain their water from this system. Other surface run-off waters in the Hamlet area enter this system and make it easily susceptible to contamination. Waters extracted from wells deeper than 100 feet and with a water level 30 feet below the surface or with at least 30 feet of casing are drawing from less contaminated supplies. These wells, depending on their depth, are extracting from deeper shale waters or saturated limestone, not surface waters. The source of ground water for these wells is most likely the wetlands north of Route 156.

Karst aquifers are known for their ability to rapidly transmit rather than treat contaminants. Whereas contaminants can be treated in soil aquifers, little to no natural treatment of water-borne contaminants occurs in karst aquifers. As a result, many serious groundwater contamination problems have resulted in karst terrains both in the United States and abroad due to poor land use planning. Millions of dollars have been spent in an effort to correct problems including groundwater contamination and toxic fume emissions from limestone fractures. Near Syracuse, a landfill placed on bare limestone pavement has led to volatile organic contaminants issuing from a karst spring, which in turn contaminated a major stream. More locally, severe animal deformity and mortality has resulted from farm animals drinking sewage laden karst spring water in East Berne. The source of this sewage contamination is believed to be from either land spreading operations or from the failed septic system of one homeowner.

Chemical contamination of a karst aquifer is particularly dangerous for two reasons. First, chemically contaminated water is not filtered as it moves through underground channels, so the contaminated water can potentially enter wells used for drinking water. Second, once in the karst system, chemicals can be absorbed into the limestone and continue to contaminate water supplies for years. Gases or fuels which enter the karst system may enter homes where they can be a fire or explosive hazard. Methane, for example, which results from the decay of organic materials is highly explosive in concentrations between 5 and 15 percent.

The infiltration of contaminants is most likely to occur where little or no soil mantle is present above the limestone, including areas of limestone pavement. Contaminant infiltration potential is also high where a moderately thick, yet discontinuous soil mantle overlies the limestone, or where the soil is unusually porous (rapid percolation). A thin, or discontinuous, or very porous soil mantle has only a limited capacity for filtering and cleansing pollutants. The same considerations may apply to potential contaminant sources placed stratigraphically higher than the limestone, which slope or drain toward an insurgence area.

Karst terrains represent the worst possible locations for hazardous waste sites, landfills, junk yards, septic systems, salt piles, or for the storage or disposal any other potentially harmful waste which would be rapidly transported long distances essentially unaltered.

Because a great potential for contamination exists in karst watersheds, approval for the placement of buildings or other development activities within these environmentally sensitive watersheds should be based on a site specific evaluation of the waste handling capacity of the surrounding soil and bedrock strata. Ideally, the substrate should have the ability to isolate or maintain all waste physically separate from the karst aquifer. This would prove to be particularly difficult for septic systems on thin mantled limestone pavement. Where approval is sought for the installation of underground storage tanks, state of the art tanks with some built in monitoring mechanism would be desirable. It is important to recognize that once a contaminant spill occurs, or a septic tank fails, it is too late to alter downgradient impacts. Land use planning should consider this accordingly.

Wells which draw their water from cave conduits are the most susceptible to contamination, so an examination of well logs for evidence that the drill point dropped through a conduit could help to identify the potential for contaminated wells.

## 4.4 Natural Resources

### 4.4.1 Weather

The Town's geology and natural resources blend together. One natural resource very much influenced by hilltown elevation and topography is the weather. Everyone who lives in Knox knows the weather here is different from the weather in Albany. Not many people remember that for many years there was a weather station in the southwest corner of the Town, near West Berne. The station was operated from about 1914 to 1970, in later years by Jesse Litts of Rock Road. Data from the West Berne station were included in Cornell Extension Bulletin 764, "The Climate of New York State" by R.A. Mordoff in 1949. As would be expected, based on the relative elevation of the two weather stations, West Berne is a few degrees Fahrenheit cooler than Albany throughout the year, but particularly in the summer months. Total annual water equivalent from precipitation was about two inches more at Albany than at West Berne but much more of West Berne's precipitation came in the form of snow. Annually, West Berne received an average of six feet of snow compared to Albany's four feet. Perhaps most significantly, the average days between frosts was 130 days in West Berne (range 92 to 188) and 174 days in Albany (range 138 to 213). In one-third of the years in which these readings were taken at West Berne, there were fewer than 120 days between frosts.

### 4.4.2 Vegetation

The Town of Knox has many vegetation communities, ranging from active agricultural fields to mature northern hardwood forests. The weather, historic and present land uses, and varying topography, soil conditions and hydrology influence the vegetation communities in our Town. The majority of the forested areas in the Town have resulted from old field succession following the abandonment of agricultural land, from timber harvesting activities and practices and/or from reforestation efforts. The less accessible areas, generally on steeper slopes, have been left relatively undisturbed and support mature forest. There are wetlands, shrublands and old fields dispersed throughout the Town. Each vegetation community within the Town provides a variety of benefits and functions. The southwest portion of Town, in the area of the hamlet of West Berne, is predominantly agricultural. Forest is found on the steeper slopes where the land is less accessible and the soils generally poorer. The southeast section of Knox is both agricultural and forested, with the agricultural land on the more moderate slopes. Due to geologic characteristics, this area is a sink hole region. There is one large lake, Thompson's Lake, as well as State-regulated wetlands here. The northeast section of Knox has large areas of shrubland, much of which is the result of agricultural land abandonment and poor growing conditions. The forested areas are predominantly hardwoods, although there are patches of mixed forest as well. The species now occupying the Town are the ones most able to adapt to diverse conditions. To survive and grow here, plants must be able to weather long, cold winters, droughty summers and a wide range of moisture conditions. Monthly precipitation ranges from less than an inch to as much as six inches. There have been a number of efforts made to classify plants in this geographic area. An 1869 article published by Verplanck Colvin in Harper's New Monthly Magazine, titled "The Helderbergs", mentions a number of plants found in the town. Frank Dobbin's 1907 article "An Afternoon in the Helderbergs", published in American Botany, describes four rare mosses on the edge of the Helderberg Cliff. Homer House, State Botanist from 1914 to 1950, associated plants and plant groups in the area with underlying soils and geology, and listed them in order of relative abundance. An account of the flora in John Boyd Thatcher Park is given in Scenic and Historic America (Vol. IV, 1935) by Raymond Torrey. The local regional office of the Nature Conservancy in Albany owns and is responsible for the Limestone Rise property in the Town. This area was inventoried in 1981 and the plant list is representative of the indigenous flora in Knox.

While plants obviously give us ecological benefits by providing diverse communities for a wide variety of animals and interesting ecosystems to research, their economic importance is often taken for granted. Early settlers were more dependent on native plants for food and shelter than we are today; imports were expensive then, and difficult to obtain. The Helderberg area offered white pine and hemlock for building; these were preferred over hardwoods due to their workability and tall straight form, ideal for structural framing. The hardwoods (oaks, maples, hickories, ash and birch) were used for

furniture and floors because of their attractive grain and durability. Nuts from the hickories and beech were used extensively because of their abundance and sweet meat. Hophornbeam and black locust have a tendency to long life and resistance to rot which made them preferable for fence posts. Individual settlers in the late 1600s and 1700s, granted lots by the patroon, used all of these species when available, or traded with neighbors for what they needed. The first markets to open in the late 1600s and 1700s were for tanning with the bark from hemlocks and pill boxes made from basswood. Most hemlock was sold to mills in the Catskills but pill boxes were made in a factory in Knox. Also during this period, a number of sawmill owners built dams on streams such as the Foxenkill Kill to provide needed hydro power for their operation. These sawmills provided valuable products for barter with valley residents, whose wood resources had been depleted earlier, and they accounted for much of the settlement in Knox in the early 1800s.

By 1850 virtually all of the Helderberg area had been cleared for farming, and agricultural crops replaced the native species. Only a few areas escaped total clearing and among them were the escarpment proper and the steep slopes along the Foxenkill Kill. Torrey and Burnham, during the early part of the twentieth century, remarked that agriculture still prevailed but that many forest and brushland species were starting to return. For this reason, the period from 1850 to the 1920s was a time when naturalists, as well as others, sought out uncleared areas such as the escarpment to enjoy and study nature.

When the Town of Knox was settled, many acres were cleared to grow crops. An accelerated return to woodland began in the 1930s as the depression forced marginal farmers to abandon the land and move either to the cities or to richer land further west. Cropland reverted first to old fields, then to shrubland and finally to woods. By the 1960s about 75 percent of the Helderberg Plateau had reverted to woodland. That trend continues to this day, but now at a much slower pace, since there are few farms left. In the 1970's, logging returned to the hilltowns as a commercial enterprise. Rudy Stempel's sawmill in the neighboring Town of Berne now produces framing material, railroad ties, pallets and packing lumber, as well as rough siding. Bark is sold for landscaping and sawdust has found a market in powders, mulch and pressed board. Several local residents are employed as loggers or haulers. The Town is producing more wood and wood products now than in any time since the mid 1800s.

The single most destructive natural disaster to strike the forest in Knox was a fungus disease that completely destroyed the American chestnut in the Northeast. Prior to 1920, the American chestnut accounted for 25% of the region's forest volume. It was a tree that grew 30% to 50% faster than the red oak and produced 1 to 3 bushels of nuts annually. It was a great asset to wildlife. The depletion of this food supply, combined with extensive land clearing and market hunting, led to the disappearance of the American turkey. The lumber these fast-growing chestnuts produced was used for many

things, such as furniture, woodwork, beams, rough cut lumber and fence posts.

Another tree infected by an imported disease was the American elm. The Dutch elm disease was brought into our country in the early 1900s, and by 1960, the disease had ravished the American elm. Young seedlings continue to come up and produce sound trees, which are able to reproduce before they die. The American Elm Institute has developed a disease-resistant tree to replace the magnificent elm that used to line the streets of many villages and cities.

The beech trees in our Town have been severely impacted by a nectria fungus that kills many of the trees as they near a mature size. However, a lot of new growth is replacing the older trees. A microplasma-like organism (ash yellows) is affecting our ash trees; the blight causing it is not under control at the present time. Fortunately, the regeneration ability of the ash is enabling it to hold its own.

The northern side of the Town is now predominantly growing species of hemlock, oak, poplar, sugar maple, ash and beech. The southern portion grows primarily oaks, sugar maple and white pine; it has better topsoil and drainage, and therefore, the white pine thrives in great abundance. The regeneration of oaks, beech, hemlock, butternut and maples has allowed the forest to become once again a prime range for the American turkey.

Medicinals have played a lesser role but were still important; many herbs, berries and roots were used by Native Americans who then passed their knowledge of plant use on to European settlers. The process of making maple syrup was learned from the Native Americans. Coltsfoot, sumac, witchhazel, pennycress, cattail roots, spring beauty tubers, fern fiddleheads, wood sorrel, mushrooms and various berries are a few of the species used for food and medicinal purposes.

Early settlers undoubtedly appreciated scenic vistas, wooded skylines and flowering plants as a diversion in their busy lives. Today, with more leisure time and an awareness of the historical significance of this area, local residents greatly value the wooded setting of the escarpment. The hemlocks, birches and maples growing at the top and the oaks, hickories and ash at the base all add to the scenic beauty of the escarpment. Whether it is bare branches laden with ice and snow in the winter, the fresh green leaves, catkins, fruiting bodies and flowers in spring or the brilliant colors of fall, the total mix of floral patterns provide kaleidoscope views of the escarpment from every turn in the road. Small flowering plants (forbs) dot the landscape, beginning with the first ephemerals of spring (colts foot, spring beauties, may- flowers, hepatica, trout lilies, trillium and jack-in-the-pulpit), continuing with late flowering asters and goldenrods and ending with witchhazel in November. Residents can find beauty in the variety of native plants found in the Helderbergs.

The flora of the Town has provided us with an invaluable cultural heritage. Native Americans used plants for food, shelter, weapons, medicine, travel (canoes and travois) and for barter. Many of these same uses were adopted by European settlers, who depended on plants for their survival and livelihood. Lumbering, pill box and ax manufacturing and tanneries were the first real industries of the settlers but these all declined as agriculture grew in importance. Today, however, some of the original wood uses, including lumber, as well as pallets, railroad ties, mulch, landscape material, powders and pressed board, find markets. As the forests continue to mature, these and other uses will provide jobs and boost the area's economy. Modern drugs may depend on the research and discovery of new compounds from plants; there will undoubtedly still be a few limited local medical remedies.

The future offers other, more intrinsic values of our native flora. While the Town does not have many unusual or rare plants other than some mosses, fungi and a few ferns, the plant communities that these and the higher plant groups (forbs, grasses, shrubs and trees) make up provide a unique collage of local ecosystems that is probably unequaled anywhere in the State. Ironically, this unique pattern has evolved from past land use and abandonment over the years. Old growth forest still exists in niches along the escarpment and steep slopes of the Foxenkill and Bozenkill drainages. Shrub and tree covers have returned along our stream courses and a patchwork quilt of old fields, shrubland and sapling to mature forest have resulted from gradual land abandonment. Even the resulting mature forest shows a surprising diversity of northern and southern hardwoods, with white pine on dry, sandy sites and hemlock on shady, wet sites. Added to this are the many plantations of Scotch Pine, Red Pine, Norway Spruce and Larch. Thus we have a wide diversity of flora to enjoy, use and protect.

### 4.4.3 Wetlands

The Town of Knox Conservation Advisory Council completed a wetlands inventory in 1993. Wetlands are transition areas between uplands and aquatic habitats. There are many types of wetlands, including wet meadow, emergent marsh, deciduous forested swamp, coniferous forested swamp, shrub swamp, floating and submergent vegetation and wetland open water. Each of these cover types provides habitats for different assemblages of wildlife and such other benefits as floodwater storage and groundwater recharge.

Wetlands are valuable habitats for many forms of wildlife. They provide grounds for breeding, nesting, feeding, resting, cover and water. Many species of wildlife depend upon wetlands for part of their life cycle, including many of those species identified as endangered, threatened and special concerns in New York State.

Wetland areas in the Town provide suitable habitats for species such as beaver, muskrat, mink, river otter, wood duck, mallard, great blue heron, northern harrier and osprey. Both the northern harrier and osprey are threatened species in New York State. Although neither of these species nest in Knox, both pass through it in migration. Many of the wetland communities in the Town also provide suitable habitat for numerous reptile and amphibian species, including two special concern amphibian species: the Jefferson salamander and the spotted salamander.

Activities affecting wetlands in the Town fall under two jurisdictions: New York State Department of Environmental Conservation (NYSDEC) and United States Army Corps of Engineers (ACOE). A Freshwater Wetlands permit from NYSDEC pursuant to the Freshwater Wetlands Act (Article 24 of the Environmental Conservation Law (ECL)) is required for any activity impinging upon or otherwise substantially affecting a regulated wetland or its adjacent buffer zone (100 foot boundary around wetland). A Section 404 permit from the ACOE is required for dredging or the placement of fill into waters of the United States pursuant to the Clean Water Act (33 CFR Parts 320 through 330). Waters of the United States are comprised of open water and wetlands. These two Acts are intended to preserve, protect and conserve freshwater wetlands and the benefits derived from them.

There are four federal agencies that have regulatory jurisdiction over wetlands - the Department of Agriculture, Department of Interior, Army Corps of Engineers and the Environmental Protection Agency. On January 6, 1994, these four agencies agreed that the Department of Agriculture's Soil Conservation Service would be the lead federal agency for delineating wetlands on agricultural lands. Consequently, farmers will be able to rely on Soil Conservation Service maps to determine the extent of their wetlands. The Section 404 program will continue to be administered by the Corps of Engineers

and the Environmental Protection Agency.

To be protected under the New York State Freshwater Wetlands Act, a wetland must be at least 12.4 acres in size or be designated as a wetland of unusual local importance. Activities regulated by NYSDEC include draining, dredging, filling, placing of obstructions, clearcutting vegetation and introducing any form of pollution. Many agricultural activities involving wetlands are exempt from permitting.

Unlike NYSDEC, there are no acreage limitations on the size of wetlands regulated by ACOE. Based on the adoption of the "no net loss" doctrine by the federal government, most activities affecting one acre or more of wetland can be regulated by ACOE. Ordinarily the wetland itself, not any buffer area adjacent to the wetland, receives protection. The ACOE identifies wetlands only when application is made for a determination in a particular case.

There are 19 State-regulated wetlands in the Town of Knox, totaling 619 acres. Of the wetlands mapped on the Freshwater Wetlands maps, one is a Class I wetland (approximately 100 acres), eleven are Class II wetlands (approximately 360 acres), and seven are Class III wetlands (approximately 159 acres). These wetlands are shown on the Natural Resources Map in Appendix D. Class I wetlands are considered the most valuable wetlands, providing the most functions and benefits; whereas, Class IV wetlands provide the least functions and benefits of the regulated wetlands. There are smaller wetlands scattered throughout the Town that provide benefits similar to the larger wetlands and may fall under ACOE jurisdiction.

The wetlands in the Town provide many functions and benefits for the public and environment. Some of the benefits derived from wetlands include: providing natural flood control; improving water quality; recharging aquifers; stabilizing the flow of streams; and providing recreational, scientific and aesthetic resources to the Town and public.

The Town Park includes a portion of one of the nicest open marsh wetlands in the Town. Here, many forms of wildlife such as ducks, geese and beavers can be observed in their natural habitat.

### 4.4.4 Wildlife

The Town of Knox Conservation Advisory Council has an ongoing inventory of wildlife resources. The draft wildlife resources report describes the various cover types and associated wildlife species and is included as Appendix I.

The wildlife of the Town comprises a diverse mixture of organisms, each associated with a distinct habitat. In any geographical area, the organisms present reflect that area's geological and hydrological history and their continued presence reflects the type and availability of suitable habitat. The link between organism and habitat affects directly the organisms that rely on that habitat.

Habitat is an inclusive term. It includes all factors that have an effect on all life stages of the population of individuals living in the area. Each population of organisms has a different, unique habitat, although there is considerable overlap of factors among them. The effect may lead to a decrease or increase in population size or a shift in range. The relationship that exists between organism and habitat is complex, multi-faceted, linked to other organisms, often unknown or unstudied and, consequently, difficult or impossible to predict.

In ecological terms, when the habitat of the human population in the area is altered or expanded, the effect on the habitats of the other populations is affected.

Many of the mammals present in New York State have been reported from the Town. Thirty-nine species from six orders have been recorded. Most are small animals, rodents, bats, shrews, moles and the small mustelids (ermine, mink, skunk). Larger carnivores (coyote, fox, and occasionally, bobcat and bear) are also present, but home ranges for these animals are large so that their presence in the area is time-dependent. White-tailed deer is the only large herbivore. Appendix I provides a complete listing.

Bats, in general, are an important component in the Town's fauna. Of the ten species of bats present in New York, five species occur in Knox. Caves in the escarpment and in the immediate area house several bat hibernacula. The relatively high regional diversity of these insect-eating mammals is probably related to the presence of suitable habitat associated with the Town.

Other mammals are important game or fur-bearing species. This group includes the white-tailed deer, beaver, ermine and mink. Still others are important links in diseases of importance to humans. The deer tick lives on several different hosts and is responsible for the spread of Lyme disease. Recently, raccoons and other mammals have become important in the spread of rabies.

Most of the vertebrate species present in the Town are birds. Over 140 species have been sighted. Most of the species are migrants and occur in the area during only part of the year. Approximately 120 of the species are bred in Knox. The only groups present in New York State which are not represented in the Town's bird fauna are the marine birds, and the gulls and terns.

Many of the birds reported from the Town are protected. The bald eagle, peregrine falcon and loggerhead shrike are endangered in New York. The eagle and falcon are also federally listed. Both the falcon and eagle populations in the area are re-introductions as both species were extirpated. Three species are protected under the threatened category. These are the red-shouldered hawk, northern harrier and osprey. Within New York, ten more species fall within the species of special concern.

Game birds make up another part of the bird assemblage. Over ten species of ducks, geese and upland game birds provide prey for hunters. The habitat requirements for these species are relatively well known.

Six snake and three turtle species have been recorded in the Town. Of these species, only six are relatively common and the other three have had recent sightings. Of the species still known to occur in area, only the wood turtle is protected as a species of special concern.

There are ten salamander and eight frog species in the Town of Knox. The spotted and Jefferson salamanders are listed as species of special concern by New York State. Recently, scientists have noted declines in amphibian populations all over the world. Many argue that these small animals are good indicator species and reflect a general decline in environmental condition. Their value as an indicator species should be noted by future planners.

The Town is not one where large numbers of aquatic organisms would be expected. The small streams that flow over the escarpment are home to only two species of fish: blacknose dace and creek chub. Both are typical of headwater streams throughout the northeast. In fact, the areas immediately surrounding the cliff face offer several opportunities for aquatic life.

The Town is divided into two main drainages. One stream, the Fox Creek, drains the south and west slopes of the Town. The Fox Creek system is a diverse tributary to Schoharie Creek and the Mohawk River. Seventeen species of fish have been collected at sites in or just outside of the Town. These fishes include a low-elevation population of sculpin and the eastern-most populations of redside dace and central stoneroller. Lakes and impounded waters within the Town hold a mixture of native lotic fishes that have adapted to standing water, native pond fishes and introduced game and bait fishes. Thompsons Lake, for example, reports thirteen species of fish. Of these, three are exotic

game fish and five others were probably introduced. None of the fish species present in the Town are completely protected.

A group of invertebrates that are relatively well known in this area are the crayfish. At least five species are found in the Town. Of these, only two are native. The crayfish assemblage offers an example of how the presence of exotic species can alter the habitat of established, native species. One of the introductions, a mid-western crayfish, was introduced into New York as a bait introduction in Thompsons Lake. This species has now expanded its range and is replacing native crayfishes in the Hudson and Susquehanna River drainages. Although crayfishes are rarely important commercially, the change in species composition reflects a general degradation of habitat. The new crayfish is aggressive and productive but tends to be smaller than the native ones in this area.

Several areas in or adjacent to Knox have been designated as significant by the New York Natural Heritage Program because of the animals found in them. These include turtle habitat in Vly and Black Creek marshes fed by streams flowing from Knox, raptor nesting areas and bat hibernacula along the Helderberg Escarpment and in several caves nearby. Often it is important to designate areas, rather than individual species, for specific management and protection of all the species present in that habitat.

Wildlife population characteristics are dependent upon available habitat. There are various vegetation communities throughout the Town providing habitats to support a fairly diverse assemblage of wildlife species. The existing wildlife habitats in the Town are diverse and provide unique values.

Though some wildlife species are associated with particular vegetation communities, most species require a variety of plant communities to meet all their life-sustaining requirements. These needs include food, cover, water, reproductive needs and other special considerations. It is best to maintain a diverse landscape to meet these various needs. Ideally, the landscape should include areas of mature and successional forests, both deciduous and coniferous, broken by patches of clearings and openings and sources of water. Wetlands within the Town provide sources of water as well as unique wildlife habitat.

Though habitat diversity is necessary to support a variety of wildlife species in the Town, some species (e.g., barred owl, pileated woodpecker and goshawk) depend upon the existence of large tracts of forested land for survival. The large forested tracts of land in the area are valuable habitats for these uncommon wildlife species.

The vegetated canopy cover over stream corridors serve to protect habitat for fish and wildlife. These vegetated stream corridors provide suitable passageways for wildlife movement. The dense forest canopy also helps to maintain the water quality (e.g., cool

water temperature, low turbidity) suitable for fish habitat.

**SECTION 5**

# GOALS

## 5.1 Introduction

The goals are general statements regarding community needs and wants in functional areas such as community facilities, infrastructure, the environment and land uses. They provide a framework of reference that lends consistency to decisions made by the Town Board through its own actions and through its appointed boards, committees and councils. The goals are rationally based. They are derived from the resident surveys, public meetings and background studies. The goals are developed in a manner consistent with the Town's unique character and the desires of its residents. The goals intertwine, are interdependent and reflect that the open rural character of the Town is, in and of itself, a valuable resource and an important reason many residents are making the Town their lifelong home.

## 5.2 General Goals

5.2.1 Protect the Town's groundwater and other natural resources.

5.2.2 Preserve the rural character of the Town.

5.2.3 Encourage the continued existence of open and agricultural lands, and agriculture.

5.2.4 Promote and protect the aesthetic, cultural and historic character of the Town.

5.2.5 Encourage economic and social vitality consistent with the Town's rural character.

5.2.6 Maintain a continuing planning process to ensure that the goals herein are implemented through appropriate revisions to the zoning ordinance, the subdivision regulations and other appropriate Town action.

# SECTION 6

# IMPLEMENTATION

## 6.1 Introduction

Prior to the turn of the century, in the Town as described in Section 1, people drove down tree-shaded lanes identified by neat stone walls, past farmhouses surrounded by white picket fences. Typically, the extent of the drive (usually by horse and wagon) was to the nearest village or hamlet for needed basic supplies or to attend a church function or Sunday service. When automobiles became more prevalent, trees were cut along the roads. Stone walls were shoved into the road bed to raise the roads, improving drainage and making snow removal much easier. Country people took great pride in their land and buildings. Old deeds show that they planned ahead to transfer their farms from one generation to the next. Instead of social services, the younger generation agreed to look after Mom and Dad until death and then, took over operation of the farm.

Before and during the great depression, people moved away from the hilltowns by the hundreds. Wood lot boundary lines were lost when land values became depressed. Land was not utilized; it often reverted to County ownership, and old boundary lines became very vague. In the early sixties, a trend started of people wanting to move back to the country. Towns closest to the cities, recognizing that uncontrolled growth could blight their rural atmosphere, started regulating the business districts and created ordinances, such as prohibiting mobile homes in certain areas. Predictably, the uses prohibited in these towns moved outward to the next towns, creating a need for more ordinances. People became more and more concerned about their environment and about saving the countryside, but sometimes made rules that worked against instead of for the environment. In many small towns, setting up a small business that satisfied the local zoning laws became more difficult. People were forced to drive miles for their supplies, thereby putting emissions into the air and wearing out their vehicles and increasing traffic on the roads. Further, some specifications surrounding development served only to make division of land prohibitively expensive rather than to improve aesthetics, the environment, or the public health. Consequently, when development has occurred in spite of these specifications, the result often was wide roads where country lanes were in order and long narrow lots that were impractical to use.

There is evidence to demonstrate that incompatible uses can destroy land values as well as diminish the incentive that families have had to maintain their land and pass it on to the next generation. Despite the variety of land use tools available to communities, they are rarely used in a context where citizens agree about how they want their villages and towns to grow. As a result, regulations tend to become "battle rules" over how sites are developed. Often the missing ingredient is comprehensive planning -- a community

effort to understand its resources and opportunities, assess its needs, set objectives, and establish priorities. The benefits of preserving and managing land are fostered by careful personal and community planning. The implementation of comprehensive planning will help avoid pitfalls and outline courses that Town residents can take to ensure their ability to manage their land in the future. To guide; to demonstrate what has proven successful rather than implement rules after the damage is done; to foster an attitude of neighbors working together during illness, financial hardship, old age and death; to maintain appropriate and compatible uses in all areas of the Town; to help people grow the crops desired by our nearby metropolitan area; and to recognize that recreation can play a large role in keeping our land intact are all important considerations in the implementation phase of planning.

This Comprehensive Plan provides that planning; if used to full advantage, it will guide the future application of land use controls in the Town of Knox to encourage and simplify the process of residential and commercial development in the most appropriate parts of the Town. Knox can and should become a town that is friendly to appropriate development. Finally, implementation of a comprehensive plan should encourage agriculture, recognize that some residential growth is inevitable and that the presence of certain types of businesses can add to the quality of residential life. Implementation will be most effective if citizens are informed and involved.

Based on a thorough review of the assets and resource maps for the Town of Knox, it is clear that some areas are more suitable for development than other areas. For example, the parts of the Town closest to the Capital District are served by good roads and have been the focus for much of the residential development in the Town; these areas were properly designated "Residential" when the Zoning Ordinance was adopted. But now, all areas of the Town are served by good roads and are subject to the pressure of residential development.

In general, land and infrastructure characteristics which are needed for residential or commercial development include:

Sufficient quantity and quality of water
Sanitary waste disposal
Clean air
Attractive surroundings
Access to transportation
Access to electricity and telephone
Good schools
Reasonable taxes

Two of the above land and infrastructure characteristics that pose significant environmental constraints on extensive residential or commercial development in

the Town are water supply and waste disposal. There are no public water supplies or public sewer systems in the Town. Thin soils overlying limestone bedrock preclude safe and sanitary waste disposal in many areas of the Town. Further, aquifers that can support public water supplies are typically in sand and gravel. However, much of the Town groundwater is in rock and low permeability soils -- the yield from which, in some areas, is nonexistent at reasonable depths or is less than the two and one half gallons per minute with storage minimums or five gallons per minute without storage required by Albany County Health Department standards. As an example, areas such as the trailer park on Knox Cave Road near Drumm Road have multiple wells and, at times, supplemental water has to be purchased to meet the demand.

Development must also be consistent with the needs, objectives and priorities of the community. Many residents of Knox built here because Knox is open and rural. Future development must be done in a way that respects the current community. Many factors are involved in the perception of rural character, including:

Active farming and agriculture
Expansive views of woods, fields, streams and hills
Small community centers or hamlets
Clear star-lit skies
Clusters of farm buildings and farm houses
Frequent sighting of wildlife

The resource maps for the Town of Knox allow the community to plan to preserve existing rural character of the Town by helping to define where the critical features are. This encourages development where it will least interfere with rural character. The resource maps show where Knox has:

Good agricultural land (whether actively farmed or not)
Other open land
Wooded land
Wetlands
Scenic views, vistas and corridors
Historic buildings (including farm buildings)

The resource maps also show other features related to appropriate development, including where the Town has:

Suitable (and unsuitable) soil and bedrock
Flood-prone areas
State, County and Town roads

Once it is determined where development should be encouraged (and what kind of development should be encouraged), the next step is to choose suitable land use tools to accomplish the Town's objectives. New York State permits towns to use a wide range of land use controls. But one of the most valuable is rarely considered: community education.

The Town has endeavored to maximize involvement of the community in the planning process; therefore, the community should also be involved in the implementation process. Through a full understanding of the objectives of the Comprehensive Plan (and how it will protect community values and lead to a better community) members of the community can help to implement the plan. Members of the community will be alert to opportunities to preserve and protect important agricultural lands and natural resources. By understanding the implications of inappropriate disposal of waste products, people can avoid (and encourage their neighbors to avoid) actions which could contaminate our air and water. Community members can also act individually and in small groups to preserve open space and to support local agriculture. Another way to maximize community involvement in the planning process is the designation of a planning component that would include a communication and representational element from the servicing school district for the Town of Knox. This would expand the benefit of our planning efforts. Subdivision reviews that would include school district objectives could circumvent problems in areas such as transportation and enrollment issues.

As valuable as community education is, the Town can also make use of appropriate policies, incentives and land use controls. Policies of the Town government such as acquisition and development of Town parkland, landscaping and maintenance of Town roads, or influencing the State and County governments in these same areas promote the goals of the Plan. The Town can also use non-mandatory incentives such as conservation easements and official recognition and encouragement of private initiatives to meet the goals of the Plan. Also, it will be necessary for the Town to use several land use control techniques together to have the desired effect. (For example, large-lot zoning -- or for that matter, small-lot zoning in the case of fully developed parcels -- can rapidly deplete the Town's open space and woodland, but used together with transfer-of-development-rights, cluster-development and conservation easements, it can help preserve rural character.) The Town already has a number of conventional land use controls in place. Some of these need to be modified and others added in order to implement community needs and wants relating to compatible land use, protection of the environment and preservation of public health.

## 6.2 Implementation

The final step in the planning process cycle is to take action that, to the fullest extent possible and practical, promotes the optimum achievement of the Town's goals. The Town's strongest implementation mechanism is its authority to create and refine local laws to promote the general welfare of its residents. Two laws that are particularly applicable to the implementation phase of the planning process are the Town Subdivision Regulations and the Zoning Ordinance.

Consequently, specific actions that will promote the optimum achievement of the Town's goals have been categorized below as they relate to needed revisions of the Zoning Ordinance, the Subdivision Regulations and those revisions that relate to both the Zoning Ordinance and Subdivision Regulations. Actions that do not relate to these two laws are included under the category "Other Action".

### 6.2.1 Zoning Ordinance

#### Pending Revisions

In support of the Town goal to maintain a continuing planning process, the Planning Board has identified a number of typographical errors and inconsistencies in the Zoning Ordinance that need to be corrected. Also, there are several refinements that should be made that will improve the Ordinance and bring it into conformance with changes in Town Law.

#### Natural and Scenic Resources

In order to promote the Town goal to preserve natural resources, it is recognized that scenic and escarpment areas are a major resource, integral to the character of the Town. For long term protection of these areas, they should be added to the official Town map and designated as green space areas of significant value to the Town by including the major escarpments in a land conservation district. An additional protection plan should be developed for the escarpments, including such strategies as outright purchase of critical areas, donation of permanent conservation easements, or donation of land to the Town or to a conservation organization such as the Albany County Land Conservancy. Some scenic areas can be similarly protected through inclusion in the land conservation zone or by acquisition of conservation easements. The scenic corridors identified in Section 4 and shown on the Cultural and Scenic Resources Map in Appendix C can be protected by establishing setback and frontage requirements along the corridors, restricting

vegetation clearing and grading in setback zones along the corridors, and by establishment of height restrictions on new structures.

## Surface Water

Another important natural resource worthy of protection is the Town's surface waters. There is a long-term need to preserve and improve the Town's surface water resources. These resources are lakes, streams and springs. Land clearing near surface water areas can cause many negative impacts, including siltation, pollution from leaching, warming and increased evaporation from loss of shade, with resultant loss of fish and wildlife habitat. The Zoning Ordinance can protect these resources by creating overlay districts with restrictions on what can be done adjacent to them. Restrictions should include: setback for all clearing within 25 feet of the resource, for all building including septic systems, driveways and other structures within 100 feet and to restrict the removal of trees to be no less than a residual basal area (which is defined as the total cross-sectional area of all live tree stems, expressed a square feet per acre and measured at a point 4 1/2 feet above the ground) of 60 square feet per acre or some other reasonable standard which precludes clearcutting of those sensitive areas.

## Thompson's Lake

A specific Town water resource worthy of special mention is Thompson's Lake. Over 50% of Thompson's Lake is located in the Town of Knox. There are approximately 20 seasonal residences located near the water; and most of them are on non-conforming, undersized lots. There is a State campsite in the area. Several former seasonal dwellings have been converted into year-round homes. It is recommended that a special Recreational Overlay Zone be incorporated around this area to provide for protection of the Lake and to encourage the recreational use of the Lake.

It is recommended that the provisions of the Zone be designed with the cooperation and input of all residents and land owners of the area around Thompson's Lake. In addition, this planning activity should be carried out with the input of the Town of Berne government which has jurisdiction over the southern end of the Lake. A cooperative effort between the two towns in protecting the Lake will ensure that Thompson's Lake continues to be the special place that it is and that it will be enjoyed by future generations.

## Land Conservation District

The Town has already established Land Conservation Districts to protect some natural resources in the Town. Other Town natural resources can be preserved by their incorporation into these districts or into overlay zones. The escarpment areas, steep forested slopes and areas with thin soils over limestone bedrock should be protected from tree clear-cutting and building and other disturbances which would intrude on the scenic resources unique to these areas and have the potential for negatively impacting ground and surface water resources. Poor and very thin soils, fractured bedrock, and steep slopes are common features and are severe constraints to development in these areas. Boundaries of the zone to protect the escarpment should follow or outline the major escarpments. These should be located by infrared photography, contour lines and field checks, and extend 200-400 feet back from the escarpment edge. While it is recognized that following contour lines would result in only portions of some parcels being subject to the requirements of this zone, the resulting boundaries should adequately represent the resource to be protected. Steep forested slopes and areas with thin soils over limestone bedrock can be further refined using the maps in the appendices to the Plan. Although further work must be done on inventories, those resources which have already been identified should be incorporated into this district.

## Business District

This relates to the Town goal to encourage economic and sound vitality. Although the Zoning Ordinance provides for Business Districts, no such districts have been designated on the zoning map. A Business District could be considered in the Knox Hamlet area. Although no specific boundaries of such a zone are suggested at this time, certain characteristics of this area lend it to creation of a business zone. This area contains a Mobile gas station, general store, the Post Office, the Dutch Reform Church, the Knox Historical Society Museum, the Town of Knox Park, Fire Department building and the Town Hall. It is generally flat and well-drained, has good access to State Route 156 and County Route 252, and is centrally located. However, other than recognizing the existing business activities, there is little room for any expansion, the lots are small, and there is no public water supply or sewer system.

Other areas that could be considered include the area accessed by State Route 156 in the vicinity of the Mountain Woodshop and Highland Farms Restaurant, the area accessed by State Route 146 in the vicinity of the Town garage and the Township Tavern, the area on Knox Cave Road near Route 7, the area near Thatcher Park in the vicinity of Thatcher Park Road and Ketcham Road and in the vicinity of the former Cater's Auction Barn on State Route 443. An important first step in

considering these areas further is to have focused public meetings with the residents of each of these areas.

Land development has a definite impact on public education. Similar to a municipality, a school district must plan for changes that are based on enrollment, tax base, and community resources. As is described in Section 4, planning decisions in the Town of Knox can have a significant effect on the local public school especially in consideration of the establishment of business districts. From a school budget standpoint, a business district tends to be a net gain in tax base. It should be noted that businesses do not directly increase enrollment and school services. There has been some debate with particular types of businesses, as to their budgetary benefit to the local municipal budget. The impact on infrastructure maintenance, and other municipal services varies from business to business. Aside from planning considerations to optimize business placement for these services as well as safety goals, school district objectives should also be given consideration as they are certainly part of the public good.

## Agricultural and Residential Districts

The Town's Agricultural District supports the Town's goal to encourage the continued existence of open spaces and agricultural land. In keeping with the results of the resident and non-resident landowner survey, minimum lot sizes in the Agricultural District should be increased to five acres, and appropriate adjustments to the Density Control Schedule in the Zoning Ordinance should be developed by the Town Planning Board. Pursuant to the prevailing comment at the public hearing and the majority consensus of the Master Plan Committee, the minimum lot size in the Residential District should also be increased to five acres. This is consistent with adjacent hilltowns. It enhances the rural character of the Town; will appropriately result in lower population densities in both Agricultural and Residential Districts; and will enhance protection of the Town's groundwater which serves as the sole-source water supply for Town residents.

The use of five acre lot zoning in the agricultural and residential districts, should whenever possible, be used in conjunction with clustering and/or transfer of development rights procedures. Otherwise, large lot zoning, used by itself, could quickly deplete the open space of the Town. For example, a one hundred acre subdivision fully developed with an allowance for clustering down to two acres could be divided into 20 lots of two acres with the remaining 60 acres of the land undeveloped for the protection of natural resources, for open space and for continued agricultural use. Of course, every five acres in the Town is not necessarily suitable for a residence; the maximum number of houses in a subdivision should be determined based on the buildable acres. Clustering or

transfer of development rights procedures are not always appropriate, but when they are, they will result in a more attractive development with reduced exposure of utilities and a less expensive road system.

### Mobile Home Ordinance

The Mobile Home Ordinance also encourages economic and social vitality by providing low cost housing alternatives with appropriate protection of the Town's natural resources. During the 1960's, there was a significant increase in the number of mobile homes being placed in the Town of Knox. Some were placed without proper water and sewage facilities. Due to the need to control this activity, the Town Board passed a mobile home ordinance in 1969 which regulated the placement of mobile homes. The Mobile Home Ordinance has been amended several times since it was first enacted.

The continual enforcement of this ordinance has been left to the Town Board. This Ordinance is a specific land use regulation which has been treated separately from all other land-use regulation due to the initial controversial aspect of mobile home placements. In addition, there was no Zoning Ordinance at the time it was first enacted.

Since the enactment of the Mobile Home Ordinance, the Zoning Ordinance was created and now has been in place for over 20 years. It is recommended that the Mobile Home Ordinance be incorporated into the Town of Knox Zoning Ordinance. This will provide for the continual enforcement of the Mobile Home Ordinance similar to all other land use regulations in the Town of Knox.

## 6.2.2 Subdivision Regulations

### Two Lot Subdivision Exemption

The two-lot subdivision exemption has an impact upon preserving the rural character of the Town, encouraging the continued existence of open spaces and agricultural land, protecting natural resources, encouraging social and economic vitality and maintaining an appropriate planning process. The Town Subdivision Regulations currently exempt two-lot subdivisions from review and approval by the Planning Board, as long as 18 months have elapsed since the lot being divided was part of a previous subdivision of two or more lots. The idea behind this provision was to allow casual property transfers (including transfers among family members) to be done without the need for the sellers to go through the subdivision review process. The opposing view is that this creates a loophole, whereby a lot can be

sold every 18 months, creating a subdivision without input from the Planning Board, the public or neighbors.

Arguments for eliminating the exemption:

* In general, the Town's concerns about review of three lot or larger subdivisions should apply to the two-lot situation, which in time could involve several lots, and subsequently, non-conforming roadways and curbcuts..

* Specifically, the review process covers several areas that are significant to neighbors of a subdivision and the Town as a whole, including:
  - layout to preserve rural character;
  - number and location of curb cuts/driveway placement involving neighbors;
  - drainage;
  - effect on wetlands;
  - the development of Town roads; and
  - preventing the creation of private roads (prohibited by the Town Board).

* It would eliminate appeals to the ZBA, where a new owner is seeking a variance because of problems with lot size, configuration, or other factors that, without exemption, would have been avoided by the Planning Board review.

* Our rules would correspond with those of the other hilltowns, which have no such exemption.

* The Town would be better prepared to deal with the inevitable increase in development.

Arguments for keeping the exemption:

* Allowing minor sales as referenced above.

* Keeps government off the backs of people who are not "developers".

* Based on the notion that to go through the process of a subdivision review, a person may as well make it worth the effort and/or cover added costs, and thus, the lack of an exemption may prompt sub-division of more land.

Conclusions and recommendations:

The Planning Board has recommended to the Town Board that the exemption be eliminated. A majority of the current Planning Board supports this position. Recognizing that there are merits to the arguments for keeping the exemption, a proposal to eliminate it should include other measures which would address the concerns of those in favor of the status quo. Recommendations to do this include:

* A short-form application, to be developed by the Planning Board.

* Individual assistance, if needed, by the Planning Board.

* An expedited approval process, including final approval only, eliminating preliminary approval. This would also be developed by the Planning Board.

* Waiver of all fees.

* Provisions for waiving a property survey. This is presently the case for minor subdivisions.

* Allowing private roads for two residences. A standard maintenance agreement is also recommended to ensure school bus and emergency vehicle access together with deed restrictions to ensure that the private road will not serve additional residences.

### 6.2.3 Zoning Ordinance and Subdivision Regulations

Rural Character Preservation

The zoning regulations should be thoroughly reviewed to identify ways in which standards could be modified or augmented to allow development to occur in a manner which is more protective of the rural, open quality of the Town. A number of criteria in the zoning regulations can impact upon rural character preservation. These include criteria such as setback requirements; height limitations on structures, including antennas and transmission towers; square footage limitations; satellite dish placement and screening requirements; street and driveway design standards; exterior lighting, and landscaping in association with new development and subdivisions.

The subdivision regulations should also be reviewed and revised to provide appropriate standards for the preservation of the Town's rural character. For

example, the preservation of existing hedgerows and stone walls should be a stated review criterion in the consideration of proposed subdivisions. Trees and other vegetation along the right-of-way should be left intact. In conjunction with revisions to the zoning ordinance, such changes to the subdivision regulations can serve to better preserve the rural character of the Town.

## Historic and Cultural Resources

Historic and culturally significant sites include private burial grounds, cemeteries, and historic structures and sites. The current Town ordinance has no provision for controlling historic and scenic resources. Section 4 includes the most recent information regarding these resources. While locations of many scenic areas and historic sites have recently been identified and mapped, a more comprehensive survey is yet to be done. The existing inventories of cultural and historic resources should be updated and information should be collected on structures eligible for listing on the State or the National Register of Historic Places.

The subdivision regulations and the zoning ordinance should be amended to specifically require information regarding the presence of historic and cultural resources with the submission of applications for subdivisions, special permits, and site plan reviews. Information on the presence of such resources at or near the site of a proposed development or land use activity can assist in determining how these resources might be affected by proposed activities and how these resources could best be preserved or protected.

Implementation of ordinances pertaining to historic resources could take different forms but generally would set out to ensure respectful consideration for historic sites and that their integrity is not adversely compromised. Ordinances for historic resources are generally established for either individual sites or historic districts. Historic resources ordinances usually refer to the Secretary of the Interior Standards for Historic Preservation as the criteria for evaluation. Projects would be reviewed by either the Planning Board or a specially appointed Historic Review Board.

### 6.2.4 Other Action

Boating Controls

As previously discussed, Thompson's Lake is a Town natural resource worthy of protection. There are presently no effective controls on boats using Thompson's Lake in spite of the Lake's small size. The use of large, fast motor boats on small lakes can create a number of environmental problems which the Town should control. High speed motor boars create a safety hazard on small lakes that are also used by rowboats, canoes, kayaks, sailing dinghies, and sail boards. High speed boats greatly reduce the effective carrying capacity of a water body since the amount of space they require to operate is much larger than slower boats. A water body that has ample room for hundreds of rowboats or canoes may be too small for the safe operation of a dozen high speed boats. High speed boats create large wakes which aggravate shoreline erosion and may make the operation of smaller craft hazardous. Gasoline and diesel powered craft, in general, leave petroleum product residues on the water which increases the water's chemical oxygen demand which diminishes the lake's ability to handle other types of nutrient loadings, such as phosphorus pollution from natural runoff or failing septic systems. In order to reduce these adverse impacts, the Town should work with residents, the Lake association, Albany County, the State Office of Parks, Recreation and Historic Preservation, and the Town of Berne.

Agricultural and Open Lands

Preservation of agricultural and open lands has been identified as a goal for the Town. The gradual loss of agricultural and open lands due to economic conditions over recent decades has been hastened by subdivision activity. Preservation of the remaining agricultural and open lands should be sought through a variety of means.

Land banking is a method of conserving large tracts of farmland, forest and open space. This allows the Town to acquire land for various future uses by purchasing land at the current market price and placing it in a public or private non-profit "land bank". Outright purchase of the land is a permanent way of protecting open space. There are several methods of purchase. Pre-emptive buying is where the Town negotiates with the land owner to purchase only parts of the entire tract such as tree groves, scenic areas, etc. Installment buying is where the Town purchases parts of the tract over time until the entire parcel is purchased. The public pays only a fraction of the cost at first and is assured of retaining a valuable parcel of land. Purchase and leaseback is where the Town purchases land and leases it back to the owner with restrictions on its use. The land maintenance costs can be passed on to

the lessee. Purchase and resale is where the Town purchases a particular piece of property and sells it for private use but with development restrictions. If the original land owner is willing, the Town could reduce this to one step by just buying the development rights.

Another method for conserving agricultural and open lands is through conservation easements. A conservation easement is a legal agreement between a landowner and the Town or a private entity to keep a parcel of land in its natural state for a specified period of time. In essence, a landowner gives up development rights, but retains all other rights and privileges of ownership. The land owner may sell the land or pass it on by will. Benefits of conservation easements accrue to both the landowner and the Town. Giving away or selling the rights to development in perpetuity is considered a gift by the IRS and the difference in the initial value as developable land and the subsequent value as nondevelopable land is deductible for Federal income tax and Federal estate tax purposes. The property remains on the property tax rolls. However, the assessed value of the land would properly reflect its actual value; that is as nondevelopable versus developable land. Pressure is removed from farmers and owners of open land who are finding it increasingly difficult to afford the cost of keeping the land undeveloped when this land is assessed and taxed as developable land.

Aside from public environmental benefits such as clean drinking water, scenic views and other aesthetic values (including maintenance of the Town's traditional rural character), open space produces a tax revenue surplus that subsidizes other land uses. Figures from an American Farmland Trust study show that farmland and open space pay an average of three and a half times more in taxes than it costs the municipality in services. Open land does not require municipal expenditures for public utilities, solid waste facilities, roads, parks, fire protection, schools, etc. In other words, and completely aside from adverse environmental consequences, Town service costs would skyrocket if all of the available agricultural and open land was subdivided and developed into minimum sized building lots for residential use. These higher service costs would translate into escalated taxes for all taxpayers. In reality, environmental and economic benefits are linked. An environmental assault on the Town could result in considerable infrastructure costs just to provide for minimal and basic environmental and public health needs such as clean water and a means to dispose of waste water. For both environmental and economic reasons, the Town should encourage the preservation of its agricultural and open lands. Towards this end, the Town should enact a local law to promote conservation easements.

Encouraging agricultural activity also serves to preserve agricultural and open lands, i.e. ensuring that the Town ordinances do not impede the establishment of local farm markets; mapping existing and potential agricultural activity in the Town;

buffering agricultural land and residential development to avoid future conflicts with essential farming activities, such as manure spreading, et al; and the adoption of a right-to-farm law.

## Roadways

Roadways, because they are the primary means of access to places, contribute significantly to defining its character and leaving strong impressions of such place. Of course, a road must also efficiently conduct traffic. A good roadway, therefore, possesses both utility and delight.

Currently, the Town maintains construction standards, applying to all new roads, which stipulate size and details of construction. In relation to the layout of new roads, the Town currently requires a site plan review to ensure the proper integration of the road to its surroundings. In addition to the construction of new roads, consideration is also given to the treatment of existing roadways. There are a great variety of road types and sizes currently with the Town which must be maintained by the Highway Department.

In view of the expense of highway improvement and maintenance together with the Town Board's concern that taxpayers are not burdened by future Town fiscal responsibility for substandard roads, it is advised that the Town Board develop a planning mechanism for future improvements of the Town roadways. Such a tool will be useful for prioritizing projects as well as to serve in an advisory capacity on associated details.

## Recreation

Adequate recreation supports the Town goal to encourage economic and social vitality. At present, there appears to be no shortage of recreation facilities and recreation lands in the Town. The Town park site and its facilities are supplemented by facilities at the Berne-Knox-Westerlo School and State-owned lands. However, there is a lack of swimming areas accessible to the public. The Town should attempt to secure a permanent swimming area for the benefit of and use by all Town residents.

This region is already a premiere recreational area for the Capital District, and it will become even more important in the future as the population in this area increases. Part of Thatcher Park lies within the Town, and a planned extension of the Long Path will pass through Knox. The Knox Game Management Area, owned by the New York State Department of Environmental Conservation, is a popular

hunting area, and the Nature Conservancy's Limestone Rise Preserve is an important destination for hikers.

Providing recreational opportunities for the Capital District may be a major opportunity for the Town. Most recreational land uses are relatively low impact activities, and so are gentle on the environment; by their very nature, they help preserve open space; and they provide opportunities for economic development. But as the population of the Capital District increases, use of existing recreational facilities will increase. To avoid overuse, the Town could increase the number and capacity of its recreational opportunities. The Town may also be able to benefit from increased tax revenues from recreational activities. Land for recreational facilities can be obtained through the subdivision process, particularly through the use of clustering and transfer of development rights. Communities can also purchase land or development rights, a process which can be facilitated through partnerships with land conservation organizations such as the Albany County Land Conservancy. Public recreational use of private land could be encouraged through appropriate zoning. The development of recreational support businesses could be facilitated through the use of floating zones.

## 6.3 Oversight

The Town Board should keep the Master Plan Committee active as an implementation working group to assist The Town Planning Board in the revisions to the zoning ordinance and subdivision regulations and to assist the Town Attorney and Town Board in developing legislation needed to implement these and other actions discussed in the Town Comprehensive Plan.

The Town should acquire the computer hardware and software to properly maintain and facilitate the various ordinances and information resources. This should include not only word processing software, but a database management capability and a geographic information system.

## APPENDIX A

## KNOX 1866 MAP

This map supplements the historical narrative in Section 2 of the Plan. It locates the buildings and sites referred to in this section. Early schools are labeled. Please refer to pages 2 through 27 for a description and explanation of the numbers shown on the map.

Map A

Map B

## APPENDIX C

## CULTURAL AND SCENIC RESOURCES MAP

The scenic views, corridors and areas shown on this map are a representative sampling of the many existing in the Town. They were chosen in part because of their accessibility from public roads. The historic sites are a preliminary listing; a more comprehensive survey needs to be done. Please refer to pages 58-65 of this Plan for a narrative description and explanation of the symbols used on the map.

Map C

Map D

## APPENDIX E

## AGRICULTURAL AND GEOLOGICAL RESOURCES MAP

This map shows the Albany County Agricultural Districts that lie within the Town of Knox, areas of Helderberg and Onondaga group limestone bedrock, and areas where soil depth to bedrock is less than one meter (about 39 inches).

The areas delineated as Thin Soils (Surficial Geology) are intended to show areas where the soil depth to bedrock is less than one meter. While this map gives a qualitative indication of the areas of thin soils, comparison with the much more accurate soils maps in Appendix G show that some large areas of very thin soils are not shown; the most significant omission is the area bounded by Witter Road, Street Road, Knox Cave Road and Pleasant Valley Road, most of which has a soil depth of less than 20 inches. Almost all of the areas indicated as having thin soils actually do have soil depths of less than one meter; an exception is the area to the east of Witter Road and south of Route 146, where, according to the soils map, the depth is mostly over 60 inches.

About half of the Town has limestone bedrock. As explained in the Geology section of the Comprehensive Plan, the karst geology associated with limestone bedrock can make it easy for the groundwater in those areas to become contaminated. Therefore, the safety of wells drilled into or through the limestone layers is a significant public health concern. The Town must be particularly concerned about areas where potential contaminants might enter the groundwater.

Because soil helps to filter and treat waste water and other water borne contaminates (from sources such as septic tanks, junk yards, leaking chemical containers, etc.) before it enters the limestone bedrock, it is areas where the limestone bedrock is covered by only a thin layer of soil that are of greatest concern. These environmentally sensitive areas are shown on the Agricultural and Geological Resources Map as the areas where the thin soils pattern overlaps the Helderberg and Onondaga Group bedrock patterns. The Town Conservation Advisory Council should work to more clearly define these environmentally sensitive areas, and the Town Planning Board should use this information when making decisions on subdivisions and clustering so as to prevent groundwater pollution.

Areas where thin soils overlie limestone bedrock also present problems for the construction of homes and other buildings. These areas are susceptible to sinkhole development. If a sinkhole were to open under a building, there would likely be serious and expensive damage to both the building and our groundwater resource.

In areas known as limestone pavement, where the soil is so thin that the limestone is essentially exposed to the elements, the limestone dissolves along natural cracks. Limestone pavement, with its dissolutionally enlarged fractures, presents not only very difficult foundation problems, but the Albany County Health Department will not permit construction of conventional septic systems in these environmentally sensitive areas.

In any plan to preserve agricultural lands, it can be helpful to identify and map the current extent of agricultural activity by mapping prime soils and existing viable farms. Prime soils are delineated in the detailed soil maps in Appendix G. Existing farms are identifiable from aerial photographs and through the expertise of Cooperative Extension and Soil Conservation District staff. Transparent map overlays of this information would be useful and could be prepared using the agricultural and geological resources map in this Appendix as a base. The loss of prime agricultural soils to residential and non-farm commercial development is an environmental problem that is frequently ignored. Once development on a prime soil occurs, the land is very unlikely to be recovered for agricultural uses.

Map E

# APPENDIX F

# APPENDIX G

Conventional and Special Symbols Legend

Map 8

Map 9

Map 15

Map 16

Map 17

Map 22

Map 23

Map 24

Map 29

Soil Legend

**APPENDIX H**
Soil Table

## APPENDIX I

## THE VERTEBRATE WILDLIFE OF KNOX, NEW YORK

with their preferred habitats

Compiled by Stephen Browne

This list of the vertebrate wildlife of Knox has been compiled as part of a natural resource inventory being conducted by the Knox Conservation Advisory Council.

The primary source for occurrence of amphibians, reptiles and mammals is 25 years of personal observation by the compiler, who is a wildlife biologist. Personal observation is supplemented by published sources and records from other field observers. The bird occurrence records are from the same sources. The primary published source for birds is The Atlas of Breeding Birds in New York State to which the compiler was a contributor. The fish occurrence records were supplied by Robert Daniels from research by him and others at the New York State Museum. This was supplemented by several Department of Environmental Conservation publications.

The habitat preference designations are based on personal experience in the field in Knox and on the following publications:


Roger Conant. 1984. A Field Guide to Reptiles and Amphibians of Eastern and Central North America.

Thurman Bishop. 1930. The Salamanders of New York.

Roger Tory Peterson. 1980. A Field Guide to the Birds.

William Burt and Richard Grossenheider. 1976. A Field Guide to the Mammals.

William J. Hamilton. 1943. The Mammals of Eastern United States.

This listing has several potential uses:

1. The list can be used to provide initial indications of what types of wildlife might potentially be affected by development in certain types of habitat.
2. Conversely, the list can be used to estimate what wildlife may be attracted or enhanced by creation or modification of habitats. For instance, building a small pond or wetland near a woods may attract gray treefrogs, but a similar pond in an old field will not.

3. The list can be used to help locate wildlife for viewing or study and indicates what species one may expect to encounter on rambles through Knox.

4. This list can assist in the identification of specimens. If animals are not on the list, extra care should be taken when establishing their identity. Presence on the list can enhance confidence in identification of specimens not familiar to the observer.

For the sake of simplicity, clarity and utility, only seven habitat types have been used:

W = Water
F = Forest
B = Brushland
O = Old field
P = Pasture
C = Cropland
L = Lawn

Water (W) as used here includes lakes, ponds, streams, marshes, swamps, etc. and their immediate environs.

Forests (F) are areas dominated by trees over 15 feet in height. No separation into deciduous and evergreen forests is attempted here, although some species prefer one over the other.

Brushland (B) is dominated by tree and shrub species under 15 feet in height.

Old field (O) habitats are reverting agricultural fields dominated by non-woody plants such as goldenrods, asters and various grasses. Old fields are often invaded by shrubs, like dogwood, and tree seedlings, like white pine or white ash.

Pastures (P) are primarily permanent grasslands which are usually grazed or mowed annually. These are sometimes being invaded by old field plants.

Cropland (C) is used here to designate agricultural fields that are harvested annually, whether they are in hay, rowcrops, like corn, or grass crops, like oats or wheat. It is not intended to include home vegetable gardens.

Lawn (L) as used here includes actual lawns and areas landscaped with trees and shrubs. Houses, barns and other buildings are also included in this category.

Preferred Habitats, as used here, are those areas providing the food, shelter and breeding conditions an animal must have to survive or which it uses if it has a choice.

Habitats change. If croplands are not harvested, they soon become old field habitats, then brushland, and eventually, forests. The transition can take as little as 50 years in our area. The different habitat types defined above change gradually and often blend into one another. The animals that use them also tend to change and some overlap occurs.

A few other introductory remarks need to be made to clarify the entries in the animal list. Many birds, being migratory, spend only part of the year in Knox. The 120 species of birds that breed in Knox are indicated with an asterisk (*). Among the other groups, it can be assumed they live year around in Knox. Some of the bats which migrate are an exception. Some of the other mammals (like bobcats and otters) may not now live year around here because they are scarce and travel extensively, but they may be seen in the Town at any time of the year. Although black bears are not included in the list and do not live in the Town on a regular basis, they do occasionally wander through, usually in the spring or early summer.

I hope this list proves helpful to the citizens and governing groups in Knox. Suggestions for corrections, additions or other changes to make the listing more useful are encouraged.

Knox Wildlife and Their Preferred Habitat

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