Constructing the Third Teacher

New Jersey's Center-based Facilities for Low-Income Children

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1. Introduction

To state the obvious, center-based child care programs require a physical space in which to deliver their services.[1] The scarcity of licensable space is a recognized problem contributing to localized supply shortages. Less attention is paid to how a center's built and natural environments contribute to, or undermine, a child's development. There is often a tacit assumption that the physical environment has little impact on a child's development. Yet, this report argues, New Jersey's most vulnerable young children, during the most developmentally critical period of their lives, often spend half their waking hours in physical settings that limit the ability to achieve the programmatic quality and positive child outcomes that early childhood professionals and advocates seek. This report examines the relationship between the qualitative character of child care facilities and early childhood development as well as the role public policy could play in creating better environments for young children, especially those low-income children raised amid concentrated poverty, and their caregivers.

The Assignment

The Maher Charitable Foundation has been a leading philanthropic supporter for improving the quality of early childhood education in New Jersey's low-income communities. It has taken a unique interest in the physical conditions of child care centers, focusing both on the suitability and supply of facilities. In recent years, the Foundation made significant capital grants to rehabilitate and expand several early childhood centers. Its growing familiarity with the impact facilities have on early childhood development has prompted its interest in identifying strategies that address the physical barriers to quality early education and to formulate policy responses proportional to the scale of the challenge.

> ***The state's most vulnerable young children, during the most developmentally critical period of their lives, often spend half their waking hours in physical settings that limit their ability to achieve positive child outcomes***

New Jersey has been an innovator in adopting early learning as a lever to address educational injustices caused by racial segregation and economic inequality. Programmatic quality is a critical variable in closing the academic achievement gap. The Foundation's growing experience suggests that the

[1] This report largely overlooks distinctions based on funding or the characteristics of the organizations, businesses or institutions that deliver early care and education services. Therefore, unless otherwise identified, this report uses the terms *child care*, *early education*, *early learning, child development* and similar phrases interchangeably to describe the services delivered in center-based programs for children birth to five.

availability of appropriate physical facilities continues to be a factor limiting the state's ability to improve academic performance in low-income communities.

The Foundation commissioned this report to gather more information about the prevalence of these facility quality issues; to develop a deeper understanding of the physical attributes that contribute to positive child development, and to explore potential strategies that can expand the supply and quality of early childhood facilities in New Jersey.

Many parents choose Family Child Care, because of its in-home setting, the small number of children and families who are cared for, and its homey ambience. The dual use of the provider's home for a business reduces capital needs and creates a business tax deduction for the provider. While a provider may need to make some capital investments in fencing, accessibility, or miscellaneous repairs, for example, family child care's capital needs are fundamentally different in kind, scale, and structure from those of center-based settings. Therefore, this report focuses exclusively on the capital-intensive requirements characteristic of center-based programs.

The Framework

The term "environment" in early childhood programs typically alludes globally to how a center supports healthy child development. Indeed, the most widely used tools for measuring quality are the series of *environmental* rating scales (ERS) originally developed by Thelma Harms and Richard Clifford. In the ERS, environment refers to everything from personal care routines, programmatic activities, and aspects of the caregiver's interactions with children. These are critical sources of process quality. However, the space and furnishings subscale – the portion of the tool that most obviously refers to the physical environment – contains only a few generally described observations about the built and natural environment. The subscale is mostly about room arrangement, materials, and furnishings. In other words, the subscale measures how programs equip and use the space, not the built environment and its effect on space utilization. To focus on the physical environment, it is helpful to divide a center's environment into four components: the organizational, physical, programmatic, and interpersonal environments.

This report deconstructs the global notion of environment in the early childhood field. It differentiates between four interdependent environmental categories: the organizational, the physical, the programmatic, and the interpersonal environments.

The ***physical environment*** embraces a center's built and natural elements – the land and building. This is the asset typically purchased or leased as real estate. The built component of the physical environment does not include furnishings and equipment, except for those that are built in, such as cabinets and counters. Outdoor play structures, since they are secured to the property, are treated as part of the physical environment, as is fencing, paved walks and parking areas. The natural elements of the physical environment consist

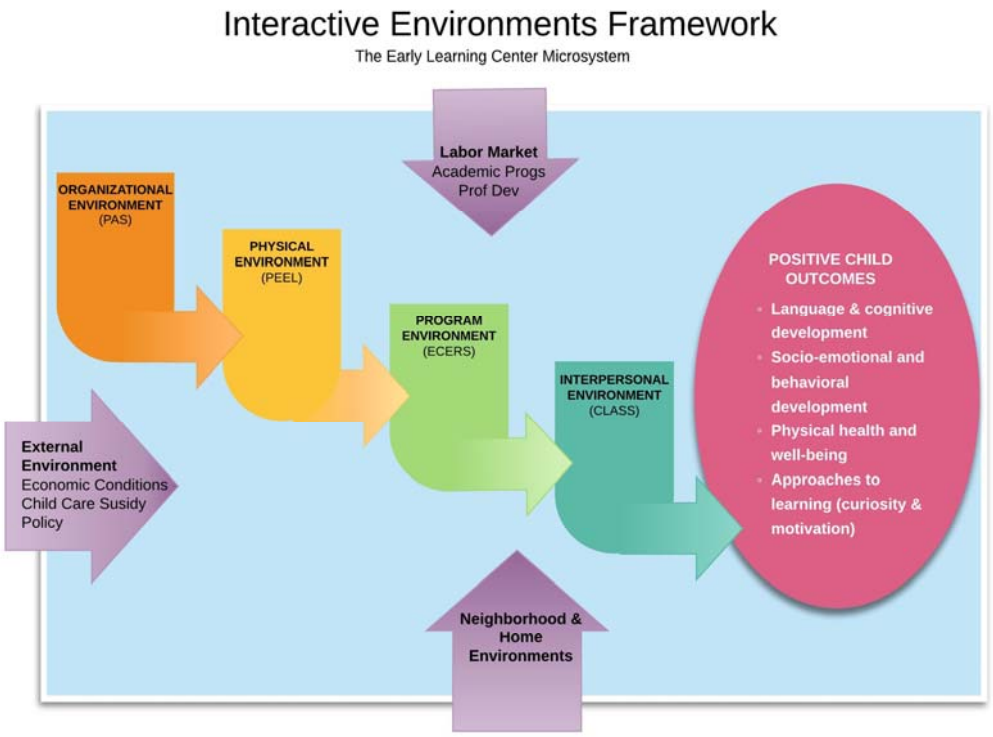

Figure 1: *The Interacting Environments Framework, illustrated here, places the early learning programmatic environment in a larger context of factors that influence the quality of a child's experience and relationships. Elizabeth Jaeger and Carl Sussman developed this framework to illustrate the environmental structure of child development centers and the larger context within which they operate.*

of the land, including the physical features – trees, plantings, rock outcroppings and other topographic and landscape features. *Physical Environments for Early Learning* (PEEL)[2] is a tool for measuring the quality of a center's built and natural environments.

The ***organizational environment*** incorporates the center's business model, operating policies and procedures, leadership, and corporate culture. The organizational and physical environments are part of the supportive infrastructure required to deliver strong programs and build nurturing relationships. A center's primary functions are carried out in the ***programmatic*** and the ***interpersonal*** environments. These four environments operate interdependently as a single dynamic system.

[2] C. Sussman, et al. (2013). *Physical Environments for Early Learning: A Rating Scale for Center-Based Programs*. Newton: MA: Author.

2. The Physical Environment: Its Importance and Challenges

Loris Malaguzzi, the founder of the Reggio Emilia preschools, referred to the classroom as "the third teacher." The initial insight conveyed with this metaphor is that children learn by interacting, not only with parents, teachers, and peers. Children also learn by interacting with their physical environment.

Malaguzzi's metaphor connotes an additional meaning. Certainly, one of the foremost design challenges for an architect planning a child care center is how to configure classrooms to make it humanly possible for staff to supervise and nurture the number of children that approach the staff/child ratios stipulated in New Jersey's licensing regulations. How can one adult adequately care for 5 or 6 children aged 18 months to 2½ years? Or 10 to 12 four-year-olds? The physical contours and features of the space they use should be designed to function like an additional pair of adult hands. But how is that possible?

Affordance is one answer environmental psychologists might suggest. The term "affordance" refers to characteristics of a place or an object that elicits behaviors. When they interact with an environment, people perceive cues that influence how they act and behave. In other words, the environment "affords" or lends itself to certain uses and behaviors. An evaluation of child care centers constructed or renovated with capital grants from the state of Massachusetts, for example, discovered that children were on average spending 20 minutes more each day in gross motor activities. The researchers noted the addition of indoor multipurpose spaces and improved playgrounds as enabling this change. Affordance is one important pathway through which the physical environment can enhance the programmatic environment.

In studying child care center environments Sybil Kritchevsky and Elizabeth Prescott found the, "clues to the need for spatial improvement primarily…in teachers' and children's behavior. Tired or irritable teachers; apathetic, hyperactive, or uninterested children; high noise level; large amounts of time spent in routine management; and excessive use of teacher-directed activity, all have a high likelihood of being spatially induced."[3] They found that by changing the physical environment they could solve behavioral challenges. A long corridor invariably prompts young children to run. Kritchevsky and Prescott encountered this phenomenon in a classroom they studied. They resolved the problem by reconfiguring the space to reduce the length of a pathway within the classroom. In other words, a maladapted facility can interfere with programmatic goals. The converse is also true; a well-designed space can facilitate programmatic goals.

Architects experienced in designing early childhood facilities understand the challenges users of these environments face. With a reasonable construction budget, they can design space that might feel as though there is a third teacher in the classroom since teachers cannot always be available to interact on a one-on-one or small group basis with all the children in a classroom. The physical environment needs to support children to engage safely in self-directed play, to partake in positive peer interactions, and to exhibit age-appropriate independence. In short, the physical setting can facilitate certain behaviors and

[3] Kritchevsky, Sybil and Prescott, Elizabeth, with Walling, Lee (1977) *Planning Environments for Young Children: Physical Space.* Washington, DC: NAEYC, p. 42

interactions while hindering others. It shapes program quality, child development and the inherent rewards or burdens of teaching young children.

Unfortunately, for much of the early childhood industry, finances dictate that the physical environment be treated as a cost center to be contained rather than an investment in productivity and a source of value. Occupancy is typically the second largest expense category in a center's operating budget. Given the slim operating margins, when establishing a new center or relocating an existing one, the site-selection decision-calculus is driven by the need to minimize the occupancy cost. Three critical variables govern cost:

- The market value of the property determined by location, market demand and physical condition,
- the construction or rehabilitation expense required to license the facility, and
- the amount of space purchased or leased.

These factors usually translate into acquiring or renting space in:

- an existing building designed for some other use,
- located in a sub-prime location,
- undertaking as little renovation as possible and
- minimizing classroom size, space for internal circulation, storage, and administrative offices.

Finding such a site with room for a playground further narrows the options. Balancing all these factors results in classrooms that rarely have much more than thirty-five square feet per child; hence the problem many New Jersey community-based programs faced in meeting the New Jersey PreK space requirements. It is not surprising, therefore, that center-based facilities are inherently ill-suited to early childhood programming. The sponsoring organization's financial condition compels decisionmakers to ration scarce operating dollars, prioritizing more immediate needs over those associated with the building, including its maintenance and repair. In other words, finances – inadequate revenue and capital – is the factor shaping these environments.

For the most part, academics, practitioners, advocates, and policymakers have yet to fully grasp the potential impact a well-planned and financed physical environment can have on program quality. In today's early learning centers, it is often impossible to find evidence of a skilled and helpful "third teacher." Most center-based programs occupy jury-rigged, poorly adapted, low-cost space, in cramped residential structures, outdated school buildings, forlorn strip mall storefronts, and, even to this day, church basements. These buildings can be made sufficiently safe and healthy to be licensable, but not adequately adapted to meet the unique demands of caring for groups of very young children. So, these environments not only impede child development and education, they can also be crowded, loud, burdensome, and frustrating workplaces for poorly paid educators who spend long hours doing a physically and emotionally demanding job.

What are the signs of this third teacher's presence? These are the characteristics most frequently cited:

- **Plumbing System:** Having bathrooms directly adjacent to and accessible from each classroom, rather than boys' and girls' bathrooms shared among all the classrooms on a corridor, has an enormous impact on programs. It resolves coverage difficulties; leaves more time for children to engage in classroom activities and nurtures independence and self-reliance. Classroom handwashing sinks are important for good health and hygiene. Their presence can also support many classroom experiences. An adult height sink is equally as important.
- **Space:** Too little space causes crowding, limits activities, and contributes to behavioral and classroom management challenges. Licensing requires 35 square feet of usable classroom space per child. This is inadequate. The New Jersey PreK 50 square feet standard is much better, but rare. This quantitative benchmark, though, is only one attribute of physical space. Indoor spaces are three-dimensional and have important qualitative characteristics that affect the way people experience these settings. A room's shape, ceiling height, window placement and artificial lighting scheme all influence its character and utility. The typical classroom is a rectangular box that is poorly laid out to accommodate the variety of activities that take place within it.
- **Natural playground:** Being outdoors provides opportunity for exuberant play; something children must hold in check while in the classroom. It is also the setting that should allow children to experience and explore nature. It is common, especially in more urbanized neighborhoods, to find playgrounds that are flat, covered in some combination of synthetic materials, and with one centrally placed climbing structure. Natural playgrounds provide a more stimulating and sensory-rich playscape that lend themselves to many more varied experiences.
- **Auxiliary activity areas:** While transitions can be difficult, having children spend most of their waking hours in one room is limiting. Early childhood centers need auxiliary activity areas within the building. The most common is a multi-purpose space that can accommodate gross-motor activity in bad weather as well as other special events and projects. Special purpose spaces, such as an area for cooking projects, can further enrich the experiences available to children while in preschool.
- **Ambient environment**: Rarely do early childhood centers address ambient conditions, especially natural and artificial lighting, indoor air quality, and acoustics. With respect to natural light, for instance, the national health and safety performance standards for early care and education programs states that natural light should be available in any room that a child occupies for more than two hours and that the windows should be at child's eye level to "provide a variety of perceptual experiences of sight, sound, and smell, which may serve as learning activities for children and a focus for conversation. The visual stimulation provided by a window is important to a young child's development." Sadly, many classrooms do not satisfy these requirements. Since many centers are in older quarters without, or with poorly maintained, mechanical ventilation systems, there has long been concern about indoor air quality. Air quality affects respiratory health; an issue that is receiving more attention because of the coronavirus pandemic. Acoustical conditions too do not receive the attention they need.

For a more thorough exploration of these issues and the way they impact program quality and, presumably therefore, child outcomes, see appendix D.

The situation is not hopeless. There are public policies that can deliver resources to mitigate the financial conditions that cause an underinvestment in the physical environment of early learning settings.

3. The Physical Environment: A Vehicle for Enhancing Child Development

This report begins by stating the obvious: center-based child care programs require dedicated physical space to deliver their services. Yet their capacity to pay rent or service debt is extremely limited. They also lack the capitalization to purchase or build out space that satisfies the higher design standards described in the preceding section of this report and in Appendix D. Because of these financial constraints, with only rare exceptions, center-based early learning facilities that provide care to low-income children remain in crowded and largely unimproved spaces originally designed for other purposes. The business model and financial structure of programs serving low-income children simply will not support more than the most minimally satisfactory environments.

A few foundations and state governments, however, have created facility financing programs to overcome, or at least mitigate, the financial barriers centers face securing or enhancing physical settings for children. The goal of this exploration is to formulate a financing proposal New Jersey might adopt to enhance the physical environment and measurably improve child outcomes. The hope is to envision an approach with a sufficiently deep capital subsidy to enable centers to design an optimal play-based experiential learning environment from scratch instead of defaulting to the prevailing institutional school building paradigm critiqued in Appendix D.

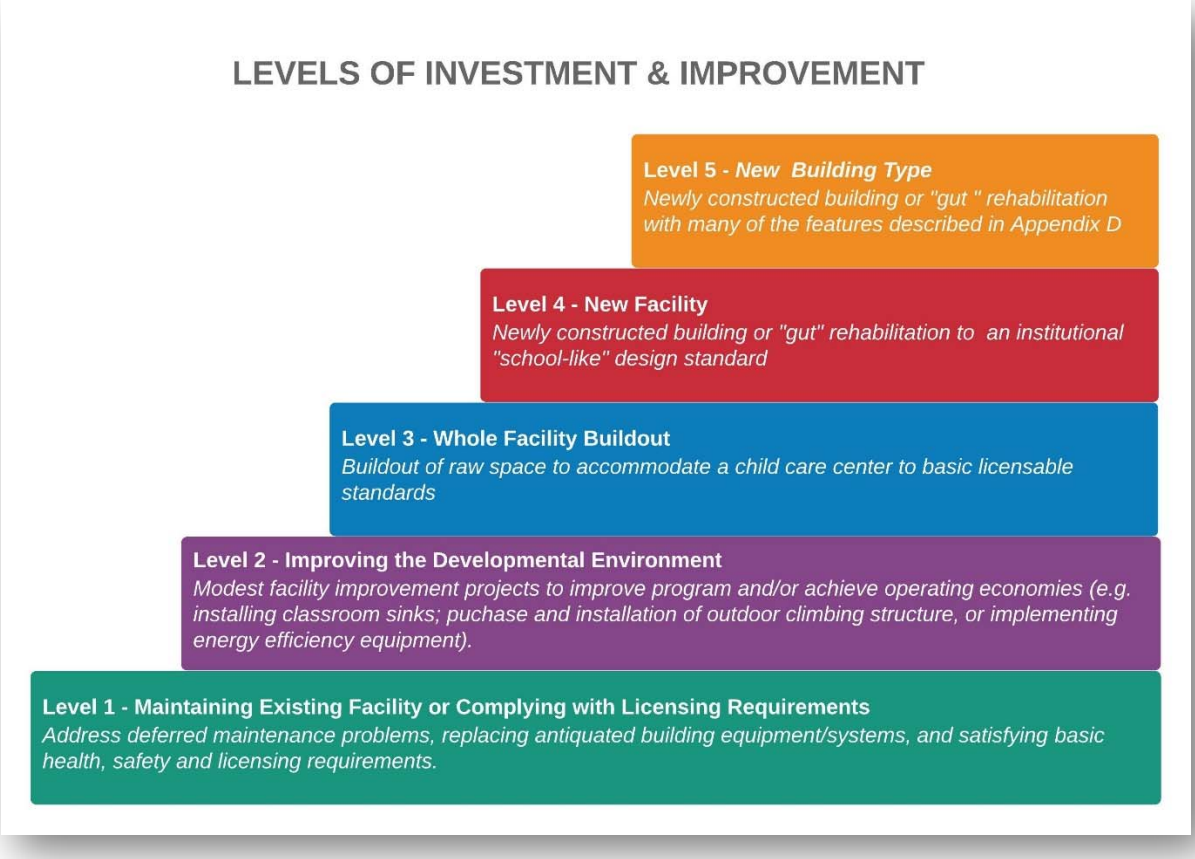

Figure 2: *The quality of physical space runs along a continuum. It improves with deeper levels of capital investment.*

There have been widely scattered but noteworthy initiatives to fund improved physical settings. While most were never intended to fund a transformational level of investment, these funding mechanisms add to our understanding of strategies that could bring cutting-edge facilities within reach. Figure 2 depicts a way to categorize the level of improvement various funding programs make possible.

- **Level 1** – The most rudimentary improvements enable cash-strapped centers to address deferred maintenance issues and satisfy or maintain the regulatory conditions required of licensed facilities.
- **Level 2** – With a little more investment centers can enhance the activities available to children and/or establish a more financially sustainable operating condition. These are limited but yield noticeable modifications although they are not extensive enough to be apparent throughout the building. Examples include the addition of a sink to a classroom or replacing the HVAC system with a more effective and energy efficient one.
- **Level 3** – At the next higher funding strata, a program can make basic, but center-wide improvements, such as the buildout required to convert raw commercial space into a new licensable child development center. The scope of work would produce newly configured classrooms and administrative space, but the funding would be insufficient to provide bathrooms in every classroom or some of the desirable auxiliary activity areas described in Appendix D.
- **Level 4** – Still higher levels of investment can support a newly constructed or completely rehabilitated building. The product would be equivalent to a budget-constrained school-like institutional structure but including a few features that reflect the special requirements of a facility serving pre-K children, like a bathroom in each classroom and a multipurpose room. The scope of work would typically include completely or substantially new interiors and building systems – plumbing, electrical, HVAC, etc. – and the administrative facilities to support the program.
- **Level 5** – The most capital-intensive projects can be as comprehensive as level 4 in terms of building systems but would incorporate many of the transformative design features spotlighted in Appendix D. For example, the funding would support more non-classroom auxiliary activity spaces, such as an art studio, and at least 50 square feet of usable classroom space per child. Outdoor play spaces would allow the center to offer a wide variety of activities with many natural elements and varied terrain. The configuration of classrooms would depart from the rectangular box that is the norm in school-like buildings. Instead, classrooms would have a more architecturally complex configuration to encompass a wider variety of physically delineated activity areas. Special attention would be given to the indoor environmental quality, especially thermal comfort, air quality, acoustical conditions, natural light, and varied artificial lighting. The building would also provide improved working conditions for teaching professionals, including a dedicated and well-equipped breakroom as well as workspace for curriculum planning and documentation.

Philanthropic Capital

Working up this 5-level continuum, the investment per square foot increases from modest to very costly. Because of the scarcity of capital for center-based programs, each funding interval results in much needed improvements.

Charitable institutions and individuals have stepped forward with capital grants, sometimes in partnership with local government. This has been an important, and sometimes the only, source of capital for nonprofit organizations.

Capital campaigns can work for larger and well-established nonprofit child care and multiservice organizations. To tap into private philanthropy, organizations depend on at least some internal fundraising capacity, because, to succeed, nonprofits generally need to have cultivated individual donors over years and established relationships with foundations. This is a financing strategy that works for a relatively small cohort of programs.

Some foundations have made significant grants to intermediaries. These nonprofit intermediaries regrant or lend the capital to multiple child care organizations to address facility needs and can reach a larger group of centers that may have limited fundraising capacity and experience.

In 2003, for example, the William Penn Foundation launched its 5-year Child Care Initiative (CCI) in partnership with the City of Philadelphia and several other funders. They raised $17 million, including $5 million from the city. The funds flowed through the Nonprofit Finance Fund (NFF), a community development finance institution (see sidebar for a description of CDFIs). CCI funding permitted NFF to provide business technical assistance in addition to grants and loans. By the end of 2007, NFF made 53 capital grants. The grants of $10,000 to $50,000 were used to maintain and improve facility quality, and to marginally expand enrollment. These grants were sufficient for recipients to undertake level 1 and 2 projects. NFF also made 5 loans ranging from $75,000 to $1 million, although two of these were working capital business loans. Facility loans of that size are sometimes sufficient to support level 3 projects.

CDFIs

Community development financial institutions (CDFIs) are nonprofit organizations funded by the US Treasury Department to expand economic opportunities in low-income communities. They are financial institutions, like banks, that provide loans and financial services. However, they are capitalized in a way that enables them to assume more risk than other financial institutions.

CDFI's can be affiliated with conventional banks and credit unions but many grew out of community loan funds and other local, regional, and national community development nonprofits. CDFIs promote economic revitalization and community development in low-income communities through loans and other financial instruments and by providing less sophisticated borrowers with technical assistance to plan projects.

The National Children's Facilities Network is a loose association of 25 CDFIs that have shown a special interest in strengthening early childhood education organizations.

Beginning in 2014, the Reinvestment Fund (TRF), a Philadelphia-based CDFI, and another nonprofit, the Public Health Management Corporation (PHMC), received $4.6 million from the William Penn Foundation and Vanguard Charitable to launch the Fund for Quality. TRF is using the funds to make facility grants of up to $300,000. The foundation funding also expands TRF's ability to lend its own capital because a portion of the foundations' grant can be used for credit enhancements. These protect TRF against the risk that a borrower is unable to repay a loan. It also provides TRF with the flexibility to reduce the interest it charges to early education borrowers. Lowering the borrower's cost also reduces the risk of default. Like CCI, the Fund for Quality provides resources to deliver technical assistance. (See sidebar about technical assistance). PHMC's role in the Fund for Quality is to assist potential grantees and borrowers to analyze business viability and retain the professional services to perform the pre-construction planning needed to secure TRF's facility financing.

CCI and the Fund for Quality provided welcomed infusions of capital. They allowed many early learning organizations to deal with needs that otherwise might have gone unaddressed. The grantors' restriction that the funds be used to tackle facility needs also mattered. Otherwise, many eligible organizations might have directed the funds to competing programmatic needs that require less effort and offered more immediate results but provided fewer lasting benefits than an investment in their physical environments.

Technical Assistance

The CCI illustrates an important characteristic of almost all capital funding programs for the child care field: they underwrite technical assistance as well as capital. It is generally acknowledged that early childhood programs manage their severe financial constraints by prioritizing the direct mission-related resource needs of the programmatic and interpersonal environments (described in the earlier discussion of the Interactive Environments Framework) over those of the organizational and physical environments. The IEF also posits that a relationship exists between the organizational and physical environment. In other words, an early education center's ability to successfully undertake a facility improvement project depends to some extent on its organizational capacity. Because the technical assistance provided prior to capital grant awards buttresses a grantee's organizational capacity, these services have become an essential feature of capital funding programs. From experience, intermediaries, like NFF and others described below, have learned that technical assistance improves a grantee's ability to plan and successfully complete investments in its physical environment.

NFF provided two types of technical assistance. It offered general business planning technical assistance to aid prospective grantees to forecast the wisdom, for instance, of asking for $35,000 to convert underutilized space into an additional classroom. The other type of technical assistance covers a grantee's out-of-pocket pre-construction expenses such as architectural and engineering fees or a deposit to bind a lease agreement.

These grants allowed some centers to resolve basic health and safety issues, ensuring their ability to maintain licensure. Others used the grants to attack issues caused by deferred maintenance or to replace antiquated plumbing and heating systems and enhance energy efficiency.

Even after making the grant-funded improvements, many recipients still had unmet facility needs. CCI's evaluators reported that more than half of the grantees still had a list of other routine repairs and improvements, including "bathroom repairs or renovations, playground equipment and safety surfacing, water heater repair or replacement, flooring, kitchen upgrades, plumbing, window and door repair or replacement, exterior building repairs, etc." Nonetheless, these two grant programs made it possible for centers to make much needed level 1 and 2 improvements.

The role of philanthropy is more limited when it comes to the increasingly capital hungry projects involving level 3, and especially level 4 and 5 investments. Nonetheless, where foundations have made such commitments, the results have been dramatic. A group of Atlanta-area foundations formed and capitalized a nonprofit, Early Learning Property Management (ELPM), in 1999. At the time Fulton County faced the loss of its Head Start grant because of the grantee's limited physical capacity. The foundations made direct grants to improve or relocate some centers. It created ELPM as an intermediary to develop, own and manage other early childhood facilities. This was the funding collaborative's most dramatic innovation. To date ELPM has developed 15 centers. It has had the resources to lift the quality of its facilities to the level 4 standard.

A few philanthropic investments have yielded centers that achieve the transformational quality reflected in level 5 improvements. These are purpose-built early childhood facilities. This report argues that such environments can contribute significantly to achieving the outcomes associated with very high-quality programs. These centers are not schools (or storefronts, or church basements); they fall into a distinctive and emerging building type because they are specifically designed for group care of children from birth to five. Since very young children are experiential learners, they need a stimulating environment and opportunities to engage in a rich variety of activities and interactions. They also learn best in the context of engaged and warm interactions with motivated caregivers. The underlying challenge for all center-based programs is facilitating the ability of two or three adults to manage and engage 15 or 20 young children in tight quarters. Even in well-staffed classrooms, teachers are expected to be available to, and engage with, multiple children. Malaguzzi's metaphor – that the physical environment is the third teacher – alludes to the insight that the environment needs to afford engrossing opportunities for experiential learning and positive child-initiated play-based interactions with other children unmediated by an ever-present adult. Such facilities are costly.

In New Jersey, the Maher Charitable Foundation made such an investment in the Ironbound Community Corporation's Early Learning Center in Newark. It cost roughly $400 a square foot in 2012-2013. With construction cost inflation, the square foot cost of that project today would easily top $500. The Educare Network is another example of philanthropically backed facility development that delivers level 5 capital investments.

To achieve this level of investment in facility quality means having different expectations about the type of building needed to support the healthy development of very young children. Building types emerge though an evolutionary process. In this case early childhood educators and architects have amassed enough experience designing, constructing, and using purpose-built, state-of-the-art early childhood facilities to perfect a set of recognized design tenets. (Appendix D includes a lengthier discussion of building type). Philanthropy, however, is not a scalable solution to what is a systemic condition. These institutions have funded projects that have helped define this new building type. They do not have the resources required to lift facility quality at scale. To do that will require a public sector investment.

Public Capital

Three states have funded capital investment programs for early childhood facilities.

- Illinois – In 1992 the Illinois Department of Children and Family Services launched a pilot Child Care Facility Development Program. It set up a real estate development partnership with the Illinois Facilities Fund (IFF), another CDFI, to construct seven child care centers in five underserved communities. IFF served as the turnkey developer. The projects were entirely financed with a pooled tax-exempt revenue bond. The bond was marketable because of the state's commitment to service the debt over the loan's ten-year amortization schedule. Pooling required all seven projects to proceed on the same schedule. This was challenging since IFF was building each project for, and in consultation with, a different organization. To save money, IFF hired the same design and construction companies for all seven centers and coordinated the development and construction schedules. In addition, by raising the required capital for all seven centers through one pooled bond, instead of issuing a revenue bond for each center, the state was able to reduce its transaction costs. As planned, when the debt was retired, IFF transferred ownership to the nonprofit organizations operating the centers.

- Connecticut – In 1997 Connecticut enacted its School Readiness Act; a pre-K program targeted to the same type of high-need communities covered by New Jersey's Abbott decision. Recognizing it would need to increase the supply of high-quality programs to accommodate the new stream of pre-K funding, Connecticut created a debt-service support mechanism patterned on Illinois' pilot. Whereas Illinois structured its program as a one-time pilot, Connecticut's statute created an on-going funding mechanism. By issuing revenue bonds with a leisurely 30-year amortization schedule, the state's initial and modest $2.5 million annual debt service appropriation resulted in the immediate construction of a significant number of facility projects. Low monthly payments meant providers could shoulder a share of the debt, and in turn, their debt payments allowed the state's investment to support more projects. For a typical center, Connecticut covers 70 percent of the capital cost. Meanwhile, each of the preschool programs pays the remaining 30 percent, including roughly 12 percent in project equity raised from philanthropic and public sector grants and gifts. Since that initial appropriation, the state twice increased spending on the program by $1 million, bringing the annual debt service support for early childhood facilities to $4.5 million. The combined state and provider debt payments supported $93.9 million to construct 29 high quality centers serving 3,406 children in some of

the state's most distressed communities. The recession in 2008 led the state to suspend the program although the state has continued to honor its outstanding debt service commitments. Although state revenues recovered from the recession, the legislature has not appropriated additional funds to expand the inventory of new facilities. Providers in Connecticut developed their own facilities with technical assistance from a statewide child care program operating under the auspices of the Local Initiatives Support Corporation (LISC).

Figure 3 a and b: *School Readiness-funded Mt. Olive Child Development Center, Hartford, CT, with playground accessible directly from each classroom and in-classroom bathrooms. (Photo source: Carl Sussman)*

Figure 4 a and b: *School Readiness-funded centers in Waterbury (left) and Milford, Connecticut (right). (Photo source: LISC).*

- Massachusetts – In 2013 the Commonwealth of Massachusetts established the Early Education and Out-of-School Time (EEOST) Capital Fund as part of quinquennial legislation authorizing the sale of general obligation bonds to finance the state's affordable and supportive housing programs. The legislation authorized the administration to make $45 million in grants to nonprofit center-based providers serving low-income children. During the Capital Fund's first 5-year term, the administration awarded $25 million to build or renovate leased or owned facilities. In 2018 the state authorized the sale of another $45 million for capital grants of up to

$1 million over the succeeding five years. With other governmental grants and tax credits, capital campaigns, organizational net assets and debt, the Capital Fund's $32 million in grants supported an investment of $251 million in the state's early childhood infrastructure. These projects created or improved facilities for 5,236 children, 84% of whom receive vouchers or are enrolled in Head Start.

Figure 5 a and b: *YWCA Southeastern Massachusetts in New Bedford (Photo Source: Children's Investment Fund)*

Figure 6: *Beverly Children's Learning Center, Beverly, MA* (Photo Source: Children's Investment Fund)

Figure 7: *Community Art Center, Out-of-School-Time program in Cambridge, MA* (Photo Source: Children's Investment Fund)

A Development Financing Program for NJ: Design Considerations

The three state mechanisms described above fall into a category of public policy known as development finance. Development finance involves investment of public capital for a class of physical development projects that are infeasible relying on conventional market financing mechanisms but are in society's long-term best interest. State housing finance agencies, for example, offer financing and credit enhancements to residential real estate developers to build housing affordable to tenants who cannot manage market rents. There are valuable lessons for New Jersey in these three states' experiences fashioning development finance programs to spur the construction of improved facilities for young children.

- **Create a *New* Early Childhood Funding Source** – In all three state programs described above, the funds did not come from an existing early childhood source. The goal was to augment what exists so that the funds represented a net gain to the early childhood community. The early childhood system is both underfunded from an operating budget perspective and undercapitalized when it comes to the investment in well-functioning physical settings. Therefore, generating capital for facilities should not diminish the flow of funds for routine operating expenses like personnel, materials, and utilities. This is also an important principle to maintain the support of advocates for the early childhood sector. Without strong support from operators and advocates, it is hard to expect policymakers to expend their political capital on a facility financing program.

- **Finance the Capital Cost** – Given the political and policy effort required to secure a state commitment of capital for this purpose, it is critical that advocates resist the temptation to settle for a one-time appropriation. For legislators and gubernatorial administrators, a one-time appropriation can be a politically expedient way to satisfy a constituency, making it as hard or harder to win a subsequent appropriation.

  But there is an even more fundamental economic reason to finance the cost with long term public debt. Child care centers are capital investments. Unlike government-funded services, which rely on annual appropriations, a physical facility delivers value every year for decades. No one would depreciate the value of a building over one year. Yet a one-time appropriation effectively does exactly that.

  Illinois and Connecticut used revenue bond-financed debt amortized over 10 and 30 years, respectively. Massachusetts uses general obligation bonds and incorporates the issuance and debt service as a routine part of the state's capital budgeting process; just as it does with all infrastructure projects.

- **Program Continuity** –Illinois called its program a pilot and paid for it through a one-time contract to pay debt service on the revenue bonds over ten years. The other examples have a statutory framework, telegraphing an on-going policy commitment. Establishing a program in statute, rather than a one-time or time-limited appropriation, creates a greater expectation of its renewal.

  Program continuity is not just important politically. It is vital to the facility financing program's operation. The expectation of ongoing funding is needed to stimulate a pipeline of projects. It takes time and upfront cash to identify and secure a site; prepare construction documents; navigate the zoning and the permitting process, and finally, arrange financing. Potential applicants are unlikely to commit the time and assume the financial risk of planning a project unless future funding availability is a reasonably plausible assumption.

  One-time funding creates a chicken and egg dilemma. States most frequently deploy development finance when capital markets fail to respond to existing demand. In the case of housing, for instance, there are developers eager to construct affordable housing provided they

can raise capital at a cost that makes projects feasible. There is, however, another kind of market failure: cases in which demand is non-existent, even though the need is high. This is the situation for early childhood centers. In such instances, development finance needs a supply-leading approach. To prime the demand pump, providers must be coaxed to commit the time and resources for project planning. This is required to aggregate a pipeline of worthwhile proposals for the state to finance. To build demand, the financing program must reflect a sustained commitment to creating such facilities. A one-time appropriation will not stimulate a pipeline of fundable facility projects.

A statutory foundation is no guarantee of ongoing funding. Connecticut's approach to development finance involved debt service payments from the state's Department of Social Services annual budget. These outlays continue for the 30-year term of the bonds. When state tax revenues dipped during the 2008 recession, Connecticut stopped issuing new debt service commitments for School Readiness centers, suspending the program. The state continued to fulfill its obligation to appropriate $4.5 million annually for debt service on completed centers. Even after the economic recovery, however, and despite the statutory authority to revive the program, the political will apparently has not existed to reinstate it.

Still, a statutory foundation provides a greater expectation of, and support for, continued funding. New Jersey should consider Massachusetts' capital budget approach. To finance projects, that state relies on general obligation bonds, rather than the revenue bonding Illinois and Connecticut used. Because of the use of general obligation bonds backed by Massachusetts' full faith and credit, funding for child care centers flows through the state's capital budgeting process. Funds do not get appropriated annually, as they do in Connecticut, nor do they flow through Massachusetts' equivalent to Connecticut's DSS. Instead, the program is renewed every five years, as it was in 2018. The annualized debt service to cover its capital grants for child care center construction is miniscule within the state's overall bonded capital spending, accurately reflecting the relatively modest cost of the program.

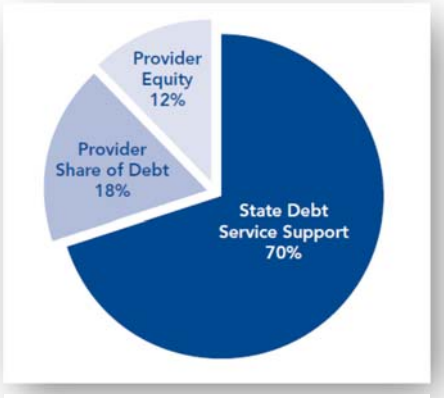

Figure 8: *Financial structure of Connecticut's School Readiness bond program*

- **Subsidy Level -** The entire cost of the seven centers built in Illinois was borne by the state. Connecticut's School Readiness program also provides an extremely deep subsidy. The state covered approximately 70% of the capital cost. (See figure 8). Connecticut's program derived those funds through the sale of tax-exempt revenue bonds. The total yield from the bond sale includes an additional increment paid by the child care provider to the state. On average the provider's share of the bond's debt service averaged 18% of the project's total capital cost. Because of the low tax-exempt rate and 30-year amortization schedule, the budgetary impact on the early childhood program for its share of the

debt service was roughly equivalent to a very affordable rent. The provider was responsible for raising the balance of the development's cost. On average, therefore, the child development program was responsible for raising 12% of the project's cost through grants and the like. That proved to be a manageable sum, especially compared to the proportion of the project cost borne by Massachusetts's child care organizations.

With a maximum grant of $1 million, Massachusetts' program provides the shallowest subsidy. The median grant covered 20% of the total development cost, although the grant, as a share of those costs ranged from 7% to 68%. Putting together the financing for each project is a time-consuming process and adds a great deal of complexity and cost. The fundraising burden constrains the scope of work for each center. In recent funding rounds many of the grantees applied for and secured New Markets Tax Credits as part of their fundraising. These are complex and costly transactions. Nonetheless, they are becoming an important part of the fundraising mix in Massachusetts.

Massachusetts' program requires providers to raise at least 25% of the total cost. With the $1 million ceiling on the state grants, however, grantees in most cases have had to raise far more than 25%. In fact, the median project cost $2.7 million. The state's share of the $251 million spent to develop centers amounted to less than 20%. The grantees raised the balance from philanthropy, including capital campaigns; other governmental sources, including New Markets and Historic Tax Credits, and long-term debt. The remaining balance came from organizational assets. While the Commonwealth leveraged almost seven dollars for every dollar of state investment, the fundraising burden limited the number of potential applicants. Moreover, projects took longer to start construction, and, quite possibly, grantees had to do more "value engineering;" the euphemism for cost-cutting late in the planning or construction phase. Value engineering always means sacrificing features or quality to achieve cost savings since, at that point in the construction process, little fat remains in the construction contingency to minimize the impact of these cuts.

Policymakers designing these capital financing programs have a difficult choice. They can minimize the state's share of the cost by providing a shallower subsidy, thereby shifting more of the fundraising burden to grantees. That allows the state to support more projects but will probably force centers to create less developmentally appropriate school-like facilities. Or the state can expedite construction of fewer centers and expect centers to make fewer design compromises.

Connecticut's approach seems like a reasonable compromise in terms of the level of state subsidy. Centers need the deep subsidy, which the state provides. But Connecticut's formula enables these child care programs to finance a portion of the cost at low rates over a long amortization schedule. The centers pay the debt service on a small part of the general obligation bonds sold by the state, leaving a manageable amount to be raised through fundraising.

- **Eligibility** – Only nonprofit organizations are eligible for the three state programs described above. In these states nonprofit organizations serve most low-income children. Massachusetts requires at least 50% of the enrolled children be subsidized. To date the average for the funded projects is 84%.

- **Prioritization** – The need for facility funds is enormous. Given limited resources, how should the state target its investment? Some possible factors include location, enrollment characteristics (ages served and demographics), source of operating subsidy, programmatic performance, readiness to proceed, size and organizational auspices. In practice organizational capacity, location, readiness, and program quality have been factored into the funding decisions in Connecticut and Massachusetts. Because of the high proportion of low-income children in Massachusetts' program and the geographic targeting embedded in Connecticut's School Readiness legislation, funded facilities are overwhelmingly located in low-income urban communities.

- **Design** – What design standards and characteristics should centers be required to meet? The Community Investment Partnership (CIP), a Connecticut LISC program dedicated to early childhood facilities development, received a contract to provide technical assistance to providers seeking School Readiness funding. Recognizing how few architects have experience with this building type, CIP provided a full-day training for the architects working on facility projects in the development pipeline. In Massachusetts, CIF prepared a set of design guidelines for projects and also offers design workshops for providers and architects. LISC national child care program, Community Investment Collaborative for Kids, also has published a very good design guide.

  For its research to document the physical needs of child care centers, Massachusetts' CIF developed an assessment tool that established three building performance standards. The most minimal standard only required compliance with Massachusetts state regulations (licensure, building codes, fire, and health regulations). The next higher standard required that the center meet professional association standards and guidelines. This required a team of advisors to translate NEAYC accreditation and Head Start performance standards into physical characteristics. The highest quality category reflects best practices, like those described in Appendix D. New Jersey would be well-served by designing a development finance model that delivers enough capital to support building of that quality.

- **Development Process** – Quite possibly the thorniest program design issue involves who develops the real estate. In Illinois, the Illinois Facilities Fund (IFF), a CDFI with extensive nonprofit facilities finance expertise, served as the "turnkey" developer. It developed the state-financed centers on behalf of nonprofit providers that would occupy the new centers. Because of Illinois' pooled tax-exempt revenue bond financing model, the seven centers were treated as a single project with one developer, IFF, and a single bond to finance the construction. IFF, as the developer, retained ownership during the bond's ten-year amortization schedule. Retirement of the debt triggered a provision in the development agreement conveying

ownership to the nonprofit child care lessees on whose behalf IFF developed the facilities. In addition to the economic efficiency of developing all the facilities as a single scattered-site project, IFF brought core competencies to the initiative – the organizational capacity and real estate development expertise – which complemented the providers' early childhood know-how.

In Connecticut and Massachusetts, the early childhood programs developed the facilities themselves. Each provider assembled and managed their own consulting team consisting of an architect, development consultant, lawyer and often others with the specialized skills to evaluate sites, negotiate site control, assemble a financing package, navigate the permitting process, select the contractor, and the other preparatory tasks required to construct a facility. In both states a CDFI-like community development organization provided technical assistance and training to aid the early childhood programs as they navigated the process. These organizations also offered grants and loans to cover the third-party planning costs incurred prior to the construction loan closing; the milestone that triggers the availability of the state's financing.

Very few early childhood programs are equipped to manage this process on their own. Applicants for Massachusetts' capital grants were understandably thrown by routine underwriting and transactional procedures including multi-year financial projections. Despite this, in both states, providers managed to successfully complete facility projects. Because of the time and complexity involved, however, Connecticut's and Massachusetts' provider-developed financing model favors programs embedded in larger, multi-site or multi-service organizations.

The cost of training and technical assistance has been significant in both cases and relies on the labor-intensive pursuit of soft money. The providers required a great deal of one-on-one technical assistance as they encountered unexpected hurdles and faced tough decisions. LISC's CIP program in Connecticut and CIF's in Massachusetts each offered training workshops on various design and development issues as well as being available for one-to-one technical assistance on an ongoing basis. In addition, every other year CIF conducts an intensive four-day residential training program, Building Stronger Centers, at an offsite conference center.[4] Building Strong Centers has been CIF's principal tool for generating a pipeline of early childhood facilities projects. It began these trainings years before the state enacted its capital grant program, thus creating a pipeline of projects. Building Stronger Centers enhanced the ability of many programs to develop and complete capital improvement projects, including new or expanded facilities.

Early Learning Property Management (ELPM) in the Atlanta, Georgia area offers a very different and promising development model. With the financial support of a group of local foundations that created it, ELPM develops, owns, and manages early childhood facilities. ELPM leases centers to operators for $5 to $6 per square foot; a deeply discounted rental rate. It can afford to do this because the properties are developed without debt. ELPM uses 60% of its rental

[4] CIF borrowed the name "Building Stronger Centers" from a now defunct training program once offered by the New Jersey Community Loan Fund.

income to support itself and cover the operating expenses for the centers in its property management portfolio. Particularly noteworthy is ELPM's practice of devoting the other 40% of its income to a capital replacement reserve. The result is a professionally developed and managed property. To date it has developed 15 centers. It currently owns and leases 7 of them. It leases 3 other properties for a nominal sum from the Atlanta Public Schools (APS) through a long-term lease arrangement. After renovating these surplused school buildings, ELPM sublets them to early childhood programs. The school system has renewed all these leases for a second 15-year term.

For those properties ELPM owns, the typical lease grants the provider an option to purchase the building at cost. Five providers have exercised that option, furnishing ELPM with the liquidity to undertake additional projects. ELPM's color-coded flow chart of the development process, shown in Figure 9, identifies the roles played by the various parties during the development phase. This chart illustrates ELPM's role as the "turnkey" developer. In that capacity it builds to suit the prospective owner or lessee and, as the term implies, when complete, ELPM "turns the key" over to the prospective occupant.

ELPM's on-going ownership bestows many benefits on the organizations operating early education programs in its facilities. In addition to the deeply subsidized rent. ELPM is responsible for the property and asset management, including these routine operating costs:

Building Exterior	Building interior and systems
→ Quarterly preventive maintenance of the roof and gutter cleaning → Underground infrastructure – pipes – cleanout → Parking lot maintenance and replacement, bi-annual re-striping → Exterior lights – pole and building → Weekly landscape and all plantings, etc. → Exterior painting → Exterior fencing → Routine pressure washing of the building's exterior	→ All life safety (fire sprinkler system, alarm system, exit lights, fire suppression systems) preventive maintenance & scheduled certifications → Electrical system → Plumbing system → Periodic building sweeps to check all caulking, plumbing fixtures, cabinet doors, etc. → Repair and preventive maintenance of the HVAC system, including replacement as needed → Termite and pest control → Elevator preventive maintenance, repair, and state inspections → Any new or changed licensing code requirements related to the building (not the program)

It is common for early learning programs to unconsciously balance their books in part by deferring routine maintenance. ELPM's model prevents this from happening. The lease between ELPM and its lessees contractually obliges it, as the owner, to do the property and asset management functions listed in the table, above, including routine maintenance. It taps the

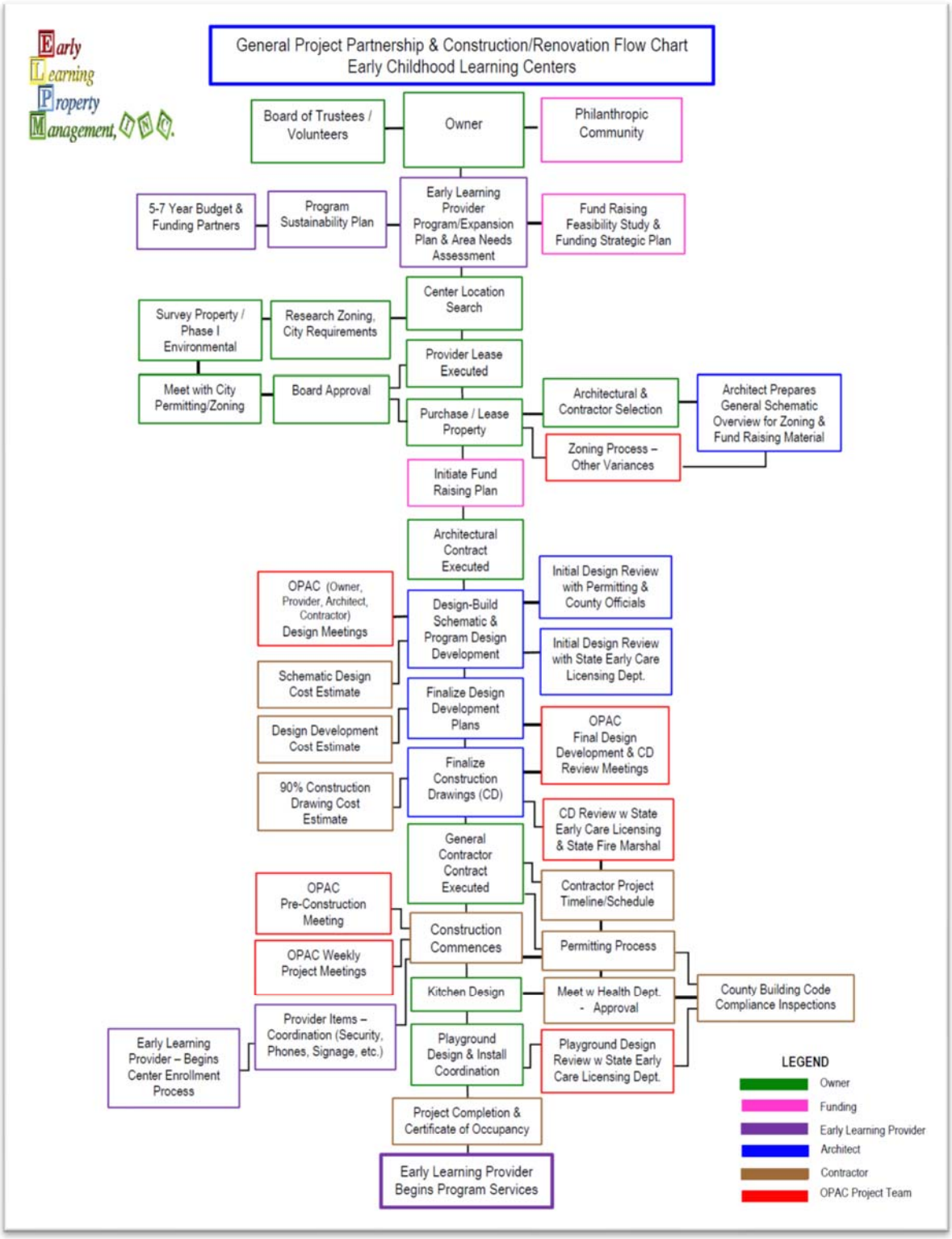

Figure 9: *ELPM project development flow chart with roles*

rent-funded replacement reserve to replace building systems and components, such as the roof and HVAC, when they have reached the end of their useful lives.

Figure 10 a and b: *ELPM's College Heights Early Learning Center in Decatur, GA* (Photo Source: Carl

This model offers many advantages over the Massachusetts and Connecticut approaches to development and ownership of facilities. In effect, under ELPM, the providers are outsourcing the facility development and ownership functions to an entity specifically designed for that purpose. This allows the provider to focus its resources on its core competency: supporting early childhood development. At the same time, the provider secures a long-term lease at a very low rate and outsources, without further expense, building maintenance and repair.

To implement this model New Jersey would need to identify or create an appropriately capitalized intermediary, like CIP, CIF, NFF and TRF. These are all CDFIs. Their core business, however, is lending. They possess the real estate development and finance expertise required to underwrite loans. CIP and CIF exclusively serve the early childhood sector. So, they are familiar with early education, including siting and design issues. They do not, however, develop and own real estate themselves. Nor do they exercise day-to-day management over a portfolio of properties. A CDFI might be able to develop these competencies, but they are not staffed, and, in many respects, are not structured to carry them out.

With Early Learning Property Management, the providers are outsourcing the facility development and ownership functions to an entity specifically designed for that purpose. This allows the provider to focus its resources on its core competency: supporting early childhood development. supports children and families need to thrive.

Kara Portnell, ELPM's executive director for the past 21 years, described a frequently overlooked intangible asset that her organization's specialization creates – relationship capital. After years working in the same geographic area developing and managing multiple properties, she has established relationships with many contractors. Providers commonly encounter difficulties identifying contractors willing to come on short notice to make needed repairs. Portnell can rely

on her existing network of business relationships to find contractors who will respond promptly to building issues as they arise. The most important advantage in having an intermediary, like ELPM, to serve as a developer is the elimination of the expensive and time-consuming capacity-building activities Massachusetts and Connecticut have either directly or indirectly had to deliver to child care organizations.

Ownership and Control – Before Connecticut and Massachusetts established their financing programs, early education organizations rarely had the financial capacity to purchase real estate. Their business model forces them to rent space in less-than-optimal locations and without many of the features that would benefit children attending their centers. Leasing space also carries the risk of escalating rents or the landlord's decision not to renew the lease. Finally, tenancy discourages providers from making meaningful capital improvements.[5] Thus, secure occupancy and cost control – benefits ELPM affords its tenants – are the highly valued advantages of ownership.[6]

The policy goal should balance the interests of the program's stakeholders in a way that safeguards the ongoing public interest in its capital investment. ELPM's intermediary model best satisfies these criteria:

- It provides a cost-efficient and timely real estate development process.
- It delivers to the providers of early education services stable affordable and long-term tenure in a high-quality and well-maintained facility.
- The lease agreement protects ELPM's charitable purpose through a legally enforceable mechanism requiring providers to deliver high quality services over time.
- It creates an effective ownership and property management structure to preserve the physical asset.

- **Public Purpose Performance Safeguards** – Like ELPM, a state's long-term capital investment obligates it to protect its interest in the facility's use to deliver a high level of programmatic performance. Both Connecticut and Massachusetts require recorded liens that enable them to recover some of their investment if the provider ends its early childhood program or defaults on other contractual obligations. In at least one case Connecticut foreclosed on a provider that lost its Head Start grant and conveyed the ownership to the successor agency. Connecticut also requires providers to secure NAEYC accreditation within 3 years of project completion and to maintain it thereafter. Massachusetts legally obligates providers to earn a 3 or 4-star QRIS rating upon project completion. Either state's security agreement requires annual reporting about the program and the organization's financial and operational health. Failure to satisfy these

[5] Massachusetts centers may use state funds to make leasehold improvements but requires a minimum lease term of 15 years. In cases of leasehold improvements financed by Massachusetts, the lessor must consent to a recorded right for the state to substitute the lessee in the event of a default.
[6] ELPM's lease agreements include a default provision entitling it to terminate the lease of a provider that loses its NAEYC accreditation.

requirements triggers a default. The state can then exercise a series of legal remedies. In most cases, they allow a provider an opportunity to cure a default but can foreclose.

Both Connecticut and Massachusetts require recorded liens that enable them to recover some of their investment if the provider ends its early childhood program or defaults on other contractual obligations.

- **Institutional Capacity** – One will search in vain for a natural bureaucratic home within state government to house an early childhood facilities finance program. States have development finance agencies that serve the housing and industrial sectors. They are staffed with real estate and finance professionals with expertise in the housing, business, or commercial enterprises to whom they funnel capital. Their borrowers are sophisticated businesses. These existing agencies, however, are ill-suited to nurturing projects from organizations new to real estate finance and development. They are even less able to fathom early childhood development and how to translate good pedagogical practices into a physical building.

  On the other hand, the line agencies that typically administer child care subsidies and regulate health, safety and group care facility licensing have insufficient know-how about finance and development. Moreover, the organizational culture that prevails in regulatory bureaucracies is incompatible with the entrepreneurially supportive roles development finance intermediaries sometimes need to play.

  In Connecticut, the state found itself reaching out to the Local Initiatives Support Corporation to deliver technical assistance and to advise the Connecticut Health and Educational Facilities Authority (CHEFA), the quasi-public state agency that issued School Readiness bonds. When it came time for that agency to hire staff to run the School Readiness financing program, it hired a member of the LISC staff that had been providing facilities development technical assistance to child care organizations. To administer the program in Massachusetts, the state's Department of Early Education and Care (DEEC) outsources the technical assistance to the Children's Investment Fund. CIF also underwrites the proposed projects and makes funding recommendations to DEEC. Once that state agency makes its grant award decisions, CIF originates the transactions, disburses funds, and provides on-going monitoring on behalf of the state agency.

- **Financial Requirements** – The experience in both the public sector and philanthropic facilities financing programs described above demonstrate the need and desirability of funding four functions:

  - **To support the state's capacity to operate the financing program**. This includes the financial resources necessary to create and sustain the institutionalized capacity to underwrite real estate development proposals; deliver specialized design expertise regarding early childhood facilities; monitor construction and provide the ongoing enforcement of the public purpose protections built into the financing documents.

These services may be delivered by a CDFI-like intermediary on behalf of the state or by a public-purpose property developer and manager like ELPM.

- **To provide project-related pre-construction planning funds and technical assistance**. These typically take the form of interest-free or interest-deferred loans due at the construction loan closing. Although these loans finance "soft costs" – outlays made prior to construction for consultant services and application fees – they are as essential as the "hard" costs incurred during construction. Therefore, these expenses are routinely capitalized as a component of the project's "total development cost" or TDC. Except where these loans are used to purchase a site, they rarely can be secured to protect the lender against nonpayment. So, in most cases, these cash advances are unsecured and thus not conventionally bankable.

- **To conduct evaluative research** to (1) expand the body of evidence about design decisions that contribute to better process quality in early education; (2) evaluate the financing program's efficacy, and (3) conduct post-utilization review case studies one year post project completion. The latter reviews generate qualitative data for the program evaluation and to support continuous program improvement.

4. Early Childhood Facilities as Social Infrastructure

Neighborhood Effects

Every three years Australia conducts a child development census. The census documents an all too familiar pattern: children raised in more socio-economically disadvantaged communities have poorer developmental outcomes than children raised in more advantaged ones. The Murdoch Children's Research Institute launched the Kids in Communities Study (KiCS) to determine what factors account for these disparities.

KiCS researchers noticed that children from some lower-income communities did better than predicted and vice-versa. This prompted researchers to take a more granular look at the "neighborhood effects" that promote better developmental outcomes for young children. Among the variables they explored was the availability of, and proximity to, ***social infrastructure***. These are the physical settings, including child development centers, that connect neighborhood people to each other, and the material and social supports children and families need to thrive. Sociologists refer to these types of interpersonal networks based on trust, reciprocity, and cooperation as "social capital." The social capital construct has been around for many years. Social infrastructure – the physical and institutional context that facilitates social capital formation – is a newer concept. For sociologist Eric Klinenberg, public libraries epitomize the community-building possibilities inherent in social infrastructure.[7] In his book on the topic Klinenberg cites Harvard sociologist Mario Small's fascinating research on child care centers in low-income neighborhoods of New York City. Small found many of the centers he studied to be a rich source of social capital.[8] He describes those centers in terms of their behavioral settings – the concept ecological psychologists use to analyze the environmental context of behavior. (See sidebar on page 29). The strength of those relationships – the level of trust and reciprocity they engender – depend on the center's institutional practices and routines.

The "neighborhood effects" that promote better outcomes for young children include the social infrastructure: the physical settings that connect neighborhood people to each other and to the developmental supports children and families need to thrive.

One factor that perpetuates economic inequality is the dearth of such network connections in some communities. Social capital theory posits that "better connected people enjoy better health, faster access to information, stronger social support, and greater ease in dealing with crises or everyday problems." Small argues that organizations in which they are embedded can give families access to extensive and diverse networks. By virtue of where they live and the early childhood programs their children attend, families are situated in organizations and settings that can be a rich source of social capital. In fact, according to Small's research, "Childcare centers are unique in their

[7] Klinenberg, E. (2018).*Palaces for the People: How Social Infrastructure Can Help Fight Inequality, Polarization, and the Decline of Civic Life*. Crown: New York, NY.
[8] Small, M.L. (2009). *Unanticipated Gains: Origins of Network Inequality in Everyday Life*. Oxford University Press: New York, NY.

Behavior Settings*

…Ecological or environmental psychologists believe behavior cannot be adequately described or understood independent of the context in which it occurs. Indeed, they maintain the environment shapes behavior. One of the field's pioneers, Roger G. Barker**, developed the concept of behavior settings as a framework for understanding the interdependence of behavior and environment. "We could predict some aspects of children's behavior more adequately," he wrote, "from knowledge of the [behavior settings] they inhabited than from knowledge of the behavior tendencies of particular children. It was this experience that led us to look at the real-life environments in which behavior occurs…"

A behavior setting has three intersecting elements:

> **Physical properties**, which are objective characteristics of physical space, place, and time.
> **Human components**, which are the people interacting in the environment, and
> **Programs**, which reflect the goal-directed human activities and institutional context.

These form the milieu – the interdependent system or ecology – in which behaviors take shape.***

The physical attributes of a child care center can facilitate or thwart the stated programmatic purpose embodied in the center's philosophy and curriculum. Thus, the physical and programmatic environments, when inhabited by teachers, children, and administrators, form a behavior setting. Moreover, this behavior setting contains within it additional behavioral units, such as classrooms and, at a more granular level, activity areas. Thus, a behavioral setting can be described as a psychologically relevant unit that contains interdependent physical, institutional, and human components.

This…framework figures prominently in the pioneering research on physical environments in child care programs conducted by Elizabeth Prescott and Elizabeth Jones and their colleagues at Pacific Oaks College beginning in the 1960s. Writing subsequently about their research, Prescott described their realization about the role the physical environment plays in the quality of preschool programs:

> We finally realized that the physical environment was the variable that appeared to be implicated. We then devised a scheme for evaluating the quality of the environment…As soon as we started working with our new tool, we found that we could see all sorts of things that had gone unnoticed. Our data also revealed that there was an association between spatial quality and behavior. In centers in which spatial quality was rated high, children were found to be more involved and teachers spent less time on management and enforcement of rules and more time in responding to children and fostering social interactions.

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* *This is an excerpt from the introduction to the* Physical Environments for Early Learning *(PEEL), a tool for assessing the quality of the built and natural environment in early childhood facilities.*

** *Barker, R.G. (1968). Ecological Psychology: Concepts and Methods for Studying the Environment of Human Behavior, Stanford University Press, Stanford, Ca*

*** *Jacob, E. (1987).* "Qualitative Research Traditions: A Review", Review of Educational Research. 57.

ability…to broker both social and organizational ties." Non–competitive organizational settings, like those found in child development centers, where parents have frequent and routine interpersonal contacts, can engender intense personal connection. In addition to these social ties, affiliation with the center gives a parent access to that organization's network of institutional relationships. Consequently, center-based child development programs can be a rich source of information, resources, and services from outside the center itself. These tangible and intangible forms of social capital are critically important because they help families cope with the day-to-day challenges of poverty and the irregular work schedules associated with low-wage jobs. (See the sidebar, Place, Family Poverty, and the Impact of Economic Instability, on page 31 to understand why this type of social capital is so vital to the wellbeing of young children).

In those child care centers where the levels of social capital are high, Small found that mothers trusted other center parents to take care of their child in a pinch. In many cases they knew these stopgap caregivers only casually because of their informal interactions at the center, such as seeing each other at drop-off and pick-up; serving as chaperones on field trips or socializing at special events. Yet, this phenomenon was not present in every center he studied. Centers that were intentional about parent outreach and engagement and that cultivated strategic relationships with other organizational sources of complementary family supports generated more social capital. Small's research looked exclusively at the child care centers' institutional practices, not the physical characteristics of the buildings.

Child development centers are part of the social infrastructure. Like building blocks, each feature in a community's social infrastructure provides a conducive behavior setting for strengthening relationships, fostering reciprocal behavior, and enhancing the wellbeing of those who interact there.

Yet, Small describes two of the three elements that define a behavioral setting – the institutional practices characteristic of these centers and how they shape interpersonal relationships. Figures 26 a and b and 27 a and b on page 52 illustrate how centers have created physical environments that welcome and encourage parental interaction. These casual gathering spaces for parents reflect and reinforce the programmatic value placed on engaging and supporting them. The parental interactions complete the behavior setting. These centers, because of their physical characteristics; institutional practices, and presence in the community and in the lives of families using them, function as social infrastructure.

As the damaging influence of economic hardship on a child's development become more apparent, two-generation programming and the purposeful embrace of parent engagement have become widely accepted practices in high-quality programs. Many centers, unfortunately, do not have the physical space to devote to it. Small's research, however, provides evidence that incorporating appropriately designed space as a physical nexus for family-support services may reinforce a center's role as part of the neighborhood's social infrastructure.

Place, Family Poverty, and the Impact of Economic Instability

Excerpted from an internal report the author prepared in 2018 for the Robert Wood Johnson Foundation, which has generously granted permission for its use here

…Influential research by economist Raj Chetty and his colleagues at The Equality of Opportunity Project has found that much of the variation in economic mobility is a function of where a child is raised. In high opportunity locales characterized by good schools, economic diversity, and extensive social networks a child is likely to experience far greater economic mobility than one raised in neighborhoods of concentrated poverty. Such communities have little economic diversity, schools are likely to be subpar and social networks are apt to be sparse…

Unfortunately, it will be a long time before every child grows up in an opportunity-rich setting. Until then, two remedial principles have enjoyed salience: Investing in children as early as possible and improving the environments in which they are raised….

Poverty is a pervasive source of adversity. It erodes the stability children need to flourish. An Urban Institute report succinctly summarizes the conditions children need to thrive: "a sense of security in the world, strong relationships with loving adults, a stable environment, and stable access to resources such as food, housing, education and health care" (Adam, G. with Bogle, M., Isaacs, J.B., Sandstrom, H., Dubay, L. Gelatt, J. & Katz, M., 2016). Unhappily, poverty is an inherently unstable condition in which many of these needs are inadequately met. Moreover, according to behavioral economists, scarcity "is not just a physical constraint" (Mullainathan, S. & Shafir, E., 2013, p.12). Dealing with chronic scarcity can overwhelm a family's coping mechanisms and contribute to further material hardships, emotional distress and, in the direst situations, pervasive instability.

This loss of stability has become a central concern for early childhood educators interested in promoting academic success and economic mobility. The Academy of Pediatrics reports that the cumulative effect of economic hardships, like unbuffered, scarcity-induced stress and adverse childhood experiences, frequently linger as toxic stress and debilitating trauma. The on-going weight of these circumstances contributes to "the intergenerational transmission of disparities in educational achievement and health outcomes." In other words, in communities marked by concentrated poverty, chronic financial insecurity feeds an almost unremitting succession of threats to a parent's ability to satisfy a family's most basic human needs. The toxic levels of stress caused by such visceral insecurity have a pervasive influence on both parents and their children, short-circuiting economic mobility, physical health, and emotional wellbeing. What is needed are "effective strategies for reducing toxic stress and mitigating its effects as early as possible, before irrevocable damage is done" (Shonkoff, J.P. et. al. 2011 p. e236).

The Urban Institute report on childhood instability uses the word "precarity" to describe the unpredictable and unstable nature of low-wage jobs. But low-wage employment is only one arena in which low-income families encounter such vulnerability. The term precarity captures the more encompassing list of poverty conditions that threaten a family's most basic material and emotional needs. Precarity is a useful way to characterize the prevalence of poverty-induced instability on family well-being.

Instability, as the Academy of Pediatrics' report notes, does not just affect parents or children; it acts upon the whole family. Because children's wellbeing is so intimately entwined with their parents' wellbeing, the early childhood field increasingly employs "two generation" or "whole-family" approaches to child development. "Two gen" strategies simultaneously address the needs of children and their caregivers.

Elements of the social infrastructure, like child development centers, operate as behavioral units within a larger neighborhood ecology, which is itself a behavioral setting. Like building blocks, each feature in a community's social infrastructure provides a conducive behavior setting for strengthening relationships, fostering reciprocal behavior, and enhancing the wellbeing of those who interact there. Therefore, for social infrastructure to successfully elicit the desired interpersonal response, the two structural elements of these settings – a conducive physical environment and the goal-directed programmatic environment – must be mutually reinforcing.

What are the implications of thinking about child development centers as social infrastructure? A state program to finance such centers needs to provide a sufficiently deep subsidy to create a behavior setting that encourages parents to spend time there. Grant awards should geographically target high need neighborhoods. And they should flow to organizations that approach their work holistically, with an appreciation for the enormous influence parents and community context have on healthy child development.

Social Infrastructure for Neighborhoods

Place-based community development is an established strategy for addressing concentrated intergenerational poverty. Its practitioners have spurred the physical redevelopment of blighted areas; constructed affordable housing; organized communities to improve public services, and lured investment to stimulate job-creation, among other tactics. The Urban Institute published a thoughtful assessment of a half century of place-based community development. The authors' concluded:

> Although most place-based and emerging place-conscious initiatives give at least some attention to the well-being and life chances of neighborhood children, an enormous opportunity remains for strategic innovation at the intersection of place-conscious and child-focused antipoverty work.[9]

"*Place-conscious, family-focused and child-centered*" might be a more suitable phrase to describe that intersection. The Urban Institute report cited a meta-analysis of research about neighborhood effects on early childhood development like the Kids in Community Study conducted in Australia described on page 28. That meta-analysis found many community-level mechanisms that "exert their influence on developmental health by subsequently altering aspects of children's family lives, including their parents' access to resources to support children's development, parental wellbeing, and parenting behaviors."[10] Echoing Mario Small's insight into child development centers as part of a neighborhood's social infrastructure and a source of social capital, the meta-analysis concluded that neighborhood effects studies "underscore the importance of the environment that is most proximal to the child, the family, while recognizing that families exist in relation to the people, resources, and opportunities within their

[9] M.A. Turner, et. al. (2014). *Tackling Persistent Poverty in Distressed Urban Neighborhoods: History, Principles and Strategies for Philanthropic Investment*. Urban Institute. Washington, DC. P. 2.

[10] A. Minh, et. al. (July 2017), "A review of neighborhood effects and early childhood development: How, where, and for whom, do neighborhoods matter?" *Health & Place.*

residential environments." This finding evokes widely accepted theories of child development like those advanced by Urie Bronfenbrenner and Lev Vygotsky.

Like so many other initiatives to improve child outcomes, measures to enhance the physical environment in child development centers are necessary but not sufficient. Alone, it will not achieve a tipping point with the power to offset the circular and cumulative processes driving inequality and perpetuating poverty. A public investment in early childhood facilities should avoid diluting its potential impact by treating each investment in isolation. A state-level investment in early education facilities should be done in a way that has neighborhood level impact on residents with young children. In other words, it should be part of a place-based strategy for addressing concentrated and persistent poverty and the neighborhood effects that perpetuate those conditions. Especially in the current moment following George Floyd's murder, it may be an opportune time to address the institutionalization of inequality and racism, with geographically concentrated investments in the social infrastructure families need to get ahead.

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Over the last 30 years there have been a succession of high-profile comprehensive place-based initiatives. These have sought to enact interventions that cross the siloed structure of systems and disciplines. These comprehensive community initiatives and collective impact projects have had a mixed history. They are not easy to pull off. But as research by the Boston Federal Reserve Bank has documented, it is possible to identify the ingredients contributing to the success of those initiatives that have had a measurable impact. The bank's research highlights the importance of "collaborative leadership, the role of anchor institutions, investment in [collaborative] infrastructure, and extension of benefits to the community as a whole. *Of these, collaborative leadership – the ability to work together across sectors over a sustained period with a comprehensive vision – was most crucial.*"

Any state-level investment in child development facilities in New Jersey ought to funnel those resources through local multisector coalitions charged with providing *sustained stewardship* over a neighborhood-wide place-conscious, family-focused, and child-centered approach to healthy child development. The state must insist that (1) the core leadership include the superintendent of schools, other key early childhood stakeholders from the community, as well as highly respected civic figures from outside the early education community, and (2) the group exhibit its commitment to the broader objective of having early childhood programs working to provide greater stability and resilience for participating families. One of the biggest challenges multisector initiatives face is the requirement that members serve as stewards; that they subordinate individual organizational agendas to the coalition's shared goals. That must be a governing principle guiding any coalition of this type.

The school district's superintendent's participation is essential because of a central theme that ran through most of the key informant interviews conducted for this research report. School districts play a significant role in shaping early childhood development because of their role as recipients of the state's pre-K funding. This funding has contributed to the fragmentation in an already fractured system of early care and education. Moreover, there is little apparent consistency in the extent to which pre-K funded children attend privately or publicly operated centers. There is a remarkable lack of data on this and about the physical environments where pre-K classes are held. Despite the state's effort to increase rates for infant-toddler care, there is ongoing concern that New Jersey's pre-K expansion has accelerated the "cannibalization" of the economically fragile infant-toddler child care system, especially for low-income families, and that it may continue to do so.

Despite the suspicions of some that at least certain school districts are indifferent to the impact public pre-K has on privately-run child care centers, public school leaders should be concerned. These programs represent the supply chain for public pre-K and for the districts' primary and secondary schools. Wise investments in the infrastructure of community-based early child development programs should translate into greater academic achievement for those children as they matriculate through the school system. And investments that simultaneously decrease family stressors should further strengthen children's later academic performance. For this reason, it is imperative that a community's center-based early childhood programs and the public schools be part of any multi-sector coalition that competes for and, if successful, guides the use of state financing for the development of early childhood centers in low-income communities. A demonstration of this type of coordination and local buy-in should be a prerequisite for the state's investment in this part of the social infrastructure.

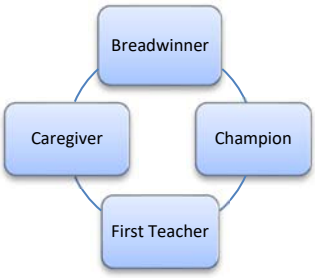
5. Recommendations

1 Establish a state of New Jersey early childhood facilities financing program to house high-quality early childhood development programs serving low-income children in state-of-the-art-facilities

- To demonstrate empirically the conditions that exist among early childhood development programs serving low-income children, hire a research team to document conditions. (See Appendix B on the facilities inventory conducted in Massachusetts.)
- Release the findings in a manner that mobilizes stakeholders and gets high profile exposure in the media and among and elected public officials.
- Work with the governor and influential members of the state legislature to submit proposed legislation to establish an on-going facilities capital investment program financed through the sale of general obligation bonds.
- The program should provide a deep capital subsidy equivalent to 80 to 90% of the total development cost.
- Funded facilities should incorporate the features described in Appendix D. State-of-the-art facilities like these represent a new building type; one designed to support very high-quality early childhood programs and not just another school-type building.
- Funds should be targeted to low-income communities and high-quality programs serving neighborhood residents with a two-generation approach.
- Facilities should be developed and managed by an intermediary institution, like ELPM in Georgia, with real estate development and finance expertise and that specializes in early childhood education facilities.
- The intermediary should own the facilities or, if state owned, manage them on the state's behalf.
- The intermediary must maintain a capital replacement reserve sufficient to preserve the building's long-term value and performance.
- Facilities should be leased at a nominal sum to selected providers subject to a set of on-going and contractually enforceable performance standards for both programs and their parent organizations.

2 Pursue a place-based implementation strategy that concentrates facility development in a few carefully selected high-need cities. To receive the state's facility investment the city must demonstrate that it has highly committed multisector civic leadership to spearhead a coordinated and high-quality birth-to-five early childhood development system that supports parents in their roles as first teacher, caregiver, breadwinner and champion.

- Integrate school districts and publicly financed pre-K into the local network of birth-to-five services to strengthen the quality and enhance the supply of infant and toddler care.
- Because the welfare of very young children is so dependent on the well-being of his or her family, to enable them to overcome the social determinants of educational outcomes, center-based programs housed in state-financed facilities must provide focused support to parents in their roles as first teacher, caregiver, breadwinner, and champion.



- Over the last 30 years there has been a proliferation of comprehensive cross-sector place-based initiatives. While the history has been uneven, that experience has reinforced the logic behind this type of multi-pronged interventions and much has been learned about the critical success factors.
- The state's financial investment in state-of-the-art early childhood facilities is also a significant addition to the social infrastructure that supports families and builds social capital in communities. These communities have historically lacked exactly these types of resources. To realize the return on the state's investment, New Jersey should fund one or more facilities in targeted low-income neighborhoods. In other words, seek to physically concentrate the investment and impact in fewer places rather than spreading it too thinly across many jurisdictions.
- A precondition for success of this focused and intensive place-based initiative is a multisector alliance with the sustained commitment from several key stakeholders – a core leadership group – who are ardent advocates for the academic success of low-income children in the community. This core group of trustees should include several influential individuals and embrace a few with positional authority, such as the superintendent of schools. However, its leaders need to be skilled facilitative leaders, not rulers. The larger group needs to engage people who have a passionate interest in the outcome and a willingness to subordinate their own organizational self-interests to the common project. All the participants must buy-in to shared accountability for measurable outcomes of family well-being, such as financial and residential stability, food security, personal safety, and physical and emotional health.

Appendix A: List of Interviewees

Rebekka Zydel, Executive Director, Child & Family Resources Inc.

Dr. Lorraine Cooke, Executive Director, Egenolf Early Childhood Center, Elizabeth.

Zeynep Ercan, Assoc. Prof., Early Childhood Education, Rowan University

Natasha Johnson, Director, Division of Family Development, Dept. of Human Services

Margaret Miliner, Ass't Director, Child Care Operations, Dept. of Human Services

Beverly Lynn, CEO, Programs for Parents

Eve Robinson, Project Director at Central Jersey Family Health Consortium

Nancy Thompson, CEO, Child Care Connections

Cindy Jackson, Director of Education and Referral Services, Child Care Connections

Ellen Frede, Co Director & Research Professor, Nat. Inst. for Early Education Research

Cynthia Rice, Senior Policy Analyst, Advocates for Children of NJ

Cecilia Zalkind, President & CEO, Advocates for Children of NJ

Michelle Roers, Education Impact Director, United Way of Northern NJ

Beth Gardiner, Early Childhood Education Technical Assistance Specialist, NIEER

Steven Dow, Founder & Former Executive Director, CAP Tulsa

Bevin Parker-Cerkez, Managing Director for Program Services, Reinvestment Fund

Kara Portnell, Executive Director, Early Learning Property Management

Barbara Reisman, Senior Advisor, Maher Charitable Foundation

Sam Crane, Director, Pre-K Our Way

Joseph Della Fave, Former Executive Director, Ironbound Community Corporation

Grace Blanco, Director, Ironbound Early Learning Center

Cindy Larson, National Program Director, Child Care & Early Education, LISC

Woodie Arthur, Principal, D.W. Arthur Associates Architects

Kevin McQueen, Director of Lending, Leviticus Fund

Beth Siegel, President, Mt. Auburn Associates

Appendix B: Conducting a Facilities Inventory

John Kingdon, a political scientist at the University of Michigan, has a model that describes how issues get on the public policy agenda. According to Kingdon, this only happens when there is a window of opportunity created by the convergence of a problem, policy, and politics.

1. Decisionmakers must first recognize that there is a **problem**.
2. A **policy solution** exists that is appropriately scaled to address the problem and can win support.
3. The **political will** to act is evident among opinion leaders and the public.

Advocates in Massachusetts succeeded in creating the right conditions to enact that state's development finance program for early childhood facilities. They followed these steps:

- **Documenting the problem**. Interviews with key informants for this report confirmed the absence of data on the conditions that exist in child development centers in New Jersey. This vacuum extends to where children in state-funded pre-K classrooms are enrolled (district schools or private providers). Some research has been conducted to identify child care deserts in some portions of New Jersey. And interviewees have formed opinions about conditions. But to get the issue on the state policy agenda, it would be valuable to have something like the Children's Investment Fund's 2011 report, *Building an Infrastructure for Quality: An Inventory of Early Childhood Education and Out-of-School Time Facilities in Massachusetts*. The report was based on a rigorous and independent analysis using a methodology CIF designed with a team of consultants and early childhood stakeholders. I have conferred with Mav Pardee, the director at CIF at the time of the study, and she believes that the methodology could be simplified without sacrificing critical pieces.

- **Disseminating the findings** – CIF worked with a public relations firm on a dissemination strategy that included the report's release at a series of regional meetings with local press, child care stakeholders from the area and their elected officials.

- **Develop the policy proposal** – CIF worked with several legislators to craft a capital grant program financed with state-issued general obligation bonds. Kingdon's window of opportunity opened when the legislature was putting together a housing bond bill enacted every five years to fund the state's affordable housing programs. The lead affordable housing advocacy organization agreed to include the CIF legislation in the bond bill. It was enacted in 2013 and, in 2018 the state adopted a second five-year authorization.

One way to create policy prominence for the issue is to have the research overseen by a state-establish study commission.

Appendix C: Methodology

The information for this report has been drawn principally from three sources:

1. Interviews with twenty-five key informants. The overwhelming majority of those interviews were with researchers; state policymakers; advocates; providers and leaders in the early childhood arena, and staff at the Maher Charitable Foundation. In addition, I reached out to a small group of other individuals from elsewhere in the country as I began to explore solutions.
2. An Internet search to familiarize myself with the early childhood policy landscape in New Jersey including reports; state regulations; materials relating to the various court decisions in the Abbott case, as well as a more general exploration of national industry data.
3. The author's consulting and professional experience.

Nineteen of the key informants were familiar with conditions typical of early childhood facilities in New Jersey. Six key informants served as resources regarding strategies for improving the physical environment in center-based early childhood programs.

Appendix D: Building Quality Physical Environment

Building Type

Buildings provide outward indications of their use. That is because a building's function strongly influences its design. Size, construction materials, siting, and architectural features provide readily identifiable cues as to its use. "Building type" is the term used to categorize properties by their use. Familiar categories include residential, retail, commercial, hotel, etc. There are all kinds of special-purpose buildings, such as carwash, theater, or self-storage facility. Their use and function are readily identifiable. Key informants interviewed for this project recognized that this is not the case when it comes to most early childhood facilities; they were not specifically designed for full-day care for very young children.

Building types emerge gradually over time from successive construction projects as architects, builders and occupants learn, through a building's use, how it performs and what characteristics best satisfy the user's functional requirements. It is an evolutionary process. Thousands of schools have been constructed over decades. While designs evolve as technology and societal expectations change, schools remain an easily identifiable archetype.

Unlike primary and secondary schools, few early childhood programs have the operating margins and capital to construct purpose-built facilities. Thus, there is limited experience from which a distinctive child development center building type could have emerged. Early childhood programs tend to locate in existing buildings constructed for a different use. Even newly constructed early childhood centers have very limited budgets and therefore have a generic quality. Only a very small tier of employer subsidized child care centers or philanthropically supported ones, like Educare, have the wherewithal to fashion a physical environment thoroughly designed to function optimally for group care of young children. Yet it is through a trial-and-error process that successive purpose-built structures yield a refined set of features and characteristics that make their use an immediately identifiable archetype.

Figure 11: *Typical American elementary school building. (Photo Source: Carl Sussman)*

Figure 12: *Load bearing columns required to create a classroom-sized space in a structure built for another purpose. (Photo Source: Carl Sussman)*

Most people think of a child care facility as a school, like the one shown in figure 11. After all, schools possess two prominent characteristics needed in child development centers: outdoor play space and a structure composed primarily of spacious "classrooms" to accommodate groups of children. The dimensions of these rooms dictate long structural spans that can support uninterrupted space. Otherwise, a forest of loadbearing columns interferes with a room's use, as shown in figure 12. Despite these two similarities, a school is an imperfect metaphor for an early childhood building type.

While the interviewees participating in this project often described centers as school buildings, they invariably added a caveat: the building should not be institutional -- a quality many associate with the wide corridors, enrollments typical of traditional schools, and voluminous, sterile box-like classrooms similar to the one in figure 13. These buildings lack the intimate scale many feel early childhood facilities need. Interviewees expressed the belief that centers ought to be more home-like. It is hard to think of two less similar building types than the typical elementary school and a residence. Pressed further interviewees described specific features that early childhood programs should have but are atypical of school buildings:

Figure 13: *A public school classroom used by a preschool child care center. (Photo Source: Carl Sussman)*

- Bathrooms directly adjacent to and accessible from each classroom rather than a boys' and girls' bathroom shared among all the classrooms on a corridor.
- Classroom sinks for handwashing; a variety of activities, from painting to waterplay, as well as adult height sinks.
- Indoor multi-purpose space that can accommodate gross motor activities and special projects.
- Playground with natural elements, such as turf rather than being largely covered in some combination synthetic materials.
- Ample natural light.
- Favorable acoustics.

An intriguing and prominent theme in the interviews and in the literature is the emphasis on a home-like environment. Yet residential structures provide poor environments for group care of young children. Some small center-based programs (not family or large-family child care programs) do locate in residential buildings. They string three or four modest residential rooms together to accumulate enough space for a licensable classroom. (See figure 14). The resulting linear configuration, however, scarfs up a disproportionate amount of space for internal circulation and yields narrow and poorly defined activity areas on either side.

Figure 14: *A single-family house converted into a small child care center. (Photo Source: Carl Sussman)*

Early childhood facilities need to abandon the vocabulary of schools. If the quality early childhood experts feel a center should evoke is home, the field should substitute the term "homeroom" or "home base" for "classroom." While the internal configuration of the classroom is most important, figure 15 shows a center in which the architectural treatment of the classroom entryways evoke this notion that a center should feel home-like.

Figure 15: *A center's classroom entries designed to evoke a home-like feel. (Photo Source: Children's Investment Fund)*

Some Key Considerations

In moving toward a distinctive building type, six elements of the physical environment deserve priority attention:

- Bathrooms
- Classroom size and crowding
- Room configuration and shape
- Acoustics
- Indoor air quality
- Auxiliary spaces
- Natural playscapes

Bathrooms: Early childhood professionals recognize that toileting is a poorly managed function in programs. One interviewee reported, "Bathrooms are the biggest challenge, especially in church buildings." The problem exists in many other types of buildings pressed into service for early childhood programs. Because of the construction cost to extend the plumbing system, rehabilitating or constructing a building with bathrooms adjacent to each classroom is extremely expensive. Consequently, as the interviewee continued, "everyone must [leave the classroom] and walk down the hall [to reach a bathroom]. It takes time from the day and interactions – the quality things we would like to see." Since children must be accompanied while they are outside the classroom, "bathroom use creates coverage issues in the classroom." Toileting also requires staff to set and enforce more behavioral limits and leads to more regimentation since groups of children are taken to the bathroom, requiring a teacher to occupy children in a corridor while they wait for classmates to finish using the restroom.

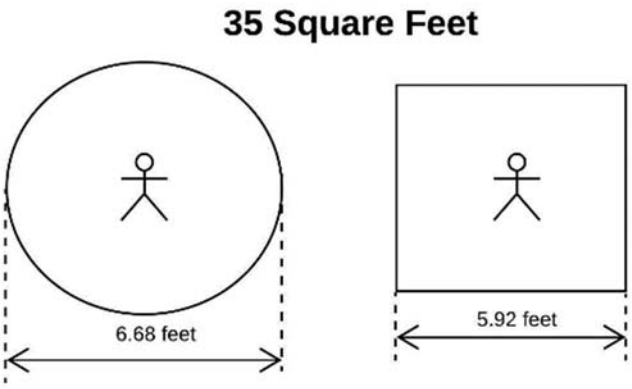
The School for Young Children, a lab school for the early childhood education program at St. Joseph's College in West Hartford, Connecticut, is a high-quality NAEYC accredited center. The college operates the center to provide hands-on experience to aspiring preschool teachers. Before her retirement, Prof. Carlota Schechter's assigned students in her research methods course an observe children at play in classrooms. Students were required to work their way through the list of children in the classroom. They observational exercise. Students observed each child for 30 seconds, classifying and recording the type of activity the child was engaged in. They also noted whether the child was interacting with one of the teachers. Each year they found teachers interacted with a child during three percent of the observations. One year, however, this natural experiment produced a very different result. Teachers were interacting with children during twenty-two percent of the observations: a seven-fold increase.

This prompted a search to explain the anomalous result. The curriculum and teaching staff were unchanged. They determined the only difference between the prior years' observations was the center's relocation from a basement to a free-standing building that had been rehabilitated to house the program. The most significant difference was the provision of bathrooms in each classroom, enabling children to use the facilities without a teacher leaving the classroom. During a follow-up focus group with the teachers to better understand how the new site had affected the program, the staff agreed that the classrooms were calmer too; a change they attributed to more generously proportioned classrooms. Afterwards the center director, Beth Bye, who is now Connecticut's Commissioner of the Office of Early Childhood, demurred. The added square footage may have been a contributor, but she suspected classroom coverage was the more likely contributor to both the increased staff-child interactions and the calmer classroom atmosphere.

***Figure 16 a and b**: Easily accessible and supervised bathrooms adjacent to classrooms with child-size fixtures. (Photo Source: Carl Sussman)*

Bathrooms in the classrooms, like those pictured in figures 16 a and b, illustrate Malaguzzi's third teacher. Classroom teachers have more time to interact constructively with children; classroom management involves less regimentation and limit-setting, and children have greater autonomy in addressing their physical needs.

Classroom Size and Crowding: What is the source of the almost universally accepted 35 square foot per child classroom licensing standard? A 2003 blogpost titled "The Great 35 Square Foot Myth" speculates that "it has its origins in health department studies that elementary school children need a minimum of 35 square feet per student to prevent the spread of communicable diseases in the classroom." Interestingly, the social distancing guidelines for the COVID-19 pandemic provide some validation for this theory. The latter's six-foot social distancing metric comes from pre-existing Centers for Disease



Control and Prevention guidance to doctors examining patients with respiratory diseases. If this is indeed the rationale for this standard found in child care facility licensing regulations, there are two problems. First, children do not, and are not expected to maintain six feet of separation from each other, a reality state regulators are grappling with today amid the coronavirus pandemic. However, if you could maintain that distance, as the accompanying diagram illustrates, a child standing in the center of a 35 square foot circle or square has almost exactly a 6-foot margin between themselves and others.

Despite this plausible public health rationale, 35 square feet per person results in a relatively high-density. Dwelling unit crowding, according to the U.S. Census, "occurs if there is more than one person per room; severe crowding occurs if there are more than 1.5 persons per room (excluding bathrooms, balconies, porches, foyers, hall-ways and half-rooms)." The US Department of Housing and Urban Development's occupancy standards require a *minimum* of 70 square feet for a bedroom for one person and 100 square feet for a shared one. If, like a classroom, a space is densely occupied for much of the day, indoor air quality will deteriorate without an exceptionally good ventilation system.

In addition to the physical health ramifications of overcrowding, there is evidence that it creates a stress-related risk to mental health and can affect a child's intellectual development. Alain Legendre conducted a frequently cited study for the French National Center for Scientific Research. He measured the stress hormone cortisol levels among young children in child care. Legendre found that 54 square feet of accessible play space per child is required to minimize children's stress levels. According to the 35 square foot blogpost cited above, Legendre's research "showed that access to adequate space reduces the occurrence of competition and conflicts and promotes the development of positive interactions between children."

The national health and safety performance standards for early care and education programs, *Caring for Our Children*, advises "forty-two square feet of usable floor space per child. A usable floor space of fifty square feet per child is preferred." The Abbott classroom requirement for 50 square feet of usable space per child satisfies this higher standard and is 43% more space than required by licensing. Abbott's measurement of "usable" floor area excludes space for circulation within the classroom, tables, chairs, and lofts. These exclusions mean Abbott classrooms, at least in theory, should have significantly more space and ought to be less stressful environments. The Abbott standard can also accommodate a greater variety of activities. A square footage standard has the virtue of being objectively measurable. Still, it is a one-dimensional way to judge something as complex and multidimensional as a classroom's

spatial quality. The national performance standards note "that other factors must also be considered when assessing the context of usable floor space for child care activities."[11]

Apart from Abbott classrooms, available evidence suggests that most children attending center-based child care programs spend their days in unusually crowded circumstances, especially when the length of the day and effectiveness (or even the existence) of ventilation systems are factored into the evaluation.

Room Configuration: If early childhood professionals express a preference for a home-like ambiance, classrooms for young children should perhaps be reimagined as a "home" composed of physically differentiated areas that have room-like qualities. Except for windows and doors, classrooms tend to be uniformly undifferentiated rectangular boxes. Teachers use furnishings – shelves, tables, area rugs and chairs – to define activity areas. Building a plain vanilla box is economical and has the virtue of flexibility.

Figure 17 a, b and c: *In effect, this infant room has been constructed to form within it three rooms that support three different functions and ambiances. (Photo Source: Carl Sussman)*

[11] American Academy of Pediatrics, American Public Health Association, National Resource Center for Health and Safety in Child Care and Early Education. 2011. Caring for our children: National health and safety performance standards; Guidelines for early care and education programs. 3rd Edition. Elk Grove Village, IL: American Academy of Pediatrics; Washington, DC: American Public Health Association.

But these minimally subdivided spaces leave intact the experience of drifting in a spiritless and relatively homogeneous void lacking in intimacy.

A critical quality in any building is its scale: the size of building elements relative to some standard. Most people instinctively use their own bodies as that standard. We experience space in terms of its "human scale." A classroom with 20 preschoolers, even with the minimal 35-square feet, yields a 700 square foot room. The dimensions of a room that size might measure 20 by 35 feet: a space far larger than any room a person would experience in an ordinary residential setting. A classroom that size is especially out of scale for its young occupants, even after using furniture to subdivide it into smaller units. Conceptually, early childhood programs might strive to achieve classrooms that enclose a "houseful" of smaller room-like enclosures. Figure 17a - c illustrate what this looks like at one center. Without building fully enclosed spaces, the partition walls between these three zones and the adjoining common area create better defined spaces, which are differentiated in terms of use. This separation reduces the distractions caused by activities in adjacent activity areas and introduces a more human scale.

There are, however, less costly design strategies for using architecture, rather than furniture, to create activity areas that users experience as more intimate. Architects achieve this effect by departing from the conventional rectangular floor plan. There is a modest literature, for example, about the advantages of L-shaped classrooms. This shape adds a fifth internal corner to the room's contours and leaves the visual sense of two rooms as shown in figure 18. Why corners? Anita Rui Olds explained it this way:

> The first priority in developing a room plan is to use the room's protected regions and its corners well. Protected regions are best for quiet activities and places of rest and retreat, and for building activities such as small unit blocks, construction toys, and manipulatives that need to be safeguarded from intrusion by traffic while being played with.[12]

Figure 18: *An L-shaped classroom. (Photo Source: Carl Sussman)*

Prospect/refuge theory is a design concept rooted in evolutionary psychology. It posits humans are instinctively drawn to protected places that also afford a way to inconspicuously surveil their surroundings. Think of the Mesa Verde's cliff dwellings. Corners have that property.

Another strategy for adding corners – one that also produces the sense of greater enclosure, intimate scale, and separation from adjoining activity areas – is to design alcoves into the floorplan as shown in figures 19 a thru d. The image in the upper right-hand corner of figure 19 is a lower cost method of

[12] Olds, A.R. (2001). *Child Care Design Guide*. McGraw Hill: New York, NY.

creating an alcove without altering the building's perimeter wall. In this case, a custom-built cot storage unit is used to separate two adjacent activity areas. A suspended faux soffit further reduces the scale of the activity area.

Figure 19 a thru d: *A variety of ways to create alcoves. (Photo Source: Carl Sussman)*

Adding corners and altering the shape of the classroom is a two-dimensional exercise. Buildings, however, are three dimensional. Distinctive spaces can be carved out of larger classrooms by taking advantage of that third dimension. Platforms, lofts, and soffits can further define and separate activity areas within the classroom. These elements have the further advantage of fashioning spaces with dramatically different properties. As figures 20 a thru d illustrate, platforms and lofts, besides providing vertical separation, offer different vantage points and, with less height between children and the ceiling, manifest a more intimate child-scaled environment than is available in other parts of the classroom. These images illustrate how an undifferentiated rectangle can be retrofitted to achieve these

Figure 20 a thru d: *Lofts yield special places for children because of their child-friendly proportions and, in the bustle of a classroom with 10, 15, or 20 children, a sanctuary of relative calmness. (Photo Source: Carl Sussman)*

Figure 21: *Combining a platform and a soffit. (Photo Source: Carl Sussman)*

goals. Figure 21, on the other hand, illustrates how an architect used both a soffit and platform to achieve a similar effect. A classroom that has these more distinctive and differentiated spaces, while still technically part of a far larger room, can transform the classroom into a residentially scaled structure harboring a series of unique and more home-like rooms.

Finally, one particularly imaginative example of how to use platforms is an infant classroom pictured in figure 22. Infants can crawl and climb their way up to the windows. The plush blue rectangular fabric built into

the first level of the platform is a waterbed, which provides a challenging surface for crawlers to navigate. It also provides a soothing motion that permits a teacher to comfort a child with one hand on the infant's back while the other is available to attend to the needs of another child.

Figure 22: *A landscape of platforms in an infant room. (Photo Source: Carl Sussman)*

Acoustics – Children are sensory-motor learners. They learn through their physical and sensory interactions with their environments This includes the acoustical environment. Classroom acoustics receive far too little attention.

A big space occupied by a group of eager children generates sound waves that ricochet off surfaces and meld into a stew of acoustical and auditory adversities. Loudness is a problem in and of itself. It can be annoying and distracting for children, interfering with attention and concentration. Additionally, as the national health and safety performance standards for early care and education programs point out, excessive noise can lead to hearing loss.[13] The other frequently encountered acoustical property that interferes with audibility is reverberation – sound that does not dampen quickly enough. It makes deciphering sounds especially difficult.

These classroom acoustical properties affect communications in ways that are especially significant in early childhood settings. Most notably, ambient or background noise levels generated by a classroom full of young children and the muddling effect of reverberation present significant auditory challenges for children who are still acquiring language. It is also a tricky environment for teachers simply trying to get the attention of and communicate with a classroom full of children.

From an acoustical engineering standpoint, one measure of degree to which background noise interferes with communications is by computing a ratio of signal, a teacher's voice for example, to the surrounding sound level. To communicate with a child, the sound of a teacher's voice must be louder than the background noise level. Speech is easy to decipher when the signal-to-noise ratio is high. But as that ratio approaches or dips below 1-to-1, speech becomes increasingly unintelligible. That ratio rapidly diminishes with distance. So, when it comes to getting the attention of the entire class, background noise often requires a teacher to raise her voice or yell. The national health and safety performance standards offer a more practical metric that does not require measurement devices or acoustical engineers: classroom acoustical conditions should not affect "the ability to be clearly heard and understood in a normal conversation without raising one's voice."

"The importance of an optimized classroom listening environment is critical," according to Dr. Nancy L. Vause, Director of the Walter Reed National Military Audiology and Speech Center, "since children

[13] Ibid., p. 211.

without phonemic awareness find it difficult to learn to read and write" in a setting that impedes hearing. She also notes that, "noise does not affect everyone equally; children have differing levels of sensitivity to noise. Its impact is particularly deleterious for children with English as a second language (ESL) or who exhibit attention deficits, developmental delays, speech, language, or learning disabilities…"[14]

While it is easy to focus on acoustical problems, sound is also a positive aspect of our sensory experience. There are many creative ways to constructively expose children to listening and to sounds in general. Windchimes and musical instruments are commonly introduced sources of sound as part of the sensory experience in classrooms. Almost every early childhood classroom appears to have a boombox teachers use for musical activities. When investments are made to improve the physical environments, more thought should be given to replacing the boombox with built-in or wireless speaker systems that do a better job reproducing sound and even allow teachers to use their smart phones to address the entire class without needed to yell.

Indoor Air Quality – As described earlier in this report, high-density occupancy is characteristic of child care centers. Moreover, many lack mechanical ventilation systems that exhaust stale air from the facility and replaces it with fresh air. Still fewer have filtration systems to remove contaminates from the air. Without a continuous flow of fresh air, routine human activity and respiration causes carbon dioxide to reach levels that affects physical comfort, mental acuity, and health. Carbon dioxide levels, because of its association with poor ventilation, is often used as a proxy for the presence of other unhealthy contaminates, some of which can trigger an asthmatic attack in children susceptible to that condition. According to one researcher, even in children and adults without health conditions "poor indoor air quality is associated with nasal discharge, eye irritation, throat dryness, headache, irritability, and lethargy."[15] The national health and safety performance standards include a caution that is particularly attention-grabbing since the emergence of COVID-19:

> Indoor air pollution is often greater than outdoor levels of air pollution due to a general lack of adequate air filtration and ventilation. The presence of dirt, moisture, and warmth encourages the growth of mold and other contaminants, which can trigger allergic reactions and asthma. Children who spend long hours breathing contaminated or polluted indoor air are more likely to develop respiratory problems, allergies, and asthma.

Even if the air is not causing any health problems, high levels of carbon dioxide can still lead children and staff to experience headaches, restlessness, and malaise; conditions that are inconsistent with a good day.[16]

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[14] Nancy L. Vause "Hearing Ergonomics for Children: Sound Advice," in Lueder and Berg Rice, p. 111.
[15] Lorraine E. Maxwell, "Preschool/Day Care" in Rani Lueder and Valerie J. Berg Rice, editors, *Ergonomics for Children: Designing Products and Places for Toddler to Teens*, Taylor and Francis, New York, 2008, p. 661.
[16] Viewed at http://www.aerias.org/DesktopModules/ArticleDetail.aspx?articleId=138&spaceid=2&su on August 30, 2010.

Auxiliary Spaces – Cost is a factor that drives many facility decisions. As a fixed overhead expense, it is not surprising that classroom space is minimized, and other space requisites often get overlooked. The typical list of inadequately provisioned areas includes storage; a comfortable teacher lounge; separate adult restrooms; meeting space for staff; a welcoming reception area; multi-purpose space for indoor gross motor and other activities, and adequate outdoor play space that provides contact with nature.

Just as public schools have special purpose spaces such as gymnasiums, cafeterias, art rooms, science labs and auditoriums, young children can benefit from a wider set of opportunities than can be afforded in a classroom. And while transitions can always be challenging, there is a lot to be said for a change of scenery during the day. Figures 23 a thru d provides some examples of what these spaces can look like.

Figure 23 a thru d: *These photographs show an art studio (upper left); kitchen dedicated to cooking activities with children (upper right); a cozy library/reading room for small* groups (lower left), and a subdivided multipurpose area for both gross motor and arts activities (lower right). *(Photo Source: Carl Sussman)*

As the name suggests, multipurpose spaces can be used for more than gross motor activities. While 3 of the 4 images in figure 23 are single purpose settings, they hint at the potential to create a flexible environment outside of the classroom for emergent project-based learning activities, like the ateliers found in the municipal preschools in Reggio Emilia, Italy. The fourth image shows a center that has created adjoining spaces for gross motor and arts activities. The point, however, is that centers ought to provide a greater range of environments. It is asking a lot of a classroom, even with the range of activity

areas they can sometimes accommodate, to provide the variety of uses that will keep children engaged for most of the day, day in and day out. Classrooms seem too insular and static to provide the stimulation and experiences young children need.

Figure 24 a and b: *Two views of a multi-purpose adult space incorporated into the center's reception area. Parents congregate at the beginning and the end of the day. It is used after hours for cooking classes and other parent and community activities. (Photo Source: Carl Sussman)*

Other auxiliary spaces that receive short shrift are those welcoming parents. Without using the term "behavior setting" (see sidebar on p. 29), one interviewee observed that parents accompany their children to their pre-K classroom in community-based programs interact with the teachers and other parents. But in her experience, when pre-K classrooms are in the district's elementary school building, parents are expected to leave their children at the entrance, just as the parents of the school's older

Figure 25 a and b: *Two views of the entry at another center designed to create a welcoming, home-like living and dining room area for parents to congregate. Coffee and tea are available in the kitchenette. (Photo Source: Carl Sussman)*

children do. This may be atypical. However, it illustrates how the institutional component of a behavior setting affects the way parents, children and teachers interact. A best practice common in high-quality child development centers is the provision of physical settings designed to encourage such interactions. For example, Figures 24 a and b show a flexible and sun-drenched adult-oriented area furnished with high-top tables and stools. The tables, on casters, can be easily rearranged to fashion a counter for the teaching kitchen built into the far wall or separated to create a café-style ambiance. Parents congregate around these tables in the morning and late afternoon in part because the design lends itself to this type of informal gathering; but also, in part because the program emphasizes parent engagement in the life of the center. While parents linger there, it is a space where the center's family advocates make themselves available as brokers for a wide variety of services offered by community partners. Figures 25 a and b illustrate another center's more informal and "homey" approach to achieve the same type of behavior setting.

Natural Landscapes – The same can be said for outdoor play spaces. Many early childhood playgrounds have a single climbing structure. Too often these structures sit like islands surrounded by a sea of synthetic surfaces. Even in newly developed facilities, "value engineering" – the process of removing costly items during construction to compensate for unexpected outlays – most often impact playgrounds. These value engineering decisions are rationalized with the thought that future fundraising will permit the playground construction to proceed later. Sometimes this happens. But sometimes it does not.

Figure 26 shows two playgrounds that provide natural elements, storage for loose parts, changes in topography, provision for waterplay, and natural shade where other centers might have a single expensive climbing structure. It does not always require a great deal of expense to equip an

Figures 26 a and b: *Playgrounds emphasizing nature and less rigidly structured play equipment. (Photo Source: Carl Sussman)*

outdoor environment with elements that have a lot of play value. Figure 25 a and b, below, illustrates how a fallen tree, a no longer seaworthy boat, and an inexpensive culvert pipe can expand outdoor play options.

Figures 23 a and b: *Sometimes simple and relatively inexpensive elements can prove to have a great deal of play value. (Photo Source: Carl Sussman)*

Strong programs embedded in dynamic organizations will struggle to achieve great child outcomes without the physical environments that create comfortable, productive, and stimulating places to work; spaces where children have more autonomy and can develop the executive functions that support academic success, and settings where parents build supportive relationships and find the resources they need to succeed as their child's first teacher, champion, caregiver, and breadwinner.

This appendix highlights some of the features frequently lacking in early childhood facilities. Their provision will not transform a center with a weak organizational environment, or a below par programmatic environment, into a setting that can close the educational achievement gap. But strong programs embedded in dynamic organizations will struggle to achieve great child outcomes without the physical environments that create comfortable, productive, and stimulating placed to work; spaces where children have more autonomy and can develop the executive functions that support academic success, and settings where parents build supportive relationships and find the resources they need to succeed as their child's first teacher, champion, caregiver, and breadwinner.

About the Author

Carl Sussman, the principal of Sussman Associates, is an MIT trained development planner. For 15 years he served as the founding executive director of the Community Economic Development Assistance Corporation, a quasi-public authority in Massachusetts that supplies capital and technical assistance for affordable housing and community facilities. For the past 30 years his professional activities have focused on the development, design, and financing for early childhood facilities serving low income children.

In 1990 Sussman helped launch and led the Children's Investment Fund, the first development finance organization devoted exclusively to the facility needs of early childhood programs. He now serves on the Fund's board of directors.

He was a founder of the National Children's Facilities Network, an association of over two dozen community development finance institutions seeking to support expanded investment in community-based child care facilities. For 12 years Sussman served as the senior technical consultant to the Local Initiatives Support Corporation's (LISC) initiative to strengthen capital improvements in the early childhood sector in low-income neighborhoods, the Children's Investment Collaborative for Kids.

Sussman is the author of a peer-reviewed article on child care facilities development; "Out of the Basement" in NAEYC's journal, *Young Children*. He is the lead author or co-author of most of LISC's guides on the design, development, and finance of child care centers. He is the lead author of the National Institute for Early Education Research's (NIEER) policy analysis, *Building Early Childhood Facilities: What States Can Do to Create Supply and Promote Quality* (2007). Sussman developed an observational rating scale for early childhood facilities, *Physical Environments for Early Learning* (PEEL); a tool that has been used in two evaluations of public financing programs for child care facilities.

During his consulting engagements and research over the past 30 years Sussman has visited more than 150 child care and Head Start centers in low-income communities in 15 states.