Phase I
Problem Seeking

Kingscott

Feasibility Study
Carver Public Schools

PHASE I MAY 2006

PHASE II JUNE 2006

Feasibility Study
School Facilities
Carver Public Schools
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I. Purpose of Feasibility Study

The purpose of the Feasibility Study is to identify and develop a series of concept planning options to address the short and long-term facility needs of the Carver Public Schools. With this study, the Space Needs Task Force and School Committee can adopt a master facilities plan, prioritize future facilities needs and propose future capital improvement plans to the Town.

The Feasibility Study will be divided into two phases. Phase I- Problem Seeking will define the problems to be solved and to which all concept planning options must be responsive. Phase II- Problem solving will be the identification and development of a series of concept planning options.

This first Phase- Problem Seeking will include: Student enrollment history and projections, assessment of current facilities, educational specifications and analysis of alternate sites. Taken together, this information as a whole, will identify the problem to be resolved.

Information for Phase I was obtained from the School, Town of Carver and numerous interviews with the District's Space Need Task Force, Central Administrators, Building Administrators, Teachers and Support Staff. The comments, proposals and conclusions are a majority consensus of those voices. There are some individual comments that are identified.

This Feasibility Study is undertaken now to put the Carver Public Schools in a position to make an application to the Massachusetts School Building Authority when the moratorium on state reimbursement for state funding of school building expires July 2007.

III. Assessment of Current Facilities

A. Edwin K. Washburn Primary School- Grades K-2

1. History and Current Condition

The building was built in 1975. The original building was a K-5 building designed for 450 students. It was a prototype one-story open plan system building built with plans purchased from the Town of Plymouth. In 1984 an 8-classroom addition was built. A double wide portable classroom was added in 1988. The square footage of the building is 64,392 s.f.

After the High School (Grades 7-12) was built in 1988 the Washburn Primary building, together with the Governor John Carver and Ben Ellis Elementary Schools served up to 1300 K-6 students. In 1998 the 6th grade moved to the High School site. After the school year 2002-2003 Ben Ellis was closed. Currently the Edwin K. Washburn Primary School serves grades K-2 with 8 of its classrooms used by the Governor John Carver Elementary, grades 3-5. There are 456 K-2 students with 35 Pre-school students housed at the Central Administration Building. There are 158 grade 3-5 students in the building, bringing the total enrollment to 614 students.

a. Site

- Size

The Edwin K. Washburn Primary School shares a 23.7-acre site with the Governor John Carver Elementary School. Located on Main Street (M-58) the site is landlocked by adjoining properties and the highway and is not practical to expand. By current standards the site is small for 979 students.

This problem is compounded by:

- Location and configuration of the current buildings and site elements
- The location of a Central Supply Building on the site.
- The current buildings do not accommodate the current or proposed educational program.

- Utilities

Storm Systems- The storm systems are adequate for the hard surface areas on the site. If any buildings or parking lots are added, the storm retention volume will need to be increased.

Sanitary- The sanitary system has a permitted capacity for 1,000 students (total for both buildings) at 10 gallons per student per day or 10,000 gallons per day. The septic tank has a capacity of 1 ½ times flow or 18,000 gallons. Any increase in the student population will require an upgrade of the sanitary system. Current code limits the peak flow to 10,000 Gallons per day for a septic system. Flows above this volume require a sewage treatment plant.

Water Utility and Fire Protection- The Primary Building has a single well (No. 2) with a 24" casing and gravel pack well screen. The well has 16 feet of partial 36" casing. The well depth is 28 feet with 25 feet of 24 inch casing. Well capacity is 100 GPM. This well has had a history of being contaminated. The pneumatic tank is 72" in diameter by 24 feet long. The capacity is 4,865 gallons.

- Sidewalk, Curbs and Walkways
  The sidewalk in front of the Elementary Building and the walkway to the Primary building has cracks. There is no barrier-free route to either building.

- Traffic Patterns
  The parent drop- off and pickup for both schools occurs in the front of the Elementary building. The Primary and Elementary buildings are entered and exited from a one-way drive off Main Street. This drive serves visitor parking, bus loop, staff parking, parent drop-off and service/ delivery. Cars that are parked in the visitor space can back out into the bus/ parent unloading traffic lane; this is a safety concern.

  Bus loading and unloading occurs in the bus loop in front of the Primary Building for students in both buildings. Four buses are unloaded at a time to avoid student traffic congestion. Service vehicles travel through the hard surface Elementary playground.

  Interviews with staff and administrators indicate the need to separate bus traffic, car traffic and service traffic. It is currently a safety concern.

- Parking
  Four parking areas, totaling 157 cars for visitor, staff and event parking, currently serve both schools.

  - Front of Elementary building- visitor parking (1BF) serves 11 cars.
  - North of Elementary building-Parking Lot 2 serves 40 cars for event parking and 15 staff during the day. This area is also the hard surfaced play area. It is a safety concern to use this area as both play area and parking. The visitor parking area also conflicts with the entering traffic and presents a safety issue.
  - West- service area staff parking 1BF serves 36 cars.
  - East Primary Building lot-staff and visitor serves 70 cars.
  - The staff indicated the preferred Staff Parking Lot was in Lot 3 in the Service Area. Parking occurs on the grass in this area. If Lot 2 is not used, since it is a playground area, additional parking is required.

    Each concept planning option will have its own solution to the traffic and parking issues.

  Parking lot and service drive condition- The paved areas of all 4 parking lots are in repairable condition. All parking lots have some cracks, which are open to the sub-surface. The sealing of cracks will prolong the life of the lots.

- Playgrounds/Playfields
  Playground areas are okay; some additional equipment would improve usage. Surfaces need to be improved to meet barrier-free and safety requirements. Currently the base under the playground equipment is sand. The Primary Building has playgrounds on the south and west sides of the building. Staff has indicated the equipment is not adequate to serve the student

population in the Primary School. Some used equipment is on hand but it has not been installed.

If the Pre-school program moves to this building, a separate fenced-in playground is required. Playfield areas are marginal. To access the playfields to the north, students cross the service/delivery drive(also use as the parent drive to the Before and After School Program) and parking, which is not ideal. As stated above, the hard surfaced play area is used for daytime parking as well as service/delivery drive and parent drive. This is a safety issue and should be eliminated.

- Fencing
  The west and north property lines have fencing as well as the city ball fields. For security reasons it is recommended that all child playground areas be fenced.

- Site Lighting
  The site lighting in parking lot 3 (service area) is not adequate. If lot 1 in front is expanded, additional lights are needed.

b. Building
The building is a one-story open plan systems building laid out on a 5 ft. x 5 ft. module. The building has 64,392 square feet of area. The building is clean and well kept. It has a cluttered look in the classroom areas due to a variety of storage systems and storage in the hallways.

- Building Envelope
  The roof is a single-ply membrane replaced in 1994. The 15-year warranty expires in 2009. If this building is renovated, remodeled and/or added onto, the roof should be replaced, and additional insulation provided to increase energy efficiency.

  The exterior wall is a modular unit with baked enamel finish, prefabricated insulated panels with steel or aluminum faces. The aluminum framed fixed windows are an integral part of the wall system. The panels are attached to the structural steel framing system. The exterior wall appears to have been repainted. The exterior doors should be

replaced. Interviews indicate the fixed windows are a problem. The inability to open windows results in the air conditioning running in moderate to cold weather, which is not energy efficient. If the power fails, the emergency generator does not have the capacity to run the air conditioning. The need for operable windows is high on everybody's list. The energy efficiency of the existing wall is low by current standards.

- Building Structure
  The structure is a steel frame with columns, truss girders, joists and steel roof deck. The structure appears to be sound.

- Interior Finishes
  The interior walls are prefabricated painted steel or aluminum modular panels. They were designed to be movable so spaces could be rearranged on a 5 ft. grid. Originally spaces were further divided with mobile storage and coat cabinets. Because the walls were intended to move, lighting control, clocks, receptacles, etc. were located in a fixed interior power panel serving each classroom and /or on the exterior wall. The ceilings in the 1975 building are a 5 ft x 5ft-vaulted module with a fluorescent fixture. In the 1984 addition these modules are flat. Both the wall and ceiling systems are no longer made and replacement parts are unavailable.

  Over the life of the building walls have been relocated, added and/or extended to the ceiling. Teachers have used various arrangements of fixed and movable equipment to divide and/or isolate teaching spaces. The original carpet flooring was replaced by hard surfaced vinyl tile. This increased the noise level and significantly changed the environmental quality of the building.

  The interviews indicated every one believes the open plan instructional areas are getting in the way of delivering a quality education program. The visual, sound and traffic distractions negatively impact teaching and learning. This serious issue is compounded by the use of space different than what was originally intended; for instance Art and Music

on a cart being taught in regular open classrooms. The need to add walls, doors and operable windows is a universal request. This change will also require a new ceiling system as well as modification of the mechanical system.

- Fixed Equipment
  The majority of fixed equipment in the classroom area needs replacement due to age and extensive use. If the classrooms become self-contained the type of fixed equipment will change. The staff interviews indicated the following concerns:

  - More staff and student storage in the classrooms.
  - Sinks and bubblers are needed in all classrooms.
  - Adequate size student cubbies in Pre School and K.
  - More general storage
  - Adequate boot, coat and backpack storage for students in the classroom and/or hall.

  The original Art and Music room are currently being used as general classrooms. Existing equipment in these rooms will need to be evaluated based on the planning concepts.

  In its present configuration the Kitchen is adequate, except it needs a new oven.

- Plumbing
  Plumbing fixtures- None are B.F. accessible
  Fixtures are as follows:
  - Water Closets
  - Lav's
  - Urinals
  - Electric water coolers
  - Drinking fountains
  - Units are repairable. Replace fixtures as required for B.F. access.

  Floor drains do not have trap primers;
  Drains do not meet current codes.

Sanitary Piping- The building is served with PVC piping below grade and cast iron piping above grade. The condition is acceptable.

Acid Waste System- None

- Heating, Ventilating and Cooling
  Heating Plant- The building is served by one hot water boiler. Boiler was installed in 1975; boiler is repairable but the efficiency is low- 65%. The boiler capacity is 420,000 BTU.

  Air Conditioning- The building is air conditioned except for the Gymnasium.

  Roof Top Air Handling Units- Spaces are served with the following air handling units with gas-fired heating and DX- cooling.
  No. 1- Roof top unit requires replacement
  No. 2- Replaced in 2001, serviceable condition
  No. 3- Replaced in 2004, serviceable condition
  No. 4- Replaced in 1999, serviceable condition
  No. 5- Replaced in 2000, serviceable condition
  No. 6- Original Unit requires replacement
  No. 8- Portable Classroom heat pump, serviceable condition.

  Roof top unit No. 7 is gas-fired heating only unit. This unit serves the Gymnasium and should be replaced with an AC unit.

  A possible solution is to replace units 1, 6 and 7 with the same equipment and the same configuration. Under this arrangement, the Gym would not be air- conditioned. Units 1 and 6 are multi- zone units with a heated air source and a cooling air source. Air dampers are used to regulate the mixing of these two air sources to get the required temperature of air supply to the building classroom zone. This is very energy inefficient and is not recommended for any new construction.

  Diffusers and registers are serviceable unless ceilings are changed or rooms are divided.

Ductwork is serviceable. Ductwork needs to be cleaned.

The interviews indicate the majority of staff believes the Primary Building is an unhealthy building. They cite the following conditions:

- The absence of and/or uneven air distribution. This is caused in part by alterations to walls in the building.
- Uneven and uncomfortable temperatures.
- Continual dust in the air
- Non-operable windows.

They believe there is a demonstrated loss of staff and student class time due to illness.

- Fire Protection
  The building is not fully sprinkled.

- Electrical
  Service
  - Consists of A 3P 1200 Amp 277/480 volt 3 phase 4 wire service.
  - 1200 Amps= 997,200 Volt Amps
  - Main Distribution Panel is "Federal Pacific" with spare spaces.
  - Building is air-conditioned, except gym.
  - 64,392 SQ. FT. at 9 Volt- Amps = 579,528 Volt Amps
  - Service is adequate.
  - Service will support an addition up too 46,419 SQ. FT. or it will serve both the primary, the Elementary School (38,938 S.F.), plus an addition of 7,481 SQ. FT.

  Lighting
  - Site lighting is inadequate- Refer to civil review.
  - Building lighting- T-8 fixtures with electronic ballasts have been installed in all rooms in the building. Lighting is adequate.
  - Occupancy Sensors- None
  - Light Harvesting/ Controls- none

Power

- Power Distribution, panel boards, breakers, spare circuits, feeders; system is inadequate
- Power Receptacles and grounding system is inadequate.
- Transient Voltage Surge Suppression- No protection on main distribution or local panel boards.

Life Safety

- Fire Alarm is a Simplex 2001 Atlas Alarm; system does not meet current codes.

Emergency Generator

- The generator is natural gas powered. Roof top units are not connected to the emergency generator.
- The following items are connected to the emergency panel: Exit signs, freezer, cooler, and perimeter heating system.

Specific Systems
The Classroom Computer Drops System is inadequate, per C.R. required 5 drops. The Clock System is inadequate; the Computer Lab System is inadequate and open to the hallways. The Sound Systems in the Cafeteria and Gymnasium are also inadequate.

The interviews indicate the staff wants more electrical power in each teaching station- a minimum of 5 duplex outlets in each room.

2. Meets current building codes and standards.

   a. Fire Safety

      - If the building is remodeled to provide walled in teaching stations with doors, several changes may be required by current code:

        - Additional exit/hallways with exterior exits.

- One hour rated walls/doors between teaching stations and hallways and/or a fire suppression system.
- Rated wall separation of storage, work, custodial, service, kitchen and mechanical/electrical areas.
- Separation of IMC and Cafeteria from hallway.
- Emergency window exiting in teaching stations without exterior exits.

- New fire alarm system will be required, to meet current code.

b. Health
   - Based on recent inspections the Kitchen meets current codes.

c. Mechanical
   - HVAC- Refer to previous section.

   - Plumbing-Refer to previous section.

   Toilet rooms will need to be revised to meet the barrier-free code. Pre-Kindergarten and Kindergarten classrooms shall have toilets in classroom.

d. Electrical
   Refer above to previous section.

e. Barrier-Free
   Any remodeling will need to meet barrier-free code.

f. Energy
   The building is not built to current state standards. As previously stated, when the roof is replaced, additional insulation should be installed. The long term savings will not justify replacing the existing exterior wall system, except installing new windows.

   Refer to previous section for energy savings associated with mechanical and electrical systems.

3. Meets needs of School's educational program and projected enrollment.

a. The Primary school and the Elementary school essentially act like one building because of shared space, program and staff. 8 classrooms in the Primary building are used to house Elementary third and fourth grade students. Students from the Elementary use the building's Library/Media Center, Computer Lab, Gymnasium and Cafeteria. There are 456 K-2 students in the building and 158 grade 3-4 students for a total population of 614 students. 2 Pre-school classrooms are housed at the Central Administration Offices.

b. The building has exceeded its capacity to accommodate the current educational program and student enrollment.

- The original Art and Music rooms have been converted to regular classrooms. Art and Music are taught on a cart traveling to the regular open plan classroom.
- The Library/Media room has been divided to accommodate a Computer Lab, Special Education classroom and Title I office/teaching station.
- Some teachers do not have an assigned teaching station or home base: OT/PT; Speech/Hearing; Special Education.
- Some teachers are in inadequate spaces: Title I; Special Education; Psychologist; Adjustment Counselor
- Administration area is inadequate; poorly laid out.
- There are no conference areas.
- The current 5 lunch periods negatively impacts the educational program.

c. The open plan classroom area creates significant distractions to learning and teaching. It is a universal request to enclose the teaching stations to provide quality education.

d. Any increase in enrollment and/or enhancement of the educational program will magnify these defiencies.

4. Meets the requirements of the Massachusetts School Building Authority: (MSBA)

The MSBA is responsible for receiving and approving community grant applications for school capital projects. With the revised School Building Grant Program, the current

moratorium on state assistance is scheduled to expire July 2007. At that time, the MSBA will again accept applications based on a new preliminary "Needs Survey" of all locally owned school facilities in the commonwealth. In this "Needs Survey" the condition of each school building is ranked on a scale of 1 to 4 as follows:

1. Equals good condition with few or no building system issues.
2. Equals generally moderate condition, a few building systems may need attention.
3. Equals approaching poor condition and some building systems may need attention.
4. Equals poor condition with multiple building systems needing repair or replacement.

This ranking will be used in determining the priority in which applications are accepted. The other criteria are Student Enrollment and whether the school's educational program is being negatively impacted by its facilities.

The preliminary "Needs Survey" ranking by the state for the Primary Building was 2.

In addition, the MSBA sets guidelines for the state reimbursement based on overall size of the building for the number of students; maximum and minimum size of rooms; cost of construction; etc. Based upon an appropriate number of students, the size of the Primary building and its individual rooms generally meets MSBA standards.

B. Governor John Carver Elementary-Grades 3-5

1. History and Current Condition

   The building was built in 1951. It is a two-story building where you enter at mid-level on the northeast (Main Street) and on the lower level on the south and west. In 1957 a two-story addition was added to the northwest with classrooms on the upper floor and a Cafeteria and Kitchen on the lower level. Currently, Governor John Carver Elementary serves grades 3-5. Of the total enrollment of 528 students, 365 are housed in the Elementary and the remaining 158 at the Primary building.

   a. Site

      See above comments under the Edwin K. Washburn Primary School.

   b. Building

      The building has an area of 34,618 square feet. It is a double-loaded corridor design except for the open Gymnasium at the center of the lower level. The Gymnasium's floor is sunk below the lower level floor; accessed by stairs and two chair lifts. The building is clean and well kept. However, if this building becomes part of the Schools long-range facilities plan, the total Mechanical, Electrical and Technology systems need to be replaced.

      - Building Envelope

        The existing single-ply roof was replaced in 1994. It has a 15-year warranty, which expires in 2009. If this building is remodeled, the roof should be replaced with added insulation to increase energy efficiency.

        The exterior wall is masonry with a brick and stone exterior. The majority of windows were replaced in 1996/1997. The remaining original windows should be replaced. The exterior wall is in good shape except the exterior doors, which should be replaced.

      - Building Structure

        The building has masonry bearing walls and poured reinforced concrete floor and roof structure. There are a few interior concrete columns. The structure appears sound.

- Interior Finishes
  The building interior is showing its age. It needs to be refurbished. The exposed concrete floor and roof structure provide classrooms, hallways and offices with wonderfully high ceilings and large window areas. However, together with hard tile floors, the buildings acoustics are poor. The majority of interior walls are masonry and/or plaster on masonry.

- Fixed Equipment
  The existing fixed equipment, because of its age and extensive use, needs to be replaced. The staff interviews indicated the following concerns:

    - More staff and student storage in the classroom.
    - More general storage.
    - Adequate student boot, coat and backpack storage in hallway or classroom.
    - 5th grade classrooms equipped for science.

  In its present configuration, the Kitchen is adequate, except provide new steam kettle.

- Plumbing
  Fixtures are as follows:
    - Water Closets
    - Lav's
    - Urinals
    - Electric water coolers
    - Drinking fountains

  Units do not meet B.F. code requirements.

  Floor drains – Do not have trap primers.

  Sanitary Piping- The building is served with cast iron piping below grade and cast iron piping above grade. The condition is unacceptable in the 1951 building.

  Domestic Water Piping- Hot & Cold- The piping is located above the ceiling. The piping is 55 years old and has internal corrosion.

- Heating/Ventilating and Cooling
  Heating Plant- The building is served by two steam boilers, which were installed in 1985 +/-. Controls were upgraded in 2004. A steam distribution system secures the 1951 building. Pumps are serviceable.

  Air conditioning- None

  Unitary Terminal Equipment- Cabinet heaters are installed in the entryways; Units have exceeded their useful life. Unit ventilators are installed in all classrooms; Units have exceeded their useful life.

  Heating Piping - Heating piping (steam piping) is above the ceiling. Condition is serviceable for steam system.

  Exhaust Systems- Roof exhaust fan is used to exhaust toilet rooms; condition is serviceable.

  Temperature Controls- The building has a pneumatic control system. The supplier is Johnson Controls. The system needs to be upgraded.

  Domestic Hot Water Heater- The domestic hot water heater is a gas-fired water heater. The unit is the original, 1951 heater with insufficient capacity. The building domestic hot water pump needs to be replaced.

- Fire Protection
  The building is not fully sprinkled.

- Electrical
  Service
  - Consists of a 2P 400 Amp 220 volt 1 phase 3 wire.
  - 400 Amps= 88,000 Volt Amps
  - Building is not air-conditioned.
  - 38,938 SQ. FT. at 8 Volt- Amps= 311,509 Volt Amps required.
  - Service is inadequate- Replace the service to support technology and air conditioning.

- Service will support an addition up to 0 SQ. FT.

Lighting- Site lighting is inadequate. Refer to Washburn Primary Site Description. There are no occupancy sensors and no light harvesting/ controls.

Power-Power Distribution, panel boards, breakers, spare circuits and feeders; system is inadequate. Power Receptacles, grounding, system is inadequate. Transient Voltage Surge Suppression- No protection of main distribution or local panel boards.

Life Safety- Fire Alarm is Simplex- Atlas. System is inadequate per current code. Emergency Lighting system is inadequate.

The interviews indicate the staff wants more electrical power in each teaching station; a minimum of 5 duplex outlets.

2. Meets current building codes and standards.

   a. Fire Safety
      - If this building is remodeled to provide long term use and the value of the remodeling is 50 percent of its present value:

        - Existing stairs, if retained, would need to have rated enclosure; exit directly to exterior; revised tread width and riser heights.

        - Gymnasium needs to be separated from hallways, entrance and exits. Its location and floor elevation make it not practical to remodel the Gymnasium in its present location. In addition, its present size is inadequate to provide 2 teaching stations as required by your program and does not meet MSBA standards.

        - All storage rooms, mechanical/electrical, work rooms and maintenance areas need to have rated enclosures.

- New fire alarm system will be required.

b. Health
   - Based on recent inspections the Kitchen meets current codes.

c. Mechanical
   Refer to previous section.

d. Electrical
   Refer to previous section.

e. Barrier-Free
   An elevator was added to the building; access to the elevator is marginal. The main entrance to the building is not barrier-free. Toilet rooms need to be redesigned to meet code.

   A revised stairwell design should allow refuge area for the physically impaired currently required by code.

   Existing chair lifts would be removed if existing Gymnasium was relocated and existing gym floor raised to the lower level floor.

   Any remodeling must meet barrier-free code.

f. Energy
   If the roof is replaced it will provide added insulation to increase energy efficiency.

   Refer to previous section for energy savings associated with mechanical and electrical systems.

3. Meets the needs of School's educational program and projected enrollment.

   a. See the above comments about shared space, program and staff with adjacent Primary School. The additional impact of this problem for the Elementary is the lost instructional time for the teacher and student when traveling to and from rooms in the Primary; especially in inclement weather.

b. The building has exceeded it's capacity to accommodate the current educational program and student enrollment:

- There is no Art or Music room. Art and Music are taught on a cart traveling to the regular classrooms; to both buildings.
- Students travel to the Primary School for instruction in Library/Media, Computer and Physical Education.
- Gymnasium is inadequate and presents safety concerns.
- 8 classrooms of 3rd and 4th grade students are at the primary; 158 students.
- Teachers that do not have an assigned teaching station or home base: OT/PT; Speech/Hearing, Special Education
- Teachers that have inadequate spaces: Title I; Psychology; Adjustment Counselor.
- Administration is inadequate. The Principal is located on the upper level, the Assistant Principal on the lower level. Administration does not have visual control of main entrance, which is a security concern. Administrators are in charge of teachers and students in two buildings.
- The Nurse's Office is inadequate and has experienced plumbing problems.
- There are no conference rooms.
- The current 5 lunch periods negatively impacts the educational program.

4. Meets the requirements of the Massachusetts School Building Authority (MSBA).

   The preliminary "Needs Survey" ranking by the state for this building was 3. Both Kingscott and the School Central Administration believe this building should be ranked 4-poor.

   The existing classroom meets MSBA guidelines for size. All other teaching stations do not meet minimum size standards.